Hawaii Statewide Transportation Plan

DRAFT - November 2022

Hawaii Statewide Transportation Plan

Draft

November 2022

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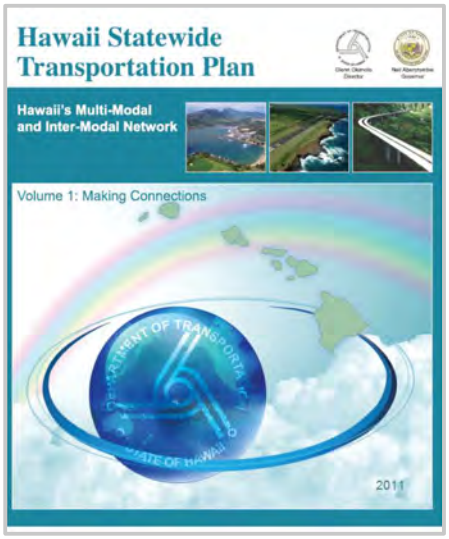
Acronyms and Abbreviations

ADA	Americans with Disabilities Act
BCR	benefit cost ratio
CBO	community-based organization
CCH	City and County of Honolulu
CFC	customer facility charge
CIP	Capital Improvement Program
COVID-19	novel coronavirus of 2019
DBEDT	Department of Business, Economic Development & Tourism
DBFOM	design-build-finance-operate-maintain
DLNR	Department of Land and Natural Resources
DTS	Department of Transportation Services
EV	electric vehicle
FAST	Fixing America's Surface Transportation
FHWA	Federal Highway Administration
FY	fiscal year
GET	General Excise Tax
GHG	greenhouse gas
HART	Honolulu Authority for Rapid Transportation
HCEOC	Hawaii County Economic Opportunity Council
HDOT	State of Hawaii Department of Transportation
HI	Hawaii
HiRUC	Hawaii Road Usage Charge
HSTP	Hawaii Statewide Transportation Plan
HSHSP	Hawaii Strategic Highway Safety Plan
MDOT	Maui Department of Transportation
MEO	Maui Economic Opportunity, Inc.
MPO	metropolitan planning organization
MTA	Mass Transit Agency

NHS	National Highway System
NREL	National Renewable Energy Laboratory
OahuMPO	Oahu Metropolitan Planning Organization
OTS	Oahu Transit Services, Inc.
P3	public-private partnership
PAB	Private Activity Bonds
PFC	passenger facility charge
PMT	Project Management Team
RAISE	Rebuilding American Infrastructure with Sustainability and Equity
SAC	Stakeholder Advisory Committee
SOEST	University of Hawaii School of Ocean and Earth Science and Technology
STAC	Statewide Transportation Advisory Committee
STIP	Statewide Transportation Improvement Program
STP	Statewide Transportation Planning
SubSTAC	Sub-Statewide Transportation Advisory Committee
TAMP	Transportation Asset Management Plan
TBD	to be determined
TDM	transportation demand management
TNC	transportation network companies
TOD	transit-oriented development
TSA	Transportation Safety Administration
TSMO	Transportation Systems Management and Operations
USACE	U.S. Army Corps of Engineers
VMT	vehicle-miles traveled
ZE	zero-emission
ZEV	zero emission vehicle

1. Introduction

Transportation is the lifeline to and backbone of our state—it boosts economic growth and productivity by enhancing the labor force's access to jobs, opens new avenues for opportunities and business, and improves the supply chain. As a geographically isolated community, we need to continuously plan and invest in our transportation infrastructure because it is in constant use and vital for our survival.



2011 HSTP

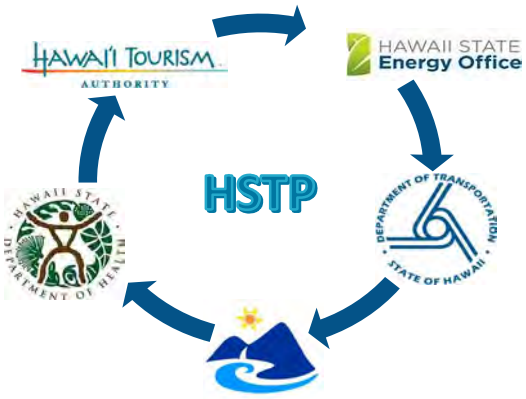
The Hawaii Statewide Transportation Plan (HSTP) establishes the framework to be used in the planning of the statewide transportation system. The HSTP provides policy-level guidance to coordinate the planning for all modes of transportation—the air, water, and land systems—as well as the connections between these modal systems. The plan provides collaborative objectives for both the HDOT's interisland and major highway planning and the counties' intra-island surface transportation planning responsibilities.

The HSTP is updated approximately every 10 years and provides an outlook for 20 to 25 years. The last HSTP was completed in 2011 (HDOT 2011b); this updated HSTP 2045 is intended to provide a look forward and guidance for the transportation system in the state through 2045. As part of this current effort to update the HSTP, the plan considers emerging trends, demographic shifts, and policies that could impact transportation policy in the state.

1.1 Purpose of the Plan

The HSTP was established by Hawaii Revised Statutes, Chapter 279A, to do the following:

1) Establish a comprehensive, multimodal statewide transportation planning process to develop coordinated transportation plans,
2) Address the obligation of the statewide transportation system to clearly serve and address social, economic, and environmental objectives, and
3) Provide a connection to and encourage coordination with the State's goals and other State agencies, such as the Department of Health, State Office of Planning, and Department of Business, Economic Development & Tourism.

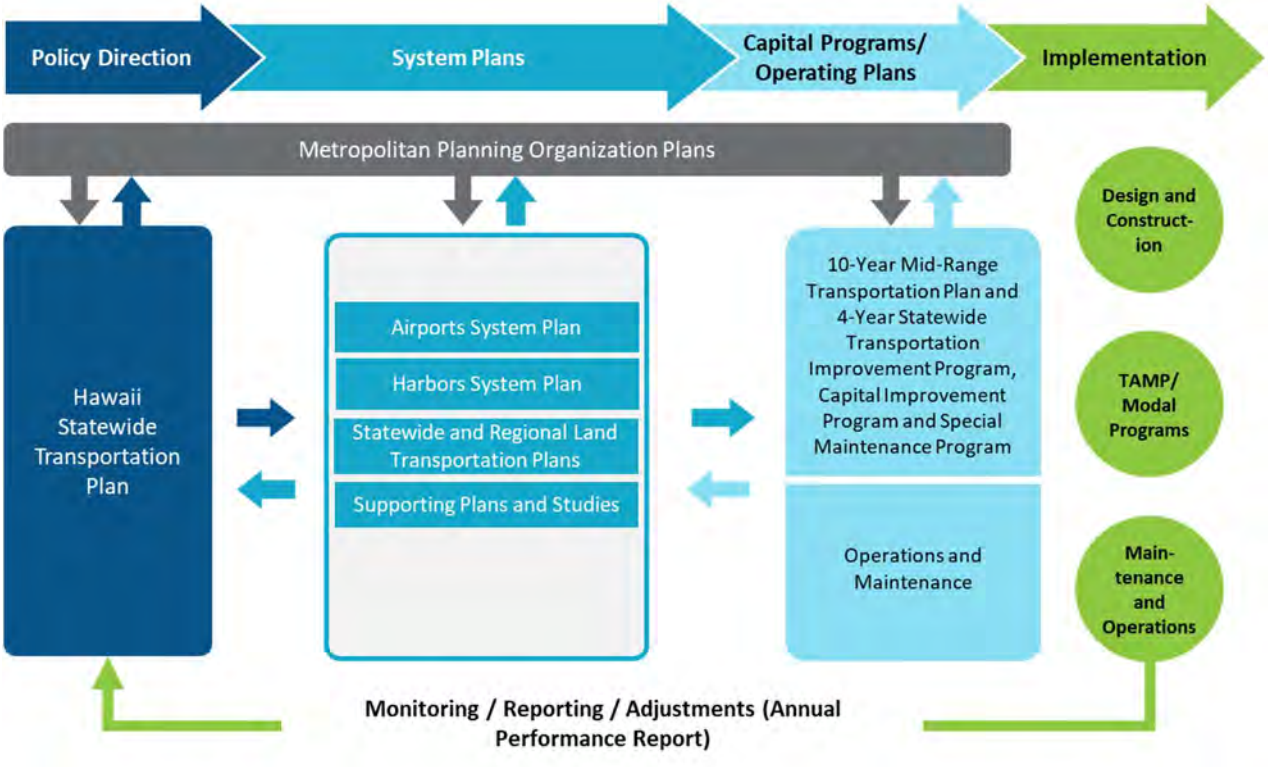


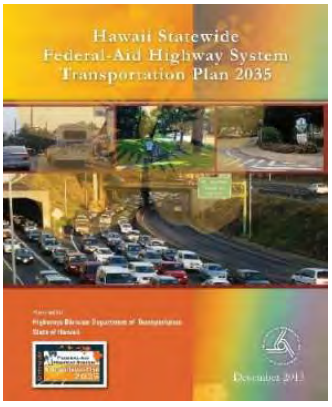
Hawaii Revised Statutes Chapter 279A specifies that the HSTP is the primary responsibility of the HDOT, with additional cooperation from and the continuing involvement of county governments.

1.2 Hierarchy of Plans

The HSTP is the overarching policy document that guides the system-level and master plans of the three primary modes of transportation (Exhibit 1-1). It establishes the framework to be used in the planning of Hawaii's transportation system and develops a process to work with the counties to delineate the coordination of the State's responsibilities for interisland and major highway transportation system planning and the counties' responsibilities for intra-island surface transportation planning.

Exhibit 1-1. HDOT Family of Plans





Working from left to right on the family of transportation plans and programs shown on Exhibit 1-1, the HSTP is on the far left side, setting the direction and establishing policies for the state planning of Hawaii's transportation system. Immediately to the right are the statewide system plans for each mode, such as the statewide long-range land transportation plan for highways, the *Statewide Federal-Aid Highways 2035 Transportation Plan* (HDOT Highways Division 2014a). This category also includes the statewide and regional land transportation and master plans for various districts and facilities. It also includes modal plans such as the *Hawaii Statewide Freight Plan* (HDOT Highways Division 2018), the *Statewide Pedestrian Master Plan* (HDOT 2013a), and the *Honolulu Harbor 2050 Master Plan*.

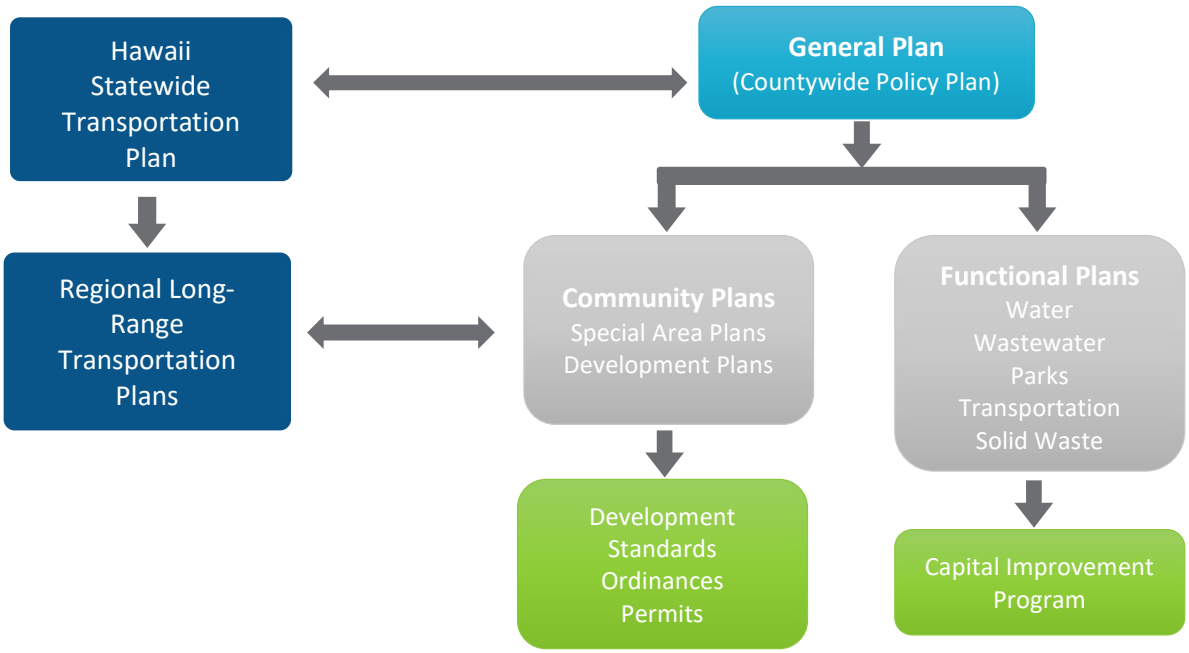
Moving further to the right, the programming level follows, where projects are funded and programmed to proceed. Examples of this are the Capital Improvement Program (CIP) or the Statewide Transportation Improvement Program (STIP).

Lastly, implementation includes the phase where projects are developed and constructed. This includes the environmental, design, construction, and operations and maintenance phases.

As with any system of plans, it is good practice to monitor the goals and objectives, report on the actions taken, and assess whether those strategies or actions helped to achieve the goals and objectives. This feedback loop is important. If the goals and objectives are not being achieved, the plan and strategies should be adjusted to try something else.

The HSTP also provides overarching policy direction for the city and counties' family of plans. Exhibit 1-1 shows how the HSTP influences and provides overarching guidance to the counties' general plans. The exhibit also shows how the Regional Land Transportation plans provide regional direction to the Community Development Plans and Functional Transportation plans.

Exhibit 1-2. Typical City and County Family of Plans



1.3 Coordination with Other Plans

As part of this HSTP 2045, the planning team reviewed federal and state policies, plans, and programs relevant to the HSTP's development. These reviews captured major components related to and aligned with the federal nationwide goals and performance measures defined in the United States Code and ensured the HSTP addressed modes and users comprehensively. The objective of the HSTP is to provide guidance to system-level and master plans of the three primary modes of transportation under HDOT's jurisdiction as well as non-motorized modes and intermodal connections.

The review of previous studies, plans, and policies is an important first step to ensure that the HSTP builds effectively on previously adopted plans and policies and will be compliant with federal, state, regional, and local requirements.

1.4 Federal Plans, Policies, and Programs

Federal transportation policy and planning programs generally provide direction and funding mechanisms for statewide or regional plans or programs. Federal transportation planning policies are intentionally broad to allow states and regions the flexibility to tailor policy implementation that works for their geography and population. Appendix B, Plan and Policy Review, includes a summary of each of the plans, policies, and programs reviewed and descriptions of their relevance and applicability to the HSTP. The following plans, policies, and programs were examined:

- Surface Transportation Reauthorization – Fixing America's Surface Transportation (FAST) Act
- Title 23: Highways, *Code of Federal Regulations* Part 450 Planning Assistance and Standards, Subpart B – Statewide and Nonmetropolitan Transportation Planning and Programming
- Title 46: Shipping, *Code of Federal Regulations* Part 393 America's Marine Highway Program
- Title 49: Transportation, *Code of Federal Regulations* Part 613 Metropolitan and Statewide and Nonmetropolitan Planning, Subpart B – Statewide and Nonmetropolitan Transportation Planning and Programming
- United States Code Title 23 Highways, Section 135, Statewide Transportation Planning
- United States Code Title 23 Highways, Section 150, National Goals and Performance Management Measures
- United States Code Title 46, Section 55601, Short Sea Transportation Program
- United States Code Title 49 Transportation, Section 5304, Statewide and Nonmetropolitan Transportation Planning
- United States Code Title 49 Transportation, Chapter 471, Airport Development

NATIONAL GOALS

U.S.C. Title 23 Highways, Section 150(b)—It is in the interest of the United States to focus the Federal-aid highway program on the following national goals:

(1) SAFETY.—
To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

(2) INFRASTRUCTURE CONDITION.—
To maintain the highway infrastructure asset system in a state of good repair.

(3) CONGESTION REDUCTION.—
To achieve a significant reduction in congestion on the National Highway System.

(4) SYSTEM RELIABILITY.—
To improve the efficiency of the surface transportation system.

(5) FREIGHT MOVEMENT AND ECONOMIC VITALITY.—
To improve the National Highway Freight Network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

(6) ENVIRONMENTAL SUSTAINABILITY.—
To enhance the performance of the transportation system while protecting and enhancing the natural environment.

(7) REDUCED PROJECT DELIVERY DELAYS.—
To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

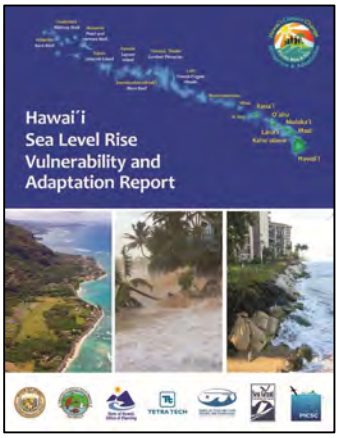
1.5 Statewide Plans and Policies

Statewide transportation policy and planning documents primarily address statewide transportation networks, with some covering all modes. Statewide plans and policies provide a general policy framework for transportation planning and direction for project and program implementation (including guidelines and standards) for HDOT facilities. These plans and policies can also serve as examples for counties to develop their own policies, guidelines, and standards. Appendix B, Plan and Policy Review, includes a summary of each of the plans, policies, and programs reviewed and descriptions of their relevance and applicability to the HSTP.

The following plans and policies were examined:

- Hawaii Revised Statutes, Chapter 279A, Statewide Transportation Planning
- Hawaii Revised Statutes Sections 264-20.5 Complete Streets; Act 54 (May 2009)
- Hawaii Revised Statutes Chapter 261, Aeronautics
- Hawaii Revised Statutes Chapter 266, Harbors
- Hawaii Revised Statutes Chapter 225, Hawaii Climate Change Mitigation and Adaptation Initiative
- *Hawaii Statewide Transportation Plan* (HDOT 2011a)
- *Hawaii Statewide Freight Plan* (HDOT Highways Division 2018a)

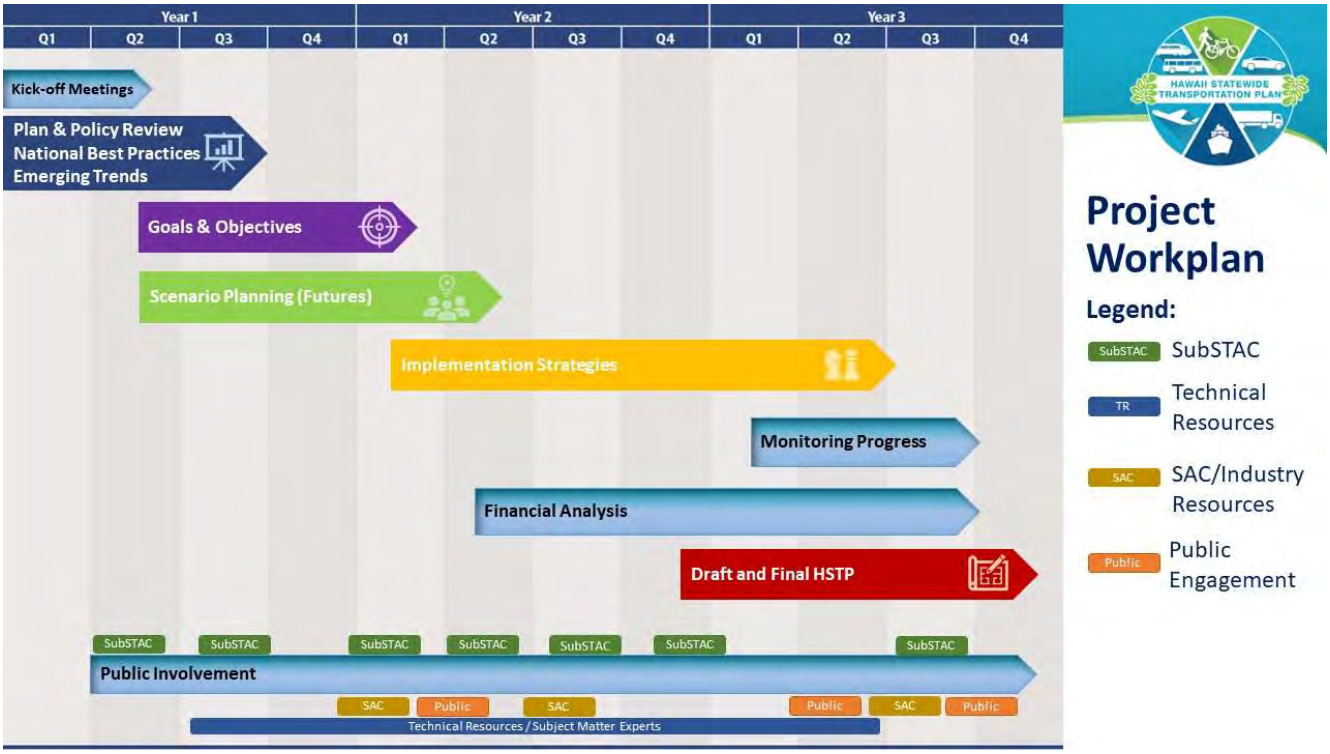
- *Hawaii State Plan Update: Phase 1* (State of Hawaii Office of Planning 2018)
- *Hawaii 2050 Sustainability Plan* (State of Hawaii Office of Planning 2008)
- *Hawaii Sea Level Rise Vulnerability and Adaptation Report* (Department of Land and Natural Resources 2017)
- *State of Hawaii Coordinated Public Transit – Human Services Transportation Plan* (HDOT 2011b)
- *Hawaii Statewide Comprehensive Economic Development Strategy* (State of Hawaii Office of Planning 2016)



1.6 HSTP 2045 Plan Development

The formulation of the HSTP is a stepped process that is grounded by plan and policy guidance (Exhibit 1-3); it investigates trends and scenarios, allowing for robust planning for the future. The key element of the approach is a structured and transparent planning process that clearly identifies major tasks and decision points. All of the project stakeholder groups provided thorough and thoughtful consideration of issues during the major tasks. This helped to ensure that quality decisions were made during each step without the need to revisit any issues later in the process because something of significance had not been considered or was improperly addressed.

Exhibit 1-3. HSTP Workplan



The HSTP planning process consisted of five unique and interrelated elements used to guide the overall plan development (Exhibit 1-4).

Exhibit 1-4. HSTP Planning Process

Public and stakeholder involvement activities, such as meetings and workshops, were integrated into the HSTP formulation process so that stakeholder input shaped the decisions made during major tasks in the planning process. The roles and responsibilities of the primary stakeholder groups are further described in Section 1.7.

1.7 Public Involvement

Note – this section will continue to be updated as public involvement continues through the end of the Draft Plan process.

This section describes the stakeholder groups that were involved during the development of the HSTP and the decision-making process, as well as a summary of the methods used to reach out to the general public. Additional details are included in Appendix A, Public Involvement Process.

1.7.1 Introduction

The public involvement and stakeholder coordination strategy needed to be flexible and adaptable to be effective and appropriate for communicating with and soliciting input from a wide range of diverse communities throughout the state. Periodic stakeholder and public outreach meetings were held throughout the course of the HSTP's development to engage community stakeholders on each island in the best way possible and to reach out to communities that are traditionally underserved. This allowed stakeholder groups and the general public to be informed on the progress of the HSTP and to provide input on a periodic basis.

1.7.2 HDOT Public Involvement Mission Statement

The HDOT is committed to a comprehensive, fair, and transparent public involvement process.

One goal of the Public Involvement Plan was to include an approach that included a pre-structured decision process, clear decision milestones, and well-defined roles and responsibilities. Thorough and thoughtful consideration of issues at each decision point by all interested project stakeholder groups helped to ensure quality decisions that did not have to be revisited because something of significance had not been addressed. In addition, the clear identification of decision points created an expectation in stakeholder groups for staying on task and schedule.

1.7.3 Stakeholders

1.7.3.1 HDOT

The Statewide Transportation Planning (STP) Office was responsible for managing and setting the framework for the HSTP update process. The STP Office's primary role was to endorse the completed plan and forward recommendations to the Director of Transportation for approval. Additional roles included reviewing input from other stakeholders and making recommendations at key decision points during the HSTP process.

1.7.3.2 Project Management Team (PMT)

The Project Management Team (PMT) comprised HDOT staff from the STP Office as well as representatives from the HDOT Airports, Harbors, and Highways divisions. This key group provided technical direction, information, insight, and reviews.

1.7.3.3 Statewide Transportation Advisory Committee (STAC)

The Statewide Transportation Advisory Committee (STAC) advises the HDOT on transportation policies and administrative issues by providing local transportation officials a forum for coordinating discussions on and review of planning, programming, and project development activities. The STAC members consist of the directors from the following agencies:

- State of Hawaii Department of Transportation
- State of Hawaii Department of Business, Economic Development & Tourism
- State of Hawaii Department of Health
- State of Hawaii Office of Planning and Sustainable Development
- State of Hawaii Office of Planning
- State of Hawaii Board of Agriculture (chairperson)
- City and County of Honolulu Department of Transportation Services
- City and County of Honolulu Department of Planning and Permitting
- County of Hawaii Planning Department
- County of Hawaii Department of Public Works
- County of Hawaii Transit Agency
- County of Kauai Planning Department
- County of Kauai Department of Public Works
- County of Kauai Transportation Agency
- County of Maui Planning Department

Public Involvement Policy

The State of Hawaii Department of Transportation (HDOT) recognizes the value of public involvement as a programmatic measure that strengthens and solidifies its transportation programs. HDOT thus encourages the integration of public involvement activities within its projects, beginning with the development of project plans and continuing throughout the life of the projects.

The HDOT Public Involvement Policy supports and encourages broad-based public involvement in the conception, development and enhancement of transportation plans, programs and projects. The policy is directed at the implementation of activities that solicit the involvement of the appropriate target communities. These citizen involvement activities should be open, honest and non-threatening, providing timely public notice, full public access, comprehensive project information, as well as the requisite schedule for early, continuous and active involvement.

This policy encourages partnerships between HDOT and the communities affected by its projects. The partnerships formed by properly implemented public involvement activities produce comprehensive community concerns, thus enabling project managers' informed decision-making. Citizens benefit by the timely dissemination of program requirements, restrictions, budgets, alternatives and the consequences of each alternative. Traditionally underserved and silent populations are provided the opportunity to voice their vital concerns. The partnerships are envisioned as enhancing the public's sense of project ownership and the establishment of vocal, community-based project proponents (i.e., support for the projects).

This public involvement policy is in effect for all programs operating under the auspices of the department.

- HDOT Highways Division 2012

- County of Maui Department of Public Works
- County of Maui Department of Transportation

Ex-officio members include the following:

- Oahu Metropolitan Planning Organization (OahuMPO)
- Maui Metropolitan Planning Organization
- Federal Highways Administration Representative
- Federal Transit Administration Representative
- Federal Aviation Administrative Representative

The STAC often designates staff to represent them, with the second group known as the Sub-Statewide Transportation Advisory Committee or SubSTAC. They represent and communicate the interests of their respective agencies, jurisdictions and industries, as well as provide technical direction, information, insight, and reviews. A full list of the SubSTAC members involved during the HSTP development process is included in Appendix A, Public Involvement Process. A total of seven SubSTAC meetings occurred during the development of the HSTP. Documentation of the discussion held and input provided during the SubSTAC meetings is included in detail in Appendix A.

1.7.3.4 Industry Representatives/Stakeholder Advisory Committee (SAC)

An industry stakeholder focus group provided a balanced representation of interests, affected communities, geographic areas, ages, and diverse populations, as well as a communication link with those interests and communities. This group is referred to as the Stakeholder Advisory Committee (SAC) and was intended to provide a comprehensive overview regarding the HSTP. Members include the affected citizen's groups, representatives of local and regional business and labor sectors, and advocates for key interests, including different modes, environmental representatives, and civic groups. SAC members include representatives of the specific organizations/interest groups shown by category in Exhibit 1-5.

Exhibit 1-5. Stakeholder Advisory Committee

Industry Stakeholder Category	Organization
Tourism	Hawaii Tourism Authority
Construction	General Contractors Association of Hawaii
Development	Land Use Research Foundation of Hawaii
Emergency Response/Civil Defense	Hawaii Emergency Management Agency
Climate Change	University of Hawaii School of Ocean and Earth Science and Technology (SOEST)
Environment	Ulupono Initiative
Energy	Hawaiian Electric Hawaii State Energy Office
Business	Chamber of Commerce
Equity-focused populations	State Office of Community Services Catholic Charities Hawaii

Exhibit 1-5. Stakeholder Advisory Committee

Industry Stakeholder Category	Organization
Cultural Resource	State Historic Preservation Division
Health	Healthy Hawaii Initiative
Non-motorized Transportation (Bicyclists and Pedestrians)	Biki Hawaii Maui Bicycle League Kauai Path PATH Hawaii
Cars	Avis Rental Cars
Transit	Oahu Transit Services
Trucking	Hawaii Transportation Association
Air Cargo	Air Cargo Association of Hawaii
Airline Users	Airlines Committee of Hawaii
Harbor Users	Hawaii Harbor Users Group
Logistics/Shipping	Matson Pasha Hawaii Transport Lines
Short Sea Shipping	Young Brothers

Three SAC meetings were held during the development of the HSTP. Documentation of the discussion held and input provided during the SAC meetings are included in detail in Appendix A, Public Involvement Process.

1.7.3.5 Technical Resources

Technical resource agencies provided guidance throughout the process and included the HDOT Highways, Airports, and Harbors divisions and the STP Office. Technical resources from other federal, state, and city/county agencies or industry organizations were also consulted for guidance. They obtained or directed the project team to potentially useful data and also provided input on specific topics that might be useful for the development of the HSTP. The project team conducted smaller stakeholder interviews and focused meetings with the technical resource agencies.

1.7.3.6 Public

A variety of public involvement processes and tools were used throughout the development of the HSTP to obtain input from the public.

Public Workshops

A focused public outreach effort occurred during development of HSTP goals and objectives to provide the public with a meaningful opportunity to affect the project outcome. Three rounds of public meetings were conducted over 3 separate days in February 2021.

In September and October of 2022, a focused public outreach effort was made to encourage the public in completing a public survey to gain feedback on the HSTP strategies and priorities. Feedback from the public was used to develop the actions and opportunities for the HSTP.

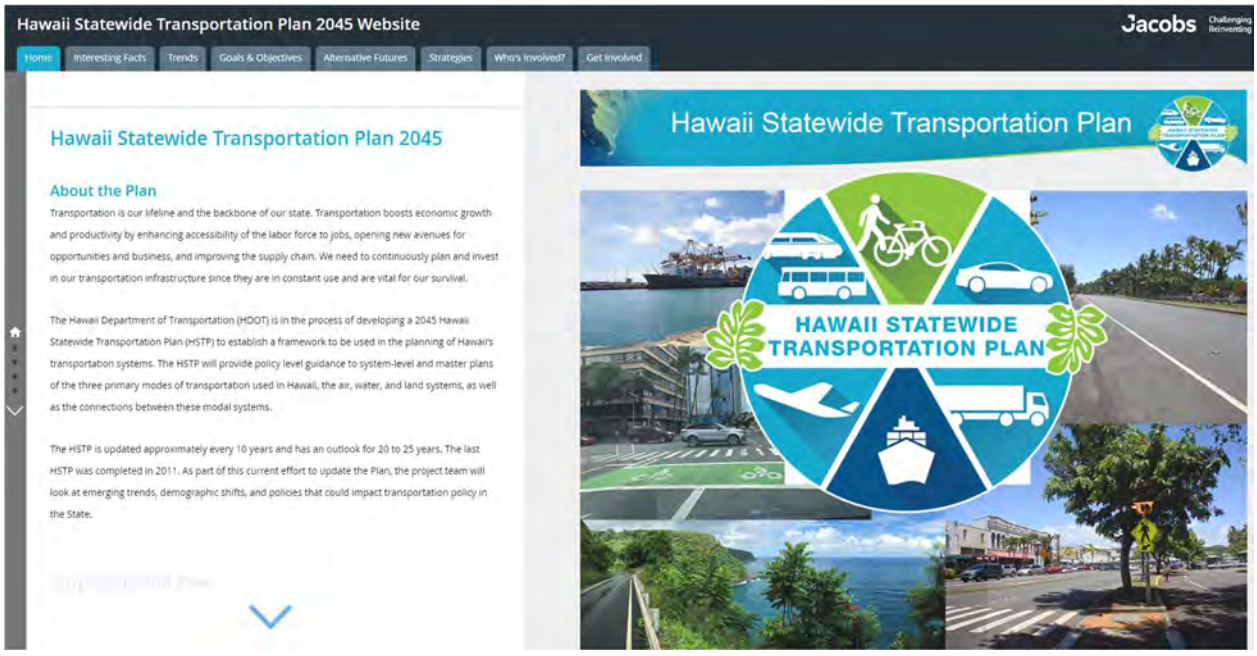
Four public meetings were also held in December 2022. These meetings were focused on obtaining public input on the draft HSTP plan.

The meetings were advertised in the five major newspapers, through an HDOT news release, and on the HDOT website and were designed to be interactive---participants had the opportunity to learn about the project and to provide input at hand. Because of the novel coronavirus of 2019 (COVID-19) pandemic, the meetings were conducted virtually online in an easily accessible meeting platform to allow for external communication and engagement. Appendix A, Public Involvement Process, includes further details of the public meetings held during the HSTP process.

Project Website

A project web page [Hawaii Statewide Transportation Plan 2045 Website] was developed to give the public a convenient way to stay informed about the project's progress and meeting schedule. The website (Exhibit 1-6) told the story of the HSTP planning process and what was learned through the tasks and included online questionnaires to provide community members with an opportunity to provide input outside of the public meetings.

Exhibit 1-6. HSTP Website



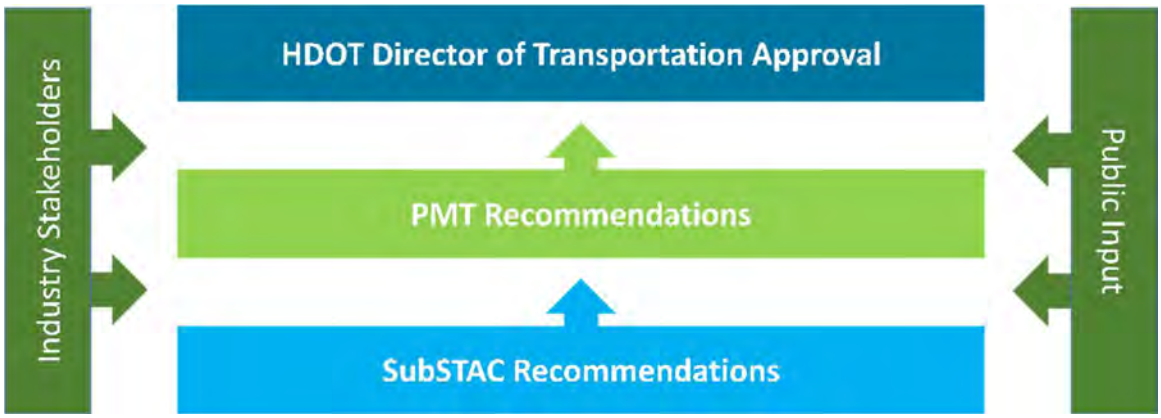
Project Survey

An online survey was also deployed to collect input on transportation strategies for each of the HSTP goals. Over 640 survey responses provided insight on the public's view of the critical needs and priorities for the statewide transportation system.

1.7.4 Decision-making Structure and Process

Industry stakeholders and public input were an integral part of the decision-making process throughout the development of the HSTP. The HDOT PMT reviewed recommendations from the SubSTAC, industry stakeholders, and the public and made final recommendations to the HDOT Director (Exhibit 1-7). HDOT PMT and SubSTAC members understood and acknowledged that the HDOT Director retains all final decision-making authority with respect to the project.

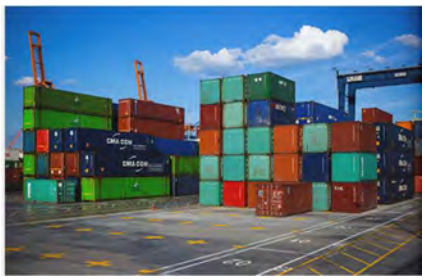
Exhibit 1-7. HSTP Decision-making Structure



2. The Transportation Network

2.1 Hawaii's Transportation Network

A safe, sustainable transportation network is critical to the movement of people and goods within the state. It provides the means for residents, visitors, and businesses to live, work, or play on all of the state's islands, and also connects Hawaii with an expanding global economy. This chapter describes the state's existing transportation system—consisting of facilities over land, air, and water—and illustrates the need for consistent policy direction and coordinated planning and maintenance to provide reliable service and seamless modal transitions into the future.



2.2 Department of Transportation

HDOT Mission Statement

To provide a safe, efficient, accessible, and sustainable inter-modal transportation system that ensures the mobility of people and goods and enhances and/or preserves economic prosperity and the quality of life.

The State of Hawaii Department of Transportation (HDOT) operates and manages a robust system that includes roadways, airports, and harbors.

There are roughly 9,800 lane-miles of roadway and bridges in the statewide transportation system. The HDOT owns approximately 25 percent of the travel lanes, which carry close to 60 percent of the total statewide miles traveled.

While land transportation facilities support the majority of travel within the counties, interisland or into- and out-of-state movement of cargo, freight, goods and people must be completed by air or by water. The State operates and manages 15 airports and 10 harbors (with 9 as active commercial ports) across the islands. These facilities handle a variety of domestic and international passenger trips. They also support large-scale cargo operations and provide essential lifelines to and from the rest of the world, as approximately 80 percent of all goods consumed within the state are imported.

2.3 Modal Division Coordination

HDOT is responsible for planning, designing, constructing, operating, and maintaining State facilities for all modes of transportation, including air, water, and land. Coordination with other state, county, and federal programs is maintained to achieve these objectives.

The Statewide Transportation Planning (STP) Office is responsible for establishing a comprehensive, multimodal statewide transportation planning process, developing a balanced, multimodal statewide transportation plan, and providing technical assistance to the counties in fulfilling their respective roles in the process. The Statewide Transportation Planning (STP) Office plays an important role in the statewide transportation planning process by coordinating HDOT's three modal divisions – airports, harbors, and highways. Coordination between divisions, as well as with partner agencies and other government entities, is crucial to providing an efficient multimodal statewide transportation system.

2.3.1 Airports

HDOT Airports Division Mission Statement

The mission of the Airports Division is to develop, manage, and maintain a safe and efficient global air transportation organization.

The HDOT Airports Division currently operates and maintains 15 airports—11 commercial service airports and 4 general aviation airports—located on the islands of Oahu, Maui, Lanai, Molokai, Hawaii, and Kauai (Exhibit 2-1). There are 37 airlines that currently offer passenger and cargo service to, from, and within Hawaii.

The HDOT Airports Division does not operate or maintain airfields located on military bases within the state.

Commercial service airports serve passenger air travel, handle cargo (including mail), and accommodate other aircraft operations, including takeoffs and landings of private or chartered aircrafts. Five major commercial service airports handle the majority of passengers and cargo statewide, while the remaining six commercial airports serve as lifelines by providing passenger service and cargo and mail deliveries to less populated areas of the state.

General aviation airports do not accommodate passenger travel or handle cargo and mail, but they do facilitate other aircraft operations, including private aircraft takeoffs and landings. Exhibit 2-2 presents air passenger statistics at the state's airports for the 2019, 2020, and 2021 calendar years.

Exhibit 2-1. Hawaii Airports

Exhibit 2-2. Air Passenger Statistics (Calendar Years 2019, 2020, and 2021)

	Airport	District	Annual Passenger Trips [a]				
			2019	2020	2021	% Change (2019 to 2021)	% Change (2020 to 2021)
Commercial Service Airports							
1	Daniel K. Inouye International [b]	Oahu	21,601,126	6,533,880	12,064,992	-44.1%	84.7%
2	Kahului [b]	Maui	7,978,651	2,378,908	6,050,254	-24.2%	154.3%
3	Ellison Onizuka Kona International Airport at Keahole [b]	Hawaii	4,058,749	1,303,482	2,885,064	-28.9%	121.3%
4	Lihue [b]	Kauai	3,382,509	994,298	2,079,714	-38.5%	109.2%
5	Hilo [b]	Hawaii	1,237,285	489,286	760,307	-38.6%	55.4%
6	Molokai	Maui	266,780	109,607	136,261	-48.9%	24.3%
7	Lanai	Maui	110,201	42,561	87,303	-20.8%	105.1%
8	Kapalua	Maui	88,560	17,575	12,046	-86.4%	-31.5%
9	Kalaupapa	Maui	12,830	4,256	6,320	-50.7%	48.5%
10	Waimea-Kohala	Hawaii	7,641	4,691	8,426	10.3%	79.6%
11	Hana	Maui	4,595	1,909	4,393	-4.4%	130.1%
		Total	**38,748,927**	**11,880,453**	**24,095,084**	**-37.8%**	**102.8%**

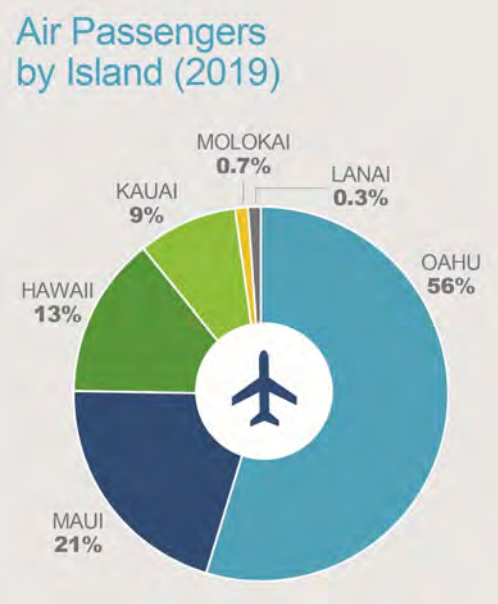
Source: HDOT Airports Division 2022a and 2022b. https://hidot.hawaii.gov/airports/library/dota-statistics-page/

[a] Includes combined number of passengers boarding and disembarking aircrafts.

[b] The airport is one of the state's Major Airports, per the HDOT Airports Division.

In 2019, the state's commercial airports accommodated nearly 39 million passenger trips. Air traffic for calendar year 2020 were highly affected by the COVID-19 health pandemic, which resulted in significant

changes to domestic and international flight schedules and travel patterns as well as impacts to global supply chain transportation and logistics.



The number of annual air passengers in 2020 at the five major airports was roughly 60 to 70 percent lower than in 2019. This could be a result of the effects of the pandemic and the ensuing shift in daily work, school, and general trip patterns for much of the general public. Air travel increased in 2021 and the number of passengers statewide doubled compared to 2020, but remained at roughly 60 percent of 2019 pre-COVID passenger levels.

Aircraft landings statewide in 2020 were roughly half of the recorded landings in 2019. Surges in passenger travel and tour operations in 2021 resulted in a 75 percent increase in landings compared to 2020, but were still just under 80 percent of pre-COVID operations. Exhibit 2-3 presents the aircraft landing statistics statewide in 2019, 2020, and 2021.

Exhibit 2-3. Aircraft Landing Statistics (Calendar Years 2019, 2020, and 2021)

	Airport	District	Aircraft Operations [a]				
			2019	2020	2021	% Change (2019 to 2021)	% Change (2020 to 2021)
Commercial Service Airports							
1	Daniel K. Inouye International [b]	Oahu	123,698	65,537	98,505	-20.4%	50.3%
2	Kahului [b]	Maui	70,672	27,107	58,543	-17.2%	116.0%
3	Ellison Onizuka Kona International Airport at Keahole [b]	Hawaii	28,348	14,462	24,936	-12.0%	72.4%
4	Lihue [b]	Kauai	54,969	15,032	34,755	-36.8%	131.2%
5	Hilo [b]	Hawaii	20,571	8,135	12,172	-40.8%	49.6%
6	Molokai	Maui	17,767	10,066	12,523	-29.5%	24.4%

Exhibit 2-3. Aircraft Landing Statistics (Calendar Years 2019, 2020, and 2021)

	Airport	District	Aircraft Operations [a]				
			2019	2020	2021	% Change (2019 to 2021)	% Change (2020 to 2021)
7	Lanai	Maui	5,733	5,044	11,005	92.0%	118.2%
8	Kapalua	Maui	5,445	1,689	1,807	-66.8%	7.0%
9	Kalaupapa	Maui	2,249	1,251	1,484	-34.0%	18.6%
10	Waimea-Kohala	Hawaii	738	699	971	31.6%	38.9%
11	Hana	Maui	1,298	601	935	-28.0%	55.6%
General Aviation Airports							
12	Kalaeloa	Oahu	66	43	543	722.7%	1162.8%
13	Upolu	Hawaii	0	1	0	n/a	n/a
14	Dillingham Field	Oahu	6,027	2,746	5,724	-5.0%	108.4%
15	Port Allen	Kauai	1,503	221	101	-93.3%	-54.3%
		Total	**339,084**	**152,634**	**264,004**	**-22.1%**	**73.0%**

Source: HDOT Airports Division 2022a, 2022b. https://hidot.hawaii.gov/airports/library/dota-statistics-page/

[a] Includes aircraft landings of passenger, charter, tour, cargo, and movement of aircraft flights as reported by aircraft operators.

[b] The airport is one of the state's Major Airports, per the HDOT Airports Division.

Note: n/a = Percentage change cannot be calculated.

As a large portion of the state's residents were encouraged to remain at home and reduce discretionary travel, an increase in goods being delivered via the mail to homes may have occurred. By the end of 2021, freight and mail tonnage handled statewide was within 5 percent of 2019 pre-COVID levels. Exhibit 2-4 presents the total tonnage of freight and mail handled at the state's commercial service airports in 2019, 2020, and 2021. No statistics were provided for Hana Airport on Maui.

Daniel K. Inouye International Airport

Exhibit 2-4. Freight and Mail Statistics (Calendar Years 2019, 2020, and 2021)

	Airport	District	Freight and Mail (Tons)				
			2019	2020	2021	% Change (2019 to 2021)	% Change (2020 to 2021)
Commercial Service Airports							
1	Daniel K. Inouye International [a]	Oahu	605,983	504,510	588,685	-2.9%	16.7%
2	Kahului [a]	Maui	62,556	54,565	54,538	-12.8%	0.0%
3	Ellison Onizuka Kona International Airport at Keahole [a]	Hawaii	46,410	36,722	38,140	-17.8%	3.9%
4	Lihue [a]	Kauai	29,428	24,995	31,925	8.5%	27.7%
5	Hilo [a]	Hawaii	33,771	32,924	30,296	-10.3%	-8.0%
6	Molokai	Maui	1,392	2,368	3,041	118.5%	28.4%
7	Lanai	Maui	1,657	1,463	2,168	30.8%	48.2%
8	Kapalua	Maui	631	456	1,365	116.5%	199.2%
9	Kalaupapa	Maui	100	114	86	-13.7%	-24.6%
10	Waimea-Kohala	Hawaii	1,748	0	0	n/a	n/a
		Total	783,675	658,118	750,245	-4.3%	14.0%

Source: HDOT Airports Division 2022a, 2022b. https://hidot.hawaii.gov/airports/library/dota-statistics-page.

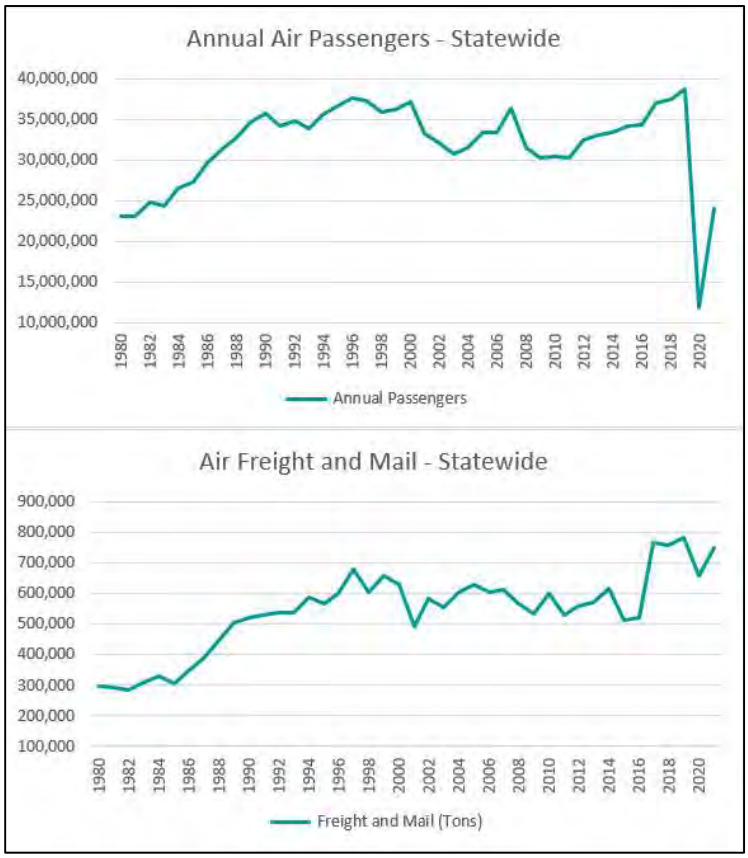
[a] The airport is one of the state's Major Airports, per the HDOT Airports Division.

Note:

n/a = Percentage change cannot be calculated.

Although the effects of the pandemic have affected air travel, Hawaii remains a popular destination for business and tourism, and residents continue to rely on imported goods. Based on passenger traffic, Daniel K. Inouye International Airport was ranked the 32nd busiest airport in the United States in 2020 and the 28th busiest in 2019.

Exhibit 2-5. Passenger/Cargo Growth Example



The number of annual air travel passengers statewide has generally increased steadily since 2008. Cargo tonnage handled at the state's airports has also increased consistently since 2008, with a significant increase in 2017. Exhibit 2-5 shows these changing trends over the past 40 years, from 1980 to 2021.

Planning for the future of the state's airports is an ongoing effort, and is a critical component in being able to accommodate passengers, cargo and mail, and aircraft operations in a changing market.

The Hawai'i Airports Modernization Program is a robust, coordinated group of airport improvement projects intended to transform the state's major airports into world-class facilities that meet the future needs of Hawaii's residents and visitors alike.

The focus of this $2.3 billion statewide program is to deliver distinctly Hawaiian airports that not only function safely and efficiently but also incorporate environmentally sustainable principles and practices and embrace uniquely Hawaiian cultural elements.

Recent airport master plans include the *Kahului Airport Master Plan* update (2016) and the *Ellison Onizuka Kona International Airport at Keahole Master Plan* (2010). The *Kahului Airport Master Plan Update* describes potential options for upgrading various airport facilities by reconstructing and extending runways, expanding terminal capacity, and improving customer services such as consolidating and relocating rental car facilities.

The *Ellison Onizuka Kona International Airport at Keahole Master Plan* includes potential long-term improvements such as terminal and gate expansion, increased capacity for arriving baggage, and relocation of fire and rescue facilities.

Ellison Onizuka Kona International Airport

2.3.2 Harbors

The commercial harbors system is Hawaii's lifeline to the world, as approximately 80 percent of all goods consumed in-state are imported. Over 95 percent of these imported goods are handled at ports.

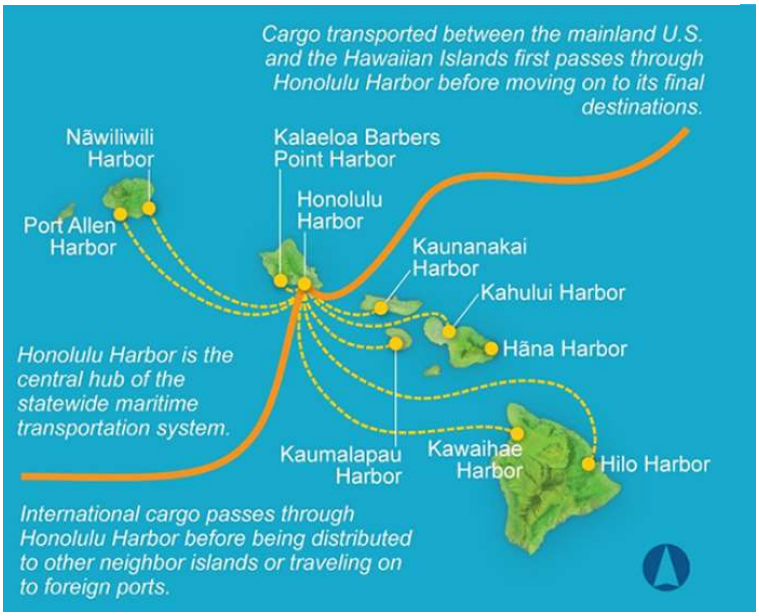
HDOT Harbors Division Mission Statement

The mission of the Harbors Division is to effectively improve and manage a commercial harbors system that facilitates safe and efficient operations of commercial cargo, passenger, fishing, and other commercial maritime-related services and support activities within the State of Hawaii and which serves to sustain and enhance the state's economic prosperity and quality of life.

There are 10 commercial harbors under the jurisdiction of the HDOT Harbors Division. Currently, there are 9 active commercial harbors on six islands, including harbors at Honolulu, Kalaeloa Barbers Point, Hilo, Kawaihae, Kahului, Kaunakakai, Kaumalapau, Nawiliwili, and Port Allen. Hana Harbor on Maui is currently inactive.

The statewide commercial harbors system operates as a hub-and-spoke model, with Honolulu Harbor as the hub (Exhibit 2-6). The majority of domestic and international cargo arrives and is handled at Honolulu Harbor before being distributed to its final destination, which includes neighbor island ports as well as some domestic and international ports. The harbor system consists of 485 acres of yard area and 20 acres of shed space. There are approximately 47,000 feet of combined berth space in the statewide system. The ocean water around and between the Hawaiian Islands was designated by the U.S. Department of Transportation as the Daniel K. Akaka Marine Highway (M-H1) (HDOT 2018). This designation reinforces the importance of the ocean as a critical component of Hawaii's statewide transportation system and its lifeline to the rest of the world.

Exhibit 2-6. Hawaii Harbors



In 2019, the commercial harbors system handled approximately 21.5 million short tons[1] of cargo statewide. In 2020, just over 20 million short tons of cargo were processed at the state's harbors. At Honolulu Harbor, more than 10.5 million short tons of cargo from overseas, domestic, and interisland vessels were handled and distributed. This amount of cargo tonnage was approximately 1 million less than was processed at Honolulu Harbor in 2019. Prior to 2020, the amount of cargo handled at Honolulu Harbor had remained relatively constant since 2013 (between roughly 11.0 and 11.5 million short tons) but could be expected to increase in the future given the reliance on critical goods imported to Hawaii. Exhibit 2-7 presents the distribution of cargo processed at each of the state's commercial harbors in fiscal year (FY) 2020.

Exhibit 2-7. Cargo Volumes by Harbor (Fiscal Year 2020)

	Harbor	District	Short Tons of Cargo (FY 2020)	Percent of Total Cargo
1	Honolulu	Oahu	10,600,000	52.9%
2	Kalaeloa	Oahu	3,760,000	18.8%
3	Kahului	Maui	2,170,000	10.8%
4	Kaunakakai	Maui	76,000	0.4%
5	Kaumalapau	Maui	224,000	1.1%
6	Hilo	Hawaii	1,300,000	6.5%
7	Kawaihae	Hawaii	1,000,000	5.0%
8	Nawiliwili	Kauai	786,000	3.9%
9	Port Allen	Kauai	131,000	0.6%
10	Hana (Inactive)	Maui	n/a	0.0%
		Total	20,047,000	100.0%

Source: HDOT Harbors Division 2021. *Cargo Statistics*. https://hidot.hawaii.gov/harbors/harbor-users/cargo-statistics/.

Note: n/a = Hana Harbor is currently inactive.

The statewide harbor system is also important to Hawaii's visitor and tourism industry. From 2016 to the onset of the COVID-19 pandemic, the state averaged roughly 256,000 cruise ship passengers annually. In FY 2019, there was an increase in cruise ship passengers to approximately 277,000. Roughly 52 percent of passengers entered the state over water via a cruise ship, 47 percent arrived by air, and 1 percent were Hawaii residents.

Cruise ship at Hilo Harbor, Hawaii Island

[1] One short ton is equivalent to 2,000 pounds.

The *Honolulu Harbor 2050 Master Plan* is currently being developed as an update to the *Oahu Commercial Harbors 2020 Master Plan* completed in 1997. This document will guide the strategic development of Honolulu Harbor over a 30-year plan horizon focusing on infrastructure improvements, types of various uses, and optimization of facilities to support anticipated future cargo and non-cargo maritime operations.

The plan will provide recommendations for implementation projects based on forecasted future needs, trends, and opportunities at Honolulu Harbor, as well as identify suggestions for project prioritization to inform the HDOT Harbors Division CIP program.

Recommended improvements at Honolulu Harbor include the following:

- Request the U.S. Army Corps of Engineers (USACE) to conduct a feasibility study to widen the harbor entrance for safety and resiliency, widen the Kapalama Channel to address navigational issues, and consider a second harbor entrance (at Kalihi Channel) to increase capacity and provide emergency event access.
- Address sea level rise through identification of feasible design solutions for raising pier heights: Pier heights should be based on an adopted 3.2-foot sea level rise by 2060 based on the 2017 Department of Land and Natural Resources *Hawai'i Sea Level Rise Vulnerability and Adaptation Report*. Because it is extremely costly and complicated to raise the piers and yards and redesign all the associated infrastructure and surrounding facilities at Honolulu Harbor, the *2050 Master Plan* will provide recommendations for determining priority piers and establishing a statewide standard pier height.
- Modernize aging terminal facilities.
- Improve resiliency of cargo terminals so that they can remain operational after disaster events.
- Redevelop underused areas to improve harbor operations and enhance revenue.

Sand Island Cargo Container Operations

Additional recommendations documented in the *2050 Master Plan* include improvements at specific piers and terminal locations. At the Pier 2 cruise terminal, improvements include expanding pedestrian connectivity between the terminal and adjacent areas like Aloha Tower and Kakaako, as well as improving circulation and staging for vehicles, service trucks, and passenger ground transportation. At the Sand Island Terminal, recommendations include increasing the number of gantry cranes and densifying grounded or stacked containers. At the Interisland Terminal, suggestions to potentially relocate buildings and reconfigure operations could increase space and improve overall efficiency.

The *Hilo Commercial Harbor 2035 Master Plan* recommends construction of a new dedicated passenger terminal (Pier 5) at the west side of the harbor (HDOT Harbors Division 2011). Hilo Harbor's cruise passenger terminal is currently located between two cargo operations, which requires passengers to traverse cargo operations to access areas outside of the harbor. The new pier would benefit both

passenger service and cargo operations by removing a significant conflict between two incompatible uses and by providing a safe and dedicated area for each activity. Other key components of the master plan include additional berth capacity at Pier 4 and yard capacity for cargo handling at the landside of Pier 1 to meet forecasted cargo demand.

The *Kahului Harbor Development Plan* (HDOT Harbors Division 2012), which is based on the *Kahului Commercial Harbor 2035 Master Plan* (HDOT Harbors Division 2007), addressed short-term needs and identified specific actions and phasing for implementation. The Development Plan identified the need to expand Kahului Harbor through land acquisition and other improvements to accommodate the anticipated growth of maritime uses, including but not limited to cargo handling and storage, liquid- and dry-bulk cargo discharge, and passenger operations. Recommended short-term improvements include covering the open drainage channel at Pier 2 for added yard space and improved operational efficiency, strengthening the pier deck at Pier 2B to accommodate heavy-lift cargo operations, integrating 3.96 acres of previously purchased land to add storage capacity,[2] reusing the Old Kahului Railroad Building for harbor user offices,[2] and acquiring two parcels adjacent to Pier 1 (a total of 10.5 acres) for expansion of cargo storage.

The *Kauai Commercial Harbor 2025 Master Plan* (HDOT Harbors Division 2001) provides general long-range recommended improvements at Nawiliwili Harbor and Port Allen Harbor based on users experiences and anticipated future trends. Key recommendations at Nawiliwili Harbor are new piers and berthing improvements to better meet the growing needs of Kauai's expanding economy, including the tremendous growth in the cruise ship industry. One of the primary objectives of the 2025 Master Plan is to accommodate the simultaneous berthing of two large cruise ships at the harbor. The Master Plan proposes to extend Piers 2 and 3 into the northwestern corner of the harbor to allow cruise ships to berth along Piers 1 and 2, or at Piers 2 and 3 when needed. The Master Plan also proposes to provide additional berthing space at the harbor by developing a new pier at the existing jetty pier area to accommodate potential future cargo activities including exporting of forestry products such as lumber, veneer, and wood chips. Navigational improvements and roadways to support operations at Nawiliwili Harbor are also part of the Master Plan recommendations. Key recommendations at Port Allen Harbor include three new piers to increase the berthing capacity of the harbor for cargo, passenger, and military vessels and allow the growth of Port Allen's maritime industries.

2.3.3 Highways

The land transportation system is key to the movement of people, goods, and services statewide; it is an integral component in providing reliable connections to modal transitions (such as the transfer of freight from the harbors to stores) and between destinations. One of the primary purposes of the state highway system is to connect military bases, which is significant for both domestic and international security. On Oahu, the interstate highways—H-1, H-2, H-3, and H-201—connect urban Honolulu with former and current military bases located in west, central, and east Oahu.

[2] Projects have been completed since the preparation of the Development Plan.

The National Highway System (NHS) is a subset of the entire roadway system (Exhibit 2-8). It provides an interconnected system of freeway and principal arterial routes that does the following:

- Serves population centers, ports, airports, military bases, public transportation facilities, and other intermodal transportation facilities and major travel destinations
- Meets strategic national defense requirements
- Serve interregional travel

Although Hawaii is an island state with no interstate or international border crossings, the NHS remains vital infrastructure providing service to the state.

Hawaii Department of Transportation Highways Division Mission Statement

The mission of the Highways Division is to maximize available resources to provide a safe, efficient, accessible, and sustainable State Highway System that ensures the mobility of people and goods and supports economic vitality and livability.

Non-NHS assets are considered to be the remainder of the statewide roadway system. Overall, the statewide land transportation system includes approximately 9,800 lane-miles of paved and unpaved roadways.

The breakdown of NHS pavement and bridges compared to the statewide system is shown in Exhibit 2-9. The NHS roadways are under both state and county jurisdictions, as shown on Exhibit 2-10.

Exhibit 2-8. National Highway System

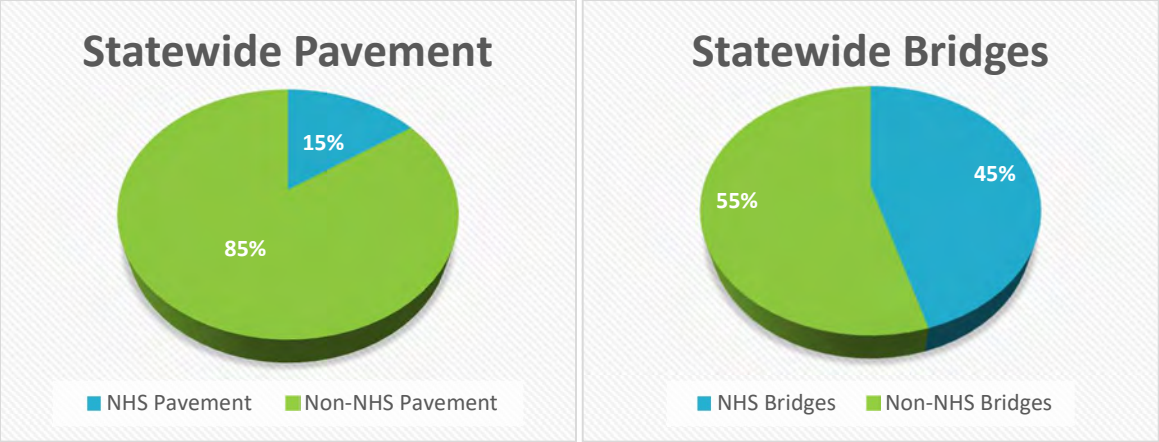
Source: FHWA 2021

Exhibit 2-9. Statewide NHS vs. Non-NHS Pavement and Bridges

NHS Pavement	1,496 lane-miles
Non-NHS Pavement	8,307 lane-miles
NHS Bridges	511 bridges (12,078,704) square feet of deck area)
Non-NHS Bridges	613 bridges (2,437,373 square feet of deck area)

Source: HDOT pers. comm. 2022

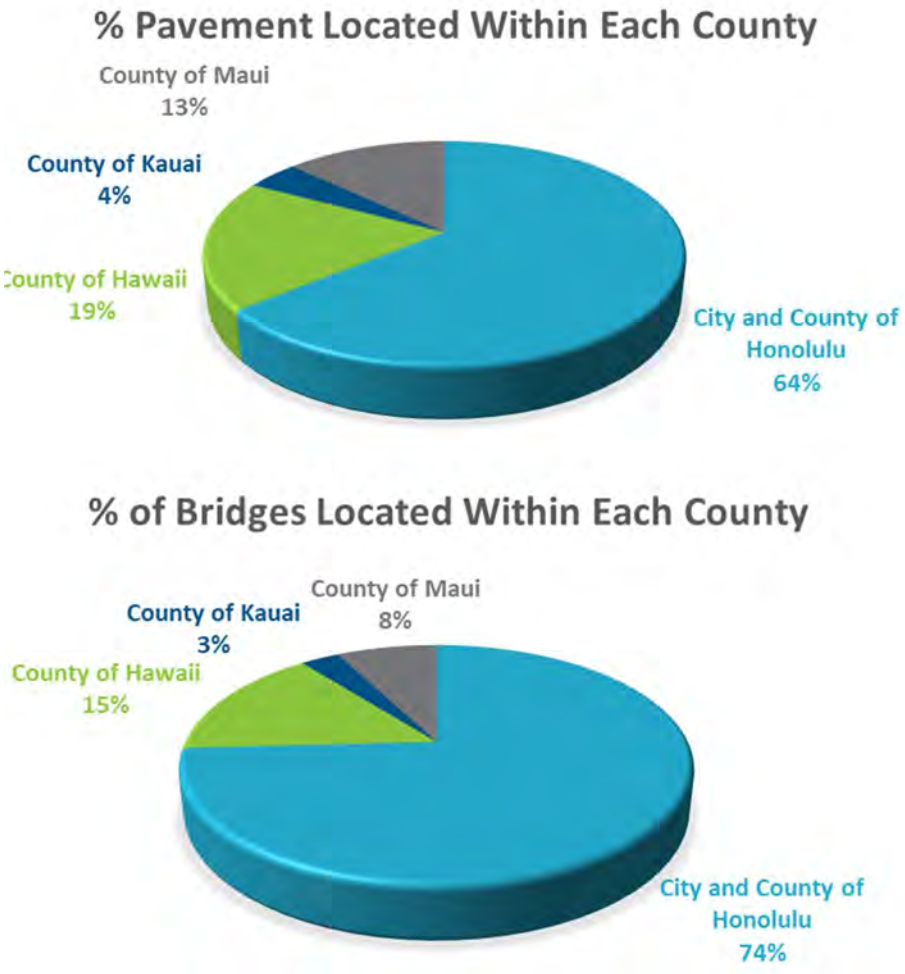
Exhibit 2-10. Percentage of NHS Pavement and Bridges on the State Land Transportation System



The HDOT Highways Division owns, operates, and maintains roughly 25 percent of the total lane-miles statewide, which carry nearly 60 percent of the total daily vehicle-miles traveled (VMT).

Exhibit 2-11 shows the location breakdown of all pavement and bridges (state and county jurisdictions) within each county.

Exhibit 2-11. Percentage of Pavement and Bridges Located in each County



Statewide daily traffic volumes are highest on Oahu, where multilane roadways are more common than on the neighbor islands. In 2019, the annual average daily traffic volume on H-1 near Pearl Harbor was greater than 240,000 vehicles combined in both directions of travel. Other segments of H-1 between the Kalihi Street interchange and the Ward Avenue overpass regularly carried nearly 200,000 daily vehicles. The effects of the pandemic altered commute patterns and the frequency of discretionary vehicle trips in 2020. Traffic volumes rebounded in 2021; however, they did not reach 2019 levels at the locations shown in Exhibit 2-12. Annual average daily traffic volumes on H-1 near Pearl Harbor decreased by 8.3 percent (to 223,800 vehicles per day) compared to 2019. Traffic volumes on segments of H-1 in downtown were about 11 percent lower than daily volumes in 2019.

In neighboring counties, the average traffic volumes are generally lower than 50,000 vehicles per day. The pandemic resulted in reduced traffic volumes in 2020 and recovery in 2021. In Hawaii County, the highest volume recorded was on Hawaii Belt Road (Highway 11) between Hilo and Keaau. This segment of Hawaii Belt Road carried an annual average daily traffic volume of 45,800 vehicles in 2019 and 44,800 vehicles in 2021, representing a 2.2 percent decrease. On Maui, nearly 45,000 vehicles traveled daily on

Honoapiilani Highway (Highway 30) near Kaanapali in 2019. In 2021, traffic decreased by approximately 9.2 percent to roughly 40,700 daily vehicles. On Kauai, Kaumualii Highway (Highway 50) fronting Kauai Community College in Lihue recorded 28,600 daily vehicles in 2019 and 25,300 vehicles in 2021, which is a volume reduction of approximately 11.5 percent. Exhibit 2-12 presents the most recent annual average daily traffic volume data available on select highways statewide.

Exhibit 2-12. Annual Average Daily Traffic Volumes by Route (2019, 2020, 2021)

Route	Location	Milepoint	2019	2020	2021	% Change (2019 to 2021)
Interstate H-1	West of Kaonohi Street Overpass	11.74	244,000	201,400	223,800	-8.3%
Interstate H-1	At Kalihi Interchange	19.27	183,500	140,800	164,600	-10.3%
Interstate H-1	At Kapalama Bridge	20.22	206,300	155,000	178,800	-13.3%
Interstate H-1	West of Nuuanu Stream Bridge	21.07	196,500	147,100	172,700	-12.1%
Interstate H-1	West of Ward Avenue Overpass	22.10	176,500	135,500	162,900	-7.7%
Hawaii Belt Road (Highway 11)	Between Hilo and Keaau	5.29	45,800	39,400	44,800	-2.2%
Queen Kaahumanu Highway (Highway 11)	Kailua-Kona near Hualalai Road	120.98	25,400	21,100	24,300	-4.3%
Queen Kaahumanu Highway (Highway 19)	Near Makako Bay Drive	93.74	28,800	20,500	27,300	-5.2%
Honoapiilani Highway (Highway 30)	South of Kaanapali Parkway	23.58	44,800	25,300	40,700	-9.2%
Hana Highway (Highway 36)	Near Central Power Plant Road	1.70	39,000	30,500	35,000	-10.3%
Maui Veterans Highway (Highway 311)	Near Nakii Road	2.38	35,200	25,800	33,100	-6.0%
Kaumualii Highway (Highway 50)	Near Nani Street	1.51	28,600	21,200	25,300	-11.5%
Kuhio Highway (Highway 56)	Near Hulei Road	2.40	15,600	11,400	13,300	-14.7%

Source: DBEDT 2021. Table 18.20 Total 24-hour Traffic Volumes at Selected Survey Sites: 2019 to 2021. https://files.hawaii.gov/dbedt/economic/databook/db2021/section18.pdf.

There are more than 1,100 bridges statewide across all counties, with HDOT responsible for roughly 500 of them.

Honoapiilani Highway Bridge

As of 2020, approximately 21 percent of all bridges were in good condition, 72 percent were in fair condition, and less than 8 percent were considered to be in poor condition. (DBEDT 2020a)

The state's land transportation system must be maintained to provide safe, efficient access for all users. Various modal and facility plans have been developed to support the HDOT Highways Division mission.

Freight movement is crucial to the state's economic vitality. The *Statewide Freight Plan* (HDOT Highways Division 2018) identifies issues affecting freight movement and operations over land, water, and air, and describes recommendations and implementation strategies to improve freight infrastructure while maintaining reliability and resiliency. Roadways that provide access to intermodal transportation facilities at the harbors and airports are especially crucial to interisland commerce. Over 6,000 trucks per day travel on Sand Island Access Road/Parkway on Oahu, which is a vital intermodal connector of the ports to the highways. Hilo International Airport's intermodal connector has the highest number of trucks of all the air connectors with over 1,000 daily trucks.

The *2019 – 2024 Hawaii Strategic Highway Safety Plan* (HSHSP) is a roadmap providing guidance and strategies to improve safety on public roadways through policy recommendations, outreach and education, and collaborative efforts from public health, first responder, and community groups. The goals of the HSHSP are to reduce the rate of traffic-related fatalities per year by 2024 and ultimately to eliminate traffic deaths altogether. The plan outlines a selection of emphasis areas to focus efforts on and includes data-driven performance measures to track progress. Emphasis areas include combating impaired driving, safeguarding pedestrians and bicyclists, building safer roadways by design, and reducing speeding.

The Statewide and Regional Federal-Aid Highways 2035 Transportation Plans sets the direction for land transportation system improvements and decisions through the year 2035. The Plans establish goals and needs, present potential multimodal solutions, and lay out priorities and funding alternatives. The Statewide Plan focuses on program-level needs and opportunities, while the three separate Regional Plans for the Districts of Hawaii, Maui, and Kauai present potential solutions to address growing demand and capacity deficiencies, connectivity issues, and preservation and resilience at the project level. The Statewide Plan incorporates findings and recommendations from the regional plans and from the Oahu Regional Transportation Plan 2035, which was developed by the Oahu Metropolitan Planning Organization (OahuMPO).

2.3.4 Transit

Public transit provides an option and opportunity for personal mobility for those who are unable to or choose not to drive. Public transit can often be a viable transportation choice for users regardless of age, income, or social or physical status. Each county within the state is responsible for operating its public transit system. The HDOT provides critical support and assistance to county transit systems, and transit systems in turn provide critical transportation services to Hawaii's residents and visitors.

2.3.4.1 Oahu

Bus

TheBus provides general fixed-route commuter service, express route service, and local circulator routes on Oahu (CCH 2020a). More than 100 routes serve over 110,000 riders weekly across the island.

The City and County of Honolulu Department of Transportation Services (DTS) operates five park-and-ride facilities across the island. The park-and-ride lots in Hawaii Kai, Mililani, and Royal Kunia have between 130 and 175 parking stalls. The lots in Wahiawa and Haleiwa have 50 and 20 parking stalls, respectively.

TheHandi-Van provides curb-to-curb paratransit service for eligible persons with disabilities who are unable to use TheBus service. TheHandi-Van operates islandwide and can be accessed through reservations made ahead of time.

Both TheBus and TheHandi-Van are operated by Oahu Transit Services, Inc. (OTS), a private, not-for-profit firm contracted by DTS. TheBus and TheHandi-Van had over 65 million passenger trips annually in 2019, which had declined to approximately 50 million in 2020 and 28 million in 2021.

Rail

The Honolulu Authority for Rapid Transit (HART), a semi-autonomous City and County of Honolulu agency, is currently designing and constructing Hawaii's first rail system, on Oahu. The 20-mile elevated rail line is anticipated to have 21 stations between East Kapolei and Ala Moana Center, with service to the Daniel K. Inouye International Airport.[3] Most stations will include bicycle parking, a kiss-and-ride area for passenger drop-off or pick-up, and seamless access to surface transit connections with TheBus and TheHandi-Van (HART 2018).

Park-and-ride lots are planned at four stations, including Kualakai and Keoneae stations in Kapolei, Waiawa Station in Pearl City at the junction of H-1 and H-2,[4] and Halawa Station adjacent to the Aloha Stadium. The lots are expected to provide roughly 4,100 parking stalls (HART 2018).

With the growing vehicle demand on Oahu's roadways and increasing congestion, the rail system is expected to provide a fast, convenient, affordable option for commuters, students, and travelers between west Oahu and downtown Honolulu. Ridership forecasts predict that more than 100,000 passengers could ride the rail system each weekday when full service begins (HART 2013). The first 10 miles of the rail is planned to be transferred to the City and County of Honolulu's Department of Transportation Services in 2023 for commencement of the operations phase.

[3] Until sufficient funding becomes available, the current project scope has been truncated to establish an interim terminus for the rail system at the Civic Center Station, which is two stations and approximately 1.25 miles short of the originally planned Ala Moana Transit Center (HART 2022).

[4] Construction of the 1,600-stall parking garage at Waiawa Station has been deferred to a future phase when funding becomes available (HART 2022).

2.3.4.2 Maui

The County of Maui Department of Transportation (MDOT), through Maui Bus, provides regularly scheduled fixed-route service (13 fixed routes and 4 commuter routes) and complementary paratransit demand-response service for eligible people with disabilities under the Americans with Disabilities Act (ADA) on the island of Maui (County of Maui 2021). Maui Bus commuter service generally operates during the morning and afternoon peak commute periods only, with limited transit trips in a single direction between residential areas and hotel and resort areas. The fixed and commuter routes are operated by Roberts Hawaii.

Passenger service transportation is provided on the Islands of Maui, Lanai, and Molokai. ADA paratransit and human services are contracted with Maui Economic Opportunity, Inc. (MEO), a nonprofit organization that provides specialized transportation services to clients with the aim of improving their economic stability. Door-to-door trips are provided for clients who reside outside of the paratransit service area, while curb-to-curb trips are provided for persons with varying abilities living within the service area.

In FY 2015, Maui Bus provided approximately 2.4 million passenger trips. Since then, ridership declined to roughly 2 million in FY 2019 and just under 1.6 million in FY 2020. In FY 2021, approximately 925,000 passenger trips were provided by Maui Bus.

2.3.4.3 Kauai

The County of Kauai Transportation Agency's Kauai Bus operates a public fixed-route bus service and a paratransit door-to-door bus service from Hanalei to Kekaha daily. The fixed-route service includes both mainline service, which covers longer distances and primarily operates along highways and arterial streets; and shuttle service, which covers smaller geographic areas with tighter spacing between stops (County of Kauai 2022).

Paratransit service is available for eligible, qualified individuals, including seniors (65 years and older and registered with the County Transportation Agency) and individuals certified and registered as ADA-eligible for service. Service days and hours are the same as public transportation and require reservations 24 hours in advance for door-to-door pickups.

Annual ridership on Kauai Bus in FY 2015 was nearly 875,000 passengers. Ridership has declined slightly since then; the Kauai Bus served roughly 760,000 passengers in FY 2019, 645,000 passengers in FY 2020, and 408,000 passengers in FY 2021.

2.3.4.4 Hawaii Island

The County of Hawaii Mass Transit Agency (MTA) operates the Hele-On Bus System, which has 13 fixed routes that can be classified as connector, commuter, or circulator (MTA 2022). The Hele-On Kakoo paratransit service started in August 2016 for both the Hilo and Kona areas and is available for ADA-eligible riders, who must complete an application process for enrollment and call in reservations 24 hours in advance. Hele-On also provides a shared ride taxi program in the Hilo urbanized area and contracts with the Hawaii County Economic Opportunity Council (HCEOC) and other agencies to provide paratransit services.

In early 2022, the Hawaii County Council approved Bill 105, which temporarily removes fares for fixed-route bus service and paratransit service offered by Hele-On. The fare-free period is expected to be in effect until December 31, 2023, and is intended to "remove barriers to riding public transit and boost and rebuild ridership" (Christophel 2022). The Big Island transit provider previously offered a fare-free system in 2009, resulting in increased ridership by approximately 400,000 annual passenger trips per year over 4 years.

Similar to other bus service islandwide, Hele-On ridership has declined in recent years. In FY 2015, Hele-On provided more than 1.1 million passenger trips. Ridership decreased to approximately 665,000 passenger trips in FY 2019 and to just 560,000 passenger trips in FY 2020 and 325,000 passenger trips in FY 2021.

2.3.5 Non-motorized Facilities

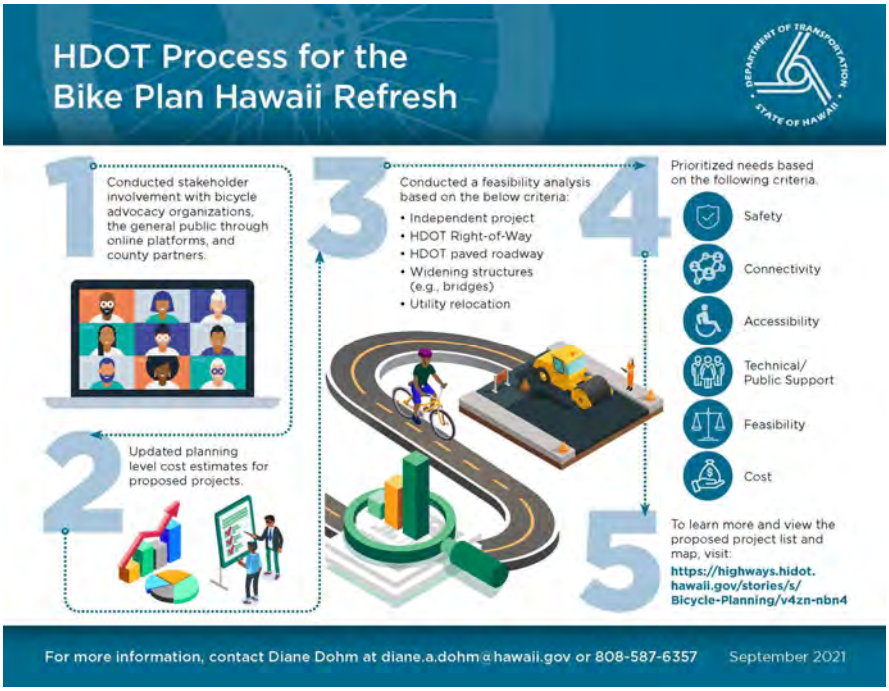
Pedestrians, bicyclists, and other users who travel via human-powered modes often share facilities with one another and with motorized vehicles on the state's roadways. Planning for facilities that accommodate all users is described in the *Statewide Pedestrian Master Plan* (HDOT 2013a) and *Bike Plan Hawaii* (HDOT Highways Division 2003).

Ke Ala Hele Makalae, Kapaa Multiuse Path

The *Statewide Pedestrian Master Plan* is a comprehensive effort that focuses on improving pedestrian safety statewide. The Plan evaluates techniques to enhance the mobility, safety, and accessibility for pedestrians, identifies needs and deficiencies within the statewide pedestrian system, and provides strategies to implement solutions and recommendations at the project level.

The Plan also includes a guide for thoughtful project implementation that provides consistent direction for the planning, design, and operation of pedestrian facilities. The *Hawaii Pedestrian Toolbox* (HDOT 2013b) is based on national and international best practices for the design of facilities, but developed specifically to address local concerns in the context of each county and to provide better consideration for pedestrians in design.

Bike Plan Hawaii outlines the State's plan to accommodate bicycling in the transportation network and increase bicycling as a viable travel mode by improving existing facilities, expanding facilities into new areas, and enabling effective coordination between other state and county planning agencies. The plan includes a review of existing facilities, identifies gaps in the system, and proposes projects and programs for implementation to ensure a successful bicycle network.



Bike Plan Hawaii Refresh Process

In 2021, the HDOT completed a refresh of *Bike Plan Hawaii* to update its inventory of existing facilities, reassess the existing and planned bike network, and re-establish priorities for proposed bike projects. The HDOT conducted public outreach to gather feedback on bicycle network gaps and areas for improved connectivity. The updated *Bike Plan Hawaii* includes a feasibility analysis to support implementation of near-term infrastructure improvements (HDOT Highways Division 2021a).

Biki, operated by the not-for-profit organization Bikeshare Hawaii, is an on-demand bicycle-share system currently being offered in downtown Honolulu and some surrounding urban areas. Users have the option of purchasing a subscription that includes a set amount of prepaid usage time or a one-time pass that allows them to unlock a bike at any of the 130 Biki Stop docking stations. Users may ride to complete their trips, and then return the bike to a docking station with available space near their destination.

In 2021, approximately 104,000 users took more than 1 million rides on Biki bicycles, covering about 2.3 million miles on Oahu (Biki 2022). This ridership represented a 31 percent increase compared to operations in 2020 during the height of the pandemic. Nearly 20 percent of all Biki Stops are located in Waikiki, and almost 40 percent of all trips taken in 2021 originated or ended in this neighborhood.

3. Goals and Objectives

The Hawaii Statewide Transportation Plan (HSTP) provides guidance to system-level and master plans of the three primary modes of transportation used in Hawaii—the air, water, and land transportation systems—as well as non-motorized modes and intermodal connections. The goals and objectives are a critical part of the HSTP. They represent the plan's vision and are intended to support the mission of the HDOT and to shape its future.

The Hawaii Department of Transportation's (HDOT's) mission is to provide a safe, efficient, accessible, and sustainable intermodal transportation system that ensures the mobility of people and goods and enhances and/or preserves economic prosperity and the quality of life. The missions of the three HDOT divisions—Airports, Harbors, and Highways—are also important foundations of the HSTP. These are shown in Exhibit 3-1.

Exhibit 3-1. HDOT Division Mission Statements

Airports	Harbors	Highways
To develop, manage, and maintain a safe and efficient global air transportation organization.	To effectively improve and manage a commercial harbors system that facilitates safe and efficient operations of commercial cargo, passenger, fishing, and other commercial maritime-related services and support activities within the State of Hawaii and which serves to sustain and enhance the state's economic prosperity and quality of life.	To maximize available resources to provide a safe, efficient, accessible, and sustainable State Highway System that ensures the mobility of people and goods and supports economic vitality and livability.

Exhibit 3-2 defines the terminology underlying the goals and objectives framework. For the purpose of the HSTP, goals represent a broad focus, while objectives are more specific.

Exhibit 3-2. Terminology

There are seven goals in the HSTP. Each goal is supported by objectives (16 in total across all goals) that provide details on how to achieve the goal. The goals build off of the 2011 HSTP but have been refined to meet future challenges that Hawaii faces. Collectively, these goals and objectives constitute a vision for the HSTP 2045. They have guided the development of the strategies and recommendations included in the HSTP.

The goals take into account input from various key stakeholders including the Statewide Transportation Advisory Committee (STAC), Sub-Statewide Transportation Advisory Committee (SubSTAC), and Stakeholder Advisory Committee (SAC) and the general public. The goals and objectives presented in this plan were developed based on the following:

- The 2011 HSTP document
- HDOT division missions and division/modal plans
- Plans and policy review as reflected in Chapter 1, Section 1.4 and 1.5
- Best practices from other states nationwide
- Input received from the SubSTAC at the July 23 and October 21, 2020, meetings
- Input received from the SAC on January 6, 2021
- Input received from the public in February and March 2021
- Existing priorities and goals identified in the June 26, 2020, Plan Policy Review
- Input received from the HSTP Project Management Team (PMT)

To help develop robust goals and objectives, this HSTP also screened the draft goals and objectives against the alternative futures developed for this plan (Section 4.3). This vetting process helped refine and in some cases broaden goals to prepare for success under an uncertain future.

The goals and objectives are shown listed by topic area in Exhibit 3-3; note that the order of the goals is not meant to show a ranking of importance, as all goals are equally vital in achieving HDOT's vision. The following changes have been made since the 2011 HSTP:

- Safety and security are now combined into one goal area.
- Energy is now broadened to include resiliency.
- Community and Infrastructure are new goal areas.
- Funding and planning were removed and incorporated into other areas of the plan.

Exhibit 3-3. Goals and Objectives

Provide a safe and secure multimodal transportation system.

- Eliminate transportation-related fatalities and serious injuries.
- Protect against security threats to transportation system users and facilities.

Provide a high-quality, well-maintained multimodal system.

- Maintain the multimodal transportation system in a state of good repair.
- Modernize transportation infrastructure.

Improve mobility and enhance access to destinations.

- Reduce delay and improve reliability across all modes, for all users.
- Improve access to destinations for system users across all modes.

Support a vibrant and changing economy.

- Serve Hawaii's communities through efficient and reliable goods movement & distribution.
- Advance and diversify statewide and local economic development.
- Improve efficiency and convenience of inter- and intra-state travel.

Anticipate and adapt to climate change, storms, pandemics and other disruptions.

- Enhance resiliency of transportation systems to the impacts of climate change, public health crises, and other disruptions.
- Improve emergency preparedness, response, and evacuation measures.

Support equity, public health, and quality of life.

- Enhance safe, convenient, and affordable options for populations with high transportation cost burdens and limited access.
- Support public health and quality of life for Hawaii residents.
- Facilitate equitable participation in transportation decision-making.

Protect and enhance natural and cultural resources and reduce climate impacts.

- Improve and preserve the quality of air, water, land, and other natural and cultural resources.
- Support the statewide goals of carbon neutrality and 100 percent clean energy by 2045.

4. Emerging Trends and Alternative Futures

The Hawaii Statewide Transportation Plan (HSTP) uses a process called scenario planning to prepare the Hawaii Department of Transportation (HDOT) for an uncertain future. This approach considers existing conditions and emerging trends to develop a range of alternative futures for Hawaii, each with unique challenges and opportunities to meeting the goals and objectives identified in Chapter 3.

The emerging trends and issues that are expected to influence the characteristics and demand for transportation include pandemics, climate change, demographics, economy, development and land use, and technology. Consideration of these trends helps to ensure that the HSTP develops transportation strategies that are resilient to change and mitigate risk factors that are outside of the State's control.

Based upon the emerging trends and issues, five alternative futures—Business as Usual, Global Health Crisis, Power in Paradise, Climate Emergency, and Technology Revolution—were considered during the planning process. These futures were used to create a plan that is responsive and adaptive to a range of changing travel needs and preferences.

This chapter includes a brief summary on the importance of scenario planning, a snapshot of key emerging trends in Hawaii, and an overview of the five alternative futures explored in this study.

4.1 Why do Scenario Planning?

Historically, long-range planning studies like the HSTP tended to extrapolate current trends decades into the future and to select plan recommendations based on those projected future conditions. However, predicting the future is a risky business, and things almost always turn out differently than planned.

Exploratory scenario planning allows for the exploration of *multiple* potential future conditions, rather than simply assuming historic trends continue. Rather than rely on one trend line alone, this approach identifies a *range* of unique but plausible future conditions drawn from alternative assessments of existing and evolving trends. Exploratory planning considers risks and uncertainties such as potential future disruptions. By considering unique challenges and opportunities to accomplishing the goals identified in Chapter 3 across each of these future scenarios, we can create a plan more responsive and adaptable to ever-evolving travel needs, preferences, economic conditions, and technologies.

Exploratory scenario planning involves four key steps, each tasked with answering a central question:

1) **Where are we now?** This step explores historic trends and current conditions on the transportation system, laying the research and data groundwork for forthcoming scenario planning assumptions.

2) **Where could we go?** This step explores various indicators and signposts of change, including potential emerging trends, to help craft a set of alternative future scenarios. These alternative futures represent a set of future conditions to explore and plan for.

3) **How could we prepare?** This step identifies potential strategies for achieving the goals and objectives within each of the alternative futures. It identifies the impacts, benefits, and tradeoffs of these various strategies either individually or as a group.

4) **What's our path forward?** This step is used to refine the potential strategies developed in Step 3 into a set of cohesive solutions that are effective under many – ideally, all – alternative futures. The outcome is a set of robust recommendations that are positioned for implementation in the near term to achieve long-term goals.

4.2 Emerging Trends in Hawaii

Hawaii's residents, communities, economy, environment, and transportation system will be shaped by the changing needs of the future. Where could Hawaii be headed? Scenario planning gives us the opportunity to address a range of plausible futures and try to implement strategies that will meet the HDOT's goals under any scenario. The following sections describe emerging trends and potential future implications for six key drivers of our future transportation system: pandemics, climate change, demographics, economics, development and land use, and emerging technologies. Future implications associated with each trend are assumed for the year 2045, this plan's horizon year, with the understanding that there will be many fluctuations between now and then.

Through the dedication and input of stakeholders and agency staff across the state, these issues were used to inform the alternative future scenarios outlined later in this chapter. Ultimately, considering these trends helps ensure that Hawaii develops and implements transportation strategies that are resilient to change and mitigate risk of factors including those outside of the State's control.

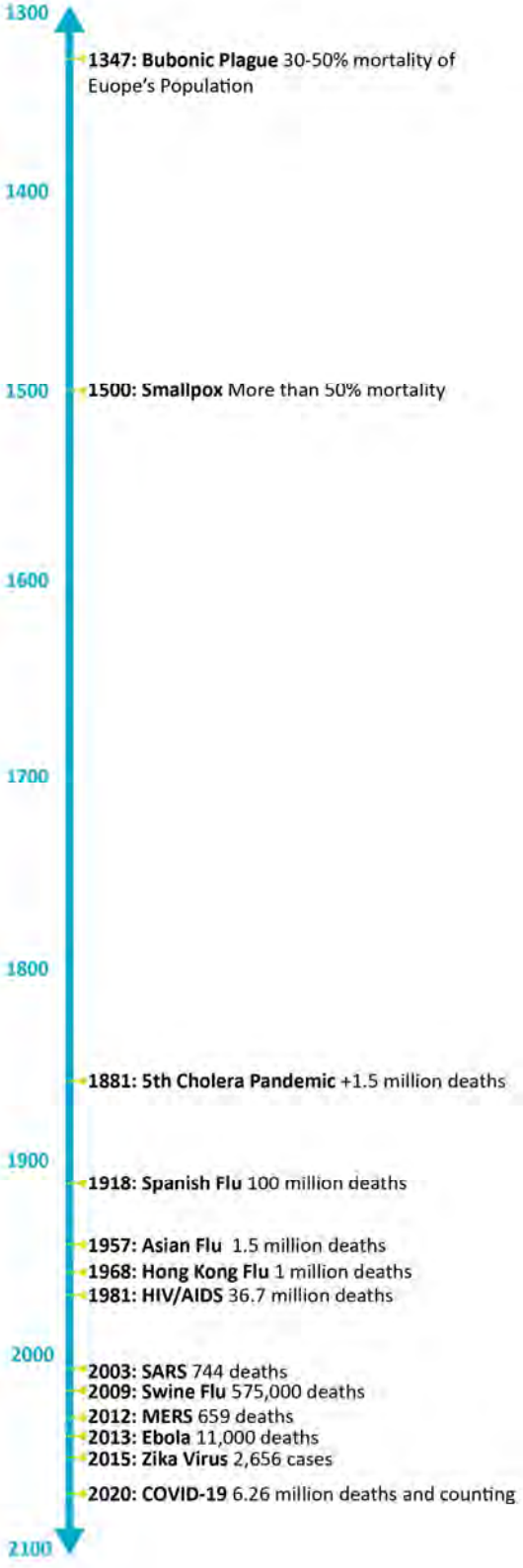
It should be noted that the onset of COVID-19 in March 2020 and the restriction of economic activity to slow the spread of the virus profoundly impacted how Hawaii's visitors and residents live, work, and travel, and how goods move throughout the state. When and how the economy recovers and how people and goods travel in the post-COVID-19 world is still highly uncertain and influences all other trends. COVID-19 is accelerating some trends that were already in motion, such as the growth of e-commerce and the decline of some brick and mortar retail. However, because reliable data on mid-pandemic conditions was both incomplete as of this writing, and uncertain to be long-term drivers of future conditions, the trend figures presented below are based on pre-COVID trajectories unless otherwise noted.

4.2.1 Pandemics

Pandemics have been increasing in frequency over the last century due to urbanization and global interconnectedness, as well as advances in science in identifying viral and bacterial strains. The recent series of pandemics, including COVID-19, the Zika and Ebola viruses, MERS, swine flu, and SARS, suggest these could be a recurring event in the future. The timeline in Exhibit 4-1 shows the dramatic increase in major pandemics over the previous century.

During and after 2020, the COVID-19 crisis demonstrated the disruptive power of a global pandemic. The effects of COVID-19 immediately altered our travel patterns and supply chains, with implications across all transportation sectors.

Exhibit 4-1. Timeline of Historical Pandemics and Epidemics



4.2.1.1 Changing Travel Patterns

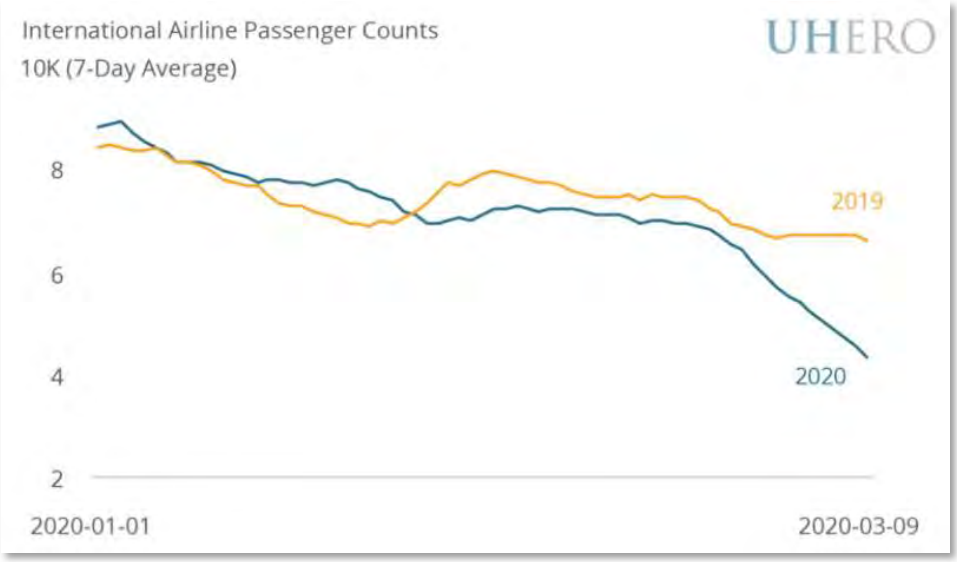
During the onset of COVID-19, many workers who previously commuted to the office transitioned to telework arrangements, and many of them may continue to do so in the future (Horton et al. 2020). Many schools shifted to distance learning, and online offerings like telehealth have experienced a significant increase in demand. Vehicle and truck traffic in Hawaii was reduced by nearly 50 percent after the shelter-in-place order was issued, though that reduction in traffic may be temporary after business resumes (Honore 2020b). The number of car registrations, statewide, fell by 24 percent between January and June 2020, compared to the same period in 2019 (The Maui News 2020).

Transportation Safety Administration (TSA) data show air travel into Hawaii decreased 98 percent between January and April 2020 as compared to 2019 (Exhibit 4-2). Cruise ship travel into Hawaii was also suspended amid the pandemic, with travel suspensions extended twice by the Cruise Lines International Association since March 2020 (Associated Press 2020). Transit ridership also substantially dropped, with ridership on Honolulu's TheBus down by 65 percent in March and 70 percent by mid-April 2020 (Honore 2020a).

In 2021, nearly 6.8 million visitors arrived in Hawaii. This is more than double the 2020 numbers, but is still a decrease of 34.7 percent compared to pre-pandemic 2019 visitor levels (DBEDT 2022).

Active transportation increased, with Honolulu bike shops reporting a 60 percent increase in sales (Honore 2020c). Shared mobility decreased, with both bikeshare and transportation network companies (TNCs) such as Uber reporting major decreases in demand (Leatherby and Gelles 2020).

Exhibit 4-2. Hawaii International Airline Passenger Counts



Source: TSA n.d.

4.2.1.2 Supply Chain Disruptions

The pandemic has had sweeping impacts on manufacturing production, consumer demand, and supply chains. For example, suppliers that warehoused, packaged, and distributed to institutional buyers (e.g., restaurants, cruise ships, and others) were challenged to change their packaging and distribution to grocery stores fast enough to meet demand, which resulted in disruptions in goods deliveries. Hawaii saw a 30 percent drop in interisland and cargo volumes (Exhibit 4-3).

Exhibit 4-3. Hawaii News Headlines during COVID-19

Home deliveries also increased as customers opted more and more for delivery options that minimize time indoors including curbside pick-up and delivery.

4.2.1.3 Transportation Implications

Potential short- or long-term transportation implications of future pandemics and epidemics, based on recent experience with COVID-19, may include the following:

- **More personal auto use** – Apprehension around transit and shared mobility could lead to more personal auto use.

- **Significant supply chain disruptions** – Impacts to the global supply chain may cause Hawaii to experience critical shortages in supplies, intensifying the need for a more diverse and resilient supply chain.
- **Reduced tourism** –Decreases or swings in tourism caused by restrictions on travel can negatively impact economic activity. The loss of small business and tourist-centered operations in Hawaii could lead to slower economic recovery from pandemics and epidemics than other states and countries (Congressional Research Service 2021).
- **Growing inequality** – Prolonged unemployment and lack of equal access to technology could exacerbate the so-called digital divide (that is, the economic, educational, and social inequalities between those who have the ability to access technology online and those who do not).
- **Reduced transportation revenues** – Reduced travel across modes could lead to reduced revenue. The reduction of vehicular travel means that residents also use less gasoline and pay less in gas tax. Drops in revenue at harbors may occur because of reduced amounts of cargo and passenger cruise traffic. The decline in new vehicle registrations will also result in reduced revenues for the state. The General Excise Tax (GET) revenues that support county transportation agencies are also down as a result of a general reduction in services and consumption.

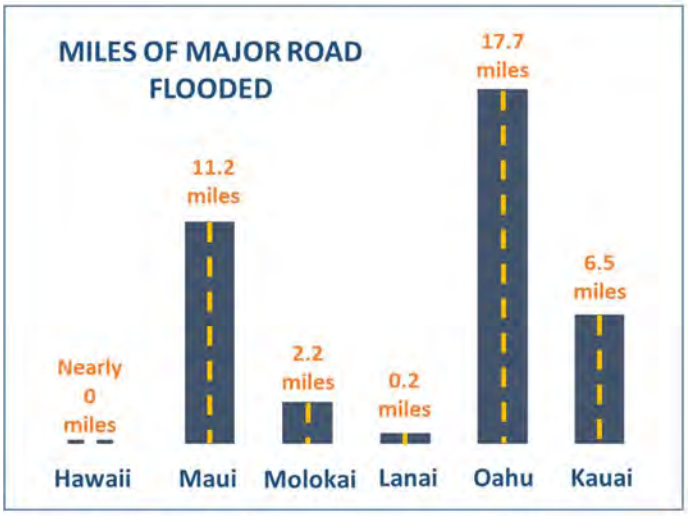
4.2.2 Climate Change

The impacts of climate change are already being felt around the world, including rising sea levels, increased heat, variability of precipitation, and more frequent and severe extreme weather events and natural disasters. The changes could have significant impacts on communities, infrastructure, the economy, and the ecosystem. The State recognizes the significance of climate change and the impacts it may have on life in the state; a white paper evaluating some of those impacts was completed and is included with Appendix C.

4.2.2.1 Sea Level Rise

As an island state, Hawaii is particularly vulnerable to the effects of sea level rise and extreme weather events. The recent *Hawaii Sea Level Rise Vulnerability and Adaptation Report* projects up to 3.2 feet of global sea level rise as early as 2060 and the loss of infrastructure valued at more than $19 billion by 2100 (Hawaii Climate Change Mitigation and Adaptation Commission 2017). Up to 38 miles of the state's coastal roads could be flooded (Exhibit 4-4).

Exhibit 4-4. Potential Miles of Major Flooded Roads with 3.2 Feet of Sea Level Rise in Hawaii



Source: Hawaii Climate Change Mitigation and Adaption Commission, 2017

4.2.2.2 Extreme Weather

More frequent and severe storms, rising temperatures, and reduced precipitation are also threatening Hawaii's infrastructure. Average annual temperatures have increased across Hawaii since the 1950s (Exhibit 4-5). In 2019 alone, nearly one-third of days saw record daily high temperatures. High temperatures are linked

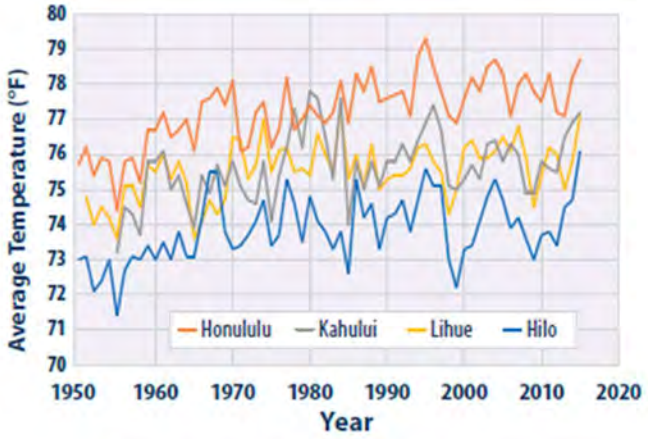
to a growing number of wildfires, which now burn about half a percent of Hawaii's land each year – more than any other state in the country.

Extreme weather events also increase the potential for loss of life and a disruption in economic activity. These events increase the state's reliance on post-disaster federal funding and threaten its long-term financial health. As a result, mitigating climate risks and increasing the state's resilience to climate change carries major implications for investments in infrastructure

Natural Disasters

Hawaii is also at risk of natural disasters, such as earthquakes, tsunamis, hurricanes, and volcanic eruptions. While not necessarily linked to climate change, these disruptions must also be accounted for throughout the planning process.

Exhibit 4-5. Hawaii Average Temperature Increase (1950-2016)



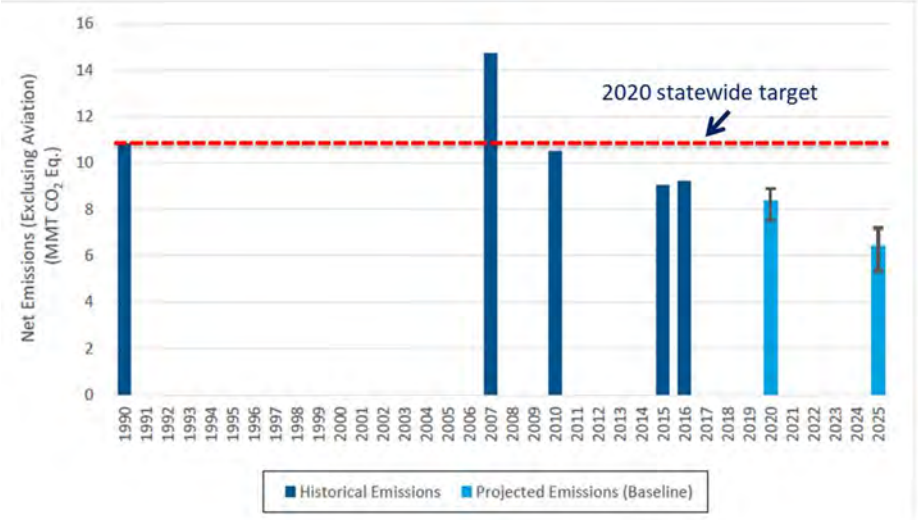
Average annual temperatures have increased across Hawaii since 1950. Source: NOAA

4.2.2.3 Greenhouse Gas Emissions

Greenhouse gas (GHG) emissions are identified as a key contributor to climate change and recent legislation has increased focus on strengthening the State's response to climate change. A Hawaii Climate Change Mitigation and Adaptation Commission has formally been established and targets have been set to achieve net zero emissions (carbon neutrality) throughout the state by 2045. Hawaii has reduced overall GHG emissions nearly 40 percent over the last decade and is expected to surpass statewide legislative targets through 2025 (Exhibit 4-6).

Exhibit 4-6. Hawaii GHG Emissions Inventory Estimates and Projections

Source: HDOH 2019



Transportation has followed this trajectory, but still remains at about 40 percent of total greenhouse gas emissions.

4.2.2.4 Transportation Implications

Potential transportation implications related to climate change include:

- **Climate-related migration** – As natural disasters and sea level rise impacts increase, those living in vulnerable locations such as low-lying islands, may migrate to Hawaii. On the other hand, food and water insecurity may also lead to out-migration. These events may also affect where residents live and how they travel in Hawaii.
- **Heightened need for emergency preparedness** – Growing risks suggest an increased need for emergency response and evacuation systems.
- **Growing health and transportation disparities** – Vulnerable communities living in coastal areas may be hit hardest in a climate crisis. These groups may find transportation less affordable in the future.
- **Declining tourism and slowed economic growth** – Tourism may be negatively impacted, and infrastructure disruptions expected with climate change would interrupt regular economic activity.
- **Increasing infrastructure costs** – Greater levels of investment will be required to mitigate and adapt to the impacts of climate change.

4.2.3 Demographics

As populations change, so does the demand for transportation. Individuals with different age, racial, ethnic, and disability characteristics have different transportation needs, and considering those needs helps identify successful future transportation solutions.

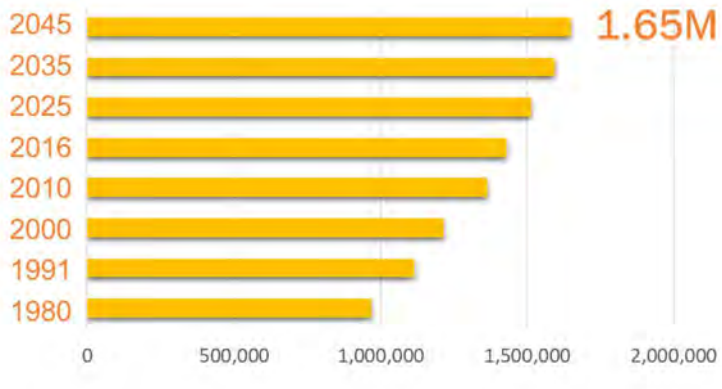
4.2.3.1 Population Growth

The current transportation network supports a population of almost 1.5 million residents across all of the six major islands – Hawaii, Maui, Molokai, Lanai, Oahu, and Kauai.

The majority of Hawaii's population (almost 70 percent) resides on Oahu in Honolulu County. Kauai County is the least populated with approximately 5 percent of the state's total population. The remainder of the population is roughly evenly split between Maui County and Hawaii County.

Exhibit 4-7. Hawaii Projected State Population by 2045

Source: DBEDT 2018a



For the past 10 years, Hawaii's population has remained relatively stable. According to the U.S. Census Bureau's 2020 Post-Enumeration Survey Estimation Report, the state's population decreased very slightly (0.26 percent) since the 2010 census (Hill et al. 2022). This decrease reflects the gradual decline in statewide population that began in 2016 (Grassroot Institute of Hawaii 2022). Since 2017, the population in Maui County and Honolulu County has declined slightly each year while Hawaii County and Kauai County saw growth, resulting in a net decrease in the number of state residents.

Although the statewide birth rate has outpaced the death rate in recent years, the change in the state's population is likely due to an increasing number of people moving out of the state seeking more affordable locations and better jobs and opportunities (Hofschneider 2022; Yerton 2022).

Longer-term, Hawaii's population is expected to increase by more than 200,000 individuals by 2045 (Exhibit 4-7), with a total population of 1.65 million residents (Hawaii Public Radio 2019b; DBEDT 2018a).

4.2.3.2 Aging Population and Accessibility Needs

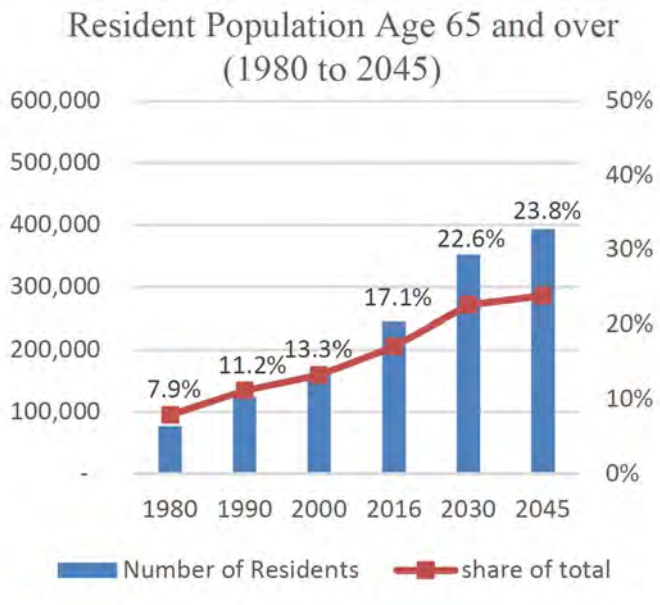
The need to travel is a daily part of life for many residents. Statewide, almost 7.5 percent of households do not have access to a personal vehicle. On Oahu, that percentage is higher at close to 10 percent, likely due to the availability of transit options and dense residential areas in the urban downtown core where walking or bicycling may be more convenient compared to other islands. In Kauai, Maui, and Hawaii counties, only 3 to 4 percent of households do not have access to a personal vehicle.

For those without access to a personal vehicle, public transportation may be a viable travel option. Public transit options are available in all counties, and many transit routes use the state's roadway network to serve passengers. Roughly 20 percent of Hawaii's overall population is under the age of 18, with another 20 percent over the age of 65. These sectors of the population may be more likely than other age groups to rely on public transportation options to travel independently.

Compared to today, future Hawaii residents are more likely to be over the age of 65 (Exhibit 4-8). Hawaii has a slightly higher dependency ratio (that is, the ratio of the population under 18 or over 65, compared to those between the ages of 18 to 65) than the United States as a whole, and that ratio is expected to increase through 2035 (Hawaii Health Matters 2022). In addition, approximately 20 percent of adults in Hawaii live with a disability, on par with the national rate.

Exhibit 4-8. Resident Population Age 65 and Over

Source: DBEDT 2018a



4.2.3.3 Growing Income Disparity

The high cost of housing (Hawaii ranks as the number one out-of-reach state for housing affordability [National Low Income Housing Coalition 2019]) and high rates of poverty (20 percent among those who identify as Pacific Islander or Native Hawaiian) continue to be persistent issues. Income inequality, though currently relatively low in Hawaii compared to the rest of the United States, is also expected to increase.

4.2.3.4 Transportation Implications

Potential transportation implications related to demographic trends include the following:

- **Growing travel demand** – As the population increases, so does the need to travel, potentially resulting in higher levels of congestion. Growing travel demand will require additional capacity, more efficient use, and more frequent maintenance of transportation assets.
- **Changing travel needs and preferences** – Travel needs and preferences may change as the demographics change. Changes such as an aging population, greater dependency ratios, and more accessibility needs may require more transportation options, particularly if driving is no longer an option for some.
- **Transportation affordability** – Transportation affordability may become more important as income inequality increases. Vulnerable communities may be priced out of housing close to desirable destinations and experience greater housing and transportation costs.

4.2.4 Economy

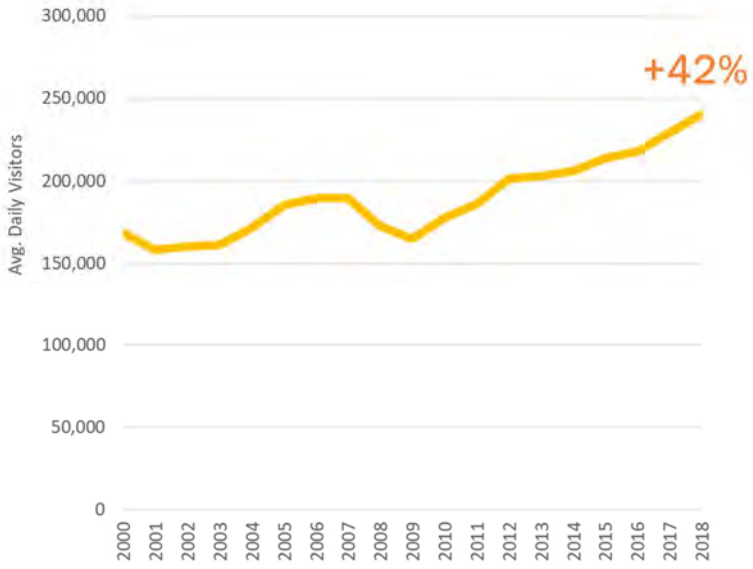
The movement of goods – and the demand for supporting infrastructure – is directly influenced by current and future economic trends. In Hawaii, this is particularly true due to the island state's geographic isolation.

4.2.4.1 Tourism Driven Economy

Tourism is a huge economic driver in Hawaii. In 2019, there were over 10.4 million visitors to Hawaii, a 5.4 percent increase from 2018 and an all-time high for the state. Visitor spending, including lodging, interisland airfare, shopping, food, car rental and other expenses spent while in Hawaii, generated $2 billion in state tax revenue and the tourism industry supported 216,000 jobs statewide, representing approximately one-third of all jobs in the state (Hawaii Tourism Authority 2020). The service industry represents 90 percent of Hawaii's Gross State Product. Exhibit 4-9 presents the substantial increase in average daily visitors (via air travel) over the last 20 years.

Exhibit 4-9. Hawaii Average Daily Visitors (2000-2018)

Source: DBEDT 2018a



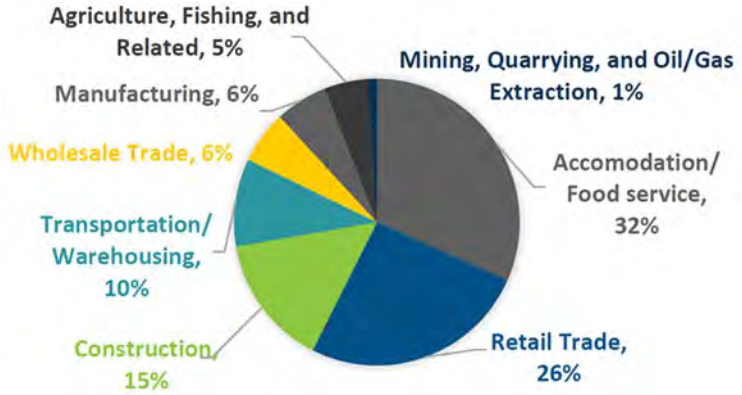
Due to the global pandemic beginning in 2020, the tourism industry in Hawaii experienced major losses and the number of visitors to the state dropped to less than 2.71 million. At the end of 2021, the number of annual visitors to the state had climbed to nearly 6.78 million (DBEDT 2022), and although not yet back to pre-pandemic levels, the visitor forecast indicates that Hawaii could see 8.86 million tourists in 2022 and nearly 9.9 million tourists by 2024 (Nakaso 2022).

4.2.4.2 Freight-dependent Industries

Hawaii's multimodal freight system is important due to Hawaii's geographic isolation. Freight-dependent industries, those that depend on reliable transport of goods to or from their place of business, employ 350,000 people, representing 38 percent of all jobs in the islands. Within freight-related sectors, accommodation and food service (tourism), retail, and construction represent the largest employment. (Exhibit 4-10).

Exhibit 4-10. Employment in Freight Dependent Sectors

Source: HDOT Highways Division 2018



4.2.4.3 Global Dependence

Approximately 80 percent of everything we use in Hawaii is imported, with the vast majority of that—96 percent, or 21.1 million tons—coming through Hawaii's harbors. Many high-value goods arrive by air. The supply of daily goods is critical to Hawaii's geographic isolation. Governor Ige has stated food and energy independence to be two of the top priorities for the state and has set targets to produce 30 percent of highway fuels from alternative sources by 2030, and to double agricultural production by 2030 (Governor of the State of Hawaii 2022).

4.2.4.4 Transportation Implications

Potential transportation implications related to these (pre-COVID) economic trends include the following:

- **Tourism –** Tourism is a massive economic engine that also generates significant revenue and VMT. Continued growth in tourism also translates into more demand for airport and port capacity.
- **Continued reliance on multinational companies –** Because of Hawaii's geographic isolation, the state is likely to continue to rely on multinational companies that enjoy economies of scale and strong supply chains in order to import food and goods through Hawaii's ports.
- **Declining fuel taxes –** Increased use of alternative fuels, if state targets are met, could lead to declining fuel tax revenues.

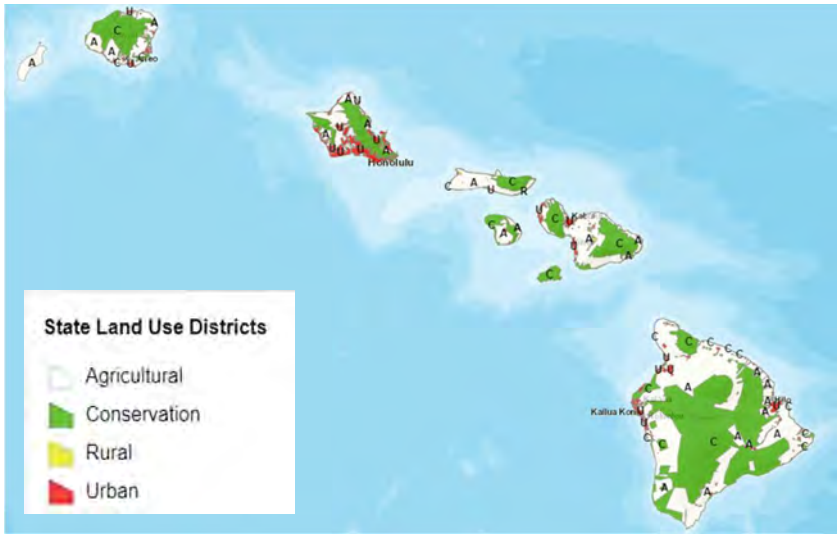
4.2.5 Development and Land Use

Proximity to jobs, housing, and other land uses impacts how far people travel, how frequently they travel, and what modes they choose. Likewise, transportation investments can impact the type, location, and density of development.

4.2.5.1 Balancing Land Uses

Half of Hawaii's land use is classified by the State as "conservation" areas, 46 percent is agricultural and rural, and just five percent of the land area is urban (Exhibit 4-11). Hawaii continues to face pressure to develop within agricultural and rural lands to meet growing demand for housing. In urban areas, protecting green space while densifying continues to be a priority to limit urban sprawl. This has led to a relatively high population density. Hawaii has the 13th highest population density in the United States, with 223 people per square mile (World Population Review 2022). Population density is also expected to increase slightly (Open Data Network n.d.).

Exhibit 4-11. Hawaii State Land Use Districts

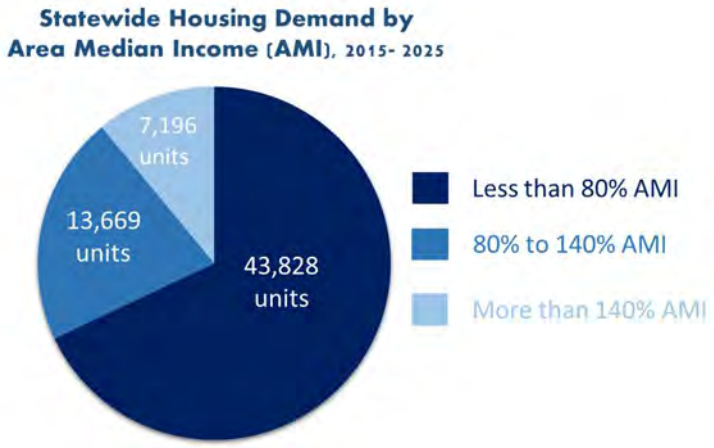


4.2.5.2 Housing Demand

Housing is expensive and in short supply in Hawaii, which may continue to jeopardize efforts to preserve undeveloped land. It is estimated that approximately 64,000 housing units will be needed to meet demand by 2025, of which approximately 70 percent are needed for low-income households (Exhibit 4-12) (DBEDT 2018b).

Exhibit 4-12. Hawaii Statewide Housing Demand

Source: DBEDT 2018a



4.2.5.3 Cost of Living

The demand for affordable housing is due to the high cost of living in the state and the limited supply of housing stock. Hawaii's housing wage is the highest in the United States, requiring a yearly household income of more than $75,000 to afford a modest, two-bedroom apartment. This is approximately two times the state's average salary. As previously noted, the national low-income housing coalition ranks Hawaii as the number one out-of-reach state for housing affordability (National Low Income Housing Coalition 2019). When factoring in the cost of transportation, Hawaii becomes even less affordable. Typically, transportation is a household's second-largest expenditure. The Housing + Transportation index, which is the combined cost of housing and transportation, provides a more complete picture of housing affordability by including the cost of transportation in the equation. While housing alone is traditionally deemed affordable when consuming no more than 30 percent of income, the Housing + Transportation index

sets the standard of affordability at 45 percent of household income for the combined cost. The four major counties in Hawaii have a Housing + Transportation index of more than 50 percent, with Hawaii County having the highest index at 67 percent (SMS Research 2019).

4.2.5.4 Transit-Oriented Development

Several initiatives and pieces of legislation seek to tackle housing through a variety of strategies, including investing in transit-oriented development (TOD) and identifying actions needed to achieve a goal of constructing 22,500 affordable rental housing units by 2026 (DBEDT 2018b). The State's TOD strategy estimates that more than 65,000 new units could be added in the rail corridor over 50-plus years.

4.2.5.5 Transportation Implications

Potential transportation implications related to development and land use trends include:

- **More dense land use** – State policies may lead to more dense land use, more efficient use of transportation assets, and may incentivize shifts to non-auto modes. Dense development patterns make transit, walking, and biking more accessible, which may also lead to better individual and community health outcomes by promoting physical activity. However, increased development could create conflicts with other land uses (such as airport facilities) and will need to be managed properly.
- **Exurban development –** As housing costs increase and the population continues to grow, demand for exurban development may increase and lead to less dense land development, contrary to the trends above. The rise of teleworking and improved wireless communications could also contribute to demand for exurban development.
- **Increasing travel time and costs –** Increasing housing costs may displace low- and middle-income renters to outlying areas where commutes are longer, fewer options and services are available, and transportation costs are higher.

4.2.6 Technology

Innovation and technology are reshaping almost every aspect of our economy—and the pace of change is accelerating. The fast-growing digital and shared economies are just the tip of the iceberg. Rapid advancements in robotics, sensors, artificial intelligence, and automation are creating new capabilities for many industries. An explosion in connectivity is magnifying the impacts of these changes—30 to 75 billion devices could be part of the Internet of Things (that is, physical devices connected to and exchanging data with other devices and systems via the internet) by 2030. Advances in nanotechnology, bioengineering, and other materials are creating new capabilities in fields such as medicine and agriculture. And new technologies and more diverse sources are making more affordable, cleaner energy more readily available.

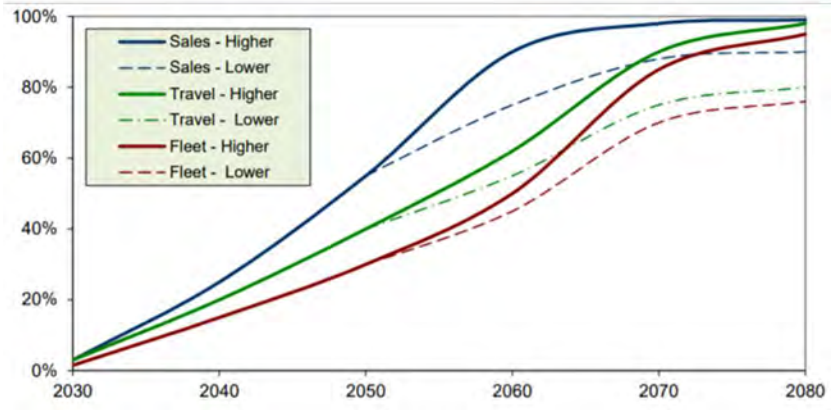
These unfolding changes are fundamentally altering the way people live, work, learn, play, do business, and travel across the globe, including in Hawaii. The following sections introduce key trends in those changes from a transportation perspective.

4.2.6.1 Autonomous and Connected Vehicles

While there is still great uncertainty concerning the widespread use of connected and autonomous vehicles, they remain an area of intense focus in the United States and in the state. There is no real consensus or precision when it comes to predicting autonomous vehicle adoptions. Some studies suggest that between 20 percent and 95 percent of miles traveled on U.S. roads could be made by autonomous vehicles by 2030 (Shaheen et al. 2018). Others suggest high levels of autonomous vehicle adoption will take place at a later date, potentially saturating the market in 2080 (Exhibit 4-13).

Exhibit 4-13. Autonomous Vehicle Sales, Fleet, and Travel Projections

Source: Victoria Transport Policy Institute 2022



Hawaii is poised to be a leader in the self-driving car revolution due to an open regulatory environment, pilot programs, and extensive research (including the University of Hawaii at Manoa's autonomous vehicle institute). The Autonomous Vehicle Legal Preparation Task Force finalized a report of recommendations in December 2020 regarding the legal and insurance regulation of autonomous vehicles in the state (Department of the Attorney General 2020). Honolulu may set a groundbreaking precedent in the U.S. with the first fully-automated wide-scale urban transit system in the country with the anticipated start of operations for the Honolulu Rail Project in 2022 (Crawford 2014). In addition, automated and connected vehicle technology is poised to increase freight efficiency.

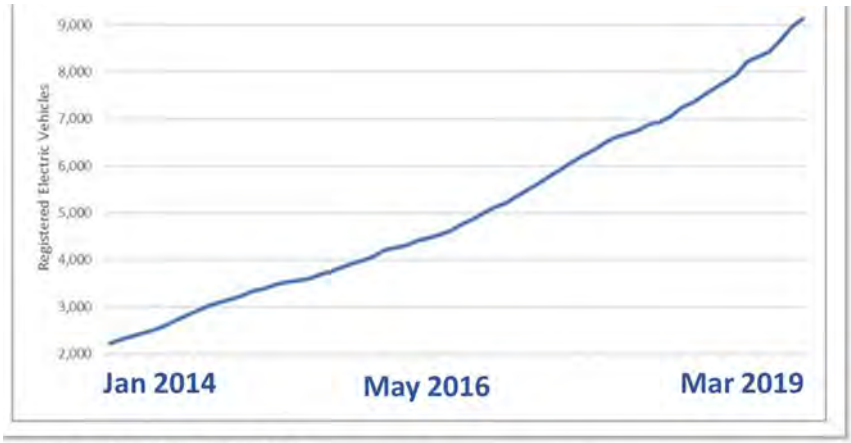
Automation and connectivity are not limited to the motor vehicle. New forms of automated transit and shuttle systems offer opportunities to move people in heavily traveled areas or in campus environments. Unmanned aerial systems, such drones, are being used for data collection and tested for delivery of goods. The aviation system is testing urban air taxi systems and preparing for a transition to next-generation satellite-based air traffic control systems. Automated boats, ships, and underwater systems are creating new capabilities for the maritime industry.

4.2.6.2 Alternative Fuels, Zero-emission Vehicles, and Electrification

To achieve statewide greenhouse gas reduction goals, Hawaii is highly dependent on transitioning to clean fuels and renewable energy sources, especially in the transportation sector. Incentivizing electric and alternative-fuel vehicles and planning for and investing in electric vehicle (EV) charging infrastructure are key actions that the state is advancing to reduce their reliance on fossil fuels and curb the impacts of climate change.

According to the Hawaii State Energy Office, registered EV increased statewide by 266 percent between 2014 and 2019 (Exhibit 4-14). Almost 2 percent of total vehicle sales are EVs, with 10,670 registered vehicles recorded in June 2021 (NREL 2021). In 2021, Hawaii ranked second to only California in EV registrations per capita by state (calculated using census and National Renewable Energy Laboratory [NREL] data). By 2045, 55 percent of personally owned, light-duty vehicles are expected to be fully electric on Oahu roads. Public charging ports to support this growth are expected to reach 2,200. EVs will reduce Oahu annual fossil fuel consumption for light-duty transportation by 56 percent by 2045 (Hawaiian Electric Companies 2018).

Exhibit 4-14. Electric Vehicles Registered Statewide



Source: Hawaii State Energy Office, 2019
Accessed from: https://energy.hawaii.gov/wp-content/uploads/2019/07/2019-FF_Final.pdf

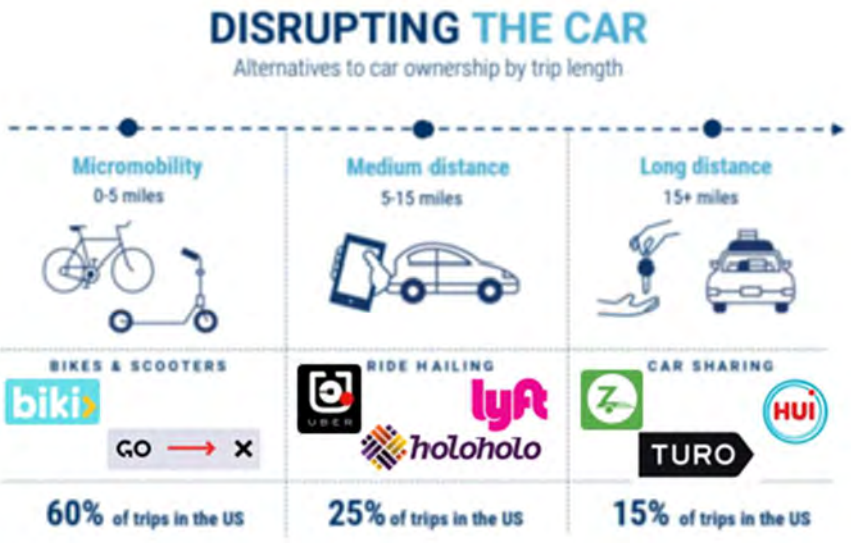
The surface transportation system is not alone in exploring alternative fuel sources – for example, many large container and cruise ships are transitioning to liquefied natural gas sources. Research also is underway on how transportation assets can help produce net energy, such as placement of solar panels in highway right-of-way or energy-producing sensors in pavement. Another avenue for saving energy is incorporating recycled plastics and carbon-entrained concrete into roadway pavement.

4.2.6.3 Transportation Network Companies (TNCs) and Micromobility

TNCs, like Uber, Lyft and Zipcar, have drastically changed how people travel by providing on-demand mobility with integrated routing, booking, and payment. While studies around the world have shown that TNCs increase traffic congestion, a 2017 study presented at the 50th Hawaii International Conference on System Sciences found that they can also reduce overall traffic by reducing car ownership, supporting shifts from single-occupancy vehicles to ridesharing, and supporting more off-peak travel (Li et al. 2017). In some cases TNCs may divert trips that otherwise would be handled by transit, but in other cases TNCs can provide convenient first-/last-mile solutions to bring riders to and from transit stops.

Hawaii also may be uniquely positioned to take advantage of micromobility solutions (for example, scooters and bikeshare). A 2019 INRIX report noted that Hawaii has more potential for micromobility than other U.S. cities because trips tend to be shorter distance (less than 3 miles) (Hawaii Public Radio 2019a). Exhibit 4-15 presents alternatives to car ownership by trip length.

Exhibit 4-15. Alternatives to Car Ownership by Trip Length



The COVID-19 pandemic has raised concerns about the safety of using shared vehicles and systems; as these concerns persist, long-term increases in demand for micromobility are anticipated to increase nationwide.

4.2.6.4 Transportation Implications

Potential transportation implications related to emerging trends in technology include:

- **Increased safety and mobility** – Technology has the potential for dramatic increases in safety and access to mobility for the elderly, youth, and people with disabilities. Connected and autonomous vehicles, in particular, may increase safety on the road by reducing human driver error. In addition, micromobility devices are often geo-coded to only work in areas that would avoid pedestrian conflicts and with speed governors to curb dangerous operation. There is potential, however for new risks from the mixing of older systems with automated vehicles on the same infrastructure, or from the potential for hacking, system failure, and other cybersecurity issues.
- **Changes in how and where people live, work, and travel** – From cars to shared mobility, from daily commutes to virtual work meetings and classrooms, technology has the potential to fundamentally change how and where we live, work, and travel. This could have repercussions on congestion and increase or decrease VMT depending on how people chose to adapt their travel patterns.
- **Shifts in transportation revenue sources and investment needs** – Zero-emission (ZE) vehicles do not require gasoline to operate and so do not support transportation revenues through the State gas tax. There could be significant shifts in transportation revenue sources and investment needs with EVs or other new technology.
- **Equity concerns** – New transportation technology has the potential to increase access and improve mobility for all, but careful consideration must be made for implementation of these technologies to ensure that vulnerable populations are not left out.

4.3 Alternative Futures

This section summarizes five potential futures for Hawaii and what they mean for transportation. Exploring and preparing for different futures will help ensure that HSTP strategies are resilient to various challenges and opportunities over the coming decades. Each alternative future uses a combination of assumptions about public health, climate, demographics, development, economy, and technology to shape a unique but plausible picture of conditions by the year 2045. These assumptions were influenced by a review of existing data, trends, forecasts for Hawaii, national research, best practices, and input from the HSTP Sub-Statewide Transportation Advisory Committee (SubSTAC), Stakeholder Advisory Committee (SAC), technical staff, and public.

These futures are not intended to predict what will happen in Hawaii nor to select a single preferred future, but rather to help the HDOT and its partners build a more agile plan that is prepared for a wide range of potential outcomes. There are five alternative futures being evaluated:

- **Business as Usual** – A future that largely returns to pre-COVID growth forecasts projected by the State of Hawaii
- **Global Health Crisis** – A future with an increased frequency and severity of pandemics and epidemics
- **Power in Paradise** – A future where Hawaii achieves energy independence
- **Climate Emergency** – A future where Hawaii faces more extreme effects of climate change and welcomes climate refugees from Pacific islands devastated by sea level rise
- **Technology Revolution** – A future where technological breakthroughs change the way humans live, work, and travel on a day-to-day basis

Each future includes a short descriptive narrative, potential transportation implications for the different HDOT divisions, and a summary of potential transportation challenges and opportunities. Note that because the futures are hypothetical realities, they are presented in simple future rather than using conditional “would” statements. Each describes “reality” in that future. These individual snapshots are followed by a chart that compares each alternative future by key driver.

Because the actual future may reflect a combination of some or all of these thought experiments, thinking through each future will help the state prepare a more effective and resonant long-range plan. This information was used in combination with the plan’s goals to generate robust strategies and actions that will help Hawaii achieve our goals, whatever the future may bring.

4.3.1 Business As Usual

After a long pandemic pause, the world addresses the COVID-19 pandemic and returns to a pre-COVID growth trajectory. Long-range forecasts from the Hawaii Department of Business, Economic Development & Tourism (DBEDT 2018) paint the following picture (Exhibit 4-16).

In 2045, Hawaii's population grows by 15 percent to 1.65 million, of which 1 in 4 residents are 65 years or older. The economy returns to slow but steady average growth, with gross state product increasing by about 1 percent annually. Tourism rises to 12 million annual visitors by 2045, fueling a strong service sector. Hawaii continues to rely on imported goods and remains vulnerable to supply chain disruptions.

Due to statewide climate mitigation efforts, by 2045 about a quarter of vehicles are fully electric, shared mobility use grows among all generations, and about 30 percent of highway fuels come from alternative sources. There have been several minor public health outbreaks over the years, but the main threat to the islands is more frequent and severe storms, sea level rise, and other climate-related disruptions.

Exhibit 4-16. Implications of Business as Usual on HDOT Divisions

Highways	Harbors	Airports
▪ Vehicle-miles traveled (VMT) increase by 25 to 30% from 2019 levels, increasing congestion and decreasing reliability ▪ Continue existing capital investments in transit to boost ridership ▪ Continued growth in active transportation, micromobility ▪ Continued constraints on traditional highway funding sources; increasing emphasis on user- and growth-related fees	▪ Continued reliance on port facilities for cruise passenger tourism, imports of food and resources, and distribution of fuel ▪ 35% growth in maritime freight by 2035 (HDOT Highways Division 2018)	▪ Continued visitor growth ▪ Continued reliance on air travel for imports of consumer goods ▪ 110% increase in air cargo by 2035 (HDOT Highways Division 2018)

Challenges	Opportunities
▪ Declining revenues for infrastructure maintenance, investment and modernization ▪ Continued congestion ▪ More frequent severe weather events strain state budgets as transportation infrastructure repair and maintenance becomes more frequent	▪ Remote access (such as teleworking and telemedicine) expands following COVID-19, lowering peak hour vehicle traffic ▪ Changing attitudes about virtual access allow more people to access online services and engage in civic life

4.3.2 Global Health Crisis

COVID-19 was just the beginning, as the connected world enters an age of more frequent and severe global pandemics. Global pandemics occur every few decades with smaller regional epidemics breaking out more frequently, causing significant disruptions to the transportation system and increasing the importance of access to health care, jobs for essential workers, and critical supply chains (Exhibit 4-17).

Through several cycles of austerity and recovery, State public health policies protect against exposure when critical, but still welcome tourists when it is safe to do so. Public health concerns and the ability to telework incentivize people to leave urban centers, leading to more disperse development patterns. All of this exacerbates the digital divide between people who can work at home and essential workers, who are more at risk for job loss.

In response to these trends, Hawaii looks inward and goes local, shifting to local agriculture and manufacturing where possible, creating booming microeconomies. Innovations in freight technology and drone deliveries bring fast e-commerce to the most remote areas of the islands.

Exhibit 4-17. Implications of a Global Health Crisis Future on HDOT Divisions

Highways	Harbors	Airports
▪ Personal auto and active transportation modes increase ▪ Transit ridership and shared mobility decrease ▪ Rental car use declines with drop in tourism ▪ E-commerce/last-mile deliveries increase statewide ▪ More rapid decline in traditional transportation revenues	▪ E-commerce increases port volumes, and a growing local and global production adds complexity to supply chains, especially in rural areas ▪ Passenger cruise ship activity declines significantly ▪ Shift from just-in-time to just-in-case freight patterns requires more storage capacity	▪ Air freight increases to support boom in e-commerce but drop in passenger travel limits capacity ▪ Passenger air travel declines with decrease in visitors

Challenges	Opportunities
▪ Implementing health and safety protocols on transportation systems ▪ Maintaining supply chain resiliency while protecting public health ▪ Funding infrastructure improvements during extended recession ▪ Providing quality multimodal options to a more dispersed population with low-density development ▪ Addressing the digital divide and maintaining equitable access to opportunity	▪ Increased market diversification and self-sufficiency to ensure local systems can mitigate global supply chain shortages ▪ Support for improved broadband connectivity ▪ Increasing demand for fast and reliable goods movement in rural areas ▪ Shifts toward active modes

4.3.3 Power in Paradise

Hawaii's renewable energy sector takes off, with 100 percent renewable energy by 2045 leading Hawaii to become the first carbon-negative state in the United States. Smart grid and ZE technology supports widespread adoption of ZE vehicles across the transportation sector, including personal and freight travel (such as electric, hydro, liquefied natural gas, and other tech), but congestion grows as a result. Air and water quality remain excellent to due reduced pollution (Exhibit 4-18).

Although sea levels still continue to rise and severe storms become more frequent, Hawaii is better prepared for climate change due in part to its drive toward energy independence. Hawaii invests in dense, energy-efficient housing, built away from flood-prone areas, while preserving space for natural, agricultural, and conservation lands in urban and rural areas.

Tourists continue to visit the islands and tourism is still the dominant industry, but the state is able to diversify its economy so fluctuations in tourism have less of an economic impact. Lower energy costs help the advanced manufacturing and tech sector attract businesses to Hawaii, leading to a growth in the workforce and a greater demand in commuting as the state attracts a diverse range of talent.

Exhibit 4-18. Implications of a Power in Paradise Future on HDOT Divisions

Highways	Harbors	Airports
▪ Increased use of alternative fuels leads to declining fuel tax revenues ▪ Denser development spurs more demand for multimodal options	▪ Shift in energy sources and flows impacts port activity and operations ▪ Port electrification and clean fuel technologies minimize maritime freight emissions	▪ Air freight increases to support increased trade

Challenges	Opportunities
▪ Ensuring equal access to new technology and career opportunities ▪ Cycling out an aging, antiquated vehicle fleet ▪ Accommodating increasing transportation demand from residents and visitors ▪ Generating stable revenue for public infrastructure maintenance, upgrades, and investment	▪ Drive toward carbon-negativity spurs local innovation and economic growth ▪ Shifts in energy consumption generate other more efficient behaviors ▪ Retrofitting old infrastructure for more productive purposes ▪ New pricing mechanisms to replace the gas tax

4.3.4 Climate Emergency

The global community fails to take the steps needed to avoid the most extreme effects of climate change. Sea levels rise beyond the anticipated 1.1 feet by 2050 and beyond 3.2 feet by 2100 (Hawaii Climate Change Mitigation and Adaptation Commission 2017). Hawaii experiences more frequent and severe storms, flooding, precipitation, and displacement of coastal communities. Hawaii's infrastructure and communities are severely impacted by these more frequent and extreme climate events (Exhibit 4-19).

Hawaii welcomes climate refugees fleeing from low-lying Pacific islands hit harder by rapid sea level rise. Due to rising seas and more frequent storms, development turns inland, shifting land use away from the coasts. Erratic climate patterns depress the global economy and deter tourism. Hawaii's economy experiences growth in services and increased development pressure to accommodate the influx of people from smaller islands. Vulnerable populations face job insecurity and displacement. There is a greater reliance on imported goods from a wider range of places around the world, creating additional strains on supply chain infrastructure.

Exhibit 4-19. Implications of a Climate Emergency Future on HDOT Divisions

Highways	Harbors	Airports
▪ Frequent storms and sea level rise damage roadways and transit routes, particularly in vulnerable areas, cutting off access to neighborhoods and cities ▪ Significant funding needed to repair and/or relocate infrastructure	▪ Port facilities at risk from catastrophic event; potential for severe disruptions to supply chain ▪ Budgets drained by frequent adaptations needed to maintain functionality in the face of sea level rise ▪ Increased reliance on imported goods leads to more demand on port facilities	▪ Frequent storms and sea level rise damage infrastructure at airports ▪ Budgets drained by frequent need to retrofit infrastructure that cannot be relocated ▪ Increased reliance on imported goods leads to more airport demand

Challenges	Opportunities
▪ Frequent disruptions and proactive steps (like relocation infrastructure) place even greater strain on transportation funding ▪ Sudden influx of climate refugees increases demand on transportation systems ▪ Growing disruptions to the transportation system ▪ Decreases in tourism lower sales tax revenue ▪ Ensuring adequate emergency communications, response, and evacuations procedures	▪ Transportation technology innovation as more nations attempt to successfully adapt to the climate crisis and lower emissions ▪ Growing population more amenable to transit and shared mobility solutions

4.3.5 Technology Revolution

Advancements in automation and information technology rapidly transform the way humans interact with one another – and how people travel. From connected homes to automated industrial systems, advanced technology becomes the norm (Exhibit 4-20).

Hawaii experiences a local technology boom which attracts skilled workers from around the world. Technology adoption varies across different demographic groups, and has the potential to increase equity gaps – especially between urban and rural residents. Hawaii still experiences sea level rise and more frequent storms. People continue to visit the islands for leisure travel, leading to growth in tourism, services, and trade.

Advances in technology lower price points for autonomous and electric vehicles, increasing the prevalence of personal ownership. Connected autonomous vehicles, improved broadband/5G, delivery drones, and other technologies allow for potential shifts toward less dense land use.

Exhibit 4-20. Implications of a Technology Revolution Future on HDOT Divisions

Highways	Harbors	Airports
▪ Potential for dramatic increases in safety and mobility for all ages and abilities ▪ Ability to increase throughput due to reduced headways and lane widths, reducing the need for expensive capacity expansions ▪ Potential for significant increases in travel and congestion ▪ Significant changes in revenue from fuel tax collections, vehicle fees ▪ Additional costs to upgrade roadway and transit infrastructure; has potential to provide better transit service	▪ Automation increases efficiency of port operations	▪ Automation increases efficiency of airport operations ▪ Next-generation air traffic control streamlines operations, improves safety ▪ Unmanned aerial vehicles and urban air mobility add complexity to airspace management

Challenges	Opportunities
▪ Potential for increased inequality due to the digital divide, tech literacy, and reluctance to adopt new technology ▪ Influx of workers and tourists could strain the natural ecosystem and degrade the environment in some areas ▪ New policy needed to regulate autonomous vehicles to avoid increased VMT and to address ethical questions about whose safety to prioritize ▪ New tech makes living remotely easier, pressuring exurban development ▪ Potential security disruptions due to hacking of autonomous vehicles ▪ New mechanisms needed to fund infrastructure maintenance and upgrades	▪ Autonomous vehicles and other technologies allow for more efficient use of space and frees up more time for leisure activities. They could also be a rich data source for understanding impacts to land use and parking decisions. ▪ Potential labor costs saving allow for more access to high-quality transit. ▪ Potential for improved system safety as connected and autonomous vehicle technology improves.

4.3.6 Comparing Alternative Futures by Driver

The matrix in Exhibit 4-21 describes the way different drivers could impact potential future scenarios. These futures were used in tandem with the plan's goals to create the robust strategies and actions outlined in Chapter 5.

Exhibit 4-21. Comparing Alternatives by Driver

Drivers	Business as Usual	Global Health Crisis	Power in Paradise	Climate Emergency	Technology Revolution
Public Health	▪ Minor periodic outbreaks	▪ Frequent global pandemics ▪ More frequent regional epidemics ▪ Growing biosecurity concerns	▪ Fewer and less severe future outbreaks ▪ Improved community health due to cleaner air and water	▪ Minor and periodic outbreaks	▪ Fewer and less severe future outbreaks
Climate	▪ Sea level +3 feet by 2100 ▪ Storms become more frequent and severe	▪ Sea level +3 feet by 2100 ▪ Storms become more frequent and severe	▪ Sea level +3 feet by 2100 ▪ Storms become more frequent and severe	▪ Sea level rises quicker and higher than projected ▪ Storms become more frequent and severe ▪ Record heat waves and natural disasters	▪ Sea level +3 feet by 2100 ▪ Storms become more frequent and severe, but climate strategies help the state adapt
Demographics	▪ Population grows by 15% to 1.65M by 2045 ▪ 1 in 5 residents are 65+; 1 in 5 adults live with a disability ▪ Increase in equity gaps	▪ Population grows by 15% to 1.65M by 2045 ▪ 1 in 4 residents are 65+ years ▪ Equity issues increase	▪ Population grows by 15% to 1.65M by 2045 ▪ 1 in 4 residents are 65+ years	▪ Population increases more than projected as climate refugees flee to Hawaii from other Pacific islands ▪ Vulnerable populations face job insecurity and displacement	▪ Population increases more than projected as additional in-migration of skilled workers from mainland ▪ Technology adoption varies; unequal access for vulnerable populations

Exhibit 4-21. Comparing Alternatives by Driver

Drivers	Business as Usual	Global Health Crisis	Power in Paradise	Climate Emergency	Technology Revolution
Development	▪ High growth in urban centers ▪ Development of agricultural and conservation lands ▪ Expanded TOD with mixed-use and affordable housing	▪ Public health concerns and social distancing drive exurban expansion ▪ Technology supports shifts to telework; significant decline in demand for office and retail space	▪ Dense, energy-efficient housing ▪ Natural, agricultural, conservation lands thrive in urban and rural areas	▪ Development moves inland to accommodate displaced residents and businesses	▪ In-migration and tech boom leads to more development ▪ Households are automated and connected, many residents work from home ▪ Shifts in land use/parking
Economy	▪ 12M annual visitors by 2045; 1% growth in spending per year ▪ Service sector grows ▪ Strong reliance on imported goods	▪ Extended / more frequent recessions ▪ Sustained decline in tourism and passenger travel ▪ Growth in e-commerce ▪ Local agriculture and manufacturing growth	▪ New economies emerge to supplement tourism ▪ Green economy attracts diverse range of businesses, talent ▪ Advanced manufacturing sector grows due to lower energy costs	▪ Extreme weather and natural disasters deter travelers; creates economic uncertainty ▪ Growth in services and construction ▪ Greater reliance on imported goods	▪ High tech industry boom in Hawaii ▪ Growth in trade, tourism, services ▪ Potential for increase in equity gaps

Exhibit 4-21. Comparing Alternatives by Driver

Drivers	Business as Usual	Global Health Crisis	Power in Paradise	Climate Emergency	Technology Revolution
Technology	▪ About a quarter of vehicles are fully electric ▪ Moderate rate of connected and autonomous vehicle adoption ▪ Shared mobility use grows ▪ 30% of highway fuels are from alternative sources	▪ Technology supports more dispersed living and telework ▪ Drone technology surges to support freight delivery	▪ Hawaii achieves 100% renewable energy by 2045 ▪ Smart grid and ZE technology supports widespread use of zero emission vehicles (ZEVs)	▪ Infrastructure disruptions slow technology adoption	▪ Majority of miles traveled by autonomous vehicles by 2045 [a] ▪ More than half of personal vehicles are fully electric by 2045 ▪ Shared mobility and micromobility demand grows ▪ Potential growth in digital divide

[a] Per Hawaiian Electric Companies 2018

Note: M = million

5. Strategies and Actions

The alternative futures presented in Chapter 4 were used in tandem with the plan goals and objectives to develop a robust set of strategies and actions.

5.1 What is a Strategy?

For the purposes of the Hawaii Statewide Transportation Plan (HSTP), a strategy is a policy, program, or action intended to achieve one or more identified goals and objectives. Strategies are intended to be broad and applicable to the statewide system and its users, rather than overly prescriptive or focused on specific locations and investments. Each strategy is intended to further progress toward meeting the seven HSTP goals (Exhibit 5-1).

Exhibit 5-1. Hawaii Statewide Transportation Plan

5.2 Where Did Strategies Come From?

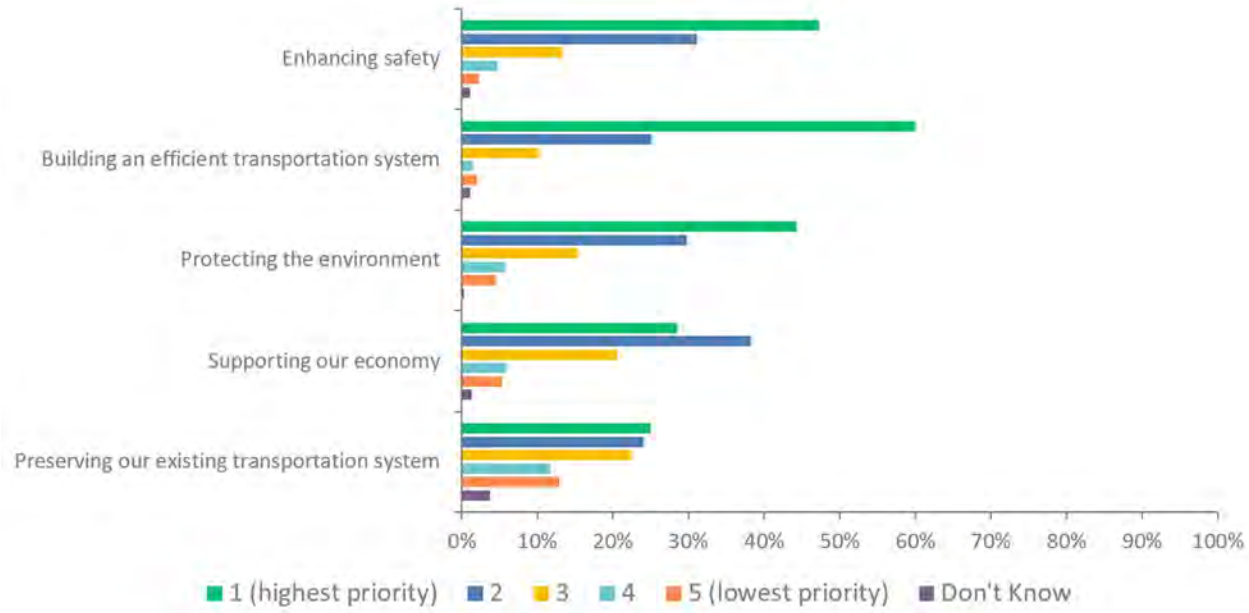
In late 2020, the project team assembled an initial database of candidate strategies gathered from the following sources:

- **Existing plans and studies**. The project team gathered and reviewed dozens of state planning documents to identify existing strategies being considered by the State of Hawaii Department of Transportation (HDOT) and its partners. These included the documents that were reviewed as part of the Plan and Policy Review in Appendix B, such as the Hawaii Statewide Freight Plan, Transportation Asset Management Plan (TAMP), Harbor and Airport master plans, Statewide and Regional Federal-Aid Highways 2035 Transportation Plans, and the Hawaii Strategic Highway Safety Plan (HSHSP). It also includes partner agency studies such as the Hawaii 2050 Sustainability Plan, Oahu Regional Transportation Plan 2035, and the Hawaii Sea Level Rise Vulnerability and Adaptation Report.

- **Research and best practices**. To supplement the existing strategies under development by Hawaii agencies, the project team reviewed a series of recent statewide multimodal long-range transportation plans prepared for California, Florida, Maryland, and Washington; and conducted a national best practices research review of emerging strategies in key topic areas such as asset and risk management, resiliency, funding and finance, and more.
- **Input from stakeholders.** The project team presented its initial database of potential strategies to the Sub-Statewide Transportation Advisory Committee (SubSTAC) in April 2021 and the Stakeholder Advisory Committee (SAC) in May 2021 to flag any strategies that may not be feasible or appropriate for our island state and to identify any new strategies to further HSTP goals. In addition, the project team held a series of technical resource meetings with agencies and lead initiatives, such as the State Climate Commission, Hawaii State Energy Office, the Department of Land and Natural Resources, the project manager of the HDOT's Hawaii Road Usage Charge (HiRUC) demonstration project, and Hawaiian Electric.

  The project team also conducted a statewide survey on Survey Monkey during the months of September and October 2022 on the draft strategies. Over 640 people completed the survey. The responses provided input on strategies for each goal. In one of the overarching questions, the results indicated that efficiency, safety, and the environment were the highest priorities for transportation policies. Exhibit 5-2 shows the breakdown of responses for the policy response.

Exhibit 5-2. Public Survey Response for Transportation Priorities



These efforts resulted in an initial database of 72 strategies organized by HSTP goal and objective.

5.3 How were Strategies Refined?

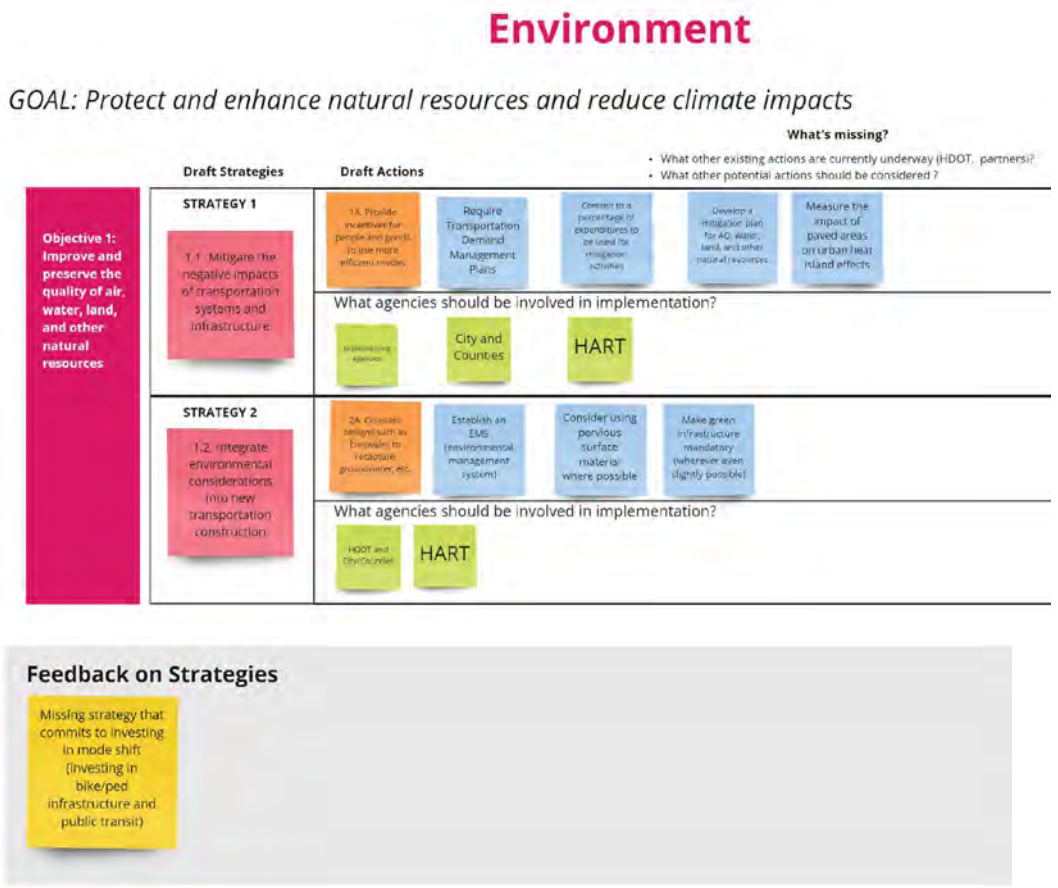
Strategies were screened and refined in a lengthy stakeholder engagement process that included the following elements:

- **SAC Strategy Discussion**. In May 2021, the project team presented draft strategies to the SAC members, with ensuing discussion centered around the following themes:
  - Strategies to build the transportation system of the future
  - Strategies to improve access and intermodal connections
  - Strategies that enhance efficient use of the transportation system
  - Strategies that further the health and safety of people and the environment
  - Strategies for better internal and external collaboration

  The SAC's input was used to refine the strategies, which the project team aligned with the plan goals and objectives.

- **SubSTAC Strategies Screening**. In July 2021, the SubSTAC was engaged in an interactive effort to further review and refine strategies as well as develop potential actions to achieve the desired outcome (Exhibit 5-3). The SubSTAC provided post-it-note-style comments on the document as well as discussed the following:
  - Are there any fatal flaws or major omissions in the draft strategies?
  - What activities or actions would implement each strategy?
  - What agencies should be involved in the implementation?

Exhibit 5-3. Snapshot of July SubSTAC Group Exercise



- **Alternative Futures Screening.** Using the HSTP's alternative futures, the project team designed a screening framework to qualitatively assess each remaining strategy's potential for navigating the range of transportation challenges and opportunities described in Section 4.3. The initial screening effort assessed the performance of a strategy for each alternative future in comparison to the Business As Usual scenario (Exhibit 5-4). The Project Management Team (PMT) and SubSTAC reviewed and refined the screening in October 2021. Robust strategies that furthered multiple goals or addressed numerous challenges of the alternative futures were noted as cross-cutting strategies.

Exhibit 5-4. Snapshot of Screening Presentation

OBJECTIVES	STRATEGIES	Global Health Crisis	Power in Paradise	Climate Emergency	Technology Revolution
1. Eliminate transportation-related fatalities and serious injuries	Champion initiatives leading to zero deaths and serious injuries	MORE IMPORTANT if more people choose to drive to avoid sharing space with others; Limiting crashes helps strained healthcare system	REMAINS IMPORTANT	MORE IMPORTANT more people driving	MORE IMPORTANT to set smart policy as new tech and potential AV are programmed to make safety decisions, increase VMT.
	Integrate safe infrastructure design strategies	REMAINS IMPORTANT	MORE IMPORTANT to accommodate mode switch	MORE IMPORTANT more people driving and at risk facilities	MORE IMPORTANT to keep pace with new transportation tech
2. Protect against security threats to transportation system users and facilities	Identify and mitigate biosecurity, cybersecurity, and other risks to the transportation system	MORE IMPORTANT as airports and harbors become first line of defense against infectious diseases	MORE IMPORTANT Electric grid, cyber security becomes more important if there is a higher share of EVs and AVs	MORE IMPORTANT Climate disruptions increase risk of security disruption and leave systems vulnerable	MORE IMPORTANT as new technology could be vulnerable to cyber attack

Screening Legend

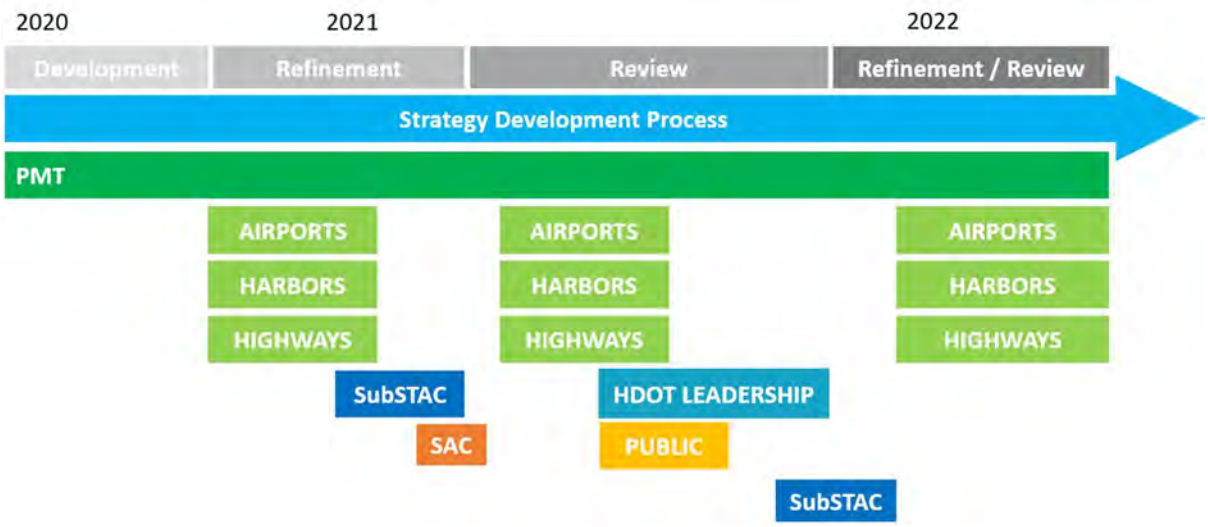
REMAINS IMPORTANT	MORE IMPORTANT	CHANGING EMPHASIS	LESS IMPORTANT
Performance is similar to BAU	Strategy is *more* critical in this future	Strategy's focus shifts in this future	Strategy is *less* critical in this future

- **Review and Refinement by HDOT Divisions and Partners**. During the first half of 2022, the project team engaged the HDOT divisions and partners in an iterative review process to refine and polish strategy language and ensure the resulting strategies list reflects planning consensus. In addition to these strategies, existing actions that the HDOT is currently implementing through plans, studies, programs, and/or projects were identified and incorporated as a way to further achieve the desired strategy. Potential opportunities to pursue that would help to achieve the specific strategies were also included.

5.4 What Was the Timeline of Strategy Development?

Exhibit 5-5 shows the timeline of engagement through which strategies were developed and refined, including periods of input and review by the PMT, SubSTAC, SAC, HDOT divisions and administrative leadership, and the public. The project team conducted well over a dozen rounds of refinement based on input and guidance from stakeholders.

Exhibit 5-5. Timeline of Strategy Development and Refinement



5.5 HSTP Goals, Objectives, and Strategies

This section incorporates all input received. Sections 5.5.1 through 5.5.7 present the identified goals and resulting objectives and strategies, while Section 5.5.8 presents cost-cutting strategies, applicable to all goals, that evolved after the alternate future screenings. The tables in Exhibit 5-6 through Exhibit 5-11 and in Exhibit 5-13 identify all of the programs and actions that the HDOT divisions are already performing for each. The shaded blue cells suggest potential opportunities that could be considered in the future by the HDOT or other agencies.

5.5.1 Goal: Safety and Security

Safety-focused strategies under this goal encompass actions that address elimination of transportation-related fatalities and serious injuries through policy and program implementation. Addressing safety through context appropriate design strategies is also an integral strategy in proactively prioritizing safety in new construction.

Security-focused strategies mitigate and prepare for biosecurity and cybersecurity risks to the transportation system.

An example of the collaboration occurring to enhance cybersecurity is being led by the Office of Homeland Security. They are collaborating with relevant federal, state, and local stakeholders to establish a 2022 grant proposal for the development of the Hawaii Cybersecurity Program Plan. The focus areas of the plan are envisioned to address governance, preparation, protection, and workforce development.

Source: HDOD 2022

Exhibit 5-6. Safety and Security Programs and Actions

Safety and Security Goal Statement: Provide a safe and secure multimodal transportation system			
Objectives	**Policy-level Strategies**	**Existing Actions and Potential Opportunities**	
Eliminate transportation-related fatalities and serious injuries	Establish policy or initiatives that lead to zero deaths and serious injuries.	Highways: Implement the HSHSP (https://hidot.hawaii.gov/highways/shsp/).	
		Highways: Prioritize safety through programs, such as Highway Safety Improvement Program, Safe Routes to School Program, Bicycle and Pedestrian Program, Guardrail and Shoulder Improvement Program, Rockfall Program, Shoreline Program, and integrate into projects.	
		Highways: Pursuant to House Bill 757, adopt a Vision Zero policy that seeks to prevent and ultimately eliminate traffic fatalities using data and tactics already available through its towards zero deaths plan, speed management through infrastructure design, and its safe systems approach to prevent and ultimately eliminate traffic fatalities through a combination of enforcement, education, and emergency response strategies with a focus on equity.	
		Highways: Ensure safety of all users is a high prioritization criterion of the Mid-Range Transportation Plan.	
		Airports: Develop and implement Safety Management Systems.	
		Harbors: Implement the Harbors Modernization Plan.	
		Harbors: Include safety as an objective in the harbor master plans.	
		Potential Opportunity	Highways: Use predictive analytics and advanced modeling platforms that will proactively identify and prioritize locations throughout the system to deploy countermeasures prior to incidents and monitor effectiveness.
	Develop and integrate safe infrastructure design strategies	Highways: Create a Building Safer Roadways by Design emphasis area ((Building-Safer-Roadways-by-Design.pdf [hawaii.gov]) through the HSHSP.	
		Highways: Create a Safeguarding Pedestrians and Bicyclists emphasis area ((Pedestrian-Bicycle-Safety-Action-Plan-rev.pdf [hawaii.gov]) through the HSHSP.	
		Highways: Collaborate with local and regional transportation agencies and operators to implement context-sensitive, multimodal safety solutions that are aligned with local land use decisions.	
		Highways: Ensure the consideration of vulnerable uses (e.g., those biking, walking, rolling, and taking transit; low-income communities; and uses like schools, hospitals, and nursing homes) when implementing projects.	
		Airports: Maintain and update airfield safety requirements to meet updated Federal Aviation Administration standards.	
		Harbors: Ensure harbors' master plans support its mission, which includes safety as a goal.	
		Airports and Harbors: Integrate safety-related objectives into airports' and harbors' planning and design efforts.	

Exhibit 5-6. Safety and Security Programs and Actions

Safety and Security Goal Statement: Provide a safe and secure multimodal transportation system			
Objectives	**Policy-level Strategies**	**Existing Actions and Potential Opportunities**	
Protect against security threats to transportation system users and facilities	Identify and mitigate biosecurity, cybersecurity, and other risks to the transportation system	Implement the Statewide Noxious Invasive Pest Program.	
		Conduct interagency coordination with federal agencies, civil defense, military, and first responders.	
		Partner with federal and state agencies and industry groups to assess and plan to mitigate biosecurity risk and respond accordingly.	
		Potential Opportunity	Develop a statewide transportation security risk assessment and action plan that identifies risks to airports, harbors, and highways; where risks may occur at connection points between modes; and roles and responsibilities in mitigating and responding to future risks.
	Invest in cybersecurity through information technology improvements	Highways: Invest in statewide Intelligent Transportation System (ITS) solutions.	
		Upgrade security infrastructure such as closed-circuit television, security cameras, and other technology on the multimodal transportation system.	
		Potential Opportunity	Advocate for a statewide cybersecurity task force with representatives from each major mode of transportation.

5.5.2 Goal: Infrastructure

Strategies related to providing a high-quality multimodal system focus on two aspects: management of existing assets and preparation of infrastructure for new technologies. The asset management and modernization plans of the HDOT divisions provide a strong path forward for both infrastructure management and enhancements.

An example is the Hawaii Airports Modernization Program, which is a statewide effort to enhance traveler experience and improve safety and efficiency. The vision of the program is to:

> *Create airports that are modern in their response to the demands and rigors of air travel; are Hawaiian in their response to the unique cultural and natural environment; airports of which both residents and visitors alike are proud; places that embody the Aloha spirit and create a gateway to Hawaii.*

The program overview and tracking and status of the various program elements are maintained on the program website by the HDOT Airport Division.

Source: HDOT Airports Division 2022c

Exhibit 5-7. Infrastructure Programs and Actions

Infrastructure Goal Statement: Provide a high-quality, well-maintained multimodal system			
Objectives	**Policy-level Strategies**	**Existing Actions and Potential Opportunities**	
Maintain the multimodal transportation system in a state of good repair	Manage transportation assets effectively and efficiently	Highways: Implement the Statewide TAMP, including future incorporation of non-NHS (National Highway System) pavement and bridges.	
		Highways: Implement the Bridge and Pavement Management Systems.	
		Highways: Work with Hawaii Asphalt Paving Industry on new pavement surface technology.	
		Airports: Maintain and implement the Asset Management Plan.	
		Airports: Implement the Pavement Management System.	
		Harbors: Implement asset management plans.	
		Potential Opportunity	Improve monitoring, enforcement, and signage related to overweight vehicles on Highways' roadways.
		Potential Opportunity	Implement and improve current data collection, recording, and reporting systems to improve monitoring and asset performance through the use of new technology (e.g., drones).
Modernize transportation infrastructure	Prepare infrastructure to accommodate new technologies	Highways: Implement information and communications infrastructure necessary to prepare for emerging technologies such as connected and automated vehicles and electric vehicles (e.g., Nimitz Highway Smart Corridor Pilot Project).	
		Harbors: Implement the Harbors Modernization Plan and recommendations from various harbors master plans.	
		Airports: Implement the Airports Modernization Program (https://www.hawaiiairportsmodernization.com/).	
		Highways: Work with a committee to develop connected and automated vehicles legislation, policy, and administrative rules.	
		Potential Opportunity	Pilot-test innovative infrastructure technologies to evaluate their costs and benefits.
		Potential Opportunity	Develop guidelines to ensure emerging technologies align with state and local goals and can be implemented uniformly statewide.

5.5.3 Goal: Mobility and Accessibility

Mobility strategies focus on increasing transportation efficiencies through partnerships and technology, as well as optimizing intermodal connections.

A recently completed project at the Daniel K. Inouye International Airport property modified signage along roadways, garages, and terminals to improve the landside intermodal circulation, access, and connections to the airport operations.

Accessibility strategies include providing choices and connections between and within communities. Choices focus on the needs of all users including, but not limited to, micromobility options and Americans with Disabilities Act (ADA)-compliance needs.

An example action being administered through the HDOT is the Rural Transit Assistance Program, which offers scholarships through the HDOT for rural transit operators to offset expenses for training. The key objectives of the program are to support coordination of public, private, specialized, and human service transportation services; facilitate peer-to-peer self-help; and make more efficient use of public and private resources.

Source: HDOT Airports Division 2022c (https://www.hawaiiairportsmodernization.com/projects/ndwp-roadway-signage-improvements)

Exhibit 5-8. Mobility and Accessibility Programs and Actions

Mobility and Accessibility Goal Statement: Improve mobility and enhance access to destinations			
Objectives	**Policy-level Strategies**	**Existing Actions and Potential Opportunities**	
Reduce delay and improve reliability across all modes, for all users	Increase the efficiency of transportation services through partnerships, advanced technologies, and operational enhancements to improve service delivery methods.	Highways: Identify and mitigate critical freight and passenger bottlenecks.	
		Highways: Improve and implement the Mid-Range Transportation Plan to assist with data-driven decision-making and project prioritization.	
		Highways: Explore ways to always provide reliable and accessible real-time modal choice information to travelers and stakeholders.	
		Highways: Upgrade signalized intersections with Advanced Transportation Controllers to improve operational efficiencies and prepare for connected autonomous vehicles.	
		Highways: Look for opportunities to increase transportation efficiencies at high-demand visitor destinations and large employment centers and other locations anticipated to see significant growth in travel demand.	
		Highways: Strategically implement transportation demand management (TDM) strategies (e.g., flexible start times, discounted transit passes, and carpool programs) and mode shift incentives.	
		Airports: Implement the airports' primary mission and goals/objectives of each individual airport's master plan.	
		Harbors: Implement the harbors' primary mission and goals/objectives of each individual harbor's master plan.	
		Potential Opportunity	Strategically deploy proven ITS and Transportation Systems Management and Operations (TSMO) technologies to improve multimodal system efficiency.
		Potential Opportunity	Look for opportunities to increase transportation efficiencies at high-demand intermodal connections, such as the connection between cruise terminals and highways, and connections between airport terminals and highways.
		Potential Opportunity	Improve the functionality and modernize the landside facilities of the airport terminals and harbor cruise terminals.

Exhibit 5-8. Mobility and Accessibility Programs and Actions

Mobility and Accessibility Goal Statement: Improve mobility and enhance access to destinations			
Objectives	**Policy-level Strategies**	**Existing Actions and Potential Opportunities**	
Reduce delay and improve reliability across all modes, for all users	Optimize intermodal connections	Highways: Continue to implement priorities from the Statewide Pedestrian Master Plan.	
		Highways: Continue to implement priorities from Bike Plan Hawaii.	
		Highways: Continue to prioritize projects on the Strategic Highway Network.	
		Airport: Continue to work on the Airport Signage Project to enhance wayfinding.	
		Potential Opportunity	Look for opportunities or projects to improve the modal connections at airports and harbors to the highways system.
		Potential Opportunity	Expand access options to/from airports and harbors, including pedestrian and bicycle access.
		Potential Opportunity	Ensure that cruise ship and other interisland marine transportation passengers can safely and efficiently get to and leave harbors' facilities.
		Potential Opportunity	Enhance passenger wayfinding, convenience, and customer experience through improved amenity and technology-based solutions at HDOT facilities.
Improve access to destinations for system users across all modes	Invest in improvements to provide choices and connections between rural and urban areas.	Provide transportation choices and access for elderly and disabled, and address statewide ADA compliance needs.	
		Highways: Implement the Rural Transportation Assistance Program and Federal Land Highway Access Discretionary Program.	
		Consider additional first-last-mile plans and solutions, including active transportation infrastructure, e-bikes, bikeshare, shuttles, and e-scooters that connect to transit, when prioritizing investments.	
		Collaborate with local partners to enhance transit service and park-n-rides.	
		Highways: Implement the Transportation Alternatives Program.	
	Strategically align transportation and land use decision-making	Integrate transportation considerations throughout the land use planning process.	
		Potential Opportunity	Develop new tools and/or use new technologies to facilitate multimodal planning, policy, and project-level decision-making at the state, regional, and local levels.
		Potential Opportunity	Promote partnerships with private industry to provide shared mobility options to residents and visitors.
		Potential Opportunity	Look for opportunities to invest in transportation infrastructure that supports and encourages compact, mixed-use development.
		Potential Opportunity	Improve land use compatibility near airports and harbors to enable future expansion and support economic development dependent on access to these facilities.
	Develop an implementation plan to support statewide broadband access for all communities, especially in rural and underserved areas	Highways: Support the implementation of the Hawaii Broadband Strategic Plan and provide increased connectivity for the State Highway System and provide reliable and affordable community wi-fi.	
		Potential Opportunity	Expand partnerships with local and regional agencies and communications companies to integrate broadband into transportation infrastructure projects.
		Potential Opportunity	Monitor telework and travel behavior implications to ensure future infrastructure investments align with changing mobility needs.

5.5.4 Goal: Economy

The strategies for the economic goal focus on the transportation system's support of local economic vitality, as well as fluent movement of people and goods within and between travel modes.

One of the actions in progress is the construction of the Kapalama Container Terminal. Located at Piers 41, 42 and 43 in Honolulu Harbor, the new terminal is a critical component in the overall harbor system. The terminal will provide additional berthing and storage space and is contiguous to the interisland cargo yard, allowing direct access between facilities.

Source: HDOT Harbors Division 2017 (https://www.kctinfo.com/wp-content/uploads/2021/02/A092-210104-025.jpg)

Exhibit 5-9. Economy Programs and Actions

Economy Goal Statement: Support a vibrant and changing economy			
Objectives	**Policy-level Strategies**	**Existing Actions and Potential Opportunities**	
Serve Hawaii communities through efficient and reliable goods movement and distribution	Optimize multimodal freight capacity and connectivity to global supply chains	Implement priorities from the Hawaii Statewide Freight Plan, harbors master plans, and airports master plans.	
		Highways: Address congestion and bottlenecks on nationally and regionally significant corridors to facilitate access to major employment, freight, and activity centers.	
		Harbors: Complete construction of the Kapalama Container Terminal.	
		Airports: Expand and improve air cargo facilities.	
		Potential Opportunity	Provide infrastructure to encourage and support the use of emerging technologies such as autonomous trucking and warehousing and freight ITS/TSMO applications to increase operational efficiencies within and between airports, harbors, and highways.
		Potential Opportunity	Enhance collaboration within and between cargo industry, airports, seaports, and trucking industry to enhance intermodal operational efficiencies.
	Modernize last-mile goods delivery and distribution systems	***Potential Opportunity***	Coordinate with the Hawaii Department of Agriculture and counties to enhance last-mile delivery systems for farms, restaurants, grocery stores, and other food providers.
		Potential Opportunity	Encourage local governments to implement strategic curb management plans.
Advance and diversify statewide and local economic development	Support sustainable development in urban and rural communities	Highways: Work in partnership with local jurisdictions and other state agencies to focus transportation corridor improvements to support development and revitalization in urban, town, and suburban centers.	
		Highways: Invest in infrastructure that supports the HDOT's mission of supporting economic vitality.	
		Highways: Implement the Capacity Program to support the local economy and affordable housing.	
		Look for opportunities to invest in strategic locations for transportation infrastructure that supports new development, particularly in areas that support local economic growth and affordable housing.	
Improve efficiency and convenience of inter- and intra- state travel	Provide Hawaii's residents and visitors with improved travel options and experiences	***Potential Opportunity***	Improve interisland travel to connect residents and visitors to in-state destinations.
		Potential Opportunity	Encourage the Hawaii Tourism Authority to conduct a study on visitor transportation needs to strategically develop multimodal alternatives to rental cars.
		Potential Opportunity	Partner with the Hawaii Tourism Authority to provide information about key tourist destinations and travel options.

5.5.5 Goal: Resiliency

The strategies aimed at addressing transportation system resiliency include adapting to weather and climate change impacts, maintaining the supply chain and movement of goods, and improving transportation system response to public health crises. In addition, the resiliency strategy incorporates emphasis on emergencies preparation through evacuation plans, multiagency cooperation, and improved communications to the public.

There are a number of forecasts and assessments that provide recommendations for preparing for transportation system resiliency. As directed by State Act 83 (2014) and Act 32 (2017), the Sea Level Rise Report (Department of Land and Natural Resources 2017) provides both a statewide assessment of Hawaii's vulnerability to sea level rise and recommendations to improve resilience and begin to adapt to related impacts. The data and recommendations included in this paper draw heavily from this report.

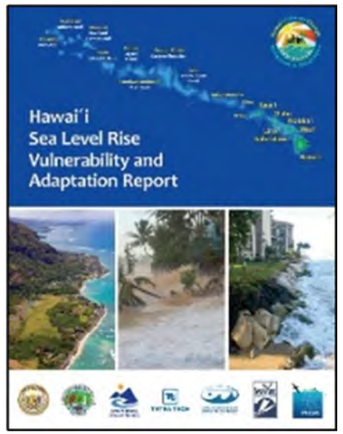


Exhibit 5-10. Resiliency Programs and Actions

Resiliency Goal Statement: Anticipate and adapt to climate change, storms, pandemics, and other disruptions			
Objectives	**Policy-Level Strategies**	**Existing Actions and Potential Opportunities**	
Enhance resiliency of transportation systems to the impacts of climate change, public health crises, and other disruptions	Adapt to climate change, storms, pandemics, and other disruptions	Identify and inventory transportation assets that are vulnerable to natural disasters (e.g., flooding, inundation, or mudslides) in accordance with Act 178 (adopted by the Hawaii State Legislature in 2021 regarding adapting to sea level rise), and develop adaptation strategies such as reconstruction, relocation, and protective infrastructure to address existing and potential future weaknesses.	
		Highways: Integrate resiliency considerations into planning activities (e.g., Resiliency Checklist, TAMP, and Mid-Range Transportation Plan).	
		Highways: Implement the Highways Climate Action Plan and incorporate adaptive design strategies.	
		Highways: Develop the Shoreline Protection Program.	
		Highways: Develop the Rockfall Protection Program.	
		Highways: Partner with the University of Hawaii to research and pilot innovative technologies for shoreline protection (e.g., Kuhio Highway at Wailua Beach).	
		Harbors: Integrate resiliency considerations into plans (e.g., harbors master plans, Stormwater Management Plan).	
		Harbors: Implement the recommendations from *Vulnerability of Hawaii Commercial Port and Harbor Facilities to Tsunamis and Hurricane Storm Surge and Wave Action* (University of Hawaii 2015) and *Hawaii Sea Level Rise Vulnerability and Adaptation Report* (Hawaii Climate Change Mitigation and Adaptation Commission 2017).	
		Potential Opportunity	Airports: Evaluate/implement climate change and sea level rise adaptation strategies to vulnerable facilities.
		Potential Opportunity	Harbors: Identify and protect critical infrastructure.
		Potential Opportunity	Coordinate resiliency approaches with federal, state, and county agencies and communities.
		Potential Opportunity	Encourage all agencies to integrate resiliency metrics into state, regional, and local asset management plans and their CIPs.

Exhibit 5-10. Resiliency Programs and Actions

Resiliency Goal Statement: Anticipate and adapt to climate change, storms, pandemics, and other disruptions			
Objectives	**Policy-Level Strategies**	**Existing Actions and Potential Opportunities**	
Enhance resiliency of transportation systems to the impacts of climate change, public health crises, and other disruptions	Facilitate robust, resilient, and sustainable supply chains and goods movement systems	***Potential Opportunity***	Implement freight-specific actions from local and statewide Climate Adaptation Plans.
	Improve system resiliency to public health crises	Ensure adequate system capacities so that critical goods can be transported during public health crisis.	
		Potential Opportunity	Coordinate with the Department of Health and community groups to respond during public health crises and prevent the spread of infectious disease on/through the transportation system.
		Potential Opportunity	Support transit and shared mobility providers in maintaining health and sanitation standards.
Improve emergency preparedness, response, and evacuation	Anticipate and prepare for system emergencies	Implement evacuation and response plans that consider all modes and protect vulnerable communities.	
		Use cutting-edge information communications technology to improve communication and coordination during emergency evacuations.	
		Harbors: Participate in multiagency port recovery planning and training.	

5.5.6 Goal: Community

Strategies to address the community goals include planning for equity for all users, reducing negative impacts of infrastructure, and expanding community outreach.

The HDOT Office of Civil Rights is an integral part of the transportation planning activities. This office maintains programs for Americans with Disabilities Act compliance as well as Title VI/Environmental Justice compliance. Their mission is "to eliminate and remedy unlawful discrimination against individuals in HDOT's services and activities, through civil rights programs that ensure departmental compliance with federal and state anti-discrimination laws, rules, regulations and executive orders." (HDOT 2022a)

Exhibit 5-11. Community Programs and Actions

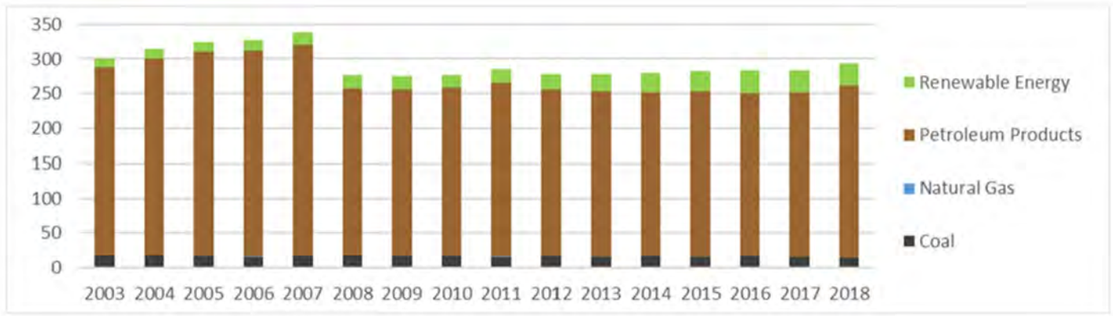
Community Goal Statement: Support equity, public health, and quality of life			
Objectives	**Policy-level Strategies**	**Existing Actions and Potential Opportunities**	
Enhance safe, convenient, and affordable options for populations with high transportation cost burdens and limited access	Integrate equity considerations into all aspects of transportation planning	Implement the HDOT's Title VI Program (Civil Rights Act of 1964).	
		Implement Executive Orders 12898 and 14008.	
		Highways: Implement the Federal Highway Administration's (FHWA) Environmental Justice Order 6640.23 through implementation of Statewide and Regional Land Transportation Plans, the Mid-Range Transportation Plan, Resilience programs, and individual project analyses.	
		Highways: Prioritize infrastructure projects that incentivize affordable housing units and partner with counties to identify priority housing developments.	
		Airports: Implement the U.S. Department of Transportation's Environmental Justice Order 5610.2, Federal Aviation Administration Environmental Program, and individual project analyses.	
		Harbors: Implement equity and environmental justice goals within master plans.	
		Support public transportation improvements and improve access to service in accordance with local transit agency plans.	
		Potential Opportunity	Develop a Statewide Equity Action Plan that clearly defines equity and establishes a framework for considering equity in all transportation plans and programs.
		Potential Opportunity	Explore opportunities to conduct an equity analysis.
		Potential Opportunity	Expand partnerships with community-based organizations (CBOs) and other equity-focused groups.
		Potential Opportunity	Provide agency training and education regarding the linkages between transportation, housing, health, and equity.
Support public health and quality of life for Hawaii residents	Reduce exposure to harmful impacts of the transportation system for vulnerable users	Identify risk and impacts of transportation-related air, water, and noise pollution when developing projects.	
		Provide a transportation system that supports and enhances quality of life.	
		Consider public health, connectivity and comfort of pedestrian and bicycle networks within and between jurisdictions (state and local governments) when prioritizing investments.	
Facilitate equitable participation in transportation decision-making	Expand community outreach and engagement	Integrate the HDOT Office of Civil Rights with outreach planning to ensure accessibility needs are met.	
		Improve and expand use of online technology platforms to enhance community engagement.	
		Potential Opportunity	Pursue and expand partnerships with CBOs to bolster community engagement.
		Potential Opportunity	Engage and educate communities throughout the transportation planning, development, and implementation phases of projects.
		Potential Opportunity	Update and implement the agency public engagement policies and guides to enhance public trust in the planning process.
		Potential Opportunity	Conduct follow-ups and report-backs to the public, directly or through existing partnerships, to increase transparency.
		Potential Opportunity	Establish a community resource list that identifies key groups to consult with across urban, suburban, and rural regions.

5.5.7 Goal: Environment

Strategies that support the environmental goals focus on both mitigation of impacts to Hawaii's natural and cultural resources as well as proactively planning for the contextual integration of transportation needs.

One of the potential actions is for transportation infrastructure and services to support reduction of fossil fuels as well as expansion of access to alternative clean fuels. Actions such as promoting new technologies and materials, and assisting with access to clean alternative energy would support the overall statewide carbon neutrality goals within the Hawaii Clean Energy Initiative. Hawaii State Energy Office data (Exhibit 5-12) show that renewable energy consumption in Hawaii has increased over time, but it still accounts for only a small portion of our overall energy use.

Exhibit 5-12. Hawaii's Energy Demand (trillion Btu per year by source)



Source: Hawaii State Energy Office 2020 (https://energy.hawaii.gov/wp-content/uploads/2020/11/HSEO_FactsAndFigures-2020.pdf)

Note: Btu = British thermal unit(s)

Exhibit 5-13. Environment Programs and Actions

Environment Goal Statement: Protect and enhance natural and cultural resources and reduce climate impacts			
Objectives	**Policy-level Strategies**	**Existing Actions and Potential Opportunities**	
Improve and preserve the quality of air, water, land, and other natural and cultural resources	Avoid or mitigate the negative impacts of transportation systems and infrastructure	Incorporate federal National Environmental Policy Act (NEPA) and Hawaii Environmental Policy Act (HEPA) compliance on projects.	
		Airports: Implement the Sustainable DOT-A Program and AIR—EE Program.	
		Harbors: Enhance and implement harbors' stormwater management plans.	
		Highways: Implement the Highways' Environmental Compliance and Hazardous Materials programs.	
		Highways: Explore and install green construction materials, such as carbon-injected concrete	
		Airports: Minimize the negative impacts to wildlife through wildlife management programs.	
		Potential Opportunity	Promote a statewide mitigation plan for air quality, water quality, and natural habitats and ecosystems.
		Potential Opportunity	Explore the development of funds for mitigation activities.
		Potential Opportunity	Increase use of bioswales, pervious surface material, and similar nature-mimicking infrastructure applications to recapture groundwater to the extent practicable.
		Potential Opportunity	Harbors and Airports: Explore green construction materials.

Exhibit 5-13. Environment Programs and Actions

Environment Goal Statement: Protect and enhance natural and cultural resources and reduce climate impacts			
Objectives	**Policy-level Strategies**	**Existing Actions and Potential Opportunities**	
Improve and preserve the quality of air, water, land, and other natural and cultural resources	Require integration of environmental considerations into new transportation construction and maintenance.	Develop historic and cultural resources management plans.	
		Airports: Implement the SustainableDOT-A program and AIR—EE program.	
		Develop and implement division Stormwater Management Plans and division-wide Environmental Management System.	
		Highways: Support zero emission vehicle (ZEV) infrastructure and incentive programs.	
		Potential Opportunity	Research and incorporate innovative practices to protect and conserve natural resources in the maintenance and operations of the transportation system.
		Potential Opportunity	Improve waste minimization techniques through product life cycle analysis, reuse, and recycling.
		Potential Opportunity	Identify and eliminate potential sources of contaminants, pollutants, and other hazards in support of overall pollution prevention and environmental sustainability.
		Potential Opportunity	Develop and implement a Green Port Strategy consistent with industry trends and initiatives including the U.S. Environmental Protection Agency's Strategy for Sustainable Seaports.
Support the statewide goals of carbon neutrality and 100% clean energy by 2045	Expand access to clean fuels and technologies across all modes	Harbors: Implement the Statewide Fuel Facilities Development Plan (HDOT Harbors Division 2009).	
		Highways: Convert existing fleet to ZEVs.	
		Highways: Explore various types of asphalt pavement, such as carbon-entrained concrete, recycled plastic in asphalt, recycled asphalt pavement, stone matrix asphalt, and highly modified asphalt.	
		Potential Opportunity	Support the implementation of the Hawaii Clean Energy Initiative. Promote new infrastructure, innovative technologies, economic and workforce opportunities to achieve clean energy.
		Potential Opportunity	Encourage the adoption of more fuel-efficient and low-polluting ships and airplane fuels.
		Potential Opportunity	Consider installing electric charging infrastructure for transportation at all facilities in the planning and design stages.
	Implement initiatives to reduce fossil fuel consumption, mitigate greenhouse gases, and improve air quality	Harbors: Encourage use of cold ironing infrastructure to reduce idling of vessels while at berth.	
		Highways: Explore various types of asphalt pavement, such as carbon-entrained concrete, recycled plastic in asphalt, recycled asphalt pavement, stone matrix asphalt, and highly modified asphalt.	
		Airports: Implement the Sustainable DOT-A program.	
		Support investments and partnerships with transit agencies to promote use of transit as a commute option to reduce congestion and improve air quality.	
		Potential Opportunity	Increase the HDOT's renewable energy portfolio within HDOT facilities and rights-of-way.
		Potential Opportunity	Support incentives for fuel-efficient technologies for medium and heavy-duty trucks.

5.5.8 Cross-cutting Strategies

The cross-cutting strategies in Exhibit 5-15 emerged as strategies that apply to all goals and remain important across all alternate futures. Two strategies surfaced across-the-board: funding and interagency collaboration.

Ensuring sustainable funding for our future transportation systems require the HDOT to diversify and likely modify sources of income. Chapter 7 provides a financial analysis of the various transportation modes, including the ability of the existing financial structures to satisfy anticipated future needs. The forecasts shows that the transportation system in Hawaii is likely going to need additional funding. One of the actions to achieve secure funding includes the HiRUC demonstration project. As technologies shift toward higher fuel efficiency, alternative means of taxing users could support the funding demands.

Exhibit 5-14. Correlation of Fuel-efficient Cars with Gas Tas Revenue

Source: HDOT 2022b (https://hiruc.org/)

Federal, state, and county interagency collaboration and information sharing is key to achieving a collective transportation vision. Continuing, collaborative, and comprehensive transportation planning will allow for both flow-down of policy and flow-up of data and progress to adjust to statewide needs. This collaboration also allows for a seamless intermodal system from all of the transportation agencies in Hawaii.

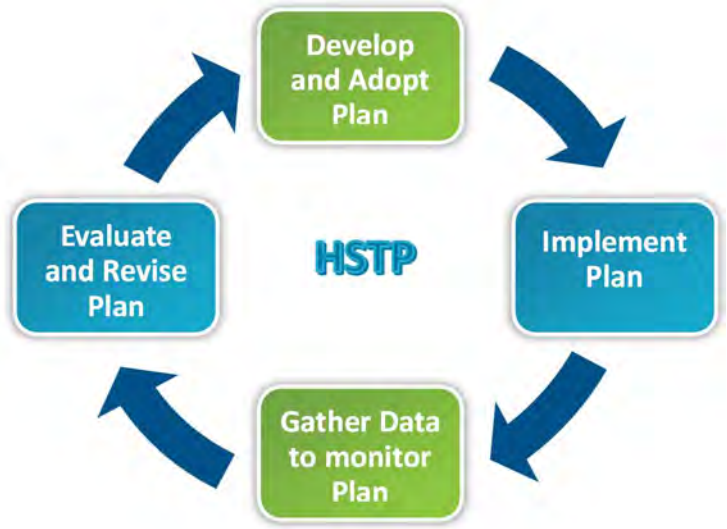
Exhibit 5-15. Cross-cutting Strategies

Policy-level Strategies	Existing Actions and Potential Opportunities	
Identify secure, flexible, and sustainable funding for transportation	Highways: Implement the Mid-Range Transportation Plan, which uses a prioritization process linked to statewide goals to optimize expenditure of available funds.	
	Highways: Administer the HiRUC demonstration project.	
	Explore opportunities for grant funding of projects.	
	Potential Opportunity	Explore non-transportation-specific funding sources such as real estate, income tax, and corporate taxes as potential transportation funding sources.
	Potential Opportunity	Increase Transient Accommodations Tax and/or rental car surcharges.
	Potential Opportunity	Explore congestion pricing.
	Potential Opportunity	Explore new mobility fees, where appropriate and feasible.
	Potential Opportunity	Investigate public-private partnerships (P3) to finance transportation projects.
Expand interagency collaboration and information sharing	***Potential Opportunity***	Improve collaboration throughout the statewide planning process.
	Potential Opportunity	Establish a statewide repository to share transportation data across jurisdictions.

6. Monitoring Progress

Monitoring progress is an integral part of an ongoing cyclical approach to long- and short-range planning. A performance-based planning approach applies principles of performance management to guide long-range transportation planning. It is designed to link policy and investment decisions made about a transportation system to the performance of that system. Monitoring progress is a vital part of this process, as it allows agencies to make well informed data-driven decisions; managing and monitoring performance is critical to making informed decisions about funding, project prioritization, and policy decisions. The Hawaii Statewide Transportation Plan (HSTP) recommends that all system plans and master plans include performance indicators. Various State of Hawaii Department of Transportation (HDOT) programs are already tracking a variety of performance measures. The HSTP recommends the continuation of tracking performance and encourages more opportunities to monitor progress. It also recommends that divisions be stewards of these data, ensuring that it is well-maintained and accessible to decision-makers. Exhibit 6-1 reflects the performance-based approach that should be applied to all plans.

Exhibit 6-1. Performance-based Approach



6.1 Benefits of Monitoring Progress

Monitoring progress involves creating progress indicators (or performance measures) to track goals and objectives and then collecting these data and reviewing them at regular intervals. An example of a progress indicator is tracking the number of serious and fatal injuries that occur on the transportation system on an annual basis or tracking pavement conditions. Benefits of monitoring progress include:

- **Ability to make informed decisions –** Creating progress or performance indicators and tracking them to see if goals are being met allows agencies to link policy, funding, and project decisions with desired outcomes. This tracking also allows for agencies to reassess their approaches and adapt to on the ground realities.
- **Facilitate coordination –** Many transportation outcomes are tied to cross-disciplinary actions; tracking progress can help pinpoint where better coordination is needed to meet goals.
- **Report to partners and the public –** Reporting to our partners and the public increases accountability and transparency.

- **Comply with federal and state regulations and align with other performance-based plans in the state –** The HDOT is required to report to the federal government at regular intervals. The divisions are also directed by Act 100 to report on additional metrics, noted in Section 6.2.1.

6.2 Creating Progress Indicators

Progress indicators (or performance measures) take time and effort to create and monitor. It is important to design them with a clear purpose in mind aligning them with a plan's goals and objectives. The easiest indicators to document are ones where the data is already being tracked and recorded either for day-to-day operations or through some other existing process. Progress indicators should be tracked and reported consistently so that the data is easy to compare over different time periods (for example, year over year).

This section provides example progress indicators that are already being tracked and an example of how these are used to make informed investment decisions.

6.2.1 Current State Regulations

Act 100 requires every Hawaii state department and agency to develop and submit an annual report that addresses the department's goals, objectives, and action plan. This document must include a process to measure performance of programs to meet stated goals, objectives, and policies. The HDOT reports on the following eight objectives to achieve their overall goal:

- Create and manage an integrated multimodal transportation system that provides mobility and accessibility for people and goods.
- Enhance the safety of the transportation system.
- Ensure the secure operation and use of the transportation system.
- Protect Hawaii's unique environment and quality of life and mitigate any negative impacts.
- Ensure that the transportation facility systems support Hawaii's economy and future growth objectives.
- Support the state's energy goal of 100 percent clean energy by 2045, which includes a target of 40 percent renewable energy and a 30 percent increase in energy efficiency by 2030, enhancing the reliability and security of clean energy sources.
- Create secure, flexible, and sustainable revenues and funding sources for transportation needs.
- Provide effective leadership department wide, focusing on accountability, ethics, training, and transparency.

Each division provides policies and projects to meet these overarching objectives. Examples of some of the ways performance is measured and tracked by the HDOT and its divisions through Act 100 include the following:

- **Harbors** tracks their finance and funding goals by collecting data on bond ratings, financial performance ratios, and saving based on cash flow financing compared to bond sales, and the number of projects delivered on time and on or under budget.
- **Airports** tracks their ability to maintain an effective workforce by collecting data on employee absenteeism rate, employee retention rate, volume and severity of worker compensation claims, and volume of critical issues resolved.
- **Highways** tracks how they are improving resiliency by collecting data on the active and completed projects with a resiliency component. Exhibit 6-3 shows a dashboard example from the HDOT Highways Act 100 online report (HDOT Highways Division 2021b).

Exhibit 6-2. Highways Act 100 Report

Percentage of Active Projects with Bicycle and/or Pedestrian Components

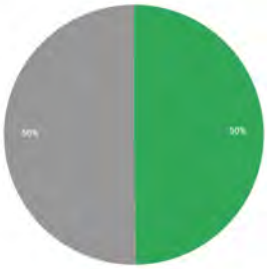
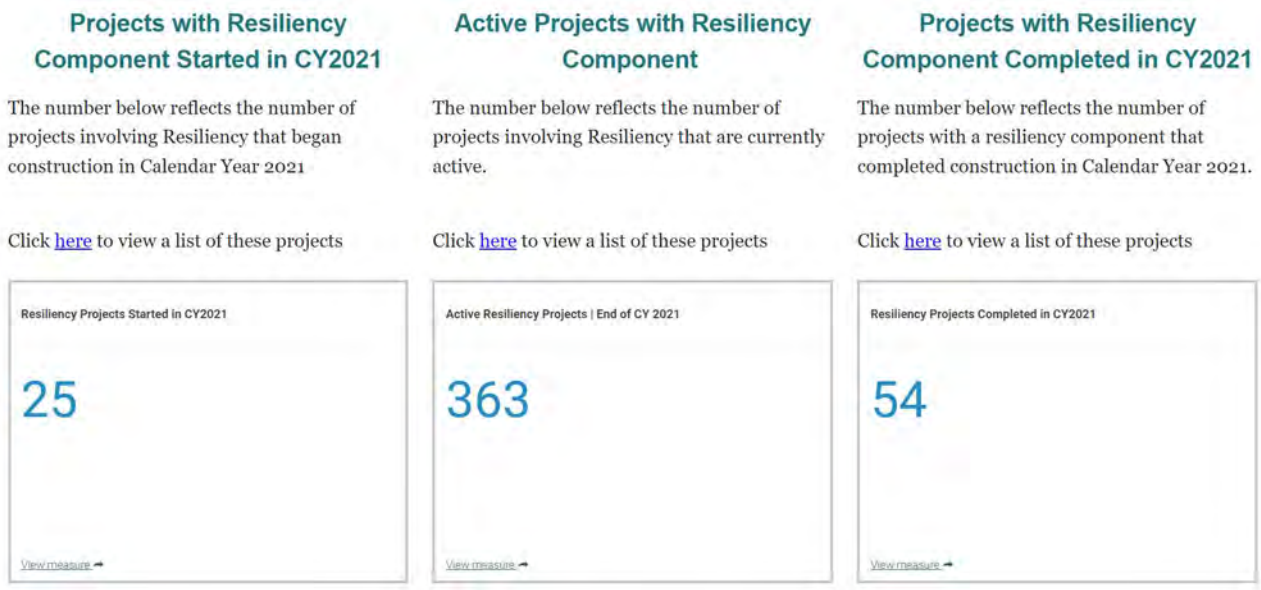


Exhibit 6-3. Dashboard Example from HDOT Highways Act 100 Online Report



6.2.2 Current Federal Regulations

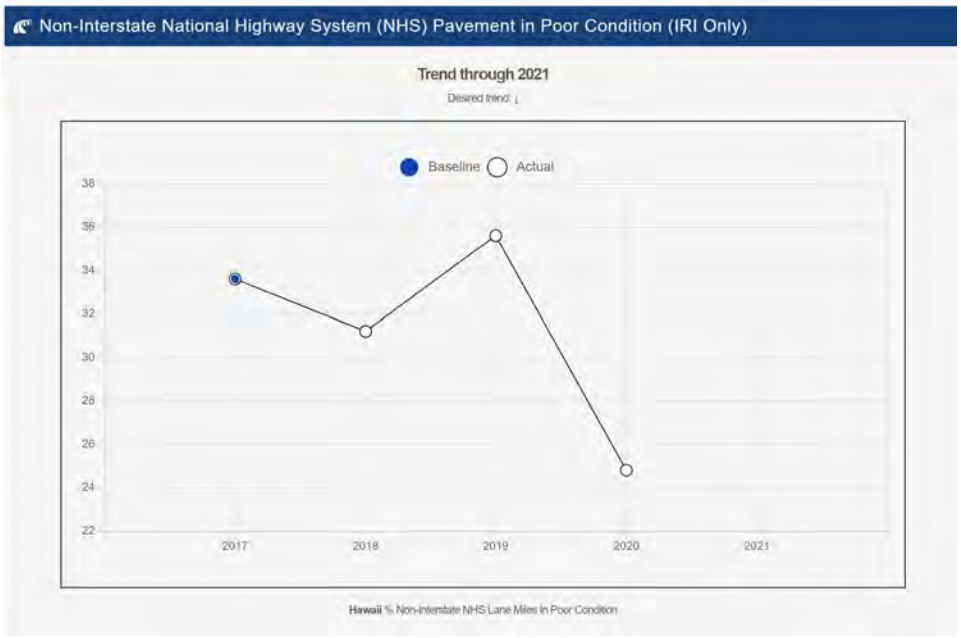
The Federal Highway Administration (FHWA) also collects performance and target data from all 50 state departments of transportation as well as the District of Columbia and Puerto Rico. Each performance metric includes a desired trend and the state's target for the future. The FHWA compiles all the of states' targets and performance metrics, which is reflected in a dashboard on their site (FHWA 2022).

A snapshot of this dashboard is reflected in Exhibit 6-4. In Hawaii, the State monitors, tracks, and provides the following data to the FHWA:

- **Safety (5 measures)**
  - Number of traffic-related fatalities
  - Rate of fatalities per 100 million vehicle-miles traveled (VMT)
  - Number of serious injuries
  - Rate of serious injuries per 100 million VMT
  - Number of non-motorized fatalities and serious injuries
- **Infrastructure Condition (6 measures)**
  - Lane-miles of Interstate pavement in good condition
  - Lane-miles of Interstate pavement in poor condition
  - Lane-miles of Non-Interstate NHS pavement in good condition
  - Lane-miles of Non-Interstate NHS pavement in poor condition
  - NHS bridges in good condition
  - NHS bridges in poor condition

Exhibit 6-4. FHWA Transportation Performance Management Dashboard

Exhibit 6-5. Dashboard of Non-Interstate National Highway System Pavement Condition Example



- **Highway and Truck Travel Time Reliability (3 measures)**
  - Interstate highway reliability person-miles traveled
  - Non-Interstate NHS reliable person-miles traveled
  - Interstate Highway Truck Travel Time Reliability Index

6.2.3 Using Progress Indicators to Make Decisions

Tracking different performance indicators helps each division know how to best invest funds to work toward their goals. An example of this is addressing safety on the HDOT State Highway System. Because the HDOT tracks serious and fatal injuries (including their location and cause), they can invest in site-specific countermeasures to prevent these types of crashes. In 2021, the Highways Division installed wider- edge lines, rumble strips, and guardrails to help reduce the number of fatalities and serious injuries caused by lane departures.

7. Financial Systems

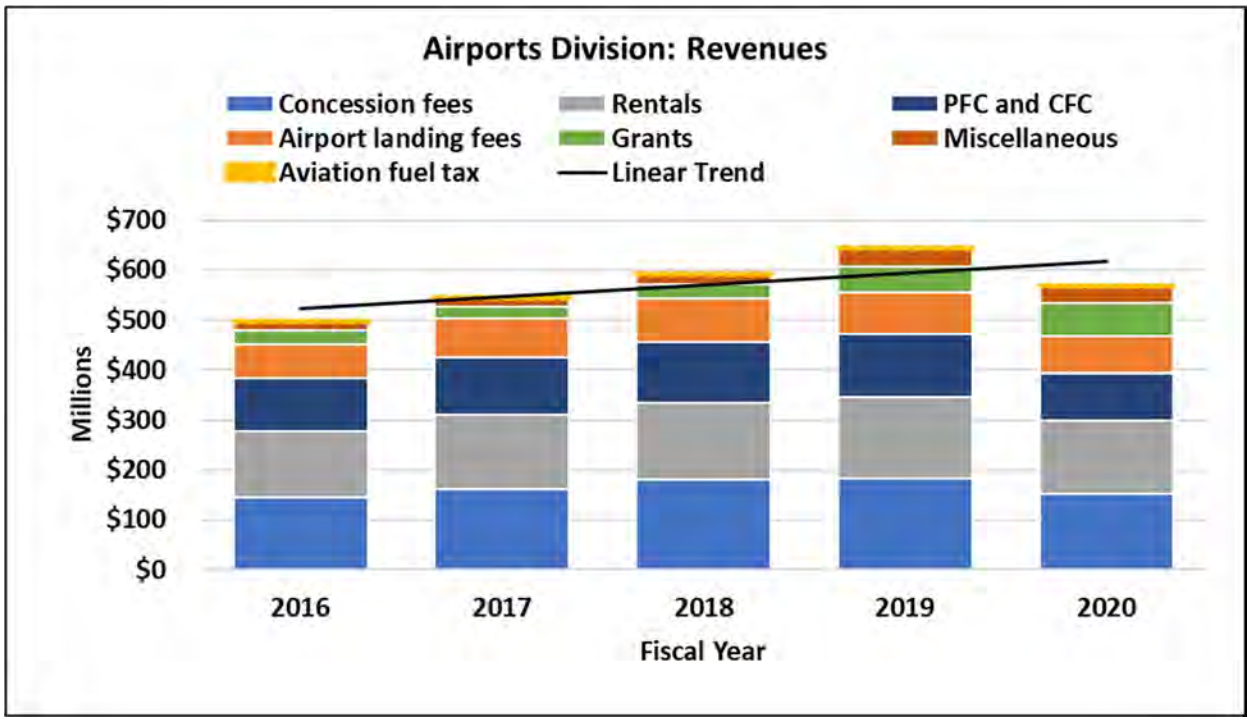
A financial analysis (Appendix D) was prepared for the Hawaii Statewide Transportation Plan (HSTP) to document the existing financial structure of each modal division and the ability of the existing financial structures to satisfy the anticipated future needs. The analysis includes order-of-magnitude shortfalls for future scenarios. For each modal division, budget and financial audit statements were reviewed and summarized; historical data are provided for fiscal year (FY) 2016 to FY 2020, while projected costs are provided for the 25-year study period, FY 2021 to FY 2045. This chapter provides an overview of the financial system and future financial forecasts for each of the State of Hawaii Department of Transportation (HDOT) divisions and county transit systems.

7.1 Airports

7.1.1 Revenue and Funding Sources

Revenue sources that fund the operating and capital costs of the Airports Division include rates and charges, fuel taxes, grants, and proceeds from airports system revenue bonds issued by the Airports Division. For the 5-year period from FY 2016 to FY 2020, the average annual operating revenue (including operating grants) was $565 million and the average annual grant proceeds were $34 million. Operating revenues are deposited into the Airport Special Fund, while bond proceeds are deposited into construction funds. Passenger facility charge (PFC) and customer facility charge (CFC) revenues are restricted for specific purposes.

Exhibit 7-1. Airports Division Revenue and Funding Sources



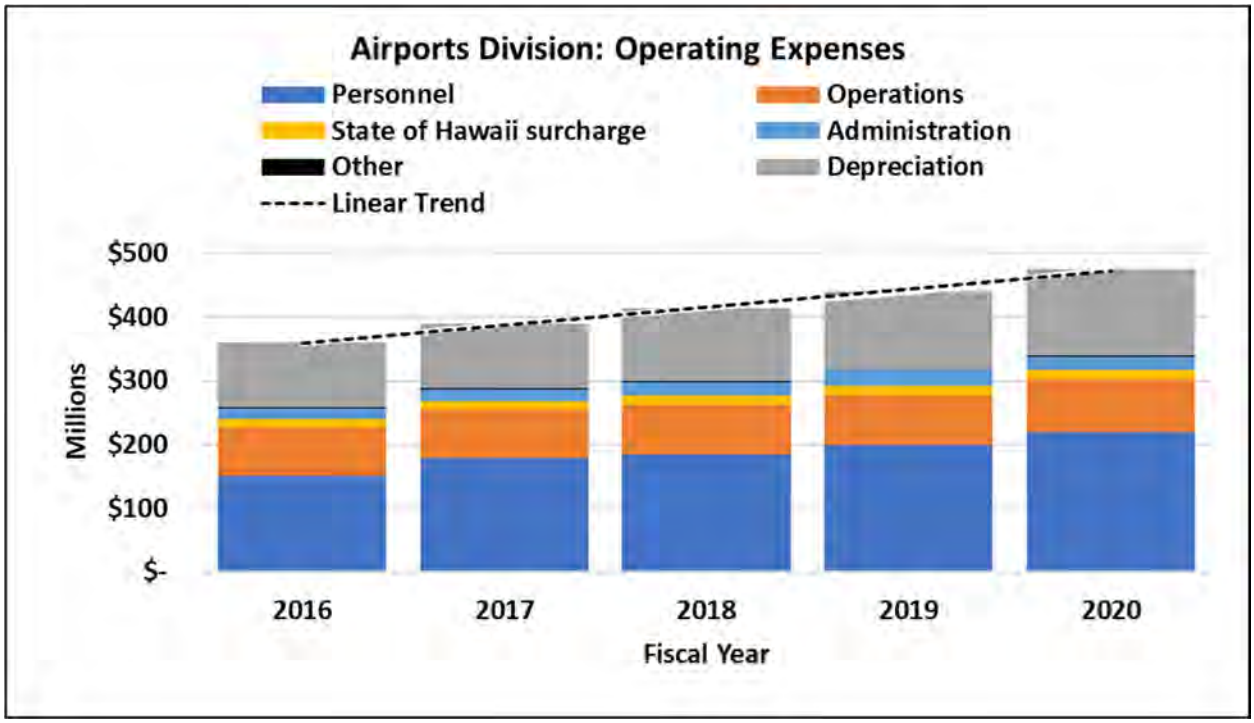
7.1.2 Operating Expenses

The operating costs for the Airports Division are categorized in the annual audit reports by the following:

- Personnel (includes salaries, wages, and benefits)
- Operations (includes repairs and maintenance, utilities, and special maintenance)
- State of Hawaii surcharge on gross receipts
- Administration (includes the HDOT general administration expense, materials and supplies, claims, insurance, bad debt expense, and other miscellaneous expenses)
- Depreciation

Over the 5-year period from FY 2016 to FY 2020, the average annual operating expenses were approximately $301 million, net of average depreciation expense of $114 million (Exhibit 7-2). During this period, operating expenses increased at a compound annual growth rate of 7 percent.

Exhibit 7-2. Airports Division Operating Expenses



Non-operating expenses include interest expense on bonds and certificates of participation, bond issuance costs, loss on disposal of assets, and other items. Exhibit 7-3 summarizes the annual non-operating expenses, which during the 5-year period from FY 2016 to FY 2020 averaged $36.7 million. The increase in interest expense in FY 2020 is due to the airports system revenue bond Series 2020.

Exhibit 7-3. Airports Division Non-operating Expenses, FY 2016 to FY 2020 (millions of dollars)

	2016	2017	2018	2019	2020
Interest expense [a]	$20.54	$19.57	$16.39	$30.42	$84.34
Loss on disposal of assets	2.23	0.04	-	1.67	0.001
Bond issuance costs	1.86	0.11	2.08	2.31	1.72
Other	0.01	-	-	0.04	0.07
Non-operating expenses, net	**$24.64**	**$19.73**	**$18.46**	**$34.44**	**$86.12**

[a] Interest expense is net of capitalized interest and amortization of discounts/premiums on bonds.

Source: FY 2016 and FY 2020 Financial Statements for HDOT Airports Division

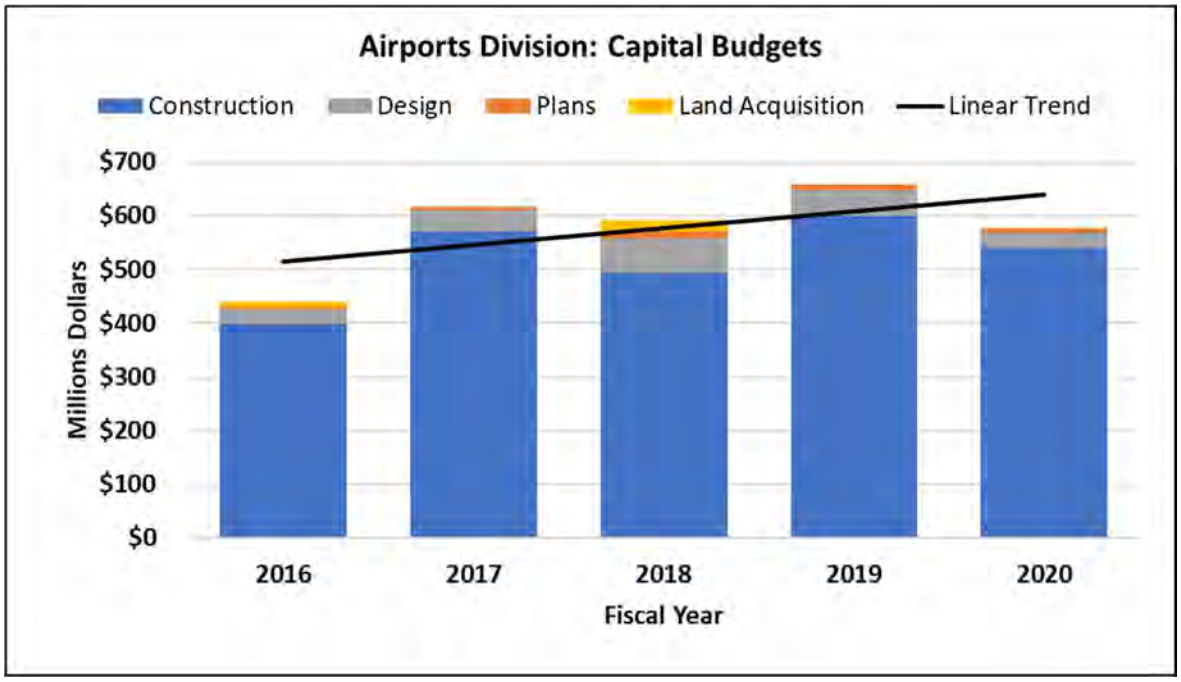
Differences due to rounding.

- = not applicable

7.1.3 Capital Project Costs

Exhibit 7-4 summarizes the Capital Improvement Program (CIP) budget for the Airports Division for FY 2016 to FY 2020; the actual capital expenditure may differ from the budgeted amounts, but the summary provides approximate annual capital needs. The budget documents identify funding sources that include Airport Special Fund, general obligation and revenue bond proceeds, private contributions and grants, and other sources. Because the HDOT develops multiyear budgets, the budget information presented may predate the COVID-19 impacts. In addition, according to the FY 2020 audited financial report, some projects were temporarily on hold, which is not reflected in Exhibit 7-4.

Exhibit 7-4. Airports Division Capital Budget FY 2016 to FY 2020



7.1.4 Financial and Scenario Analysis

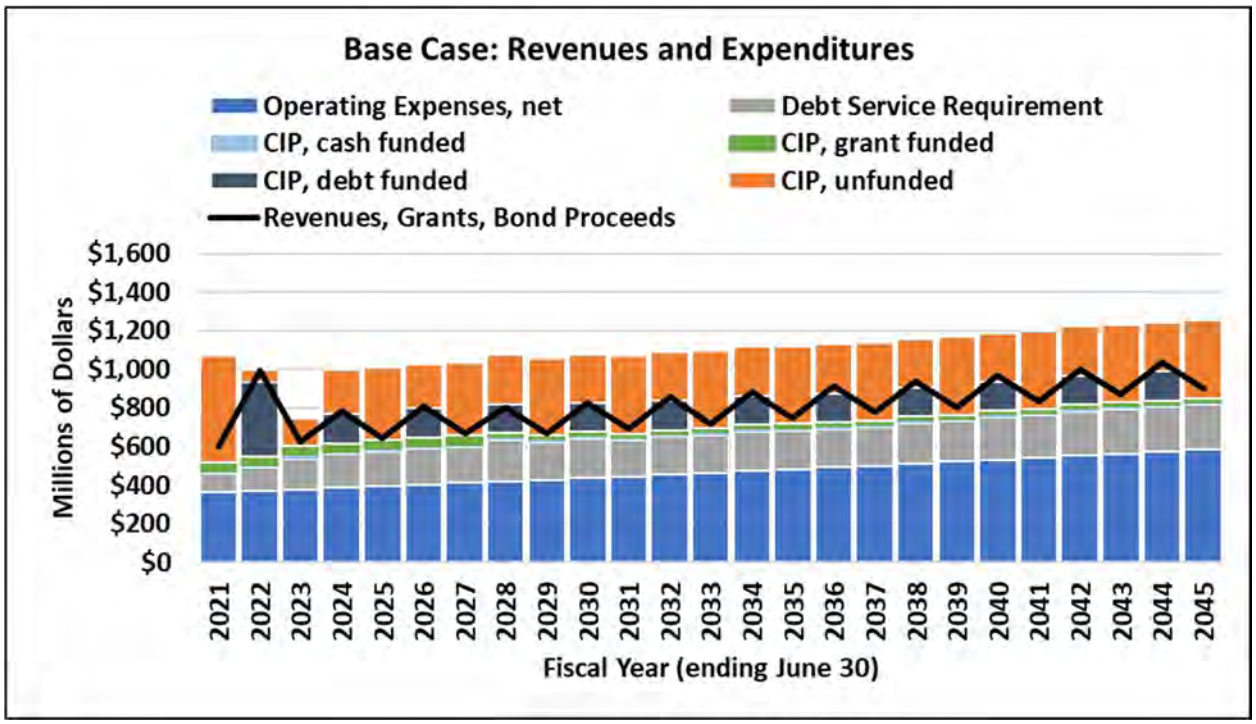
Several circumstances have impacted the HDOT Airports Division, including the COVID-19 pandemic and rising costs due to inflation. During 2020 and 2021, air travel declined because of COVID travel restrictions and reduced demand for air travel services by travelers; this resulted in a decrease in revenues. Given current market conditions, the costs of goods and services have increased, in particular costs for car rentals, fuel, food, and construction materials. For the purposes of the financial analysis, two different high-level planning scenarios were developed to evaluate long-term forecasts for the study period FY 2021 to FY 2045, as follows:

- **Base Case**: Operating revenues increase at 2 percent per year based on pre-COVID 2019 levels.
- **Scenario 1**: Operating revenues are based on the Airports Division Consultant Report provided in the Series 2022 Official Statement (Morgan Stanley/BoA Securities 2022).

7.1.4.1 Base Case

The financial forecast for the 25-year study period (FY 2021 to FY 2045) for the Airports Division was based on historical revenues and expenditures from the audited financial reports for FY 2016 to FY 2021, the biennial budget for FY 2021 to FY 2023, and Official Statements for Series 2020 and 2022 bond issuances. Exhibit 7-5 summarizes the Base Case financial scenario for the 25-year study period. Further details of the output of the financial model and the key parameters and assumptions used are included in the financial analysis document (Appendix D).

Exhibit 7-5. Airports Division Base Case Financial Analysis

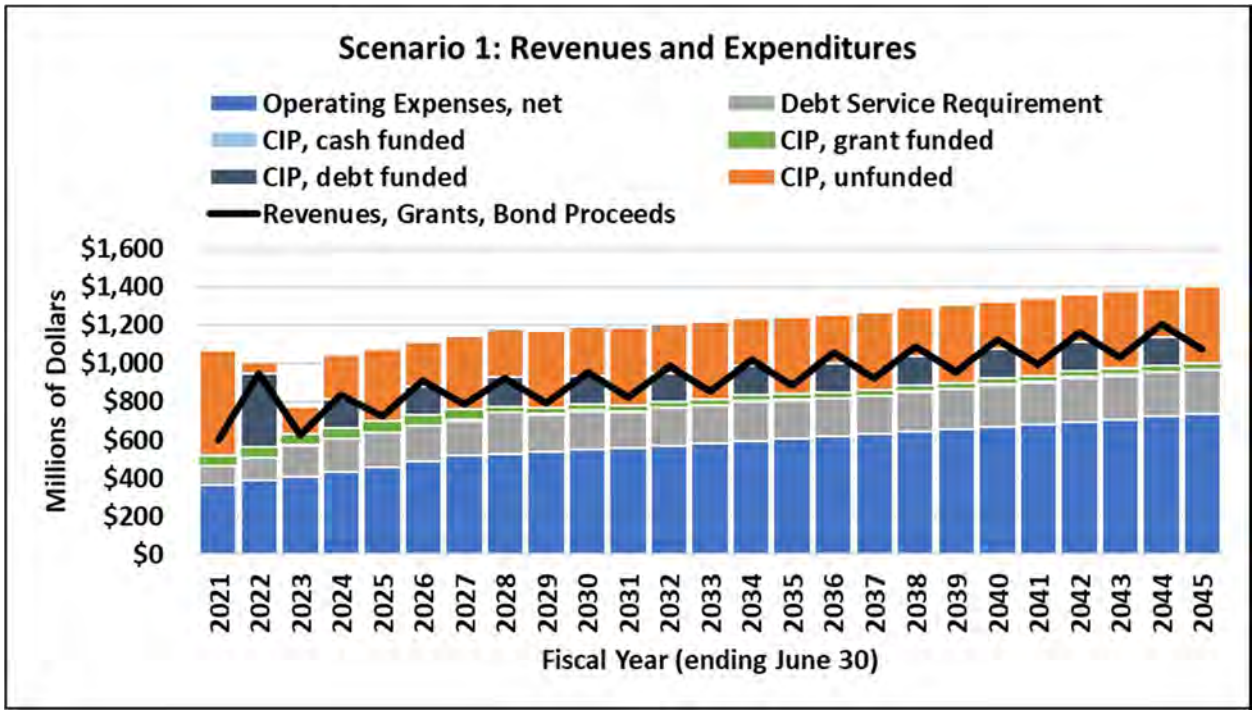


7.1.4.2 Scenario 1

Scenario 1 is similar to the Base Case with respect to expenditures, but operating revenue projections are based on the Airports Division Consultant Report included with the Series 2022 bond Official

Statement. Exhibit 7-6 summarizes the financial analysis results for Scenario 1 for the 25-year study period (FY 2021 to FY 2045). Further details of the output of the financial model and the key parameters and assumptions used to develop Scenario 1 are included in the financial analysis document (Appendix D).

Exhibit 7-6. Airports Division Scenario 1 Financial Analysis



In comparing operating revenue projections between the Base Case and Scenario 1, the following describe notable differences:

- For the period FY 2022 to FY 2027, total concession fee revenues for the Base Case are projected to be $1.18 billion, with an annual average of $196.5 million. For Scenario 1, total concession fee revenues are projected to be $987.8 million, with an annual average of $164.6 million. Over the 6-year period, this is a difference of approximately $192 million (annual average $32 million).
- For the same period, total airport landing fee revenues for the Base Case are project to be $534 million, with an annual average of $89 million. For Scenario 1, total airport landing fee revenues are projected to be $624.5 million, with an annual average of $104.1 million. Over the 6-year period, this is a difference of approximately $90.5 million (annual average $57 million).
- For the same period, total aeronautical rentals (exclusive and non-exclusive) revenues for the Base Case are project to be $903 million, with an annual average of $75 million. For Scenario 1, total aeronautical rentals are projected to be $1.3 billion, with an annual average of $109.6 million. Over the 6-year period, this is a difference of approximately $39.7 million (annual average $34.6 million).
- For the same period, total PFC revenues for the Base Case are projected to be $225.9 million, with an annual average of $37.7 million. For Scenario 1, total PFC revenues are projected to be $247 million, with an annual average of $41.2 million. Over the 6-year period, this is a difference of approximately $21.1 million (annual average $3.5 million).

7.1.5 Emerging Trends and Challenges

The following emerging trends and challenges for the Airports Division must be considered in the financial analysis:

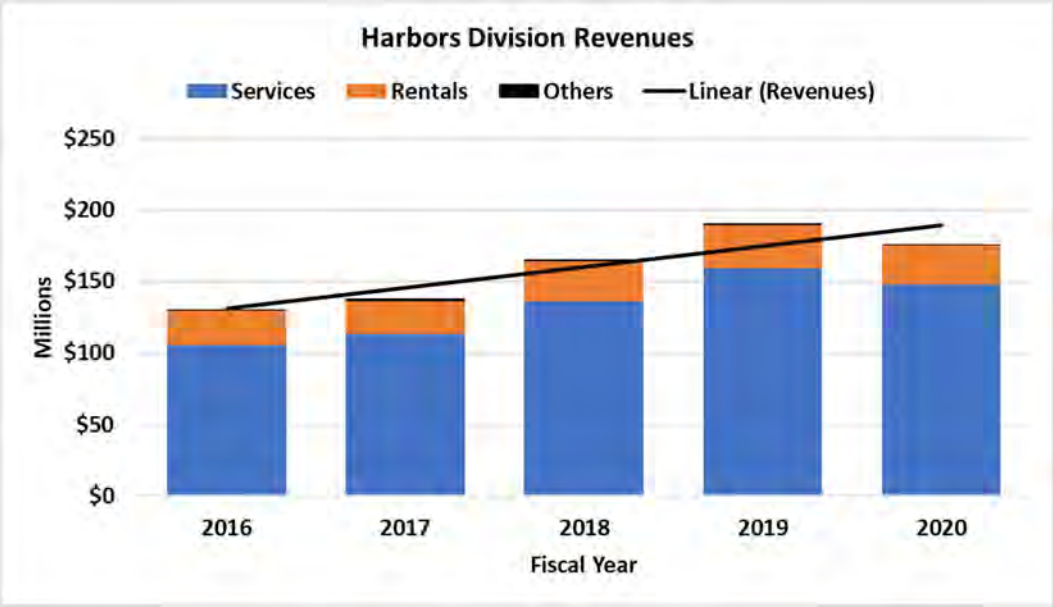
- As air travel recovers from the impacts of the COVID-19 pandemic on the industry, the pace of recovery is uncertain. While the financial forecast does develop a recovery forecast, the financial scenario references a forecast that was included in the Official Statement for the Series 2022 bond issuance.
- Inflation has significantly increased the cost of goods and services since 2021. While there is uncertainty about which direction inflation will move, it is likely that it will continue to be a challenge, and the trend will be an increase in the cost of both capital projects and ongoing operating expenditures.
- As the Airports Division continues to invest in capital infrastructure to meet airport needs and air travel demand, funding the CIP will likely continue to depend on multiple funding sources, primarily through debt financing.
- The Airports Division is a self-sustaining enterprise fund that maintains revenue levels to meet operating and debt obligations. A system of rates and charges is maintained to generate revenues sufficient to meet debt service coverage per bond covenants. Given the significant additional revenues projected in Scenario 1 compared with the Base Case, the willingness of customers (that is, travelers, airlines, and others who contribute to the revenue base) to absorb increased costs and the potential dampening impact on the level of travel activity will need to be monitored. The determination of debt service coverage is not part of the HSTP financial analysis; however, is a challenge and a trend that will also need to be monitored.

7.2 Harbors

7.2.1 Revenue and Funding Sources

The Harbors Division is self-sustaining and according to Hawaii Revised Statutes they must establish and maintain rates and charges to collect revenues to result in being self-sufficient to fund the operating and capital expenditures to maintain and to operate the harbors systems. Also, the Harbors Division has issued revenue bonds to fund their CIP and there are debt covenants that must be met. To fund the operating and capital costs, the Harbors Division relies on the following revenue and funding sources: charges for services (includes wharfage, passenger fees, and ship related fees), rentals, bond proceeds for revenue bonds issued by the Harbors Division and on occasion, federal grants and private contributions. For the five-year period FY 2016 to FY 2020, the average operating revenues (including operating grants) was $160 Million and average amount for capital grants was $1 Million. Figure 3-1 provides summary of annual revenues for these sources. For the five-year historical period based on review of audited financial statements, we identified many of the key revenue components, as summarized in bar chart on the left. For five-year period, revenues grew approximately 8% per year. However, in 2020 revenues decreased approximately 8% due to COVID-19 pandemic conditions and reduced harbor traffic, such as cruise ships and tourism. Revenues include service revenues (wharfage, passenger fees, and ship related fees) and rentals.

Exhibit 7-7. Harbors Division Revenue and Funding Sources

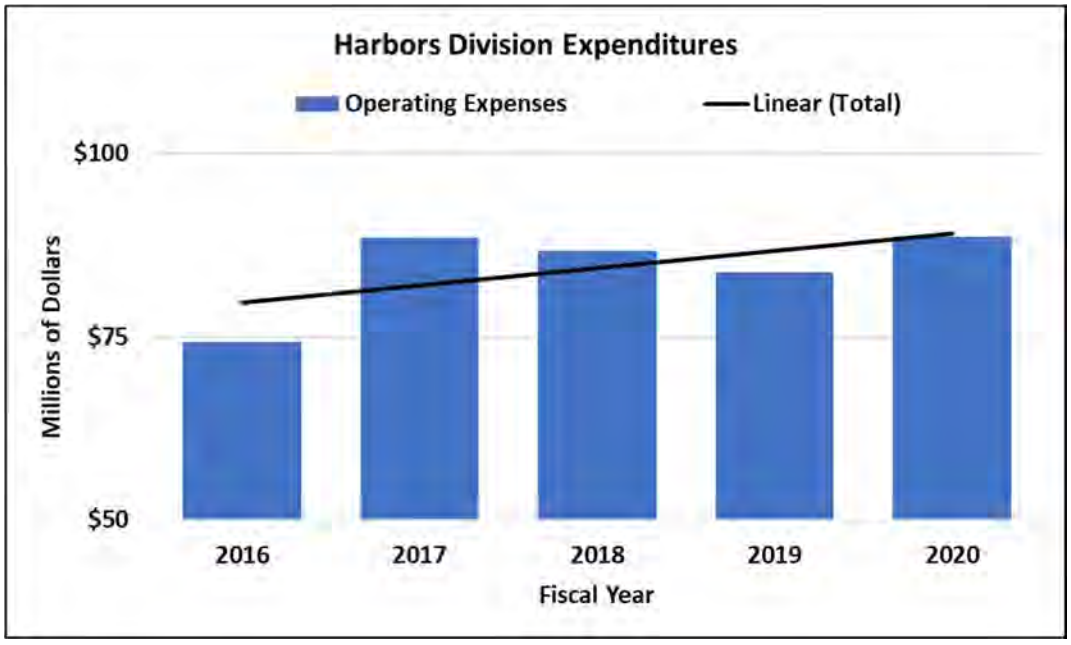


7.2.2 Operating Expenses

Operating costs for the Harbors Division are categorized by personnel, operations, administration (general and HDOT), and depreciation. Over the 5-year period from FY 2016 to FY 2020, the average annual operating expenses were approximately $73 million. While the annual amount has fluctuated during this period, there has been a slight increase, with a compound annual growth rate of 4.6 percent. The operating costs for the Harbors Division are categorized in the annual audit reports by the following:

- Personnel
- Operations (includes revenue transfers to the Office of Hawaiian Affairs for 3rd Party payments for the use of Harbor facilities located on Ceded Lands per DLNR's Public Land Trust Information System)
- Administration (general and HDOT)
- Depreciation

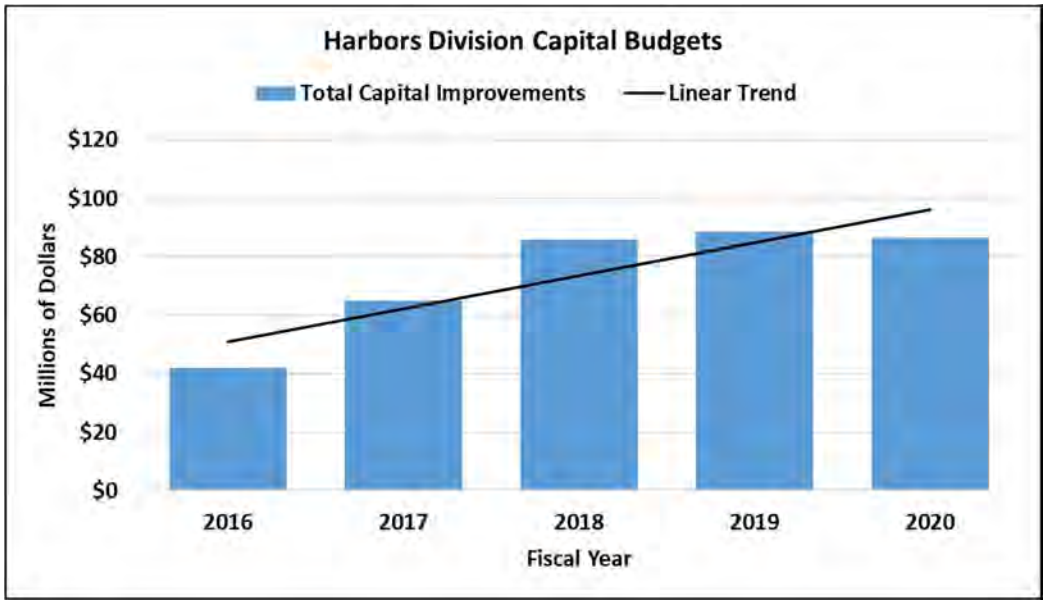
Exhibit 7-8. Harbors Division Operating Expenditures



7.2.3 Capital Project Costs

Exhibit 7-9 summarizes the CIP budget for the Harbors Division for FY 2016 to FY 2020; the actual capital expenditure may differ from the budgeted amounts, but the summary provides approximate annual capital needs. The budget documents identify funding sources that include capital grants, harbor revenue bonds, and the Harbor Special Fund. It is important to note that the CIP budget is for planning purposes and may not reflect actual activity, including use of bond funds. While the linear trend decreases during the 5-year period from FY 2016 to FY 2020, the projected CIP builds off the 2021 CIP.

Exhibit 7-9. Harbors Division Capital Budget FY 2016 to FY 2020

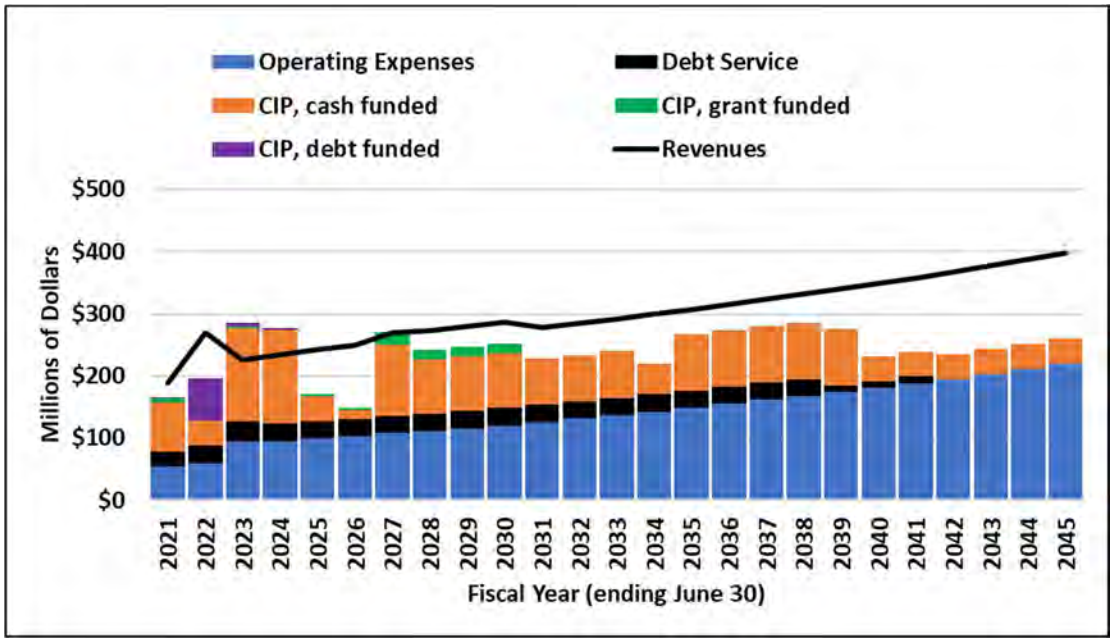


7.2.4 Financial Analysis

The financial forecast for the 25-year study period (FY 2021 to FY 2045) for the Harbors Division was based on historical revenues and expenditures from the audited financial reports for FY 2016 to FY 2021 and the biennial budget for FY 2022 to FY 2023 and input from the Harbors Division. Exhibit 7-10 summarizes the revenues and expenditures for the study period (FY 2021 to FY 2045) based on the financial analysis.

The area between the black line and top of the bars is the assumed funding gap. Since the Harbors Division is self-sufficient and funds a majority of their capital improvements with cash, there is little to no funding gap over the forecast period. Further details of the output of the financial model and the assumptions used are included in the financial analysis document (Appendix D).

Exhibit 7-10. Harbors Division Financial Analysis (millions of dollars)



7.2.5 Emerging Trends and Challenges

The following emerging trends and challenges for the Harbors Division must be considered in the financial analysis:

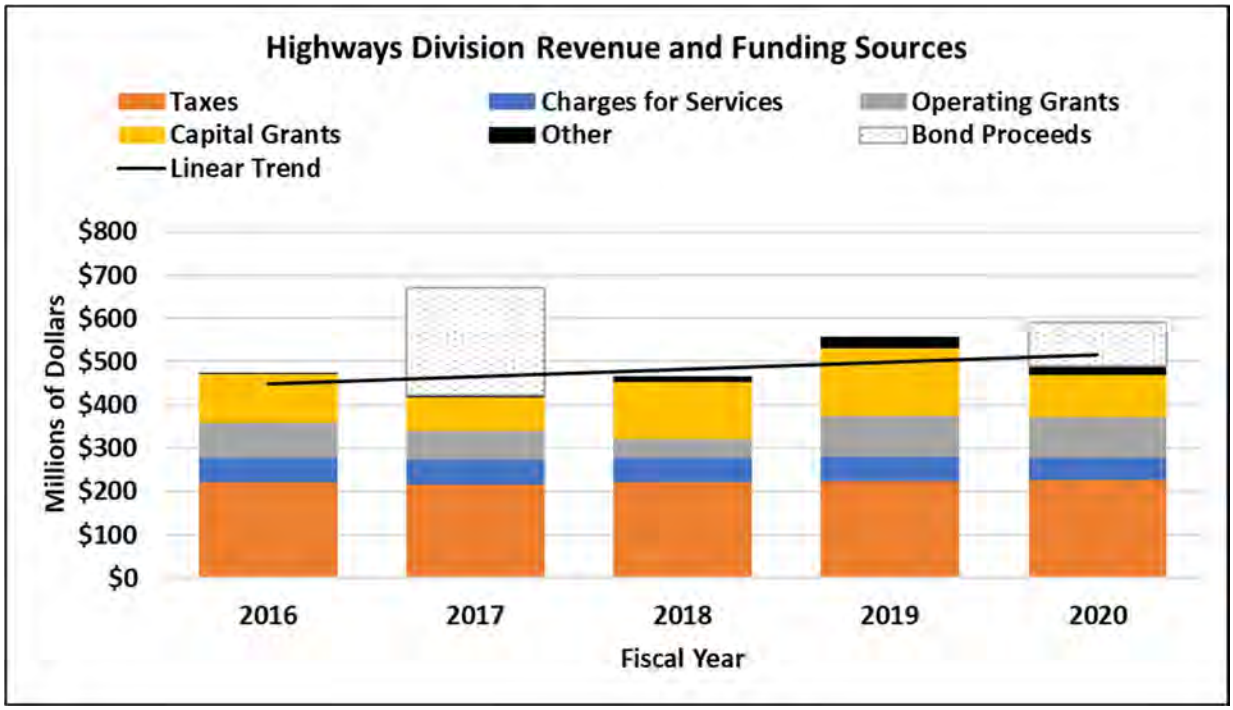
- Starting in 2021 and continuing in 2022, inflation has significantly increased. While there is uncertainty about which direction inflation will move, it is possible that it will continue to be a challenge, and the trend will be an increase in the cost capital projects.
- There have been technological advances in the delivery of road systems.
- The financial analysis indicates that there is both a trend and challenge regarding a funding gap for capital projects. Depending on the capital needs and availability of debt financing, capital financing could be limited.

7.3 Highways

7.3.1 Revenue and Funding Sources

Revenue sources that the Highways Division relies on to fund operating and capital costs include charges for services, taxes, operating and capital grants, and proceeds from highway revenue bonds issued by the Highways Division. For the 5-year period from FY 2016 to FY 2020, the average operating revenue, including operating grants, was $367 million, and the average amount for capital grants was $115 million. Revenues are deposited into the State Highway Fund and are used for the design, construction, repair, and maintenance of public highways.

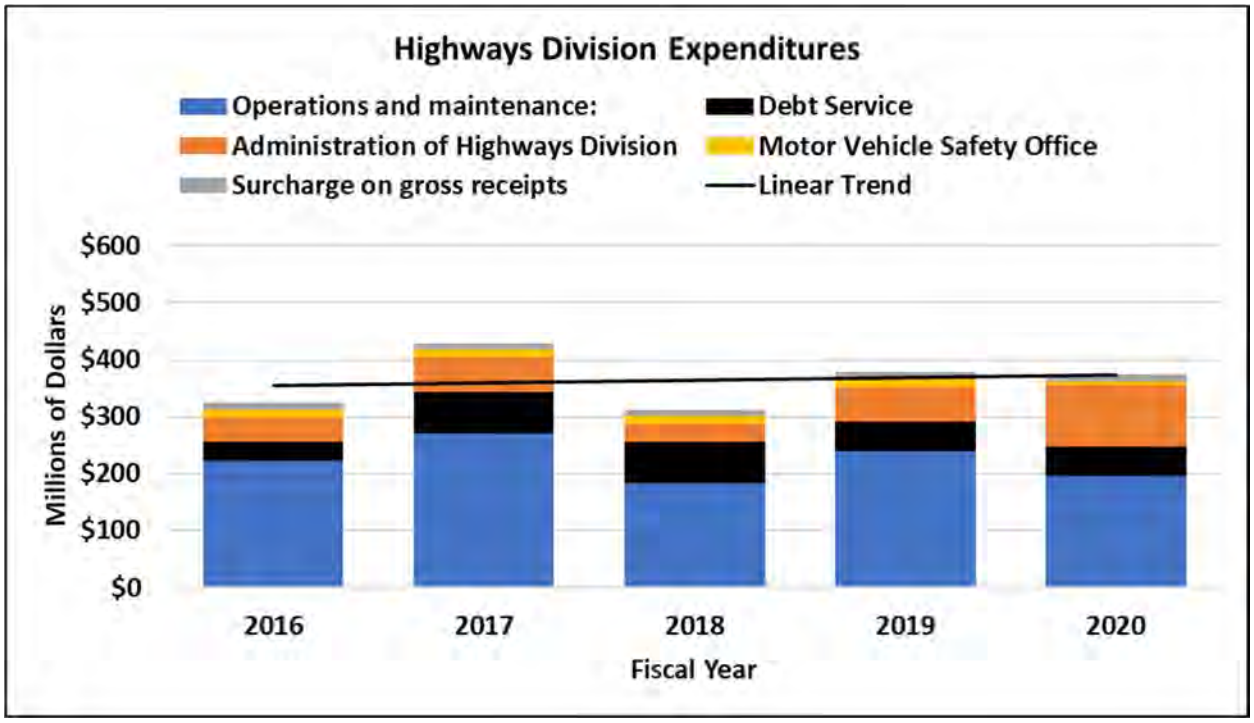
Exhibit 7-11. Highways Division Revenue and Funding Sources



7.3.2 Operating Expenses

Operating costs for the Highways Division are categorized by operations and maintenance, motor vehicle safety office, surcharges on gross receipts, and administration of the Highways Division. Over the 5-year period from FY 2016 to FY 2020, the average annual operating expenses were approximately $307 million. While the annual amount has fluctuated during this period, there has been a slight increase, with a compound annual growth rate of 2.5 percent. The decrease in FY 2018 compared to FY 2017 is attributed lower payroll because of staff vacancies, according to the Highways Division's audit report.

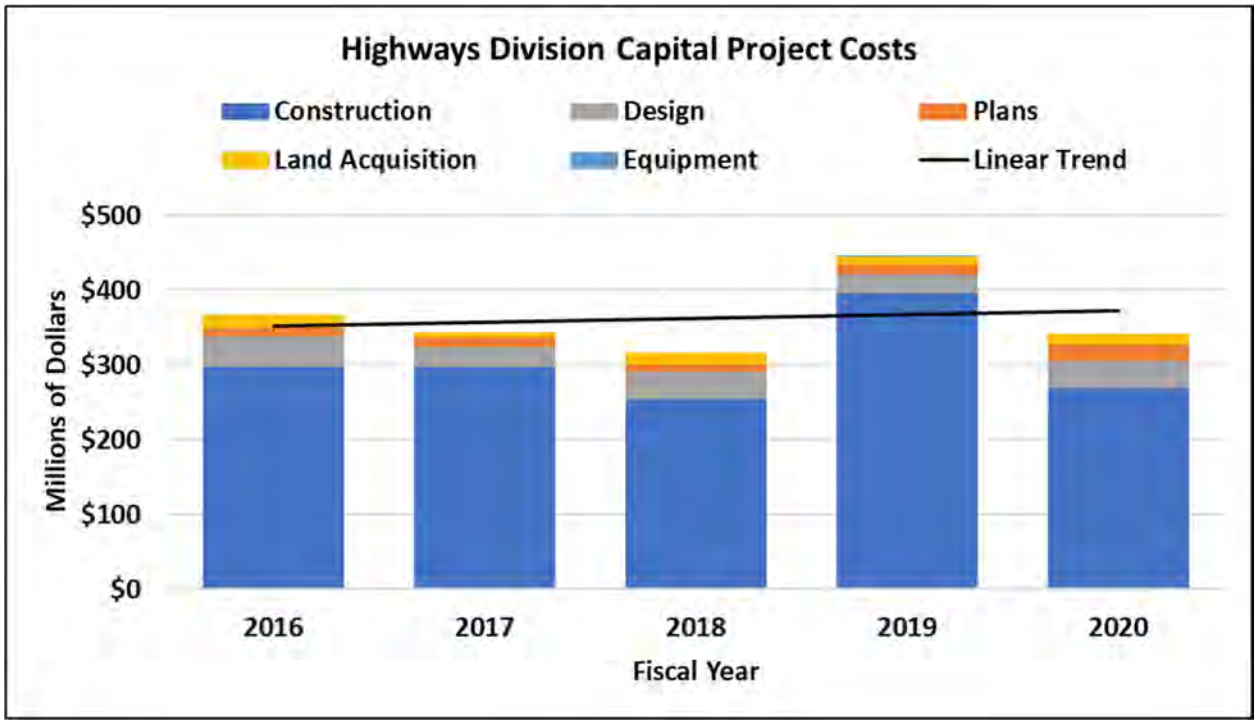
Exhibit 7-12. Highways Division Operating Expenditures



7.3.3 Capital Project Costs

Exhibit 7-13 summarizes the CIP budget for FY 2016 to FY 2020; the actual capital expenditure may differ from the budgeted amounts, but the summary provides approximate annual capital needs. The budget documents identify funding sources that include capital grants, highway revenue bonds, and the State Highway Fund.

Exhibit 7-13. Highways Division Capital Budget FY 2016 to FY 2020

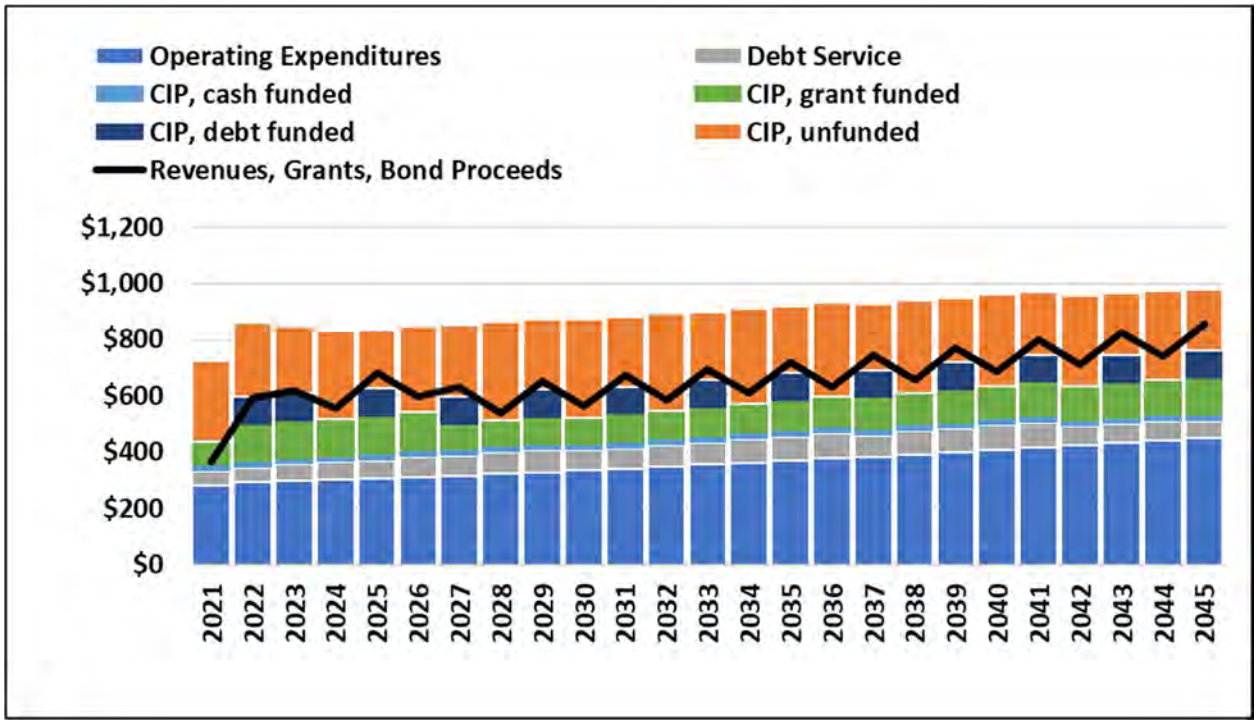


7.3.4 Financial Analysis

The financial forecast for the 25-year study period (FY 2021 to FY 2045) for the Highways Division was based on historical revenues and expenditures from the audited financial reports for FY 2016 to FY 2020 and the biennial budget for FY 2021 to FY 2023. Exhibit 7-14 summarizes the revenues and expenditures for the study period (FY 2021 to FY 2045) based on the financial analysis.

The area between the black line and top of the bars is the assumed funding gap. The cumulative funding gap over the forecast period is estimated to be $5.9 billion, with an annual average funding gap of $237 million. Further details of the output of the financial model and the assumptions used are included in the financial analysis document (Appendix D).

Exhibit 7-14. Highways Division Financial Analysis (millions of dollars)



7.3.5 Emerging Trends and Challenges

The following emerging trends and challenges for the Highways Division must be considered in the financial analysis:

- Starting in 2021 and continuing in 2022, inflation has significantly increased. While there is uncertainty about which direction inflation will move, it is possible that it will continue to be a challenge, and the trend will be an increase in the cost capital projects.
- There have been technological advances in the delivery of road systems.
- The trend toward electric vehicles may affect gas tax revenues. If there is significant shift to electric vehicles, the trend could be a decrease in gas tax revenues. The challenge is to identify revenue sources that supplement or replace the gas tax.

7.4 Transit

7.4.1 City and County of Honolulu Department of Transportation Services

7.4.1.1 Revenue and Funding Sources

Revenue and funding sources based on a review of financial data for the City and County of Honolulu Department of Transportation Services (DTS) are summarized in Exhibit 7-15. For the 5-year period from FY 2016 to FY 2020, the average total revenue was $274 million. The largest component are the transfers in of funds, mostly from the Transportation Fund. Revenues and funding sources are used for contracted services (such as Oahu Transit Services, Inc. [OTS]), maintenance of buses and facilities, administration, and other costs.

Exhibit 7-15. DTS Historical Revenue and Funding Sources, FY 2016 to FY 2020 (millions of dollars)

Fiscal Year	2016	2017	2018	2019	2020
Operating Revenues	55.5	54.1	57.0	57.6	46.8
Operating Grants	21.0	21.0	21.0	21.0	23.4
Transfers In	161.6	172.0	167.9	188.7	208.1
Capital Contributions	39.5	18.1	7.2	13.7	15.0
Total	**277.6**	**265.1**	**253.1**	**281.0**	**293.3**

Sources: CCH 2017, 2018, 2019, 2020b, 2021

7.4.1.2 Operating Expenses

Exhibit 7-16 summarizes reported actual operating expenditures for the period FY 2016 to FY 2020. During this period, operating expenditures increased on average 4 percent per year. The largest operating component is contractual services and represents 73 percent of total operating expenses, which includes the is the bus and other transit services provided by OTS.

Exhibit 7-16. DTS Historical Operating Expenditures, FY 2016 to FY 2020 (millions of dollars)

Fiscal Year	2016	2017	2018	2019	2020
Administrative and General	$1.5	$2.0	$1.6	$1.5	$1.4
Maintenance	0.1	0.0	0.2	0.1	0.2
Depreciation	18.2	19.5	20.6	21.3	20.4
Contractual Services	186.7	193.1	202.5	210.7	219.0
Fringe Benefits	0.9	1.4	1.7	1.7	1.3
Materials and Supplies	13.9	15.7	14.8	15.4	16.1
Fuel and Lubricants	12.4	13.2	14.2	15.8	15.1
Insurance	17.3	12.5	14.9	15.3	21.5
State Taxes - Fuel	3.0	2.9	3.0	3.1	3.0
Utilities	1.3	1.9	2.3	3.0	3.0
Total Operating Expenses	**$255.4**	**$262.2**	**$275.9**	**$287.9**	**$300.9**

Sources: CCH 2017, 2018, 2019, 2020b, 2021

7.4.1.3 Capital Project Costs

The capital project costs for DTS during the period FY 2021 to FY 2026 is summarized in Exhibit 7-17. During this period, the total capital project costs are approximately $439.4 million and the average is $73.2 million. It is assumed that costs are in 2021 dollars and not adjusted for inflation. Funding for

capital projects is a combination of Highway Improvement Bond Fund and federal capital grants. The largest project is for the TheBus and TheHandi-Van Acquisition Program and represents 90 percent of total project costs.

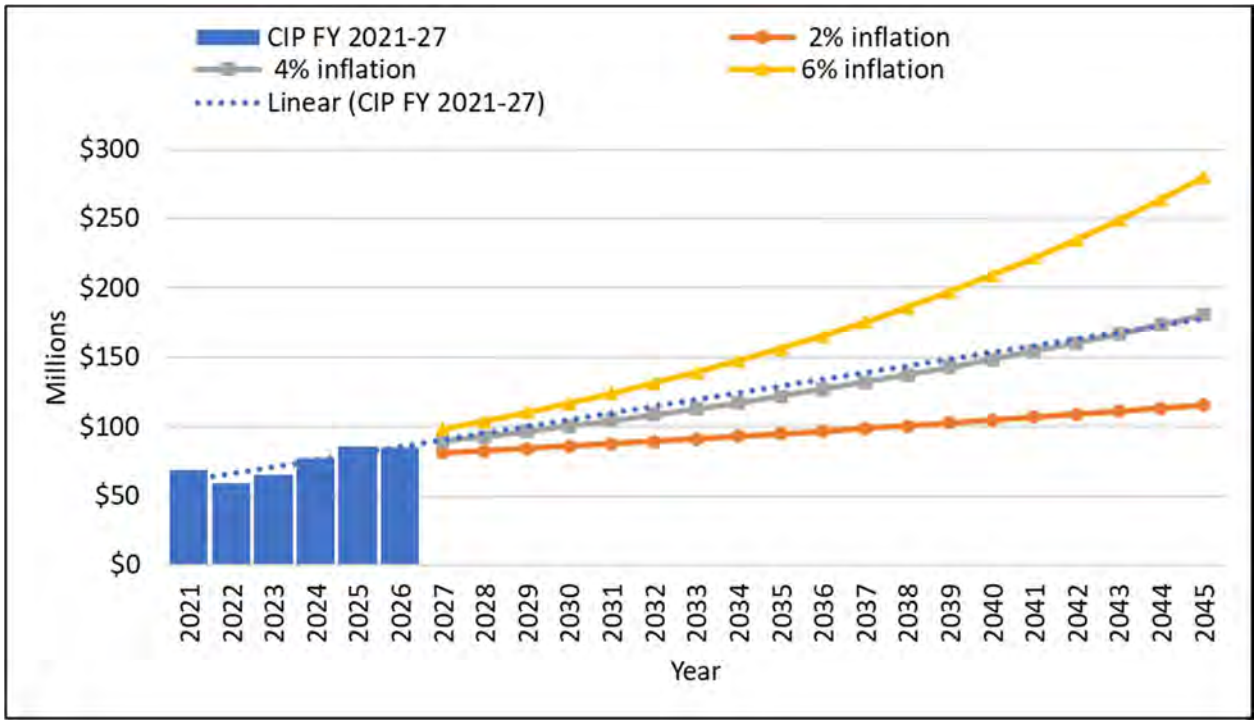
Exhibit 7-17. DTS Capital Budget, FY 2021 to FY 2026 (millions of dollars)

Fiscal Year	2021	2022	2023	2024	2025	2026
Projects						
Alapai Transportation Management Center	$0.8	-	-	-	-	-
Bus and Handi-Van Acquisition Program	30.8	58.1	63.6	74.1	84.1	84.1
Bus Stop ADA Access and Site Improvements	0.3	0.9	0.9	0.9	0.9	-
Middle Street Intermodal Transit Center	31.4	-	-	-	-	-
Transit Guideway Fiber Optic Backbone	4.8	-	-	-	-	-
Transit Safety And Security Projects	0.4	0.4	0.4	0.4	0.4	0.4
Waikiki Area Transit Catalytic Improvements	-	-	-	1.7	-	-
Total	**$68.4**	**$59.4**	**$64.8**	**$77.0**	**$85.3**	**$84.4**
Funding Sources						
Highway Improvement Bond Fund	$28.6	$40.4	$45.5	$57.3	$65.6	$64.8
Federal Grants Fund	39.8	19.0	19.4	19.8	19.8	19.6
Total	**$68.4**	**$59.4**	**$64.8**	**$77.0**	**$85.3**	**$84.4**

Sources: CCH 2020c

For the purposes of the HSTP, projected capital expenditures starting in FY 2027 assume an average of $73.2 million per year and are adjusted for inflation. Due to recent economic conditions and increasing inflation, multiple scenarios (2 percent, 4 percent, and 8 percent) are considered. Exhibit 7-18 summarizes the projected capital costs for FY 2021 to FY 2045.

Exhibit 7-18. DTS Projected Capital Project Costs, FY 2021 to FY 2045



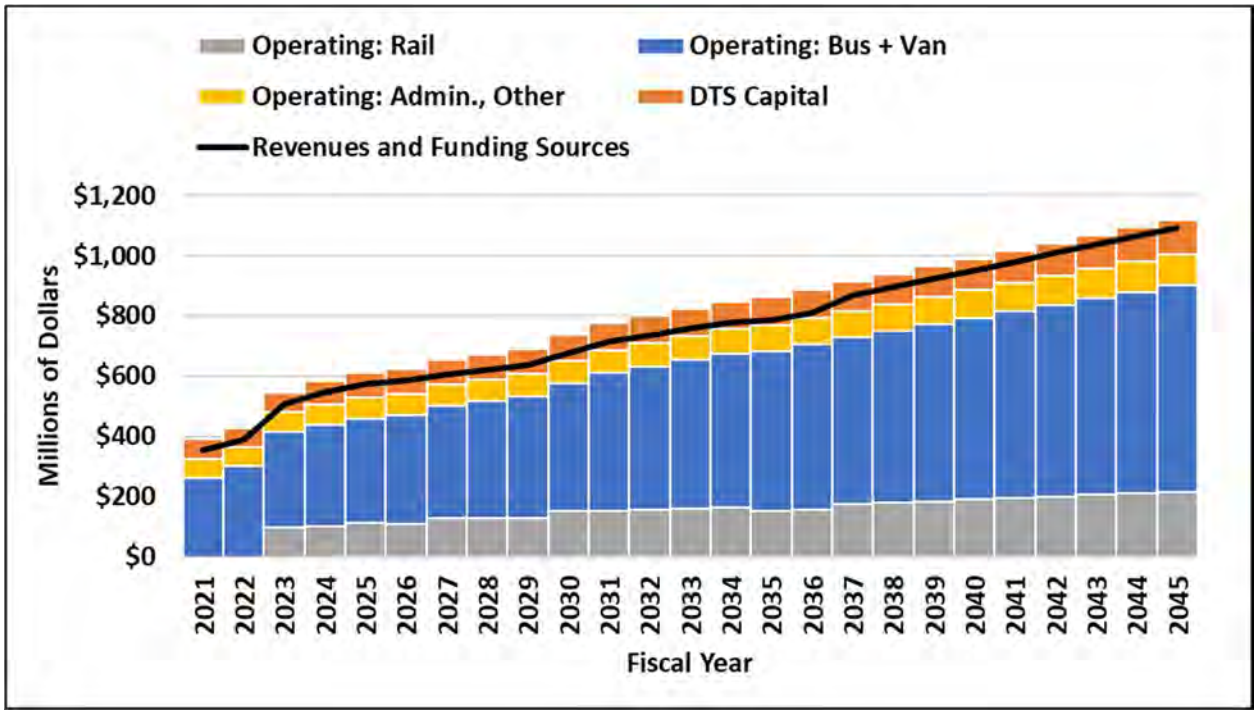
7.4.1.4 Financial and Scenario Analysis

For the purposes of the financial analysis, the two different high-level planning scenarios in the following sections were developed to evaluate long-term forecasts for the study period.

Base Case

The financial forecast of DTS transit operations for the 25-year study period (FY 2021 to FY 2045) was based on historical revenues and expenditures from the audited financial reports for FY 2016 to FY 2021. Exhibit 7-19 summarizes the Base Case financial scenario for the 25-year study period. The projections for TheBus, TheHandi-Van, and rail through 2036 are from the Honolulu Authority for Rapid Transportation (HART) *2022 Recovery Plan*. These projections include inflation-adjusted dollars, assuming a 3 percent annual inflation rate. Projections for FY 2037 to FY 2045 assume a linear trend. Further details of the output of the financial model and the key parameters and assumptions used are included in the financial analysis document (Appendix D).

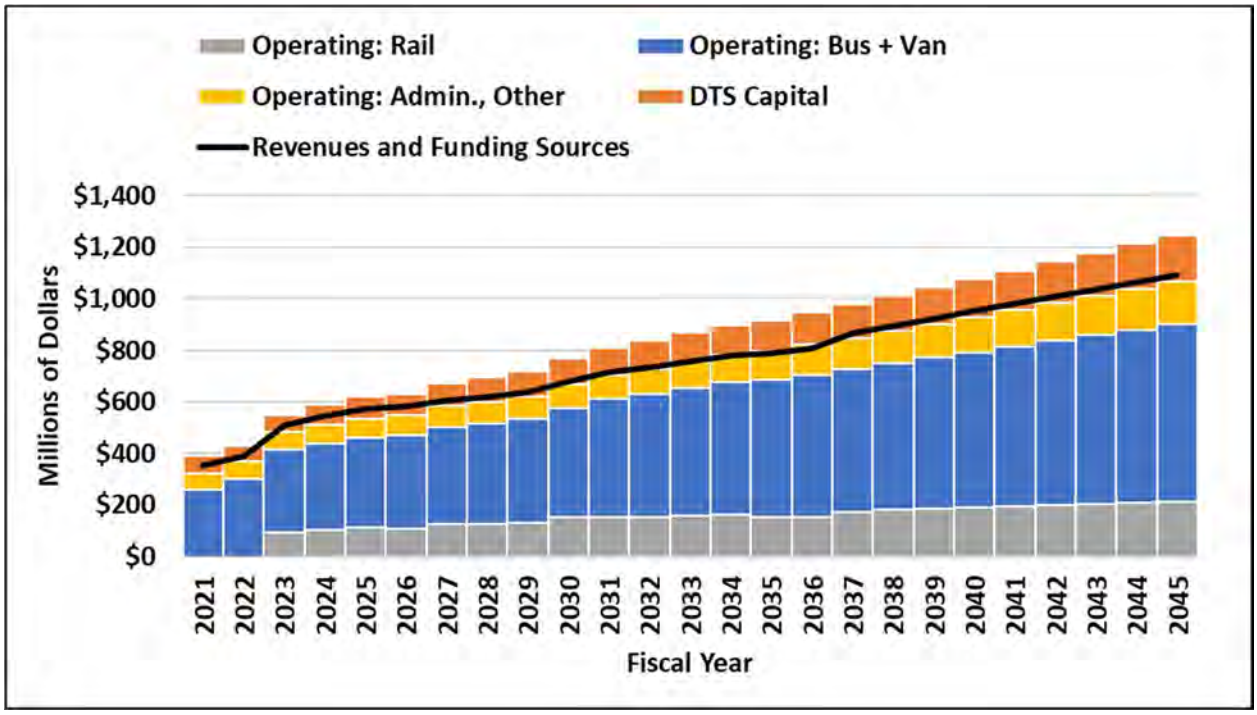
Exhibit 7-19. DTS Base Case Financial Analysis



Scenario 1

Scenario 1 was developed to consider the potential changes in assumptions. This scenario assumes the projections for TheBus, TheHandi-Van, and rail are the same as the Base Case; other operating costs are based on review of financial audits and assume a 4 percent annual inflation rate. Capital costs assume the FY 2021 to FY 2026 budget amounts, with the average used for FY 2027. For the following years, an annual inflation rate of 4 percent is assumed for capital costs. Exhibit 7-20 summarizes the financial analysis results for Scenario 1 for the 25-year study period (FY 2021 to FY 2045). Further details of the output of the financial model and the key parameters and assumptions used to develop Scenario 1 are included in the financial analysis document (Appendix D).

Exhibit 7-20. DTS Scenario 1 Financial Analysis



7.4.1.5 Emerging Trends and Challenges

The following emerging trends and challenges for DTS must be considered in the financial analysis:

- The restrictions imposed in response to the COVID-19 pandemic had an impact on ridership. While restrictions have been lifted, if restrictions are renewed and there is a subsequent decrease in ridership, it would be a challenge to maintain revenue levels.
- Starting in 2021 and continuing in 2022, inflation has significantly increased. While there is uncertainty about which direction inflation will move, it is possible that it will continue to be a challenge, and the trend will be an increase in operating and capital costs. Of particular concern is the increase in fuel costs, which have increased significantly and will result in a continued increase in operating costs.
- The shift to an electric-powered fleet will require new technology and facilities to support charging stations. In addition, the batteries in an electric-powered fleet will need to be replaced over time, and the cost of batteries could be significant.
- If there is a shift to electric vehicles by the general public, fuel usage would decline, leading to decreased fuel tax revenues. This could impact both the Transportation Fund and Public Transit System Fund.
- Once the first segment of the rail is fully operational, DTS will be responsible for the public opening and operation of the system. If ridership does not meet planned levels, fare revenues could be less than estimated.

7.4.2 Maui Department of Transportation

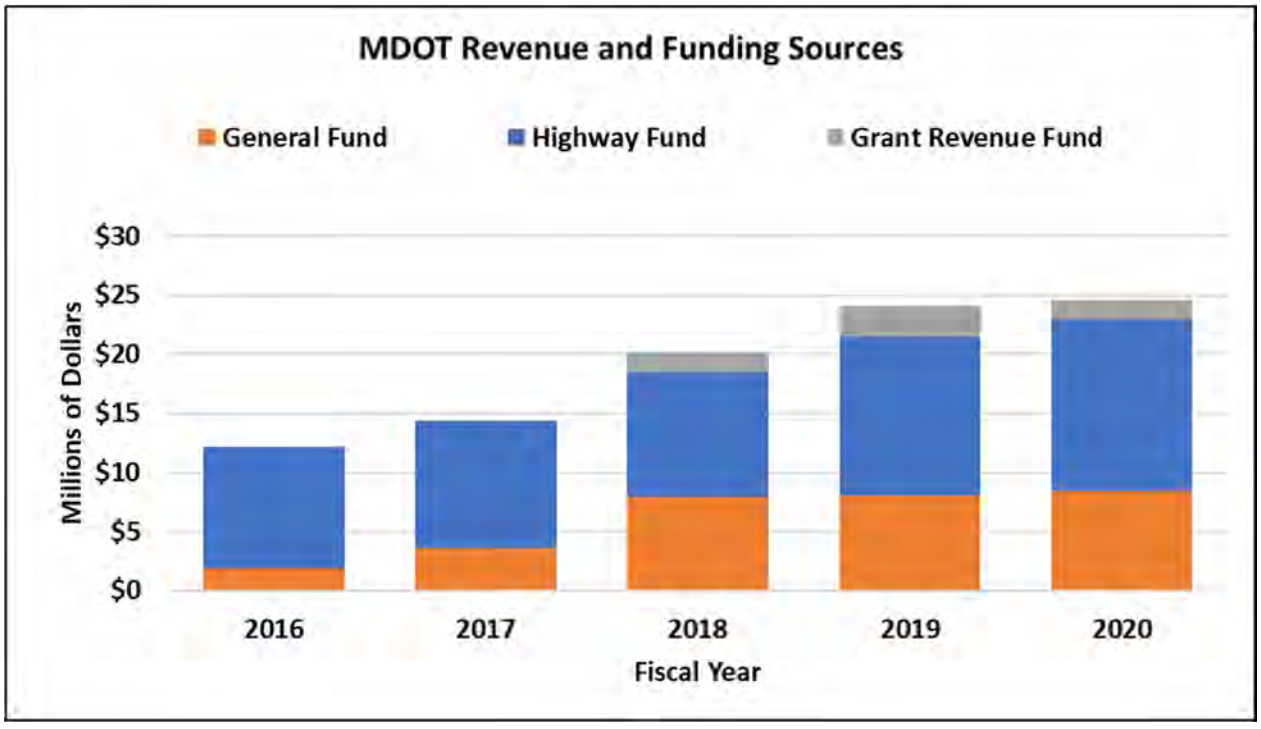
7.4.2.1 Revenue and Funding Sources

Revenue sources for operations and capital projects, based on a review of Maui Department of Transportation's (MDOT's) financial data, include the following:

- General Fund allocation; revenues are sourced from taxes on real estate, property valuations, licenses, and Public Service Company gross income (in lieu of property tax)
- Highway Fund allocation; revenues are sourced from fuel tax, franchise tax, motor vehicle weight tax, and public transit bus fare
- Grant Revenue Fund; based on federal and state grant revenues

For the 5-year period from FY 2016 to FY 2020, the average operating revenue (including operating grants) was $19 million and the average amount for capital grants was $2 million. Revenues are used for the operations of transit buses, as well as the design, construction, repair, and maintenance of public transit facilities.

Exhibit 7-21. MDOT Revenue and Funding Sources



7.4.2.2 Operating Expenses

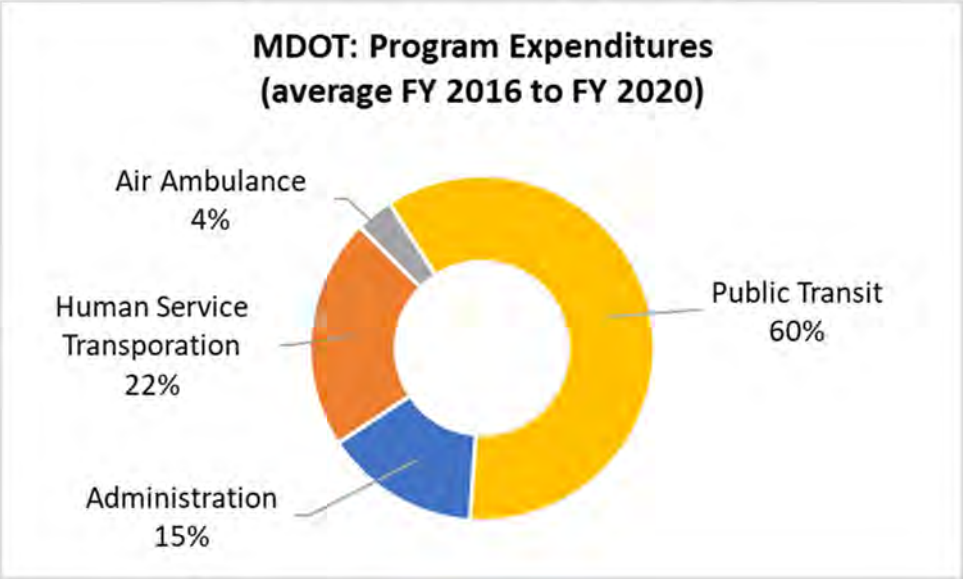
Exhibit 7-22 summarizes reported actual operating expenditures for the period FY 2016 to FY 2020. Exhibit 7-23 summarizes the percentage distribution based on the average for the historical period. During the same period, operating expenditures increased on average 19 percent per year. The largest operating component is public transit, for the Maui Bus operations.

Exhibit 7-22. MDOT Historical Operating Expenditures, FY 2016 to FY 2020 (millions of dollars)

Fiscal Year	2016	2017	2018	2019	2020
Administration	$0.8	$1.9	$3.2	$4.4	$3.7
Human Service Transportation	6.7	6.2	6.1	6.1	6.6
Air Ambulance	0.7	0.7	0.7	0.7	0.7
Public Transit	10.3	10.4	10.1	12.9	13.7
Total Operating Expenses	**$18.6**	**$19.2**	**$20.1**	**$24.1**	**$24.7**

Sources: County of Maui 2016, 2017, 2018, 2019, 2020 h

Exhibit 7-23. MDOT Program Expenditures, FY 2016 to FY 2020



7.4.2.3 Capital Project Costs

MDOT's capital budget comprises of the following two main projects:

- Bus stops and shelters
- The Central Maui Transit Hub

Additional capital project opportunities include constructing new hubs and purchasing electric- or battery-powered buses and charging stations. The capital budget does not include cost estimates for these additional opportunities, but estimates are considered in the financial and scenario analysis discussed in Section 7.4.2.4. Exhibit 7-24 provides a tabular summary of the planned capital projects and funding sources, based on MDOT's capital budget.

Exhibit 7-24. MDOT Capital Budget, FY 2021 to FY 2027 (millions of dollars)

Fiscal Year	2021	2022	2023	2024	2025	2026	2027
Projects							
Bus Stops and Shelters	$0.4	$0.6	$0.6	$0.6	$0.6	$0.6	$0.6
Central Maui Transit Hub	2.3	0.5	-	-	-	-	-
Land, Baseyard, and Maintenance Faility	-	-	17	-	-	-	20
Total	**2.7**	**1.1**	**17.6**	**0.6**	**0.6**	**0.6**	**20.6**
Funding Sources							
General Obligation Bonds	2.7	0.6	17.6	0.6	0.6	0.6	0.6
Federal Grant	-	-	-	-	-	-	20
General Fund	-	0.5	-	-	-	-	-
Total	**$2.7**	**$1.1**	**$17.6**	**$0.6**	**$0.6**	**$0.6**	**$20.6**

Sources: County of Maui 2020 (pp. 781 to 785)

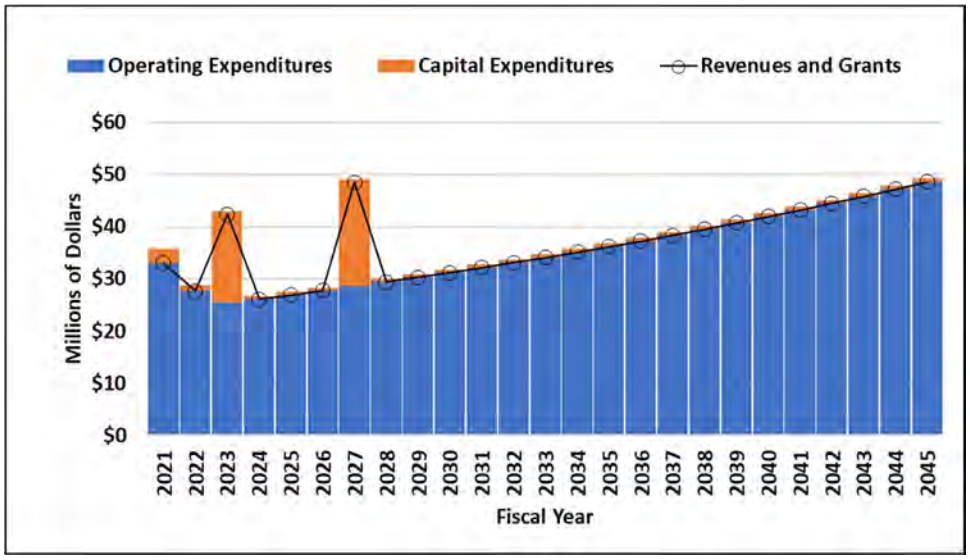
7.4.2.4 Financial and Scenario Analysis

For the purposes of the financial analysis, the two different high-level planning scenarios in the following sections were developed to evaluate long-term forecasts for the study period.

Base Case

The financial forecast for the 25-year study period (FY 2021 to FY 2045) of the transit operations for MDOT was based on historical revenues and expenditures from the audited financial reports for FY 2016 to FY 2021. Exhibit 7-25 summarizes the Base Case financial scenario for the 25-year study period. Further details of the output of the financial model and the key parameters and assumptions used are included in the financial analysis document (Appendix D).

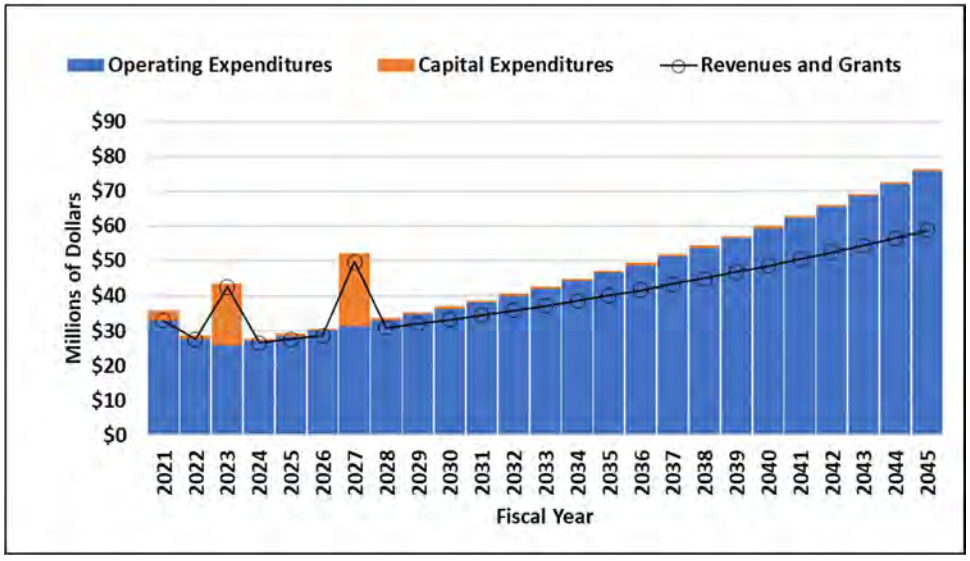
Exhibit 7-25. MDOT Base Case Financial Analysis



Scenario 1

Scenario 1 was developed to consider the potential changes in assumptions. While both expenses and revenues increase at a base rate of 4 percent per year, under this scenario, operating expenses outpace revenues because of assumed increases in population, tourism, and new routes. In part, this may recognize bus fares may need to be increased more than 4 percent per year. Exhibit 7-26 summarizes the financial analysis results for Scenario 1 for the 25-year study period (FY 2021 to FY 2045). Further details of the output of the financial model and the key parameters and assumptions used to develop Scenario 1 are included in the financial analysis document (Appendix D).

Exhibit 7-26. MDOT Scenario 1 Financial Analysis



7.4.2.5 Emerging Trends and Challenges

The following emerging trends and challenges for MDOT must be considered in the financial analysis:

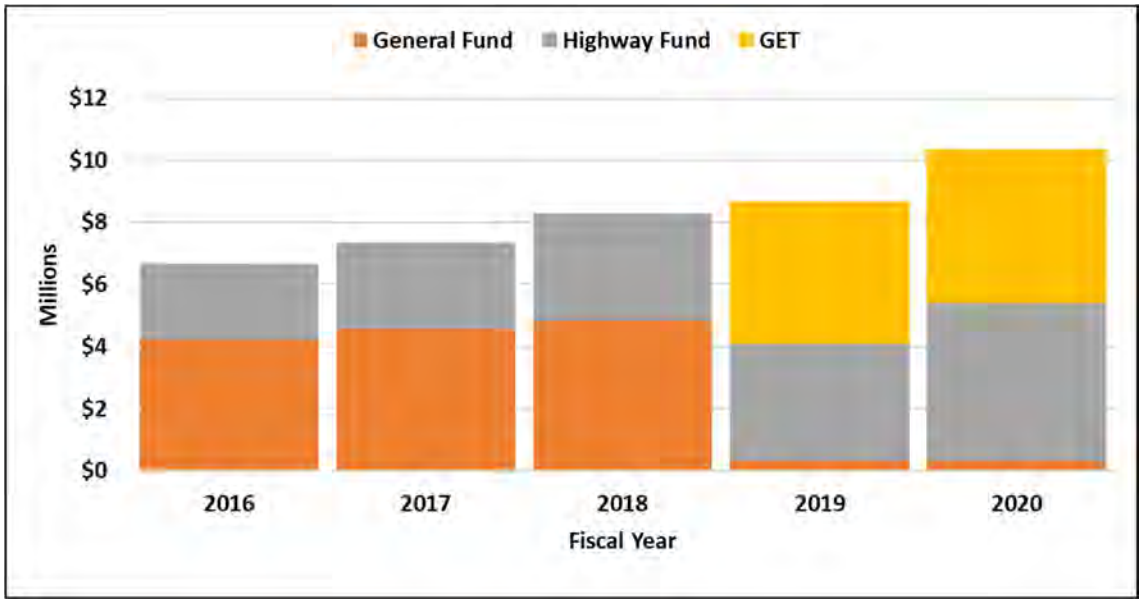
- The restrictions imposed in response to the COVID-19 pandemic had an impact on ridership. While restrictions have been lifted, if restrictions are renewed and there is a subsequent decrease in ridership, it would be a challenge to maintain revenue levels.
- Starting in 2021 and continuing in 2022, inflation has significantly increased. While there is uncertainty about which direction inflation will move, it is possible that it will continue to be a challenge, and the trend will be an increase in operating and capital costs. Of particular concern is the increase in fuel costs, which have increased significantly and will result in a continued increase in operating costs.
- A shift to an electric-powered fleet will require new technology and facilities to support charging stations.
- While MDOT is moving towards an electric-powered fleet, there is also a trend toward personally owned electric vehicles, which will impact gas tax revenues. If there is significant shift to electric vehicles, the trend could be a decrease in gas tax revenues. The challenge is to identify alternative revenue sources that could supplement or replace the gas tax revenues.

7.4.3 Kauai Transportation Agency

7.4.3.1 Revenue and Funding Sources

Revenue sources for operations and capital projects, based on a review of the Kauai Transportation Agency's financial data, include general fund allocation, highway fund allocation, and the General Excise Tax (GET). For the 5-year period from FY 2016 to FY 2020, the average operating revenue (including grants) was $8.3 million. Revenues are used for the operations of transit buses, as well as the design, construction, repair, and maintenance of public transit facilities. In 2019, a 0.5 percent surcharge on the GET was implemented by the County to raise additional revenue to cover the costs for transportation systems. The GET corresponds to a decrease in general fund allocations in FY 2019.

Exhibit 7-27. Kauai Transportation Agency Revenue and Funding Sources



7.4.3.2 Operating Expenses

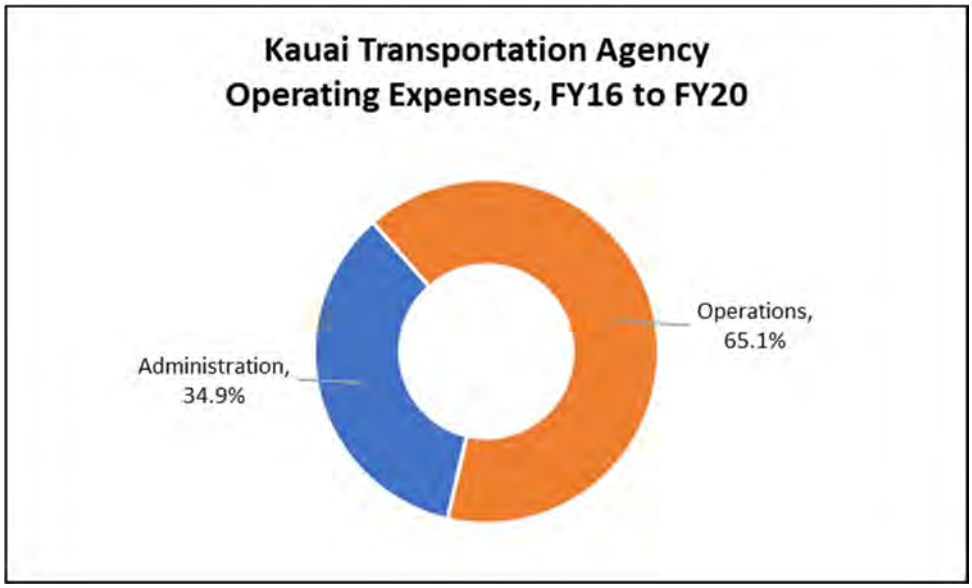
Exhibit 7-28 summarizes reported actual operating expenditures for the period FY 2016 to FY 2020. Exhibit 7-29 summarizes the percentage distribution based on the average of the historical period. During the same period, operating expenditures increased on average 12 percent per year. The largest operating component is operations, which is for bus operations.

Exhibit 7-28. Kauai Transportation Agency Historical Operating Expenditures, FY 2016 to FY 2020 (millions of dollars)

Fiscal Year	2016	2017	2018	2019	2020
Administration	$4.2	$4.6	$4.8	$0.3	$0.5
Operations	2.4	2.8	3.4	8.4	9.9
Total Operating Expenses	**$6.7**	**$7.3**	**$8.3**	**$8.7**	**$10.4**

Sources: County of Kauai, 2016, 2017, 2018, 2018, 2020 /

Exhibit 7-29. Kauai Transportation Agency Operating Expenses, FY 2016 to FY 2020



7.4.3.3 Capital Project Costs

Based on input from the Kauai Transportation Agency, the capital improvement needs for the study period (FY 2021 to FY 2045) include the following:

- The maintenance yards (including a base yard, administration building, and repair shop) are at capacity and the agency is evaluating expansion projects. The design costs are estimated to be $4.5 million over the next 2 to 5 years. Current plans call for the existing facilities to carry the agency's needs for the next 10 years. Long-range planning for 2031 to 2045 includes the construction of a new facility.
- In addition to maintenance yards, the agency evaluates the need for new bus stops and shelters every 5 years. These projects are typically bundled and often paid for by developer contributions.
- Lastly, the agency maintains a fleet of approximately 70 buses. Based on information provided in the National Transit Database, 36 buses were reported to be in operation during 2020. Typically, between 12 to 15 buses are replaced each year. Based on the trends followed by other transit agencies in the state, the Kauai Transportation Agency is planning to further implement electric buses. The estimated cost per electric bus is estimated to be $800,000.

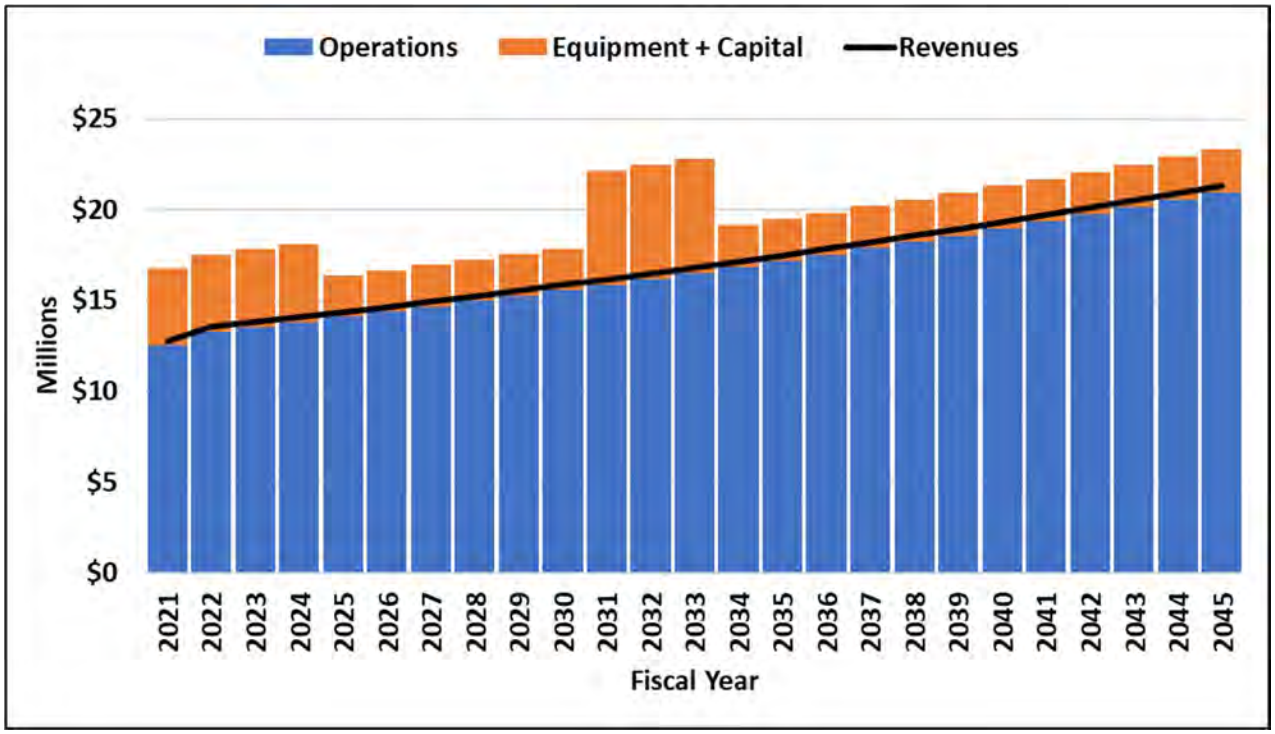
7.4.3.4 Financial and Scenario Analysis

For the purposes of the financial analysis, the two different high-level planning scenarios in the following sections were developed to evaluate long-term forecasts for the study period.

Base Case

The financial forecast of the transit operations for Kauai Transportation Agency for the 25-year study period (FY 2021 to FY 2045) was based on historical revenues and expenditures from the audited financial reports for FY 2016 to FY 2021. Exhibit 7-30 summarizes the Base Case financial scenario for the 25-year study period. Further details of the output of the financial model and the key parameters and assumptions used are included in the financial analysis document (Appendix D).

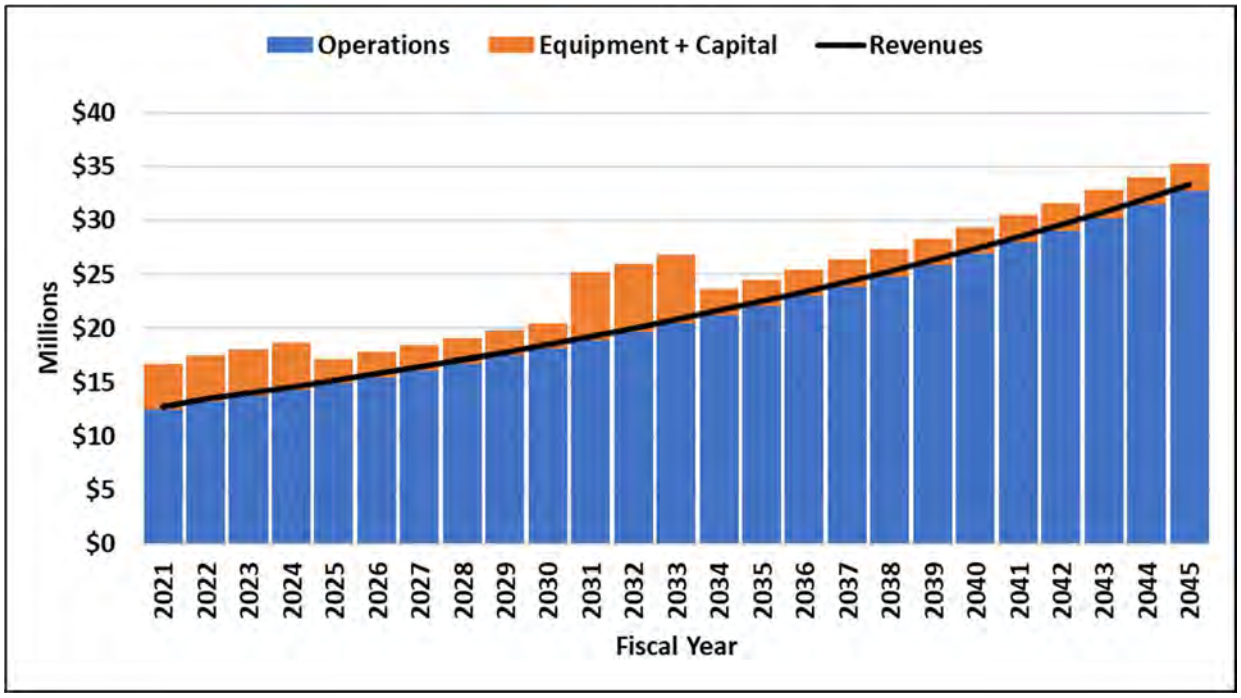
Exhibit 7-30. Kauai Transportation Agency Base Case Financial Analysis



Scenario 1

Scenario 1 was developed to consider the potential changes in assumptions, and assumes both expenses and revenues increase at 4 percent per year. Exhibit 7-31 summarizes the financial analysis results for Scenario 1 for the 25-year study period (FY 2021 to FY 2045). Further details of the output of the financial model and the key parameters and assumptions used to develop Scenario 1 are included in the financial analysis document (Appendix D).

Exhibit 7-31. Kauai Transportation Agency Scenario 1 Financial Analysis



7.4.3.5 Emerging Trends and Challenges

The following emerging trends and challenges for Kauai Transportation Agency must be considered in the financial analysis:

- The restrictions imposed in response to COVID-19 pandemic had an impact on ridership. While restrictions have been lifted, if restrictions are renewed and there is a subsequent decrease in ridership, it would be a challenge to maintain revenue levels.
- Starting in 2021 and continuing in 2022, inflation has significantly increased. While there is uncertainty about which direction inflation will move, it is possible that it will continue to be a challenge, and the trend will be an increase in operating and capital costs. Of particular concern is the increase in fuel costs, which have increased significantly and will continue to result in an increase in operating costs.
- A shift to an electric-powered fleet will require new technology and facilities to support charging stations.
- The Kauai Transportation Agency is planning for a shift towards an electric-powered fleet, which may require additional capital investment above and beyond what is planned in the CIP. This includes the purchase of new fleet of buses and facilities to accommodate charging stations.

7.4.4 County of Hawaii Mass Transit Agency

7.4.4.1 Revenue and Funding Sources

Revenue and funding sources based on a review of financial data for the County Mass Transit Agency (MTA) are summarized in Exhibit 7-32. For the 5-year period from FY 2016 to FY 2020, the average annual revenue was $274 million, with the largest component being the Highway Fund. GET surcharge revenues started in FY 2019 and eventually may replace general fund allocations.

Exhibit 7-32. MTA Historical Revenue and Funding Sources, FY 2016 to FY 2020 (millions of dollars)

Fiscal Year	2016	2017	2018	2019	2020
Federal Transit Administration Grants [a]	0.9	-	0.4	1.0	4.8
General Fund	0.9	4.4	4.7	1.9	0.9
Highway Fund	6.2	7.1	7.5	9.0	7.4
General Excise Tax surcharge	-	-	-	2.8	5.3
Total	**7.9**	**11.4**	**12.6**	**14.8**	**18.4**

[a] Amounts reported in Single Audit and reflects expenditures/reimbursements. Does not include grant authorizations.

Sources: County of Hawaii 2016a, 2016b, 2017a, 2017b, 2018a, 2018b, 2019a, 2019b, 2020a, 2020b

7.4.4.2 Operating Expenses

Exhibit 7-33 summarizes the estimated operating expenditures for the period FY 2016 to FY 2020. During this period, operating expenditures increased on average 16 percent per year. The increase is attributed to increases in bus and other transit services. The decrease in FY 2020 is assumed to be attributed to COVID-19.

Exhibit 7-33. MTA Historical Operating Expenditures, FY 2016 to FY 2020 (millions of dollars)

Fiscal Year	2016	2017	2018	2019	2020
Other Current Expenses (OCE)	3.5	5.7	6.1	5.5	7.7
Salaries & Wages (S&W)	3.3	5.4	5.8	7.9	4.5
Total Operating Expenses	**6.8**	**11.1**	**11.9**	**13.4**	**12.2**

Sources: County of Hawaii 2016a, 2017a, 2018a, 2019a, 2020a, 2021

Note: The split between OCE and S&W is based on allocations developed based on the FY 2022 Budget.

7.5 Future Funding Strategies

7.5.1 Introduction

The purpose of the HSTP is to provide guidance to system-level and master plans of the three primary modes of transportation used in Hawaii—the air, water, and land transportation systems—as well as non-motorized modes and intermodal connections.

State and federal funding sources have not kept up with the demands of the highway transportation system. Unpredictability in funding sources for transportation projects also makes it difficult for the state's Highway, Harbors, and Airports divisions plan for future facilities. Delays to improvements in the transportation system often lead to frustration among the taxpaying citizens and users, who expect the state's transportation infrastructure to keep up with the growing demand.

One of the cross-cutting strategies that was shared by a variety of stakeholders was to find more funding sources. As reflected with the financial analysis, the State is not expected to have the funding available to implement all of the solutions needed to address deficiencies. A shortage of funding will likely mean the deferral of needed projects and may delay improvements to safety, congestion relief, and infrastructure preservation. The State will need to consider alternative revenue sources to meet the needs of the transportation system.

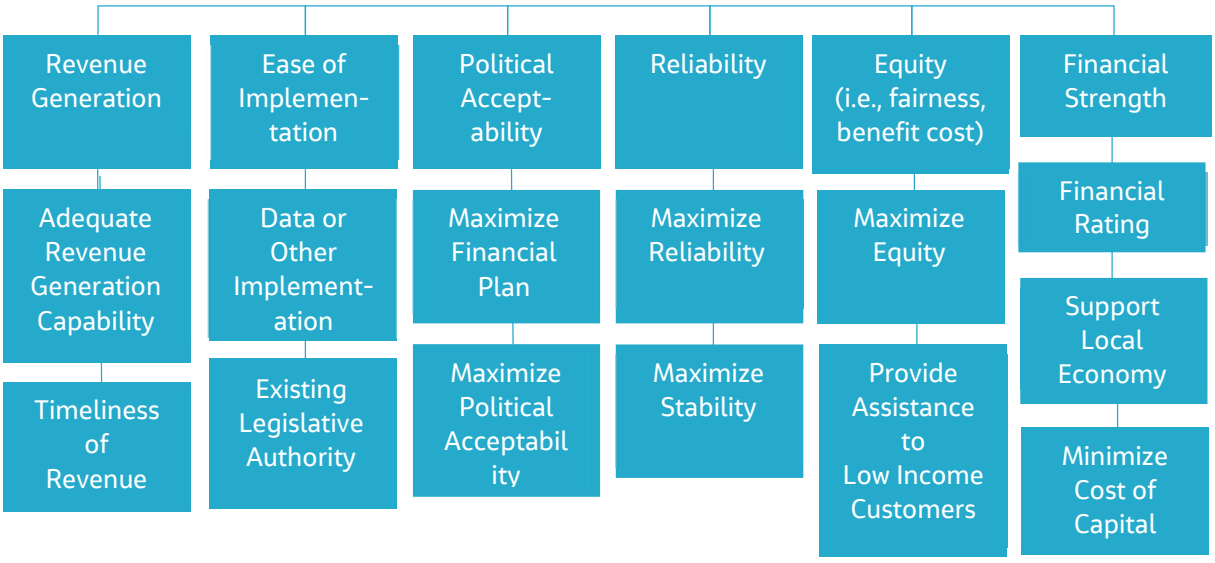
7.5.2 Future Funding Strategies

- Appendix E contains a technical memorandum presenting and describing alternative transportation funding. The unique challenges and features specific to transportation funding and financing warrant a deeper examination of funding strategies. Options for funding and financing strategies should be analyzed on a specific project or program basis. The following general principles apply:
- Transportation funding and financing is different from other forms of asset financing, such as utilities and real estate.
- Major transportation projects typically use a combination of funding and financing from multiple sources.
- Sources include both public and private options, beyond those traditionally sourced by authorities.
- The goal is to optimize or find the right mix of available funding and financing that maximizes taxpayer value for money and strategic objectives.
- Technical quantitative and qualitative analysis is required to identify and confirm funding and financing sources.
- Not all funding and financing options are always available for every project. For example, state statutes, local political appetite, availability of funds, and project characteristics, among other considerations, may limit options.

7.5.3 Considerations for New Funding Sources

There are many factors to consider when pursing a new funding source (Exhibit 7-34). Goals and objectives for the funding sources should be established to help guide whether the funding source will meet the project and stakeholders' needs. Section 7.5.4 describes factors to be considered in determining funding, while Sections 7.5.5 through7.5.13 present potential funding options and sources.

Exhibit 7-34. Considerations for New Funding Sources



7.5.4 Screening for the Right Funding or Financing Combination

A funding and financial options analysis is recommended to assess and determine the availability and applicability of sources. Assessing how an authority or agency would fund or finance a transportation project and account for it financially is a key step in the process. The funding and financing options should be narrowed down to a short-list based on goals for the project or program. Initial focus may be on availability, applicability or strategic fit, political appetite, typical agreement terms, project scheduling, risks, amount of capital required, business environment, or similar concerns. Because federal and state agencies should pay particular attention to what costs are and are not eligible, identifying what cost components are applicable is important.

An economic analysis should be done to determine the benefit cost ratio (BCR) for the specific project or program, with the ratio ideally being greater than 1. This analysis is separate from the financial analysis and is typically done prior to any financing, to confirm that the BCR is greater than 1. A financial capacity assessment is also recommended to assess the affordability to finance a project. Another key assessment is the estimation of the risk-adjusted costs, which consists of base project costs (including transferred risks), ancillary costs (such as procurement and monitoring), and value of the retained risks. Consideration of the procurement model selection and taxpayer value are important; evaluations should look at the difference in risk-adjusted cost between the public sector model and other models, including any private sector model. The value and benefits may not always be achievable, and this may require project or program attributes to be reconfigured.

7.5.5 Funding Options

The funding options discussed here include some that have been implemented elsewhere or have been proposed but not yet adopted. Options discussed include conventional methods such as fuels taxes and license fees, as well as more novel options such as user fees, public-private partnership (P3) financing, and the use of emerging technologies for revenue generation. The deliverables from this effort can assist decision-makers in identifying policies and practices that could augment the current fuel-tax-revenue system and support new state laws and practices that advance a more sustainable funding model.

Funding and financing sources currently in use by U.S. authorities generally fall into the following eight major categories:

1) Federal sources
2) State and regional sources
3) Non-operating revenue sources
4) Operating revenue sources
5) Value-capture sources
6) Local taxation funding
7) Partner agency sources
8) Private financing

The technical memorandum in Appendix E introduces each source presented for the HDOT consideration; some of the sources may be new to the HDOT, while others may be familiar. It should be noted that while not all sources of funding and financing mentioned are currently applicable within the State of Hawaii, a description of the sources is provided to further the HDOT's global understanding of transportation funding and financing. As noted in Sections 8.2.3 and 8.2.4, multiple factors should be considered and analyses run to determine if a new funding source is applicable and provides the appropriate risk and value for all stakeholders, including the public.

The following sections summarize each of the eight major categories. The full description of each funding type is included in Appendix E.

As a result of increased contract authority, the overall pot of FHWA funds has grown by approximately 29 percent.

Roads Bridges & Major Projects --$110B	
Increased FHWA contract authority (Formula funding to state DOTs)	FY22 $58.2B FY23 $59.5B FY24 $60.8B FY25 $62B FY26 $63.4B
Bridge investment (new grant program)	$36.735B
RAISE grants	$7.5B
National Infra Project Assistance grant program • New program supporting multi-modal, multi-jurisdictional projects of regional or national significance	$5B
INFRA Grants • Highway and rail projects of regional or national significance	$3.2B
Appalachian Development formula funding	$1.25B
Surface Transportation PABs • Also increases bond cap from $15M to $30M	$500M
University Transportation Centers	$95M
Culvert Removal, Replacement	$1B
Reconnecting Communities	$1B

7.5.6 Federal Sources

Federal government sources include various programs for funding, such as grants, loans, and loan guarantees. A key consideration for federal funds is that programs are competitive and additional empirical analysis may be required (such as economic Benefit-Cost Analysis). It may take time to demonstrate compliance with the various requirements for funding criteria, and additional work such as project development or engineering may be required. Federal funds may come from the following:

- Transportation Infrastructure Finance and Innovation Act Loans and Lines of Credit
- Federal Highway Administration (FHWA) Private Activity Bonds (PAB)
- Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant Program
- Federal Transit Administration New Starts and Capital Grants
- FHWA Funds

- Federal Aviation Administration Funds
- U.S. Department of Transportation Maritime Administration
- Other federal funding programs
- U.S. Department of Housing and Urban Development Community Development Block Grant Mitigation Program
- Federal Emergency Management Agency Building Resilient Infrastructure and Communities
- National Park Service, Great American Outdoors Act
- American Rescue Plan Act of 2021

7.5.7 State and Regional Sources

State and regional government sources also include various programs through which funding such as grants, loans, lines of credit, and others can be sourced. These sources may be less competitive than federal sources and there may be more willingness from these sources to fund the project as a result of its local nature. State and regional sources may include the following:

- State infrastructure bank
- State block grants
- Energy programs
- Usage tolls and VMT toll or fee
- Rental/tour vehicle surcharge
- Carbon tax or cap-and-trade system
- Aviation fuel tax

7.5.8 Non-operating Sources

Non-operating revenue is the income generated from sources not directly linked to day-to-day highway and street operations. A key consideration is the type of source; for example, rental income and investment income generate minimal revenue, while government revenue grants and vehicle registration fees could provide a credible revenue stream. Non-operating revenue sources could include the following:

- Government revenue grants and subsidies
- Rental income
- Investment income
- Vehicle registration fees
- Bicycle registration fees

7.5.9 Operating Sources

Operating revenue is generated from a company's primary business activities. For transportation projects, that includes income generated from day-to-day highway, street, or other transportation operations (such as public transit). Key funding considerations include demand risk, configuration, and modal competition, as well as other considerations. Operating revenue sources could include the following:

- Fareboxes
- Advertising
- Naming rights
- Station revenues
- Special situations
- Parking

- Concession fees
- Landing fees
- Aeronautical rentals

7.5.10 Value-capture Sources

Value capture is a funding source tied to the value of real estate within a predefined vicinity of the transit infrastructure. In value-capture scenarios, public transit agencies attempt to capture some of the increases to the value of private land that resulted from the provision of transit services. Because value capture is linked to real estate valuation, a key consideration for this funding source is the cyclical nature of the real estate market and the accompanying risks of revenue variability. Other considerations include the time it could take to structure and entitle a project with multiple real estate developers.

Transportation networks and urban land values are closely linked. Transportation improvements increase accessibility and make surrounding locations more desirable as a result. Transportation improvements often increase the value of nearby land, benefiting landowners and developers. Value-capture techniques harness a portion of the increased property values to pay for the improvement or for future transportation investment. While value-capture techniques are used more commonly for transit projects, they are also used to fund highway improvements. There are several different forms of value capture used in the United States, with the most common including air rights, impact fees, joint development, land value tax, negotiated exactions, sales tax districts, special assessments, tax increment finance, capital leasing, and transportation utility fees. Value-capture sources could include the following:

- Transit-oriented development (TOD)
- Joint development
- Air rights
- Right-of-way use agreements
- Tax increment finance districts
- Ad valorem tax (property taxes)
- Impact fee
- Asset monetization

7.5.11 Local Taxation Funding Sources

Local taxation funding sources are typically those imposed by a local government, such as a city or municipality. Key considerations include political risks and local voter approval; increases in taxation may be unpopular, for example, but they can be successfully implemented if done correctly. Local taxation sources could include the following:

- Special tax assessment districts
- Local option gas tax
- Surtax
- Local sales tax
- General funds
- Tourist and convention development taxes on transient rentals
- Vehicle-miles traveled (VMT) toll or fee

7.5.12 Partner Agencies Sources

Partner agency funding sources are those agencies who may have an interest in a transportation infrastructure project and are willing to partake in funding. Key considerations are the interest of such agencies and an assessment of any impacts to their current finances. Partner agency sources could include the following:

- Regional authorities (including those that may collect road tolls)
- Community redevelopment agencies

7.5.13 Private Financing Sources and Mechanisms

Private financing sources provide direct funding from private institutions such as developers, banks, pension funds, and equity funds. The cost of private capital is offset through risk transfer, and returns reflect the risk-reward profile of the investment. One local example of private financing is the Honolulu Rail Project currently being delivered by HART. For the project, HART is developing a 20-mile, 21-station transit system located between East Kapolei and downtown Honolulu under a design-build-finance-operate-maintain (DBFOM) delivery model.

Private financing sources could include the following:

- Private equity (direct developer contribution)
- P3 private equity
- General obligation bonds
- Revenue bonds
- Bank loans
- Pension funds
- Lease financing (for vehicles)

7.6 Reducing Funding Needs

Exploring funding strategies is important, however, another option for the State to help minimize the future funding gap is to consider strategies to reduce funding needs. By working with public and private entities to reduce the demand on the transportation system, potential needs could be reduced without investing directly into the transportation network. Strategies for this include the following:

- **Land Use Planning** – The demand for auto-based travel can be influenced through land use decisions and urban design. The development of denser, mixed-use areas could lead to greater travel options, and private auto use could decline when the environment is attractive to pedestrians, bicyclists, and transit users. Achieving land use changes requires zoning codes and regulations that allow for mixed uses and flexible design.
- **Transportation Demand Management (TDM)** – Multiple strategies to help manage travel demand involve changing the mode of travel (usually from single-occupant, auto-based), the time of travel, or to remove the trip from the network altogether. Demand strategies and actions for doing that can include the following:
  - *Make bicycling attractive* – Require bicycle-friendly facilities, such as easily accessed and secure bike parking and storage, showers at destination locations (including employers), and other amenities.

- *Make walking attractive* - Require sidewalks and pedestrian infrastructure such as mid-block crossings, pedestrian activated signals, and shaded routes. Change land use patterns or zoning codes to create more walkable districts and improve connectivity among pedestrian destinations.
- *Make transit attractive* – Increase the number of transit routes, expand service hours, and shorten headways to improve the overall transit network. Create transit priority corridors to ensure transit is an attractive option to the single-occupancy vehicle.
- *Make ridesharing attractive* – Implement education and ride-matching programs to increase the number of people per vehicle. Work with employers and high volume destinations to implement ridesharing programs through incentives such as preferential parking. Explore social media and mobile apps to facilitate connections between program participants.
- *Change travel times* – Work with employers to implement flexible work schedules to reduce congestion during typical peak travel times.
- *Reduce potential trips* – Work with employers to implement teleworking to reduce the amount of trips employees take to work.

8. Moving Forward

The Hawaii Statewide Transportation Plan (HSTP) outlines a vision to inform and guide the State of Hawaii Department of Transportation's (HDOT's) divisions, Hawaii's metropolitan planning organizations (MPOs), local governments, and other partners. It describes the many different opportunities and challenges that Hawaii faces in the next few decades and identifies transportation's role in addressing and meeting these opportunities and challenges.

This chapter provides an overview of where the HSTP fits into the statewide and federal transportation planning processes, identifies the goals and objectives to enhance this statewide planning process, and provides a vision for implementing this plan moving forward.

8.1 Hawaii's Path Forward

Within the next 25 years, Hawaii's transportation systems will encounter many opportunities and challenges. It is important that the HDOT, its divisions, and its partners work closely together to implement the vision laid out in this plan. This plan should be seen as the launching pad for ongoing collaboration to implement policies and programs that will achieve our collective goals.

This section provides a brief overview of why planning for implementation is important and ways that the HDOT and its partners can move forward to achieve our common goals no matter what the future brings.

8.1.1 Why Planning for Implementation is Important

Implementation is a process to identify, track, and adjust individual and collective actions to help achieve common goals. Setting up an implementation process for the HSTP will enhance statewide planning and decision-making and ensure that all the research, planning, and collaboration that went into this plan is used to create meaningful outcomes in the state.

A successful implementation process should do the following:

- **Identify roles and responsibilities** – Clearly defining roles and responsibilities will ensure that the HDOT, its divisions, and its partners have a shared understanding of what actions they need to take to achieve the collective goals outlined in this plan and avoid duplicative or conflicting actions.
- **Track progress toward goals** – Defining progress indicators, setting aspirational and/or interim targets, and tracking progress toward these targets allows the HDOT to have a realistic understanding of what areas need more support to achieve its goals. Using this information, the HDOT can optimize investments and guide policies to help achieve its target over time.
- **Allow for future adjustments** – Implementation plans should be flexible and adaptable as the state's needs change, particularly during this period of uncertainty.

8.1.2 Initial Implementation Priorities

Exhibit 8-1 reflects the implementation framework necessary to ensure the HSTP is executed. The HSTP identified Hawaii's future transportation goals, objectives, and strategies and developed an initial set of actions and potential progress indicators. Implementation should build on this foundation in two ways:

- **Actions**: Chapter 5 of the HSTP includes an initial list of existing actions and potential new activities that would help advance the HSTP strategies. The HDOT and its divisions, with input from the MPOs and other partners, should refine this initial list of actions, including adding detail on roles, responsibilities, timing, and resources for each action, and produce a list of prioritized actions that can guide implementation and be adjusted over time.
- **Progress Indicators**: Chapter 6 of the HSTP introduced a framework for defining and organizing indicators to track progress toward the HSTP goals and objectives. The HDOT and its divisions should refine and implement an initial set of indicators, building on performance measures required in state or federal law and rule to include additional quantitative or qualitative indicators that help assess overall progress toward the goals and objectives as well as the status of specific strategies and actions. This process would include identifying roles and processes for collecting and analyzing relevant data. The HDOT and its divisions also should establish a process for periodically reporting on progress toward HSTP goals and objectives.

Exhibit 8-1. Implementation Framework

Goals are broad statements that describe a desired result or outcome

Strategies primarily organized around objectives

- Policy-level directive or program to achieve the objectives
- Test against alternative futures

Actions defined by strategy

- Combination of existing and potential

Objectives are specific statements that support achievement of a goal

Process to track progress over time

- Existing + new performance measures
- Additional qualitative indicators

In addition to these initial priorities, HSTP implementation also should include the following types of activities:

- Enhance the statewide planning process to support the HSTP goals, objectives, and strategies (Section 8.2.1).
- Enhance coordination with state, regional, local, and federal partners (Section 8.2.2).

- Create linkages between the HSTP and other statewide modal and system plans (Section 8.2.3).
- Ensure staff of the HDOT, its divisions, and its partners are aware of the HSTP and their role in supporting implementation through ongoing internal and external engagement activities.
- Enhance data collection and analysis capabilities to support implementation of the progress indicators and the statewide planning process.
- Ensure reliable and sustainable funding to support implementation priorities (as discussed in Chapter 7).
- Monitor trends, conditions, and uncertainties to determine if Hawaii is moving toward any of the potential alternative futures (see Chapter 4), as well as to identify potential disruptions that might influence progress toward the HSTP goals and objectives. Develop a process for adapting the plan over time, such as an annual review of actions by HDOT leadership with partner input.
- Document trends, conditions, opportunities, and challenges that should be considered in future updates of the HSTP.

8.2 Enhancing the Statewide Planning Process

In addition to the specific initial implementation priorities documented in Section 8.1, the HDOT, its divisions, and its partners will continue to advance long-term enhancements to the statewide planning process to comply with state and federal law, advance HSTP implementation, maintain strong collaboration, and more explicitly link statewide and regional plans to the HSTP framework, as well as to investment decisions.

8.2.1 Strengthening the Statewide Planning Process

The statewide transportation planning process is a structured functional and organizational process that provides for HDOT's Continuing, Cooperative, and Comprehensive transportation planning process (3C process). This process must comply with Hawaii Revised Statutes 279A and United States Code Title 23 Section 135.

As part of HSTP development, the HDOT and its divisions, with input from the MPOs, local governments, and other transportation partners, reviewed and assessed the existing statewide planning process. A guiding principle and seven objectives were developed to communicate how this process can be strengthened to support HSTP implementation:

Guiding Principle: Implement a statewide transportation planning process that correlates land use and transportation while supporting decision-making and programming for Hawaii's integrated, comprehensive, multimodal transportation systems.

- **Objective 1.** Achieve the federal requirements for a comprehensive, cooperative, and continuing (3C) transportation planning process, and continue to improve efficient and effective planning.
- **Objective 2.** Maintain a dynamic planning process that ensures coordination, cooperation, and feedback between the state, federal, and county governments, the private sector, and the public.
- **Objective 3.** Incorporate new and evolving methods of public involvement, communication, and social networking to keep the public informed of transportation planning efforts, and highlight

opportunities for participation in decision-making and programming. Continue to regularly update the HDOT Public Involvement Policy to support this objective.

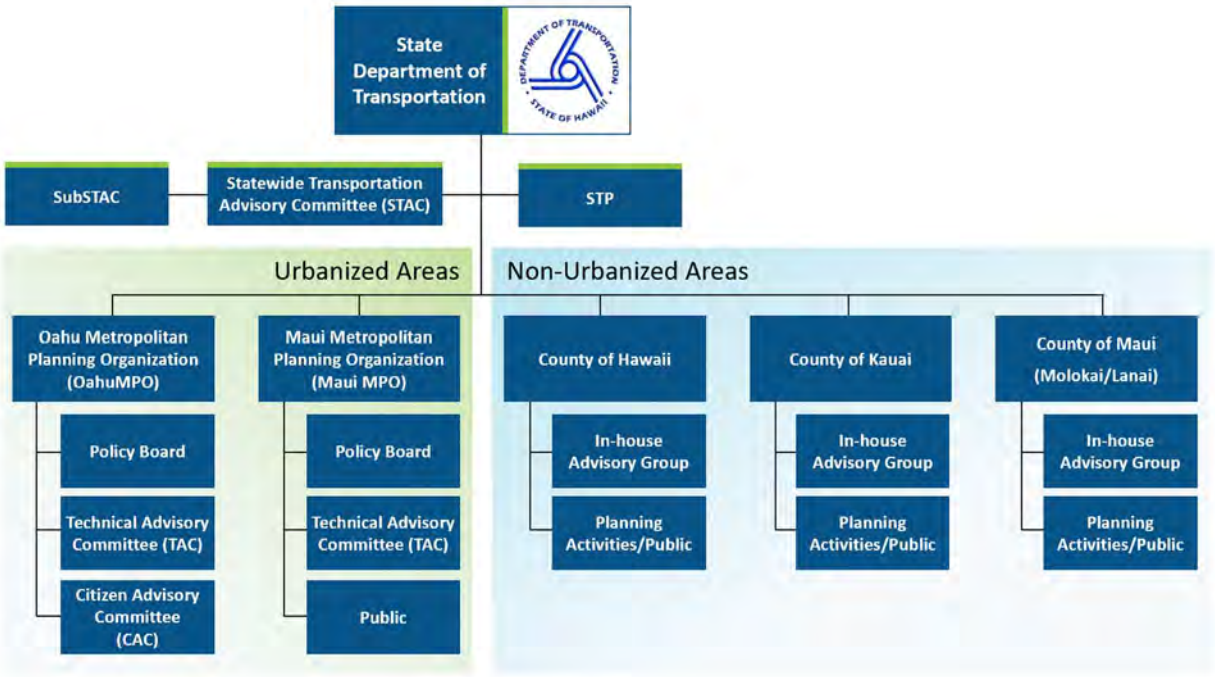
- **Objective 4.** Keep abreast of current and evolving programs and regulations that affect transportation in Hawaii.
- **Objective 5.** Seek wider application of geospatial technologies, further develop the land use database.
- **Objective 6.** Integrate visioning in transportation planning.
- **Objective 7.** Develop performance measures or progress indicators to manage strategic goals and assets and to assist with better decision-making, communication, transparency, and accountability to stakeholders.

8.2.2 Enhancing Internal and External Collaboration

A key outcome of the statewide planning process will be to enhance internal and external collaboration to accomplish Hawaii's transportation goals and objectives.

Exhibit 8-2 documents the internal and external partners and coordinating groups involved in Hawaii's statewide transportation planning process.

Exhibit 8-2. Statewide Transportation Planning Organizational Structure



8.2.2.1 Agency Roles

- The **HDOT** is the lead agency responsible for development and implementation of the statewide transportation planning process. The HDOT Director is the final decision-maker for the activities resulting from the statewide transportation planning process. The participants within the

organizational structure will serve in an advisory role, developing and recommending transportation policy, direction, and plans.

  - The HDOT Airports, Harbors, and Highways divisions are responsible for detailed planning and implementation for each of their respective modes.
  - The Statewide Transportation Planning (STP) Office is responsible for the development of the HSTP. The STP Office also coordinates HSTP implementation and monitors progress toward HSTP implementation.

- Hawaii's two **MPOs** are responsible for regional land transportation planning for the urbanized areas of the state. They are currently limited to the islands of Oahu and Maui. A Policy Board comprising elected or appointed state and city representatives is responsible for final approval of the direction and activities for each MPO. A Technical Advisory Committee comprising federal, state, and county agency staff provides technical input and review for each MPO, The OahuMPO also maintains a Citizens Advisory Committee to advise the MPO of public concerns, needs, and interests, and both MPOs maintain robust public involvement processes.
- The various **counties and municipal governments** are responsible for the regional land transportation planning process in nonmetropolitan areas of the state, including public transit planning.

8.2.2.2 STAC and SubSTAC

The **Statewide Transportation Advisory Committee (STAC) and the Sub-Statewide Transportation Advisory Committee (SubSTAC)** act in an advisory capacity to the HDOT Director. These groups brings together the HDOT, its divisions, the MPOs, and county agencies to coordinate the statewide transportation planning. The STAC and the SubSTAC consist of the agency directors and their technical liaisons. Each member is responsible for representing his or her respective agency and acts as the liaison for the agency within the planning process. Each member is also responsible for coordinating the transportation planning efforts through this venue for coordination and collaboration purposes. Current participants include representatives from the following agencies:

The STAC/SubSTAC are an important group for collaboration and implementation of the statewide transportation process.

- HDOT, including the Airports, Harbors, and Highways divisions and the STP Office
- State of Hawaii Department of Business, Economic Development & Tourism
- State of Hawaii Department of Health
- City and County of Honolulu Department of Planning and Permitting
- City and County of Honolulu Department of Transportation Services
- County of Kauai Planning Department
- County of Kauai Department of Public Works
- County of Kauai Transit Agency
- County of Hawaii Planning Department
- County of Hawaii Department of Public Works
- County of Hawaii Transit Agency
- County of Maui Planning Department
- County of Maui Department of Public Works
- County of Maui Department of Transportation

- Ex-officio members
  - Oahu Metropolitan Planning Organization
  - Maui Metropolitan Planning Organization
  - Federal Highway Administration
  - Federal Transit Administration
  - Federal Aviation Administration

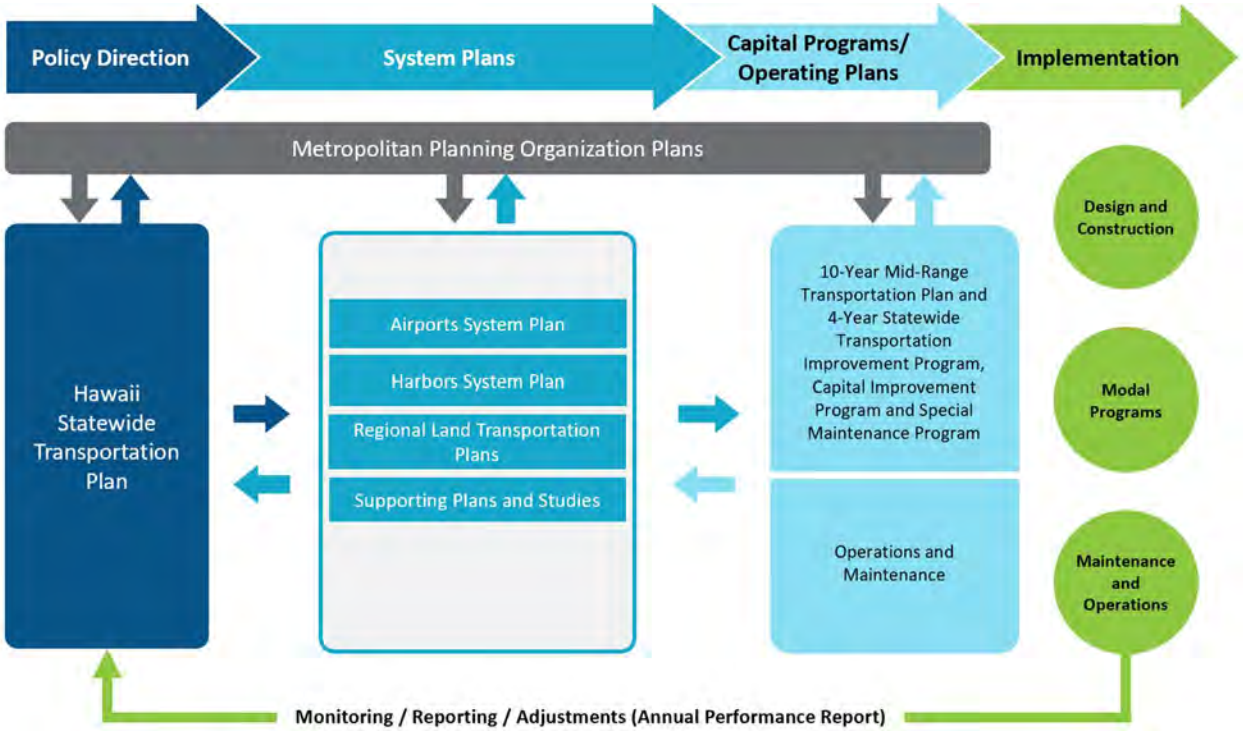
The gathering of the SubSTAC is an excellent venue to coordinate statewide transportation planning activities, share educational opportunities, and communicate lessons learned. The SubSTAC should strive to meet quarterly, or as needed.

8.2.3 Creating a Family of Plans

Another key outcome of the statewide planning process should be to create linkages among plans and from plans to investment decisions. Key linkages are from the long-range policy and vision plans (such as the HSTP and the statewide modal plans), through program development (which includes the mid-range and system master plans) to the short-range budgeting and project development plans. In other words, all statewide transportation planning efforts should use the process described in this section to produce and update their plans.

The process is meant to be ongoing and collaborative to allow for both flow-down of policy and flow-up of data and progress to adjust to changing statewide needs, as shown on Exhibit 8-3. The ongoing collaboration allows the HDOT to align the HSTP vision with short-term and investment-oriented plans, monitor progress towards plan goals, review data, and make adjustments to achieve the desired outcomes throughout the HDOT family of plans.

Exhibit 8-3. HDOT Family of Plans



Transportation is the lifeline to and backbone of our state. This plan considered existing conditions, emerging trends, and alternative futures to create goals and objectives that will guide the State as it aims to serve the people of Hawaii. It provides policy-level guidance to system-level and master plans of the three primary modes of transportation used in Hawaii—the air, water, and land systems—as well as the connections between these modal systems. The next step will be to focus on moving forward and implementing the goals and objectives of the HSTP using the framework of the statewide transportation planning process.

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