

# **Cost Estimation Report Oahu Regional Transportation Plan 2035 Project**

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Prepared for the  
Oahu Metropolitan Planning Organization

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## **Acronyms Used in this Document**

HDOT	Hawaii Department of Transportation
ORTP	Oahu Regional Transportation Plan
STIP	Statewide Transportation Improvement Program
YOE	Year of Expenditure

# **1 Background**

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The Oahu Regional Transportation Plan (ORTP) is a guideline for the City and the State to coordinate efforts on a high level to address transportation issues throughout the island of Oahu. The plan targets mobility issues and transportation needs within the community, and takes into account projected growth areas and anticipated financial resources. The plan encompasses a 25-year time horizon and is typically updated every five years. The purpose of this increment of the ORTP update (2035 ORTP) is to revise, refine, and amend the previously prepared plan approved in April 2006 (2030 ORTP). The revised summary of projects and projected costs is provided at the end of this report.

## **1.1 Project Scope**

The scope of work for this project includes evaluating the reasonableness of the current project estimates, updating the project listing (scope, schedule, and budget), approximating the Year of Expenditure (YOE) for each project, and evaluating cost escalation rates to take into account recent construction and material cost trends.

## ***2 ORTP 2035 Project Cost Updates***

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Updates to the 2030 ORTP projects include the following:

- Updated project listing, description, and cost estimates based on input from the City and County of Honolulu Department of Transportation Services, the Hawaii Department of Transportation (HDOT), and the Honolulu Rapid Transit Project Team;
- Estimated YOE for each project;
- Further refinement of project costs based on local knowledge of the area and associated construction trends; and
- Increased estimated costs to YOE dollars in lieu of current dollars.

### ***3 Order of Magnitude Cost Estimate Analysis & Assumptions***

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The basis for the order of magnitude cost estimate analysis for the 2035 ORTP is as follows:

#### ***Inflation***

Per HDOT memo (HWY-PS 2.6453) dated December 8, 2007, a constant four percent inflation rate per year was assumed for all projects. The basis of the cost estimate is the 2030 ORTP, which is referenced to 2005 dollars (2005\$).

In addition, an independent analysis of long-term inflation in Hawaii was conducted. It was determined that the four percent inflation per year was reasonable over the 30-year period from 1979 to 2009 based on published data from the State Department of Business, Economic Development and Tourism and the U.S. Bureau of Labor Statistics.

Transit cost escalation factors used to calculate YOE dollars were consistent with those used in the August 2009 Financial Plan and are different from HDOT's direction to use four percent per year. The cost escalation in the August 2009 Financial Plan reflects direction from the Federal Transit Administration.

#### ***Year-of-Expenditure***

Where applicable, the anticipated YOE for projects listed in the Statewide Transportation Improvement Program (STIP) was extracted from that document. For all remaining projects not listed in the STIP, the midpoint of the projection period (2015 for mid-range projects and 2028 for long-range projects) was assumed as the YOE. The exceptions are those projects submitted by HDOT in which the estimated project costs were already provided in anticipated YOE dollars; and therefore, the anticipated YOE reflects the midpoint of the project's construction period. In addition, as noted above, transit costs through 2030 were reflected in YOE dollars.

#### ***Roadway Improvements***

The original basis for the 2030 ORTP was the GASB 34 Implementation Document dated August 2002<sup>1</sup>. New roadway costs per lane mile, roadway widening cost per lane mile, and bridge cost per square foot was extracted from this document and inflated at four percent per year to 2005\$. In addition, a 30 percent contingency factor was applied. These values, shown below, provided the basis for the 2030 ORTP cost estimates.

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<sup>1</sup> State of Hawaii, Department of Transportation, Highways Division, GASB 34 Implementation Final Methodology for Generating Historical Infrastructure Costs Statewide, August 2002.

<b>Work Item</b>	<b>GASB 34 (2002\$)</b>	<b>2030 ORTP (2005\$ + 30% contingency)</b>
New Roadway (\$/lane-mi)	\$2,240,000	\$3,280,000
Roadway Widening (\$/lane-mi)*	\$4,690,000	\$6,860,000
Bridge (SF)	\$425	\$500

\*Construction costs for road widening are generally higher than new roadway construction costs due to the presence of existing utilities and other infrastructure that often require relocation.

Due to recent economic activity and the availability of actual inflation data between 2002 and 2005, a re-evaluation of the projected 2005\$ costs was performed. The results indicated a slightly lower unit cost of approximately two-and-a half percent. The slight reduction was considered negligible over the long-term, and therefore, the unit costs used for the ORTP 2030 were deemed reasonable and was carried forward for use in the 2035 ORTP.

#### Rail Transit

Estimated costs specific to rail and bus transit were extracted from the project's August 2009 Financial Plan, as submitted to Federal Transit Administration. Estimated YOE dollars were provided for years 2010 to 2019 for each of the ten Standard Cost Categories for the fixed guideway from East Kapolei to Ala Moana Center. The mid-range total is the sum of all anticipated expenditures between 2010 and 2015. The long-range total is the sum of all anticipated expenditures between 2016 and 2019. All amounts are reported in YOE dollars.

The future expansion projects were estimated based on the unit cost of the fixed guideway between East Kapolei and Ala Moana Center, excluding the costs for new vehicles and the maintenance and storage facilities.

#### Pearl Harbor Corridor

The project cost estimate for the Pearl Harbor Corridor included a four-lane, one-mile long immersed tube tunnel under the mouth of Pearl Harbor. A tunnel of this magnitude has not been constructed previously in Hawaii, so similar projects around the world were used as a basis for the cost estimating exercise. Three similar projects with available construction costs were used as a basis for determining the immersed tube tunnel unit cost. These projects were:

- Sydney Harbour Tunnel (Australia),
- Fort McHenry Tunnel (Maryland), and
- New York Siphon Tunnel (New York).

Each project was scaled to represent a comparable length and size and was inflated to the appropriate YOE.

*Other Non-Roadway Infrastructure Projects*

Several projects categorized as “non-Roadway Infrastructure” include the Bike Plan Hawaii, Enhancement Projects, Intelligent Transportation Systems, Rockfall Protection Program, Van Pool Program, Shoreline Protection Program, Operational Improvements, Operation and Maintenance Contracts, and System Preservation. It was not possible to quantify these projects based on the available data and project definitions/descriptions. For this reason, the project cost estimate provided by the lead agency was not evaluated in detail.

## ***4 Final Project List with YOE Cost Estimates***

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The following table is a compilation of the 2035 ORTP project listing with YOE cost estimates.

## OAHU REGIONAL TRANSPORTATION PLAN 2035 -- POTENTIAL PROJECTS LIST

PROJECT NO.	FACILITY/PROJECT TITLE	PROJECT DESCRIPTION	ESTIMATED COST (Millions of YOE \$)
<b>ISLANDWIDE PROJECTS - 2011 TO 2020</b>			
1	Alapai Transportation Management Center	Construct a transportation management center behind the Alapai Transit Center. Center will combine transportation management with City, State, and emergency response agencies. The City's Emergency Operations Center will also be relocated to the joint traffic management center.	\$158.7
2	Bike Plan Hawaii - Oahu (2011-2020)	Implement Oahu elements of the State of Hawaii's Bike Plan Hawaii.	\$47.3
3	Oahu Bike Plan (2011 - 2020)	Implement City and County Bike Projects (Priority One)	\$18.6
4	Enhancement Projects (2011-2020)	Implement enhancement projects, including, but not limited to, projects from the Transportation Enhancement Program for Oahu.	\$8.7
5	Intelligent Transportation Systems (ITS) (2011-2020)	Implement ITS projects including, but not limited to, those identified in the Oahu Regional ITS Architecture.	\$56.9
6	Transportation Demand Management (TDM) Program (2011-2020)	Develop an aggressive TDM program that could include, but is not limited to: 1. Free real-time online carpool matching, 2. Outreach promotion and marketing of alternative transportation, 3. Emergency ride home program, 4. Major special events, 5. Employer based commuter programs, 6. Emerging and innovative strategies (i.e., car sharing).	\$33.9
7	Van Pool Program (2011-2020)	Continue implementation and expansion of the State's Van Pool Program.	\$29
8	Human Services Transportation Coordination Program (2011-2020)	Provide a range of transportation services targeted to disadvantaged populations under the Human Services Transportation Coordination Program. Specific projects include: 1. Human Service Agency-provided Trips (TheHandi-Van), 2. Local Shuttle Service, 3. Mobility Management Center	\$14
<b>SAFETY &amp; OPERATIONAL IMPROVEMENT PROJECTS - 2011 TO 2020</b>			
9	Rockfall Protection, Various Locations	Install rockfall protection or mitigation measures along various state highways at various locations.	\$57.8
10	Kalaniana'ole Highway, Safety & Operational Improvements, Olomana Golf Course to Waimanalo Beach Park	Construct safety and operational improvements along Kalaniana'ole Highway between the Olomana Golf Course and Waimanalo Beach Park. Specific safety and operational improvements include construction of turning lanes, sidewalks, wheelchair ramps, bike paths or bike lanes, traffic signal upgrades, utility relocation, and drainage improvements.	\$47.6
11	Kamehameha Highway, Safety Improvements, Haleiwa to Kahaluu	Construct safety improvements along Kamehameha Highway, from Haleiwa to Kahaluu. Safety improvements include turn lanes, guardrails, signage, crosswalks, etc. to improve safety. Widening of Kamehameha Highway will only be in areas where needed for storage/turn lanes safety improvements.	\$19.3
12	Kamehameha Highway, Safety & Operational Improvements, Kaalaea Stream to Hygienic Store	Construct safety and operational improvements along Kamehameha Highway, between Kaalaea Stream and Hygienic Store. Safety and operational improvements include passing and turning lanes, modification of signals, and installation of signs, flashers, and other warning devices. This project also includes replacement of Kaalaea Stream Bridge and Haiamoa Stream Bridge with structures that meet current design standards.	\$17.0

## OAHU REGIONAL TRANSPORTATION PLAN 2035 -- POTENTIAL PROJECTS LIST

PROJECT NO.	FACILITY/PROJECT TITLE	PROJECT DESCRIPTION	ESTIMATED COST (Millions of YOE \$)
13	Highway Safety Improvement Program	Comprehensive program to fund safety improvements to reduce collisions and damage to property. Strategies may include installation of left turn lanes, roadway widenings, traffic signal modifications, installation of rumble strips and crash attenuators, installation of guardrails and bridge railings and others.	\$25.0
14	Shoreline Protection Program	Kamehameha Highway and other locations	\$26.6
<b>CONGESTION RELIEF PROJECTS - 2011 TO 2020</b>			
15	Farrington Highway, Widening, Golf Course Road to west of Fort Weaver Road	Widen Farrington Highway from two-to-four lanes, from Golf Course Road to just west of Fort Weaver Road.	\$44.1
16	Fort Barrette Road, Widening, Farrington Highway to Barber's Point Gate.	Widen Fort Barrette Road from two-to-four lanes, from Farrington Highway to Barber's Point Gate.	\$23.5
17	Hanua Street Extension, Farrington Highway to Malakole Street; Interstate Route H-1, New On- & Off-Ramps, Palailai Interchange	Hanua Street: <ul style="list-style-type: none"> <li>• Extend Hanua Street from Malakole Street to Farrington Highway. This new 4-lane roadway will provide access to Kalaeloa Harbor.</li> </ul> Interstate Route H-1, Palailai Interchange: <ul style="list-style-type: none"> <li>• Construct new on- and off-ramps at Interstate Route H-1 Palailai Interchange to Hanua Street extension.</li> </ul>	\$120.0
18	Interstate Route H-1, New Interchange, Kapolei Interchange	Construct new Interstate Route H-1 Kapolei Interchange for Kapolei between the Palailai Interchange and Makakilo Interchange. Project to be constructed in multiple phases.	\$47.7
18	Interstate Route H-1, Operational Improvements, Lunalilo Street to Vineyard Boulevard	Modify the weaving movements on the Interstate Route H-1, in the westbound direction, between the Lunalilo Street on-ramp and the Vineyard Boulevard off-ramp.	\$36.0
20	Interstate Route H-1, Widening, Ola Lane to Vineyard Boulevard	Widen the Interstate Route H-1 by 1 lane, in the eastbound direction, from Ola Lane to Vineyard Boulevard, as identified below: <ul style="list-style-type: none"> <li>• From two-to-three lanes from Ola Lane/Middle Street to Likelike Highway off-ramp</li> <li>• From three-to-four lanes from Likelike Highway off-ramp to Vineyard Boulevard</li> </ul> This project also includes the widening of: <ul style="list-style-type: none"> <li>• Gulick Avenue overpass to allow five lanes to pass under it</li> <li>• Kalihi Interchange overcrossings to allow four lanes to pass under it.</li> </ul>	\$104.0
21	Interstate Route H-1, Widening, Waiiau Interchange to Waiawa Interchange	Widen Interstate Route H-1 in the westbound direction by one lane from the Waiiau Interchange to the Waiawa Interchange.	\$338.9
22	Interstate Route H-1, Widening, Waiawa Interchange	Widen the Interstate Route H-1 by 1 lane, in the westbound direction, through the Waiawa Interchange. This project will begin in the vicinity of the Waiawa Interchange and end at the Paiwa Interchange. <ul style="list-style-type: none"> <li>• From two-to-three lanes in AM peak</li> <li>• From four-to-five lanes in PM peak</li> </ul>	\$16.2

## OAHU REGIONAL TRANSPORTATION PLAN 2035 -- POTENTIAL PROJECTS LIST

PROJECT NO.	FACILITY/PROJECT TITLE	PROJECT DESCRIPTION	ESTIMATED COST (Millions of YOE \$)
23	Interstate Route H-1, Contra Flow Lane extension (PM), Waiawa Interchange to Kunia Interchange and Keehi Interchange to Radford Drive	This project would construct an extension of the PM contra-flow lane on the Interstate Route H-1, in the westbound direction, on the west end from Waiawa Interchange to Kunia Interchange and on the east end from the Keehi Interchange to Radford Drive. Project will include upgrade of the shoulder lane from the Waiawa Interchange to the Waikele off-ramp to assist in traffic dispersion from the Contraflow lane.	\$60.0
24	Interstate Route H-1, Widening, Waipahu Off-Ramp	Widen the Interstate Route H-1 Waipahu Street off-ramp from one-to-two lanes, in the westbound direction, at the Waiawa Interchange.	\$28.8
25	Interstate Route H-2, Widening, Waipio Interchange	Widen both on- and off-ramps on Interstate Route H-2, at the Waipio Interchange. This project includes the widening of the Ka Uka Boulevard overpass and intersection improvements to facilitate movement to and from the on- and off-ramps.	\$30.6
26	Interstate Route H-1, Operational Improvements and Widening, Ward Avenue On-Ramp to University Avenue Interchange	Improve traffic flow on the Interstate Route H-1, in the eastbound direction, from the Ward Avenue on-ramp to the University Avenue Interchange through operational improvements. Widen the existing H-1 by one lane in the eastbound direction from Ward Avenue to Punahou Street.	\$65.0
27	Interstate Routes H-1 & H-2, Operational Improvements, Waiawa Interchange	Modify the Interstate Routes H-1 and H-2 Waiawa Interchange, to improve merging characteristics through operational improvements (e.g., additional transition lanes).	\$112.1
28	Kamehameha Highway, Widening, Lanikuhana Avenue to Ka Uka Boulevard	Widen Kamehameha Highway from a three-lane to a four-lane divided facility between Lanikuhana Avenue and Ka Uka Boulevard. This project includes shoulders for bicycles and disabled vehicles, bridge crossing replacement, bikeways, etc.	\$96.5
29	Kapolei Parkway, Extension, Kamokila Boulevard to Fort Barrette Road	Extend the existing six-lane Kapolei Parkway between Kamokila Boulevard and Fort Barrette Road.	\$101.3
30	Kapolei Parkway, Extension & Widening, Aliinui Drive to Kalaeloa Boulevard	Extend Kapolei Parkway (six lanes), from Aliinui Drive to Hanua Street. This project includes widening of Kapolei Parkway from four-to-six lanes from Hanua Street to Kalaeloa Boulevard.	\$69.4
31	Kualaka'i Parkway, Widening & Extension, Interstate Route H-1 to Franklin D Roosevelt Avenue	Widen and extend Kualaka'i Parkway as follows: <ul style="list-style-type: none"> <li>• From three-to-six lanes from Kapolei Parkway to Interstate Route H-1</li> <li>• Extend from Kapolei Parkway to Franklin D Roosevelt Avenue (six lanes)</li> </ul>	\$25.3
32	Interstate Route H-1, Widening, Vineyard Boulevard to Middle Street	Widen the Interstate Route H-1 by one lane in the westbound direction, from Vineyard Boulevard to Middle Street.	\$117.0
33	Kalaeloa East-West Spine Road, New Roadway, Kalaeloa Boulevard to Geiger Road	Construct a new four-lane east-west spine road within Kalaeloa by realigning and connecting portions of the existing Saratoga Avenue from Kalaeloa Boulevard in the west and to Geiger Road in the east.	\$271.1
34	Keoneula Boulevard, Extension, Kapolei Parkway to Franklin D. Roosevelt Avenue	Extend Keoneula Boulevard from Kapolei Parkway to Franklin D. Roosevelt Avenue.	\$209.5

## OAHU REGIONAL TRANSPORTATION PLAN 2035 -- POTENTIAL PROJECTS LIST

PROJECT NO.	FACILITY/PROJECT TITLE	PROJECT DESCRIPTION	ESTIMATED COST (Millions of YOE \$)
35	Paiwa Street, Extension, Ka Uka Boulevard to Lumiauau Street	Extend Paiwa Street from north of Lumiauau Street, to the intersection of Kamehameha Highway and Ka Uka Boulevard.	\$37.0
36	Pearl Harbor Corridor	Construct an alternative route through the Pearl Harbor corridor to provide direct connection between Honolulu and the Ewa Plain. A new tunnel beneath the mouth of Pearl Harbor and a series of bridges spanning Pearl Harbor are potential options for this route. This project could operate as a toll facility.	\$7,000.0
37	East-West Road	Construct as four-lane roadway between Farrington Hwy and Ft. Weaver Rd	\$57.3
38	Kamokila Blvd	Extend as four lane roadway between Roosevelt and Saratoga	\$30.2
39	Fort Barrette Road	Extend as four-lane roadway between Roosevelt and Saratoga	\$10.7
40	Salt Lake Boulevard Widening Project	Widen Salt Lake Boulevard from two-to-six lanes, between Maluna Street and Ala Lili'oi Street.	\$66.0
<b>SECOND ACCESS PROJECTS - 2011 TO 2020</b>			
41	Makakilo Drive, Second Access, Makakilo Drive to Kualaka'i Parkway/Interstate Route H-1 Interchange	Extend Makakilo Drive (vicinity Pueonani Street) south to the Interstate Route H-1 Freeway Interchange as four-lane roadway, connecting Makakilo Drive to Kualaka'i Parkway.	\$78.5
<b>TRANSIT PROJECTS - 2011 TO 2020</b>			
42	TheBus Service, Expansion, Islandwide (2011-2020)	Expand the bus service through increase of capacity of the existing system to accommodate population growth. Expanded service will be ADA-compliant. This includes: <ul style="list-style-type: none"> <li>• Expansion of Services to and within Ewa, Kapolei, Central, and Windward Oahu</li> <li>• Expansion through increase of Express service to the North Shore, Waianae, and Windward Oahu</li> <li>• Restructure of service in urban Honolulu</li> </ul>	\$456.0
43	Transit Centers, Various Locations (2011-2020)	Construct transit centers at various locations islandwide to support transit operations	\$45.6
<b>OPERATIONS, MAINTENANCE &amp; SYSTEM PRESERVATION - 2011 TO 2021</b>			
44	City Operations and Maintenance (O&M): Transit (2011-2020)	Maintain and operate the City's existing and future transit, and paratransit operations and routine maintenance. Includes, but is not limited to, operation of the transit system (including bus, paratransit, and rail), replacement of existing fleet, plan, design and construct a third bus operating facility, etc.	\$2,618.0
45	City Operations and Maintenance (O&M): Roadways (2011-2020)	Maintain and operate the City's existing and future roadway. Includes, but is not limited to, resurfacing, guardrail and shoulder improvements, lighting improvements, drainage improvements, signal and sign upgrades and replacement, etc.	\$337.5

## OAHU REGIONAL TRANSPORTATION PLAN 2035 -- POTENTIAL PROJECTS LIST

PROJECT NO.	FACILITY/PROJECT TITLE	PROJECT DESCRIPTION	ESTIMATED COST (Millions of YOE \$)
46	State Operations and Maintenance (2011-2020)	Maintain and operate the State's existing and future highway operations and routine maintenance. Special Maintenance Program (SMP) Projects include, but is not limited to, pavement repair, preventative maintenance, resurfacing and rehabilitation, etc.	\$1,011.0
47	System Preservation (2011-2020)	Preserve the highway system through projects including, but not limited to, bridge replacement and seismic retrofit, guardrail and shoulder improvements, lighting improvements, drainage improvements, sign upgrades and replacement, traffic signal upgrade and retrofit, etc.	\$400.0
<b>COST SUBTOTALS: MID-RANGE PLAN (2011 TO 2020)</b>		<b>CATEGORIES SUBTOTALS</b>	
		Islandwide Projects	\$367.2
		Safety & Operational Improvement Projects	\$193.3
		Congestion Relief Projects	\$9,118.2
		Second Access Projects	\$78.5
		Transit Projects	\$501.6
		Operations, Maintenance, & System Preservation	\$4,366.5
		<b>All Categories</b>	<b>\$14,625.4</b>
<b>ISLANDWIDE PROJECTS - 2021 TO 2035</b>			
48	Bike Plan Hawaii - Oahu (2021-2035)	Implement Oahu elements of the State of Hawaii's Bike Plan Hawaii.	\$176.7
49	Oahu Bike Plan (2021 - 2035)	Implement City and County Bike Projects (Priorities Two and Three)	\$81.7
50	Enhancement Projects (2021-2035)	Implement enhancement projects, including, but not limited to, projects from the Transportation Enhancement Program for Oahu.	\$75.0
51	Intelligent Transportation Systems (ITS) (2021-2035)	Implement ITS projects including, but not limited to, those identified in the Oahu Regional ITS Architecture.	\$225.0
52	Transportation Demand Management (TDM) Program (2021-2035)	Develop an aggressive TDM program that could include, but is not limited to: 1. Free real-time online carpool matching, 2. Outreach promotion and marketing of alternative transportation, 3. Emergency ride home program, 4. Major special events, 5. Employer based commuter programs, 6. Emerging and innovative strategies (i.e., car sharing).	\$136.9
53	Van Pool Program (2021-2035)	Continue implementation and expansion of the State's Van Pool Program.	\$88.1
54	Human Services Transportation Coordination Program (2011-2020)	Provide a range of transportation services targeted to disadvantaged populations under the Human Services Transportation Coordination Program. Specific projects include: 1. Human Service Agency-provided Trips (TheHandi-Van), 2. Local Shuttle Service, 3. Mobility Management Center	\$33.2
<b>SAFETY &amp; OPERATIONAL IMPROVEMENT PROJECTS - 2021 TO 2035</b>			

## OAHU REGIONAL TRANSPORTATION PLAN 2035 -- POTENTIAL PROJECTS LIST

PROJECT NO.	FACILITY/PROJECT TITLE	PROJECT DESCRIPTION	ESTIMATED COST (Millions of YOE \$)
55	Farrington Highway, Safety Improvements, Makua Valley Road to Aliinui Drive	Construct safety improvements on Farrington Highway along the Waianae Coast, from Makua Valley Road (Kaena Point) to Aliinui Drive (Kahe Point). This project includes realignment around Makaha Beach Park, between Makau Street and Water Street.	\$209.0
56	Rockfall Protection, Various Locations	Install rockfall protection or mitigation measures along various state highways at various locations.	\$96.2
57	Shoreline protection program	Implement shoreline protection programs at various locations.	\$44.3
58	Highway Safety Improvement Program	Comprehensive program to fund safety improvements to reduce collisions and damage to property. Strategies may include installation of left turn lanes, roadway widenings, traffic signal modifications, installation of rumble strips and crash attenuators, installation of guardrails and bridge railings and others.	\$37.0
<b>CONGESTION RELIEF PROJECTS - 2021 TO 2035</b>			
59	Farrington Highway, Widening, west of Fort Weaver Road to Waiawa Interchange	Widen Farrington Highway from Kunia to Waiawa by one lane in each direction, from west of Fort Weaver Road to Waiawa Interchange.	\$130.8
60	Farrington Highway, Widening, Hakimo Road to Kalaeloa Boulevard	Widen Farrington Highway from four-to-six lanes, from Hakimo Road to Kalaeloa Boulevard, including intersection of Luulualei Naval Road.	\$233.1
61	Interstate Route H-1, On- & Off-Ramp Modifications, Various Locations	Modify and/or close various on- and off- ramps on the Interstate Route H-1 from Middle Street to University Avenue. This project includes modification of auxiliary lanes at various exits and other operational changes to Interstate Route H-1. The identification of the precise improvements to be made will require a separate detailed corridor study.	\$108.0
62	Interstate Route H-1, On- & Off-Ramp Modifications, University Avenue Interchange	Modify on- and off-ramps at the University Avenue Interchange on Interstate Route H-1. This project includes the construction of new ramps to allow all movements, as well as safety improvements including the closure of the eastbound on-ramp at University Avenue Interchange to Interstate Route H-1 and the construction of a new makai bound off-ramp to University Avenue from Interstate Route H-1.	\$42.0
63	Interstate Route H-1, HOV Lanes, Waiawa Interchange to Makakilo Interchange	Construct two new lanes in the freeway median for HOV use, one in the westbound direction and one in the eastbound direction, on Interstate Route H-1, from the Waiawa Interchange to the Makakilo Interchange.	\$102.4
64	Interstate Route H-1, Widening, Waiawa Interchange to Halawa Interchange	Widen the Interstate Route H-1 by one lane in the eastbound direction, from the Waiawa Interchange to the Halawa Interchange.	\$540.3
65	Interstate Route H-1, Widening, Ward Avenue to Punahou Street	Widen the existing Interstate Route H-1 by one lane in the eastbound direction, from Ward Avenue to Punahou Street.	\$48.6
66	Interstate Route H-2, New Interchange, Pineapple Road Overpass	Construct a new full-service freeway interchange on Interstate Route H-2, between Meheula Parkway and Ka Uka Boulevard, to accommodate future developments in Central Oahu. This project includes the widening of the existing Pineapple Road Overpass from two-to-four lanes; and addition of new on- and off-ramps to and from Interstate Route H-2 at Pineapple Road Overpass.	\$102.5

## OAHU REGIONAL TRANSPORTATION PLAN 2035 -- POTENTIAL PROJECTS LIST

PROJECT NO.	FACILITY/PROJECT TITLE	PROJECT DESCRIPTION	ESTIMATED COST (Millions of YOE \$)
67	Kahekili Highway, Widening, Kamehameha Highway to Haiku Road	Widen Kahekili Highway from two-to-four lanes, from Kamehameha Highway to Haiku Road. This project also includes the following improvements: <ul style="list-style-type: none"> <li>• Contraflow in existing right-of-way between Hui Iwa Street and Haiku Road</li> <li>• Intersection improvements at Hui Iwa Street and Kamehameha Highway</li> </ul>	\$75.0
68	Kunia Road, Widening and Interchange Improvement, Wiliikina Drive to Farrington Highway	Widen Kunia Road as follows: <ul style="list-style-type: none"> <li>• From two-to-four lanes, from Wiliikina Drive to Anonui Street.</li> <li>• From two-to-four lanes, Anonui Street to Kupuna Loop.</li> <li>• From four-to-six lanes, Kupuna Loop to Farrington Highway.</li> <li>• Add one lane eastbound loop on-ramp at Kunia Road &amp; Interstate Route H-1.</li> </ul>	\$348.9
69	Likelike Highway, Widening, Kamehameha Highway to Kahekili Highway	Widen Likelike Highway from four-to-six lanes, from Kamehameha Highway to Kahekili Highway.	\$32.9
70	Makakilo Mauka Frontage Road, New Roadway, Kalaeloa Boulevard to Makakilo Drive	Construct a new two-lane Makakilo Mauka Frontage Road, mauka of Interstate Route H-1, from Kalaeloa Boulevard to Makakilo Drive.	\$18.2
71	Nimitz Highway, High Occupancy Vehicle (HOV) Flyover, Keehi Interchange to Pacific Street	Construct a new two-lane elevated and reversible HOV flyover above Nimitz Highway, from the Keehi Interchange to Pacific Street. This project includes the removal of the existing eastbound contraflow lane in the AM peak and restoration of all turning movements on the at-grade portion of Nimitz highway.	\$537.5
72	Piikoi-Pensacola Couplet Reversal	Reverse the direction of the existing one-way Piikoi Street and Pensacola Street couplet.	\$10.4
73	Puuloa Road, Widening, Pukuloa Road to Nimitz Highway	Widen Puuloa Road, from Pukuloa Road to Nimitz Highway: <ul style="list-style-type: none"> <li>• From three lanes (one lane southbound and two-lane northbound) to five-lanes (two lanes southbound and three lanes northbound), from Pukuloa Road to Kamehameha Highway.</li> </ul>	\$24.6
<b>SECOND ACCESS PROJECTS - 2021 TO 2035</b>			
74	Waianae, Second Access, Farrington Highway to Kunia Road	Construct a new two-lane second access road to Waianae from Farrington Highway in the vicinity of Maili, over the Waianae Mountain Range, to Kunia Road.	\$1,269.0
75	Central Mauka Road, Second Access, Millilani Mauka to Waiawa	Construct Central Mauka Road, a new four-lane road from Millilani Mauka to Waiawa. Road connects Meheula Parkway to Kamehameha Highway in Pearl City; parallel to & mauka of Interstate Route H-2. The new four-lane north-south road includes connections to Interstate Route H-2 interchanges.	\$394.4
76	Wahiawa, Second Access, Whitmore Avenue to Meheula Parkway	Construct a new two-lane second access road between Whitmore Village and Wahiawa, from Whitmore Avenue to California Avenue. Continue the new two-lane second access road to Millilani Mauka, from California Avenue to Meheula Parkway.	\$158.7
77	Makapuu Tunnel	Secondary access road (tunnel) to provide connection between Hawaii Kai and Waimanalo areas from the vicinity of Lunalilo Home Road to the vicinity of Kalaniana'ole Highway north of Sea Life Park; lane configuration to be determined.	\$600.0

### TRANSIT PROJECTS - 2021 TO 2035

## OAHU REGIONAL TRANSPORTATION PLAN 2035 -- POTENTIAL PROJECTS LIST

PROJECT NO.	FACILITY/PROJECT TITLE	PROJECT DESCRIPTION	ESTIMATED COST (Millions of YOE \$)
78	TheBus Service, Expansion, Islandwide (2021-2035)	Expand the bus service through increase of capacity of the existing system to accommodate population growth. Expanded service will be ADA-compliant. This includes: <ul style="list-style-type: none"> <li>• Expansion of Services to and within Ewa, Kapolei, Central, and Windward Oahu</li> <li>• Expansion through increase of Express service to the North Shore, Waianae, and Windward Oahu</li> <li>• Restructure of service in urban Honolulu</li> </ul>	\$848.0
79	Fixed Guideway, West Kapolei to East Kapolei	Plan, design, and construct a fixed guideway system between West Kapolei to East Kapolei	\$2,031.6
80	Fixed Guideway, Ala Moana to Manoa/Waikiki	Plan, design, and construct a fixed guideway system between Ala Moana and Manoa/Waikiki	\$1,828.4
81	City Rail Rehabilitation and Fleet Expansion	Provide for rehabilitation of track and expansion of rail fleet.	\$203.0
82	Transit Centers, Various Locations (2021-2035)	Construct transit centers at various locations islandwide to support transit operations.	\$19.0
<b>OPERATIONS, MAINTENANCE &amp; SYSTEM PRESERVATION - 2021 TO 2035</b>			
83	City Operations and Maintenance (O&M): Transit (2021-2035)	Maintain and operate the City's existing and future transit, and paratransit operations and routine maintenance. Includes, but is not limited to, operation of the transit system (including bus, paratransit, rail, and ferry), replacement of existing fleet, plan, design and construct a third bus operating facility, etc.	\$6,957.0
84	City Operations and Maintenance (O&M): Roadways (2021-2035)	Maintain and operate the City's existing and future roadway. Includes, but is not limited to, resurfacing, guardrail and shoulder improvements, lighting improvements, drainage improvements, signal and sign upgrades and replacement, etc.	\$749.3
85	State Operations and Maintenance (2021-2035)	Maintain and operate the State's existing and future highway operations and routine maintenance. Special Maintenance Program (SMP) Projects include, but is not limited to, pavement repair, preventative maintenance, resurfacing and rehabilitation, etc.	\$1,257.0
86	System Preservation (2021-2035)	Preserve the highway system through projects including, but not limited to, bridge replacement and seismic retrofit, guardrail and shoulder improvements, lighting improvements, drainage improvements, sign upgrades and replacement, traffic signal upgrade and retrofit, etc.	\$924.3
<b>COST SUBTOTALS: LONG-RANGE PLAN (2021 TO 2035)</b>		<b>CATEGORIES SUBTOTALS</b>	
		Islandwide Projects	\$816.6
		Safety & Operational Improvement Projects	\$386.5
		Congestion Relief Projects	\$2,355.2
		Second Access Projects	\$2,422.1
		Transit Projects	\$4,930.0
		Operations, Maintenance, & System Preservation	\$9,887.6
		<b>All Categories</b>	<b>\$20,798.0</b>
<b>COST SUBTOTALS: 2010 TO 2035</b>		<b>CATEGORIES SUBTOTALS</b>	
		Islandwide Projects	\$1,183.8
		Safety & Operational Improvement Projects	\$579.8
		Congestion Relief Projects	\$11,473.4
		Second Access Projects	\$2,500.6
		Transit Projects	\$5,431.6
		Operations, Maintenance, & System Preservation	\$14,254.1
		<b>All Categories</b>	<b>\$35,423.4</b>