

Upgrading Hawaii Commutes

Pavement preservation treatments tested in the effort to improve highways

BY PRISCILLA PÉREZ BILLIG

Buy a new car. Don't change the oil until the engine dies.

That's equivalent to what has happened on Hawaii roads and highways, says Adrian Archilla, a professor in the department of civil and environmental engineering at the University of Hawaii. Pavement is laid down and nothing is done until it is practically destroyed, he says.

Archilla is monitoring the effectiveness of various pavement preservation



Adrian Archilla

treatments, including slurry seal, seal coat, fog seal and crack sealing, at test sites in Pearl City and Waipahu. The city will use the results to determine the cost effectiveness of the treatments.

"The first thing is to quantify how many benefits we get, show that these things work and, in the end, that they save money because it costs less money compared to repairing," Archilla says. "The idea is to keep the roads going in good condition at a relatively low cost and avoid or postpone, as much as possible, the bigger costs associated with rehabilitation."

The Hawaii Asphalt Pavement Industry (HAPI) is also taking part in the pavement preservation treatment

project. Its membership includes Grace Pacific LLC, Road Builders Corporation, Jas. W. Glover Ltd., Road and Highway Builders LLC, R.M. Towill Corp. and more than 2,100 asphalt pavement producers, laydown contractors, pavement treatment suppliers and consultants in Hawaii and on the Mainland.

"We provide training seminars and workshops, as well as addressing concerns from government agencies, design



Jon Young



Hawaiian Dredging Construction Co. works on the H-1 widening in Pearl City.
PHOTO BY ED GROSS/THE IMAGE GROUP LLC

consultants and elected officials,” says Jon Young, HAPI executive director. “These efforts have increased the visibility of our asphalt industry as well as advancing the asphalt pavement solutions throughout the state of Hawaii. We are improving Hawaii’s roads ... one lane at a time.”

Efforts to extend the pavement life, building new roads and widening of existing roads and highways are driven by the fact that of Hawaii’s 844 miles of major roads, 27 percent are in poor condition; Hawaii motorists pay at least \$480 million a year in extra vehicle repairs and operating costs, according to the American Society of

2015 Urban Mobility Scoreboard for Honolulu

Honolulu ranks second in the nation in freeway travel time. Only Los Angeles is worse.

Honolulu rates an index of 1.51, which means any given trip on the freeway takes 51 percent more time than it would without traffic. A 40-minute trip takes an hour with traffic.

Honolulu ranks third in the nation in freeway stress index, after San Francisco and Los Angeles, which means extra travel time in peak direction (town-bound) during the peak period (morning commute).

Drivers in 2014 spent an extra 50 hours in traffic due to congestion.

Excess fuel per auto commuter: 26 gallons (national average is 18).

Congestion cost per auto commuter: \$1,125 (national average is \$870).

SOURCE: Texas A&M Transportation Institute and INRIX, August 2015

Civil Engineers.

Hawaii has 4,371 centerline miles of roadway, based on a road's physical length regardless of the number of lanes. This total amounts to 9,523 lane miles, which is based on the total length of lanes. For example, a one-mile road with four lanes would constitute four lane miles.

Keep the Traffic Flowing

Repaving the main traffic corridor linking East Honolulu with downtown Honolulu has presented a challenge to Grace Pacific. It's taken on resurfacing approximately 25 lane miles in a \$14 million project along Kalaniana'ole Highway from West Hind Drive to the vicinity of Hanauma Bay Road with an estimated completion

date of February 2016.

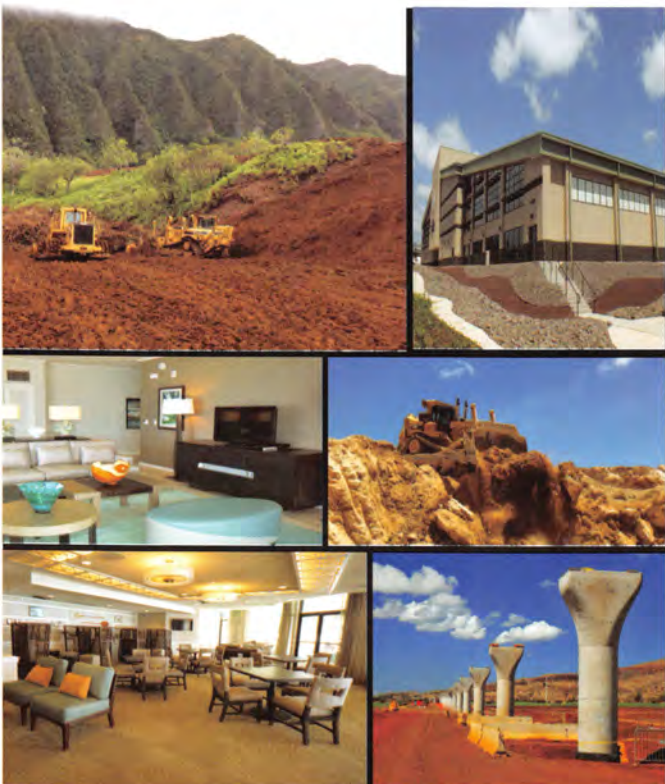
"Unfortunately, as we were doing the reconstruction work, we encountered sections with Portland cement

concrete buried anywhere from 4 inches to 8 inches under the asphalt pavement surface," says Raymond Nii, manager for engineering,



The rail crossing over Fort Weaver Road

PHOTO BY ED GROSS/THE IMAGE GROUP LLC



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Raymond Nii

administration and IDIQ of the paving department at Grace Pacific.

“Rather than remove the concrete sections, we cold-planed the asphalt pavement to a depth of at least 3 inches, paved a leveling course and applied GlasGrid (fiberglass strands coated with an elastomeric polymer) over the concrete area before paving the 2-inch asphalt pavement surface layer. The GlasGrid reinforcement helps in the prevention of reflective cracking and increases the fatigue life of asphalt pavement overlays.”



Grace Pacific is resurfacing Kalaniana'ole Highway.

PHOTO BY ED GROSS/THE IMAGE GROUP LLC

Nii adds that Grace Pacific promotes the use of asphalt pavement as a sustainable, reusable product. “Asphalt pavement from older roads is milled out at the project site and delivered to our hot mix asphalt plant facility,” he says. “At the plant, the ground-up asphalt pavement material



New roads and repaving in Kapolei
PHOTO BY ED GROSS/THE IMAGE GROUP LLC

(recycled asphalt product) is fractionated and a percentage of it is used in the manufacturing of the asphalt pavement mix.”

Keeping the traffic flowing smoothly through this highly used corridor while resurfacing the highway was the biggest challenge for Grace Pacific, Nii says. “Working in partnership with the state, through public education, adjustments in the traffic signal patterns and the scheduling of the various work areas, we were able to limit the inconvenience to the motoring public.”

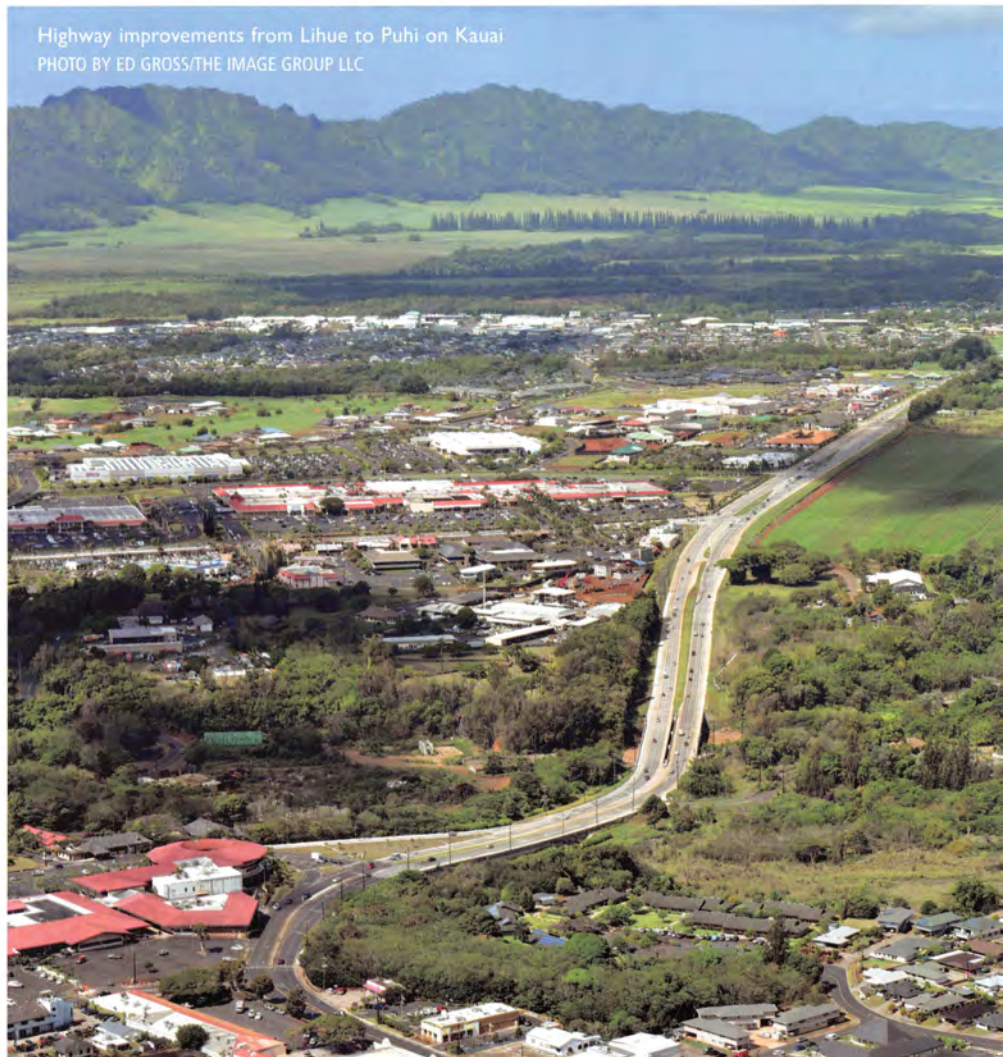
The following are top public projects planned out to 2034:

The Hawaii Department of Transportation, Highways Division estimates approximately \$540.30 million for H-1 (eastbound) widening, Waiawa Interchange to Halawa Interchange and \$233.10 million for the Farrington Highway widening, Hakimo Road to Kalaeloa Boulevard. HART estimates \$542.14 million for the West Oahu/Farrington Highway guideway and \$371.93 million for the Kamehameha Highway guideway.

County Roads

According to Honolulu Mayor Kirk Caldwell’s office and its 2015 second quarter report, the city and county is

Highway improvements from Lihue to Puhi on Kauai
PHOTO BY ED GROSS/THE IMAGE GROUP LLC



The Purpose of Pavement

Load support. Pavement material is generally stiffer than the material upon which it is placed, thus it assists the *in situ* material in resisting loads without excessive deformation or cracking.

Smoothness. Pavement material can be placed and maintained much smoother than *in situ* material. This helps improve ride comfort and reduce vehicle operating costs.

Drainage. Pavement material and geometric design can affect quick and efficient drainage, thus eliminating moisture problems such as mud and ponding (puddles).

SOURCE: *Hawaii Asphalt Paving Industry*



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TJ Gomes Trucking Co. performs roadwork at Kehalani on Maui.

PHOTO BY ED GROSS/THE IMAGE GROUP LLC

committed to repaving 1,500 lane miles of city roads by the end of 2017. As of July, a total of 1,820 lane miles have been repaved, or completed under projects slated as rehabilitation of streets, since 2013.

The “Report on the State of Physical Infrastructure in Hawaii, Phase II” published by the Hawaii Institute for Public Affairs (HIPA) last June notes that the City and County of Honolulu projects \$600 million in road reconstruction and paving over the next 20 years. The report also points out that with the growth and development of new areas on Oahu over the last 20 years, “it may be surprising to learn that the City and County of Honolulu has not built many of the new roads constructed. This is just an example to illustrate how the public sector has relied on private developers to provide basic infrastructure.”

Roadwork & Development

Improvements, such as widening a section of road or interchange, enable

numerous developers to build new homes and commercial business areas, and provide the added benefits of new jobs and revenues for the economy, the HIPA report details. TJ Gomes Trucking Company Inc. is performing roadwork for Kehalani, a 550-acre master-planned community south of

Wailuku, Maui.

Another project, says HIPA, Oahu's Kunia Road Widening and H-1 Kunia Interchange Improvement, costing between \$40 million and \$60 million, can stimulate the development of more than 40,000 new homes, 39,000 new jobs and \$85.9 billion of economic activity over a 30-year period. Road & Highways Builders LLC is resurfacing Kamehameha Highway from Dairy Road to Laiewai Bridge at a cost of more than \$13.8 million.

Physical infrastructure has a direct impact on the economy; it provides jobs and generates revenues for the state and municipalities, local businesses and residents, the HIPA report sums up. “The planning and building of new infrastructure influences how and when land is utilized, where communities grow and what businesses will flourish. Hawaii’s current infrastructure needs to be replaced or repaired as it ages. As our population continues to grow, there is more demand for our streets and utilities.” 🏠

Top Traits Drivers Want from Roads

- Well-maintained roads without closures
- Safe roads that reduce the risk of traffic-related crashes
- Smooth roads that are more comfortable and cause less wear-and-tear on vehicles

SOURCE: *Hawaii Asphalt Paving Industry*