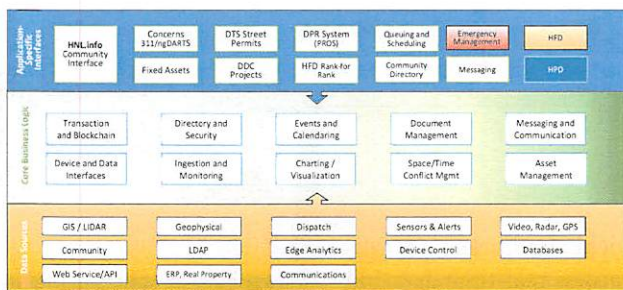# Lōkahi   *Working Together. Working Smarter.*

Integrating Workflows and Data across the Enterprise

An innovative platform for managing City operations, Lōkahi integrates departmental management and workflows for City agencies into a single tool, fostering collaboration and reducing silos. It provides transaction processing, monitoring, research, training, testing, and automation in a single tool.

Honolulu's unique vision for a Smart City goes beyond the typical integration of sensor and mapping data, integrating key business processes into a common platform, ensuring a Common Operating Picture of dynamic information, whether it be financial, geospatial, temporal,
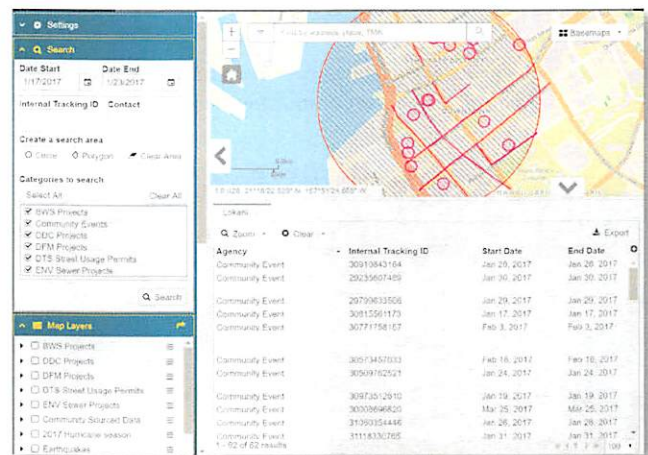

With a single Application Platform for multiple agencies and situations ranging from daily operations all the way through emergencies, thousands of employees can comfortably work with a common set of familiar tools without switching programs for different tasks or roles, or waiting on another department for information.

Lōkahi is simple to use, yet feature-rich. Everything runs in a standard web browser and requires no software to be installed. A common Console implements a robust security model to control multiple views, all customized to a user's needs.

Coordination of Activities in the Public Realm

Every city faces challenges coordinating projects like road repair, construction, and permitted activities like parades. When public utility and state projects are added, potential for conflict becomes a near certainty.

Search Projects and Events by Location and Time

Since Lōkahi aggregates data from a myriad of agencies and establishments, it is an ideal tool for detecting conflicts, collaborating, and managing projects. Based on the user's role, the Console will access detailed project, event, contact, and permit information. Each agency decides how much and with whom information is to be shared, and other agencies can view pertinent information.

Lōkahi is also designed to coordinate community activities such as fundraisers, festivals, cultural events, and sporting events. Details for these types of events could prove useful during planning or when responding to emergencies. For the community, information on admission, directions, and websites is provided by Lōkahi through HNL.info.
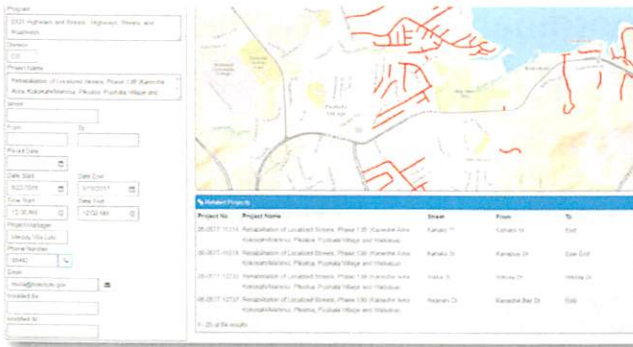
Workflows Tailored to Honolulu's Requirements

While off-the-shelf applications can provide rich functionality, they often have a rigid workflow that doesn't fit the City's needs. Then there is the cost of acquisition, maintenance, and customization. At best, the City ends up with a standalone application which doesn't integrate with other systems. Lōkahi uses a component approach to implement common requirements across all agencies.
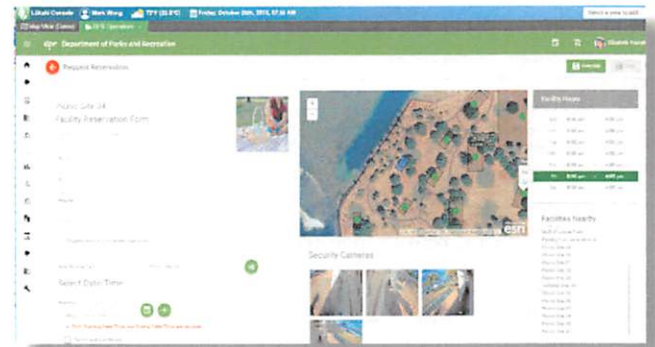
By consolidating workflow applications and systems of record for multiple departments on a single platform, the City reduces or eliminates the need to transfer or synchronize data between systems. Users in one department can access information from another department without having to switch applications. This City-developed platform has much lower ownership costs and faster technology cycles, and bypasses RFPs, bids, protests, and funding challenges.

Because Lōkahi provides context-sensitive views, users have task-specific information and tools. Mapping tools for Parks present features for managing park facilities, while the same tools for others may be roads-oriented.

Dept. of Design and Construction - Projects

Dept. of Parks and Rec. - Facility Scheduling with Live Video, 360° Views

Police Department Incident Clustering

Beach Data Collection System

Public Safety

Public Safety agencies can report field conditions, view dispatches and vehicle locations, and access real-time data, video, imagery, and campus/building plans and directories. The ability to combine so many sources into a single view gives First Responders a Comprehensive Operating Picture.

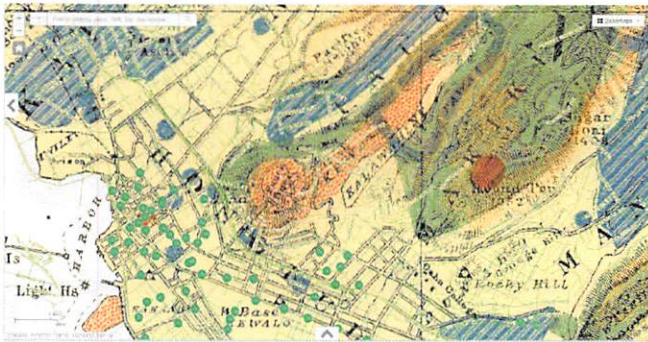*Fire Department Overtime Recall (Scheduling)*

Dept. of Emergency Services - Ambulance Dispatch+Campus Map

Comprehensive Geospatial Visualization and Analysis

Lōkahi offers an unusually rich selection of GIS Layers, with nearly 47,000 2-D layers at the beginning of 2019. Data governance becomes critical when managing large amounts of data, and DIT is creating a system based on the Amazon shopping model, where data from multiple providers can be curated, searched, and graded for quality. A master database catalogs the schema and metadata for layers, and scheduled tasks search servers for new or updated data sources.

All critical data sources, including most basemaps, are stored locally - ensuring continued operation should the City lose external network connectivity.

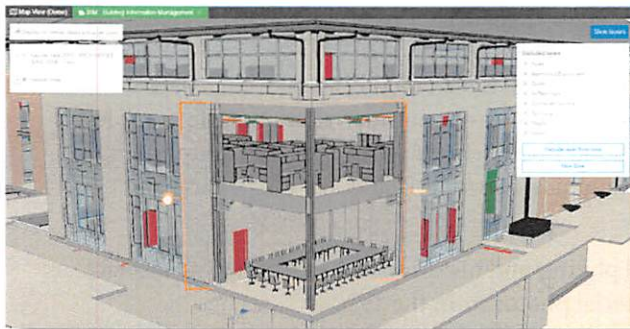*1902 Map with 2017 Bikeshare locations*

Adaptive Tools

Users can choose from a palette of tools to control data selection and viewing. Data can be combined in almost limitless ways, browsing either by category or by keyword. Drag-and-drop viewing of datasets and layers is supported, as well as powerful drawing tools.
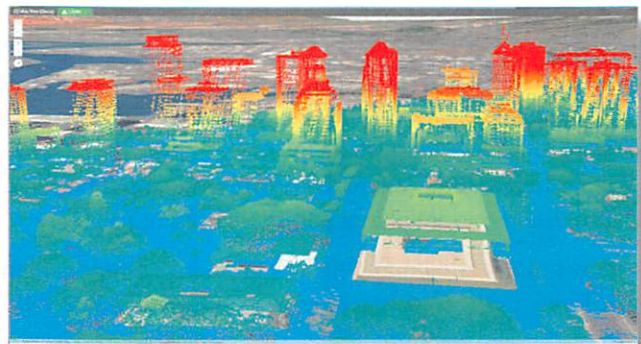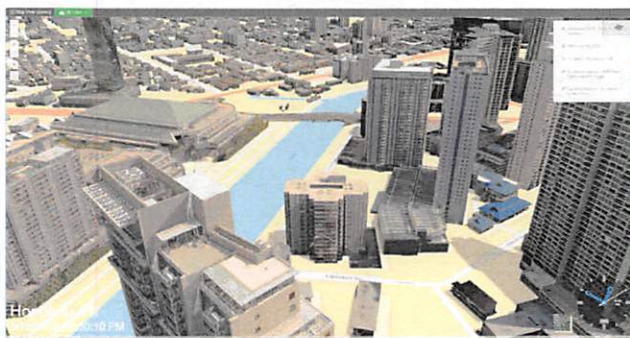

3-D Modeling

A variety of 3-D data sources are accessible with Lōkahi, enhancing the visualization of data. The City is adding more LIDAR sources for large areas like neighborhoods, and higher resolution data like street conditions. Newer standards like X3D are being integrated to allow browser viewing of 3-D .dwg and .rvt models.
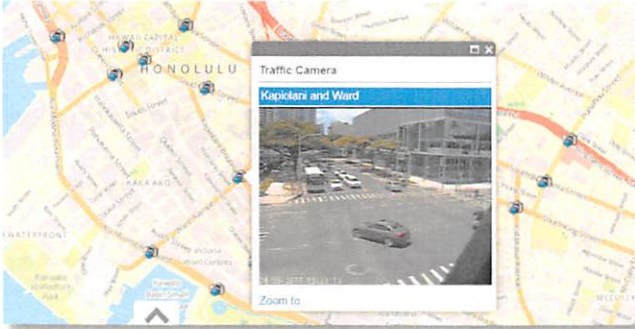

3-D CAD Modeling for Kapolei Hale

LIDAR Imaging

3-D Rendered Buildings in Waikiki

Waikiki under 10 feet of water
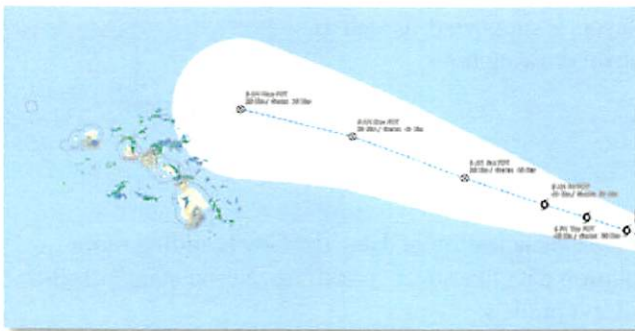
Real-Time Monitoring

Decision makers require accurate and timely data whether dealing with day-to-day business or an emergency situation. In the past, information was siloed in departmental systems or various external sites. Lōkahi can present this information in a consolidated view, eliminating the need to research multiple sources in order to determine a course of action. Real-Time data can come from sensors, cameras, database and GIS feeds, GPS, and the Internet-of-Things (IoT) like parking meters, smart street lights, and WiFi-enabled devices.
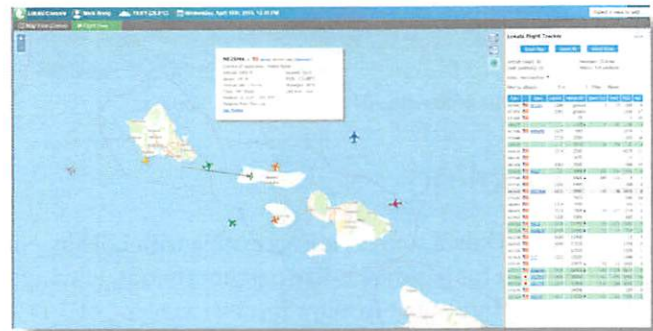

Traffic Camera at Kapiolani and Ward

Rail Lines and Stations, Bike Share, and Real-Time Bus and Traffic

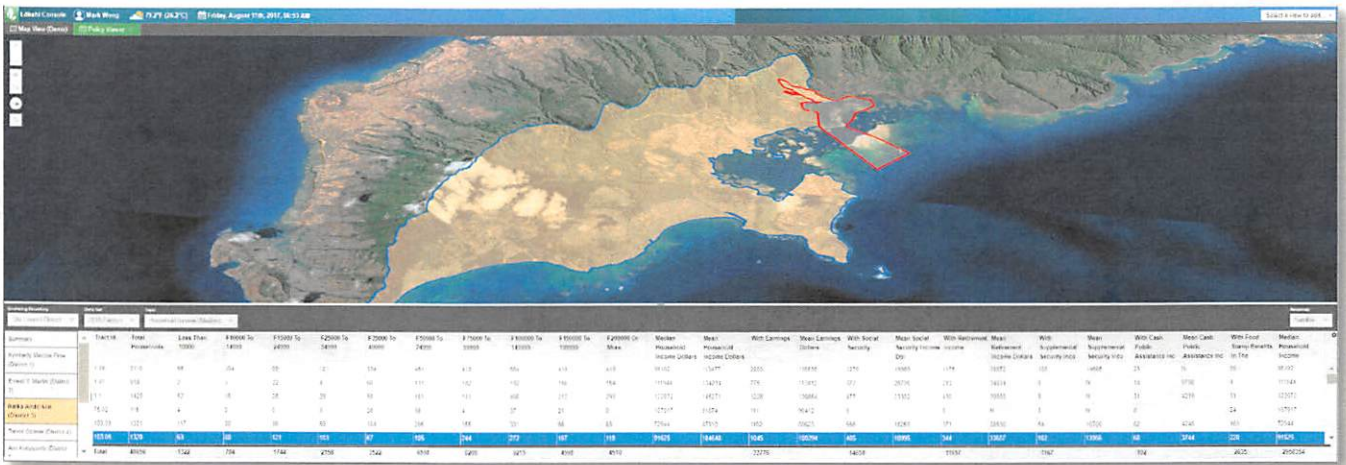*Weather Radar, Hurricane and Tropical Storm Forecasts*

Tracking of Aircraft over Hawaiian Air Space

Powerful Policy and Research Tools

For the first time, City policy makers can easily make sense of vast amounts of data. Lōkahi can take large datasets like the annual American Community Survey, IRS data, and agency statistics, and easily summarize at multiple break levels for any boundary like Council District, Census Block, or Neighborhood Board. There are over 22,000 unique demographic attributes in Lōkahi. Data is presented in both tabular and graphical format, 2D and 3D. Regression and Correlation functions are planned for the near future.

Land use and zoning maps, historical photos, building plans, aerial photos, and historical street maps are all available as basic layers in the Console. Maps date back to the late 1700's, and aerial photos from the 1920's.
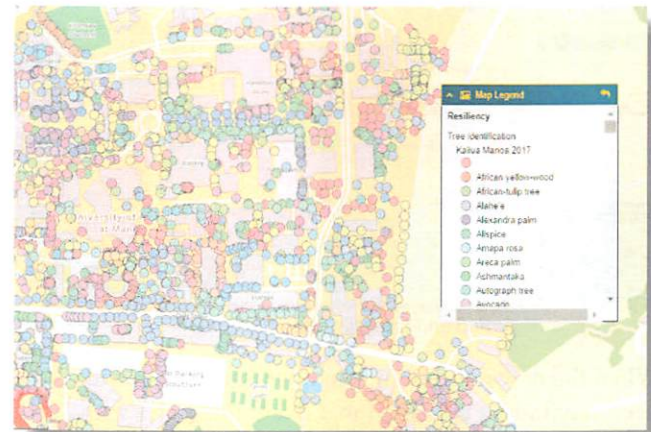

2015 Census Ancestry by Neighborhood Board and Census Tract - Tabular and 3D Map

Resiliency and Sustainability

As an island community, the City and County of Honolulu is especially concerned with sea levels, weather, erosion, supply chain, flora, fauna and external dependencies. Lōkahi has over 4,100 layers from the USGS, 3,497 from NOAA, and hundreds from the University of Hawaii, FEMA, and other governmental agencies. The layers all can be combined with tabular information, real-time, economic, and demographic data. One dataset of over 440,000 local businesses dates back to 1855.
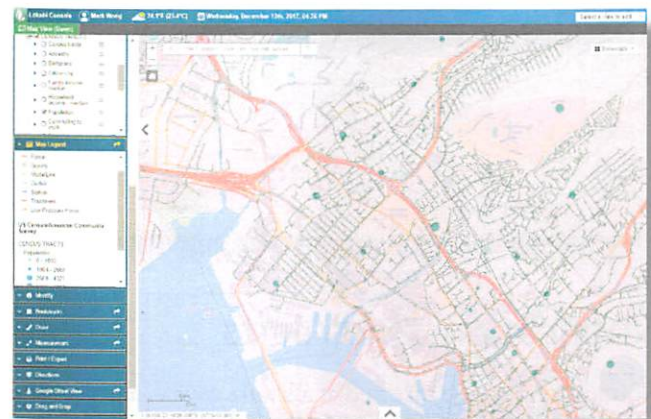

Solar Energy Projects vs. Sky Cover

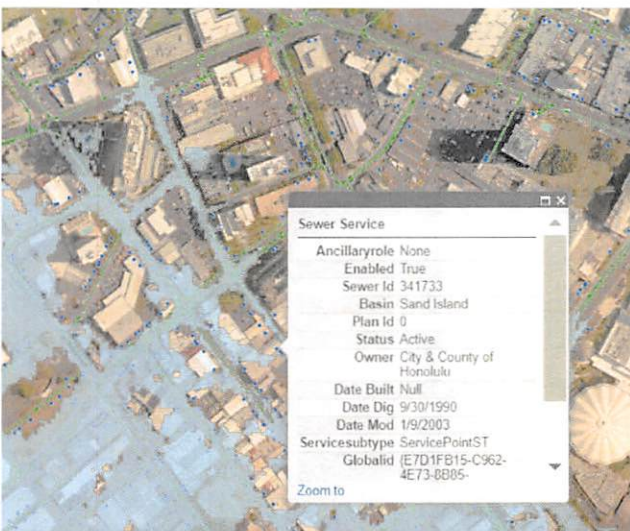*Tree Identification - UH Manoa Campus*

Assets and Infrastructure

Lōkahi provides tracking, scheduling, and lifecycle maintenance support for City assets, as well as critical infrastructure such as bridges, hospitals, clinics, airports, helipads, dams, shelters and supplies.
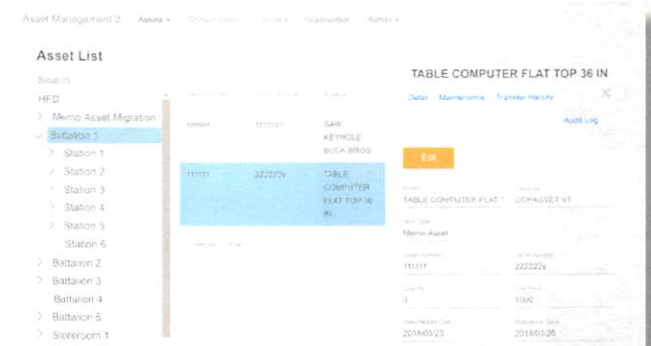
Planners, first responders, and emergency management have access to infrastructure details for water supply, storm water, wastewater, electric, gas, and fuel utilities. Lōkahi also has information on broadband, wireless networks, and broadcast media.

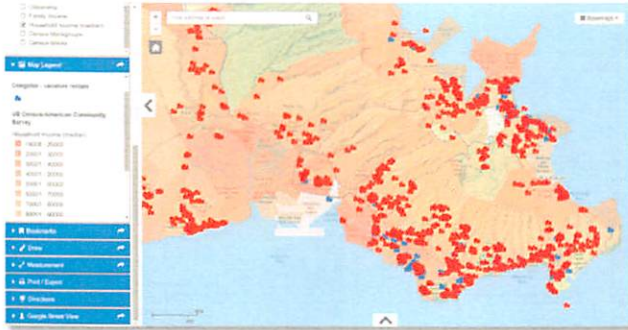*Sewer Mains vs. Population by Census Tract*

5 foot Sea Level Rise + Sewer Infrastructure
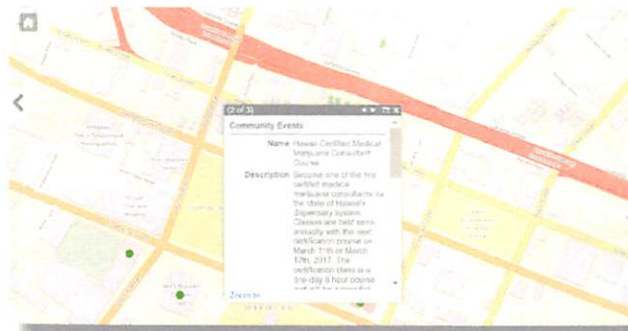

Enterprise Asset Management

Citizen Concerns

Lōkahi isn't designed just for City government, it also integrates needs of the community. Starting with the existing 3-1-1 reporting systems, citizen concerns are built into Map View.

AirBnB and Craigslist Vacation Rentals

When the new rail system is in operation, riders will need wayfinding information. Lōkahi integrates with Google Places, Yelp, Open Table, and other sites to store information about thousands of establishments on Oahu.
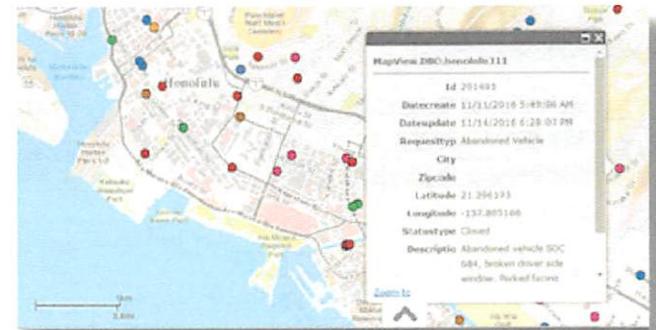

Community Events

Calendaring

The calendaring functions in Lōkahi provide a central repository for both City and community events. They also provide a more complete picture of activities which may be affected by City projects or emergency operations.
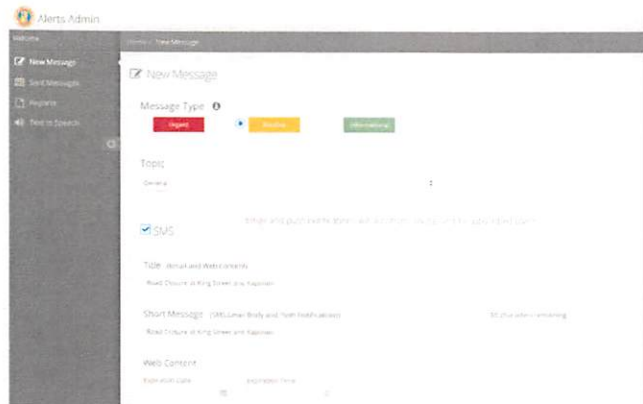
Video displays in City venues display meetings and events for a specific location, or of general interest.
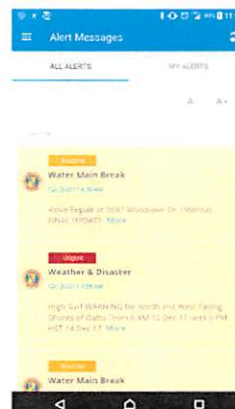

Community functionality is delivered through **hnl.info**, a subsystem which integrates calendaring, wayfinding, alerts and notifications, and online access to transactions with City agencies. Although much of the data in Lōkahi is sensitive, publicly-viewable data will be available on the City's data.honolulu.gov website.
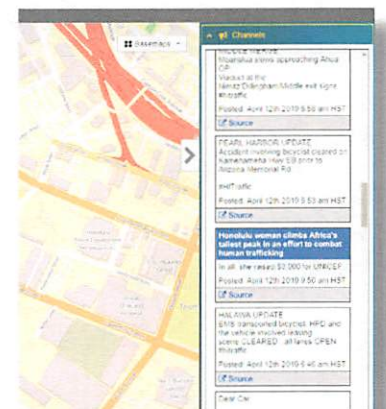
Notifications and Alerts

Notifications can be directed at a single device, a group of devices, subscribers by topic, or all devices. Messages can be sent manually from the Notifier Console or sent automatically when a threshold or event triggers an action. Messages can be sent via e-mail, SMS text messages, telephone, social media, or native notifications for mobile devices. Lōkahi can also display real-time alerts and news feeds in the Channels panel of the viewer.

Notification Console

HNL.info Android

Channels

State-of-the Art Development

Lōkahi was developed using only in-house programmers and analysts, and using leading-edge technology. In order to maintain a consistent and high level of competency the Department of Information Technology trains its staff with classroom and online training sessions and labs in the Honolulu Academy of Computer Knowledge (HACK).

Most sessions are planned and led by DIT employees. These HACK Sessions ensure that our developers keep abreast of the latest developments in a rapidly evolving industry. Sessions over the last six months have included Angular 4, Blockchain, MongoDB, NodeJS, PKI Architecture and Certificates, and RESTful API.

HACK Session

Document Management

The Department of Information Technology offers round-the-clock imaging services to City agencies, scanning large drawings and maps of virtually any size, boxes of files, bound books, and even 3-D objects. And once documents are archived digitally, agencies can use an industrial shredder to quickly destroy large quantities of sensitive printed material.

Large Document Imaging

Hyperscale Computing

A highly elastic and resilient computing platform supports Lōkahi. The HIperCloud system runs Linux, and can scale to tens of thousands of service containers running across multiple data centers with 100 gigabit/second connections. The system has over 700 CPUs as of August 2018. Our operations are staffed 24x7x52.

Hardware Development

DIT's in-house engineering staff allows it to develop custom hardware to integrate with Lōkahi. Notable projects include our self-service kiosks, display sequencing and synthesized speech systems, and a 71 megapixel E-size document capture system.
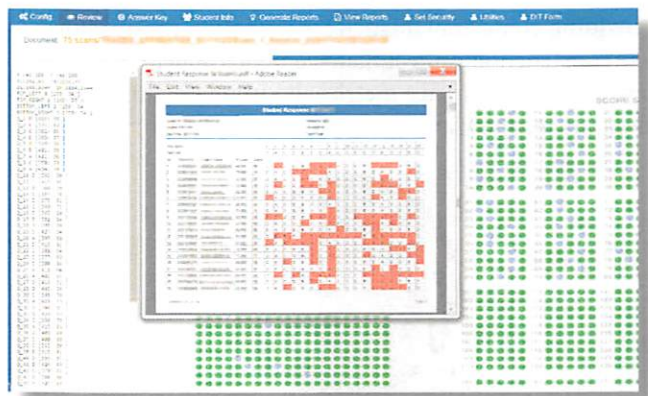

DIT-designed and built Kiosk

Training and Testing

A wide range of features s provided by Lōkahi for deploying online traning programs, polling and testing, scoring, and statistical reporting. Recent applications include online and mail-in elections, ethics training, online and optical mark testing, and job applicant testing.
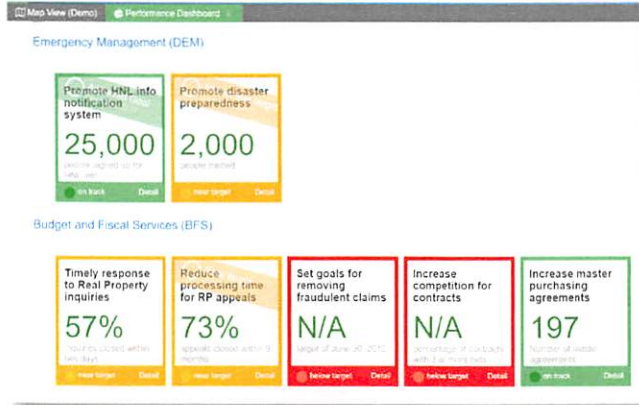
Lōkahi can support any application with internal and external identity management, providing user authentication, automated reminders, and compliance tracking.
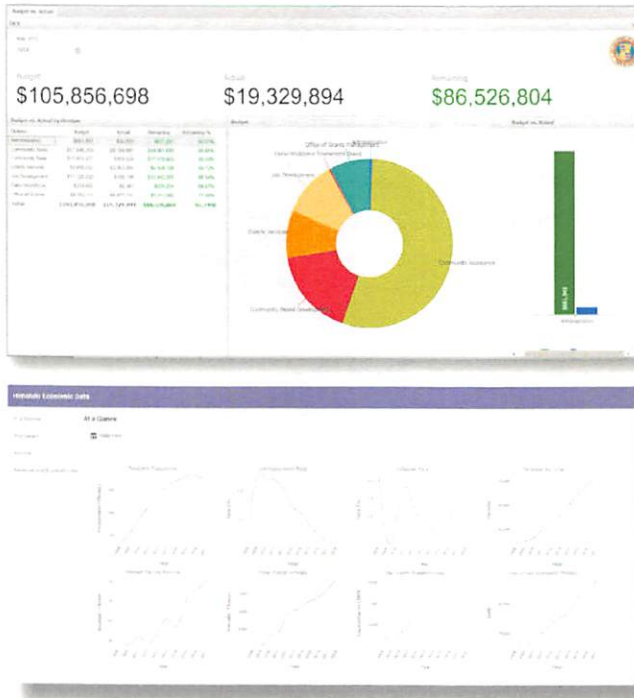

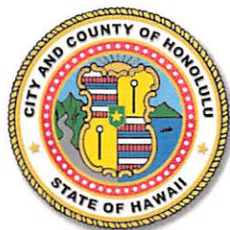*Scoring Optical Mark Recognition (OMR) Forms*

Performance Management

Lōkahi provides that framework to track and assess performance metrics.

Finance and Economy

$105,856,698 $19,329,894 $86,526,804

Lōkahi views can integrate with the City's ERP system, providing contextual financial information in workflows like construction project management, capacity planning, and performance metrics. It also maintains data about the economy.
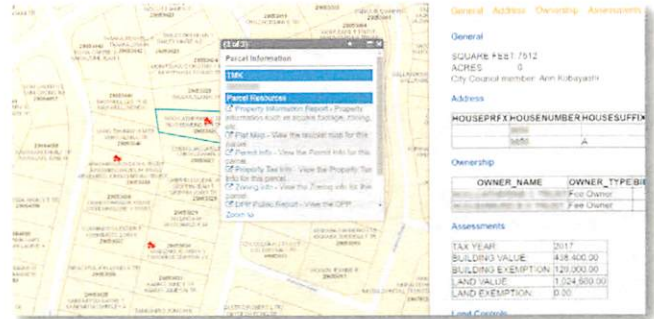
External Integration

Government IT often focuses on its own systems and overlooks the wealth of information kept in the private sector. Lōkahi has robots that can be taught to scour websites for information, and integrate the data into departmental processes. Listings, events, map data, and almost anything else can be ingested by Lōkahi, and it currently has integrations with companies like Google, Yelp, OpenTable, and EventBrite.

A user can view Airbnb listings with Real Property and Permitting information with just a few mouse clicks.

A Comprehensive Solution for the Future

Lōkahi is designed to take the City from legacy paper-centric systems to mobile devices and digital business-to-business connections. With its public-facing counterpart, HNL.info, Lōkahi promises to make City and County government more productive, responsive, and effective.

Asset Manager	AlohaQ scheduling	Neighborhood Board Elections	Performance Management
HFD Rank for Rank	HNL Alerts / HNL.info	DDC Projects	Ethics Online Training
daBus mobile app	DTS Street Permits	DPR Parks Management	Land Management
Enterprise Directory	DFM CityWorks interface	Motor Vehicle Registration	Combined 3-1-1 + DART
DHR OMR Testing	DEM EOC	Vacation Rental Tracking	High Speed Edge Analytics

City and County of Honolulu

As Good as IT Gets