Office of the City Auditor

City and County of
Honolulu
State of Hawai`i

Audit of the City's Information Technology Modernization, Services, and Support

Report to the Mayor
and the
City Council of Honolulu

Report No. 22-01
January 2022

Audit of the City's Information Technology Modernization, Services, and Support

A Report to the
Mayor
and the
City Council
of Honolulu

Submitted by

THE CITY AUDITOR
CITY AND COUNTY
OF HONOLULU
STATE OF HAWAI`I

Report No. 22-01
January 2022

OFFICE OF THE CITY AUDITOR
CITY AND COUNTY OF HONOLULU
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ARUSHI KUMAR
CITY AUDITOR

January 7, 2022

The Honorable Tommy Waters, Chair
and Members
Honolulu City Council
530 South King Street, Room 202
Honolulu, Hawai`i 96813

Dear Chair Waters and Councilmembers:

A copy of our audit report, *Audit of the City's Information Technology Modernization, Services, and Support*, is attached. This audit was initiated by the Office of the City Auditor pursuant to Section 3-502.1(c) of the Revised Charter of Honolulu and was included in the Office of the City Auditor's Annual Work Plan for FY 2021-22. The Office of the City Auditor determined this audit provided a timely opportunity to assess the department's modernization efforts, including benefits, performance, and improvements, and to evaluate technical support and services provided to city departments and the public.

The audit objectives were to:

1. Review the cost of modernization for IT systems, infrastructure, and other supporting projects during the time period of Fiscal Years 2013-2020;
2. Review the implementation of selected IT projects identified as annual priorities, including realized benefits, performance, and improvements; and
3. Review technical service and support of city department initiatives and requests for IT support and improvements, including meeting public expectations for IT-based city services.

Background

The Department of Information Technology (DIT) manages the city's information technology (IT) program, excluding those systems maintained by the Board of Water Supply and semi-autonomous agencies, and sets and enforces citywide technology and data security standards and policies. DIT also provides technical expertise in computer and communication technologies to all branches of city government through various processes including the Help Desk, Customer Service Representatives, and Requests for Service. Finally, DIT assists the mayor with promoting a technology industry in the City and County of Honolulu. In 2013, the city administration sought to modernize Honolulu's outdated IT infrastructure and streamline the city's website. Certain supporting infrastructure and key hardware and software had not been modernized for many years and lacked the necessary upgrades that were needed for supporting the city's IT services.

Audit Results

During the time period Fiscal Years 2013-2020, DIT performed much needed major modernization of the city's IT systems, infrastructure, and staff capabilities to provide appropriate current IT services; many longstanding projects, such as renovating the city's data center, upgrading the emergency radio system and supporting facilities, and upgrading the mainframe, were completed or near completion. However, the cost of major IT projects are incompletely reported, and therefore the department could not provide complete data on cost-effectiveness and savings associated with each IT project. Additionally, another important focus of this review was DIT's technical support of city department initiatives and requests for technical support, which have direct daily impact on city users' ability to perform their duties and serve the public. We found that support and service limitations in DIT have resulted in many department concerns and needs not being met or being significantly delayed; this may warrant a return to planning with departments to meet their needs.

The audit report made 13 recommendations to help the Department of Information Technology increase transparency, effectiveness, and accountability in providing IT support and services to City departments and the public.

The Director of the Department of Information Technology and the Managing Director mostly disagreed with the audit approach, findings, and examples. We did not make any significant amendments to the audit report as a result of management's response, but provided clarifying comments in the Management Response section of the report and made technical, non-substantive changes for purposes of accuracy, clarity, and style.

We would like to express our sincere appreciation for the cooperation and assistance provided us by the managers and staff of the Department of Information Technology and many others we contacted for this audit. We are available to meet with you and your staff to discuss this report and to provide more information. If you have any questions, please call me at 768-3134.

Sincerely,

Arushi Kumar

Arushi Kumar
City Auditor

c: Rick Blangiardi, Mayor
Michael D. Formby, Managing Director
Mark Wong, Director, Department of Information Technology
Andrew Kawano, Director, Department of Budget and Fiscal Services

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Background

Introduction

This audit was self-initiated by the Office of the City Auditor pursuant to Section 3-502.1(c) of the Revised Charter of the Honolulu. The auditors reviewed the Department of Information Technology's (DIT) efforts from 2013-2020 to modernize the city's information technology (IT), support departmental initiatives and efforts, and meet user and public needs for IT-based city services to see if they were cost- and time-effective and resulted in benefits to services and other improvements. While DIT performed a much needed major IT modernization of the city's IT systems, infrastructure, and staff capabilities to provide appropriate current IT services, an important focus of the review was over DIT's technical support of city department initiatives and requests for technical support, which have direct daily impact on city users' ability to perform their duties and serve the public.

Background

In 2013, the city administration sought to modernize Honolulu's outdated IT infrastructure and streamline the city's website. Certain supporting infrastructure and key hardware and software had not been modernized for many years and lacked the necessary upgrades that were needed for supporting the city's IT services. Many of the systems were written in old programming language and were costly and hard to maintain. With a rise in retirements, there were concerns the system would start to fail and the problems could not be immediately solved. Therefore, DIT took an aggressive approach to modernize the city's IT services and address rising concerns.

The campaign to modernize and improve city IT services has included re-visioning the department's roles in bringing about necessary changes and improvements and taking on an innovative mindset. DIT prioritized in-house development initiatives, which included its own training and research to introduce the latest technologies and develop staff IT skills. The current director has focused on developing in-house applications where possible, placing less reliance on the purchase of vendor IT solutions and services, and instead creating more IT applications and services in-house. The department has focused on solving problems that are costly and highly visible, including eliminating costly legacy technologies, to save money and allow the city to spend on other key areas. The department has also focused on better

use of data and applications to meet citywide and agency needs, and solutions to provide support and services to city department, agencies, and the public.

Department of Information Technology

Overview

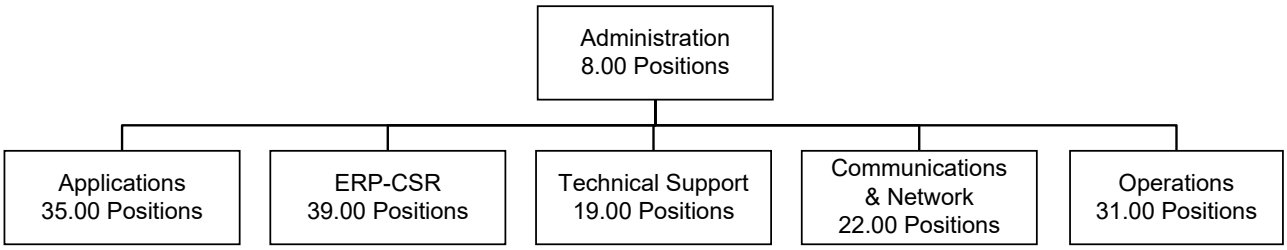
The Department of Information Technology (DIT) manages the city's information technology program, excluding those systems maintained by the Board of Water Supply and semi-autonomous agencies. DIT sets and enforces citywide technology and data security standards and policies. In addition, the department provides technical expertise in computer and communication technologies to all branches of city government and assists the mayor with promoting a technology industry in the City and County of Honolulu.

The department is headed by an administration and divided into five divisions: Applications, Enterprise Resource Planning and Customer Service Representatives, Technical Support, Radio & Network Infrastructure, and Operations.

Administration and the director

The administration manages and directs the department's administrative policies, procedures, and plans. The administration is responsible for operating information systems, providing technical expertise in information systems/technology, assisting the managing director in management information analysis and evaluation, advising the mayor on IT matters, providing objective third-party guidance in the selection of technologies for all city departments, chairing the Public Safety Oversight Committee and facilitating an integrated approach to technology deployment in the area of public safety, and performing other duties as may be required by law.

Exhibit 1.1
Organizational Chart – Department of Information Technology

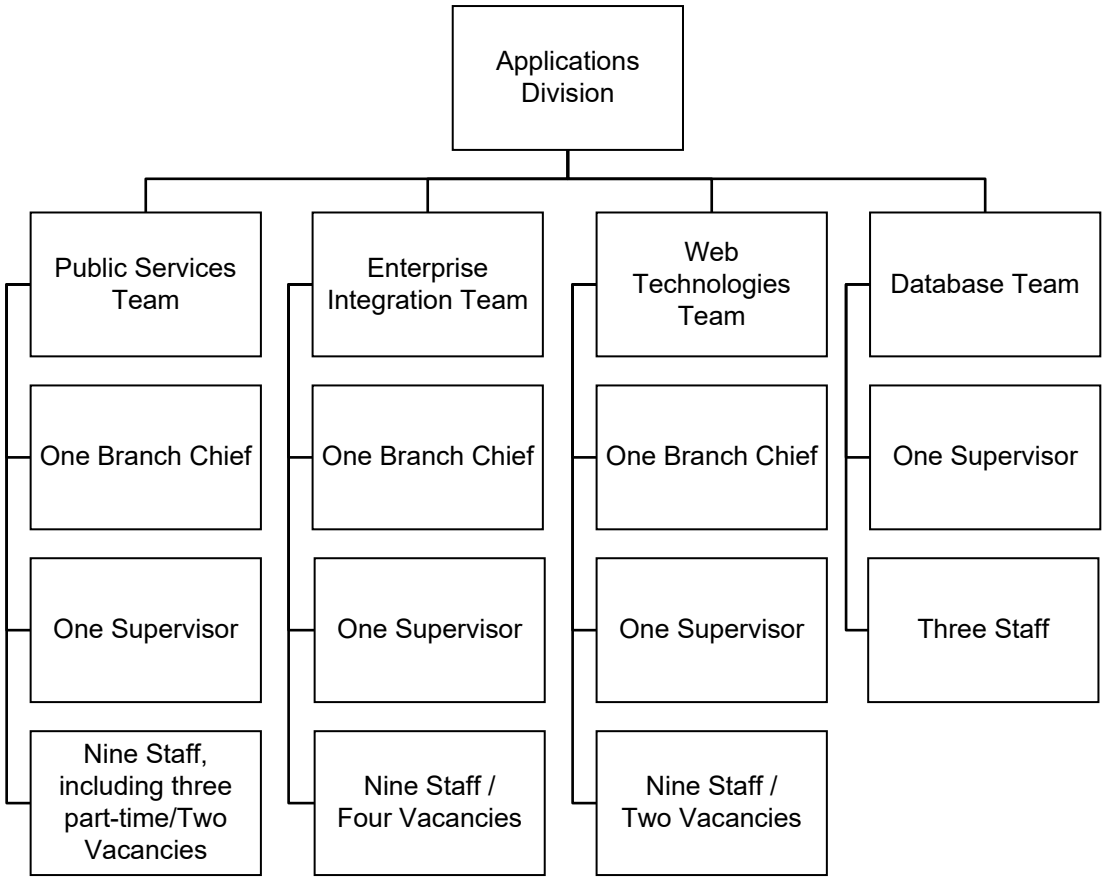


Source: Department of Information Technology

Applications Division

The Applications Division performs the full range of computer systems development including feasibility studies; Request for Proposals and Request for Bids development; systems analysis and design, and computer programming; systems testing, personnel training, and detailed documentation of the developed systems; maintaining implemented systems both developed in-house and acquired; providing consulting services to end users; digital data management; assisting the user department to plan and coordinate technology goals in line with enterprise-wide technology objectives; and coordination between the user department and DIT as it relates to the deployment of technology.

Exhibit 1.2
Applications Division Organizational Chart

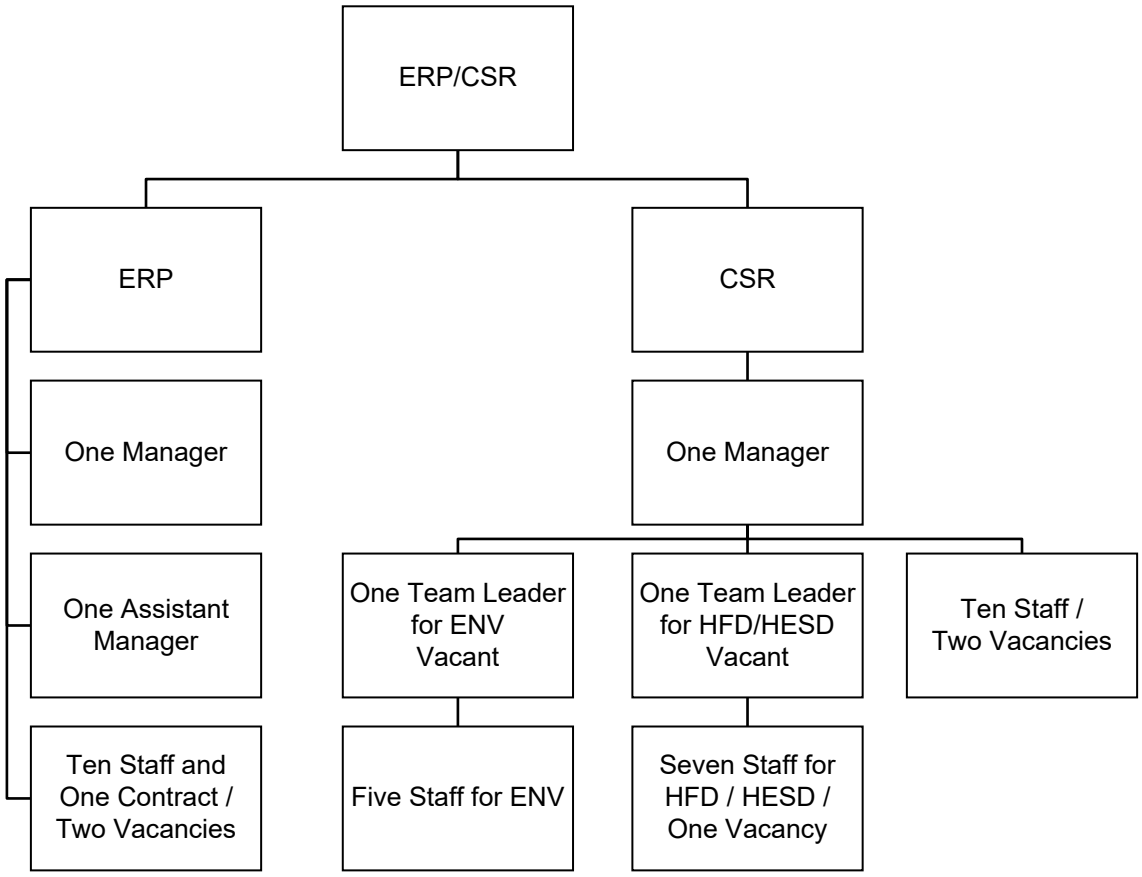


Source: Department of Information Technology

ERP – CSR Division

The Enterprise Resource Planning (ERP) and Customer Service Representative (CSR) Division provides data processing support for the citywide ERP financial management system and integration into the user agency's workflow processes in the city; conducts evaluations of user agency needs, provides technology support services, designs and develops automated systems and procedures, assists in developing plans and obtaining approvals, and implements the city's technology plans with regards to the ERP financial management system and other related automated systems. Each agency within the city has a CSR to support the IT needs of that department and its end-users.

Exhibit 1.3
ERP – CSR Division Organizational Chart



Source: Department of Information Technology

Technical Support, Radio and Network Infrastructure, and Operations Divisions

Technical Support – Plans, installs, administers, and maintains systems software for the mainframe and midrange computers. The division also supports and controls the servers, communications networks, and storage area networks. Responsibilities also include protection, security, and integrity of the city's information resources. Security-related functions include enforcing policies and procedures in monitoring and preventing attacks on the city's information system.

Radio and Network Infrastructure – Serves as the infrastructure support division for first responder communications including the wired and wireless city networks, radio, microwave, 800 MHz, P25, Voice over Internet Protocol, video conferencing and related

systems; responsible for the management of related technology and facilities, including buildings and towers; and oversees all security access, both physical and digital, to the various technology systems supported by DIT.

Operations - Plans, administers and coordinates the DIT central and backup computer systems, including mainframes, servers, centralized printers, scanners and data entry devices; develops and maintains monetary and document controls to ensure accuracy of processed data; develops computer schedules, routes documents and reports to and from users; provides the initial phase of troubleshooting and incident categorization; monitors security access and camera alarm systems for key radio and microwave sites; communicates both critical and routine technology updates in a timely manner; coordinates software and hardware changes with user agencies; provides diagnostic services on telecommunications and computer networks; acts as network controller by coordinating installation and de-installation of operations center based equipment; supports the Emergency Operations Center, providing key direction and technical advice to city agencies during a disaster; and coordinates plans and activities for data and system recovery within DIT in the event of a disaster.

Staffing

Department positions have remained consistent from 2013-2020 with total positions ranging between the lowest at 151.0 in FY 2015 to the highest at 155.0 in FY 2017.

Exhibit 1.4
Staffing of Departmental Divisions, FY 2013-2020

Year	*Admin*	*Applications*	*ERP-CSR*	*Technical Support*	*Radio & Network*	*Operations*	*Total*
2013	8.0	35.0	37.0	22.0	18.0	32.0	152.0
2014	8.0	35.0	39.0	22.0	18.0	32.0	154.0
2015	8.0	35.0	39.0	22.0	17.0	30.0	151.0
2016	8.0	39.0	39.0	22.0	17.0	31.0	153.0
2017	8.0	37.0	39.0	23.0	17.0	31.0	155.0
2018	8.0	35.0	39.0	19.0	22.0	31.0	154.0
2019	8.0	35.0	39.0	19.0	22.0	31.0	154.0
2020	8.0	35.0	39.0	19.0	22.0	31.0	154.0

Source: Department of Information Technology

In FY 2013, the Applications Division had significant vacancies with almost one-quarter of division positions needing to be filled. By FY 2020, the vacancy rate had declined to 14 percent. The division was provided with 35 positions for staff during most of FY2013-2020. There was a temporary increase in positions in FY 2016 (39) and FY 2017 (37) that led to the highest staffing of the division, but this was short lived.

Exhibit 1.5
Applications Division Staffing, FY2013-2020

Fiscal Year	*# of Positions*	*Vacancies*	*FTE*	*Vacancy Rate*
2013	35.0	8.5	26.5	24%
2014	35.0	8.5	26.5	24%
2015	35.0	7.0	28.0	20%
2016	39.0	5.0	34.0	13%
2017	37.0	6.0	31.0	16%
2018	35.0	6.5	28.5	19%
2019	35.0	6.5	28.5	19%
2020	35.0	5.0	30.0	14%

Source: Department of Information Technology

Since FY 2014, ERP-CSR Division has been comprised of 39 FTE. It has reduced its overall vacancy rate from 19 percent in 2013 to 5 percent in 2020.

Exhibit 1.6
ERP-CSR Division Staffing, FY 2013-2020

Fiscal Year	*# of Positions*	*Vacancies*	*FTE*	*Vacancy Rate*
2013	37	7	30	19%
2014	39	7	32	18%
2015	39	2	37	5%
2016	39	2	37	5%
2017	39	2	37	5%
2018	39	3	36	8%
2019	39	3	36	8%
2020	39	2	37	5%

Source: Department of Information Technology

Budget

Since FY 2013, the total expenditures for DIT have increased. From FY 2013-2019, annual expenditures have been between $17-21 million. For FY 2020, department expenditures were $29,557,231, an increase attributed to a C2HERPS upgrade of $7.5 million .

Exhibit 1.7
Budget for Department, FY2013-2020

Fiscal Year	*Salaries*	*Current Expenses*	*Equipment*	*Total Expenditures*
2013	$7,558,733	$9,352,663	$263,497	$17,174,893
2014	$8,091,928	$12,791,054	$174,523	$21,057,505
2015	$8,777,988	$12,869,722	$290,380	$21,938,090
2016	$9,095,258	$10,391,272	$581,859	$20,068,389
2017	$9,105,773	$11,328,772	$1,078,311	$21,512,856
2018	$9,512,251	$10,753,164	$1,088,020	$21,353,435
2019	$9,747,747	$10,778,437	$665,195	$21,191,379
2020	$10,146,045	$17,260,232	$2,150,954	$29,557,231
Totals	$72,035,723	$95,525,316	$6,292,739	$173,853,778

Source: Departments of Budget and Fiscal Services and Information Technology

Department's IT Support Roles

Planning support

The DIT director has the responsibility for developing the city's long-range IT-related plans, goals, and objectives, as well as measures for their achievement. The director must ensure that all plans are consistent with, and supportive of, the stated needs of the various departments. The director is also tasked with advising and assisting departments in preparing long and short-range plans for using IT within their departments, as well as procuring and implementing computer applications that support the needs of city agencies and departments. DIT also must evaluate each city agency's IT plans and service requests for technical feasibility and impact on DIT's resources.

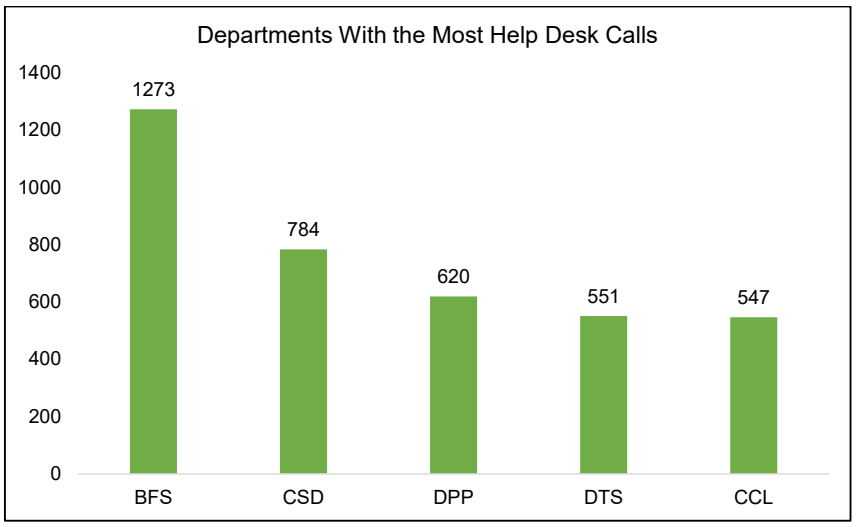
Department direct IT support roles

The department provides IT services to the mayor and city agencies so that city government can serve the public in a cost-effective and efficient manner. Three key direct IT support roles include Help Desk support, CSR support, and Request for Service (RFS) support.

Help Desk for desktop support

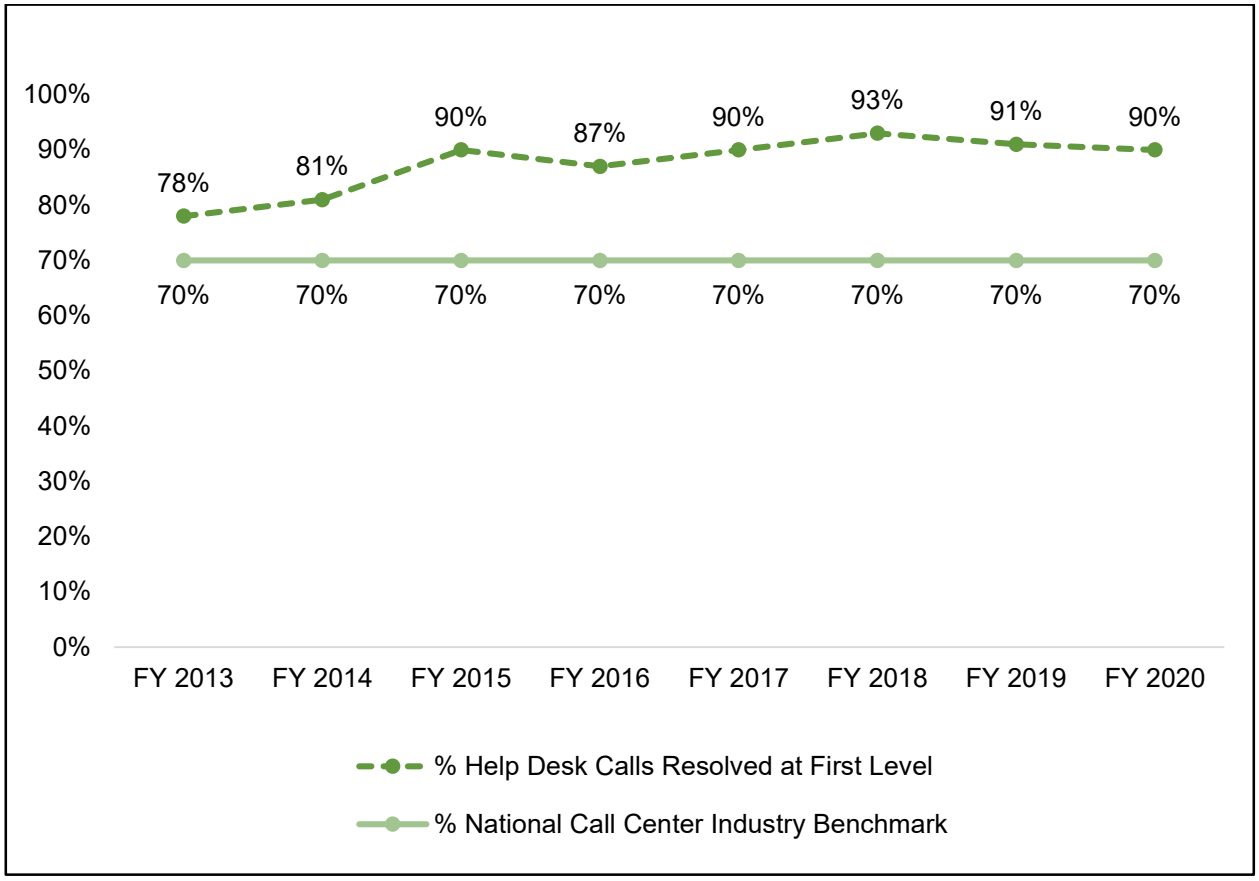
The Help Desk is maintained by the Operations Division. Since 2013, the percent of Help Desk Calls resolved at First Level, which is a problem that can be resolved directly by the Help Desk, has been above the national call center benchmark of 70 percent, and it has significantly improved since FY 2013. The most common calls for help relate to Microsoft office products, virtual private network (VPN) and access from home, desktop and laptop issues, printer issues, and password reset. The Help Desk is available to all city departments and agencies.

Exhibit 1.8
Department Help Desk Calls



Source: Department of Information Technology

Exhibit 1.9
Percent of Help Desk Calls Resolved at First Level, FY 2013-2020



Source: Department of Information Technology

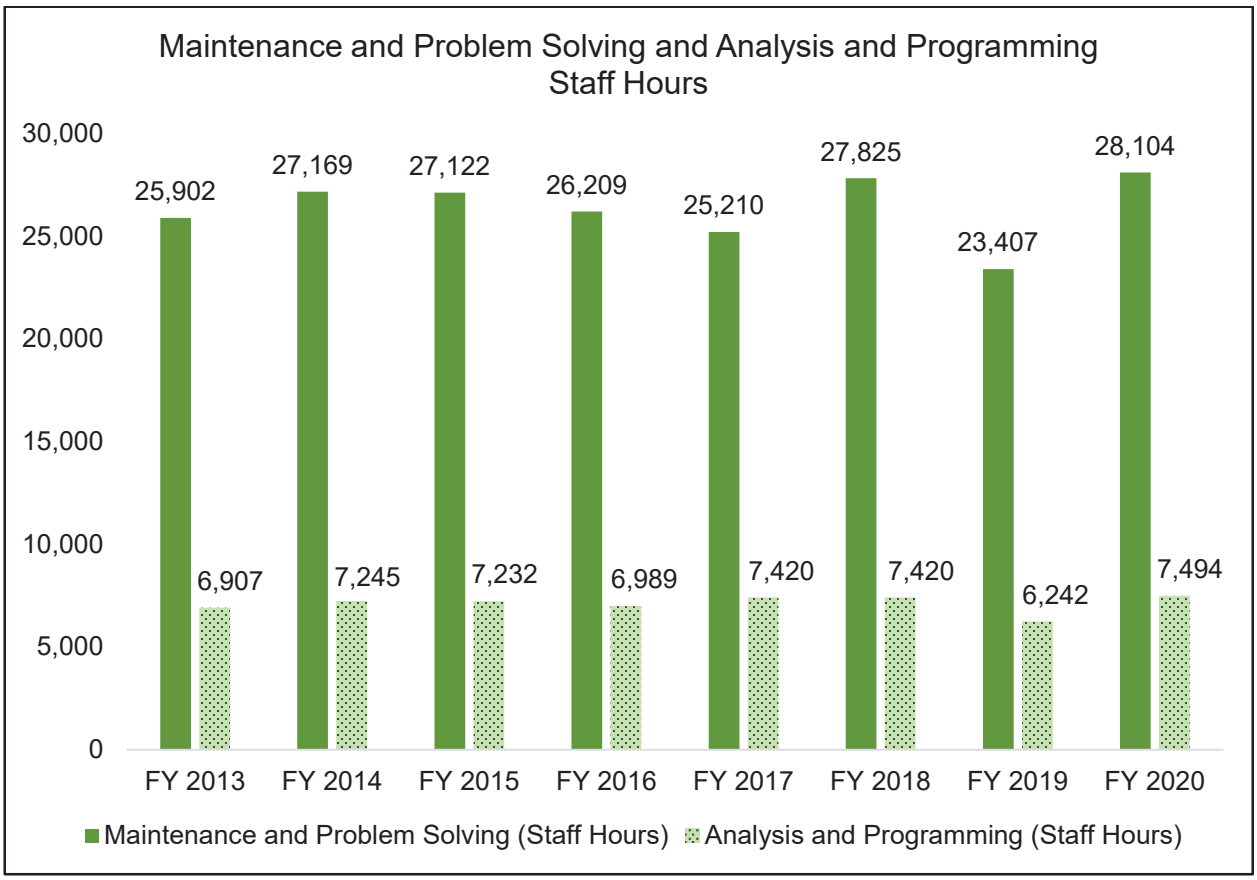
According to DIT, the high percentage of First Level response can be attributed to technicians' knowledge for troubleshooting various issues. Technicians are assigned to specific city agencies, which allows them to become familiar with the network connections, hardware devices, and software applications used by specific city agencies and department, thus increasing the likelihood of First Level response. DIT also reports a reduction of problems since implementing monitoring systems that check and host services, which has enabled technicians to focus attention on desktop support.

Customer Service Representative

Each city agency has a Customer Service Representative (CSR) to support the IT needs of that agency and its end users. The CSRs assist with maintenance, problem solving, analysis, and

programming. The exhibit below identifies the staff resources allocated to these functions.

Exhibit 1.10
CSR Maintenance, Problem Solving, Analysis, and Programming, FY 2013-2020



Source: Department of Information Technology

While there was an increase from FY 2013 to FY 2015, annual staff maintenance and problem solving hours have generally varied since FY 2016. The division reported that the overall trends in maintenance and problem solving have occurred due to a decreased number of division staff.

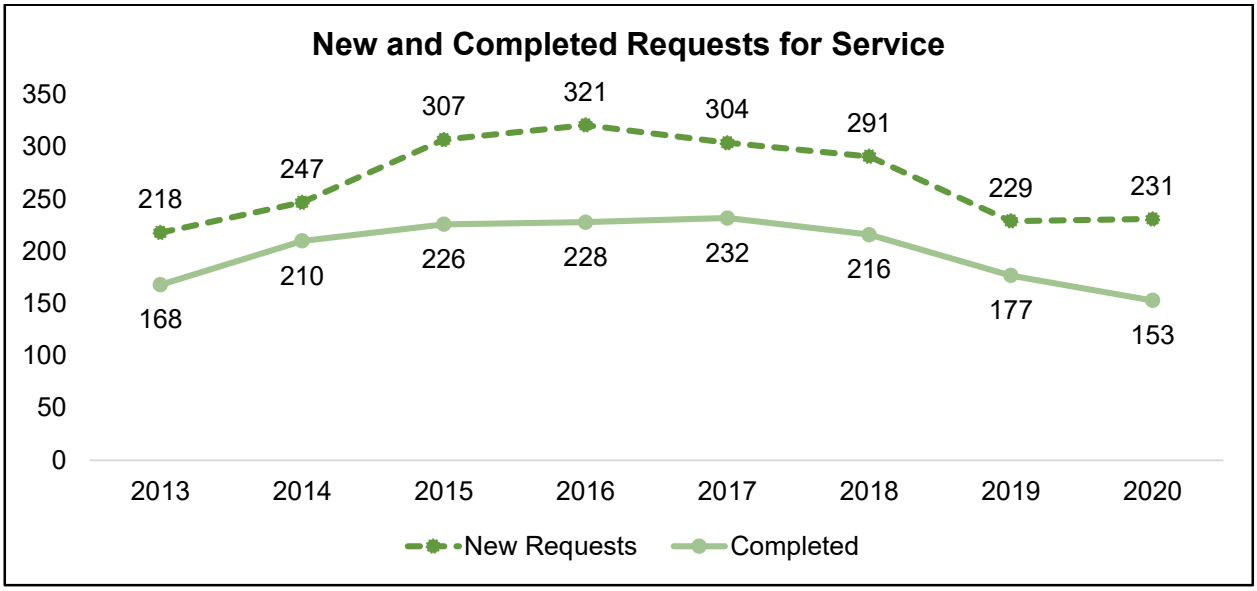
Requests for Service (RFS) support

Requests for Service (RFS) are requests that various departments submit to DIT, usually to the Applications Division, for service. A request can be sent either internally within DIT or externally

from another city agency. After receiving an RFS, DIT routes service requests to the appropriate division, which is usually Applications. If approved, it is routed for servicing and completion of the request.

Starting in FY 2013, the number of RFSs reached over 200, more than double from the previous year (96). By the end of FY 2015, the number of RFSs were over 300. DIT attributes this spike in requests to a time period when DIT was working towards a new and more secure infrastructure. The number of requests has since decreased and stabilized around 230 per year. With the past increases in RFS, there have been a number of requests outstanding at the end of each year. In recent years, the amount completed has not exceeded the volume of new requests.

Exhibit 1.11
2013-2020 Requests for Service Information



Source: Department of Information Technology

Audit Objectives, Scope and Methodology

The objectives of this audit were to:

1. Review the cost of modernization for IT systems, infrastructure, and other supporting projects during the time period, FY2013-2020;

2. Review the implementation of selected IT projects identified as annual priorities, including realized benefits, performance, and improvements; and

3. Review technical service and support of city department initiatives and requests for IT support and improvements, including meeting public expectations for IT-based city services.

To complete this audit, we reviewed the department's attempt to modernize city IT and services during calendar years 2013 through 2020. We also reviewed selected services and support provided by the department to other agencies and the public. We identified and reviewed department policies and procedures, functional statements, roles and responsibilities, ordinances, laws and the city charter, and other sources of information that provided insight into key department functions and processes, and guidance for support and service roles. We also reviewed management internal control objectives and responsibilities, quality and cost control initiatives, and improvement efforts implemented by the department as they related to our audit objectives

For purposes of this audit, we assessed the adequacy and sufficiency of information and data pertaining to project costs, their completion, benefits; department needs for IT service and support; service requests; individually and in general, using professional judgment and reasonableness in review of meeting compliance, criteria, or management objectives. This review was criteria-based and focused on the resulting impacts and outcomes of the department's efforts to modernize city IT technology and support and serve other departments and the public. We did not apply expert technical IT standards for making these assessments, or review any discretionary decisions made on these bases.

We identified and reviewed selected department IT modernization projects to determine their costs, benefits, performance, and improvements. We identified them from annual budgetary requests submitted by DIT, and reviewed costs and other project information provided by DIT. We reviewed the use of in-house development as an approach to deliver services and support, and as a cost-savings measure. When possible, we compared cost savings there were by completing IT projects in house as opposed to purchasing off the shelf software for a third-party vendor. We then reviewed how cost savings were applied to or facilitated other IT projects. We compared approaches taken with other modernization efforts taken in a similar jurisdiction to review reasons for modernization, transparency about efforts and results,

setting of benefits and performance criteria, and servicing other departments and the public.

We reviewed how DIT supports and serves other city agencies, such as through the Help Desk, CSRs, and Requests for Services (RFS). We reviewed major areas of responsibility for providing services to departments, staffing impacts, expectations of service and service level provided, and how they may affect the support and service of city agencies.

We developed questionnaires to city and county agencies asking about their interactions with DIT, the level of support they needed for their IT initiatives, and what kind of IT services and support DIT and third-party vendors provide. We reviewed their reasons for deciding to seek IT software from DIT or third-party vendors. We asked about DIT support of projects, initiatives, and efforts to improve efficiency and effectiveness using IT solutions. We received completed questionnaires from all departments, including divisions of selected departments, and analyzed the results. We sent follow-up questions to the agencies, and interviewed members of the department's management, supervisors, and other staff to obtain a better understanding of the needs and concerns listed in their initial questionnaire. We also assessed the costs and support impact that departments face when DIT is not capable of fulfilling their IT needs. We evaluated the role of planning in supporting and serving other department's IT needs, concerns, and issues.

We sent questionnaires to all department CSRs to review their support and service of their assigned agencies, their service responsibilities, and observations about their support role. We received 64 percent of the questionnaires back. We inquired about the support level provided, how many agencies they served, and kind of services requested or required. We assessed effectiveness factors such as how long CSRs had been with the CSR team and how long they had been fulfilling the IT services of the agency or agencies they had been assigned to, and service continuity issues for the served departments. We asked them about their interactions with agencies, their roles in initiatives, projects, and planning to meet IT needs. We asked them about the impact of their service and support, including positive and negative experiences.

We reviewed a statistically valid random sample of Requests for Services (RFS) sent by city agencies to the Applications Division of DIT for FY 2018, 2019, and 2020. We reviewed a sample of 87 requests from calendar years 2018 through 2020. This sample

was derived from a statistically valid random sample based on the total complaint counts for these years, using a 90 percent confidence interval.

We reviewed what agencies sent those requests, the nature of the requests, and when they were completed. We reviewed the internal and external review request for service processes, including information about the process, such as initiation, approval, monitoring, and completing requests. We reviewed whether DIT was able to meet the dates the agency wanted the service to be completed by. We reviewed how long it took DIT to complete these requests, and if late, how long it took DIT to complete the requests after the estimated date of completion passed. We considered management practices and approaches to manage request processes.

Prior OCA Audits

The Office of the City Auditor conducted three prior audits concerning DIT. However, none of the previous audit findings or recommendations were relevant to the objectives in this audit. The three prior audits for informational purposes only are:

- Audit Report 06-01, Audit of Selected Information Technology Controls;
- Audit Report 11-01, Audit of the Honolulu Police Department's Utilization of the 800 Megahertz Telecommunications System; and
- Audit Report 16-04, Audit of the City's Information Security and Risk Management Program.

This audit was performed in accordance with generally accepted government auditing standards from April 2021 to November 2021. These standards require that we plan and perform the audit to obtain sufficient and appropriate evidence to prove a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Audit Results

Modernization efforts have progressed well, but more planning is needed to better focus on ways that the department can service other departments and the public. There has been significant progress in modernization. Many longstanding projects, such as

renovating the city's data center, upgrading the emergency radio system and supporting facilities, and upgrading the mainframe, provide a stable foundation for modern IT support and services.

Cost of recent modernization and major IT project efforts are incompletely reported. Better reporting is needed about project costs, cost effectiveness, and savings. The department has prioritized in-house development and support of systems and projects as a cost savings and efficiency measure. Apart from IT purchases, we found that the department is not reporting on the full project costs that it considers for supporting decision making about selection of IT projects to develop, support, and maintain in house. This reporting is also needed to demonstrate the cost effectiveness and cost savings realized from IT modernization and other priority IT project efforts. We found that the department can estimate, evaluate and review full project costs to support decision making about selection of IT projects to develop, support, and maintain in house. This reporting would help policymakers to better understand the costs and resources required to develop, support and service IT projects, and aid user agencies in vendor purchasing decisions. This would also enhance evaluation of resources required to support and service IT projects.

There is a need moving forward to shift focus to better address support and service department and public IT needs. While the department does thoughtfully plot and plan its overall course for major IT projects and efforts, current support and service limitations have resulted in many concerns and needs not being prioritized or met and warrant a return to planning with departments to meet their needs. More planning and prioritization of service and support is needed to effectively address customer departments' needs for services and support. Due to current staffing and resources, current services and support are affected by CSR coverage and continuity, slow completion of requests for service, and decreased planning to meet other department needs and priorities.

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Chapter 2

Modernization Efforts Have Progressed Well, but More Planning Is Needed for Responsive Efforts Going Forward

Modernization efforts have progressed well, but more planning is needed to better focus on ways that the department can service other departments and the public. There has been significant progress in modernization. Many longstanding projects like renovating the city's data center, upgrading the emergency radio system and supporting facilities, upgrading the mainframe provide a stable foundation for modern IT support and services.

However, cost of recent modernization and major IT project efforts are incompletely reported. Better reporting is needed about project costs, cost effectiveness, and savings. Apart from IT purchases, we found that the department is not reporting on the full project costs that it considers for supporting decision making about selection of IT projects to develop, support, and maintain. The department provided us with information on several vendor system and solution replacements that were replaced by DIT in house solutions. It defines cost savings as costs it no longer pays to vendors or for replaced systems. The department does have the information on the costs to develop, support, and maintain its own projects, but has not reported on them. This reporting is needed to demonstrate the comparative cost effectiveness and cost savings realized from IT modernization and other priority IT project efforts. This would also help policymakers to better understand the costs and resources required to develop, support, and service IT projects, and aid user agencies in vendor purchasing decisions. This would also enable evaluation of resources required to support and service IT projects.

There is a need to shift focus moving forward to better address support and service department and public IT needs. While the department does thoughtfully plan its overall course for major IT projects and efforts, a return to planning with departments to meet their needs is warranted in light of current support and service limitations, which have resulted in many concerns and needs not being prioritized or met. More planning and prioritization of service and support is needed to effectively address customer departments' needs for support and services. Evaluations with departments to assess and review if IT systems are meeting needs are also necessary.

Background

Since 2005, DIT has engaged in an ambitious program of modernization to transform and modernize the city's IT systems and key supporting infrastructure to improve IT support of city operations and public service. A former department director reported that an independent study conducted during the Hannemann administration concluded that the city's IT had been underfunded by at least $100 million in the preceding five years. Since that time, many efforts in different IT areas have been made, including major continuing efforts to improve legacy IT systems and applications, the public safety radio system and supporting facilities, and the city's data center. These were intended to address significant challenges concerning these important systems and infrastructure. A summary of selected issues is provided for background, as these are the largest recent modernization cost items.

800 MHz radio system ($16.9 million). While interoperable and stable, the city was facing the end of life of its 800 MHz system in 2010, which is critical to the communication needs of the police department in promoting public safety and for enabling communications between first responder agencies in the event of emergencies. A new radio system needed to be purchased. It also needed to address physical, security, and environmental challenges concerning its supporting radio sites, facilities, and towers, which could be vulnerable to disruption.

City data center ($4.6 million). Over fifteen years, efforts were made to address issues with the city's aging primary data center, including improvements to resolve physical and environmental control issues (e.g., water intrusion, fire suppression, physical access control, power and cooling issues). These led to the construction of a new state-of-the-art data center, and improved use of the space to support other DIT operations (e.g., computer operations, service center, printing and scanning).

Image Source: Department of Information Technology

Legacy software. The city had successfully implemented its enterprise resource planning system (CH2ERPS) to replace its legacy financial system for $10 million. It still had an assortment of legacy software running in its mainframe environment (e.g., motor vehicle registration, driver's license), which also support statewide systems. The department was challenged by changing requirements that could not be addressed due to the difficulty with modifying the older programs. Costs for legacy software were increasing, and it is more difficult to maintain (e.g., older programming language, staff retirements). The estimated costs for acquiring legacy system replacements were also prohibitive (e.g., $40-60 million for motor vehicle registration).

There are longstanding policy objectives and priorities to improve the delivery of city services

Mayor's Directive 06-02 is the current city policy on information technology services. In order to meet the general strategy of enabling the city to best manage all of its IT resources, this policy identifies the following items to improve the delivery of city services include (in relevant part):

- Improve the underlying information technology infrastructure (infrastructure);
- Bring legacy systems to current state-of-the-art levels (legacy: state of the art);
- Expand e-government (more online/less inline) (e-government);
- Improve agency workflow with a move to less paper-oriented operations (workflow); and
- Improve interoperability of a common radio system to enhance communications between and among agencies (public radio)

We compared these policy objectives with the *Spending to Make a Difference* projects of FY2017-2021 and found the objectives, though now 15 years old, remain relevant for improving delivery of city services using technology. These are summarized by IT strategy and listed in Exhibit 2.1. We noted that the top three strategic objectives of projects undertaken focused on long term modernization objectives, such as:

- Improve the underlying information technology infrastructure (infrastructure);

- Improve agency workflow with a move to less paper-oriented operations (workflow); and

- Bring legacy systems to current state-of-the-art levels (legacy: state of the art).

We found that all priority projects listed in budgets of the recent five years could be categorized as meeting one or multiple strategies to improve the delivery of city services using technology. We created a strategy called enterprise platform to identify and categorize the projects that concerns the department's development and enhancement of the Lokahi enterprise operations platform, which represented the third largest strategy for recent projects.

Exhibit 2.1
FY2017-2021 Spending to Make a Difference Project Summary by IT Strategy

Strategy	*Count*	*Percent*
Infrastructure	10	23%
Enterprise Platform	9	21%
Workflow	8	19%
Legacy: State-of-the-art	5	12%
e-Government	3	7%
Public Radio	3	7%
Development	2	5%
Workflow, e-Government	2	5%
Legacy: State-of-the-art, Workflow	1	2%
Total	43	

Source: Office of the City Auditor and Department of Information Technology

The current administration of DIT has developed twelve principles to annually group and categorize its accomplishments and efforts for projects and initiatives listed on its technology road map. Using these principles, we found that the largest number of

DIT initiatives undertaken from FY2017-2021 were focused on the following three principles:

- Lokahi (enterprise platform) (26 percent)
- Workflows (19 percent)
- Improvement & Innovation (21 percent)

Department indicates its high priority projects annually

Since the FY 2015 budget, the department has annually identified key projects and initiatives it will undertake during the year in a section entitled *Spending to Make a Difference*. We reviewed the 43 projects and initiatives listed in the previous five years budgets, FY2017 through FY2021, for their cost, benefits, and implementation status. These projects and initiatives corresponded to high-priority items and tasks listed in the department's Technology Road Map, which it uses as a strategic plan. For the years reviewed (2017-2021), the road map had indicated 100 tasks in various areas of focus categories (e.g., security, Lokahi, mainframe modernization, etc.) that it had planned to accomplish.

Of these 43 projects and initiatives listed, we noted that there were ongoing projects or initiatives that continued from year-to-year, indicating project phase progress, adding on features, and plans for further development. To avoid replication of costs and redundant project information, we grouped ongoing projects, where possible, indicating the duration of years, unless we could determine distinct phase progress or feature addition. We narrowed the listings down to 36 projects or initiatives on this basis.

Project priorities

We found the department has made substantial progress in putting modern infrastructure in place to support city IT operations. Longstanding objectives to modernize the city's primary data center and first responder radio system have been initiated and are substantially completed. Current efforts will result in improving and modernizing IT infrastructure. In our review, we found that the department has implemented 56 percent of the projects and priorities identified in its previous five budgets. Currently 36 percent are in progress.

Developing key infrastructure in place to support city IT

We found the department has made substantial progress in putting modern infrastructure in place to support city IT

operations. Longstanding objectives to modernize the city's primary data center and first responder radio system have been initiated and are substantially completed. Infrastructure projects such as the third mainframe will enable modernization of legacy mainframe applications and reduce maintenance costs.

New Data Center. At the time of our review, the department has substantially completed a new state of the art data center to replace the city's primary facility built over forty years ago. The new data center has been constructed and is awaiting the move of equipment from the old data center. The benefits of the new data center are the following:

- It is half the size of the old data center with efficient cooling technologies and infrastructure to support redundant power;
- There will be improved monitoring and response with a modern operations and service center;
- It is expected to reduce power and cooling costs by 28 percent; and
- It will enable the old data center to be repurposed to house technicians and Help Desk staff, build a conference center, and provide a storage/staging area for equipment.

P25 800 MHz radio system. With final acceptance scheduled for July 2021, the new radio system replaces and upgrades the 30-year old analog 800 MHz first responder radio system to a new digital system. The system supports the expansion of first responder users to include DEM, Fire, EMS, Ocean Safety as well as HPD. The new system will offer increased user capacity and improved radio system performance and features, including advanced standard features to promote better potential officer and first responder life safety in the field.

Third mainframe. This agreement was executed in December 2019. At the end of the current lease of the two current mainframes this year, the third mainframe will replace the primary and backup mainframes used by the city. This will allow for the development of applications which are free from legacy technologies, accelerate the modernization of legacy applications like motor vehicle registration and driver's license, and improve support of critical public safety applications. When these applications are moved over to the new mainframe, DIT expects the city to realize $200,000 savings per year in legacy software costs.

Progress made on priority projects and initiatives identified

We reviewed the 36 projects and initiatives noted in the *Spending to Make a Difference* portion of the department's budgets for fiscal years 2017-2021. We found that 33 projects have been completed or are in progress (92 percent). Exhibit 2.2 contains project information and status on selected major projects provided at the time of review. More information is provided in Appendix A, which includes detailed project information/descriptions, status, and other information.

Overall, we found that 20 projects were already implemented (56 percent). These included:

- Lokahi, created in 2017;
- Lokahi Conflict Management for public works agencies to discover activities happening in project areas, implemented in 2018;
- AM2 (asset management), implemented in 2019;
- PROS for public to register for DPR activities online, implemented in May 2020; and
- Motor Vehicle Registration, dealer registration of cars, implemented in December 2020.

We found that 13 projects were ongoing (36 percent), including:

- Implementing the new P25 800 MHz radio system. Final acceptance scheduled July 2021;
- Deploying the P25 radio system to user departments (HPD currently in progress, all other user departments issued radios in 2020);
- New data center constructed. Awaiting move of equipment from old data center;
- Data Center, Phases 2 and 3. Phase 2 expected completion at end of April 2021; and
- Email archiving, increasing storage, and e-Discovery. Storage expected completion: July 2021, Email expected completion: December 2021.

We found the pending three items are subject to certain set conditions occurring in the near future.

- New mainframe 5-year lease to begin after old lease ends in 2021;
- New cloud storage, current system end of life is October 2021; and
- New core network switches and routers, to be installed when new data center completed.

Exhibit 2.2
FY2017-2021 Major Project Status Information

Project	***Status***
P-25 Radio System (includes system contract and consultant)	80% complete OS, EMS, HFD completed in 2020. HPD in progress
State-of-the-Art Data Center (Phase 1, 2, and 3)	Phase 1: Construction completed, pending cut over Phase 2: Pending punchlist items Phase 3: Ongoing
Joint Traffic Management Center (JTMC) equipment	Completed
Lokahi	Deployed 2017. Additional feature development ongoing annually
Electronic Fare Collection system for Bus and interim Rail operation	Completed
Payroll Time and Attendance (PT&A) application – AEM	Development ongoing, currently in Phase 3
Next generation workflow forms system (data validation, digital signatures and PDF tools)	Various projects deployed and in development since 2017
HiperCloud	Deployed 2019
Implementation of application programming interface (API) gateway to secure microservices and continuous integration, continuous delivery (CI/CD) tool for agile development of APIs	Implemented
My Honolulu Citizens Concerns systems (311)	Deployment ongoing, switching to OneView

Source: Department of Information Technology

Cost of recent modernization efforts are incompletely reported

During our review of the previous five years of priority projects and initiatives for the department, the department provided costs for projects that were contracted or purchased, so the external costs for these initiatives are available for reporting. However, this amount of external costs will not be final until projects are completed projects, and all current or ongoing cost have been incurred in the future. These costs are not a total cost of all initiatives, projects, and purchases because the department does not report costs for in-house developed projects and initiatives.

DIT informed us that it considers the resources for these projects to be covered by the time and salaries of existing staff, so this information was not provided. Some project costs were not updated to reflect current contract or purchase costs.

When completed, listed priority projects of the past five years may cost approximately $28.7 million

We found that the costs for priority projects and initiatives listed in the *Spending to Make a Difference* portion from FY2017-FY2021 may cost approximately $28.7 million when completed. This is about $2.2 million more than estimated. The purchase costs and amount expended on *Spending to Make Difference* Projects for fiscal years, FY2017-2021 is provided in Exhibit 2.3.

Exhibit 2.3
Estimated Total Cost of *Spending to Make a Difference* Projects, FY2017-2021

Fiscal Years	*Project*	*Contract/ Purchase Cost ($)*	*Current Amount Expended ($)*	*Notes*
2017	Intelligent Operations Center (Lokahi)	196,613	196,613	
2016-2021	P25 Radio System Contract	15,379,817	14,111,253	Initial contract amount $13,121,193
2015-2020	P25 Radio System Consultant	1,590,910	1,424,938	Phase C not started
2017	Workflows Forms System	95,654	95,654	
2017	Email archiving, increase storage, and E-discovery **(Email)**	93,580	93,580	
2017	Email archiving, increase storage, and E-discovery **(Storage)**	516,442	516,442	
2017-2018	Joint Traffic Management Center Equipment Installation and Operations	800,000	800,000	
2018	My Honolulu Citizens Concern System (311)	24,950	124,750	Cost is for year 5 of 5 year annual license. 5 year total is indicated
2016-2019	New Time and Attendance System, Phase 1	100,000	179,150	
2019-2020	New fare collection system for Bus and Rail interim operation	200,000	200,000	
2019-2021	New Application Protocol Interface Management Tools	102,100	102,100	
2019-2021	HiperCloud	178,310	178,310	
2020	new City Data Center, Phase 1	2,094,325	2,079,575	
2020-2021	new City Data Center, Phase 2	2,500,000	2,498,920	
2021	new City Data Center, Phase 3	2,000,000	1,928,009	
2020-2024	Third mainframe (5-year lease)	2,189,586	437,917	First year of 5 year lease, annual lease payment of $437,917.
2021	New cloud storage	108,653	108,653	4 physical servers at $27,163.31
2021	New core network routers and switches	500,000	500,000	
Total Amount		28,670,940	25,575,863	

Source: Departments of Information Technology and Budget and Fiscal Services

In Exhibit 2.3, we listed the costs reviewed for purchases and contracts by the department for the projects, and the current amount expended. Major cost changes for the public radio system included modifications made after completed system design, and purchase of additional radios. The following discusses cost differences we noted with the public radio system.

Changes to radio system costs

The public radio system project cost was initially provided to us as $20 million. This was the department's prepared cost estimate for replacing the 800 MHz public radio system for first responders. We verified with the department that a replacement radio system was purchased, and a consultant was hired to assist with the technical implementation of the system during the project. The contract costs initially totaled $14,712,103, broken down below:

- $13,121,193 for the public radio system replacement
- $1,590,910 for the project implementation consultant

There were two contract amendments that made price changes to the radio system purchase contract. These changes increased the price of the contract by about $2.26 million. The changes were due to modifications known only after completing the final design, selecting options, adding and deleting services, and purchasing additional radio equipment for Ocean Safety division. A summary of the changes were as follows:

Contract Amendment #1: $2,020,480

In the original contract, it was anticipated that certain modifications would be necessary, but only known for sure after completing a final detailed design. The city was permitted to make modifications to the contract after completion of a detailed design process and final system requirements determination, adding and deleting services, and selecting options. It also provided the schedule of work and milestones payment schedule. These changes amounted to an increase in cost of $2.02 million. A table with a breakdown of all changes is provided as Appendix B.

Contract Amendment #2: $238,145

This amendment covered the purchase of 60 portable radios and 5 mobile radios for the Honolulu Emergency Services Department, Ocean Safety Lifeguard Division.

The city is contracted to pay a total of $15,379,817 for the radio system contract. According to the payment schedule, city owes approximately $1.1 million to be paid upon final acceptance of the system scheduled for July 2021.

Radio system implementation consultant: $1,590,910

The city hired a consultant, Scientel Wireless, for consulting services to implement the city's new 800 MHz public safety radio system at a contract price of $1.59 million. The consultant was to provide services in four phases, including request for proposal support, radio system manufacturing, installation, and project closeout, independent radio coverage verification. The user agency transition plan was not started.

Phase C User Agency Transition Plan: $62,283

This phase is for the transition from the city's old radio system to the new public radio system for the following agencies:

- Honolulu Police Department;
- Honolulu Fire Department;
- Department of Emergency Management;
- Honolulu Emergency Services Department (Emergency Medical Services Division and Ocean Safety and Lifeguard Services Division); and
- Department of Information Technology.

The city will pay an estimated $16,970,728 for its new radio system. This is approximately $3 million less than estimated project costs provided of $20 million. As implemented, it will incur about $2.26 million in costs above the original agreement largely due to modifications made based on the final detailed design and requirements determined.

Costs provided were not updated to reflect new estimates or actual costs

We found that some costs provided to us by DIT for some projects were estimates that had not been updated, and not the costs incurred by the city. Although it had access to the information, the costs to purchase or implement the projects were not maintained to be current. A summary of the non-radio projects with different costs than provided are as follows:

- Four project costs were provided that were more than actual costs, totaling $199,903;
- Three project costs were provided that were less than actual costs, totaling -$233,973;
- This resulted in an actual difference of $25,174 less than provided costs.

According to the Government Accountability Office (GAO) Information Technology Investment Management (ITIM) framework, control processes such as creating and maintaining better project-level cost information are needed to support executive decision making. This helps with recognizing when there is a need for corrective actions if there is trouble with meeting schedule or cost estimates. With better data collection and aggregation, administration can be provided appropriate information to execute its oversight responsibilities. In this case, more accurate cost information could be maintained by the department about its projects.

HIperCloud. HIperCloud is an on-island, high-performance cloud providing highly resilient and scalable computer, network, and storage capacity for containers running across multiple data

Exhibit 2.4
Differences In Provided Costs and Reviewed Purchase Costs

Fiscal Years	*Project*	*Provided Cost ($)*	*Purchase Amount ($)*	*Difference ($)*
2017	Intelligent Operations Center (Lokahi)	250,000	196,613	(53,387)
2017	Email archiving, increase storage, and E-discovery **(Email)**	243,580	93,580	(150,000)
2016-2019	New Time and Attendance System, Phase 1	100,000	179,150	79,150
2019-2021	New Application Protocol Interface Management Tools	90,000	102,100	12,100
2019-2021	HiperCloud	200,000	178,310	(21,690)
2021	New cloud storage	100,000	108,653	8,653
2021	New core network routers and switches	400,000	500,000	100,000
Total Amount		1,383,580	1,358,406	(25,174)

Source: Departments of Information Technology and Budget and Fiscal Services

centers. The current system will reach end of life in October 2021, so DIT is migrating to a new platform.

- Initial three-year provided costs for annual licensing and maintenance were higher than the actual three-year costs to contract for these services.

Exhibit 2.5
Annual Licensing and Maintenance Cost

Year	*Cost Provided*	*Purchase Amount*
2019	$ 60,000	$ 52,513
2020	$ 60,000	$ 52,513
2021	$ 80,000	$ 73,284
Total	$ 200,000	$ 178,310

Source: Departments of Information Technology and Budget and Fiscal Services

- Provided cost to purchase four servers was lower than actual purchase price. Provided at $100,000 ($25,000 per server), actual cost was $108,653 ($27,163.31 per server).

- Total project costs of $300,000 were provided for the project. The actual project cost as implemented was $286,963, which is $13,037 less.

Email archiving, increase storage, and E-discovery (Email). DIT implemented a project for email archiving, increasing storage, and improving E-discovery capabilities to increase email storage and usability while increasing search capabilities for state open information requests (Hawaii Revised Statutes 92F) and litigation holds. This enabled email archiving and search service for approximately 8,500 city users. The actual purchase costs were $150,000 less than initially provided.

Deploy new time and attendance system. DIT initiated a project to migrate the city's legacy payroll time and attendance application from an unstable, unsupported Window platform to a new server using Adobe Experience Manager. Phase 1 costs were provided as $100,000. In three years from 2016-2019, the project had spent about $179,150, which was $79,150 above the provided costs.

New core network routers and switches. New core network routers and switches to restructure the network architecture in the new data center and to provide expanded segmentation for greater security. This project is pending completion of the new data center. The initial costs provided were $400,000. The actual costs of the necessary equipment were provided as $500,000 when implemented, higher by $100,000.

Complete project costs of all priority projects could not be fully determined

We were not able to complete a final cost of the reviewed *Spending to Make a Difference* projects and initiatives because some projects are ongoing, and because some projects are considered to be in-house projects for which the department reports no cost, but has the capability to report accurate costs for development, support, and maintenance. Some costs are estimated since certain projects are ongoing or are contracted and will occur in the future. These projects include:

- P25 radio system contract;
- P25 consultant contract, one phase incomplete;
- New city data center, phases 1, 2, and 3, contract and purchase order still open; and
- 5-year lease for replacement mainframe, which is effective after old lease expires later this year.

Projects and initiatives we reviewed that the department reported as developed in house were:

- Online and kiosk-based customer service with credit card payments for convenience;
- Lokahi, centralized intelligent operations center;
- Motor Vehicle Registration System;
- Driver License System;
- Lokahi Viewer;
- Lokahi Project Conflict Management Search;
- Lokahi Online Testing and Training;

- Lokahi AM2 (Asset management);
- HNLPay (Centralized payment management system); and
- PROS (Park and Recreation Online System).

Better reporting is needed about project costs, cost effectiveness, and savings

Apart from IT purchases, we found that DIT is not reporting on the full project costs that it considers for supporting decision making about selection of IT projects to develop, support, and maintain. The department has provided information on cost effectiveness and cost savings in terms of costs it no longer pays to vendors or for replaced systems. It also internally prepares cost and staffing information to develop, maintain, and support IT projects. This reporting is needed to evaluate the cost effectiveness and cost savings realized from IT modernization and other priority IT project efforts. This would also help policymakers to better understand the costs and resources required to develop, support and service IT projects, and aid user agencies in vendor purchasing decisions.

DIT has data and information about the internal costs of development, ongoing support, and maintenance of its in-house developed projects, which it can use to estimate and then later evaluate the costs and resources applied. Using this data and information, it can verify that the total costs of in-house developed software and systems of similar capabilities, compared to vendor systems and products, are more cost-effective and have saved the city money. This is important because apart from cost considerations, staff that are used to develop, support, and maintain systems are limited resources. Better reporting on projects the department has undertaken versus have vendors provide support for may result in better utilization of limited staff and resources.

Using in-house development and support costs and other selection criteria may also improve project selection. With better reporting, the department may demonstrate to user agencies, the administration, and the public that the in-house IT projects it selected have been more cost effective or lower cost compared to outsourced projects. If DIT chooses to develop in house rather than procure IT products and services from vendors, it can promote transparency about its comparative evaluation to show how it is makes an appropriate selection based on cost or know if its current approach is cost effective.

Costs are developed for external purchases and internal supported projects and services

We found that costs are developed by DIT for external purchase of systems, services, and equipment, and for internally supported projects and services. Current city procurement requirements require assessment of costs, benefits, and risks, and evaluation of selection criteria to help inform selection of vendors, products, services, etc. While cost, benefit, and risk information are reviewed for external purchases, costs of internally supported projects and services are not reported on for costs or cost effectiveness.

Due to purchasing requirements, DIT estimates the costs for all external purchases of vendor products and support, but it does not develop full lifecycle costs for any project. According to ITIM, full cost information collected to evaluate an IT project or system includes external costs, internal costs, and costs of maintenance and support. For external purchases, as above, the costs of IT project purchases specify and provide the costs of the product, service, equipment, professional services, and support and maintenance offered. What is not covered with external purchases is the cost of any internal support within the department that needs to be provided, but this information is available for the department to use and report on.

For example, the radio system replacement will cost approximately $16.9 million. DIT's radio and networking will provide the technical support, infrastructure repair, and network monitoring rather than the system vendor after installation. The DIT radio service staff is dedicated to providing these services, and as currently staffed, annual salary costs are up to $250,000. Over the ten-year expected useful life of the radio system, this support service cost in salary is up to an estimated $2.5 million. Vendor support and service is optional, for a shorter term, and costs more on an annual basis. The city providing this service is therefore more cost effective.

DIT does not report on the ongoing internal costs to maintain and support a project or system after implementation, although typically its staff provides the required support and service afterwards. Various DIT staff, including computer service representatives (CSRs), application branch staff, technical support, or operations staff may provide support for both vendor and in-house developed systems, projects, and equipment. These costs can vary as support may vary according to level of support, from dedicated to as needed support, and number of staff involved. Maintenance and support costs can vary based on position, staff

seniority, dedication of time, and other factors. This cost is not usually as much as vendor support and maintenance costs, but internal resources available that can be used to support and maintain are limited. Thus, assessing, evaluating, and reporting on the comparative costs and resource effects are important, since this information is available.

Department can determine costs for in house projects or initiatives

We found the department has information from which it can determine costs for projects or initiatives that it develops in-house. It prepares these costs and the time involved to be covered by existing resources, such as salaries paid to its staff, project time, resource application, and indirect costs. While these costs and information are available, these costs are not reported. During our review, the department showed an example that they discovered additional cost savings had been identified in the case of one project while providing information for this review. The information can also be used to after development and during support to assess and evaluate if these projects continue to be cost and resource effective, whether projected and comparative cost savings did result, and are current resource allocations appropriate.

According to ITIM, cost information should be collected on each project and system for decision making to select a project, confirm continued support, or terminate a project. To get a full picture, this can be evaluated as total cost over its lifetime, which can include items like actual development, annual operating and maintenance costs, and expected lifecycle costs. DIT currently does not collect cost information completely to assess the various costs of projects, their full lifetime costs, or cost effectiveness.

Department has realized cost savings from review product replacements and in-house development

For examples of cost savings, the department provided examples of replacing products and systems that cost the city nearly $2 million annually in 2014. The department provided information that it reduced costs by replacing selected products and systems with annual fixed costs, providing an annual and 5-year cost savings estimate of up to $10 million. The department indicated that this had the beneficial effect of freeing up budget by eliminating cost legacy technologies. Exhibit 2.6 shows the department's annual cost savings estimate of the technology replaced and new costs. All of these items were replaced in 2014, and no other examples of cost savings were provided or reviewed.

Exhibit 2.6
2014 DIT Reported Annual Costs of Technology Replaced

Product/System Replaced	*Annual Cost*	*New Annual Cost First Year*	*Net Savings Estimate First Year*
Xerox D100 printer	$100,000	$76,000 Initial $12,000 Recurring	$12,000
IBM Maximo Asset Management	$250,000	$0	$250,000
Handi-Van application	$180,000	$0	$180,000
Recware Parks Management Upgrade	$60,000	$0	$60,000
Accela/Envista Conflict Management	$125,000	$0	$125,000
Queue and Appointment System	$125,000	$0	$125,000
Nixle Notification System	$400,000	$12,000	$388,000
IBM p-Series Server and Tape Library	$750,000	$0	$750,000
Total Annual Cost Savings Estimate	$1,990,000	$100,000	$1,890,000

Note: Nixle notification system is an estimated maximum annual cost

Source: Department of Information Technology

The department developed in-house software to provide similar capabilities for the above products replaced. Exhibit 2.7 includes the product replacement information and department reported benefits. As a current project selection practice, higher priority is given to initiatives that may result in greater savings or efficiencies. DIT considers expense and funding in selecting its major initiatives, and notes that initiatives that result in substantial savings precede and enable other initiatives that can be funded from those savings.

Exhibit 2.7
Product/System Replaced With DIT Solution

Product/System Replaced	*Replaced With*	*Benefits*
Xerox D100 printer	Xerox D125 printer	Pay only amount printed
IBM Maximo Asset Management	AM2 by DIT	Enterprise wide asset tracking system
Handi-Van application	Huakai by DIT	Tool to facilitate data collection and reporting for the city's transportation programs. Enables drivers to log and review trips provided to citizens to/from program and community activities. Data collected are used for monthly invoicing and monthly and annual reporting for National Transit Database (NTD)
Recware Parks Management Upgrade	PROS by DIT	Register online for Park and Recreation activities and reserve park facilities
Accela/Envista Conflict Management	Lokahi Conflict Management by DIT	Offers public works agencies easy way to find out about activities happening in their project area
Queue and Appointment System	Aloha Q by DIT	Scheduling system for citizens to make appointment for city services (e.g., driver license, vehicle registration, liquor permit services
Nixle Notification System	HNL Info Alerts by DIT	Alerts notify citizens over a variety of communications. City agencies can announce up to date relevant information to citizens.
IBM p-Series Server and Tape Library	Eliminated	

Source: Department of Information Technology

The department is able to determine the cost savings of these in-house projects and whether they were more cost effective than the replaced systems or solutions. Although considerations of cost savings are important, according to the GAO, informed investment decisions on selecting any IT projects are best supported by quantitative data on cost/benefit and risks. While it estimated the benefits of these replacement projects, DIT did not report relevent full lifecycle costs.

According to the GAO, key information needs to be made available to decision makers to evaluate the impacts and opportunities created by proposed or continuing IT projects. Policies and procedures need to be developed to collect information about the IT products and systems needed to support

the determination, including specifying individual project costs (e.g., actual development costs, annual operating and maintenance costs, and expected life cycle costs). Currently these have not been reported to decision makers, costs are not reported because they are developed in-house, although the information is available.

As with in-house projects, DIT did not report the internal costs or estimate ongoing costs to maintain the listed projects, although it had this information available. These costs are also not available for other decision makers to evaluate when projects are considered for selection, or generally to inform funding and resource decisions. The department does not report on this evaluation. As a result, decision makers such as user agencies, the administration, or policy makers are unable to review whether in-house IT projects are more cost effective than the outsourced projects they replaced.

As part of our review, we wanted to assess potential cost savings or cost effectiveness created by the replacement of the systems and products listed with in house developed projects. DIT provided the actual system replacement costs, and internal costs for development, support, and maintenance. Exhibit 2.8 presents a comparison of annual vendor costs and city support costs.

Exhibit 2.8
Estimated Cost Comparison of Annual Vendor Costs and City Supported Costs

Replaced Vendor Solution	*DIT Project*	*System Replaced Initial Cost ($)*	*System Replaced 5-Year Costs ($)*	*Development Costs (2-3 staff) ($)*	*5-Year Cost Support and Maintenance Cost (1-3 staff) ($)*	*Cost Difference*
IBM Maximo	AM2 (asset management)	767,944	3,150,648	28,148	12,756	3,877,688
Paratransit App	Huakai	180,000	568,332	57,045	10,057	681,231
eTrak Parks and Rec and Ikayzo DPR Camping Permits	PROS	686,250	-	473,308	14,456	198,486
Accela/Envista	Lokahi Conflict Management	125,000	625,000	30,683	14,937	704,380
Qless	Aloha-Q	195,950	636,950	115,756	24,103	693,041
Nixle	HNL Info Alerts	400,000	2,000,000	26,864	12,756	2,360,380
Indirect Expense				100,916	12,282	(113,198)
Fringe Benefits				544,608	66,282	(610,890)
Totals		$2,355,144	$6,980,930	$1,377,327	$167,630	$7,791,117

Source: Office of the City Auditor using DIT data and Department of Human Resources salary information

To assess cost savings of the listed projects, we reviewed and compared the annual cost of the system replaced and the in-house costs to develop, maintain, and support the DIT developed replacement systems over a five-year period. Full project costs include external costs, internal costs, and maintenance and support costs. With vendor products, the primary costs are the external costs owed for the product/service and any support offered. For an in-house developed solution, the costs are internal development, support and maintenance costs.

Different levels of complexity affects the development time required and the number of staff needed to develop, maintain, and support a project. The results of our review comparison are in Exhibit 2.8. Assuming both could meet the city's needs, as typically staffed, it was cost effective for DIT to develop, maintain, and support the product/system replacements. By our estimation, we found that:

- The internal costs for developing, supporting, and maintaining these projects cost about $1.54 million.; and

- In terms of total cost to develop, support and maintain versus vendor costs, the city would have paid about $7.8 million more over the 5 years for the vendor solution, had DIT not developed a replacement IT solution.

Developing in house development costs and other selection criteria may improve project selection

For this audit, we sought to analyze and compare costs for in-house and outsourced projects as a basis for project selection. To make the comparison and evaluation, information needed to be collected on the costs of the vendor system, product and/or service, vendor support and maintenance, and other relevant costs. DIT does have this kind of information available to it when making an evaluation. DIT can compare its own applicable internal support costs for development, internal support, maintenance to review and determine which method has lower costs, and/or greater cost-effectiveness. As a result, the department is able to determine whether the in-house IT projects it selected are most cost effective or lower cost compared to outsourced projects.

We noted in our review of criteria that the decision to develop in-house IT solutions or to outsource/select a vendor typically involves a consideration of cost effectiveness or cost-benefit. The department has a current practice supported by several policy rationales that it will generally prefer to develop in-house rather than procure IT products or services from vendors. It has information to conduct an evaluation of cost effectiveness, so that can determine if its approach is cost effective or if it is making an appropriate selection decision based on cost.

According to ITIM, information such as costs, benefits, schedule, risk assessment, performance metrics, and system functionality, and performance should be collected to support decision making on project selection or replacement. As above, given the typical development time and staffing levels required, in-house developed and supported projects did not cost more than a vendor alternative over the same period, given certain parameters. Some customer departments seem to be unaware that DIT can justify developing, supporting, and maintaining its own solution in terms of cost, schedule, support, and maintenance.

A common concern raised by several departments we surveyed was that DIT may fail to consider well-established, cost-effective

vendor solutions as best fit alternatives that could conserve its resources for other priorities. The following concerns were raised:

- Off the shelf products and solutions are available that can adequately serve needs, be deployed quickly, and at fair cost;
- DIT lacks enough resources, and it is difficult to get on the development calendar, it has longer timeline for implementation, is uses more resources, and the end product may not be better;
- Making sure expectations are in alignment with what they can do. Strong forward lean from top, but suggested scope and timelines department will struggle to deliver on reliably. It may not have technical expertise for IT projects to support complex operations (e.g., regulatory, compliance);
- Unsure if DIT's preference to develop solutions internally is most cost-effective and efficient path to delivering improved services; and
- Reinventing the wheel in the sense that DIT wants to recreate code and programs that perform what existing, well-established programs already perform, which is a questionable use of resources and time.

With more evaluation and reporting, the department can help their customer agencies make good IT purchasing decisions, and this may also have a positive outcome that staff and resources could be more optimally utilized with better information and evaluation of vendor products/services and projects that the department should undertake. (See Chapter 4 discussion on Request for Services for the impact on the Applications Division's ability to respond to service requests in addition to developing priority projects and initiatives.)

Limited planning risks not meeting specific department and overall city needs

While key modernization and major project priorities have received planning attention, greater focus should be shifted to better address DIT's primary role in supporting and servicing department and public IT needs. While the department does extensively plan its overall course for major IT projects and efforts, it has a current policy role in Mayor's Directive 06-02 to advise and assist departments with long- and short-term planning with departments to meet their IT needs. We found that this role is more important now in light of current support and service

limitations, which have resulted in many current customer department concerns and needs not being prioritized or met. The department can make better progress towards supporting the IT needs of city departments and the public by assessing what they are, prioritizing their achievement, and selecting them for implementation. We found that there are potential opportunities to save the city $950,000 on vendor support costs caused by not meeting customer agency priorities. The department could also provide more transparency and greater focus on how their efforts support key department services and efforts, performance, and serving the public.

Currently many customer department's needs and concerns are not addressed

We found that planning for long- and short-term IT in departments to establish priorities is not consistently used. Under the current approach, some department needs, concerns, and issues are not addressed or remain unresolved. Outside of a few selected departments, most departments do not have a regular time or evaluation scheduled with DIT to discuss their concerns or evaluate needed IT changes to improve their efficiency, effectiveness, or service. Determining the level and priority of internal coordination currently needed to support IT customer departments is not happening. Without receiving the project and support priorities for various departments, some departments' initiatives or projects may not be prioritized, supported, or be delayed.

Under the current policy, Mayor's Directive 06-02, DIT has the responsibility to advise and assist departments in the preparation of long-range and short-range plans for using IT within their departments, as well as for the procurement and implementation of computer applications that support the needs of the departments. In this process, the customer departments have the responsibility of specifying department priorities and planned projects and defining their anticipated benefits (e.g., increase in staff productivity and efficiency, lower operating costs, increased public service). DIT and the departments are also to determine the level and priority of internal coordination necessary to adequately support all the customer department's IT activities.

Apart from making direct requests, we found that there is no current planning and evaluation process for most city departments to establish their long- and short-term IT priorities for support and assistance from DIT. While previous regular planning and evaluation with departmental participation helped set projects, priorities, schedules, and needed coordination,

many departments now reported concerns that their priorities or initiatives may not be prioritized or supported to meet their needs when needed, or improvement ideas they have will not be heard because this no longer occurs. Performance or public service may suffer as a result.

We surveyed all city agencies and received 36 responses about the level of support and service they received from DIT. All agencies surveyed provided responses (100 percent response rate), which included divisional responses for some departments. We conducted follow-up meetings with seventeen of the departments who had commented about support or service. A common concern was about how to initiate a discussion with DIT about their concerns and to evaluate or plan for needed IT changes. These departments reported that there was no regular time or evaluation scheduled with CSR or DIT management where they could discuss their IT concerns or ideas for changes to improve efficiency or effectiveness**.** With the exception of ENV, Fire, and DFM, the other 14 agencies had not met and planned with DIT to address their priorities or determine coordination and needed level of support needed for their use of IT for department operations or servicing the public.

Current department planning is limited to overall major projects and efforts

We found that formal planning and evaluation is not used consistently for developing service and support expectations or meeting city department IT needs, so certain key IT needs, concerns and issues are not addressed. Current guidance from the general policy on IT services provides for formal planning, evaluations, and assessments to help define IT priorities for all city departments, but is not followed. Currently long- and short-term IT plans for departments are not used to define IT priorities. Priority and level of coordination needed to support certain city departmental IT activities is not determined. We found the following impacts to departments due to the lack of priority and level of coordination:

- An agency had old computers that were to be replaced by NUCs (next unit of computing, mini personal computers). Some of the old computers were failing, and some were inappropriate for videoconferencing during the pandemic (no mics, speakers). There was no date set for rollout, and when received no one was available to install and format. The operational impact was that deadlines could not be met without the new computers, so the issue had to be elevated. Two other comments shared similar concerns

about adhering to PC upgrade schedules for old computers to help daily operations.

- One agency needed ongoing technical support for CGI-related (CHERPS) projects. Their vendor asked questions of a technical nature, which they could not answer, that DIT support could help answer (e.g., file size, storage, attachments) in order to move the project forward. Generally, in working with the vendor on upgrades and improvements, they need more active support in technically translating their ideas to resolve current problems, support their system initiatives, and generally determine if vendor suggested improvements are necessary or cost effective.

- Volume of transactions. Due to generating a large number of billings, an agency would like to improve their online payment portal to accept various types of payments to help move more transactions online rather than conducting them in-person. Discussing with local vendor for support, due to current technical limitations with city application environment.

- Need assistance with backup of an off-the-shelf accounting program. The agency needs program backups to run annual rollovers or upgrades. This backup is needed if anything goes wrong, so that data is available to revert to a previous state. As an agency priority, they would like DIT support to assist with the backup, and consultation about support or software alternatives.

- Within three years, a user division has a project that will likely result an ongoing utility operation and fee that requires much more IT support in areas such as complex billings, services, etc. There has not been any meetings, planning, or discussions about how to support this.

- Three agencies provided comments about their priorities and needs for additional storage/memory, more servers, backup of key data to support their operations or service.

We asked the department if regular meetings were held with the various departments to discuss their long- and short-term IT plans, initiatives, and needs. Currently, DIT holds regular strategic agency meetings with:

- Customer Services Department;

- Honolulu Fire Department;

- Honolulu Police Department;
- Mayor/Managing Director; and
- the City Council Chair.

We found that current policy provides for an IT steering committee (ITSC) to provide guidance to DIT in best managing the city's IT resources and providing input to DIT to develop the city's strategic information systems plan, but it has not met for over ten years. The steering committee was made up of members from all city departments. The role of departments as members was to help identify and prioritize all requests to DIT. As such, the current IT plans of DIT risk not meeting specific department needs because many customer departments do not have the regular opportunity to provide input concerning their departmental priorities.

There are two key roles for the ITSC in the city's current policy on IT services: providing guidance to DIT in managing IT resources and providing input for developing the city's strategic information systems plan. The policy's general strategy is:

> *To enable the city to best manage all of its IT resources requires DIT,* ***under the guidance of the IT Steering Committee (ITSC)****, to develop and direct an integrated network of computer resources that will provide data processing and telecommunications services to all city agencies and authorized users. Through centralized management of IT services, all users of the city's network will be able to more effectively share data, information, technology, resources, and technical expertise in a cost-effective and efficient manner.*

Also, DIT is responsible for developing a strategic information systems plan for the City *with input from the ITSC* and for reviewing the plan on a regular basis to ensure proper product prioritization, control, and viability in the face of rapid technological changes in the industry.

DIT reported that it found steering committee meetings unproductive due to superficial ideas and few measurable results, so they were discontinued over 10 years ago. Currently strategic agency meetings are held with select departments and meetings are also held regularly for active major projects (e.g., fare collection system, PROS, HNL Pay, Asset Manager 2, and HNL Info).

One of the purposes of the steering committee was for the departments to identify and prioritize their IT project requests to DIT. Stopping these meetings removed a primary way that departments can identify and indicate their important projects requests to DIT. Now, most departments do not have the opportunity to regularly discuss their initiatives and needs with DIT, indicate their priorities, and have them be prioritized for implementation or development.

Many departments have support and service needs that require planning and prioritization to attain

The Mayor's Directive 06-02 recognizes that DIT should assist customer departments in their planning for use of IT, and that the departments should specify their priorities. We found that more focus is needed to provide appropriate priority to servicing and supporting departments, since former methods like committees and regular planning and evaluation are not consistently used for customer departments to identify and prioritize their DIT project requests.

Some departments would prefer a return to regular technical discussions about planning that including DIT about issues, concerns, and needs. Without meetings, departments have to make requests of DIT or go through the CSR. Previously, DIT would conduct a technical plan review, update it on an annual basis, and establish annual priorities. This change began about ten years ago during a shift to rely more on vendors to support the city's IT needs. Now only a few departments, like Fire and ENV, continue to plan in this way as part of their extensive overall strategic and functional planning. Some departments indicated that this was a good way to accomplish IT priorities and address concerns.

During our review, we found that some of the more experienced CSRs were continuing to conduct annual technology reviews. We were able to review two recent plan reviews, and found that they generally provided information that described an overview of the department, current department applications and initiatives, and status and support information. In discussion with CSR staff, they indicated that all departments have plans to some degree, but some are more extensive, regularly updated, and used to guide managerial decisions, like budgeting, procurement, and support requirements. The departments whose plans we reviewed also expressed satisfaction with the support and service they received, that their initiatives and ideas were evaluated and implemented, and that their IT needs were met or were in process of being addressed.

Some departments would like more flexibility to meet their business needs, whether by DIT or an outside vendor, or by choosing the technical solution that they feel is most appropriate. Departments felt that DIT did not work with or accommodate their requirements. This led to the following concerns:

- They felt the solutions proposed were inadequate to their needs;
- While security is often a primary DIT concern to disallow certain solutions, there was no consultation to develop workable alternatives; and
- They had to seek their own solutions and self-support them. This was common with departments whose operations involved outside parties that needed to access city information and systems but could not be granted access.

Six departments surveyed indicated that their objectives depend on a combination of support, technology enhancements, and service, where their objective depends on timely upgrades of systems, supporting technology, and DIT support to assist with implementation, where one improvement depends upon another. We found that ENV and Fire are able to address this issue with the larger numbers of dedicated support and service staff provided from DIT. For Fire, they have acquired additional vendor support when DIT support and service did not meet their needs. For the other agencies without dedicated support and service staff, this situation would be improved by adequately planning and prioritizing IT improvements. Currently these improvements can be delayed due to budget, staffing, technical complexity, and lack of overall priority for implementation. The Department of Planning and Permitting (DPP) indicated that these concerns have prevented it from receiving needed equipment and upgrades, and technical support and services for its computer systems and operations.

The city could potentially save over $900,000 in current vendor support costs

In our review of customer department priorities for service and support, we found that several agencies had priorities which could be supported by DIT, which are currently provided by vendors. Based on the selected services and support reported, opportunities may exist to save various departments and agencies vendor support costs. The city can potentially save almost $950,000 if DIT can provide the support and services required.

Exhibit 2.9 provides vendor support costs incurred by customer departments that could be supported or serviced by DIT.

Exhibit 2.9
Vendor Support Costs

Department/Agency	*Vendor Service*	*Cost*
BFS RPAD	Website vendor (annual support)	$60,000
BFS RPAD	Website vendor (upgrade estimate)	$140,000
BFS RPAD	Microfiche reader maintenance	$1,310
Fire	Website (public facing)	$31,204
Fire	Community Online Data for Emergency Services Support (CODES) Application Program Annual Maintenance/Support	$55,200
Fire	New web portal (CODES integrated) (HFD personnel)	$24,995
Fire	Fire Records Management System Data Support	$29,799
City Clerk	Miscellaneous Development Services Custom Applications)	$75,000
DPP	Scanning contract	$529,498
Total Vendor Support Cost Estimate		$947,006

Source: Department of Budget and Fiscal Services, Ethics Commission, Honolulu Fire Department, City Clerk, Department of Planning and Permitting

These departments and agencies indicated that they had turned to a vendor because a vendor could provide the support and service required to meet their needs at the time. These are opportunities for DIT to provide support and service of agencies priorities for cost savings.

- BFS RPAD wanted DIT support its website and provide an upgrade to it. In 2008, DIT had approved this project and funding for vendor support. With new initiatives for in house development, RPAD wanted DIT assistance to support this need for public service. RPAD also wanted to avoid payment processing costs if DIT could provide a solution. DIT reportedly lacked the manpower to support and design the website. It also wanted support to digitize its microfiche, which would save it office space by removing the reader and digitize its old records.

- Fire has various projects that it would like to have the support and service from DIT.

- City Clerk chose the state's IT vendor to provide development services and support for two custom applications, because they felt the vendor could deliver timely, suitable solutions.

- DPP needed assistance with its backlog of scanning plans in order to offer current information to the public and digitize paper plans. DIT offered supplemental scanning services to scan current plans for free but was unable to scan certain paper sizes or accurately enough to provide a viable alternative.

Planning can be used to facilitate efforts to provide transparency and focus on how their efforts support key department services and efforts, performance, and public service

We reviewed how IT departments in other jurisdictions with similar duties and roles and responsibilities not only supported city services and the public through their IT services, but were also planning, evaluating, and sharing how their efforts supported key city priorities, other departments, department services and efforts, performance, and public service. Comparatively, we found that San Jose, California and its Information Technology department provided a local government example which demonstrated how they supported city services and the public, how their efforts and performance supported key current city and public priorities, and were periodically evaluating and transparently reporting how they were doing.

According to its website, the DIT provides IT services to the mayor and city agencies to enable them to serve the public in a cost-efficient manner. Mayor's Directive 06-02 recognizes that there is a continuing need for the city to work in concert with the entire community – federal, state and county agencies, as well as the private sector and the public. DIT is to continuously promote an environment of automated information exchange using various technologies to improve the delivery of city services.

We found that the city of San Jose, California's Information Technology Department was very transparent and used its IT three-year strategic work plan to reflect current realities, responding to COVID-19, community equity concerns, and resource management in an economic emergency. They used planning to facilitate efforts to provide transparency and focus on how their efforts supported key city priorities, department

services and efforts, performance, and public service. Their IT strategic plan reflected their department's role in accomplishing and supporting their city administration's key enterprise priorities, the city's overall annual road map priorities, and achieving the city's smart city vision. The department's annual IT work plan provided key results and metrics to be accomplished, growth goals for IT contributors, in order to align with the overall strategic direction of the city.

San Jose's IT department recognized that it is a catalyst for its organization and the community, helping to accelerate smart and data-driven decision making, enable collaboration, and ensure the city is responsive and resilient. It also recognizes that when the department supports the needs of the city through great technology, clarity, and commitment, the department successfully elevates the city and the community they serve.

The department developed and listed their key IT strategic goals and provided IT metrics for quantifying meeting specific performance metrics to evaluate whether department and division goals are being met. Examples of this included performance measure goals in meeting customer satisfaction, project success, IT service reliability, and employee engagement. The department, each division, and staff teams are evaluated on specific factors that contribute to meeting overall goals. These provide behavior and work expectations and emphasize the need for coordination between all levels to achieve goals and the direction set by the city administration and its policymaking body. These evaluation scorecards are regularly updated and reviewable by the public in the interest of accountability and transparency.

Currently there is no such requirement that this kind of assessment including performance metrics and measures is completed by DIT on how, as a department and its divisions, it contributes to meeting city priorities, customer department goals, service priorities, public service expectations, and the like. Generally, this kind of approach could help DIT plan, evaluate, and inform about its current approaches to modernization, service and support have realized benefits and performance improvements for city programs and the public.

DIT needs to ensure that IT projects and systems support and meet business and user needs

We found that DIT does not have a complete program to ensure that IT projects and systems support the city's business needs and meet user needs. It does not involve users in identifying and documenting benefits from implemented projects, or periodically

evaluate if IT projects and systems meet needs. This results in an inability to:

- Identify end user benefits provided by IT systems and if they are performing to expectations;
- Assess a project or system's outcomes and its value compared to defined expectations, or determine whether and how well it is meeting expectations;
- Measure ability and success to continually meet business or user needs;
- Determine the value of every IT system to the city and its users; and
- Realign systems with strategic goals and objectives or determine need for replacement.

Customer departments and end users should play a role in identifying and documenting realized benefits from systems

The department does not incorporate customer departments and their end users to identify and document benefits from IT systems after implementation. Users need to be involved throughout an IT project's or system's life cycle. DIT incorporates customer departments and end users during some stages of a project's life cycle, including developing initial requirements, business needs, and opportunities, and user acceptance testing. They are not involved in analyzing whether active systems and projects meeting intended benefits, outcomes, or performance measures. As such, DIT is currently unable to regularly identify end user benefits provided by IT systems and if they are currently performing to expectations. This is because it does not evaluate whether IT systems are providing value, outcomes, and meeting intended operational needs of supported agencies.

ITIM recommends that during the operational phase of the system, end users should play a major role to help identify and document any benefits that are realized from the system's implementation. Users should also participate in the operational analysis of the system, including collecting and comparing information about the system's performance with requirements or previous performance. This would help identify the benefits provided and if it is meeting expectations.

Department does not evaluate whether system's outcomes are meeting expectations

The department does not regularly evaluate whether the outcomes of IT projects and systems are meeting expectations. Because the city historically has technology and systems that it uses, maintains, and supports for a long period of time due funding and resource limitations, it should periodically and more regularly evaluate whether and how well a project or system is meeting expectations, providing value, and is cost effective and risk appropriate. According to ITIM, the department should periodically evaluate the alignment of its IT projects and systems with its overall strategic goals and objectives and take corrective action when there is misalignment. There is no current process or evaluation like this, so the city is not able to:

- Assess a project or system's outcomes and its value compared to defined expectations, or determine whether and how well it is meeting expectations;
- Measure ability and success to continually meet business or user needs;
- Determine the value of every IT system to the city and its users; or
- Realign systems with strategic goals and objectives or determine need for replacement.

After deployment, a system's success is measured by its ability to continually meet business or user needs. According to ITIM, operational IT systems are investments that need to be reviewed on a regular basis to ensure that they are still providing value, in a cost-effective and risk appropriate manner. Periodic evaluation of each IT project or system according to risk, historical data, system expectations, or other relevant factors can help determine the ongoing value that each investment is providing to the city and its users. These evaluations are critical to determining whether or not to continue to fund and support an IT system. It should conduct it with the system's departmental users, who are most familiar with performance, operational, and public service requirements and how well IT systems are doing in meeting them. This enables correction and realignment when important goals and objectives are not being met, detects diminishing returns from older systems, and may identify obsolete systems as business requirements change.

Not conducting evaluations can lead to ongoing inefficiency and ineffectiveness caused by systems not meeting expectations; key business and user needs may not be met; increasing support and service requests; increased costs to continue supporting and maintaining systems; and unnecessary continued use of systems or projects that have limited value to operating departments and the public. All of these can increase the support and service burden on DIT. The department may fund or support in the absence of critical information that demonstrates improvements and achievements in program, business, or mission performance. Over time, limited attention to regularly evaluate may lead to the need for large expensive upgrades, whole system replacements, and extensive modernization programs similar to what has been previously and currently required of DIT to meet its service and support needs to customer departments and public.

Recommendations

The Department of Information Technology should:

1. Evaluate and report on cost and resource effectiveness in its selection and evaluation of developing IT solutions in house, including to support agency decisions about procuring IT solutions;

2. Consider ways to develop a strategic IT plan for the city, with input from other departments, and review it periodically;

3. Recommend work priority and implementation schedules for accomplishing the IT plans and service requests of departments;

4. Advise and assist other departments with assessing IT requirements and preparing long- and short-range plans for using IT in their departments, including identification of departmental priorities and action plans;

5. With assistance from customer departments and end users, periodically evaluate whether IT systems are meeting business and user needs, expectations, and outcomes; and

6. Consider evaluating and reporting on its IT service efforts to support key city priorities, other department services and efforts, performance goals, and providing public service.

Chapter 3

The Department is Unable to Meet Certain Service and Support Expectations Due to CSR Coverage, Continuity, and Communication

The Computer Service Representative (CSR) section plays an important role in supporting and serving city agencies, and assisting with their IT projects, initiatives, and solutions. Many city agencies have reported positively about their CSR's support and service efforts to ensure their IT needs are met. The CSR staff has been successful in serving and supporting customer departments due to many experienced, long term staff, who are familiar with department needs via years of service and support. There is a growing concern over replacing long term support and future retirements within the CSR section, which can cause short-term impacts for meeting critical city IT needs in key support areas.

Currently, customer demand for service and support from CSRs occurs daily, while needs for more planning and project support are increasing. Current staffing of CSRs unevenly distributes support to city departments. As currently staffed, the majority of CSRs support only three city departments. Supporting the remaining departments requires multiple primary department assignments per CSR, with several agencies having to share a CSR with two or more others, and some agencies having no backup to their primary CSR. Some CSRs with large workloads and multiple assignments need to tradeoff certain support and service activities to meet their current workloads and short-term support needs. This comes at the expense of assisting other agencies with planning, supporting initiatives, and long-term customer agency IT effectiveness.

Support levels are also causing inconsistent communication which may be limiting some customer departments' ability to relate their concerns, initiatives, and ideas for improvement to DIT. Limited ability to support and service does not allow each CSR to proactively plan with agencies to develop their IT capabilities. Instead, CSRs need to reactively respond to their assigned agencies rather than planning support and service to meet customer department needs, initiatives, and priorities, or to meet support contingencies for retirements and vacancies.

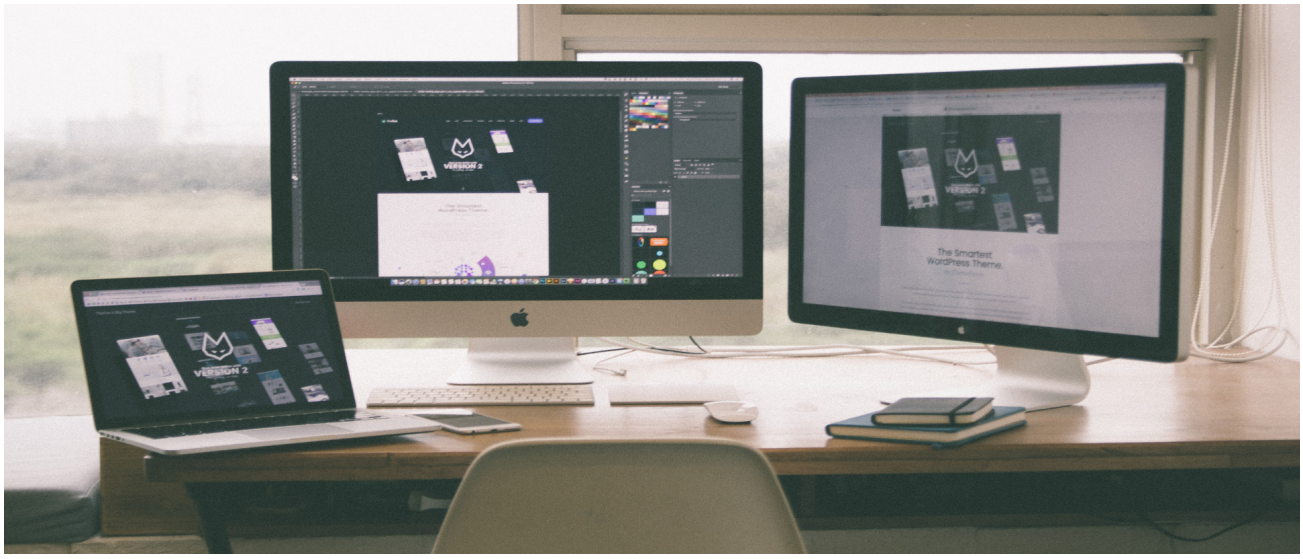


Image Source: Piktochart

Background and Responsibilities

Each city agency is assigned a computer service representative (CSR), who acts as the central contact point between the agency and DIT. The CSR coordinates and assists with information technology tasks within the department such as analyzing requirements and finding solutions, installing and configuring hardware and software, and troubleshooting computer problems.

Generally, the CSR is responsible for supporting the agency (or agencies) they are assigned; becoming familiar with the agency's functions identifying needs to accomplish the agency's mission; helping the agency with their IT needs; bringing technology to the department workplace and functions; and determining more efficient ways for the agency to accomplish tasks using information technology. CSRs are the face of the department and the personnel who meet with city agencies frequently for IT issues.

CSR support responsibilities may vary by their roles or needs of the supported agency

CSRs are required to become familiar with the major programs, software, and systems of the departments that they support. Typical support duties may include performing maintenance activities such as adding users, making sure user lists are accurate, providing support for applications supported by DIT Applications Division (e.g. installed and working for users), and providing support for commercial off-the-shelf software.

While all CSRs generally work on the information technology needs of the agencies they service, the responsibilities of each individual CSR can vary considerably depending on the agency assigned. These responsibilities can vary from straightforward to

vast and complex. Each department's mission and objectives are different, so service and support roles required of the CSR staff for one department may be extremely different than another. Some of the common challenges are providing sufficient service when the CSR Division has high vacancy rates or new CSRs that lack experience or training. It is challenging because familiarity and experience with a department and its systems is often required for CSRs to be able to fully assist, including supporting key systems and IT initiatives, becoming familiar with department operations and objectives, and identifying opportunities for improvements.

Customer department expectations for support and service are increasing

According to its functional statement, DIT must provide IT services to the mayor and city agencies to enable them to serve the public in a cost-effective and efficient manner. We found that currently there is increased demand for services and support from departments that require IT assistance to improve operations and public service, their own efficiency and effectiveness, and support department initiatives. These roles are the responsibility of an agency's CSR.

In recent years, we found that many customer departments (81%) have made requests of DIT to help them design a project to help with their operations, public service, or accomplish other important departmental objectives. DIT has completed many (71%) of the projects requested, with most (52%) evaluated as meeting the customer department's expectations. Many agencies (69%) are also requesting support from DIT to implement their initiatives to use IT to improve their efficiency and effectiveness. Nearly all (94%) of the requested initiatives have been completed.

Departments are also aware that DIT can help them use IT solutions to be more efficient and effective in their operations, public service, etc. CSRs or DIT representatives are providing information and support to many (60%) departments to help make their operations more efficient and effective using IT.

CSR support of agencies is required on a daily basis

We found that most CSRs expect that they must provide support and service to customer agencies daily. We surveyed all department CSR staff about their experiences of addressing the IT needs of city agencies and asked about customer department needs for support and evaluation of their IT needs. We received responses from 14 of the 23 CSR staff (64 percent). The vast majority (12 respondents, 86 percent) reported the agencies ask for support on a daily basis. The remaining two reported agencies needed support on a weekly basis or as needed.

CSRs play a key role in customer department IT projects, initiatives, and solutions

Generally, we found that many departments request DIT to design projects for various improvements. Many customer agency IT initiatives have also been successfully supported by DIT. DIT has informed agencies or supported their initiatives to use IT more efficiently or effectively in their operations. Usually these will come through and be facilitated by an agency's CSR.

CSRs are IT business analysts of DIT who need to develop familiarity with their department's operations, business processes, needs, and initiatives. They are to advocate for department initiatives and improvements. We found that this responsibility is governed by city IT standards. CSRs are to evaluate proposed IT solutions using city standards for security, technical compatibility, and ability to support, among other factors of consideration.

We surveyed all DIT's customer departments and commissions. A few departments like BFS and DFM provided survey responses from their internal divisions. These surveys included general questions on DIT support and service of IT systems, programs, and operations, and on key issues such as the following:

- *Has DIT helped your department design an IT project to help with your operations, your service of the public, or accomplish other important departmental objectives? Describe the project, its purpose, status and whether it has met expectations.*

- *Has DIT provided support for any initiatives your department has come up with to make IT improvements (e.g. operations, public service, etc.)?*

- *Does your CSR or other DIT representatives inform your department of ways that DIT can assist you in being more efficient or effective by using IT? Provide details or examples and if suggestions were implemented.*

Many departments request DIT to design projects for various improvements

In response to our surveys requests, we received 36 responses (100% participation) and the following answers were provided concerning DIT designed projects:

- 29 respondents (81%) indicated that DIT had designed a project in recent years to help with operations, public service, or accomplish other important departmental objectives.

- Out of 56 listed projects, 40 were implemented (71%), 15 were in progress (27%), and one was not implemented (2%).

- Out of 29 departments with projects, 15 respondents (52%) indicated that the project met their expectations, 11 provided no answer (38%), and three provided qualified explanations (10%) with comments about key specified features not being provided, comments about IT solution unsuitability, and suggestions for improvements.

DIT provides support of many customer department IT initiatives

In response to the surveys, we received 36 responses and the following answers were provided concerning CSR support for customer department initiatives for IT improvements:

- 25 respondents (69 percent) indicated that DIT had provided support for their IT initiatives. Ten provided no answer (28%), and one provided a qualified explanation (3%) providing general observations about being more supportive of customer wants and focusing more on customer needs.

- Out of 34 listed initiatives, 32 were implemented (94%), and two were in progress (6%).

DIT informs many customer departments about solutions for IT efficiencies and effectiveness

In response to the surveys, we received 30 responses and the following answers were provided concerning whether CSRs or DIT representatives informed them of ways to use IT more efficiently or effectively. Eighteen respondents (60 percent) indicated that CSRs or DIT representatives did inform them of ways to use IT more efficiently or effectively.

Survey revealed generally favorable impression of CSRs

CSR respondents to our survey reported that most interactions reported by both the departments and CSRs were positive, and few reported negative experiences. The overall perception was that CSRs have developed good rapport between their departments by both long-term service and doing their best to fulfill their IT needs. Agencies have reported that many of the CSRs were vital to continuing their services to the city and the public. This rapport has allowed CSRs to better support agencies with their IT improvement initiatives and efforts to improve their

operations and services by using IT solutions that could help with the overall mission of agencies.

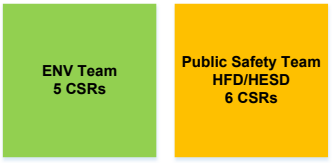
Uneven distribution of CSR support results in tradeoffs between short-term support and long-term effectiveness

Current staffing of CSRs features uneven distribution of support to city departments. This leads to the general support team receiving the bulk of the primary support roles, creating the need for multiple primary assignments per CSR, and agencies needing to share a CSR with 2 or more others. Some CSRs with large workloads and multiple assignments need to tradeoff certain support and service activities to meet their current workloads and short-term support needs at the expense of planning, supporting initiatives, and long-term customer agency IT effectiveness. Inconsistent communication may be limiting some customer departments' ability to relate their concerns, initiatives, and ideas for improvement to DIT.

Currently CSRs are distributed around environmental, public safety, and general support

According to current department staffing plans, DIT staffs its CSRs around three functional areas: an environmental services team that primarily supports the department of environmental services: a public safety team that primarily supports the Honolulu Fire Department and the Honolulu emergency services department, and a general team to primarily support all of the other city departments, divisions, and agencies.

Eleven CSRs serve two teams that support only three departments



The general service team has 8 CSRs that serve 33 agencies

BFS Admin	BFS Accounting	BFS Budgeting	BFS Fiscal	BFS Internal Controls	BFS Payroll	BFS Purchasing	BFS RPAD	BFS Treasury
LIQ	DCS	COR	CSD	DDC	DDC Facilities	DEM	DES	DFM
DFM Kapolei	DHR	DLM	LEG	MAY-MDO	NCO	RHB	MED	DPR
DPR Kapolei	DPP	PAT	HART	DTS	BWS			

Source: Office of the City Auditor, Department of Information Technology

Exhibit 3.1
Support of Departments by Grouping

	Support	*Departments Supported*	*Number of Department/Division/ Agency Support Roles*	*Current Staffing*
ENV Team	Primary	ENV	1	6
HFD/HESD Team	Primary	HFD, HESD	2	8
General Team	Multiple	All Other	33	10
Totals			36	25

Source: Department of Information Technology

If fully staffed according to the staffing plan,

- Six CSR staff are provided to support the Department of Environmental Services, including a team leader. Currently there is one vacancy.

- Eight CSR staff are provided to support both the Honolulu Fire Department and Honolulu Emergency Services Departments, including a team leader. Currently there are two vacancies.

- Ten staff are provided to support all other departments, divisions, and agencies in the city. Currently there are two vacancies.

We found that as currently staffed, the majority of CSRs support a few departments. Eleven CSRs support only three departments in the environmental and public safety areas, while the remaining eight CSRs provide primary support to all other remaining departments, divisions, or agencies. So although every agency is provided a CSR for primary support, the number of CSRs available to support nearly all of city makes primary one-to-one CSR support of an agency rare, and multiple primary assignments are unavoidable.

Every city agency has a customer service representative to help with their IT needs. However, there are city agencies that have multiple customer service representatives. There are eight agencies that have multiple CSRs, with ENV having six. The number of CSRs assigned to each agency for primary support

is provided in Exhibit 3.2. The department reported that one of the reasons why some departments have multiple CSRs is for additional support. Over the years, increasing needs for IT support and services in certain departments or in certain critical service areas (e.g, environmental services and emergency services) have resulted in multiple CSRs being assigned to support certain divisions like BFS, ENV, and FIRE/HESD.

Exhibit 3.2
Number of CSRs Assigned to Each Agency for Support

Agency	*CSR Roles*	*Staff Assigned*	*Staff Assignment*	*Staff #1 Other Primary Assignments*	*Staff #2 Other Primary Assignments*	*Notes*
BFS	9	2	Split	DEM, DTS, DHR	COR, PAT, RHB	BFS coverage: Staff #1, 5 divisions; Staff #2, 4 divisions
LIQ	1	1	Primary			
DCS	1	1	Split	DES, NCO		
COR	1	1	Split	BFS (4 Divisions), PAT, RHB		
CSD	1	1	Primary			
DDC	2	2	Split	DLM, DPR	DFM, MED, BWS	
DEM	1	1	Split	BFS (5 divisions), DHR, DTS		
HESD	2	2	Primary			
DES	1	1	Split	DCS, NCO		
ENV	6	6	Primary			
DFM	2	2	Split	DPR	DDC. MED, BWS	
HFD	3	3	Primary			
DHR	1	1	Split	BFS (5 divisions), DEM, DTS		
DLM	1	1	Split	DDC, DPR		
LEG	1	1	Split			
MAY-MDO	1	1	Split	DPP		
NCO	1	1	Split	DCS, DES		
RHB	1	1	Split	BFS (4 Divisions), COR, PAT		
MED	1	1	Split	DDC Facilities, DFM, BWS		
DPR	2	2	Split	DDC, DLM	DFM	
DPP	1	1	Split	MAY-MDO		
PAT	1	1	Split	BFS (4 Divisions), COR, RHB		
HART	1	1	Primary			
DTS	1	1	Split	BFS (5 divisions), DEM, DHR		
BWS	1	1	Split	DDC, DFM, MED		

Source: Department of Information Technology

Several CSRs serve more than one department to provide service coverage

Apart from the CSR staff (14 members, 61% of CSRs) dedicated to ENV, HFD, HESD, CSD, HART, and LIQ, which only support those departments and the liquor commission, we found that several CSR staff members support more than one primary department or division. This means the customer agency has a primary support CSR, but that CSR may also be primary support for at least one or more agencies. Exhibit 3.3 shows the number of primary support roles assigned to each CSR. At the time of our review, eight CSRs were assigned to multiple departments or divisions as shared primary support.

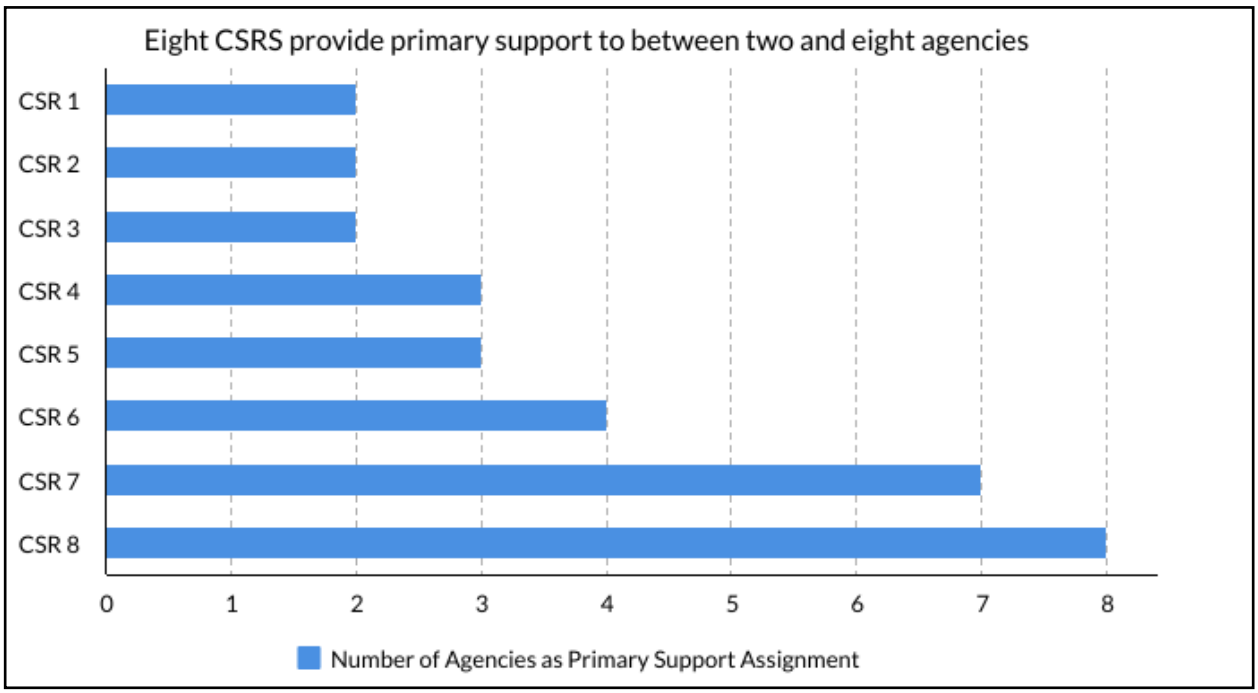


Exhibit 3.3
Number of Primary Support Roles Assigned to Each CSR With Multiple Assignments

CSR	*Primary Assignment for Following Agencies*	*Number of Agencies Primarily Supported*
CSR 1	MAY-MDO, DPP	2
CSR 2	DFM (Kapolei Hale), DPR (Kapolei Hale)	2
CSR 3	DCS, DES, NCO	3
CSR 4	DDC, DLM, DPR	3
CSR 5	DDC Facilities, DFM, MED	3
CSR 6	Legislative Agencies (CLK, CCL, OCS, OCA)	4
CSR 7	BFS Administration, Purchasing, Real Property Assessment, Treasury, COR, PAT, RHB	7
CSR 8	BFS Budget, Accounting, Fiscal, Internal Controls, Payroll, DEM, DHR, DTS	8

Source: Department of Information Technology

The CSR section indicated that when support coverage for a CSR expands (2 or more), focus shifts from departments and their projects to providing adequate service coverage to all their assignments. When covering multiple departments, the CSR becomes more focused on broad service to all their assigned departments rather than direct support of their individual department, including projects. This can directly affect meeting the needs of city agencies.

In its current staffing, the CSR section reported that when departments have CSR support vacancies, they may also need to shift CSR support around and rearrange the agencies supported by the CSRs. This causes department coverage for individual CSRs to expand. As a result, several CSRs must provide support to more than one department. The only CSRs affected are on the general support team that must support all other city agencies that the environmental and public safety teams do not support.

This shift to providing adequate service coverage from focusing on departments and their priorities and projects is created by the increased support and service workload of some CSR staff. We reviewed criteria from a nonprofit management about workloads and trade-offs. Applying these criteria, with CSRs, there is a staffing plan that assigns support and service to each department that the CSR section is responsible for doing. Each CSR is

allocated support responsibilities. There is a certain realistic amount of work that can be assigned to each CSR. There are support responsibilities that are not assigned to any CSR due to vacancy that must be covered, the section has prioritized adequate service coverage. Since there is not unlimited time and resources, some items are more important or have more priority than others, resulting in others given less priority for achievement.

After being assigned their support assignments, CSRs have to prioritize which support and service efforts are important, and given their limited resources, which are essential and important to do, and which may not be done or done in a reduced fashion. Essentially, tradeoffs are made over what is the important objective. Some things get dropped or deprioritized (take longer). The customer agency's expectation for support and service remain the same, even though there may be less ability for a CSR with a heavy workload to do more than provide them with as needed service and support coverage. The section indicates that a CSR may request to be taken off of supporting an agency if their workload is too much. A customer agency may request a change of a CSR if the support relationship is not working (e.g., not understanding what they want, poor relationship over time). These were the main ways workload would be managed besides rotation to provide backup or coverage of a vacancy.

For CSRs with a heavy workload, this can have impacts in level of direct support and service provided. It results in reactive support of requests for assistance, problem solving, or evaluations. It limits and affects the ability of CSRs to work on particular projects and priorities for agencies. It affects engagement in important policy-defined roles because there is less time available to help agencies plan, evaluate and prioritize their IT initiatives and projects. There is limited time and resources to spend on helping a customer agency improve its efficiency and effectiveness using IT.

Various customer service comments indicate current concerns about effectiveness of support and service required

Customer service concerns illustrate greater demand of DIT from its customer departments for IT service that is timely, improves efficiencies, and supportive of customer department initiatives. Eleven of the 36 surveys received (38%) provided comments on customer service and related issues experienced, which included:

- Staff not available (e.g., need to wait for service, technology rollout, not enough coverage, less responsive/support sporadic, more resources needed for pandemic and remote work)

Technology rollout. A backup CSR was not assigned to assist with a scheduled new computer rollout while primary CSR was unavailable. Pandemic required virtual meetings and phones with long distance calling capability. They had computers with no mics and speakers, some phones without long distance calling, and computers were beginning to fail. Had to elevate to director due to issues meeting work deadlines.
Availability of support. Several days wait for response due to lack of adequate CSR coverage. When primary CSR is on leave, difficult to get assistance from backup
Less responsive/sporadic. Levels of support sporadic due several changes to agency's CSR in the past year

- Need more information on improving IT efficiency and effectiveness

  Thirty responses expressed an expectation that one of the CSR roles (or DIT staff in general) is to help them improve their operational efficiency and effectiveness by using IT. However, nine of the 30 responses (30%) indicated that CSRs or DIT representatives did not inform them, with reasons such as they were not offered, are not proactively provided, or there is no time

- Not enough staff (e.g., to design/maintain project, troubleshoot application, doing own troubleshooting)

  Design/maintain project. Agency currently using a vendor requested DIT to design a website with a payment function and maintain it for them. DIT indicated there was not enough staff to support it.
  Doing own troubleshooting. CSRs not immediately available, need to resort to resolving problems on own, or operating without use of program.

- Quality of support (e.g., knowledge to support system, understanding of business processes
  - Concerns such as department does not take the time to understand business processes to offer advice or viable solutions.
  - Despite a forward lean to create in house solutions, DIT lacks the technical expertise and knowhow to develop and support critical systems, like regulatory and compliance systems. Concern that it is inefficient to try and recreate the wheel when there are well established, cost effective, and suitable systems available to meet customer agency needs that can be quickly purchased and implemented.

- **Who does the CSR serve?** This leads to contention and friction between departments and DIT about what the department wants versus what DIT can or should support. It has been mentioned that DIT is not user or department focused enough to meet their needs. The belief is while CSRs are supposed to serve the needs of the agency, they ultimately take their marching orders from DIT administration, which can add difficulties and delays to getting their needs met appropriately. On balance, DIT must consider whether the IT solution meets city standards for security, technical compatibility, ability to support, or will work in the city's current IT environment. On the other hand, these agencies want DIT to be more open minded in supporting their preferences rather than provide less than optimal solutions or deny requests.

Hit-or-miss communication between CSRs and agencies may limit opportunities for IT improvements

Communication is an important component of successfully servicing and supporting customer departments. However, we found that inconsistent communication may be limiting customer department's ability to relate their concerns, initiatives, and ideas for improvement to DIT. Customer agencies realize that when CSRs are in communication, they can give and receive input to advance their IT initiatives and meet their needs.

CSRs are the link between DIT and city agencies. Department management highlighted that CSRs are embedded within departments which gives DIT the opportunity to plan more proactively, rather than only responding to the issues that rise to the attention of DIT administration. Therefore, it is essential there is proper communication between them. When it comes to communicating, survey respondents indicated that communication can be *hit or miss* between customer service representatives and their assigned agencies. There have been agencies that said the customer service representative was always in communication and provided necessary input to the agency to advance their IT needs. When successful, survey responses reflect the following conditions:

- CSR provides excellent initial and ongoing support
- CSR is very responsive and helpful

- Our CSR has been responsive to our needs
- CSR is extremely responsive and works in a timely manner to get issues resolved.

Other agencies have noted that while their CSR is helpful in assisting with IT needs, communication has been limited. Some agencies have reported that communication is usually one way and that happens only when they request something from the CSR. Agencies have also noted that limits of CSR staff resources and time prevent discussion of improvements to meet the IT needs of the agency. We noted ten responses (28%) that reported DIT did not do this and also found that that the supporting CSRs had at least three to several primary agency support assignments, so were prevented by their workload.

With current staffing levels and the need of CSRs to support multiple primary support assignments, the section emphasis is on broad coverage to provide support and service, and that working individually with specific agencies on their projects or initiatives becomes difficult. With CSRs having to manage multiple agencies, communication and the free flow ideas becomes scarce, and communication usually comes in the form of requests. Some survey responses reflected limitations in communications:

- Although our CSRs have been helpful in all instances when we reached out for assistance, we have not received IT information that was proactively provided by DIT.
- Inconsistently. Not every situation is communication always provided. Sometimes we find out from our staff or staff from other departments.
- Communication happens occasionally, although the more significant ideas are not trickling to us via the CSRs, but rather tends to come from other DIT staff.
- DIT assists agency only when asked.

Department needs addressed reactively rather than planned

Due to numerous support obligations and limited time of CSRs, department IT needs are mostly addressed and evaluated reactively. By city policy, CSRs should be assisting the department to develop its short- and long-term IT plans and priorities, and developing internal coordination to support these IT activities. A reactive approach to evaluation and assistance has negatively impacted some departments in accomplishing their priorities,

increasing their efficiency and effectiveness, and supporting their operations.

We found that there is no standard approach that CSRs use to evaluate or plan for customer department IT needs. CSRs are encouraged to meet with their agency and evaluate their IT needs. Most of our CSR survey respondents (65%) indicated that IT needs are often evaluated on an ad hoc basis, usually daily, as needed or when requested. Evaluations can also be trigged by requests for service or technical approval. Two CSRs indicated that they performed it when assigned the evaluation by a supervisor.

The other three responses suggested that they took a periodic or planned approach to evaluations indicating that they are conducted periodically (monthly, annually) or to support IT planning in the department. For the fire department, this includes a series of planned evaluations in order to keep their technology up to date: a small evaluation each quarter (e.g., to finalize and plan purchases); a larger evaluation to plan the annual IT budget; and then a large-scale evaluation to update HFD's IT plan every 5 years. For annual evaluations, a technology and planning review is prepared for a department.

We found that the first style was the more common approach noted by departments and CSRs than the second style. Generally, IT needs are constantly coming in from management and end users. Each is evaluated and solutions/options are provided. For more complex issues, customer department and DIT management are brought into the discussion to ensure all parties are satisfied. Although current policy provides that the CSRs should assist with engaging in this style of evaluation, there is a trade-off with limited resources to provide short term support. The number of agencies primarily supported does not leave time for more thorough evaluations or planning of short and long term needs and priorities.

The second style may be more responsive to ensuring better address of customer department overall needs, concerns, and priorities, but it is less used currently by CSRs as they attempt to respond to current service and support needs. Based on responses received, only departments like Fire and ENV have CSRs who assist with conducting formal planning similar to current administrative directives.

We were able to review both department's plans. These plans were consistent with the planning contemplated by the city's current policy in the Mayor's Directive 06-02, that DIT assists departments to develop long and short-range plans for utilizing IT

within the customer department. Planned projects are prepared that list details of anticipated benefits, increases in productivity and efficiency, lower operating costs, and increases in services to the public. The plans are intended to communicate departmental priorities and are updated as necessary to reflect additions and changes. The section noted that ENV prepares a technology plan review in consultation with its vendors. We also reviewed a technology plan review for ENV. A common feature of the planning documents was that they were prepared by senior CSRs who had many years of experience, so were familiar with preparing these planning documents. Without planning, customer department priorities are only be addressed as current resource levels and priorities allow.

Evaluations occur to meet current needs and requests rather than for planning support and service

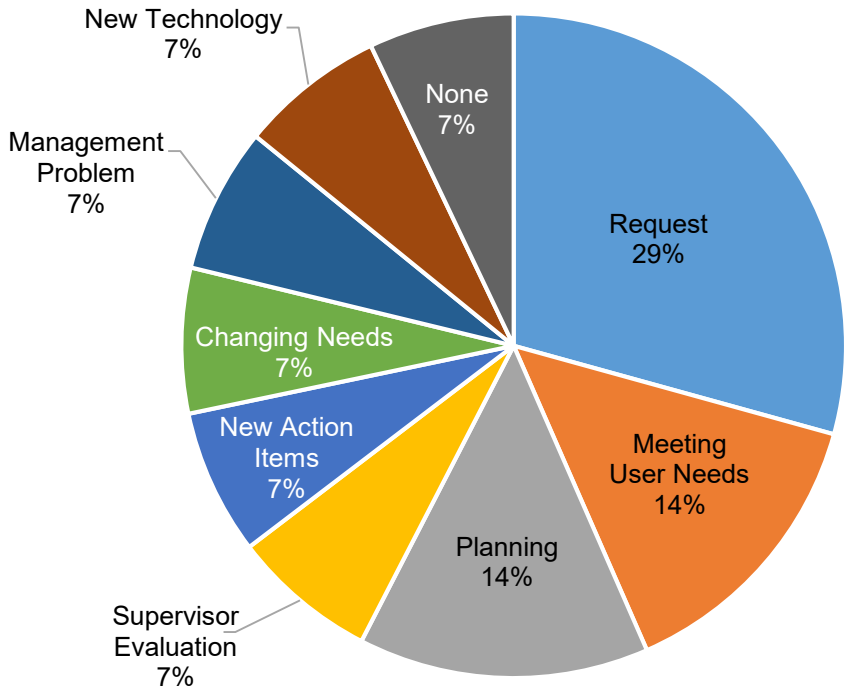
We found that evaluations are primarily occurring to meet user needs and be responsive to practical needs and requests, and that this is necessary because of the current support workloads on a minority of CSR staff. We asked CSR survey respondents what triggers a CSR to evaluate a department needs. Requests from the department (29%) was indicated as the primary trigger for the evaluation, while meeting user needs and evaluating on a planned basis (14% each) were the other most popular reasons given to evaluate department IT needs. Other reasons reported included practical ones such as changing needs, solving management problems, and new technology.

While planning is noted as an evaluation trigger, responding CSRs noted that evaluations conducted for planning purposes was less frequently cited as a reason to assess department needs, concerns, and priorities. We inquired about the role that CSRs plan in assisting with the IT planning/budgeting for a department (e.g. technical reviews, annual plans for initiatives, etc.). The section noted that every customer department has plans to some degree, but not as formal as for ENV or Fire. Apart from requesting current needs, some departments find it difficult to discuss and plan out their IT priorities and initiatives with DIT. The formal planning intended by former administrative directives is no longer conducted by DIT management (e.g., IT steering committee); regular planning meetings are only held with a few select departments and largely concern active priority IT projects.

If an agency does not have regular planning meetings with DIT or an active priority project, it must depend on the request process or the ability of their CSR to assist them with project or initiative. This makes it difficult to get priorities communicated

and accomplished, or to plan out their short and long-term IT initiatives and the support and coordination required for their initiatives according to planning requirements in the current policy. The current approach can hamper agencies with clear IT needs and priorities, which require planning and coordination to meet their objectives.

Exhibit 3.4
Triggers for Evaluation of Department IT Needs



Source: Department of Information Technology

Some examples include:

- Department has a vendor supported major system and needed more DIT involvement and technical assistance in meetings to technically translate their new initiatives, resolve current issues, help meet it needs, and maximize cost effectiveness. While they attend meetings, they do not assist the department during planning process before meetings, and department is unprepared to explain what they want and translate it into IT terms.

- Department has major IT operational needs requiring coordination with DIT on issues such as technical support, implementation of technology, and delayed upgrades. Its high priority initiatives require planned timing and sequenced implementation as they are dependent on and build on one another. Department desires regular discussions on how to utilize new technologies, greater DIT support of other technologies, and the ability to adopt and implement new systems when technology changes. Only one CSR assists them, and it is hard to get their initiatives prioritized through CSR or by request. They would like a return to the previous practice of annual planning and technical plan reviews to establish priorities.

- Department is small and shares a primary CSR with a few other larger agencies. They have certain initiatives that will take time (e.g., implementation of a case management system, archiving old data, assistance with a payment system); however as a small agency they do not get planning attention, everything is by request, and through the CSR. As a result, some projects have taken longer than expected or have not progressed.

Prioritizing service and support among most customer departments is generally reactive

Generally, in most other situations, we found that if there is a need to prioritize service and support, the management consideration is similar to the *squeaky wheel getting grease*, attention goes to where the problems are. The section indicated that if a situation has public service issues or media attention, the more likely that the underlying IT issues will be looked at and understood. CSR section acknowledges that some departments are not vocal about their needs, concerns, and priorities. Without being notified directly, current staffing levels and ability to service do not ensure that CSR management will know about their issues and concerns.

On the other hand, we found that certain departments with more CSR staff support, or embedded staff, can receive more direct service and support than other departments (e.g., ENV, Fire). CSRs are embedded at departments (work on location) if DIT gets positions from the customer department, if the customer department is located away from the civic center (e.g., Kapolei Hale), or if there is a lack of space. In these departments, the CSR is often contacted for support directly about a variety of issues, in lieu of contacting the Help Desk or requesting services through the normal request for service process. These embedded staff can, at times, provide more ability to customize appropriate solutions

with greater direction from their departments. We note that departments with embedded CSR staff expressed very positive comments about the support and service they received from their CSRs. The section acknowledges that these are advantages of embedded staff.

In terms of prioritizing service and support, certain departments have functions that are vital to city operations and are supported on a 24/7 on-call basis. These include the CSR public safety group that supports Fire and HESD. These CSRs are on stand-by to respond to off-hours requests. Also, as previously noted, CSR support is also provided by assignment of primary support and backups.

In the current policy, agencies are to work with DIT to determine the priority and level of internal coordination to adequately support all departmental IT activities. This is not currently occurring, so some agency needs, concerns, and priorities are not known or met. According to policy and previous practice, this would be accomplished by assistance of the customer agency in preparing short and long-term plans, indicating annual priorities, defining projects, and planning the coordination required for support. Other previous practices were to have regular meetings to discuss issues, plans and priorities, and to review, plan, and update IT plans annually. Certain CSR workloads appear to prevent this, and only allow ad hoc service and support. Only the dedicated environmental and public safety teams have continued according to policy and previous practice and have the ability to invest the time and effort. This is an unintended tradeoff of grouping the vast majority of support roles on the general support team, which results in a CSRs attention being divided among two or more primary agencies to support.

Continuity of support and service is a key issue for the department

We found there are continuity issues with the current assignment of primary support and backup roles. Support and service issues are created by not assigning all departments or divisions a backup CSR to provide as needed coverage and develop familiarity and support experience. We found that all CSRs assigned backup roles already have multiple primary agencies to support and are each assigned multiple backup roles. This happens because there are not many CSRs available to take on primary and backup roles for the majority of city agencies. This is not effective for providing needed coverage and effective, as needed support.

The CSR staff has been successful in serving and supporting customer departments due to an experienced, long-term staff, who becomes familiar with department needs via years of service and

support. While there is value in long term support, continuity of that high level of support is a concern.

A primary concern cited by departments is over their long-term CSR resigning or retiring, which may result in losing institutional knowledge and effective IT support for their operations and services. Many long-term CSRs serve in critical IT support roles, including over key systems. Retirements of senior IT staff at these departments have led to recent transitional difficulties, and the need for other CSR team members to take on expanded roles to take up slack caused by vacancies.

Backup system is needed to support primary CSRs

There are fifteen agencies that have only one primary CSR. To provide continuity of support, agencies are assigned backup CSRs in case their primary CSR cannot assist them. We found that all CSRs assigned backup roles already have multiple primary agencies to support. Some agencies (DEM, DFM, DTS, and BFS Fiscal Services) have a secondary backup CSR because their duties are considered vital to the city.

However, some agencies like HART, MED, and LIQ, DDC Facilities division, and the Kapolei Hale offices of DFM and DPR have no backup assigned to their primary CSR. Along with no backup, DDC Facilities, MED, and Kapolei Hale DFM and DPR also do not have a dedicated primary CSR. There have been concerns with some agencies that they do not have enough CSRs to effectively assist with their IT needs. From our review of department assignments given to CSRs, we found that several CSRs have two or more departments that they are primarily assigned to support, with some assigned a combination of up to eight to support.

Not all departments or divisions have backup CSRs creating potential support issues

Some CSRs are the single support for their agency, and they have no backup assigned to their departments or divisions. HART, MED, and LIQ are city agencies that do not have a backup CSR assigned to support them should their primary CSR be unavailable. DDC Facilities Division, DFM and DPR's Kapolei Hale offices also only have one CSR assigned to primarily support them without an assigned backup. For agencies that are supported by a single CSR with no backup, assignment of a backup would afford that backup CSR an opportunity to learn about the agency's needs should it be needed. Otherwise, when the need arises, the covering CSR would be completely new to the

customer department, and completely unfamiliar with it and its support and service needs.

In one case, a small department shared a primary CSR with two other agencies. It had a major new system that it wanted to purchase, a major project that required IT support to archive data, assistance with a payment system for its services, and setting up database to maintain records. While the department was satisfied overall with their support from their CSR, they felt unable to advance their priorities or make timely progress on these key initiatives, while feeling they are low priority for service and support due to their size. The purchase took years due to lack of support, and the archiving project has progressed slowly and stalled for a year.

A common support challenge cited by customer departments and CSRs is that it is initially challenging for CSRs to develop familiarity and experience to fully assist and be effective in their support and service role. Besides direct backup experience, there is limited opportunity to develop knowledge about a different agency's support needs and issues. We found that not many CSRs have direct, long-term experiences supporting other departments.

We found that although backup CSRs have been assigned to cover temporary needs or position vacancies, many CSR staff assigned as a backup do not have previous experience in supporting other departments other than their current CSR primary support assignment. We found in our survey of CSR staff that many had only supported their primary current department assignments, with no other direct support experience of a different agency. Only six (43%) had supported other departments prior to their current CSR support assignment, while the other eight had not.

Recently, one of the CSR staff that provided single support to two locations transferred to another section in DIT leaving two CSR support vacancies that had no backups assigned to temporarily fill in for these two primary support roles. While DFM and DPR have another CSR that provides primary support to them, those other two CSRs already had three agencies each that they primarily support. So while familiarity may not be a problem, the additional workload may create temporary service and support issues with the new assignment until vacancies can be filled, and further dilute their ability to support and serve their other existing primary assignments.

Assignment of multiple backup roles may not be effective for providing support

We found that seven of the eight CSRs assigned to be backups already support at least two or more agencies each as their primary support responsibilities. The CSR section generally assigns another CSR to act as the backup (or secondary backup) to the primary CSR for supporting those departments when their primary CSR is not available. Fourteen CSRs assigned to ENV, HFD, HESD, CSD, HART and LIQ are not assigned to any backup roles.

We found only members from the general service team of eight CSR staff were assigned to backup support roles. Much like the distribution of primary assignment roles, more backup support is needed than there are staff available, so backup assignments also fall on those who already have multiple primary support assignments. According to the current staffing plan, assignment of multiple backup roles may not be effective for providing support because current backup assignments are given to CSRs with multiple pre-existing primary and backup support assignments.

Exhibit 3.5
Support Assignments of CSRs with Backup Assignments

Primary Support Assignments	*Backup Assignments*	*Secondary Backup Assignment*	*Number of Primary Support Assignments*	*Number of Backup Support Assignments*
CSD	DPP		1	1
DDC, DLM, DPR	DFM		3	1
Legislative Agencies (4)	MAY-MDO		4	1
MAY-MDO, DPP	Legislative (4)	DEM	2	4
BFS Accounting, Budget, Fiscal, Internal Controls, Payroll, DEM, DHR, DTS	BFS Purchasing, COR, DLM, PAT		8	4
DCS, DES, NCO	BFS Administration, Fiscal, Payroll, Real Property Assessment, Treasury, RHB	BFS Fiscal	3	7
BFS Purchasing, Real Property Assessment, Treasury, COR, PAT, RHB	BFS Accounting, Budget, Internal Controls, DCS, DES, NCO		7	6
CSR Section Supervisor		DFM, DTS	0	2

Source: Department of Information Technology

The large number of primary and backup assignments is made necessary by only making the general support team available for these roles. The workload and current assignments for certain CSRs calls into question whether they can realistically backup primary CSRs, particularly if a number of them should become unavailable for any significant amount of time. This is a primary risk of the current uneven distribution of support roles, greater workloads and assignments can make coverage and support questionable. As indicated earlier, there have been some coverage and support issues, where CSRs are not available to provide support, to provide regular or prompt assistance, or are less responsive due to CSRs being on leave and backups not available to cover. This can delay the implementation of initiatives which affect customer agency productivity (technology rollouts, equipment upgrades). During the pandemic, support of in-workplace agencies was impacted on a few occasions by availability of CSRs to provide as needed, direct support at times.

Although the primary concern is providing appropriate coverage, a primary challenge is that it may be difficult for a CSR to assume another's role to provide service and support given the lack of familiarity and experience. The other challenge is availability to act as a backup in light of pre-existing primary assignment to support multiple agencies. Current backup assignments in light of primary assignments that number more than a few may make only broadly providing minimum service possible, when needed, which may not be adequate or comparable to that of the primary CSR.

While fourteen (61%) of 23 CSRs have one or two support roles assigned, we noted that six CSRs were assigned four or more total support roles, which included multiple primary assignments and backup roles. Multiple assignment of primary and backup support roles must be considered as a major contributing factor that can directly affect the quality of service and support received by customer departments.

During our review of department and CSR support information, we found that some CSRs with several support roles are perceived as providing less support and service, with some quality issues, as reflected by support and service concerns noted by CSR staff and customer agencies. We were able to find examples of service and support concerns indicated by customer departments about staff with many support roles assigned. The concerns were the following:

- Although many departments have long-term CSRs, one agency felt support of one of its key systems required

acquiring experience and familiarity from long-term dedicated support, but the frequent rotation of its CSRs led to a cycle where once a CSR learned it, they were transferred, leading to repeated support difficulties for the new CSR and the department during the repeated process to learn and become familiarized with its key system. This situation may also have been exacerbated by switching CSRs that already had too many primary assignments. Both CSRs, previous and current, had more than five primary work and backup assignments.

- A department needed more involvement and planning assistance prior technical discussions with a vendor of a major system to implement its initiatives and ideas so their needs can be met, are technically appropriate, and have cost effective results for the city. Its current CSR has several divisions and departments they are primarily assigned to support, and has not provided this kind of necessary support.

- One of the CSRs self-reported that workload issues prevent them from proposing improvements to their serviced departments because they already have too much on their plate, too little time to complete their current workload, , and adding extra things would be detrimental and only add to their work. They are also primarily assigned to several different agencies to support.

- Another department noted that while staff [CSR] are very supportive, they are not accessible to them due to resources and time available. This prevents the opportunity to discuss/implement their ideas to improve their efficiency and effectiveness with IT. We noted that their supporting CSR has one of the largest primary and backup assignment workloads. This department is planning to initiate its own internal process to meet with DIT administration in order to discuss and prioritize these ideas. However, this is an outcome DIT intends to avoid because it believes effective CSR engagement with their supported customer agencies leads to better solutions than a meeting of department administrations could ever produce. This is a role that CSRs are expected to fulfill as a job function, because they have the familiarity and experience of supporting their customer agencies at the operational level. This situation makes a case that more time and priority must be given to these kinds of discussions.

The CSR section staff acknowledged that support provided to departments starts to decrease with more primary assignments. Rebalancing the number of primary assignments among all general city support team staff may be appropriate. This would allow departments to benefit more from the familiarity and experience created by fewer service obligations, more opportunities to understand user department wants and needs, assisting with department projects and initiatives, and recommend solutions that could improve department effectiveness and efficiency in operations and service.

With long term support, continuity of support is a concern

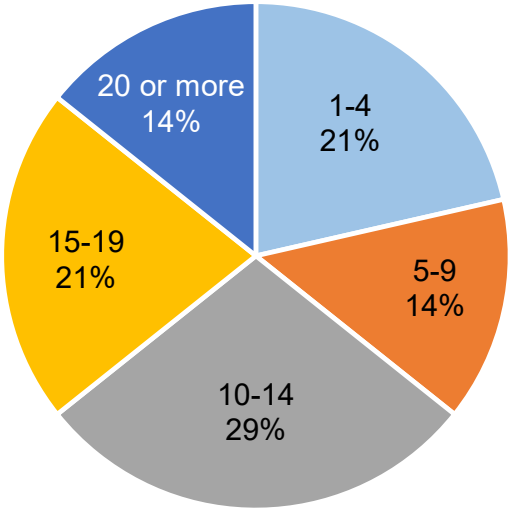
The CSR staff has been successful in serving and supporting customer departments due to an experienced, long term staff, who has become familiar with department needs via years of service and support. While there is value in long term support, continuity of that high level of support is a concern.

The section indicated current CSR staff is composed primarily of two groups: a very experienced senior group of staff that will near retirement over the next several years, and a younger group of staff that is just starting out. There are a few middle career staff.

We surveyed the current members of CSR staff about their roles as a CSR and received responses from 14 (64 percent response rate). The surveys received provided the following general responses about experience level and general support of departments:

- 86 percent had only served as a CSR while employed by DIT;
- 63 percent had 10 or more years of service as a CSR; 21 percent with 4 years or less; and
- 64 percent also had 10 or more years serving their assigned department(s) or division(s), similarly 21 percent had served their department(s) or division(s) for 4 years or less.

Exhibit 3.6
Years of Experience as a CSR



Source: Department of Information Technology

The section indicated that generally CSRs stay in the CSR role, rather than change job positions at DIT. In our CSR survey, 86 percent of the respondents had only been a CSR. Many have served their assigned departments for a long time. Thirty five percent of the respondents had served their current department for 15 years or more. Furthermore, it indicated that it is rare that a customer department will request that their CSR be switched, this normally only occurs due to prolonged service or communication difficulties (e.g. lasting for more than a year; not understanding what user department wants or needs).

Replacing and maintaining high level support is critical to key city agencies

A primary concern cited by departments is over their long-term CSR resigning or retiring, which may result in losing institutional knowledge and effective IT support for their operations and services. Many long-term CSRs have developed special familiarity or experience in serving their departments, and many serve in critical IT support roles, including over key systems. Emergency services departments expressed concerns that systems which help them support emergency services operations require a lot of familiarity, and in the case of disruption, they may not be able to service confidently or resolve issues without experienced IT support. Retirements of senior IT staff at these departments have

led to recent transitional difficulties, and the need for other CSR team members to take on expanded roles to take up slack caused by vacancies.

We noted the following transitional impacts of recent CSR changes:

- Staff performing their own job duties while temporarily assigned managerial and supervisory duties. Currently in HFD, there is a temporarily assigned CSR team member to fill the retired manager's role while still maintaining their own regularly assigned key duties that include supporting the computer aided dispatch system and its users; supporting 65+ HFD servers; various project work; front end support for 1000+ users; managerial tasks; and attending budget and planning meetings.

- The difficulty of replacing regular staff with contract support. HESD has two contract support staff to support their IT operations. The lack of experience and familiarity of contract staff is cited as a disadvantage compared to CSR support and service.

- Loss of planning support. The two retired team leaders assisted with the planning, budgeting and evaluation for the environmental and public safety teams support of the administrations of ENV, HFD, and HESD, a large and complex undertaking.

Continuity planning may be needed to better serve agencies in a support transition

The CSR section indicated that replacing a resigning or retiring CSR is normally covered by the backup CSR assigned to the department. However, we found that there is no formal planning or discussion with the served department to address contingency support and service issues caused by the vacancy. Currently, the section relies on being informed that staff will retire and will make preparations at that time to prepare someone to take over the role.

Administratively, this includes identifying the positions as vacancies to be filled and preparing current staff for a temporary assignment role to provide coverage. The section noted that it is not always possible to fully prepare for these situations, but it does request that the leaving employees prepare notes on their tasks and responsibilities, so that they can brief the staff member who will assume or cover their role.

Recently the department has had to address the replacement of two supervisory CSR staff in their environmental services and emergency services teams, one of which retired, and one which will retire soon. These are important positions for service continuity and have important department support roles in the areas of planning, evaluation, and budgeting. Both of these positions conduct formal planning and evaluations to address the substantial IT service and support needs on a short term, long term, and programmatic basis of the environmental services department and the fire and emergency services departments. These roles are critical to supporting and servicing these departments.

Standard IT service management practice recommends a continuity planning process that includes an assessment of the service level required to support the agency, discussions with the supported agency about what their critical systems are, operational needs, and service expectations, and then planning for ensuring a transition of duties and responsibilities and any additional staffing required. The department currently attempts to provide adequate coverage by filling support roles by temporary or backup assignment. With some city agencies, their key operations and services cannot afford to be affected by problems in IT support and services caused by staffing or supervisory changes. With continuity planning, the concerns of the customer agencies for continuity of support and service for their operations are taken into account, and transitional situations could be planned for and managed ahead of time with minimal disruption.

Key staff vacancies exist which have service and support implications

We found that the department has key staff vacancies in its CSR staffing which have service, support and leadership implications. Both the environmental and emergency support teams do not have permanent direct supervisors to lead and oversee their CSR teams, due to retirements. The emergency services support team leader is temporarily assigned to a current staff member, which leads to that member having to do their existing job plus additional supervisory and management duties due to current staffing. The CSR section also lacks an assistant section supervisor to back up the section manager. The three vacancies in general support team staffing make it such that current staff must take on additional multiple primary support assignments for service coverage, which affects overall support of those agencies. It also indicates that the department has lost key experience, skills, and institutional knowledge that are not easily replaced.

Team leader and supervisory staffing positions are important positions that ensure service continuity and sufficient leadership for CSRs. The positions provide supervision to their support teams and have important department support roles in the areas of planning, evaluation, and budgeting.

In team staffing, there are two staff vacancies in the general city agency support team, currently with eight staff, and there is one staff vacancy in the emergency services support team, currently with six. The section noted that when a non-supervisory staffing vacancy occurs due to retirement, the position is generally filled at the entry level, which creates the need for extensive training due to the loss of experience, skills, and institutional knowledge. Even if vacancies are filled, CSRs of the general support team will still need to be primary support for multiple departments based on the support need of covering all but three city departments. As a result, meeting department needs, priorities, and concerns via CSR support remains very challenging.

Recommendations

The Department of Information Technology should:

7. Evaluate its current staffing plan to establish appropriate primary and backup staffing support and service for each customer agency;

8. Consult with each agency to develop an IT support and continuity plan to cover expected support and service levels, and plan for contingencies such as CSR retirements or vacancies; and

9. Review current policies to establish planning, evaluation, and coordination of agency IT projects, initiatives, and priorities, and improve communications with user agencies.

Chapter 4

The Department Cannot Meet Certain Service and Support Expectations of Departments Due to Inconsistent Completion of Requests for Services

Requests for Service (RFS) are Used to Address Department Needs for IT Services

In the past several years, the overall volume of requests for services has increased due to the department's modernization and in-house development efforts to improve city IT systems and services. This has increased the overall workload of the Applications Division which receives the majority of the requests. With the increased use of IT in all city agency operations, agencies have increased expectations for prompt service of their requests, and assistance to meet their IT priorities. The department is often unable to set and meet completion dates that match agency preferences. In our review, we found that key department initiatives and operations have been affected by delays in completing service requests. This is caused by the current increased workload on Applications Division staff to complete requests, in addition to their work on priority projects and maintain applications. Management of the request process could improve as development, assessment, and defining requirements of requests can delay timely service and completion. There is also a need for increased monitoring of service request progress, particularly on agency requests that are high priority or time sensitive. Currently agencies have no capability to monitor the progress of their requests, which creates uncertainty and delay over resolving their service requests.

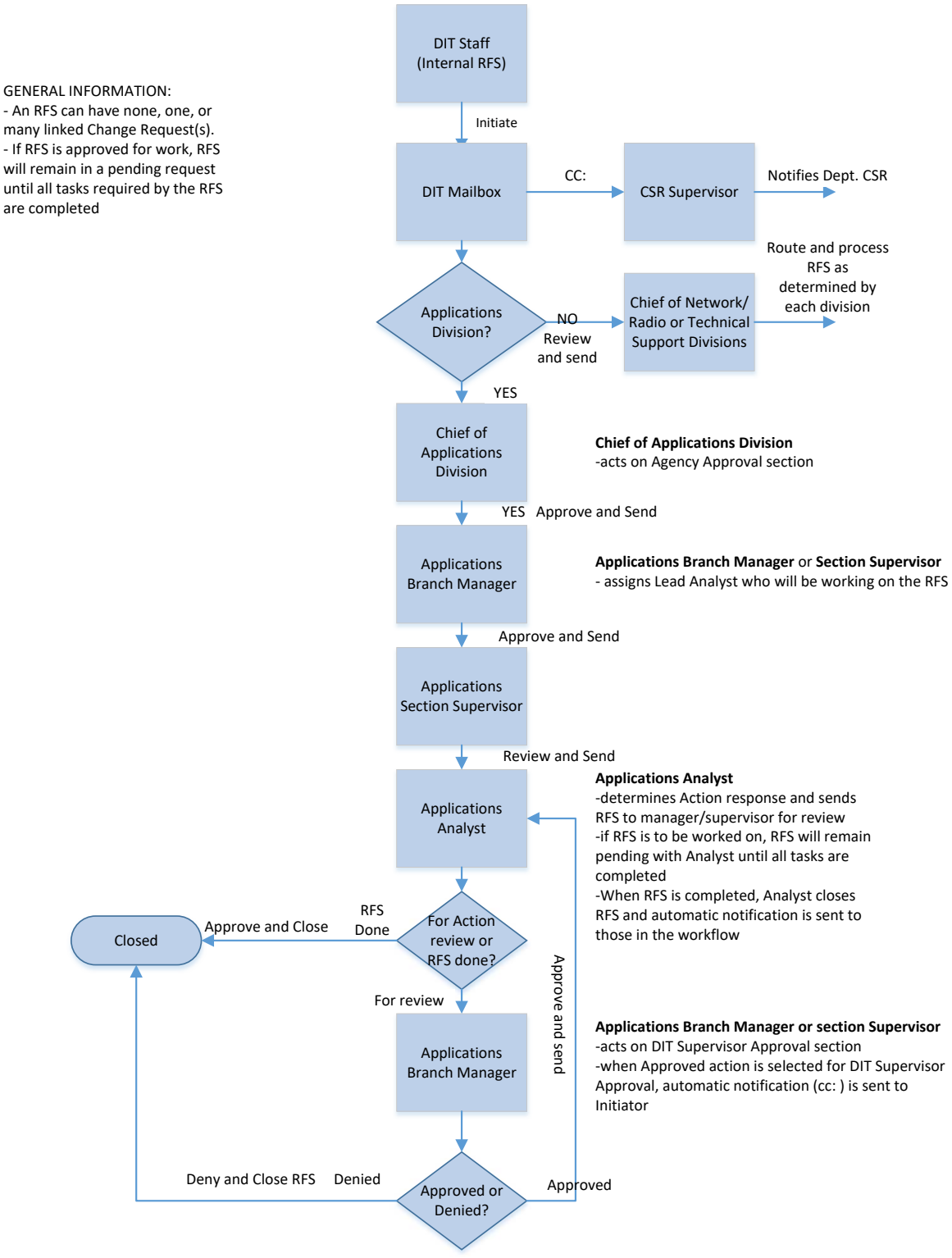
Background

A Request for Service (RFS) is an electronic forms process where city agencies send their requests to DIT for support and service of their IT needs. RFSs are handled by three divisions: Network/ Radio, Technical Support, or Applications. Agencies can request DIT to perform many different IT services including adding personnel logins to software, gathering data, and updating and improving electronic forms (eForms). The Applications Division provides services such as supporting applications; developing software, services, and other requested projects and extended features; maintaining implemented systems developed in house or acquired externally; and data management and reporting. This division completes RFSs ranging from routine to complex, such as applying new technologies (e.g. machine learning and artificial intelligence).

Process

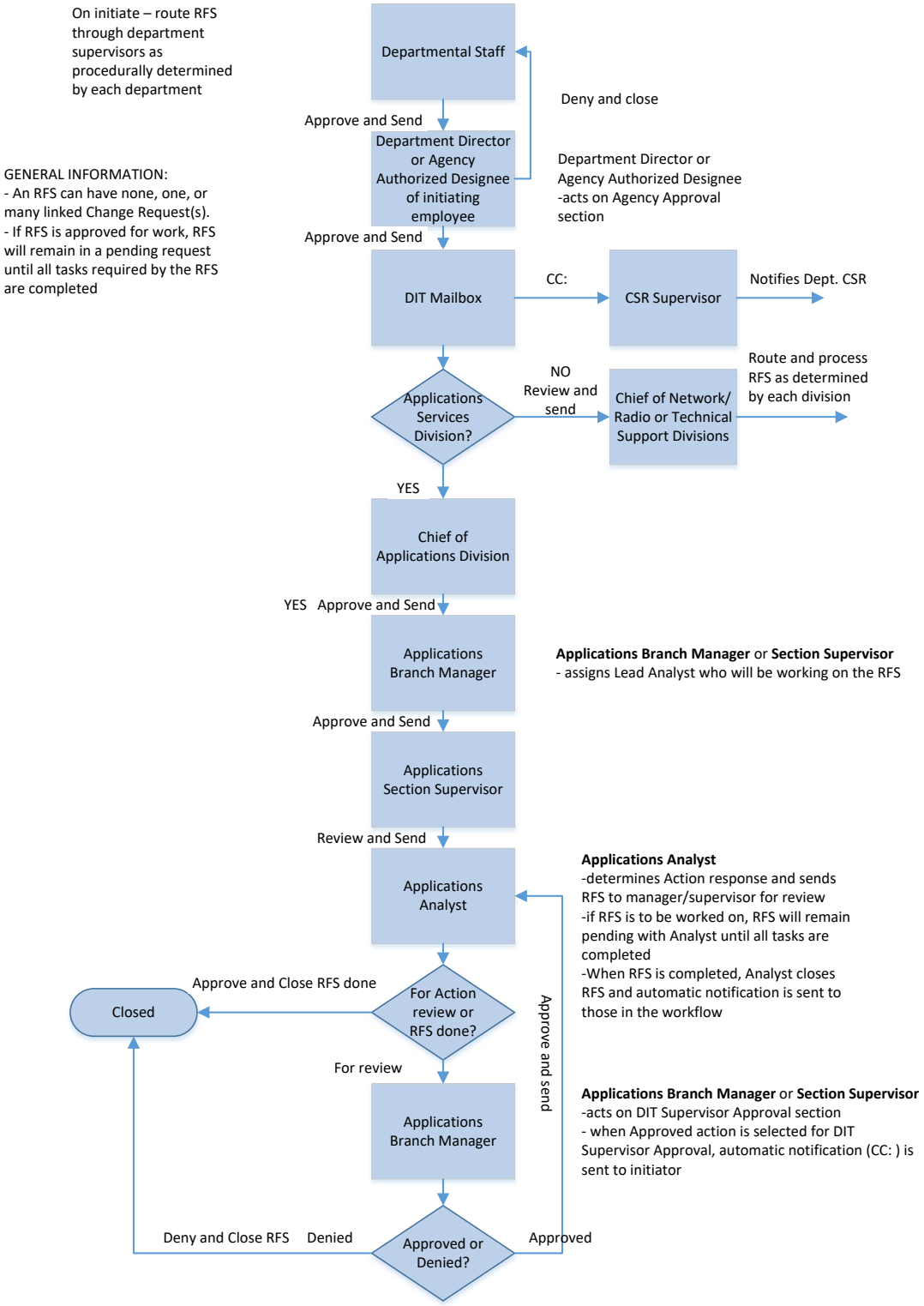
By policy, departments must present written requests to DIT for all IT services desired using the appropriate designated forms. An RFS is initiated by submitting an eForm request to DIT detailing their request and can be initiated internally by DIT or externally from another department. These various processes are shown in more detail below in Exhibits 4.1 and 4.2. When DIT receives a request, it is processed it to the Applications Division or appropriate division for approval. If approved, it is assigned for action and completion of the request. For requests sent to the Applications Division, an analyst determines the action and sends the request to their supervisor for review when completed. While undergoing review and analysis, the request's status will be *pending* until all assigned tasks are completed. When completed, the analyst closes the RFS and an automatic notification is sent to the requestor and others in the workflow.

Exhibit 4.1
RFS Process for Internal Requests



Source: Department of Information Technology

Exhibit 4.2
RFS Process for External Requests

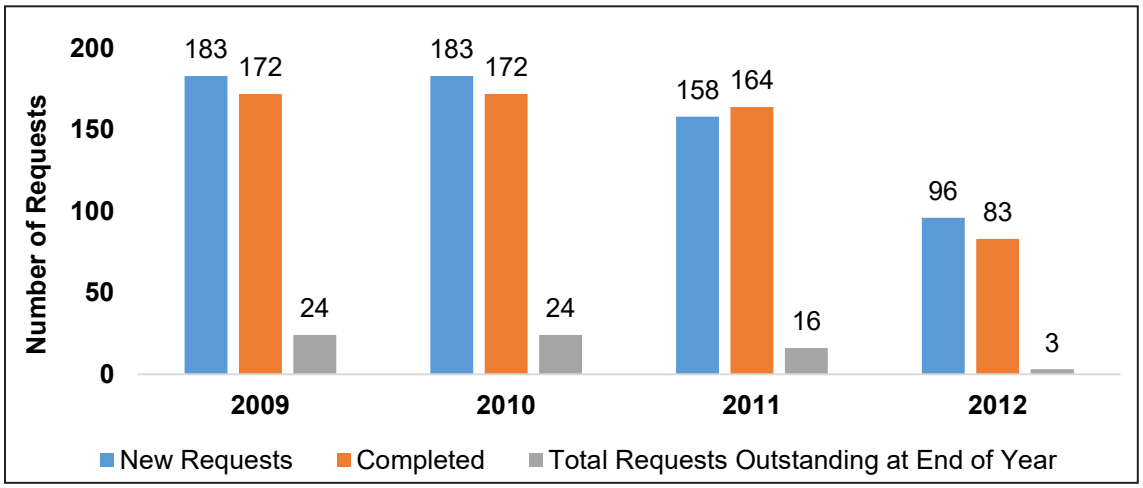


Source: Department of Information Technology

RFS volume over the years

From 2009-2012, new requests stayed below 200; in 2012, new requests did not reach 100. There were more new requests than completed requests, except for in 2011. For the four fiscal years, there were a total of 620 new requests, with 591 completed.

Exhibit 4.3
2009-2012 Requests for Service



Legend
New Requests are requests processed in the indicated fiscal year, any RFS routed in the fiscal year.
Completed is any RFS that was approved and closed within the fiscal year, which could include old RFSs from previous fiscal years.
Pending include RFS that last moved in the indicated fiscal year, with pending status when data was gathered

Source: Department of Information Technology

Volume of RFS have increased in recent years due to modernization and in-house development efforts

Modernization efforts, such as modernizing internal infrastructure, application frameworks, security infrastructure, and developing applications in-house rather than purchasing vendor applications, have significantly increased the RFS volume over the past several years. This is in addition to increased routine service, maintenance, and support requests. In FY 2013, the number of new requests more than doubled to 218 from 96 in the previous year. New requests totaled 225 or more per year through FY 2020. Few requests are denied or cancelled, so request volumes are not decreased by the review and approval process.

In FY 2015, ongoing tasks to modernize infrastructure to complete internal requests contributed significantly to the total requests outstanding as well as increased development work on major projects (e.g. AlohaQ, 311, etc.). By the end of FY 2015, the annual requests for service totaled over 300, and would stay above 300

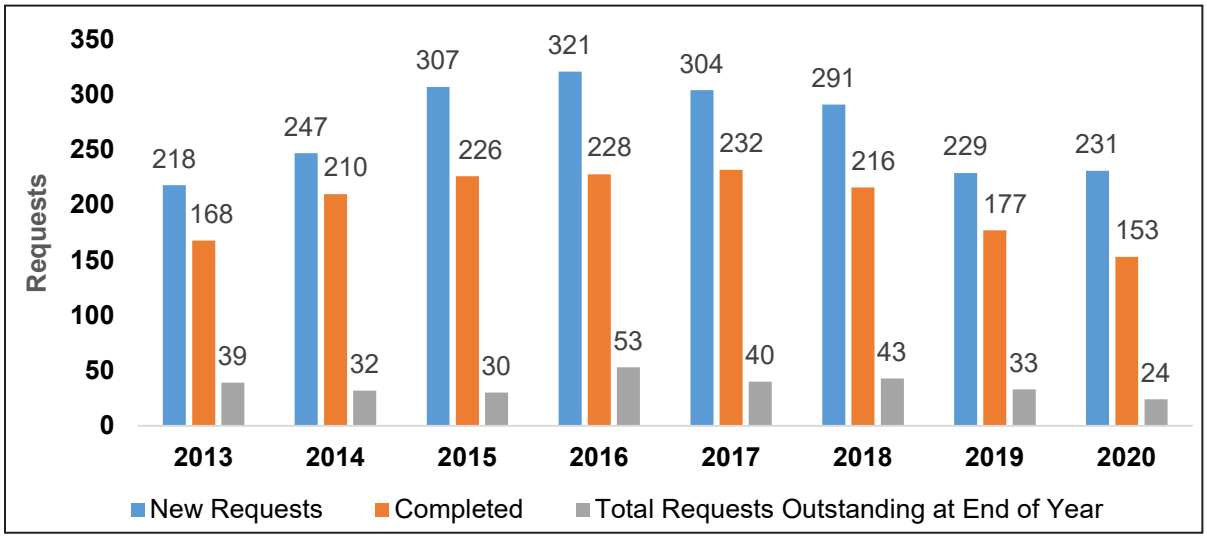
through FY 2017. The total number of new requests for FY2015 - FY2017 had also surpassed the total number of RFS from FY 2009-FY 2012. Volume has recently declined in the past two fiscal years as demand from certain modernization efforts has declined.

Along with supporting ongoing requests for modernization efforts, changes in staffing levels affect the completion of requests and total requests outstanding in a given year. While DIT completed the fewest RFSs in FY 2020 with 153 completed, total completed requests in a year may vary based on the scope and complexity of the requests. The Applications Division noted that their job is to complete all approved requests, despite staffing and resource limitations, but they do not have role in prioritizing requests unless there are urgent circumstances for completing the request.

The problem with outstanding RFS is that it adds to the overall workload and may result in a backlog of requests, especially since the volume of new requests have exceeded request completions annually. Generally, with more RFS volume, there has been an increase in the number of requests outstanding at the end of the year. New requests have outstripped the number of completed requests each year, and there have been at least 30 requests outstanding at the end of the year in most years. Without efforts to plan and prioritize request completions and manage workload, DIT's ability to service routine requests and timely complete service requests are diminished.

DIT should assess whether establishing a priority-based workflow to manage and complete requests is needed. DIT has not accounted for the relationships between new requests, ability to complete requests, and pending/ongoing requests, which could have helped it better manage the overall workload of requests. The department only takes into account issues of complexity and scope when determining estimated completion dates. The number of new requests, completed requests, and ongoing requests are used as performance indicators but their effects on total workload are not considered nor do they depict an accurate picture of the overall workload. Priority is to complete requests but staffing and resource limitations affect how fast it can address certain requests.

Exhibit 4.4
2013-2020 Requests for Service Information



Source: Department of Information Technology

Departments and Requests

We reviewed a sample of 444 completed RFSs from the Applications Division for FYs 2018, 2019, and 2020. We reviewed 154 RFSs from 2018, 137 RFSs from 2019, and 153 RFSs from 2020. The department with the most requests was the DIT with 157 of the 444 completed RFSs, about 35 percent of total completed RFSs. These are considered internal requests for service. External requests for service come from other city agencies. The departments with the most completed external requests during the period was the Department of Customer Services (64), Department of Budget and Fiscal Services (33), the Honolulu Police Department (28), and Honolulu Authority for Rapid Transportation (22). More detailed information about these requests and the sample we reviewed is provided in Appendix C.

Request Tasks

The types of support and services requested can vary quite considerably due to the different missions and operations of the agencies sending the RFS. We note the following as some examples for services requested by departments:

- Requests for support with reports from various systems and applications

- Updating webservices
- Electronic forms (eForms) support
- Support of operations forms (e.g., human resources forms)
- Adding functions to legacy systems
- Extracting data for various purposes

We examined and evaluated two RFSs each from FY 2018, FY 2019, and FY 2020. These examples are the actual agency details provided by requesting agencies. According to DIT, agency requests often do not include sufficient information or detail in order to properly evaluate the request and act within a timely manner:

2018

- Kapalama Satellite City Hall Vertical Display - Adding information and sliders to Kapalama satellite city hall vertical display.
- Update on-line voter registration webservice – Update on-line voter registration webservice to manage transactions after voter registration deadline has passed.

2019

- View to access eForms Security Liaison for attestation - Create a view to access EForms Security Liaison list for attestation application. Create EFormsAttestationUser to access the new view.
- Amend benefits processing session (BPS) form to add a field – please insert a new field which calculates the number of days between the BPS date and new employee orientation (NEO) date. If the NEO date is less than 7 days after the BPS date, the form cannot proceed forward. Issue: Departments are not following the instruction to wait 7 days after BPS to send their new hires to NEO. As a result, there are walk-ins to NEO.

2020

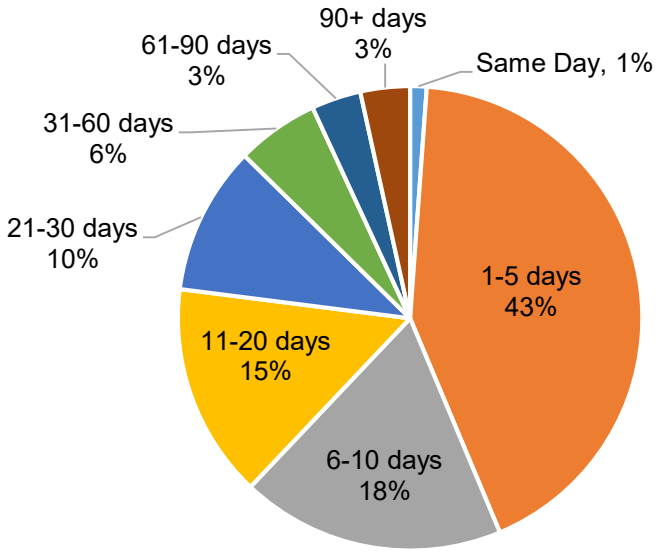
- Online Motor Vehicle Registration (MVR) Fee Calculation - Coordinate the 2 new national park plates fee calculations with the mainframe program MFEE changes. NP plates (Special Plate Codes 7 and 8) are $10 versus the $5 plate fee for most of the other types of license plates.

- Request for data from the Legacy of Life Hawaii - Provide listing of zip codes, dates of birth and genders of driver license and state Identification card holders who checked the box to be an organ donor."

General service expectation is that requests are completed within ten days

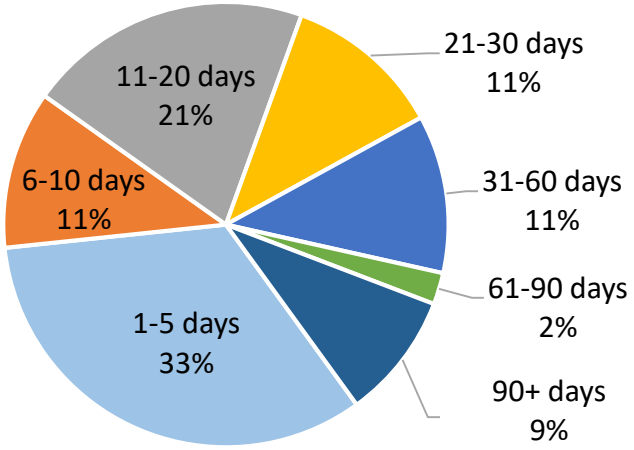
In the last three years, most requestors (61%) wanted their RFS to be finished or completed within 10 days of initiating their request, which is something the Applications Division is not capable of doing. The most common completion dates requested for desired and alternate dates (which allow for more time) provided between one to five days for completion. DIT staff noted that this kind of completion date is appropriate for a straightforward or routine request for service, but there are no timeframes provided for requestors to assess how long their request may take. DIT will accommodate agency requests if urgent or as their workload permits. If it cannot meet the service expectation listed, it will propose an alternate date of completion and offer to discuss with the requesting agency. Grouped together, 86 percent of requests reviewed desired completion of requests within a month.

Exhibit 4.5
Requestor Desired Completion Date (Days to Complete)



Source: Office of the City Auditor, DIT data

Exhibit 4.6
Requestor Alternative Completion Date (Days to Complete)



Source: Office of the City Auditor, DIT data

Assistance could be provided to improve request process

In every request for service, requestors set a desired date and an alternate date of completion, which allows more time for DIT to close out the request. There is no guidance provided on how to set the date, factors that might affect completion, or a request to consult with DIT staff on how to appropriately set dates for requests if assistance was needed. According to the Project Management Institute, these are standard information practices suggested for managing a RFS process. DIT indicated that some requestors do not know how to write what they need, set unrealistic dates for completion, or do not adequately consider the complexity and scope of the request. Consultation with DIT prior to submitting a request would help them understand a potential request and help manage the expectations for when it could be completed.

CSR/Trained Personnel could complete the RFS

When there are issues with defining requests and services, one method to manage a technical request process is to provide technical assistance in developing or communicating the request. Currently CSR's only receive a copy of the department's request after it is submitted. They are not always included in defining or developing a service request for their customer department. A possible solution may be to incorporate the CSR or other DIT staff in developing the RFS and submit it on behalf of the requesting department (as happens with some internal DIT requests). This

may lead to more complete request details and reduce time spent handling incomplete or inadequate requests. The Applications Division could also offer training seminars to teach how to effectively complete an RFS and what information DIT needs to complete a request. This could also reduce time spent developing requests so that they can be acted on. The division indicates that often their developers require more information, and the current short and long descriptions provided in the request form do not provide enough detail.

Completion date estimates offered do not meet requestor preferences

In our review of RFSs from FY 2018 - 2020, we found that DIT accepted an agency's desired date of project completion in only 38 percent of requests. Additionally, most completion estimate dates (43%) issued by DIT were set after both the requestor's desired and alternate dates of completion. When an RFS is approved, the division will give an estimated date of completion for the request. This date can be the preferred date, alternative date, a date specified by DIT, or an unspecified future date.

For unspecified future dates, DIT contacts the requestor when they are available to work on a request. The division noted that unspecified future dates are often used when projects are too large and complex, so an exact date cannot be given. In situations where DIT sets its own date or defers work, requestors are offered an opportunity to discuss why the DIT determination is unacceptable.

In our review, we found that DIT issued the following work date estimates:

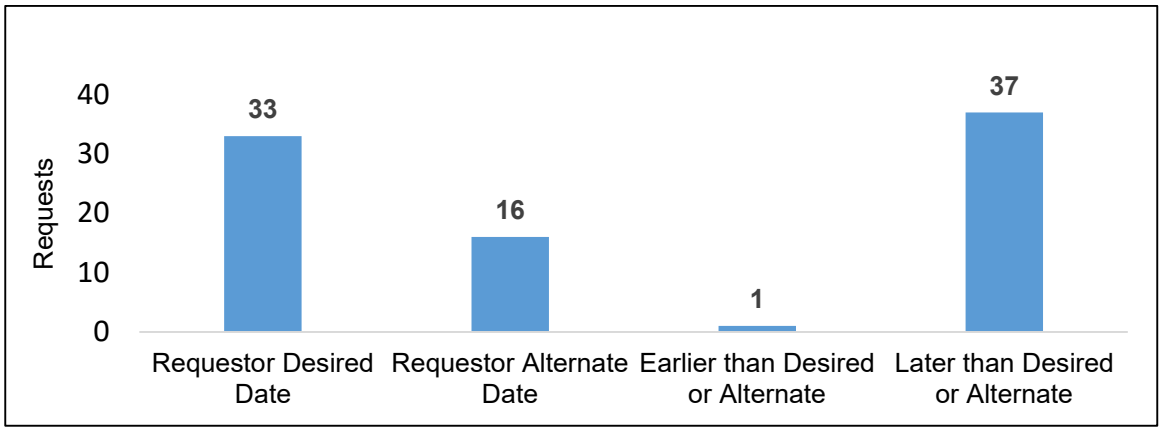
- 33 completion estimates (38% of total estimates) were set for the requestor's desired date;
- 16 estimates (18% of total estimates) were set for the requestor's alternate date;
- 37 estimates (43% of total estimates) were set by DIT to a date later than the desired or alternate date;
- Only one completion estimate could be completed prior to the requestor's preferred dates.

We identified the following trends in the data for completion estimates for FY 2020:

- DIT agreed to the requestor's desired date more than in the previous two years combined;

- DIT agreed to complete more requests by the requestor's alternate date, on par with FY2018;
- The amount of requests assigned a later completion date reduced by more than half compared to the previous two years.

Exhibit 4.7
DIT Expected Completion Date for Requests



Source: Office of the City Auditor, DIT data

Most RFS completion estimates are set after requestor preferred dates

Our review found that when work completion estimates were set later than requestor preferences, they were most often set for between one to ten days after the requestor's preferred alternate completion date (40%). Overall, about 60 percent of work estimates were set for one month or less after the preferred completion date, 35 percent were estimated for more than a month after, and five percent were not assigned an estimated date for completion.

The department uses the scope of work involved to set the estimated date, this consideration helps define whether suggesting later dates or late request completion is acceptable. The division indicated that it is willing to work with requestors with urgent needs that cannot accept a later date of completion and accommodate them as soon as possible.

Exhibit 4.8
Work Completion Estimate is Set Later than Alternate Date

Days Later Than Alternate Date	*Requests*		
	2018	*2019*	*2020*
1-5 Days	3	4	2
6-10 Days	4	1	1
11-15 Days	0	1	0
16-20 Days	1	2	1
21-25 Days	0	0	0
26-30 Days	0	2	0
31-60 Days	2	3	2
60+ Days	3	2	1
Unspecified	2	0	0

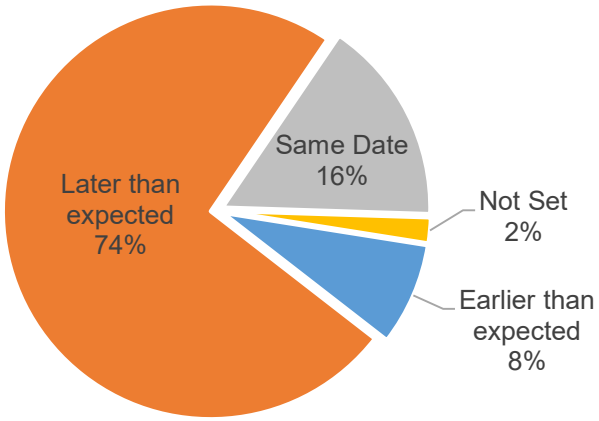
Source: Office of the City Auditor, DIT data

Requests are being completed later than promised

In recent years, dates given for work completion estimates are rarely met. Using reports provided by DIT showing the completion dates for requests for FY2018-FY2020, we reviewed how often DIT completed requests in our sample by the estimated date that was given. Almost three-fourths (74%) of the RFS were completed later than the estimated date. Only 16 percent were completed by the estimated date, and 8 percent were completed earlier than expected.

After the management response period, the department provided a hypothetical demonstration workflow to show that old requests can be reopened, worked on, and closed at a much later date, to purportedly show incorrect auditor calculation or conclusion about request completions. As above, we reviewed reports provided from DIT's own data during FY2018 - FY2020, which listed dates called completion dates for actual request for service submittals. This demonstration indicates the possibility that some reported completion dates may be unreliable because certain administrative activities may prevent capturing the actual date of request completion. This is a potential administrative internal control issue for the department to review and resolve in order to have accurate internal information about request for service completion.

Exhibit 4.9
RFS Completion Dates Compared to Estimated Completion



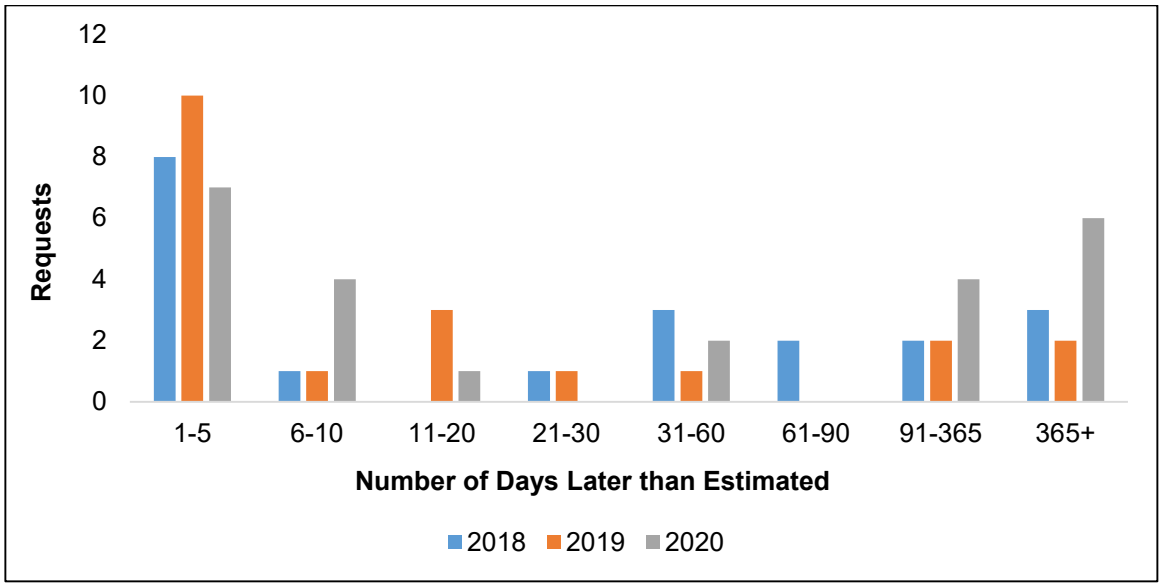
Source: Office of the City Auditor, DIT data

Nearly half of late RFSs are completed within 10 days of estimates

Given the number of sample requests completed later than expected, we reviewed how late the requests were completed in comparison with completion estimates. About 40 percent of the late RFSs were completed one to five days past the expected date of completion. This was the largest group in each of the last three years. Nearly half of the requests were completed within ten days past the expected date. However, 30 percent of late RFS completions were more than 90 days past the expected date, with 17 percent of those requests taking more than one year past the expected date. Request completions later than three months and more than a year have increased significantly in FY 2020. The division acknowledged that late completion of requests is not ideal and that they would like to complete service requests on time, but often cannot not for staffing and workload reasons.

As a result of the untimely completion dates, city agencies were forced to delay implementing IT projects, causing less efficient and slower agency operations. It also delayed any benefit to taxpayers in receiving city services in a more proficient and effective manner. This is discussed in more detail below concerning project monitoring.

Exhibit 4.10
Number of Days Late for Requests Completed After Estimate Date

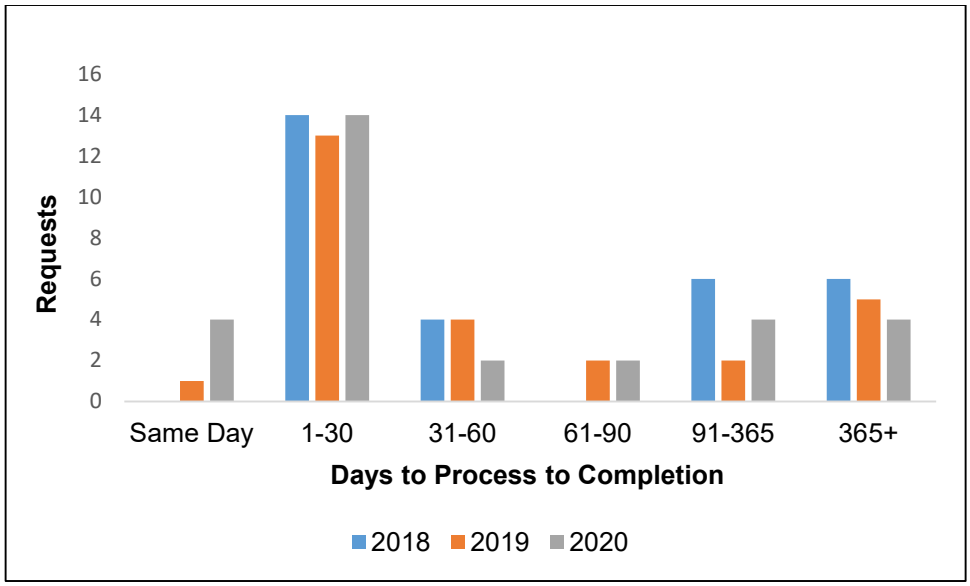


Source: Office of the City Auditor, DIT data

Most requests are processed to completion in a month or less

Currently, the Applications Division handles a multitude of tasks resulting from requests for service. Some of these tasks can be completed on the same day while other tasks can take over a year to complete. We found that for more than one half of the requests (53%), the entire request process from initiation to completion required one month or less, with 6 percent being initiated and completed on the same day. However, 31 percent of the requests took three or more months to complete, with 17 percent of the RFSs taking more than one year.

Exhibit 4.11
Request for Service Cycle Time



Source: Office of the City Auditor, DIT data

Complex service requests need further assessment

Since very few requests are denied, more review is needed over how to prioritize completion of requests or reduce request workload. The Applications Division indicated that it can handle 80 percent of the tasks requested. When a request is approved, they will work towards completing it. For more difficult tasks requested, which may include incorporating new technologies (e.g., machine learning, artificial intelligence) into their IT solutions, DIT staff need time to learn and research how to apply those technologies. This will add more time to complete the requests. For more complex or larger scope tasks, the request should be sent to DIT administration to determine whether it can be approved or not, given staffing, workload, or other resourcing considerations. DIT needs to create an assessment to determine when a request should be sent as an RFS to Applications or as a formal request to the administration; large or complex jobs would require more resources and staff to complete.

One example of a complex RFS is from June 2015. A city agency sent an RFS to the Application Division requesting that DIT copy information from an 11-year span from the agency's mainframe to other databases. This request was submitted in the middle of June 2015 with desired and alternative completion dates of early August 2015 and September 2015. The division said they could complete the RFS by the desired date. DIT completed

the RFS in the middle of July 2019, over four years later. This was not surprising due to the size of the project, as the agency wanted to move 11 years of data. This request should have been sent to administration for final determination due to the size of the project, which required more planning and prioritization to support and complete. Instead, Applications accepted the request, but did not have the resources to complete it in a timely manner. As a result, the requesting agency had to wait four years for the data migration and was unable to utilize that data and effectively manage its operations.

Difficulty in estimating completion

Applications Division reported that a number of factors affect timely completion. Applications explained that city agencies do not know the extent of what goes on to complete an RFS. When designing an application, it is difficult for them to give an accurate estimate for completion. Only when the request is approaching the end can the division give a more accurate estimate for completion. For short and relatively simple tasks, it is easier for them to give an accurate estimate for completion. The more demanding and more complex a task is, the more likely it is going to take longer than the agency expects. Applications staff noted that projects are completed late because the RFS short and long description do not have enough detail, and the developer needs to call for more information. DIT also reports that it can take the agency time to respond to queries for more information which further prolongs the process.

Applications Division cites staffing problems affect completion of requests

Applications Division noted that it does not have the money, manpower, or time to complete requests promptly. It has improved its staffing level in recent years but still has a 14 percent vacancy rate. The division observed that even if it filled all of its positions, it would be challenged to complete a workload of routine development and maintenance, much less its current workload. This is partly because of the support that the division provides to modernization projects, in addition to servicing requests and supporting city applications. Most division project teams have a staff of one to two people due to the lack of personnel, and most are assigned to several projects. A more complex project (e.g., motor vehicle registration) will have more staff assigned.

The division does not have a mechanism in place to effectively manage its assigned work because it does not have a role in

planning or prioritizing projects or service. The division indicated that it is overwhelmed with COVID projects support, supporting the new administration's requests, and supporting major projects and modernization efforts. This is all in addition to its normal responsibilities, so it is difficult to have RFSs completed promptly.

The division also cited challenges with hiring, training, and retaining staff. A benefit of the current approach in the department to use current IT tools, techniques, and programming languages is that it can hire staff from colleges who are more familiar with current approaches. The division will then train them in the latest technology and techniques and invest in their skills development.

Image source: Department of Information Technology

On the other hand, some newer DIT staff do not stay long and leave to enter into the private sector. The skills and knowledge the IT personnel learn at DIT have direct application with the skills and knowledge demanded by the private IT industry. The division explained that the private IT industry pays better wages than the City and County of Honolulu. Therefore, it is common for personnel to work a couple of years at DIT, then transfer to a private sector position. This puts the division in a constant training and recruiting cycle. This is a change from when government IT skills were more specifically applicable to only the government environment, and skills or tools used did not translate well to the private sector.

RFS process requires more monitoring over progress

DIT's ability to respond to requests may vary depending on the task requested and availability of staff to support it until completion. Additionally, more monitoring over progress is required to ensure responsiveness and timely completion of requests. The RFS process could be improved with an ability to track the implementation and completion of a requested task. Currently, there is no way for requestors to track the status of their request.

After submission, an RFS is routed for approval. Once it is approved for DIT action, the requestor is not able to track the tasks associated with the request. In our review of the past three years, we found that 61 percent of requests were reviewed and approved within 30 days, with a median of 15 days. As noted earlier, most requests we reviewed desired completion of their request within 10 days after submission, so the ability to review and approve requests promptly does have impact on both managing and meeting agency service expectations. With a set timeframe for review and approval, the department can minimize the uncertainty on whether the request will be approved, can be timely addressed, and avoid extended impacts to agency operational efficiency and effectiveness.

Once it is approved for DIT action, the requestor is not able learn the status of their request via self-service, or track the progress of their request and associated tasks. In terms of DIT status, the request is regarded as *pending* until all tasks are completed, and status notification is only sent after the request is completed. Currently, there is little formal internal or external monitoring, except for when an agency contacts DIT for the status of their request or if DIT staff has a reason to communicate with the requestor.

We noted the following examples:

- Special opening hours:
  - Department of Customer Services was planning to open one of its licensing locations on Saturdays for two months (ending in December), and needed support with its webcams, display, and appointment system. The department initiated the request in October 2017 as a same day request. DIT reviewed and completed the request at the end of April 2018. Reviews and approval were logged and reported nearly six months later.

- Support of public safety:
  - Since it supports the statewide system, DIT accepted a State Attorney General report requesting an investigation about the status of salvage vehicles on Hawaii Island in February 2018. It allowed for a two-day completion. Reviews and approvals were logged and reported in July 2018, nearly five months later.
- Supporting fee collection:
  - CSD requested service for adding two National Park Service special license plates fees to the mainframe program and collecting the special $10 fee. The request, which was initiated in March 2017, established a completion date of mid-April. DIT accepted the estimated completion in mid-April as requested. Reviews and approvals were logged and reported in May 2020, three years later.
- Meeting transitional needs:
  - Storm Water Quality division was moving from the Department of Environmental Services (ENV) to Department of Facility Maintenance in July 2015 and needed an eForms routing process. The request was initiated by ENV in June, with a requested completion date of August 2015 (alternate date). DIT reviewed the request and completed it in March 2018. This request had remained open for 2 ½ years, yet by the service information recorded it took four days to complete when it was finally assigned to an analyst.

Departments seek updates on request status

Since many RFSs are completed later than expected, some years after expected, more monitoring and communication is necessary to provide status updates. It is vital that DIT implement a monitoring system to track each RFS. This could be in the form of an application that can be used internally or for self-service that breaks down each step of the process and where DIT is in that process.

During the RFS process, city agencies have reported it is difficult for them to get the status of their request or when it will be completed. According to city agencies, DIT reports feedback about the status of their request only when it is completed. Combined with many RFSs taking more time to complete than what is

initially estimated, departments are finding it difficult to get updates on their request's status.

DIT has reported that it tries to keep the departments updated as much as possible by meeting with the departments on a regular basis as the service is performed to see if the agency approves. However, there is still a need for more communication or ability to inquire about request status. Our review found that 30 percent of late RFS completions were more than 90 days past the expected date, with 17 percent of those requests taking more than one year past the expected date. In conclusion, further monitoring is needed internally and externally to ensure timely completion and support.

Key department initiatives and operations may be affected by service delays

The inability to complete RFSs on-time may impact key department initiatives and operations. This has made some departments reconsider whether DIT can support certain initiatives it may have and deliver them according to their time or service needs. This can result in city agencies preferring to go to outside vendors to support their IT needs, which the department generally wants to avoid to manage ongoing costs and system support. One agency reported that it had used DIT for support and services via RFS several years ago, but its experience was that DIT took a long time to complete large projects or complex requests, and its operations required timely service because it was event and deadline driven. The result of this experience with late requests is the city agency is more comfortable using an outside IT vendor for its IT projects as the vendor can offer faster and more direct service, unless it has more lead time or a less complex task.

We reviewed these other examples:

- Providing management reports:
  - In September 2014, CSD requested a conversion of its motor vehicle licensing reports from its legacy system, so that reports could be formatted and printed on office printers and requested them by January 2015 (alternate date). DIT approved the request and committed to a later date of February 2015. This was logged as completed at the end of November 2017, more than two and a half years later.

- Providing public information:
  - In January 2017, CSD requested a change in location information be provided in their document guide application because the driver licensing location at City Square had moved to Kapalama Hale. CSD requested it be done in two days with an additional two days extension if needed. DIT estimated that it could be done in two days. Nearly one year later in January 2018, the request was logged as completed.
- Support of key service applications:
  - DIT requested server administration tasks (upgrades, research, training, and normal server maintenance) for the Department of Planning and Permitting and its POSSE system in May 2017, allowing until the end of the year for completion. DIT logged the completed request in January 2019, one year later.
- Support of key service applications:
  - DIT requested patching and upgrading of ias/iasWorld for the Department of Budget and Fiscal Services. Requested in June 2015, allowing until early September 2015. DIT logged the completed request at the end of July 2019.

Recommendations

The Department of Information Technology should:

10. Provide training and guidelines to city personnel on effectively completing the request for services form, including consulting with DIT during preparation;

11. Evaluate and update current request for service process, including creating service benchmarks, service level expectations, and general timeframe, to manage requestor expectations, completing requests, and the overall request process;

12. Create a self-service tracker by which the department and requesting agencies may consult about the progress of their requests; and

13. Create assessment criteria to evaluate service requests of greater complexity or resource requirements for discretionary routing to department administration for review and approval.

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Chapter 5
Conclusion and Recommendations

Conclusion

For many years, DIT has been engaged in an ambitious program to transform and modernize the city's information technology systems and key supporting infrastructure to improve IT support of city operations and public service. The department provides IT services to the mayor and city agencies to enable them to serve the public in a cost-effective and efficient manner. Currently, there is increased demand for services and support from departments that require IT assistance to improve operations and public service, to improve their efficiency and effectiveness, and to support their IT initiatives.

The past several years focused heavily on modernization and innovation. The recent efforts to modernize and improve city IT services have included re-envisioning the department's roles in bringing about necessary changes and improvements and taking on an innovative mindset. DIT has prioritized in-house development initiatives, which included its own training and research to introduce the latest technologies and develop staff IT skills. The current director has focused on developing in-house applications with placing less reliance on the purchase of vendor IT solutions and services, and instead emphasizes creating more IT applications and services in house. The department has focused on solving problems that are costly and highly visible, including eliminating costly legacy technologies, to save money and allow the city to spend on other key areas. The department has also focused on better use of data and applications to meet citywide and agency needs, and solutions to provide support and services to city department, agencies, and the public.

Modernization efforts have progressed well, but more planning is needed to better focus on ways that the department can service and support other departments and the public. There has been significant progress in modernization, including for many longstanding projects like renovating the city's data center, upgrading the emergency radio system and supporting facilities, and upgrading the mainframe provide a stable foundation for modern IT support and services, and supporting critical operations statewide. There is a need moving forward to put emphasis on how to better address and support and service department and public IT needs.

While the department has a plan for the overall course of major city IT projects and efforts, a return to planning with departments to meet their needs is warranted in light of current support and service limitations. This would better ensure that department concerns and needs will be prioritized and met. Along with limited resources and staff, current support and service is affected by support representative coverage and continuity, slow completion of requests for service, and decreased planning to meet other department needs and priorities. Consideration to increase staffing and resources along with more planning and prioritization of service and support may be needed to effectively address customer departments' needs for support and services.

Recommendations

The Department of Information Technology should:

1. Evaluate and report on cost and resource effectiveness in its selection and evaluation of developing IT solutions in house, including to support agency decisions about procuring IT solutions;

2. Consider ways to develop a strategic IT plan for the city, with input from other departments, and review it periodically;

3. Recommend work priority and implementation schedules for accomplishing the IT plans and service requests of departments;

4. Advise and assist other departments with assessing IT requirements and preparing long- and short-range plans for using IT in their departments, including identification of departmental priorities and action plans;

5. With assistance from customer departments and end users, periodically evaluate whether IT systems are meeting business and user needs, expectations, and outcomes;

6. Consider evaluating and reporting on its IT service efforts to support key city priorities, other department services and efforts, performance goals, and providing public service;

7. Evaluate its current staffing plan to establish appropriate primary and backup staffing support and service for each customer agency;

8. Consult with each agency to develop an IT support and continuity plan to cover expected support and service levels,

and plan for contingencies such as CSR retirements or vacancies;

9. Review current policies to establish planning, evaluation, and coordination of agency IT projects, initiatives, and priorities, and improve communications with user agencies;

10. Provide training and guidelines to city personnel on effectively completing the request for services form, including consulting with DIT during preparation;

11. Evaluate and update current request for service process, including creating service benchmarks, service level expectations, and general timeframe, to manage requestor expectations, completing requests, and the overall request process;

12. Create a self-service tracker by which the department and requesting agencies may consult about the progress of their requests; and

13. Create assessment criteria to evaluate service requests of greater complexity or resource requirements for discretionary routing to department administration for review and approval.

Management Response

In response to a draft of this audit report, DIT mostly disagreed with audit findings, examples, and auditing approach. Based on its response, the department seems only open to a favorable audit report that understands departmental operations as it does, characterizes its own efforts as it does, and only provides recommendations for improvements that they are in agreement with. Many of its criticisms ignore or overlook the fundamental findings or issues contained in the report. This raises continued concern that planning, direct support, and responsive technical service that may help other city departments and the public will continue to be a low priority compared to projects with internal administrative emphasis. We provide the following comments to provide clarification about the management response received.

The department questioned the scope of the review, desiring more attention to and credit for other major efforts that it had undertaken to improve the city's information technology systems and services. These, it reported, included its quick response to COVID-19 pandemic needs and support, and the reported success of its motor vehicle registration modernization effort. It also

commented on the coverage of the report, which in its opinion should have included all of its divisions, including its enterprise resource planning system. We must clarify that audits are not openly scoped to cover every operation, division, cost, process, etc. concerning a department. Sampling and reviewing high risk areas are standard audit procedures to establish areas for auditing and review. This is how the audit objectives were developed and this review was conducted.

One of the issues identified in the audit was limited cost data and reporting for in-house efforts to develop and support IT systems and solutions. This leads to an incomplete picture of costs and supporting efforts to achieve the modernization, service, and support provided by the department. It can also lead to an incomplete picture to evaluate an IT purchasing decision for a user agency. The department reported to the city auditor that they utilize CHERPS in house and have more access to this information than any other department. Despite access to all this information, we question whether this information is regularly reviewed, analyzed, and reported on to define how projects are developed, resourced, and supported in-house. This is why we recommended that a more thorough and comprehensive cost analysis and reporting would help policymakers better understand the costs and resources required to develop, support, and service IT projects, aid user agencies in vendor purchasing decisions, and enhance internal department evaluation of required project resources, including cost savings. It should also include assessment of qualitative factors like risk and benefits.

We concur with the department that IT projects and modernization efforts cannot be fully assessed by using quantitative metrics alone (e.g., costs, time/schedule). This is why we consulted the U.S. Government Accountability Office's Information Technology Investment Management (ITIM) framework in our review to assess how projects and the overall portfolio of sample projects were selected, controlled, and evaluated. This was dismissed by the department as antiquated or of little use for its project management because of its reliance on procurement and purchasing IT systems. To fill in this lack of information, we believe the department should be developing and establishing qualitative performance measures and metrics, in consultation with its customer departments, to supplement more conventional qualitative performance metrics and enable better assessment and demonstration of project value. We note again that ITIM defines these capabilities and establishes characteristics which demonstrate increasing maturity and ability to better select, control, and evaluate IT projects, including regularly using

fundamental information like costs, benefits, and risks to support management decisions.

The department provides a lengthy discussion about our findings concerning the request for service process. If we were to open the city's electronic forms (eforms) menu today, we would find many of the various 20+ requests for service that the department reports it handles. Nearly all are for very specific technical issues. In our review and discussion with user departments, staff raised concerns about the request for service process indicated in the report (e.g. timeliness, status). This is the process by which the user departments understand a request for service is filed, if it is not for a specified technical service. Most have very clear and prompt expectations of service completion due to concerns about supporting essential operations and providing public service. DIT currently provides an information guide and process chart for IT requests in the city's eforms system. However, it lacks the information for which user departments are concerned about, including the ability to track, define requests appropriately, and manage expectations for what it possible, etc. If it is as DIT characterizes, the request for service process is an old process not meant to be used to collect and process requests, or to provide users with status information or ability to track, and is of little use to DIT besides request detail and generating a file number; if we follow DIT's pursuit of modernization, such a system or process should be reevaluated and itself modernized for its suitability to meet the needs of its users and internally within the department, for which there are clear concerns and resulting implications.

We acknowledge the significant progress the department has made in its IT modernization efforts. Initiatives have provided a stable foundation for modern IT support and services and supports critical operations statewide. Although the department director disagrees with our audit findings, we continue to believe our audit results indicate a need for improved reporting on IT project costs and benefits to support decision making. Enhanced cost and benefits information also aids in justifying staffing and resources needed for direct assistance, technical support, and focused planning for meeting user agency and the public's IT needs, and improved responsiveness to IT service requests. We hope the director will implement the recommendations or alternative corrective actions to resolve the shortcomings disclosed in our audit report.

We did not make any significant amendments to the audit report as a result of management's response, but we made technical, non-substantive changes for purposes of accuracy, clarity, and style. A copy of management's full response can be found on page 114.

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December 29, 2021

Ms. Arushi Kumar
City Auditor
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1001 Kamokila Boulevard, Suite 216
Kapolei, Hawaii 96707

Dear Ms. Kumar:

SUBJECT: Response to the Audit of the City's Information Technology Modernization, Services, and Support

Thank you for the opportunity to review, comment on, and respond to the audit report transmitted to the Department of Information Technology (DIT) via email on December 13, 2021. This revised report corrected some of the major errors DIT highlighted in our response of November 24, 2021, and we appreciate the efforts of the Office of the City Auditor in correcting major portions of the report.

Executive Summary

The stated goal of the audit was to assess DIT's modernization efforts, support of departmental initiatives and efforts, and meeting of user needs and public needs for information technology (IT)-based City services between 2013-2020. Unfortunately, many of the department's major efforts received no mention except for inclusion in tables provided by the department.

More seriously, the audit claims to review technical service and support of city department initiatives, yet doesn't touch upon DIT services that cover 40% of staff positions and more than 75% of the operating budget. Major operations that were completely overlooked include ERP (comprising almost 25% of the budget), Network, Security, Technical Support, and Operations. Instead, about 25% of the report is focused on the Applications Division, whose budget accounts for less than 9% of DIT's budget.

The report corrects the previous draft of the report, in which the auditors estimated greatly inflated development costs, overstating them as much as 13,465%.

The current report removes the incorrect implication that it is not cost-effective to develop applications in-house, and DIT would like to acknowledge this correction.

Unfortunately, the portion of the report focused on a legacy form called the Request for Service (RFS) makes a similar mistake, ignoring facts and injecting speculation to support findings that are misinformed and misleading.

Report emphasizes cost and 'Completion' dates over effectiveness and benefits

- Although DIT has demonstrated substantial cost savings through its strategic planning and emphasis on a skilled workforce, it finds that the report focuses on cost and cost reporting, while ignoring the benefits of IT modernization projects. Not all projects are replacements for existing solutions; innovation often involves uniquely envisioned applications. The report also completely overlooks DIT's rapid response in developing emergency applications during the COVID pandemic. IT effectiveness is not measured solely in dollars and days.
- Focusing narrowly on cost of replacement is an inappropriate approach to planning and assessing IT modernization. The typical analog telephone handset cost less than $50 in the 1980's. Apple spent over $150 million in development on the iPhone, which retailed for $500, or 1000% of the product it 'replaced'. Based solely on costs, the iPhone was an unsuccessful attempt at modernization. In fact, iPhone has changed the entire world in immeasurable ways. The smartphone is far more than a replacement for the analog handset.
- Benefits of modernization include increased productivity and efficiency, new features, greater capacity, expanded coverage, better security, improved convenience, reduction of manual effort, tighter integration, and a host of other factors. Modernization sometimes results in cost savings, but often requires additional investments. Of the 180 modernization projects detailed in the department's Technology Roadmap, the report did not assess the benefits of a single project, choosing only to compare costs with estimates and to narrowly focus on 'replacement' costs attributed to development and support.
- No mention was made of major efforts which prepared the City to respond to the COVID-19 crisis on Day One. These include video conferencing and digital signature projects that were started years before they were required because of stay-at-home orders. The City Vax and Safe Access Oahu applications were each developed and put into production in less than one week, using only DIT developers.
- The department's largest and most complex development project is the cloud-native modernization of the mainframe motor vehicle registration (MVR) system dating from the 1960's. DIT committed to the Hawaii Auto Dealers Association

(HADA) at their 2016 convention that they would be able to register new vehicles with a new Dealer Online/On-demand Registration System (DOORS) by the end of 2020. The state's largest dealer executed their first digital vehicle registration on December 22, 2020, exactly on schedule. Although new vehicles sales have significant statewide economic and customer service impact, DOORS is not mentioned even once in the report.

- HNLpay is a wide-ranging enterprise platform developed by the City to centralize online payments. It didn't warrant acknowledgement in the report. One paragraph describes the desire for an online payment portal to accept various type of payment, yet neglects to mention that HNLpay is such a system. On page 49, the report says "DIT reportedly lacked the manpower to support and design the website [and online payments] (for BFS RPAD)". HNLpay handles high-volume online payments for Hanauma Bay, for example, and has been providing credit card settlement reconciliation for several other applications since early 2020.
- Presumably, these major projects were overlooked by the auditor because they, like many projects, are not initiated as a result of a Request for Service.

Currently many customer department's needs and concerns are not addressed, page 43

- Exhibit 2.9 and the following narrative on pages 49 and 50 state that DIT could save $529,498 for DPP but was "unable to scan certain paper sizes or accurately enough." This is an incorrect statement that is surprising to anyone familiar with the wide array of scanning equipment in DIT's imaging center. Calls to the imaging center indicate that 57,610 sheets of DPP scanning jobs in Calendar Year 2021 were handled, and none have been rejected. Another call to the DPP Deputy confirmed that DIT has been scanning all their media sizes and types, and has them "covered".
- Although the section states that "currently" many needs are not addressed, another example refers to a 2008 project for a Real Property website. As current DIT leadership was not in place thirteen years ago, none of the current modernization efforts were started yet. The audit states a subject period of 2013 to 2020, and citing examples from over a dozen years ago is not an appropriate way to describe the "current" situation.
- Opinions and hearsay are often incorrect, and should be fact checked. Including factually incorrect information under the imprimatur of an audit does a disservice to the City and the public which it serves.

Ms. Arushi Kumar
December 29, 2021
Page 4

Chapter 4 - Request for Services (RFS) Metrics

- The audit places a tremendous deal of reliance on metrics from RFS forms. The auditors decided at the outset of the audit that this form was the key to revealing the lack of cost tracking and project management at DIT. In fact, the RFS is used merely as a reference number and a record of authorization to proceed, and has never been used to determine the completion of work since the form was created in the late 1960's, before the advent of email and fax. It has been repeatedly explained to the audit staff that dates in an RFS Audit Trail do not indicate completion of any service, and the inability or refusal of the audit staff to understand this basic concept has resulted in misguided and incorrect findings.
- The audit also repeatedly criticizes RFS audit log activity after the initial service is completed. This demonstrates a lack of understanding of IT services, where an authorization can cover one or more years duration, or where comments and updates can come in years after a task is completed. The report bases the entire chapter on the rather meaningless time spans between initiation of an RFS and the last audit activity (often merely a comment) in an RFS.
- The RFS is just one of the 25 forms used for initiating projects at DIT, and many RFS are created by DIT, not by other city departments. The purpose of the RFS is to create a tracking number used by other documents and processes, and to record the initial authorization to proceed with a task. It plays virtually no role in project management, is rarely used outside a single division, and certainly does not reflect the breadth of projects at DIT.
- Archived documents from the 1980's show that the RFS wasn't designed to track time. The April 1977 *Technical Manual*, Chapter 3.2 *Work Authorization*, states "The **authorization** to perform work for any City agency is the Request for Service (RFS) signed by the requesting department head and approved by the Director of Data Systems." The *Change Request Form* is actually the form that tracks granular data related to an RFS. It has two dated fields indicating testing and completion of the task. In addition, the *User Test Certification* is submitted for 243 of the most active projects. Neither of these forms or even their concepts are discussed anywhere in the report, indicating that the audit did not make the most superficial attempt to understand the workflow for requests.
- Some RFS are created to track requests made of external vendors. Depending on the granularity needed by the branch or the project, the RFS can be created for a single large task, for multiple small tasks, or for a time duration. A single RFS can be a reference number for dozens of tasks. The date of creation and closing of an RFS does not indicate task duration, an erroneous assumption that led the auditor to report several issues as being closed months or years late, when the tasks were actually completed on time.

- In one example, the audit recklessly suggests that an agency waited "over four years" for data that was sent to them just one month after the alternate desired date. In this and other examples, the report crafts "findings" that the audit trail has exposed as complete fabrication.
- In the section titled "RFS process requires more monitoring over progress", it is clear that the auditor misunderstands the purpose of the RFS, and cannot accept that the RFS was never designed to monitor the progress of a request. Instead the report attempts to impose its own fictitious purpose on the RFS, and proceeds to expound critical pronouncements when this false purpose is not achieved.
- It has been repeatedly explained that an RFS might be left open for several years, with multiple tasks or Change Requests referencing the RFS number. It is incorrect to assume that tasks are not complete until an RFS is closed or until the date of the most recent comment. A closed RFS can also be rolled back and closed again many years after the last associated task is complete.
- The audit fixates on the number of days following a desired date and the last data in the audit trail. IT projects are not races. Closing an RFS just to meet an arbitrary date and have good metric optics is simply poor IT management. The goal of providing a service is to solve a given problem accurately, securely, and in a fashion that leaves a service maintainable for the future. No experienced IT manager would ever suggest that departments should set their "Service and Support Expectations" based on the closing dates of the RFS, yet that is exactly the basis of Chapter 4, stated in the bold face title.

Complex service requests need further assessment, page 100.

In the following paragraph the underlined text indicates prejudicial elaborations by the report author(s), indicating the extent to which the facts have been imaginatively metamorphosized.

- *"One example of a complex RFS is from June 2015. A city agency sent an RFS to the Application Division requesting that DIT copy information from an 11-year span from the agency's mainframe to other databases. This request was submitted in the middle of June 2015 with desired and alternative completion dates of early August 2015 and September 2015. The division said they could complete the RFS by the desired date. DIT completed the RFS in the middle of July 2019, over four years later. This was not surprising due to the size of the project, as the agency wanted to move 11 years of data. This request should have been sent to administration for final determination due to the size of the project, which required more planning and prioritization to support and complete. Instead, Applications accepted the request, but did not have the resources to complete it in a timely manner. As a result, the requesting agency had to wait four years for the data migration and was unable*

to utilize that data and effectively manage its operations."

- The request for the data extraction was conveyed through RPA from Tyler Technologies, working on a contract with the counties of Maui and Kauai. The auditor makes several assumptions about this request without researching the audit trail for RFS 2015-325. The report implies the size of the project is large because there is 11 years of data, and that the request should have been sent to the administration for final determination due to the size of the project. It goes on to say that Applications did not have the resources to complete it in a timely manner. These claims are not supported by the audit trail, and are false.
- Each of the four counties implemented their own real property systems after migrating from a legacy mainframe system. DIT operations noted occasional logs reporting neighbor island users attempting to access the decommissioned mainframe application. When the access was terminated, Tyler Technologies asked for an extract of transfer notes for Kauai and Maui.
- The audit draws its own incorrect conclusion that the size of the request was large and complex, based on zero subject matter expertise. The audit trail is quite clear. The data extract was four text files of a mere 380 megabytes each, small enough to fit on a single floppy disk. Much of the elapsed time was agreeing on a data format with the consultant. This work was done by a single individual in less than eight hours, and is very typical of small mainframe extracts, refuting the editorial comment about complexity. The report states that the requesting agency had to wait more than four years for the data, when in fact **the data was sent to the user one month after the alternate completion date**. The requestor did not have to wait "four years for the migration data", as the report states, and the statement that DIT did not have resources to complete the task in a timely manner is not based in fact.
- Data extraction was complete by the database administrator on 8/20/2015 and sent to Tyler, which did not respond until 10/1/15, when it asked for data to be broken down into smaller text files. This additional request was completed 10/15/2015, 107 days after the RFS was submitted, and 31 days after the alternate desired date. A comment was added to the RFS and rerouted on 1/11/2017 because the requestor had a question, which was answered the next day. A comment was added 09/12/2017 to note that some space was allocated on the new RPA system, having nothing to do with the mainframe extraction. Finally, the request was closed in 2019 after adding a comment that the requester decided not to use the data because it was so old (2001). Clearly, the requesting agencies did not need this historical data to "effectively manage its operations" as the report implies.
- The entire section turns out to be baseless for many reasons. First, the example of a "complex RFS" is an example of a simple RFS. The report creates a fictional narrative explaining how such complex tasks need a complex

assessment, with more time to learn and research how to apply technologies, implying the department should have taken more time to review, while in the same section reporting that the department took too long to service the request. In fact, the database administrator reported that the task was completed in one day, and the vendor had their data long before they were ready to use it. The several charts and tables developed for the report are based on an incorrect definition of "completion date", and are basically useless.

Special Opening Hours, page 103:

The next section in this chapter features yet another example ignoring the audit trail. The report states:

- *"Department of Customer Services was planning to open one of its licensing locations on Saturdays for two months (ending in December), and needed support with its webcams, display, and appointment system. The department initiated the request in October 2017 as a same day request. DIT reviewed and completed the request at the end of April 2018. Reviews and approval were logged and reported nearly six months later."*
- RFS 2017-452 was created 10/19/2017 with same-day desired date of 10/19/2017 and an alternate date of 10/20/2017. The first Saturday was 10/21/2017, when Kapalama DL opened without any recorded incident. The application AlohaQ, did not require application modifications to open or close days or time slots, so no action was required except to assign a developer to monitor the situation for several months.
- As far as closing the RFS at the end of April 2018, an April 19, 2018 email from the requesting agency indicates that recent extensions to DL services need to be "available till May 31, 2018. As this becomes popular, we will all need to increase the schedule further". It is precisely because of constant updates like this that RFS are not closed when the initial task is complete. The audit report suggests that the final review and approval was six months late, **but the RFS close date of 04/27/2018 was only eight days after the last update from the requesting agency**, not the six months as the report implies.

Support of Public Safety, page 104:

The next example demonstrates the same type of inaccuracy:

- "*Since it supports the statewide system, DIT accepted a State Attorney General report requesting an investigation about the status of salvage vehicles on Hawaii Island in February 2018. It allowed for a two day completion. Reviews and approvals were logged and reported in July 2018, nearly five months later."*

- RFS 2018-80 was created 2/21/2018. The Audit Trail shows "Created program to extract info. Sent file to Naomi on Feb 21, 2018". Although the request allowed for a two-day completion, **the report was sent the same day as the request**, yet the audit report incorrectly implies that the request took "nearly five months". In fact, this date was merely the date that a form was attached to the RFS. This form was created by Hawaii County three days after the data was already sent to them.

Supporting Fee Collection, page 104

In the final example in this group of four, the report attempts to characterize a delay of three years for a requested service that was actually completed ahead of schedule:

- *"CSD requested service for adding two National Park Service special license plates fees to the mainframe program and collecting the special $10 fee. The request, which was initiated in March 2017, established a completion date of mid-April. DIT accepted the estimated completion in mid-April as requested. Reviews and approvals were logged and reported in May 2020, three years later."*
- RFS 2017-132 Online MVR Fee Calculation (3/23/2017) with desired date 4/3/2017 and alternate 4/14/2017. The request was completed 3/29/2017, **one week *before* the desired date,** nowhere near the three years implied by the report. The auditor was apparently confused by a comment added on 01/21/2020 asking if the calculation was also applicable to a new MVRFeeInq API. This is another example of the auditor placing undue importance to comments added to an RFS long after the work is complete.

Meeting Transitional Needs, Page 104:

- *"Storm Water Quality division was moving from the Department of Environmental Services (ENV) to Department of Facility Maintenance in July 2015 and needed an eForms routing process. The request was initiated by ENV in June, with a requested completion date of August 2015 (alternate date). DIT reviewed the request and completed it in March 2018. This request had remained open for 2 1/2 years, yet by the service information recorded it took four days to complete when it was finally assigned to an analyst."*
- RFS 2015-307 was created 06/09/2015 and approved by the agency head on 06/17/2015. **The work was completed on 06/18/2015, one day after approval**. The audit incorrectly concludes that the RFS should have been closed after the initial eform was completed. In fact, new requirements resulted in a completely new eform going into production on 3/5/2018, and the RFS was closed four days later.

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Providing Management Reports, page 105

This section appears under a sub header "Key department initiatives and operations may be affected by service delays". An example is provided, presumably to demonstrate negative impacts from delayed implementation, but instead illustrates the folly of relying solely on completion dates as a measure of good service:

"In September 2014 CSD requested a conversion of its motor vehicle licensing reports from its legacy system, so that report could be formatted and printed on office printers and requested them by January 2015 (alternate date). DIT approved the request and committed to a later date of February 2015. This was logged as completed at the end of November 2017, more than two and a half years later".

- This is an example of extended implementation periods due to the customers, some of whom did not request or were not ready for the change. CSD set the initial desired date without regarding or consulting the other three counties. Three Change Request Forms were issued in response to RFS 2014-379. CSD quickly realized that these reports also affected neighbor islands, which were not prepared for electronic distribution, so conversion was delayed until 10/20/2015. Although the programs were completed, the RFS was left open for two years to allow for additional changes by the other three counties.
- The section attempts to illustrate how service delays affect key department initiatives, but in this example forcing the completion of the request by the desired date would actually have **caused** a disruption in services with neighbor islands. This is clearly an example of a very low priority request that must accommodate the needs and schedule of the customer, not DIT.

Providing Public Information, page 106

The report characterizes a January 2017 CSD request for a change in location information as taking nearly one year to complete. RFS 2017-36 had a desired date of 01/25/2017, but the branch manager reported that two developers had already worked on this, one of whom reports in the Audit Trail that "**It was completed by the desired date**". The audit fails to demonstrate how this task, in spite of being completed by the desired date", might affect key department initiatives and operations.

Support of key service applications, page 106

- The report cites an example (RFS 2017-223), misstating the task as "allowing until the end of the year for completion". The actual RFS description reads "Upgrades, research, training, normal server administration maintenance, etc... for POSSE from May 2017 to December 2017." Furthermore, the RFS was not ever approved by any Agency Head, and was not even approved by the Branch

Manager until 01/07/2019. There were never any specific tasks described in the RFS, so it is basically an empty and unapproved request, and fails to illustrate any service delay or impact to a department.

- In the same section, the report describes a request to patch and upgrade ias/iasWorld in June 2015. There is no record of any patch/upgrade requests in June 2015, but similar RFS are generally blanket RFS with individual Change Request Forms referencing the blanket RFS. These Change Request Forms indicate a range of one to four days from Initiate to Close. Providing this example fails to demonstrate any deficiency or impact to any agency.

Chapter 4 Response Summary

- The report relies on a flawed audit process to make unsupported conclusions. In every example provided in this chapter, the actual facts demonstrate that DIT is responding in a timely manner to requests with no detrimental impact to agency operations. There is ample detail in the audit trails, however, to show that the audit derived inaccurate, sometimes grossly incorrect, conclusions about timeliness. The audit calls for self-service so that agencies may consult about the progress of their requests, while simultaneously demonstrating how the auditors were misled by a combination of full transparency and lack of ability to comprehend the information.
- In spite of examining hundreds of requests over a period of several years, the audit was only able to provide examples that show effective and prompt management of service requests once the facts are examined, rendering virtually no value to the analysis or the many charts and tables extrapolated from incorrectly interpreted information.
- Hypothetical problems seem to have been pulled from case studies, with facts manipulated to fit a narrative or predetermined conclusion. Audits should be based on the unvarnished truth, as these embellishments are easy to expose.

CSR Coverage

- The report correctly identifies inadequate CSR coverage, but implies that this could be remedied with better planning. In fact, neither funding nor the number of CSR positions given to the department has increased with the addition of new departments and other workgroups. The report also points out that certain departments have better CSR coverage, but this is due to funding provided by that department. The larger departments have greater needs, more applications, more employees, and greater funding. The report also states that DIT has not assessed the need for more CSRs, but that is not correct. Unfortunately, the report's recommendations are of little value. Determining the need for more resources does not automatically result in funding for more

resources, and evaluating the current staffing plan is not going to result in greater staffing levels. If there is a more effective way to utilize the limited resources given to the department, the report fails to demonstrate how.

Prioritization

- The report finds that DIT selects certain departments and projects over others, and that some projects receive a disproportionate amount of attention while others are deferred or rejected. The report draws a conclusion that this is due to a lack of prioritization. DIT determines the relative importance of projects, placing the most critical at the top and the least important at the bottom. It considers this process to be the very definition of 'prioritization'. Unless there are adequate resources to fulfill all needs, some needs will be left unfulfilled.
- The report provides examples of projects where DIT did not chose to take projects in-house. The implication is that these are missed opportunities for DIT to help the City save vendor costs. Since DIT does not always have the available resources or subject matter expertise for every application, it gives highest priority to those projects which will have successful outcomes. Lack of ability to solve the City's every problem is not an indication of lack of prioritization or planning.

Costs were not updated to reflect new estimates or actual costs, page 26.

- The report discusses the P25 radio project, one of the largest and longest IT projects in the City's history. It is customary to build in a contingency, and this is not lowered to reflect savings since projects can also experience escalations in cost. DIT budgeted $20 million before executing a contract, and the final costs are expected to be about $17 million. The report criticizes the department for not revising the estimate costs for this ongoing project. The department believes that, when funding is adequate, it is more prudent to wait until a project is completed before finalizing costs. It is premature to "count your eggs before they hatch."

Conclusion

DIT has documented a very large number of concerns and factual inaccuracies with both the draft report and the revised report received December 13, 2021.

Audits should be concise, accurate, and unbiased. Examples should be balanced. If only a small number of negative examples can be found, they should not be proffered as the only representative findings.

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It is further misleading to draw incorrect conclusions from a small number of misstated examples, such as using fabricated "completion dates" to argue that "requests are being completed later than promised". Requestor's 'Desired Date' is neither a promised date, nor an 'Expected Completion Date' as the report redefines. It goes on to justify these misleading statements by characterizing a request as taking nearly five months when the audit trail clearly shows that results were sent to the requestor the same day as the request.

The credibility of the entire audit is jeopardized when 100% of the examples in Chapter 4 are mischaracterized in a similar manner, and months of engagement can produce cost estimates that are inflated by magnitudes of order. While these errors can be corrected after publication, they should not have to be pointed out by the subject of the audit. DIT actually had to perform an audit of the report itself, correcting many errors that could have been avoided with a disciplined and unbiased audit engagement.

We realize that understanding IT is difficult for the lay person, and recommendations must not be pronounced for subject matter that cannot be comprehended. Estimates and assumptions cannot serve as proxies for solid and factual data. Auditors need to ask for explanation and clarification, not create their own definition and data as they see fit. The failing of the audit is that it bases assessments on quantitative evaluation of arbitrary metrics while ignoring qualitative evaluation. It downplays or ignores positive metrics and amplifies perceived negative metrics.

We reiterate our suggestion that a new objective audit be undertaken under the supervision of a certified auditor. The recommendations of the current audit are based on a minimal understanding of the department, and thus do not serve a constructive purpose. We welcome an audit that will seek to understand the operations of the department, accurately characterize the efforts of the department, and offer recommendations that can result in improved service.

Sincerely,

Mark D. Wong
Digitally signed by Wong, Mark D
Date: 2021.12.30 13:33:40 -10'00'

Mark D. Wong
Director and CIO

APPROVED:

Digitally signed by Formby, Michael
Date: 2021.12.30 15:21:54 -10'00'

Michael D. Formby
Managing Director

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Appendix A

Project Status of Spending to Make a Difference Projects, FY2017-2021

Fiscal Year(s)	*Project*	*Description*	*Benefits*	*Improvements (internally, department operations, public service, performance, etc.*	*STATUS*	*Expected Implementation*
2017	Intelligent Operations Center (Lokahi)	Deployment of a centralized Intelligent Operations Center (IOC)	Provide collection, monitoring, correlation, visualization and analysis of Big Data from city systems and external information sources. Improve cyber security, planning and transportation analysis and response for emergency operations as well as for situational awareness on a continual basis.	DIT, Citywide enterprise support	Implemented	
2016-2021	P25 Radio System	New P-25 Radio System Implementation	Increase reliability, performance, and resiliency to the city's radio system while cutting cost to operate dual radio systems.	Support of first responders	Ongoing	Final Acceptance July 2021
2018-2021	Deploy P25 radio system	Deploy New P-25 Radio System to system users	Complete deployment to Ocean Safety, EMS, Fire in 2020. Police deployment is ongoing.	Support of first responders	Ongoing	HPD 75% implemented
2017	Workflows Forms System	Develop next generation workflow forms system.	Data validation, digital signatures and PDF tools.	Various department operations	Ongoing	Various
2019-2021	Email archiving, increase storage, and E-discovery **(Storage)**	Email archiving, increase storage and E-Discovery.	Increase Email storage and usability	DIT infrastructure for city support	Ongoing	July 2021

Fiscal Year(s)	*Project*	*Description*	*Benefits*	*Improvements (internally, department operations, public service, performance, etc.*	*STATUS*	*Expected Implementation*
2019-2021	Email archiving, increase storage, and E-discovery **(Email)**	Email archiving, increase storage and E-Discovery.	Increasing search capabilities for 92F requests and litigation holds.	DIT infrastructure for city support	Ongoing	December 2021
2017	Joint Traffic Management Center Equipment Installation	Joint Traffic Management Center (JTMC) equipment installation. This includes network phone and server installations to create a third Data Center	For redundancy and backup capabilities.	Support of first responders	Implemented	
2018	Continue Deployment of Intelligent Operations Center (IOC) (Lokahi)	Continued the deployment of a centralized Intelligent Operations Center (IOC)	In house version of IOC	DIT, Citywide enterprise support	Implemented	
2018	My Honolulu Citizens Concern System (311)	Deploy My Honolulu Citizens Concerns systems (311) to replace Dart and Riser systems.	Automate public facing site to internal workflow within the City for greater citizen concerns tracking.	Departmental operations, Public service	Ongoing	
2018	Online and Kiosk-based Credit Card Transactions	Develop more online and Kiosk based Credit Card payment transactions	Better customer service and convenience.	CSD, HFD, Citywide support, Public service	Implemented	

Fiscal Year(s)	*Project*	*Description*	*Benefits*	*Improvements (internally, department operations, public service, performance, etc.*	*STATUS*	*Expected Implementation*
2018	Joint Traffic Management Center Equipment Operations	Joint Traffic Management Center (JTMC) equipment operations.	This includes network phone and server for a third Data Center for redundancy and backup capabilities.	Support of first responders	Implemented	
2019	Lokahi Viewer and Conflict Management Search	Deployment of Lokahi, a centralized Intelligent Operations Center	Provides integration of Workflows and Data across the Enterprise. The system coordinates activities in the Public Realm, tracks assets and infrastructure, and provides public safety agencies with visibility to public safety information with video in 2D and 3D. Lokahi provides real time monitoring and is a powerful policy and research tool. It provides performance management and can ingest data from external sources.	First responder, public works, Citywide support	Implemented	
2019-2020	New Application Protocol Interface Management Tools	New Application Protocol Interface (API) Management tools deployed and integrated	For application security, stability and agility. Implemented API gateway to secure microservices and continuous integration, continuous delivery (CI/CD) tool for agile development of APIs.	DIT applications development	Implemented	

Fiscal Year(s)	*Project*	*Description*	*Benefits*	*Improvements (internally, department operations, public service, performance, etc.*	*STATUS*	*Expected Implementation*
2019	New Time and Attendance System, **Phase 1**	Development of a solution to migrate the city's legacy Payroll Time and Attendance (PT&A) application from its unstable and unsupported Windows platform onto a new server using an Adobe Experience Manager (AEM) solution.	Phase I which includes Timekeeper submitted timesheets for employees, auditing reports and the Auditor Approval Dashboard went live in December 2018 with a select group of DIT employees. Replace outdated system for better accuracy and documentation.	Citywide support	Implemented	
2019	New Motor Vehicle and Driver's License System	Develop new Motor Vehicle and Driver's License system.	Transform a legacy system to a more modern system and infrastructure	Statewide support, CSD, Public service	Ongoing	Driver License Ongoing. See Motor Vehicle Registration for implementation details
2020	Lokahi 3D Viewer	Lōkahi, a centralized Intelligent Operations Center which provides integration of Workflows and Data across the Enterprise.	Provides public safety agencies with visibility to public safety information with video in 2D and 3D. Added additional data sources	First responder, public works, Citywide support	Implemented	

Fiscal Year(s)	*Project*	*Description*	*Benefits*	*Improvements (internally, department operations, public service, performance, etc.*	*STATUS*	*Expected Implementation*
2020	HiperCloud	HIperCloud, an on-island, high-performance cloud	Highly resilient and scalable computing, net-work, and storage capacity for containers running across multiple data centers	DIT infrastructure for city support	Implemented	
2020-2021	HNLpay	HNLpay, a centralized payment management system.	Centralized payment management and reconciliation. Provide quicker implementation of online transactions with faster and more consistent processing	Citywide support	Ongoing	
2020	PROS	PROS, a new Lōkahi component to manage the Department of Parks and Recreation.	Allow the public to register for activities online. Implemented May 2020.	DPR, public service	Implemented	
2020	AM2, **Phase 1**	AM2, a new Lōkahi component	Manage assets across the enterprise.	Citywide support	Implemented	
2020-2021	Extend features, Lokahi Online Training and Testing	Online training and testing component of Lōkahi.	Extended Ethics Online Training for use by City's Boards and Commissions. Working with DHR EEO on Prevention of Sexual Harassment (POSH) online training module.	Citywide support	Ongoing	

Fiscal Year(s)	*Project*	*Description*	*Benefits*	*Improvements (internally, department operations, public service, performance, etc.*	*STATUS*	*Expected Implementation*
2020	New Time and Attendance System, **Phase 2**	New Time and Attendance, Phase II included features like employee submitted timesheets, bulk approvals and a complete set of audit reports went live in September 2019. DIT rolled out employee submitted timesheets to two pay locations.	Providing more comprehensive automation, better accuracy, and accountability.	Citywide support	Implemented	
2020-2021	Joint Traffic Management Center (Occupancy)	Occupancy of the new Joint Traffic Management Center, including a large data center.		Support of first responders	Implemented	
2019-2020	New electronic Fare Collection system for TheBus and interim rail operation	Deployed new electronic Fare Collection system for Bus and interim Rail operation and went live.	Operated by HART and subcontractor INIT	OTS, HART/DTS	Implemented	
2021	Lokahi extend features	Lōkahi, a centralized Intelligent Operations Center which provides integration of Workflows and Data across the Enterprise.	New modules for DFM and DTS. Added additional data sources	First responder, public works, Citywide support	Implemented	

Fiscal Year(s)	*Project*	*Description*	*Benefits*	*Improvements (internally, department operations, public service, performance, etc.*	*STATUS*	*Expected Implementation*
2021	HiperCloud Projects	HIperCloud, an on-island, high-performance cloud	FY2021 projects include substantial parallel computing resources for artificial intelligence and deep machine learning.	DIT infrastructure for city support	Ongoing	
2019-2021	Motor Vehicle Registration Modernization. Phase 1	Motor Vehicle Registration modernization, most comprehensive redesign of the system in over forty years.	Reduce manual processing and paperwork, resulting in significant savings. Modern application programming interfaces allow dealers to register new vehicles without having to complete physical or electronic documents.	Statewide support, CSD, Public service	Implemented	
2021	HNLSign	HNLsign, a secure digital certificate signing system	Eliminate many workflows that currently generate large amounts of paper. Digitally signed emails will reduce vulnerabilities to email phishing attacks	Citywide support	Implemented	

Fiscal Year(s)	*Project*	*Description*	*Benefits*	*Improvements (internally, department operations, public service, performance, etc.*	*STATUS*	*Expected Implementation*
2021	PROS extend features	PROS, a new Lōkahi component to manage the Department of Parks and Recreation	Allow the public to reserve and register for a wider variety of facilities and activities	DPR, public service	Implemented	
2021	AM2	AM2, a new Lōkahi component	Deployed order tracking module for CSD	Citywide support	Implemented	
2021	New Time and Attendance System, **Phase 3**	New Time and Attendance system Phase III includes feature corrections and speeding up application response time went live in September 2020. EmployeeTimesheet training guides were developed and a third pay location started submitting timesheets. The approval workflow for all of DIT was also implemented.	Providing more comprehensive automation, better accuracy, and accountability.	Citywide support	Ongoing	CHERPS Upgrade FY 2023
2021	new City Data Center, Phase 1	Completion of a new state-of-the-art data center to replace the City's primary facility built over forty years ago, which will also reduce power and cooling costs.	State of the art data center, Reduce power and cooling costs	Infrastructure to support city	Ongoing	Construction completed. Pending move of equipment from old data center

Fiscal Year(s)	*Project*	*Description*	*Benefits*	*Improvements (internally, department operations, public service, performance, etc.*	*STATUS*	*Expected Implementation*
2021	new City Data Center, Phase 2	Dual power source for new data center. Build out Computer Operations Center, DIT Service Center, Printer and Scanner Room	Dual power source for new data center. Facility improvements for DIT	Infrastructure to support city, DIT facility improvements	Ongoing	Pending punchlist items
2021	Third mainframe	Installation of a third mainframe	Development of applications free of legacy technologies.	Infrastructure to support city and application development	Pending	Current Mainframe Lease Expires 2021
2021	New cloud storage	Installation of new cloud storage	Expand capacity and extend capabilities to the new HIperCloud.	Infrastructure to support city	Pending	Current System End Of Life October 2021
2021	New core network routers and switches	New core network routers and switches to restructure the network architecture in the new data center	Provide expanded segmentation for greater security.	Infrastructure to support new data center	Pending	Pending Data Center Completion

Source: Department of Information Technology

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Appendix B

Public Radio System Replacement, Contract Amendment #1 Summary of Cost Changes

Amendment 1 Changes

Alternate Design Equipment	14,641,436.00
Alternate Design Systems Integration	3,710,387.00
Frequency Study	(30,000.00)
Add 2 Channels (Town Simulcast)	557,800.00
DC Power Removed (Kokohead, Waimanalo Ridge, Puu Manawahua, Waianae Police Station	143,605.00
Rx Diversity	311,334.00
Test Equipment	105,231.00
1 PD, 1 FD Op at DEM Consoles at Fasi	79,646.00
Add 2 Channels Keaau Beach (6 Channels Total)	39,602.80
Delete: Equipment Removals	(54,485.00)
Add: Battery removals and disposal (sites with new DC Power)	42,000.00
Delete: UPS's	(101,454.72)
Add: Inverters	40,860.00
Add: Redundant Prime (Town Simulcast)	268,627.33
Add: Transcoding	150,000.00
Add: Ka'ala Site (12 Channels)	499,401.77
Add: Net Change: Redesigned Antenna Systems, Custom Tower Mounts, Tower Painting	84,451.34
Add DC Power Updates	102,335.00
Add: Antenna System Spares	15,956.35
Add: 1 Op EMS Koapaka, 1 Op EMS JTMC, 1 Op Ocean Safety Koapaka (unfunded)	119,469.00
Selected Options	20,438,542.87
Text Messaging Server Credit	(30,000.00)
One Time System Discount	(2,300,000.00)
Subtotal Before 11% System Discount	18,108,542.87
System Discount (11%)	(2,248,239.72)
BAFO Credit	(1,400,000.00)
Amendment 1 Infrastructure and Services Total (before tax)	14,460,303.15
Excise Tax (4.712%)	681,369.48
Grand Total with Tax	15,141,672.63

Original Contract Price	13,121,192.96
Amendment 1	2,020,479.67
New Contract Price	15,141,672.63

Source: Department of Information Technology and Department of Budget and Fiscal Services

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Appendix C
Completed Requests by Departments, FY2018-2020

The Office of the City Auditor reviewed a sample of completed requests for the Applications Division for fiscal years 2018, 2019, and 2020. DIT produced a listing for each fiscal year, totaling 444 completed requests. There were 154 RFS completed in 2018, 137 RFS completed in 2019, and 153 RFS completed in 2020. Combined there were 444 RFS. The department with the most completed RFS was the Department of Information Technology with 157 of the 444 RFS. This is about 35% percent, or about one out of every three requests. The department with the second most completed requests was the Department of Customer Services with 64 RFS, and Department of Budget Fiscal Services was third with 33 RFS completed. Others with more than 20 completed RFS included HPD and HART.

Requests for Service by Department, FY2018-FY2020

Departments	*2018*	*2019*	*2020*	*Total*
BFS	23	6	4	33
DCS	0	0	1	1
COR	0	1	1	2
ETH	1	1	1	3
CSD	24	14	26	64
DDC	0	0	1	1
DEM	2	6	2	10
HESD	1	2	0	3
DES	1	0	0	1
ENV	2	5	3	10
DFM	3	1	1	5
HFD	0	1	0	1
DHR	1	4	4	9
DIT	40	50	67	157
DLM	2	0	0	2
City Council	1	2	4	7
OCS	6	6	1	13
Clerk	13	0	4	17
OCA	0	1	1	2
Neighborhood Commission	3	2	0	5
Office of Managing Director	2	5	7	14
MED	0	0	0	0
DPR	5	1	0	6
DPP	7	4	3	14
HPD	6	15	7	28
PAT	0	0	0	0
HART	7	9	6	22
DTS	4	1	9	14
BWS	0	0	0	0
Total	154	137	153	444

Source: Office of the City Auditor, DIT data

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Appendix D
Review Sample of Completed Requests by Department, FY2018-2020

For further analysis, OCA reviewed a statistically valid sample of every fifth RFS that was reported completed by the Application Division in FY2018-2020. OCA requested the selected RFS documents from DIT for review. OCA reviewed 30 RFS from FY2018, 27 RFS from FY2019, and 30 RFS from FY 2020. We reviewed what agencies sent those requests, the nature of the requests, and when they were completed. We reviewed whether DIT was able to meet the dates the agency wanted the service to be completed by. We reviewed how long it took DIT to complete these requests, and if late, how long it took DIT to complete the requests after the estimated date of completion passed. We also reviewed the cycle time from initiation of a request to completion.

In the reviewed sample, the department with the most completed requests was DIT with 30, CSD was second with 15 completed, and BFS was third with eleven completed. These departments were the same most represented in the overall 444 RFS completed. Internal RFS were 34 percent of the sample internal RFS completed.

Review Sample of Completed Requests by Department, FY2018-2020

Department	*2018*	*2019*	*2020*	*Total*
BFS	5	3	3	11
CSD	8	1	6	15
COR			1	1
HESD		1		1
ENV	2		2	4
DFM	1			1
DHR		2		2
DIT	6	9	15	30
OCS	2	1		3
City Clerk	2			2
City Auditor		1		1
Neighborhood Commission		1		1
DPR	1			1
DPP	1	2		3
HPD		5	2	7
HART	2	1		3
DTS			1	1
Total	30	27	30	87

Source: Office of the City Auditor, DIT data

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