

Office of the City Manager

WORKSESSION  
March 16, 2021

To: Honorable Mayor and Members of the City Council

From: Dee Williams-Ridley, City Manager

Submitted by: Savita Chaudhary, Director, Information Technology

Subject: Digital Strategic Plan (DSP), FUND\$ Replacement Program and Website Redesign Project Update

### INTRODUCTION

The purpose of the City of Berkeley's Digital Strategic Plan & Roadmap (DSP) post implementation assessment is to take measure of the progress made since the launch of the DSP in November 2016. Both volumes of the original DSP can be found on the City's website (<https://online.flippingbook.com/view/1044070> and <https://online.flippingbook.com/view/1048383/>).

The Digital Strategic plan was developed to fit the City of Berkeley's current and anticipated future technology needs and prioritize the initiatives based on City needs and goals. The DSP published in November 2016 identified a series of strategic business technology initiatives to be executed over a five year timeline. The original plan identified a total of 101 Information Technology initiatives and projects, including strategic initiatives, infrastructure hardware, software, professional consulting services, and internal IT operational projects. The plan included five (5) annual technology refresh replacement Programs, six (6) annual reporting and compliance programs, two(2) short term council referrals, and twenty-nine (29) existing non-DSP initiatives for FY17. The details can be found in the council presentation dated November 15, 2016, ([http://www.cityofberkeley.info/Clerk/City\\_Council/2016/11\\_Nov/Documents/2016-11-15\\_WS\\_Item\\_01\\_Digital\\_Strategic\\_Plan.aspx](http://www.cityofberkeley.info/Clerk/City_Council/2016/11_Nov/Documents/2016-11-15_WS_Item_01_Digital_Strategic_Plan.aspx)).

In parallel, the City conducted a rigorous Request for Proposal (RFP) process and selected Tyler Munis as the software to replace the Core Financial, Human Resources, and Payroll functions currently residing in FUND\$. The City also initiated the RFP process for a needs assessment to replace the remaining modules currently residing in the FUND\$ system and is currently in negotiation or contract with several of the module replacement vendors.

The DSP helps staff make informed decisions about where to best guide resources, as well as outline department goals and how to measure progress towards accomplishing them. The plan serves as a crucial tool to not only measure performance, but to push us

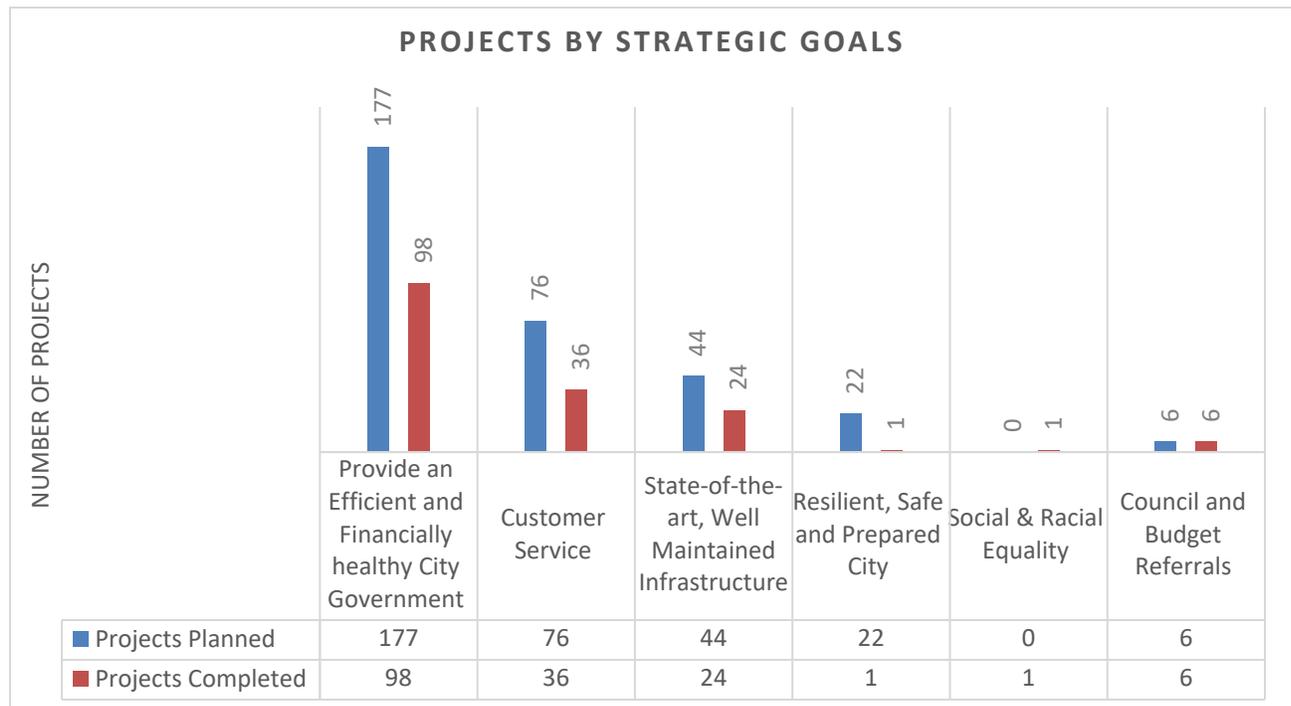
to look at the possibilities of what we can and should be doing to continue innovating as we deliver projects and services to the City of Berkeley community.

The Department of Information Technology (DoIT) is in year four of five of the original DSP, and have completed **166 initiatives, versus the 97 (ninety-seven) planned in the first four years**. An additional 50% more projects have been carried out than planned, an extraordinary achievement.

DSP initiatives are tied to the City of Berkeley’s Strategic Goals and encompassing the following:

<b>Efficient:</b>	Provide an efficient and financially-healthy City government
<b>Customer Service:</b>	Be a customer-focused organization that provides excellent, timely, easily-accessible service and information to the community
<b>State-of-the-art:</b>	Provide state-of-the-art, well-maintained infrastructure, amenities, and facilities
<b>Resilient:</b>	Create a resilient, safe, connected, and prepared city
<b>Social &amp; Racial Equality:</b>	Champion and demonstrate social and racial equity

The figure below illustrates completed IT initiatives tied to key strategic City goals. The leading strategic areas are organizational efficiencies and customer service, followed by and state-of-the-art technologies and resiliency. Over the last 4 years many projects were added to the list of projects and timelines were readjusted and realigned to accommodate for any regulatory, compliance or COVID related projects. Some projects are multiyear projects and are listed as In-Progress at various stages of completion rate. Given the current and anticipated economic challenges of the pandemic, the IT Department has played, and will continue to play, a key role in the City’s cost containment posture. (Some projects applied to more than one City Goal).



The details on the projects progress are explained in the in the Section 5 and Section 8 of the Attachment 1: “Digital Strategic Plan (DSP) Assessment: Provides the Post Implementation Assessment for DSP”

**CURRENT SITUATION AND ITS EFFECTS**

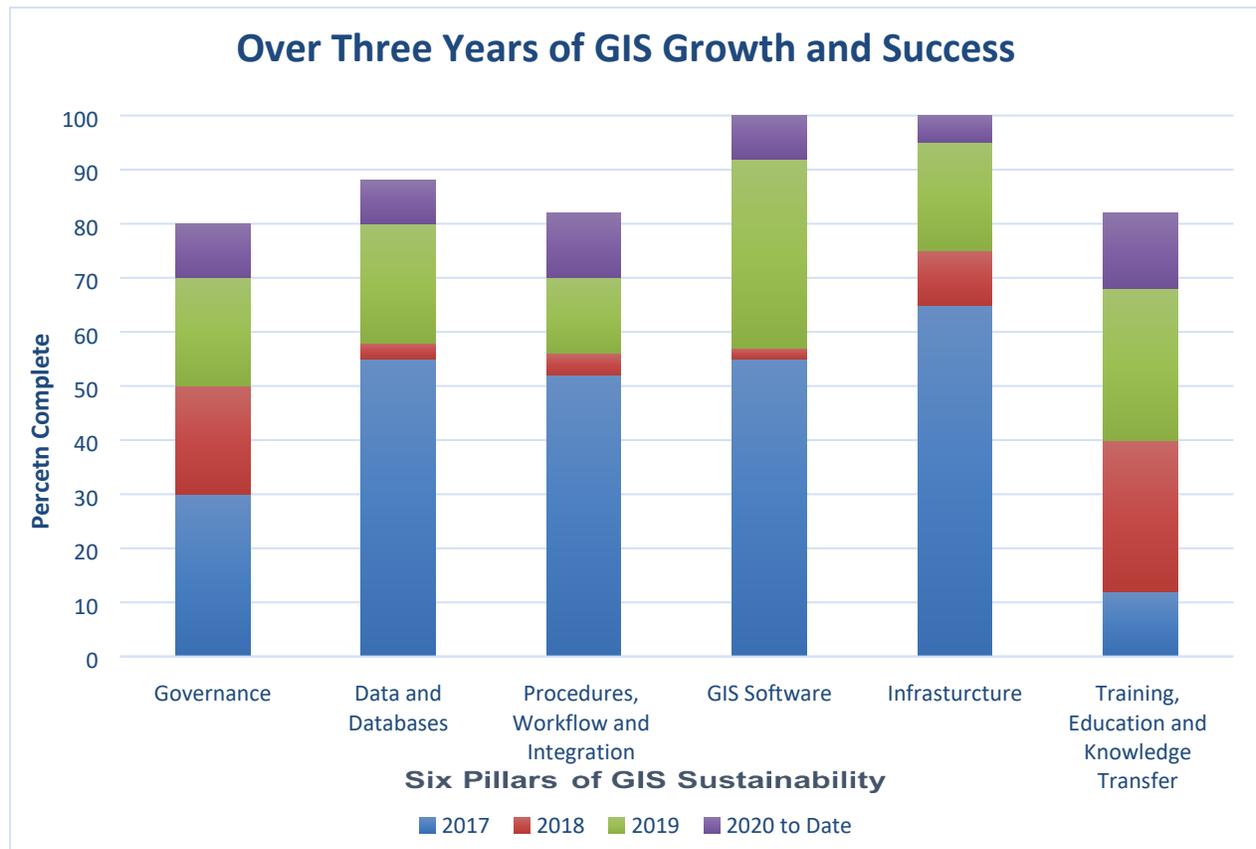
The DSP development and planning process provides a five-year roadmap, which include phased and prioritized Information Technology initiatives. The DSP development process considered various paths that might be helpful for the City of Berkeley such as Online Services, 24x7x365 Services, Cloud Computing, Open Data/Transparency, Mobile Devices and Gov 2.0 Social Media. The DSP is a living document facilitating the effective planning, procurement, implementation and management of information systems at the City of Berkeley.

Many initiatives were listed as a single project in the original DSP and upon completion of assessments they resulted in list of projects spread over multiple years. Some of the highlights of key initiatives is listed below:

1. **Disaster Recovery (DR)** – At the beginning of the DSP implementation the City had **no** Disaster Recovery in place. Over the four years DoIT has implemented various DR measures such as:
  - a. Datacenter upgrade to include onsite and offsite redundancy
  - b. VoIP upgrade to upgrade hardware and software including onsite redundancy
  - c. Replacement of backup system to include both onsite and offsite backups

The details are identified in section 8.4, 8.5 and 8.6 of the Attachment 1.

2. **Infrastructure Replacement** – Many projects related to Infrastructure replacements were listed as Annual replacement programs. The details are identified in section 3.3 of the Attachment 1. Some of the key achievements of the infrastructure replacement programs are:
  - a. **50% reduction of rack space** - In FY 2019, the IT department upgraded the server and storage backend infrastructure to support the City's Cyber Resilience efforts and to provide operational and offsite DR including business continuity to our critical applications. The City now has operational backup between the two data centers for business continuity and a remote offsite for DR. The overall hardware footprint was reduced by 50% reduction of rack space resulting in energy efficiencies and reduced staff time in support.
  - b. **40% reduction in network equipment** - In FY 2019, the network routers and switches were consolidated at remote sites to advanced layer 3 switches resulting in 40% reduction in network equipment thus resulting in energy efficiencies and reduced staff time in support.
3. **Cyber Resilience Plan** – The project was identified in DSP as single project and the plan was developed and resulted in a roadmap of action items to address the cyber security risks and develop mitigation plans including incident response plans. The roadmap identifies implementation of technology, policies and procedures and developing training plan for staff. The details are identified in section 8.3 of the Attachment 1.
4. **GIS Master Plan** – The project was identified in DSP as single project and the plan was developed and resulted in a 5-year roadmap of GIS data assessment and data layers, to support services provided by these City of Berkeley Programs. The details are identified in section 8.7 of the Attachment 1.



5. **COVID-19 Response** – The COVID-19 pandemic resulted in the immediate implementation of remote work and technologies. IT was also flooded with a myriad of requests for software solutions to assist with remote work. In addition to implementation of technical solutions, the 311 team was inundated with an increased demand to support the EOC, Community support, implementation and managing of COVID-19 email box, and Nurse Triage phone line for Communicable Diseases. The details are identified in section 4 of the attachment 1.

6. **FUND\$ Replacement** - One of the major and largest initiatives for the DSP is the replacement of our existing AS400 financial database, FUND\$. The City conducted a rigorous RFP process and selected Tyler Technologies’ Munis ERP software (referred to as erma within the City) to replace the Core Financial, Human Resources, and Payroll functions currently residing in FUND\$.

To date, the City has transitioned core financial components of the general ledger, accounts payable, payroll, and HR functionalities into Munis. We are working on implementing time card replacement software, Employee Self Service, Budget builder, and the remaining component or core financials in Calendar year 2021 and early 2022. The new system replaced the limited functionality and lack of integration between existing systems that requires that staff utilize many shadow systems to support key business processes. With this project, the City aims to improve business processes,

gain efficiencies, simplify and standardize use of systems, reduce the use of paper, streamline redundant processes into a singular path, and install core public sector ERP functionality. The City purchased the following Tyler Munis modules:

**Implemented:**

- Accounting
- Human Resources & Talent Management
- Payroll
- CAFR Statement Builder
- Capital Assets
- Contract Management
- IVR Gateway
- Munis Analytics & Reporting
- Project & Grant Accounting
- Purchasing
- Tyler Content Manager

**In Progress:**

- Tyler Forms Processing
- Accounts Receivable
- Cash Management
- Executime Time and Attendance
- General Billing
- Employee Self Service
- Tyler Cashiering

**ON Hold:**

- eProcurement

The City has timelines in place for all In Progress modules. Additionally, to replace the FUND\$ system we needed to replace multiple other modules:

**Phase 2 Projects:**

- **Zero Waste System** (including Billing) – contracted with vendor and in kick off phase of Project
- **Work Order System including Facilities Management** – in contract with vendor, launch planned Winter 2021
- **Fleet Management** – contract executed, launch planned Fall 2022
- **Onboarding / Performance Management / Learning Management System** - contract executed, launch planned Fall 2022

**Phase 3 Projects (Unfunded)**

- Business License System Replacement – TBD ending completion of core financial projects
- Property Tax Assessment System / Land Management Module - TBD

The details for the project status are identified in section 8.1 of the attachment 1.

7. **Website Redesign Upgrade:** A new City website was identified as a priority project in the DSP and the City's 2018-2019 Strategic Plan. This project represents a complete overhaul of aspects of the City's website, including:

- replacement of outdated software with a modern content management system
- complete visual redesign
- streamlined and simplified web content
- improved online 311 reporting
- improved search functionality
- restructuring of internal web governance practices to incorporate clear standards, workflows, and ownership for the creation and maintenance of web content

Work on the new website was suspended for much of 2020 due to project staff being redeployed to COVID-19 emergency response. System development has continued with the vendor at a reduced pace. A secure off-site hosting platform has been provisioned and core software development has been completed, with custom application build, technical integrations, and cybersecurity testing remaining to be completed. Launch of the new website is projected for late 2021.

**The details for the project status are identified in section 8.2 of the attachment 1.**

The City's DSP identified and recommended a number of Information Technology initiatives over 5 years. The DSP also identifies that a strategic plan is just that – a plan, and it is not cast in concrete. Therefore, it is understood that the strategic plan has flexibility baked into it, and is subject to change as the needs of the business change and/or the financial position of the City changes. The City's Digital Strategy ensures investments and strategic business technologies are sound and deliver the greatest possible value to the City and its constituents, in alignment with the City's Strategic and Resilience Goals. The City has enacted a governance process to ensure that those decisions are made in line with the city's strategic goals, have available funds to cover the cost and appropriate resources are diverted from alternate projects. The DSP structure provides a mechanism for the city to articulate the impact of a new project on currently scheduled projects.

## BACKGROUND

The City's Department of Information Technology has experienced significant changes over the last few years in terms of technology changes, staffing, and budget resources. Over the past few years, we have seen a remarkable increase in community demand for web, mobile, and cloud technology. The new DSP specified ways in which recommended technology solutions will improve the City of Berkeley's operations and overall service delivery, streamline operations to achieve cost efficiencies, and increased productivity,

and support open and transparent governance. To be successful on a long-term basis, the Digital Strategic Plan acknowledges current and expected trends in order to position the City to take advantage of new and emerging technologies in a timely manner.

The goals of the Digital Strategic Plan and Roadmap are to:

- Develop high performance/reliable IT infrastructure.
- Align IT initiatives with overall City strategic goals and City's Resilience Strategy.
- Invest in IT systems based on a rational and impartial assessment of tangible and intangible benefits - and a realistic assessment of project costs, benefits and risks.
- Reduce operational costs, while improving the quality of services delivered to customers
- Deliver IT services in a cost-efficient manner.

Since 1991, the City has used the SunGard Public Sector (formerly HTE) solution for financials, budgeting, payroll, community development, work orders, refuse billing, and land management functions.

In May 2015, the City contracted with the Government Finance Officers Association (GFOA) for a review of its current financial processes, and for identification of areas of improvement, and recommended business process changes. Discussions with GFOA included organizational and functional scope, as well as the development of functional requirements the City should seek in an ERP system. From the resultant project planning activities, the City has made many strategic future business process decisions based on best practices that are to be included in a system's implementation. This assessment led to the determination that a new enterprise system will improve integration, reporting and roll-up capabilities, and organizational processes, and allow for the implementation of business process best practices. Accordingly, the City intends to incorporate and implement the requisite high-level processes into its new enterprise system.

In parallel, staff have also been working with GFOA on the vendor selection process for Enterprise Resource Planning (ERP) project for FUND\$ replacement.

On January 26, 2016, Council authorized staff to release an RFP to solicit proposals to replace FUND\$ and the City has designated a dedicated team to lead the process from procurement of a new ERP through implementation. The City conducted an assessment of its systems and processes and determined that a new enterprise system will improve integration, reporting and roll-up capabilities, organizational processes, and allow for the implementation of business process best practices.

The DSP will continue to be updated annually to accommodate and be in compliance with the changing laws and regulations, budget requirements, and organizational priorities which are in line with our Department's vision, mission, and values.

### ENVIRONMENTAL SUSTAINABILITY

The adoption and implementation of the Digital Strategic Plan, although not directly related, will map out more mobile and web-based services for our community, which will reduce travel associated with on-site visits to City offices, and reduce the amount of paper used in place of online applications, payments, etc.

### POSSIBLE FUTURE ACTION

Staff will continue to provide annual updates for the Digital Strategic Plan (DSP) projects including the Enterprise Resource Planning (ERP) project progress to the Council. The DSP will be adjusted to align with the City Council prioritization process as a result of strategic realignment in FY22. In order to accommodate for the current financial situation due to pandemic the Department of Information Technology has decided to not develop a 5-year plan at this time. DoIT will develop a 2-year plan to align with future budgeting process and continue to provide annual updates.

### FISCAL IMPACTS OF POSSIBLE FUTURE ACTION

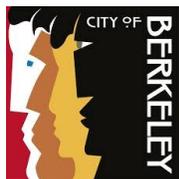
The Digital strategic plan will help City Council and staff throughout the organization to prioritize the projects scope, time, and resources to the City's Strategic Plan and the Resilience Strategy. The projects listed in DSP are aligned with the City's Strategic Plan, the Resilience Strategy, and the Budgeting process. The procurement process for the initiatives identified will need to follow the procedures as identified by the City Policy.

### CONTACT PERSON

Savita Chaudhary, Director, Information Technology, 510-981-6541

### Attachments:

1: Digital Strategic Plan (DSP) Assessment: Provides the Post Implementation Assessment for DSP



Department of Information Technology  
**Performance and Service Level Metrics**  
Digital Strategic Plan Update

March 16, 2021



# Innovation

Contents

**1. Executive Summary** .....4

    1.1 DSP Vision.....4

    1.2 DSP Project Performance Summary.....4

**2. Department of Information Technology Business Model** .....6

    2.1 About Us .....6

    2.2 Goals.....6

    2.3 Mission, Vision and Values .....6

    2.4 Guiding Principles.....7

**3. Performance Metrics**.....8

    3. Performance Metrics.....8

    3.1 Technology Administration and Customer Service 311 Call Center Measures .....9

    3.2 Infrastructure, Operations and Security Measures.....16

    3.3 Annual Infrastructure Replacement Programs Update.....19

    3.4 Project Management and Analytics Measures.....21

    3.5 Open Data Portal Measures .....22

**4. COVID-19 Response**.....24

    4.1 Established Telecommuting for Employees .....24

    4.2 Hardware for Telecommuting .....24

    4.3 Policy / End User Documentation for Telecommuting.....24

    4.4 In-Person and Remote Support Efforts.....25

    4.5 New Technology Implementation and Software Support during COVID-19.....25

    4.6 311 COVID-19 RESPONSE.....25

**5. Project Performance** .....27

    5.1 Projects Completion Status FY 2016 Thru FY 2020 .....27

    5.2 Completed Projects Highlights .....29

    5.2 In Progress Projects FY 2021 Highlights.....34

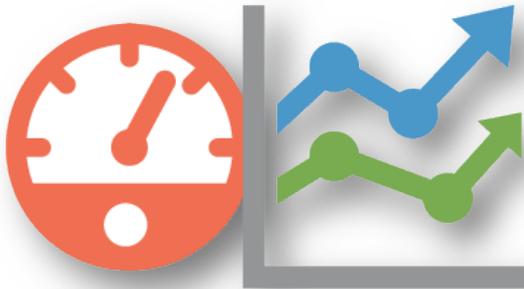
    5.3 Deferred Projects due to COVID-19 .....37

    5.4 Cancelled Projects .....38

    5.5 Planned Projects / Projects List FY 21- FY22 .....38

<b>6.</b>	<b>Reinventing the IT Service Model</b> .....	<b>39</b>
6.1	Industry Recognition .....	39
6.2	Challenges.....	39
<b>7.</b>	<b>Contact Us</b> .....	<b>41</b>
<b>8.</b>	<b>Appendices</b> .....	<b>42</b>
8.1	FUND\$ Replacement Project .....	43
8.2	Website Redesign Update .....	49
8.3	Cyber Resilience Plan Update.....	52
8.4	Business Impact Assessment/Disaster Recovery (BIA/DR).....	54
8.5	Data Center Infrastructure Disaster Recovery - Nutanix Project .....	55
8.6	Backup Strategy.....	57
8.7	Geographical Systems (GIS) Master Plan Update.....	58
8.7	Useful Links .....	66

# 1. Executive Summary



## 1.1 DSP Vision

The City of Berkeley’s Department of Information Technology vision is to provide excellent customer service through innovative and intuitive solutions with a diverse workforce to enable City operations, and to connect and deliver quality solutions for the community.

## 1.2 DSP Project Performance Summary

### 1.2.1 Planned to Actual Projects

The original 5-Year Digital Strategic Plan (DSP), completed in October of 2016, identified **101** Information Technology initiatives and projects, including infrastructure hardware, software, professional consulting services, and internal IT projects. The IT Department is in year four of five of the original DSP, and have completed **166 initiatives, versus the 97 (ninety-seven) planned in the first four years**. An additional 50% more projects have been carried out than planned, an extraordinary achievement.

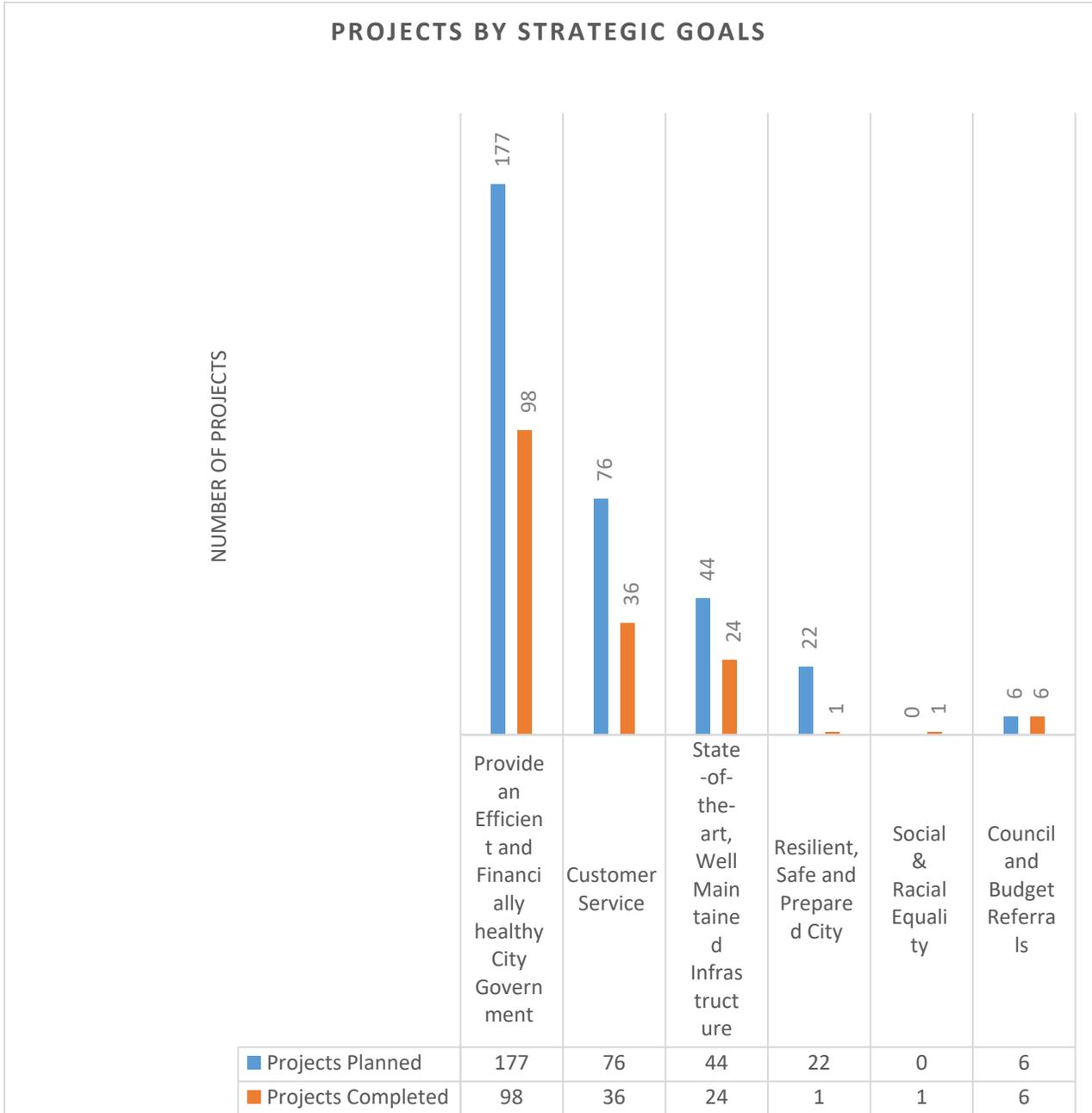
**150%**  
**Completed**  
**projects in 4 years**

### 1.2.3 Projects Tied to Strategic City Goals

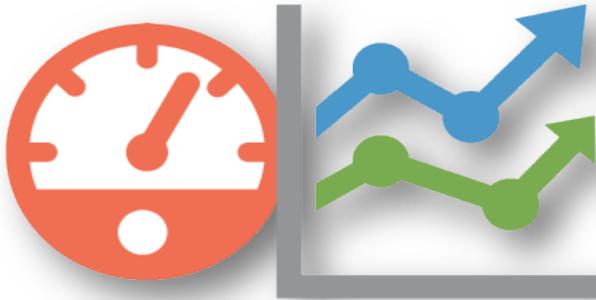
DSP initiatives are tied to the City of Berkeley’s Strategic Plan Goals and encompassing the following:

<b>Efficient:</b>	Provide an efficient and financially-healthy City government
<b>Customer Service:</b>	Be a customer-focused organization that provides excellent, timely, easily-accessible service and information to the community
<b>State-of-the-art:</b>	Provide state-of-the-art, well-maintained infrastructure, amenities, and facilities
<b>Resilient:</b>	Create a resilient, safe, connected, and prepared city
<b>Social &amp; Racial Equality:</b>	Champion and demonstrate social and racial equity

The figure below illustrates completed IT initiatives tied to key strategic City goals. The leading strategic areas are organizational efficiencies and customer services, followed by state-of-the-art technologies, and resiliency. Given the current and anticipated economic challenges of the pandemic, the IT Department has played, and will continue to play, a key role in the City’s cost containment posture. (Some projects applied to more than one City Goal)



## 2. Department of Information Technology Business Model



### 2.1 About Us

The Department of Information Technology serves our community by exploring, developing, implementing, and supporting effective and innovative use of technology through teamwork, collaboration, innovation, and accountability to our department partners.

The IT Department strives to provide the highest level of service to its customers through innovation and teamwork. Responsibilities include the planning, development, implementation, and support of the City's technology infrastructure, while addressing the challenge of improving performance at various levels, as well as implementing next generation technologies to benefit our end users and providing excellent service to our community.

### 2.2 Goals

- Develop high performance/reliable IT infrastructure.
- Align technology initiatives with overall City's Strategic Plan goals and City's Resilience Strategy.
- Invest in technology systems based on a rational and impartial analysis of tangible and intangible benefits, as well as a realistic assessment of project costs, benefits and risks.
- Reduce operational costs while improving the quality of services delivered to customers.
- Deliver IT services in a cost-efficient and secure manner.

### 2.3 Mission, Vision and Values

#### **Mission**

We provide cost-effective smart technology solutions to our business partners and community with integrity and commitment to excellence.

#### **Vision**

Provide excellent customer service through innovative and intuitive solutions with a diverse workforce to enable City operations to connect and deliver quality solutions for the community.

## Values

<p><b>Leadership in Technology</b> We use an enterprise approach to provide innovative technology solutions to facilitate delivery of services to the community.</p>	<p><b>Be a Model of Customer Service</b> We are committed to anticipate and exceed customer service needs and be flexible to address and resolve competing priorities.</p>
<p><b>Integrity</b> We are committed to transparency and respectful communication in our relationships.</p>	<p><b>Collaboration</b> We work together as a team to be a collaborative and inclusive partner with our clients and each other.</p>
<p><b>Responsiveness</b> We are responsible and accountable for our actions. We follow up and follow through.</p>	<p><b>Effectiveness and Efficiency</b> We use best practices to deliver projects on time and within budget.</p>

## 2.4 Guiding Principles

1. **Leadership:** City management technology as a strategic enabler and utilize IT to improve the way City staff perform their jobs and deliver services to residents and businesses.
2. **Communications:** foster effective communications between the City and constituents to keep all parties involved and informed on the progress of IT initiatives via its website, Open Data/ Citizen Engagement and other appropriate means.
3. **IT Governance:** adopt a formal management process to ensure that IT initiatives are properly vetted for consistency with the DSP Roadmap, IT industry trends, are fiscally sound, are effective in improving operating efficiencies and customer service prior to proceeding with IT initiatives.
4. **Enterprise Approach:** when procuring, implementing and managing the City's information technologies utilize state-of-the-practice technology ensuring investments are effectively leveraged across departments, employing economies of scale wherever possible. Information technologies will foster cost containment and/or the highest return on investments possible.
5. **Accountability:** create an environment that encourages accountability through service level agreements, performance measures and individual responsibility, including the City contracted service providers.
6. **Proven Technology:** contemporary, proven technologies that maximize future options by emphasizing open standards, use Commercial Off-the-Shelf software wherever possible, and be web based, wireless ready, employing a Service Oriented Architecture, and geographic information system (GIS) enabled, where appropriate.
7. **Efficiencies:** decisions regarding funding for technology initiatives based on a Business Process Improvement assessment producing a comprehensive business case.
8. **Strategic Investments:** IT assets, systems, skills and support operations will be viewed as strategic investments critical in attaining City business objectives.
9. **Partnerships:** with outside organizations to undertake collaborative efforts in the provision of information/services, and obtain expert advice and knowledge of IT trends.
10. **Accessibility:** Implement technology that provides internal/external customers easy and timely access to information and services.

## 3. Performance Metrics



### 3. Performance Metrics

- 3.1 [Technology Administration and Customer Service 311 Call Center](#)
- 3.2 [Infrastructure, Operations and Security Measures](#)
- 3.3 [Annual Infrastructure Replacement Programs Update](#)
- 3.4 [Project Management and Analytics Measures](#)
- 3.5 [Open Data Portal Measures](#)

### 3.1 Technology Administration and Customer Service 311 Call Center Measures



#### Baseline Services: Administrative Measures

- Completed 125 technology contracts including annual contracts, renewals and amendments
- Developed the roadmap for the Cyber Resilience Plan (CRP) and continued Business Impact Assessment for applications
- Negotiated multiple new contracts, Business Associate Agreements for COVID-19 Response to support departments
- Procurement and technology setup to enable City staff to telework
- Consolidated IT Infrastructure Asset Tracking including Software Licensing Enterprise Agreement Renewals
- Developed budget projections to achieve 18% reductions in General Fund portion of IT Cost allocation fund due to COVID-19
- Executed DSP initiatives including CRP and GIS Master Plan initiatives to achieve efficiencies by collaborating with executive leadership and City staff across all departments to ensure its integration with the City's Strategic Plan Goals, City's Resilience Plan and Council Priorities

- Established policies and procedures to ensure optimum and uninterrupted service delivery by deploying IT Service Management and Project Portfolio Management Software
- Developed an IT "people strategy" in collaboration with Human Resources that aligns with the business and IT strategy. Both teams work together to continually look for leading-edge and innovative solutions to the recruitment, development and retention of the IT workforce
- Assisted City Auditor's office with various Audits

**RFP Examples:**

1. Replacement of City's Server/Storage Infrastructure
2. Replacement of Backup System and Hosted Cloud Storage
3. Voice Over IP Upgrades and Support
4. Zero Waste Billing Software
5. Work Order, Asset Management including Facilities Management Software
6. Fleet Management Software
7. Street Level Imagery (GIS Asset Extraction for Work Order System)
8. Public Records Request Software
9. Human Resources Case Management
10. Cybersecurity Event Monitoring and Security Information and Event Management (SIEM)

**Baseline Services: Customer Service 311 Call Center Measures**

**311 Mission:**

311 provides community members, businesses and visitors with a centralized Customer Service Center to resolve inquiries and concerns. We empower the community to easily connect with City government to obtain accurate quality information and services.

**311 Vision:**

We strive to build a culture of "first call resolution" to resolve customer inquiries at the first point of contact through the use of advanced technology and robust municipal knowledge. We serve the community politely, accurately and comprehensively by collaborating with City departments and outside agencies to provide excellent city services.

**311 Values:**

1. We are customer Service professionals; we conduct ourselves with integrity, and a true commitment to provide satisfaction to our community members.
2. We take responsibility for being attentive and creating a respectful interaction with our customers, and accept the other person's ideas as true to them.
3. We do not ignore problems or mistakes; we work together to identify and solve them.

4. We help develop and support citywide policies, operational processes, and technology systems to promote value-added city services.
5. We get the job done!

### **311 Performance Report**

311 provides a first point of contact for City of Berkeley services and information, and was established to provide those who live, work and visit Berkeley easy City access to government service, report problems and ask general questions. Customer Service Specialists are trained across City wide services to provide answers to routine and non-routine questions, process payments and provide critical community services associated with refuse, sewer, traffic hazard incidents, environmental and much more. The 311 team has extensive knowledge of City Services, City Policy, Ordinances, Amendments, Resolutions and General Services. 311 provides excellent customer service that connects Community members with the City in a helpful and cost effective manner by using call center best practices and leading technology tools. Berkeley's 311 center is focused on maximizing productivity, managing costs, and ensuring service levels and other industry standards are met.

**Fiscal Year (FY) 2020** was a challenging year due to many unusual events that affected our community. Total Community contacts with 311 were 117,840.<sup>1</sup>

Residential Parking Permit (RPP) season started in July 19' on the new Parking Management Software, Passport. During renewal season July - September the Community had many questions about the new online RPP process and virtual permits. July – September represented 30% or 25,759 calls of our total answered calls for FY20.

In October 2019, 311 assisted the Emergency Operations Center (EOC) with the PG&E PSPS. Calls were directed to 311 to gather information on those individuals who needed assistance. 311 staffed the call center the last weekend in October providing timely weekend updates to the community. October was the third highest month for community contacts of FY2020. (10,606 contacts)

February 2020, the 311 Customer Service call center joined the EOC activation for the COVID-19 pandemic. Acting in an Essential Service role, the 311 team remained fully staffed. With the Shelter in Place (SIP) Order of March 16, along with the need to social distance in the COB office, the team reduced staff by 50% and rotated staff working in the office.

---

<sup>1</sup> 311 total call volume for FY2020 was reduced in April – June for City Clerk and City Attorney lines, and May – June for Human Resource's main line. (Approximate reduction of 1,500 calls)

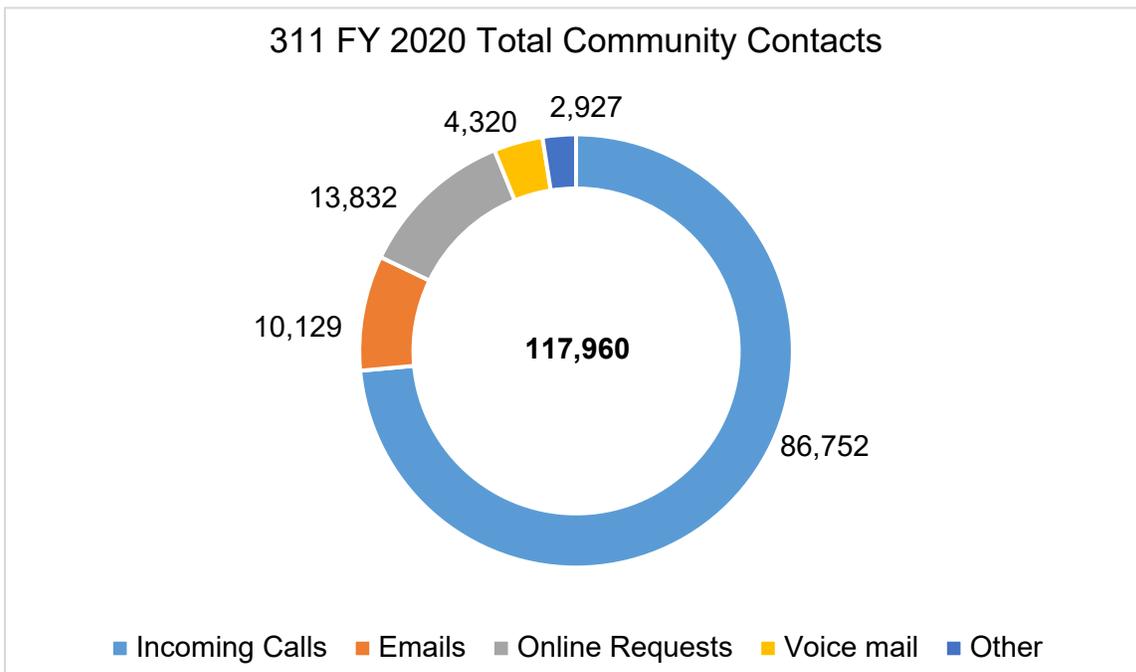
In March and April 2020, 311 managed commercial businesses 525 requests for reduction and temporary stop of Refuse Services and 311 continues to adjust refuse services, as needed.

**Table 1: Total Incoming interactions and abandonment rate (calls that are dropped due to long wait times ir busy phone lines)**

	Total Incoming Interactions	Staff Positions	% Abandonment Rate
2009	66,227	9	7%
2010	79,280	10	8%
2011	84,702	9.5	7%
2012	98,840	8	8%
2013	101,815	8	9%
2014	102,870	8	7%
2015	102,916	8	9%
2016	110,974	8	13%
2017	112,668	8	14%
2018	115,299	8	15%
2019	120,299	9	15%
2020	117,960	9	15%
Est. 2021	116,969	9	18%
Est. 2022	124,600	9	15%

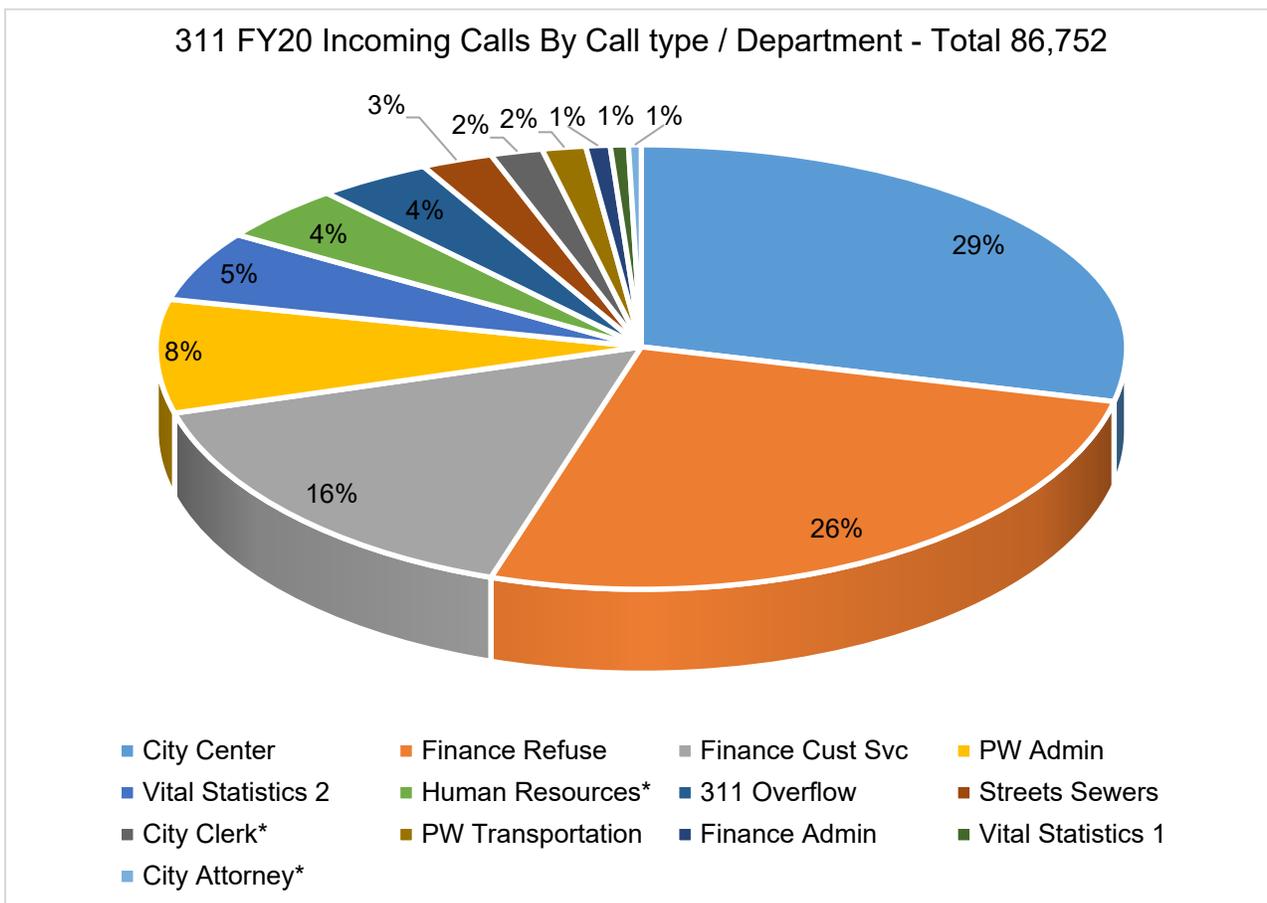
\*\*Note: Calls not answered will opt for voicemail or will abandon and call back at another time.

### 311 FY 2020 Dashboard



Estimated 2021 – Total contacts 116,969

Estimated 2022 – Total contacts 124,600



***\*City Attorney, City Clerk calls answered July – March. Human Resources calls answered July – April, call routing directory implemented for HR in May.***

Estimated Calls 2021 - 81,600  
 Estimated Calls 2022 – 87,000

**311 Challenges:**

Responding to incoming service calls remains 311 main focus. On average, 311 receives 400 calls each day. During Business License season and Residential Parking Permit (RPP) season, or after a holiday, 311 calls increase to 500 day. The average call length is approx. 4 – 7 minutes due to staff working in multiple systems and complexity of refuse and recycling calls. The average time to answer is 1:45 minutes, average time for customers to abandon is 1:25 minutes. Currently 311 answers 85% of all calls presented to the call center. Calls not answered will opt for voicemail or will abandon and call back at another time.

- Due to lack of system integration, 311 works in nine different computer software systems to research, log and process service requests
- City online 311 portal does not provide the Community with status of their service requests which requires them to call into the City for status
- **2020/2021** – With the COVID-19 SIP order, 311 has implemented rotating schedules. Staff working at home, are managing side work office duties. (311 Online Service Center Service (OLSC) requests, Customer Service email, 311 voice mail, SeeClickFix mobile cases and responding to Direct Line answering service calls for service. 311 is acting as the main Customer Service Center for the City as most service center counters are closed to the public. On average our five person in-office team receives 1,500 calls a week, and the in-home staff responds to a weekly average of 300 on-line cases, 290 emails, and 100 plus voicemails.

**Risks:**

- Increased frustration from community members and business as call wait times increase; calls are typically abandoned at about 1:10 – 1:25 minute mark when waiting. Community members often get busy and do not call back, resulting in missed City services such as free garbage pick-up for missed pick-ups called in within two days of scheduled service day
- 311 is challenged with balancing a growing workload, service needs, and timely response with current staffing levels, lack of system integration and COVID19 SIP Order
- With our current Customer Relationship Management software CRM (Lagan) Community, Council and some City Staff cannot view service request status on-line and must call 311 and wait in call queue or email Customer Service for service status
- **Due to COVID-19 and budget reductions, the request-for-proposal (RFP) for a new CRM system is currently unfunded and was put on hold as part of proposed budget reductions**
- City relies on the SeeClickFix software for a mobile application which is not the most efficient mobile application, with a new CRM the City could replace SeeClifkFix as our Cities mobile application

**Opportunities:**

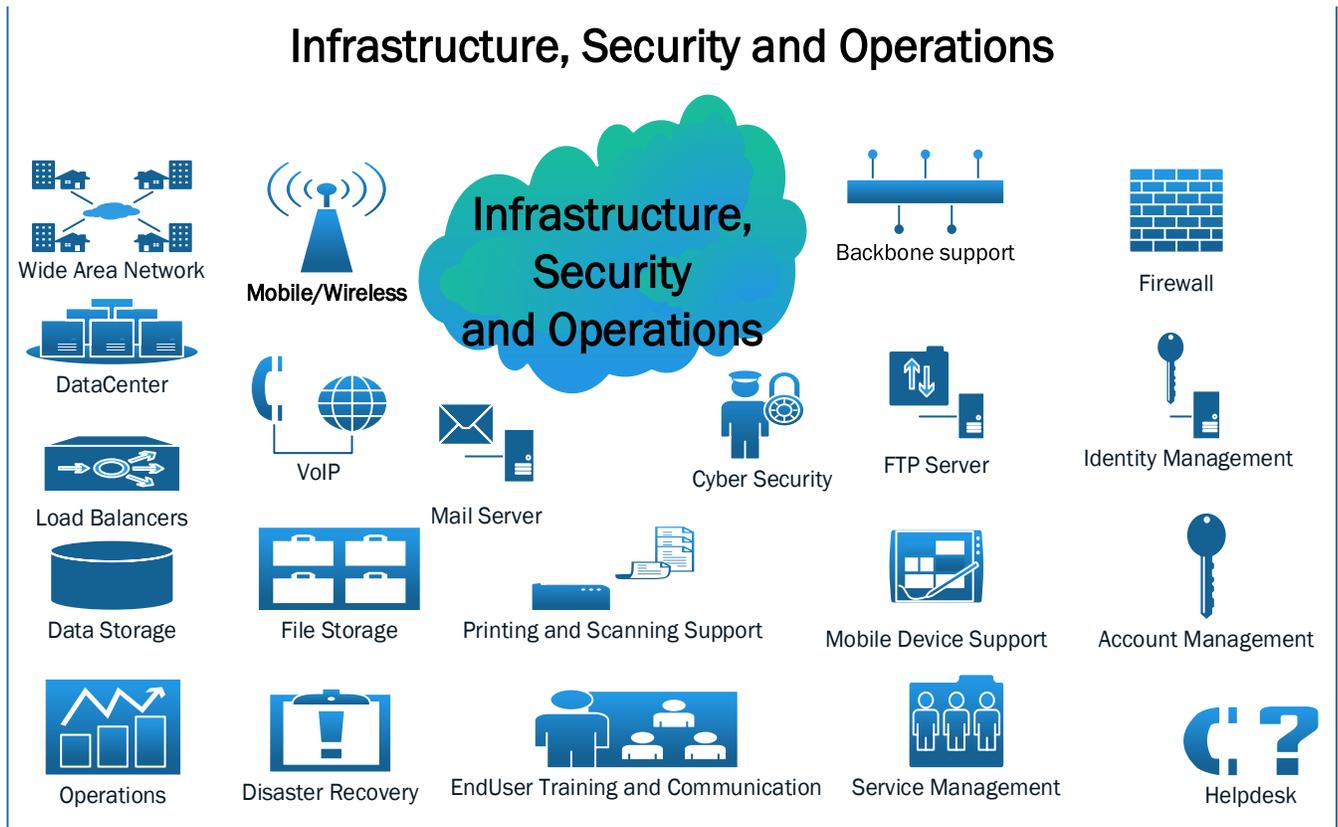
311 upgraded the Lagan CRM system in January 2019, and gained many logistical efficiencies for case management for 311 and back office departments such as Public Works, Parks, etc. 311 is working with Information Technology and Public Works on the implementation of a new Work Order

system, NexGen, to implement case notes integration between Lagan and NexGen. System integration will streamline information and reduce multiple call handling when community members call for status or updates.

311 will publish a RFP for a new CRM system in late FY2022 pending budget approval. The CRM project is delayed due to the COVID budget reductions. Requirements for the new CRM will include:

- City of Berkeley branded Mobile device application
- Public facing portal for community and businesses to log service request via self-service portal and review status of tickets on-line
- Case integration with NexGen and Refuse billing system to increase visibility of action taken by Public Works
- Include future technology for option to communicate with community on-line, chat, and text if 311 is staffed accordingly
- On-line access for City Management and Council to view CRM cases and work order status
- Embedded knowledge link for customer self-service and CSSIII case logging

## 3.2 Infrastructure, Operations and Security Measures



### Baseline Measures Infrastructure, Operation and Security:

**Baseline** services are included in the IT Cost Allocation Plan, and reflect work to maintain the City's general technology infrastructure. Staff members in this unit are responsible for:

- Infrastructure
  - a. Help Desk for 200+ Applications
  - b. 4,000+ Workstations & Telephones
  - c. 1,100+ Mobile Devices (Laptops, iPhones, iPads, etc.)
  - d. 300+ Servers, Routers, & Switches
  - e. 400+ Printers/Scanners/Copiers
  - f. Network infrastructures and Enterprise Solutions
- Security
  - a. Active Directory (AD) Identity and Access Management (IAM)
  - b. Teleworker/Remote Access and Security
  - c. Computers and Network Security & Protection
  - d. Cyber Incident Response (IR), including: data breach, phishing, ransomware, account takeovers, hacking attempts and attacks, financial and payroll account scams, etc.
  - e. Phishing and Ransomware Awareness Training
  - f. Field Services at 42 City locations
  - g. 24-hour Police & Fire Support

- h. Technical support and documentation for Annual Reporting and Compliance
- i. Backups & Records Retention
- j. Disaster Recovery and Off-Site Datacenter (with instantaneous failover and failback)
- Operations
  - a. Implemented Change Advisory Board (CAB) to review and monitor system changes that impact servers
  - b. Move/Add/Change of office moves for divisions, departments, buildings and individuals
  - c. PRA Request Assistance (searching for emails and files based on keywords)
  - d. eDiscovery requests (for both PRA and internal investigations)
  - e. 24/7 on-call support for City operations that run in the evenings and weekends
  - f. City Council and Commission Meeting online webcast support
  - g. Database Management
  - h. Data Management
  - i. FUNDS\$ hardware upgrade (improved nightly backups, faster processing)

The DoIT Service Request and network systems provide real-time data regarding incoming requests, requestors and resolutions. See Table 3 below.

#### **Non-Baseline Measures Infrastructure, Operation and Security:**

Non-baseline work includes cyber-resilience, infrastructure and enterprise solutions work in support of Business Applications projects as well as data and database management, constructing infrastructure and enterprise solutions, and developing enterprise-compatible innovative solutions for projects and vendors that are adapted.

Non-baseline projects require new funding and aim to improve a specific business process; costs are funded by the sponsoring department. Once non-baseline projects are complete, associated maintenance usually becomes part of IT baseline services.

#### **Performance Measures**

The Department of Information Technology uses the following performance measures to manage operations:

- **Baseline Service Metrics:** The Department of Information Technology (DoIT) uses ServiceNow and Customer Relationship Management (CRM) tool to provide real-time data on the type of service request, how the service request was relayed, who submitted the service request, and length of resolution. See Table 3 below.
- **Server Uptime: Metrics** collected using network management tools indicates the total “uptime” of the City’s server farm. See Table 3 below.
- **Lost Time:** Lost time is defined as unplanned absences, including sick leave.
- **Project Milestones:** The Department of Information Technology aims for a 90% rate of on-time project milestones.

- **Customer Service Surveys:** Reinstated in 2015, the Customer Service Surveys are automatically issued to clients whose DoIT Service Requests are completed and closed.

**TABLE 3:** Baseline Services: Network Operations & Help Desk

Performance Measure	FY18	FY19	FY20	FY21 Projection	FY22 Projection
<b>Calls Answered</b>	13,117	11,321	<b>10,026</b>	11,000	11,000
<b>Call Abandon Rate<sup>1</sup></b>	6.38%	9.86%	<b>20.91%</b>	15%	10%
<b>Incoming Help Desk Tickets</b>	12,160	11,930	<b>10,920</b>	11,000	11,000
<b>Closed Help Desk Tickets</b>	11,389	11,311	<b>9,805</b>	10,000	10,000
<b>1st Call/Same Day Resolution</b>	44%	49%	<b>45%</b>	50%	50%
<b>Help Desk Emails Service Now Deployed FY19</b>	n/a	15,622	<b>23,098</b>	22,000	21,000
<b>Help Desk Voicemails</b>	n/a	n/a	<b>892</b>	900	900
<b>Customer Service Surveys<sup>2</sup></b>	627	1422	<b>634</b>	700	800
<b>Data Server Uptime</b>	99.886%	99.886%	<b>99.888%</b>	99.999% <sup>3</sup>	99.999% <sup>3</sup>
<b>Phone Server Uptime</b>	99.999%	99.999%	<b>99.850%</b>	99.999% <sup>3</sup>	99.999% <sup>3</sup>

<sup>1</sup> A 20% vacancy rate, combined with the shelter in place order March-June, contributed to the increased abandoned call rate in FY20.

<sup>2</sup> Changed customer service survey delivery in January 2018, which has led to an increase in survey responses.

<sup>3</sup> Industry benchmark

### 3.3 Annual Infrastructure Replacement Programs Update

Annual Infrastructure Replacement Programs		
1	Computer Replacement	The PC's are replaced on a 5-year replacement cycle and each year 1/5 <sup>th</sup> of the inventory is replaced on annual basis
2	Server / Storage Replacement Program	The Servers/Storage Infrastructure is on a 5-year replacement cycle and is evaluated each year for current computing needs
3	UPS Upgrade / Replacement	The UPS's are replaced on a 6-year device replacement cycle and the batteries are replaced every 3 years
4	Wireless Equipment Upgrade / Replacement	The Wireless devices are replaced on a 5-year replacement cycle and each year 1/5 <sup>th</sup> of the inventory is replaced including any new installations are completed
5	Network Devices Upgrade / Replacement	The Network Devices are replaced on a 7- year replacement cycle and each year 1/7 <sup>th</sup> of the inventory is replaced on annual basis

\*All Non-Baseline Projects are listed under Projects Performance

\*\* All Laptops and Police/Fire mobile computers are replaced outside of the Computer replacement program and departments are responsible for funding these equipment on as needed basis

#### Efficiencies achieved by Annual Replacement Programs:

In FY 2019, the IT Department developed a Technology Internal Service Fund, which accounted for IT infrastructure costs. Now, PCs, servers, storage, wireless, uninterrupted power supplies (UPS'), and network devices are fully funded. Cyber Security initiatives remain partially unfunded at this time.

**50% reduction of rack space** - In FY 2019, the IT department upgraded the server and storage backend infrastructure to support the City's Cyber Resilience efforts and to provide operational and offsite Disaster recovery (DR) including business continuity to our critical applications. The City now has operational backup between the two data centers for business continuity and a remote offsite for DR. The overall hardware footprint was reduced by 50% reduction of rack space resulting in energy efficiencies and reduced staff time in support.

**40% reduction in network equipment** - In FY 2019, the network routers and switches were consolidated at remote sites to advanced layer 3 switches resulting in 40% reduction in network equipment thus resulting in energy efficiencies and reduced staff time in support.

**Voice Over IP (VOIP) / Backup System Upgrades** - In FY 2020, the IT Department began the RFP process for the VoIP phone system upgrade and backup replacement solutions, both of which

will be implemented in FY 2021. The VoIP Phone system will provide a redundant onsite system for DR needs. The offsite redundancy is still unfunded. The backup replacement solution will provide both onsite and offsite backup and redundancy.

In FY 2021, the IT Department will also replace the legacy core network switches located in City Hall and the Public Safety Building, as well as the network switches on each floor that serve our largest City facilities; City Hall, the Public Safety Building, and 1947 Center Street.

### 3.4 Project Management and Analytics Measures



#### Annual Reporting and Compliance Projects Update

- Property Tax Reporting to Alameda County
- Support and Coordination for Finance Business License Renewal Cycle
- Network Testing & Documentation for Berkeley Police Department's (BPD) Department of Justice (DOJ) Assessments
- Testing & Documentation for the City's audit
- Testing & Documentation for the annual Credit Card/Payment Card Industry (PCI DSS) assessment
- Conducts HIPAA Security Risk Assessment Audits
- TCM Program Cost Report Data and Audit Files
- Annual reporting for SB272 (Enterprise Catalogue) page on Website
- Spearheads California Code (CC 1798.29) Breach Notification Protections and Reporting
- Annual ServiceNow (helpdesk software) Upgrade
- Weekly Patch management to maintain infrastructure
- Track ticket SLAs, project tasks for IT projects and project overall status for all City Strategic Plan projects and DSP projects

**\*\*All Non-Baseline Projects are listed under Projects Performance**

### 3.5 Open Data Portal Measures

Open Data Portal serves the community need for analytics with 120 Data Sets. In 2020, the open data portal has over 2 million views and the most viewed and downloaded datasets are from the COVID-19, Berkeley Police Department and Business Licenses. Most datasets are updated yearly or as needed. These datasets are update nightly:

- Berkeley PD - Calls for Service
- Berkeley PD Log – Arrests
- Berkeley PD Log – Jail Bookings
- 311 Cases
- Business Licenses

The Top 9 Datasets are:

- COVID-19 Confirmed Cases
- Berkeley PD Log – Arrests
- Berkeley PD - Calls for Service
- Business Licenses
- BESO Time of Sale Property Status
- COVID-19 Confirmed All Test Resulted Daily
- COVID-19 Confirmed All Test Resulted Weekly
- Berkeley PD - Calls for Service Heat Map

Top searches are related to COVID-19, Permits, Parcels, Police, and Census Portal usage analytics are available publicly via the Open Data Portal at <https://data.cityofberkeley.info/analytics>.

See screenshots from analytics on the next page.



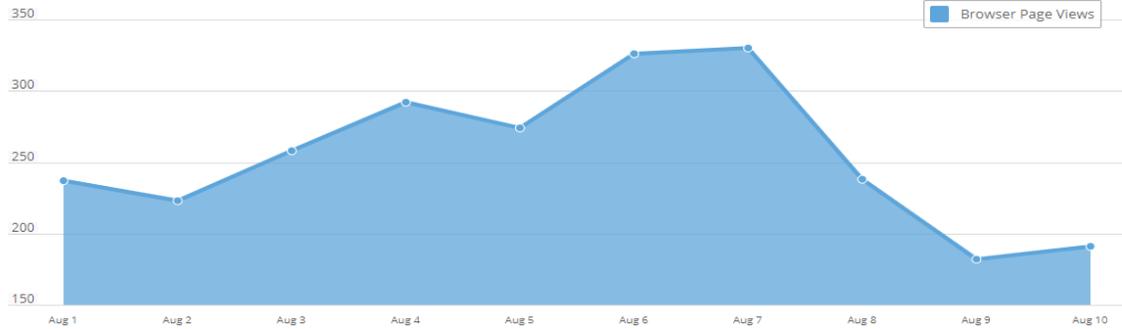
Analytics

Aug 1, 2020 - Aug 10, 2020

Browser Page Views <b>2,399,872</b> <span style="color: green;">+ 2,551</span>	Total Datasets <b>120</b>	Total Stories <b>0</b>	Total Rows <b>323,083,531</b>
Embeds <b>10,511</b> <span style="color: green;">+ 129</span>			

View: **Browser Page Views**

View Granularity: Daily



Downloadable Files <b>1</b>	Charts <b>24</b> <span style="color: green;">+ 1</span>	Filters <b>89</b> <span style="color: green;">+ 1</span>	External Datasets <b>1</b>
Maps <b>52</b>	Snapshots <b>0</b>		

Top Datasets

Name	Count
COVID-19 Confirmed Cases	791
Berkeley PD Log - Arrests	292
Berkeley PD - Calls for Service	178
Berkeley PD Log -Jail Bookings	139
Business Licenses	76

Show More

Top Datasets Referrers

Name	Referrals
https://www.berkeleyside.com	602
https://www.cityofberkeley.info	473
https://www.google.com	426
http://baidu.com	5
https://patch.com	4

Show More

Top Stories

No data for this time period

Top Story Referrers

No data for this time period

Top Search Terms

Name	Count
covid	10
28193	4
building permit	4
addresses	4
2020-00034384	3

Show More

Top Embeds

Name	Embeds
https://www.berkeleyside.com	64
https://www.google.com	51
https://www.cityofberkeley.info	14



## 4. COVID-19 Response



### 4.1 Established Telecommuting for Employees

IT assisted with setting up close to **700 City staff to be able to securely work remotely from home**. This work included:

- Setting up close to **700 Fortitokens** to all VPN users for 2-factor authentication to improve security.
- Setting up close to **700 staff with Skype for Business dial-in numbers for conference calls**
- Increasing the number of remote **terminal servers from 1 to 7**.
- Implementing login limits per server and load balancing across all servers to improve stability and performance
- Address any unique remote software needs on a case by case basis, by installing additional software on all 7 terminal servers. **Exceptions to this rule:**
  - Software that is too resource intensive for the terminal servers (ex: AutoCAD, ARCGIS)
  - Software that is only used by a handful of City staff (ex: EnvisionConnect, Chameleon)
  - In these cases we provided remote access to personal computers for access to this software
- Implemented the **Citrix Storefront** as an alternative solution to remote access to City software and resources

### 4.2 Hardware for Telecommuting

- Configured and deployed **close to 70 laptops** for remote work
- Setup and distributed **over 200 iPhones (and counting)** for remote work

### 4.3 Policy / End User Documentation for Telecommuting

- **Worked with HR and City Attorney's Office to draft telecommuting policy**
- **Published over 25 knowledgebase articles** related to remote work

#### 4.4 In-Person and Remote Support Efforts

- Brought in Library IT staff to assist with the high volume of Help Desk calls, and to allow some members of Help Desk staff to assist with hardware deployments vs phone support
  - **Help Desk call volume increased by 45%** between February and March 2020 (when the Shelter in Place was announced)
  - **Help Desk ticket volume increased by 50%** between February and March 2020 (when the Shelter in Place was announced)
- Implemented a **Walk-in Appointment Calendar** at the Help Desk to reduce crowds at the Help Desk and improve social distancing efforts.

#### 4.5 New Technology Implementation and Software Support during COVID-19

- IT was also flooded with a myriad of requests for software solutions to assist with remote work. Examples include:
  - a. Remote building inspection solution for Planning
  - b. Assisted HHCS with multiple technology solutions and business associate agreements:
    - i. Tele-health solution
    - ii. Tele Texting
    - iii. Forms / survey solutions
    - iv. Contact Tracing contract coordination
  - c. A video conferencing solution for City Council Meetings
  - d. Video Conferencing / Teleconferencing tools for Staff

#### 4.6 311 COVID-19 RESPONSE

As a result of the increased demand related to COVID-19, Direct Line answering service assists 311 two hours a day while staff meet each morning for daily updates, lunch coverage, and at the end of the day while 311 processes credit card edits for the Finance Department's Treasury division. The 311 Division is the only full service Customer Service Center available to the Community during the Shelter-In-Place (SIP) closure of City buildings.

##### Implementation & Managing of COVID19 Email box

The COVID-19 email box was established May 1, 2020, and is managed and maintained by the 311 Manager and staff from library. To date over 12,000 emails have been generated. This volume includes emails received, responded to and internal emails with Public Health, City Attorney's Office, Office of Economic Development and EOC to ensure accurate responses.

**Implementation & Managing scripting of COVID-19 Nurse Triage phone line for Communicable Disease**

311 and Help Desk set up and managed scripting of the Communicable Disease Nurse Triage line for community members to initially set up COVID-19 testing appointments and get their sensitive questions answered. As the requirements of the Nurse Triage line changed over the 12 mos., the phone scripts and programming to call lines were updated as the program adapts to the changing COVID-19 situation.

**Service Level increase and impacts**

Throughout our SIP closure, the 311 team took the challenge of supporting the community by revising staff duties and operating with resilience and pride. 311 has remained open for service Monday-Friday. The team focuses their efforts on each day’s service needs and activities (general City services and COVID19 questions) and have maintained 83% answer rate on incoming calls, and are responding to email, voice mail and online internet cases within 48 hours.

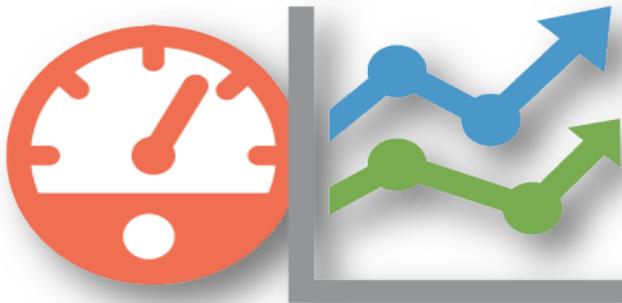
**OPEN DATA – Most downloaded dataset was for COVID-19 related search and datasets**

The screenshot shows the City of Berkeley Open Data portal. The header includes the City of Berkeley logo, the text "City of Berkeley Open Data", and navigation links for "Catalog", "Developers", a search icon, and "Sign In". Below the header is a search bar with the text "Search".

The main content area shows search results for "34 Results filtered by View Types > Datasets". The results are sorted by "Recently Added".

Category	Description	Created	Views
Health	<b>COVID-19 All Tests Resulted Weekly</b> Number of tests resulted weekly among Berkeley residents. Tags: health, covid, coronavirus, testing	June 23, 2020	215
Health	<b>COVID-19 All Tests Resulted Daily</b> Number of tests resulted daily among Berkeley residents. Tags: testing, coronavirus, covid, health	June 23, 2020	420
Public Safety	<b>Berkeley PD - Stop Data (NEW)</b> This data was extracted from the Department's Public Safety Server and covers data beginning January 26, 2015. On January 26, 2015 the department began collecting data pursuant to General <a href="#">More</a> Tags: traffic, pedestrian, search, bicycle, enforcement, and 3 more	May 4, 2020	420

## 5. Project Performance



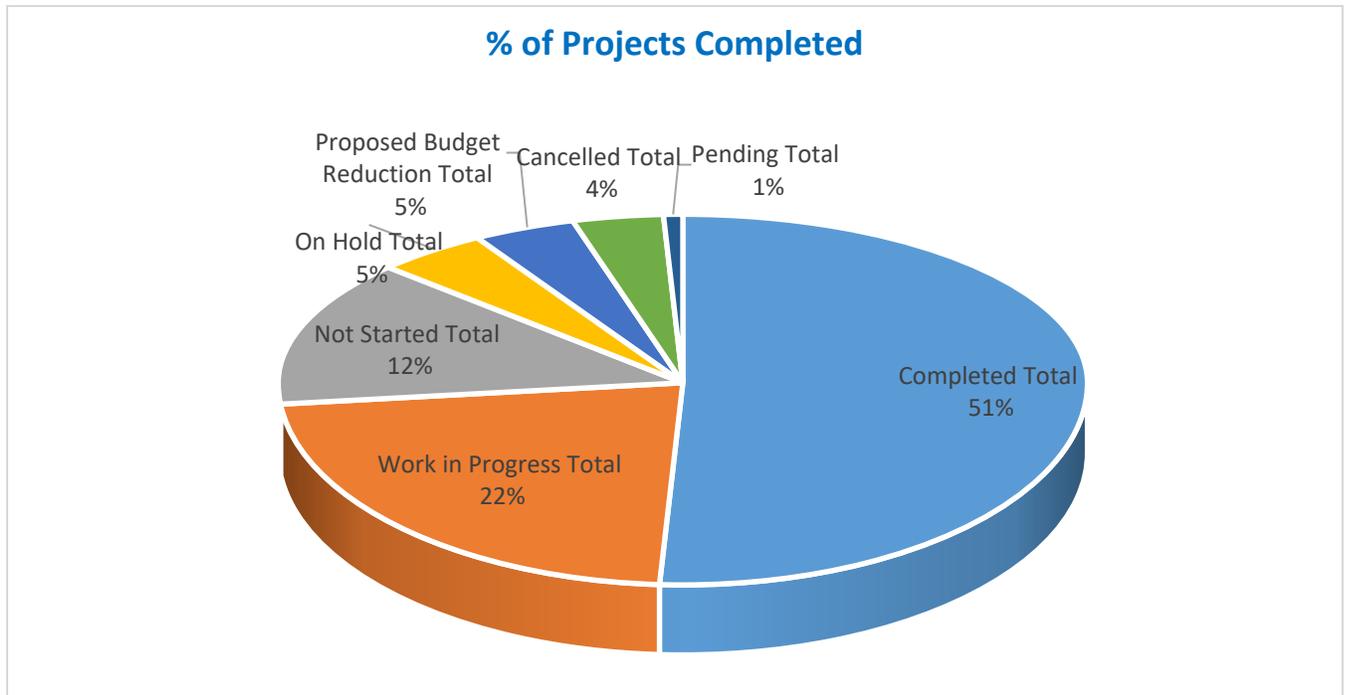
### 5.1 Projects Completion Status FY 2016 Thru FY 2020

The original DSP identified 101 projects and 40 types of potential benefits such as Efficiency, Time and Cost Savings, Resiliency, State of the Art technology infrastructure, annual compliance, enhanced operational effectiveness and improved staff efficiencies were a few of them if the 5-year was implemented. Since the adoption of original DSP in NOV 2016 the plan was revised on an annual basis and projects were added including operational projects, compliance projects as regulations changed, department business need changes and technology changes to keep in alignment with City's Strategic goals.

The unexpected advent of the COVID-19 pandemic challenged the resilience of the City of Berkeley, and none were more tested than the IT Department. A number of the following initiatives were already part of the DSP, as resilience was one of the performance parameters in the initial DSP project. Others were initiated in response to the public health catastrophe.

The table below provides an overall status of projects completion status over the 4-year period NOV 2016 through FEB 2021.

Status	Program	Project Count	Percentage of Count
Completed	Citywide Infrastructure Improvements	6	3.61%
	Digital Strategic Plan & Roadmap	99	59.64%
	GIS Master Plan	4	2.41%
	IT Annual Infrastructure Equipment Replacements	18	10.84%
	IT Annual Reporting Compliance Projects	22	13.25%
	IT Operational Projects	11	6.63%
	Long-Term Referrals	1	0.60%
	Short-Term Referrals	5	3.01%
Work in Progress	(empty)	1	1.37%
	Citywide Infrastructure Improvements	8	10.96%
	Cyber Resilience Program	12	16.44%
	Digital Strategic Plan & Roadmap	34	46.58%
	IT Annual Infrastructure Equipment Replacements	2	2.74%
	IT Operational Projects	16	21.92%
Not Started	(empty)	3	7.50%
	Citywide Infrastructure Improvements	2	5%
	Cyber Resilience Program	2	5%
	Digital Strategic Plan & Roadmap	15	37.50%
	IT Annual Infrastructure Equipment Replacements	1	2.50%
	IT Annual Reporting Compliance Projects	2	5%
	IT Operational Projects	15	37.50%
On Hold	Cyber Resilience Program	2	13.33%
	Digital Strategic Plan & Roadmap	11	73.33%
	IT Annual Infrastructure Equipment Replacements	1	6.67%
	IT Operational Projects	1	6.67%
Proposed Budget Reduction	Citywide Infrastructure Improvements	2	13.33%
	Cyber Resilience Program	5	33.33%
	Digital Strategic Plan & Roadmap	4	26.67%
	IT Operational Projects	4	26.67%
Cancelled	(empty)	2	14.29%
	Citywide Infrastructure Improvements	2	14.29%
	Digital Strategic Plan & Roadmap	8	57.14%
	IT Annual Infrastructure Equipment Replacements	1	7.14%
	IT Operational Projects	1	7.14%
Pending	Citywide Infrastructure Improvements	1	33.33%
	Digital Strategic Plan & Roadmap	2	66.67%
<b>Total</b>		<b>326</b>	<b>100%</b>



## 5.2 Completed Projects Highlights

One of the cornerstones of the DSP is a focus on providing exceptional service delivery and fostering a strong sense of community and community wellbeing. Other main goal is to enhance operational effectiveness and foster improved efficiencies

The following are a sampling of representative technology initiatives completed reflecting the efficiencies achieved by each project.

### 1. Syntech Fuel Management System



The system replaced the previous antiquated system GasBoy, which exceeded its useful life and did not meet the City's needs for accurate accounting of fuel usage by vehicle and equipment.

#### Efficiencies achieved by the project are:

- Replaces 20+ year old unsupported hardware and software with cloud based solution.
- Minimizes/Eliminates data entry errors when fueling because system can read which vehicle is fueling; this greatly improves the accuracy of billing and accounting.
- Allows remote monitoring of fuel levels and manages our fuel consumption at the Corporation Yard and Transfer Station which supports emergency response.
- Will be able to expand to Fire Stations to allow remote monitoring of their fuel levels as well.

### 2. Zonar (Pilot Project) Fleet Telematics System



The GPS – Global Positioning System is being piloted on 112 PW, Parks, and parking enforcement vehicles to support safety and emergency preparedness by providing real time information on assets and equipment. Project also includes electronic vehicle inspections. Vehicle telematics are also critical for fleet electrification and right sizing.

Efficiencies achieved by the project are:

- Provides real time information on where our vehicles are to support emergency response and response to breakdowns.
- Enables electronic pre/post trip inspections; this replace paper inspections and reduces manual entry errors.
- Sends diagnostic codes directly to equipment maintenance mechanics. Allows data-driven real-time vehicle servicing, diagnostics reporting which leads to better maintenance and repair planning and staff time allocation.

### **3. New Irrigation Management System**

Improve water efficiency by replacing 266 individual clocks/controllers for the City's irrigation system in 52 parks and medians with one remote management system.

Efficiencies achieved by the project are:

- Ability to manage the irrigation controllers remotely and the system will allow to communicate via the cloud and automatically coordinate and regulate flow levels
- Provides control and visibility over water usage
- The system takes into account weather conditions and other irrigation factors such as slope and alters watering patterns for each sprinkler accordingly

### **4. Recreation Registration Software**

Implement the Recreation Registration Software, an online calendar utilized for coordinating a variety of recreation programs, to a cloud-based solution and increased efficiency for registering for PRW camps, events, location reservations.

Efficiencies achieved by the project are:

- Increased efficiency for registering for PRW camps, programs, and events, and reservations of picnic sites and tennis courts
- Reduce the use of paper
- Instant access to and up to date information on reservation and registration counts and availability
- Accessible 24/7

- Increase revenue
- Increase customer satisfaction
- Improve Recreation employee's happiness
- Align with the City's Strategic Plan: Be a customer-focused organization that provides excellent, timely, easily accessible service and information to the community.

## 5. NEMO-Q Replacement

Implement a new Ticketing Queuing System in Permit Service Center and Finance Customer Service Center to prioritize queue based on customer service request type and streamline wait times.

### Efficiencies achieved by the project are:

- Faster Permit Service Center Welcome Desk process by adding flexibility to assign permit applicants to the correct queue reducing staff time and Welcome Desk wait times.
- Allows Permit Service Center staff to see who is waiting for what service and for how long and enables staff to proactively help clients if their queue is open, thus making more efficient use of staff time and reducing Permit Service Center wait times.
- Allows staff to monitor the presence of applicants who may be waiting in the Permit Service Center to see them from their desks, eliminates wasted staff time walking out to see if persons have arrived for an appointment.
- Real time monitoring and longer-term trend reporting of Permit Service Center wait times and queue demand enables supervisory staff to make efficiency decisions based on data and real time awareness of problems and successes.

## 6. ACCELA Upgrade Version 8 – Version 10

Upgraded the ACCELA permitting and business license software from version 8 to V10 in early 2020.

### Efficiencies achieved by the project are:

- Reduce Accela system downtime by moving Accela software, Windows Server operating system, SQL Server database software, and ESRI GIS software to supported software versions.
- Accela 10 is reported by staff users to be faster and more responsive than Accela 8 enabling many small, but cumulative, improvements in staff efficiency.

## 7. Business License Upgrade

Implemented online renewal for Short Term Rental business license type. A new Accela Citizen Access website was built for better usability. Automation of the overpayment process was also implemented.

Efficiencies achieved by the project are:

- For renewal of Short-Term Rental business license type, the website allows community members to access the system 24/7.
- The online website is easier to use and reduces paper waste
- Automation of overpayment process allows accurate reporting of revenue when overpayments are received.

**8. Human Resources Case Management**

Software to manage and track Human Resources Employee Relations and Equal Employment Opportunity cases.

Efficiencies achieved by the project:

- Unifies case management in a centralized database and allows for better search capabilities (case and documents for example PRA) and reporting
- Simplifies the case management process by allowing for routing case management tasks
- Workflow feature that shows tasks, due dates, etc.
- Dashboard that shows status updates on cases

**9. Commissioner Tracking System (Phase 1)**

Reason: Helps track commissioner membership, commission details and contact information and develops report that gets published to website. During this project, IT performed enhancements and bug fixes to the commissions tracking system.

Tasks completed:

- Migrated the Commissioner Information System (CIS) Access database to Microsoft SQL database
- Converted the CIS Access forms and report to a web application
- Secured the web application with Active Directory

Efficiencies achieved by the project are:

- Migrated off an Access database located on a network drive to a browser based application on a robust enterprise platform
- Provided greater data integrity for concurrent user usage

**10. Public Safety Projects**

- **NG 911:** this is a set of projects that implements text to 911, enabling emergency requests to be transmitted by Text to the 911 Call Center. Scope of the project included upgrade of the CAD software, adding AT&T fiber, and new servers and connections to 911. Under AB 1168, local 911 dispatch centers must deploy a text-to-911 service allowing individuals to text “911” for emergency services that can accept short message service (SMS) and real time text (RTT) messages. This system also allows for better call routing. If our comm center goes down it is easy to route calls to other comm centers. Berkeley is in final testing phases for this functionality.
- **RIPA:** The Racial and Identity Profiling Act (RIPA) was formed as part of AB953 (Weber, 2016). City of Berkeley has set up and rolled out a RIPA phone application that officers are using to collect stop data information per specific requirements of the DOJ. Berkeley started collecting data in October 2020, well ahead of the January 2022 deadline. Data is posted monthly on the City of Berkeley Open Data Portal.

## **11. Health, Housing and Community Services Projects**

- **REDCap:** REDCap (Research Electronic Data Capture) is a secure HIPAA-compliant web application for building and managing online surveys and databases. Implemented for Public Health to create secure surveys to capture required information when investigating foodborne disease and outbreaks.
- **Clinic Sliding Scales for Self- Pay Charges:** Modified FY19//20 Patient Responsibility table data and created new Sliding Scale schedules for Public Health Clinics that automatically calculate service fees based on poverty rates.
- **Implement State WIC MIS System with California Department of Public Health:** Implemented State MIS system that supports food benefit issuance via EBT processing for all WIC participants in California. Implemented for use by local City program staff to deliver benefits efficiently, reconcile payments, operate affordably, enhance client services by improving access to prescribed WIC foods, and simplify the retail point-of-sale transactions (to reduce participation stigma and improve shopping convenience).
- **Emphasys Elite Major Software Upgrade and System Migration to new Virtual Server**  
The legacy Elite physical server, using SQL Server 2008, was replaced with a virtual server running the latest SQL. All databases were migrated to the new server, and major Elite software upgrades were tested and implemented for two groups: 1) the Berkeley Housing Authority (BHA) using Elite and HQS for Section-8 and inspections in the field; and 2) the City of Berkeley's Health Housing and Community Services (HHCS) Shelter Plus Care (SPC) Program.
- **Mobile Crisis Team Incident Log Software Upgrade Business Analysis and Requirements**  
- Completed business analysis with Mental Health stakeholders to identify new requirements for MH crisis and access service programs. Prepare necessary information to determine if system should be replaced with new product or if custom development of the application is feasible.
- **NextGen Behavioral Health Implementation Project**  
Implement NextGen Behavioral Health templates to replace paper-based charting at the BHS Health Center for Mental Health services provided to clients. Produce export of grant required

data for SBHC visits (Behavioral Health and Physical Health) to eliminate manual entry in external system. Behavioral Health Specialty will be implemented for the first time. Mental Health providers at the BHS Health Centers will begin collecting electronic data; instead of hand-writing information on paper forms. Grant data will also automatically be produced; replacing years if staff swivel-chair process to manually enter data in separate system.

- **NextGen EPM-EHR System Migration to new Virtual Servers**  
Project included standing up new servers; and migration of system from legacy servers running SQL Server 2008 to new servers: Production SQL 2018 Server; Development SQL 2016 Server; Report SQL 2016 Server; Application Server; Communication Server; Interface Server; and 3 Servers with Terminal Services.
- **NextGen Major System Upgrade to EHR 5.9 / EHR 8.4** with Workflow Improvements; and Implement Upgrade Required for E & M Office Visit Changes Effective 2021
- **Implement Public Health Clinic & BHS Health Center Telemedicine**  
Implement new Public Health Clinic workflow with NextGen templates to collect telehealth service information and bill for those services. Clinic service providers now able to deliver important services to clients via telephone calls during shelter-in-place orders. The State has authorized payment for these services when medical claims are submitted with correct codes and information.
- **Targeted Case Management (TCM) Telephone Encounters and Service Claims**  
Persimmony ECM software changes were implemented in order that Case Managers from PHN and Aging Services are able to capture and bill TCM services via telephone encounters instead of face-to-face visits. The State has authorized these services as reimbursable because of the current shelter in place requirements to limit the spread of COVID-19. Ability to provide Targeted Case Management services to our vulnerable Medi-cal client populations, including Seniors, mothers and children.
- **TCM Program Cost Report Data and Audit Files 2019 & 2020**  
Produce Annual TCM Cost Report Data and Provide Audit Support for both fiscal years.
- **Implementation of HIPAA Auditing Solution for Mobile Crisis Team (MCT) Incident Log**  
Determine if and how MCT Incident Log System can be upgraded for HIPAA Compliance auditing and security. Research HIPAA requirements and SQL compliance tools and/or add-ons. Identify application and/or configuration changes required to accommodate auditing tools. Develop the Proof of Concept (PoC) testing and evaluation Develop Issues, Recommendations & Options Report for Mental Health. Conduct Meeting with Mental Health Division stakeholders to review and discuss recommendations and greenlight an option.

## 5.2 In Progress Projects FY 2021 Highlights

1. **Enterprise Resource Planning (ERP) Phase I (Core Financials and HR Payroll Modules)**  
Implement the Tyler Munis Core Financials and HR Payroll Modules – Chart of Accounts, Accounts Payable / Accounts Receivables, Miscellaneous Billing, Contracts Management, HR Payroll, Electronic Timesheets. The core ERP Project team is also assessing current business practices, and identifying areas of business process improvement to optimize efficiency and return on investment of instituting a modern ERP.

2. **Website Redesign Request for Proposals (RFP) and System Selection** – In February 2018, the City issued an RFP seeking a vendor to implement a complete redesign of Berkeley's website, including a new content management system and secure, high-performance offsite hosting. The RFP received a robust response, garnering over two dozen strong proposals. After three rounds of review by a multi-departmental evaluation team, the City selected [Rolling Orange, Inc.](#) to develop the new website. The details on project status are in the Appendices.
3. **SharePoint Intranet** - In March 2018, contracted with Emgage to design and implement design for a SharePoint intranet and provide a modern method for communications and for information sharing among City Staff. We reviewed work of four vendors and chose Emgage because of ease of use and clean design.

**Status: HOLD**

**The project is on hold due to shelter-in-place order.**

**Reason:** Sharepoint is hosting our new intranet site which will replace the S drive and iCOBWeb. <https://cityofberkeley.sharepoint.com/>

This transition will begin with **ALL documents** in these folders becoming **READ-ONLY as of TBD**. Each department will have their own SharePoint homepage which will serve as a location to share files, data, etc. with other Departments in the City. Each department will also have an internal page specific to their department, divisions, and work groups for internal file sharing. We have the latitude to determine how we wish to organize the file structure and, in general, what permissions we wish to set on them.

4. **Cyber Security Resilience Plan / Business Impact Assessment** – Develop a Cyber Resilience Plan in alignment with the City's Resilience Strategy, including software upgrade needs, policies and cyber security training for staff. The details on project status are in the Appendices.
5. **Office 365 Migration Planning and Deployment** – Upgrade and migrate all City staff from current Office 2013 client to the most current Office 365 client. The project will be completed in Phases: Email, One Drive, SharePoint, Office suite. Completed the RFP Process in FY 19 and selected the vendor. In the planning phase and will be developing a project plan for migration.
6. **Windows 10 Upgrade** – Upgrade all City computers from Windows 7 to Windows 10, to maintain computer and network security, and to ensure operating system compatibility with modern desktop software applications.
7. **iPhone Upgrades** – Coordinate the purchase and replacement of about 300 City iPhones for remote work due to the Shelter in Place, and to ensure phone data security and compatibility with modern iOS apps.

8. **Backup Replacement and Hosted Cloud Storage** – Replace the City’s backup solution to meet the current and future technology needs of the City. Also provide for redundant cloud-based offsite backup to preserve and protect City data in the event of a local disaster or emergency. The details on project status are in the Appendices.
9. **VOIP Upgrade** - The City is upgrading it's current Voice Over IP (VoIP) telephone system that has been in place since 2013. Upgrades include hardware, software, and voicemail system upgrades, improved call center services (including 311 and the Help Desk), and critical upgrades to meet current “e911” law and regulations in accordance with Kari’s Law, Ray Baum’s Act, and FCC regulations.

#### 10. **Public Records Act (PRA) response software replacement project:**

The PRA software is designed to be an easy-to-use freedom of information act (FIOA) and public records portal, easily accessed by a link from the City Website. City of Berkeley PRA staff are able to receive, work and fulfill requests within a single repository. Community members and requestors can view responsive documents on file and open to the public through the self-service PRA portal, therefore reducing repetitive requests. Workflow and auto-generated reminders and redaction tools allows for better internal management and efficiencies.

**In November 2018**, the City issued an RFP seeking a vendor to implement a Public Records Act response software replacement, including a new online portal, content management system and secure, high-performance offsite hosting. The RFP received two responses. 311 Customer Service Center from Department of IT is leading this project. A project team comprised of members from City Clerk, City Attorney, Planning, Fire, Police, Public Works and IT Security have scored the proposals and participated in Software demonstration presentations. Final vendor selection will be concluded in April 2019 and will follow the City’s procurement processes to get Council Spending Authority approvals.

PRA Software project was launched internally in 2020 and the City’s PRA portal will be functional by Summer 2021.

#### 11. **Mission Mark**

**Status:** In Progress

The Auditor’s office selected Mission Mark Audit Platform to aid the City Auditors in managing ongoing audit recommendations.

**Reason:** Implement the Mission Mark Audit Platform to aid the City Auditors in managing ongoing audits recommendations.

##### **Efficiencies achieved by the project:**

- Streamlines the audit process and provides improved collaboration between the City Auditor’s office and other City departments.
- Centralizes the audit repository and allows for quick searches

- Provides dashboards that provides quick status updates and can publish

## 12. **ServiceNow (Phase 3 in Progress) - IT Service Management/Enterprise PM Tool**

**Status:** In progress

Testing Orlando release upgrade  
Configuring hardware asset management

**Reason:** Replace Help Desk software, implement project portfolio management software, and technology asset management

**Efficiencies achieved by the project:**

- Greater visibility of high priority incidents on dashboards
- Auto-route tickets to the appropriate I.T. teams for greater efficiency.
- Better communication channel between requester and IT via the portal
- Self-service walk-in appointments scheduling for social distancing at IT Help Desk

**Phase 1 and Phase 2 Modules Implemented:**

- Helpdesk Software
- Incident, Change, Problem Management
- Visual Task Boards
- Project Portfolio Management including Council RRV Prioritization
- Self-Service Portal
- Catalog / Database Setup
- Knowledge Base
- Project Reporting

## 13. **Integration Software Upgrade and perform Integration Enhancements**

**Status:** In Progress

**Reason:** Provide a more stable integration platform and prepare the City for additional integration enhancements for FUND\$ replacement projects.

**Efficiencies achieved by the project:**

- Provides latest version of Webmethods which provides product enhancements and bug fixes thereby reducing downtime.
- Automates the communication between different applications that will increase customer service response time.  
Optimizes integration environments to allow for increased transaction response time.

### 5.3 **Deferred Projects due to COVID-19**

1. **Customer Relationship Management (CRM) Replacement Project:** The project is deferred due to COVID-19 and RFP for CRM System is planned to be released in the summer of 2021.

## 5.4 Cancelled Projects

1. **Capital Improvement Project (CIP) Management Tracking:** Project (CIP) tracking tool to better document and manage project implementation and related financial information. Rejected proposal; will rebid at a later time. Need ERMA to be developed more prior to implementing. Cost and resources need to be evaluated before starting this critical project.

## 5.5 Planned Projects / Projects List FY 21- FY22

A draft list of projects by department and category with Council Priority for FY21 through FY22, and including carryover projects from prior years will be submitted as part of the FY2022 budget planning process. These projects are also contingent upon Council's adoption of future years' budget and annual appropriation ordinances.

## 6. Reinventing the IT Service Model



### 6.1 Industry Recognition

The city has received the following for its innovative initiatives and exceeding high rate of success in systems deployments:

- Municipal Information Systems Association of California (MISAC) Excellence Award 2017, 2018, 2019
- Helpdesk staff received certifications from HelpDesk Institute
- DoIT staff successfully completed all required training par to the City's Core mandatory trainings provided by Human Resources department
- 5 staff members have completed PMP (Project Management Professional) certification and are sharing knowledge with entire team. Task Force from this group is reviewing all project life cycle documents and processes and refining same for Berkeley IT department. The staff will be creating a knowledge base of documents.

### 6.2 Challenges

The technological needs for departments are growing exponentially and given this new landscape, new additional resources may be needed to provide effective implementation and ongoing support. Some of the other challenges are around Recruitment, Retention and Class specifications.

- Class Specifications are outdated and refer to early 1990 technologies and skill set. The Class specifications don't reflect the current department skillset required and results in low retention rate for new employees (**project deferred due to COVID-19**)
- Staffing Challenges
  - The industry standard ratio of Employee to helpdesk ratio is about 70:1
  - For City of Berkeley the ratio is 266:1 (as we have 6 helpdesk employees serving a staff of approx.. 1600 (Reference - <https://www.roberthalf.com/blog/management-tips/how-many-help-desk-tier-1-personnel-do-you-need>))

- Difficult to recruit – Expectation of Class Specification, Work and Skillset do not match
- Lack of growth opportunities for staff
- Lack of physical space impacts productivity, COVID-19 concerns
- Increased helpdesk requests due to digital transformation efforts and deployment of multiple technologies simultaneously
- Impact to resource allocation for projects where DoIT serves as supporting department such as Implementation of Short Term Rentals, U1 Measure, T1 Bond
- Staff resource deployments to EOC and other adhoc events resulting in shifting priorities from daily assigned tasks
- Additional 311 calls due to unforeseen event such as COVID, PGE Power Shutoff events which results in increased calls for service

## 7. Contact Us



**Hours of On-site Support:**

8:00 am- 5:00 pm  
Monday-Friday

**After Hours Support:**

24 hrs. X 7 days  
Critical Systems only

**Phone:** 510-981-6525

(After hours support, press 0)

**Self-Service Portal:** (requires City Login ID)

<http://cityofberkeley.service-now.com/sp>

**Email:** [helpdesk@cityofberkeley.info](mailto:helpdesk@cityofberkeley.info)

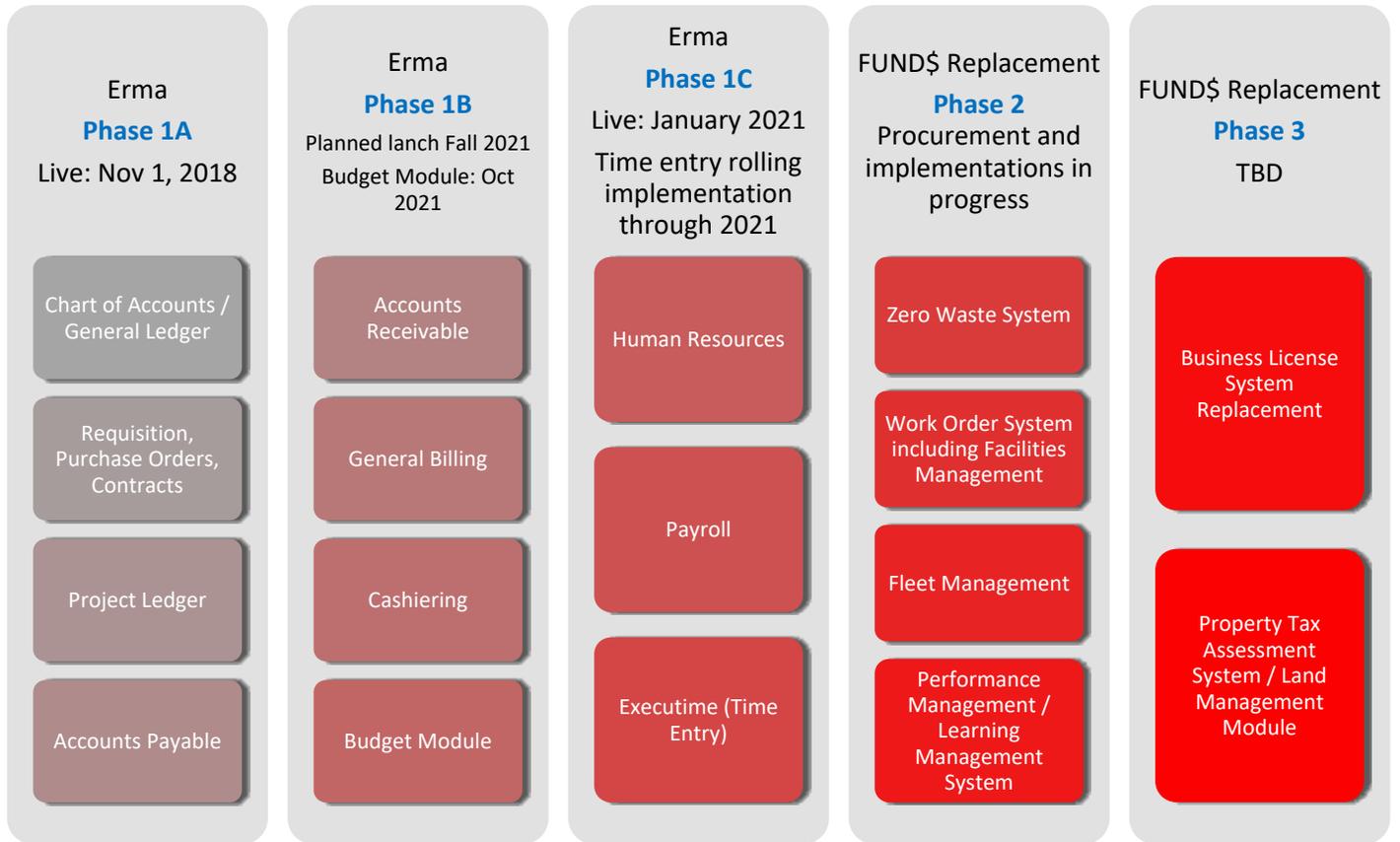
## 8. Appendices



## 8.1 FUNDS\$ Replacement Project

### FUNDS\$ Replacement Project - Phase I: Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) Phase 1 deliverable is to implement a new software solution to address core financials, Human Resources and Payroll services. The project plan extends through several years of the Digital Strategic Plan (DSP) and the phase 1A through Phase 1 C is planned to be fully implemented by the end of FY2022. Each module is defined in the narrative below.



### Phase I: Enterprise Resource Planning (Erma) - Core Financials and Human Resources / Payroll

In May 2015, the City contracted with the Government Finance Officers Association (GFOA) to conduct a needs assessment of its systems and processes including a review of its current financial processes, and for identification of areas for improvement and recommended business process changes.

The City determined that a new enterprise system will improve integration, reporting based on specified criteria, organizational processes, and allow for the implementation of business process best practices. Discussions with GFOA included organizational and functional scope, as well as the development of functional requirements the City should seek in the new ERP system. From the resultant project planning activities, the City has made many strategic future business process decisions based on best practices that are to be included in the system's implementation. Accordingly, the City intends to incorporate and implement the requisite high-level processes into its new enterprise system.

**In February 2016** the City hired a Project Manager to conduct a full replacement of all modules in the current ERP system known as FUND\$.

**In May 2016**, the City released an RFP and in June the City co-located a core team of Functional Leads throughout the City to work on the project. All positions are tied to the project duration and funding.

**In May 2017**, The City completed a rigorous RFP and contract negotiation process and selected Tyler Munis as the software to replace core financial, Human Resources and Payroll functions currently residing in FUND\$. The limited installed functionality and lack of integration between existing systems requires that staff utilize many shadow systems to support key business processes. With this Project, the City aims to improve business processes, gain efficiencies, simplify and standardize use of systems, and install core public sector ERP functionality. The following needs statement and goals were outlined in the RFP:

The Project's key goals and success indicators remain as follows:

- Improvement to business processes
- Implementation of business processes based on best practices
- Implementation of grant, project and budgeting processes and functionality
- Improvements to and updating of outdated technology
- Improvements of system and data integration to stand-alone systems where possible
- Elimination of duplicate data entry
- Provide access to source data and user-friendly reporting tools
- Reduce paper use
- Broaden employee self-service capabilities
- Broaden vendor self-service capabilities

The City purchased the following Tyler Munis modules:

- |                                 |                                       |
|---------------------------------|---------------------------------------|
| • Accounting                    | • Human Resources & Talent Management |
| • Accounts Receivable           | • IVR Gateway                         |
| • CAFR Statement Builder        | • Munis Analytics & Reporting         |
| • Capital Assets                | • Payroll with Employee Self Service  |
| • Cash Management               | • Project & Grant Accounting          |
| • Contract Management           | • Purchasing                          |
| • eProcurement                  | • Tyler Cashiering                    |
| • ExecuTime Time and Attendance | • Tyler Content Manager               |
| • General Billing               | • Tyler Forms Processing              |

**In November 2018**, the City launched the Phase IA which included Chart of Accounts / General Ledger, Requisition, Purchase Orders, Contracts, Project Ledger, Accounts Payable Modules

**Project Challenges** - The project team experienced setbacks with staffing challenges due to retirements and staff moving on to new roles within the organization. Currently, there is one dedicated team for the project to support cityside training and change management, all other team members are located within their home departments and are conducting implementation activities in conjunction with regular department activities. The team began with 7 dedicated team members. Mitigation plans included contracting with an outside project manager to assist with Phase 1A go-live and Phase 1C implementation. Both positive and negative lessons learned from Phase 1A have been documented. Due to the age of the existing financial system, data conversion was a challenge, and a significant portion of the data needed to be converted manually. These challenges are being

addressed, and a project plans are updated to include the additional detail and requirements from the lesson learned from Phase 1A.

**In January 2019**, the City began working with Tyler to develop a timeline which includes launching the following modules: Budget (**Fall/Winter 2021**), Accounts Receivables, General Billing and Cashiering in **FY 2022**.

The payroll and Human Resources modules were launched December 27<sup>th</sup>, 2020. This included payroll and the transition from Employee Transactions Forms (a paper process) to electronic Personnel Actions conducted within the ERP. This eliminating many paper forms. Additionally, once we launch the Employee Self Service Portal we will further reduce use of paper as pay stubs for direct deposit will be available to employees electronically and will only be printed upon request. Employee Time entry (in ExecuTime) will begin 3 months after payroll launch. ExecuTime will be rolled out in 5 phases. Breaking this implementation into smaller launch groups will allow for focused and specialized training and more availability to support the transition with limited resources. As with the other components, this launch will greatly reduce the use of paper to report time and request time off and will have an electronic process that will provide meaningful data.

### **Change Management and Training:**

The Program Manager works closely with the Steering Committee, which provides leadership for the business process changes that go along with implementing a modern ERP. While many changes will coincide with the new system, the change management initiative is a critical component of the implementation. The Program Manager along with an internal change manager and an experienced consultant to work with key stakeholders, subject matter experts and department leadership to identify and facilitate adoption of changes that will create immediate efficiencies. The Program Manager is also engaging in focused change management initiatives to optimize City staff readiness and identify potential areas of risk or low adoption rates and working to mitigate those risks. Deliverables include development of the internal SharePoint site for the payroll component including training videos, workflow maps, cheat sheet, a paystub cross-walk and other critical collateral,

The City has also identified additional needs required to support the level of change the City is experiencing. To address these additional needs, Staff have engaged with a third-party vendor to assist with the development of an additional communications plan, a comprehensive and department-specific training plan relevant to the phase of the FUND\$ Replacement module which Staff are implementing, and process documentation materials that resonate with staff to address questions and business processes and support change management with specific action items to support adoption of the new ERP.

In light of Covid-19, , the team has adjusted the training plan from in person training to virtual platforms. While this was a significant shift for the team developing the training program, there are some benefits to the city. The third party vendor developed recorded trainings (ranging from simple watch videos to interactive learning experiences) which are available to staff after go live to support staff in learning new processes in erma. The process is inclusive and is being informed by staff across the organization indifferent departments and at various levels and with different roles and positions. These trainings will be stored on the intranet and available for staff to use at any time. Additional videos will be created for employee time entry which will begin to roll out in calendar year 2021.

## FUND\$ Replacement Project - Phase II

**In August 2017**, the City released an RFP for a consultant to conduct a needs assessment to guide the replacement of the additional modules in FUND\$: namely: Work Order and Asset Management, Fleet and Facilities, Real Property/Lease Management, Property Tax Software, Refuse Billing, Business licenses, Performance Management and Learning Management. The Needs Assessment includes assessment of current gaps, developing a roadmap for improved business systems to achieve operational excellence, development of requirements and scope for related RFPs and vendor analysis for applicants.

The goal of the FUND\$ Replacement project Phase II is to replace the outdated functionality of the existing FUND\$ system with contemporary and strategic application software. It represents the continuation of the ERMA/Tyler Munis Finance System implementation, except this phase focuses on Public Works: Work Orders, Asset Management, Fleet Management, Real Property Lease Management and Human Resources: Performance/Learning Management technologies.

**In February 2018**, Phase II was kicked off in parallel to Phase I. After a RFP process, Thirdwave was selected to perform the needs assessment and business process requirements. The project was structured in five phases:

1. Ongoing Project Management
2. Discovery Phase
3. Software Requirements Gathering Phase
4. Request for Proposal & Procurement Phase
5. Vendor Selection & Contract Negotiation Phase

February 2018 through April 2018, Requirements definition included holding nineteen (19) Rapid Workflow® workshops. Staff attendance and input was outstanding. Seventy-nine (79) City staff/management representing all of the departments in the project participated, with some staff participating in numerous workshops (anywhere from 2 to 9, and IT Application Portfolio Coordinators, participating in as many as twelve (12) workshops).

Consequently, total workshop participation consisted of 176 City staff, an impressive level of end user engagement.

Business processes assessed in the project include those listed below:

- |  |  |
|--|--|
| 1. Public Works, Fleet Work Orders                     | 11. Public Works, Zero Waste Start Stop  |
| 2. HR Performance Management                           | 12. Public Works Inventory Management    |
| 3. HR Learning Management                              | 13. Public Works, Zero Waste Start Stop  |
| 4. Public Works, Streets Work Orders                   | 14. Public Works, Work Order Reports     |
| 5. Public Works, Asset Management, Depreciation Orders | 15. Parks Landscape Maintenance Work     |
| 6. Public Works, Traffic Meter Maint. Work Orders      | 16. Public Works Interfaces              |
| 7. Public Works, Facilities, Parks Work Orders         | 17. Fixed Asset Management (Equipment)   |
| 8. Public Works, Forestry Work Orders                  | 18. Fixed Asset Management (CIP)         |
| 9. Public Works, Vehicle Replace Internal Bill WOs     | 19. HR Performance & Learning Management |
| 10. Public Works, Owned Lease Management               |  |

**Procurement process in progress at various stages**

**October 2018**, included the development and posting of four solicitations and subsequent procurement activities, including pre-bid conferences, issuance of addendum. The RFPs were posted for the following systems:

- Zero Waste System [Vendor AMCS Selected](#)
- Work Order System including Facilities Management [Vendor NEXGEN Selected](#)
- Fleet Management [Vendor AssetWorks Selected](#)
- Performance Management / Learning Management System [Vendor NEOGOV Selected](#)
- Real Property Leasing and Management Solution [ON HOLD – NO RFP released](#)

To facilitate the evaluations, cross departmental teams were created specific to the software. The vendor selection process is in progress and it is estimated that all vendors will be selected and spending authority approvals will be presented to Council by **June/July 2019**. The detailed timelines will be shared once the vendor selection process is completed.

Given below is the status of various projects of PHASE II.

PROJECT	STATUS
<p align="center"><b>NEXGEN Work Order / Asset Management / Facilities Management System for PW/PRW</b></p>	<p><b>Status: IN PROGRESS</b></p> <p><b>Configurations Complete and Signed off (3 of 18):</b> Waterfront, Meters, &amp; Forestry</p> <p><b>Configurations In Progress (10 of 18):</b> Sewer, Storm, Clean City, Electrical, Radio Shop, Facilities (PRW/PW), Landscape, Janitorial, and Safety</p> <p><b>•Business Analysis Complete, Configuration Not started (5 of 18):</b> Sidewalks, Street Maintenance (Asphalt), Traffic Maintenance, Transportation Engineering, and Engineering/Fiscal/CIP</p> <p><b>Reason:</b> FUND\$ work order module is being replaced because it is 28 years old and does not link to GIS or provide the information staff need to make decisions, budget, effectively respond to customers. Accela is also being replaced.</p>
<p align="center"><b>AssetWorks Fleet Management System</b></p> 	<p><b>Status: IN PROGRESS</b></p> <p><b>Contract Signed and Kickoff Scheduled in March.</b></p> <p><b>Reason:</b> FUND\$ Fleet module is being replaced because it is 28 years old and does not provide the information staff need to make decisions, budget, maintain vehicle records and know when to replace vehicles.</p>

PROJECT	STATUS
<p data-bbox="180 249 511 369"><b>AMCS Zero Waste Work Order / Billing System</b></p> 	<p data-bbox="537 205 1068 281"><b>Status: IN PROGRESS</b> <b>Contract Signed and Kickoff in March.</b></p> <p data-bbox="537 338 1393 499"><b>Reason:</b> This is a new Zero Waste Division information database for invoicing residential and commercial service, and customer service request. Fund\$ handles current billing of Zero Waste Customers and is being replaced.</p>
<p data-bbox="191 621 505 783"><b>NeoGov Onboarding, Performance and Learning Management</b></p> 	<p data-bbox="537 575 1378 651"><b>Status: IN PROGRESS</b> <b>Onboarding module in progress to be complete in May 2021.</b></p> <p data-bbox="537 707 1377 869"><b>Reason:</b> Implement a product suite for hiring and developing the employee. From new hires onboarding process to performance feedback and developing training and certifications. The new training product will replace VTA (Virtual Training Assistance).</p>

**FUND\$ Replacement Project - Phase III (UnFunded)**

The ERMA Phase 1B and HR Payroll along with the Phase II Projects required significant staff time from multiple departments. The largest impact was for the Departments of Information Technology, Public Works, Planning and Finance departments. Due to resource limitations it was decided to postpone these projects until funding sources are identified. The IT Department will be conducting workshops for business requirements gathering, developing timelines and working on procurement process for these projects and get back to Council with updates next year.

**These projects are unfunded at this time and will be subject to future and additional budget appropriations.**

**Not Started**

- Business License
- Property Tax Assessment and is dependent on other projects:
  - GIS Master Address database
  - Land Management Module

## 8.2 Website Redesign Update

The City's website, [cityofberkeley.info](http://cityofberkeley.info), receives over 2 million visits each year, serving as the first point of contact for many community members when seeking information about City services.

Despite its critical role as an information and customer service tool, the current website does not meet community expectations for online service delivery. In surveys, focus groups, one-on-one interviews, and direct feedback via email or phone, community members voice dissatisfaction with outdated, duplicative, and conflicting content, dense, jargon-heavy text, difficult navigation, poor search functionality, cumbersome online reporting, and a dated design that does not adapt to mobile devices. Additionally, the City's existing website does not meet ADA compliance standards, meaning the existing resource is not fully accessible to community members with disabilities.

The *Web Reinvention Project* is a multi-year initiative to overhaul all aspects of the City's website, including the replacement of outdated software with a modern content management system, visual redesign, streamlined and simplified web content, and a restructuring of internal web management structures to incorporate clear standards, workflows, and ownership for the creation and maintenance of web content.

### History & Project Summary

Berkeley's 2018-2019 Strategic Plan identified a new City website as the first goal under priority #9, "Be a customer-focused organization that provides excellent, timely, easily-accessible service and information to the community."

*Create a new design, look, and information architecture for the City website so that it is interactive and services and prioritizes the needs of the community, including a focus on increasing the number and types of transactions and services available online.*

City issued an RFP for a vendor to design and develop the new website February 2018. After a competitive bidding process, the City selected [Rolling Orange, Inc.](#), a Bay Area based web design and development firm specializing in government and higher education sites. Rolling Orange has previously developed websites for the City of Hayward, BART, SFMTA, the San Francisco Arts Commission, and UC Berkeley.

The City commenced work with Rolling Orange in March 2019, with the expectation that a new website would launch in 2020. Design work completed with Rolling Orange includes:

- **New information architecture:** Menus and content on the new website will be organized to reflect the way community members interact with the City, creating an intuitive and seamless visitor experience that makes it easy to complete tasks by grouping content into user-friendly categories like *City Services*, *Construction & Development*, and *Your Government*, in keeping with industry best practices.
- **New visual design:** The new website incorporates a spacious, modern design aesthetic that adapts seamlessly to any device. The project team placed special emphasis on typography, using a strong visual hierarchy and large text to ensure content is easily

readable for all visitors, including older residents - a group which particularly reports finding text on the City's current website challenging to read.

- **Content templates:** User-friendly, mobile-responsive templates will allow web contributors to create uniform, attractive, ADA compliant webpages for events, capital projects, boards and commissions, zoning projects, and more with the ease of filling out a form. The new site features 15 templates custom tailored to accommodate the full breadth of information types present on the City's website.

**Community Input:** Rolling Orange conducted usability testing on a prototype version of the new website in the Spring of 2020, asking community members to complete a series of common tasks. The new website performed extremely well and received enthusiastic response from testers.

Concurrent with the site development work with Rolling Orange, the City is streamlining and re-writing all web content to improve ease of use for community members. The City has engaged a web content copywriting firm, NV5, to work with staff subject experts to re-write web content for the launch the new website. This one-time effort will establish a new baseline for what web content should look like. Post-launch, content will be developed and maintained by in-house staff.

**Web Governance:** The Communications Office has developed governing standards to guide staff contributors to the website, including a web style guide that reflects best practices in web usability, readability, and digital accessibility and a web policy that defines clear workflows for the creation, maintenance, and sunset of web content.

To ensure content is kept up-to-date and maintains a high standard of quality, the City will implement a new web governance structure with the launch of the new website. A two-tier posting system will allow for routine updates to be made through simple forms for wide number of contributors, while more complex needs will be funneled to a smaller group of well trained staff who have received in-depth training in digital accessibility and writing for the web. The new system clearly defines maintenance expectations and responsibilities, the absence of which were identified by current staff as the primary reason content on the current website is not kept up to date.

## **Status**

Before the pandemic, the new website was scheduled for launch in October 2020. With project staff redeployed full-time to COVID-19 response, work on the new website has largely been suspended.

The City Council approved funding for two new Digital Communications Coordinator positions in December 2020. One of these positions will assume project management responsibilities for launch of the new website. Recruitment opened March 1, 2021. The City hopes to have this position filled in the next few months, at which point the project can resume at full pace and a new launch timeline will be developed.

Work on content production with staff subject experts had begun in February 2020 and was suspended due to the pandemic. Project staff have recently resumed working with the web

copywriting vendor on a small set of high priority content. Most content production work will take place during summer 2021, once new project staff has been on-boarded.

System development has continued with Rolling Orange during the pandemic at a reduced pace. A secure off-site hosting environment has been provisioned and is being used to host development of the new site.

Core development and configuration for the new content management system are completed. The vendor is now focused on completing development of custom applications, technical integration with the Lagan CRM system which will allow easier online 311 reporting, and testing templates and displays.

Software build-out is expected to be complete in summer 2021. Following this, the next steps will be:

- **Cybersecurity testing:** the City's cyber-resilience team will be overseeing a series of cybersecurity tests on the new website before launch, including penetration testing and a thorough threat modeling analysis.
- **Staff training:** training for web contributors on new software, and organizational training on governance program which is modeled after best practices in other jurisdictions

The new website is projected for launch in late 2021, pending the successful completion of the Digital Communications Coordinator recruitment.

### 8.3 Cyber Resilience Plan Update

Starting in the First Quarter of Fiscal Year (FY) 2019, the City of Berkeley (City) began the process of building a five (5) year, multi-focused City-wide strategy called the “Cyber Resilience Plan (CRP)”. The CRP is an important part of establishing the blueprint that creates a methodical approach and evolves cyber-security for the City of Berkeley to the benefit of its community members. This strategy aligns with the City’s vision of reducing cyber-risk exposure, maturing cyber-security capabilities, technologies and systems, and effecting efficient regulatory compliance.

The City has produced a plan to be more resilient to physical, social, and economic shocks and stresses. The CRP aligns with the City’s adopted Strategic Plan goals of:

- Creating a resilient, safe, connected, and prepared City
- Provide state-of-the-art, well-maintained infrastructure, amenities, and facilities
- Be a customer-focused organization that provides excellent, timely, easily accessible service and information to the community

The CRP also adopts strategies that align with the DSP.

The City established a framework of five (5) key focus areas of cyber-resilience capabilities applicable across the municipality. These areas are:

- **Data Transparency, Data Privacy, and Data Security**
- **Monitoring, Response & Mitigation**
- **Policy and Rationale**
- **Program Functional Design**
- **Training & Culture**

The City’s CRP is the result of a comprehensive and thorough “AS-IS” assessment and evaluation of the City’s existing technologies, operational requirements and service delivery needs against thirty-nine (39) cybersecurity and Public Sector key processes and procedures, organizational norms, and technologies applicable to these five focus areas. The results provide the City a situational awareness of:

- i. its present-day cyber-risk exposure;
- ii. maturity of its cyber-security capabilities, technologies, and systems; and
- iii. its inefficiency in addressing regulatory compliance.

The CRP resulted in action items that the City must act upon in order to reduce its current risk exposure, mature its capabilities, and become more efficient.

Using the action items from the CRP, the City created a five-year implementation plan in order to itemize and prioritize each of the action items. This five-year roadmap defines the workload needed to accomplish each of these action items, identifies which departments will need the most support to complete the action items, and identifies and itemizes the resources required to accomplish each action item. The CRP roadmap is thus technologically strategic, operationally responsive, and fiscally responsible. It addresses the unique requirements of the mission critical business needs of the City and its constituents, visitors, and business community. Staff presented the details about the plan to Council in a closed session on DEC 01, 2020. Annual updates will be provided in closed session.

Staff published two cyber-resilience RFPs in FY 20

Cyber-Resilience FY20 RFPs

1. Back-up Upgrade Solution and Hosted Cloud Storage
2. Cybersecurity Event Monitoring and Security Information and Event Management (SIEM) also known as Managed Security services Provider (MSSP)
3. End Point Protection and Detection/Response (EPP/EDR/MDR)

FY21 will have seen the implementation of both of the MSSP and EPP projects, as well as additional projects for which an RFP is not required:

1. FY20's planned Business Impact Assessment (BIA) – Tier 2 Applications/Infrastructures
2. Improved Cyber Incident Response (IR) Playbook
3. Additional Remote Access and Monitoring
4. More Phishing and Ransomware Awareness Training
5. Launching City-wide Data Safety Program

FY22 will see the implementation of the following cyber-resilience projects, and RFPs if required, pending Council approval of the proposed citywide budget and annual appropriations ordinances:

1. Improved Identity & Access Management (IAM)
2. Additional Cyber-Hygiene with Continuous Patch & Configuration Management
3. Launching City-wide Cyber Risk Management
4. Various Cyber-Resilience policies and procedures

In addition to the CRP, several cyber-security needs - emergent as well as identified in the As Is Assessment - have been addressed and actions taken this year.

## 8.4 Business Impact Assessment/Disaster Recovery (BIA/DR)

FY19 was the first time that the City of Berkeley had ever conducted a Business Impact Assessment (BIA). Performing a BIA is a thorough and comprehensive undertaking. **The second year of the assessment was scheduled for FY20 but was deferred due to COVID-19.** It was intended to address the second most critical applications and infrastructure (called “Tier 2”) that departments require in order to deliver their services to our community members – those that could be momentarily interrupted, but would be needed for each department’s recovery of operations.

The BIA looks at the City’s services, as well as resources and technologies that we use to support those services. For example, some of our city services include answering phone calls at the public safety call centers, health clinical activities, and conducting building inspections. Some of the resources and technologies we use include applications, internet access, and city networks.

The BIA analyzes the City’s services, resources, and technologies so that in a disaster the most critical services, resources, and technologies are provisioned first, aiding a smoother recovery.

**There are five critical questions being asked of each Department and of the senior executive team (SET) within our BIA:**

1. What is the criticality of each the activities we do in the City of Berkeley? Which ones of yours are designated as “essential functions”?
2. What is your Department’s and the City-wide priority to resume each of the processes listed in #1?
3. Following a major disruption or disaster, how soon must time-sensitive City services resume in order to avoid significant adverse impacts on the City and its community members?
4. What resources and technologies are needed to support the time-critical operations and minimize potential services interruption?
5. What are the magnitude of financial, operational, reputational, or legal impacts that arise from extended down-time?

The answers to each of these questions directly impacts the scope and priorities of the Cyber Resilience Plan (CRP) fourth focus area (monitoring, response and mitigation) and the development of disaster recovery (DR) policies, processes and metrics (a component of the third focus area of the CRP). We are also leveraging the BIA to begin to identify the sensitivity of information within the City. This collected information will, in turn, be used to inform our planned data transparency, data privacy, and data security work efforts and milestones (CRP focus area #1).

With the sudden onset and long duration of COVID-19, and its fiscal impact, the BIA data collection effort for FY21 has been adjusted to: (1) validate the FY19 data collected in the specific case of a pandemic, and (2) apply the impacts of a pandemic in answering the above questions for each department’s Tier 2 processes and applications.

## 8.5 Data Center Infrastructure Disaster Recovery - Nutanix Project

One of the major projects was the migration of the City of Berkeley onto the NUTANIX Hyper-Converged Infrastructure (HCI) and the standing up of Xi LEAP, NUTANIX's Disaster Recovery (DR) off-site datacenter as a service (DRaaS). Until this project, the City of Berkeley did not have any off-site datacenter so when a regional disaster – like an earthquake or mass fire – occurs, we would have been dead in the water. All city services depending upon technology would have ceased to operate.

Efficiencies Achieved by this new HCI solution additionally provides full operational redundancy between the datacenters at City Hall and the Public Safety Building. It is built secure, it provides data encryption and other cyber security controls by default, and its security is incident-tested. This is one of the core goals of the Cyber Resilience Plan.

Furthermore, the previous datacenter infrastructure was setup in a 3-tier model (virtual environment, servers, and backend storage) – an outdated technology that required high overhead, was time-consuming - taking 400 hours a year to maintain, including and approximately 40-50 hours of additional overtime per year - and also costly to maintain. It additionally lacked the stability needed for our mission critical applications. Delays were frequent and lengthy when vendor support was needed.

In summary, some of the expected benefits of the solution are:

### 1. Efficiencies

- i) Achieves DoIT operational and cost efficiencies along with improved application performance by leveraging software-defined technology – the latest technology
- ii) Increased datacenter, server and data security
- iii) Enhanced delivery of services to the community

### 2. Disaster Recovery Capabilities

- i) Provides a single management console with high availability and improved failover while also creating disaster recovery (DR) capabilities
- ii) Allows both data centers to replicate between themselves with an increased capacity that is large enough to host both of them in the event one fails
- iii) DR offsite in case both datacenters were to go down and we need to activate the EOC and the DR offsite

### 3. Staff Time

- i) Scalable infrastructure that simultaneously reduces deployment time from days to hours, improving resource allocation of DoIT staff
- ii) Nutanix has the ability to do one button upgrades for all software and components. The staff time savings are estimated at 1/3 staff member (FTE) time which can be reallocated to the other infrastructure projects as identified in the City's Digital Strategic Plan (DSP) and Cyber Resilience efforts.
- iii) Decreased standard maintenance and support delays and overall time to complete

**4. Server Room Space**

- i) Reduced our datacenter footprint, avoiding costs tied to provisioning storage while dynamically expanding resources when and as needed
- ii) The Civic Center Data Center (CCDC) reduced 24U (U- Unit) of rack space to 16U needed for the Nutanix servers or 33% less rack space thus resulting in power savings

**5. Environmental Benefits:**

- i) Reduces our server rack space, power and cooling requirements, producing power savings and reducing our carbon footprint
- ii) Power and Cooling - 20 systems at the CCDC reduced to 8 for Nutanix. Each system uses 2 power cables. For instance, average usage of one server is 850 watts per hour with an average of 7446kWh (kilowatt hour) per year. The existing power consumption comes to 148,920 kWh/year compared to 59,568 kWh/year needed for the Nutanix systems or 60% less power requirement thus resulting in power savings and reducing carbon footprint. According to the U.S. Energy Information Administration ([https://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.php?t=epmt\\_5\\_6\\_a](https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a)), as of December 2018 the average rate for electricity is 19.44 cents per kWh thus bringing the operational power costs down from \$28,950.05 to \$11,580.02 annually

This single Cyber-Resilience Project not only created an off-site datacenter for when a regional disaster strikes, it improved the Department of IT's daily IT operations, it improved application performance for all City of Berkeley departments, and it added baseline cybersecurity to our datacenters' infrastructure.

## 8.6 Backup Strategy

The City is in the process of implementing a modern data backup architecture and solution, Cohesity, through a tiered data protection strategy the Department of IT developed this past year. In order to protect our organization from the loss of data that can happen due to various reasons like hardware or software failure, power failure, natural disasters, data thefts, intrusion, or human errors, backups are required.

We can define “backup” as simply a method and tool for executing two primary functions:

### **Data Continuity –**

- fast initial access time is critical
- to provide a local copy of data
- uses primary datacenter facility
- enabling fast restore
- smaller retention period

### **Data Recovery –**

- this need not be time critical
- a copy of data which is off-site
- uses secondary datacenter facility
- restored from another location
- longer retention period

### **Tasks Completed**

- Implemented retention policies so we can restore data when needed with minimal downtime.
- Support 70+ databases and 230+ applications with our data backup and retention policies.
- Implemented monitoring systems to notify server space, memory, performance, user access to data, servers’ uptime, servers’ maintenance, and other critical functions.

### **Current data servers:**

- Total AHV SQL VMs=40
- Total AHV Non-SQL VMs=180
- Total NAS and Physical servers=10

### **Current data size:**

- Total Non-SQL Data size=25TB
- Total SQL Data size=15TB
- Total NAS and Physical file servers=16TB

In February 2020, the City of Berkeley issued **RFP No. 20-11386-C** for a Backup System Replacement and received four (4) qualifying vendor responses. The RFP review committee evaluated each proposal and determined that the proposal from ePlus for the Cohesity Backup Solution with hosted Cloud Storage best met the City’s operational, technological, and fiscal requirements. The Cohesity system implementation is in progress and is expected to be completed in FY 2021.

The Data Backup Solution, is intended to provide retention in accordance with the results of the BIA:

- 1 hour, 12 hour and 1 day Service Level Agreements (SLAs)
- SQL VMs=1-2yr
- Non-SQL VMs=2yr
- NAS and Physical servers=2yr
- Optional O365=1yr

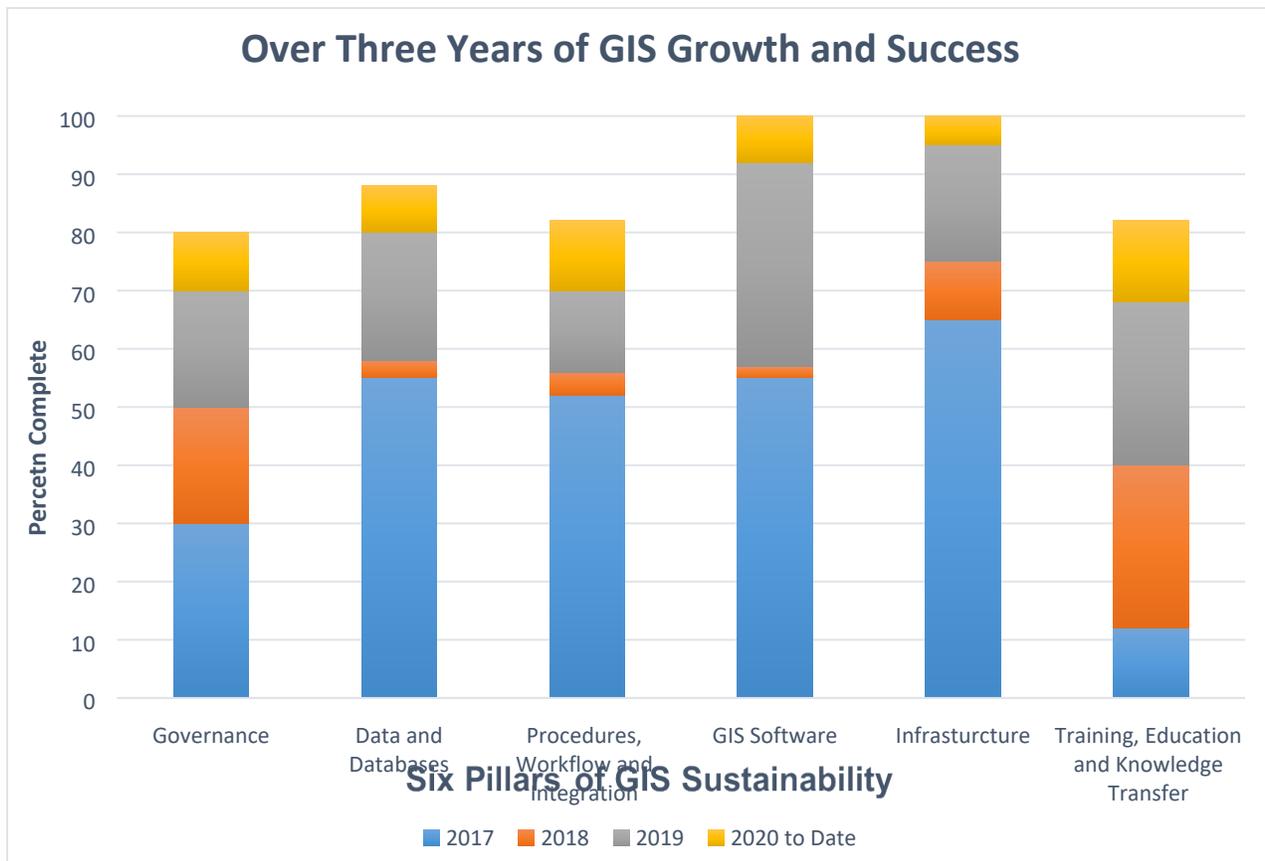
**The expected efficiencies from the new Cohesity backup solution are:**

- **New functionality** - Perform snapshot backups of entire virtual servers instead of just being able to back up the data on the servers. This feature will provide the City a new capability of full virtual server recovery in a disaster recovery scenario.
- **Efficiency / Compliance** - Provide a global search feature to allow staff to search through backups for keywords and file names to ensure fast and efficient recovery of lost data, and to improve regulatory compliance performance.
- **Staff Time Savings** - All newly created virtual servers will be automatically backup up at the time of creation, thus replacing the manual process in the old backup solution.
- **Redundancy** - In addition to Cloud Storage there is an additional local backup appliance for the Cohesity solution which is designed with redundancy in mind, so that no single server or drive failure will cause the solution to stop any backups or recoveries from completing which has been an issue with the current solution.

## 8.7 Geographical Systems (GIS) Master Plan Update

The Geographical Information Systems (GIS) Master Plan was developed in FY 2017 with a 5 year roadmap of GIS data assessment and data layers, to support services provided by these City of Berkeley Programs.

1. **In 2018**, the City created a Mobile GIS Action Plan.
2. **In 2018**, the City create a digital newsletter, The Pin Drop, to maintain a GIS culture of collaboration with stakeholders.
3. **In 2019**, the City developed a comprehensive GIS training program and platform for the City utilizing all resources available such as online and classroom workshops, videos, blogs, social media, and brown bag lunches and provide a plan for knowledge transfer.
4. **To date in 2020**, The City of Berkeley has implemented many of the recommendations detailed in their GIS Strategic Master Plan. The team operates according to Best Business Practices (BBP) and Standard Operating Procedures (SOP). **Successes include:**
  - a. Enterprise Solutions
  - b. Open Data Portal
  - c. Departmental Applications
    - i. Planning and Development
    - ii. Police
    - iii. Parks, Recreation, and Waterfront
    - iv. Health, Housing, and Community Services
    - v. Public Works



### Six Pillars of GIS Sustainability, its successes and efficiencies achieved:

#### 8.7.1 GIS GOVERNANCE

- The GIS Users group is now established and meets on regular basis. The GIS Coordinator keeps the group informed of the progress on various initiatives on GIS Master plan and incorporated feedback to prioritize the projects.

#### 8.7.2 GIS DATA/DATABASES, PROCEDURES

##### • **GIS Newsletter**

- The GIS newsletter markets our successes and services and, in general, increases communications around GIS.
- **Efficiency Achieved**
  - Provide transparency and accountability by keeping stakeholders and community members in the loop through easily accessible media.

##### • **Policies and Procedures Documentation**

- Standard operating procedures and policies detail the ways in which GIS technologies are to be manipulated in order to meet user needs.
- **Efficiency Achieved**
  - Prevent redundancy in data compilation and unnecessary effort. Adoption also decreases organizational liability.

- **GIS Community Portal**

- The GIS Community Portal, <https://www.cityofberkeley.info/gisportal/> , launched to the public in January 2019. An Off Agenda Memo was shared with Council and the News Release was posted on the city website.
- The existing GIS web page had a legacy product known as “Parcel Popper” which allowed citizens to enter an address and receive information for a given property including regulations. The new portal features a custom widget that mimics the functionality of Parcel Popper but also includes additional features.
- **Efficiency Achieved**
  - The GIS Community Portal allows residents, businesses, city officials, and developers the ability to better understand what zoning and land use policies apply to properties of interest to them, without the need to call staff necessarily

- **GIS Data Assessment**

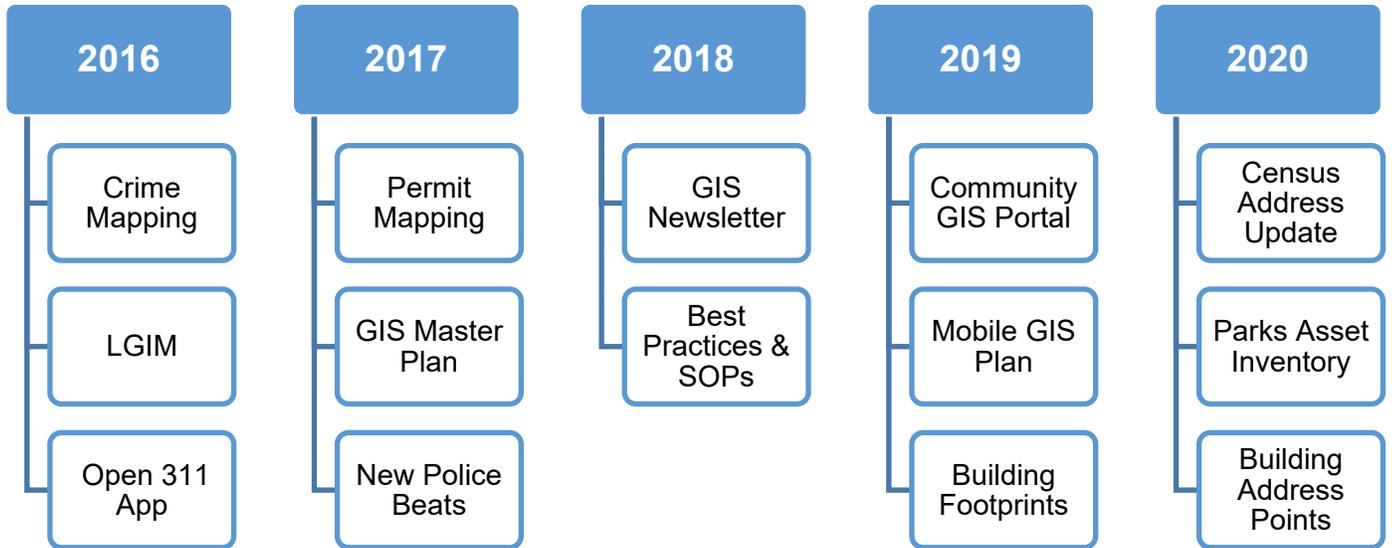
- The GIS Data Assessment was completed in June 2018.
- **Efficiency Achieved**
  - The assessment allows the City to have a comprehensive snapshot of the quality and completeness of all GIS data and establish a benchmark of data accuracy. It also allows the City to plan and prioritize improvements to its extensive data repository. The final report will include an Excel table of price estimates for improving the data layers ordered by Department.

- **GIS Mobile Plan**

- The GIS mobile plan was completed in September 2018.
- **Efficiency Achieved**
  - The mobility of GIS and the use of mobile technology to view, edit and analyze geospatial data, as well as make decisions in the field is a critical factor in building a true citywide, enterprise-wide, scalable, and enduring GIS.

### 8.7.3 **GIS INFRASTRUCTURE, SOFTWARE**

- The GIS server and storage infrastructure was upgraded to latest version for both public safety and non-public safety and then later migrated to Nutanix for Disaster recovery.
- The city also continued its commitment to ESRI Enterprise Licensing Agreement.
- **Efficiency Achieved**
  - The GIS Software was upgraded to meet the needs of Text to 911 needs



## ENTERPRISE SOLUTIONS

### • COMMUNITY GIS VIEWER

- Viewer contains multiple templates for:
  - Property and Planning
  - Recreation
  - Environment
  - Transportation
  - City Services
- A custom “Parcel Conditions” Widget allows users to query information on property within the City from multiple sources. Information can be searched by address, Parcel APN, or Owner.

Visit - <https://www.cityofberkeley.info/gisportal/>

## DEPARTMENTAL SOLUTIONS

### • HEALTH, HOUSING & COMMUNITY SERVICES

- Berkeley has an ordinance that forbids the sale of tobacco within 600 feet of a school. Users can type in the address of their business into this web map to determine whether it lies within the 600-foot buffer zone.
- [Tobacco Retail Buffer Zone Map](#) (clickable link)
- **Daytime Population Mapping & Statistical Analysis – Health, Housing & Community Services Department**
  - In partnership with IT, the Public Health Division utilized the statistics tool, R, and GIS to create an interactive application of statistics and mapping of the daytime population (and daily transitions from night to day) in Berkeley.

- **PARKS, RECREATION & WATERFRONT**

- Story Maps - ArcGIS Applications that combine text, interactive maps and multimedia content to tell the public a story.
- [“Berkeley Parks Highlights: A Virtual Tour”](#) (clickable link)
- [“City of Berkeley Measure T1 Capital Improvement Projects”](#) (clickable link)
- **Tree Inventory Project** - There was a need by the forestry folks to update tree species and their respective common names as drop down menus or picklists to an existing tree inventory application using GIS. Staff figured out how to get the data choices needed into the app in a way that makes it easy for the forestry folks to update the GIS data layer from the field.
- **Parks Viewer**
  - Allows viewing and querying of park assets
  - Contains supplemental data, including the tree inventory, transportation routes and stops, flood zones, and more
  - Includes custom widgets

- **PLANNING DEPARTMENT**

- In 2017, the City launched a map application <https://berkeley.buildingeye.com/> for the public to browse and query permits.
- The 2017 GIS Master Plan identified building outlines as a needed reference data layer and recommended its purchase yearly.
- The Master Plan also recommended building outlines for disaster planning use – to identify location of destroyed structures.
- In 2019, the City acquired a Building Outlines layer from Pictometry.
- Future building outline acquisition allows for change detection of new and demolished structures.
- **Density model of Southside**
  - The GIS team created a density model of the zoning districts R-S and R-SMU. Land Use Planning wants to determine which buildings should be encourage to build with higher density standards.
  - Planning will leverage the model to analyze density and consider zoning changes and land-use options. The tool can also be used for engagement. Zoning can be complex and confusing, and this offers a way to visualize that complex information.

- **POLICE** - Police calls for service are geocoded and uploaded nightly to both our open data portal and the clickable links are provided below:

- [Calls for Service](#)
- [Calls for Service - Heat Map](#)
- And, a private party solution: [CrimeMapping.com](#)
- [The City is considering to replace the crime mapping software in calendar year 2021](#)

- **PUBLIC WORKS**

- [Bike Parking Map](#) - The public uses this web map to help us locate the best places for new bike racks <http://cityofberkeley.info/bikeparkingmap/>

- Engineers use ArcGIS Desktop (ArcGIS Pro) to edit our sanitary sewer network directly in the Enterprise servers. These changes are available to field staff in real time through interactive map applications.
- **Community input map – Public Works Department**
  - The City’s Pedestrian Master Plan update process began in 2018 and continues through 2019. The Transportation Division gathered feedback via an interactive wikimap  
<http://wikimapping.com/wikimap/Berkeley-Pedestrian-Master-Plan.html#.W1EIL9hKiys> .
  - They invite the community to show us where and why you walk in Berkeley by drawing and commenting on the map.

#### 8.7.4 **GIS Trainings and Workshops**

- **GIS Training portal was launched for City staff**
- **GIS 101 Training**
  - Ten staff from across departments attended VTA class “GIS 101 for New Employees” early this year. The GIS Coordinator taught the course. Staff learn the fundamentals of GIS and how to access the city’s Enterprise GIS resources.
- **GIS Orientation for new Planning staff**
  - Six new staff from the Planning Department attended a special GIS 101 with an emphasis on Planning GIS. The GIS Coordinator taught the course.
- **GIS Disaster Preparedness & Resiliency Workshop 2018**
  - Co-hosted by IT and our GIS vendor, Esri, over 20 participants from cities and counties around the Bay Area joined us for a hands-on GIS disaster preparedness and resiliency workshop. We discussed recent disasters in our region and learned how to best prepare our GIS for a natural disaster.
- **Mobile GIS Training**
  - The GIS Coordinator participated in a hands-on Mobile GIS training for City staff with our GPS vendor and our Esri technical advisor. The GIS Coordinator also conducted a classroom Mobile GIS training for City staff in November.
- **Desktop training**
  - The GIS Coordinator led a GIS Desktop Users training in best practices and standard operating procedures in December.
- **GIS Community Portal Trainings**
  - The GIS Coordinator conducted hands-on training in September 2019 for City staff in Planning and Fire whose use the Parcel Conditions application.
- **Census 2020**
  - The GIS Coordinator attended the California State Data Center annual meeting in October. This year’s meeting focused on the 2020 Census and provided an update on the status of LUCA for California.
- **Esri User Conference**
  - The GIS Coordinator and other city staff attended our GIS vendor’s conference in Jul virtually due to COVID

### 8.7.5 Return of Investment (ROI) and Business Realization Planning

#### A GeoSmart City: Resilience and Mission Alignment

- Improved Information Retrieval
- Real-time, Dynamic Databases
- Innovative Decision Making
- Accurate and Reliable Record Keeping
- Real-time Dashboard Analytics
- Automated and Advanced Field Inspection and Data Collection
- Streamlined Processes and Communications — Better Collaboration
- Improved Navigation and Locational Awareness
- Proactive Management and Increased Efficiencies
- Advanced Community Engagement
- Improved Social Equity
- Interoperability and Integration with other organizational systems
- **Public Safety and Police**
  - Crime Patterns, Crime Zones, Crime Heat Maps
  - Historic data and types of crime.
    - Determine patrol beat changes
    - Determine Community policing strategies
- **Utilities and Assets**
  - Age and condition of Infrastructure and Assets
  - Predict where failure will occur based on age and condition of infrastructure to determine City budget for replacement

*GIS is an advanced tool to support resilience and sustainability.*

### 8.7.6 GIS MAJOR PROJECTS IN PROGRESS:

#### **Asset Extraction and 360 Street Level Imagery (In Progress)**

DoIT collaborated with Public Works to identify assets for data extraction. The proposal from CycloMedia is for the following: 360° GeoCycloramas™ will be captured for 285 miles total which will include LiDAR capture and processing. The project was approved by Council in July 2020 and the drive through is completed. The next step is the Asset extraction for various asset types including: Curb paintings, Pavement markings, Signs (MUTCD), Light posts, Parking meters, Pedestrian and bike trails and sidewalk inventory and condition assessment.

**Reason:** Geographic Information Systems (GIS) is a critical tool for infrastructure asset management to gathers, manages and analyzes data in a map based view.

**Sub GIS Projects:** Cyclomedia (Geographic Information System infrastructure asset data acquisition), Sewer Master Plan, NexGen

**Digitize Parks Inventory - GREEN CITY GIS INVENTORY (In Progress)**

This project includes a comprehensive inventory of the City of Berkeley's parks system. This project is phase I of a total solution. It includes the databases design and field inventory of all infrastructure, buildings, such as bathrooms, benches and newly planted trees in the city parks system. (Note: the City has an existing inventory of trees that requires updating). The City is working with the vendor Geographical Technology group (GTG) to digitize irrigation features for 26 parks and nine miles of medians.

**GIS PUBLIC PORTAL ENHANCEMENT (In Progress)**

This project involves updating the City of Berkeley's existing Parcel Condition Widget (PCW). Today the PCW offers very specific functionality that includes access to parcel information stored only in the GIS database. Accessing other parcel pertinent information required linking to other software solutions. The City required the PCW to have additional "seamless" functionality that will include the ability of a user to see parcel information stored in other systems including the City's permitting system. The objective of this project is to add the following functionality to the City's PCW - **Add BESO status and scores via link to Green Building Registry and our open data portal**

## 8.7 Useful Links

### + Digital Strategic Plan (DSP)

- [IT DSP Findings & Recommendations](#)- Identify a comprehensive set of possible management, business process improvement, and Information Technology initiatives.
- [Vol 2: Implementation Roadmap](#) - Provide final proposed and prioritized initiatives, budget estimate, 5-year timeline, and cost allocation plan.
- [Annual DSP Update 2017](#) – Information Report - Sep 19, 2017

+ [Berkeley Community Connection Portal](#) – City’s Open Data set powered by 311 requests for service information and enables community members to search by an address or filter by neighborhood and date range, and save the search by creating an alert to monitor changes over time is provided in an easily searchable format and depicted on a city map.

Visit - <https://berkeley.connect.socrata.com>

+ [Geographical Information Systems \(GIS\) Master Plan](#) - The document reflects a combination of Needs and Data Assessment, Technology and Organizational Readiness Assessment, and identifying a roadmap for GIS implementation and Tactical Plan that is technologically strategic, operationally responsive, and fiscally responsible.

+ [GIS Community Portal](#) - Provides GIS interactive maps and map pdf’s. All data, information, and maps are provided "as is" without warranty or any representation of accuracy, timeliness or completeness. Visit - <https://www.cityofberkeley.info/gisportal/>

+ [GIS Map Room](#) - City's Geographic Information System (GIS) resources via an interactive map. Visit: <https://www.cityofberkeley.info/maproom/>

+ [Open Data Portal](#)-\_City's Open Data Portal serves community and provides 120 data sets. Visit: <https://data.cityofberkeley.info/>

+ [Online Permits Portal](#) - Implement an online mapping solution for City-issued permits to enable community members to search and review permit details and to easily identify permitting information based on address and business type. Visit - <https://berkeley.buildingeye.com/>

+ [Online Services Center \(311\)](#) - Contains information on various online services Visit: <https://www.cityofberkeley.info/onlineservicecenter/>

+ [Records Online](#) - Records Online contains Election information, Ordinances, Resolutions, Agendas, Meeting Minutes, Contracts, Communications and other City documents. Visit - <https://www.cityofberkeley.info/recordsonline/paFiles/cqFiles/index.html>

+ [Bike Parking Map](#) - The public uses this web map to help us locate the best places for new bike racks Visit: <http://cityofberkeley.info/bikeparkingmap/>

+ [“Berkeley Parks Highlights: A Virtual Tour”](#)

+ [“City of Berkeley Measure T1 Capital Improvement Projects“](#)

+ [Tobacco Retail Buffer Zone Map](#)

