Five-Year IT Roadmap

Department of Public Safety

Aligning business goals and technology forecasts

July 2019

COLORADO
Governor's Office of
Information Technology
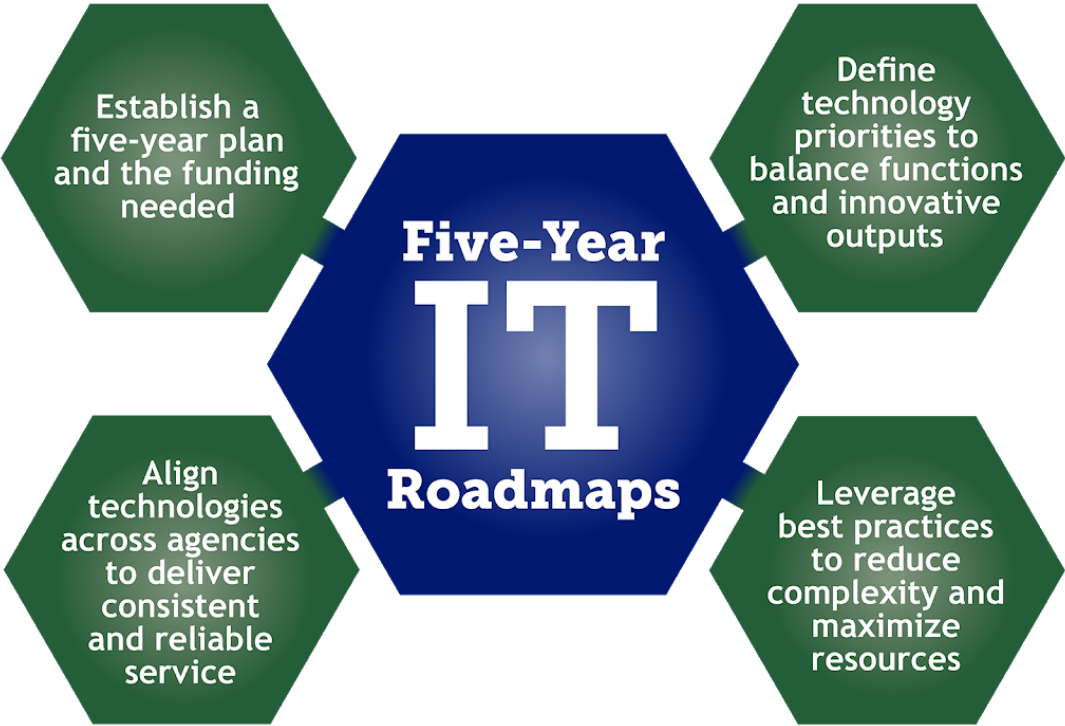Serving people serving Colorado

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Introduction

The Governor's Office of Information Technology (OIT) works in partnership with our customers to create a Five-Year IT Roadmap for each agency we serve. OIT has four primary goals that guide our technology planning to help state agencies receive the most from their technology and related services.

Technology Planning Goals

Establish a five-year plan and the funding needed

Define technology priorities to balance functions and innovative outputs

Five-Year **IT** Roadmaps

Align technologies across agencies to deliver consistent and reliable service

Leverage best practices to reduce complexity and maximize resources

Assumptions

Agency and enterprise initiatives, timelines and costs within this document operate under the following assumptions.

Environment

- Decisions related to major agency initiatives or projects may alter this plan.
- Infrastructure and security will be maintained to meet state and federal compliance.
- OIT is a cloud-first advocate and, therefore, will look to cloud solutioning for all new service needs. OIT will also seek cloud service capabilities for legacy applications/workloads requiring refresh before targeting on-premise utilizations.
- As it relates to this document, the term "enterprise" is used to define high-impact, IT services utilized by multiple OIT customers.

Drivers of Cost and Complexity

- Costs are estimates that are based on an initial quote, vendor information or past initiatives and are subject to change.
- It is estimated that overall IT costs will increase by no less than 3% per year.
- Cost allocation for Decision Items are based on OIT's current Common Policy rates.

Assumed Constants

- Staffing is assumed to remain constant.
- Hardware refresh cycles are assumed to be executed on a four-year lifecycle for desktop computers and a three-year lifecycle for laptops.
- Approximately 20% of the state IT infrastructure is refreshed annually with the intent of completing a full infrastructure refresh every five years. Budget constraints may impact this cycle.

Changes to Roadmap

- This is a living document which will be updated once per year; dependencies, timelines, and cost estimates are subject to change.

Agency Business Objectives

Maximizing technology resources requires that agency business objectives drive technology investments. The objectives below have been identified by the Colorado Department of Public Safety and submitted to the Governor's Office of State Planning and Budgeting (OSPB) to reflect the agency's current top strategic IT priorities. OIT works with the agency to provide the best solutions to support each objective.

Objective 1

Reduce fatal and injury crashes on Colorado's highways.

Objective 2

Increase Schools' Preparedness for Emergencies.

Objective 3

Increase support of local law enforcement black market marijuana investigations.

Objective 4

Expand availability of juvenile diversion programs.

Objective 5

Implement performance-based contracting in Community Corrections.

Agency Initiative Roadmap

The graph below shows where agency and enterprise objectives fit into the overall five-year roadmap and plan for scheduled completion. The graph contains three sections. The first presents mission critical technology debt which are either agency or enterprise initiatives that are vital to the functioning of government services. The second section presents new solutions which are requested by the agency or initiatives that OIT has identified as a gap in services or solutions, and the third section presents future innovations which are proposed as solutions that will increase state employee efficiency and improve service to Colorado residents and state visitors.

		FY20	FY21	FY22	FY23	FY24
Mission Critical Technology Debt	Application Decommissioning		■	■	■	■
	CAD Reprocurement	■	■	■	■	■
	CCIC Refresh	■	■	■	■	■
	CDPS/CSP Network and Telephone Redundancy Project	■	■	■		
	CSP Port of Entry Hosting Facility	■	■			
	DFPC Records Management System 2.0	■				
	DHSEM Emergency Operations Center Technology Refresh	■	■	■		
	Maintain and Refresh the CDPS Blade Server/Storage Area Network	■	■			

		FY20	FY21	FY22	FY23	FY24
New Solutions	Maintain and Refresh the IT Infrastructure Environment	🟩	🟩	🟩		
	CBI Sex Assault Case Tracking System	🟧				
	CBI Sex Offender Registry System	🟧				
	CBI/CSP Arvada Training Center	🟧				
	CSP Mobile Data Computer Conversion to a Lease Program	🟧	🟧	🟧		
	CSP Records Management System - New DR-3447 Report	🟧				
	CSP SharePoint Forms Upgrade	🟧				
	CSP Telephone Refresh	🟧	🟧	🟧		
	Data Analytics	🟧				
	DCJ Grants Management System	🟧				
	DCJ Sex Offender Management Board Case Management System	🟧				

		FY20	FY21	FY22	FY23	FY24
Future Innovations	Community Corrections Information and Billing (CCIB) System Replacement	██	██	██		
	Division of Homeland Security and Emergency Management (DHSEM) Infrastructure Upgrades for the Watch Center	██				
	Document Approval and Workflow System	██				
	Integration with the District Attorney's e-Discovery System	██	██			
	Video Surveillance System for Port of Entry Offices		██			
	Port of Entry Fixed Virtual Weigh Stations		██			
	Port of Entry Mobile Virtual Weigh Stations		██			

Agency Initiative Details

Mission-Critical Technology Debt

These initiatives are vital to the functioning of normal government services. Delay in pursuing the initiatives will create a need for future effort and resources that surpass the resources needed if the initiative were carried out proactively.

Application Decommissioning

At CDPS, there are four applications recommended for decommissioning. This will result in the requirement for Enterprise Applications to process decommission and consolidation plans and obtain agency approval to remove data and decommission servers. This initiative is unfunded and the timeline is FY21-24.

CAD Reprocurement

The Computer-Aided Dispatch system (CAD) was procured in 2010 and deployed in 2014; ongoing maintenance is provided by Motorola - the original author of the system. The system is being upgraded with a new major version release and equipment (servers/storage area network) in FY19 and FY20, which will provide three to five years of additional life in the system. In 2025, the system will need to be re-procured. CAD provides dispatch and 911 services for law enforcement and tow truck firms across the state. The cost of a new CAD system is estimated to be approximately $20 million and could take up to three years to procure and implement. The Colorado State Patrol (CSP) will submit a Capital Construction request to obtain funding for the new system in the 2020 legislative session. The total high-end cost of the system, $20 million, is expected to be expended over a three year period of FY23-25. CSP will engage a contractor to assist in writing the requirements for the Request For Proposal (RFP) for this acquisition in FY21 - estimated cost for this engagement is $100 thousand.

As the CAD System is being replaced, CSP Command Staff will be making major strategic decisions about the scope of this system, whether to just replace the CAD portion of the system, or combine the functions of CAD, Records Management and Evidence Management Systems into one comprehensive system. This initiative is unfunded and the timeline is FY19-24.

CCIC Refresh

The Colorado Crime Information Center (CCIC) was deployed by CBI in May 2010; ongoing maintenance (provided by Computer Projects of Illinois (CPI), the original author of the system, was re-procured in 2016. CCIC is going through a major version upgrade and infrastructure upgrade during FY19-21, giving this system at least three to five years of additional life. The cost for this upgrade is covered using existing CBI funds. CCIC provides real-time access by law enforcement agencies across the state to criminal history/background records, stolen property records, etc. CBI engaged a contractor to assist in writing the requirements for the Request For Proposal (RFP) for a new CCIC system in FY18-19. In 2025, it is expected that a new version of the National Crime Information Center (NG3 - NextGen 3) will be deployed. At that time there is a possibility that CCIC will need to be upgraded to comply with NG3. This initiative is funded and the timeline is FY20-24.

CDPS/CSP Network and Telephone Redundancy Project

Certain mission critical CDPS and CSP facilities currently have limited network and telephone redundancy. Some of the facilities utilize the OIT CenturyLink MIPC telephone system, which provides a certain amount of redundancy, but not for the "last mile". This project will identify alternative network and telephone capabilities that can be added to these facilities to provide the necessary redundancy. This initiative is unfunded and the timeline is FY20-22.

CSP Port of Entry Hosting Facility

The Port of Entry (POE) Business System that went live in FY18 is currently hosted by the application support vendor (Pro-Miles). In FY21, POE will need to find a new hosting facility for this system. This could be a the CDPS Data Center in the Kipling campus or possibly at a cloud vendor.

DFPC Records Management System 2.0

The Division of Fire Prevention and Control (DFPC) will be upgrading the records management system (RMS) in Salesforce.com that was originally deployed in 2016. The records management system consists of a Wildfire Operations Records Management System; Firefighter Certification and Testing System; and a Fire Inspections, Auditing and Permitting System. DFPC has hired a Salesforce Administrator that is performing a large portion of this work, but may require assistance from the OIT Salesforce Application Development team as the project progresses. This initiative is funded and the timeline is FY19-20.

DHSEM Emergency Operations Center Technology Refresh

DHSEM is developing plans for a complete technology refresh of the equipment in the Emergency Operations Center (EOC). This will include a refresh of audio/visual, desktop computers, etc. This effort with be grant funded and is in the early planning stages.

Maintain and Refresh the CDPS Blade Server/Storage Area Network

The CDPS Blade Server/Storage Area Network supports a large number of CDPS business applications and the department-wide shared file system. The system also provides a disaster recovery environment for these systems and services. The current CDPS Blade Server environment was purchased in FY14 and the 690 Kipling and eFORT Disaster Recovery equipment was refreshed/upgraded in FY19. The equipment for the DHSEM Mineral Facility and the Emergency Operations Center (EOC) needs to be refreshed in FY21. The estimated cost of refreshing or upgrading this equipment is $250,000. This initiative is unfunded and the timeline is FY19-21.

Maintain and Refresh the IT Infrastructure Environment

The IT infrastructure environment supports the entire CDPS IT environment. This effort includes refreshing network switches and routers, UPS, firewalls, etc., over the next several years. The majority of the CDPS IT infrastructure has recently been upgraded. This initiative is unfunded and the timeline is FY19-22.

New Solutions

These initiatives provide new yet fundamental service to agencies. Heightened end-user technical expectations are driving service providers to strengthen system functionality. Delay in implementing these new services in the coming years would exacerbate major inefficiencies and significantly impair the state from meeting citizen expectations.

CBI Sex Assault Case Tracking System

CBI indicates a need for a new Sex Assault Case Tracking System - CBI can handle this function for CBI cases with the existing Laboratory Information System. However other police departments throughout the State may need a state-built/operated system to handle this function for them. This initiative is unfunded and the timeline is FY20.

CBI Sex Offender Registry System

CBI currently has a Sex Offender System in operation. Douglas County also has a Sex Offender Registry System (SOTAR) which is currently not funded nor supported by Douglas County. This initiative will update CBI's Sex Offender Registry System to replace the functionality of the Douglas County system which will then be used by the entire state. This initiative is unfunded and the timeline is FY21.

CBI/CSP Arvada Training Center

CBI and CSP is considering building a new CDPS Training Center and Evidence Vault in Arvada near the existing CBI Arvada Lab. Further details are being formulated for plans for this initiative. This initiative it unfunded and the timeline is FY20-21.

CSP Mobile Data Computer Conversion to a Lease Program

The Colorado State Patrol (CSP) currently purchases Mobile Data Computers (actually hardened tablets) for each CSP patrol car. They will be converting this purchase program to a lease program during FY19 and FY20. CSP posted an RFP to obtain bidders for this lease program in FY19. Four bidders were selected to participate in an onsite trial of their products. Selection is expected by the end of FY19, with deployment continuing through FY20-22. This initiative is funded and the timeline is FY19-22.

CSP Records Management System - New DR-3447 Report

The CSP Records Management System currently supports the DR-2447 Crash Report which is a report filled out by all CSP Troopers to document automobile crashes on the state highways. Law Enforcement is moving to a new, improved crash report, the DR-3447. This project will enhance the Records Management System to accommodate the data capture needs of this report, along with transmitting this data to the Department of Revenue. This initiative is funded and the timeline is FY19-20.

CSP SharePoint Forms Upgrade

Certain CSP SharePoint Forms are no longer maintainable due to being in older versions of SharePoint InfoPath. These need to be moved to a supportable forms platform. It is too soon to estimate the cost of this upgrade. This initiative is unfunded and the timeline is FY20-21.

CSP Telephone Refresh

The telephone systems in the Colorado State Patrol (CSP) troop/post offices and Port of Entry Offices are approaching 15-20 years old and need to be upgraded/replaced. Some of these offices will be replaced using OIT's MIPC telephone system, but some of the phone systems are too small to make MIPC financially feasible. These smaller telephone systems will be replaced with small local telephone systems available from vendors that serve the CSP remote offices. During FY19, three of the CSP offices had their phone systems replaced. The project will continue through the next few years. This initiative is partially funded and the timeline is FY19-22.

Data Analytics

A number of CDPS Divisions are starting to make use of the vast amounts of data collected in the CDPS business systems. There is now a desire for a better understanding of the data through analytics. Examples of data analytics needs include, but are not limited to, developing analytics for the Colorado State Patrol Data Warehouse, CBI Forensics, the CBI Information Management Unit and the Division of Criminal Justice. OIT will partner with CDPS members to better understand the data analytics needs of the Department and assist in the procurement and deployment of data analytic tools and systems to meet these needs. This initiative is unfunded and the timeline is FY19-21.

DCJ Grants Management System

The Division of Criminal Justice (DCJ) manages millions of dollars in grant funding each year and requires a sophisticated and comprehensive grants management system. DCJ used the COGMS system to manage grants over the past few years, however, that contract expired in late 2016 and was not renewed. DCJ has been using a low-cost, web-based grants management system (Zoomgrants) until the outgoing CORE grants management module is available. It has been determined, as expected, that the Zoomgrants is not as robust as the previous system and requires some processes to be done manually. Moving to some other grants management system is being considered as the last testing of the CORE grants management modules (outbound grants management) showed that it would not meet DCJ needs. Funding amount and funding for this new system are unknown at this time. This initiative is unfunded and the timeline is FY19-21.

DCJ Sex Offender Management Board Case Management System

Recent legislation requires the Sex Offender Management Board (SOMB) to collect and use data to evaluate the effectiveness of its guidelines and standards. OIT is working with the Department of Criminal Justice (DCJ) to develop a Sex Offender Case Management System that will enable sex offender services providers to enter case/treatment/results information into the system. This information can be used by DCJ personnel to prepare analytical reports about the effectiveness of Board guidelines and standards. The system will include a secure user authentication and security system that will enable only specific members of the sex offender services provider community and DCJ to access the highly sensitive, highly confidential HIPAA data maintained in this system. The system will be developed using in-house OIT/CDPS application resources. Funds allocated for this new system are from a recent Decision Item for CDPS and will be used to acquire additional hardware to host the system in the CDPS data center as well as external staffing costs for a Technical Writer to develop user documentation for the system. This initiative is funded and the timeline is FY19-20.

Future Innovations

The ideas in this section have been proposed as solutions by the agency to provide new, innovative offerings to their customer.. The solutions in this section will increase state employee efficiency and improve service to Colorado residents and state visitors. We may see these as new projects in the future.

Community Corrections Information and Billing (CCIB) System Replacement

The Community Corrections Information and Billing System (CCIB) is a system that integrates statistical data on community corrections programs, boards, and offenders with monthly and annual billing records. The CCIB system, developed in 2008 by ClientSolv Inc. was designed as a web-based solution to paper-level billing and data collection. As internet browsers, operating systems and web servers have advanced since 2008, the basic architecture and structure of the CCIB system has remained on a static platform and will be outdated and possibly inoperable shortly after the year 2020. OIT is collaborating with DCJ members to obtain the cost of replacing this system. A capital construction request is being developed to obtain funding for the new system in FY20. The new system is estimated to cost $2 million, with annual licensing, hosting and maintenance costs of $250 thousand. This initiative is unfunded and the timeline is FY20-22.

Division of Homeland Security and Emergency Management (DHSEM) Infrastructure Upgrades for the Watch Center

The new CDPS Watch Center requires a number of new systems and infrastructure upgrades to assure effective execution of the center's mission. These new systems include the acquisition of a records management system that will enable the Watch Center staff to effectively manage and report on activities and events covered by the Watch Center. An upgraded phone system for the Watch Center includes the voice recording of calls and call handling statistical reporting. Cost estimates for this new capability are unknown at this time. This initiative is funded and the timeline is FY19-20.

Document Approval and Workflow System

This new system will automate the document approval workflow of certain documents used in the normal course of CDPS business, focusing initially on contracts and grants. DocuSign will be used to implement this functionality for the Department. The system will accommodate various levels of management approval, email notifications and digital and electronic signature. The OIT team supporting CDPS will work with DocuSign staff to deliver this functionality. Cost estimates must be obtained to determine whether the Department has funding for this system. If not, a Decision Item may be required. This initiative is unfunded and the timeline is FY20.

Integration with the District Attorney's e-Discovery System

The Colorado District Attorney's Council has developed an e-discovery system that facilitates the exchange of data among various law enforcement and judicial agencies. CSP will integrate its Digital Evidence Management System (sourced from video cameras in CSP trooper cars) and the CSP Records Management System to exchange criminal justice information with the District Attorney's office. Cost estimates for this new capability are unknown at this time. This initiative is unfunded and the timeline is FY19-20.

Video Surveillance System for Port of Entry Offices

The Colorado State Patrol requires the installation of a new video surveillance system in each of the Port of Entry offices in the state. This initiative is unfunded and the timeline is FY20.

Port of Entry Fixed Virtual Weigh Stations

The CSP Port of Entry Unit intends to purchase and deploy a set of Fixed Virtual Weigh Stations to supplement the current fixed ports of entry. This would require integration with the Port of Entry Business System. It is too early to place a price tag on this system as well as identify the source of funds for this new capability. This initiative is unfunded and the timeline is FY21.

Port of Entry Mobile Virtual Weigh Stations

The CSP Port of Entry Unit intends to purchase and deploy a set of Mobile Virtual Weigh Stations to supplement the current fixed ports of entry. This would require integration with the Port of Entry Business System. It is too early to place a price tag on this system as well as identify the source of funds for this new capability. This initiative is unfunded and the timeline is FY21.

CDPS Unfunded Technology Outlook

The totals below are high-level cost estimates where funding has not been clearly identified. In most cases, for technology initiatives defined as an OIT enterprise initiative, OIT seeks funding through Decision Items. Enterprise initiatives help ensure that the state maintains consistent technology service and is able to take advantage of scalable rates.

For a more detailed breakdown, contact your agency's IT Director.

	FY20	FY21	FY22	FY23	FY24
Mission-Critical Technology Debt	$567,400.00	$7,048,000.00	$7,012,000.00	$13,623,333.33	$15,246,203.33
New Solutions	$1,000,000.00	$1,000,000.00	$250,000.00	$250,000.00	$250,000.00
TOTAL	$1,567,400.00	$8,048,000.00	$7,262,000.00	$13,873,333.33	$15,496,203.33

Mission Critical Technology Debt, New Solutions and Total
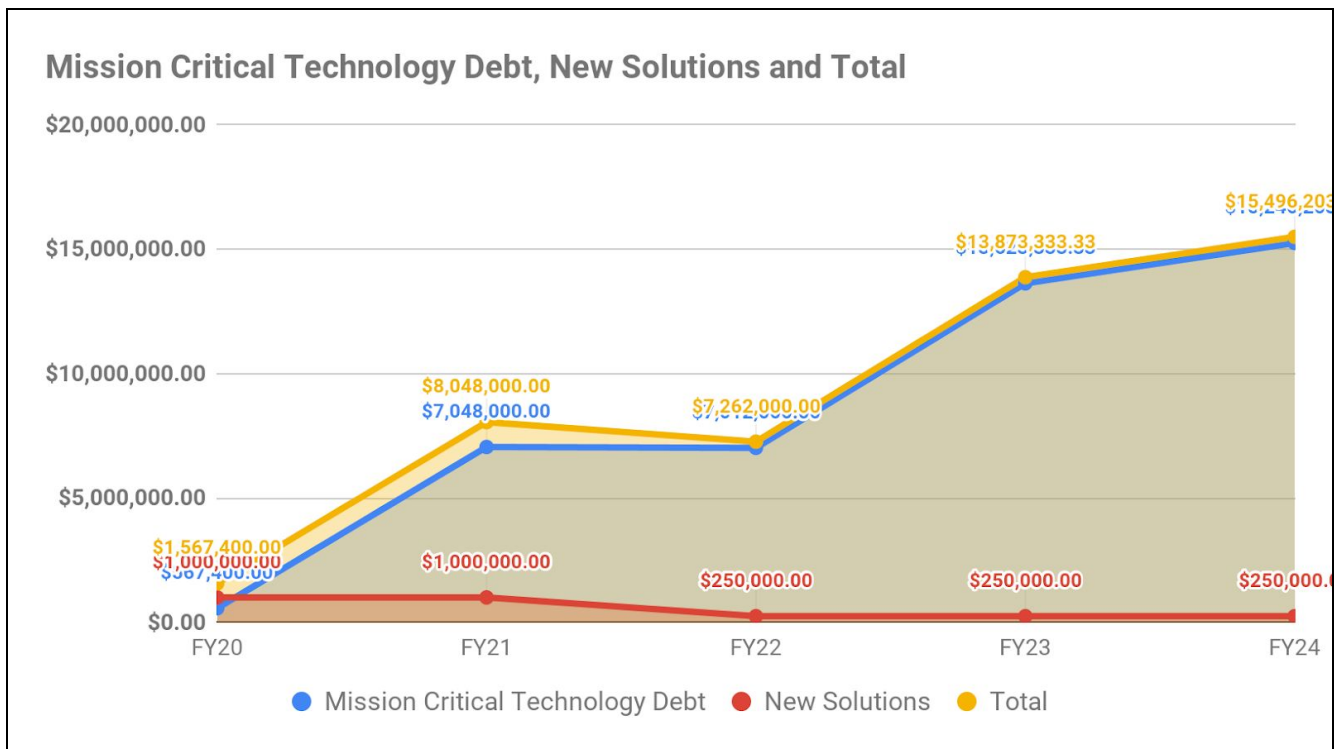
Appendix A: Enterprise Initiative Roadmap

The timeline below represents OIT's enterprise initiatives. Enterprise initiatives help to ensure that the state maintains consistent technology service and is able to take advantage of scalable rates. These initiatives are part of OIT's overall strategic direction and may be mandated or offered to agencies optionally.

This timeline has been included to provide a reference as to how an individual agency's IT Roadmap correlates to OIT's enterprise plan. Descriptions of each initiative can be found in Appendix B.

	FY20	FY21	FY22	FY23	FY24
Enterprise Initiatives					
Application Lifecycle Management	███	███	███	███	
CORE NIST File Transfers	███				
Clarity PPM (CA PPM or Clarity)	███				
Enterprise Infrastructure Refresh	███	███	███	███	
Firewall Upgrades	███				
HRWorks	███	███	███		
Mainframe Decommission	███	███	███	███	
Network & Infrastructure Refresh	███	███	███	███	
Next Generation Colorado	███	███	███	███	
OS Server Upgrades	███	███			
Telecom Enhancements (MIPC)	███	███			
Two-factor Authentication	███				
Windows 10 Upgrade	███				

		FY20	FY21	FY22	FY23	FY24
New Solutions	Antivirus Protection Removal	███	███	███	███	███
	Content Services Application Consolidation	███	███	███	███	███
	Content Services Enterprise Solution Deployment	███	███	███	███	███
	CrowdStrike	███	███	███	███	███
	Desktop Cloud Backup	███	███	███	███	███
	MyColorado	███				
	Privilege Access Management	███				
	Salesforce Platform Org Strategy	███	███	███	███	███
	Salesforce Lightning Migration	███	███	███	███	███
	Salesforce Release & Environment Management	███	███	███	███	███
	Secure Office Print Ecosystem (SOPE)	███				
	Technology Accessibility and Mobile Assessment, Testing and Remediation	███				
Future Innovations	Cloud Access Security Broker	███	███	███	███	███
	Data and Access Governance	███				
	Cloud Access Security	███	███	███	███	███
	East West Traffic Security	███				

	FY20	FY21	FY22	FY23	FY24
Easy Secure Service Excellence - ESSE					
End-to-End Monitoring and Logging					
Identity Analytics and Risk Intelligence					
Server and Deskside Endpoint Management					
Smart Cities Exploration					

Appendix B: Enterprise Initiative Details

This section provides an overview of each Enterprise Roadmap initiative.

Mission-Critical Technology Debt

These initiatives are vital to the functioning of normal government services. Delay in pursuing the initiatives will create a need for future effort and resources that surpass those needed if the initiatives are carried out proactively.

Application Lifecycle Management

With an inventory of 1100+ applications, a key strategy for OIT is to streamline the application footprint. Through the consolidation of existing and new applications onto standard enterprise platforms, OIT can create a simpler and easier end-user experience, reduce the long-term cost of maintaining duplicative applications, and strengthen OIT's support capabilities. Consolidation efforts completed through FY16 were funded through the Eliminate Redundant Applications Decision Item; with the funding of the Service-Oriented Business System Refresh Decision Item, $800,700 will be approved for this program in future years. Allocation of the funds will be under the authority of an agency focused governance team. This funded initiative impacts all agencies and the timeline is FY20-23.

CORE NIST File Transfers

The CORE secure file transfer service provides file transfer services between the State (all agencies, Wells Fargo and other external / higher ed institutions) and the CORE financial system. The CORE file transfer service was originally implemented during the CORE project as a temporary service. The service compromises regulatory compliance and security of the assets entrusted and has significant risks from process and personnel perspectives. Although meant to be a secure file transfer server, this asset is also used for archival of data files and the nature of that use compromises both the asset and the content. Data currently on the CORE secure file transfer server needs to be migrated to the properly structured and organized file storage and appropriate archiving and retrieval processes need to be established. If not executed there will be severe impacts to the CORE system and continued audit findings, it will cause a drain on OIT resources needed to support the current solution and perpetuation of risk due to inadequate business processes and inadequate, costly IT solutions supporting those processes. CORE secure file transfer server replacement will require any current department/agency user of CORE to become a consumer of technology platforms (Automic and MoveIT) providing new CORE integration services. This unfunded initiative impacts all agencies and the timeline is FY20.

Clarity PPM (CA PPM or Clarity)

Clarity PPM is a comprehensive project and portfolio management tool in use by OIT and other agency customers to track and report on projects, programs and maintenance activities across the State enterprise. In recognition of this, OIT will begin distributing the costs associated with the tool by user license and type. Invoices are received from the vendor on or about July 1 of each fiscal year. OIT will produce a report of all users on July 1 of each year and based upon license type disburse the expense amongst the agencies of the user community. This initiative impacts all agencies and the timeline is FY20.

Enterprise Infrastructure Refresh

This effort includes refreshing infrastructure support equipment (power, HVAC, UPS systems, etc.) for all agencies in order to ensure service uptime is in accordance with our service level commitments. This unfunded initiative impacts all agencies and the timeline is FY20-23.

Firewall Upgrades

OIT will continue upgrading the disparate agency-specific firewalls to the statewide standard Next Generation Firewall. These firewall upgrades will increase security through web filtering, application inspection, and intrusion protection systems, and we expect to see significant cost savings from an enterprise licensing agreement. This funded initiative impacts all agencies and the timeline is FY19-20.

HRWorks

The Department of Personnel & Administration (DPA) and OIT continue their work to develop an enterprise Human Resource Information System (HRWorks). The HRWorks project is a collaborative effort to consolidate approximately 80 disparate, outdated, and redundant systems into a modern, seamless solution that will eventually integrate with CORE, the state's financial system of record. Development of the system is funded through a DPA FY16 Decision Item. At this time the HRWorks project consists of human capital management (HCM), benefits module, payroll, labor allocation and timekeeping. Work is underway to Identify the impact to each agency. Decommissioning of CPPS and related applications will be handled as a separate project. This funded initiative impacts all agencies and the timeline is FY20-22.

Mainframe Decommission

OIT is working to retire the mainframe and associated applications. Integration and data sets must be identified and planned for migration or retirement. This includes determining agency costs. Agencies that still have applications on the mainframe include the Departments of Human Services, Labor & Employment Personnel & Administration, and Revenue. Additionally, with the state payroll system on the mainframe, all agencies are impacted by this initiative. OIT has identified dependencies amongst other large projects that will prevent the retirement of the mainframe until functionality residing on the mainframe moves to new applications, and will require agency funding to address agency-specific migration and services costs. This funded initiative impacts all agencies and the timeline is FY20-22.

Network & Infrastructure Refreshes

OIT is developing a statewide refresh lifecycle that will annually replace 20% of network and systems infrastructure that is at its manufacturer's end-of-support lifecycle. This will keep the state's technology current and under warranty, which ensures continued support for these critical components. Customers will experience increased IT system performance with decreases in downtime, outages and lost connectivity with the added availability to a secure and stable infrastructure. This is an ongoing effort that will incur some impact to each agency each year. The effort has been funded through the FY16 Infrastructure Refresh Decision Item; however, the funding does not cover all the needed network refreshes, so agencies will need to fund part of the agency-owned network components. The systems infrastructure portion of the refresh initiative includes shared storage and vBlock hosting platforms in the two state data centers. Agencies do not pay additional funding outside the Decision Item budget line for this portion of the refresh effort. This unfunded initiative impacts all agencies and the timeline is FY20-23.

Next Generation Colorado

This is a two-part initiative representing infrastructure and operational improvements as well as data center modernization. Next Generation Colorado is an initiative to develop the automation and operations to support quick service delivery, transparent cost modeling, scalability on-demand, high availability, upgrades and agility of workloads across the enterprise. This effort will also include data center modernization, operational management and hybrid cloud solutioning to span private and public Infrastructure as a Service (IaaS) models. This is a capital-funded initiative from a FY18 Decision Item. Half of the funding was approved for use in FY19 and will support cloud readiness and sustainability, security improvements and data center repairs. The second half of the funding is expected to be approved for use starting in FY20 and will be used to continue our FY19 work as well as automation and service efficiencies. This funded initiative impacts all agencies and the timeline is FY19-23.

OS Server Upgrades

As Windows Servers (2003, 2008 and 2012) reach their end-of-support lifecycles, it is increasingly difficult to find service providers who continue to support these operating systems (OS). To ensure state servers continue to receive appropriate support and reduce risk, OIT will retire and replace all server end-of-support operating systems used by supported agencies. Moving to a newer version will give customers a more secure and supportable OS for their applications. The Enterprise Applications and the Server Admin teams will work together to determine the affected applications in FY19 and migrate the servers to the new OS in FY20 and FY-21. This unfunded initiative affects all agencies and the timeline is FY19-21.

Two-factor Authentication

OIT will enable two-factor authentication (2FA) to add an extra layer of security to the verification process and thus reduce the risk of data breaches and meet data privacy requirements. OIT's internal and statewide Access Control policies require that access to the state's information systems be restricted to just those who need access to perform their jobs, using the principle of least privilege. The implementation to CDHS, CDPHE, DNR, DOLA will be completed by the end of FY20.

Windows 10 Upgrade

Support for the Windows 7 operating system (OS) expires in January 2020. To ensure there is no lapse in support, OIT will upgrade all Windows 7 computers (desktop and laptop) to Windows 10. This is a multi-year effort that spans 17 agencies and more than 28,000 devices. The Microsoft Enterprise License Agreement will cover the upgrade for all agencies except four that will need to cover the cost of the upgrades: CDHS, CDOC, DNR and HC. This is a funded initiative and has a timeline of FY20.

Enterprise New Solutions

These initiatives provide new yet fundamental service to agencies. Heightened end-user technical expectations are driving service providers to strengthen system functionality. Delay in implementing these new services in the coming years would exacerbate major inefficiencies and significantly impair the state from meeting citizen expectations.

Content Services Application Consolidation

Per the findings from a recent audit, Enterprise Content Services (ECS) will strategically assist agencies in transitioning and migrating away from unsupported, legacy content services applications. The goal is to eliminate redundant agency deployed ECM applications, which will dramatically reduce agency hardware and software costs by leveraging our Enterprise License Agreement with Hyland. Furthermore, this will streamline content management applications and directly support the playbook strategy of "Strengthening Colorado's Technology Landscape". We will continue to move the states legacy and/or unsupported applications to our enterprise content services platform, which will reduce the total number of applications. The EDW application is the immediate focus in FY20-FY22 and is used by 14 agencies today. HP Records Manager deployed at CDPHE will also drive forward in FY21-FY22. This initiative is unfunded and the timeline is FY20-24.

Content Services Enterprise Solution Deployment

ECS is continuing to develop enterprise solutions that can be leveraged by all agencies - highly standardized with an ability to customize via embedded non-code configuration will dramatically increase time to value. Agencies will directly benefit with improved operational efficiency, document/information sharing, visibility and cloud infrastructure. This effort ties to many of the agency application modernization efforts. Targeting License, Permitting & Inspections, Contract Management, Electronic Requisitions, Employee File Management, and Travel Requests, Approval & Reimbursement solutions. These solutions will improve business processing times and bring complete visibility to each business lifecycle, saving time and money! Content Services enables us to establish these enterprise solutions, which become standardized products offerings in our solutions portfolio. This initiative is based on the assumption that approximately half of the agencies leverage each of the following solutions:

1. License, Permitting & Inspections - OIT pilot is underway. Standard service offerings are slated for FY20.
2. Contract Management - contract creation through signatories (integrated with DocuSign). OIT project in-flight.
3. Electronic Requisitions - complete processing of funding requests with dump into CORE - already live at OIT.
4. Employee File Management - focus on capturing and managing HR employee files. OIT and CDOT are in-flight.
5. Travel Requests, Approval and Reimbursements - already live at OIT.

This unfunded initiative affects all agencies and the timeline is FY20-24.

Crowdstrike Deployment

Deploy Crowdstrike across all agency systems to provide the very best endpoint security and protection from current threats, for the agency. This is a funded initiative and the timeline is FY20 - FY24.

Desktop Cloud Backup

OIT will be providing expanded backup services across the state in the future. This expanded service will now include providing backups of documents and files that are stored on individual laptops and desktops. This is a funded initiative and the timeline is FY20 - FY24.

myColorado

OIT is leading the effort to create a mobile application that will deliver current and future agency services on a modern and mobile platform. The myColorado app will provide residents, visitors and businesses easy and secure access to services via Federated Identity Management for users engagement through a single interface accessible anytime, anywhere. The solution will provide easy integration for agencies wanting to add a service to the app. It will provide users a protected entry point into state services, and once they establish a profile, it will reduce the need to re-enter that data. Phase 1 is the release of the app through the Department of Revenue in FY19 with the initial services of driver license and vehicle registration renewal as well as the ability to store a digital copy of a vehicle insurance card. It will also include the ability for the Governor's office to provide direct communication to app users. Future phases will include the integration of services provided by multiple state agencies. Phase II, could include state services provided by DNR, DOC, DOLA, DPA, CDPS and CDE. The planning efforts are underway which includes determining costs and funding. This is a funded initiative and the timeline is FY20.

Optimization of Endpoint Security

Assess endpoint security tools to ensure the most effective security while minimizing performance impact. This may result in the lessening or removal of the McAfee endpoint agent, and may incorporate additional tools and capabilities to ensure appropriate anti-virus, encryption, and patching. This is a funded initiative and the timeline is FY20 - FY24.

Privilege Access Management (PAM)

This is an effort to implement a least privilege management solution to oversee enterprise password management over privileged credentials, application password management and session logging and server privilege management to ensure administrator and root security and compliance. The benefits are many and include: a dashboard for operations, management and audit reports, an open standards tool that integrates with ITSM, IDM, Active Directory, etc. It also offers automatic discovery of systems with privileged access, automating the creation of role-based access, assisting in role definition/creation, and secure employee exit deprovisioning which currently relies on manual processes that create security risks and the loss of assets. This funded initiative affects every agency and the timeline is FY20.

Salesforce Platform Org Strategy

Defining a Salesforce Org Architectural Strategy to improve business/IT alignment, platform effectiveness and IT cost savings is part of the Salesforce Program strategic initiatives planned to continue transforming how government innovates, maintains and promotes secure cloud-based agile technology platforms in an enterprise model. This approach will account for the OIT enterprise Salesforce support model and application management best practices. This initiative is unfunded and the timeline is FY20-24.

Salesforce Lightning Migration

Continued migration of existing legacy applications to and development of all new applications in the Salesforce Lightning (UI) is an effort to maintain the quality of the platform and accessibility to new product features. This is part of the effort to improve business/IT alignment, platform effectiveness and IT cost savings and is part of the Salesforce Program strategic initiatives planned to continue transforming how government innovates, maintains and promotes secure cloud-based agile technology platforms in an enterprise model. This initiative is unfunded and the timeline is FY20-24.

Salesforce Release & Environment Management

Salesforce Release & Environment Management practices and tools to govern how changes occur between the platform and various environments is an effort to minimize application issues and protect the integrity of existing applications in the multi-use environment when deployed to production. This initiative is unfunded and the timeline is FY20-24.

Secure Office Print Ecosystem (SOPE)

OIT is working with the Department of Personnel & Administration (DPA) on the Secure Office Print Ecosystem (SOPE) project to secure the state's multifunction printers against hackers. This project involves approximately 656 devices managed by DPA's Multifunction Printer Program, which are distributed in 16 executive branch agencies. As partners of the SOPE project, OIT's security and deskside teams are helping to upgrade firmware and secure the printer platform and its entry points into the state network. OIT is also providing project management services. DPA is incurring all costs associated with this managed print service solution. This unfunded initiative affects all agencies and the timeline is FY20.

Technology Accessibility and Mobile Assessment, Testing and Remediation

OIT has a statutory obligation to work with executive branch agencies to improve technology access to users with disabilities, including those who are blind and/or visually impaired (see C.R.S. 24-85-101 et seq). To fulfill our duty to improve these services, OIT must provide tools, methods and resources to adequately assess, remediate and maintain the systems for their ability to provide proper accessibility (in conformance to industry standards). This initiative will establish project governance, application testing requirements, standards and training to achieve the goals and mandates of this statute. Any changes needed to address accessibility within an agency will be funded by the agency. The initiative is scheduled for assessment in FY19-20 and remediation thereafter.

Enterprise Future Innovations

The ideas in this section have been proposed as solutions that will allow OIT to grow and discover new and innovative services for state agencies. The solutions in this section will increase state employee efficiency and improve service to Colorado residents and state visitors. These ideas are either unfunded or funded through Decision Item funding. We may see these as new projects in the future.

Cloud Access Security Broker

Cloud Access Security is a software functionality that enables automation of manual processes used to govern the use of and protect sensitive state data in the cloud. As cloud computing continues to grow, OIT needs a way to deliver consistent security across multiple clouds and protect everyone using that data, this is outside of on prem data storage. The solution is scheduled to go active in FY20 with ongoing funding each year thereafter. This funded initiative impacts all agencies and the timeline is FY20-24.

Data and Access Governance

This initiative ensures that sensitive, unstructured data is only accessible to approved users. Funding will be used to implement data governance to analyze, approve and fulfill unstructured data access to files, folders, shares across Microsoft NTFS file systems, Network Attached Storage (NAS) devices and SharePoint - on prem storage. The solution is scheduled to go active in FY20 with partial ongoing funding each year thereafter for maintenance. This funded initiative impacts all agencies and the timeline is FY20.

East West Traffic Security

The East West Traffic Security initiative addresses vulnerabilities present within the traffic going to public cloud, traffic between agency-to-agency applications, and traffic from network to servers. These initiatives are the "glue" that helps bind the security infrastructure together, representing agency network upgrades and firewall upgrades and enhancements. They cross the functional infrastructure, Network, Access Control and Security Operations. The solution is scheduled to go active in FY20 with partial ongoing funding each year thereafter for maintenance. This funded initiative impacts all agencies and the timeline is FY20.

Easy Secure Service Excellence - ESSE

The Enterprise Application team is requesting a network solution that will allow all application developers to access the code at any agency in the Executive branch. At this time, firewall rules and servers are set up currently, because each agency has its own network, developers would need remote access to 17 agencies to perform work. This request is being made in hopes that Enterprise Applications will be able to align with Demand Management infrastructure, enabling developers to serve across many domains, working across a multitude of practices. This structure will directly impact the level of service EA is able to provide to the customer. In order for EA to move to a Service Excellence model, this demand must be met. This unfunded initiative impacts all agencies and the timeline is FY21-24.

End-to-End Monitoring and Logging

This initiative will increase the annual budget for this particular activity, which enables OIT to have the management platform to automate, manage and patch more endpoints and at a faster pace. Technical training and an incident response retainer are inclusive of this initiative. The anticipated outcome of this initiative is that all agency endpoints would be aligned under a common platform that deploys scripts, patches, and updates for proper security compliance and hardening. In short, agencies can expect to see the number of vulnerable endpoints to be drastically reduced. The solution is scheduled to go active in FY20 with ongoing funding each year thereafter. This funded initiative impacts all agencies and the timeline is FY20.

Identity Analytics and Risk Intelligence

OIT would like to incorporate identity analytics into our security and big data strategy using machine-learning and advanced behavioral analytics that consume and analyze data and will improve our capabilities to detect and respond to risk timely, help with digital change, increase agility and enable higher levels of automation. This funded initiative impacts all agencies and the timeline is FY20.

Server and Deskside Endpoint Management

This initiative will increase the annual budget for this particular activity, which enables OIT to have the platform to automate, manage and patch more endpoints and at a faster pace. Technical training and an incident response retainer are inclusive of this initiative. The anticipated outcome of this initiative is that all agency endpoints would be aligned under a common platform that deploys scripts, patches, and updates for proper security compliance and hardening. In short, agencies can expect to see the number of vulnerable endpoints to be drastically reduced. The solution is scheduled to go active in FY20 with ongoing funding each year thereafter. This funded initiative impacts all agencies and the timeline is FY20.

Smart Cities Exploration

A smart city is a designation given to a locality that incorporates information and communication technologies to enhance the quality and performance of urban services such as energy, transportation and utilities to reduce resource consumption, wastage and overall costs. Traditional smart city projects focused on community internet access, smart lighting, transportation and citizen data sharing. State effort around smart cities would be focused around the coordination of infrastructure and standards to enable smart applications that seamlessly transition as residents transition from one locality to another. This unfunded initiative impacts all agencies and the timeline is FY20-24.

Appendix C: CDPS Application Lifecycle Recommendations

The table and chart below show the applications used by CDPS, and the lifecycle recommendation for each application. In future years this will be expanded to include the application lifecycle timeline. The definitions for the recommendations below are as follows:

- **Consolidate**: Recommended when more than one application is being used to perform a single process. The multiple applications should be consolidated to perform the process.
- **Decommission**: Recommended for applications that have a definite plan to be decommissioned.
- **Enhance**: Recommended when an application that needs to be upgraded requires a more significant effort to upgrade than a recommendation to sustain.
- **Replace**: Recommended when an application needs to be replaced with a newer application.
- **Re-Platform:** Recommended when an application has the proper functionality but may be written in an outdated language or database and needs to be moved to a better platform.
- **Sustain**: Recommended when an application is functioning properly and does not require a major upgrade or change.
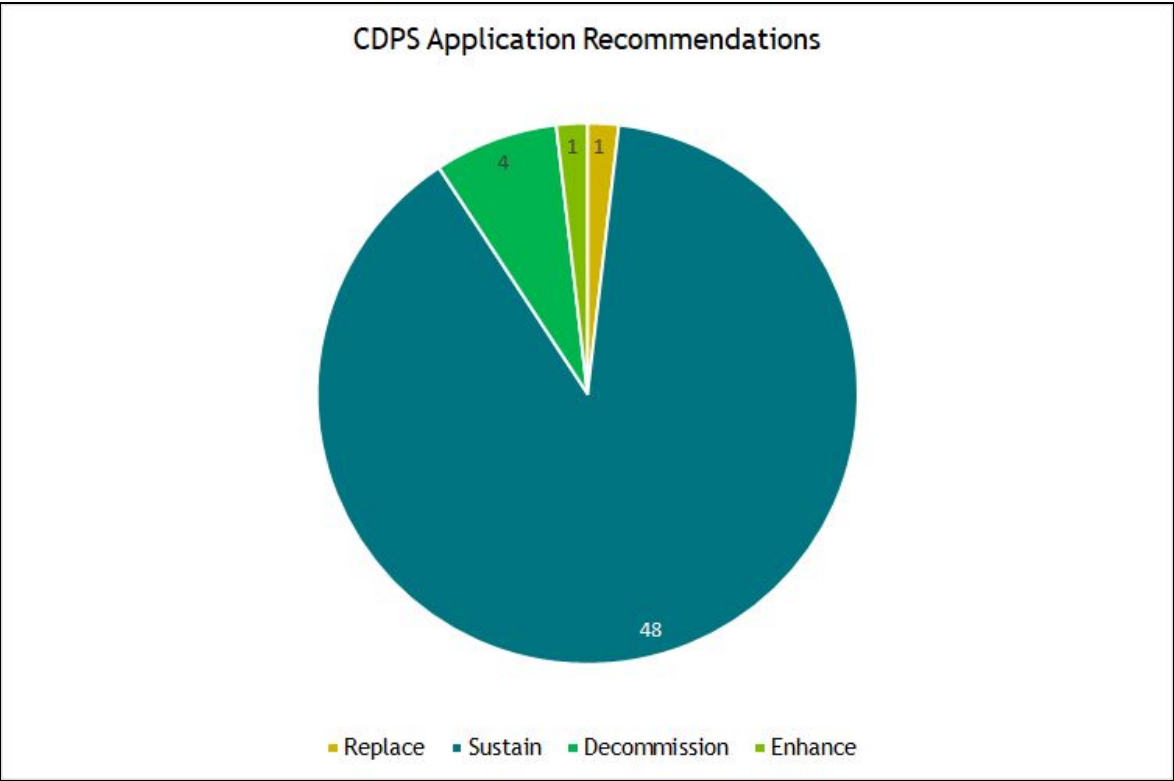
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Five-Year IT Roadmap