Five-Year IT Roadmap

Department of Transportation

Aligning business goals and technology forecasts

July 2019

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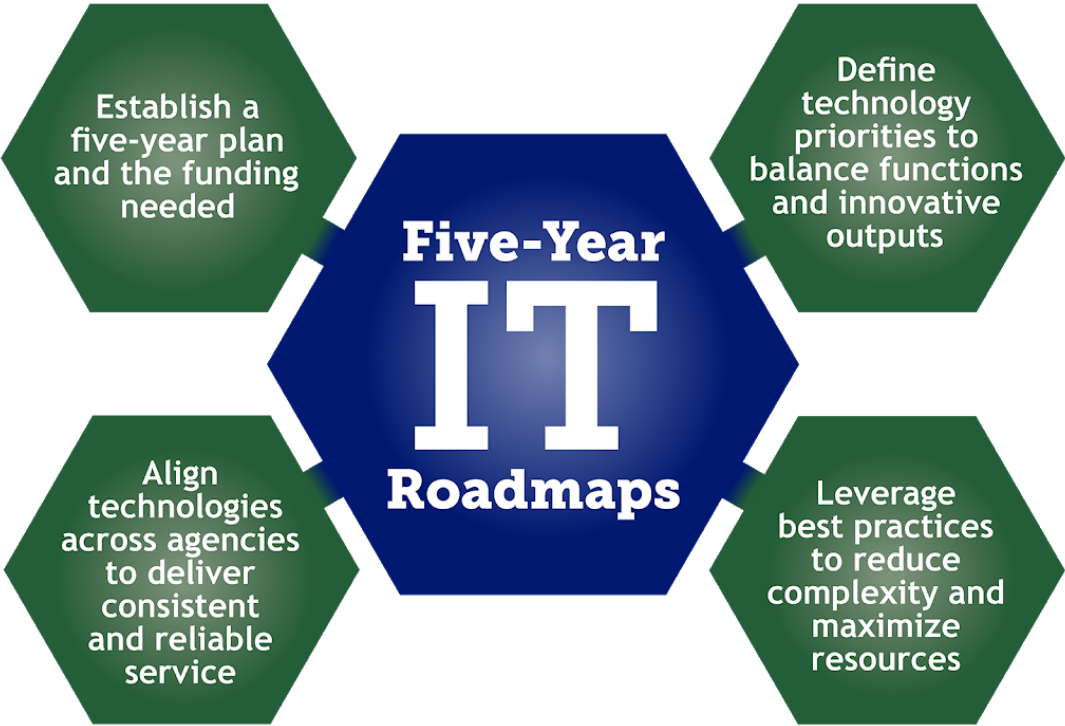**Information Technology**
Serving people serving Colorado

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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 Transportation 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

SAFETY - We work together to achieve a high performing safety culture! We promote and apply consistent and sustainable safe work behaviors in everything we do.

Objective 2

PEOPLE - We value our employees! We acknowledge and recognize the skills and abilities of our coworkers and draw strength from our diversity and commitment to equal opportunity.

Objective 3

INTEGRITY - We earn Colorado's trust! We are honest and responsible in all that we do and hold ourselves to the highest moral and ethical standards.

Objective 4

CUSTOMER SERVICE - We strive to provide the highest level of customer satisfaction and experience! With a can-do attitude, we work together and with others to respond effectively to our customers' needs.

Objective 5

EXCELLENCE - We are committed to quality! We are leaders and problem solvers, continuously improving our products and services in support of our commitment to provide the best transportation systems for Colorado.

Objective 6

RESPECT - We treat everyone with respect! We are kind and civil with everyone, and we act with courage and humility.

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	AASHTOWare SiteManager Upgrade to AASHTOWare Project	███				
	Application Modernization	███				
	Application Decommissioning		███	███	███	███
	Deighton's Total Infrastructure Management System (dTIMS) Upgrade	███				
	Oracle 12c Database Software Upgrade	███				
	ProjectWise Transition to the Cloud	███	███			
New Solutions	Behavioral and Engineering Safety Data and Traffic (BESDT)	███				
	Bridge Inspection and Asset Management Software	███				

	FY20	FY21	FY22	FY23	FY24
Bustang Phase II	███				
ITS Connected Vehicles-V2X	███	███			
ITS Data Analytics Intelligent System (DAISy)	███				
On Track	███				
SAP Fiori	███	███			
Cloud Technologies	███				
Content Management (OnBase) Electronic Document Management	███				

Future Innovations

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 efforts and resources that surpass the resources needed if the initiative were carried out proactively.

AASHTOWare SiteManager Upgrade to AASHTOWare Project

CDOT is evaluating a potential upgrade of its SiteManager application to the web-based AASHTOWare Project. SiteManager is currently used to manage the construction phase of every project. It tracks, reports, and analyzes material data from contract award through finalization of the construction project. AASHTO, the American Association of State Highway and Transportation Officials, is a nonprofit association that represents the highway and transportation departments in the 50 states, the District of Columbia, and Puerto Rico. It is the only association that represents all five transportation modes - air, highways, public transportation, rail, and water. It maintains and administers a cooperative software development program that produces the AASHTOWare suite of products. This initiative is funded and the timeline is FY19-20.

Application Modernization

CDOT has four applications on PowerBuilder. EA will analyze and provide recommended solutions to migrate away from PowerBuilder because it is very difficult to find resources that can support this language. The apps are CDOT SHAXAM, CDOT SiteManager Accessories, CDOT SiteManager Materials Reports and SHAXAM. The Enterprise Applications team is currently upgrading the in-house applications they support from PowerBuilder and C++ to .NET/C#. This initiative is funded and the timeline is FY19-21.

Application Decommissioning

At CDOT, there are 15 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.

Deighton's Total Infrastructure Management System (dTIMS) Upgrade

CDOT's Division of Transportation Development (DTD) has elected to upgrade its asset management software. Deighton dTIMS has been used as CDOT's pavement asset management software since 1997. In 2012, DTD selected dTIMS v.9 as CDOT's multi-asset management system and scaled it to include nine other asset classes in addition to pavement. Currently, the system is operated through a thick client user interface supported by a server side database. New federal performance requirements call for collaboration with planning partners that don't have access to the system through CDOT's network. The new version will be a web-based platform that offers new features, enhanced performance, a redesigned platform, and a licensing structure that allows external stakeholders controlled access to analysis functionality. This initiative is funded and the timeline is FY19-20.

ProjectWise Transition to the Cloud

CDOT uses ProjectWise for project information management and collaboration. Currently, the ProjectWise application is hosted by the state and supported by OIT and the vendor, Bentley. Work was done throughout FY18 to stabilize the current environment in preparation for moving to Bentley's cloud-based version of ProjectWise. In order to properly distribute the workload once in the cloud, several caching servers will be deployed throughout CDOT's regions and supported by OIT. This initiative is funded and the timeline is FY19-20.

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.

Behavioral and Engineering Safety Data and Traffic (BESDT)

The BESDT system will consolidate and replace previous crash data systems that need to be updated to address changes in data transmission from the Colorado Department of Revenue (DOR). BESDT will automate the transfer of data from its raw format received from DOR into the CDOT summary tables. This initiative is funded and the timeline is FY19-20.

Bridge Inspection and Asset Management Software

CDOT Bridge Inspection personnel have a new requirement for a Bridge Inspection and Asset Management Software Interface to replace the current process of using paper to collect bridge and structural asset data. This process creates errors in the translation of the data, increases data capture time, delays reporting and is out of compliance with CDOT's "no paper" policy. In addition, only data related to inspections is currently being gathered and managed. The new solution will provide an expandable interface to incorporate additional and new assets which will be inspected in the future without having to pay premiums for custom development on our current system. It will be a geospatial management interface for all bridge/structure inspection, project, and asset management-related data including connections to all other major CDOT systems including GIS,ProjectWise, and SAP. This initiative is funded and the timeline is FY19-20.

Bustang Phase II

Q2/2018 to keep up with the demand. Planning for additional routes and buses is already underway. Bustang Phase II is the next step in the evolution of this now established transportation entity. This initiative will integrate Bustang with the Regional Transportation District's (RTD) operational infrastructure, via its well-established, intelligent transportation platform, INIT (Innovation in Transportation). Advanced functions like automated planning, CAD/AVL dispatch, vehicle health monitoring, automatic passenger counting and many more, are cornerstones of every major transportation organization throughout the country and the world. This partnership between RTD, INIT, Inc, Ace Express Coaches and all its other participating vendors will provide CDOT with a state-of-the-art, 21st century operational transportation infrastructure that will scale, allowing for more growth and success in the years ahead. This initiative is funded and the timeline is FY20.

ITS Connected Vehicles-V2X

CDOT, in partnership with Panasonic, is developing a Connected Vehicle network on I-70 that is a fully integrated, compatible, operationally sound system that includes maintenance and support. Potential reduction of congestion and hazard avoidance on the I-70 Corridor is the overall goal of the requested program. The project team is developing a Dedicated Short-Range Communication (DSRC) radio infrastructure to expand the Connected Vehicle Road-X program. The proposed infrastructure will operate seamlessly alongside CDOT's current transportation management scheme. Additional roadside and in-vehicle hardware will be primarily DSRC-focused. This includes DSRC in-vehicle radios referred to as On-Board Units (OBUs) and roadside locations referred to as Roadside Units (RSUs). These new in-vehicle and roadside radios will be connected to the backend via CDOT's existing power and fiber network at the roadside. This project is in-flight and is currently testing the technology across a 90 mile stretch of I-70. This initiative is funded and the timeline is FY19-21.

ITS Data Analytics Intelligent System (DAISy)

CDOT's Intelligent Transportation Systems (ITS) team is working with OIT and Kritech, LLC, to develop a cloud-based Big Data platform capable of hosting its Data Analytics Intelligent System (DAISy). Over 30 different data sources have been identified to be captured within the platform for the system, including SAP, Ramp Meters, Traffic Signals and Tunnel Operations. The system will provide Colorado drivers with real-time information that will help keep them safe on the roads. This platform is a critical element of CDOT's overall Connected Vehicle strategy. This initiative is funded and the timeline is FY20.

On Track

CDOT has identified a need to better integrate its Project Management, Design, and Construction teams and is exploring opportunities to do so by implementing a system that will track tasks for all three groups on a common, integrated Gantt chart. It will also serve to help develop future projects by creating a knowledge base of how long it takes to perform construction tasks common to all of CDOT's projects. This initiative is funded and the timeline is FY19-20.

SAP Fiori

CDOT has made a significant investment in SAP and will continue to leverage its capabilities for the foreseeable future. CDOT uses SAP for HR, timekeeping, training, payroll, payments to vendors and to manage project money received from the federal government. SAP's Fiori web interface will provide a unified, role-based, customizable launchpad for CDOT's employees to access their applications. This initiative is funded and the timeline is FY19-21.

Future Innovations

The ideas in this section have been proposed as solutions by the agency to provide new, innovative offerings to their customers. 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.

Cloud Technologies

As CDOT's data assets continue to grow, CDOT and OIT will need to work together to build a strategy around how best to host these assets in a way that is technologically efficient and financially responsible. CDOT will consult with OIT to identify the best hosting partner, be it Microsoft Azure, Google's Cloud Platform, Amazon's Web Services, CenturyLink or OIT's own private cloud. All future projects will be charged via Common Policy or will be agency funded. Planning will continue throughout FY19 after which time more specific timelines can be developed. This initiative is funded and the timeline is FY20.

Content Management (OnBase) Electronic Document Management

CDOT is in the early stages of developing a project to deploy Hyland's OnBase Enterprise Content Management solution. Perceptive, also owned by Hyland, was evaluated but couldn't accommodate CDOT's geospatial integration needs. OIT and CDOT's Chief Data Officer will be key stakeholders in the OnBase project, which is in the early phases of requirements gathering. Planning will continue in early FY20 after which time more specific timelines can be developed. This initiative is funded and the timeline is FY20.

Data Services Integration Platform

CDOT's consulting Chief Data Officer (CDO), in partnership with OIT, MuleSoft, and ESRI, is working to develop a comprehensive Data Services Integration Platform (DSIP) that will enable CDOT to leverage analytics for faster decision making. Over 150 data sources from CDOT's divisions will fill CDOT's "Data Lake" including crash and incident data, road asset information, historical weather data and real-time construction and work zone information. CDOT's Chief Data Office is currently planning proof-of-concept activities from which future projects will likely be scoped. Planning will continue throughout FY19 after which time more specific timelines can be developed. This initiative is funded and the timeline is FY19-22.

## Partnership With Colorado Broadband Office (CBO)

The Colorado Broadband Office (CBO) is teaming up with the Colorado Department of Transportation to develop a long-term strategic plan for telecommunications infrastructure throughout Colorado. The plan, which will look at both the wired and wireless needs within our state, has three main objectives. First, it seeks to identify the existing assets that are owned and managed by the state. Second, it will look at future demand drivers to understand where additional infrastructure is needed. Finally, it will develop mechanisms to support the investment necessary to deploy new infrastructure. This law provides approximately $115 million to the Broadband Fund over the next six years with the partnership continuing thereafter.

CDOT 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	$0.00	$0.00	$0.00	$0.00	$0.00
New Solutions	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL	$0.00	$0.00	$0.00	$0.00	$0.00

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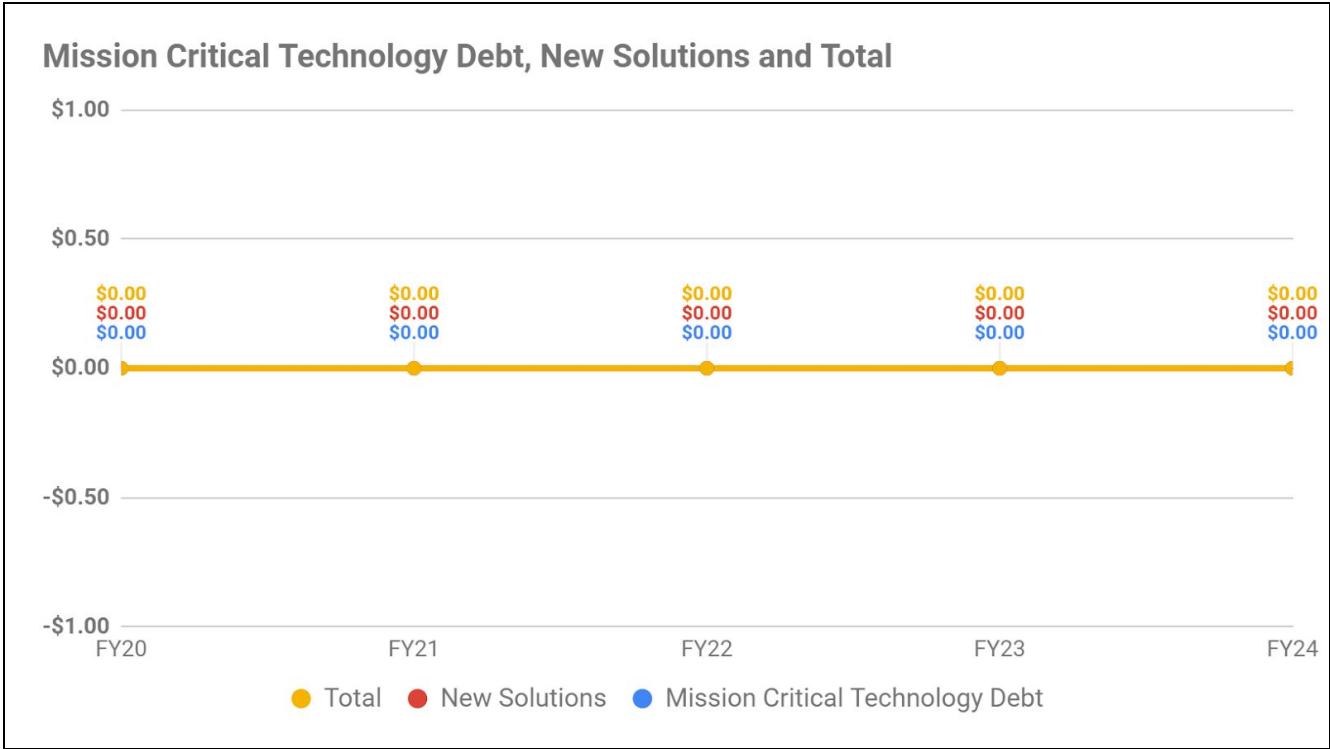
Appendix A: Enterprise Initiative Roadmap

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	██	██	██	██	
	HRWorks	██	██	██		
	Mainframe Decommission	██	██	██	██	
	Network & Infrastructure Refresh	██	██	██	██	
	Next Generation Colorado	██	██	██	██	
	OS Server Upgrades	██	██			
	Windows 10 Upgrade	██				
New Solutions	CrowdStrike Deployment	██	██	██	██	██
	Desktop Cloud Backup	██	██	██	██	██
	Content Services Application Consolidation	██	██	██	██	██
	Content Services Enterprise Solution Deployment	██	██	██	██	██

		FY20	FY21	FY22	FY23	FY24
	MyColorado	▓				
	Optimization of Endpoint Security	▓	▓	▓	▓	▓
	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	▒				
	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

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 efforts 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; has significant risks from process and personnel perspective; Although meant to be a secure file transfer server, this asset is also using 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.

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 move 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 of 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.

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.; automatic discovery of systems with privileged access; automating the creation of role-based access; assisting in role definition/creation; and secure employee exit de-provisioning 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. It 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 members 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 platform to automate, manage and patch more endpoints and at a faster pace. Technical training and 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 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: CDOT Application Lifecycle Recommendations

The table and chart below show the applications used by CDOT, 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.

CDOT Application Recommendations

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■ Replace ■ Sustain ■ Decommission ■ Re-Platform
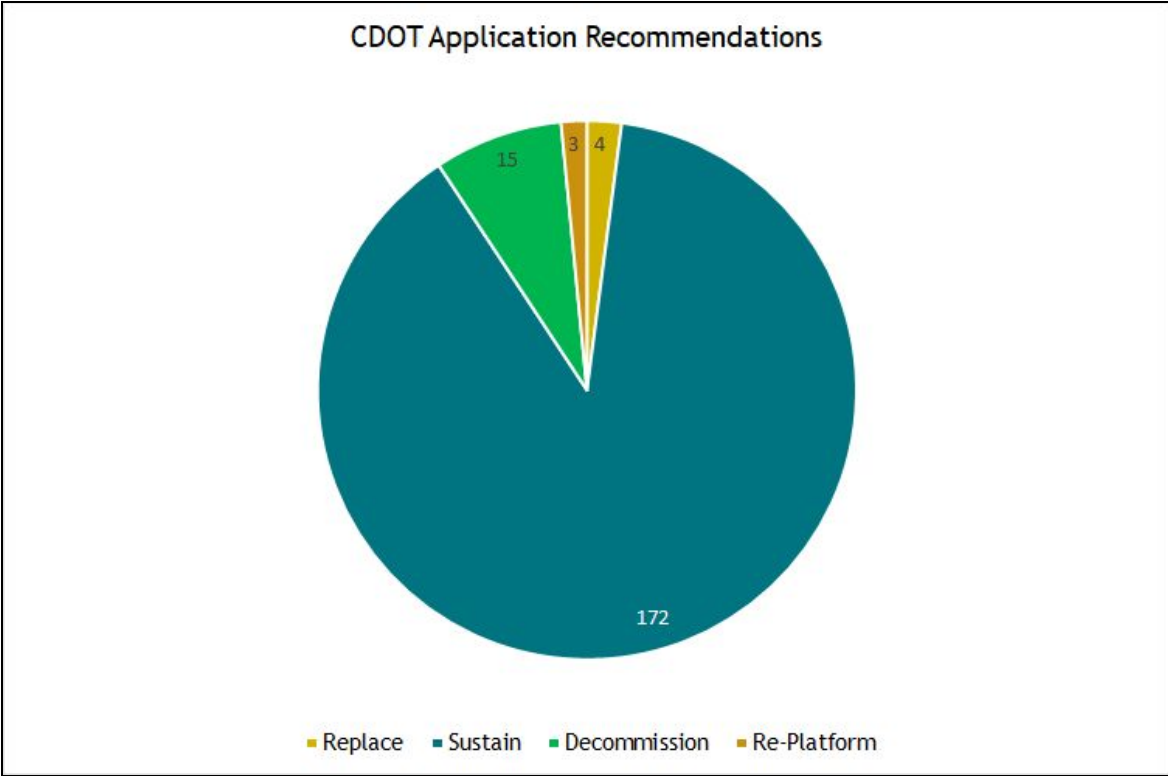
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Five-Year IT Roadmap