Department of State Lands

Information Resource Management Strategic Plan 2020-2024

Table of Contents

1 EXECUTIVE SUMMARY

The Oregon Department of State Lands (DSL) 2020-2024 Information Resource Management (IRM) Strategic Plan was developed in support of the DSL Strategic Plan and Natural Resource policy area IRM. The plan describes the IT current state environment and strategic goals, objectives, and outcomes to improve enterprise IT alignment within the agency. The IRM Strategic Plan is a forward-looking approach to advance the use of IT resources to support the mission, goals, and objectives as the administrative arm to the Department of State Land.

The IRM focuses on four common strategic goals and associated objectives to provide agency technology guidance and alignment across the Governor's Responsible Environmental Stewardship Focus area. The policy area IRM strategic goals are:

Strategic Goal 1 - "Supporting our stakeholders" Integrating high quality information and IT solutions and excellent service delivery to accomplish the mission of the agency

Strategic Goal 2 - "Stewardship of the enterprise IT resources" Effective management of resources through the cost- efficient implementation of information and IT solutions.

Strategic Goal 3 - "Enhancing information security" Protecting the confidentiality, integrity, and availability of agency information by strengthening our cybersecurity efforts with technology and human resources.

Strategic Goal 4 - "Invest in our workforce and partnerships" Strengthening our IT skills and ability to provide quality resources while building strong partnerships within the business and IT community.
These goals describe strategic outcomes, which guide development of objectives, and tangible outcomes to help agency planning and governance of IT and IM investments.

2 INTRODUCTION

The FY 2020-2024 Department of State Lands (DSL) Information Resources Management (IRM) Strategic Plan summarizes the goals and objectives of agency information management (IM) and information technology (IT) activities, under the leadership of the DSL executive team and IT department. This Plan provides the strategic framework for planning, managing and delivering IT for all aspects of the agency's work, from supporting its mission programs to day-to-day operations. The plan leverages the FY 2020-2024 Natural Resource policy area's IRM that was developed by the Enterprise Information Services (EIS) and 14 Natural Resource agencies

Governor Kate Brown's Action Plan for Oregon:

To make Oregon a place where everyone has the opportunity to thrive.

At the highest level, the Governor's Requested Budget and Action Plan lays out two initiatives that have been used in developing the plan .

Good Government

- Modernizing State Purchasing: Making the Most of Every Taxpayer Dollar in Oregon's $8 Billion Procurement System
- User-friendly, Reliable and Secure: Modernizing State Information Technology Systems and Oversight

In support of the Governor's Natural Resource Policy area IT and IM must manage DSL data and oversee the delivery of its mission. Where possible, DSL IT and IM should also work with other Natural Resource agencies, aligning commonly used information and supporting the State's ability to manage the environment more holistically and effectively. There are also common technology needs in information security management, mobile computing efficiencies, and geospatial information used in field work, monitoring, and decision making that can be leveraged for this purpose.

DSL Strategic Plan 2017-2021 Goal One:

Deliver consistent, timely and dependable public service in all our interactions, and make it a priority to reach out to our customers to understand their needs.

Workforce investments in DSL IT resources and partnerships with stakeholders are critical in advancing technology to meet strategic initiatives. DSL must continue to develop improved IM systems to store, manage, track, and deliver electronic information for agency use and public records disclosure needs. These will provide information collaboration and decision making opportunities across stakeholder domains.

3 STRATEGIC INFORMATION MANAGEMENT FRAMEWORK

3.1 OVERVIEW

The visions, missions, strategic plans and drivers inform the development of the IRM Plans:

- The DSL IRM Plan and priority project initiatives support the Governor's Vision as well as align with and support the State Chief Information Officer's Enterprise Information Resource Management Strategy (EIRMS).
- DSLs Business Plan provides specific guidance and direction on Agency priorities, mission and is used in developing the agency IT strategy.

3.2 DRIVERS

Federal and State Mandates: Federal and State mandates extend across agency mission- and non-mission-related responsibilities. These can be funded or unfunded mandates created through legislative or legal processes that affect an agency business process. Some of the IT mandates from DSL and the state government that affect DSL include: IT security, transparency/public records disclosure, system development life cycle management, performance assessment, financial accountability, collaboration services, and privacy protection.

Stakeholder Expectations: DSL stakeholders request efficient, simplified, and integrated IT/digital services that can access and exchange information freely across all levels of the agency and with external stakeholders.

Fiscal Responsibility: Demanding fiscal constraints require new levels of innovation and leadership across organizations, programs and partnerships. DSL will find new ways in which IT can maximize efficiencies to meet business demands. When available, DSL will utilize shared services and technologies for common business needs to better meet stakeholder needs, improve public services, and lessen funding needs across programs and agencies.

External Factors: Science constantly identifies new risks, recalibrates known risks and presents new operational challenges for agencies. Managing State Owned Land , and protecting wetland and our environment with a growing population will continue to challenge Oregon's use of the state's natural resources. DSL must therefore adapt rapidly and remain agile to manage these unplanned demands.

3.3 IRM PURPOSE

The purpose of the 2020-2024 DSL IRM is to provide a shared vision in guiding decision making and organizing the use of information resources across the agency. The IRM also provides a strategic framework for planning, managing and delivering IT for all aspects of the agency's work, from supporting its mission programs to day-to-day operations. The IRM supports approaches and advancement in information technology for resource management, security, data management, and stakeholder support.

3.4 IRM GUIDING PRINCIPLES

The IRM Strategic Plan and initiatives need to support DSL's mission, vision, and strategic plan. The IRM initiatives should be business-driven, transparent and have measurable outcomes.

3.5 IT MANAGEMENT VISION

The DSL IT vision is to serve the agency, staff and Oregonians through information technology solutions, with a mission to mature technology governance, leverage investments in enterprise technology services, ensure transparency, and deliver secure systems and innovated solutions. IT leadership will deliver effective, efficient and innovative uses of technology and resources which support and align with business processes.

3.6 IRM MISSION

The IRM mission is to securely deliver quality information, technology, and services to advance DSL and the State of Oregon's missions.

3.7 IRM GOALS

Strategic Goal 1 - "Supporting our stakeholders" Integrating high quality information and IT solutions and excellent service delivery to accomplish the mission of the agency

Strategic Goal 2 - "Stewardship of the enterprise IT resources" Effective management of resources through the cost- efficient implementation of information and IT solutions.

Strategic Goal 3 - "Enhancing information security" Protecting the confidentiality, integrity, and availability of agency information by strengthening our cybersecurity efforts with technology and human resources.

Strategic Goal 4 - "Invest in our workforce and partnerships" Strengthening our IT skills and ability to provide quality resources while building strong partnerships within the business and IT community.
These goals describe strategic outcomes, which guide development of objectives, and tangible outcomes to help agency planning and governance of IT and IM investments.

4 ENTERPRISE IT OVERVIEW

4.1 IT ENVIRONMENT

DSL has seven (7) locations across the state of Oregon that require IT support for applications and infrastructure:

Area	Locations	Number of Staff	PC's Supported
Headquarters	Salem	88	149
Bend	Bend	12	26
SSNERR - Estuarine and Coastal Ocean Sciences (ECOS)	Charleston, OR	12	26
SSNERR – Interpretive Center (IC)	Charleston, OR	9	29
Joe Nay Communications Building	Charleston, OR	0	0
Maintenance Building	Charleston, OR	2	1
Spruce Ranch	Charleston, OR	0	0
Land Use Board of Appeals (LUBA)	Salem, OR	8	8
	Totals	**131**	**239**

DSL has a support ratio of 239 personal computers (PC) utilized within the 131 agency staff; all of which are supported by the IT department. The large number is partially due to the need for field computers, dedicated scientific machines and check out lap tops for telecommuting. The agency replaces desktops based on a 4 year lifecycle and laptops/surfaces on a 3 year cycle.

Resources

The DSL IT Team has a total of 7 technical staff and IT Manager to support the IT infrastructure, users and software applications. The team's primary work focus is operational in supporting the existing infrastructure and applications. The team is primarily located in Salem with one staff member permanently located at the South Slough National Estuarine Research Reserve (SSNERR). Salem and Bend offices are supported by Salem IT technical staff consisting of four individuals. The staff also has two staff that support the agencies Geographic Information System (GIS) and spatial databases. The IT team is missing business analyst/project management resources to support business process improvements with new IT projects and database administrator/data analytics person to manage they application data and need information analytics.

DSL IT manages its own small data center at its headquarter and provides support for all servers, networking, backups, and firewall network security utilized by the agency. The majority of the servers are housed and running the core systems which include the web servers, SQL servers, DMZ, A/D and Exchange email. DSL supports 3 primary locations in Oregon; Salem, Bend and Charleston with connections to state networking at Salem and Bend. Charleston is connected via an IP sec VPN thru network services provided by the Oregon State University. Additionally, at each location, there are physical file servers and print servers.

DSL also provides IT services to the Land Use Board of Appeals (LUBA) and Oregon Water Enhancement Board (OWEB). DSL provides LUBA support for eight PC's, email, file, print and applications. For OWEB DSL provides internet access to Oregon Watershed Enhancement Board (OWEB) using a separate interface for OWEB on DSLs agency firewall.

Core Software Applications Supported:

DSL has several core mission systems that are critical to supporting the business areas within DSL. These include Laserfiche document management, Land Administration System (LAS), Cash accounting/billing, State Land & Wetland Inventory Systems, GIS, Microsoft Office and KAPS unclaimed property. The LAS and Cash systems have been in production for 20 years and are no longer aligned with business technology needs. DSL has initiated a project to replace these two system to improve business process. The project is estimate to take 3-4 years to complete at an estimated cost of 3.5 million. This is the largest IT undertaking that the agency has done since originally implementing it.

Core Application and Users:

Software Application	Approx. # of users
Laserfiche	135
Microsoft Office Suite (O365 E3)	135
ActivTrak	120
Arc-GIS	80
Land Administration System (LAS)	60
CASH	60
Adobe Acrobat Pro	60
KAPS	14
State Land Inventory System (SLIS)	17

There are numerous instances where Microsoft Excel and Access files are used to support business services and processes. Many of these files have been developed without the IT engagement as a work around to gaps in current environment.

The DSL Change Management Committee (CMC) is currently tracking over 150 operational projects or major system changes. There are commonly around ten small projects in progress, ten in planning and 40+ remaining in initiation, definition and approval stages.

4.2 IT WORKFORCE

All but one of the eight IT staff are a part of the central IT department that is located in Salem. The non-central staff person is located in Charleston at the South Slough National Estuarine Research Reserve. The staff person is a part if the IT team but reports to a different manager. The South Slough technician's manager and the IT Manager/CIO collaborate and the Salem Team Lead has been given authority to direct his work. Staffs focus is on operational support and have shared responsibilities over multiple technical areas. The Salem IT team supports the main datacenter directly, and also provides added support to the other locations.

DSL is missing two important positions a database administration and business analysis/project manager. Not having a dedicated Database Administrator (DBA) is reflected in the lack of quality reporting, analytics and data integrity in the majority of DSLs systems. The current state of the Land Administration System which has evolved over the last 20 years is a good example of the issues DSL is facing. Changes made to the system and the data have created data structure confusion and it is nearly impossible to glean statistical information from the system to assist in managing workload and strategic planning.

The Business Analyst(s) is needed to communicate between IT and the program side of the agency to ensure both parties understand the system requirements and process improvements using technology for both the Program and IT to support continuous improvement. The position could also provide project management support for small projects and system upgrades.

The following table provides a comparison of agency FTE to IT FTE:

Department	Agency FTE	Seasonal / Volunteer	LUBA	IT FTE	% of IT FTE
Department of State lands	115	30	8	8	5.2%

The following table shows the DSL IT workforce breakdown by duties:

Team Work Area	FTE
Infrastructure	
Manager/CIO	1
Desktop Support	2
Server System Administration	2 @ 30%
Network Administration	2 @ 30%
Database Administration	0
Security Administrator	1 @ 30%
Integration Developer	1 @ 30%
Data Analyst/Report Writer	1 @ 50%
Software Applications	
GIS	2
Laserfiche	1
Awareness and Education	
Training Coordination	1 @ 50%
Project Management Office	
Project Managers	0
Technical writer, tester, trainer	0

Team Work Area	FTE
Business Analyst	0

4.3 IT BUDGET

All hardware and software purchased for DSL is completed under the IT budget. Individual program areas are not responsible for purchasing. SSNERR does obtain some of it's funding from National Oceanic and Atmospheric Administration (NOAA), which is considered federal funding.

Agency cell phones are not purchased under the IT budget.

Agency Budget 17-19	Other Fund	Federal Fund	Agency Total	IT	IT %
Personal Services	$22,992,240	$1,583,320	$24,575,560	$2,083,408	8.5%
Services & Supplies	$33,650,290	$701,864	$34,352,154	$1,539,799	4.5%
Capital Outlay	$902,013	$10,025	$912,038	$81,619	8.9%
Special Payments	$7,162,554		$,162,554		0.0%
Total	**$64,707,097**	**$2,295,209**	**$67,002,306**	**$ 3,704,826**	**5.5%**

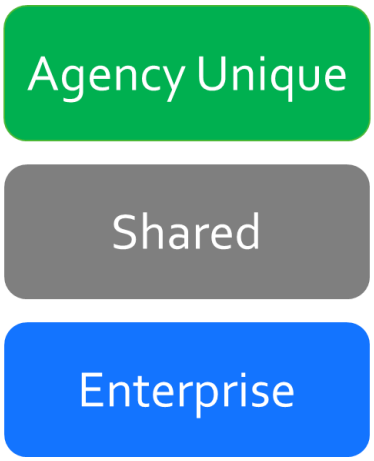
4.4 IT STRATEGY AND GOVERNANCE

IT governance refers to business management processes established to ensure the most effective use of IT for achieving the organization's business goals. Established IT governance frameworks and practices are needed to allow evaluation, prioritization and resource allocation for competing investments. IT governance also provides oversight and measures the outcomes of IT projects.

4.4.1 Enterprise IT Governance:

The Enterprise Information Resource Management Strategy (EIRMS) provides a governance framework which helps provide the appropriate level of oversight for each project or service. This governance occurs along a spectrum from agency leadership to the enterprise level. Enterprise IT governance supports statewide review, prioritization and oversight for all agencies.

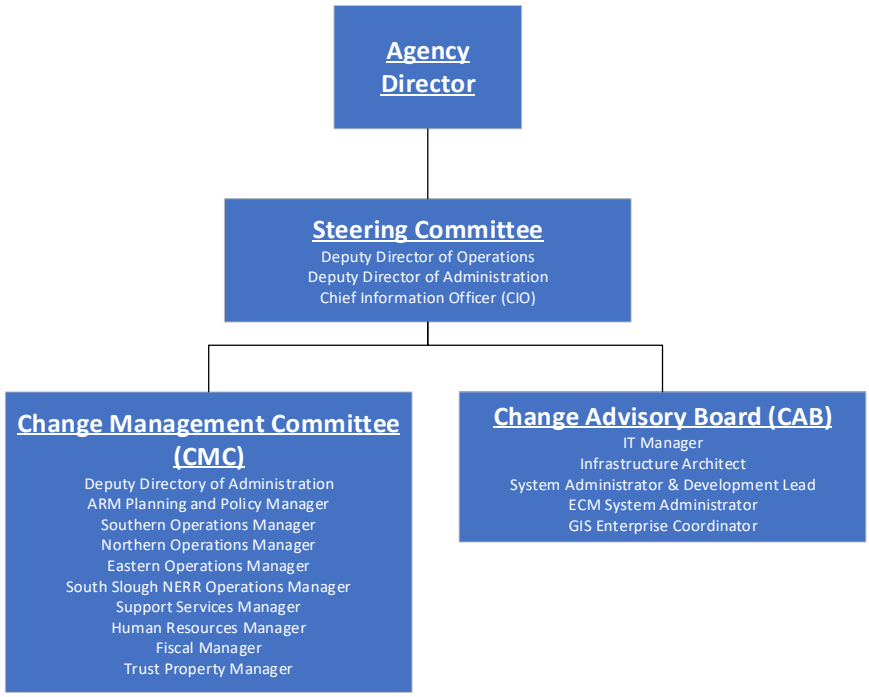
State IT service and governance framework:



This high-level governance occurs through the Enterprise Information Service Office (EIS) with input from several governing bodies including the Enterprise Leadership Team (ELT), the Enterprise Information Technology Governance Council (EITGC).

4.4.2 Agency Governance

DSL has a governance structure to review IT projects and investments from an agency-wide perspective. The governance team, called DSL Change Management Committee (CMC), is composed of an executive, all program managers and the information technology manager/CIO.



The CMC is critical to a functioning governance structure since it encompasses all agency business areas. In the past most agency IT projects were focused on the program area and prioritized within the program. There has been a very limited approach to agency-wide projects or an enterprise business strategy to IT. The CMC also

struggles because they do not have business analysts who can identify the actual problem the business is attempting to solve and associate benefits and costs. If the CMC cannot come to an agreement as to which task needs to be prioritized first then the items are taken to the IT steering committee, which consists of DSL executives and the IT manager/CIO.

DSL has recently implemented a Change Advisory Board (CAB). DSLs CAB is responsible for implementing the process of controlling hardware, software, firmware, and documentation to protect the technology environment against improper modification before, during, and after system implementation. Managing these changes is a critical part of providing a robust and valuable infrastructure. Before any change is implemented, it must first be reviewed by the DSL CAB to ensure the requested change meets the business need, priority, and aligns properly to the enterprise.

There are three components to successful IT governance that DSL needs to incorporate:

1. A **formal IT strategic planning governance process** that aligns to agency goals and objectives with business engagement and responsibility at the executive level.
2. An **IT demand-side governance process** in place to prioritize IT projects that provide the most measurable benefit to the agency while also providing appropriate oversight. For demand-side governance to be effective, it should include an IT tactical plan that includes projects, resourcing needs and alignment to the strategic plan.
3. **IT supply-side governance**, which focuses on identifying which IT services are provided and the service level the IT organization operates at to support the agency. For supply-side governance to be effective, it should include an operational plan with service level agreements, resourcing needs and alignment to the strategic plan.

4.5 IT Security

Safeguarding DSLs agency data and systems is increasingly becoming more complex. Threats continue to increase and become more sophisticated across government and private sectors. These threats range from trying to gain access to personal information to encrypting entire systems for ransom money. DSL, like every other government entities continually experiences some type of cyber security threat on an ongoing basis.

Information security is primarily focused on the protection of information from various threats or unauthorized access. This protection results in minimizing business risk and maintaining business continuity. DSL is responsible for information security by establishing controls within existing business processes.

The state's Enterprise Information Services (EIS) is responsible for implementing the State Information Security Plan and the Statewide Information Security Standards Policy, which outline requirements for each state agency to follow when creating individual agency security plans.

IT Security Assessment and Controls

The Enterprise Information Services (EIS) conducted a CIS Controls Basic Assessment of DSL in October, 2018. Several vulnerabilities were discovered from the assessment, including a vulnerability with the Unclaimed Properties internet facing server resulting in data breach notifications to more than 180,000 individuals. Other vulnerabilities or weaknesses identified thru the assessment included password and security policy violations; time synchronization issues, and no central logging implemented. The subsequent investigation concluded that there was no evidence of any lateral movement by the identified hacking activities of the unclaimed properties system.

Significant improvements have been made with the Tenable Security Center deployment at DSL. Vulnerabilities per Host (VPH) have decreased from 1.46 vulnerabilities per host in July 2018 to .22 vulnerabilities per host in June 2019. The Agency still has improvements to make as our scan quality is still around 70% while the enterprise recommendation is 90%. DSL currently does not utilize the State's firewall and security services and has elected to managing their own perimeter, DMZ and VPN. This is a redundant cost since the State's EIS security services are paid for from an assessment cost to the agency for these services.

DSL has physical security items which are a part of daily operations. Door security access cards are installed on each entry door, as well as various other doors inside some of the facilities. This helps to ensure that only authorized personnel gain access to secure areas.

The Agency also has equipment for check out by DSL staff members for offsite meetings and other in field operations. This equipment can range from cell phones, wireless hotspots and to laptops, depending on the need.

DSL has implemented centralized logging for all systems including server and networking devices, however the solution does not provide for any analysis. DSL implemented Netwrix, a System Incident and Event Monitoring (SEIM) solution, for A/D, Servers and Networking devices. DSL plans to move from Netwrix to Elastics "Elastic Stack", a SaaS hosted solution.

DSL IT staff monitors numerous security functions of the agency. This is accomplished in a number of ways including reviewing automated alerts. The automated alerts are generated from a number of DSL systems including but not limited to Spiceworks, Netwrix, OpenNMS, and Fortinet. DSL IT staff also monitor the health and operations of our server and Active Directory infrastructures. Many of these specific monitors are accomplished thru PowerShell scripts and other scheduled tasks to report the overall health of various system such as Active Directory, Windows Distribution File System (DFS), and License usage for Arc-GIS.

DSL does not currently employ an internet proxy server supporting internet access throughout the agency. DSLs managed Fortinet firewall provides for some level of content filtering, the agency cannot restrict internet access based on Active directory users or groups. The agency also uses ActiveTrak to monitor internet usage, however ActiveTrak is not integrated with DSLs other logging solutions making investigations very difficult when correlating activities across the various platforms.

Level 3 Data Management

DSL currently does not maintain, process or store regulated data such as Criminal Justice Information (CJI), Federal Tax Information (FTI) or Social Security Administration Information (SSA), however DSL does maintain Protected Health Information (PHI) in the form of death certificates in the Unclaimed Property Program. Unclaimed Properties also maintains Personally Identifiable Information (PII) in the form of Social Security Numbers (SSN). DSL has found it difficult to transmit these documents electronically without an encrypted email solution. DSL is looking to leverage Office 365 Message Encryption to address these challenges.

Shared Service Support Issues

<u>Oregon Watershed Enhancement Board (OWEB)</u>

Beginning in December 2010, DSL began providing internet access to Oregon Watershed Enhancement Board (OWEB). This is accomplished by provisioning a separate interface for OWEB on DSLs agency firewall. Over the past 12 months, DSL has managed 9 issues to address unauthorized usage of TCP/IP port 25 thru the internet

services provided to OWEB. DSL also provides and supports a public wireless access point for OWEB which is connected to a public VRF on the DSL firewall.

There are numerous devices on the OWEB network that are not under management of DSL which further complicates DSL supporting the environment. Among those devices, OWEB has installed their own wireless access points which do not currently meet statewide information and cyber security standards, placing DSL, OWEB and LUBA systems at risk. Specifically, in July 2019, OWEB had compromised mobile devices connected to their wireless access point which was infected with HTML/Framer.INF!tr. DSL was unable to identify the infected source device due to the non-standard implementation of OWEBs access point configured as a "router".

Land Use Board of Appeals (LUBA)

LUBA has a custom application (Diary) originally developed for Microsoft Access which requires support, maintenance and development activity from DSL IT on a somewhat regular basis.

DSL does not have governing authority over OWEB and LUBA regarding how they utilize their systems. OWEB and LUBA are not currently required to follow DSL policies and procedures. As LUBA is directly connected and "coupled" to DSL systems (Active Directory, File shares, Exchange, etc.), LUBA introduces significant risk to OWEB and DSL systems. LUBA and OWEB are not integrated into DSLs governance structure ensuring systematic changes do not negatively impact other systems or business processes. Additionally, DSL is not staffed to operate as a data center or internet service provider and lacks the systems, policies and procedures necessary to ensure cross agency implementations do not impact each other.

DSL providing the above services to OWEB and LUBA are not in alignment with Oregon's Enterprise Architecture, Enterprise Information Services (EIS) policies and procedures or ORS 176A.300 as these implementations do not provide the oversight needed by EIS to ensure the confidentiality, integrity and availability of state resources are appropriately secured. As such, OWEB and LUBA should seek to decouple their services from DSL by engaging with DAS IT, EIS and ETS for the above services currently being provided and supported by DSL. Doing so will significantly diminish the security risks associated with DSL providing these services.

Security Initiatives

Competing priorities and implementation approval delays have kept DSL from implementing many security solutions needed. These solutions include but are not limited to:

- Mobile Device Management
    - Agency plans to implement Microsoft Intune which would be included in the Microsoft O365 M5 licensing.
- Multifactor authentication
    - In February of 2019, DSL had credentials compromised, likely due to a phishing email. This unauthorized access would not have occurred were MFA to be in place for access to our mail system.
- The Elastic Stack (ELK)
    - While the agency is now logging all server and network device logs to a central repository for "after the fact" investigations, we currently do not have the tools implemented to be able to quickly analyze and alert against these logs.
- RADIUS Authentication

- DSL has undergone significant efforts to ensure shared accounts are no longer used, however the need to maintain numerous accounts to manage our environment is taxing and complicated. Implementing RADIUS allows for DSLs infrastructure to be managed using central authentication and authorization.

4.6 Business Continuity/Disaster Recovery

A Business Continuity Plan (BCP) and a system Disaster Recovery (DR) solution are critical to the agency to sustain business services from a minor data loss disaster to a major disaster loss of IT and business services. The agency has a COOP\BCP, however it is not currently tested.

DSL has developed a Disaster Recovery Plan (DRP), however requires updating to include changes to the environment over the past several years. There is no process in place to ensure annual review and update of the DRP is conducted. The DRP is not currently tested and DSL has not implemented any tabletop exercises. DSL does plan to utilize the Cyber Security Services (CSS) in the near future to schedule tabletop exercises.

The agency currently does not have a Disaster Recovery Site and developing one is not currently planned or designed.

Backup and Recovery

DSL has challenges with increasing data growth, older backup system failing to meet capacity, and ability to migrate digital records for offsite storage for BCP purposes. The current backup system does not have reliable storage of the data and system in a number of areas to no backup at all in some areas. This is one of the most critical areas that needs to be addressed by leveraging the State's enterprise backup and disaster recovery system.

To reduce costs DSL also uses the backup system for a one year archive of all agencies data and needs to evaluate archiving needs and alignment with the State's data retention policy. DSL does not have an Email Archival system in place and will be leveraging the Statewide O365 email that will provide an archiving solution.

4.7 Enterprise Architecture

Information Technology Enterprise Architecture (EA) will help the agency make more effective decisions about which IT projects to pursue and which technology or products are best utilized in the implementation. This will help agencies eliminate waste and duplication, increase shared services, close performance gaps, and promote a broader engagement among government, industry, and external stakeholders. EA does this by conducting enterprise analysis to find common business needs and technology solutions which support the agency, policy area, and statewide strategies.

With the development of the new Land Administration System (LAS), DSL is reviewing overall agency application usages and applying an EA approach to the project.

4.8 IT Applications and Systems

The DSL Information Technology (IT) team supports most of the agencies commercial off the shelf systems (COTS) utilized by DSL staff. The agency does not support software development except for some customizations and integrations to existing web applications. There are approximately 85 currently known

applications supported by DSL IT. Historically, DSL has lacked maintaining an official approved software inventory with appropriate governance to oversee the applications in use by the various programs. The Agency is developing a formal request and approval process to only offer approved applications for implementation and support.

DSL has six system that support the core business processes for the agency and several of these are also utilized by other state agencies:

Land Administration System and CASH
The Land Administration System and CASH accounting/billing are two of the core applications that were developed in 1999. The technology is a legacy Power Builder client server platform that must be supported by a contractor since DSL staff do not have the expertise or needed resources. The two systems are highly integrated to support the day to day business process for permits and leases issued by the Real Property Program and the Aquatic Resource Management Program.

The complexity of the billing process has lead staff to use multiple Excel spreadsheets and Access databases to track billings. There are 50+ different regulatory and proprietary permit types. All the permit types have their own fee schedules and billing parameters.

The system replacement is currently a project to modernize business process and provide online services and mobile field computing.

Laserfiche
Laserfiche document management has been used by the agency over several years and is highly integrated in to the day to day business processes. The system allows the agency to store all document in a digital document for ease of storage and retrieval. The system is highly integrated into Land Administration System and Unclaimed Properties that utilizes one FTE to support the system. The system will need to be leveraged for integration with the new LAS system.

State Land Inventory System
The State Land Inventory System (SLIS) was developed in 2010 as low cost solution for managing real property information that is owned by the State of Oregon and administered by its various agencies. The system is maintained by the Oregon Department of State Lands (DSL) in cooperation with the Department of Administrative Services (DAS) and the 16 land-owning agencies. The system leverages ESRI Geographic Information System for mapping all properties and mineral rights.

There are several disparate systems between DSL, DAS and land owning agencies to manage state property. DSL and DAS need to partner to review the current systems and provide a system modernization plan for managing state owned property.

KAPS Unclaimed Properties
KAPS was implemented in September 2019. This system allows claimants to request payments of unclaimed property via the internet. The Unclaimed Property Program manages property previously held by an organization that has not had contact with the owner for an extended period of time. Property is usually considered unclaimed after one to three years, when it is then turned over to the State of Oregon. Banks, retailers, credit unions, utilities, corporations, insurance companies, and governmental entities are some of the many sources of unclaimed property. The system has over four million names and properties valued at more than $600 million combined, returning approximately $35 million to owners a year. The unclaimed properties

system was on an older legacy system that was found to have security vulnerabilities and possible breach in fall of 2018. The system was replace with a modern unclaimed properties system to mitigate further issues. During the 19/21 Legislature session Senate Bill 454 was drafted to transfer Unclaimed Properties to the Oregon Treasury. The Legislature has asked DSL and Treasury to develop a plan on the transfer and needed funding for the 21/23 session.

ESRI ArcGIS Geographic Information System (GIS)
DSL utilizes GIS for day to day business processes and analytics. A full description of the uses and services in covered in the plans GIS section.

SSNEER Applications
SSNERR requires 27 different scientific and technology application to support the business data collection and research needs. This has proven to be challenging since many of the SSNERR application technologies do not emerge quickly with upgrades or supported options. Many of these applications do not include deployment methods for deploying to multiple systems. Some of the applications in use require the use of software no longer managed or supported by the vendor. For example, the GPS units used for mapping require Microsoft Windows Mobile Device Center (WMDC). WMDC is no longer supported by Microsoft, therefore DSL has had to implement manual solutions to allow users to transmit the data captured by these devices to the DSL network. DSL has made significant improvements to ensure only vendor supported applications are in use.

SSNERR has proven to be difficult in modernizing applications due to the scientific nature of business done in that location. Many of the SSNERR application technologies do not emerge quickly with upgrades or supported options. Many of these applications do not include deployment methods for deploying to multiple systems. Some of the applications in use require the use of software no longer managed or supported by the vendor. For example, the GPS units used for mapping require Microsoft Windows Mobile Device Center (WMDC). WMDC is no longer supported by Microsoft, therefore DSL has had to implement manual solutions to allow users to transmit the data captured by these devices to the DSL network.

Appendix 1 lists all the known software applications supported by DSL IT.

4.9 IT INFRASTRUCTURE

DSL supports 3 primary office locations in Oregon; Salem, Bend and Charleston were the IT team supports and maintains its own infrastructure and data center at the Salem headquarters.

Salem HQ
The DSL data center houses 1 Nutanix hyperconverged appliance (hosting 25 virtual servers) and 3 physical servers that are running the Microsoft operating system or Ubuntu Linux. The lifecycle replacement for the Nutanix is 8 years. Salem also operates an aging intel blade servers hosting a backup server in the Salem DSL server room. The agency does not have an asset management plan and/or identified budget for replacing server / networking equipment when it is at the end of its lifecycle other than requesting budget increase through a POP when that time comes.

DSLs bandwidth to the internet in Salem is currently 250MB/950MB down/up. Bandwidth for SSNERR is 100MB synchronous and Bend is 14MB synchronous. The agency is currently working to increase speeds for the Bend office to 115 MB up and down.

South Slough National Estuarine Research Reserve (SSNERR) is comprised of 3 offices in Charleston, OR

Estuarine and Coastal Ocean Sciences (ECOS) Center has 2 physical servers for a Domain Controller (virtual), File/Print (virtual) and Backup (physical). Interpretive Center has 2 physical servers for File/Print and Backup. Maintenance/Spruce Ranch has networking and desktop services only. The network is provided by Oregon State University that has some reliability issues. DSL needs to look at network improvements from other resource to improve the reliability.

Bend

The Bend Office has two physical servers for File/Print, DHCP and local backups. The network is a state service but does not provide the needed bandwidth for staff to utilize the DSLs central data center. Improved network bandwidth would help to improve services for staff and manageability of the technology

Land Use Board of Appeals (LUBA)

DSL also provides supports and services to the Land Use Board of Appeals (LUBA):

- File Shares (~148 GB of data storage)
- Active Directory Services
    - 8 Computer Accounts
    - 9 user accounts
- Microsoft SQL Database Services
    - Diary Database
- Microsoft Exchange (email)
    - 8 mailboxes and addresses
- Software
    - Adobe Acrobat Pro (4 instances)
    - Office 365 (8 instances)
    - Laserfiche (8 instances)
    - Cylance (AV) (8 instances)

KnowBe4 (Phish training/testing) (8 instances)

Servers and Operating Systems

DSL primary operating system is Microsoft and Linux. DSL does not use Microsoft software assurance and have eight (8) server operating systems are nearing end of life. The existing Microsoft Windows Server 2008 servers will require extended support agreements in order to maintain security and critical updates until the server can be upgraded or migrated to a hosted solution such as the state data center or Microsoft Azure.

The server standard for the agency is Windows Server 2012. However the agency still supports a number of legacy servers back to Windows Server 2008 that are still in the environment, most of which is running in the Nutanix virtualization environment.

Server OS or Core Service	Quantity	Physical	Virtual	End Of Life
Windows 7	1	1	0	1/14/2020
Windows 2008 R2	8	0	7	1/14/2020
Windows 2012 R2	15	3	12	10/10/2023
Windows 2016 Hyper-V	1	1	0	1/11/2027
Microsoft SQL Server Std 2008 R2 SP3	1	0	1	7/9/2019
Microsoft SQL 2014	3	0	3	7/9/2024
Microsoft Exchange Server 2010	1	0	1	1/20/2020
Linux	12	0	12	N/A
Total	41	5	36	

Databases

DSL uses Microsoft SQL server for managing its application databases. The Production Microsoft SQL server is running Microsoft SQL 2008 Standard which also will require extended support agreements until the application can be upgraded or migrated to a hosted solution.

Data Storage

The department of state lands data repositories collectively amount to approximately 23 TB. This storage is production data and does not include storage for data backups or disaster recovery. There is approximately a 15% growth rate per year.

The services provided from the IT Team range from helpdesk request initiation and desktop support to server administration, procurement, email administration, and network administration. The one non-central IT technical staff provides localized services that only range up to light server administration; beyond that level of service, support is provided from the Salem IT Team. Salem IT Staff travel to Bend monthly to support their desktop needs and to South Slough when higher level support is needed.

Backup and Recovery

DSL manages the majority of the backups using their own BackupPC system. Core systems are backed up on the State's Commvault system. This is becoming more challenging to manage with the ongoing data growth within agency. The disaster recovery has only been tested on certain system areas with no major issues.

Network

The primary DSL network is utilized for the majority of production work throughout the agency for access to email, internet, file shares and software applications.

The agency utilizes segmented VLANs to provide wireless networking options for access to DSLs internal network, DMZ network, as well as a separate guest solution for visitors. One of the biggest challenges facing the team is the ability to support and modernize infrastructure while incorporating IT security. The security work is primarily one FTE who also provides server, networking, and Tier 3 desktop computer support among other job duties.

Contracts and Licensing
DSL maintains annual service contracts with several vendors to provide licensing, maintenance, and support above what agency staff are trained for and capable of providing. These contracts are managed by the IT procurement tech who is also the desktop tech.

The current desktop standard is Windows 10 and Microsoft Office 2016. DSL has historically ordered new computers with Windows 10 Pro preinstalled by the vendor. These systems are not re-imaged prior to deployment. The PCs are added to A/D, software installed and then deployed to the user. Microsoft System Center Configuration Manager (SCCM) in on the future roadmap to configure and deploy, however the agency must revise current licensing structure to include SCCM.

Email Services
DSL manages its own email system using a Microsoft Exchange server 2010 that is also at its end of life on January 14, 2020 and has only two people that can support it for the agency. The State strategy is to move to Office 365 which includes Microsoft cloud email and SharePoint services. Office 365 is a yearly lease model with free upgrades versus the Office 2016 which is a purchase model and does not include the email, SharePoint and ongoing upgrades.

Cloud Services
Due to numerous stakeholder requests to deliver documents digitally to DSL could data sharing service was implemented using a Dropbox solution. They system automatically downloads any files placed in the Dropbox repository directly onto a server share were staff can retrieve the documents. DSL is currently replacing the Dropbox functionality with Box.com since it incorporates improved security requirements using the Oregon IT contract security rider in the contract.

DSL will be include this functionality in the new LAS system, replacing Box.com.

Asset Management
DSL does not currently have an asset lifecycle management plan that tracks IT equipment, systems and applications associated with a defined biennium budget and owner, but the IT department has been asked to support them. In the past servers were used past the normal 5 year lifecycle and were not budgeted.

Software and Hardware inventories are not comprehensive or consolidated causing managing equipment lifecycle a challenge. Additionally, the lack of an approved software / application list causes staff to support many iterations or differing applications providing the same function. Microsoft System Center Configuration Manager (SCCM) includes automated software inventory tools that would be leveraged to ensure accurate software inventories are maintained. At this time, DSL does not have SCCM available due to our current Microsoft licensing.

Personal Computers/Devices and Management
Desktop and laptop computers and all monitors vary in brand,. The agency plans to implement Microsoft Intune once we move to the M365 licensing model. DSLs office products have been purchased under the Microsoft Office 365 E3 Product line. This service offering does not include other needed functions such as Microsoft System Center Configuration Manager (SCCM) which will allow the agency to maintain a “standard” desktop imaging solution. The agency is currently working with the EIS on a migration plan to include moving to M365, which includes SCCM. DSL also plans to implement additional services included in the M365 licensing including

Intune (Mobile Device Management), Multifactor Authentication and tools such as Teams as they are approved and available.

DSL also does not currently purchase Microsoft Windows 10 Enterprise licensing. All desktop licenses are purchased thru hardware resellers and do not include enterprise solutions such as bit locker (local hard drive encryption).

The agency issues smartphones at the request of managers for staff that require remote communications; these phones are on the Android platform and currently are not managed by a mobile device management solution. Multifunction Copiers for agency use are leased from Pacific Office Automation, and are generally printer/scanner/fax machines. DSL purchases desktop printers for some users workspaces (Human Resources, Executive management, etc.). DSL purchases network switches for the infrastructure and are primarily Cisco. All switches with one exception (Joe Nay Building) are managed devices.

The IT team often faces following challenges:

- Investing and updating old and incompatible technologies
- Inconsistent and non-standard operations and management (lack of service level agreements)
- Non-standardized program business rules and operations
- Data standards not understood or supported by the program
- Program-developed nonstandard applications (such as Access, Excel, etc..) and other Office sub-systems
- Lack of a fully staffed workforce to cover long business hours, weekends and off hours

4.10 E-GOVERNMENT AND E-COMMERCE

4.10.1 E-Government

DSL provides electronic services to the public ranging from information delivery on business services to interactive web applications. Agency programs must standardize their program business rules and operations to optimize e-Government business practices and provide a coherent e-Government services to the public and DSL's customers. Agency services that are current and planned are highlighted below:

- Redesign of the agency website to improve usability for stakeholders, allow users to find what they need quickly, and provide an overall public service focus on the site.
- DSL is working closely with the EIS eGovernment office and is aligned with its strategy
- DSL has been rolling out browser-based internet applications for the past 5 years. DSL would like to focus on providing more mobile technology for its stakeholders, general public and other government agencies.
- DSL has recently replace its antiquated Unclaimed properties system known as UPOnline with KAPS. The new solution is a SAAS based product allowing Oregonians the ability to quickly and easily search, file and check for status on unclaimed properties in their name.

4.10.2 E-Commerce

DSL contracts with NIC-USA for all of DSLs Credit Card processing for services and goods. There are currently 3 forms of Credit Card intake methods at DSL:

1. Online payments thru NIC-USA state web portal (apps.oregon.gov).
    a. Removal Fill Permits

   b. Leases, Easements, and Licenses
   c. Registrations
      i. Dock
      ii. Boat Houses
      iii. Boat Ramps
      iv. Pilings
      v. Floating Cabins
   d. Wetland Delineations
2. NIC-USA ACH debit payments
   a. Unclaimed Property Holder Payments made thru KAPS website
3. In person credit card machine
   a. This machine has only been used by the business three (3) times in the past two (2) years.
      i. Once for Unclaimed Property Finders CD Payment
      ii. Twice for ARM Program related permit payments.
   b. As this system is so seldom used, we are recommending to the Program that it should be removed.

The following table shows an increase of more than double the annual electronic transaction from FY 17 thru FY 19 using the state (NIC USA), agency or external online internet applications:

Ecommerce Receipts:

Department	State or External	Fiscal Year	Fiscal Year Annual Amounts
Department of State Lands	State	2017	$311,645
Department of State Lands	State	2018	$487,538
Department of State Lands	State	2019	$659,098

4.11 Geographic Information System (GIS) and Geospatial Data

DSL uses ESRI's ArcGIS through the state enterprise license agreement for their GIS software solution. DSL has implemented an ArcGIS Enterprise System that serves as a foundational Hub for GIS within the agency, which includes all mapping, visualization, analytic and mobile capabilities. DSL has standardized by using the ESRI suite of ArcGIS tools. DLS IT has two IT FTE that support the GIS applications and dataset as a portion of their duties.

All DSL owned GIS Data is in the process of being migrated to an Enterprise Geodatabase hosted in MS SQL 2014. These would include but not limited to the following:

- Essential Salmonid Habitat
- Heads of Tides
- Local Wetlands
- Surface/Sub-surface
- State Owned waterways
- Filled Lands

The above services are available from within DSL's Enterprise GIS Portal via REST endpoints. There are a few services owned by other source which, DSL has found necessary to download and offer back out to our customers. DSL is aware this is not the most efficient method of sharing these data but found it necessary for varies reasons such as, the need to change the way the service is displayed and/or performance issues. In many

cases by utilizing the Enterprise approach, DSL has easily been able to discover datasets from other providers without having to store them in a duplicative manner. Such datasets include Imagery, tax lots, public land survey system boundaries, etc.

DSL has also been able to establish a collaboration between DSL's Portal for ArcGIS and the State of Oregon's ArcGIS Online (AGOL) Portal. This allows DSL to share DSL dataset to the State's Enterprise hub while maintain security and integrity of the data from DSL's local Portal.

DSL currently has approximately 40 staff that utilize GIS tools on a regular basis at our Bend, Salem and South Slough offices. The Salem DSL IT/GIS program provides primary GIS support to these users via an agency GIS Coordinator, and IT GIS System Analyst. DSL utilize a FLEX License Manager (LM) which houses 12 Concurrent user licenses of ArcGIS Desktop/ArcGIS Pro (Basic), 7 Concurrent Advanced licenses of ArcGIS Desktop/ArcGIS Pro and 10 Named user licenses of ArcGIS Online hosted at the DAS Geo Office.

DSL has been a partner agency in the State's Enterprise License Agreement, between the State of Oregon's DAS Geo office and ESRI which provides ArcGIS software to agencies at a reduced cost. DSL shares the license among their Salem, Bend, and South Slough offices. In the last two years the South Slough office has been able to acquire some of their desktop ArcGIS licenses from NOAA free of charge. South Slough is a research partner that receives grant funding support from NOAA. In addition the South Slough office uses a few AGOL licenses via DSL because NOAA limits the use of their AGOL platform.

DSLs ArcGIS Enterprise system consists of:

- ArcGIS Portal
- ArGIS Server
- ArcGIS Data Store
- ArcGIS Web Adapter

DSL hosts the following primary Interactive GIS based web sites, among others, that both staff and the public all utilize:

- Published Services (REST Endpoints)
    - Ownership (Surface, Subsurface, Heads of Tides)
        - DSL Waterways
            - Navigable Rivers
            - Meandered Lakes
            - Tidally influenced Waters in the territorial sea
            - Portland Harbor Datasets
        - DSL Minerals (Track all state agency property ownership) (AKA State Land Inventory)
        - DSL Lands (Upland properties owned by DSL)
            - Elliot State Forest
    - Jurisdiction Coordinators
    - Mitigation Sites and Banks
    - ArcGIS Online
    - Essential Salmon Habitat
    - Local Wetlands Inventories
    - Wetland Mitigations

DSL leverages several Internet GIS services to conduct its business functions. Some of these services include:

- Department of Geology and Mineral Industries (DOGAMI) LIDAR hill shade service; used to portray the change in elevation in web, desktop, and print mapping.
- The DOGAMI LIDAR digital elevation models (DEM); used to create elevation contour lines for use in establishing regulatory jurisdiction and for establishing the extent of State ownership on waterways.
- DAS location services; used to find points of interest, such as searching for a specific city or address.
- The Federal government has deployed a wide variety of GIS data in Services that DSL makes use of such as the US Fish & Wildlife's National Wetland Inventory and the US Geologic Survey's National Hydrography Dataset.
- DSL relies on internet services for aerial photography, more commonly referred to as "imagery". DSL uses imagery from the Federal government in the form of the USDA's National Agriculture Imagery Program (NAIP), from the GIS company ESRI's World Imagery services, and Oregon's own Oregon Explorer Program.

These services are not only used to show current conditions, the historical imagery is often used to understand how conditions on the ground have changed over time.

In the past DSL's mobile GPS/GIS solution has been both Trimble Navigation and ESRI's ArcPAD software installed on dedicated Trimble PDA/GPS devices. We are currently planning to migrate to ESRI's mobile solutions, which consist of: Collector, Surevy123, and Native Apps by App Studio. All of these apps are free of charge and are in alignment with ArcGIS Enterprise and ArcGIS online.

DSL hosts the following primary Interactive GIS based web sites, among others, that both staff and the public utilize:

- State Lands Inventor (FLEX and JavaScript APIs)
- State Wetlands Inventory (JavaScript API)
- Essential Salmon Habitat (FLEX and JavaScript APIs)

DSL's overall GIS goals are to make available GIS resources while providing more efficient robust content management, collaboration, and outreach for our staff and stakeholders within the State of Oregon. We plan to accomplish this by using the full suite of tools available through the ArcGIS Enterprise System.

DSL's overall GIS goals for the new enterprise deployment are intended to provide for more efficient and robust content management, collaboration, and overall GIS resources to our staff and stakeholders within the State of Oregon.

DSL's does not have the DBA resource or expertise for managing the large amount of GIS data in their SQL database system. The GIS data lacks an ongoing review and needed maintenance work for normalization and optimization of the data as well as disaster recover planning and testing.

4.12 PROJECT MANAGEMENT AND IT PROJECTS

DSL IT provides support for all aspects of small, medium and large-scale information technology projects. Projects may be limited to a specific DSL program, division, agency-wide, inter-agency (within Oregon or other states) or related to federal agency information systems integrated throughout DSL.

DSL IT is responsible for:

- Consulting and assisting management and staff with operational improvements and analysis of program operations in conjunction with information technology
- Developing and documenting the practice of system development and IT project management disciplines at DSL
- Carrying out IT-related special projects as directed
- Accurately estimating software acquisitions, given a set of requirements and assumptions
- Developing task-level project plans and proposals by working with IT Project Managers and IT professionals
- Being the agency experts on IT project management and therefore participating in high level discussions and activities regarding strategic planning and IT governance

DSL does not currently have positions or duties for IT project management and business analysis. IT projects of any scale requires DSL IT staff and IT manager to have multiple duties to perform project management tasks as well as developing business requirements, stakeholder management, vendor and business expectations throughout each project. This is especially realized with small projects, which is mostly the size of IT projects DSL implements. Lacking project management for IT projects detracts from DSL IT's ability to focus on implementing and supporting IT solutions and does not align well with supporting our stakeholders.

4.12.1 Major Projects

Program Areas	Project	Budget	Status/Phase	Completion Time Frame
Agency Wide Except Unclaimed Properties	New Land Administration System (LAS)	$3,900,000	Planning / Stage Gate 2	TBD
Agency Wide	Firewall Replacement	$16,000	Hardware in testing	Oct 31, 2019
Agency Wide	Upgrade to M365 tenancy. Move Exchange to 0365.	$49,735 for 5 years	Initiation, waiting on ETS	TBD
ARM/CSFP	GIS Web Portal	Included in existing licensing	Design/UAT	Jan 2020
Agency Wide	Server/Service migration to Azure	$111,800 for 5 years	Initiation, waiting on approval	TBD

5 MAPPING GOALS AND OBJECTIVES

5.1 CORE CAPABILITIES

Governance • Information and IT Management • Enterprise Architecture, Policy, and Standards • Cybersecurity • IT Workforce Management			
Strategic Goal 1 ***"Supporting our Stakeholders"*** Integrating high quality information and IT solutions and excellent service delivery to accomplish the mission of the agency.	**Strategic Goal 2** ***"Stewardship of the enterprise IT resources"*** Effective management of resources through the cost- efficient implementation of information and IT solutions.	**Strategic Goal 3** ***"Enhancing information security"*** Protecting the confidentiality, integrity, and availability of agency information by strengthening our cybersecurity efforts with technology and human resources.	**Strategic Goal 4** ***"Investing in our workforce and partnerships"*** Strengthening our IT skills and ability to provide quality resources while building strong partnerships within the business and IT community.
Objectives 1.1 Improve delivery of enterprise information and IT solutions by understanding stakeholder needs and activities. 1.2 Create new capacity and collaboration mechanisms through cloud services that will achieve enhanced performance of information access and implementation of IT solutions. 1.3 Ensure the availability of and access to information that enables stakeholders to make timely, informed decisions. 1.4 Provide IT solutions by deploying innovative information technologies while enhancing existing technologies.	Objectives 2.1 Implement enterprise information systems, policy and standards. 2.2 Develop comprehensive IT costing and benefit measures. 2.3 IT decisions are informed and supported by strong governance processes. 2.4 Increase the efficiency of agency IT investments by streamlining IT acquisition and improving project management processes.	Objectives 3.1 Establish and implement agency standards and expectations to fulfill state security requirements. 3.2 Prevent and promptly resolve cybersecurity threats by strengthening agency situational awareness through IT security assessments, incident response plans security training and communication.	Objectives 4.1 Proactively support the agency information technology needs with a talented, diverse workforce. 4.2 Utilize IT industry best practices to execute staff responsibilities. 4.3 Collaborate with government, industry, and academic partners to share information and foster innovation.

6 STRATEGIC OBJECTIVES

Strategic objectives were developed to advance the use of IT resources to support agency missions, goals and objectives. The identified objective outcomes guide agencies in developing supporting initiatives and identifying IRM alignment with existing strategies.

GOAL 1 - SUPPORTING OUR STAKEHOLDERS

Objective 1.1

Improve delivery of enterprise information and IT solutions by understanding stakeholder needs and activities. ***Objective outcomes*** – Identification of stakeholders, roles and expectations. Implementation of IT systems that meet stakeholder needs. Obtaining stakeholder feedback throughout the system lifecycle to improve, maintain and understand user preferences.

- Core Mission System Modernization of Land Administration System and State Land Inventory (SLI).
- Utilize industry best practices for Project Management and Business Analysis on IT projects .
- Document current state business process and develop business process improvement for future state
- Develop business requirements for selecting systems that best meet the business needs
- Utilize Software as a Services that provide ongoing improvements and lessens IT supportability and customization.

Objective 1.2

Create new capacity and collaboration mechanisms through cloud and/or State shared services that will achieve enhanced performance of information access and implementation of IT solutions. ***Objective outcomes*** – Implementation of collaboration services, capitalizing on cloud technology to improve information input, decision making and IT performance.

- Utilize the Oregon Data Center Services (DCS – formerly State Data Center SDC), Cyber Security Services (CSS -formerly Enterprise Security Office ESO) and/or cloud services.
- Migrate into the Enterprise Email and Office 365 cloud services for collaboration internally and with stakeholders

Objective 1.3

Ensure the availability of and access to information that enables stakeholders to make timely, informed decisions. ***Objective outcomes*** – Maintaining an accurate asset inventory, Identification of the usability of systems, need gaps and plans for improving or replacing systems that do not meet stakeholder's needs.

- Leverage a Service Desk and Asset Management System to assure accurate inventory and management of the assets.
- Develop an IT operational plan for IT life cycle management and associated policy.

Objective 1.4

Provide IT solutions by deploying innovative information technologies while enhancing existing technologies. ***Objective outcomes*** – Consideration of Enterprise Architecture and system designs that allow for phased development or implementation and modulated systems that can be modernized without impacting core systems.

- Develop Land Administration System business process improvements for all program areas that will look at enterprise system or modular systems that are integrated.
- Ensure IT resources are staffed appropriately to provide the needed support to insure IT investments and data are maintained to meet ongoing business needs through continuous process improvement.

GOAL 2 - STEWARDSHIP OF THE ENTERPRISE IT RESOURCES

Objective 2.1

Implement enterprise information systems, policy and standards. ***Objective outcomes*** - Merging of disparate systems. Collaboration both internally and across agencies to provide better citizen services.

- Land Administration System (LAS) project will collect an inventory of all disparate DSL business systems and manual processes to integrate them into an enterprise system.
- Continue to collaborate with other agencies and stakeholders on State Lands Inventory System (SLI) and Land Administration System permitting business requirements and system selection.
- Continue to engage in and utilize the State's new enterprise eProcurement system (OregonBuys)
- New IT systems will provide a citizen/stakeholder Internet service portal for service delivery, collaboration, transparency, and information sharing.
- Continue to utilize and leverage online payment processing for services offered.

Objective 2.2

Develop comprehensive IT costing and benefit measures. ***Objective outcomes*** – Comprehensive budgeting of IT resources across agencies. Use of equitable service allocations that are easily understood and supported. Implementation of performance measures on services and systems. Identification of gaps in needed services and costs which will be used for governance and strategic planning.

- Implement an IT service desk that will track service request and performance measures.
- Leverage the IT service desk to enable DSL IT to track and report on items that have a budget impact enabling DSL to more accurately prepare for biennium budgeting and POPs.
- IT business projects will develop a business case that includes a cost benefit analysis and project process that include business benefits management and realization plans.

Objective 2.3

IT decisions are informed and supported by strong governance processes. ***Objective outcomes*** – Ensure business responsibility for IT demand governance, providing measurable benefit to the agency and project oversight. Ensure IT supply-side governance, providing IT operational service levels that support the agency.

- Enhance the current IT governance structure that incudes key program managers and develop a governance framework and charter.
- Continue to develop and grow the DSL Change Management Committee (CMC) and Change Advisory Board (CAB) to ensure agency leadership and business stakeholders have appropriate oversight and engagement with all DSL IT systems.

Objective 2.4

Increase the efficiency of agency IT investments by streamlining IT acquisition and improving project management processes. ***Objective outcomes*** – Develop statewide price agreements, strategic partnerships and

vendor management that reduces acquisition cost and time. Ensure projects are delivered to meet business needs, are on schedule and within budget projections.

- Continue to evaluate opportunities to utilize State Base Camp IT price agreements for technology purchases and resource services for projects and staff augmentation needs.
- Continue to work with the DAS Enterprise Information Services (EIS) to ensure the agency is following best practices for project management on IT projects and engage staff with State project management training opportunities.

GOAL 3 - ENHANCING INFORMATION SECURITY

Objective 3.1

Establish and implement agency standards and expectations to fulfill state security requirements. ***Objective outcomes*** – Create and/or update agency security policies and operational procedures. Schedule annual assessments and cybersecurity exercises.

- Continue to work with Enterprise Information Service (EIS) Cyber Security program in evaluating and update DSL's IT security policy on an annual basis for compliance with the State's IT security policies.
- Continue to develop System Security Plans for all new and existing systems to insure compliance with DSL's and State's IT security policies.
- Continue to ensure all systems have operational management procedures that include monitoring, vulnerability scanning and logging.
- Ensure all new systems have Disaster Recovery Plans and needed redundancy to support the agencies Business Continuity Plan.

Objective 3.2

Prevent and promptly resolve cybersecurity threats by strengthening agency situational awareness through IT security assessments, incident response plans, security training and communication. ***Objective outcomes*** – Develop IT security assessments, mitigation plans and strategic initiatives. Establish a security training partnership with IT, HR and Communication Officers to improve ongoing communications. Continue data classification efforts to ensure information security.

- Continue to utilize and enhance the agencies vulnerability scanning.
- Continue to require yearly, ad-hoc and new employee IT security training using State's iLearn system and DSL training ongoing and new threat awareness.
- Migrate to and leverage the State's Enterprise Firewall
- Develop plans to utilize Data Center Services and/or cloud solutions for Back-Up services
- Develop IT security incident response plan
- Continue to engage in third party IT security assessments on an annual basis
- Annually test the agencies disaster recovery plan

GOAL 4 - INVEST IN OUR WORKFORCE AND PARTNERSHIPS

Objective 4.1

Proactively support the agency information technology needs with a talented, diverse workforce. ***Objective outcomes*** – Perform ongoing workforce skills assessments. Develop workforce plans in alignment with strategic initiatives i.e. succession planning, diversity training and hiring practices.

- Develop an operational plan that outlines IT resource capacity, capability, expertise with needed development/training plans to support IT operations and strategic initiatives.
- Identify gaps in specific expertise and/or capabilities of current staff to support DSL systems and infrastructure.

Objective 4.2

Utilize IT industry standards and best practices to strengthen and mature processes. ***Objective outcomes*** – Establish operational best practices and training using industry standards such as ITIL, COBIT, EA, SANS and PMBOK. Provide ongoing training and development of procedures and supporting strategic initiatives.

- Develop IT, security and operational policies and procedures in alignment with local, state and federal rules and requirements.

Objective 4.3

Collaborate with government, industry, and academic partners to share information and foster innovation. ***Objective outcomes*** – Implement workforce training and system designs that promote enterprise data sharing and collaboration such as geospatial data sharing partnerships, shared services and stakeholder collaboration.

- Continue to leverage shared DOGAMI Lidar data at the Oregon Data Center Services (DCS) services.
- Collaborate with other agencies for the Land Administration System project and State Land Inventory System to ensure the systems improve data sharing and support other agency services.

7 APPENDIX 1

Program Area	Key Applications
Information Technology	• BackupPC – File-level local backups of agency data • Foldermatch – Used by 2 staff for file content comparisons and synchronization • iTarian Remote Control – Remote support tool used by IS staff • Java – Used ubiquity unify controller (Wifi); GIS applications • Netwrix – Pseudo SIEM – Automatic Security Reporting • NXLog – Central System Logging Facility mechanism used on Microsoft servers. • OpenNMS – Network Management System (Up/Down Reporting) • Powerchute – automated UPS Server control • Putty – Terminal Emulator • Tenable Security Center – State Data Center hosted Security Scans • Ubiquiti Unifi – WiFi Configuration and management
Finance	• Rocket BlueZone – Terminal Emulator to mainframe • SAP SFMA access (DAS Managed Application) • Cash (LAS Financial System) • Hyperion – Used by Finance to connect to Datamart hosted by SFMA
Support Services	• Dymo Label Printing – Label Printer
Unclaimed Property	• KAPS/ONBASE – SAAS for Unclaimed Property • Time Matters – Estate Time Tracking and case management
HR / Managers	• ActivTrack – User activity monitoring
SSNERR	• Adobe Illustrator – Graphics editor • Adobe InDesign – Desktop publishing • Adobe InDesign CS6 – Desktop publishing • Convert to Rinex – Data conversion utility • Device Configuration Utility (Campbell Scientific) – Hardware setup utility • Endnote – Note and collaboration tool • GPS Configurator – Hardware setup utility • GPSBabel – GPS Points conversion utility • Hoboware - Graphing and analysis software • Hyperterminal – Terminal Emulation software • IDEXX MPN Generator – Test calculation utility • KOR-EXO - Instrumentation and water quality data manager • Levellogger - Submersible pressure transducer management software • LoggerNet – Datalogger utility software • Olympus GPS Utility – GPS operation utility • Permanova - Permutational multivariate analysis of variance utility

	• PowerBI – Business Intelligence software (Microsoft) • Primer – Univariate, graphical and multivariate routines for analyzing arrays • Primer 7 – Univariate, graphical and multivariate routines for analyzing arrays • R – Scientific integrated development environment (IDE) application • R Studio – Scientific integrated development environment (IDE) application • SAMI_Client – Sunburst Sensor analysis client • SatLink Communicator – Satellite communications application. • SCS Data Manager - organizes and updates site controller data • Sprinter DataLoader – Convert measurements to excel format • UASMaster - Photogrammetry-Grade Processing for Unmanned Aerial Systems (UAS) and Terrestrial Close-Range Imagery • VDatum - Vertical Datum Transformation software by NOAA

All	• 7-Zip – File compression and encryption utility
	• Adobe Acrobat DC Pro – Working with PDF files
	• Adobe Acrobat DC Reader – Working with PDF files
	• Adobe Flash Player – Working with Flash files
	• Adobe Photoshop Elements – Photo editor
	• ArcGIS – ESRI's suite of GIS utilities
	  ○ ArcCatalog – Maintain geospatial data and the corresponding metadata
	  ○ ArcGIS Desktop – create, analyze, manage and share geographic information
	  ○ ArcGIS Pro – create, analyze, manage and share geographic information
	  ○ ArcMap – Primary GIS Application
	  ○ ArcPad Studio – Map-centric, Windows-based mapping and field data collection utility
	  ○ ArcGIS Server - platform for sharing your GIS resources
	Comodo/Itarian – Endpoint Security
	• Cylance – Antivirus
	• Daisy - Java/XML open-source content management system (Wiki)
	• DropBox – File storage and collaboration
	• FileZilla – FTP client
	• FortiClient SSL VPN – VPN client
	• Google Earth Pro – Online mapping tool
	• Greenshot – Screen capture utility
	• Land Administration System (LAS)
	• Laserfiche – Document management server and client
	• MailChimp – E-mail marketing
	• Microsoft Business Intelligence (BI) – Business analytic software
	• Microsoft Office 365
	• Microsoft Project 2016 / 2016 Pro
	• Microsoft Visio 2016 / 2019

	• Smartsheet – SAAS solution that allows DSL to plan, capture, manage, automate, and report on work across the business.
	• Spiceworks – Helpdesk ticketing and inventory system
	• Trimble Office - Manage, process and create deliverables for all survey tasks
	  ○ Trimble Business Center
	  ○ Trimble Data Loader
	  ○ Trimble Data Transfer
	• VLC Media Player - Multimedia player
	• WEPP model for Windows - Process-based, distributed parameter, continuous simulation, erosion prediction model software
	• WordPress - Online, open source website creation tool
	• Zoom - video communication and collaboration application