

Sen. Nancy Todd, Chair
Sen. Jeff Bridges
Sen. Jack Tate

Rep. Jonathan Singer, Vice-Chair
Rep. Mark Baisley
Rep. Brianna Titone



Joint Technology Committee

State Capitol Building, Room 029
Denver, Colorado 80203-1784
(303) 866-3521



February 25, 2019

Senator Dominick Moreno
Chair, Joint Budget Committee
200 East 14th Avenue, Third Floor
Denver, Colorado 80203

Dear Senator Moreno,

On February 22, 2019, The Joint Technology Committee (JTC) met to review three FY 2019-20 information technology operating budget requests that were referred to the committee by the Joint Budget Committee (JBC) pursuant to Joint Rule 45 (a)(3)(B). The JTC recommends fully funding all of the requests, as submitted. JTC staff analyses of these requests can be found in Attachments A, B, and C.

Judicial Department Request

R-06: IT Infrastructure. In a February 6, 2019, letter to the JTC, the JBC requested that the JTC review the Judicial Department's FY 2019-20 operating budget request R-06, IT Infrastructure, for \$8,393,774, including \$2,744,021 General Fund and \$5,649,753 cash funds. After consideration, the JTC recommends fully funding the request.

During its deliberations, the JTC encouraged the department to continue to seek efficiencies in its IT operations, including increasing its use of cloud services, taking into consideration broadband bandwidth and data security issues, and examining leasing options instead of purchasing IT hardware used by the department. The JTC also expressed concerns related to the department's extensive use of custom software applications and encouraged the department to examine this practice.

Governor's Office of Information Technology Requests

In a January 4, 2019, letter to the JTC, the JBC requested that the JTC review two of the Governor's Office of Information Technology (OIT) FY 2019-20 operating budget requests.

R-02: Securing IT Operations. The JBC requested that the JTC review OIT's R-02 request, Securing IT Operations, for \$11,857,490 in reappropriated funds and 9.0 FTE. After consideration, the JTC recommends fully funding the request and supports OIT's cybersecurity initiatives.

R-06: Enterprise Data Integration Services. The JBC requested that the JTC review OIT's R-06 request, Enterprise Data Integration Services, for \$3,139,756 in reappropriated funds and 2.0 FTE. After consideration, the JTC recommends fully funding the request and supports OIT's efforts to further integrate and share data across different agencies, and with the public, as is appropriate.

If you have any questions or concerns about the JTC's recommendations, please call Luisa Altmann, Legislative Council Staff, at 303-866-3518.

Sincerely,



Senator Nancy Todd, Chair
Joint Technology Committee

c: Joint Technology Committee Members
Joint Budget Committee Members
Joint Technology Committee Staff
Hugh Wilson, Judicial Department
Lauren Larson, Office of State Planning and Budgeting
Andrea Day, Office of State Planning and Budgeting
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Memorandum

February 15, 2019

TO: Joint Technology Committee

FROM: Luisa Altmann, Research Analyst, 303-866-3518
Joint Technology Committee Staff

SUBJECT: JTC Staff Analysis of JBC-Referred FY 2019-20 Budget Request
Judicial Department
R-06 Information Technology (IT) Infrastructure

Summary of Request

The Judicial Department is requesting \$8.4 million for FY 2019-20, including \$5.6 million in cash funds spending authority and \$2.7 million General Fund, for a variety of IT infrastructure projects.

Reason for Referral

This memorandum responds to the letter sent by the Joint Budget Committee (JBC) following the staff briefing on the Judicial Department on December 5, 2018, requesting that the Joint Technology Committee (JTC) provide a technical review of the department's FY 2019-20 IT infrastructure budget request. Additionally, JBC staff expressed concerns about the ability of the Judicial Department Information Technology Cash Fund to support the ongoing operating expenses that will result from the projects being requested.

Staff Analysis

JTC staff believes that the department has provided ample detail and information related to the request and has no significant concerns, especially given that the majority of the request is cash-funded.

Request Details

The Judicial Department is requesting the following components as part of this budget request. The exact amounts for these components are shown in Appendix A.

IT infrastructure – \$8.1 million. This money will be used for a variety of projects to upgrade IT infrastructure in judicial districts across the state. This includes:

- \$4.4 million for a variety of hardware, software, and professional service support related to IT infrastructure, including \$1.9 million for CenturyLink telecommunication and network costs; \$1.9 million for a variety of operations and maintenance software and hardware acquisitions, such as server hardware maintenance, Microsoft datacenter software licensing, and server backup software; and \$0.7 million for operations and maintenance support services;
- \$2.0 million to upgrade the phone, network, and wireless systems at 13 county court locations; and
- \$1.6 million for the replacement of IT infrastructure at locations across the state, including replacing: 78 outdated servers that are distributed across 26 locations with a modern, centralized server solution in five data center facilities; end-of-life routers and switches at 74 facilities; and end-of-life wireless access points at 22 facilities.

Technical services – \$4.8 million. This money will be used to transition the department to Microsoft Office 365; replace desktop and laptop computers within the department; and acquire a variety of software licenses and services, including VideoLink software which enables remote appearances from jails and other facilities.

Application development – \$1.8 million. This money will be used to support the department's case management system and e-filing programs with ongoing software licensing; build a data warehouse solution to increase the department's ability to generate reports from multiple data sources; and replace the current technology that is being used to provide search functionality within the department's public and intranet websites.

Executive services – \$1.7 million. This money will be used to contract with outside vendors for the provision of staff support and consulting services on a variety of projects. The department plans to fill several roles, such as Chief Technology Officer, enterprise architect, and database administrator, on a contract basis while the department determines the long-term need for these to be permanent positions.

IT security – \$1.2 million. This money will be used to obtain IT security professional services, including the performance of an information security assessment, and to acquire a variety of IT security software and hardware, such as endpoint/malware protection software, identity management software, web filtering hardware, and anti-virus software. This also includes the development of an enterprise encryption system to properly secure personally identifiable and confidential information stored on the department's file shares.

Justification. According to the department, the various projects and initiatives contemplated in this request will enable the department to provide the necessary support to courts and probation, ensure public safety across the state, and provide a high level of customer service to the citizens of Colorado. Justification for the individual components of the request are as follows:

IT infrastructure. The department conducted a statewide technology health assessment at all remote courthouse and probation locations. This assessment determined a need to replace end-of-life and end-of-support equipment across the state to prevent facility outages and the delay of essential services to the public.

Technical services. The department is requesting to transition its users from Microsoft Office 2010 to Microsoft Office 365 to address security vulnerability and to support the move of the department's email service to the cloud. Additionally, the department is currently on a four-year replacement cycle for laptops and desktops, which allows it to leverage updated technologies and security improvements and to help with operating system transitions. Finally, the department is requesting maintenance and support for VideoLink, which enables remote appearances from jails and other facilities, thereby saving counties from having to pay to transport individuals for these appearances.

Application development. A major component of this portion of the application development request is designed to build a data warehouse to improve reporting capabilities within the department, which will provide key decision makers within the department, the public, and other government agencies with the information they need. The data warehouse will be built to aggregate the department's large volume of complex data and address current reporting limitations related to the required manual manipulation of certain data, the inability to do certain trend analyses, and the time required to run certain reports.

Executive services. An independent IT assessment performed in June 2018 recommended the establishment of several key IT positions within the department's IT organizational structure. The additional staff is needed to help the department establish recommended IT governance and enterprise architecture structures and processes and to help modernize the department's enterprise case management, public access, data exchange systems, and infrastructure.

IT security. The department is requesting funding to enhance and implement a variety of data, hardware, and software security controls designed to protect access to, and storage of, personally identifiable information and confidential information.

Cash funds. The Judicial Department Information Technology Cash Fund, created in Section 13-32-114, C.R.S., is funded with fees and cost recoveries related to electronic filings, network access and searches of court databases, electronic searches of court records, and any other IT services. The cash fund is subject to annual appropriation by the General Assembly to the Judicial Department for any expenses related to the department's IT needs.

The department has made the decision to increase spending from the cash fund on IT infrastructure needs to bring the fund into compliance with the statutory fund balance limit. In response to JBC staff concerns, the department has indicated that it believes the cash fund will be able to sustainably support the anticipated operations and maintenance costs.

General Fund projects. The request includes a total of \$2.7 million from the General Fund, which is to be used to support projects that will be primarily based in county courthouses, including:

- replacing phone, network, and wireless infrastructure at 13 district court locations;
- replacing and centralizing district court servers; and
- providing VideoLink maintenance and support.

Options for Committee Action

The JTC has three options for committee action when it provides a technical review of an operating budget request to the JBC. The JTC can:

- recommend the request to the JBC for funding with no concerns, as outlined in the JTC Staff Analysis section;
- recommend the request to the JBC for funding with concerns; or
- not recommend the request for funding with concerns.

**Appendix A
Judicial Department Budget Request Details**

IT Infrastructure: \$8,095,688

Item	Cost
Statewide projects to:	\$1,622,865
<ul style="list-style-type: none"> • replace and centralize 78 district servers across 26 locations; • replace end-of-life and end-of-support routers and switches at 74 facilities; and • replace end-of-life and end-of-support wireless access points at 22 facilities. 	
Upgrade the phone, network, and wireless systems at 13 county court locations	\$2,046,115
Baca County Combined Court	\$103,523
Broomfield County Combined Court	\$103,323
Cheyenne County Combined Court	\$103,523
Commerce City Probation	\$195,444
Denver District Court (Civil)	\$530,627
Jackson County Combined Court	\$84,096
Jefferson County Combined Court	\$203,621
Kiowa County Combined Court	\$103,523
Logan County Combined Court	\$195,744
Morgan County Combined Court	\$195,444
San Juan County Combined Court	\$45,128
Sedgwick County Combined Court	\$103,223
Teller County Combined Court	\$78,896
Software & Hardware	\$3,767,153
CenturyLink telecommunication & network circuit costs	\$1,867,080
Annual network equipment maintenance & support	\$276,543
Server hardware maintenance	\$225,436
Microsoft datacenter software licensing	\$225,283
Application server software	\$187,395
Enterprise document management system software	\$183,650
Physical storage maintenance & support	\$154,600
IBM hardware licensing & support	\$139,392
Server backup software	\$97,675
IBM software licensing & support	\$96,736
Network equipment (spare routers, switches, UPS units, etc.)	\$83,000
Data replication & high availability software	\$80,000
Phone system software & hardware licensing, maintenance, & support	\$34,785
Learning management software	\$34,500

**Appendix A (Cont.)
Judicial Department Budget Request Details**

IT Infrastructure Software & Hardware (Cont.)

Item	Cost
Virtual server software licensing & maintenance	\$25,116
Network monitoring software	\$25,000
Rocket Software support & maintenance	\$12,352
Wireless spectrum analysis toolkit	\$8,000
Desktop management software	\$7,890
FTP software	\$1,780
WordPerfect software (for document conversion)	\$940
Professional Services	\$659,555
Contract senior iSeries systems engineer to provide daily support of its mission critical iSeries (AS/400) servers	\$251,520
Statewide managed services network and phone support for the Department	\$222,135
Professional services needed to assist department IT staff with highly complex technical issues, such as storage management, advanced server and network design and support, load balancer support, and assistance with problem identification and resolution	\$91,400
IBM hardware and software support	\$77,000
Enterprise document management system support	\$17,500

Source: Judicial Department.

**Appendix A (Cont.)
Judicial Department Budget Request Details**

Technical Services: \$4,841,548

Item	Cost
Chat support for internal customers & external customers (public, attorneys, etc.)	\$20,000
Replace desktop & laptop imaging system	\$150,000
Imaging services	\$82,000
Software & Hardware (Operations & Maintenance)	
Laptop/desktop replacements	\$1,815,000
Microsoft Office 365 & Windows 10	\$1,500,000
Courtroom audio recording & monitoring software & hardware	\$383,282
Desktop/laptop hardware maintenance	\$118,728
Public access terminal software solution for courts & probation	\$103,885
IT service management/ticketing system	\$87,864
Printer replacements & maintenance for courts & probation	\$56,870
IT asset management software solution	\$51,931
Annual maintenance for statewide PDF editing software solution	\$50,046
Print server management maintenance	\$41,227
Desktop backup software solution	\$33,015
Desktop/laptop specialized software (MS Project & Visio) licensing	\$19,229
Mobile device management software	\$11,229
Professional Services	
IT service management/ticketing system consulting services	\$17,243
VideoLink	
Polycom video conference maintenance	\$150,000
Dedicated technician to support video conferencing equipment in all equipped courtrooms	\$150,000

Source: Judicial Department.

**Appendix A (Cont.)
Judicial Department Budget Request Details**

Application Development: \$1,778,023

Item	Cost
Build a data warehouse solution	\$691,500
Website search functionality	\$50,000
Software licensing, including:	
<ul style="list-style-type: none"> • Rocket Software, which the department's legacy case management system (ICON/Eclipse) is built upon; • electronic document software that supports the department's e-filing program, such as tools which convert documents to PDF to allow courts and probation to scan and upload documents into the case management system; • the department's business intelligence software, which provides reporting capability for the department to respond to data requests from the public, legislation, and internal customers; • development tools that are necessary for the department's application development teams to build and support our internal case management and e-filing applications; and • professional services that provide development and support services for the department's case management system and business intelligence program. 	\$1,036,523

Source: Judicial Department.

**Appendix A (Cont.)
Judicial Department Budget Request Details**

Executive Services: \$1,686,400

Project/Task	Position/Consultant Role	Total FY 20 Hours	Hourly Rate	Total
Assist the department CIO by overseeing all critical enterprise system design decisions and changes in architecture, to include a Cloud strategy.	Chief Technology Officer	1,248	\$175.00	\$218,400
Responsible for helping design and modernize the department's case management system, public access, and data exchange systems with external state and local agencies.	Enterprise Architect	1,248	\$165.00	\$205,920
Responsible for helping the department assess the overall health of its databases and ensure optimization of its systems and applications.	Database Administrator	832	\$120.00	\$99,840
Responsible for all architecture and design decisions, advanced system administration tasks, and ensuring the department's systems are up 24/7.	Lead iSeries System Architect	2,080	\$127.00	\$264,160
Responsible for helping the department establish an enterprise level Quality Assurance Program.	Quality Assurance Engineer	1,248	\$133.00	\$165,984
Responsible for helping the department migrate from its legacy programming language to a sustainable and supportable programming language.	2 Senior RPG Software Engineers	4,160	\$140.00	\$582,400
Management consulting services for the implementation of COBIT 5, which is a nationally leading business framework for the governance and management of enterprise IT.	Senior Management Consultant	832	\$180.00	\$149,760

Source: Judicial Department.

**Appendix A (Cont.)
Judicial Department Budget Request Details**

IT Security: \$1,248,383

Security Software & Hardware		Cost		
Encryption software for file servers			\$320,000	
Endpoint/malware protection software			\$184,403	
Identity management software			\$145,800	
Web filtering hardware			\$120,000	
Implement basic TrustSec and 802.1x Phase 1 (SCAO, COA, & One Judicial District)			\$100,000	
Anti-virus software			\$73,000	
Information security training software			\$70,000	
Managed Engine AD audit software			\$36,000	
Secure website certificates			\$29,000	
Security Information and Event Management System (SIEM) software			\$20,000	
Email encryption software			\$10,000	
Firewall & intrusion detection/prevention hardware			\$9,500	
Vulnerability and penetration testing software			\$3,600	
Security Professional Services		Hours	Hourly Rate	Total
Information security professional services (for software & hardware)		160	\$165	\$26,400
Identity management professional services		120	\$170	\$20,400
Information security assessment				
Information Security Assessor/Penetration Tester		40	\$147	\$5,880
Senior Security Analyst		180	\$120	\$21,600
Senior Security Engineer		220	\$130	\$28,600
Information Security Analyst		220	\$110	\$24,200

Source: Judicial Department.



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Memorandum

February 15, 2019

TO: Joint Technology Committee Members

FROM: Jean Billingsley, Senior Research Analyst, 303-866-2357
Joint Technology Committee (JTC) Staff

SUBJECT: JTC Staff Analysis of JBC-Referred FY 2019-20 Budget Request
Colorado Governor's Office of Technology
R-02 Securing IT Operations

Summary of Request

The Governor's Office of Information Technology (OIT) is requesting \$11.8 million and 9.0 full-time employees (FTEs) in FY 2019-20 for four IT security operations projects and to accelerate its existing Security Colorado initiative, consisting of seven projects.

Reason for Referral

This memorandum responds to the January 4, 2019, letter from the Joint Budget Committee (JBC) to provide a technical review of the OIT FY 2019-20 Securing IT Operations budget request (request).

Staff Analysis

Staff found that the justification, cost estimates, and research that OIT provided to support its FY 2019-20 operating budget request is thorough and detailed. Staff recognizes that assessing technology risks, including identifying potential security threats (i.e., computer viruses) and vulnerabilities (i.e., outdated server patches) has become a critical function for the state. IT security assessments may lead to a decision to mitigate a security risk by implementing security controls. Even so, the decision to mitigate a risk depends on the options and the tolerance level of the organization to accept a security risk. On that basis, OIT says that this request addresses all of its identified needs, and it has no plans to procure additional IT security software or services in FY 2019-20.

Specifically, the request addresses gaps discovered after the Colorado Department of Transportation (CDOT) security incident, and mitigates cloud solution security vulnerabilities with additional FTEs,

term-limited contractors, software, and hardware by creating four IT security projects and accelerating the existing seven Secure Colorado projects. For each additional FTE and contractor position needed for the security projects, OIT provides a description of the role, and corresponding role responsibilities, along with estimated hours for each role. OIT also provides itemized cost estimates, milestones, planned end dates, and details for each of the projects described in the request. Finally, OIT explains the need for security personnel training, security staff salary increases, and the creation of essential documentation.

Request Details

OIT explains that the request will mitigate security risks by adding or improving its existing IT security human resources, processes, technology, and services. In the request, OIT references the security incident that occurred at CDOT in February 2018. Roughly half of the department's computers were attacked by ransomware, which is malware that infects a computer, and restricts user access, usually until a ransom is paid to unlock the system to possibly decrypt a system's data.

Justification. OIT provides the justifications described below for its four IT security operations projects.

East-west network traffic. OIT explains that updating the east-west network traffic will improve securing applications that communicate with each other at the state data centers. OIT says that the CDOT incident may have been contained if the east-west traffic were more secure.

Public cloud. OIT explains that it supports and manages technical solutions on site, but it cannot adequately manage additional public cloud solutions within current resources. As of January 2019, OIT has 149 cloud projects or solutions it supports, and it has received a total of 273 cloud requests since March 2018. OIT says the limitation in resources became particularly evident after the CDOT security incident.

Identity and access management. The request provides resources to accelerate cloud integration with privileged account management to prevent inappropriate administrative access, such as inadvertently granting elevated permissions, or a malicious bad actor obtaining administrative access. The request completes the statewide implementation of securing integration with four high-priority systems, such as the state's new human resource system, HRWorks.

OIT infrastructure security teams. The request adjusts salaries for the security staff. OIT says that its security department, comparable to regional and national IT security attrition trends, experienced approximately a 65 percent turnover in 2016 and 2017, compared to a 16 percent turnover in the entire OIT organization. OIT explains that it is concerned about retaining its security operations staff, who are the front-line defense against cyber attacks, and it recommends adjusting salaries in these hard-to-fill positions.

OIT provides the following justifications for accelerating its existing Secure Colorado initiative. OIT began Secure Colorado in 2012 to support strategic decisions that protect the state's information assets. OIT explains that without the funding in the request, some of its Secure Colorado projects may not be

completed until 2023, or later. However, with the funding in the request, all the Secure Colorado projects will have a planned end date of June 2020 or sooner.

OIT describes the Secure Colorado projects as the: (1) *Logging Repository Storage* project, which will prevent attacks, and will be used for security forensics after a security incident; (2) *Role Based Access* project and *Privileged Access Management* project, which will grant and manage user permissions according to a user's job, along with added controls for privileged access; (3) *Two-Factor Authentication* project, which will add another layer for authenticating access to a state system; (4) *Agency Firewalls* project, which will upgrade the firewall with significant security enhancements; (5) *Server and Deskside Endpoint Management* project, which will implement a statewide tool instead of the variety of tools being used at the agencies currently; and (6) *Staff Augmentation* project, which will hire temporary resources to perform proactive assessments while existing personnel increase the completion of audit activities.

Itemized cost information. OIT provided estimates for each security project (see Appendix B, FY 2019-20 Securing IT Operations Request Itemization). \$6.0 million of the request is for the four IT security operations projects. Approximately 35 percent, or \$4.1 million, of the FY 2019-20 request is to accelerate the existing Secure Colorado projects. Secure Colorado funding has increased each fiscal year as follows:

- \$4.1 million in FY 2015-16;
- \$5.1 million in FY 2016-17;
- \$8.1 million in FY 2017-18; and
- \$7.8 million in FY 2018-19.

Future operating expenses. Departments will see an increase in the OIT reappropriation cost allocation in FY 2019-20 ranging from \$2.5 million, charged to the Colorado Department of Corrections, to \$0.01 million, charged to the Colorado Department of the Treasury (see Appendix A: OIT Reappropriation to the Departments).

Cost estimates and research. OIT used market research in order to determine the costs and the recommended tools. For each of the existing Secure Colorado projects, OIT gave JTC staff a milestone list of project deliverables, such as testing, developing a proof-of-concept, and publishing a request for information. OIT also provided the status of its existing Secure Colorado projects.

Program Information

The mission of OIT's Office of Information Security is to develop and manage the state's information security program. OIT directly aligns its goals and objectives with the National Strategy to Secure Cyberspace, along with establishing partnerships with federal, state, local, and private sector experts. In 2012, the OIT Chief Information Security Officer developed the Secure Colorado initiative with the help of the Colorado Information Security Advisory Board. In 2015, the Colorado Information Security Advisory Board reviewed Secure Colorado, and found its direction and priorities to be relevant, appropriate, and sound.

Options for Committee Action

The JTC has three options for committee action when it provides a technical review of an operating budget request to the JBC. The JTC can:

- recommend the request to the JBC for funding with no concerns, as outlined in the JTC Staff Analysis section;
- recommend the request to the JBC for funding with concerns; or
- not recommend the request for funding with concerns.

Appendix A
OIT Reappropriation to the Departments

Department	FY 2019-20	FY 2020-21
Agriculture	\$115,300	\$49,238
Corrections	\$2,471,321	\$1,055,356
Education	\$236,799	\$101,123
Governor's Office	\$55,161	\$23,556
Healthcare Policy and Financing	\$180,748	\$77,187
Higher Education	\$54,369	\$23,218
Human Services	\$1,952,949	\$833,989
Judicial	\$1,836,297	\$784,174
Labor and Employment	\$506,371	\$216,241
Law	\$186,947	\$79,834
Local Affairs	\$69,075	\$29,498
Military and Veterans Affairs	\$31,422	\$13,418
Natural Resources	\$577,094	\$246,443
Personnel and Administration	\$167,098	\$71,358
Public Health and Environment	\$526,055	\$224,647
Public Safety	\$712,408	\$304,228
Regulatory Agencies	\$226,512	\$96,730
Revenue	\$567,895	\$242,515
State	\$54,369	\$23,218
Transportation	\$1,316,275	\$562,104
Treasury	\$13,024	\$5,562
TOTALS	\$ 11,857,490	\$ 5,063,637

*Source: Governor's Office of Technology
FY 2019-20 Operating Budget Request.*

Appendix B
FY 2019-20 Securing IT Operations Request Itemization

OIT Securing IT Operations Requested Allocations of Funds

Description	FY 2019-20	FY 2020-21 and Out-years
Network Upgrades at Agencies <i>improve network, remote, web access</i>	\$1,500,000	\$0
Palo-Alto Firewall Upgrades <i>added capabilities to create security rules</i>	\$1,285,000	\$231,300
1.0 FTE Network Engineer <i>design, implement, test, vendor management</i>	\$140,653	\$140,653
Salary Adjustments <i>address existing attrition issues</i>	\$407,000	\$407,000
East-West Network Traffic:	\$3,332,653	\$778,953
2.0 FTE Cloud Architects <i>design cloud solutions-emphasis on security</i>	\$267,189	\$267,189
2.0 FTE Cloud Engineers <i>implement / change environments</i>	\$267,189	\$267,189
1.0 FTE Security Program Manager <i>security expert for large-scale security projects</i>	\$153,951	\$153,951
One-time Onboarding Costs <i>personal computer, furniture</i>	\$50,876	\$8,549
Public Cloud:	\$739,205	\$696,878
2.0 FTE Senior Analyst <i>manage identity services and user access</i>	\$307,901	\$307,901
Identity Analytics and Risk Intelligence <i>solution for identity and access management</i>	\$361,000	\$1,000
Data and Access Governance <i>solution granting access to sensitive data</i>	\$730,000	\$370,000
Cloud Access Security Broker <i>tool to automate access to data in the cloud</i>	\$492,000	\$402,000
Identity and Access Management:	\$1,890,901	\$1,080,901
1.0 FTE Security Engineer <i>execute cloud security strategy and best practices</i>	\$126,535	\$126,535
Technical Training and Development <i>security certifications two leads from each infrastructure group for</i>	\$180,000	\$0
Incident Response and Management Training <i>training to address gap discovered after CDOT incident</i>	\$105,000	\$0
End-to-End Monitoring and Logging <i>real-time visibility between the user device and the application</i>	\$1,175,000	\$900,000
Standard, and Operational Sustainability Documentation <i>two contractors for one year to document infrastructure standards</i>	\$180,000	\$0
OIT Infrastructure Security Teams:	\$1,766,535	\$1,026,535
Logging Repository Storage	\$250,000	\$90,000
Role-Based Access Controls	\$650,000	\$0
Privileged Access Management	\$607,350	\$44,523
Two-Factor Authentication	\$335,846	\$155,846
Upgrade Agency Firewalls	\$975,000	\$45,000
Server and Deskside Endpoint Management	\$1,145,000	\$1,145,000
Staff Augmentation	\$165,000	\$0
Existing Secure Colorado Projects:	\$4,128,196	\$1,480,369
Grand Total:	\$11,857,490	\$5,063,636

Source: Governor's Office of Technology FY 2019-20 Operating Budget Request.



Legislative Council Staff

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Memorandum

February 15, 2019

TO: Joint Technology Committee Members

FROM: Andrea Denka, Research Analyst, 303-866-4781
Joint Technology Committee (JTC) Staff

SUBJECT: JTC Staff Analysis of JBC-Referred FY 2019-20 Budget Request
Colorado Governor's Office of Technology
R-06 Enterprise Data Integration Services

Summary of Request

The Governor's Office of Information Technology (OIT) is requesting \$3.1 million in reappropriated funds and 2.0 full-time employees (FTE) to procure an enterprise license agreement (license agreement) with OIT's enterprise service bus (ESB) vendor in FY 2019-20.

Reason for Referral

This memorandum responds to the December 21, 2018, letter from the Joint Budget Committee (JBC) requesting the JTC to provide a technical review of OIT's FY 2019-20 Enterprise Data Integration Services budget request. The letter stated that the JTC would have more technical knowledge of interfaces, ESB technology, and data sharing.

Staff Analysis

Generally, staff does not have concerns with the request; however, the support gap analysis OIT conducted and submitted for this budget request showed more resources needed than requested. OIT provided a gap analysis of current hours of work needed to support developing and managing the data integration system and application program interfaces (APIs). This analysis shows a 4.0 FTE equivalent of support needed for further developing the data integration service within the state. This budget request, however, only requests 2.0 FTE. Staff has concerns that the requested funding will be inadequate for a successful implementation. OIT stated that it will be performing ongoing evaluation to determine if future funding for more FTE is needed.

Request Details

OIT is developing a data integration service, through a contract with an ESB vendor, that will provide access to different data and systems through APIs. Currently, each department that requests APIs for data integration builds the APIs internally through an ESB license loaned out by OIT. The office explains that the ESB license with the vendor is funded when departments request a license to build APIs.

Justification. Since departments have been developing their own APIs, OIT states that APIs within the data integration service are duplicative and inefficient, which is time-consuming for staff to monitor and maintain. OIT predicts that the departments will increase their use of ESB technology to create more APIs, which will become a larger burden on current OIT staff, and could cause problems with funding the data integration service in the future.

According to OIT, a license agreement with the ESB vendor will benefit the ongoing development and use of the data integration service. The office states that a license agreement will:

- give the departments unlimited licenses to build APIs through the vendor's cloud system;
- give OIT the opportunity to procure the best price for the ESB license with the vendor; and
- allow OIT to manage security and risk for current and new APIs in a centralized location.

OIT states that the two requested FTEs will reduce the time and money other OIT employees spend on managing APIs. Standardizing APIs makes the process of replicating them for similar projects in the future easier and less costly.

Cost estimates. OIT is requesting a total of \$3.1 million for the license agreement and two FTE. The cost of a license agreement with the ESB vendor is \$4 million, but OIT is utilizing existing appropriations from departments using licenses to offset the license agreement price. The \$3.1 million request will be reappropriated from the departments requesting a license in FY 2019-20. The office states that the price of the license agreement has already been negotiated with the ESB vendor.

Itemized cost information. OIT itemized the net cost of the request, as shown in Table 1.

**Table 1
FY 2019-20 Request**

Cost	FY 2019-20	FY 2020-21
Enterprise License Agreement	\$4,000,000	\$4,280,000
Existing Licenses (HR Works, CBMS, Marijuana Data Coordination)*	(\$1,165,656)	(\$1,165,656)
2.0 FTE Senior Developers	\$305,412	\$296,006
FY 2019-20 Net Request	\$3,139,756	\$3,410,350
Total	\$6,279,512	\$6,820,700

Source: OIT.

*Existing Licenses reflects how much is being spent on department licenses in the current fiscal year. These costs will offset the total ELA price.

Cost-benefit analysis. OIT has not yet purchased a license agreement with the ESB vendor. OIT anticipates that in FY 2019-20, the state will reach the \$4 million in project costs needed to buy a cost-effective license agreement. OIT has provided a list of projects that currently use ESB technologies and the cost of the projects that will use ESB licenses beginning in FY 2019-20 (see Appendix A, Costs of Current and Pending Projects That Use ESB Licenses).

OIT estimates its production license cost \$18,000 this past fiscal year, and each department-requested license cost \$9,700. OIT states that it cannot currently negotiate the best price of a license with the ESB vendor because it is difficult to know what the statewide budget for department ESB licenses will be each year. OIT also says price negotiations are difficult because there are a limited number of licenses available for departments to use.

With a license agreement, OIT estimates that the cost for a production license would be \$10,420, and each department-requested license would be \$6,250, a savings of \$8,620 and \$3,450, respectively. Based on the number of licenses OIT expects departments to request for FY 2019-20, OIT expects that purchasing a license agreement will save \$2.7 million.

Data security measures. Currently, OIT states that since APIs have been developed by a variety of departments, they are difficult to monitor for security compliance. The state data integration service has the ability to manage and access all APIs from one secure location, but all current APIs live within departments' servers. According to OIT, having a license agreement with the ESB vendor will allow all APIs to be moved onto one cloud platform, which the office can monitor for security compliance.

Future operating expenses. OIT states that it will see what the demand for ESB licenses is over the next several years to assess if additional operating funding is needed in the future.

Options for Committee Action

The JTC has three options for committee action when it provides a technical review of an operating budget request to the JBC. The JTC can:

- recommend the request to the JBC for funding, with concerns, as outlined in the JTC Staff Analysis Section;
- recommend the request to the JBC for funding, with no concerns; or
- not recommend the request for funding, with concerns.

Appendix A
Costs of Current and Pending Projects That Use ESB Licenses

Department	Project	Type	FY 2019-20 Cost
Health Care Policy and Financing	Healthcare Data Exchange	FY 2019-20 Capital	\$100,000
History Colorado	E106	FY 2019-20 Capital	\$35,000
Human Services	CHATS Modernization	Current Project	\$85,168
Human Services	iNotifyIntegration	Current Project	\$42,584
Human Services	Interoperability	FY 2019-20 Capital	\$1,470,000
Human Services	Judicial SANCA Encryption	Current Project	\$42,584
Human Services	PEAK/LEAP	Current Project	\$85,168
Labor and Employment	Unemployment Insurance	FY 2019-20 Operating	\$1,200,000
OIT	CBMS	Current Project	\$568,179
OIT	HR Works	Current Project	\$330,519
OIT	Marijuana Data Coordination	Current Project	\$266,958
Personnel and Administration	CARS	FY 2019-20 Capital	\$20,000
Public Safety	CCIB	FY 2019-20 Capital	\$70,000
Revenue	GIS	FY 2019-20 Operating	\$195,000
Transportation	CDOT Data Office and Future Projects	Planned Project	\$500,000
Total			\$5,011,160

Source: OIT