M E M O R A N D U M

TO: **Joint Budget Committee Members**

FROM: **Kevin Neimond, Joint Budget Committee Staff, 303-866-4958**

SUBJECT: **Marijuana Data Coordination Budget Amendment**

DATE: **March 16, 2016**

Request: The Office requests an increase of $1,109,625 reappropriated funds transferred from State agencies for FY 2016-17 to create a data platform to identify, locate, collect, combine/assimilate, store, analyze, disseminate, and present marijuana-related information.

Recommendation: Staff recommends an appropriation of $1,109,625 reappropriated funds for FY 2016-17 to begin the marijuana data coordination project. The moneys transferred to the Office originate as revenues credited to the Marijuana Tax Cash Fund.

Committee Action: The Joint Budget Committee tabled this request and recommendation on Thursday, March 10th pending the dissemination of more detailed information of the marijuana-related data generated by each of the State agencies seeking to participate in this data coordination project.

New Information: The Governor's Office of Information Technology provided the following list of data by agency that would be included in the marijuana data coordination project. Additionally, staff has attached a copy of the budget amendment request submitted by the Governor's Office of Information Technology for reference.

Department of Education
- Disciplinary and demographic statistics

Federal Substance Abuse and Mental Health Services Administration
- National Survey on Drug Use and Health survey

Department of Human Services
- Office of Behavioral Health (treatment admissions, DUI assessment)
- Division of Youth Corrections (youth usage)

Judicial Branch
- Probation Services (drug testing results)
- Courts (Case filings for marijuana offenses and DUI)

Department of Law
- Peace Officer Standards & Training (data for law enforcement training to recognize drug impairment)

Department of Local Affairs

- State Demography Office (demographic data to produce rates for many of these other data sources)

Department of Public Health & Environment

- Colorado Health and Environmental Data (Healthy Kids Colorado Survey, Behavioral Risk Factor Surveillance System)
- Retail marijuana (Hospitalization, ER, and Poison Control supplied by outside sources)
- Medical marijuana (medical marijuana cardholder)

Department of Public Safety

- Colorado Bureau of Investigation (arrest and offense data)
- Colorado State Patrol (DUID)
- Division of Criminal Justice (Community corrections)
- Colorado Intelligence Analysis Center (Seizures and diversion out of state)

Department of Revenue

- Marijuana Enforcement Division (licensees, sales, tax revenue)

Department of Transportation

- Fatality Analysis Reporting System (Fatal accident data)

Cost and FTE

- The Office of Information Technology (OIT) requests $1,109,625 Reappropriated Funds in FY 2016-17 and $638,750 in Reappropriated Funds on-going to create a data platform to identify, locate, collect, combine/assimilate, store, analyze, disseminate, and present marijuana-related information.
- For this initiative participating agencies will receive funding through the Marijuana Tax Cash Fund which will then be reappropriated to OIT. Participating Departments include: Human Services, Public Health and Environment, Revenue, Education, Transportation, Corrections, Law, and Judicial.

Current Program

- OIT currently maintains data management platforms for storing and presenting data for analytic purposes across the State. The platforms, however, cannot be easily modified to include the data requirements specified in C.R.S. 24-33.3-516.
- The Department of Public Safety currently employs an analyst responsible for collecting and analyzing marijuana related data in an effort to report the impacts of legalization, however, the initiative lacks the necessary resources to create a data clearing house for analytics.

Problem or Opportunity

- The Department of Public Safety commissioned a study of law enforcement's activity and costs related to the implementation of Article XVIII, Section 16 of the State constitution. The resulting *Marijuana Data Discovery and Gap Analysis* report found that Colorado has a "medium to low capability…to collect the statutorily required data". To improve Colorado's data collection capabilities, the report recommended that the State create a centralized data platform to collect and house marijuana-specific data called for by C.R.S. 24-33.3-516.

Consequences of Problem

- The *Marijuana Data Discovery and Gap Analysis* additionally found that systemic inefficiencies exist in marijuana-related data collection and categorization due to the lack of a centralized data platform.
- Colorado is the first political entity in the world to implement a regulated commercial marketplace for the sale of marijuana for recreational purposes. As a result, there are limited data about the effects of that marketplace on public health and safety. Anticipating these data challenges, the Colorado General Assembly passed SB13-283 to enable data collection to begin to understand the impact of marijuana legalization in Colorado.
- Unfortunately the statutorily required data sets are collected by different state agencies utilizing distinct taxonomy and data architecture. It is impossible to easily evaluate marijuana's impact on any number of inter-related public health and safety metrics. Lacking that evaluation, it is difficult for policymakers and implementers to understand and efficiently respond to the challenges posed by this new marketplace.

Proposed Solution

- The solution will be an open source data platform allowing various audiences to evaluate the impact of marijuana legalization on public health, safety, and youth use. Funding will support building out the hardware, software, and technological infrastructure needed to support, maintain, and segment multi-agency marijuana-related data. Funding will also support analytics software for analyzing and presenting data to various audiences.

COLORADO

FY 2016-17 Funding Request | January 4, 2016

Department Priority: BA-01
Request Detail: Marijuana Data Coordination

Summary of Incremental Funding Change for FY 2016-17	Total Funds	Reappropriated Funds
Marijuana Data Coordination	**$1,109,625**	**$1,109,625**

Customer Impact:

For the purposes of this request and initiative, "customers" are the participating state agencies, namely, the Departments of: Human Services, Public Health and Environment, Revenue, Education, Transportation, Corrections, Law, and Judicial.

With the implementation of the proposed platform, the Office of Information Technology (OIT) will be able to deliver real-time data as a service in a governed, secure, manageable, and scalable solution to customers. Rather than obtaining data through manual gathering and consumption of comma separated value files (CSVs), flat files, thumb drives, web pages, etc., OIT customers will be able to access and leverage data sources in an automated, operationally efficient and secure manner.

This service implementation will enhance the State's work performance and risk exposure with the ability to overlay security measures that are not currently in place. Additionally, multiple analysts, agencies, and policy-makers will be able to work from the same data sets with common business rules applied. Ultimately, this will allow Colorado to move toward the ability to apply automated data-integration and, eventually, cross-agency-analytics that are currently being done manually - if at all. Further, as agencies adopt the new platform, data exchanges will take place through the State infrastructure, allowing individual agencies to remove the unsecure, costly, redundant and time-consuming point-to-point data exchanges of today.

Problem or Opportunity:

The Office of Information Technology (OIT) requests $1,109,625 Reappropriated Funds in FY 2016-17 and $638,750 in Reappropriated Funds on-going to create a data platform to identify, locate, collect, combine/assimilate, store, analyze, disseminate, and present marijuana-related information. The budget amendment is being processed due to an unforeseen contingency. When legislation was passed to require multiple agencies to participate in marijuana-related data exchanges, it was not known that a secure methodology for making those exchanges was not available.

When it comes to engagement and service, citizens and policy-makers have the same expectations of government institutions as they do of private organizations. These expectations must be met in an environment of increased scrutiny and budgetary pressures. To meet - and ultimately exceed – expectations, Colorado needs to be a state that is prepared to embrace the future, while not relinquishing access to, or discounting the value of, its historical and present-day data assets. This means the State needs to be able to find data repositories, know what they contain, and be able to link them to each other in meaningful, consistent ways while keeping security and personal privacy a top priority.

Today, the State does not have a platform to allow agencies to share marijuana-related data in a secure, transformative, real-time, manner. Instead, many hours are spent creating manual data extracts and exchanges, or inter-agency data usage agreements and memorandums of understanding before manually creating linkages or data dumps to be handed to the receiving agency. Once those exchanges take place, the State does not have additional access to those strategic data assets, nor are those agencies able to search for additional potentially-related impacts as the data exchanges are only created to address very specific questions. Additionally, these data files are simply a point in time snapshot at the moment the query was run and the business rules used to create that query is not captured or communicated to others that might want to use the data.

Historically, agencies have had their own IT departments and methodologies. When agencies were not aware of what solutions might already be available to them, and in the interest of time, individual agencies have received each individual data or reporting request/mandate and tried to find ways of fulfilling those requests internally. As such, today, vast quantities of state data changes hands via thumb drives, email, file sharing, and any other method available to this "sneaker net". Some agencies have been able to create point-to-point Virtual Private Networks (VPN's), which take months of multi-agency contract writing, man hours (internal or external) to setup the VPN, and hope that the VPN is maintained and securely accessed. Unfortunately, most of these VPNs - and all of the manual data exchanges - do not comply with The Office of Information Technology (OIT) Security Policies/Guidelines. Further, the information exchanged within those VPN's cannot be shared with additional agencies-of-interest without repeating the entire contracting process and coding efforts. Lastly, any business rules applied to the information being shared is not shared – thus, as involved-employees change position, the knowledge of the initial setup and reasoning is frequently lost too.

The State of Colorado is at the forefront of marijuana legalization. As such, the State has entered into an implied contract with its citizens and businesses that it will protect, understand, and communicate the impacts of this emerging industry. Data, being a pure and unfiltered source, plays a key role in understanding impacts to the state and meeting the terms of this new social contract and legislative requirement. There are many unanswered questions regarding the impacts of marijuana legalization to the public health and safety, welfare of children, state economy, and industry. Data is a critical asset in answering many of these questions for the State of Colorado and the nation. The current data collection/inputs, storage, collation, accessibility, and analysis processes make it challenging for the State and nation to answer those questions or accurately measure the impacts the new industry is having on people, resources, and the economy. It is imperative these questions are created, understood, addressed, answered and presented through an unbiased data solution.

The Office of Marijuana Coordination (OMC) was created with C.R.S. 24-38.3-101. Within this Statute, the OMC is required to provide information from various agencies – including, but not limited to: "the department of human services, the department of public health and environment, the department of transportation, the department of revenue, the department of public safety, and the department of education, to align the programming and regulations provided by each executive branch department to maximize efficiency and ensure coordinated strategies in the government's response to the legalization of marijuana." (C.R.S. 24-38.3-102(1)).

Additionally, per C.R.S. 24-38.3-102(2), the OMC is to:

> "(b) Align all policy suggestions and the promulgation of rules across state agencies to increase efficiency and eliminate unintended negative impacts on the state;
> (c) Communicate with other states related to the economic, health, and safety implications of retail marijuana legalization and regulation;
> (d) Identify data gaps in the impact of marijuana legalization on public health, safety, or economics across the state;
> (e) Anticipate, prioritize, and respond to emerging issues with the legalization of retail marijuana;"

In 2013, the legislature passed SB13-283, directing the Colorado Department of Public Safety, Division of Criminal Justice to collect and report on a number of potential impacts from marijuana legalization. In response to this legislation, The Division of Criminal Justice hired an analyst in September 2014 to begin the data collection and analysis tasks. The analyst has identified data sources and started manually collecting baseline information. The state agencies currently supplying (or in talks to supply) data include: CDHS, CDPHE, DOR, CDPS, CDE, CDOT, DOC, Law, and State Judicial. Additionally, many non-Executive Branch agencies contribute data. For example, the Substance Abuse and Mental Health Services Agency, individual local police departments, the U.S. Postal Inspection Service, Drug Enforcement Administration, private toxicology labs, out-of-state law enforcement, and out-of-state judicial departments. Clearly, there has been great cooperation across agencies to share data; however, this current file sharing practice has significant constraints and inefficiencies (identified below). The current data exchange model is not sustainable in the longer term as staff, agency and administrative leadership changes. This process results in:

- Stale, or out-of-date, data.
- Lack of shared business rules.
- Potential issues with data ownership.
- Compliance with data security / privacy issues.
- Additional overhead in transmitting and sharing data between agencies.
- Limited formal accountability or requirement by other agencies to share data with CDPS.
- Additional resources to manage data that are not directly understood or relevant to the Public Safety domain.
- Potential issues with the data comprehension or formatting, CDPS becomes a broker between agencies and the data requests.
- Inability of the state to stay ahead of – or even with – the pace of this dynamic new industry due to the lack of automation.

Additionally, the Governor's Office commissioned a data gaps analysis to determine the availability of data and the feasibility of future data collection. Unfortunately, the October 2014 Marijuana Data Discovery and Gap Analysis report (commissioned by the Colorado General Assembly) found that Colorado currently has a "medium to low capability…to collect the statutorily required data [relating to the impact of legalized marijuana]" in fourteen discrete public health and safety categories. Those categories, pursuant to C.R.S. 24.33.3-516 are:

- Marijuana-initiated contacts by law enforcement;
- Marijuana criminal arrest data;
- Comprehensive school data;
- Data related to drug-endangered children;

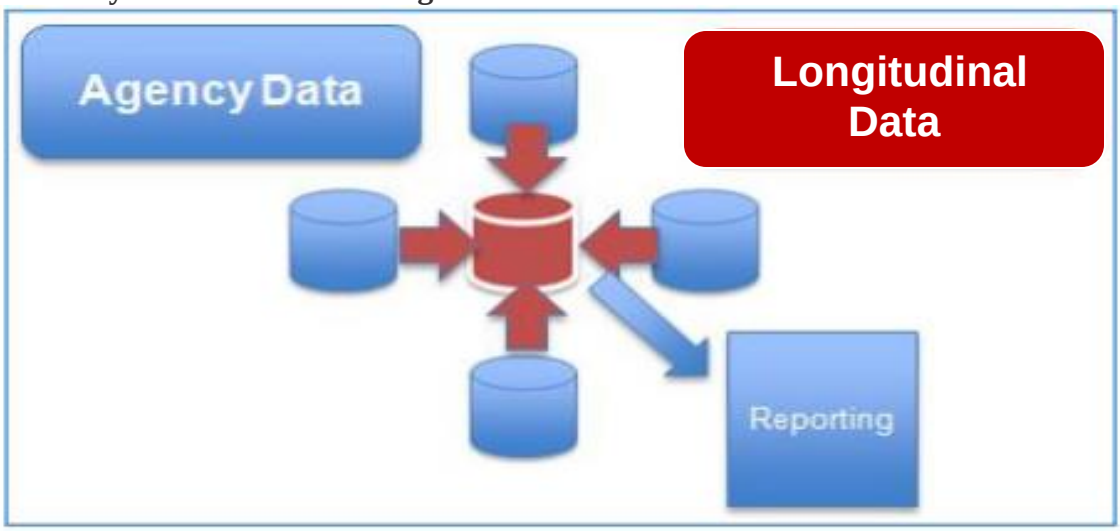
- Data related to diversion of marijuana to minors;
- Data on marijuana-related traffic accidents;
- Data related to the diversion of marijuana out of Colorado;
- Data related to crime occurring in and relating to the operation of marijuana establishments;
- Data related to the utilization of parcel services for the transfer of marijuana;
- Probation data;
- Data related to emergency room visits related to the use of marijuana and the outcomes of those visits;
- Data related to money laundering related to both licensed and unlicensed marijuana;
- Data related to the role of organized crime in marijuana; and
- Data related to the potential health effects of marijuana.

Proposed Solution:

The Office of Information Technology (OIT) requests $1,109,625 Reappropriated Funds in FY 2016-17 and $638,750 in Reappropriated Funds on-going to create a data platform to identify, locate, collect, combine/assimilate, store, analyze, disseminate, and present marijuana-related information pursuant to C.R.S 24-33.5-516. For this initiative participating agencies will receive funding through the Marijuana Tax Cash Fund which will then be reappropriated to OIT.

Graphic 1 below illustrates the high-level concept that shifts Colorado data exchanges from a single responsible agency (i.e. CDPS) to a centrally-located Enterprise Service Bus (ESB) aggregator, integrator, and analytic space to facilitate a distributed reporting structure.

Graphic 1: Centrally Located Data Sharing Environment



An Enterprise Service Bus (ESB) provides a way to meet the challenges of integrating applications and provide a single, unified architecture that can:

- Distribute information across an enterprise quickly and easily.
- Mask differences among underlying platforms, software architectures, and network protocols.
- Ensure information delivery even when some systems or networks may go off-line from time to time.
- Re-route, log, and enrich information without requiring applications to be rewritten.
- Provide incremental solution implementations so all enterprise services and applications need not change immediately or all at once.

- Protect remaining production processes as new hardware or software patches need to be implemented in a node of the network.

ESB is not a new software product, it is a way of looking at how to integrate applications, coordinate resources, and manipulate information. An Enterprise Service Bus (ESB) is used to integrate enterprise applications or data sources via programming languages called web services. Common examples of programming languages include: Extensible Markup Language (XML), Simple Object Access Protocol (SOAP), JavaScript Object Notation (JSON), or Representational State Transfer Application Programming Interface (REST APIs). ESBs and Web services make it easier for enterprises to repurpose their existing IT investments and connect with external departments, partners, customers and—increasingly—the Web and mobile devices. The ESB model for enterprise application integration promotes flexibility and agility in the way applications communicate. ESBs are usually comprised of a data adaptation layer, a message routing layer and a service composition layer, all of which must be assembled together before the integration work can begin. For this reason, ESBs alone often prove both complex and costly to implement—especially on a project-by-project basis. To bypass the complexity associated with conventional ESB deployments, many organizations have started employing Services Oriented Architectures (SOA) or Application Programming Interface (API) gateway hardware. Whereas an ESB is typically built from the ground up, a gateway simply needs to be installed and configured, making initial set up significantly faster and easier. Set up of a gateway is further simplified by the fact that the appliance exists separate from the applications it is integrating—unlike an ESB, which often requires server software to be deployed on every piece of hardware in the network. Once installed, gateway hardware delivers simplified ESB-like operation via a range of easily configured user interfaces.

Today, the State of Colorado places greater demands on its analytical needs and need to integrate data, regardless of whether it is structured, semi-structured, or unstructured, from multiple sources. Traditionally, the data types and their associated processes were kept distinct and separate. The analytical needs have also converged to create complete views to answer business requirements, with all types of data. The architectural challenge is to bring the two paradigms together. So, rather than approach this analytic solution as a new technology silo, organizations strive to create a unified information architecture – one that enables it to leverage all types of data, as situations demand, to promptly satisfy business needs. Customers are moving towards this mixed Information Management architectures where data is brought together through metadata, data virtualization (processing data 'in place'), distributed processing, where large data engines work on specific data preparation tasks, and sophisticated optimization and management capabilities. This approach, described as a Logical Data Warehouse (LDW) provides a single view of the data, without necessarily moving it but needs specific software for managing and deploying its development.

The idea is that a data warehouse does not have to be one physical database. It can be a heterogeneous set of data sources that each contains a fragment of the data end users need for business intelligence, reporting and analytics applications, but it presents itself as a single data source. So, the logical data warehouse is a system architecture that pretends all the data are compiled in one large database. Note however, that this combining of data elements is for analytic purposes only. Long term storage, archiving, and repository of the data remain the purview and responsibility of the original data source. This request as presently envisioned does not replace those disparate data systems.

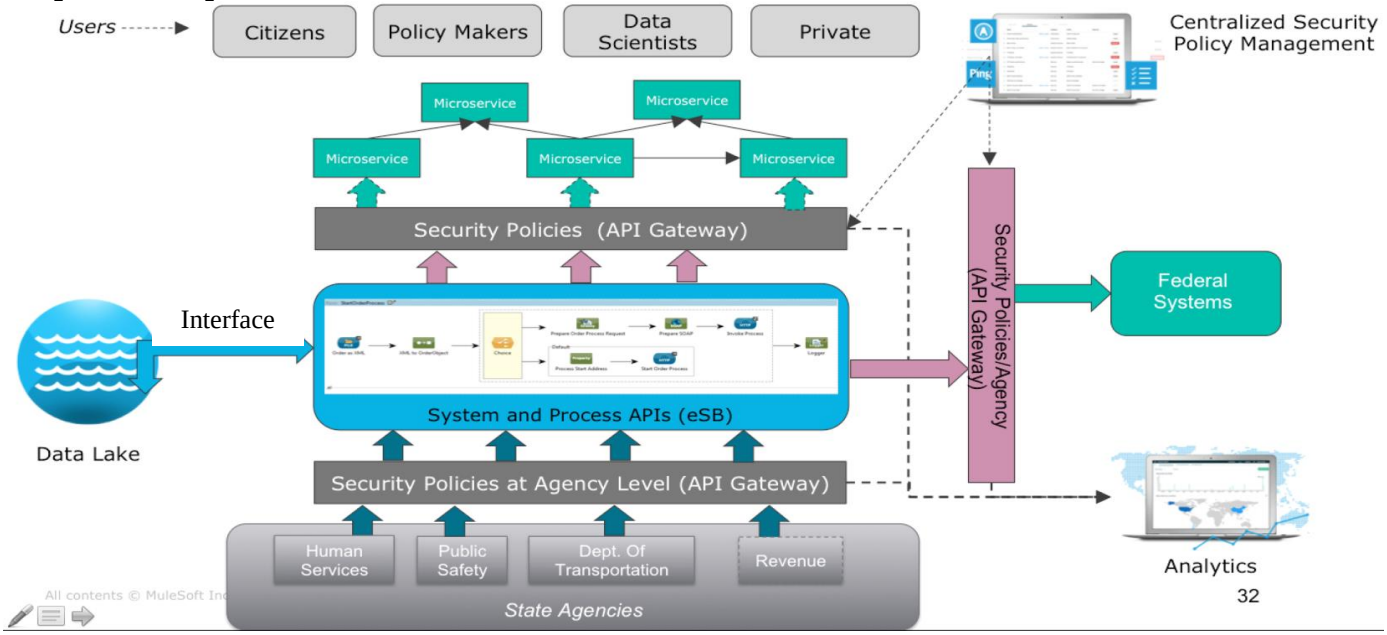
To accomplish these goals in the most cost-effective means known, OIT proposes Application Program Interface (API) led connectivity be inserted between all data exchanges - internal and external to the State. In particular, an API-centric enterprise service bus that will maximize the re-use of existing assets while creating the bridge into legacy applications, current cloud and mobile platforms, as well as the ability to embrace

upcoming technologies. Additionally, the proposed solution allows for masking data-in-motion (DIM) when security requirements dictate.

Once this foundational solution, referred to as the Enterprise Service Bus (ESB), is implemented in a secure, enterprise-accessible and governed space, OIT will encourage the agencies to reduce individual inter-agency point-to-point VPNs, contracts, maintenance, security risk exposure, and redundant man-hours – as well as vendor / consulting expenditures – by migrating into the enterprise technology. Adoption of the OIT ESB solution will provide a layer of security controls for agencies that may otherwise find themselves out of compliance with any internal or external security audits that may arise. Furthermore, this ESB solution can allow agencies a seamless connection to the Colorado Information Marketplace (CIM) platform in the effort of increasing our transparency and publicly-available datasets as appropriate. In addition to the CIM, via API-led connectivity, the ESB could allow for future expansion to include additional customers (constituents/policy-makers), partners, suppliers, mobile devices, sensors, cloud platforms, social media, Software-as-a-Service, as well as the Enterprise systems, custom apps, and databases/repositories as the State's needs evolve. Such expansion is not a part of this request, as the data sets envisioned with this request are specific to marijuana. If customer Departments wish to expand on analytic capabilities for additional datasets the option remains open for them to initiate, but further costs and timeframes may be involved.

Lastly, OIT will need to create the metadata and analytic space for agencies to truly investigate and explore the impacts of legalized marijuana and, per C.R.S. 24-38.3-101, the Office of Marijuana Coordination to have a single Center of Enablement from which they can measure the effectiveness and impacts of new policies, regulations, programs, and strategies. Graphic 2 below illustrates an implementation whereby any agency – or department – is able to connect to any source or data retainer – in any programming language or connector desired. The state will be able to reuse queries, connections, sources, and business logic that have already been defined to create outputs to any and all relevant recipients in whatever format those recipients require. The connections, access to data, transformation of data (ie: mm/dd/yyyy -> yyyy/mm/dd), and the security can all be managed from a single user interface. At the same time, the individual agencies are able to retain their personal security requirements as they see fit.

Graphic 2: Proposed OIT Framework



Anticipated Outcomes:

Moving from an antiquated data sharing environment to a centrally located Enterprise Service Bus (ESB) solution would ensure compliance with legislatively mandated reporting requirements and produce many technology and business benefits to OIT and the State agencies. Tables 1 and 2 below provide details on the anticipated outcomes and measures to ensure success.

Table 1: Compliance Outcomes and Indicators

Anticipated Outcome	Metric / Measure of Success
Compliance with legislatively-mandated marijuana reporting (per C.R.S. 24-38.3-101).	Implementation of this solution allows for the collection of marijuana-related data across agencies where data is currently siloed.
Compliance with legislatively-mandated appropriate collection and synthesizing of data to provide information as laid out in C.R.S. 24-37.5-701(1)(c).	This platform allows for the creation of data transformations (synthesizing) internally.

Table 2: Technology and Business Benefits

Key Performance Indicator	Category	Description	How to Measure/Relevant Metrics
Composition	API-led Principle	Economies of scale, complexity abstraction, and reusability enabled through an API-led architecture. APIs become modular, swappable, clearly defined, and distributable components of service architecture and technology/business capabilities that can be easily discovered, leveraged (or removed) in a capability efficiently, quickly and with ease.	- FTE time savings throughout app development software development life cycle (SDLC): design, development, test, deployment, management. - Faster overall application development/decrease in time-to-market. - Opportunity cost savings allows for more FTE time-spend on innovation rather than integration. - Improved return on asset (ROA). - Lower IT operating expense spend.
Enhanced Systems Interoperability	Technology / Business Benefit	APIs remove the complexity and technical debt of point-to-point architectures. An API-led architecture makes it easy to swap and distributable APIs seamlessly to enable enterprise's target capabilities.	- Reduction in number of interfaces required to connect disparate systems. - FTE time savings in capability delivery (SDLC process improvements and time reductions, etc.). - Improved Operational Efficiencies (productivity) and Operational Effectiveness (ROA).
Application Development Efficiencies	Technology / Business Benefit	API-led architecture promotes an agile, minimally viable product SDLC, improving the agility and speed of the enterprise and enhancing product/capability development effectiveness.	- Reduction in development time through code/API re-use; FTE time savings throughout app development SDLC design, development, test, deployment, management; opportunity cost savings.

			- Faster time to market. - Opportunity cost savings.
Enhanced Systems Scalability	Technology / Business Benefit	Modular benefit enabling the scaling up and down of connected systems.	- FTE time savings throughout app development SDLC design, development, test, deployment, management. - Faster overall application development/decrease in time-to-market.
Improved Operations & Maintenance Visibility	Technology / Business Benefit	Single pane of glass view of all APIs and integrations allow for seamless management of services, business processes, compliance, etc.	- FTE time savings in operations, maintenance, governance. - Risk mitigation.
Agility, Abstraction, & Technology Modernization	Technology / Business Benefit	APIs enable a "facade layer" on top of systems. Systems beneath APIs can be replaced without any impact on the capability the API is supporting. APIs enable the ability for IT to evolve at the pace of the business, i.e., "Mode 2 IT" (faster speed of IT), maintain compliance, etc.	- FTE time savings in creating new/updating existing capabilities. - Cost reductions through elimination of legacy systems and adoption of lower total cost of ownership, best-of-breed applications. - Enhanced time-to-market. - Improved operational efficiencies (productivity) and operational effectiveness (ROA).
Discoverability & Sharing	Technology / Business Benefit	Through a common API portal, exposing valuable APIs, services, and capabilities for broad consumption enhances ROA and drives leverage and cross-functional collaboration across the enterprise.	- Adoption: APIs developed and re-used across capabilities/projects. - Improved ROA. - Enhanced productivity (output/hr.).
Improved Data Quality	Technology / Business Benefit	Common, secure, governed model to accumulate, aggregate, and share data improves data accuracy and lowers management costs, while acting as an engine to distribute contextually-rich information to right stakeholders at right time.	- FTE time savings in data management and governance. - Decrease in time to access relevant information. - Enhanced productivity (output/hr.). - Enhanced customer satisfaction scores with stakeholders.

Assumptions and Calculations:

Once this proposed solution has been built and tested for the marijuana-effectiveness studies, OIT will be able to create Integration-as-a-Service (IaaS) to keep the on-going maintenance and scaling costs as low as possible. Once the new solution is implemented, OIT can grow the offerings to any agency and any segmentation – internal and external to state agencies – as needed. For example, any Interoperability efforts, Public Safety, DORA, eLicense implementations, and many others, will be able to benefit from the implementation long-term.

Production cores will be the basis in which Common Policy allocations are made to each participating Department. Production cores relate to the processing power necessary for each unique data set to be properly integrated into the proposed solution. The size and complexity of the data impact the process power necessary to integrate into this solution and will vary depending on the nature of the data.

The increased cost in the implementation year (FY 2016-17) can be explained by the need for additional resources involved with standing-up a new solution. These additional resources (e.g., state application modifications, production hardware) will not be necessary in subsequent years following implementation. After the solution has been implemented, only costs associated with maintenance and support will be necessary in order to sustain the solution.

As agency adoption rates increase, OIT will be able to create economies of scale and negotiate better maintenance and subscription rates. Until that point, recurring subscription and support fees are charged based upon the number of "ESB Production" cores a new adoption would require - with a total recurring cap at $1,109,625 per year for unlimited production cores (cost to be shared across all adopters). Table 3 below provides a cost breakdown for the marijuana platform implementation by department.

Table 3: FY 2016-17 Cost Detail by Department

Department	Production Cores	Price Per Production Core ($) FY 17	FY 2016-17 Cost ($)	Price Per Production Core ($) FY 18	FY 2017-18 Cost ($)
Public Safety	15	$14,795.00	$221,925	$8,516.67	$127,750
Public Health & Environment	15	$14,795.00	$221,925	$8,516.67	$127,750
Transportation	10	$14,795.00	$147,950	$8,516.67	$85,166
Human Services	5	$14,795.00	$73,975	$8,516.67	$42,583
Education	5	$14,795.00	$73,975	$8,516.67	$42,583
Revenue	10	$14,795.00	$147,950	$8,516.67	$85,166
Local Affairs	5	$14,795.00	$73,975	$8,516.67	$42,583
State Judicial	5	$14,795.00	$73,975	$8,516.67	$42,583
Attorney General's Office	5	$14,795.00	$73,975	$8,516.67	$42,583
Total Projected	**75**		**$1,109,625**		**$638,750**

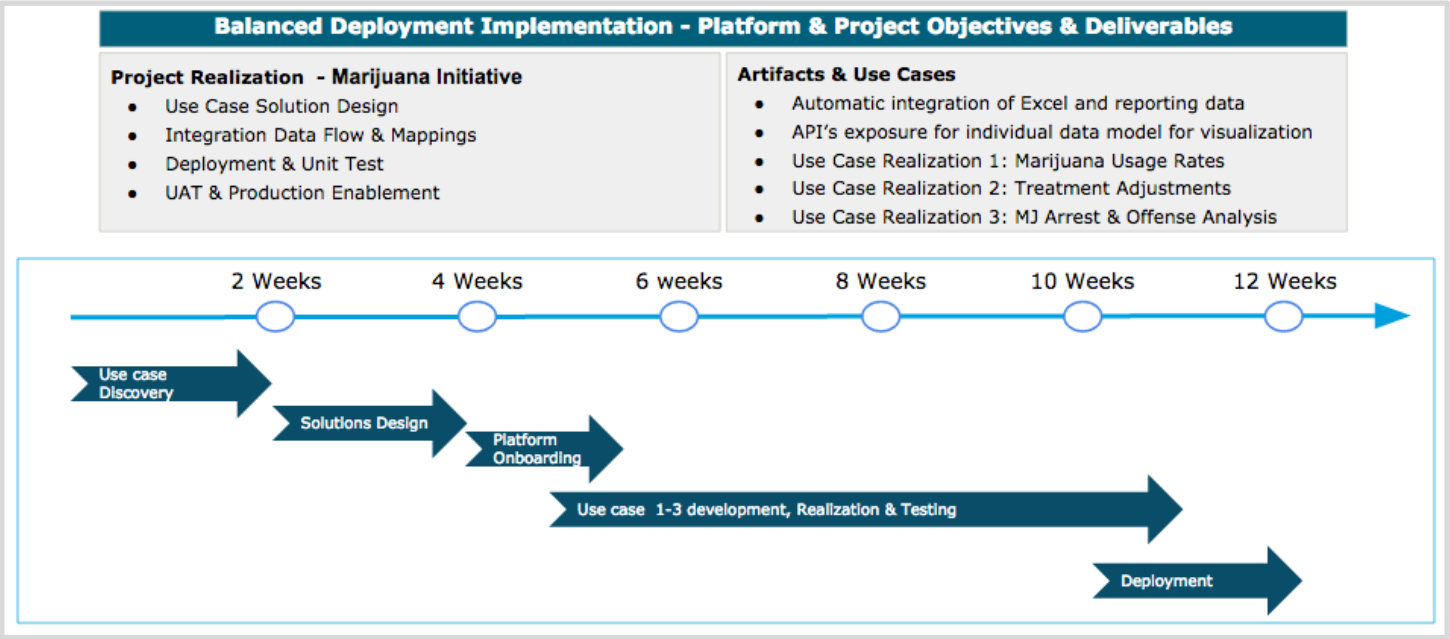
***FY 2017-18 costs by Department does not include cents, which are reflected in the total projected amount of $638,750.**

Table 4: Cost Component Detail

Item	Detail	FY 2016-17 Cost ($)	On-going Cost ($)
Data Analytics Software	Data Analytics Software: ● Collect data. ● Analyze data. ● Scrub data (clean of any personal information).	$121,500	$121,500
Implementation Services	• Marijuana use case solution design workshop. • Design and implement data acquisition from excel based reports and spreadsheet into Marijuana analysis schema. • Design and implement data acquisition and transformation of SPSS data. • Expose API's for individual data models for visualization frameworks. • Use case realization of Marijuana usage rates. • Use case realization of Treatment adjustment. • Use case realization of Arrest and Offense analysis. • Deployment & UAT enablement. • Onboard marijuana-related data into OIT platform and productize identified initial use cases.	$135,000	$135,000
State Application Modification	Modification of existing state applications to collect new marijuana related data activity.	$432,500	$102,125
Production API Environment	API Gateway: Interfaces that allow real time access to marijuana related data activity and Colorado Information Marketplace.	$245,000	$245,000
Production Hardware	Expanding existing state hardware to collect and store marijuana related data (e.g. servers, storage, database).	$175,625	$35,125
Total		**$1,109,625**	**$638,750**

Graphic 3 below outlines the expected timeline and deliverables in FY 2016-17 to implement the solution for marijuana data coordination.

Graphic 3: Implementation Timeline and Deliverables for Marijuana Data Coordination Initiative



Impact to Common Policy:

A multi-functional platform for Marijuana specific data is a new service that does not exist in Common Policy. This request does not link to services provided by OIT, therefore, OIT does not currently have service utilization metric in which to allocate costs.

OIT respectfully request Reappropriated Funds in FY 2016-17 to stand up a new service. Following FY 2017-18, this service would transition into base Common Policy and be allocated to customer Departments based on current production cores as previously explained.

Supplemental, 1331 Supplemental or Budget Amendment Criteria:

The budget amendment is being processed due to an unforeseen contingency. When legislation was passed to require multiple agencies to participate in marijuana-related data exchanges, it was not known that a secure methodology for making those exchanges was not available. Furthermore, as marijuana-related activities are not federally approved, the state must keep all related data within state boundaries. To do so, we must implement a solution that provides the oversight, security, scalability and integration capabilities that this emerging industry and out constituents require.