



# COLORADO

Department of Education

John W. Hickenlooper  
Governor

Katy Anthes  
Commissioner

FY 2018-19 Capital IT Request | November 1, 2017

Signature

Date

**Department or CCHE Capital Construction Priority: CC-01  
Information Management System Updates**

Summary of Capital Construction Request	Total Funds	General Fund	Cash Funds*	Federal Funds
FY 2018-19	\$2,331,000	\$2,331,000	\$0	\$0
FY 2019-20	\$223,000	\$223,000	\$0	\$0
FY 2020-21	\$137,500	\$137,500	\$0	\$0

### Request Summary:

As the Department faces security threats of increasing frequency and sophistication to its systems and data it is necessary to respond with equal or greater sophistication. Equipment and software must be updated to ensure effective service to stakeholders and constituents and support from vendors if there are problems with software and hardware. The Department has an opportunity to address these issues with this request

### Project Description:

This request seeks to bring critical systems up to date and establish an ongoing maintenance cycle which will allow the Department to stay abreast of ever-evolving threats, and phase out and replace or update aging systems. The total request is \$2,331,000, and it is broken down into the three major areas/projects below:

- **“Catch-up” Maintenance of Infrastructure.** To date, the Department has prioritized investment in upgrades by identifying the highest risk systems and areas to do so. A decision item two years ago, and federal State Longitudinal Data Systems (SLDS) grants in 2007 and 2009 allowed for upgrades in the most important areas. This request will assist with shoring up the remaining systems, and will initiate an ongoing plan to maintain them going forward.
- **Security Infrastructure and Data Privacy Improvements.** Two positions (2.0 FTE) to keep up with the latest developments in threat management, privacy, and security. Every month bad actors get more sophisticated as evidenced by news reports of ransomware attacks, social engineering, and other methods of hacking into systems. These FTE will shorten response time to threats and incidents and provide additional capacity to take proactive measures to improve the security of student data. These roles will assist school districts and BOCES by providing services to ensure only the authorized personnel access sensitive data. They will also provide up-to-date training of district staff on privacy and security threats and challenges.

- **Improved Public and District Data Reporting and Other System Enhancements.** One position (1.0 FTE) is necessary to modernize and re-design our public and private data reporting processes and systems. Data is a cornerstone of CDE’s work, and a critical lever for department success. Without accurate and timely data, CDE’s education-supporting programs cannot operate. The requested one-time and ongoing funds are required to update this systemic process with contract services and software. The reauthorization of No Child Left Behind (NCLB), is the Every Student Succeeds Act (ESSA). A new requirement under ESSA is a parent-friendly report card. This requirement is beyond a static report card. It is a new way of collecting, storing, and providing data back to the public to achieve the best outcomes for students, parents and other stakeholders. Also included in this component of the budget request is funding to support a feasibility study to examine the pros/cons of a statewide student data system that would potentially assist rural districts and BOCES to reduce their IT burden. This feasibility study will help to determine potential costs of such a system, and together with district stakeholders help CDE to determine the return on investment if such a system is implemented in the near future.

## **Background and Justification:**

### Background:

Significant upgrades to hardware, legacy systems and software are needed, so the Department can continue to provide the same level of district and staff support. The majority of the Department’s applications are over six years old, and some key systems, such as the Record Integration Tracking System (RITS), which is the system that assigns and tracks unique student identifiers, are as much as 15 years old. In comparison, most IT obsolescence replacement programs for PCs and laptops is between 3 and 5 years at most, and operating systems such as Microsoft Windows are replaced or upgraded even more often.

Moreover, the number of students and therefore amount of data collected continues to increase. System upgrades are also required to keep pace with the increasing storage and processing requirements driven by the growth around the state. In the same hand, it is necessary to ensure the Department can maintain the same level of service to districts ensuring they can submit and access data as efficiently, quickly, and painlessly as possible.

Finally, as the result of an Office of Civil Rights review of the Department’s website, additional investments and activities are required to ensure all residents and stakeholders have access to district reporting and services in a manner that is secure, accurate and actionable.

### Justification:

The first portion of the request is to enable the Department to “pay its bills” with respect to existing hardware and software licenses/maintenance; next it is to update the most obsolete and mission critical system within the Department (Student Identifier system). The next item in the request is to provide additional capacity for the Department’s security infrastructure, which will prevent and address threats, and safeguard the data that decision-makers and stakeholders around the state rely upon. As the threats get more sophisticated, CDE security controls and staff must do the same. Without re-investing in the security of student data, the risk of a data breach goes up. It’s much more cost efficient to prevent the incident in the first place than it is to remediate it after a breach has occurred. The results of the last “Cost of Data Breach Study” conducted by Ponemon Institute, indicates that the average cost of a public sector

breach is \$80/record. Assuming 2016 student count of approximately 900,000 students, a data breach would cost \$73 million. Understanding that this takes in to account the size of the breach, the time it takes to identify and contain a breach, the detection and escalation of the incident, and other factors, it obviously varies. But the findings indicate that preventing the breach in the first place is considerably cheaper than remediating the effects afterwards. It also tells us that the faster the breach can be identified, and the sooner the vulnerability is removed, the less expensive it will be. The summary takeaway is that regularly investing a relatively small amount in an organization's security infrastructure and personnel will pay dividends in the long run. And of course, this approach will help to keep Colorado students' data safe.

Finally, this request will allow the Department to provide accurate and timely data to stakeholders. Data required for policy and practice decisions must be timely and accurate, and the systems in use at CDE now are lacking in timeliness. Although CDE takes great pains to only release accurate data, that sometimes takes more time than classroom teachers and other district leaders have. Without accurate data, policy and other critical decisions can be delayed and even worse, potentially be in error without the right data at the right time. This systemic upgrade will reduce the risk of that occurring.

### **Implementation Plan**

This request links directly to every goal within the Department's Performance Plan. The information that is collected, compiled, and reported is essential to all other Departmental goals. The data systems at the Department contain the raw assessment and other results that are provided to the districts and public via the School View Growth Model and other reports. This information provides critical insight to legislators, the public, school districts and Department personnel, which informs education policy statewide. Although there are many legislative demands on CDE as it pertains to data, a key goal of CDE is to collect that data in such a way that it minimizes effort and workload on the part of the school districts. And obviously it is critical that IMS provides the security controls and practices protect student data. Individual implementation plans for each piece of this request must be developed in collaboration with program units across the Department, as we proceed with the Department's ongoing performance planning process.

### **Alignment with OIT Best Practices**

The Department has consulted with OIT throughout the development of this request. It aligns with OIT's best practices around security, equipment replacement, and maintenance.

### **Security and Backup/Disaster Recovery**

A portion of the request, \$630,000 is offsite backups, security enhancements such as firewalls, and server capacity offsite to accommodate the most critical aspects of security, backup and disaster recovery. Please see (E) Equipment section of the CC-IT summary template, and the Assumptions and Calculations section below.

### **Business Process Analysis**

The process the Department went through to identify the costs/items was to determine the greatest need and most critical systems and focus on those. This is a request to maintain ongoing systems and provide minimal enhancements. Obsolescence was the greatest driver with the student identification system being over 15 years old. However, security and threat prevention were also determined to be of critical importance.

This request is designed to allow the Department to maintain current levels of service for the school districts it serves, and enhance those capabilities where possible.

## Systems Integration Opportunities

This is not applicable for this request.

### Cost Savings and Consequences if not Funded

The bulk of this request is about risk mitigation. It is very difficult to state conclusively when an IT system will fail, but the likelihood of failure goes up exponentially with every year that the system is no longer supported (or its component h/w and/or s/w is aging beyond recommended life). The catch-up maintenance request is directed specifically at preventing catastrophic failures that might occur if key systems are allowed to degrade due to insufficient funding to pay increasing yearly maintenance fees. If maintenance is not kept up on our hardware and software, then key security patches will not be available to CDE, nor will vendor expertise be available to assist with critical incidents. As an example, Data Pipeline could go offline and the result would be that districts would no longer be able to submit their student count information necessary to determine their yearly funding allocations. The Data Pipeline collects student count information which provides the information for calculating the distribution of over \$4 billion of state and federal funds to school districts and BOCES every year. If the system were to go offline, the ensuing costs to re-establish those vendor contracts and/or to support the districts in manual efforts to submit their data would be staggering.

In addition to addressing aging systems and the need to upgrade those, the upgrades to the Department's security infrastructure will prevent and address threats, which safeguards the data and systems that decision-makers and stakeholders around the state rely upon. Without this investment the risk of a data breach increases. It is more cost effective to prevent incidents than respond to them after they have occurred.

### Operating Budget Impact:

The Department has submitted a corresponding request for the FTE associated with this item.

### Assumptions for Calculations:

See the table below for the Department's breakdown of costs by item.

Item Description	Year 1 Cost	Yr. 2 and Ongoing Maint.
Identity Verification	187,000	
Student Identity Protection	360,000	
Firewall Hardware	350,000	35,000
E-Fort, H/W and support	280,000	
<b>TOTAL for Security/Infrastructure</b>	<b>1,177,000</b>	
Secure Interactive Data Reporting for Districts	590,000	22,500
Rural Relief (Data System Feasibility Study)	120,000	
<b>TOTAL for Reporting and System Improvements</b>	<b>710,000</b>	
System Maintenance Increases (annual/ongoing)	80,000	80,000
Student/Educator ID Assignment	364,000	
<b>TOTAL for Catch-up Maintenance</b>	<b>444,000</b>	

	<b>2,331,000</b>	<b>137,500</b>

The types of expenditures for each of the categories above are as follows:

- **Security and Infrastructure:** \$1,177,000
  - Hardware (firewalls/servers): \$630,000
  - Consultants/Contractors: \$547,000
  
- **Reporting and System Improvements:** \$710,000
  - Software Tools/Business Intelligence Tool: \$400,000
  - Consultants/Contractors: \$310,000
  
- **Maintenance/Catch-up:** \$444,000
  - Software and Hardware Maintenance: \$80,000
  - Updates/Rewrites for Student ID System: \$364,000

ADDITIONAL REQUEST INFORMATION	
<b>Please indicate if three-year roll forward spending authority is required.</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Date of project's most recent program plan:	N/A
Please provide the link to the program plan or attached the first page of the analysis to this document:	
Request 6-month encumbrance waiver?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
New construction or modification?	<input type="checkbox"/> New <input type="checkbox"/> Renovation <input type="checkbox"/> Expansion <input type="checkbox"/> Capital Renewal
Total Estimated Square Footage	ASF <span style="margin-left: 100px;">GSF</span>
Is this a continuation of a project appropriated in a prior year?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If this is a continuation project, what is the State Controller Project Number?	
CONTINUATION HISTORY (DELETE IF NOT APPLICABLE)	

ESTIMATED PROJECT TIME TABLE		
Steps to be completed	Start Date	Completion Date
Updates to existing systems	7/1/2018	6/30/2019
Ongoing Maintenance	7/1/2019	6/30/2021