## Budget

Cleveland Municipal (043786) - Cuyahoga County - 2014 - Straight A Fund - Rev 0 - Straight A Fund - Application Number (209)

### U.S.S. Fund #:

Plus/Minus Sheet (opens new window)

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<th>Object Code</th>
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<th>Retirement Fringe Benefits 200</th>
<th>Purchased Services 400</th>
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<th>Capital Outlay 600</th>
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**Adjusted Allocation** 0.00

**Remaining** -5,000,000.00
Applicants shall respond to the prompts or questions in the areas listed below in a narrative form.

### A) APPLICANT INFORMATION - General Information, Experience and Capacity

1. **Project Title:** CMSD Core IT Infrastructure Development

2. **Executive summary:** Provide an executive summary of your project proposal and which goal(s) in question 9 you seek to achieve. Please limit your responses to no more than three sentences.

### B) PROJECT DESCRIPTION

8. **Please provide a brief description of the team or individuals responsible for the implementation of this project including relevant experience in other innovative projects.** You should also include descriptions and evaluations of the team's work on previous projects.

9. **Which of the stated Straight A Fund goals does the proposal aim to achieve?**

   - [ ] Student achievement
   - [ ] Spending reductions in the five-year fiscal forecast
   - [ ] Utilization of a greater share of resources in the classroom

10. **Which of the following best describes the proposed project?**

    - [ ] New - never before implemented
    - [ ] Existing and researched-based - never implemented in your district or community school but proven successful in other educational environments
    - [ ] Mixed Concept - incorporates new and existing elements
    - [ ] Enhancing/Scale Up - elevating or expanding an effective program that is already implemented in your district, school, or consortia partnership

11. **Describe the innovative project.**

    The Cleveland Metropolitan School District seeks to increase student achievement, improve employee productivity, and achieve spending reductions in the five-year fiscal forecast by investing in and upgrading our Core IT Infrastructure, and moving it to a district facility. Our current Core IT Infrastructure is 7-10 years old, unsupported by the vendors and does not support the current school district requirements. As a result, the district experiences numerous bottlenecks which diminish access to information and externally hosted (cloud) solutions like common core. These numerous technical challenges are summarized below:

   - **Increased Data Loss:** Current storage hardware failure rates are increasing resulting in increased data loss. Accelerated Support Risks - Current hardware is at or past end of life and cannot support the latest supported software versions which results in lack of vendor support during a failure and no option for upgrades.
   - **Reduced Performance:** Current internet access is limited to 25% of the available bandwidth because of hardware limitations. The impact grows significantly as more end-user devices coming online at the district as part of the Blended Learning Initiative, and the increased use of online learning and testing.
   - **Lack of Security:** The current network hardware does not permit the use of new technologies (i.e. virtualization, etc.) that would significantly reduce operating costs. Limited Enhancement Options - Current IT environment provides little to no option of automating new district business requirements and results in inconsistent processes and poor data quality.

   It is imperative to make timely business decisions. It is imperative that the district invest in new, more efficient and cost-effective Core IT Infrastructure. Thus, this grant request will allow us to significantly improve our Core Infrastructure capacity and performance, by making specific investments and upgrades to the following key items: Upgrade Security and Authentication - Move to update and modernize our authentication and security capabilities. This project will need approximately 4-6 physical servers with 500GB of disk space. The result will be focused on improve security, reduces maintenance, and up to date support. CMSD authentication for cloud (hosted) solutions - As the district begins to leverage cloud-based (hosted) solutions, this provides the capability to ensure all communications are secure and protected. SchoolWires is one of the projects that will require this type of set up. This project will require 1 physical server with 10GB of disk space. New/Upgraded Software Implementations - The current server infrastructure is fully utilized and unsupported. Requirements for Server and SAN space will vary. Additional Internet Capacity - Provides for the capability to leverage the full capacity of our Internet service provider's capability thus resulting in the ability to utilize all state required testing services as well as district's shared service solutions. A key partner of CMSD is The Lubrizol Corporation. Lubrizol has donated extensive support of its IT and finance staff, helping the district assess its IT and finance systems. As a $6.1 billion, global company, Lubrizol has modern advanced IT and finance systems and processes in place, and their staff expertise is providing much needed consulting and technical support as CMSD seeks to modernize its respective systems.
C) SUSTAINABILITY - Planning for ongoing funding of the project, cost breakdown

13. Financial Documentation - All applicants must enter or upload the following supporting information. Responses should refer to specific information in the financial documents when applicable:

a. Enter a project budget

b. Upload the Straight A Financial Impact Template forecasting the expected changes to the five-year forecast resulting from implementation of this project. If applying as a consortia or partnership, please include the five-year forecasts of each school district, community school or STEM school member for review.

c. If subsection (b) is not applicable, please explain why, in addition to how the project will demonstrate sustainability and impact.

14. What is the total cost for implementing the innovative project?

5,000,000.00 * Total project cost

* Provide a brief narrative explanation of the overall budget. The narrative should include the source and amount of other funds that may be used to support this concept (e.g., Title I funding, RTT money, local funding, foundation support, etc.), and provide details on the cost of items included in the budget (i.e. staff counts and salary/benefits, equipment to be purchased and cost, etc).

New Server Infrastructure Recommendations:

The new server infrastructure should have the minimum requirements: 10 Gigabit connections supporting 10Gb and Gigabit Ethernet, 5 Gigabit connections minimum. The system must have robust reporting for security audits (authentication attempts, current login, failed authentication attempts, etc.) and 5 Gigabit connections minimum. It must also support for Virtual Chassis and converged Ethernet. Support Multicasting via PIM, BGP, OSPF, Advanced Routing Protocol, BGP, OSPF, Advanced Routing Protocol, and IPv6 and Sflow/Netflow.

An additional $100,000 savings for the hosting services of eSchoolPLUS is $216,000 per year. The cost savings associated with the Virtual Desktop Infrastructure will be $2,000,000 per year. This is being accomplished by being able to purchase thin clients versus traditional PC workstations. The budget for a 4 year PC refresh cycle using traditional PCs is $3.8 million/year. Utilizing thin client hardware the cost would be $1.9 million allowing the district to save $1.9 million annually for hardware replacement. An additional $100,000 savings will be realized through decreased tech support. The thin client devices are much easier to support and the configuration/applications are managed centrally. Over the five year period of this grant, we will have anticipated savings of $12,230,000.

15. What new/recurring costs of your innovative project will continue once the grant has expired? If there are no new/recurring costs, please explain why.

0.00 * Specific amount of new/recurring cost (annual cost after project is implemented)

* Narrative explanation/rationale: Provide details on the cost of items included in the budget (i.e. staff counts and salary/benefits, equipment to be purchased and cost, etc.). If there are no new/recurring costs, please explain why.

NA

16. Are there expected savings that may result from the implementation of the innovative project?

2,466,000.00 * Specific amount of expected savings (annual)

* Narrative explanation/rationale: Provide details on the anticipated savings (i.e. staff counts and salary/benefits, equipment to be purchased and cost, etc.)

The cost savings associated with Moving all Windows systems to Linux will not be as great, but will still provide some cost savings annually. Currently, the COL0 Network is housed and operated by Blue Bridge Networks, with an annual cost of $300,000/year. Our contract with Sunguard K-12 Education for the hosting services of eSchoolPLUS is $216,000 per year. To move this function in-house will require CMSD to hire an eSchoolPLUS administrator, at the cost of $70,000 per year. Thus the net annual savings will be $146,000 per year. The cost savings associated with the Virtual Desktop Infrastructure will be $2,000,000 per year. This is being accomplished by being able to purchase thin clients versus traditional PC workstations. The budget for a 4 year PC refresh cycle using traditional PCs is $3.8 million/year. Utilizing thin client hardware the cost would be $1.9 million allowing the district to save $1.9 million annually for hardware replacement. An additional $100,000 savings will be realized through decreased tech support. The thin client devices are much easier to support and the configuration/applications are managed centrally. Over the five year period of this grant, we will have anticipated savings of $12,230,000. Thus, this project is not adding costs, but will have a substantial cost saving.

17. Provide a brief explanation of how the project is self-sustaining. If there are ongoing costs associated with the project after the term of the grant, this explanation should provide details on the cost reductions that will be made that are at least equal to the amount of new/recurring costs described above. If there are no new/recurring costs, explain in detail how this project will sustain itself beyond the life of the grant.

The annual recurring cost for software maintenance will not dramatically change and is part of the existing budget structure. The cost savings will occur with the added efficiencies in the new hardware and network infrastructure will afford increased opportunity and lower cost to maintain (less failures) and user satisfaction. The cost savings associated with bringing the data center back in house will result in cost savings in excess of $37,000 per year. Currently, the COL0 Network and Server Infrastructure is housed and operated by Blue Bridge Networks, with an annual cost of $300,000/year. Additionally, there will be savings of $146,000/year with CMSD taking over hosting responsibilities with eSchoolPLUS. Finally, the major savings from developing the Virtual Desktop Infrastructure will be $2,000,000 per year. Over the five year period of this grant, we will have anticipated savings of $12,230,000. Thus, this project is not adding costs, but will have a substantial cost saving.

D) IMPLEMENTATION - Timeline, communication and contingency planning

18. Fill in the appropriate dates and an explanation of the timeline for the successful implementation of this project. In each explanation, be sure to briefly describe the largest barriers that could derail your concept or timeline for implementation and your plan to proactively mitigate such barriers. In addition, the narrative should list the stakeholders that will be engaged during that stage of the project and describe the communication that occurred as the development was applied.

Describe the ongoing communication plan with the stakeholders as the project is implemented. (Stakeholders can include parents, community leaders, foundation support and businesses, as well as educational personnel in the affected entities.)

* Proposal Timeline Dates

Plan (MM/DD/YYYY): 01/01/2014

* Narrative explanation

CMSD has already completed all planning, including specifications and prices, for this Core Infrastructure Development Project, and we are ready for implementation.
23. Describe the substantial cost savings of the project, as that will allow us to get one full school year of usage. Working with our help desk, we will be able to historically track a multitude of service requests, by category, and determine what issues have declined and our level of service improvement. It is expected that with this Core infrastructure upgrade, we will be able to measure frequency of down-time, service interruptions, nature of service calls, and speed of problem resolution.

**E) SUBSTANTIAL IMPACT AND LASTING VALUE - Impact, evaluation and replication**

24. Describe the rationale, research or past success that supports the innovative project and its impact on student achievement, spending reduction in the five year forecast or utilization of a greater share of resources in the classroom.

The rationale to invest in CMSD Core infrastructure development is based on the reality that effective 21st Century teaching and learning is not possible without access to technology. Technology can be used to bring exciting curricula to real world problems into the classroom; provide scaffolds and tools to enhance learning; give students and teachers more opportunities for feedback, reflection, revisio; build local and global communities that include teachers, administrators, students, parents, practicing scientists, and others; and expand opportunities for teacher learning. Further, many young people live in a world that revolves around technology, and expect to be able to surf the internet and access information with a few taps of their fingers. The technologies and applications that we will use to implement this project will give students and teachers access to a variety of applications such as web-based learning modules, mobile learning applications, and professional development opportunities. This new technology will allow the District to provide timely and appropriate resources for student assessment and other educational opportunities, be they computer aided and web-based learning, instruction and assessment, or exploring the development of blended learning school models.

25. Is this project able to be replicated in other districts in Ohio?

Yes

26. Describe the substantial value and lasting impact that the project hopes to achieve.

The substantial value in the significant cost savings of self-hosting our Software Environment is reducing the cost associated with external hosting of our server infrastructure. To assess this requires approximately six to nine months of analyzing current infrastructure costs compared to self-hosting, hardware failure analysis is complete. The cost savings is more feasible to self-host its IT infrastructure, or is it more cost effective to outsource?

27. If so, how?

If the determination is to self-host, then the IT migration will take approximately six months to be phased in.

28. If so, how?

As needed after Project 1.

29. The successful attainment of project goals by reducing external costs, improving performance, and laying the foundation for an academic technology plan. We have significant costs associated with external hosting services, and by investing in the upgrade and migration of these services in-house, we will be able to eliminate these costs. Without these investments we cannot upgrade these services in-house. We also acknowledge that there is a productivity cost with frequent system disruption, and this investment will significantly improve productivity and thus productivity. Finally, any academic technology plan is only as good as the infrastructure which supports it. With this investment, we will be able to pursue and develop quality online and web-based learning modules. CMSD will be able to sustain this project after the grant, as we can reinvest the significant cost savings, plus we will not be having to make a vastly huge infrastructure investment all at once, but can make consistent smaller investments yearly to support this.

20. Describe the rationale, research or past success that supports the innovative project and its impact on student achievement, spending reduction in the five year forecast, or utilization of a greater share of resources in the classroom.

The substantial cost savings are a result of the district deciding to host its own server infrastructure. This project will lead to immediate cost savings of approximately $18,114.74 per month in external hosting costs. This project will lead to the successful attainment of project goals by reducing external costs, improving performance, and laying the foundation for an academic technology plan. We have significant costs associated with external hosting services, and by investing in the upgrade and migration of these services in-house, we will be able to eliminate these costs. Without these investments we cannot upgrade these services in-house. We also acknowledge that there is a productivity cost with frequent system disruption, and this investment will significantly improve productivity and thus productivity. Finally, any academic technology plan is only as good as the infrastructure which supports it. With this investment, we will be able to pursue and develop quality online and web-based learning modules. CMSD will be able to sustain this project after the grant, as we can reinvest the significant cost savings, plus we will not be having to make a vastly huge infrastructure investment all at once, but can make consistent smaller investments yearly to support this.

21. Is this project able to be replicated in other districts in Ohio?

Yes

22. If so, how?

If the determination is to self-host, then the IT migration will take approximately six months to be phased in.

23. Describe the substantial value and lasting impact that the project hopes to achieve.

The substantial value in the significant cost savings of self-hosting our Software Environment is reducing the cost associated with external hosting of our server infrastructure. To assess this requires approximately six to nine months of analyzing current infrastructure costs compared to self-hosting, hardware failure analysis is complete. The cost savings is more feasible to self-host its IT infrastructure, or is it more cost effective to outsource?

24. What are the specific benchmarks related to the fund goals identified in question 9 that the project aims to achieve in five years? Include any other anticipated outcomes of the project that you hope to achieve that may not be easily benchmarked.


25. What are the specific benchmarks related to the fund goals identified in question 9 that the project aims to achieve in five years? Include any other anticipated outcomes of the project that you hope to achieve that may not be easily benchmarked.

Project 1: Implementation of Server/SAN Environment in COLLOCATION and migration to Windows 2008 Active Directory functionality with new domain controllers Timeframe: 1 month Infrastructure Needed: SAN initially configured at minimum 40TB raw storage New backup system implementation with disk backup configured in relation to production SAN. Two (2) server blade enclosures populated with four servers in each enclosure (8 blade servers total) Network interconnectivity to interface new server blade infrastructure and ISCSI to the existing Cisco 6500 Distribution Switches (Windows 2008/2012 Datacenter licensing, any virtual licensing, etc). Project 2 - Implementation of new server implementations as requested. Forefront Identity Management Implementation. Timeframe: As needed Project 1. Infrastructure Needed: server blades and enclosures to support incoming projects as needed SAN and expansion past 40TB raw storage (as needed) 1-2 server blades for Forefront Identity Management Additional Software to Support infrastructure (Windows 2008/2012 Datacenter licensing, any virtual licensing, etc.) Project 3 - Migration of existing server environment to new system Timeframe: 3-6 months Infrastructure Needed: Server blades and enclosures to support existing environment (estimated 20-25 server blades with virtualization) SAN expansion past 40TB raw storage (as needed) Backup storage expansion (as needed) 1-2 server blades for Forefront Identity Manager Implementation and Additional Software to Support Infrastructure (Windows 2008/2012 Datacenter licensing, any virtual licensing, etc.) Project 4 - Decommission of Old Server/SAN Environment Timeframe: 1 week after the completion of Project 3. Project 5 - Initial Virtual Desktop Infrastructure (VDI) implementations as requested. Timeframe: after Project 1, 3-4 months Infrastructure Needed: Server blades and enclosures to support incoming projects as needed SAN storage (as needed) Backup storage expansion (as needed) 2-4 server blades for VDI server/ Virtual Desktop Infrastructure (Windows 2008/2012 Datacenter licensing, any virtual licensing, etc.) Phase 4 - Implement New Network Hardware at Location TBD Project 1 - Design network topology with current MAN provider for service turn up and plan outper at location TBD. Work with ISP and MAN providers to install service at new location. Timeframe: 2 months Project 2: Migration of New Network Hardware at the location T&D Timeframe: 1:2 months Infrastructure Needed: All network recommendations proposed in section 4.3. Project 3 - Migration of New server to new network hardware Timeframe: 1 month Infrastructure Needed: Migrate Internet Content Filter to new location (note: purchase of new network filter is out of scope of this document) Phase 3 - Migration of New server/Network Environment to New Location TBD Timeframe: 1 week Phase 4: Decommission of Old Network/Server/SAN Devices at Old Location(s) Timeframe: 1:2 months

26. Describe the plan to evaluate the impact of the concept, strategy or approaches used.

* Include the method by which progress toward short- and long-term objectives will be measured. (This section should include the types of data to be collected, the formative outputs and outcomes and the systems in place to track the program's progress.)

This project requires the evaluation of the successful implementation and migration of hardware/software, measuring how this upgrade in our server infrastructure has improved performance and productivity, and how this upgrade lays the foundation for CSMD to develop an academic technology plan. The successful implementation and migration of the hardware and software needed to upgrade our server infrastructure is probably the easiest to evaluate, as it entails managing the selecting, purchasing and installation of hardware/software, then testing and troubleshooting the system prior to full
Working with Intellinet Corporation, which is currently awarded the E-Rate contract for server maintenance, network support, and email services, we have high quality project management and implementation support to assure that this part of the project is on-time, on-budget, and is operationally tested for a smooth transition and full implementation. We anticipate this aspect of the project to be fully completed by June 30, 2014. Once this is completed, we will evaluate cost savings based on prior year’s expenses for external hosting of the server and E-School Plus with current expense reports. We expect to see a significant cost savings, but also recognize the potential for hidden costs post-project completion. Thus, we will track this expense line item for the duration of the five years of this grant, to verify actual results. Next, we will evaluate how the infrastructure upgrade will improve performance and productivity. The two main areas to evaluate if the upgrade to our core infrastructure improves performance and productivity is to measure the frequency of server failure/disruption, and speed, plus to measure the volume and nature of calls to the CMSD Help Desk. We do not have an external benchmark or industry standard by which to measure performance and productivity, plus how these can be extrapolated into cost savings, so we are developing our own metric for this. For server failure/disruption, we will look at the historical record of the frequency and severity of server failure/disruption, to create a baseline for how often this happened, and how long it took to get back online. With this information, we will model what this means in terms of productivity and loss work hours. Next, we will acquire the same information for the new server, to develop pre and post comparison points. Finally, with this information, we will be able to develop a cost saving matrix, which will reveal cost savings due to increased performance. We will do this every year beginning 6/01/2015, after having a year with the new system. Finally, for the academic technology plan, we will evaluate the successful implementation of this by assuring that each objective is achieved, and that the academic technology plan, including assessment of current capacity, expansion strategies, and recommendations for blended learning models are adopted by the Board of Education, by June 2014.

By virtue of applying for the Straight A Fund, all applicants agree to participate in the overall evaluation of the Straight A Fund for the duration of the evaluation timeframe. The Governing Board of the Straight A Fund reserves the right to conduct evaluation of the plan and request additional information in the form of data, surveys, interviews, focus groups, and any other related data to the legislature, governor, and other interested parties for an overall evaluation of the Straight A Fund.

PROGRAM ASSURANCES: I agree, on behalf of this applicant agency and/or all identified partners to abide by all assurances outlined in the Assurance section of the CCIP. In the box below, enter “I Accept” and indicate your name, title, agency/organization and today’s date:

I accept” Diana Ehlert Deputy Chief of Academic Resources/State and Federal Programs Cleveland Metropolitan School District October 24, 2013