

The School Board of Broward County, Florida

**Agreed-Upon Procedures Report
January 22, 2021,
except as to the emphasis of matter paragraph,
which is as of May 19, 2021**

Bid #16-059E - IT Technology Devices



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THE SCHOOL BOARD OF BROWARD COUNTY, FLORIDA

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Independent Accountant's Report on Applying Agreed-Upon Procedures

To: Members of the School Board of
Broward County, Florida

We have performed the procedures enumerated below, which were agreed to by The School Board of Broward County, Florida (the "SBBC") solely to assist the specified parties in evaluating Broward County Public School's ("BCPS") compliance with its purchasing policies and requirements related to the purchases of technology devices on Bid 16-059E. We are not responsible for the BCPS's compliance with those requirements, which is the responsibility of the BCPS's management. The sufficiency of these procedures is solely the responsibility of those specified parties in this report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

The procedures performed are located on pages 4 - 9 and our findings, observations and recommendations are detailed in Exhibit I.

This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. We were not engaged to and did not conduct an examination or review, the objective of which would be the expression of an opinion or conclusion, respectively, on Broward County Public School's ("BCPS") compliance with its purchasing policies and requirements related to the purchases of technology devices on Bid 16-059E. Accordingly, we do not express such an opinion or conclusion. Had we performed additional procedures; other matters might have come to our attention that would have been reported to you.

Emphasis of Matter

The agreed upon procedures report was originally issued on January 22, 2021. Certain presentation of charts and wording were made subsequent to the original issuance of the agreed upon procedures report to cause this report to be reissued with new information.

This report is intended solely for the information and use of the School Board of Broward County and BCPS's management and is not intended to be and should not be used by anyone other than these specified parties.

HCT Certified Public Accountants & Consultants, LLC

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January 22, 2021, except as to the emphasis of matter paragraph, which is as of May 19, 2021

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EXECUTIVE SUMMARY

Purpose: The School Board of Broward County, Florida (the “SBBC”), Office of the Chief Auditor requested that HCT Certified Public Accountants & Consultants, LLC (“HCT”) perform an Agreed-Upon Procedures engagement related to the District’s purchase of technology devices on Bid 16-059E.

The scope of the engagement specifically focused on the technology selection, purchasing and provisioning processes related to Lenovo Laptops and CDI tablets. The specified objectives of the engagement were as follows:

Objective #1 - Determine if the purchases related to Bid Identification #16-059E were in accordance with BCPS policies 3320, 5306 and 5306.1.

Objective #2 - Review if purchases related to Bid Identification #16-059E were in compliance with SMART Bond guidelines for technology purchases.

Objective #3 - Research if Edco Education had any involvement in the purchases related to Bid Identification #16-059E.

Objective #4 - Review BCPS technology requirements as they relate to the purchases of Lenovo laptops/desktops made under Bid ID #16-059E to determine if these purchases met those requirements.

Objective #5 - Examine transaction structure based on SMART Bond technology funding.

SUMMARY OF FINDINGS AND OBSERVATIONS

- **Finding #1-01 *Purchase order assigned to the wrong bid number in SAP.***
We noted that a PO report generated on July 7, 2020 for IT Audit indicated PO 7519007853, which has a document date of March 8, 2019, was assigned to Bid ID #16-059E. As such, Electronic Data Inc. (EDI) payments of \$420,309.04 were recorded under Bid 16-059E in SAP. There are only two vendors (Lenovo and CDI) approved for payments under Bid 16-059E.
- **Finding #1-02 *Error in the legal date as reflected in SBBC board packet:***
The Original Board Packet documents included the “Financial Analysis Worksheet” which reflected a date of February 1, 2015. The Bid was not advertised until November 2015.
- **Finding #1-03 *Errors in the Awarded Vendors on Financial Analysis Worksheet***
We noted that the Financial Analysis Worksheet lists Lenovo (United States) Inc. as the sole vendor of the awarded amount of \$81,040,000. Bid 16-059E contained two awarded vendors.
- **Finding #1-04 *Lack of documentation regarding the time stamped-in for Bids received from Vendors:***
We were provided “Stamped in Bids” documentation on 2 of the 5 vendors. There was no stamped-in documentation available for the 2 awarded vendors.
- **Observation #4-01 – *Purchases of Lenovo laptops/desktops made under Bid ID 16-059E meet BCPS requirements.***
Purchases of Lenovo laptops/desktops made under Bid ID #16-059E met BCPS requirements. The BCPS technology devices selected were based on the specifications and the dollars to be expended based on the TAC Committee recommendation and other specifications as provided from the community.
- **Observation #4-02 – *Purchase orders from vendors (Lenovo and CDI) were for the correct proposed devices.***
Purchase orders from vendors (Lenovo and CDI) were for the correct proposed devices.
- **Observation #4-03: – *Quality level of actual purchases***
We performed research on the actual technology devices by reviewing the submitted incident tickets from June 18, 2020 to September 27, 2020. Additionally, we examined the quality assessment of Lenovo devices for the period 2016-2018.
- **Observation #05-01 *Technology funded by SMART program on computer devices related to Bid 16-059E.***
 - ❖ The technology associated with the SMART Bond monies accounted for 34% of the total technology device expenditures. The 66% of the Technology devices expenditures were from General fund monies or other BCPS funding sources.

➤ AGREED-UPON PROCEDURES REPORT

BACKGROUND:

Bid # 16-059E for Technology Computing Devices was selected by the Office of the Chief Auditor Office to determine if the purchases made were in accordance to the Broward County Public Schools (“BCPS”) purchasing policy and technology selection guidelines. Bid # 16-059E allowed the District to procure technology devices using the Microsoft Windows operating system to support the educational and administrative environment. The financial impact to the District would be approximately \$82M for a three (3) year and eleven (11) month period.

During the contract period February 10, 2016 to December 31, 2019 for the Bid# 16-059E, BCPS purchased approximately 83,400 devices for \$45.6M. The bid was divided into four categories:

- Group 1 and 2 (Windows Laptop Systems & Windows Desktops Systems)
- Group 3 (Windows Tablet Systems)
- Group 4 (Windows low-end Cloud devices)

Group 1 and 2 combined were awarded to a single manufacturer, group 3 and group 4 were each awarded to a single vendor. The groups were awarded to the lowest priced responsive and responsible bidders meeting specifications, terms and conditions. The following vendor(s) are awarded under Bid# 16-059E:

- Lenovo (United States) Inc. for Group 1 and 2
- CDI Computer Dealer Inc. for Group 3
- Lenovo (United States) Inc. for Group 4

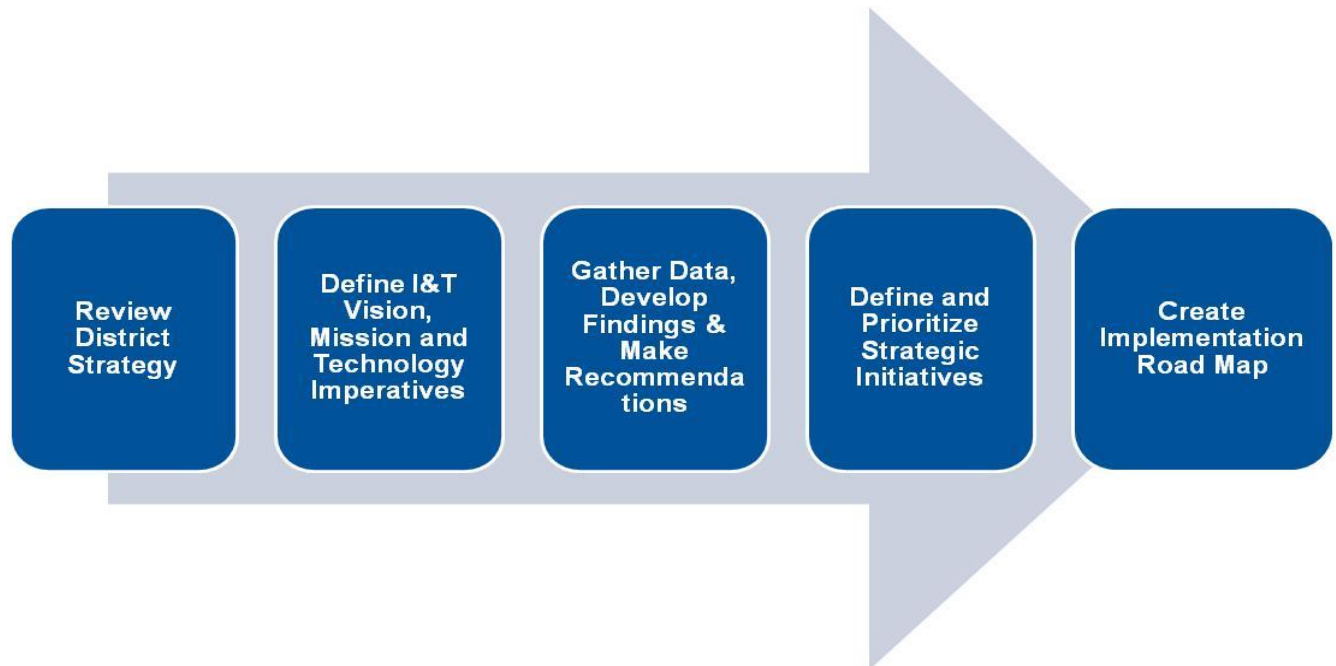
At the January 2014 BCPS board meeting, the former CIO and the Chief Strategy and Operations Officer presented the Information & Technology (I&T) Strategic Plan for Broward County Public Schools (BCPS). The Information & Technology (I&T) Strategic Plan provides a road map for the deployment of technology to support the District’s overall strategic goals over the next three to five years. This plan sets out to accomplish the following:

- To describe the vision and mission for technology deployment in the District;
- To define the key technology objectives needed to support the District’s three strategic goals of high-quality instruction, continuous improvement and effective communications;
- To assess where the District is today and provide recommendations to meet District goals; and
- To identify a set of prioritized strategic initiatives and technology investments and a road map for implementation over the next three to five years.

This plan was developed over a three-month period by the former Chief Information Officer (CIO) with guidance from the I&T Strategic Planning Advisory Council and Gartner Consulting. The information needed to develop this plan was gathered through:

- Extensive interviews with internal and external school District stakeholders: principals, teachers, students, District staff and administrators, external community members and business partners; and
- Workshops with the Technology Advisory Council, the I&T Strategic Planning Advisory Council and I&T staff.

The following diagram shows the steps followed to develop the I&T Strategic Plan for the District



District-wide Computer Refresh Initiative – The District-wide computer refresh initiative was one of the top initiatives. This initiative seeks to replace all outdated computers in schools and administrative offices over a period of 36 months followed by a consistent ongoing refresh cycle that will replace District-wide computers on a regular schedule. This initiative includes any one-to-one student computing ratio activities. There are several benefits and rationales as listed below:

- Ensures students have access to computers that help them acquire the technology skills required for college and career readiness
- Ensures student have access to computers that can handle personalized learning and instructional software requirements
- Ensures students have access to computers that meet common core curriculum for technology skills and online assessment requirements

Under the SMART program technology initiative, the District continued to refresh, replace older and outdated equipment. The SMART program technology initiative works towards a minimum of a 3.5:1 student to computer ratio thus closing the computer gap. Funding is provided to close the digital device gap at schools and provide the school with at least 1 device for each 3.5 students.

The School Board of Broward County, Florida Office of the Chief Auditor hired HCT Certified Public Accountants & Consultants, LLC (“HCT”) to perform an agreed-upon procedures engagement to examine these transactions.

SCOPE AND OBJECTIVES:

The scope of our review specifically focused on the procurement process, technology selection, purchasing and provisioning processes related to the IT Technology Devices and accessories purchased within the contract term of February 10, 2016 - December 31, 2019.

The objectives of our engagement included the following:

Objective #1 - Determine if the purchases related to Bid Identification #16-059E were in accordance with BCPS policies 3320, 5306 and 5306.1.

Objective #2 - Review if purchases related to Bid Identification #16-059E were in compliance with SMART Bond guidelines for technology purchases.

Objective #3 - Research if Edco Education had any involvement in the purchases related to Bid Identification #16-059E.

Objective #4 - Review BCPS technology requirements as they relate to the purchases of Lenovo laptops/desktops made under Bid ID #16-059E to determine if these purchases met those requirements.

Objective #5 - Examine transaction structure based on SMART Bond technology funding

METHODOLOGY:

To satisfy the engagement objectives, we performed the following agreed-upon procedures:

We reviewed BCPS's purchasing and procurement policies and procedures related to this transaction as follows:

- 3320 - Purchasing Policies
- 5306 – School and District Technology Usage
- 5306.1 – Technology Advisory Committee

We reviewed the bid process, documents and approvals related to the following Bid# 16-059E:

The Broward County Public Schools ("BCPS") employed Bid Identification #16-059E during the years of 2016 to 2019. Purchases related to Bid Identification #16-059E were in accordance with BCPS policies 3320, 5306 and 5306.1. The technology devices purchased with Bid #16-059E were in compliance with SMART Bond guidelines for technology purchases. Technology requirements for the purchases of Lenovo laptops/desktops made under Bid ID #16-059E met BCPS requirements. The SMART Bond technology funding and SBBC Policies requires that the TAC Committee be involved with technology purchases. TAC committee gives recommendations and

the proposed financial impact to District for the 3-year period. As a condition precedent to participate in the solicitation, all interest vendors must have attended the BCPS mandatory Bidders' Conference. The procurement department was authorized only to direct the attention of prospective bidders to various portions of the bid so they may read and interpret the answers to their questions. There were four groups assigned technology devices created for this procurement. Those four major categories were laptops, desktops and cloud-based devices and tablets.

Summary of interviews conducted:

Interview with BCPS's Finance Manager Information Technology (IT) Department

HCT participated in a zoom interview on September 25, 2020 with the Finance Manager of the IT Department. HCT formulated preliminary questions based on our initial review of the funding documentation. We remitted the preliminary questions to SBBC staff on September 23, 2020 in preparation of our interview on September 25, 2020.

During the zoom conference, we discussed if any purchase, lease, and/or loan arrangements occurred for items purchased under this bid. The response from IT finance was that they have no knowledge of lease funding used by IT during the contract period of Bid #16-059E.

Interview with BCPS's Procurement and Warehouse Services (PWS) Department

A zoom conference was held on September 25, 2020 with personal from HCT, the Chief auditor's office and the Director of Procurement and Warehouse Services. During the zoom conference, discussions centered on several Bid #16-059E documents. Based on the interview, it appears that the director was not involved with Bid 16-059E.

Interview with BCPS's Capital Budget Department

An interview with the Capital Budget Director held on October 5, 2020 to determine the funding structure and SMART Bond processes. We discussed the purchase, lease, and/or loan arrangements for items purchased under this bid. We ascertained that 34% of the dollars expended to purchase technology devices were from the technology portion of the SMART program.

Interview with BCPS's Computer Operations Department

A zoom conference interview was held with the Director of Computer Operations on October 14, 2020. We learned that new director was hired after the creation, commencement and roll out of technology devices from Bid 16-059E. The Computer operations director did serve as the task assigned CIO after the voluntary termination of the former CIO.

Interview with BCPS's Network Integration Department

A virtual interview was held with the network integration director on October 28, 2020. We posed several questions to him on his knowledge of any purchase, lease, and/or loan arrangements for items purchased under this bid. The Director explained in his response that Bid 16-059E was presented before the TAC committee several times and the all procedures were followed. The Director advised us on the specifications and the cost maximums imposed by SBBC. Please see Observation #4-02 for additional discussion.

Interview with Former TAC chair

We interviewed the Former BCPS Technology Advisory Committee (TAC) Vice Chair / Chair to determine the TAC's involvement in Bid #16-059E and the selection of the Lenovo laptops/desktops. We noted that TAC was made aware of Bid #16-059E. TAC participated in the inception, drafting and bid specifications of Bid 16-059E. BCPS hired an independent consulting firm to review and assist with the process of Bid 16-059E. We noted the direct involvement by the BCPS Chief Strategy & Operations Officer through this the reporting of actions planned and actions completed in the processes for Bid 16-059E. In accordance with SBBC policy, TAC had direct involvement and knowledge of Bid #16-059E.

Interview with W/MBE Department

We discussed policy 3320, the procurement policy on diversity with suppliers and local vendors. The policy was effective and implements in June 2017. The responding vendors to Bid 16-059E were not required to partner with any MWBE vendors. We noted that the procurement department was not require nor did they track the WMBE utilization under Bid 16-095E. We noted that one of the award vendors did employ a WMBE vendor in with original proposal.

Interview with Chief Strategy & Operations Officer

Per the Chief Strategy & Operations Officer, the Procurement Director is the team leader for procurement. The Chief Strategy & Operations Officer described his role in Bid 16-059E as oversight of the process. The Chief Strategy & Operations Officer duties include assisting with issue resolution where a problem may exist. Chief Strategy & Operations Officer reviews and approves board items. Based on Chief Strategy & Operations Officer review and approval involvement, he would have reviewed and approved the SBBC board submission for Bid 16-059E. Chief Strategy & Operations Officer receives period updates from staff on action items. Chief Strategy & Operations Officer was involved with Bid 16-059E

Per the Chief Strategy & Operations Officer, there is an inherit responsibility to perform in various ways to ensure that his team adheres to all policies. The Chief Strategy & Operations Officer employs the following objectives assist with the team adherence to SBBC policies:

- empowers smart people to lead this department.
- to make sure that polices is update to reflect any and all new state statutes.
- ensure that protocols are in place to make sure the team is heading in the correct direction.

- provide the right of system to track and monitor and ensure adherence to the policies – 3320; 5306 and 5306.1.
- hire and retain the people so that the departments are strengthen and staffed to ensure the fidelity of the policies and processes.
- give the Staff the authority to implement and maintain the aforementioned policies

The Chief Strategy & Operations Officer discussed the IT grants and other financing that schools may receive to purchase devices. The fundraising for technology is important and allowed for SBBC schools. The Chief Strategy & Operations Officers not aware of any involvement of Edco Educational.

EXHIBIT I

FINDINGS, OBSERVATIONS, AND RECOMMENDATIONS:

OBJECTIVE #1 - Determine if the purchases related to Bid Identification #16-059E were in accordance with BCPS policies 3320, 5306 and 5306.1.

We performed procedure to determine if the purchases related to Bid Identification #16-059E were in accordance with BCPS policies 3320, 5306 and 5306.1. The appropriate BCPS policies are listed below:

- 3320 - Purchasing Policies
- 5306 – School and District Technology Usage
- 5306.1 – Technology Advisory Committee

SBBC Policy 3320 establishes procurement procedures and designates the authority of staff in order to implement this policy. Policy 3320 is a structural manual based on levels of expenditures by dollar thresholds.

SBBC Policy 5306 adheres to the belief that technology should play a vital role in meeting the needs of the broad range of abilities, disabilities, cultural backgrounds and ethnic populations represented in District schools. To assure that technology shall play a predominant role; this policy provides guidance for appropriate technology utilization and integration into the curriculum, as well as infusion into school/District administration and management.

SBBC Policy 5306.1 requires that TAC be involved with technology purchases. TAC gives recommendations and the proposed financial impact to District for the 3-year period. We compared the TAC recommendations to the awarded vendors Bid Tabulation Sheet. A review of the process highlighted the large difference in financial impact for all Groups as compared to vendor proposed amounts.

We reviewed the procurement documentation provided on the bidding process that was followed for Bid #16-059E. We obtained documentation that gave insight into the “then” current process for procurement that was in place at the time of Bid #16-059E. We reviewed the following:

- Bidders’ Conference Sign-In Sheet: All vendors that submitted bids were verified / noted as in attendance on the sign-sheet of Bidders’ Conference held November 19, 2015, as a requirement for submitting a vendor bid.
- Bid Review Committee List: BCPS’s Procurement and Warehouse Services (PWS) Department noted that this committee was not applicable for this bid. The award would be based on lowest price.
- Posting of the Bid Award on Demandstar: The bid award was original posted on December 9, 2015. The bid award was re-posted on December 11, 2015 because the Lenovo Group 2 tabulation did not include item 2D.

Documentation to indicate if the process was fully implemented in 2018 for Bid #16-059E to ensure no overspend of POs: We were provided with the Standard Operating Procedures Purchase Requisition Purchase Order (SOP PR-PO) Conversion checklist.

- Total amount to awarded vendors Lenovo and CDI: The following chart provides the total amount awarded to each vendor for each Group.

ITB 16-059E Groups	Award Vendor	Amount Awarded
Group 1 / Group 2	Lenovo Inc	\$ 64,040,000
Group 3	CDI Computers	\$ 12,000,000
Group 4	Lenovo Inc.	\$ 5,000,000
	TOTAL	\$ 81,040,000

- The amount of payout to CDI was drastically lower than the originally proposed. The original bid amount of \$12 million was awarded for Group 3. The Lenovo payout is within the original proposed amount in Bid 16-059E for awarded Groups 1, 2 and 4 totaling \$69,040,000.00. The following chart provide total amount awarded to Lenovo over a 3-yr period (FY 2016-2019) and CDI over a 3-yr period (FY 2016-2018)

VENDOR	AWARDED AMOUNT	TOTAL PO SPEND	TOTAL INVOICES APPLIED
Lenovo (United States) Inc	\$69,040,000.00	\$ 45,232,512.11	\$ 45,192,203.12
CDI Computer Dealers Inc	\$ 12,000,000.00	\$ 40,956.00	\$ 40,956.00
Grand Total	\$81,040,000.00	\$ 45,273,468.11	\$ 45,233,159.12

Findings #1-01 – Purchase order assigned to the wrong bid number in SAP.

- ❖ We noted that a PO report generated on July 7, 2020 for IT Audit indicated PO 7519007853, which has a document date of March 8, 2019, was assigned to Bid ID #16-059E. There are only two vendors (Lenovo and CDI) approved for payments under Bid 16-059E. Upon further questioning on the EDI payouts and investigation by the Procurement Department, it was found that EDI was noted as a vendor under Bid #16-059E in error in the SAP system.
- ❖ A screenshot of Purchase Order 7519007853 was provided demonstrating that a request and change from Bid #16-059E to Bid #57-040E was performed on July 13, 2020. Incorrect posting of vendor payments to an inappropriate bid number allows for misallocation of expenditures and potential over spending with vendors for goods and services not originally awarded or contracted for.

Changes Recorded to PO # 7519007853 on 07/13/2020:

Changes Purchase Order 7519007853									
Item	Object	Short text	Action	New value	Old value	Version	User	Date	Time
	Header	Header note	Entered			1	P00000657	07/13/2020	15:36:30
	Header	Our Reference	Changed	57-040E	16-059E	1	P00000657		15:36:30

PO Bid ID after changes:

Framework Order 7519007853 Created by	
Document Overview On Messages Personal Setting	
Framework Order 7519007853	Vendor 131909 ELECTRONIC DATA INC Doc. date 03/08/2019
Salesperson	Your Reference
Telephone	Our Reference 57-040E
Language EN	

Recommendation – We recommend that the SBBC implement internal controls over vendor entries being posted to bids in SAP. The SBBC should consult with the IT department to implement a system control that only allows specific vendors to post to specific bids.

Management Response – Mary C. Coker, Director, Procurement & Warehousing Services

Procurement & Warehousing Services (PWS) has issued an RCA (Root Cause Analysis) and has identified that the Purchasing Agent assigned to the (IT) module was on vacation the week the Purchase Order (PO) was issued incorrectly by the back up (PWS) purchasing staff. The back-up Purchasing Agent Specialist acknowledged this was human error and a typo mistake in converting the Purchase Requisition (PR) to Purchase Order (PO) in error due to the vendors being similar in name from CDI to EDI. PWS has added an additional step to the existing Standard Operating Procedures (SOP) / Work instructions to include this verification against the Bid No. With this new control, it adds an additional layer of verification by the Purchasing Agent Specialist that reduces any risk in this happening again.

Findings #1-02 - Error in the legal date as reflected in SBBC board packet:

- ❖ The Original Board Packet included the “Financial Analysis Worksheet” which reflected a date of February 1, 2015. The Bid was advertised in November 10, 2015. We noted that the “Financial Analysis Worksheet” was dated “February 1, 2015”, which was nine (9) months before the Bid was advertised in November 10, 2015. Upon questioning about the discrepancy with the Procurement Department, their investigation determined the following:
 - i. During the interview with the Director of Procurement, it was noted that a data entry error was made by the Purchasing Agent responsible for the bid at that time;
 - ii. This was an open entry field in the FAW and manually filled;
 - iii. After checking the file properties, it is dated in February 2016;
 - iv. The “Notes” section contained an amount expended that was from the previous contract.

Recommendation – We recommend that the SBBC implement a review of legal dates and other pertinent information in any legal bid document to ensure accuracy.

Management Response - Mary C. Coker, Director, Procurement & Warehousing Services

The Financial Analysis Worksheet (FAW) form and process was completely revamped and has since been automated including the date fields and all other pertinent fields; this eliminates any manual and or typos such as the one identified in this case. In addition, PWS also reviews those date fields as part of the new process with the new FAW, ensuring the corresponding dates match with the existing Bid that is being presented as a board item for board approval.

Findings #1-03 - Error in the Awarded Vendors on Financial Analysis Worksheet:

- ❖ We noted that the Financial Analysis Worksheet lists Lenovo (United States) Inc. as the sole vendor of the awarded amount of \$81,040,000. Bid 16-059E contained two awarded vendors. Based on our follow up on the discrepancy with the Procurement Department, their investigation determined a data entry error by the Purchasing Agent responsible for the bid at that time. The explanation from Procurement stated that “this was an open entry field in the FAW and was manually filled.” Based on the estimated Spending listed in the Executive Summary of the ITB, the awarded amounts should have been as follows:

1. Lenovo (awarded groups 1,2,4) = \$69,040,000
2. CDI (Awarded group 3) = \$12,000,000

Recommendation – We recommend that the SBBC implement a supervisory review of the financial analysis worksheet and any other pertinent information provided to the Board or the public to ensure accuracy.

Management Response - Mary C. Coker, Director, Procurement & Warehousing Services

The Financial Analysis Worksheet (FAW) form and process was completely revamped and has since been automated including the date fields and all other pertinent fields; this eliminates any manual and or typos such as the one identified in this case. In addition, PWS also reviews those date fields as part of the new process with the new FAW, ensuring the corresponding dates match with the existing Bid that is being presented as a board item for board approval.

Findings #1-04 - Lack of documentation regarding the time stamped-in for Bids received from Vendors:

- ❖ Stamped in Bids: We were provided with documentation on 2 of the 5 vendors who were documented as having submitted a bid, as noted below. There was no stamped-in documentation available for the 2 Awarded vendors, Lenovo Inc., and CDI.
 - Lenovo (United States) Inc. (awarded) - No stamped-in documentation provided;
 - CDW-G (not awarded) – Stamped-in documentation provided. The documentation did verify that CDW-G did submit their bid response at 3:31pm as noted in the submission chart, which was cause for their disqualification. The required time of submission was by 2:00pm deadline date;
 - CDI Computer Dealers, Inc. (awarded) - No stamped-in documentation provided;
 - Comtread (not awarded) - No stamped-in documentation provided; and
 - Dell (not awarded) - Stamped-in documentation provided and valid submission confirmed.

Recommendation – We recommend that the SBBC implement a procedure and process to ensure that the proper documentation exists for bid receiving that includes a time stamped in.

Management Response - Mary C. Coker, Director, Procurement & Warehousing Services

In the past there was not a standardized process for the Bid openings. Currently there is a formal process followed by all the Purchasing Agents that ensure that each Bid received is stamped accordingly by the due date and time stipulated in the Bid instructions and requirements. Having these required time sensitive documents available is mandatory and are now scanned and documented both manually and electronically eliminating them to be lost or misplaced. In researching the history of this file back in late 2015 and 2016, the document used to stamp the time of receipt (prior to the public Bid opening) cannot be located. PWS current staff did manage to locate the list of attendees of the Mandatory Bid conference which included the list of all participants, with those vendors mentioned in the audit, as not having had a time stamped document of receipt to have been present as well. Please note that this list does not replace the opening Bid list of attendees. There indeed was a Bid opening, also not having had a protest from another vendor also validates that the Bids were received timely (though there is not the document to show it) but considering the vendors attendance in presenting their Bids publicly concludes they were received timely.

OBJECTIVE #2 - Review if purchases related to Bid Identification #16-059E were in compliance with SMART Bond guidelines for technology purchases.

The SMART initiative is a multi-year effort. Projects began in 2015 and continued through 2019. The technology category of the SMART PROGRAM was allocated \$68.5 (million). Of which \$56.5 (million) were distributed to Computers and Hardware for District-Owned Schools and \$12.0 to Charter Schools.

Safety, Music & Art, Athletics, Renovations and Technology (SMART), is an ongoing capital improvement program to address infrastructure and equipment needs of Broward County Public Schools. Funding sources include the \$800 million General Obligation Bond (GOB) and other capital funding. One of the objectives of the SMART program was to improve the Technology at Broward County Public Schools by bringing in new computers and replace outdated computers and out of warranty computers to achieve a student to computer device ratio of 3.5 to 1. This project scope was titled “Additional computer to close computer gap”.

 SMART Program APPROPRIATIONS IN MILLIONS (As of June 30, 2020)					
					
SMART APPROPRIATIONS	PROGRAM YEARS 1-5	PROGRAM YEAR 6	PROGRAM YEAR 7	PROGRAM YEAR 8	TOTAL
SAFETY	\$87.6	\$57.1	\$7.6	\$1.5	\$153.8
MUSIC & ART	\$32.0	\$9.5	\$0.4	\$1.1	\$43.0
ATHLETICS	\$7.2	\$0.4			\$7.6
RENOVATION	\$555.6	\$379.1	\$40.8	\$11.7	\$987.2
TECHNOLOGY					
Computers and Hardware (District-Owned Schools)	\$56.5				\$56.5
Charter School Technology	\$12.0				\$12.0
TOTAL	\$750.9	\$446.1	\$48.8	\$14.3	\$1,260.1

The SMART technology deployment was fully completed for all 230 schools as of 9/30/2017. All work had been completed for the three (3) Project Scopes identified in the SMART Program:

- ✓ Computer Gap 83,362 computing devices were delivered to 209 schools. Many schools exceeded the goal of 3.5:1 student to computer ratio, bringing the District to a 2:1 average student to computer ratio.
- ✓ Infrastructure Upgrade Completed for all Schools.

- ✓ Wireless/Cat6 Upgrade 13,166 Wireless Access Points were installed, in addition to installing 12,738 CAT6 Wiring drops.

See tables below for devices deployment breakdown:

Description	Ordered	Installed
Student Laptops	64,455	64,455
Teacher Laptops	13,333	13,333
Student/Teacher Desktops	5,051	5,051
Tablet Computers	523	523
Computer Carts for Laptops	1,066	1,066
Wireless Access Points	13,166	13,166
Category 6 Cable Drops	12,738	12,738

According to the FY2018 Quarter1 Bond Oversight Committee (BOC) report, there were 83,362 computer devices purchased. Per the FY2020-21 District Educational Facilities Plan (DEFP) report, \$42,325,000.00 was spent at 209 District schools to purchase additional computers to close the computer gap. The amount was tabulated by calculating the dollar amount spent under “Additional Computers to Close Computer Gap” for each school.

209 Schools with Additional Computers to Close Computer Gap Total \$42,325,000		
Amount		Description
\$ 42,325,000		Additional Computers to Close the Computer Gap
\$ 3,725,000		CAT 6 Data Port Upgrade
\$ 10,095,206		Smart Core Infrastructure Upgrades (TSSC)
\$ 15,507,000		Technology Infrastructure (Servers, /Racks) Upgrade
\$ 904,794		UPS / Support for aging batteries
\$ 16,358,000		Wireless Network Upgrade
\$ 88,915,000		TOTAL

We reviewed the SMART bond newsletter and the SMART bond website. Technology SMART monies in Bid 16-059E was used for close the gap technology devices purchases in a total amount of \$15,603,145 out of the total expenditure of \$45,693,777.

Conclusion: Technology SMART Program monies in the amount of \$15,603,145 were expended to purchase 43,318 technology devices. Please note that 728 units of cart wiring were also expended with the \$15.6 million. The purchases of the 43,318 technology devices were in compliance with the SMART bond.

OBJECTIVE #3 - Research if Edco Education had any involvement in the purchases related to Bid Identification #16-059E.

We scanned throughout the documentation provided for the name of the former CIO and the CEO of Edco, and any other noted persons involved with Edco over the past 2 years.

We researched if Edco Education had any involvement in the purchases related to Bid Identification #16-059E.

- Reviewed all documentation provided on bid #16-059 and scanned for the name of the former CIO of BCPS and the CEO of Edco Education.
- Performed interviews with three (3) SBBC staff.
- Interviewed and attempted interviews made in previous months to discuss with Edco and former BCPS CIO availing no substantial information of Edco Education involvement of bid purchases.
- All purchase orders were reviewed and no mention of Edco or indication of Edco involvement was found.
- Additional questions performed during interview with Director of Network Integration, asking of any awareness and/or level of involvement by Edco Education in Bid #16-059E availing no knowledge of Edco involvement.
- Similar questions as posed to the Director of Network Integration proposed to be presented to Chief Strategy & Operations Officer in an interview.

Conclusion - After performance of a thorough review of bid documentation and interviews with several BCPS staff, there was no indication in documentation or mentioning during interviews of any involvement of Edco Education in the purchases related to Bid #16-059E.

OBJECTIVE #4 - Review BCPS technology requirements as they relate to the purchases of Lenovo laptops/desktops made under Bid ID #16-059E to determine if these purchases met those requirements.

Observation #4-01 – Purchases of Lenovo laptops/desktops made under Bid ID 16-059E meet BCPS requirements.

Our focal points for this observation are if *all vendors received Fair Review and Consideration; if Awarded Vendors Met Minimum Specifications; if the 2 Awarded vendors proposed in their original Bids (1) the technology devices that were subsequently actually purchased by BCPS and (2) if those technology devices met minimum specifications; and the Quality Level of Actual Purchased Devices.*

We noted the BCPS technology devices selected were based on the specifications and the dollars to be expended based on TAC's recommendations and specifications as provided from the community.

We reviewed Bid 16-059E supporting documentation to ascertain if *all vendors received Fair Review and Consideration.* The BCPS 2015 bid process for the acquisition of technology to adequately fulfill the BCPS need for advance technological devices laptops, desktops, accessories and cloud-based¹ devices (i.e. tablets and accompanying devices) appears adequate. The adequacy of the procurement process provides fair public access for bidders to propose devices in multiple 'groupings' with proposed prices and specific specifications for each grouping. Careful review of each groupings criterion and responses all appear accurately recorded, documented, and acquired.

We reviewed Bid 16-059E supporting documentation to ascertain if *Awarded Vendors Met Minimum Specifications (or Exceeded):* The technological review of each of the group's minimal expectations versus adequacy of submission is summarized in the table (Exhibit A) for review and consideration. In summation, all five submitting vendors (**a. CDI Computer Dealers, b. Comtread, Inc., c. Dell Marketing, L.P., d. HP dba as HP Computing and Printing, Inc., and e. Lenovo, U.S.) exceed the specifications** prescribed by BCPS.

The technology purchased by SBBC during the post procurement was consistent with the proposed technology devices and the actual subsequently purchased technology devices. Our review found that the items purchased exceed the minimal expectations for the BCPS groupings 1-4. In particular both *CDI Computer Dealers and Lenovo, U.S. exceed the specifications* prescribed by BCPS. Price is a heavy criterion for school Districts to consider in the acquisition of products and services. The usage of taxpayer dollars garners additional fiscal responsibility to purchase within or below budget. The notion of shopping for 'top of the line' products and services fall under the rules of whether the purchase is **allowable, reasonable, necessary, & allocable.** The technology investment is nominal in comparison to the overall SBBC budget². (Investment is roughly 1.155% of the SBBC \$2.26 billion 15-16 budget).

¹ Cloud computing means storing and accessing data and programs over the internet instead of your computer's hard drive. (The PCMag Encyclopedia defines it succinctly as "hardware and software services from a provider on the internet.") For more see: <https://www.pcmag.com/news/what-is-cloud-computing>

Recommendation: We recommend (1) to ensure long-term criteria of customer satisfaction, the BCPS should conduct utilization satisfaction study toward future consideration of extensive technology purchases, (2) BCPS should include progressive purchasing options to ensure replacement and upgrades permits the purchasing of the latest technology when the industry makes advancements, (3) BCPS may wish to release a similar procurements with the ability to purchase at different levels to create a short-term ‘utilization’ window to explore relevant hardware before investing in the line of products for a long-term contract with the specific awarded vendor. We compartmentalized four (4) sections to evaluate and determine if the IT devices proposed and purchased under this bid met the requirements. After thorough review of BCPS technology requirements, we ascertained that the purchased technology devices met the requirements of Bid16 -059E

Management Response: Maximo Rosario, Director Classroom Technology & Desktop Support Services. It is the goal of the IT Division to gather information from stakeholders on the satisfaction and feedback of endpoint technologies. The implementation of IT's new helpdesk ticketing system will be accompanied by short satisfaction surveys (1-5 stars) as well as an annual technology survey to be implemented by SY22. Our current contract allows for changes to account for changes and upgrades within the endpoint sector. Additionally, the current contract was created with a multi-tiered approach to account for different levels of uses and to account for short- and long-term shifts in the industry. The IT Division uses multiple platforms to determine the validity of the purchases made to assist with the delivery of content to include but not limited to the IT Standards Committee, TAC, Digital Projects and the various OSPA Principal Leadership groups.

² See the SBBC budget here:

<https://www.browardschools.com/cms/lib/FL01803656/Centricity/Domain/12473/District%20Budget/District%20Budget%202017.pdf>

Exhibit A
 Bid #16-059E - IT Technology Device
 Determination of Minimum Specifications

Vendor	Group 1 Minimum Specs	Group 2 Minimum Specs	Group 3 Minimum Specs	Group 4 Minimum Specs	Price (Group 1) 1A-1E	Price (Group 2) 2A-2D	Price (Group 3) 3A-3C	Price (Group 4) 4A-4B	Overall Estimate	Items Purchased	Perceived Quality	Meas ure of Bid Fairn ess
CDI Computer Dealers, Inc.	N/A	N/A	Exceeds	Exceeds	N/A	N/A	\$2,620,000	\$697,000	\$3,317,000	Adequate	Adequate	Yes
Comtread, Inc.	N/A	N/A	Exceeds	N/A	N/A	N/A	\$4,109,000	N/A	\$4,109,000	N/A	Adequate	Yes
Dell Marketing, L. P.	Exceeds	Exceeds	Exceeds	Exceeds	\$22,824,000	\$4,653,000	\$4,654,000	\$703,500	\$32,834,500	N/A	Adequate	Yes
HP Ind. Dba HP Computing and Printing, Inc.	Exceeds	Exceeds	Exceeds	Exceeds (section 4a)	\$22,242,900	\$4,806,000	\$4,326,160	\$502,000	\$31,877,060	N/A	Adequate	Yes
Lenovo (US) Inc.	Exceeds	Exceeds	Exceeds	Exceeds	\$18,145,000	\$4,867,000	\$4,035,000	\$475,000	\$27,522,000	Adequate	Adequate	Yes

Observation #4-02 Purchase orders from vendors (Lenovo and CDI) were for the correct proposed devices.

We reviewed BCPS documentation to determine if actual purchase made from vendors met the requirements of the approved bid with regards to unit price, quantity and specifications of each device. Our review found that the technology devices purchased meets the budgetary requirements for groupings 1-4.

We reviewed BCPS documentation to determine if Lenovo ThinkPad X1 Tablet purchased were tablets and why weren't they purchased from awarded vendor CDI Computer Dealers Inc. The device Lenovo ThinkPad X1 tablet is a 2-in-1 convertible laptop which can be used as a laptop or a tablet. However, they were purchased under the classification of laptops by BCPS. The proposed CDI tablets were not purchased by BCPS due to CDI making a model change (as indicated in an email dated 7/9/18) that no longer permitted them to price them the same as proposed Edugear Onebook tablets in Group 3 and their lack of response when asked to provide a comparable device to BCPS.

We reviewed the provided documents to determine if the variance with actual devices purchased and amount budgeted poses any issue with the awarded vendors agreement. Our review indicates variances in all groupings 1-4 when compared to actual against budgeted item. The procurement department noted that certain internal purchasers seek funding for devices which they needed prior to Bid #16-059E.

We sought to determine if the comparison outcome of the Lenovo ThinkPad X1 vs Edugear Onebook EAW23 is in fact a Tablet and why was it purchased from Lenovo and not CDI-Computer Dealers Inc. It was stated by Computer Operations Director, during his interview, that the alternative Lenovo ThinkPad X1 convertible tablet was selected for the sole purpose of a laptop as its intended usage, despite the tablet capability. It was stated that the Lenovo ThinkPad X1 did not fall into any particular device group category of minimum specifications for Bid 16-059E. However, schools and departments had the option to purchase anything listed in BCPS standards. Therefore, although it did not fall in any group category, the purchase was allowable, and did not require submission of a waiver due to it meeting BCPS standards.

❖ We performed an analysis of the Lenovo ThinkPad X1 Tablet under Bid ID #16-059E.

We inquired with the Director of Network Integration about the waiver documents submitted for approval of replacement of original bidded Lenovo laptops to be replaced with the Lenovo ThinkPad X1 Tablet. Per the Director of Network Integration, "There was no waiver to replace the laptops on Bid #16-059E. Waivers were used to purchase devices outside of BCPS standards"

We inquired if any information or research was performed justifying the replacement (benefits of replacement) and justification for the increase of cost per unit vs. the cost of original proposed laptops. Per the Director of Network Integration, the Information Technology Division did not replace the proposed laptops on Bid #16-059E.

During our interview with the Director of Network Integration Information, we inquired on decision/reasoning to choose not to purchase the CDI eduGear Onebook Tablets. We were informed of the following by the Director of Network Integration

- The devices that were offered by CDI were placed in our standards.
- School and District office made the decision if they wanted to purchase these devices
- CDI made model changes but could not provide the same prices (Spring 2018)
- CDI were informed by staff that they needed to keep the same prices as agreed in the BID. They never came back to us with a substitute device. (Spring 2018)
- CDI provided Demo units to the team for evaluation, but the demo units did not meet the required specification of having a detachable keyboard.
- CDI Computer Dealer discontinued the models listed and did not provide a replacement device, based on an email from the CDI representative (7/9/2018)

We inquired about the purchase of the Lenovo ThinkPad X1 tablet as replacement of the CDI Edu Gear Onebook Tablets. And, if so, justification for why only 82 CDI Edu Gear Onebook purchased, which is much less devices than budgeted units of CDI tablets to be purchased. Per the Director of Network Integration, “schools and departments had the option to purchase anything listed in our standards. Any item outside of the standards needed a waiver request.”

❖ We examined the warranty information on the Lenovo Devices for Bid #16-059E

We found the warranty details found in sections 32-36 of BID #16-059E. We were provided warranty information associated with Lenovo desktops, laptops and windows devices as well as tablets as follows:

- What is covered – Details of the coverage
- Various levels of warranties on the devices
- Who provides the replacements

The reliability of equipment after the 1-year warranty expires engenders the need to purchase equipment with a high history of reliability beyond the basic 1-year warranty.

The BCPS employed best practices and lessons learned with the new technology bid FY20-123. Based on our inquiry, we were provided the below responses regarding minimum specifications selected for Bid FY20-123. We were advised by the Director of Network Integration that research was conducted through various methods:

- Reviewed Gartner Research Data on devices and endpoints
- Conducted a leasing RFI on computer devices between May 2019 and June 2019 (RFI#FY20-015)
- Reviewed existing contracts within other school Districts in Florida to include Miami-Dade, Seminole, Palm Beach, Hillsboro and Duval counties
- Compared current District purchased device with other platforms (internally)
- Consulted with the major OEM including Dell, HP, Microsoft and Lenovo
- Consulted with major chip manufacturer at the time (Intel)
- Presented to Technology Advisory Committee

- Reviewed historical Break-Fix Data
- Conducted proof concepts on various devices on the Microsoft operating system and applications (including Chromebooks and Apple devices)
- Discussed within various groups such as the Standards Committee with representatives from all levels including technical colleges and centers along with the Broward Network Team
- Team attended various conferences to obtain current industry knowledge

Observation #4-03 – Quality level of actual purchases.

We performed research on the actual technology devices by reviewing the submitted incident tickets. The submitted incident tickets spanned from June 18, 2020 to September 27, 2020. Within this window, the highest month was September 2020.

We analyzed the 10,043 submitted incident tickets spanning from June 18, 2020 to September 27, 2020. For the selected period, the highest month was September 2020 with 5,323 incidents. From the 10,043 incidents, 8,471 are from laptops, 1,519 from 2-in-1 devices, 19 desktops, and 34 desktop-mini's. Lastly, 1,030 of the 10,043 incidents are due to accidents (10.26%). The 10,043 incidents were reported by BCPS for Lenovo laptops were analyzed to provide a pictorial of the number of Lenovo tickets per month during the relevant period, the number of resolved or close tickets per month during the evaluation period, and the number of Lenovo tickets per product type / name.

Exhibit II provides details on the data review which includes a Tableau breakdown of the various Lenovo equipment ticketed issues reported through the SBBC ticketing system. In Exhibit II, the resolved tickets data shows 7,643 of the above 10,043 tickets are resolved (76.10%). The top 5 noted mechanical issues are as follows:

- Keyboards / Key caps – comprised 2,721 incident tickets
- Hard Drives– comprised 1,931 incident tickets
- LCD Screen– comprised 1,301 incident tickets
- System Board– comprised 823 incident tickets
- Hinge– comprised 376 incident tickets

Please note that in the technology industry, these laptop/tablet components often break through regular wear and tear.

We examined the quality assessment of Lenovo equipment. We noted that the BCPS purchased the best quality products for the budget allocation available during 2016-2018. The number of tickets correlates with the opening of school when both students and teachers tax the systems to perform. The reliability any laptop/tablet equipment³ after the 1-year warranty expires engenders the need to purchase equipment with a high history of reliability beyond the basic 1-year warranty. To see reliability of laptops and tablets in 2015⁴, 2016⁵ and 2017⁶ see the footnotes. In 2017, customer satisfaction results appear in JD Power⁷. The Lenovo laptop appears 5th on the list here: <https://www.newrisingmedia.com/blog/2017/8/3/laptop-deals-5-best-cheap-laptops-to-buy-2017>.

³ For more see: <https://www.geckoandfly.com/6311/the-most-reliable-laptop-survey-best-netbook-reliability-comparison/>

⁴ See: <https://www.portableone.com/Tech-News/9-laptop-brands-put-to-the-reliability-test-Apple-MacBook-Air-comes-out-on-top>

⁵ For the complete article see: <https://www.pcmag.com/news/readers-choice-awards-2016-laptops-and-desktop-pcs>

⁶ Please read: <https://www.quora.com/Which-laptop-is-the-best-Lenovo-Dell-Acer-or-HP-if-all-four-have-same-specification>


⁷ See: <https://www.jdpower.com/business/press-releases/jd-power-2017-us-tablet-satisfaction-study>

Recommendation: We recommend (a) rotate 1/3 of the technology annually; (b) avoid moving parts, (c) budget to afford extended warranties.

The exhibits provide an assessment on the level of the quality of the laptops. This standard indicates the value to purchase price, value to school usage/need, and if more value was in repairing item or replacing devices. We could not determine if the IT department viewed repairing devices as a more cost-efficient methodology than to replacing devices. It provides an assessment regarding the Lenovo's perceived quality.

Operating and purchasing under the premise the Lenovo equipment would last between 3 to 5 years is a high expectation of quality. The 10,000 Lenovo tickets represent evidence it is necessary to rotate technology between 2 to 3 years. This opinion recommends rotating 1/3 of the overall number of 'laptops/tablets' every year to ensure the viability of maintaining reliable quality equipment in the hands of the end users as a minimal measure of high customer satisfaction and usability. Further, the best practice with the rapid evolution of technological advancement, budgeting should align with the notion of purchasing new technology (laptops/tablets) every 2.52 years, providing 6 months to properly procure the 'latest' equipment.

When the above is not possible, the necessity to purchase more warranty coverage is evidence as well in the above ticketing data. The top 5 equipment components which are present in the 10,000+ Lenovo tickets assert moving parts, interfaces, and core system hardware receive the great 'wear and tear'. Future purchases must consider these factors in avoidance of equipment concerns going forward.

Top 5 Components		
Excludes Out of Warranty		
Keyboard/Keycaps	2,721	
Hard Drive	1,931	
LCD Screen	1,301	
System Board	823	
Hinge	376	

1 See: https://www.squaretrade.com/htm/pdf/SquareTrade_laptop_reliability_1109.pdf and

https://www.pcworld.com/article/182376/Report_A_Third_of_Laptops_Fail_Within_3_Years.html

2 Read: <https://www.linkedin.com/pulse/how-estimate-tco-save-money-tomas-tiefenbach/>

3 Hard-drive failures read: <https://www.extremetech.com/computing/170748-how-long-do-hard-drives-actually-live-for>

4 For more see: <https://www.>

Management Response: *Maximo Rosario, Director Classroom Technology & Desktop Support Services.* Budget permitting, IT Divisional goals includes the continuous refresh of laptop where 75% of devices will always be under warranty by the manufacturer. Contract requirement is to ensure a minimum 3-year manufacturer warranty on all devices purchased. Additionally, original equipment manufacturers must be ISO 9001 certified as a basic industry standard for quality and service. Lastly, the original equipment manufacturers must provide evidence of their methods and results certifying the ruggedness of all student devices to include, but not limited to, drop test of at least 70cm, spill and pick resistant keyboard, and the durability of the hinges and screen.

OBJECTIVE #5 - Examine transaction structure based on SMART Bond technology funding –

We examined the funding structure related to the technology purchases made under Bid Identification #16-059E. We interviewed BCPS staff in an effort to analyze the purchase, lease, and/or loan arrangements for items purchased under this bid. We discussed financing arrangements for purchases under this bid with BCPS personnel in the following departments

- Finance -
- IT Finance -

We interviewed the Capital Budget Director on the funding structure and SMART Bond processes. The SMART bond assigned functional areas to track the SMART technology expenditures.

Observation #05-01 Technology initiative funded by SMART program on computer devices

We reviewed all documentation related to funding sources utilized and itemization of expenses for Bid #16-059E by looking at the functional area associated with the purchasing transactions. Our preliminary questions were formulated based on outcomes from our initial review of funding documentation and sent to the SBBC Finance Manager of the IT Department. Our analysis of purchase order reports and summary reports show a variance between budget/ approved bid quantity against actual amount purchased.

Our review any/all purchase, lease, and/or loan arrangements on Bid 16-059E indicated no knowledge of lease funding used by IT during period of Bid #16-059E.

Please see chart of actual purchase of technology devices vs. budget purchases of technology devices.






Chart of Actual Purchase of Technology Devices vs. Budget Purchases of Technology devices

	Actual			Budget as Approved in Bid 16-059E			Difference	Difference
	Unit		Cost	Unit		Cost	in	in
	Price	Quantity	\$	Price	Quantity	\$	Quantity	Cost
CDI - Computer Dealers Inc.								
Edugea Onebook EH2N1 - Tablet (Student)	\$ 288.00	20	\$ 5,760.00	\$ 288.00	1000	\$ 288,000.00	288	\$ 282,240.00
Edugear Onebook EAW23 - Tablet (Teacher)	\$ 558.00	50	\$ 27,900.00	\$ 558.00	2000	\$ 1,116,000.00	558	\$ 1,088,100.00
Edugear Onebook EAS23 - Tablet (Teacher)	\$ 608.00	12	\$ 7,296.00	\$ 608.00	2000	\$ 1,216,000.00	608	\$ 1,208,704.00
		82	\$ 40,956.00		5000	\$ 2,620,000.00	4918	\$ 2,579,044.00
EDI - Electronic Data Inc.								
	Unit							
	Price	Quantity	Cost					
Software Maintenance	420,309.04	1	420,309.04	** Finding #1-01 further discusses this expenditure.				
Lenovo (United States) Inc.								
Lenovo Group 1A - 1E							Difference	Difference
	Actual			Budget as Approved in Bid 16-059E			in	in
	Unit			Unit				
	Price	Quantity	Cost	Price	Quantity	Cost	Price	Quantity
Student-Laptop Non-Touch (N22)	\$ 199.00	16010	\$ 3,185,990.00	\$ 199.00	20000	3,980,000	\$ 199.00	3990
Student-Laptop -Touch (N23)	\$ 229.00	34381	\$ 7,873,249.00	\$ 229.00	25000	5,725,000	\$ 229.00	-9381
Staff-Laptop Non-Touch (E460)	\$ 684.00	1500	\$ 1,026,000.00	\$ 684.00	5000	3,420,000	\$ 684.00	3500
Staff-Laptop -Touch (T450)	\$ 824.00	458	\$ 377,392.00	\$ 824.00	5000	4,120,000	\$ 824.00	4542
Laptop (Ultra-light) (X250)	\$ 900.00	-	\$ -	\$ 900.00	1000	900,000	\$ 900.00	1000
		52349	\$ 12,462,631.00		56000	18,145,000		3,651
Lenovo (United States) Inc.							Difference	Difference
Lenovo Group 2A - 2D							in	in
	Unit			Unit				
	Price	Quantity	Cost	Price	Quantity	Cost	Price	Quantity
Student-Desktop (M700)	\$ 529.00	605	320,045	\$ 529.00	2000	1,058,000	\$ 529.00	1395
Staff-Desktop (M700)	\$ 599.00	2295	1,374,705	\$ 599.00	2000	1,198,000	\$ 599.00	-295
Special purpose-Desktop (P310)	\$ 1,153.00	501	577,653	\$ 1,153.00	1000	1,153,000	\$ 1,153.00	499
AIO Touch - Desktop (M800z)	\$ 729.00	1709	1,245,861	\$ 729.00	2000	1,458,000	\$ 729.00	291
		5110	3,518,264		7000	4,867,000		1,890
Lenovo (United States) Inc.								
Lenovo Group 4A - 4B							Difference	Difference
	Actual			Budget as Approved in Bid 16-059E			in	in
	Unit			Unit				
	Price	Quantity	Cost	Price	Quantity	Cost	Price	Quantity
Cloud-Focused or Low Cost Window Devices-Student (N22)	180		-	180	2000	360,000	180	2000
Cloud-Focused or Low Cost Window Devices-Staff (N23)	230		-	230	500	115,000	230	500
		-	-		2500	475,000		2,500
								475,000

Conclusion – Overall the purchases of technology devices were within the budgeted parameters.

EXHIBIT II

By product, these Lenovo products present the most problematic ticketing concerns, N23, 11E, X13IE, N22, 300E, & ThinkPad Yoga's.

Top 5 Components		
Excludes Out of Warranty		
Keyboard/Keycaps	2,721	
Hard Drive	1,931	
LCD Screen	1,301	
System Board	823	
Hinge	376	

The top 5 equipment components which are present in the 10,000+ Lenovo tickets assert moving parts, interfaces, and core system hardware receive the great 'wear and tear'.

Data Review, Key Points, and Recommendations

Objective 1 Data Review: Below includes a Tableau breakdown of the various Lenovo equipment ticketed issues reported through the SBBC ticketing system.

Submitted tickets: The data review aggregates 10,043 submitted incident tickets spanning June 18, 2020 to September 27, 2020. Within this window, the highest month is September with 5,323 incidents. From the 10,043 incidents, 8,471 are from laptops, 1,519 from 2-in-1 devices, 19 desktops, and 34 desktop-mini's. Last, 1,030 of the 10,043 incidents are due to accidents (10.26%).

Resolved tickets: data shows 7643 of the above 10,043 tickets are resolved (76.10%). 4,879 of the resolved tickets were out of warranty (48.58%)

Key Point: The resolution rate is an industry best for the resolution team of Metro-Technical. (see these for rationale [A](#) & [B](#))

Top 5 ticketed Component Parts: 2,721 keyboards, 1,931 hard-drives, 1,301 LCD screens, 823 system boards, and 376 hinges. These results are from 8,471 laptops, 1,519 from 2-in-1 devices, 19 desktops, and 34 desktop-mini's.

Key Point: In the technology industry, these laptop/tablet components often break through regular wear and tear. (see these for rationale [A](#), [B](#), [C](#).)

Objective 2 Quality Assessment: Was the Lenovo equipment a quality purchase?

Key Point: SBBC purchased the best quality products for the budget allocation available during 2016-2018.

Rationale: the Lenovo products begin to deteriorate due to wear and tear beginning the week of August 23 according to the data. The # of tickets correlate with the opening of school when both students and teachers tax the systems to perform. The reliability **any** laptop/tablet equipment¹ **after the 3-year warranty** expires engenders the need to purchase equipment with a high history of reliability beyond the basic 3-year warranty. To see reliability of laptops and tablets in 2015², 2016³ and 2017⁴ see the footnotes. In 2017, customer satisfaction results appear in JD Power⁵. The Lenovo laptop appears 5th on the list here: <https://www.newrisingmedia.com/blog/2017/8/3/laptop-deals-5-best-cheap-laptops-to-buy-2017>.

Recommendations: Operating and purchasing under the premise the Lenovo equipment would last between 3 to 5 years is in opposition of expectation of quality. The above 10,043 tickets represent evidence toward the notion to rotate technology between 2 to 3 years⁶. This opinion recommends rotating 1/3 of the overall # of 'laptops/tablets' every year to ensure the viability of maintaining reliable quality equipment in the hands of the end users as a minimal measure of high customer satisfaction and usability. Further, the best practice with the rapid evolution of technological advancement, budgeting should align with the notion of purchasing new technology (laptops/tablets) every 2.5⁷ years, providing 6 months to properly

¹ For more see: <https://www.geckoandfly.com/6311/the-most-reliable-laptop-survey-best-netbook-reliability-comparison/>

² See: <https://www.portableone.com/Tech-News/9-laptop-brands-put-to-the-reliability-test-Apple-MacBook-Air-comes-out-on-top>

³ For the complete article see: <https://www.pcmag.com/news/readers-choice-awards-2016-laptops-and-desktop-pcs>

⁴ Please read: <https://www.quora.com/Which-laptop-is-the-best-Lenovo-Dell-Acer-or-HP-if-all-four-have-same-specification>

⁵ See: <https://www.jdpower.com/business/press-releases/jd-power-2017-us-tablet-satisfaction-study>

⁶ See: https://www.squaretrade.com/htm/pdf/SquareTrade_laptop_reliability_1109.pdf and https://www.pcworld.com/article/182376/Report_A_Third_of_Laptops_Fail_Within_3_Years.html

⁷ Read: <https://www.linkedin.com/pulse/how-estimate-tco-save-money-tomas-tiefenbach/>

ticketing data. The top 5 equipment components which are present in the 10,000+ **Lenovo** tickets assert moving parts, interfaces, and core system hardware⁸ receive the great ‘wear and tear’. The hard-drive failures follow the traditional 2 to 3-year life span. The acquisition of SSD⁹ drives, keyboard -less devices, and screens which prove to have a history fewer failures are considerations for future procurements.

Recommendation Key Points: (a) rotate 1/3 of the technology annually, (b) avoid moving parts, (c) budget to afford extended warranties.

Exhibit

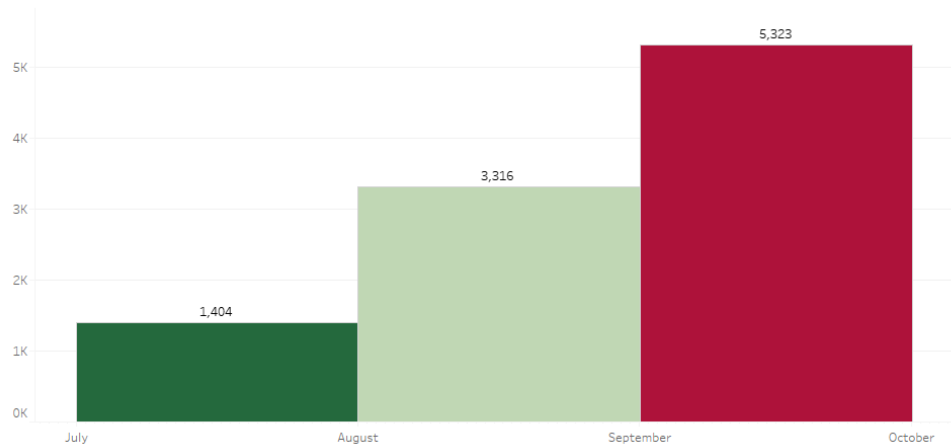
Tableau depictions of the Lenovo submitted tickets and resolutions.

⁸ Hard-drive failures read: <https://www.extremetech.com/computing/170748-how-long-do-hard-drives-actually-live-for>

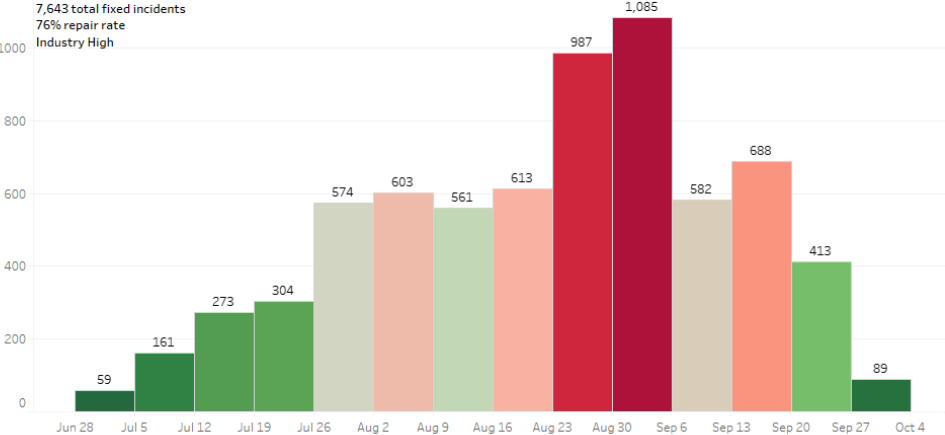
⁹ Read the difference here: <https://www.pcmag.com/news/ssd-vs-hdd-whats-the-difference>

Tableau Depictions of Lenovo Submitted Tickets & Resolutions

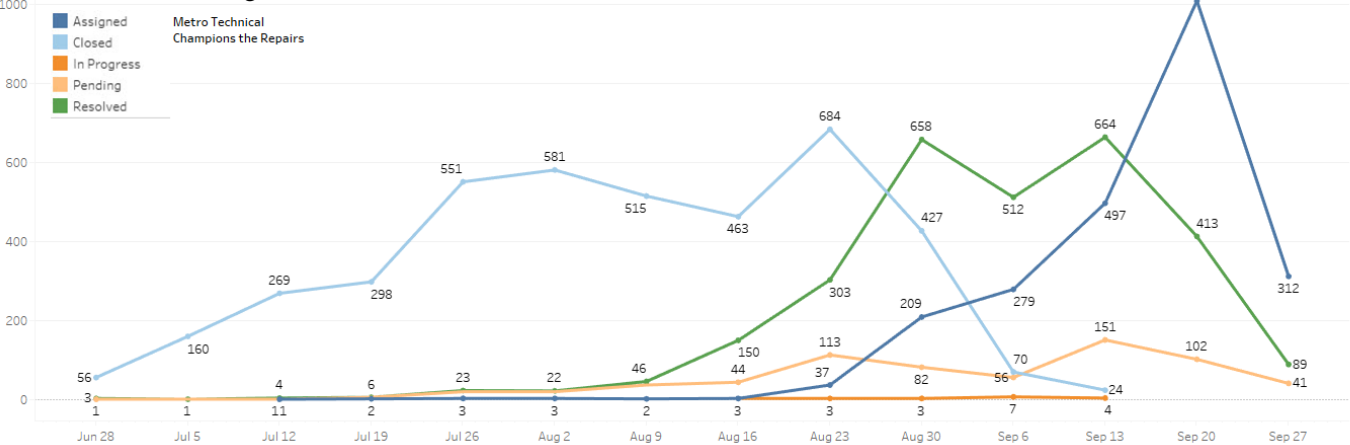
of Tickets logged



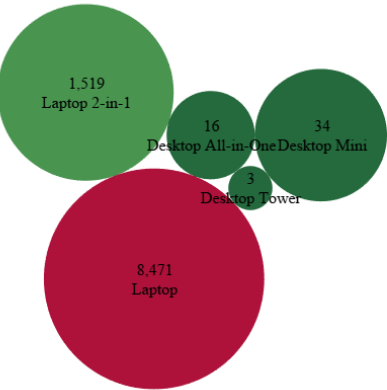
Resolved /Closed



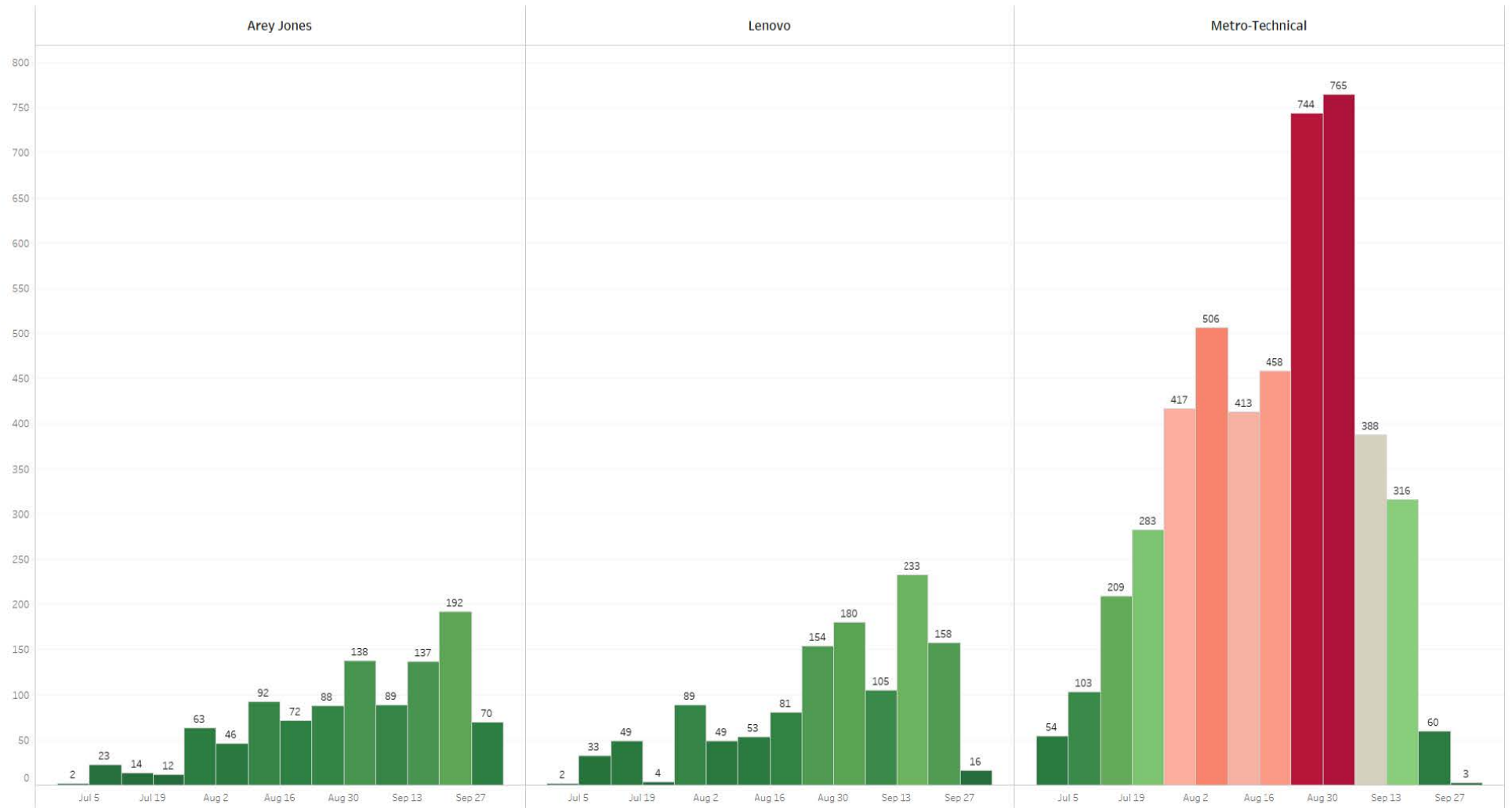
Lenovo Incident Status based on the legend below



Incidents by Product Type



Resolved or Closed By Group



Accidental Damage



Submitted Tickets Which Are Out of Warranty

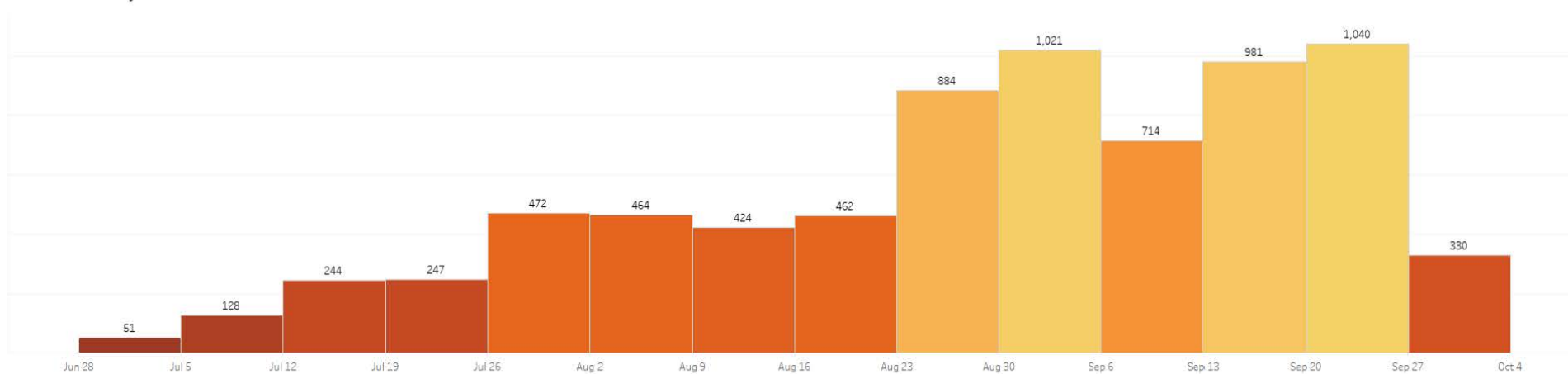


EXHIBIT III

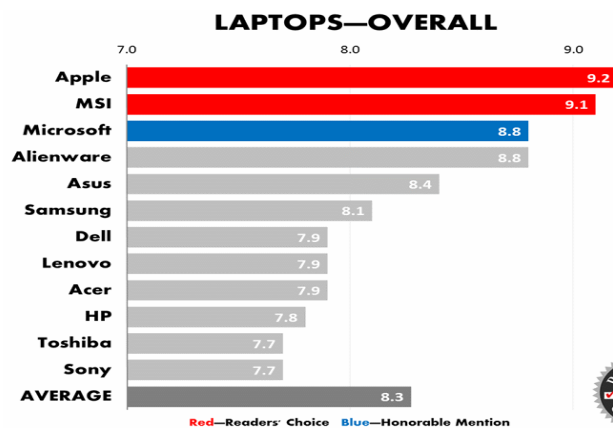
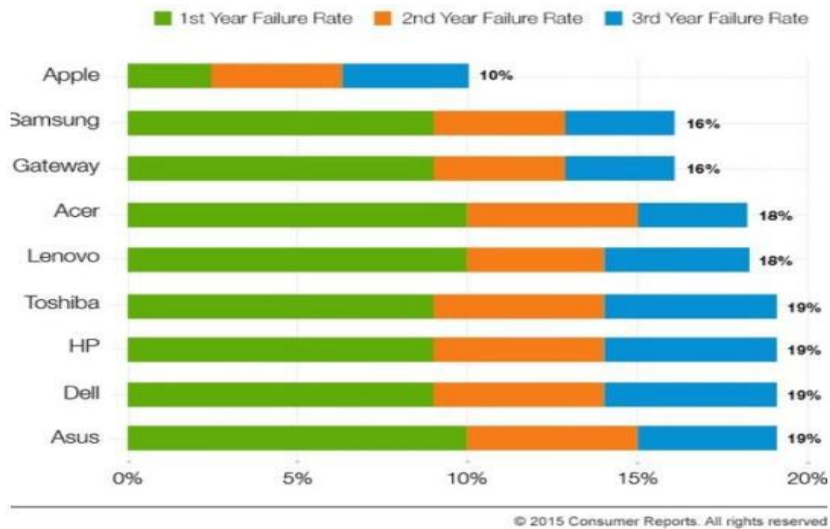
Reliability of Laptops and Tablets in 2015⁵, 2016⁶ and 2017⁷

⁵ See: <https://www.portableone.com/Tech-News/9-laptop-brands-put-to-the-reliability-test-Apple-MacBook-Air-comes-out-on-top>

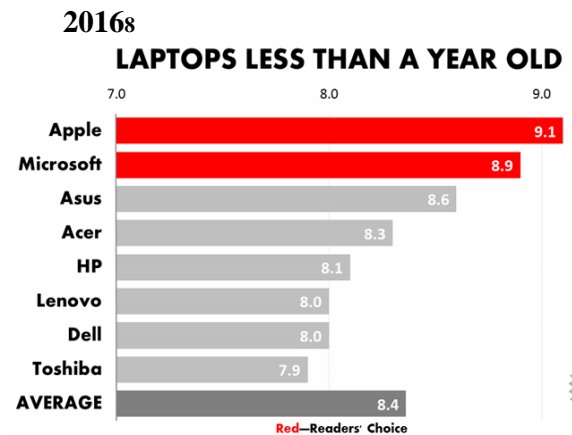
⁶ For the complete article see: <https://www.pcmag.com/news/readers-choice-awards-2016-laptops-and-desktop-pcs>

The table below provide some indication of the industry performance regarding the laptops and tablets at the same time of the purchases made by SBBC.

2015



Readers' Choice 2016 - Laptops, Overall Scores

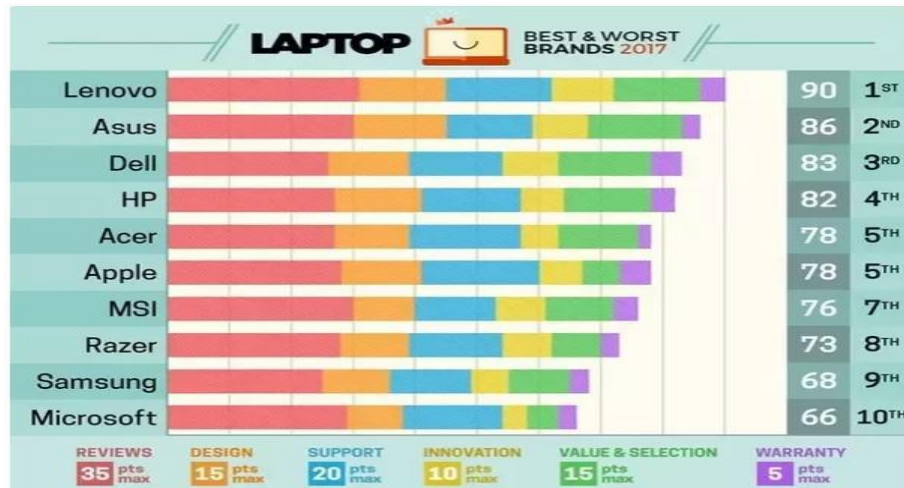


Readers' Choice 2016 - Laptops, Less Than a Year Old

⁷ Please read: <https://www.quora.com/Which-laptop-is-the-best-Lenovo-Dell-Acer-or-HP-if-all-four-have-same-specification>

⁸ Other rankings: <https://www.businessinsider.com/best-laptops-you-can-buy-guide-2016-12#the-lenovo-thinkpad-x1-yoga-oled-packs-one-of-the-most-gorgeous-laptop-displays-weve-ever-seen-into-a-comfortable-time-tested-design-12>

2017



Tablets hold a great deal of reviews in 2017. Lenovo tablets are not honorable mentions by JD Power⁹. The Lenovo laptop appears 5th on the list here: <https://www.newrisingmedia.com/blog/2017/8/3/laptop-deals-5-best-cheap-laptops-to-buy-2017>.

The SBBC purchase of Lenovo equipment (laptops and tablets) ultimately prove not to hold their initial quality several months after actual usage by the students and teachers. The ‘shields’ did not prove to protect the ‘delicate’ components, namely the keyboards, screens, and hinges. The hard-drive failures did not follow the traditional 2 to 3-year life span. The evidence of over 10,000 support tickets adds more credence to the notion of SBBC procuring more robust equipment going forward. The acquisition of SSD¹⁰ drives, keyboard-less devices, and screens which prove to have a history of fewer failures are considerations for future procurements.

⁹ See: <https://www.jdpower.com/business/press-releases/jd-power-2017-us-tablet-satisfaction-study>

¹⁰ Read the difference here: <https://www.pcmag.com/news/ssd-vs-hdd-whats-the-difference>

EXHIBIT IV

TIMELINE FOR BID 16-059E

