School District Technology Plan

Designing the Classroom of the Future

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Prepared for:	School District 22 (Vernon)
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1.0 - Executive Summary

The purpose of this plan is to build on the District's current shared vision for transforming our classrooms and educational practices. It is essential that the plan be directly linked with the School District's current and future strategic plans. At the same time, transforming infrastructure, teaching practices and our classrooms is inherently a long-term endeavour and therefore this paper will map out a 5 year plan that represents our best thinking at this time. The plan will suggest broad goals and actions that will move us in the direction of our shared vision. Of course, flexibility and agility are necessary traits in this age of rapid change. In keeping with this, we will treat this plan as a 'living document' and give ourselves permission to update and modify our ideas as necessary.

This plan is broken into seven parts including sections on Learning, Assessment, Teaching Practice, Innovation (Research & Development) , Infrastructure, Administrative Technology, and Leadership. As mentioned, it is critical that this technology plan reflect a District consensus on how to ensure that our technology services line up with curricular goals, and with activities in our schools and classrooms. The following are some overarching goals of this technology plan:

1. To formally assess how technology services in School District 22 link to current and future curricular goals and activities. From a technology standpoint, we need to determine where we are now and consider where we want to be in the future.

2. To ensure that the technology infrastructure has the capacity to support curricular goals, now and in the future. Also, to ensure that technologies are implemented with industry best practices in mind.

3. To ensure that technology supports the business needs of the organization. To assess current administrative technologies to ensure that they are cost effective, of a high quality, and meet the needs of the district.

4. To look at ways to improve productivity through technology, by challenging and revising learning and business processes. To ensure that educators in the District are fully supported and have professional development opportunities that will facilitate our building the classroom of the future.

5. To look at ways to improve cost effectiveness and quality of services by working with other districts and developing shared services.

In the fall of 2015, a district Education-Technology (Ed-Tech) committee was formed. The purpose of the advisory committee is to ensure that all key IT services, initiatives and investments have a direct connection to education, and connects to the district's current and future strategic plans. The committee primarily consists of Teachers and School Principals. Within this current group, there is representation from elementary schools, secondary schools, student services, and the District Board office.

Completing This Plan

The primary task for the Ed-Tech committee this year was to help with the development of the long-term technology plan and to ensure that it is directly connected to learning and assessment activities in classrooms. Working from a *Technology Plan Framework* (***See Appendix 'A'***), the committee addressed numerous Ed-Tech related questions that helped to build on the existing vision for technology, and forms the foundation for goals for the future.

It is also important that the Technology Plan be connected to other internal and external education related strategies / goals / artefacts including the following:

a.   District curricular goals,
b.   District Achievement contract / strategic plan.
c.   Aboriginal Enhancement Agreement.
d.   Future District strategic plan(s)
e.   BC Education Plan.
f.   New provincial curriculum (analytics)
g.   New formative based assessment approaches.
h.   In concert with the ideals and specifics related to the BC K-12 Innovation Strategy

1.1 Summary of Recommendations

The following is a summary of the key recommendations for actions contained in the Technology Plan.

Learning

1. *It is recommended that the District continue to facilitate increased access to digital resources for teachers and students.*
2. *It is recommended that the District continue to fine tune computer acquisition choices to ensure devices are function specific and that the best possible value is received from these purchases.*
3. *It is recommended that the District set standards and develop approaches for teaching Digital Citizenry skills for students.*
4. *It is recommended that the District ensure that there is equitable access for all students to digital tools and resources.*
5. *It is recommended that the District ensure that communication and tracking tools are available to ensure that the goals of the Aboriginal Enhancement Agreement are realized.*

Assessment

1. *It is recommended that the District continue the development of a model for assessment that includes ongoing gathering and sharing of data for continuous improvement of learning and teaching.*

2. *It is recommended that through research, thoughtful inquiry, and collaboration inside and outside the district, the District design and develops student analytics and learning dashboards.*
3. *It is recommended that the District continue with pilot projects that involve ePortfolio such as FreshGrade, Quio and SharePoint.*
4. *It is recommended that the District facilitate and encourage pilot projects that explore how embedded assessment technologies can be used to engage students while assessing their learning.*

Teaching Practice

1. *It is recommended that the District develop strategies for utilizing in-service and professional development to increase the technology capacity of educators.*
2. *It is recommended that the District develop a common set of technology competency expectations for educators.*
3. *It is recommended that the District formally survey where teachers' and administrators' current technology skills are to identify where gaps exist.*
4. *It is recommended that the District host the GAFE conference and utilize this opportunity to develop an ongoing Ed-Tech conference.*

Innovation

1. *It is recommended that the District continue to initiate, facilitate and incubate practical research and pilot projects.*
2. *It is recommended that the District develop approaches to measure the effectiveness of pilot projects, to ensure that lessons learned are communicated across the district, and to promote active dialogue regarding innovative practices around the district.*

Administrative Technology

1. *It is recommended that the District follow a disciplined and comprehensive process for making decisions regarding administrative technology.*
2. *It is recommended that the District continue their search for new Accounting / ERP software over the next several years.*
3. *It is recommended that the search for a new work order system be suspended until the decision regarding the Accounting system has been made.*
4. *It is recommended that the District not refresh all cell phones at once.*
5. *It is recommended that the District research the feasibility of providing WiFi access on school busses.*

Leadership

1. *It is recommended that the District continue with providing leadership in the IT area to ensure that there is effective and strategic leadership of the IT function and to ensure that education is technology-enabled throughout the District.*
2. *It is recommended that the District continue to look into opportunities for shared leadership, and other shared service opportunities.*
3. *It is recommended that the District continue the development of the Ed-Tech committee to ensure that technology initiatives are directly connected to education.*
4. *It is recommended that the District regularly update the long term technology plan.*
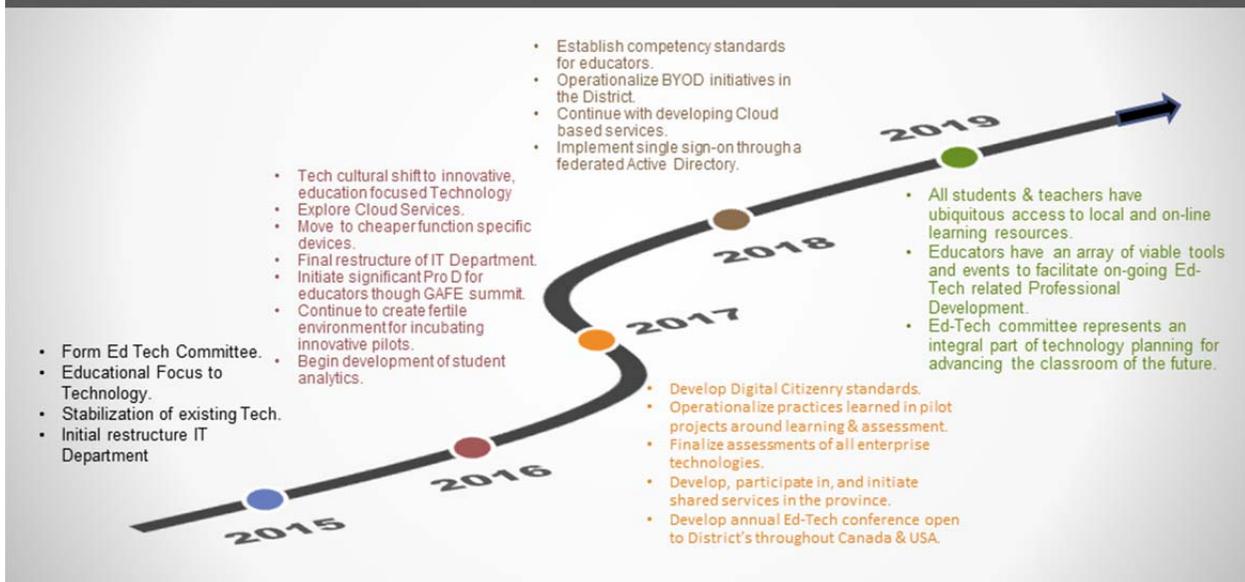
Infrastructure

1. *It is recommended that the District perform updates to their infrastructure on an annual basis in contrast to all at once every 5-7 years.*
2. *It is recommended that the District begin adopting Cloud based services in an effort to find better value for infrastructure investments, and for more effective educational technology.*
3. *It is recommended that the District begin the development and adoption of single sign on technology through its Active Directory.*
4. *It is recommended that the District adopt a standardized, stakeholder based process for analysing all core technologies to ensure that the best possible value is received, and that student's education is at the forefront of investments.*
5. *It is recommended that the District base their computer device purchasing decisions on the specific end user functional needs for teachers, students, administrators and board staff.*
6. **It is recommended that the District develop an IT Risk Management plan that includes both a Disaster Recovery Plan and a Business Continuity Plan***.*

Resources

It is recommended that we set aside an annual amount for technology Capital Expenditures for the replacement of both computing devices and server infrastructure.

The following graphic provides a high level view of the long-term Ed-Tech goals for the District as envisioned at this point in time.

Learning – Assessment – Innovation - Teaching

- Establish competency standards for educators.
- Operationalize BYOD initiatives in the District.
- Continue with developing Cloud based services.
- Implement single sign-on through a federated Active Directory.

2019
- All students & teachers have ubiquitous access to local and on-line learning resources.
- Educators have an array of viable tools and events to facilitate on-going Ed-Tech related Professional Development.
- Ed-Tech committee represents an integral part of technology planning for advancing the classroom of the future.

- Tech cultural shift to innovative, education focused Technology
- Explore Cloud Services.
- Move to cheaper function specific devices.
- Final restructure of IT Department.
- Initiate significant Pro D for educators though GAFE summit.
- Continue to create fertile environment for incubating innovative pilots.
- Begin development of student analytics.

2018

2017

- Form Ed Tech Committee.
- Educational Focus to Technology.
- Stabilization of existing Tech.
- Initial restructure IT Department

- Develop Digital Citizenry standards.
- Operationalize practices learned in pilot projects around learning & assessment.
- Finalize assessments of all enterprise technologies.
- Develop, participate in, and initiate shared services in the province.
- Develop annual Ed-Tech conference open to District's throughout Canada & USA.

2016

2015

2.0 - Introduction

Technology is a powerful tool and when implemented correctly, can radically transform learning. A strategic approach to technology investments and activities at School District 22 can significantly contribute to the advancement of the relationships between teachers and students. In addition, technology can facilitate the innovation of new approaches to learning, assessment, teacher development and collaboration.

We currently have the opportunity to rethink technology services through the lens of the district's curricular priorities, the BC Education plan, the new provincial curriculum, and the industries best thinking and research into the classroom of the future. Current technology infrastructure is rapidly evolving whereby devices are becoming more powerful and less expensive. Cloud services are presenting many viable (and better) options for hosting, data storage, and disaster recovery. BC's Next Generation Network is providing opportunities for lightening speeds through their fibre based network.

The purpose of this plan is to build on the District's current shared vision for transforming our classrooms and educational practices. It is essential that the plan be directly linked with the School District's current and future strategic plans. At the same time, transforming infrastructure, teaching practices and our classrooms is inherently a long-term endeavour and therefore this paper will map out a 5 year plan that represents our best thinking at this time. The plan will suggest broad goals and actions that will move us in the direction of our shared vision. Of course, flexibility and agility are necessary traits in this age of rapid change. In keeping with this, we will treat this plan as a 'living document' and give ourselves permission to update and modify our ideas as necessary.

2.1 Information Technology at School District 22: Current Profile

The IT department currently consists of four technicians, a web support person, a Help desk person and an IT Director. The department also has a high level of integration and communication with the Technology Innovation Coordinators (TIC) and other educators working in the curriculum area.

The department is responsible for managing, supporting and implementing technology throughout the District including networks, servers, computing devices and applications. The past 4 years has seen significant change in in this area through a 'refresh project' that included the replacement of approximately 2500 computers, the replacement of all servers throughout the District, the creation of a central data centre, and the implementation of numerous enterprise applications. Subsequent to the refresh project, a process for restructuring the IT department was commenced to better align the skills and interests of department staff with the new technologies implemented. There is a high level of cohesion and interaction within the IT teams as well as with educators around the District.

The following table summarizes the key elements of technology infrastructure currently implemented in the District.

Schools & Board Office	Each building has server infrastructure to store data, manage device images, applications used for user authentication, and applications for classroom management.
	Each building has one or more physical wiring closets containing switching technologies, firewalls and Telus equipment.
	Each building contains laptops, desktops, printers, networked photocopiers and other computing devices for use by students, teachers, administrators and clerical staff.
Data Centre	The District's primary data centre is located at Vernon Secondary school. The Data centre contains an array of servers, storage area network equipment, network equipment and backup technologies.
Secondary Data Centre	The District has a secondary data centre located in the Board Office. The data centre hosts servers for accounting, email, transportation applications and DNS services.
Staff	The IT department has four core technicians, one Helpdesk staff and a part-time web staff to implement and maintain technologies throughout the District.
	The District has employed the services of three Technology Innovation Coordinators (TIC) who are tasked with supporting and raising the tech capacity of teachers throughout the District. The TICs also help to facilitate Innovative pilot technology projects related to assessment and learning.

2.2 About This Plan

In the fall of 2015, a district Education-Technology (Ed-Tech) committee was formed. The purpose of the advisory committee is to ensure that all key IT services, initiatives and investments have a direct connection to education, and connects to the district's current and future strategic plans. The committee primarily consists of Teachers and School Principals. Within this current group, there is representation from elementary schools, secondary schools, student services, and the District Board office. The committee also includes the District's *Technology Innovation Coordinators* who have been tasked with raising the overall capacity of teachers for using technology in the classroom.

In addition to the above 'broad' purpose, the committee has established sub-committees to focus on specific Ed-Tech areas as follows:

Learning:	Includes curricular goals & activities, education software, access to technology, FOIPPA and safety.
Assessment:	Formative & summative assessment, assessment 'of' and 'for' learning, and analytics.
Teaching:	Transforming the classroom, building learning communities, capacity building.
Productivity:	Opportunities for shared services, enabling personalized learning.
Research & Development:	Initiating and facilitating pilot projects, fostering innovation, communication of results, continuous elaboration of a district vision and tech plan.
Infrastructure:	Analysis and planning for current and future infrastructure including device management, network, on premise services, off-site services and disaster recovery.

The primary goal of the committee this year is to provide the educational lens for the development of the technology plan. To date, the group has met several times to develop a framework and to collect specific feedback and suggestions related to the above areas. The final meeting this school year will be to review the plan, and to develop strategies for executing recommendations and actions.

This plan is broken into seven parts including sections on Learning, Assessment, Teaching Practice, Innovation (Research & Development) , Infrastructure, Administrative Technology, and Leadership. As mentioned, it is critical that this technology plan reflect a District consensus on how to ensure that our technology services line up with curricular goals, and with activities in our schools and classrooms. The following are some overarching goals of this technology plan:

1. To formally assess how technology services in School District 22 link to current and future curricular goals and activities. From a technology standpoint, we need to determine where we are now and consider where we want to be in the future.

2. To ensure that the technology infrastructure has the capacity to support curricular goals, now and in the future. Also, to ensure that technologies are implemented with industry best practices in mind.

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4. To look at ways to improve productivity through technology, by challenging and revising learning and business processes. To ensure that educators in the District are fully supported

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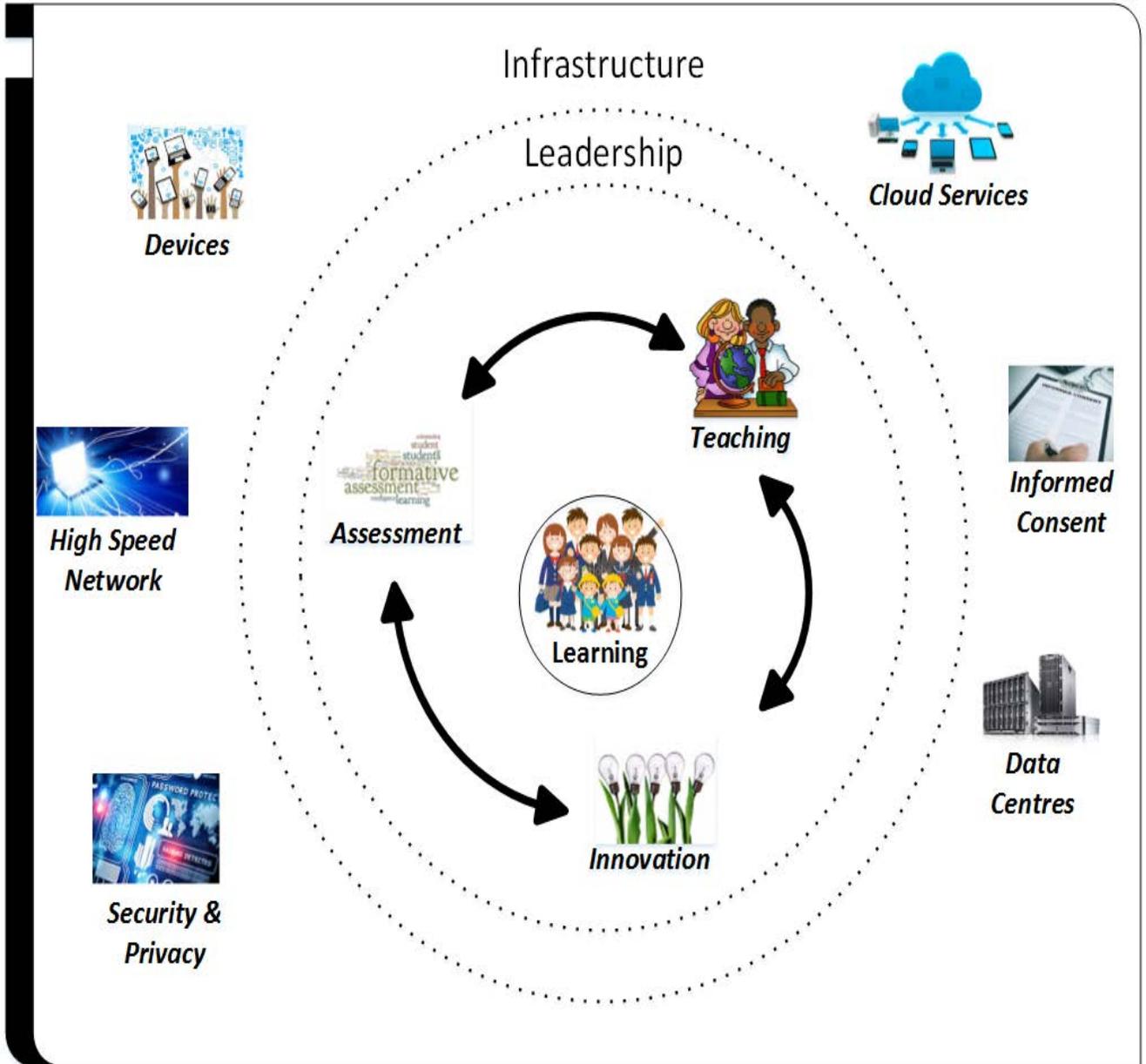
5. To look at ways to improve cost effectiveness and quality of services by working with other districts and developing shared services.

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In conjunction with the goals suggested above, the following are suggested principles to keep in mind while going through the process of developing a long-term Tech Plan.

General Overarching Principles

1. Technical services, investments and initiatives should be derived from curricular activities, goals, strategies and pilots. Technology should not be randomly adopted and then dictate or restrict education.

2. While the Tech Plan is a momentary static document, ideally there needs to be an on-going and agile process for ensuring that the Tech Plan can 'live' and evolve continuously in response to changes in philosophy and in the education environment.

Figure 'A' below depicts the relationships between the key elements of technology plan that is educational focussed and agile.

Infrastructure

Leadership

Devices

Cloud Services

Teaching

Assessment

Learning

Innovation

High Speed Network

Informed Consent

Security & Privacy

Data Centres

3.0 - Learning

Outside of school, most students have ready online access to information and resources. They participate in social networks, collaborate with people from all around the world, share ideas, and learn new things. Students are free to pursue their own interests and passions in their own way and at their own pace. The challenge for education is to mirror this to create engaging, relevant and personalized learning.

In the past, the question facing district decision makers has been whether or not technology should be used to help facilitate learning. Now, of course, few dispute the need for technology. The important questions now relate specifically to 'how' to employ technology to help facilitate the highest possible educational experience for students. Researchers and educators have a significantly increased understanding of how people learn. As a result, this has paved the way to personalize learning and give students choice over what they learn, how they learn, and at what pace. This in turn will help to prepare learners to direct their own learning for the rest of their lives.

Over the past 4 years, the school district has made significant investments in technology infrastructure. These investments were made at a point in which most of the back-end technology services, network, and client devices were long overdue for replacement. The following is a summary of the key activities completed.

A technology 'refresh' plan was developed in partnership with IBM to replace servers, devices, and district wide applications. The technology refresh plan replaced approximately 2500 desktops and laptops. In addition, approximately 500 of the older devices were still functional and redeployed accordingly. At the conclusion of the refresh, students were provided with access to desktop resources, district wide applications, education related databases and other resources on premises and through the Internet. Other outcomes included the following:

(i)   The existing network infrastructure was completely updated with modern switches and routers.

(ii)   Physical network cable runs were replaced and/or augmented to raise the cable standard to Cat 6 and fibre where appropriate.

(iii)   A data centre was built in VSS to provide a variety of virtualized, Windows based enterprise applications to the district, provide file storage and backup, and provide a central management location for workstation images.

(iv)   Active Directory was implemented to manage security, user management and access policy throughout the district.

(v)   Email services were migrated to MS Exchange and Outlook.

(vi)   SharePoint was implemented district wide to provide internal and external web services for all schools and for the School District in general.

(vii)   A new architecture was developed and implemented for creating and deploying workstation images and updates using Tivoli Provisioning Manager and APP-V.

(viii)   The District migrated to the new Provincial wide area network. The Next Generation Network (NGN) implemented fibre linkages to every school, the data centre and to the Board Office. The new infrastructure immediately increased individual site bandwidths and provided the platform for significant growth in bandwidth for future needs.

In addition to infrastructure investments, the school district has already made significant progress in terms of leveraging technology to transform learning. The following table provides a brief overview of progress made in a number of key educational areas.

Current Educational Technology Progress	
Leadership	An Education-Technology committee consisting of teachers from around the district has been formed to ensure that technology investments and activities are directly connected to education.
	A long term Technology Plan is currently being developed in collaboration with Teachers to create and implement a long term vision that connects with education activities, curricular goals and with the District's Education strategy.
	The district has hired an outside consultant to lead the IT department, to complete outstanding projects, connect the district's current and future technologies to education, and to develop strategies for implementing viable long-term leadership.
Kindergarten	The mobile Makerspace project includes a BeeBot (programmable robots) module to support learning through activities for letter recognition, sight words, phonological awareness and spatial awareness.
	In addition to the above, kindergarten students are given access to early learning web-tools that support literacy development.
Early Learning	Primary grade students are given access to digital resources and web tools and applications that support the early learning goals providing personalizable plans that can be scaffolded to the appropriate reading level of individual students.
Literacy	Students are provided access to digital resources and web-tools that help supplement the literacy goals supporting personalized learning plans at the appropriate reading level of the individual students
Numeracy	The robotics program provides students the opportunity to put math problems and concepts into action while learning spatial awareness and critical math principles that support numeracy outcomes.
	Students are provided access to digital resources, software and web-tools that help supplement numeracy learning goals providing the opportunity to personalize learning plans that are at an appropriate level of individual students.
	Students are provided access to Smart Technologies that provide hands-on learning activities to support the math learning objectives.

Aboriginal	Technology has been implemented in a way to express learning of Aboriginal content such as oral stories that can be shared through stop-motion videos, audio recordings and visual presentations. Share ideas and stories digitally widening the ability to easily access resources.
Social Responsibility	Students are provided access to digital resources such as EVERFI and MediaSmarts which raises awareness of Internet safety and further develops digital literacy skills.

The formation of an Ed-Tech committee has begun the process of ensuring that technology truly supports and facilitates educational activities throughout the District. Every dollar spent in the name of Information Technology should relate to education either directly, or indirectly. It makes sense that there needs to be an intense collaboration between the educational activities and vision in the district, and with the IT department.

The Ed-Tech committee has met several times this year with the primary goal of developing a long-term technology plan that is rooted in the district's education activities, curricular goals and overall district strategy. Working from a *Technology Plan Framework* (***See Appendix 'A'***), the committee has addressed numerous Ed-Tech related questions that help to build on the existing vision for technology, and forms the foundation for goals for the future.

The following summarizes the committee work in this area as it relates to ***Learning***.

Access To technology

Students and Teachers will require increased levels of access to technology, and to on-line and on premise resources. There are numerous shifts in the classroom than can be expected in the short term, medium term and long term. These shifts include the following:

i) Teachers will be expected to adopt technologies in their classrooms for content delivery, learner support, and learner assessment.
ii) Teachers will be expected to gain and develop the skills required to adopt the technologies described above.
iii) Teachers will be expected to collaborate with other teachers and professionals inside and outside their school and district.
iv) Students will be expected to use a variety of technologies to socialize, organize, and engage in learning activities both formally and informally. This will occur during and beyond the traditional school day.
v) It is expected that open educational resources (OER) will play an increasing role in the classroom.
vi) As classrooms continue to evolve and shift, classroom pedagogies will include online learning strategies and increased collaboration in the classroom. Hybrid learning models will allow teachers to engage students in a broader variety of ways. 'Flipped classrooms' will facilitate group work and project based activities during the day. Other learning activities

such as reading, viewing educational videos, and consuming other content will occur outside normal classroom hours. This will effectively extend the learning day.

vii) As students and teachers become more adept at integrating technology and learning, the opportunities for students to 'bring their own device' (BYOD) will become viable.

viii) It is expected that traditional libraries will transform into a 'learning commons' for students and teachers. The idea of a learning commons is to create a shared space for information technology, remote /online education, tutoring, collaboration, content creation, meetings, reading, and study.

ix) The traditional approach to computing device selection is best described as 'one size fits all'. This has lead to significant over purchasing of computing power. It is expected that district based device purchases will be based on the intended specific function. For example, students needing only access to the Internet require inexpensive light weight machines such as a Chromebook or Cloudbook. These devices are substantially cheaper than a traditional laptop.

x) Both Google and Microsoft are providing inexpensive, and in most cases, free access to their core products for K-12 districts. It is expected that the District will implement a single sign on solution so that both Teachers and Students will have easy access to all relevant platforms including Google Apps for Education (GAFE) and Office 365.

    a. GAFE is a core suite of productivity applications that Google offers to schools and educational institutions for FREE. These communication and collaboration apps include Gmail, Calendar, Drive, Docs and Sites, and a GAFE account unlocks access to dozens of other collaborative tools supported by Google. All of these applications exists completely online (or in the cloud), meaning that all creations can be accessed from any device with an Internet connection. There is no storage limitation for students or teachers.

    b. Office 365 for Education is a collection of services that allows students and teachers to collaborate and share schoolwork. It's available for free to teachers and students. The service includes online versions of Word, PowerPoint, Excel, and OneNote, and 1TB of storage in OneDrive.

xi) Not all students have the same access to technology. Social and economic factors give rise to disparities between different groups and create a 'digital divide'. The District needs to continue to be aware of this and to develop strategies to ensure that all students have equal access to the technologies that are facilitating learning in the classroom and at home

Improved Communication between Home and School

A technology enabled school and classroom will provide considerable opportunities for improving communications between home and school. The trends in this area include the following:

i) There is a clear shift in education from reporting at a moment in time (snapshot) to reporting ongoing learning. There are a number of evidence based reporting tools currently

being piloted in the school district including Freshgrade and Scholantis ePortfolio. It is expected this type of reporting will become the norm in the future.

ii) Numerous other informal communications can be facilitated though discussion forums, hangouts, and other social media platforms.

Protection of On-Line Privacy

Digital Citizenship is the body of knowledge related to safe online behavior and includes security, privacy, personal information, use of photographs, digital property rights and protection from viruses and malware. Digital Citizenship is a way to prepare students for a society full of technology. Digital citizenship represents the norms of appropriate and responsible technology use. It is expected that districts will need to set standards for students and teachers in order to articulate and set policy to define and govern appropriate use of technology, and for the protection of personal privacy.

Openly Licensed Educational Resources

There is growing use of open license digital learning materials in K-12 and other educational environments. These materials have been created under an open licensing scheme which means they may be used, modified, and shared without paying any licensing fees or requesting permission. Open licenses for this purpose have been created by organizations such as the Creative Commons for learning resources. There are also a number of open licensing schemes for software such as the GNU General Public License and others recognized by the Open Source Initiative. This is significant considering that billions of dollars are spent in North America alone each year purchasing commercial learning resources. Significant cost savings can be realized through the use of Open Source materials. In addition, openly licensed materials can be more accurate than traditional textbooks because they can be updated continually as content changes. Openly licensed materials also allow teachers to exercise their own creativity and expertise so they can tailor learning materials to meet the needs of their students.

Aboriginal Education

The Aboriginal Education Enhancement Agreement has been developed to continually improve the quality of education for all Aboriginal students, to support collaborative relationships between Aboriginal communities and school districts, and to provide Aboriginal communities and districts greater educational autonomy. There are a number of goals set out in the agreement between the Aboriginal community and School District 22 as follows:

Goal 1: Increase Aboriginal student success through improving communication and understanding of the Enhancement Agreement in School District 22.

Goal 2: Increase the knowledge and understanding of the culture and traditions of Okanagan people and Aboriginal peoples for all students, parents, community members, and School District 22 employees.

Goal 3: Aboriginal students will believe in themselves and be proud of their Aboriginal heritage and identity.

 Goal 4: Aboriginal students will have a strong vision of who they want to be.

Communication

There are a number of areas were technology can assist in realizing these goals, particularly in the area of communication. For example, video conferencing tools can be used to help bring stakeholders within the Aboriginal working group together for interactive meetings and other collaborative activities. Web based technologies can also be used to convey information, host forum based discussions and communication related activities.

Tracking Progress

One of the key administrative tasks for managing this agreement is tracking the work and activities of Teachers and Aboriginal Support Workers. It is key to the success of the agreement that these on-going activities and contact with students be tracked in detail for formal and informal reporting purposes.

3.1 Recommendations for Action: Learning

Overall, the vision in the Vernon School District is to ensure that all students will have engaging and empowering learning experiences in both formal and informal settings. These experiences will prepare students to be active, creative, knowledgeable and ethical participants in our globally connected society. This vision is consistent with the District's goal of moving ***towards a 100% success rate for all students.***

1. **It is recommended that the District continue to facilitate increased access to digital resources for teachers and students.**

   There is a proliferation of Internet and Cloud based resources and services that are relevant for K-12 education. These include web based applications, digital resources, open source resources, services such as GAFE and Office 365.

2. **It is recommended that the District continue to fine tune computer acquisition choices to ensure devices are function specific and that the best possible value is received from these purchases.**

   The current average cost of a computing device is approximately $1100 for devices that are quite powerful. Often, these devices are used for simple internet access and word processing. There is a new generation of extremely inexpensive devices that are less than

$300 that will meet the needs for this type of use. As the District matures in their use of technology in the classroom, approaches and policies for BYOD can be developed.

3. **It is recommended that the District set standards and develop approaches for teaching Digital Citizenry skills for students.**

    It is critical that teachers understand, and impart to students why it's important to address the 21st century skill of digital citizenship whereby students connect, collaborate, and communicate responsibly and safely. Both on premise and web based resources can be utilized for this effort.

4. **It is recommended that the District ensure that there is equitable access for all students to digital tools and resources**.

    Strategies for the equitable use of District resources can be developed to ensure that all students have access to digital resources.

    It is recommended that the District ensure that communication and tracking tools are available to ensure that the goals of the Aboriginal Enhancement Agreement are realized.

    A tracking tool could be either purchased or developed to ensure that internal and external reporting needs are met. The use of existing tools could be utilized for assisting the Aboriginal Enhancement working group can meet and collaborate on a more frequent basis.

4.0 - Assessment

Assessment plays an important role in student achievement. Assessment is the process of gathering evidence of what a student knows, understands, and is able to do. It can also help to identify students' learning needs. To makes these assessments Teachers have to rely on numerous inputs including their insights, knowledge about learning, and experience with students, and prescribed learning outcomes.

There has been much discussion in recent years regarding the use and effectiveness of different types and approaches to student assessment. It can be expected that technology will play an important role in supporting current and future types of student assessment. Current research in

this area includes the following observations:

1. *Districts and schools need new and better ways to measure what matters; diagnose strengths and weaknesses of students; involve multiple stakeholders in the process of designing, conducting, and using assessments.*

2. *Student-learning data can be collected and used to continually improve learning outcomes and productivity. For example, learning data could be used to create a system of interconnected feedback for students, educators, parents, school leaders, and district administrators.*

Methods of Assessment

At present, primary approaches to assessment in BC Districts are based on tests and letter grades that are predominantly summative in nature. In addition, there are numerous standardized tests including PSA's, provincial exams, and other assessments that provide a snapshot in time. In general, the goal of summative assessment is to evaluate student learning at the end of an instructional 'period' by comparing it to some standard or benchmark.

There is a clear shift however to incorporating increased levels of formative assessments for students. The goal of formative assessment is to monitor student learning to provide on-going feedback that can be used by teachers to improve their instructional practice. Formative assessments can also be used by students to improve their learning. In general, this type of assessment can help students identify their strengths and weaknesses and target areas that need work. Teachers can identify where students are struggling and address problems immediately. In BC, assessment of student learning is undergoing profound change in sync with profound changes in the new provincial curriculum, and BC's Education plan.

Technology and Assessment

While the focus on student assessment is not new, the instructional technology tools to help implement meaningful assessment and feedback are. Modern technology offers educators a variety of new tools that can be used in the classroom. Technology can help teachers track and assess their students' progress, as well as their own. It can also be used to facilitate communication between students, teachers and parents and to create digital records of student growth and development that can easily be passed along from grade to grade.

Other ideas, observations and shifts that have come through discussion in our districts Ed-Tech committee, and other research, can be summarized as follows:

i)   Assessments delivered using technology can provide a complete and more comprehensive picture of student needs, interests, and abilities as compared to traditional assessments. This allows educators an opportunity to personalize learning.

ii) Embedded assessments will allow educators to see evidence of students thinking during the learning process. This gives teachers real-time feedback and insight into student learning.

iii) Student dashboards can be developed and implemented to provide the real-time feedback described above and allow teachers to take more immediate action. Families can be better informed about what and how their children learned on any particular day.

iv) Technology has the potential to move assessment from disjointed separate measures of student progress to an integrated system of assessments and personalized instruction to meet the needs of the learner. Technology can integrate more fully student classroom experiences, homework assignments, and formative and summative assessments, all of which are tied closely to academic standards.

v)   The use of ePortfolio is currently being 'piloted' in the district. This trend is expected to continue into the foreseeable future and will set the stage for defining the standard for the District.

vi) There is clear evidence that centralizing student assessment information from disparate sources including external tests, internal standardized assessments, student information systems and learning management systems will provide a much deeper look into student learning. Currently, the school district is mapping out the details on how to centralize and display this information in an effort to discover patterns and learning preferences and to store this over time.

4.1 Recommendations for Action: Assessment

The recommended overall goal is to develop assessment technologies and systems that will leverage the power of technology to measure what matters and use assessment data to improve learning. The following are specific recommendations in this area.

1. **Continue the development of a model for assessment that includes ongoing gathering and sharing of data for continuous improvement of learning and teaching.**

    This will require the design and implementation of processes for the integration of data from disparate sources. This also implies that we continue with practices and events that increase the capacity of teachers, and other education personnel, to understand and design assessment strategies.

2. **Through research, thoughtful inquiry, and collaboration inside and outside the district, design and develop student analytics and learning dashboards.**

    The District currently has the technologies to store, manipulate and analyze student data.

Our server infrastructure and web technologies will allow for reliable storage and access to this information year over year. Web technologies currently implemented will allow for analysis and display of relevant student analytics. The biggest challenge facing the district is to develop appropriate business processes for collecting and inputting data, and for formulating relevant questions to inform teaching practices.

3. **It is recommended that the District continue with pilot projects that involve ePortfolio such as FreshGrade, Quio and SharePoint**.

   The next step in assessment related pilot projects will be to determine the viability of these technologies and make recommendations for standardizing the use of ePortfolio tools for the future. It is expected that the decision to use one application over the other will be made in the coming year. Once the decision is made, plans will be developed to implement the assessment tool on a broader scale, and to increase the involvement of other stakeholders.

4. **It is recommended that the District facilitate and encourage pilot projects that explore how embedded assessment technologies can be used to engage students while assessing their learning**.

   Examples include simulations, collaboration environments, virtual worlds, and project based learning.

5.0 - Teaching Practice

Over the past 25 years, the world has changed faster and with more complexity than ever before. The most significant driving force is the advent of the Internet and the rapid advancement of technology as part of the digital age. Such a radical global transformation has demanded people learn new theories and knowledge that simply did not exist two decades ago. We need to find ways to evolve K-12 teaching approaches that are in sync with the evolving technological changes and competencies.

Building Teacher Capacity

Technology offers the opportunity for teachers to become more collaborative and extend learning beyond the classroom. Educators can create learning communities composed of students, fellow educators in schools, museums, and libraries. Technology can be implemented to access after-school programs, experts from around the world in all disciplines, and members of community organizations.

The availability of technology-based learning tools gives educators a chance be co-learners alongside their students and peers. Educators cannot be expected to know everything there is to know in their disciplines. On the other hand, they can be expected to know and model how to leverage available tools to engage content and access other learning resources.

To realize this vision, the District will need to support teachers in accessing needed technologies and in learning how to use it effectively. They will also need continuous, just-in-time support that includes professional development, mentors, and informal collaborations.

GAFE Summit and Ongoing Ed-Tech Conference.

The district is currently planning a Google Apps for Education summit which has already been approved by Google. In partnership with the EdTech team (Google's summit organizers) the school district will organize the event which is scheduled to take place on October 21 & 22, 2016. This two-day high-intensity event will focus on deploying, integrating, and using Google Apps for Education (and other Google tools) to promote student learning in our classrooms. The typical program features Google Certified Teachers, Google Apps for Education Certified Trainers, practicing administrators, solution providers, Google engineers, and representatives from the Google education teams.

The GAFE summit is an opportunity for the District to raise the technology capacity of teachers in a significant way. While the conference focuses on Google specific applications, the event will also serve as a professional development event that will raise the overall digital literacy of district educators. The summit will also serve as an excellent springboard for developing an annual Ed-Tech conference in BC. This kind of event holds the possibility of attracting educators from districts around the BC as well as other provinces. At present, most Ed-Tech conferences are organized in the USA and as such are expensive to attend. Hosting an annual Ed-Tech conference in BC will provide an affordable, ongoing option for Teachers to raise their technology awareness and capacity.

Model for Connected Teacher

Educators can collaborate far beyond the walls of their schools. Through technology, educators are no longer restricted to collaborating only with other educators in their schools. They now can connect with other educators and experts across their communities or around the world to expand their perspectives and create opportunities for student learning. They can connect with community organizations specializing in real-world concerns to design learning experiences that allow students to explore local needs and priorities. All of these elements make classroom learning more relevant and authentic.

Other ideas, observations and shift that have come through discussion in our districts Ed-Tech committee, and other research, can be summarized as follows:

i)   Developing the capacity of educators needs to be compelling for teachers. Essentially, this means that educators need to see the endeavour is useful. Teachers need to be attracted to the approach as opposed to the approached being promoted.

ii) Raising the capacity of teachers will require awareness that some teachers still have considerable fear and misunderstanding of the nature and role of technology in education.

5.1 Recommendations for Action: Teaching Practice

The recommended overall goal is to ensure that educators will be supported, and professionally developed in a way that will allow them to leverage technology to connect to people, data, content, expertise, learning experiences and other resources. With this support, it is expected that teachers will be empowered to provide more effective teaching for all learners. The following are specific recommendations for this area.

1. **It is recommended that the District develop strategies for utilizing in-service and professional development to increase the technology capacity of educators.**

   The purpose of professional development is to raise the capacity of teachers to improve their overall ability to use technology inside and outside the classroom. In turn, this will enable them to create compelling educational activities that improve learning and teaching, assessment, and instructional practices.

2. **It is recommended that the District develop a common set of technology competency expectations for educators.**

   Like all school districts, there is a considerable difference in the Ed-Tech skills that teachers bring to the classroom. These differences relate to different formal education backgrounds, different philosophies, and different levels of experience with technology. While levelling the technology competencies is a long term task, articulating expectations now can help teachers better understand where gaps and exist and how to set about closing these gaps. Common technology competencies can also be used to communicate and provide input into post-secondary institutions where teachers are educated.

3. **It is recommended that the District formally survey where teachers' and administrators' current technology skills are to identify where gaps exist.**

   This process will assist in determining what types of professional development activities are needed for teachers to better utilize technology for instructional practices and assessment. This will inform the District for developing strategies to create professional development activities.

4. **It is recommended that the District host the GAFE conference and utilize this opportunity to develop an ongoing Ed-Tech conference.**

    Professional development is an inherently difficult and expensive proposition. Many high quality conferences are located in the USA and this severely limits the number of teachers that can be exposed to this type of development. At the same time, with changing education approaches, changes in assessment and ongoing changes to technology, there is a very high demand for quality professional learning opportunities. This is an issue for all Districts in Canada.

    Developing a high quality Ed-Tech related conference in BC is an opportunity for the Vernon School district to annually provide an event to train our teachers and to open it to all other districts to help offset, or totally pay for the high cost of training. The specific costs and projected revenues will be looked at more closely should the District decide to pursue this recommendation.

6.0 Innovation (R & D)

While Canada's education systems are among the best in the world, there is still a need to engage in practical research and to develop innovative ways to do better. There are significant and widespread changes going on in BC Education including; a clear shift towards developing personalized learning approaches; a comprehensive vision for the future of education in BC as articulated in the BC Ed plan; a new provincial curriculum to give teachers the flexibility they need to personalize their students' learning experiences; and changes to approaches to student assessment.

Much of the changes that are occurring within the BC education system have been articulated at a high level and without specific approaches for changing instructional practices. There is no instruction manual on how to move personalized learning from concept to everyday practice. As a result, districts, schools and educators will need to innovate to move personalized learning from concept to the classroom.

In School District 22, we are currently sponsoring numerous innovative projects that relate to shifting instructional approaches, and to assessment. As the district progresses in this area, it will need to continue to develop a culture of innovation and allow educators opportunities to explore new ways to deliver education. In an effort to increase the visibility of all pilot projects in the, it is recommended that the District host an annual showcase to share results and collaborate with stakeholders.

In support of facilitating and encouraging innovation, the province of BC has developed *The K-12 Innovation Strategy*. This endeavor has been designed to help and encourage teachers as they

develop successful approaches that move personalized learning from concept to everyday practice. The heart of the strategy is the K-12 Innovation Partnership, which will be a community of practice focused on bridging the theory and practice of personalized learning. The partnership will be composed of identified schools from throughout the province that are interested in developing new approaches.

Recently, School District 22 and the Technology Innovation Coordinators were recognized by the Partnership for their implementation of STEAM activities through the 'mobile makerspace' project. In addition to providing technology support for all teachers in the District, this same group has implemented numerous innovation practices including Breakout EDU, developing approaches for adding computer coding to course curriculums, and participation in the global Hour of Code event.

6.1 Recommendations for Action: Innovation

The overall recommended goal is to continue to develop a healthy culture of innovation in the school district, to continuously analyse the success of these projects, and to adopt practices emanating from these projects where appropriate. Specific recommendations for actions include the following:

1. **It is recommended that the District continue to initiate, facilitate and incubate practical research and pilot projects.**

   The District is well on its way for developing a healthy innovative culture that encourages exploration, development and learning of new and innovative ways to deliver education, and to assess learning. This culture will also help to develop and operationalize formative assessments, and approaches to embed assessments into everyday classroom activities. The work of the *Technology Innovation Coordinators* has been extremely successful for supporting Teachers and for initiating and facilitating innovative practices throughout the District.

2. *It is recommended that the District develop approaches to measure the effectiveness of* **pilot projects, to ensure that lessons learned are communicated across the district, and to promote active dialogue regarding innovative practices around the district.**

   Measuring the effectiveness of a pilot project is largely uncharted territory, especially considering that it is difficult to come up with objective measures. Notwithstanding this, approaches through discussion, collaboration, and qualitative analysis will need to be developed to determine the long term viability of learning approaches and assessment that are being trialed in pilot projects. Currently there is a registration process in place that requires the sponsor of the pilot to develop metrics for determining the effectiveness of the project.

7.0 - Technology Infrastructure

IT infrastructure refers to the composite of hardware, software, network resources and services required for the existence, operation and management of an enterprise IT environment. It allows an organization to deliver IT solutions and services to its employees and students.

IT infrastructure consists of all components that together play a role in overall IT service delivery. In addition to hardware and software, infrastructure also includes the people and processes that deliver IT services. Preparing students to be successful for the future requires a robust and flexible learning infrastructure capable of supporting new types of engagement and providing ubiquitous access to the technology tools that allow students to create, design, and explore. The essential components of an infrastructure capable of supporting transformational learning experiences include the following:

Ubiquitous Connectivity: To prepare for the future, all schools and classrooms require persistent access to high-speed Internet in schools. During the District's refresh project all physical cable runs were brought up to Category 6e standard. In addition, the District's switches and wireless infrastructure were updated and will meet current and medium term needs.

In the fall of 2015, the district migrated to the provinces Next Generation Network (NGN). After the implementation, all schools and the Board Office were connected to province's new high speed, fibre based network. This architecture will allow bandwidth expansion into the foreseeable future as our needs change.

It is expected that the demand for online and/or cloud services will increase substantially in the future. With this increased demand, the weak link will be with our wireless infrastructure, and with our current contracted level of bandwidth at schools. With this, we will likely have to increase our bandwidth levels in schools by contracting for increased bandwidths as required.

Powerful Function Specific Learning Devices: Students, Teachers and other district staff require devices that connect them to desktop and enterprise applications, on premise services, and to the vast resources of the Internet. They are also used to and facilitate communication and collaboration. At present there is a relatively homogeneous fleet of computers and workstations in the District. The majority of computing devices (workstations, computers, servers) are Lenovo as well as some legacy Dell computers. Most of the devices came as a result of recommendations contained in the Technology Refresh plan, and range in price between $750 and $1,300 per unit (not including servers).

There is a broad range of computing requirements throughout the district. In general, there are some groups who have very 'light' computing requirements, some who have 'average' requirements and of course those that are high end users and require considerable computing power. In the

future, it is expected that the District will move to a much more heterogeneous environment whereby the computing device deployed will closely match the intended purpose and function. With this approach, it is expected that the average cost per device will be considerably lower than it is today.

Bring Your Own Device (BYOD): There has been much talk over the years about the possibility of students using their own devices in the classroom. This would increase the ratio of computers to students and allow learners more ubiquitous access to digital resources. This is a desirable outcome and would be economical in terms of the overall investment in technology infrastructure. At the same time, there are some obstacles to BYOD as follows:

i)   For the most part, teachers are not ready for a classroom consisting of a large mixture of computing devices. It can be very difficult for teachers to manage learning experiences and activities when they have to support multiple platforms and device types, and some activities may be incompatible with some devices.

ii) The district will need to develop processes, safeguards and /or implement mobile device management to ensure that acceptable use guidelines are adhered to, personal data is protected, and other virus and malware issues are managed.

iii) Schools will have to be aware of potential economic disparities whereby not every student can afford their own device. Strategies will have to be developed to ensure that all students have equal access to on-line and on premise resources.

On Premise vs Cloud Services: For the most part, all of the districts applications and or services reside on desktops or on servers in one of the District's data centres. The following table summarizes the key applications and services that the District currently provides.

Data Storage	Student & Teacher data is stored on local school servers. Board office files are stored in the Board Office data centre and the VSS Data Centre.
Email Service	Microsoft Exchange resides in the VSS Data Centre and most all devices run Microsoft Outlook for their email client. All users also have access to the Outlook Web Application which is a web based client hosted in the VSS Data Centre.
Classroom Management	The District currently uses School Connect; a product developed by IBM. The application is web based and runs on each school's local server. The application gives students and teachers the ability to create

	classes, drop boxes and other functionality to provide content and file storage.
Library Software	The district currently uses L4U for tasks related to library management, textbook management, and resource centre management. For the most part, the application runs locally on a desktop in the specific library. In some cases, the data is stored in a central computer and access is provided through a client workstation.
Student Information System	The district currently uses CIMS as the core Student Information System (SIS). While the system is somewhat dated, it still adequately performs administrative and statutory tasks such as collecting student demographics, attendance, incidents, timetables and a wide array of administrative and educational reports. The program also has some classroom functionality including gradebook, assessment, and attendance. The system is hosted in the Kelowna SD data centre on a cost sharing basis with the Salmon Arm SD. Vernon school district also pays separately for support from Take Two software and from WeidenHammer.
Web Services / Portal	The district currently uses SharePoint and Scholantis for their district and school websites. The technologies employed also provide the functionality for student and teacher portals as well as other classroom learning management functionality. School websites have a consistent look and feel to them and as a result seem easy to navigate. At present, only a small percentage of students and teachers utilize the available technology.
Education Applications	Most educational applications are installed on each individual computing device and managed through the districts Tivoli Provisioning Manager (TPM), APP-V to create, maintain and push out images. The District also uses JAMF to manage mobile devices and the applications that are deployed on these devices.
Administrative Software	The District currently hosts most, if not all of their Administrative software on premises. There may be an excellent case to host some of these applications in the cloud to reduce costs, improve access, and to provide better disaster recovery options.
Disaster Recovery	In general, the cloud offers excellent opportunities for disaster recovery and business continuity. These options are currently being evaluated for services such as email, active directory and file storage.

The hosting of applications and services will be considerably different in the future. There is a marked trend in all organizations to license applications and services that are hosted in the Cloud. Cloud services means technology services made available to users on demand via the Internet from a cloud computing provider's servers, as opposed to being provided from a company's own on-premises servers. Generally speaking, the idea with 'the Cloud' is that organizations contract with 3rd parties to store their data files, host applications, and provide other centralized services. The benefits to this approach are economic (cheaper), ease of administration, ability to easily recover from disasters and well as providing access to files and services from anywhere.

Both Microsoft and Google are competed heavily for providing cloud base services to K-12 organizations.

i. Google Apps for Education (GAFE) is a core suite of productivity applications that Google offers to schools and educational institutions for FREE. These communication and collaboration apps include Gmail, Calendar, Drive, Docs and Sites, and a GAFE account unlocks access to dozens of other collaborative tools supported by Google. All of these applications exists completely online (or in the cloud), meaning that all creations can be accessed from any device with an Internet connection. There is no storage limitation for students or teachers.

ii. Office 365 for Education is a collection of services that allows students and teachers to collaborate and share schoolwork. It's available for free to teachers and students. The service includes online versions of Word, PowerPoint, Excel, OneNote, a OneNote Class Notebook, and 1TB of storage in OneDrive.

These are significant offerings from these organizations are and very compelling for school districts. The benefits of implementing these services are as follows:

i. Services described above are free which makes them very compelling for Districts.
ii. Google is offering unlimited data storage and Microsoft is offering 1 terabyte of storage for students and teachers. This means that as a district we can offer unprecedented levels of storage space that is extremely easy to manage. Specifically, this would reduce our need to store this data on premises which will reduce our costs for core storage and for backup. It will also remove a significant administrative burden of moving files around as students transition from grade to grade and school to school.
iii. Google Apps For Education is a fully hosted suite of education applications that is easy to manage, and is very intuitive to use. A number of teachers are piloting this service now and preliminary feedback is very positive.
iv. Microsoft's Office 365 is also a very compelling suite of applications and storage potential. All of the key Office productivity applications are included and are highly recognizable to most end users.

Single Sign On: Applications and tools can be configured to enable single sign-on—allowing teachers and students to log in to all their applications with a single password. A teacher teaching seven classes of students a day with multiple apps and tools needs a way to manage learning content, attendance, student progress, and grades. Students and teachers have to keep track of a different user name and password to log in to each system; this wastes time and creates frustration. For all these reasons, solutions involving single sign-on are needed for teachers and students to access all their applications through a single log-in credential.

Device and Server Replacement: Notwithstanding the major shifts occurring with hosting and data storage, the District still has a need to refresh their on premise servers and devices on an ongoing

basis. At present, the computing devices and servers are approximately 4 years old. In addition, there are still a small group of devices that are approximately 8 years old. Over the next several years, the District will need to begin replacing these devices and servers as they reach the end of their physical and/or operating system life.

The most efficient and effective way to refresh technology infrastructure is to do a little bit each year. This has the major benefit of spreading these costs over a longer planning horizon so that the District is not faced with a large one-time cost. The approach also has the benefit of allowing the district to continually modify the plan as technologies change year over year. This provides significant flexibility in terms of choice and cost of devices and servers, and whether to employ Cloud services.

Table 1 below summarizes the computing devices currently in the district by type and by anticipated replacement year over the next 5 years. The projection assumes that we continue with the status quo in terms of numbers and costs of future equipment.

TABLE 'A' – Device Replacement				
			Total for 3 years	
Type	**2015-16**	**2016-17**	**2017 - 2020**	**TOTAL**
Desktop	**67**	**339**	**495**	**901**
Admin & Clerical	9	13	110	132
Students	58	326	325	709
Teachers			60	60
Laptop	**71**	**2**	**1956**	**2029**
Admin & Clerical	7		38	45
Students	14	1	1431	1446
Teachers	50	1	487	538
Tablet			**20**	**105**
Admin & Clerical			1	1
Teachers			104	104
Grand Total	**138**	**341**	**2471**	**3035**

Table 2 below summarizes the computing devices currently in the district by type and by anticipated replacement year over the next 8 years.

TABLE 'B' – Server Replacement		
Description	**Year**	**Budget**

Back-up / Disaster Recovery, Network Monitoring, Image Re-Build, MDM, SCCM.	2015 - 16	$ 48,000
Domain Controllers, SCCM, Server Replacement	2016 - 17	355,000
Physical Server Replacement, SBO, Commvault, Veeam	2017 - 18	255,000
Replace / Upgrade Wireless Infrastructure - Multi-year Strategy	2018 - 19	263,000
Replace / Upgrade Wireless Infrastructure - Multi-year Strategy	2019- 20	263,000
Replace / Upgrade Wireless Infrastructure - Multi-year Strategy	2020 - 21	263,000
Replace / Upgrade all Network Switches - Multi-year Strategy	2021 - 22	263,000
Replace / Upgrade all Network Switches - Multi-year Strategy	2022 - 23	263,000
	TOTAL	**$ 1,973,000**

Appendices 'B' and 'C' provide full details and budget estimates for the replacement of devices, servers, and network infrastructure over the next 8 years.

The Classroom of the Future

Classrooms continue to evolve in concert with changes in instructional practices, assessment, teacher knowledge, and technology. In most recent history classrooms have been equipped with Wi-Fi, Smart Boards, computing devices, LCD projectors and other learning devices. The Ed-Tech committee is currently looking at the profile for the design and structure of the classroom of the future to match up with changes to learning and assessment.

IT Risk Management

Disaster Recovery & Business Continuity: Business Continuity refers to the continuation or resumption of technology enabled educational activities in the event of a natural disaster such as a flood, fire, epidemic or a malicious attack from the Internet. These are critical plans that involve the

implementation of specific technologies as well as orchestrated procedures in the event of a disaster.

In conjunction with other district stakeholders, the IT department has developed a draft disaster recovery approach for specific disasters or technology failures. The exercise has identified a number of deficiencies including the need for off-site and off district storage, and the need to provide an alternative method of access the districts local network and the Internet in the event of catastrophic failure.

Approach to Risk Management

IT risk is the organizational risk related to the use, ownership and operation of Information Technology in the District. These risks specifically relate to events that could potentially impact the delivery of education. In addition, it is useful to understand that risks could relate to operational type things such as viruses, malware, disasters. They could also be related to compliance type risks such as FOIPPA, informed consent, and best practice standards.

In addition to the specific 'risk management' tasks identified above, it is proposed that a comprehensive approach be adopted for the analysis and response to potential IT risk events. Specifically, it is recommended the District adopt a recognized 'best practice' framework such as COBIT or ISO to manage IT risk.

The analysis of all IT risks in the District, and planned responses to risk events should consider the following principles:

1. Risk analysis and responses need to be done within the context of the District's strategic plan and educational goals.
2. Risk analysis and proposed responses need to consider the overall costs and benefits of the response.
3. All risks and planned responses need to be communicated across the District.
4. Risks and planned responses need to be continuously analysed and elaborated as necessary.

7.1 Recommendations for Action: Technology Infrastructure

Overall, students, educators, administrative staff, and board staff will have access to a robust and comprehensive infrastructure when and where they need it for learning and other business and administrative tasks.

Specific recommendations are as follows:

1. **It is recommended that the District perform updates to their infrastructure on an annual basis in contrast to all at once every 5-7 years.**

    Doing a little bit each year is more sustainable and affordable in terms of the overall investment in Information Technology. It also provides the District considerably more flexibility and agility to adopt and leverage new technologies as they occur for the betterment of facilitating education.

2. **It is recommended that the District begin adopting Cloud based services in an effort to find better value for infrastructure investments, and for more effective educational technology.**

    Specific attention will be given to the free and low cost services offered by Google (Google Apps for Education) and from Microsoft (Office 365). Both of these services show excellent promise for increased value at a substantially lower price. Adoption of these services will significantly change how IT services are delivered in this School District.

3. **It is recommended that the District begin the development and adoption of single sign on technology through its Active Directory.**

    Single sign on provides significant benefit to educational technology. It essentially means that students and teachers need only log-on once giving them access to hundreds (or more) applications related to their education. These applications would include the free services being offered through GAFE and Office 365. This offers considerable value and provides a choice for teachers to decide which tools best work for them in their instructional practice,

4. **It is recommended that the District adopt a standardized, stakeholder based process for analysing all core technologies to ensure that the best possible value is received**, and that student's education is at the forefront of investments.

    Technology infrastructure is extremely expensive to acquire and to implement. Due to these factors, it is very easy to get locked into specific technology decisions because of the significant barriers to implementing new applications and services. Notwithstanding this, it is a key success factor that technology be rooted in education and to be of high value. Therefore, the District should be always on the lookout for finding better, less expensive alternatives to serve education better. This approach would be adopted for all technology investments including educational software such as FreshGrade, GAFE and Office 365.

    There are numerous core enterprise technologies currently used in the District that should be reviewed and challenged over the next 1-5 years. These include CIMS, L4U Library software, School Connect, Scholantis / SharePoint web services, SDS, My Budget File and Web Works.

5. **It is recommended that the District base their computer device purchasing decisions on the specific end user functional needs for teachers, students, administrators and board staff.**

Devices are simultaneously becoming more powerful and considerably less expensive. The District should focus on purchasing 'just enough' computing power for the specific function that the device is intended to be used for. This will either reduce the overall cost of devices ion the District, or increase the ratio of students to devices, or both.

6. **It is recommended that the District develop an IT Risk Management plan that includes both a Disaster Recovery Plan and a Business Continuity Plan.**

   Business Continuity (BC) refers to maintaining education and business functions in the event of a major disruption, whether caused by a fire, flood, epidemic illness or a malicious attack across the Internet. A BC plan outlines procedures and instructions the district must follow in the face of such disasters. Ideally, the plan would include processes for continuing business processes and safeguarding assets and human resources, and communications with employees, parents and the community at large.

   A Disaster Recovery Plan focuses mainly on restoring specific IT infrastructure and operations after a crisis. It forms an integral part of a complete business continuity plan. Restoring servers, restoring data, re-establishing network and internet connections are examples of items included in a Disaster recovery plan.

8.0 - Administrative Technology

There are many technology services in the district that are primarily administrative in nature. While they support education activities in schools and classrooms, they are not directly linked to learning and/or assessment. Examples of Administrative technology include accounting systems, student information systems, device management applications, infrastructure technologies, IT support functions, and day-to-day business processes. Many administrative technologies are expensive to implement and support year over year. In many cases this is unavoidable. At the same time, they should be continually challenged and consideration needs to be given to ways that we can do things better, and more cost effectively.

Board Office

Accounting

Currently, the District uses the SDS system for its General Ledger, Accounts Payable, Accounts Receivable, Human Resource, Payroll, Purchasing and other related functions. The system has performed well for the District and is well supported by the vendor. Like all ERP applications, the support fees are relatively expensive and cost the District approximately $60,000 per year.

The vendor, Harris Systems, has notified the District that the SDS system as it presently stands will be deemed 'end of life' within the next several years. Although the vendor has indicated that the

system will be supported into the foreseeable future, no further product enhancements will be released. They have however indicated that they will continue to update tax tables related to the payroll module and other related sub-ledgers.

While there are not a large number of options for ERP systems suited for K-12 education, it is a logical time for the District to view other possibilities in the market place. To this end, the District has already begun the process to look at other software options and will continue to do this with an eye to possibility migrating to a new system within the next 3-4 years.

In March 2016, the District participated in a presentation from Cayenta who are a subsidiary of Harris System's and are promoting their new web based accounting system to take the place of the SDS system. In addition, end users will attend a presentation from SRB Education Solutions to review the functionality of this alternative ERP option.

Cell Phone refresh

The District currently manages a cell phone fleet of approximately 110 units. In general, phones are issued to senior staff, management and other employees where there is a need to have a cell phone. In the past, phones have been refreshed every 3 years regardless of condition or functionality. The overall experience is that the phones last 3-5 years unless there is specific failure with the hardware, or if the phone has been lost. Currently, the district is replacing approximately 30 phones per year based on a specific need for replacement. There does not appear to be any compelling reason to refresh cell phones until they stop functioning properly, or if they are lost.

The phones are issued specifically for priority and/or emergency situations and therefore their primary purpose is for phone calls and email. In some cases, district staff uses the phone to look at facilities drawings or other pertinent safety information. At present, the primary type of phone issued in the district is the Samsung Galaxy 5. This is the most economical phone for the District and performs all of the required functions envisioned by the District. There does not appear to be any reason to offer any other phone model for district users.

Photocopier Refresh

The District leases Kyocera machines for schools and the Board Office for photocopying, faxing and scanning purposes. The devices appear to be functioning as expected and have not been overly troublesome. The current lease will expire in 2017 and the District will have the option to renew the

lease at that time. Prior to the lease expiring, a process for formally looking at the market options, and total costs should be performed.

My Budget File

The My Budget File application is being implemented by management to prepare annual budgets. The program uses a central database which makes it relatively simple for the Accounting department to roll up and consolidate budget estimates and analysis. Annual maintenance fees for the application are approximately $18,000.

The budgeting process in the School District is comprehensive and is a major annual task for the Board Office and schools. It makes sense to have a centralized system to track and consolidate estimates for this task. At the same time, the product is relatively expensive to support. A process to determine if this is the best application for District budgeting should be completed.

Student Information System

The district currently uses CIMS as the core Student Information System (SIS). While the system is somewhat dated, it still adequately performs administrative and statutory tasks such as collecting student demographics, attendance, incidents, timetables and a wide array of administrative and educational reports. The program also has some classroom functionality including gradebook, assessment, and attendance.

The system is hosted in the Kelowna SD data centre on a cost sharing basis with the Salmon Arm SD. Vernon school district also pays separately for support from Take Two software and from WeidenHammer.

The nature and delivery of education is gradually changing in BC from a factory style of education to a more personalized approach. As these changes occur, the needs of districts will drive new demands and different functionality from their chosen student information system. Business processes such as timetabling, learning assessment, reporting to parents, and data collection will put pressure on districts to update or change systems.

In addition to the above, it is possible in the current provincial environment that Vernon (and other CIMS districts) will be legally or effectively mandated to move to the provincial MyEducation BC application.

In advance of possible mandating of the MyEd application, it would be beneficial for the District to complete a formal GAP analysis with respect to CIMS specifically and student information systems in general. The analysis should take the following into consideration:

i.   The current state of business processes and CIMS in Vernon SD.
ii.   The future desired / anticipated state for business processes and how that fits with CIMS and alternatively with MyEducation BC.
iii. Recommendations and a plan to move from the current state to the future state.

Participation in ERAC

The District is a member of the Educational Resource Acquisition Consortium (ERAC). ERAC is a cooperative member based organization. The group works in partnership with members who include BC public school districts as well as independent schools. ERAC provides a range of services to its members that include evaluation, licensing and acquisition of print, software, and digital learning resources. At present, the District purchases Windows server and desktop licensing, Office 365 Licensing, access to learning / research databases, and a number of other enterprise based desktop licenses

Working as a consortium, ERAC is able to leverage better prices for learning resources, software and videos. ERAC is funded through membership fees, an annual BC Ministry of Education grant and cost recovery fees for services performed on behalf of vendors or members. Overall, ERAC provides exceptional value to the school district

Maintenance

Work Order System

The District currently uses Web Works for managing work orders for maintenance and IT staff. The program has worked adequately for the past 10 years however currently it is somewhat outdated and has not been updated for a number of years. The Maintenance department has requested that the software be updated or replaced to better serve their needs now and in the future.

Recently, the IT Department facilitated a process to bring together stakeholders from around the district to gather and collate the functional requirements for a new Work Order system. The process was completed and then sent to a selection of vendors to find the best fit for the District's needs. Based on vendor's specific ability to meet the requirements, the list was shortened to 5 companies / products and each were invited to present to our stakeholder group.

 Vendor presentations were completed in February 2016 and at the end of this process the applications were ranked based on a consolidation of both quantitative and qualitative factors. One of the presentations was made by Cayenta, who are a subsidiary of Harris Systems. It was determined during the presentation that the Cayenta work order system would fit very well in terms of the District's functional requirements. It was also determined that the Cayenta work order system would be a compelling option given that it would be fully integrated with their ERP system should the District move in that direction. Due to these compelling reasons, it was decided to hold off on the final decision for a new work order system until decisions regarding a new Accounting / ERP system are made.

Resource Information for Facilities Staff

As maintenance staff complete work at specific district sites, staff often need easy and quick access to site or situation specific information in regards to technical and/or safety information. It would be beneficial for maintenance staff to have the ability to access site specific information, and other

relevant resources, to assist them in their day-to-day tasks. To this end, the IT department is currently looking at hosting all of this data on premises and developing a way to search and retrieve this type of information through cell phones and other mobile devices.

Telephones – Voice Over IP (VOIP)

The District uses a traditional analog telephone system with switches and wiring in every building and school. While this system is working adequately for the District, there is a growing trend in organizations to adopt VOIP to provide improved functionality and potentially a lower total cost of ownership. It is recommended that the District research the feasibility and business case for implementing a fully digital VOIP phone system.

Transportation

Routing Software – Transfinder

Transfinder software is used by the transportation department to optimize bus routes, allocate and manage students on routes, and manage field trips. At present, the application is working well for the department and no further changes are recommended.

ProFuel

The ProFuel program is used to help manage the department's fuel system. It is used in conjunction with the information gathered when drivers fuel up their busses / vehicle and to provide a variety of usage and efficiency information for the manager. The program is currently meeting the needs of the transportation department and no upgrades or enhancements are required at this time.

Zonar GPS

The Zonar program provides real-time tracking of bussing and other vehicles. The program is currently meeting the needs of the transportation department and no upgrades or enhancements are required at this time.

WiFi on Busses

The practice of equipping school buses with Wi-Fi is growing in popularity in many jurisdictions in both Canada and the USA. The idea is to essentially extend the classroom and provide students with access to educational resources while they are travelling to and from school. In terms of developing flipped classroom, the 'internet enabled' bus would provide time outside the classroom to access digital content, consume education related videos and possibly to video conference or chat with teachers. This would allow for more classroom time for project based work, collaboration and discussion.

The practice has met with success in many jurisdictions and has also lead to diminished behavioral issues for drivers to deal with.

8.1 Recommendations for Action: Administrative Technology

In general, it is recommended that the District follow a disciplined and comprehensive process for making decisions regarding administrative technology. The process should be rooted in a proper business case approach that identifies the specific functional requirements first, selects vendors to do presentations based on their specific ability to meet the requirements, and then perform an analysis that weighs both qualitative and quantitative factors. To the extent possible, all stakeholders should be included in the process and have significant input into the final decision.

1. **It is recommended that the District continue their search for new Accounting / ERP software over the next several years.**

   An excellent process has already been initiated whereby needs have been identified and stakeholders have been identified and involved. As the process continues, other vendor applications will be identified and invited to present the functionality of their respective applications.

2. **It is recommended that the search for a new work order system be suspended until the decision regarding the Accounting system has been made.**

   If the District decides to pursue the Cayenta application there will be very compelling reasons to implement their work order system given that the system would be fully integrated with the accounting system. In addition there may be considerable economic benefits associated with dealing with the same vendor.

3. **It is recommended that the District not refresh all cell phones at once.**

   Phones should be replaced on an as needed basis. At present, the standard phone for the District should be the base Samsung Galaxy model as this unit offers the best combination of value and functionality.

4. **It is recommended that the District research the feasibility of providing WiFi access on school busses.**

   Research should be performed to look at other School Districts that have implemented this technology and determine if educational goals were met. If there appears to be educational benefit, it would be worthwhile to look at the feasibility, costs and other factors related to implementing the technology.

9.0 - Leadership

Taking full advantage of technology to transform learning requires strong leadership capable of creating a shared vision of which all members of the school district feel a part. Technology alone does not transform learning; rather, technology helps enable transformative learning. In school District 22, we have initiated the Ed-Tech committee which naturally serves as the platform for developing a shared vision for the district.

Education needs to be at the centre of all technology initiatives. In fact, there should not be any *Technology Initiatives* per se, only *Education Initiatives*. In essence, every dollar that is spent with respect to technology should be demonstrably linked to education or to an education initiative. The only way to achieve this is to develop an intensive partnership and collaboration between Education and Information Technology activities in the district.

There are several ways to ensure that both Education and Information technology work closely and effectively together. These can be summarized as follows:

    i.   Maintain an Education-Technology committee in the district to ensure that all technology is rooted in Educational thinking and practice. Ensure that membership is representative and non-political. For success, there needs to be buy-in at all levels and areas throughout the district.

    ii.   Ensure that Information Technology leadership occurs at the senior level in the district to guarantee that there is a continuous and shared vision for technology, and that there is buy-in and communication at all levels.

Just as specific technologies have rapidly changed over the past 25 years, so has the need for IT Leadership. Traditionally, IT has been managed by senior technical staff, teachers, principals, or by the business function in the district. With the current challenges, changes and complexities facing districts today, none of these approaches provides all of the necessary skills and experience demanded of this position. In reality, IT departments require an executive level leader to provide the appropriate balance and depth in the areas of leadership, technical savvy and relevant experience to connect IT services to education.

In addition to getting things done in a cost effective manner, the purpose of this role is to provide vision, leadership skills, team building and collaboration abilities, communication skills, and project management expertise. Above all, an IT leader needs the ability to understand and align technology initiatives with the districts' and regions' education goals and initiatives

Effective leadership is an essential component of Educational Technology and for managing district infrastructure. The following are some benefits to having on-going senior leadership for the technology function in the district:

i.   To ensure that all existing technologies are managed and maintained on a daily basis.
ii.   To ensure that technologies are refreshed and budgeted for on an annual basis.
iii.   To ensure that district staff technology needs & issues are completed on a timely basis.
iv.   To ensure that tech staff are properly trained and professionally developed for current and future technologies.
v.   To ensure that technology projects are managed in an efficient, effective and cost-effective way.
vi.   To ensure that there are tested plans for disaster recovery and business continuity.
vii.   To ensure that all technologies relate to education and education initiatives. Specifically, to implement the facilitating technologies related to schools strategic education plans.
viii. To provide strong technical leadership throughout the District,.
ix.   To ensure that there is a continuous vision for technology and education for the future.
x.   Raise the overall service maturity level of participating districts in response to deficiencies noted by the Auditor General. This could be achieved through alignment with industry published industry standards including ITIL, ISTM and ISO 20000.
xi.   To provide a structured approach to initiating and managing IT projects that addresses change, implementation and operation.
xii.   Preparing and managing annual budgets for sustaining the IT function.
xiii. Develop relationships with external vendors and service providers to ensure high quality and cost effective outsourced solutions (where required).
xiv.   To build effective relationships throughout the District and education communities to remain current with educational initiatives in other jurisdictions, to remain current with all relevant technologies,   and to ensure that the District can leverage all of the above to their advantage.

IT Department Restructuring

The IT department should be structured and organized in a way that will optimize the ability to manage and deliver IT services in the District, now and into the future. A strategically structured department will also allow for significantly improved communications and a consistent approach to all technology services across the District.

Phase I Restructuring

Over the past year, extensive restructuring has been completed in the department to better align skill sets with the current and anticipated needs and technologies deployed in the District. The department has moved away from the 'Universal Technician' approach in favour of creating technology specialists that fit with the needs of the District and with staffs interests and aptitudes.

Phase II Restructuring

There will be a number of issues that face the IT department in the coming years. These issues relate to expected retirements, skills gaps, alignment with shared services, provision of IT services in the event of a strike, and overtime. An approach for this restructuring is currently being developed and will have no immediate impact on the department's budget.

<u>Shared Services</u>

School districts are faced with ongoing challenges related to the overall leadership, investment, implementation and management of Information Technology. These challenges are particularly true for small and medium sized districts. Technology has become extremely diverse and is increasingly relied upon by stakeholders throughout the organization. At the same time, technology has become more complex, specialized, and is ever changing. This leaves districts with insufficient resources to deal with these realities including budget shortfalls; service gaps; knowledge gaps for education, admin and technical staff; and insufficient resources to raise the overall tech capacity of the district.

For the above reasons, it makes sense for small and medium sized Districts to develop and pursue shared services by collaborating with other Districts. The following are some compelling reasons to do this:

i. For many districts, there is insufficient knowledge or experience at the senior staff level to make fully informed decisions regarding the choice and 'flavour' of technologies. External vendors are often relied upon to fill the gap in this area, which is helpful, but not always in the best interests of districts/schools/students. This often results in one or more issues:

   a. Over investment in technology; this includes investment in the wrong technology, and / or too much investment in specific areas.

   b. Under investment in technology; this includes not enough infrastructure to handle the load and demands of the district and / or gaps and bottlenecks in areas that are critical to education.

   c. Undue reliance on outside vendors to perform a specific IT service.

   d. Not enough reliance on outside vendors where the nature of the technology and implementation make outsourcing a logical option.

ii. A significant proportion of IT work is involved with the initiation of new technologies and with managing the change that accompanies these implementations. Leadership and management of these tasks have evolved into a specific specialty known as 'Project Management'. The benefit of professional project management lies with organizing, planning and controlling tasks including the management of budget, timelines, risk, quality and change.

iii.   BC school jurisdictions are looking to significantly change the way that education is delivered. Our understanding of how children learn has led to new ideas on how to evolve our classrooms, and to personalize learning. Technology has a significant role to play in these changes; it is both the medium AND the message. IT departments need to keep up with changes to pedagogy to help facilitate the delivery of education. They also need to provide technology mentorship to educators so that they can reflect its rapidly changing nature in the classroom. It is critical that IT departments be in alignment with these educational changes.

iv.   Every two years the Auditor General of BC reviews and issues a report on a District's overall IT maturity level, and the controls that are in place to ensure confidentiality, integrity and availability of IT systems. Many districts have not fared well with these reports and moreover, do not have the resources to address deficiencies. By pooling resources, districts can address these deficiencies and improve overall service levels. There is also a growing need to approach IT from a service perspective, and to structure and standardize this around industry frameworks such as ITIL, ITSM and ISO 20000. This will be specifically addressed in the planning stages for shared services.

Shared Service Initiative in BC

In June 2015 district technology leaders convened in Richmond to discuss the potential for shared services. Many ideas and governance preferences were discussed and documented by the organizing group of Districts. What has emerged from this meeting is a concept paper to create a shared service organization called the *British Columbia District Collaborative Initiative.* The purpose of the collaborative is to create a technology centric organization to share services and advance capacity for technology facilitated learning, and other administrative functions. The collaborative would specifically address many areas of technology including knowledge sharing, policy making and advocacy, procurement, and technology development.

District 22 has been participating in the initial and follow-up meetings, and believe that there is sufficient interest in this initiative throughout the province.

Information Technology Projects

The IT department, and technology services in general, has undergone significant changes over the past 16 months. The feedback regarding changes has been positive and overall staff morale has improved significantly. With the formation of the Ed-Tech committee, and high level of integration with the District Helping teachers, there is a clear sense that the culture of IT around the district is changing in a positive way. There are numerous projects completed over the past year related to both infrastructure stabilization and to education. Some of these projects are still underway are and are expected to be completed within the next 18 to 24 months.

9.1 Recommendations for Action: Leadership

The overall recommended goal is to ensure that there is effective and strategic leadership of the IT function and to ensure that education is technology-enabled throughout the District.

1. **It is recommended that the District continue with providing leadership in the IT area into the foreseeable future to ensure that education remains at the centre of technology initiatives and investments.**

    The leadership function should be tasked with day-to-day leadership of the IT department, managing infrastructure and Ed-Tech projects, facilitating communication and collaboration amongst internal and external stakeholders for all technology initiatives, and establishing relationships inside and outside the district to maximize the benefit of technology investments. It is also critical that technology investments be sustainable, secure, robust and cost effective.

2. **It is recommended that the District continue to look into opportunities for shared leadership, and other shared service opportunities.**

    The District is currently participating in the province wide initiative - the *British Columbia District Technology Collaborative*. In addition, the district will continue to pursue opportunities directly with other districts, particularly in the area of shared leadership. A long-term viable leadership option for the district is to share the costs of a Director position with other school districts in the province and simultaneously have a full time IT Manager with strong technical skills. ***Appendix 'E'*** describes the Business Case for such a scenario and details the roles for both the part-time Director and full time Manager positions.

3. **It is recommended that the District continue the development of the Ed-Tech committee to ensure that technology initiatives are directly connected to education.**

    The Ed-Tech committee is progressing in a way that develops a culture that is innovative, open, collaborative, progressive, and respectful. As we progress as a District in this area, it can be expected that technology decisions will be transparent, rooted in education and enable personalized learning in and outside the classroom.

4. **It is recommended that the District regularly update the long term technology plan.**

    Technology plans need to be flexible and stakeholders need to be agile to ensure that technology initiatives are responsive to changes in education policy and practice. In an environment of rapid technological change, the District should be poised to leverage new technologies as they emerge in a way that benefits student education.

10.0 – Required Resources

Department Budget

The department has prepared a budget to reflect the anticipated costs of staffing and training the department, provisioning licensing and applications District wide, refreshing computing devices, and refreshing back-end server technologies. **Table 'C'** below summarizes the budget projection for 2016-17.

The analysis below is based on the assumption that the Status Quo will prevail into the future. This of course is not realistic. It is anticipated that District IT costs will be reduced in the coming years due to decreased device costs and reduced server costs as we implement cloud based technologies.

Table 'C' Budget Summary					
Department					
Human Resource FTE & Device Count					
	2016-17	**2017-18**	**2018-19**	**2019-20**	
Human resources (FTE)					
Teachers (technology innovation coordinators)	*3*	*3*	*3*	*3*	
IT Director / Manager	1	1	1	1	
IT Technician	4	4	4	4	
Website support	0.5	0.5	0.5	0.5	
IT Helpdesk	1	1	1	1	
Computer Replacement - Device Count (assuming status quo)					
Admin and support staff	16	13	50	50	
Teachers	72	1	217	217	
Students	50	327	585	585	
Total	138	341	852	852	

IT Budget ($'S)					
	2016-17	**2017-18**	**2018-19**	**2019-20**	
Staff					
Director / management contract/ salary	135,000	136,350	137,714	139,091	
Support staff wages	389,048	392,938	396,868	400,837	
Total Staff	**524,048**	**529,288**	**534,581**	**539,927**	
Services & Supplies					
Professional development	53,750	53,750	53,750	53,750	
Software licensing and support	243,243	243,243	243,243	243,243	
Supplies, support and warranty	92,000	92,000	92,000	92,000	
GAFE conference	25,000				
Software to track and analyze student results	20,000				
Total Services and Supplies	**433,993**	**388,993**	**388,993**	**388,993**	
Capital Expenditure (assuming status quo)					
Computer replacement	256,849	863,795	863,795	863,795	
Server infrastructure replacement	355,000	255,000	263,000	263,000	
Total Capital Expenditure	**611,849**	**1,118,795**	**1,126,795**	**1,126,795**	

Budget Notes:

1. The average Capital Expenditure per year is calculated as follows:

2016-17	$	611,849
2017-18		1,118,795
2018-19		1,126,795
2019-20		1,126,795
Total 5 Year $		**3,984,234**
Average per year $		**996,059**

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Appendix 'A'

Technology Plan Framework

Prepared by:	Tim Agnew
Date:	October 30, 2015
Version:	1.0

Introduction

Over the past 9 months, the primary focus of the IT department has been to complete outstanding tasks & projects, stabilize existing technologies in the district, and restructure the IT department. Appendix 'A' summarizes the tasks and projects and their current status.

Many of the outstanding tasks require broad based district input and ideally should be guided by education goals and activities. Given this, and for many other reasons, I think it is the right time to develop a 3-5 year strategic IT plan for the school district.

There are many good reasons to develop an IT Strategic plan but perhaps the biggest is to develop a consensus on how to ensure that our technology services line up with curricular goals and activities in the our schools and classrooms. The goals of the Tech Plan include the following:

Goals

1. To formally assess how technology services in SD 22 link to current and future curricular goals and activities. From a technology standpoint, we need to determine where we are now and consider where we want to be in the future.

2. To ensure that the technology infrastructure has the capacity to support curricular goals, now and in the future. Also, to ensure that technologies are delivered with industry best practices in mind.

3. To ensure that technology supports the business needs of the organization.

4. To look at ways to improve productivity, through technology, by challenging and revising learning and business processes.

5. To look at ways to improve cost effectiveness and quality of services by working with other districts and developing shared services.

6. To assess current administrative technologies to ensure that they are cost effective, of a high quality and meeting the needs of the district.

In conjunction with the goals suggested above, the following are suggested principles to keep in mind while going through the process of developing a long-term Tech Plan.

General Overarching Principles

1. Technical services, investments and initiatives should be derived from curricular activities, goals, strategies and pilots. Technology should not be randomly adopted and then dictate or restrict education.

2. While the Tech Plan is a momentary static document, ideally there needs to be an on-going and agile process for ensuring that the Tech Plan can 'live' and evolve continuously in response to changes in philosophy and in the education environment.

Process & Timelines

To ensure success of the Tech Plan, it is critical to collaborate with a representation of all stakeholders and end-users around the district. The following is a summary of the suggested steps and timelines.

Step	Notes	Timeline
Recruit and organize planning team.	This will include management, the District Ed-Tech committee and others as required.	Oct 31 2015
Solicit feedback from stakeholders based on the Framework document.	Management teams, Ed-Tech committee & other stakeholders need to consider questions contained in this framework document.	Nov 30 2015
Develop a detailed inventory of current technologies and assets.	Answer the question; where are we now with our current technologies and expertise around our technologies.	Nov 30 2015
Review and discussion of District curricular strategies and goals.	Answer the question; where would we like to be in the future in terms of curricular activities, goals and strategies.	Dec 15 2015
Preliminary Analysis of current technologies, strategies and goals. Draft recommendations.	Answer the question; what technologies do we require to facilitate our curricular goals.	Dec 31 2015
Draft Tech Plan budget for 2016-17	Based on a preliminary analysis of above, develop a draft budget.	Dec 31 2015
Finalize plan in time for Budget approval		Feb 28 2016
On-going review, update and communication of the plan.		Ongoing

The following section looks at key observations and questions across seven different areas. The areas include **Learning**, **Assessment**, **Teaching**, **Infrastructure**, **Productivity, Administrative Technology,** and **Research & Development**. Each area includes a brief description, observations, and questions.

The observations come from a variety of research sources and illuminate some of the current thinking in the area. Please feel free to add your own observations as you see fit. The framework document will be posted to our portal and provide everyone an opportunity to share their own observations. Once completed, we will have an excellent foundation to develop a *Vision Statement* and *Mission Statement* for the tech plan.

The questions also come from a variety of sources and will hopefully provoke some answers from you. Once again, since the Framework document will be posted to our portal, it will provide everyone an opportunity to provide input and discussion as they see fit. I will also post a few surveys to develop a baseline understanding of technologies used in the classroom, and overall level of tech skills and experience of educators. Once completed, we will have an excellent foundation to develop goals and implementation plans for technology services in the district.

Learning

Description:

In many respects, this is the heart of the Tech Plan. It includes an analysis of current and future curricular goals and how technology can help to facilitate these. It forces us to examine our current and future education applications and how to monitor and measure their effectiveness. The area also includes access to technology, FOIPPA, and internet safety.

Observations:

1. *Outside of school, students already have mobile access to information and resources; They participate in social networks, collaborate with people from all around the world, share ideas, and learn new things. Students are free to pursue their own interests and passions in their own way and at their own pace.*

2. *The challenge for education is to mirror this to create engaging, relevant and personalized learning.*

Questions:

a. Describe teachers' and students' current access to technology tools both during the school day and outside of school hours.

b. Describe the district's current use of hardware and software to support teaching and learning.

c. What are the district's current curricular goals?

d. What are the districts future curricular goals?

e. How can technology be used to improve teaching and learning by supporting the district curricular goals?

f. How do students acquire technology specific skills and information literacy skills needed to succeed in the classroom and the workplace?

g. How can schools and the district ensure appropriate and ethical use of information technology by all student and teachers?

h. How can the schools and the district ensure that teachers and students are trained to protect online privacy and avoid online predators?

i. How can technology be structured and implemented to ensure appropriate access to all students.

j. How can technology be structured and implemented to make student record keeping and assessment more efficient and supportive of teachers' efforts to meet individual student academic needs

k. How can technology be structured and implemented to use technology to improve communication between home and school.

Assessment

Assessment plays an important role in student achievement. Assessment is the process of gathering evidence of what a student knows, understands, and is able to do. It can also help to identify students' learning needs. Teachers use their insight, knowledge about learning, and experience with students, along with the specific criteria they establish, to make judgments about student performance in relation to prescribed learning outcomes for each subject or course and grade.

There has been much discussion in recent years regarding the use and effectiveness of different

types and approaches to student assessment. It can be expected that technology can play an important role in supporting current and future types of student assessment.

Observations:

1. *Districts and schools need new and better ways to measure what matters; diagnose strengths and weaknesses of students; involve multiple stakeholders in the process of designing, conducting, and using assessments.*

2. *Student-learning data can be collected and used to continually improve learning outcomes and productivity. For example, such data could be used to create a system of interconnected feedback for students, educators, parents, school leaders, and district administrators.*

3. *Need relevant data made available to the right people, right time, right form.*

Questions:

   a. What are the current methods of student assessment used in SD22?

   b. What types of assessments is the district considering in the future (e.g. summative, formative)? How can technology assist in future assessments?

   c. What are the questions that need to be answered to better inform learning practices and activities related to student learning, achievement and assessment?

Teaching

Description:

Over the past 25 years, the world has changed faster and with more complexity than ever before. The most significant driving force is the advent of the Internet and the rapid advancement of technology as part of the digital age. Such a radical global transformation has demanded people learn new theories and knowledge that simply did not exist two decades ago. We need to find ways to evolve K-12 teaching approaches that are in sync with the evolving technological changes and competencies.

Observations:

1. *What are your thoughts about building the capacity of teachers by leveraging technology?*

2. *What does the model of connected teacher look like in SD22? How can we give educators access to resources and expertise to improve instructional practices?*

3. *Thoughts about providing educators with 24/7 access to data and analytic tools. What tools?*

4. *How can we strengthen & elevate the teaching community? What technical resources are required to give educators the ability to research & develop new approaches and models for learning?*

5. *How can technology assist in the building of online learning communities?*

6. *How can technology help to facilitate teacher skills development in a way that is collaborative and continuous?*

Questions:

    a. Survey of teachers' and administrators' current technology skills and needs for professional development.

    b. What types of professional development activities are needed for teachers in the areas of learning, teaching and assessment? How can technology improve the delivery of these activities in a cost effective way?

Infrastructure

Description:

IT infrastructure refers to the composite of hardware, software, network resources and services required for the existence, operation and management of an enterprise IT environment. It allows an organization to deliver IT solutions and services to its employees and students.

IT infrastructure consists of all components that together play a role in overall IT service delivery. In addition to hardware and software, infrastructure also includes the people and processes that deliver IT services.

Typically, a standard IT infrastructure consists of the following components:

- Hardware: Servers, computers, data centers, switches, hubs and routers, etc.
- Software: Enterprise applications, education applications, administrative applications, analytic data tools.
- Network: Network enablement, Internet connectivity, firewall and security.

In addition to the above, organizations need to develop comprehensive disaster recovery and business continuity plans.

Observations:

1. *The District needs appropriate and comprehensive infrastructure for learning and administration so that students, educators, administrators have access to resources when and where needed.*

Questions:

a. Describe the existing hardware, Internet access, electronic learning resources, and technical support already in the district that will be used to support the Curriculum and Professional Development Components

b. Describe the technology hardware, electronic learning resources, networking and telecommunications infrastructure, physical plant modifications, and technical support needed by the district's teachers, students, and administrators to support future activities in the Curriculum and Professional Development Components of the plan.

c. Describe the District's replacement policy for obsolete equipment.

d. What will the schools and classrooms of the future look like? What types of devices will students need for learning? What devices will teachers need for instruction and assessment?

e. What is the role of BYOD in the future? What sort of instructional activities will utilize devices that are not owned / managed by the district?

f. Describe the district's plans and strategy for disaster recovery.

g. Describe the district's plan and strategy for business continuity.

Productivity

 Description*:*

As districts face on-going budget pressures, it is important that we work together to improve productivity as we evolve our approach to student learning and assessment. Increasing instructional productivity by doing more with less is not easy to do, especially as expectations for students and school systems continue to rise. The following are some observations for consideration:

 Observations:

1. *Technology can play a significant role in increasing productivity at every level of the education system.*
2. *There is an opportunity to rethink learning and assessment processes to help facilitate improvements in these areas.*

3. *Smart use of technology is primarily about allowing each person to be more successful by reducing wasted time, energy, and money. It is also about creating accessible learning opportunities for all students, including low-income students, English Learners, and students with disabilities.*

Questions:

a. How can we utilize technology to reduce wasted time, wasted energy and wasted money in the delivery of education in the district?

b. How can we collaborate with other districts to develop shared services for administrative, education and infrastructure services?

c. How can technology assist in the streamlining of administrative processes to improve productivity?

Research & Development

Description:

While Canada's education systems are among the best in the world, there is still a need to engage in practical research and to develop innovative ways to do better. As a district, we need to develop a culture of innovation and allow ourselves to explore new ways to deliver education.

Observations:

1. *There is a growing emphasis on how students learn, rather than only on what they learn. Young people need to learn to live together successfully in a diverse and connected world.*

2. *The old commitment to equal educational opportunity is being replaced by a promise of optimal benefits for all young people.*

3. *Schooling must ensure that all students are able to make the most of their potential: in today's world, all young people need the competencies that reflect the competencies required for the digital age.*

4. *Leveraging technology and developing innovations at all levels of the system are opening up new possibilities and contributing knowledge about what works best.*

Questions:

a. How can we initiate and incubate practical research and pilot projects to explore, develop and learn new and innovative ways to deliver education. How can IT help facilitate this research?

b. How can we document the effectiveness of pilot projects to ensure that there is transparency across the district (or region), a business case for initiating a research project, and develop metrics to measure the success of the endeavor.

Administrative Technology

Description:

There are many technology services in the district that are primarily administrative in nature. While they support education activities in schools and classrooms, they are not directly linked to learning and/or assessment. Examples of Administrative technology include accounting systems, student information systems, library systems, device management applications, infrastructure technologies, IT support functions, and day-to-day business processes.

Observations:

1. *Many administrative technologies are expensive to implement and support year over year. In many cases this is unavoidable. At the same time, they should be continually challenged and consideration needs to be given to ways that we can do things better, and more cost effectively.*

Questions:

a. Many enterprise technologies are long-term in nature in that they affect a large number of stakeholders, are expensive to implement and expensive to maintain. What criteria do we use evaluate our enterprise technologies?

b. What administrative district and/or school business processes could we improve by leveraging technology?

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Appendix B
Computer Replacement Detail

Desktop	2015-16			2016-17			2017 - 2020		
	Quantity	Unit $	Total $	Quantity	Unit $	Total $	Quantity	Unit $	Total $
Admin	9	751	6,759	13	$ 751	$ 9,763	110	751	82,610
Students	58	751	43,558	326	$ 751	$ 244,826	325	751	244,075
Teachers		1,195	-		$ 1,195	$ -	60	751	45,060
Laptop									
Admin	7	1,195	8,365		$ 1,195	$ -	38	1,195	45,410
Students	14	1,065	14,910	1	$ 1,065	$ 1,065	1,431	1,065	1,524,015
Teachers	50	1,195	59,750	1	$ 1,195	$ 1,195	487	1,195	581,965
Tablet									
Admin							1	650	650
Teachers							104	650	67,600
Grand Total	138		$ 133,342	341		$ 256,849	2,556		$ 2,591,385

Projects / Upgrades	Status	Year	Cost
Back-up / Disaster Recovery	In Progress	2015 - 16	$ 27,000
Deploy / Build Symantec Antivirus Infrastructure		2015 - 16	$ -
Create / Rebuild Existing Image For Deployment		2015 - 16	$ -
Architect / Deploy Network and Server Monitoring Infrastructure		2015 - 16	$ 15,000
Upgrade Firmware all Firewalls - EOL		2015 - 16	$ -
Deploy Base MDM for Initial Ipad Fleet	In Progress	2015 - 16	$ 6,000
		2015 - 16	$ -
Total 2015-16	**2015 - 16**		**$ 48,000**
Upgrade Domain Controllers to Windows 2K12 - Federate		2016 - 17	$ 10,000
Architect SCCM Infrastructure and Deploy Test Site(s)		2016 - 17	$ 40,000
Migrate all Sites to SCCM		2016 - 17	$ -
Complete Google Apps Integration		2016 - 17	$ 20,000
Physical Server Replacement - Data Center, School Sites		2016 - 17	$ 275,000
MDM Device Fees Expansion		2016 - 17	$ 10,000
Total 2016-17	**2016 - 17**		**$ 355,000**
Physical Server Replacement, SBO, Commvault, Veeam		2017 - 18	$ 90,000
Replace Firewalls all sites		2017 - 18	$ 160,000
Build / Update District wide image		2017 - 18	$ -
MDM Device Fees Expansion		2017 - 18	$ 5,000
Total 2017-18			**$ 255,000**
Replace / Upgrade Wireless Infrastructure - Multi-year Strategy		2018 - 19	$ 258,000
Build / Update District wide image		2018 - 19	$ -
MDM Device Fees Expansion		2018 - 19	$ 5,000
Total 2018-19	**2018 - 19**		**$ 263,000**
Replace / Upgrade Wireless Infrastructure - Multi-year Strategy		2019- 20	$ 258,000
Build / Update District wide image		2019- 20	$ -
MDM Device Fees Expansion		2019- 20	$ 5,000
Total 2019-20	**2019- 20**		**$ 263,000**
Replace / Upgrade Wireless Infrastructure - Multi-year Strategy		2020 - 21	$ 258,000
Build / Update District wide image		2020 - 21	$ -
MDM Device Fees Expansion		2020 - 21	$ 5,000
Total 2020-21	**2020 - 21**		**$ 263,000**
Replace / Upgrade all Network Switches - Multi-year Strategy		2021 - 22	$ 258,000
Build / Update District wide image		2021 - 22	$ -
MDM Device Fees Expansion		2021 - 22	$ 5,000
Total 2021-22	**2021 - 22**		**$ 263,000**
Replace / Upgrade all Network Switches - Multi-year Strategy		2022 - 23	$ 258,000
Build / Update District wide image		2022 - 23	$ -
MDM Device Fees Expansion		2022 - 23	$ 5,000
Total 2022-23	**2022 - 23**		**$ 263,000**

<u>**NOTES**</u>

The primary goals for the next 2 years in terms of District infrastructure services include the following:

(a) Complete the deployment and documentation of a formal Disaster Recovery plan.
(b) Deploy server & network monitoring solutions. Establish baselines
(c) Implement software for managing the growing pool of mobile
(d) Architect & deploy SCCM for the management of device images, updates and virus files.

(e) Begin the process of upgrading / replacing our server technologies as they approach the end of their physical life, and approach the end of the support for their current operating system. Thee physical devices will be 7 years old and the operating systems will be 10 years old.

These amounts represent a long-term plan for replacing our existing server infrastructure (hardware only). The total costs are detailed in the 'Server Infrastructure Detail' tab. The total costs have been spread out over a 7 year period as follows:

2016-17	275,000
2017-18	250,000
2018-19	258,000
2019-20	258,000
2020-21	258,000
2021-22	258,000
2022-23	258,000
TOTAL	**1,815,000**

Notes

1) Back-up / Disaster Recovery
   a. Complete commvault, centralized backup for school sites
   b. Purchase spare – core units for key areas
   c. Load configuration into spare switches and rack in DC for accelerated failure recovery
   d. Pre load spare servers (Elementary and High School / SBO) (2) Units
   e. Complete disaster recovery documentation / plan

2) Deploy Symantec Antivirus Infrastructure
   a. Load / design proper distributed antivirus solution
   b. Required for image build
   c. Software renewal for existing unmanaged environment was already purchased

3) Create / Rebuild Existing Image For Deployment
   a. Existing image has to patched / redone to support scheduled transition to SCCM

4) Architect / Deploy Network and Server Monitoring Infrastructure
   a. Design and deploy the solution
   b. Create the baselines
   c. Set alarms and thresholds
   d. Consolidate log files
   e. Automate network switch configuration backups

5) Upgrade Firmware all Firewalls – EOL
   a. Firewall firmware deployed by NGN contractor is essentially end of life
   b. EOL date has been subsequently pushed back by one year, but has to be done

6) Deploy Base MDM for Initial Ipad Fleet
   a. Build MDM infrastructure to support IOS devices

7) Upgrade Domain Controllers to Windows 2K12
   a. Domain Controllers have to be upgraded to windows Server 2012 R2
   b. Federate directory to allow SSO (Single Sign On) for Google Apps
   c. Projected Costs are for IBM K12 Services

8) Architect SCCM Infrastructure and Deploy Test Site(s)
   a. Requires installation and integration into AD
   b. Build new image base and create app infrastructure
   c. Projected Costs are for IBM K12 Services

9) Migrate all Sites to SCCM
   a. To be complete by District personnel

10) Complete Google Apps Integration
   a. Estimated costs for outside services to enable the migration

11) Physical Server Replacement - Data Center, SBO, School Sites
   a. Replace DC servers, SBO-DNS and School Sites
   b. Equipment to be purchased at the end of 2016-17 School Year *
   c. *May be coordinated with Domain Controller migration
   d. Average Server Uptime 4.5 years
   e. Middle of 10 year cycle
   f. Update VMware – virtualized dc environment
   g. All server deployments to be upgraded to Windows Server 2012 R2

12) Physical Server Replacement, SBO, Commvault, Veeam
   a. Replace SBO servers, backup functions, storage arrays in DC

13) Replace Firewalls all Sites
   a. Upgrade all PA-500 models (High School, SBO Sites) to higher throughput devices

14) Replace / Upgrade Wireless Infrastructure – Multi-year Strategy
   a. Replace Wireless Controllers and licenses
   b. Upgrade access points to higher density units

15) MDM Device Fees Expansion
   a. Additional devices added to the device manager

Business Case:

Regional IT Director and Shared Services
Part 1

Appendix D

Prepared by:	Tim Agnew
	Director of Information Technology
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School District 22 - Vernon

1401 – 15th Avenue

Vernon, BC

School District 22 – Vernon

Business Case

Regional IT Director & Shared Services

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Table of Contents

Revision History

Revision Number	Revision Date	Summary of Changes	Author
V 1.0	August 19, 2015	Base document	Tim Agnew
V 1.1	November 16, 2015	Changes to 1.5, 1.8	Tim Agnew

Reference Documents

Please see the following documents for more information:

Document Name	Author	
N3xt Practices	Darryl Vidal and Michael Casey	
Integrated Business Plan 2015-16 (Canada. Shared Services Canada)	http://www.ssc-spc.gc.ca/media/documents/IBP-2015-internet-eng.pdf	Accessed Nov 15-2015
BC Campus Strategic Plan 2013-2016	http://bccampus.ca/files/2013/10/2013-ar-stratplan.pdf	Accessed Nov 15-2015

Distribution List

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BC ASBO – Thompson / Okanagan Region

1.0   Executive Summary

The purpose of this Business Case is to investigate the viability of creating a Regional IT Director role and developing shared services that could be accessed by any number of School Districts in BC.

The idea of creating a Regional IT Director position comes from the observation that few districts can afford both strong technical management and overall Senior IT leadership. While this is particularly true for small and medium sized districts, some of the larger districts also struggle with the right mix of skills for this type of position. In general, the complexity and ever changing environment of technology has forced organizations to look at different skill sets for their senior IT leaders. In addition to the traditional need for technical savvy, the changing dynamic of the workplace has put considerably more emphasis on other leadership abilities such as vision, goal setting, project management, communications, team building, collaboration and customer service.

Shared services has been a large topic of conversation for a number of years now. It has been discussed in regards to many departments in school districts including transportation, facilities, purchasing and Information technology. While there have been some initiatives sponsored by both the Ministry and/or by districts, there are still many opportunities that have not yet been explored. It is believed that the best chance for success lies with districts working with each other, and tailoring solutions that directly fit with current IT services and with district goals. There may also be opportunities to explore shared services with other public sector organizations such as local government.

1.1   Business Need

School districts are faced with a number of challenges related to the overall leadership, investment, implementation and management of Information Technology. These challenges are particularly true for small and medium sized districts. The challenges can be summarized as follows:

a. Districts need to be strategic with their IT investments and services, in their desire to connect their activities directly to education. Few districts can afford both the technical and leadership depth required to be successful at this.

b. Technology has become extremely diverse and is increasingly relied upon by stakeholders throughout the organization. At the same time, technology has become more complex, specialized, and is ever changing. This leaves districts with insufficient resources to deal with these realities including budget shortfalls; service gaps; knowledge gaps for education, admin and technical staff; and insufficient resources to raise the overall tech capacity of the district.

c. For many districts, there is insufficient knowledge or experience at the senior staff level to make fully informed decisions regarding the choice and 'flavour' of technologies. External vendors are often relied upon to fill the gap in this area, which is helpful, but not always in the best interests of districts/schools/students. This often results in one or more issues:

    a. Over investment in technology; this includes investment in the wrong technology, and / or too much investment in specific areas.

    b. Under investment in technology; this includes not enough infrastructure to handle the load and demands of the district and / or gaps and bottlenecks in areas that are critical to education.

    c. Undue reliance on outside vendors to perform a specific IT service.

    d. Not enough reliance on outside vendors where the nature of the technology and implementation make outsourcing a logical option.

d. A significant proportion of IT work is involved with the initiation of new technologies and with managing the change that accompanies these implementations. Leadership and management of these tasks have evolved into a specific specialty known as 'Project Management'. The benefit of professional project management lies with organizing, planning and controlling tasks including the management of budget, timelines, risk, quality and change.

e. BC school jurisdictions are looking to significantly change the way that education is delivered. Our understanding of how children learn has led to new ideas on how to evolve our classrooms, and to personalize learning. Technology has a significant role to play in these changes; it is both the medium AND the message. IT departments need to keep up with changes to pedagogy to help facilitate the delivery of education. They also need to provide technology mentorship to educators so that they can reflect its rapidly changing nature in the classroom. It is critical that IT departments be in alignment with these educational changes.

f. Every two years the Auditor General of BC reviews and issues a report on a District's overall IT maturity level, and the controls that are in place to ensure confidentiality, integrity and availability of IT systems. Many districts have not fared well with these reports and moreover, do not have the resources to address deficiencies. By pooling resources, districts can address these deficiencies and improve overall service levels. There is also a growing need to approach IT from a service perspective, and to structure and standardize this around industry frameworks such as ITIL, ITSM and ISO 20000. This will be specifically addressed in the planning stages for shared services.

1.2   Business Case Approach

It is important that all participating districts be involved with the design of shared services to ensure their strategic goals are maintained. It is also critical that existing staff in each district are including in the design and rollout activities to ensure that it is a collaborative process, and that technology services are optimized. Given this, the business case will be completed in two phases. The **Business Case - Part 1** is for distribution and presentation to districts and will present a high level business case to key stakeholders. The purpose is to present the overall concept, and to get permission from potential participating districts to study their IT operation in a little more detail so that realistic alternatives can be explored and analyzed. *The Business Case - Part 2* will come after this review. The review will consist of a look at each district's technology, HR characteristics, tech plans, goals and strategies. This will identify the realistic opportunities that exist, and will pave the way for the detailed business case to be completed. Following the completion and approval of the Business Case, a comprehensive *Regional IT Leadership & Shared Service Plan* will be developed in collaboration with all participating districts. This plan will describe the implementation, operation, and governance for regional shared leadership and IT services.

The following is a summary that will be found in the business case and planning documents.

Business Case - Part 1

The following are the sections to be found in Part 1 (this report) of the Business Case:

1.   Business Need

2.   Anticipated Outcomes

3.   Description of Services

4.   Key Success Factors

5.   Governance (Part 1)

6.   Risk Analysis (Part 1)

7.   Expected Benefits (Part 1)

8.   Next Steps

Business Case - Part 2

The following are the sections to be found in Part 2 of the Business Case:

1.   Analysis of Current IT Services by District

2.   SWOT Analysis

3.   Recommendations for Future Shared Services

4.   Performance Measures

5.   Best Practices: Application of ITIL, ITSM & ISO 20000

6.   Governance (Part 2)

7.   Risk Analysis (Part 2)

8.   Expected Benefits (Part 2)

9.   Change Analysis

10.   Cost Estimate

11.   Cost / Benefit Analysis

12.   Schedule

Regional IT Leadership & Shared Service Plan

1.   Overview of the Business Case & Findings

2.   Implementation Plan

3.   Operational Plan

4.   Governance Approach & Plan

5.   Life Cycle Plan

1.3   Anticipated Outcomes

The following is a summary of the key outcomes that are expected to result from the successful implementation of Regional IT Leadership and Shared Services plan:

a.   Reduction of IT costs resulting in direct savings to districts.

b.   Increased service levels in terms of breadth and quality of service.

c.   A direct connection between IT services and education.

d.   Raise the overall service maturity level of participating districts in response to deficiencies noted by the Auditor General. This could be achieved through alignment with industry published industry standards including ITIL, ISTM and ISO 20000.

e.   A structured approach to initiating and managing IT projects that addresses change, implementation and operation.

This business case proposes two major objectives. The first is to provide a model for Regional IT leadership and the second is to develop a catalogue of shared services that districts can opt in, or out of depending on their unique circumstances and needs. It is clear from the outset that the issue is not whether or not there are potential opportunities for shared services. Most people would agree that there are many possibilities. The real challenge is in 'how' these services can be designed and then implemented across a partnership of districts. In fact, the key to the success of this initiative is with ensuring that each district is truly an equal partner, and that services are tailored to each district's specific needs and characteristics.

1.4   Description of Services

Regional IT Leadership

Just as specific technologies have rapidly changed over the past 25 years, so has the need for IT Leadership. Traditionally, IT has been managed by either senior technical staff, a teacher, or by the business function in the district. With the current challenges, changes and complexities facing districts today, none of these approaches provides all of the necessary skills and experience demanded of this position. In reality, IT departments require an executive level leader to provide the appropriate balance and depth in the areas of leadership, technical savvy, and relevant experience to connect IT services to education.

In addition to getting things done in a cost effective manner, the purpose of this role is to provide vision, leadership skills, team building and collaboration abilities, communication skills, and project management expertise. Above all, a regional IT leader needs the ability to understand and align technology initiatives with the districts' and regions' education goals and initiatives. Overall, there appears to be an excellent case for exploring how these 'services' could be designed and delivered regionally.

.

Shared IT Services

Technology has become increasingly diverse and complex over the past 25 years. With this has come the need for IT staff to specialize and to continually develop their technical skills and related certifications. At the same time, stakeholders throughout the district have become highly reliant on technology which in

turn has put added emphasis on the need for IT staff to possess customer service and instructional skills, and the ability to help raise the overall capacity of end users. All of the above has put huge strain on IT budgets and points to the need for districts to collaborate and develop shared functions to increase service levels and to reduce costs.

The following table contains examples of some of the possible shared services to which districts could subscribe. The list is not exhaustive but serves as a starting point for the many possible opportunities for shared services.

Shared Service	Description
Technical Infrastructure	Implementation, management and monitoring of a network including firewalls, Layer 3 switches, cables runs, terminations.
Technical Server Infrastructure	Implementation, management and monitoring of virtualized and other back-end servers.
Enterprise Application Support	Management and support for enterprise applications including student information systems, accounting / ERP systems, productivity tools, library systems etc.
Shared Cloud Services	Development of Cloud based services for functions such as: disaster recovery, business continuity, hosting of applications, common data centre for co-location of equipment and support, providing Software as a Service (SaaS) eg. Moodle, Storage as a Service.
Education Application Support	There is a broad and quickly growing range of education and assessment applications that are being utilized by teachers in the classroom. In partnership with education, IT departments need to understand the nature and architecture of these so that they can be properly deployed, managed and supported.
Help Desk Services	Day-to-day individual support, security management, knowledge sharing & management, LDAP management, work order and call centre management, ticket escalation to appropriate specialist and software support.
MyEducation BC	Delivery of Level One (L1) support for MyEd BC. Development and delivery of on-going training services for teachers and admin personnel.
Google Apps for Education	Development and delivery of GAFE related services including implementation, training, support, and purchasing.

Workstation Procurement and Device Management	Development of workstation / device procurement and optimization. Day to day support and management of devices through SCCM, TPM, Air Watch, and other Mobile Device Management tools.
HR Strategy & Succession	Regional planning to provide and develop strategies for personnel specialization to deliver IT services in a cost effective way. Ensure that there is succession planning for all technical areas.
Custom Reporting, Student Achievement Analytics, Data Mining.	The capacity to systematically warehouse student and other data from a range of disparate sources. In partnership with education to develop analytics and other pertinent information that can improve the delivery and effectiveness of education to students.
Project Management	The ability to initiate IT projects that are in sync with district / regional goals and education strategies. The skills to successfully manage change and IT projects; on time, on budget and with a high degree of quality.
Software Development	The capacity to develop software applications in a cost effective and timely manner, and that can map directly to stakeholder needs.

1.5   Key success factors

Key success factors are as follows:

    a.   **Collaboration**: The design and implementation of shared services and/or regional IT leadership has to be accomplished through a collaboration of peers. There needs to be a detailed analysis of each district's technical needs and their existing strengths, weaknesses, gaps etc. in order to see what and how a shared service might work. A 'cookie-cutter' approach will not work.

    b.   **Effective & Equal Governance**: There needs to be a form of governance that offers a form for constructive dialog, decision making, priority setting and follow through.

    c.   **Sustainable:** There needs to be a critical mass of districts opting into one or more of the shared service offerings in order to make the initiative viable. Shared leadership and IT services need to be designed and implemented in a way that can be sustained in the long run.

d.   **Strategic Alignment:** Shared service initiatives will have a higher likelihood of success if they are strategic in nature. In addition, the model for shared services needs to respect the culture of each district and needs to preserve existing Ed-Tech projects and services. Again, a 'cookie-cutter' approach will not work and effort has to be put into finding shared service solutions that protect and build on previous success.

e.   **Professional Delivery**: The shared service model needs to respect existing technical personnel. The business plan needs to build on existing strengths and services of districts, and afford opportunities for existing staff to grow and develop in positive ways. Services should be designed around best industry practices.

1.6   Governance (Part 1)

The detailed model for governance will be determined by the partnership (or consortium) of districts that choose to participate in the shared services. In general, the governance approach is expected to be collaborative in nature and will reflect the needs of districts in a fair and equitable way.

1.7   Risk Analysis (Part 1)

There are a number of risks related to this project that are summarized below. Each risk will be analyzed and mitigation and/or avoidance strategies will be developed for each one.

Table 1: Part 1 - Expected Risks

Risk	Mitigation / Avoidance
Districts (that are approached) are concerned that the 'shared service' model is a top down and cookie-cutter architecture.	The specific purpose of the **Business Case - Part 1** is to lay down a foundation of collaboration and exploration of shared services that will work given the specific plans, goals and characteristics of each district. This should be perceived as non-threatening and a win-win opportunity.
General concern that a district's existing IT environment will be compromised.	The development of the **Regional IT Leadership & Shared Service Plan** will come as the result of a detailed analysis of the district's environment to ensure there is no service disruption and/or degradation.
That the Shared Service plan will not preserve and ensure the alignment to a district's existing IT plans & strategies.	The development of the **Regional IT Leadership & Shared Service Plan** will come as the result of detailed analysis of the district's technical environment, HR characteristics and existing plans and goals to ensure it preserves the alignment to existing goals.

That the benefits and goals of the initiative are not realized.	The goals and benefits of the ***Regional IT Leadership & Shared Service Plan*** come as a result of authentic collaboration, and are clearly articulated and documented. Metrics are developed to measure and evaluate the effectiveness of the shared service and to ensure that all benefits are realized.
That the governance process will not be transparent, fair and equitable.	The governance process will be designed for and by the participating district to ensure effective communications and transparency.

1.8   Expected Benefits (Part 1)

The following table describes the key benefits that are expected to result from a shared leadership and IT services mode.

Benefit	Description
Cost Savings	a. In the short term, creating specialties across the region will result in lower training costs. For example, at present, each district needs to train / certify technicians to architect and manage their physical infrastructure including network, firewall, and layer 3 switch technologies. Often, a single district may have to train 2 or more staff in this area to ensure there is coverage for vacations, short-term leaves, etc. This could translate into upwards of 10 people trained in this necessary skill area. In a 5 district partnership, the region would require only 3-4 (at most) people to deliver the same service. This analysis and cost savings applies to a wide array of IT service specialties including infrastructure, file services, enterprise applications, education applications, workstation device management, virtualized servers, reporting and student analytics, etc. b. In the long term, it could result in lower technical staffing levels from attrition, or reassignment of responsibilities. c. By combining various IT application services, savings will be realized through reduced licensing, reduced support and reduced infrastructure as a result of combining the service. For example, if something like email or library software were centrally hosted, the region would save money on hardware, application licensing and on support costs. d. By collaborating and sharing resources, districts can develop disaster recovery and business continuity plans that are more cost effective. e. Development of unified procurement activities will ensure lowest cost, standardization, and highest quality.

Quality of Service	a. Developing regional specialties will result in higher skill levels of IT staff, and in turn will result in a higher level of service to end users.
	b. The ability to collaborate on disaster recovery and business continuity plans will reduce down-time and guarantee the overall delivery and quality of service.
	c. A region can develop more prolific Help Desk services to ensure that end-users get support from the right specialist, instead of the 'universal' Help Desk approach model by most districts.
	d. Improved information and data analytics will link student achievement to classroom learning practices.
	e. Establishing a centralized project management office (PMO) will ensure effective project management, standardization of best practices and continual IT project improvement.
Breadth of Service	a. Many districts have gaps in their ability to deliver a full range of IT services to end-users. This is particularly true in small and medium sized districts. Typically, under serviced areas include: knowledge of education applications; business intelligence tools and student analytics; customer service skills and end-user training skills; and software development skills.
Strategic IT Leadership	a. Skilled and strategic management will bring a number of positive IT and organizational benefits including a high level vision for technology and how it can connect to education and other goals; appropriate selection, initiation and management of technology projects; higher levels of collaboration between the tech department and other departments / schools in a district; team development abilities; change management and project management abilities.
Human Resource Continuity and Succession	a. A regional approach to IT services will allow districts to ensure the continuity of IT support, and to plan for and minimize service disruptions from staff attrition.
	b. Regional services will allow for staff specialization, optimization of technical skills, and improved staff job satisfaction.

1.9   Next Steps & Timelines

The following is a preliminary list of next steps and expected timelines. It is anticipated that this will evolve as districts provide feedback into the overall process and timing.

Approximate Date Range	Task
01-Oct-2015 **to** 30-Nov-2015	Vernon: Internal review of Business Case – Part 1 and finalization for presentation to potential participating districts.
01-Dec-2015 **to** 31-Jan-2016	Presentation to possible participating districts.
01-Feb-2016 **to** 31-Mar-2016	Detailed study of districts wishing to explore shared service possibilities.
01-Apr-2016 **to** 30-Apr-2016	Completion of Business case – Part 2 and Approval from Districts
01-May-2016 **to** 30-Jun-2016	Completion and approval of regional Leadership and Shared IT Services plan