WEST LINN - WILSONVILLE SCHOOL DISTRICT

2014 CAPITAL IMPROVEMENT PROGRAM

February 22, 2014

West Linn – Wilsonville Schools

To: School Board
Bill Rhoades, Superintendent

From: Long Range Planning Committee
Tim Woodley, Director of Operations

Date: February 14, 2014

Subject: **2014 Capital Improvement Program**

At the regular September 2013 School Board Meeting the Board asked the Long Range Planning Committee to explore future facility needs for the District as related to a concurrent update of the District Long Range Plan. This report, entitled "2014 Capital Improvement Program", summarizes that effort and is respectfully submitted to support future planning by the Board.

The CIP covers capital improvements in response to growth, equity, student security, STEM/robotics, technology and life-cycle replacement needs at all district sites. This document is the result of a true collaborative effort with district administration, staff, community members, private partners, the School Board and Long Range Planning members.

Every effort has been made to fairly and accurately represent the needs of the District. It should also be noted that this document is not prioritized in any way and has not yet been subjected to public scrutiny and comment. It is our recommendation that the Board continue that process.

Respectfully

DEPARTMENT OF OPERATIONS

Tim K. Woodley

Tim K. Woodley, Director

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ACKNOWLEDGEMENTS

West Linn-Wilsonville School District is deeply appreciative of the generous contributions freely given by patrons and staff.

In particular, we wish to extend recognition and thanks to the following individuals and groups for their tireless efforts in compiling the information contained in this report.

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Alternative Education Task Force; Margaret Allen, Chair
Music and Arts Partners; Jane Stickney
Advance Road Masterplan; Greg McKenzie

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Holly Omlin-Ruback, Bolton Primary
Jennifer Patterson, Boones Ferry Primary
Peter McDougal, Cedaroak Park Primary
Patrick Meigs, Lowrie Primary
Debi Briggs-Crispin, Rosemont Ridge Middle
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Jen Freeborn, Stafford Primary
Lisa Hawking, Sunset Primary
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Aaron Downs, Wilsonville High
Saskia Dresler, Arts and Technology High

WITH PROFESSIONAL ASSISTANCE FROM

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AND THANKS TO

City of West Linn
City of Wilsonville
County of Clackamas

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INTRODUCTION

The West Linn - Wilsonville School District is once again facing school capacity deficiencies due to continued growth in the District. Facility improvements will be necessary to maintain the excellent education programs, which are the District's trademark. The public is invited to help the District determine which improvements should be made and how they should be accomplished. This report is intended to support consideration of a capital bond measure in the near future by providing background information relating to issues facing the District and the potential improvements that could address them. This report is divided into four key sections:

Overview - WHAT is the District's mission, what are the challenges, and what is the capital improvement program?

Excellence in Education - WHY does the District's goal for excellence in education serve as the basis for the Capital Improvement Program?

Capital Improvement Planning Process - HOW is the Capital Improvement Program developed and how will the proposed projects support the District's commitment to excellence?

Next Steps - WHEN will the Capital Improvement Program projects be prioritized and implemented?

Overview:

DISTRICT COMMITMENT TO EXCELLENCE

The West Linn - Wilsonville School District is committed to excellence in education. Our educational system must maximize human potential by providing high-quality basic education, which enables all children to function successfully in our changing world. Our strength lies in our ability to access information, to use that information, to communicate that information to others, and to function at high literacy levels. We want a high-quality education for all children, one that provides a personalized education for students and affords all learners the opportunity to capitalize on strengths, meet challenges, and maximize potentials.

This unyielding commitment to excellence has produced a public education system that is second to none in the state. Students in the District have flourished, not only during their years as students, but in their adult lives as well.

GROWTH-THE KEY CHALLENGE

Creating and maintaining a quality education environment is constantly challenged by enrollment growth, which has increased by 61% from 5,644 students in 1990 to 9,076 students in 2013. In addition to providing the capacity to give each and every student a superior education, the District must also maintain and upgrade existing facilities and constantly look for ways to improve education programs and techniques.

To meet this challenge, the School Board created the Long Range Planning Committee (LRPC) made up of District residents in 1988. The committee's key responsibility is to review the capital improvement and facility needs of the District and to advise the School Board regarding these needs and the priorities for addressing them.

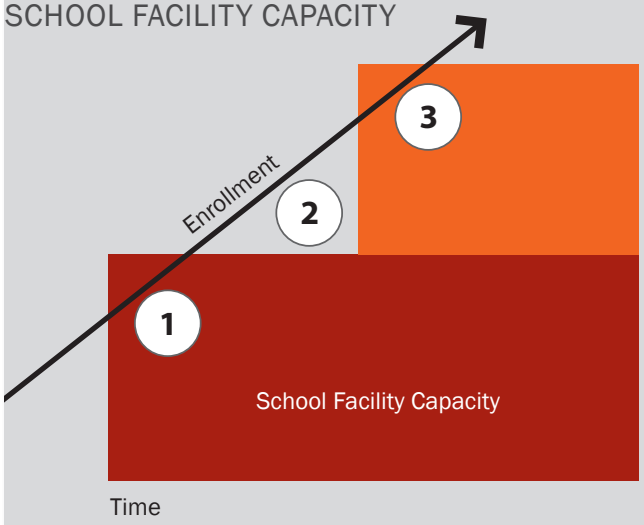
To further enhance the District's ability to proactively plan for the future, it developed the West Linn-Wilsonville School District Long Range School Facilities Plan in 1996, the first of its kind in the state. This plan, developed under the guidance of the LRPC, has provided a rational framework for evaluating and addressing future school facility needs as the West Linn and Wilsonville areas grow. The plan was updated in 2000, 2006 and 2013 to retain its value as a planning tool.

BALANCING ENROLLMENT GROWTH AND CAPACITY

As noted above, the District has experienced a steady increase in enrollmentover the past 20 years. To provide adequate school facilities for primary, middle, and high school students, the District has received voter approval of school bond measures during this same period to construct new facilities and upgrade and maintain existing assets.

The District is committed to providing educational facilities in the most financially prudent manner possible. The key is to balance efficiency with maintaining quality educational environments.While overcrowded schools may be financially efficient, they compromise the student's ability to learn. The District must balance steady enrollment growth with capacity, which must occur in distinct increments because new facilities must be constructed at once, not incrementally. Figure 1 demonstrates the balance the District must maintain between enrollment growth and capacity:

Figure 1
SCHOOL FACILITY CAPACITY



1. As enrollment exceeds capacity, the District constructs one or more facilities to increase capacity. There is excess capacity following construction, but because of associated operating expenses, to be financially efficient, this extra capacity should not be too large.

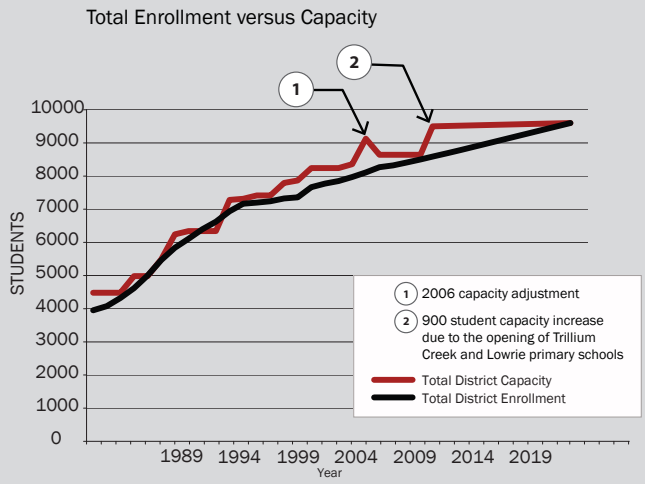
2. After completion, the enrollment continues to increase and the capacity remains static. Eventually the extra capacity is absorbed, and the District is over capacity. Portable classrooms, larger class sizes, and other measures are used to accomodate students during this period.

3. Periodic capacity deficits are considered necessary, however, they soon need to be addressed with another increment of new capacity or serious overcrowding will result.

Facility capacity is directly influenced by educational programs. Following its commitment to provide educational excellence for all students, the District continually seeks to improve its teaching practices. The District has found that an inquiry-based, collaborative, and integrated approach to teaching and learning actively engages students in their education. This well-balanced approach for creating quality education includes the following basic programs:

- Early childhood education
- All-day kindergarten
- Open enrollment
- Alternative education
- Personalized special need education

Figure 2
TOTAL ENROLLMENT VERSUS CAPACITY



The implementation of these programs has effectively changed the District's capacity because many of them have building space ramifications. For example, with half-day kindergarten, two classes can be accommodated using one classroom, but all-day kindergarten requires two classrooms to accommodate the same number of students. Improving educational programs may reduce school capacity. However, modest declines in capacity are outweighed by the improved educational results created by these programs.

CAPITAL IMPROVEMENT PROGRAM

With the District committed to educational excellence and efficiently providing quality facilities, the LRPC continually examines existing functional needs stemming from aging facilities, expected student population growth, and education program equity for all students. This must be treated as an ongoing process for the District to successfully anticipate needs well in advance. Planning and efficiently providing educational services for the community go hand-in-hand. District residents have approved capital improvement bond (CIP) measures in 1979, 1988, 1989, 1992, 1997, 2002, and 2008. This pre-planned sequence of smaller bonds (rather than less frequent large bonds) has enabled the District to successfully balance enrollment and capacity in a way that minimizes public debt and provides lasting solutions in real time. The 2014 Capital Improvement Program represents the next step toward fulfilling the District's Long Range Plan first envisioned over 20 years ago.

1979 - Wood middle School

1988 - Classrooms for Stafford and Wilsonville Primary Schools

1989 - Boeckman Creek Primary and Athey Creek Middle Schools

1992 - Wilsonville High School

1997 - Boones Ferry Primary and Rosemont Ridge Middle Schools

2008 - Trillium Creek and Lowrie Primary Schools

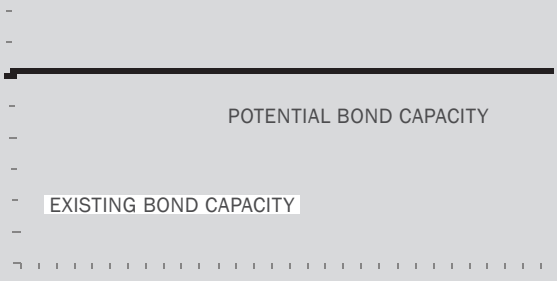
2002 - Wilsonville and West Linn High Schools

Future - Sunset Primary Replacement and New Wilsonville Middle School

POTENTIAL BONDING CAPACITY

Since 2001, the District has held to its commitment to keep capital bond levies at or below $3.00 per $1,000 of assessed value at any given point in time. With previous bonds expiring in 2015, the LRPC sees an opportunity to present a capital bond to voters in the near future to continue the excellence in education the communities of Wilsonville and West Linn have come to expect, without increasing taxes.

Figure 3
ANY PUBLIC SCHOOL DISTRICT
EXISTING VS. POTENTIAL BOND CAPACITY



Excellence in Education:

PROGRAMMING AFFECTING SCHOOL CAPACITY

Suitable school facilities are an essential prerequisite for providing a quality education. Virtually all educational programs rely on them. The District uses many programs to create a collaborative, integrated approach that provides a high-quality education. While these necessary programs increase the space needs for the District, they significantly enhance the overall quality of education offered to the students. Programs strategies include:

- Early childhood education
- Optional all-day kindergarten
- Open enrollment
- Alternative education
- Personalized special education

PROGRAMMING AFFECTING FACILITY SIZE, DESIGN, AND NEEDS

The District believes school design should create a welcoming and nurturing environment for learning. Schools are a visible and daily symbol to students and teachers of the community's commitment to education. Schools that are well designed and maintained provide a supportive environment for learning and achievement.

In planning for new facilities, the District supports the following design recommendations:

- Design schools to support a variety of learning styles.
- Enhance learning by integrating technology.
- Foster a "small school" culture.
- Support neighborhood schools.
- Create schools as centers of community.
- Engage the public in the planning process.
- Make healthy, comfortable, and flexible learning spaces.
- Consider non-traditional options for school facilities and classrooms.

As the District continues to grow, new and remodeled school facilities will be created that express the values of our community and allow the best environment for teaching all children. In addition to the traditional auxiliary facility needs, such as administrative spaces, libraries, music rooms and gymnasiums to name a few, the following programs have implications for the size and design of future facilities.

- World languages
- Interactive/technology-rich learning environments
- Learning communities/collaboration/the library
- Green schools initiative
- Center for research in environmental sciences and technologies (CREST)
- CREST farm to school program
- STEM education/maker spaces
- Robotics

Capital Improvement Planning Process:

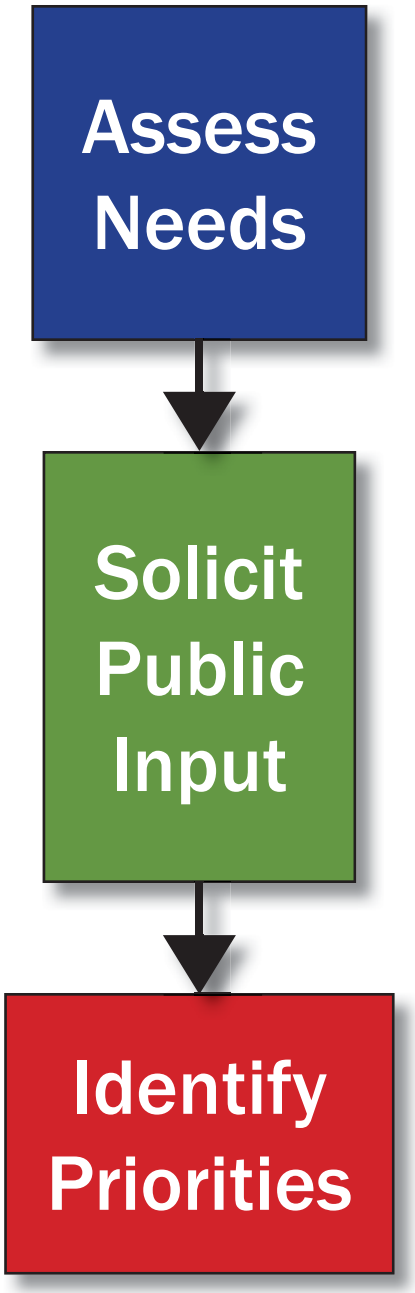
CAPITAL IMPROVEMENT PROGRAM (CIP) HISTORY

District residents have approved Capital Improvement Program (CIP) bond measures in 1979, 1988, 1989, 1992, 1997, 2002, and 2008. This pre-planned sequence of smaller bonds (rather than less frequent large bonds) has enabled the District to successfully balance ongoing maintenance, needed facility improvements, and expanding enrollment and capacity in a way that minimizes public debt and provides lasting solutions in real time.

The last CIP bond measure, passed in 2008, represents the most recent step toward fulfilling the District's Long Range Plan first envisioned over 20 years ago. Highlights of the bond included: construction of new libraries and kitchens at existing schools; various athletic field improvements; new technology district-wide; total renovation of the district administration building and technology hub center; and construction of a new primary school in West Linn and a new primary school in Wilsonville. The bond provided additional square footage in excess of 135,000 square feet to district facilities, as well as contributing to the local economy during an unprecedented local/regional/national economic downturn.

The District's CIP is based on an over-arching strategy to "capitalize" general fund expenses by incorporating bond planning and spending with daily facility management. This allows for regularly occurring bond eligible expenses to be incorporated into the CIP thus preserving general fund monies. Over the bond's 5-year period, including bond eligible expenses in the CIP has freed up over $6-million in expenses that otherwise would have been paid by the general fund. As a result, more annual resources are available for classroom instruction.

Building on that history, and the committment to provide quality facilities, the LRPC has examined the existing functional needs of the District stemming from aging facilities, expected student pupulation growth, equity for all students to learn in the most conducive environment and respect for the stewardship required to maintain the facilities we currently utilize. Through this process, the LRPC has compiled and categorized this infromation into this 2014 Capital Improvement Program.



RESPONDING TO GROWTH

The District currently has nine primary schools, three middle schools, two comprehensive high schools, one alternative high school, and one charter school. To better define the true educational capacity of each school, an evaluation of the facilities and programs was conducted in 2001, 2006, and 2013 to derive an accurate capacity figure for each school. Educational capacities of the schools are updated as existing schools are expanded, remodeled, or as curriculum and special education programs change. Primary school capacities will change in 2015 when all kindergarten students will attend full-day classes. The current school capacities are shown in Table 2. For the 2012-13 school year, the primary schools are operating under capacity, and middle schools are operating over capacity. The high schools have room for additional enrollment growth. The opening of Lowrie and Trillium Creek primary schools for the 2012-13 school year increased primary school capacity by 974 students and alleviated the capacity shortfall at the primary level. Portable classrooms at Wood Middle School will remain to address the middle school capacity issue until permanent facilities are funded and constructed.

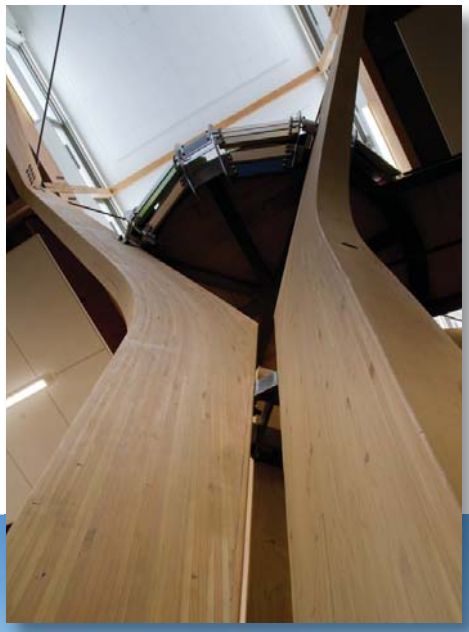


Figure 4

SCHOOL	CAPACITY		ENROLLMENT			PROJECTIONS*				
	2013	2015	2011	2012	2013	2014	2015	2016	2017	2018
PRIMARY										
Boeckman	479	457	631	555	541	541	508	489	464	439
Boones Ferry	689	645	823	531	536	608	596	599	609	598
Lowrie	476	432	0	407	480	574	668	753	819	898
Wilsonville Subtotal			1,454	1,493	1,557	1,722	1,772	1,841	1,892	1,935
WV Available Capacity	1,644	1,534		151	87	-78	-238	-307	-358	-401
Bolton	363	341	269	278	300	284	284	282	290	299
Cedaroak	407	385	413	318	320	311	301	293	287	294
Stafford	501	479	525	450	512	436	434	423	422	387
Sunset	432	410	409	285	296	409	407	394	398	402
Willamette	501	479	609	510	549	594	602	591	570	571
Trillium Creek	498	454	0	458	492	444	433	416	409	387
West Linn Subtotal			2,225	2,299	2,469	2,478	2,460	2,398	2,376	2,339
WL Available Capacity	2,702	2,548		403	233	224	88	150	172	209
Subtotal			3,679	3,792	4,026	4,201	4,233	4,239	4,268	4,274
Total Available Capacity (K-5)**	**4,346**	**4,082**		**554**	**320**	**145**	**-151**	**-157**	**-186**	**-192**
MIDDLE										
Wood			706	737	715	831	869	934	994	1,048
Avail. Capacity	640	640		-97	-75	-191	-229	-294	-354	-408
Athey Creek			602	607	637	584	570	608	624	677
Avail. Capacity	624	624		17	-13	40	54	17	0	-53
Rosemont Ridge			692	684	714	769	765	767	749	719
Avail. Capacity	668	668		-16	-46	-101	-97	-99	-81	-51
Subtotal			2,000	2,028	2,066	2,184	2,204	2,308	2,367	2,444
Total Available Capacity (6-8)	**1,932**	**1,932**		**-96**	**-134**	**-252**	**-272**	**-376**	**-435**	**-512**
HIGH										
Wilsonville	1,472	1,472	1,084	1,121	1,162	1,232	1,313	1,315	1,351	1,451
West Linn	1,748	1,748	1,506	1,553	1,612	1,555	1,609	1,604	1,632	1,626
Art Tech	86	86	86	105	105	105	105	105	105	105
Subtotal			2,676	2,779	2,879	2,891	3,027	3,024	3,088	3,182
Total Available Capacity (9-12)	**3,306**	**3,306**		**527**	**427**	**415**	**279**	**282**	**219**	**124**
TOTAL			8,355	8,599	8,971	9,276	9,464	9,571	9,722	9,900
Total Available Capacity (K-12)	**9,584**	**9,320**		**985**	**613**	**308**	**-144**	**-251**	**-402**	**-580**

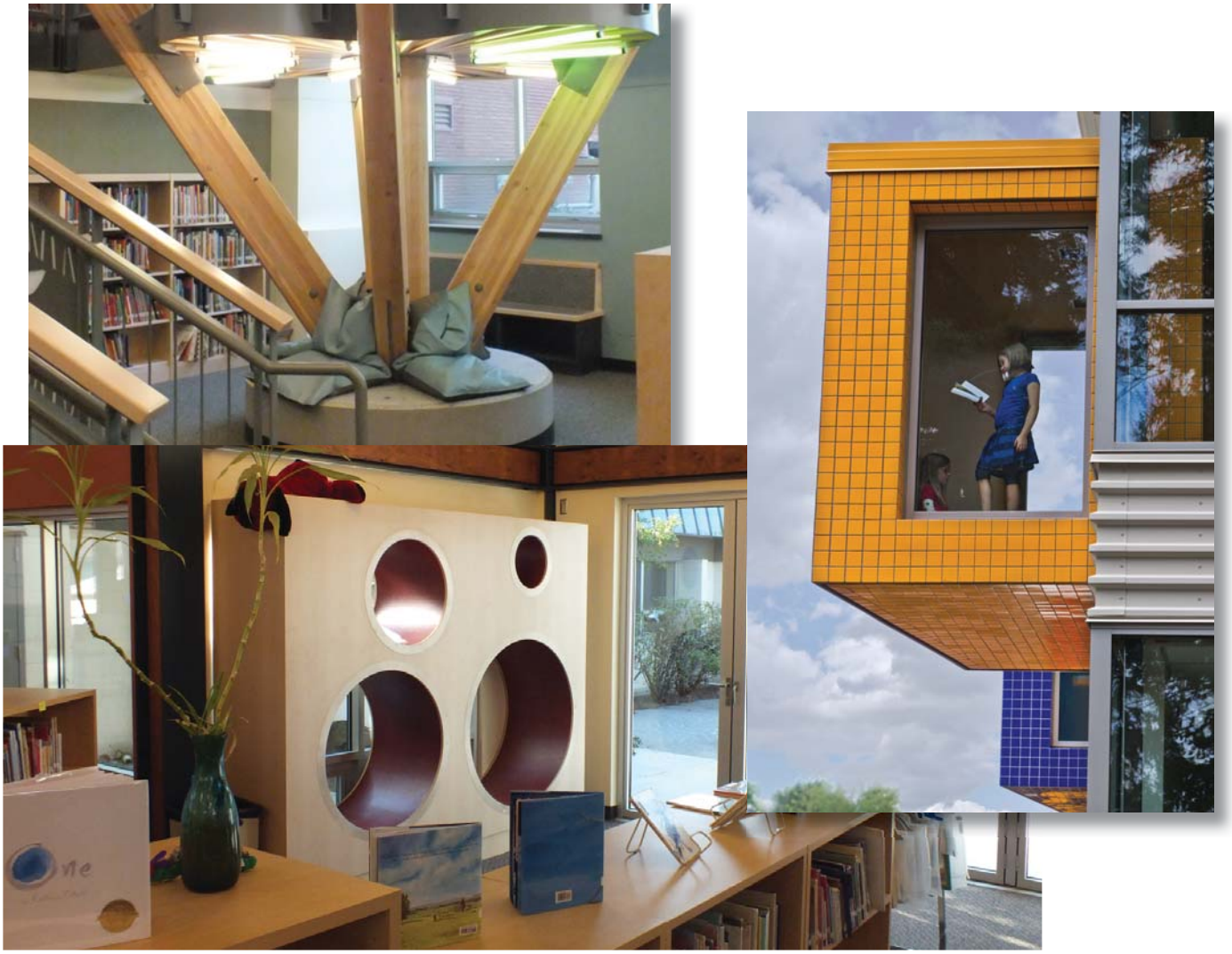
* Projections assume that current school attendance areas remain unchanged.

** Assumes full-day kindergarten beginning in 2015.

PRIMARY SCHOOLS

As demonstrated in Figure 4, primary level enrollment today is 87 below capacity in Wilsonville, and 233 below capacity in West Linn. When full day kindergarten becomes the standard in 2015 primary school capacities will be reduced by 264. As noted earlier in this report the most efficient way to balance enrollment and capacity is to allow enrollment to exceed capacity for a period of time before constructing an additional facility.

The Long Range Planning Committee recommends the replacement of Sunset primary school which has been a subject of public discussion for years. A Sunset Task Force was created to evaluate the various options available in 2009 and the decision was made to replace the school at it's current location in the sunset neighborhood. A key point in this plan was the procurement of a portion of the adjacent city park. This was accomplished as part of a land swap in 2010, clearing the path to a replacement school at the existing Sunset Primary school site. The original report submitted by the Sunset Task Force to the School Board is attached as part of the Appendix. This would provide an excellent, modern, and efficient school for the sunset neighborhood for many years to come.



MIDDLE SCHOOLS

Growth at the middle school level is increasing at the same rate as primary. However, since there are fewer grade levels involved, the growth evidences itself as a smaller number of additional children. The enrollment table shows the middle school level is 134 students over capacity as of September 2013, and is expected to continue to increase steadily for years to come. While the District placed portable classrooms at Wood Middle School, all district middle schools are experiencing pressure as a result of this crowding. The Long Range Plan has long predicted a fourth middle school, to be constructed in Wilsonville in response to growth. The property purchased on Advance Road just east of Wilsonville was purchased in 2003 with this facility in mind. The main barrier to use of this site has been that it was outside of the Urban Growth Boundary (UGB). District staff worked diligently in coordination with the City of Wilsonville and Metro to bring the site within the UGB in 2013. Staff will continue to work with the city to annex the site in to the City of Wilsonville.

Ultimately a new middle school will be built to address this problem. Thefore, the 2014 Capital Improvement Plan recommends construction of a new 700-student middle school at the Avance Road site in Wilsonville.

HIGH SCHOOLS

Capacity issues at the high school level have been resolved through the passage of capital improvement bonds in 1992, 1997 and 2002. As seen in Figure 4 the projections for enrollment capacity continue to show available capacity for the high schools.

The primary issue facing the high schools is the location of Arts and Technology High School. The District has leased a facility owned by the City of Wilsonville for several years. The lease for this building has been extended only with the understanding that the District will actively seek an alternative accommodation. The District needs to determine a new location for the school (Advance Road Site?).

PROJECT SELECTION:

IDENTIFICATION OF FACILITY NEEDS

Discussions regarding future facility needs began in earnest in September 2013, when School Board members and administrative staff asked the LRPC to:

1. Review the West Linn - Wilsonville School District Long Range School Facilities Plan with a specific focus on growth in Wilsonville and potential growth in the Stafford Basin area as well as "infill" development in West Linn and Wilsonville.
2. Develop a list of potential projects/capital items, which could be included in the next bond issue.
3. Develop possible strategies for a future bond issue.
4. Re-calibrate student capacity at all schools.

Throughout this study, the LRPC arranged interviews with Board members, administation, principals, building adminsitrators, classified employees, certified employees, the District Safety Committee, the District Facility Use Fee Review Commiette, the District Technology Stewardship Commitee, as well as the district land-use planner, architect and mechanical/electrical engineer.

Following the District's Vision Themes, the operations' staff canvassed the District to determine the current state of existing facilities and percieved near-term (five year) needs. To weigh this information, several evaluation ciretria were developed. Each criterion has unique relevance to District goals and the Capital Improvement Program:

PROJECT EVALUATION CRITERIA

- **Growth:** Primarily related to student enrollment increases; also program and staff growth and expanded offerings.
- **Equity:** The notion that every patron's child should enjoy the same educational experience regardless of which school in the district they attend.
- **Teaching and Learning:** School facilities must be designed and have adequate capacity to accommodate successful educational programs, including special education, and early childhood development.
- **Health and Wellness:** New state and federal mandates require a health and wellness policy. The District adopted this new policy in 2006. It impacts health curriculum, physical education and food service.
- **Energy Conservation:** Technological advances in mechanical and electrical systems provide significant savings in annual operating costs.
- **Sustainability:** The CIP assumes all projects will be environmentally friendly and sustainable to the greatest extent feasible. The District recognizes that green buildings make a positive impact on the health and environment of children, as well as reduces operating expenses, and helps to create a sustainable community.
- **Safety & Security:** Prioritized responsibility paramount to all other operational details. Includes hazardous material management and abatement.
- **Technology:** Recognition that today's education requires knowledge and skill acquired through use of computer and electronic technology. Also relates to how the District carries out instruction and business responsibilities.
- **Stewardship:** The strong community support experienced over many years has provided the District with some of the finest public education facilities in the state. Stewardship contemplates measures needed to protect these investments, including capital-level maintenance and life cycle replacement.

In addition, the supplemental criteria regarding community partnerships and community athletics affect all CIP themes. These projects will provide the District with the ability to respond proactively to opportunities that arise to enable the District to continue to provide quality facilities in efficient ways.

- **Community Partnerships:** Joint ventures with in-district groups to further the District's mission and empower community interests to the benefit of all. Category of opportunity at school board discretion.
- **Community Athletics:** Limitations on district-sponsored athletics has caused significant growth in community sponsored athletic offerings. District facilities remain the primary venue for all organized sports in the District. The community expects the District will construct and maintain athletic facilities as required.

CAPITAL PROJECTS:

The Long Range Planning Committee and operations staff utilized these criteria to bring forward projects that were not funded previously, add new projects, as well as address facilities needs for the next five years.

2014 CAPITAL IMPROVEMENT LIST

A. New Wilsonville Middle School	$ 44,150,000.00
B. New Sunset Primary Replacement School	$ 24,250,000.00
C. New Arts & Technology High School Facility	$ 9,000,000.00
D. New Wilsonville High School Auditorium	$ 11,000,000.00
E. Remodel West Linn High School '700'-Building	$ 5,750,000.00
F. Student Safety & Security	$ 415,000.00
G. Technology	$ 10,700,000.00
H. District-Wide Improvements (Range $5,847,176.00 - $10,624,526.00)	
I. Site Improvements: includes parking lots, playfields, sidewalks, storm drainage, covered play structures, stadium seating, etc.	$ 1,765,500.00
II. Interior Improvements: includes carpet, painting, small remodels, casework, etc.	$ 1,869,050.00
III. Furniture, Fixtures and Equipment	$ 902,000.00
IV. Roofing / Exterior Envelope	$ 1,422,476.00
V. Mechanical / Electrical / Plumbing	$ 4,665,500.00
Total Estimated Value:	$115,889,526.00

New Wilsonville Middle School

Location: Advance Road Site, Wilsonville

Project Summary:

The school district has three middle schools. Wood Middle School in Wilsonville was built in 1980 and has an educational capacity of 640-students with enrollment of 737. Athey Creek Middle School, built in 1990, is centrally located at Stafford/Borland Roads and has a capacity of 624-students with current enrollment at 637. The newest, Rosemont Ridge Middle School in West Linn, was built in 1999 and has a capacity of 668 with enrollment in 2013 of 714 students. Overall, these three middle schools have an educational capacity of 1,932 students. Fall 2013 enrollment is 2,066 with projections for a steady increase in enrollment to 2,444 in 2018. All three middle schools are over capacity and a long-planned fourth middle school is now necessary.

As an aid to the planning process, this project is described as a new middle school with a capacity of 700 students. Price includes all soft costs and hard construction costs; as well as instructional technology; and furniture, fixtures and equipment necessary to function at par with any school in the district.

Conceptual estimate based on 2016 start date: $44.15 million

New Sunset Primary Replacement School

Location: Current Sunset Primary School Site

Project Summary:

Sunset Primary School has an educational capacity for 410 students, kindergarten through fifth-grade; plus special services programs and pre-school throughout the school year. Portions of the current Sunset School were construed in 1930, 1941, 1957, 1960 and 1966.

Maintaining Sunset at a consistent and adequate operational level requires an ever increasing investment in time, energy and capital. While cleanliness and surface presentation is acceptable, the rate of basic infrastructure failure is increasing. Exposure of building occupants to safety hazards has not necessarily increased over the past few years. To the contrary, hazardous materials, such as asbestos, have been incrementally removed since 1998. However, exposure to the ever-present hazard of fire (with no sprinkler system) and earthquake (un-reinforced structures) cannot be eliminated or even mitigated without significant effort.

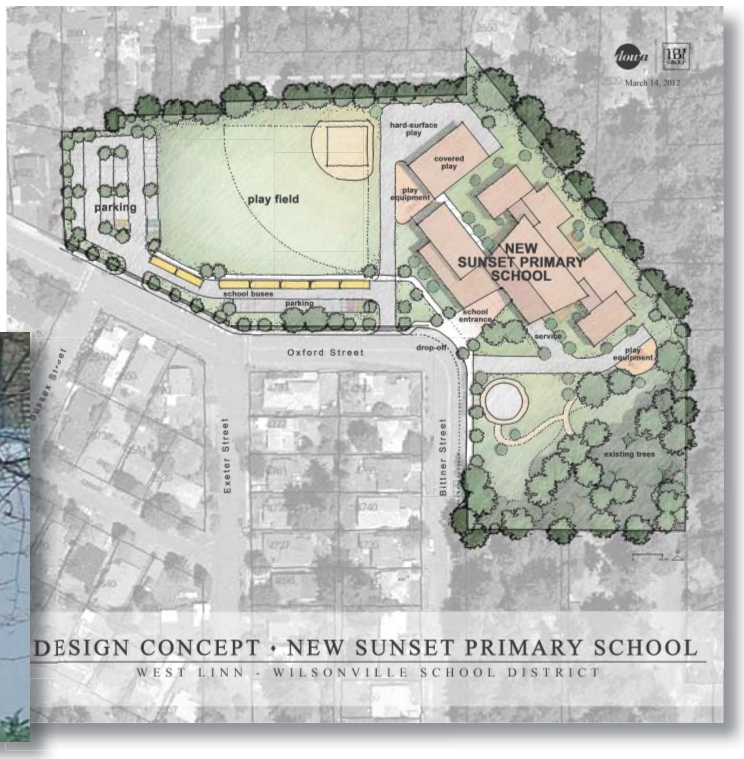
An architectural study of the Sunset facility was conducted by Dull Olson Weekes Architects and results were published October 1, 2007. Deficiencies of all systems were documented and attested by certified registered architects and engineers and resulted in a recommendation by District Operations to consider major reconstruction or total replacement of the facility.

Given the current status of Sunset, the Superintendent formed a community patron-based task force to review all information available and make a recommendation for the future of this school, to be presented to the Long Range Planning Committee in 2009.

Following this public process, the following recommendation was submitted:
1. Replace Sunset School on the same site.
2. Consider options to increase the size of the existing site.
3. Consider a smaller school building so long as program and space utilization are not compromised.

Since that time, the City of West Linn and the School District entered into an Intergovernmental Agreement to jointly facilitate a land swap. In May of 2010 the City of West Linn voted affirmatively to sell 1.6 acres of Sunset Park to the school district thereby creating adequate land to rebuild on the same site.

Conceptual estimate based on 2016 start date: $24.25 million



New Arts & Technology High School Facility

Location: To be Determined (Advance Road Site?)

Project Summary:

Started as a Charter School by the School District in 2005, Arts & Technology High School has a strong, successful history of providing an alternative style and setting for high school students apart from the traditional large high school. This program provides service for up to 100 full-time high school students at a leased property located in Wilsonville and owned by the CITY. Since its initial launch, various task forces and committees have provided in-depth research and guidance for the development of "Art Tech" High, and in 2008 forwarded a recommendation that the next capital bond include a special facility for the purpose of serving students whose needs would best be met in an alternative setting to the current comprehensive high school model.

For the purpose of planning, it is recommended that a small, separate facility for approximately 150 students be designed and constructed at a permanent, district-owned location for Arts & Technology High School.

Conceptual estimate based on 2016 start date: $9.0 million

New Wilsonville High School Auditorium

Location: Wilsonville High School

Project Summary:

The major project for this school is a large performance theater with the accompanying support spaces for band, choir, and drama instruction, stagecraft and production. Project would construct a new 600-seat theater (similar to WLHS) and remodel existing choir, band and arena theater. Convert existing performing theater to support space. Reconfigure drive and pedestrian ways, and convert existing practice soccer field into parking.

These items are being recommended for consideration for inclusion in the bond and were developed by the principals with teachers and are supported by the community leaders who serve with Music and Arts Partners (MAP).

Conceptual estimate based on 2016 start date: $11.0 million

Remodel West Linn High '700'-Building

Location: West Linn High School

Project Summary:

West Linn High School has undergone major reconstruction in 3-phases beginning with a new Entry and Commons in 1992, a new North Classroom Wing and Administration in 2000 and most recently new Gymnasium, Kitchen/Cafeteria, Weight Room, Dance Studio and Performing Arts Building in 2005.

This project represents the last phase to complete the campus master plan. The 700 Building, built in 1959 as an industrial arts building, will be remodeled to accommodate classroom space for Art, Environmental Science and Health/Wellness. Site and utility construction in this area will also be included.

Conceptual estimate based on 2016 start date: $5.75 million

Student Safety and Security

Location: All District Locations

Project Summary:

Providing the best education possible for our students also means creating a safe and secure environment for both students and staff. Over the past year there has been a heightened awareness regarding school safety and security at the national, state and local level. West Linn-Wilsonville School District is committed to creating and maintaining safe, secure facilities for students, staff and patrons as a partnership with our community, neighboring school districts, area law enforcement and emergency responders.

Under the leadership of the District Safety Committee, with cooperation from building principals, site emergency response teams and local law enforcement, our schools have been assessed for safety-related corrections and has identified the following themes that have identified specific improvements for each unique school facility.

- Building Communication Systems
- School Entrance Security
- Door Hardware and Locking
- Safe Classroom Accommodations
- School-grounds Exterior Security Measures
- Limited Video Surveillance
- Lighting and Controls

This category provides a budgeted amount of money to be used at all District facilities over a period of 2-4 years to equitably purchase and install specific safety/security related products, components, systems and assemblies; as identified and prioritized by the District Safety Committee.

Conceptual estimate: $415,000.00

Learning with Technology

Location: All District Sites

Project Summary:

Our schools have a long-standing tradition of excellence that is rooted in a culture of action research and innovative practices. It is a culture in which all members of the learning community participate and collaborate in the ongoing pursuit of the district's mission, visions, and goals.

Within this learning environment, technology is now widely used by our students for research, close reading and production. Students use the technological tools available to calculate, to read and write, to tap into streams of live information, to communicate with others, and to do so from school and from home.

Digital video, digital music, graphic multimedia presentations are becoming common in our classrooms. When children are invited to make public presentations of complex learning, the products become exemplars for the next student, the next class. In this way, a rising standard of student performance is emerging in the learning community. These multimedia presentations have become more polished and are used more extensively with new production technologies.

Learning with technologies allows children to do what they could not otherwise do. Well-designed software coaches children in mathematics. Video sources provide a window to worlds the student cannot visit, a seat in the great lecture halls of the world, and quick reference for review or expansion of concepts. Computer adaptive software allows students to explore mathematics they do not yet understand, test ideas, fail, and construct a useful understanding of the concept. Well-designed writing software coaches children through the complexity of written composition. Web quests and research software link questions to resources and help students juggle the use of multiple sources in a recursive research process.

Simulation software allows children to manipulate and tweak the parameters of the variables in complex situations gaining an understanding of the principles of mathematics, science and the social sciences. Design software allows children to take on design challenges in robotics, geometry, graphic arts, art, and architecture. Quick access to references on line allows students to read dense text with more understanding.

Assessment with technology escapes the boundaries of time, becoming timely, personalized, and adaptive. Computer adaptive assessment has greater power to yield useful assessment information for teachers to use as feedback and actionable data to aid in planning. Computer adaptive assessment, particularly in a low stakes environment, has the power to provide students effective feedback on the learning.

The prophecy of every student having access to a device when and where they need it is not new. This has been the vision for years. However, it is only recently – perhaps accelerated by the power of personal, mobile technology – that this as a potential reality has been achievable. At the same time, Internet access is also spreading. Technology tools and the resources that are made available by these phenomena are increasingly ubiquitous and transparent.

When technology is deployed in a 1-to-1 fashion, the power of serendipity and immediacy can take effect. The impact of having a question now, and being able to pursue that question now cannot be overstated.

With a technology tool in-hand, a student can actively access multiple definitions and the background of a word or term. Imagine reading a passage that refers to the Leaning Tower of Pisa. Within a few clicks, students can access a picture along with some quick facts about the building, the city, the area, and the culture. These insights bring deeper meaning and relevance to the original text.

In the social sciences, students can access varying viewpoints. They can research the history of a situation from various angles and gain deeper understanding.

In the math classroom, technology can bring greater synthesis to the application of the theories being learned. For example, we can be told that linear algebra is actually the basis to most computer animation. But with a technology tool in hand, they can be given tasks that cause them to manipulate the mathematical model to create specific results in an animation.

In Wellness, students can track their diet and exercise habits in order to influence their physical well-being.

The research and inquiry aspects provided by access to technology are clear as well and so too are the communication and collaboration opportunities provided by these resources.

Technology allows the engineering in STEM to come alive. When posed with a real-world problem – for example, program this robot to navigate through a maze of unknowns – the significance of doing something real causes the learning to come alive. The notion of a STEM Hub contemplates how the District can collaborate with partners to provide unique learning opportunities for students in STEM learning. Related to that, the District sees value in establishing a STEM center to strengthen existing programs and provide the space and flexibility for future endeavors. A STEM center would facilitate learning through robotics, sustainable agriculture, computer software courses, engineering design and other programs currently happening throughout the District. Cohesiveness and support around these programs will also provide important professional development opportunities for teachers looking to also expand their practice and integrate STEM education into their curriculum.

Teaching in this way is complex, sophisticated, challenging, and intensely intellectual work. The role of each individual teacher has become extraordinarily significant. Successful teachers are those who prepare for their students, not just for their lessons. Successful teachers are more skillful in knowing and understanding individual learners. Successful teachers respond to diverse learners with varied culturally responsive approaches to instruction. Each teacher has a range of strategies and is able to choose the strategy to fit both the content and the learner. Teachers prepare student-centered, divergent learning experiences that draw each and every student to high standards of performance. Teachers in this Age of Learning work from student strengths rather than focusing on the weaknesses. Effective teachers carry the belief that every child can be successful. This mindset leads to a reorientation of teachers' role and disposition toward teaching.

It is important to note that our technology plan is not about the technology itself. While much thought needs to put into the selection of devices, it is not the device that should drive this. The improvement and enhancement of the pedagogical practices in the classroom that enhance the educational experiences of students toward the achievement and surpassing of initiatives like the Common Core Standards or the Next Generation Science Standards is the ultimate goal.
As we pursue the themes and values around teaching and learning as outlined in our comprehensive District Technology Plan, we intend to:

- Pursue one-to-one deployment models of devices to students
- Continue lab-based arrangements for certain activities
- Update core teaching and office systems
- Renew the infrastructure of the district to keep the core systems robust and stable

Conceptual estimate: $10.7 million

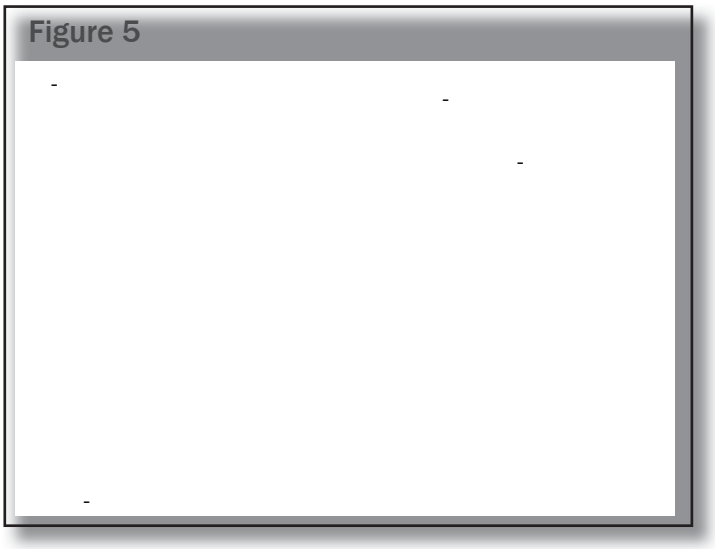
District-Wide Improvements

Project Types:

This category of projects represents work at all district sites that has been identified over time as improvements that respond to life-cycle replacement, upgrades required by code, changes in instructional models, growth in activity participation and obsolescence.

Project Type:	Total Value:
I - Site Improvements	$1,765,500.00
II - Interior Improvements	$1,869,050.00
III - Furniture, Fixtures & Equipment	$902,000.00
IV - Roofing / Exterior Envelope	$1,422,476.00
V - Mechanical / Electrical / Plumbing	$4,665,500.00

Figure 5



Type I - Site Improvements:

This category of projects represents work at all district sites that has been identified over time as improvements that respond to life-cycle replacement, upgrades required by code, changes in instructional models, growth in activity participation and obsolescence.

Highlights:
-New Athletic Field Restroom/Concessions/Team Room at Rosemont Ridge
-Stadium Seating Expansion at West Linn High and Wilsonville High
-New Playground Equipment

Type II - Interior Improvements:

These include projects for minor interior remodels, carpeting, painting, finishes, ceiling replacement, doors, hardware, casework, etc.

Highlights:
-Convert Basement Locker Rooms into Instructional Space at Bolton
-Fully Renovate 60-Classrooms at District Schools (walls, floors, ceilings, casework)
-Remodel Main Office Area to include Testing Lab at Boeckman Creek
-Renovate Main Office at Bolton

Type III - Furniture, Fixtures and Equipment:

These items are in constant use by students and staff every day and include classroom furniture, projection screens, wall coverings, tackboard/whiteboard, carts, lockers, office furniture/equipment, file cabinets, storage systems, etc.

Highlights:
-Aggregate dollar amount to be distributed at all District Schools

Type IV - Roofing / Exterior Envelope:

The 1997 Bond provided funding to repair/replace many district roofs. In 2014, funding is required at many district buildings to again ensure waterproof integrity. Also includes some repair/replacement of identified siding and windows at specific buildings.

Highlights:
-Aggregate dollar amount for itemized priority work.

Type V - Mechanical / Electrical / Plumbing:

Fairly self explanatory; includes repair/replacement of pumps, motors, boilers, fans, electrical components, plumbing components, etc. These projects provide both improved performance and reliability, and also capture energy savings.

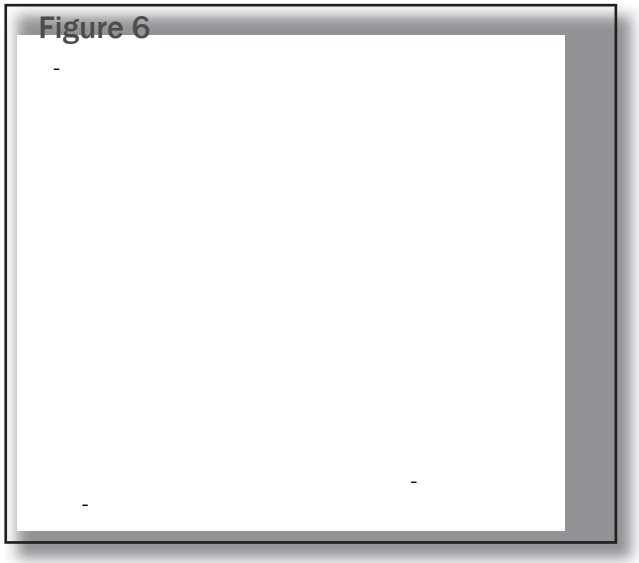
Highlights:
-New Gym Lighting
-Various at all sites

Project Categories:

The total list of District Wide Improvement Projects is fairly extensive. To help determine which projects should have priority funding, each project Type line item has been assigned to one of three Categories:

A - Mission Critical	$5,847,176.00
B - Mission Important	$2,758,850.00
C - Deferrable	$2,018,500.00

Figure 6



Category A - Mission Critical:

These project components represent work to correct issues that are in/near failure, are out of compliance with code thereby failing to pass critical inspections or cause inordinate labor/repair to keep operational.

Examples:
-T-12 light tubes are no longer manufactured. To remedy, many light fixtures require replacement or rebuild.
-Fire Alarm System at Wilsonville High: Original system is obsolete and incompatible with newer system. Parts for frequent failure are non-existent or extremely expensive.
-Carpet that is simply worn out.

Category B - Mission Important:

This Category of work, while not a threat to daily operations, does have significant value toward efficiency and effectiveness in operations and/or curriculum delivery.

Examples:
-Classroom renovations (paint, carpet, ceiling, floor, casework)
-Restroom Upgrades (tile, fixtures, privacy stalls, etc)
-Equipment replacement (window coverings, furniture)

Category C - Deferrable:

This Category represents work that is not in failure, nor necessary to improve instruction or student performance. This list contains items that are currently functional but may require repair/replacement in the next 10-years or are suggested as upgrades that would be useful but not critical.

Examples:
-Athletic Field Seating at middle schools
-Window Replacements
-Additional Storage
-Display Cases/Surfaces

Summary

All District-Wide Improvement Projects have a grand total conceptual value of $10,624,526.00 that is broken out by Project Type; and each Type is broken out by Category. This strategy provides the ability to select projects for prioritized funding based on most important determination.

Type I - Site Improvements

Category A	$815,500.00
Category B	$780,000.00
Category C	$170,000.00
Total Type I	$1,765,500.00

Type II - Interior Improvements

Category A	$603,800.00
Category B	$1,032,250.00
Category C	$233,000.00
Total Type II	$1,869,050.00

Type III - Furniture/Fixtures/Equipment

Category A	$810,000.00
Category B	$42,000.00
Category C	$50,000.00
Total Type III	$902,000.00

Type IV - Roofing/Exterior Envelope

Category A	$1,122,876.00
Category B	$184,600.00
Category C	$115,000.00
Total Type IV	$1,422,476.00

Type V - Mechanical/Electrical/Plumbing

Category A	$2,495,000.00
Category B	$720,000.00
Category C	$1,450,500.00
Total Type V	$4,665,500.00

The Advance Road Site

Imagine the Possibilities...

The advance road site northeast of Wilsonville presents forty acres of opportunity for the West Linn - Wilsonville community. The District has intended ten of the forty acres of land for a city park as part of a land swap for the Lowrie Primary School site. The remaining thirty acres could accommodate a number of the goals of this Capital Improvement Program in a move towards the latest design model in education design.

Combined sites is a concept the District has supported for many years as a way to gain efficiencies. Stafford Primary and Athey Creek Middle Schools share a site similar to Boeckman Creek Primary/Wilsonville High School and Wood Middle/Boones Ferry/CREST. These combined sites provide opportunity to share resources from parking lots and athletic facilities to classrooms and staff. The next iteration of this concept is the campus model. In K-12 schools this model brings multiple schools and/or programs into a single campus and even a single facility. This model would bring a number of significant benefits to the District.

- **Substantial Energy and Maintenance Savings:** A single building core with large efficient mechanical, electrical and plumbing (MEP) systems to support the two schools as well as additional programs as feasible.
- **More Community Use Opportunities:** Parking is a key constraint for community use, the campus model would accommodate more parking than single schools.
- **Staff Sharing:** Including personalized special need education, physical education, custodial and others to maximize efficiency and effectiveness.
- **Improved Access to Key Tools:** All students would have age-appropriate access to broader learning opportunities in an expanded library, additional gymnasiums and athletic fields and with an expanded technology inventory.

Applied to the Advance Road site, this model could provide main building infrastructure (gymnasiums, library, administrative offices, kitchen, mechanical room, electrical room, etc) to support a middle school classroom wing and a future primary school classroom wing, with expansion options for both as enrollment continues to grow. These basic shared building components would be constructed to support both schools, meaning a lower cost to expand the campus later. It would also be possible to contemplate additional programs housed on the same campus, minimizing both initial and recurring costs for these programs as well.

- **Arts and Technology High School replacement:** The opportunity exists to construct a new Art Tech High School building at the Advance Road site. Such a facility could have its own frontage, driveway, presentation and character while sharing spaces and infrastructure with the larger middle/primary school structure.
- **Robotics facility:** STEM programs and robotics in particular are a growing interest in the West Linn - Wilsonville community, and the Advance Road campus could support a variety of flexible "maker spaces" to support robotics for the schools and the community.
- **CREST Farm to School program:** The current location of the CREST Farm program is isolated with little staff/adult supervision and support. Relocating the "farm" to the Advance Road site as part of the initial design could help bring daily stewardship and active participation from teachers and students to provide real-time opportunity for learning.

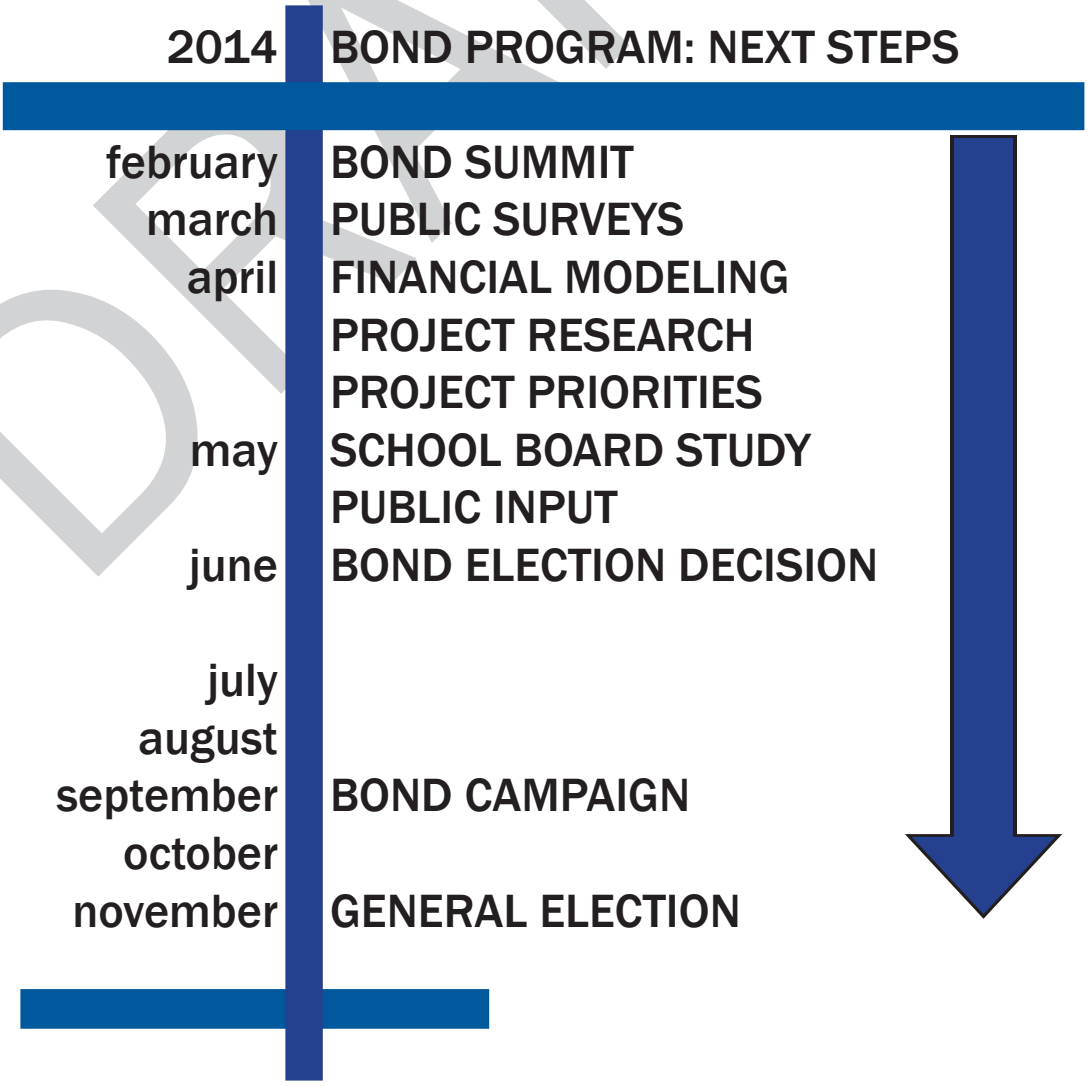
As seen in the enrollment projections in Figure 4, the District anticipates crowding at the primary school level as soon as 2015. The campus model would provide the District with the flexibility to respond to enrollment growth at a much faster rate since design and permitting would have been accomplished.

AND, as the City of Wilsonville develops their own 10-acre athletic/recreation park at this site, there will be opportunity to plan shared facilities for site transportation, parking, restrooms and sport venues. Imagine the possibilities...

WHERE DO WE GO FROM HERE...

"Today's understanding leads to tomorrow's reality. We strive to accomplish for our children that which we did not have for ourselves."

Continuing convserations between district leaders and our community will focus and prioritize an action plan to cement a vision that leads toward a 2014 Capital Bond Campaign and the creation of a school district that elevates opportunities and success for every child.



West Linn – Wilsonville School District

December 2013 ***DRAFT***

District Technology Plan

This Technology Plan is the collective work of the Technology Advisory Committee. The members of this committee include:

William Rhoades, Superintendent
Jane Stickney, Deputy Superintendent
Kathy Ludwig, Asst Superintendent
Tim Woodley, Operations Director
Jennifer Spencer-Iiams, Student Services Director
Curtis Nelson, IT Director
Nell Achtmeyer, STEM Coordinator
Aaron Downs, Principal – Wilsonville High
Barb Soisson, Principal – Wood Middle School
Peter McDougal, Principal – Cedaroak Oak Primary
David Pryor, Principal – Willamette Primary
Kathy Gregg, Asst Principal – Athey Creek Middle School
Stacy Erickson, Teacher Librarian – West Linn High
Stuart Levy, Teacher-Librarian – Wood Middle School
Tara Perkins, Teacher-Librarian – Cedaroak Park and Sunset Primary Schools
Patrick Minor, Instructionl Coordinator – Stafford Primary
Emilie Bennett, Instructional Coordinator – Sunset Primary
Dave English, IT Specialist – Wilsonville High
Peggy Pricer, IT Specialist – Rosemont Ridge and Athey Creek Middle Schools
Joe Wade, Former IT Specialist – WLWV Schools
Jennifer Ziolko, Instructional Coordinator – Student Services

In addition to bringing their own voice and perspective to this work, each member was additionally charged with representing all groups that they associate with as well.

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EXECUTIVE SUMMARY

The West Linn - Wilsonville School District has a strong history of creating and implementing a dynamic and comprehensive technology plan that supports the district's technology systems and networks, efficient work environments, innovative and effective instructional practices, and trends in Science, Technology, Engineering & Mathematics (STEM) education (including increasingly robust robotics and engineering programs).

The West Linn – Wilsonville community has supported the evolution and updating of our instructional technology and technology systems through passage of capital and facilities improvement bonds in 1997, 2002, and 2008. As the district continues its inventory and needs assessment to inform the Technology Plan for 2013 and beyond, we find that the network and hardware remain relatively robust AND, as with all technologies, they are becoming dated and must be continually renewed and refreshed. As we do this we simultaneously keep abreast of new standards, applications, developments, innovative teaching and learning systems, wireless applications, personal desktop accessories, new specialized hardware and software, and the changing nature of supportive facilities.

This plan considers the current state as well as the next phases of technology of planning for the district. It includes review and revision in the areas of Leadership, Stewardship, Curriculum and Instruction, Management and Operations, and in the Physical Technology Structure and resource needs.

It is the role of **Leadership** to promote and provide the stimulus for creativity and innovation, integration, and utilization of technologies. We believe that Technologies should be integrated through all district areas, levels, and functions; be available and accessible as needed; and be a powerful and exciting enhancement to teaching, learning, and leadership.

The **Stewardship** of the plan is led by the **Technology Advisory Committee** who assists in setting direction and recommending strategies for technology acquisition, staff development, integration of best practices, and evaluation/assessment of technology and applications. Because this is a dynamic plan a major role of the Technology Advisory Committee is to keep abreast of and advise on current research on effective and efficient uses of technology to enhance our systems of teaching, learning, and work.

The **Learning and Teaching for Students** component is focused on creating effective and efficient curriculum models and standards, instructional applications and innovation, and a rich learning environment through collaborative instruction and interactive technologies. It includes achievement of technological and informational literacy as a strong focus on research and inquiry, and the development of digital citizenship. We believe strongly that instruction and high quality teaching and learning systems should lead the work of the district and that technologies should be considered as powerful tools to support that work.

The **Learning and Teaching for Staff** component emphasizes the need and process for effective professional learning. Our goal is to prepare staff for the integration of technologies into the daily learning of the classroom by incorporating the current understandings of research on best practices in using technology to enhance learning and child development. We understand that this is a rapidly evolving field and that our ability and willingness to learn and adapt is critical in our professional growth models.

The purpose of the **Management and Operations** plan is to imagine, fund, create, implement, and deploy technology infrastructure, hardware, and software to streamline decisions and maximize resources in the daily operation of the school district. Special focus will be made on minimizing time demands for external reports and other management tasks.

The **Networks and Systems** plan outlines a system that significantly increases student access to technology and its related resources. The specifications outline a dynamic classroom environment in which use of technology is seamless, transparent, and non-disruptive.

It is important to note a couple of distinguishing characteristics of this plan:

1) This plan is intended to be more than the purchase and infusion of technology – the concepts incorporated in this plan embrace an evolving classroom environment characterized by the district's six vision themes. We believe that instructional strategies and learning environments are undergoing rapid and exciting improvements and that technology is a core piece of these new environments.

2) This plan provides our district with a path for moving forward with these new environs. It creates the path, provides methods, and creates the organizational culture for opportunity and growth in teaching and learning. There will be a renewal process to continue to move ahead even as we implement new technologies.

INTRODUCTION

Beginning In 1997, the West Linn - Wilsonville School District passed a series of bond measures that included significant and far-reaching upgrading of the district's technology systems and networks which supported efficient work environments, innovative and effective instructional practices, and trends in Science, Technology, Engineering & Mathematics (STEM) education (including an increasingly robust robotics program).

The results included the creation of an agile and adaptable networked district. The district supports an infusion of new computers in every classroom, fully supported data, voice, and video systems, upgraded electrical and network wiring at each school, the creation of a telephone system with its own prefix and telephone numbers, video systems that support a growing application for distance learning and video productions, extensive access to wireless networking, enhanced and updated web presence…. The technology network and systems are fully supported through the district Information Services Department and building technology experts support the network and applications at each school. While the network system and technologies are still generally robust and effective, as with all technologies, they become dated and need to be refreshed regularly to keep abreast of current technological applications and developments for all components of the district.

Technology integration to support student learning and STEM education is ever-evolving and planning must be dynamic in support of curriculum applications to enhance teaching and learning for students and staff. Professional development opportunities are provided in an ongoing and often "in-time" fashion to enhance staff and student use of technology and in understanding elements of information literacy, STEM, and digital citizenship. Curriculum for instructional technology has been aligned to the International Society for Technology in Education standards, the Common Core, the Next Generation Science Standards, and Oregon's Standards for Technology.

There are significant new technological application developments and research on effective teaching and learning with technology that are influencing future network, hardware, software, and curricular needs. These trends include wireless applications, rapid evolution of mobile technology, digital curriculum, on-line data bases and resources, distance learning, content specific technologies, research and data retrieval systems, assessment systems, one to one environments, assistive technology for children with special needs, and new specialized applications in teaching, learning, and management. Each of these trends influence and are addressed in the district technology plan.

Demographics of the District

The West Linn - Wilsonville School District serves a 42 square mile area in Clackamas County, Oregon, serving the communities of Wilsonville, West Linn, and a large unincorporated area between the two cities. The 2013-2014 projected enrollment is 9000. The District is made up of 9 primary schools, 3 middle schools, 3 high schools, and one charter school and employs approximately 470 licensed staff, 255 support personnel and 28 administrators.

District Vision and Vision Themes

The Vision of the West Linn - Wilsonville School District is an inquiry: ***How do we create a learning communities for the greatest thinkers and most thoughtful people for the world?***

The West Linn - Wilsonville School District community shapes our children's future by generating knowledge and hope, and with tradition and vision. We envision a school learning community that allows for:

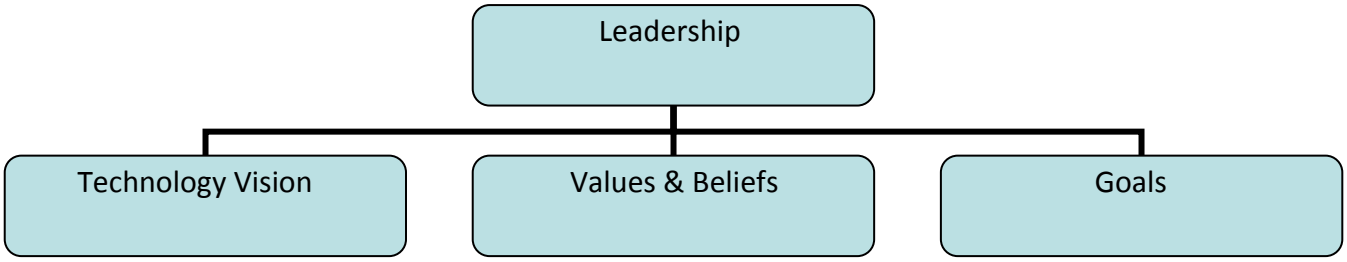
- The demonstration of personal and academic excellence.
- A personalized education to improve each and every child's performance.
- The establishment of community partnerships that expand the classroom beyond the school.
- The creation of a "Circles of Support" for each child.
- The education and development of the whole child.
- The integration of technology into our daily learning and our work.

District Technology Goal Areas

The Technology Advisory Committee includes central office and building administrators, teachers, instructional coordinators, Teacher-Librarians, the Director of Information Services, Director of Operations, Bond Manager, IT Specialists, and Student Services Specialists. Their primary tasks have been to develop and update the district technology plan and curriculum, to monitor progress in implementing strategies, and to make recommendations for revision based on current research and review. The Technology Advisory Committee reviews and informs around six major goal areas. They are:

1) Leadership
2) Stewardship and Advisory
3) Teaching and Learning for Students
4) Teaching and Learning for Staff
5) Management and Operations
6) Network System Specifications

TECHNOLOGY LEADERSHIP SECTION



Technology Vision

Leaders of technology will inspire and lead development and implementation of a shared vision or comprehensive integration of technology to promote excellence and support transformation throughout the organization. We will create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students We will promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources. We will provide digital age leadership and management to continuously improve our organization through the effective use of information and technology resources. We will model and facilitate understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture.

Technologies should be integrated through all district areas, levels, and functions; be accessible and available to all at the level and intensity needed; and, be a powerful and exciting enhancement to teaching, learning, and leadership.

Leadership goals for the implementation of the district vision are:

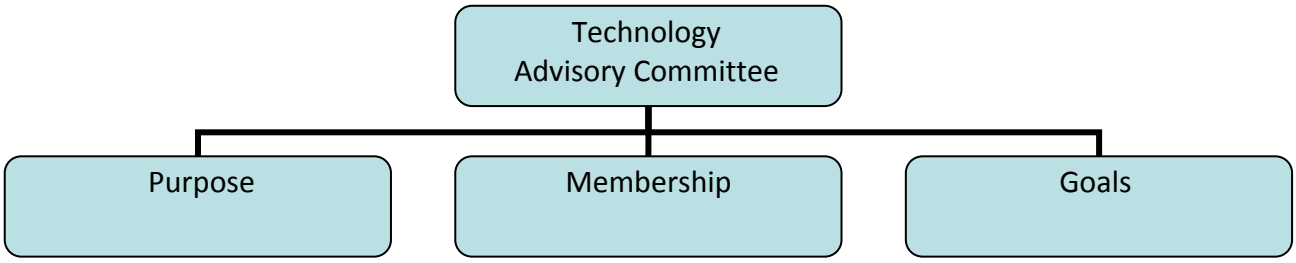
1. Empower leaders at each level to ensure that curriculum design, instructional strategies and learning environments integrate appropriate technologies to maximize learning and teaching with a focus on the National Education Technology Standards.
2. Develop a shared vision and implement a systemic plan aligned with that shared vision for school effectiveness and student learning through the infusion of information and communication technology (ICT) and digital learning resources
3. Maintain ongoing professional learning and gather, communicate and provide venues for the implementation of contemporary research on use of technologies to enhance professional practices, student learning and effective and efficient management systems.
4. Integrate the use of technologies to support productive systems for learning, teaching, administration, management, and operations and ensure equitable access.
5. Use technologies to plan and implement comprehensive systems of effective assessment and evaluation.
6. Promote ethical and responsible use, digital citizenship, and model responsible decision-making in the use of technologies.

7. Promote policies, financial plans, accountability measures, and incentive structures support the use of information and communication technologies and other digital resources for learning and in district school operations

Goals for the Use of National Educational Technology Standards

1. Improving higher-order thinking skills, such as problem solving, critical thinking, and creativity
2. Preparing students for their future in a competitive global job market
3. Designing student-centered, project-based, and online learning environments
4. Guiding systemic change in our schools to create digital places of learning
5. Inspiring digital age professional models for working, collaborating, and decision making

TECHNOLOGY STEWARDSHIP



The Technology Advisory Committee originated in 1994 as part of the stewardship of the district vision theme: **Integrating Technology into Daily Learning**. The work of this committee has been instrumental in developing, and implementing the long-range technology plan used to guide the 1997, 2002, and 2008 capital improvement efforts and have subsequently provided extensive guidance and leadership in the implementation of the plan. Activities have focused primarily on maintaining the technology vision through regular researching, progress monitoring and eventual advising and coaching district leaders to support their decision making in regards to the use of technology.

The Technology Advisory Committee has also engaged in development of the district's web pages, created software purchase guidelines, prepared hardware purchase guidelines and procedures, studied aspects of distance learning, conducted surveys of current and needed skills, and studied issues of technology support, technology standards, instructional strategies, and safety and security issues related to technology.

Statement of Purpose

The purpose of the Technology Advisory Committee has been to assist the district in setting vision and direction and in developing and implementing action plans for technology acquisition, staff development, and evaluation/assessment of technology and technology applications in the district.

Integrating Technology into Daily Learning is one of the district's guiding vision themes. As the district moves into the next generation of technology and technology standards, the Technology Advisory Committee will meet monthly to give guidance to leadership for implementing goals in teaching, learning, and professional development. The Technology Advisory Committee will actively study best practices supporting the achievement of technology standards. The advisory committee will support the development of all aspects of the technology plan with a particular emphasis on teaching, learning, and professional development.

Members

The Technology Advisory Committee includes central office and building administrators, teachers, instructional coordinators, Teacher-Librarians, the Director of Information Services, Director of Operations, Bond Manager, IT Specialists, and Student Services Specialists.

Goals

1) Meet regularly to monitor and update the implementation of the technology plan through the systematic review of current research on technological applications that enhance teaching, learning, and operations.

2) Create and support professional development programs that support the ongoing integration of the standards within the technology plan.

3) Provide guidance and support in the development and use of specialized applications as well as universal applications.

4) Develop systems to monitor progress and provide support for all students and teachers in continually improving technology and information literacy skills.

5) Evaluate annual progress toward the achievement of the standards and goals in the district technology plan with a focus on maximizing and optimizing usage.

6) Create partnerships with technology and business corporations (such as our South-Metro STEM partnership) in ways that enhance integration of technology into daily instruction and work flow.

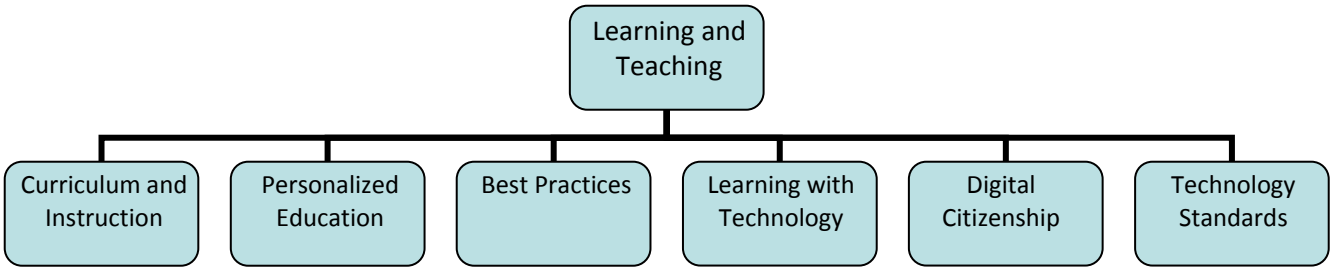
7) Develop and implement a system-wide, collaborative process to provide recommendations for annual technology plan review and budget planning.

8) Make recommendations for the planning and implementation of technologies in both the instructional and operations of the district.

9) Support the development of leadership, technical expertise, knowledge, and systems that successfully support and integrate technology into school organizations.

10) Develop guidelines for cycles of equipment purchasing and consider specifications that insure maximum life and minimal maintenance requirements.

LEARNING AND TEACHING FOR STUDENTS



Curriculum and Instruction:

The West Linn-Wilsonville Schools have a well-developed curriculum framework defined by:

- major conceptual themes
- specific content knowledge
- academic research skills
- intellectual skills for inquiry, analysis, and innovative thought

The curriculum is linked to Common Core State Standards (CCSS) and Next Generation Science Standards (NGSS) in each discipline. In each area of the curriculum the complex processes of learning is recognized with the habits and mind, mathematical, scientific and engineering practices and the literacy practices defined in the CCSS. Each discipline is mapped from Kindergarten through grade 12 for coherence. The curriculum is embedded in instruction that is both integrative and inquiry-based. In our classrooms, curriculum arising from children's questions is a way of learning and a way of teaching. It is open, flexible, and responsive to children's interests and developing capabilities. Assessment is authentic and formative, giving children the keys to their own improvement in learning.

Such an approach to learning draws upon children's concerns and questions, actively involving them in planning, executing, presenting, and evaluating a negotiated learning experience. These investigations provide meaningful and purposeful contexts in which the basics like reading, writing, mathematics, and technology are essential tools for discovering and communicating the results of a study.

Broadly, the work of learning advances children's understanding in several ways.

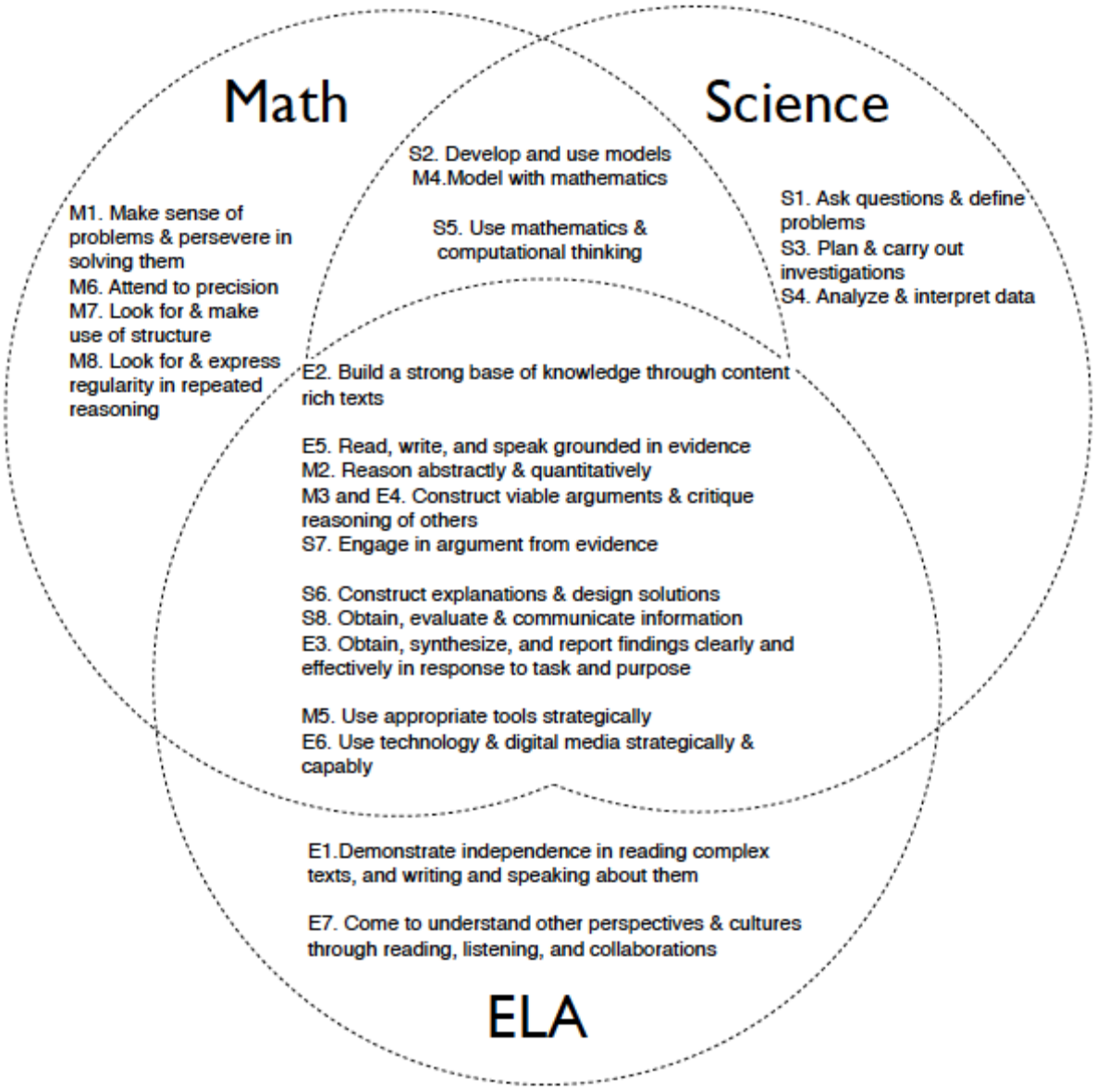
- Classroom work with technology broadens children’s experience and knowledge of the subject or area of study.
- Technology Skills are developed through which the children can control and direct their own learning, including their linguistic, numeric, and manipulative skills.
- Children build concepts that enable them to generalize, organize and relate ideas, and make informed judgments.
- Attitudes, or dispositions, which foster a growth mindset are developed, including the willingness to question, listen and observe, concentrate on a task in hand, and deal with ambiguity and complexity.
- Children learn to work individually and cooperatively, engage in multiple revisions, celebrate successes, and use their experience as springboards to further inquiry.

Instruction occurs in complex ways. After posing questions, children embark on an information search. They learn, within the context of the study, to locate, extract, record, interpret, interrogate, and integrate information leading to the construction of knowledge. With a purpose in mind, children explore organizational patterns and select formats that most closely and powerfully match their identified audience and message. They work through draft, revision, and editing phases, completing their efforts with reflection, evaluation, and presentation of their thinking.

These ideals incorporate more than simple technology skills or knowledge. Children are invited to engage in higher-order *expert thinking*. *Expert thinking* requires sustained reasoning, managing complexity, testing solutions, evaluating information, and collaborative thinking in team learning environments. Students are increasing their ability to *use computers as tools that facilitate expert thinking and complex communication.* (Levy and Murnane, 2004). Technology enables the development of learning environments in which these ideals are modeled and practiced. In these learning environments each student's personal access to technology facilitates communication, analysis, creativity, thinking, and decision-making. Educational technologies and relevant curriculum content are interwoven to create the conditions for deep understanding and powerful learning. An educational experience crafted with these ideals provides students with the key cognitive strategies, key content knowledge, key learning skills and techniques and key transition knowledge and skills that define a student who is prepared for success in college and future careers (Conley, 2012).

The convergence of the standards and practices in a well crafted interdependent curriculum are represented in the graphic in chart 1. Students practice thinking within the disciplines and making connections between the disciplines throughout the school experience.

The secret joy in work is excellence. -Pearl Buck



Toward Powerful Learning and a Personalized Education

The development of an Ethic of Excellence has a significant history in the West Linn-Wilsonville School District. Since the 1990s, the school district has been moving toward more democratic, student-centered schools. Constructivist learning engages children in a process for making meaning. Children develop personal schema and the ability to reflect on their experiences through shared inquiry. Unique outcomes are expected and encouraged as children find their passions, and develop their own voices. Assessment is integral to the learning process and most effective when children are supported in taking control of their journey toward high standards of performance, valuing craftsmanship in thinking and the production of *beautiful work* in every setting. Children increasingly learn to place a personal signature on their own learning.

This approach to learning and the redefinition of roles and responsibilities emerges from and contributes to the district vision for ***Personalized Education.*** In this environment, student achievement is soaring.

The following chart shows the movement that now exemplifies most classrooms in West Linn-Wilsonville schools.

From Traditional Classroom	To West Linn-Wilsonville Classrooms
Teacher centered instruction	Student-centered instruction
Serious, regimented drill	Challenging, purposeful, complex, joyful investigation
One perspective	Culturally responsive curriculum
Fixed Mindset	Growth Mindset
A single story	Culturally rich perspectives
Rule based tasks	Sustained reasoning, managing complexity, testing solutions
Compartmentalized instruction	Integrative instruction
Part to whole	Whole to parts to whole
Assigning work	Workshop strategies
Single sources/textbooks	Multiple resources/books/digital content
Single entry points	Multiple points of access
Isolated work	Individual and collaborative work
Passive learning	Active, inquiry-based learning
Factual knowledge based	Knowledge creation, research, critical thinking
Single way of learning	Multiple intelligences
Individual classroom focus	School/community focus
Separated environments	Inclusive environments
Autocratic classrooms	Democratic classrooms
Private work completion	Public demonstrations of learning/portfolios
Rules/punishment	Guidelines/group agreements and logical consequences

Work of Excellence is transformational.
Once a student sees that he or she is capable of excellence,
that student is never quite the same. -Ron Berger

Best Practices **for Instruction**

In West Linn-Wilsonville schools, the learning culture mirrors the new world of interactive technologies and character-based collaborative organizations. Many elements of successful corporate and public sector cultures are being transformed from the broadcast, talk-down, authoritarian model to a culture that is open, interactive, collaborative, principle-centered, and thoughtful.

Best Practices in teaching have often been debated and politicized in the United States. The West Linn-Wilsonville School District seeks to maintain coherence with *the strong consensus* among *the major professional organizations, research centers, and subject-matter groups in American education. The term "Best Practices"* is *a shorthand emblem of serious, thoughtful, informed, responsible, state-of-the-art teaching* (Zemelman et al, 2005). *Best Practices* in instruction are characterized as student-

centered, active, experiential, authentic, culturally responsive, democratic, collaborative, rigorous, and challenging. Best Practices in instruction are clearly purposeful, managing the tools, tasks and talk that bring lessons alive. Best Practices are characterized by high leverage instructional strategies, those strategies that give access to all students, are most powerful for engaging all learners, and most likely to lead to deep connected understanding.

The Common Core mathematical practices, the scientific and engineering practices, and the literacy practices defined in the Common Core State Standards describe those high leverage strategies and practices that research tells us are most likely to raise rigor while simultaneously closing achievement and opportunity gaps.

Some instructional technologies from the past worked only in one direction, to disseminate information. The lecture, broadcast TV, and commercial film are examples. The instructional technologies of the present and future are more open and interactive. Each student is an actor on the stage, a player in the game, synthesizing knowledge, creating content and interacting in powerful ways with diverse ideas and diverse people.

Learning with Technology

Technology has the potential to change the learning and the learner. In the earliest days with computers in schools, the workbook style activity was transferred to the computer format. Very little changed in the learning, in fact, research showed that basic facts practice, as it was presented in its simple form, did nothing to increase the quick recall of facts.

Technology is now widely used by our students for research, close reading and production. Students use the technological tools available to calculate, to read and write, to tap into streams of live information, to communicate with others, and to do so from school and from home.

Teachers and students in West Linn-Wilsonville schools are harnessing the power of graphic organizers for analysis and synthesis. The morphological chart formerly drawn on paper can now be transferred to a database where sorting and analysis take the student to a more complex form of thinking.

Digital video, digital music, graphic multimedia presentations are becoming common in our classrooms. When children are invited to make public presentations of complex learning, the products become exemplars for the next student, the next class. In this way, a rising standard of student performance is emerging in the learning community. These multimedia presentations have become more polished and are used more extensively with new production technologies.

Learning with technologies allows children to do what they could not otherwise do. Well designed software coaches children in mathematics. Video sources provide a window to worlds the student cannot visit, a seat in the great lecture halls of the world, and quick reference for review or expansion of concepts. Computer adaptive software allows students to explore mathematics they do not yet understand, test ideas, fail, and construct a useful understanding of the concept. Well designed writing software coaches children through the complexity of written composition. Web quests and research software link questions to resources and help students juggle the use of multiple sources in a recursive research process.

Simulation software allows children to manipulate and tweak the parameters of the variables in complex situations gaining an understanding of the principles of mathematics, science and the social

sciences. Design software allows children to take on design challenges in robotics, geometry, graphic arts, art, and architecture. Quick access to references on line allows students to read dense text with more understanding.

Assessment with technology escapes the boundaries of time, becoming timely, personalized, and adaptive. Computer adaptive assessment has greater power to yield useful assessment information for teachers to use as feedback and actionable data to aid in planning. Computer adaptive assessment, particularly in a low stakes environment, has the power to provide students effective feedback on the learning.

Digital Citizenship

Information search broadens the view from the classroom to global sources. Children have wide access to print, video, and live contact with people and places around the world. They learn to communicate with people who hold differing perspectives and prepare content to share with others around the world. Children now embrace the challenge to understand people from varied cultures and to communicate with wider audiences. They take on the challenge to evaluate sources and develop a thoughtful and discerning use of information that broadens the view capturing richness and complexity. A basis for deeper understanding comes with this wider view.

Digital citizenship compels attention to the ethical use of technologies and a strong family and school dialogue about what one ought to do with technology. Students' digital life reaches beyond classroom time into their home and beyond the school year. We attend to a process for creating the conditions for students to develop as safe and productive digital citizens. This learning advances and is nurtured by a strong partnership between the children, their parents and school. The conversation about digital safety and productive use of technologies is guided by the same values that guide other school and family behavior. Lessons at school and communication with families assist students as they consider the implications of decisions they will make with technology. In the classroom they practice citing sources, selecting appropriate language, following protocols of civility and demonstrating good judgment, respect, responsibility and courage. A coherent curriculum is defined to articulate the development from early years to more sophisticated uses of technology.

Learning Into The Future

> *We live in a time of vast changes that include the accelerating globalization, mounting quantities of information, the growing hegemony of science and technology, and the clash of civilizations. These changes call for new ways of learning and thinking in school, business, and the professions.* -Howard Gardner

Gardner suggests five capacities, five minds, needed by professionals in the future:

- *The disciplinary mind* – mastery of major schools of thought (including science, mathematics, history) and of at least one professional craft.

- *The synthesizing mind* – ability to integrate ideas from different disciplines or spheres into a coherent whole and to communicate that integration to others
- *The creating mind* – capacity to uncover and clarify new problems, questions, and phenomena
- *The respectful mind* – awareness of and appreciation for differences among human beings
- *The ethical mind* – fulfillment of one's responsibilities as a worker and a citizen

To prepare children for the world they will inherit, the learning experiences we design for them should cultivate facility with the major disciplines. Students should be invited into integrative and creative thinking within and between disciplines. Students' experiences at school and in their wider life should develop the skills and dispositions to use ideas and information for worthy purposes to accomplish *beautiful work*.

A Convergence of Standards

Our schools are educating learners to be technology-capable and information-literate digital citizens. We are educating children to be literate readers, writers, researchers, and creative and critical thinkers. We are educating children to be capable mathematicians and scientists. Schools live, learn, and work in an increasingly complex and information-rich society where Standards for students are defined by the Common Core State Standards, The Next Generation Science Standards, the National Educational Technology Standards, and State standards in the Arts, Social Studies, World Language, Physical Education and Health.

The STEM/STEM construct emphasizes the natural interconnectedness of four disciplines, Science, Technology, Engineering and Mathematics. The connections are made explicit through real and appropriate contexts integrated into instructional practices, curriculum and assessment. Addressing challenges and solving complex problems with critical and creative solutions is the heart of the STEM/STEAM movement.

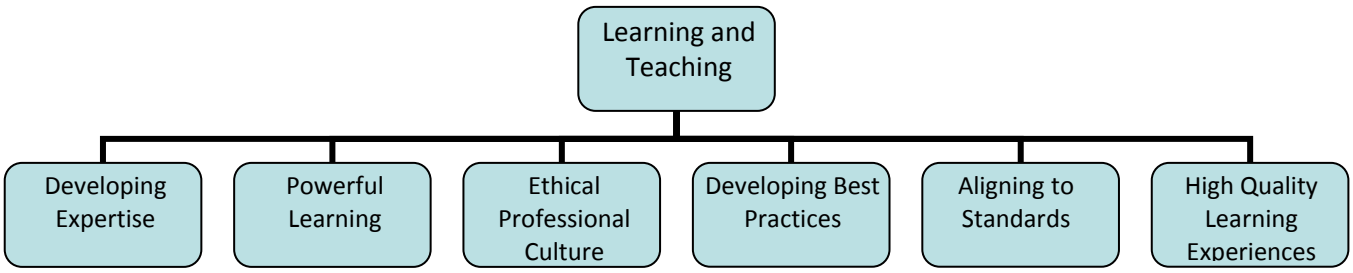
Attached in Appendix E is the district STEM/STEAM Education Overview and Framework.

LEARNING AND TEACHING FOR STAFF

PROFESSIONAL DEVELOPMENT

Too many organizations have spent too much time obsessing on the information they want their networks to carry and far too little time on the effective relationships those networks should create and support.

- Michael Schrage, MIT



Our Strength Lies in Learning Expertise and Teaching Expertise

Professional development in The West Linn-Wilsonville School District is both generous and engaging. It is based on the strength of each staff member to demonstrate Learning Expertise and Teaching Expertise. Staff members demonstrate *Learning Expertise* by continually refining skills and attitudes, practicing self-monitoring, and finding ways to avoid plateaus in his or her own learning. *Teaching Expertise* cultivates the ability to create conditions for learning for all students (Fink & Markholt, p.9-11, 2011).

Staff members are invited to participate in rigorous collaborative learning experiences that take on many forms and formats. Graduate level studies, studio and lesson study, essential readings discussion groups, cohort studies, new teacher study groups, action research projects, district-wide sponsored speakers and symposiums are some of the most powerful formats. These staff development opportunities engage teachers in wide and ongoing conversation about high leverage instruction, powerful assessment, effective feedback, school and classroom culture, equity of access, deep content, and culturally responsive instruction. These studies link members of the learning community to the mission of the school district and the important goals that define the district theory of action.

Professional development is designed with each teacher setting out professional goals. Each year, the teacher and principal agree upon professional development goals to advance teacher learning. The professional goals coordinate with the school goals and contribute to the goals of the school district and the state of Oregon. The goals are written in terms of impact on student performance.

Professional development offerings are designed to create a strong professional culture, characterized by value for growing teacher expertise. In the professional culture of the district, teachers are invited to go where their questions lead. Teachers operating on the edge of their own learning provide leadership for the entire professional community. In this culture of inquiry, teachers ask questions

about and grapple with the significant issues of technology in student learning. Far more than simple courses about how technology works, the emphasis for professional development in technology is on the changing role of the teacher, the active role of the learner, and the interface between technology and daily learning. Annual goals for certified staff address how the teacher will adapt to the new teaching and learning environment that is fostered by technology with information literacy and digital citizenship as a core concept.

The *Professional Teaching Standards*, defined by New Teacher Center, and *The Five Dimensions* from Center for Educational Leadership provide useful structures for thinking about teacher development. The *Professional Teaching Standards* define the teacher's responsibilities in six areas: engaging and supporting all students in learning, creating and maintaining effective environments for student learning, understanding and organizing subject matter for student learning, planning instruction and designing learning experiences for all students assessing student learning, and developing as a professional educator. The *Continuum of Teacher Development* is a tool for teacher reflection, for coaching conversations, and for formative assessment of a teacher's level of practice. Teachers and principals are using this framework to understand the dimensions of practice that contribute to strong learning and teaching. The new Professional Growth and Evaluation system is founded in these standards. *The Five Dimensions* framework provides a tool that allows teachers and principals to dive more deeply into purpose, engagement, curriculum, pedagogy, assessment, and classroom culture. This framework provides questions to lead the professional inquiry toward greater levels of instructional effectiveness.

The Common Core State Standards (CCSS) and Next Generation Science Standards (NGSS) define practices for disciplinary thinking that teachers use to ground every course and lesson. These practices and habits of mind deepen meta-cognitive processes and strengthen the opportunities students have to think deeply about the themes, trends, and crosscutting disciplinary concepts bringing meaning to their studies.

Toward Powerful Learning

Effective learning for the staff parallels the elements of learning and teaching for students.
The learning environments described in the section on **Learning and Teaching for Children** are both capital-intensive and people-intensive. The widespread infusion of technologies calls for a significant capital outlay. But, boxes and wires do not educate. Integration of technologies creates a compelling need for more highly educated teachers – teachers who know how to personalize student learning. Peter Drucker suggests that we are in an *Age of Learning*. In this *Age of Learning*, he asserts, technology can do some of the simpler tasks so that teachers are free to do what teachers do best – to attend to the intellectual, emotional, and ethical development of the child. Teachers choose technologies to do the more simplistic tasks once required of teachers. More importantly, teachers select technologies that provide integrative learning opportunities that were not previously available.

Teaching in this way is complex, sophisticated, challenging, and intensely intellectual work. The role of each individual teacher has become extraordinarily significant. Successful teachers are those who prepare for their students, not just for their lessons. Successful teachers are more skillful in knowing

and understanding individual learners. Successful teachers respond to diverse learners with varied culturally responsive approaches to instruction. Each teacher has a range of strategies and is able to choose the strategy to fit both the content and the learner. Teachers prepare student-centered, divergent learning experiences that draw each and every student to high standards of performance. Teachers in this *Age of Learning* work from student strengths rather than focusing on the weaknesses. Effective teachers carry the belief that every child can be successful. This mindset leads to a reorientation of teachers' role and disposition toward teaching.

Highlight my strengths, and my weaknesses will disappear. Maori saying.

An Ethical Professional Culture

A vibrant collegial culture takes advantage of formal learning teams, natural collaboration, and differing expertise.

Learning teams for adults, as for children, mean that people have formal connections defined by assignments, roles, and responsibilities. The development of the skills of team learning is a deliberate focus. Teams are developing collective responsibility for the success of each member and of the whole team. Teams reflect on their work and in the planning process ask themselves, "How could we make this better, stronger?" The *Culture of Critique* and the skills of teaming are being taught and practiced through dialogic processes, studio and lesson study, action research, critical friendship techniques, dialogue, and varied protocols for group inquiry.

Natural collaboration for adults, as for children, means that people work together in varied and flexible groups. Everyone comes to the table, the task, or the discussion with a unique interest and piece of the truth. Natural collaboration requires openness, respect, a relentless drive to improve, and an unlimited capacity for inquiry.

Differing expertise is a concept that recognizes the unique contributions of each learner. Different questions, different experiences, different lenses through which one makes meaning all contribute to differing expertise. When adults working together recognize each other for their differing expertise, a rich culture of collaboration develops.

The West Linn-Wilsonville School District is uniquely prepared to support the requests of a single teacher or a group of teachers who identify an interest or staff development need. The tuition reimbursement format, the PDC grant format, staff development days, summer curriculum time, and grant money from several federal grants, all are designed to be responsive to teacher staff development needs.

Developing Best Practices

Professional Development is designed with the following components of effective professional development in mind.

- Development and practice close to the classroom
- Connection to student learning
- Developing disciplinary expertise and content knowledge
- Hands-on technology use
- Curriculum-specific applications
- New roles for teachers
- Collegial learning
- Active participation of teachers
- Ongoing process
- Sufficient time
- Technical assistance and support
- Adequate resources
- Continuous funding

Teachers in the West Linn-Wilsonville School District are engaged in the study of many critical issues. Some of the current topics are referenced in the list below. Each of these study areas has an implication for and connection to integrated use of technologies.

1. Mathematics
    a. Algebra Structures
    b. Math Best Practices
    c. Productive Mathematical Collaboration
    d. Growth Mindset
    e. Common Core Standards and Practices

2. Science
    a. STEM and STEAM
    b. Engineering
    c. Contextualized Field Study
    d. Student research
    e. Sustainability
    f. Growth Mindset
    g. Next Generation Science and Engineering Standards and Practice

3. English, Language, Literacy, Social Sciences
    a. Culturally Responsive teaching and materials
    b. Writing
    c. Close reading

d. Common Core Standards and Practices
e. Growth Mindset
f. World Language and culture for all students
g. Educating Emerging Bilingual Children
h. Best practices instructional strategies in the regular classroom
i. ELD Through Content
j. English Language Development
k. Dual Language

4. Educating children with Special Needs
   a. Best practices instructional strategies in the regular classroom
   b. Growth Mindset
   c. Circles of Support for all children
   d. Intensive Expert Instruction in Reading
   e. Intensive Expert Instruction in Writing
   f. Intensive Expert Instruction in Mathematics
   g. Intensive Expert Instruction in Social-Behavior
   h. Special Education

Aligning to Standards

The emphasis at the district level is to increase attention to the role of technologies in integrative student research, mathematics and science inquiry, and deep literacy learning. Staff development is designed to address the national technology standards for students, teachers, administrators, and libraries in technology and information literacy. These standards documents are included in Appendix A.

1) ***Technology Educational Standards for Students***
2) ***Technology Educational Standards for Teachers***
3) ***Technology Educational Standards for Administrators***

Through coursework and professional development experiences, the district is supporting the implementation of High leverage Instructional strategies. In this culture, teachers are expanding their expertise, tapping into the research base, adopting a scholarly approach to professional improvement, practicing with colleagues, and developing the natural collaborations that take advantage of brilliance within the learning community.

Diverse Training and Learning Opportunities

The district hosts a "Teaching and Working Summit" in the summer just before school begins. The summit is a full-day event of 45-60 minute sessions covering technology tools and resources as well as their integration into the Teaching, Learning, Administration, Curriculum, and Assessment of the district.

The structure and content of the event is determined based upon feedback received from teachers and administrators via electronic survey as well as from anecdotal conversation and the leadership of the district. Teachers are asked what topics they would like to attend and are also asked what sessions that they may be able to teach. The T&W Summit schedule of sessions is developed by the IT Director.

Additionally, each school – through the school leadership team – provides regular on-going training opportunities for all staff throughout the year. Although the specifics are slightly different, each school offers these workshops and trainings approximately every few weeks.

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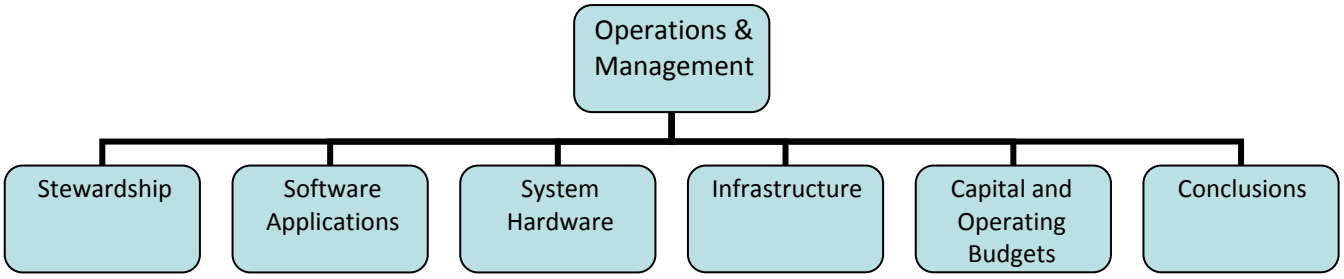
OPERATIONS & MANAGEMENT



The "business" of operating and managing a modern high-performance public school system requires the professional application of technological tools at a level equal to or higher than that associated with any successful business enterprise.

To support necessary and expected educational and curriculum goals, school districts must create and implement basic business strategies including but not limited to the areas of:

Finance	*Personnel*	*Inventory*
Printing & Publishing	*Technology Infrastructure Management*	*Food Service*
Transportation	*Geographic Distribution*	*Data Management*
Facility Management	*Energy Conservation*	*Environmental Safety*
Capital Construction	*Public Law*	*Public Relations*
Communications		*Student Records*

These fundamental imperatives must be carried out in the most efficient and effective way possible. Advanced technology, as a tool, provides the best, and possibly the only, means by which the public's business can be routinely assured.

This section of the Technology Plan, therefore, responds to these elementary needs by laying the framework, aside from, but not totally independent of, the educational goals associated with public education.

Stewardship Goals

The term "stewardship" best describes the role the district plays in operating and managing the district's technological assets. The following goals support that notion:

1. Construct and maintain technology systems that support and enhance learning.
2. Create technology-based solutions to efficiently manage daily operations.
3. Identify and resolve network system inefficiencies.
4. Develop effective funding strategies and budgets to support operational and long-term Technology Plan goals.

Software Applications

Each of the various operational functions of the school district relies on technology to carry out individual department goals in coordination with the district wide vision. Many software components are readily interchangeable between departments and between operations and instruction.

In some cases however, software is not compatible, or applications are specialized for the intended purpose only. Examples include:

- Boundary software that enables forecasting and planning for school attendance boundaries.
- Direct Digital Control software that monitors, manages, and troubleshoots all HVAC equipment district wide.
- Inventory software that manages and records district moveable assets.
- Food Service software that keeps track of lunch tickets and accounts receivable.
- Scheduling Software for extra-curricular and Community Ed building use.
- Student Information Databases for Attendance and Grading, Special Education Tracking, and Standardized Test Score Tracking.
- Project Management software for maintenance and capital construction.
- Work Order software to manage and record daily maintenance activity.
- Variety of financial, personnel, and business programs tailored to specific functions.

Each of these applications requires a process for purchasing, training, daily usage, licensing and upgrading over time. Budgets to support current applications as well as future opportunities must be accommodated.

System Hardware

Similar to software applications, in some cases specialized hardware is necessary to carry out non-instructional functions. Examples include:

- Computers with exceptional speed and/or memory (PC and/or laptop)
- Application software specific computers
- Mobile devices to manage personal time and resources
- Digital photo and video equipment
- Projection devices
- Telephone system hardware components and handsets
- Cellular telephones
- Paging devices
- Security system hardware
- Fire alarm system hardware
- Public address system components
- Sound amplification and distribution systems
- Copiers, fax's, printers, routers, servers, monitors, etc.

Each of these hardware devices serves a specific purpose, increases safety and greatly enhances the educational experience of students, as well as the productivity and effectiveness of district staff.

Infrastructure

Related to all technology is the built environment in which it is installed and operated.

Furnishings, floor space, voice/data/video connections, electrical power and cooling/ventilation are necessitated by each hardware purchase.

Architectural Design and Construction

Since 1989, the district has been in an almost constant state of construction due to increased enrollment. For this reason, the district has become fairly sophisticated in regard to contemporary design for K-12 educational facilities and has led the Pacific Northwest in cutting-edge design. A significant amount of energy and time has been devoted to integrating technology into the architectural design of all buildings, whether new or remodeled.

Classrooms, Libraries, Offices and general building spaces have been designed such that technology is a central theme. Examples of successful building design that supports technology based curriculum includes all district libraries. Lowrie, Trillium Creek, Inza Wood, Athey Creek, Boeckman Creek, Cedaroak Park, West Linn High, Wilsonville High, Rosemont Ridge and Boones Ferry all take advantage of classroom pods clustered around versatile technology-friendly "porches" that facilitate collaborative teaching and learning.

As the district expands and is renovated, unique and innovative architectural design solutions that respond to technology use should continue.

Data Cabling

Generally, the district has an adequate data and telephone-cabling network. The demands of current applications into the future will continue to put a strain on the existing capacity though. The need to update the main in-building backbones of the buildings with higher capacity and throughput is upon us.

Although the district is currently wired for most applications and is reasonably flexible in terms of location availability, installation and/or relocation of data/voice port connections is fairly routine. In many cases, the district currently uses private contractors to make these changes.

Wireless Networking

Wireless access to the system is in place throughout all district facilities. The Wifi system currently consists of local wireless network controllers in each building and a distributed network of Wireless Access Points (WAPs). There are currently well over 300 WAPs deployed around the district's facilities. The wifi network uses a combination of the 802.11a, b, g, and n standards. While adequate at this time, the reliance on wifi networking is exploding at a very high rate. We will need to deploy additional WAPs – perhaps doubling or even tripling the quantity – and we should take advantage of the newly adopted 802.11ac standard that brings increased throughput and stability.

Wide Area Network

The district's local area networks are interconnected via Gigabit wide area circuits provided by Comcast. These circuits support all data and voice traffic in the district. With some intergovernmental

agency coordination, we hope to be able to tap into the county dark fiber project to replace our current service. This will include some costs to make the last legs of connections. It will also mean the need to update some electronics in our schools to connect into these new connections. The monthly costs of this ongoing WAN service should be dramatically reduced as a part of this, even as we take advantage of the dark nature of the fiber to increase the bandwidth with minimal costs into the future.

Electrical Power

All locations have new adequate line-power electrical entrances. Internal distribution in the older schools remains problematic; however, the addition of circuits and receptacles is achievable. The district does not have an electrician on staff and therefore must contract for all electric technical installation.

Heating/Ventilation/Air-conditioning

As of 2013 all of the fifteen schools and three support facilities in the district are new enough, or have been upgraded such that heating, ventilation and air-conditioning (HVAC) systems are adequate to sustain the heat loads produced by the technology equipment.

Intercom Systems

With recent current events, the need to be able to address the entire school, or portions thereof, has become heightened. While our phone systems provide some ability to perform this function, they are simply not adequate in many cases, sometimes simply due to volume. Also, where no phone exists or a space is large, a single phone cannot get the attention of everyone in the vicinity. Our middle and high schools (except for Arts & Technology High) have these building-wide, overhead intercoms, but we recognize the need for these systems in the primary schools as well. Integration of these systems with the phone systems, so as to be able to make announcements from anywhere inside or outside of the school is also important.

Cell Phone Coverage

The district, like many agencies, has become increasingly reliant on cellular phone communication in order to handle a wide-variety of activities. Currently, there are pockets of cell coverage issues throughout our schools. This particular technology also assists in communications for emergency service providers (police, fire, etc). We are working with providers to increase this coverage via strategically located towers, but may need to install DAS (Distributed Antenna Systems) within some locations in order to provide adequate coverage.

Capital and Operating Budgets

Fiscal 2001-2002 was the first year the district identified specific budget line items for technology. The operating budget includes funding for technology support personnel, supplies and materials, and minimal equipment replacement due to failure. In Fiscal 2004-05, additional funds were budgeted for expansion of the tech support staff. In Fiscal 2005-06, additional budgetary items were added for software license renewal.

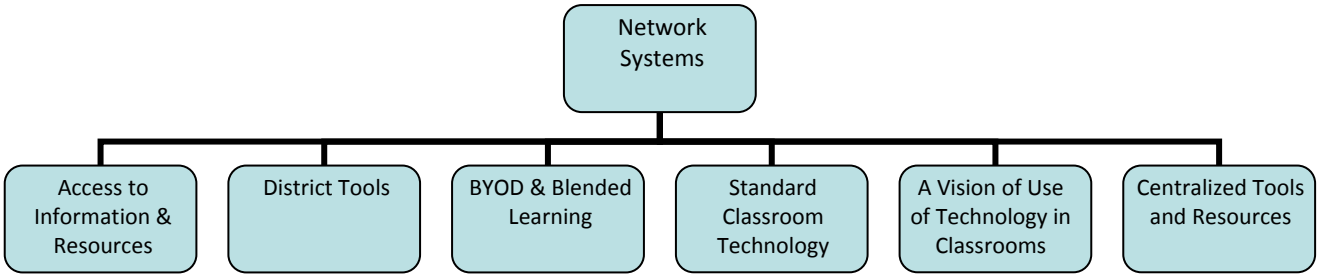
Capital funds come to the district primarily through local bond elections. The 1997 bond provided the infrastructure and some of the hardware/software components in use today. Major upgrades to those components began in 2003 via funds from the 2002 bond with district-wide refreshment between 2009-2012 from the 2008 bond. As is typical of all technology, obsolescence is inherent in the industry. As the district expands in both enrollment and capacity to use technology, capital funds for upgrades, enhancement, expansion and system component replacement will be necessary on a regular basis.

Conclusion

A "systems approach" requires stewardship of the district technology plan in all areas that support education; from academics to support services. Creating, funding, and implementing flexible strategies to maintain and expand these services is imperative; and will assure success for generations to come.

Recognizing that the School District is a multi-million dollar business that is held to the highest level of accountability for both public assets and quality of children's education, "technology" and its successful application is primary to honor and maintain the public trust.

TECHNOLOGY NETWORK SYSTEMS



Access to Information and Resources

It has been argued that access to information and resources levels the playing field of educational opportunity. Students who are deprived of this access suffer from limited exposure to information, especially that of differing viewpoints. In a very real sense, we all have the ability to carry the enormity of access to virtually any piece of information in our pocket. Think about that – the resources of the Library of Congress at your fingertips. And yet, it is actually even way more than that. In our society, anyone with the right tool can access just about any piece of information desired and often within seconds.

Where the labor of that information retrieval consumes valuable time and energy, there is an inability to raise education beyond algorithm processing and information recollection. However, where the barriers to that information are removed, deeper analysis and synthesis of information can be achieved, additional points of view can be accessed and scrutinized, and collaborative opportunities can widen perspective and connections.

In order to reach these realities, students and staff must have access to the tools needed and also must have access to connect. The infrastructure as outlined in the previous section of this plan provides stable, high-speed access within our buildings.

While the district has some limitations in terms of our ability to provide online access in the home, we will attempt to influence and coax those who can help bridge this divide to do so, especially for those in need. That may include service providers themselves but also municipal and county governmental agencies and perhaps even providers of low-income housing locations.

The prophecy of every student having access to a device when and where they need it is not new. This has been the vision for years. However, it is only recently – perhaps accelerated by the power of personal, mobile technology – that this as a potential reality has been achievable. At the same time, Internet access is also spreading. Technology tools and the resources that are made available by them are increasingly ubiquitous and transparent.

When technology is deployed in a 1-to-1 fashion, the power of serendipity and immediacy can take effect. The power of having a question now, and being able to pursue that question now cannot be overstated.

With a technology tool in-hand, students can also become more active in their education. Consider the task of reading a chapter in a book. With hard copy, the student is constricted by the media. We have

developed lots of strategies to become a more active reader. For example, students learn to use context to build vocabulary.

However, with a multi-purpose tool in hand, a student can actively access multiple definitions of a word and beyond. Imagine reading a passage that refers to the Leaning Tower of Pisa. Within a few clicks, students can access a picture of it along with some quick facts. These insights bring deeper meaning and relevance to the original text.

In the science classroom, experiments can be simulated by simply adjusting variables. More simulations create better insight.

In the social sciences, students can access varying viewpoints. They can research the history of a situation and gain deeper understanding.

In the math classroom, technology can bring greater synthesis to the application of the theories being learned. For example, we can be told that linear algebra is actually the basis to most computer animation, but with a technology tool in hand, they can be given tasks that cause them to manipulate the mathematical model to create specific results in an animation.

In Wellness, students can track their diet and exercise habits in order to influence their physical well-being.

Technology allows the engineering in STEM to come alive. When posed with a real-world problem – for example, program this robot to navigate through a maze of unknowns – the significance of doing something real causes the learning to come alive.

The research and inquiry aspects provided by access to technology are clear as well and so too are the communication and collaboration opportunities provided by these resources.

Near real-time assessment tools, like NWEA MAP, provide the opportunity for quick results to be obtained and discerning teaching adjustments to take place.

The debrief of our Studio Classroom projects often bring forward some aspect of the classroom experience that was either enriched by the insightful deployment of a technology resource or that could have been.

The possibilities are endless. Teachers need to come to understand these types of activities and others like them, and then allow/encourage them to be appropriately and masterfully used in their classrooms. As a district, we will continue to provide opportunities for our staff to learn of these types of activities from experts, but also from ourselves. As a leadership group extending to include the IT staff and Teacher-Librarians, we will foster this environment of exploration and innovation. While there may certainly be value to doing some things the “old way”, access to technology opens new opportunities.

The focus is on the experiences and outcomes that lead to better teaching and learning through inquiry and synthesis.

It is important to note that this plan is not about the technology itself. While much thought needs to put into the selection of devices, it is not the device that should drive this. The improvement and

enhancement of the pedagogical practices in the classroom that enhance the educational experiences of students toward the achievement and surpassing of initiatives like the Common Core Standards or the Next Generation Science Standards is the ultimate goal.

District-Provided Tools

While an environment of self-selected tools has some power, it is clearly preferable in the educational arena to have conformity and consistency of device and the abilities they provide. For example, if you have various devices and form-factors in play, a simple instruction such as "Turn to page 37" can mean vastly different things depending on the pagination methodologies of the particular tool.

In order to achieve this consistency and conformity of device, we plan to provide these devices to our students.

As things stand, our current student to computer ratio is nearly one-to-one in terms of sheer inventory and tallies. By comparison to most of our neighboring districts, this ratio is quite good. However, the age of our devices is an issue that limits this potential.

This is also wanting in that specific devices for specific purposes are not available when needed. For example, a school with 280 students, 250 PC computers, and 60 Macintosh computers would seem to have enough to accommodate everyone with a device. However, when movie editing is the desired task, there may simply not be enough of the preferred device (Macintosh computers) available. And, despite occasional thoughts to the contrary, there is a difference in some devices' abilities to perform certain tasks.

Even as students have access to a device dedicated to them, there will be times when other devices are needed for specific tasks and learning activities. So, while numbers would seem to indicate that a computer/device per student should be "enough", even that is simply not true.

As we move ahead, we intend to pursue:

- One-to-one deployment models of devices to students
- Lab-based solutions for certain activities
- Update/replace core teaching and office systems
- Updates to the infrastructure of the district to keep the core system robust and stable

Our intent is to have 3 rollouts of technology tools over the next 6 years. The first would occur in school year 2015-16 with subsequent purchases in summers of 2017-18 and then 2019-20. The specifics of each will be determined just before the actual purchases. In this way, we are most able to capitalize on the latest technological developments. However, in an effort to provide some insights as to the possibilities, a purchase in 2015-16 ***might*** include:

- Enough tablets to cover an entire grade level of students (or multiple grade levels)
- Sets of full-size traditional laptops (for standardized testing or other needs that would be best performed by specific abilities) for each school
- Replacement/updating of approximately 1/3 of core teaching systems
- Upgrades to the wifi system in our district

BYOD – A piece of the plan, but…

Our plan, as laid out in this document, will not rely on BYOD to achieve our goals. However, we will continue to allow personal devices into our environment within the guidelines of the individual school and classroom so long as they do to not cause issues to the educational or technological environment.

We must be clear in our expectations about personal devices at school. In particular, students and families must understand that use of the tool should be safe and appropriate to their education. Students who bring their devices to school must understand that the devices may be confiscated and reviewed at any time by school staff. Students are responsible for the security of their device. Students must also understand that they should always follow the instructions of teachers and staff regarding the use of personal technology.

As we partner with parents, we ask that they take an active role in making sure that technology brought to school does not contain information or data that could be disruptive to the learning environment.

Blended Learning

Our buildings are constructed with learning porches, living rooms, and spaces that allow for various types of groupings and projects. This works well in a technology-rich environment in which varying and evolving tools necessitate different settings. It has also further opened the door to various forms of blending learning environments.

A blended learning environment is a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path, and pace, AND at least partly at a supervised brick-and-mortar location away from home. Of significance here is that a blended learning environment is not a virtual school, at least not entirely.

In our schools, we have many variations of blended learning environments. At the younger ages, the educational environment is largely teacher driven and organized. Technology use is purposeful and periodic. As students get into the upper primary grades, they use technology tools more often and productively. Open-ended projects that incorporate technology begin. Students use technology to produce products of their learning.

As students enter middle school, technology begins to be used for more personal organization, a skill that is difficult to learn. They continue to use technology to perform research and produce products. However, they also begin to use technology tools to organize their contacts, maintain to-do lists, keep track of class assignments, and maintain a personal schedule. Students engage in peer review and collaborative activities using a variety of tools.

As we evolve into this more personalized technology world, our systems will adjust. We will take advantage of various online tools to help us deliver materials and communicate, and capitalize on the learning moments to discuss confidentiality and security of information. These tools might very well include RosettaStone, GoogleApps for Education, Edmodo, Moodle, and various others as well.

As mentioned in previous sections of this plan, students need to understand the concepts of Digital Citizenship, in its various domains. Students need to learn how to be safe. They also need to learn how to perform intricate web searches and be able to critically scrutinize sources. They need to be aware of copyright. They need to understand the etiquette of online collaboration. Students should realize that they can leave a digital footprint. We are using a resource called "Common Sense Media" (www.commonsensemedia.org) to help us develop a scope and sequence that will steer us further down the road as outlined by the ISTE Standards.

In this new environment, the value of teachers will be heightened. While students will have more access to data and information, they'll still need direction in creating meaning from and interpreting the value of this information. Teachers will need to stay with students as they explore topics and materials that are sometimes new to the teachers themselves. They will need to help students at the learning moments that occur. They will need creatively frame inquiry and help students establish pathways for learning. The effective, innovative teacher will be willing and able to adjust and adapt as new opportunities become available and understood. The teacher's ability to continually assess the effectiveness and availability of these tools will be paramount.

Standard Technology for all Classrooms

The typical classroom will have access to the following technologies:

- Data Projector
- Document Camera
- Phone
- Digital Camera
- Computer (at least one)

While we have occasional desires to mount equipment (projectors, sound systems) in rooms, we have come to discover that the need for the classroom to remain a flexible space, including the use and placement of the various technologies, makes permanent mounting solutions not as desirable as might be expected. Permanent mounts somewhat limit the ability to upgrade equipment in place as mounting locations may or may not be correct for the next generation device.

Many of our schools have wide-scale deployment of end-user devices in the classrooms themselves. This has proven to allow for serendipitous learning opportunities and also to further understand the usefulness of the device itself.

We also have schools that use carts of laptops or tablets to accomplish classroom tasks. This model allows resources to be pooled to provide access to full classes and, like the classroom deployment model, has also been effective but for slightly different uses.

A Vision of Use of Technology in Classrooms

In every classroom in the district, the teacher has a multimedia capable setup that includes projection of computer images as well as still and motion video on a display at least 60 inches in diagonal size. The room has adequate speakers for ease of listening and appropriate volume. Wherever possible, wireless technology is employed so as to reduce clutter and potential hazards.

Our core technology system is robust and strong. We are the only district in the area that provides students with network personal and shared storage space. Students, like many adults, are at least occasional creatures of “re-creation”. This means that students often pick up something that was worked on in the past and modify it. In this sense, they are being “re-creative”. The ability to access documents and projects from prior school years can be very valuable. And, as anyone who has changed devices over the years or suffered from accidental loss of information, storage on mobile devices themselves is sometimes unstable and occasionally problematic.

So, we will continue to provide personalized, centralized storage to our students and staff and will encourage its use for permanent storage. We acknowledge that having access to your data right on your device is often more convenient especially since Internet access, while increasingly pervasive, is not yet ubiquitous or necessarily fast. Being able to store documents and data on our system provides the security of it being backed up and also provides a method of sharing between users and potentially between an individual user’s many devices.

Our unique WLWV Cloud along with its related tools allows Macintosh and PC computers access to these locations. Third party tools allow similar access to these systems from iOS and Android devices as well.

Every student has a district provided email account. Students can print things in both color and black-and-white. Teachers can distribute notes, worksheets, and other materials to students in their home directory and then collect it back. Teachers can email their entire class with a single address. Teachers can email all parents of the students in their class with a single address. Schools send periodic newsletters and announcements to the students and to the homes via email.

As we go further down the road of one-to-one computing, students and staff will focus less on the technology itself and more on the educational benefits it allows – collaboration opportunities, access to information, the ability to collect data in real-time, the reality of real-time documentation of processes and steps, and much more.

Some shared spaces will continue to have desktop computers available. These spaces may be used in a variety of ways, much like they are now. However, they will not be dominated by entire class usage as is often the case as things currently stand.

Our phone system includes wired, VoIP-based phones in every occupied room of the building with some additional in shared office spaces. The phones integrate with the computer network so that a computer with microphone/headphones could become anyone’s phone as needed or desired. Phone system changes, modifications, and additions are managed by our IT staff via a web-based configuration system.

Our video system will continue in its latest incarnation as an IP-based solution as well. Old style TVs, VCRs, and other similar equipment will naturally become less-used, but some will remain so as to allow the use of older sources.

Access to our resources will be 24 by 7 by 365. This is accomplished through redundancy of systems, connections, and power supply. Access to our licensed services is available via VPN access into the network thus allowing an outside computer to be accessible as if it were inside the network. File Servers are centrally located and managed taking advantage of virtualization technologies to reduce power use.

Centralized Technology Tools and Resources

As we expand and enhance our use of technology, our reliance on stable networking will continue to explode, especially in the wireless technologies. Our heavy reliance on our core server environment will be lessened as devices become more personal and the servers are increasingly focused on storage.

Our main links within our buildings need to be expanded as may be the case with the links between buildings and out to the Internet as well. We will continue to monitor this usage and already have begun plans to expand this access.

We will also be looking to retire some older equipment that has reached the end of its useful life. In a few cases, we will be replacing the equipment and system with newer hardware and software that is both more feature-rich and less expensive. In other cases, the systems will be discontinued.

Safety is always a paramount focus of our schools, and technology's role in that focus is even bigger than it ever has been before. Our need to communicate within our schools has never been higher. Many of our schools have only the phones to serve as their intercom system and many have no reliable cellular phone coverage.

We are looking at both short and long term solutions to both of these issues. We are exploring alternative intercom systems as well as attempting to quantify and fully comprehend the extent of our cell coverage issues.

As is always the case, we continue to pursue the most complete use of the systems that we already have as well. From our projectors and document cameras to our websites and email systems and everything in between and beyond, we are always seeking to exploit the full capabilities of all of our systems.

We continue to reap the benefits of core system upgrades invested in as part of the 2009 bond:

- Our virtual file server environment and SAN has kept us nimble and able to deploy new systems very quickly and at minimal expense
- Our core network electronics continue to run well and at necessary speeds

While our current technology has allowed us to explore the one-to-one environments and will continue to do so for another year or so, we will need to engage all stakeholders in helping us to achieve the one-to-one environments that we believe are the future, even as those end-user devices begin to reach obsolescence. Key partners in this are local parent-teacher organizations. As these organizations fund-raise for the various initiatives at a school, we ask them to help us pursue this one-to-one environment, especially in an ongoing sustainable way.

The Need for Ongoing Support

The district currently has approximately 5,000 computers in total; roughly 750 of those are primarily used by staff which leaves about 4,250 that are used primarily by students. There are about 1,250 desktops and 3,750 laptops. There are also an ever expanding number of iPads as well. At the time of this document, that number was approximately 750. There are about 475 data projectors and 450 document cameras. We also have nearly 800 digital cameras.

There are several important things that we have done that make such an inventory of equipment continue to thrive:

1. We have an outstanding staff of well-versed IT support people,
2. We have held strong to hardware and software standardization whenever possible,
3. We maintain a hard drive imaging system which dramatically reduces implementation timelines and support demands, and
4. We have had stability and consistency in our system.

Our frontline IT support staff of 8 full-time employees supports our 5,000 computers. In the industry, the preferred computer-to-tech support ratio is approximately 60-to-1. According to Justine Nguyen of CNET, in extremely efficient environments, this ratio can approach 125-to-1. In WLWV, this ratio is over 600-to-1. As a package, the strategies outlined above have allowed us to expand our system without increasing our IT staff even while keeping it functional and thriving. The size of our support staff, however, may need to expand as we make these leaps forward, especially in needing to help with a wider variety of devices and resources.

APPENDIX A

ISTE-NETS-S

International Society for Technology in Education
National Educational Technology Standards – Students

- Creativity and Innovation

  Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

  a. Apply existing knowledge to generate new ideas, products, or processes
  b. Create original works as a means of personal or group expression
  c. Use models and simulations to explore complex systems and issues
  d. Identify trends and forecast possibilities

2. Communication and Collaboration

   Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
   b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
   c. Develop cultural understanding and global awareness by engaging with learners of other cultures
   d. Contribute to project teams to produce original works or solve problems

3. Research and Information Fluency

   Students apply digital tools to gather, evaluate, and use information.

   a. Plan strategies to guide inquiry
   b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
   c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
   d. Process data and report results

4. Critical Thinking, Problem Solving, and Decision Making

   Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

   a. Identify and define authentic problems and significant questions for investigation
   b. Plan and manage activities to develop a solution or complete a project
   c. Collect and analyze data to identify solutions and/or make informed decisions
   d. Use multiple processes and diverse perspectives to explore alternative solutions

5. Digital Citizenship

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

a. Advocate and practice safe, legal, and responsible use of information and technology
b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
c. Demonstrate personal responsibility for lifelong learning
d. Exhibit leadership for digital citizenship

6. Technology Operations and Concepts

Students demonstrate a sound understanding of technology concepts, systems, and operations.

a. Understand and use technology systems
b. Select and use applications effectively and productively
c. Troubleshoot systems and applications
d. Transfer current knowledge to learning of new technologies

ISTE-NETS-T

International Society for Technology in Education
National Educational Technology Standards – Teachers

Effective teachers model and apply the NETS·S as they design, implement, and assess learning experiences to engage students and improve learning; enrich professional practice; and provide positive models for students, colleagues, and the community. All teachers should meet the following standards and performance indicators.

1. Facilitate and Inspire Student Learning and Creativity
   Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.
   a. Promote, support, and model creative and innovative thinking and inventiveness
   b. Engage students in exploring real-world issues and solving authentic problems using digital tools and resources
   c. Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes
   d. Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments

2. Design and Develop Digital Age Learning Experiences and Assessments
   Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS·S.
   a. Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity
   b. Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress
   c. Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources
   d. Provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching

3. Model Digital Age Work and Learning
   Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.
   a. Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations
   b. Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation

c. Communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital age media and formats
d. Model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning

4. Promote and Model Digital Citizenship and Responsibility

Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

a. Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources
b. Address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources
c. Promote and model digital etiquette and responsible social interactions related to the use of technology and information
d. Develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools

5. Engage in Professional Growth and Leadership

Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

a. Participate in local and global learning communities to explore creative applications of technology to improve student learning
b. Exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others
c. Evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning
d. Contribute to the effectiveness, vitality, and self renewal of the teaching profession and of their school and community

ISTE-NETS-A

International Society for Technology in Education
National Educational Technology Standards – Administrators

1. Visionary Leadership

   Educational Administrators inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization.

   a. Inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital-age resources to meet and exceed learning goals, support effective instructional practice, and maximize performance of district and school leaders
   b. Engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans aligned with a shared vision
   c. Advocate on local, state and national levels for policies, programs, and funding to support implementation of a technology-infused vision and strategic plan

2. Digital Age Learning Culture

   Educational Administrators create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students.

   a. Ensure instructional innovation focused on continuous improvement of digital-age learning
   b. Model and promote the frequent and effective use of technology for learning
   c. Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners
   d. Ensure effective practice in the study of technology and its infusion across the curriculum
   e. Promote and participate in local, national, and global learning communities that stimulate innovation, creativity, and digital age collaboration

3. Excellence in Professional Practice

   Educational Administrators promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources.

   a. Allocate time, resources, and access to ensure ongoing professional growth in technology fluency and integration
   b. Facilitate and participate in learning communities that stimulate, nurture and support administrators, faculty, and staff in the study and use of technology
   c. Promote and model effective communication and collaboration among stakeholders using digital age tools
   d. Stay abreast of educational research and emerging trends regarding effective use of technology and encourage evaluation of new technologies for their potential to improve student learning

4. Systemic Improvement

   Educational Administrators provide digital age leadership and management to continuously improve the organization through the effective use of information and technology resources.

   a. Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources
   b. Collaborate to establish metrics, collect and analyze data, interpret results, and share findings to improve staff performance and student learning
   c. Recruit and retain highly competent personnel who use technology creatively and proficiently to advance academic and operational goals
   d. Establish and leverage strategic partnerships to support systemic improvement
   e. Establish and maintain a robust infrastructure for technology including integrated, interoperable technology systems to support management, operations, teaching, and learning

5. Digital Citizenship

   Educational Administrators model and facilitate understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture.

   a. Ensure equitable access to appropriate digital tools and resources to meet the needs of all learners
   b. Promote, model and establish policies for safe, legal, and ethical use of digital information and technology
   c. Promote and model responsible social interactions related to the use of technology and information
   d. Model and facilitate the development of a shared cultural understanding and involvement in global issues through the use of contemporary communication and collaboration tools

APPENDIX B

Oregon Educational Technology Standards Adopted December 2008

1. **Creativity and Innovation**
   Students demonstrate creative thinking and problem solving skills to develop innovative products and processes using (digital) technology. Students:
   A. Apply existing knowledge to forecast possibilities and generate new ideas, products or processes.
   B. Create original works as a means of personal or group expression.
   C. Develop or apply models and simulations to explore complex systems, issues and trends.

2. **Communication and Collaboration**
   Students use digital media and environments to communicate and work collaboratively, across the global community, to support individual learning and contribute to the learning of others. Students:
   A. Interact and collaborate with peers, experts, or others employing a variety of digital environments and media.
   B. Effectively communicate and publish to multiple audiences using a variety of media and formats.
   C. Engage with learners from other cultures to develop cultural understanding and global awareness.
   D. Contribute to project teams. Produce original works or solve problems in a team setting.

3. **Research and Information Fluency**
   Students select and apply digital tools to gather, evaluate, validate, and use information. Students:
   A. Plan strategies to guide inquiry.
   B. Locate, organize and use information ethically from a variety of sources and media.
   C. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
   D. Analyze, evaluate, and summarize information or data and report results.

4. **Critical Thinking, Problem Solving, and Decision Making**
   Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students:
   A. Identify and define authentic problems and significant questions for investigation.
   B. Plan and manage activities to develop a solution or complete a project.
   C. Collect and analyze data to identify solutions and or make informed decisions.
   D. Use multiple processes and diverse perspectives to explore alternative solutions.

5. **Digital Citizenship**
   Students understand human, cultural, and societal issues related to digital technology and practice legal, ethical, and responsible behavior. Students:
   A. Advocate and practice safe, legal, and responsible use of information and digital technology.
   B. Model and practice a positive attitude toward using digital technology that supports collaboration, learning, and productivity.
   C. Demonstrate personal responsibility for lifelong learning.

6. **Technology Operations and Concepts**
   Students utilize technology concepts and tools to learn. Students:
   A. Select, use, and troubleshoot tools efficiently.
   B. Transfer current knowledge to learning of new technologies.

APPENDIX C

Technology Estimations for Remaining 2008 Bond Money

Wifi Upgrade	$50,000.00
Mini Maintenance	$30,000.00
Teacher Stations	$400,000.00
Cell Boosting	$250,000.00
Intercom	$25,000.00
iPad Project	$330,000.00
Total	$1,085,000.00

Explanation of Items:

Wifi Upgrade: Mainly additional Wireless Access Points to support the more dense and increasing use of wifi devices

Mini Maintenance: Batteries and other repair components to keep as minis functional for as long as possible (we currently have about 3100 mini computers)

Teacher Stations: Computer, Projector, Doc Camera setups for teachers – some to be acquired in summer 13 for added teaching spaces, but mostly updating teaching systems in summer of 2014

Cell Boosting: Estimate of the cost to install cell phone boosting technology in schools where coverage is inadequate

Intercom: An intercom system at Athey Creek where there is no such system and internal communication needs are high

iPad Project: iPads and associated components to have at least a class set at each school

APPENDIX D

Estimating for Future Technology Needs

Wifi Upgrades	$400,000.00		
10 GB Circuits	$200,000.00		
Dark Fiber in WV	$200,000.00		
User Devices - Rnd 1	$1,625,000.00	30% of enrollment (~2500) @$650 each	
User Devices - Rnd 2	$1,625,000.00	30% of enrollment (~2500) @$650 each	
User Devices - Rnd 3	$1,625,000.00	30% of enrollment (~2500) @$650 each	
Teacher Presentation Systems	$2,350,000.00	Computer/Tablet	$900.00
470 Stations		Projector	$1,000.00
		Document Camera	$500.00
		Classroom Interactivity System	$2,000.00
		Amplification System	$600.00
		Total per Teacher Presentation System	$5,000.00
Server Updates/Upgrades	$250,000.00		
Office Computer Systems	$225,000.00	150 @ $1500	
Salaries	$1,650,000.00	$275,000 for 6 years	
Network Upgrades	$250,000.00		
Intercoms	$300,000.00		
Total	$10,700,000.00		

Explanation of Items:

Wifi Upgrades: Additional Wireless Access Points and replacement of some existing along with controllers to bring wifi technology to the AC standard (faster and more redundancy)

10 GB Circuits: Upgrade of existing 1 GB WAN circuits, includes cost of installation and equipment

Dark Fiber in WV: Cost to be able to join the Clackamas County fiber project in Wilsonville

User Devices: Specific items to be determined leading up to actual purchase *Round 1, 2, and 3* are intended to be 3 large purchases of these items spaced 2 years apart

Teacher Presentation Systems: These are teaching stations like what we have now, but with a couple added components – audio amplification and potential classroom interactivity systems. Each setup would be approximately $5000 and there are 470 such teaching locations in

	the district. The plan will be to update these systems in 3 stages synchronized with the User Devices.
Server Updates/Upgrades:	Cost to keep current VM environment functional and augmented with some servers for specific applications
Office Computer Systems:	Computers for staff who primarily work at their computers during the day (secretaries, counselors, etc)
Salaries:	Costs associated with the staff needed to implement the items outlined above
Network Upgrades:	Network components to support upgrading internal networking environments
Intercoms:	Enhanced intercom systems within schools (10 schools @ $30,000 each)

APPENDIX E

WLWV STEM White Paper
follows over the next pages

STEM Education and West Linn-Wilsonville School District: An overview and framework for development

Nell Achtmeyer
CREST, STEM Program Coordinator
Last Updated: February 4, 2014

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Executive Summary

The West Linn-Wilsonville's learning communities of great thinkers will use science, technology, and mathematics to engineer solutions to problems for the world. STEM education supports the learning and development of essential, innovative, creative and foundational skills to support these learning communities of great thinkers and thoughtful global citizens. The District's STEM education initiative considers the following elements.

Best Practices and Instructional Leadership. The District is exploring studio and lesson study models of professional development to support effective instructional improvement in mathematics and science across all levels. In these models, teachers collaborate and study together in order to understand best instructional practices in their disciplines, deepen their familiarity of state and national standards in content areas, and give and receive feedback during teaching observations to improve instructional practices and better integrate STEM disciplines to enhance student learning. These professional learning communities are essential to expanding our collective understanding of STEM education and how to create meaningful learning experiences for students.

K-12 STEM Experiences. State and national standards in STEM disciplines provide important frameworks for best practices and the scope and sequence for content across the grade levels. Using these frameworks and curricular resources is important to develop integrated STEM education experiences for kids and to see commonalities between science, math, engineering and technology practices, such as asking question, defining problems, and using models. The scope and sequence of K-12 experiences considers the diverse ways that students engage in STEM education and areas for further development. Current and future STEM experiences include school day experiences, after school clubs, independent research projects, and non school day experiences. While every student may not choose to enroll in a STEM related field of study or pursue a STEM career, all students will have the experiences to build the knowledge and skills in STEM disciplines to pursue those pathways if they choose.

Exemplars of STEM Education Programs. The District has many exemplars of STEM education programs currently across the schools and grade levels. These programs and unique learning experiences integrate STEM disciplines in ways that provide hands-on and relevant learning experiences that support innovative thinking and are often supported by community partners or STEM industry professionals. These exemplars set our work apart from other local initiatives and continue to inspire the development of additional STEM programs and experiences.

STEM Learning Spaces and Contexts. The Center for Research in Environmental Sciences and Technologies (CREST) is well positioned to support this larger STEM education initiative through the lens of sustainability and the environment. Grounding STEM education experiences in the environment and the context of sustainable development reinforces our District's mission of supporting great thinkers for the world. The arts also provide an additional context for STEM education. STEAM education provides opportunities to interpret information, thinking critically, and ground student thinking about art in math, science, engineering, and technology practices. Facilities around the District support these unique and diverse learning experiences and contexts, providing not only the physical spaces, but also the tools and resources needed to support meaningful learning for students.

Career and College Readiness. STEM experiences work to deepen student understanding of STEM disciplines while also providing opportunities to develop entrepreneurial oriented skills for both career and college readiness. This includes, but is not limited to, supporting creative thinking and innovative design solutions, mentoring by industry professionals, internships with experts in STEM fields of study, and work experience in STEM settings. Career and Technical Education (CTE) programs also foster skills that are both relevant for STEM fields of study and career paths. The District is working to develop additional CTE programs that provide a unique approach to STEM education, such as a program of study in sustainable agriculture that blends course work with farming.

Community Partners. Fostering new and enhancing existing partnerships to support STEM education is important in collaborating around the development, funding, and mentorship for the District STEM education programs. The District currently works with Oregon Tech, Clackamas Community College, and Oregon State University Extension to provide dual credit offerings and support Oregon Department of Education's 40-40-20 initiatives. In addition, partnerships with METRO and the Cities of West Linn and Wilsonville support real world environmental and community based experiences. The District is part of the South METRO Salem STEM Partnership and gained access to STEM industry and community partners through this network.

Definition and Background on STEM Education

The Oregon STEM Education Initiative proposes the following as a new description of STEM Education:

> *An approach to teaching and lifelong learning that emphasizes the natural interconnectedness of the four separate STEM (science, technology, engineering and mathematics) disciplines. The connections are made explicit through collaboration between educators resulting in real and appropriate context built into instruction, curriculum, and assessment. The common element of problem solving is emphasized across all STEM disciplines allowing students to discover, explore, and apply critical thinking skills as they learn.*[i]

Following research and data collection on STEM education, the Oregon Department of Education further articulated the needs for STEM education in our schools:

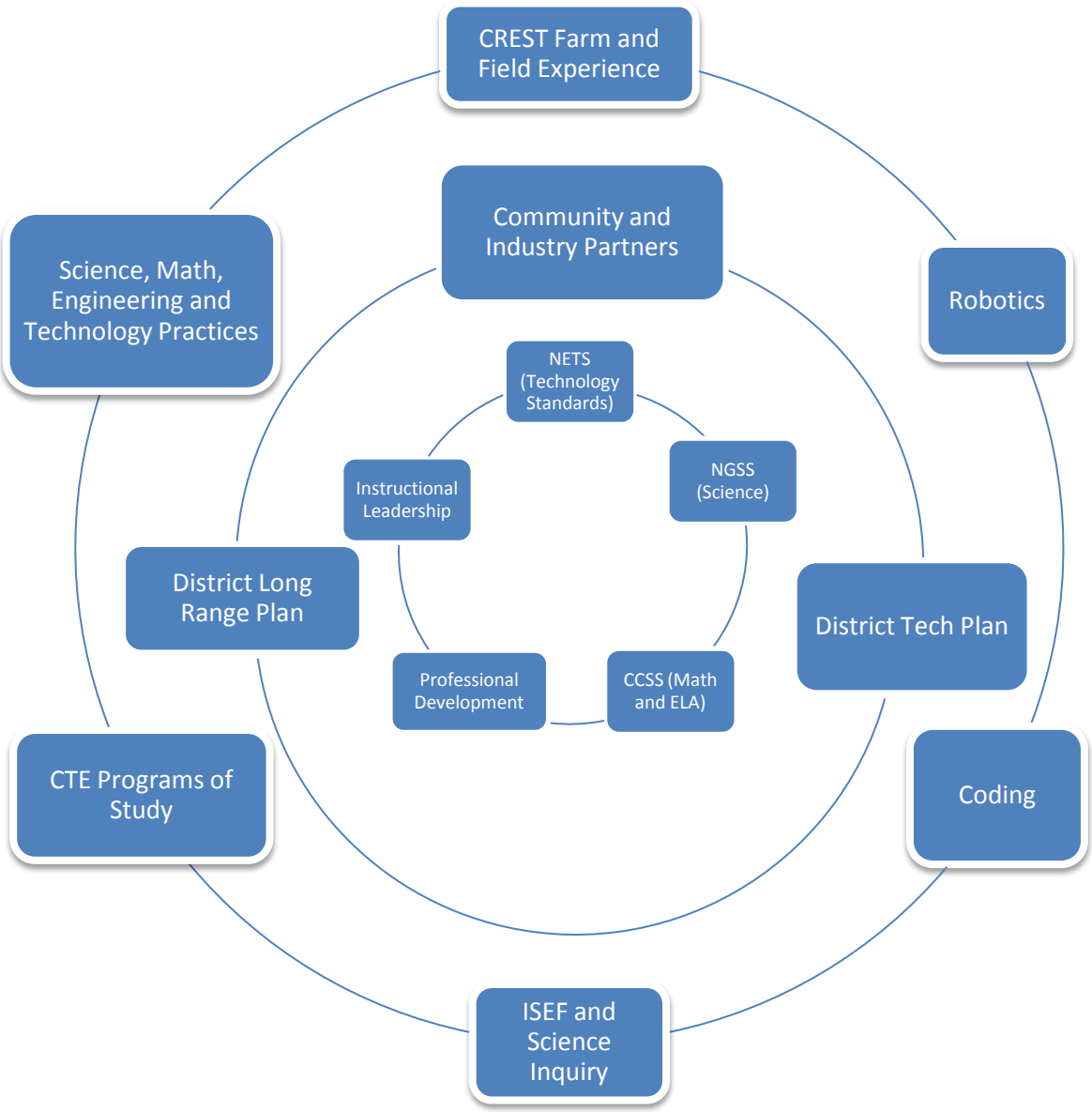
> *Our nation, state, and local communities face challenges that will only be solved with assistance from a well-trained and STEM educated citizenry. The growing world demand on energy has created a need to develop new and cost effective resources. An aging population will require increased services from the health care industry. Finally, driving an economy that thrives on innovation requires a growing number of innovators. Increasingly, the solutions to these problems have required a coherent and coordinated effort from all four disciplines in STEM. Many of the problems faced will require some form of engineered solution. However, these solutions will rely heavily on the knowledge base in science and mathematics as well as the analytical power of sophisticated technological tools*[ii]*.*

District Mission, Vision Themes and STEM Education

The core elements of STEM education are inherent in the District's vision themes and mission question: *How do we create learning communities for the greatest thinkers and most thoughtful people…for the world?* The West Linn-Wilsonville School District envisions a school learning community which:

1. Demonstrates personal and academic excellence;
2. Provides a personalized education to improve student performance;
3. Establishes community partnerships and expands the classroom beyond the school;
4. Creates a circle of support for each student;
5. Educates the whole person—intellectually, emotionally, physically, and ethically;
6. Integrates technology in daily learning.

Great thinkers will use science, technology, and mathematics to engineer solutions to problems for the world. A personalized education for all students that is inquiry-based, collaborative, and integrates technology in teaching and learning is important in providing real world connections to STEM disciplines. This approach allows teachers and students to extend learning from the classroom through field and community based experiences. Similarly, integrating technology into daily instruction and learning provides students with tools to make connections to and between science, math, and engineering disciplines. Considering a STEM program that is grounded in the District vision themes and the mission question provides a framework for a K-12 continuum that identifies milestones and learning opportunities for students to advance in STEM education. STEM education in the District, as described in the diagram below, integrates many existing programs, while also planning for expansion and the establishment of new learning opportunities and experiences for students. Practices in science, math, engineering, and technology are important for not only STEM education, but also supporting life long learners and thoughtful global citizens.


CREST Farm and Field Experience
Community and Industry Partners
Science, Math, Engineering and Technology Practices
Robotics
NETS (Technology Standards)
Instructional Leadership
NGSS (Science)
District Long Range Plan
District Tech Plan
Professional Development
CCSS (Math and ELA)
CTE Programs of Study
Coding
ISEF and Science Inquiry

Best Practices and Instructional Leadership

The District sees the value and effectiveness in engaging teachers and administrators in a studio based, lesson study professional development experience. The District is exploring an approach for professional development in all STEM disciplines that is similar to what is used for instructional improvement in mathematics and literacy. A studio experience provides an opportunity to engage all teachers in a given disciplines or at a given grade level to study together and connect standards with instructional practices. It also allows teachers to work to identify commonalities in the practices and standards within science, math, engineering and technology and strengthen and create integrated STEM curriculum. Defining and documenting best practices in a discipline and then engaging in a year-long study of instructional strategies employed in the classroom, connections to curriculum, and assessment of student learning is critical in making professional development meaningful and relevant. In addition, the District sees this studio and lesson study approach as an important opportunity to explore the connections between STEM disciplines, a critical area for teachers to explore to make STEM education relevant and transdisciplinary.

Professional Learning Communities and Lesson Study in Primary Schools

The Center for Research in Environmental Sciences and Technologies (CREST) staff and District administrators are well positioned to work with teacher teams at primary schools to form professional learning communities (PLCs) at individual grade levels around the best instructional practices and standards within STEM disciplines. Teachers will collaborate with their PLCs and a STEM expert during an initial workshop that dissects best instructional practices and the standards based approach to STEM education. PLCs will then engage in deep lesson study, in which teachers review best instructional practices in science and work to develop lessons to implement in their classrooms. In subsequent years, PLCs will integrate the work from math studio to develop multidisciplinary lessons. Over time, studio work with technology and engineering practices will be folded into the PLC work and explorations to truly integrate STEM education into student learning. The PLC will provide feedback as they observe each other teach the lessons that they will create together to highlight best instructional practices. PLCs will either reviewing tapes or making first hand observations during class times depending on funding and scheduling. One example of organizing and supporting this type model is described below:

Year	School Year	Participants	Focus	Funding Requirements
1	2013-2014	STEM Coordinator, school principals, school ICs	Understanding the lesson study model	Subs for a District wide leadership STEM workshop in winter 2014
2	2014-2015	School ICs, grade level teams K-2	Lesson study for science	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year
3	2015-2016	School ICs, grade level teams 3-5	Lesson study for science	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year
		Grade level teams K-2	PLC during planning times and staff meetings and professional growth Wednesdays to continue lesson study work in less formal setting	None.
4	2016-2017	School ICs, grade level teams K-5	Lesson study for integrated math and science	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year
		Grade level teams 3-5	PLC during planning times and staff meetings and professional growth Wednesdays to continue lesson study	None.

			work in less formal setting	
5	2017-2018	School ICs, grade level teams K-5	Lesson study for integrated math and science	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year

Lesson Study with District Middle Schools

The District will support an intensive lesson study model, aligned with what is described above for the primary level, with all middle schools in the District beginning in the early months of 2014. Based on the success from recent studies and programs in middle schools in Northern California, the District will support a lesson study model for instructional improvement with both math and science teachers. One example of organizing and supporting this type model is described below:

Year	School Year	Participants	Focus	Funding Requirements
1	2013-2014	STEM Coordinator, MS principals and assistant principals, MS science teachers	Understanding what is a lesson study model and best practices in science	Subs for a District wide leadership STEM workshop in winter 2014
2	2014-2015	Separate PLC of school/ grade level team of science teachers	Year long workshop on NGSS and CCSS and understanding math and science practices	Extra pay for workshops or additional PLC times??
3	2015-2016	Grade level teams for science teachers	Lesson study for science	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year
		Grade level teams for math teachers	Lesson study for math	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year
4	2016-2017	Grade level teams for both science and math teachers	Lesson study for integrated math and science	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year
		STEM Coordinator, MS principals and assistant principals, MS science and math teachers	District wide PLC for MS science and math teachers	Subs for a District wide STEM workshops and planning and observation times between Middle Schools
5	2017-2018	School teams with both science and math teachers to work across school departments	Lesson study for integrated math and science	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year

Integrated High School STEM Experiences

The District also plans to support an intensive lesson study model with high school teachers as well. The District is continuing to research effective approaches to studio and lesson study models at the high school level, but will base an initial approach on the success seen at the primary and middle school levels. One example of organizing and supporting this type model is described below:

Year	School Year	Participants	Focus	Funding Requirements
1	2013-2014	STEM Coordinator, HS principals and assistant	Understanding what is a lesson study model	Subs for a District wide leadership STEM workshop in

		principals, math and science department heads		winter/spring 2014
2	2014-2015	Separate PLC of school/ department of math and science teachers	Year long workshop on NGSS and CCSS and understanding math and science practices	Extra pay for workshops or additional PLC times??
3	2015-2016	Grade level teams for science teachers	Lesson study for science	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year
4	2016-2017	Grade level teams for both science and math teachers	Lesson study for integrated math and science	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year
5	2017-2018	School teams with both science and math teachers to work across school departments	Lesson study for integrated math and science	Subs for teachers to watch each other teach and meet during planning times at least 3-4x per year

CREST Summer STEM Professional Learning Community Experiences

In addition to supporting professional development and instructional improvement in STEM education during the school year, The Center for Research in Environmental Sciences and Technologies (CREST) is well positioned to adopt a studio model during its current Learning on the Go summer programs. This expansion to CREST's current summer programs will allow a diverse population of students to have the change to engage in a STEM summer camp experience, while also providing a weeklong studio type setting for teachers to explore themes of environment and sustainability in STEM education. Groups of teachers will have the opportunity to work with CREST staff, high school and post-high school counselors, and students for a weeklong session of this hybrid STEM professional development and summer camp model. One day per session will occur at the CREST farm site to model instructional practices for garden-based education. In this model, teachers will have the opportunity to observe instructional practices modeled by CREST staff and work in grade level teams to review STEM practices and create integrated place-based and education for sustainability themed STEM lessons. Teachers will observe peers and provide feedback in this condensed lesson study experience. One example of organizing and supporting this type model is described below:

Participants: 10-15 teachers per session, HS and post-HS counselors, and CREST staff
Funding Requirements: Stipend for teachers, CREST staff, and HS and post-HS counselors during each session

Session	Month/Week	Grade Level
1	End of June	K-2
2	Beginning of July	3-5
3	Middle of July	6-7
4	End of July	7-8
5	Beginning of August	3-5

Books and Supplemental Resources

Below are some lists of recommended websites and books to integrate into presentations, workshop or additional reading during professional development in STEM education.

Websites

- Videos about teaching science from UK
- TedTalk on Teaching Science

- STEM Video games
- Robotics
- Real World Internships and Career Readiness
- Technology integration
- Next Generation Science Standards

Books

- *Lesson Study: A Japanese Approach To Improving Mathematics Teaching and Learning (Studies in Mathematical Thinking and Learning Series)* by Clea Fernandez and Makoto Yoshida
- *Leading Lesson Study: A Practical Guide for Teachers and Facilitators* by Jennifer Stepanek, Gary Appel, Melinda Leong, Michelle Turner Mangan, Mark Mitchell
- *Lesson Study Step by Step: How Teacher Learning Communities Improve Instruction* by Jacqueline Hurd and Catherine Lewis
- *Supporting Grade 5-8 Students in Constructing Explanations in Science: The Claim, Evidence, and Reasoning Framework for Talk and Writing* by Katherine L. McNeill and Joseph S. Krajcik
- *The NSTA Reader's Guide to A Framework for K 12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* by Harold Pratt
- *STEM Lesson Essentials, Grades 3-8: Integrating Science, Technology, Engineering and Mathematics* by Jo Anne Vasquez, Michael Comer, and Cary Sneider

K-12 STEM Experiences

While every graduating student might not choose a STEM related field of study or career after high school, we want to ensure that every student has the creative and critical thinking skills and deep understanding to succeed should they choose a STEM pathway. Being scientifically literate, understanding the essential principles in mathematics, and graduating with meaningful experiences with engineering design and technological understandings are important components of STEM education, college and career readiness, and global citizenship.

State and National Standards

Effective STEM education is grounded in teaching for deep and enduring understanding in all disciplines. We see the Common Core State Standards (CCSS) in Mathematics and English Language Arts, as well as the Next Generation Science Standards (NGSS), as important resources in establishing frameworks for developing a deep understanding and cogitative skills in the STEM disciplines. District administrators, school principals, CREST staff, and teachers continue to work in collaborative groups to unpack and integrate the Common Core State Standards (CCSS) and Next Generation Science Standards (NGSS) into the District's work. Printed in the book *STEM Lesson Essentials*[iii], the table below shows how mathematical, scientific and engineering practices listed in these state and national standards are strongly related. Teachers and administrators continue to identify these commonalities as an initial step to integrate lessons and enhance STEM education across the grades levels.

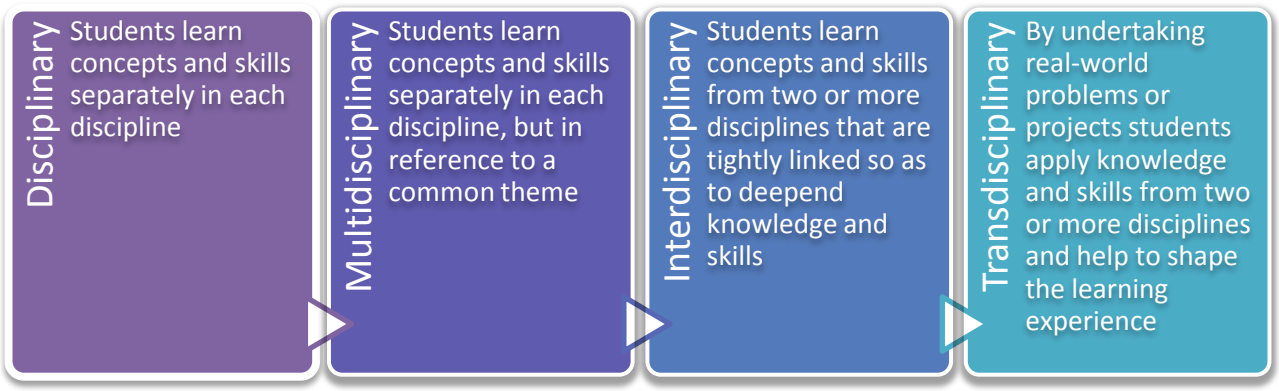
Commonalities between STEM Practices

Scientific Practices (NGSS)	Engineering Practices (NGSS)	Technology (NETS)	Mathematical Practices (CCSS)
Ask questions	Defining problems	Become aware of the web of technological systems on which society depends	Make sense of problems and persevere in solving them
Develop and use models	Develop and use models		Model with mathematics
Plan and carry out investigations	Plan and carry out investigations	Learn how to use new technologies as they become available	Use appropriate tools strategically
Analyze and interpret data	Analyze and interpret data		Attend to precision
Use mathematics and computational thinking	Use mathematics and computational thinking	Recognize the role that technology plays in the advancement of science and engineering	Reason abstractly and quantitatively
Construct explanations	Design solutions		Look for and make use of structure
Engage in argument from evidence	Engage in argument from evidence	Make informed decisions about technology, given its relationship to society and the environment	Construct viable arguments and critique the reasoning of others
Obtain, evaluate, and communicate information	Obtain, evaluate, and communicate information		Look for and express regularity in repeated reasoning

Integrating STEM Disciplines

In the book, *STEM Lesson Essentials*, authors Sneider, Comer and Vasquez explore the relationship between STEM disciplines in teaching and learning. Considering the increasing level of awareness about the importance of STEM education in schools, *STEM Lesson Essentials* provides a continuum that outlines approaches to integrating STEM curriculum. This continuum is an important resource as we think about existing and future K-12 learning experiences and define our goals for STEM curriculum integration across the levels. While the format of the table below is different

from what is published in the book, the figure below using the language and concepts from *Figure 8.6* in *STEM Lesson Essentials*[iv].



Our vision for STEM learning is based on the balance of this continuum of integrating STEM curriculum throughout the grade levels. There is a need to balance deep learning in independent disciplines with transdisciplinary lessons and learning to undertake real world, project based problems to solve through STEM education. STEM experiences vary across the grade levels, providing different opportunities to use real-world problems that students can use when engineering solutions. Considering the scope and sequence for K-12 STEM experiences is important as we think about students building on their understanding in STEM disciplines and having real world and relevant opportunities to reinforce that learning. Working through the lens of the environment and sustainability, as well as providing varied experiences for our diverse student population, the District has thought about how early elementary experiences prepare students for upper elementary and ultimately middle and high school skills and understandings.

Grade Level STEM Goals

The California Department of Education has articulated STEM goals for each grade band at the elementary (K-5), middle (6-8), and high school (9-12) levels. This language, as provided below, will inform the District's thinking about similar goals and experiences within our K-12 STEM education continuum.

Elementary School Grades:

- Provides the introductory and foundational STEM courses that lead to success in challenging and applied courses in secondary grades
- Introduces awareness of STEM fields and occupations
- Provides standards-based, structured inquiry-based and real-world problem-based learning that interconnects STEM subjects
- Stimulates student interest in "wanting to" rather than "having to" take further STEM related courses
- Bridges and connects in-school and out-of-school learning opportunities

Middle School Grades:

- Introduces an interdisciplinary program of study consisting of rigorous and challenging courses
- Continues to provide standards-based, structured inquiry-based and real world problem-based learning that interconnects STEM-related subjects

- Bridges and connects in-school and out-of-school learning opportunities
- Increases student awareness of STEM fields and occupations, especially for underrepresented populations
- Increases student awareness of the academic requirements of STEM fields and occupations
- Begins student exploration of STEM related careers, especially for underrepresented populations

High School Grades:

- Provides a challenging and rigorous program of study focusing on the application of STEM subjects
- Offers courses and pathways for preparation in STEM fields and occupations
- Bridges and connects in-school and out-of-school learning opportunities
- Provides opportunities for student exploration of STEM related fields and careers, especially for underrepresented populations
- Prepares students for successful post-secondary employment, education, or both

Exemplars of STEM Education Programs

The District has many exemplars of STEM education programs across the schools and grade levels. The following descriptions provide a short overview of indicators of STEM education happening in the District. These programs and unique learning experiences integrate STEM disciplines in ways that provides hands-on, real world, and relevant learning experiences for students, often supported by community partners or STEM industry professionals. These exemplars set our work apart from other local initiatives and continue to inspire the development of additional STEM programs and experiences.

CREST Field Experiences

STEM education begins with fostering a sense of wonder and giving students place-based field experiences to have strong connections to the surrounding community. Exposing kids to their environment at the early grades is essential to support curiosity and inquiry about the interaction between STEM disciplines. Expanding field experiences to include a great part of the community and region during the upper elementary and middle school provides opportunities for students to focus and explore those interests. By high school, students have had diverse field experiences and can pursue specific opportunities related to their interests, whether through participation in ISEF (see below), AP classes, or internship experience with the CREST Farm to School site related to sustainable agriculture. In this model, all experiences are informed by and grounded in the CCSS Mathematical Practices, NGSS Scientific and Engineering Practices, and the Big Ideas in Education for Sustainability. Students integrate science and literacy across the grade levels by using the claim, evidence, reasoning and rebuttal framework for talking and writing in science and mathematics. This approach, widely accepted by the science education community, has been heavily researched and written about by Katherine L. McNeil. As such, teachers and CREST staff will continue to work to integrate these practices into instructional practices in science and the CREST field experiences.

Engineering Curriculum

Engineering courses and experiences take different forms across the grade levels. Engineering is Elementary is a resource that the District adopted with its most recent science adoption for the primary level. This curriculum, developed at the Museum of Science (Boston), provides units that integrate literacy and anchor texts with real world engineering design problems. As stated on their website, the mission of Engineering is Elementary "is to foster engineering and technological literacy among ALL elementary-aged children." These units and experiences provide primary school students with experience in engineering design, as an extension of science units and concepts outlined in the NGSS. The Museum of Science (Boston) also develops curricular resources for engineering to be integrated into middle and high school mathematics courses. As primary school teachers implement Engineering is Elementary units, the District will continue to explore *Building Math* and *Engineering the Future* as another opportunity to provide STEM education experiences for middle and high school students.

Described in greater detail below, the District's partnership with Oregon Tech (OIT) also provides an opportunity for high schools students to enroll in OIT's Introduction to Engineering High School Transition course bundle. These college level courses will provide a strong foundation in a diverse range of engineering fields, while also giving students a chance to earn college credit. This partnership is important for our on-going development of dual credit opportunities for students. District teachers plan to work with OIT professors to develop more engineering courses at the middle and high school levels.

Science Inquiry, Research and the Intel International Science and Engineering Fair (ISEF)

Science inquiry and research takes place at every grade level. The interest and curiosity fostered at the younger grades is further supported with formalized inquiry projects and local science fairs at the upper grades. Students entering middle school and high school have a strong foundation in scientific and engineering design and the opportunity to participate in the District's Science Symposium, which then prepares students for the state-level Northwest Science

Expo and Intel International Science and Engineering Fair (ISEF). Inquiry fairs and ISEF provide an opportunity for students to apply their understanding and interest in the STEM disciplines through meaningful inquiry and research projects that are grounded in real world applications. Presenting their research connects students with STEM professionals who mentor their projects and act as judges during the various fair competitions. College scholarships are also available for certain fair awards, making local universities more accessible for students following high school graduation.

Farm to School and Sustainable Agriculture

STEM education in the West Linn-Wilsonville School District has a strong history in the environmental sciences. We ground students' experiences in the natural world around our schools and in the community to provide meaningful and relevant design problems for engineering solutions, connections to science inquiry, and the use of local technologies. The CREST Farm to School site provides a unique opportunity to experience STEM in action. Students work with a resident farm manager and CREST educators on a 10 acre District owned property to understand components of sustainable agriculture. Students design and construct solutions related to the cultivation, harvest, and distribution of produce from the farm site and have opportunities for year round internships to extend their learning in the classroom. A deep understanding in STEM disciplines is required when learning about all of the components of vegetable production and distribution from the farm. Fifth grade classroom field experiences then encourage middle school and eventually high school students to gain relevant and important work and career skills through summer and year round internships at the farm.

US FIRST and LEGO Robotics Programs

Students experience disciplinary core ideas in science, technology, engineering and mathematics when they engage in the District's robotics program. Beginning at the primary level, all second grade students work with engineering design principles and experience authentic inquiry with the LEGO WeDo curriculum. Connected to Next Generation Science Standards, second grade classes explore programming, using models, and engineering design. Building on this universal experience, fourth and fifth grade students are able to participate in the For Innovation and Recognition of Science and Technology's (FIRST) LEGO League teams. These teams form as enrichment classes or after school clubs, working to solve problems commonly faced by scientists and engineers, as well as to build small LEGO robots. Continuing at the middle level, sixth through eighth grade students build on these foundational experiences and continue work and participation with FIRST LEGO League teams. These teams are supported by teachers, schools, and parents and prepare students for competitions. At the high school level, students from Wilsonville and West Linn High Schools combine forces on the District's FIRST Robotics Challenge team. With support from community partners, professional mentors, and a teacher advisor and coordinator, high school students have seen great success on the regional and national stage during these competitions. Through integrated learning in science, technology, engineering, mathematics, students design and build robots to meet certain criteria and functions for local and national competitions. The team's mission, *Building Robots. Building People*, reinforces how students and teachers believe that this team provides a unique opportunity for real world, leadership experiences through the deep understanding of STEM disciplines.

Providing experiences with robotics is important when integrating STEM education into student experiences across the grade levels. Continuing to foster partnerships with local educational providers, industries, and professionals, engage teachers at all levels in professional development around robotics and engineering, and support robotics teams throughout the District is important to the sustained growth of these teams and programs. Robotics programs throughout the District connect to other salient components of the District's STEM education program, such as coding and programming. In addition, robotics connects to the District Technology Plan, which outlines how technology supports teaching and learning for students and teachers at all levels.

Green Building Design and School Buildings

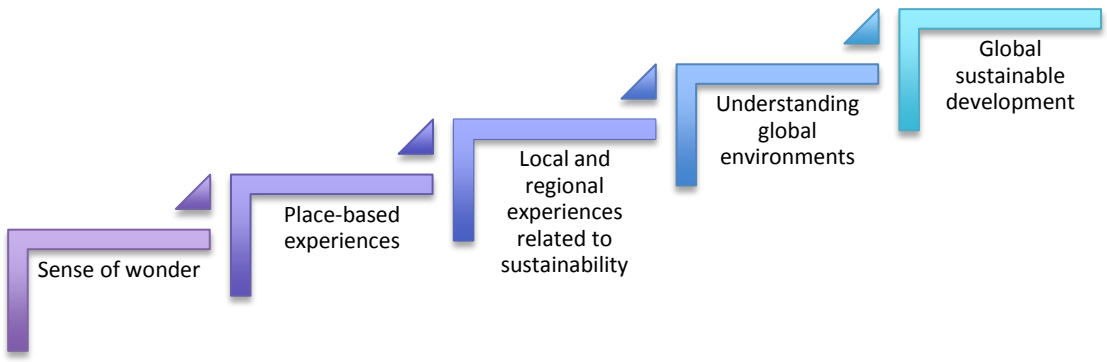
Green building design is an important piece of understanding elements of sustainable development, both at the local and global scale. Students around the District have an opportunity to explore sustainable design features that are demonstrated in buildings within our community. Trillium Creek and Lowrie Primary Schools, which opened for the 2012-2013 school year, are both Leadership in Energy and Environmental Design (LEED) Gold certified schools. This US Green Building Council (USGBC) rating system provides credits for a variety of design features and construction practices within six categories. Gold is the second highest rating. Trillium Creek and Lowrie Primary Schools were designed and built with student learning in mind and both provide opportunities for students and visitors to learn about and continue to tell the story of sustainability. These schools demonstrate a range of green building design strategies, from energy conservation to school gardens. Through partnership with DOWA-IBI Group, the architectural firm that has designed many of schools in the District, middle school students also have a unique opportunity to enter into a design competition as they are tasked with designing a new middle school to meet certain green building criteria. Green building and design is also an important focus and component of high school environmental science courses as students explore the relationship between the built environment and strains on natural resources, urban planning, and energy efficiencies. These themes continue to be important considerations for creating learning experiences for students, but also the Long Range Plan and current and future planning around District facilities, programs, and operations.

STEM Learning Spaces and Contexts

The Environment and Sustainability

With support from CREST, students in the District are engaged in science inquiry and field based experiences in the early primary grades to extend learning from the classroom. Place-based field experiences, garden-based and farm to school related education, and education for sustainability programs support the early development of scientific inquiry and wondering about the world around us. These programs occur both during the school day, as well as in the summer and non-school calendar to provide learning opportunities in science and engineering throughout the year. Highlighting the environmental threads and context within STEM education reinforces the interconnectedness of these disciplines. Transdisciplinary STEM education is necessary to achieve a deep understanding of sustainable agriculture, science inquiry and research, field based experiences involving long term data collection, hands-on science, and the "3 E's" (environment, economy, and equity) of education for sustainability.

Based on current research in the fields of place-based education, environmental education, and education for sustainability, a continuum for student experiences in the environment has emerged. Beginning first with developing a strong sense of wonder and appreciation for the natural world, student experiences build to integrate long-term studies and experiences in the schoolyard and community. Applying that understanding and learning to the larger region and local natural phenomena and resources continues to build an understanding about principles of the natural world that can be applied to global environments. Following focused service-learning experiences at the middle school, concepts and notions of global sustainable development become more attainable for high school students. The diagram below captures and outlines this thinking.



CREST Program Coordinators and the CREST Director work to find community partners and grant opportunities to expand and develop student programs. CREST Program Coordinators are also actively involved with professional development in schools, working with teachers to better understand best practices in teaching science, and the practices and core ideas of the Next Generation Science Standards (NGSS). CREST staff model effective instructional strategies for science inquiry and field based experiences for students, working with teachers to build capacity and instructional improvement. Moving forward, CREST staff will integrate resources and additional trainings about STEM education as an important expansion of their work.

Learning with the Arts and STEAM

The arts provide an important context for STEM education. STEAM education gives students opportunities to think critically, interpret information, and engage other essential mathematic, science, engineering and technology practices. Arts education fosters collaboration between peers, but also with community members and artists in residence. One example of this is that Beauty and the Bridge STEAM project that took place in Wilsonville. During the 2011-2012 school

year, students from primary, middle and high schools in Wilsonville experienced the integration of STEAM disciplines in a community-based project. Following the development and expansion of Wilsonville's commercial area adjacent to the I-5 corridor, there was an opportunity to bridge the two sides of Wilsonville. In collaboration with the City of Wilsonville, students worked with City officials and staff to understand the need for connectivity in walking and biking paths, vehicular safety, and the master plan for the development of this area of Wilsonville. Collaborating and conducting in depth research on native flora and fauna of the North Willamette Valley, students at all grade levels in the Wilsonville schools worked to select various native plants, animals and landscapes for this community art project. With the support of art teachers and artists in residences, students researched, sketched, critiqued and refined their contribution to the project before ultimately painting the 7,200 tiles now installed in the underpass of I-5 at the Wilsonville interchange. Projects like this show how important the arts are in providing a real world context for STEM education.

The arts connect to STEM education also through the notion of artistic, innovative thinking being essential for engineering creative solutions to complex problems. Discussed in greater detail below in the College and Career Readiness section, creative thinking is essential for students when they will need to thinking critically about a problem they have defined, ask questions, and engineer a long-lasting solution.

Learning with Technology

Technology has the potential to change the learning and the learner. In the earliest days with computers in schools, the workbook style activity was transferred to the computer format. Very little changed in the learning, in fact, research showed that basic facts practice, as it was presented in its simple form, did nothing to increase the quick recall of facts. Technology is now widely used by our students for research, close reading and production. Students use the technological tools available to calculate, to read and write, to tap into streams of live information, to communicate with others, and to do so from school and from home.

Teachers and students in West Linn-Wilsonville schools are harnessing the power of graphic organizers for analysis and synthesis. The morphological chart formerly drawn on paper can now be transferred to a database where sorting and analysis take the student to a more complex form of thinking. Digital video, digital music, graphic multimedia presentations are becoming common in our classrooms. When children are invited to make public presentations of complex learning, the products become exemplars for the next student, the next class. In this way, a rising standard of student performance is emerging in the learning community. These multimedia presentations have become more polished and are used more extensively with new production technologies.

Learning with technologies allows children to do what they could not otherwise do. Well designed software coaches children in mathematics. Video sources provide a window to worlds the student cannot visit, a seat in the great lecture halls of the world, and quick reference for review or expansion of concepts. Computer adaptive software allows students to explore mathematics they do not yet understand, test ideas, fail, and construct a useful understanding of the concept. Well designed writing software coaches children through the complexity of written composition. Web quests and research software link questions to resources and help students juggle the use of multiple sources in a recursive research process.

Simulation software allows children to manipulate and tweak the parameters of the variables in complex situations gaining an understanding of the principles of mathematics, science and the social sciences. Design software allows children to take on design challenges in robotics, geometry, graphic arts, art, and architecture. Quick access to references on line allows students to read dense text with more understanding.

Assessment with technology escapes the boundaries of time, becoming timely, personalized, and adaptive. Computer adaptive assessment has greater power to yield useful assessment information for teachers to use as feedback and actionable data to aid in planning. Computer adaptive assessment, particularly in a low stakes environment, has the power to provide students effective feedback on the learning.

Spaces for Innovative

The notion of spaces for innovation, or maker spaces, has generated widespread support within K-12 education. Initially referenced in the launch of the White House's 2009 "Educate to Innovate" campaign, President Obama said, "I want us to think about new and creative ways to engage young people in science and engineering, whether it's science festivals, robotics competitions, fairs that encourage young people to create and build and invent—to be *makers* of things, not just consumers of things."[v] Since then, non-profits such as *Maker Education Initiative* have formed with a mission to "create more opportunities for young people to develop confidence, creativity, and spark an interest in science, technology, engineering, math, the arts, and learning as a whole through making."[vi]

Taking the pulse of this initiative is important for our own thinking about maker spaces in the District. The design for the District's multidimensional libraries and open, flexible spaces support this notion and have already started to support informal spaces for innovation in the primary schools. It will be important to think about the opportunity these flexible spaces provide as our on-going stewardship of District spaces and places and how they support important learning for students. An emerging idea to support this stewardship is to provide garage like spaces around the District. By providing flexible, open and somewhat ill defined places we encourage authentic invention to emerge from student ideas and creative thinking and their desire to create the STEM project that they see as truly innovative.

STEM Education and the Long Range Plan

There are strong connections between the STEM education initiative and the Long Range Plan. Our STEM education initiative supports and helps to frame a portion of the planning for future growth, both for enrollment and facilities, and the long-range operations of the District. Similarly, considering the components of STEM education programs when planning for current and future facilities and District owned property ultimately enhances student learning opportunities in STEM. Whether it is the notion of maker spaces, robotics, ISEF research projects, or farm to school and sustainable agriculture CTE programs, STEM education and our understanding of technology in education will continue to evolve as research in these fields is published. The Long Range Plan remains poised and prepared to support the needs of these initiatives and will be critical for the collective success of STEM education in the District.

College and Career Readiness

The regularly researched idea of supporting creative, entrepreneurial thinking in students of all ages applies directly to STEM education. As we engage in this discussion across curriculum and instruction topics, it resonates strongly with STEM education and the idea of college and career readiness. One of the most documented goals of STEM education is to prepare students to be able to pursue careers within STEM pathways and fields of study. While this aligns with District goals as well, we also inject the idea of entrepreneur-oriented education in addition to this more traditional idea of career-oriented education. Supporting engineering studies, for example, that supports and fosters the creative thinking needed to be innovative about solving problems and finding elegant solutions and engaging the creative brain is essential for all students regardless of their post high school pursuits.

Dr. Yong Zhao of the University of Oregon talks specifically about opportunities to support entrepreneurial thinking as an important component of career readiness. As Zhao writes in his book, *Catching up or leading the way: American education in the age of globalization*, "In the new era, we need more diverse talents rather than standardized laborers, more creative individuals rather than homogenized test takers, and more entrepreneurs rather than obedient employees."[vii] STEM education engages students in real world, meaningful experiences to develop critical thinking skills, gain job related skills, and experience the natural blend between science, math, engineering, and technology practices. Effective STEM education programs use these experiences to foster entrepreneurial and innovative thinking to solve problems for the changing world around them. Thinking towards the future is essential when applying STEM thinking and disciplines to solving problems in the ever changing landscapes of our global society.

STEM education is important for increasing the number of students leaving high school prepared to succeed in STEM fields of study and eventually STEM career pathways. High wage job opportunities in STEM fields outnumber non-STEM job opportunities currently in Oregon and are projected to increase as we understand that economic, environmental and social issues will continuously be solved through skills and knowledge in STEM disciplines.[viii] Providing diverse STEM experiences throughout the grade levels that builds artistic and creative thinking skills to solve problems and think critically gives students opportunities to determine areas of interest, strengthen foundational skills and knowledge in STEM disciplines, and have meaningful internships in the community to better understand potential career and academic pathways.

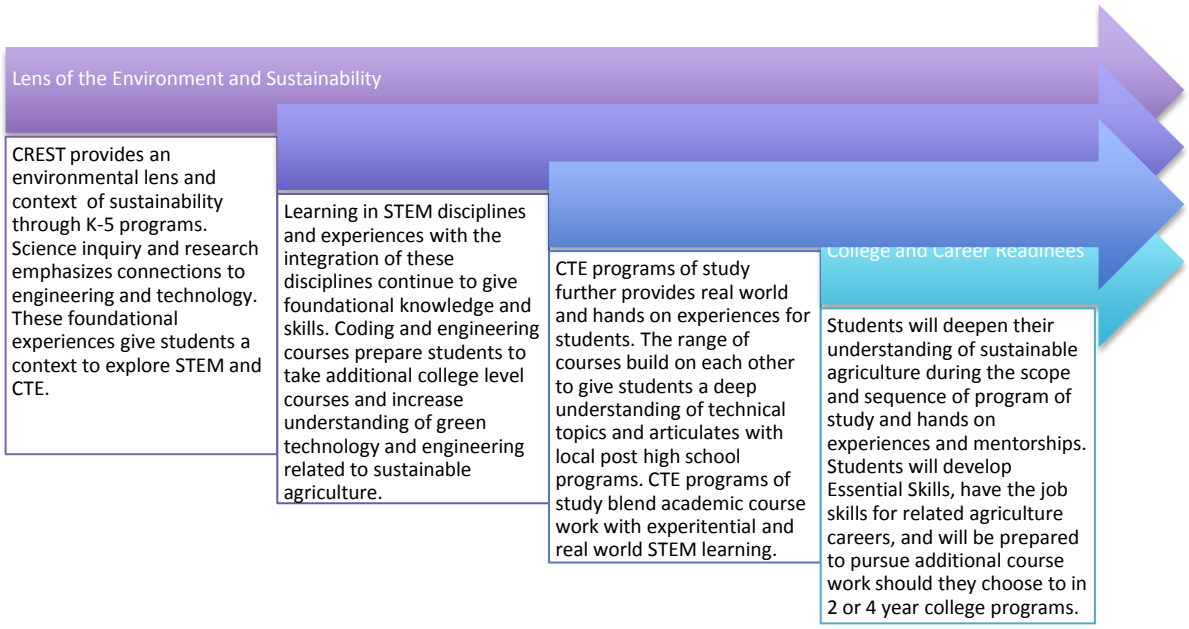
David T. Conley writes about college readiness in his research. In a report prepared for the Bill and Melinda Gates Foundation, he outlines the four facets within his comprehension definition of college readiness: key cognitive strategies, key content, academic behaviors, and contextual skills and awareness.[ix] Conley describes these facets in details in many of his publications, providing a framework for thinking about college readiness as more than course credits and standardized testing, but rather the "understanding and mastering key content knowledge… through the exercise of broader cognitive skills…"[x] While this research is central to many leadership meetings and discussions in general, it is also important as we continue to define STEM education experiences. Like all courses and experiences, we believe that formative STEM experiences should include these facets of college readiness in order to best prepare students for success in their post high school fields of study.

College and career readiness isn't reserved solely for high school programs. Using STEM education as a lens and context, middle school students tour local college campuses, talk with college students about STEM fields of study, and engage in real world, project based learning that connects students with local STEM professionals. These experiences are essential for students to be able to see themselves as successful in rigorous STEM academic programs or as they define their interest in STEM career pathways.

Career and Technical Education (CTE) Programs

The District is working to revitalize its CTE programs, especially as we support students' college and career readiness. One notion is to expand the CREST Farm to School program to include a vibrant CTE program in sustainable agriculture. This program of study would enhance existing learning and internship opportunities and

include additional academic courses related to career and technical education in agriculture. In general, CTE programs foster new and enhance existing partnerships with professionals and educational providers. A CTE program in sustainable agriculture would dovetail with existing partnerships. One possibility is that this CTE program could provide a larger context of sustainability and green engineering for eligible students to enroll in Oregon Tech's (OIT) "Introduction to Engineering" course bundle as they gain college credit. Sustainable agriculture has strong connections to engineering and having a foundational understanding of various engineering fields as a result of the OIT course bundle will be essential for any student wanting to pursue studies or a career in sustainable agriculture. Finally, through this partnership with OIT, a CTE program in sustainable agriculture would also support professional development and provide opportunities for teachers to connect with OIT professors to create additional dual credit opportunities for student in the coming years. CTE programs are important for STEM education and learning in the District.



Community Partnerships

Fostering meaningful experiences for students to engage with their community aligns with the notion that STEM education is a joint responsibility of the larger community. The District has existing partnerships that we are actively expanding and redefining as our understanding of STEM education grows. In addition to educational providers and existing industry partners, the District is working to foster new partnerships with local organizations and companies working in STEM fields to provide additional mentorship opportunities between STEM professionals and students.

South Metro-Salem STEM Partnership

The District signed a memorandum of understanding to join the South Metro-Salem (SMS) STEM partnership at the end of the 2012-2013 school year. WLWV joins thirteen other school districts in a collective effort to shape STEM education in the region with the support from industry partnerships and PK-20 education providers. The mission of the partnership is to "collective optimize PK-20 STEM education by utilizing a full spectrum of public and private resources and model instructional practices to develop a career-ready, diverse, and adaptable workforce that enhances that enhances the regional economy and community."[xi]

As of January, 2014, the industry and community partners involved in this partnership and actively offering support to school districts include: Autodesk, Eaton, First Tech Credit Union, FLIR systems, Garmin AT, Intel, Legacy Meridian Park Hospital, Mentor Graphics, PGE Foundation, Xerox, Business Education Compact, Evergreen Aviation and Space Museum, Mad Science of Portland and Vancouver, MESA (Math Engineering Science Achievement), NASA Space Grant Consortium, Oregon ASK (After School for Kids), Oregon FIRST, and Project Lead the Way. The District is working to grow these partnerships and define ways students and schools can engage with industry professionals and these companies to enhance STEM learning.

In addition to participating in the larger partnership network, District staff and administrators participate in the planning and on-going work of the Professional Learning Communities sub-committee. This group of teachers, principals, and educators work towards developing a plan for professional development for teachers within the participating Districts. This partnership provides important resources and a forum to deepen our understanding about STEM education, how to support its development and integration in schools, and ways to expand educational and industry partnerships to enhance learning opportunities for students and professional development opportunities for teachers.

Regional STEM Hub and District STEM Center

Plans to support STEM education across the state are still in development, however, we know that partnerships between industry partners, secondary educational providers, and K-12 school districts are essential. The notion of a STEM Hub contemplates how an organization like the SMS STEM partnership can have a space, the needed materials, and resources to collaborate and provide unique learning opportunities for the community in STEM learning. Similarly, we see the value in establishing a District STEM center to strengthen our existing programs and provide the space and flexibility for future endeavors. A STEM center would facilitate learning through robotics, sustainable agriculture, computer software courses, engineering design and other programs currently happening throughout the District. Cohesiveness and support around these programs will also provide important professional development opportunities for teachers looking to expand their understanding and ability to STEM education into their curriculum. As we plan for existing and future facilities and District owned properties, supporting the design of a District STEM center allows us to strengthen existing programs by meeting distinct needs for infrastructure and technologies, while also providing future opportunities to expand STEM programs through connections to Career and Technical Education (CTE) programs, as one example. While the SMS STEM partnership is applying for

funds to support a regional STEM Hub, the District is concurrently considering how a similar notion would align with our Long Range Plan, Technology Plan, and other District initiatives and vision themes.

Clackamas Community College

Clackamas Community College (CCC) provides opportunities for our students to gain advanced college credit. Students have the opportunity to enroll directly in college level courses or gain credit through dual credit courses offered at the high schools and articulate with CCC programs. As the District continues to define our STEM education program, more specific opportunities in STEM disciplines and connected to STEM career pathways and field of study will emerge within the scope of this partnership.

Clackamas Career and Technical Education (C-TEC)

The Clackamas Career and Technical Education Consortium (C-TEC) provides education, training, and employment opportunities for low-income students with barriers to employment. As stated on their website, "C-TEC is a consortium of schools and partners Clackamas County committed to creating high quality pathways from education to the workforce. The consortium prioritizes partnership, collaboration, innovation and leveraged resources to provide high quality programs and efficient use of public resources. C-TEC supports Career and Technical Education programs, Advanced College Credit, School to Careers activities, and the Workforce Investment Act Youth Program (C-TEC Youth Services)." The District's partnership with C-TEC is growing rapidly as we look to provide diverse ways for students to gain college credit, have meaningful work and career experiences, and support CTE and STED education in and out of school.

Oregon Tech (OIT)

The partnership with Oregon Tech (OIT) has possibilities around shared resources, mentorship by OIT professors for high school teachers in the District, and enrollment opportunities for eligible high school students. In thinking about supporting STEM education in the District and expanding learning opportunities for students, our partnership with OIT takes three forms: STEM High School Transition (HST) courses, dual credit offerings, and CTE course development. OIT hosted an Open House in January 2014 for District teachers, staff, administrators and community members to tour the new Wilsonville campus and learn more about OIT programs. We are working with high school counselors around scheduling and forecasting in order to help students take advantage of these enrollment opportunities in the years to come.

STEM HST Courses

We will initially focus on the "Introduction to Engineering Program" STEM HST Course bundle. This decision was made based on the void of classes currently offered at the high schools in engineering disciplines. This bundle is comprised of six courses designed to provide a solid foundation in engineering principles and an overview of the different engineering disciplines, including software and embedded engineering, electrical and electronics engineering, renewable energy engineering, and mechanical engineering. The District and OIT will work to streamline the enrollment process into three of the six courses in this bundle in the first years of this partnership. We hope to enroll a small number of eligible of students who have been identified by math teachers, high school counselors or advisors in the spring 2014 term. Courses are offered $25 per credit, in addition to course books and material costs.

Dual Credit Offerings

By identifying the prerequisites students need prior to enrolling in the Introduction to Engineering Program STEM HST course bundle, OIT staff and professors will be able to work directly with high school teachers to align curriculum for future dual credit opportunities. This will be important to ensure that course curriculum is preparing those students who elect to enroll in classes at OIT, as well as creating the opportunity for all students taking these

certain high school math classes to receive dual or accelerated credit. Determining the needed teaching credentials for these high school teachers to be qualified to teach dual credit courses will be an important piece of this work.

CTE Course Development
Within the context of revitalizing the District's Career and Technical Education (CTE) programs, OIT staff and professors have expressed interest in working with District administrators and teachers to develop relevant courses at the high school level related to the proposed program of study. A long-term goal is to provide dual credit for these courses once the CTE program is further developed.

Oregon State University (OSU) Extension

CREST has been working with OSU Extension throughout the development of the CREST Farm to School program. Weston Miller, an Urban Horticulturist with the OSU Extension Horticulture Department, has supported the program, master-planning efforts, and provided professional development opportunities for the resident farm manager. This partnership will continue as the District considers the expansion of the Farm to School program to integrate a potential Career and Technical Education (CTE) sustainable agriculture program of study.

Intel and Science Inquiry and Research

CREST has supported science inquiry and independent student research since the program officially began in 2001. A component of the science inquiry and research program has been the Intel International Science and Engineering Fair (ISEF) and the District's CREST-Jane Goodall Science Symposium. The ISEF affiliated symposium is a regional high school exposition for student projects with the following goals:

1. To provide opportunities for our talented students to compete internationally & be recognized for their achievements in science, math & related fields.
2. To create opportunities for scholarships.
3. To engage students in dialogue with practicing scientists.
4. To encourage our students to embrace math and science as career goals.
5. To enrich our business community with high achieving students focused on math & science.

Footnote References

[i] Oregon Department of Education, *Oregon STEM Education Initiative*. Web. http://www.ode.state.or.us/search/results/?id=382 Accessed: 10, January. 2014.

[ii] Oregon Department of Education, *Oregon STEM Education Initiative*. "STEM Framework Summary." Web. http://www.ode.state.or.us/search/results/?id=382 Accessed: 10, January. 2014.

[iii] Vasquez, Jo Anne, Michael Comer, and Cary Sneider. *STEM Lesson Essentials, Grade 3-8: Integrating science, Technology, Engineering, and Mathematics.* Portsmouth, NH: Heinemann, 2013. Print.

[iv] Ibid.

[v] The Digital Shift, "Meet the Makers: Can a DIY movement revolutionize how we learn?" Web. http://www.thedigitalshift.com/2013/06/k-12/meet-the-makers-can-a-diy-movement-revolutionize-how-we-learn/ Accessed: 10, January. 2014.

[vi] Maker Education Innovative, *About*. Web. http://www.makered.org/about/ Accessed: 10, January. 2014.

[vii] Zhao, Yong. *Catching up or leading the way: American education in the age of globalization*. Alexandria, VA: ASCD, 2009. Print. Page 181.

[viii] STEM Connector, *STEM State Connector Profiles*. Web. http://www.stemconnector.org/state-by-state/oregon Accessed: 10, January. 2014.

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West Linn – Wilsonville Schools

From: 2009 Sunset Primary School Siting Committee
Greg McKenzie, Facilitator
Tim K. Woodley, Director of Operations

To: Roger Woehl, Superintendent

Date: December 2, 2009

Subject: **Sunset School Siting Recommendation**
Report to Superintendent

Roger: The Sunset School Siting Committee has concluded their work and offer herein both the Committee recommendation and a summary of how the group reached this conclusion. This report is provided in the timeframe requested, for your information and use. Greg McKenzie, group facilitator, is prepared to provide an overview of the process and conclusion at the next regular board meeting.

Executive Summary

After studying the information available to compare construction of a primary school at either the current Sunset Primary site, or Oppenlander site, the Committee concluded the current site achieves comprehensive educational goals while optimizing community and neighborhood values. In making this decision the Committee recognizes that Oppenlander Field, beyond its value to community sports, is an important playfield annex for all West Linn schools. Therefore the 2009 Sunset Primary School Siting Committee recommends that the re-construction of Sunset Primary School be located on the current Sunset Primary School site.

As the time for building the new school approaches, the Committee also recommends the school board consider the following:

1. Additional land through: Right of way vacation
   Minimal portion of Sunset Park
   Property acquisition

2. A smaller school building on the site, (if necessary) so long as program and space utilization are not compromised

3. Jointly plan the use of Sunset Park with City of WL and the Sunset neighborhood.

4. Maintain and enhance Oppenlander (especially parking) as a playfield annex for all WL schools

Additionally, the Committee recommends that in order to generate strong support from the community, an information campaign be undertaken to inform the community about the work of this committee and its recommendation to rebuild at the current site.

In conclusion, the Committee suggests that even though the site is 4.5 acres and the school district's Long Range Facilities Plan recommends at least 10 acres for a primary school, the Superintendent and School Board should select the current site based on a comprehensive examination of the overall circumstances, the level of neighborhood support and the district's strong commitment to the neighborhood school concept.

Background

In the Spring of 2007, the LRPC report to the Board included a recommendation to consider the replacement of Sunset Primary school as part of the next capital bond election. Subsequently, the Board asked district administration to follow up with two specific activities.

First was a complete architectural and engineering review of the Sunset Primary facility to determine the extent of the needs of this facility if it were to be remodeled. Additionally, playground needs were reviewed. Second, the Board asked district administration to organize a citizen's task force to review the findings of the architectural study in the context of the question:

> "Should Sunset Primary be remodeled to bring it up to current codes and academic standards or should it be razed and replaced with a new facility on the same site?"

A citizen task force was organized to review information pertinent to this question and prepare a recommendation for the School Board. The task force charge at that time was to:

1. Review the architectural study and recommendations.

2. Review the structural needs of a primary school in the West Linn - Wilsonville S.D. Consider issues of curriculum and academic needs and equity.

3. Weigh the options between remodeling and replacing the Sunset Primary facility. Consider cost/benefit of each option.

4. Prepare a recommendation to be initially presented to the Long Range Planning Committee in November, 2007.

The recommendations of that task force were to:

1. Raze the current Sunset Primary facility and,
2. Rebuild a replacement school at Oppenlander field.

Subsequent to the recommendations of the 2007 task force to the Board, several community meetings were held with Sunset Neighborhood Association and other interested groups. Neighbors in the current Sunset Primary School area were unhappy with the task force's recommendation to relocate the new Sunset Primary to Oppenlander. The Board decided not to include funding for the replacement of Sunset Primary in the 2008 Capital Improvement bond. However, the Board did include funding for revisiting the 2007 Sunset Primary Task Force recommendation to locate a replacement school at Oppenlander field. The LRPC, Board and Administration determined that the evidence supporting the replacement of the current Sunset Primary facility was conclusive but that the location of the replacement facility remained an open question.

Administrative Direction to Sunset Primary Committee - 2009

The District engaged the services of Greg McKenzie to facilitate the 2009 Sunset Primary Committee work to examine the location on which to rebuild Sunset Primary. Mr. McKenzie initiated, at the direction of District Administration, a three-fold process.

1. Determine the stakeholder groups that should be represented on the task force.
2. Bring the established stakeholder representation together to design and agree upon the process of answering the question: "Where should the replacement of Sunset Primary be located?"
3. When the process agreements were in place, answer that question (item 2).

Approximately 350 contacts and invitations were sent to community members inviting them to participate. Included in the list were five Neighborhood Associations, parents of Sunset students, future parents of Sunset students, other Sunset area residents who are not active in the Sunset NA, members of the previous Task Force (not including Wilsonville members), David Lake of the LRPC and facilitator of the 2007 Sunset Task Force, neighbors adjacent to Oppenlander Field, neighbors adjacent to the current Sunset Primary School, senior citizens, Ken Worcester from City of West Linn, and youth recreation groups.

West Linn – Wilsonville Schools

The invitation proposed the following tasks for the Committee:

- Develop a community process to study the site options
- Investigate the feasibility of site options
- Evaluate site options
- Develop a recommendation for locating a new Sunset Primary

Committee Process

Nineteen (19) members of the school district community responded and became members of the Committee. A roster of the Committee members is attached to this Memo. The Committee members represented neighbors around both the current Sunset Primary School site and the Oppenlander Fields site. Representatives from the neighborhood associations closest to each site also participated. The City of West Linn was represented by Ken Worcester.
The Committee was staffed by:

Tim Woodley, Director of Operations
Amy Berger, Bond Operations Assistant
Kathy Ludwig, Principal at Sunset Primary School
Norm Dull, architect (Dull Olson Weekes)

A series of four Committee meetings were held:

Time	Date	Location
6:30 pm	Thurs. Oct. 22, 2009	District Administration Building
6:30 pm	Mon. Nov. 9, 2009	District Administration Building
6:30 pm	Mon. Nov. 23, 2009	District Administration Building
6:30 pm	Tues. Dec. 1, 2009	District Administration Building

The meetings format consisted of facilitated small group discussions and whole group discussions. Each meeting lasted about 3 hours.

Committee Protocols

Committee members agreed to the following operating guidelines for the work of the Committee.

1. Keep an open mind
2. Engage active listening skills
3. Challenge assumptions - ask clarifying questions
4. Conversation and discussion will include all Committee members
5. Be courteous and respectful of other's opinions
6. Seek commonalities and areas of agreement

7. Stay focused on the task at hand
8. Have a parking lot for topics to be revisited at a later time
9. Keep discussion focused on the best interests of the students and community
10. Have a sense of humor
11. The facilitator presides with rules of order and process at the discretion of the facilitator
12. Meetings are open to the public, but not subject to the Public Meetings Law
13. Action by the Committee will be based on a strong consensus which is more than a simple majority, but less than unanimous
14. No Committee member is authorized to speak on behalf of the Committee to the media, unless authorized by the Committee
15. All recommendations from the Committee to the Superintendent are advisory only
16. Research material and other information requested by the Committee will be directed to the staff through the facilitator

First Meeting Summary (10-22-09)

At the first meeting, Superintendent Roger Woehl presented a Superintendent's Memo dated October 22, 2009 outlining the work of the Committee. He explained the link between the work of a prior task force in 2007 concluding that Sunset Primary needs to be replaced and the work of this Committee to make a recommendation about where the new facility should be located. This Committee was charged with developing a process to study and evaluate site options, then submit a recommendation to the Superintendent. The Committee needs to be confident that the recommendation will have strong support from the community.

Director of Operations, Tim Woodley discussed the recent work done at Sunset Primary school. The main concerns are that the building is safe for the children and staff. Work was done in the 2002 bond in the cafeteria, library, kitchen, and other upgrades. The 2008 bond addressed water quality, safety lighting, seismic reinforcement in the gym, remodeled bathrooms, window replacements, parking lot paving, and removing asbestos as well as technology upgrades. Sunset needs to be a viable place for students for the next few years until the school is replaced.

Facilitator Greg McKenzie divided the Committee into table work groups and posed these questions for their discussion with the responses recorded on flip chart:

Protocols Question: For the operation of this Committee, what guidelines or protocols should be followed for group interaction?

Question #1: What characteristics about Sunset Primary should be preserved?

Question #2: What elements about Sunset Primary need to be improved?

Question #3: What information do we need to make an informed decision about the location for a new Sunset Primary?

The Committee agreed that others could be invited to join the group so long as new members studied the work to date, committed to attending the remaining meetings and notified the school district about their interest.

Information was requested from the staff by the Committee to begin its deliberations.

Information needed

1. Comparison of costs for constructing similar sized schools on each site
2. Zoning for each site: current & future
3. Parking requirements for a school on each site
4. Traffic impact on Rosemont Rd. if Sunset Primary moves to Oppenlander
5. Research studies about impact of larger vs. smaller primary schools
6. Seismic/Geologic status for each site
7. Information from prior work
   - Data from 2008 Bond Summit
   - Sunset neighborhood petition
   - Sunset Neighborhood Assn. complaints about parking
   - Information about neighborhood schools vs. busing
8. Criteria for determination that 8-10 acres are needed for a primary school
9. Impact on busing students at each site
10. Projected enrollments for the area

Other Questions

1. Is more land available to expand the current Sunset Primary site?
2. What options are available to replace any portions of Sunset Park lost to the school site?
3. Is the right of way behind Sunset Primary available to expand the site size?
4. What is amount of cost difference between constructions at each site amounts to a significant differential?
5. What is the impact on Sunset neighborhood if more parking is added at current Sunset Primary site?
6. Are any design plans already proposed for each site?
7. What is correct acreage of other primary schools in the district?

Second Meeting Summary (11-09-09)

At the second meeting of the Sunset Primary School Committee, the facilitator reviewed a Facilitator's Memo dated October 28, 2009 that had been circulated to Committee members electronically and by handout at the meeting. The Facilitator's Memo organized the first meeting discussions into a format that might be useful for the Committee's deliberations.

The Committee decided the following should be categories used to compare the two sites.

West Linn – Wilsonville Schools

Categories for Comparison

1. Community/neighborhood ambiance including school history

2. Total costs associated with re-construction of Sunset Primary
3. Traffic flow, safety and impacts
4. District's long-term plan for growth
    - Enrollment projections
    - Demographics
    - Walking vs. busing
    - Attendance area adjustments required
5. Utilization for non-selected site
6. Selected site characteristics
    - Sustainability
    - Parking
    - Program constraints
    - Site size

The school district staff and architect Norm Dull of DOWA provided information and handouts for the Committee in response to the requests for information from the first meeting. Committee members discussed the information and asked questions. For historical perspective Jeanette Spence shared a petition signed by approximately 125 neighbors, submitted to the Long Range Planning Committee from the Sunset Neighborhood Association after the 2007 Sunset Task Force, which proposed Oppenlander as the site for the re-built Sunset Primary.

Other Handouts

Chart of acreages for WLWV primary schools
Recent WL Tidings article about Parker Rd.
Sunset site plan study July 22, 2009
District capacity vs. enrollment chart
Excerpts from Long Range School Facilities Plan for Primary site size
History of Sunset Primary

Third Meeting Summary (11-23-09)

At the third meeting of the Sunset Primary School Committee Troy Bowers reported information from Oregon School Board Association about neighborhood schools and the master plan for the Sunset Neighborhood Association including elements directed at keeping Sunset Primary in its present location.

The facilitator led discussion about each of the Categories for Comparison recording the observations and comments about each site. Each category was evaluated by the Committee based on prior information provided by staff, Committee members and the architect. A preferred site choice for each category was determined.

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The results of the discussion about Categories for Comparison are:

Neighborhood/Community		
Sunset		**Oppenlander**
Already existing		New unknown issues
Status quo situation		School would be in back yard of neighbors
Neighborhood wants school		
Emotional attachment to school		
Neighbors already comfortable with the benefits and burdens		
School district should embrace neighborhood desire		
School would be in front yards of neighbors		
Neighbors moved in because of school		

Choice: **Sunset**

Total Costs		
Sunset		**Oppenlander**
Parking requires a creative solution		Infrastructure costs unknown
Infrastructure costs unknown		Building costs same per SF
Building costs same per SF		

Choice: **Undecided.** Note this topic probably received the most discussion over the course of 4 meetings. Based on the information available, the Committee concluded that the uncertainty of future infrastructure costs, parking, and other factors made differentiation of the two sites on a "cost" basis a difficult analysis. Please note that we will never know the cost of the un-chosen site. The consensus is that the overall infrastructure costs including parking facilities at both sites appear to be comparable or within the acceptable range.

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Traffic		
Sunset		**Oppenlander**
Would not significantly change traffic volume, patterns		Adds traffic burden to Rosemont Road
More kids within walking distance		Neighbors concerned about more traffic
Spanish Immersion program may increase transitory traffic		Compounds LDS church impacts, but primarily after school hours
		Ball field traffic already a problem
		Flow patterns more predictable
		Only one way in - one way out
		Rosemont Road only gets worse

Choice: **Sunset**

District's Plan for Growth		
Sunset		**Oppenlander**
		More changes in attendance areas required
		School not in center of attendance area
		Too close to Erickson (Note: for kids already in district and does not impact Sunset needs)

Choice: **Not a factor**. Future growth in Stafford triangle area will require additional schools. The Sunset Primary where ever located will not serve that enrollment need.

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Site Characteristics		
Sunset		**Oppenlander**
4.5 acres		10 acres
Small site		Ideal size site
Already integrated into "green space"		Avoids construction dislocation
Maybe options to expand site available		Districts comprehensive education goals can be met
District's comprehensive education goals can be met		

Choice: **Oppenlander**.

Other Site Future Use		
Sunset		**Oppenlander**
Unknown		Serves as playfield annex for all WL schools including Erickson
		Fields in middle of town
		Would need to replace fields at cost to community
		Would need to find replacement land
		More flexible for future uses

Choice: **Sunset**

Fourth Meeting Summary (12-1-09)

At the fourth and final Committee meeting, the group assembled to review their recommendation and finalize the written draft. Direction was provided to staff to produce a final draft, forward to Committee for review and submit to the Superintendent in preparation for a regular school board meeting scheduled December 7, 2009 in the district board room.

Overall Site Selection

After considering each of the Categories for Comparison, the facilitator led a general discussion about the Committee's overall preferred site for the re-built Sunset Primary School. A strong

consensus without dissent favored the current Sunset Primary site, but the Committee felt that other considerations should be added to the recommendation to the Superintendent. The committee recognizes that Oppenlander fields, beyond their value to community sports are an important playfield resource to all site-constrained West Linn schools.

Therefore, the Committeee concluded the following:

Preferred site: Current Sunset Primary location

Recommended Considerations:

1. Consider additional land for site through
   - Right of way vacation
   - Minimal Portion of Sunset Park
   - Property acquisition
2. Consider a smaller school building on the site, (if necessary) so long as program and space utilization are not compromised
3. Jointly plan the use of Sunset Park with City of WL
4. Maintain and enhance Oppenlander (especially parking) as a continued playfield annex for all WL schools

[END OF REPORT]