NEVADA READY 21:

IGNITING ECONOMIC DEVELOPMENT THROUGH STUDENTS' 21ST CENTURY SKILLS

NEVADA COMMISSION ON EDUCATIONAL TECHNOLOGY
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VISION, MISSION, AND DEFINITION OF *NEVADA READY 21*

Vision:
Nevada Ready 21 ignites economic development by delivering a 21st century workforce, and by ensuring student equity through personalized access to a connected, 21st century education.

Mission:
To provide all Nevada students an equitable, technology-rich education that supports high standards, an engaging learning environment, and the development of the 21st century skills students will need to fuel the economic growth of the state. Furthermore, *Nevada Ready 21* will support educators in their efforts to create more engaging and personalized instruction by providing the essential tools and the ongoing professional development to guide their transformation.

Definition of one-to-one student computing:
One-to-one computing provides students and teachers with 24 hour access to their own personal, portable, technology device connected wirelessly to the Internet.

For a video representation of what *Nevada Ready 21* could look like, click here.

EXECUTIVE SUMMARY

If Nevada's students are going to compete in the global marketplace, our education system must ensure students have the necessary skills to thrive in the digital age. *Nevada Ready 21* transforms K-12 education by engaging all students in a personalized, learner-centered education. By purposefully infusing technology into students' daily experience, *Nevada Ready 21* teachers will provide students with a 21st century education that builds a vibrant, diverse economy. Without serious and significant investment in curricula, long-term professional development, and the technology and infrastructure that support the development of these skills, our schools face the impossible challenge of developing 21 century students within a 20th century educational system.

Every *Nevada Ready 21* student will have access to the two most important educational opportunities available:

1. Skilled educators who value connected, personalized, student-centered learning, and
2. Continuous access to a personal, portable device that is connected wirelessly to the Internet.

Every *Nevada Ready 21* educator will have on-demand access to sustained professional development, membership to a network of other innovative, *Nevada Ready 21* teachers, and essential tools for delivering an equitable, engaging, technology-rich educational environment that supports all students' learning and Nevada's economic development.

Nevada Ready 21 grew out of the *Nevada Ready!* initiative. *Nevada Ready!* is a statewide initiative led by the Nevada Department of Education and the Nevada Board of Education in partnership with the Nevada System of Higher Education, local school districts, as well as public and private organizations to raise awareness of the state's public school standards. The standards define what students are expected to learn and to be able to do as they move from grade to grade. Ensuring students reach and exceed Nevada academic content standards is at the core of *Nevada Ready 21.*

Nevada Ready 21 utilizes research findings and addresses Nevada's unique educational landscape to generate bold, focused educational transformation. Drawing from the successes of nationally recognized programs as well as from local Nevada programs, this is a plan that customizes proven accomplishments to Nevada's unique educational landscape. Most important, *Nevada Ready 21* ensures that communication outreach specifically targets parents and caregivers. Schools will hold meetings and classes with parents to ensure they are informed partners of *Nevada Ready 21*.

The Nevada Ready 21 final product is described in the latter half of this plan. *Nevada Ready 21* includes devices, internal infrastructure, professional development for teachers and school administrators, parent outreach, internal evaluation, and program staff. This plan was developed by a team of state and national experts who focused on a set of key implementation factors identified by the One-to-One Institute. The planning committee designed the components of the key elements and assigned a *seat price* to those components that includes all of the components necessary to implement *Nevada Ready 21*. The seat price for each component can be multiplied by the number of students at a school to arrive at the estimated cost for implementation at that school.

Through the planning process, it became apparent that many of Nevada's rural schools lack the external infrastructure to implement *Nevada Ready 21*. As such, this plan also lays out the first steps for bringing this infrastructure up to par; however, deep analysis and planning are necessary to remedy the problem. Without adequate connections, many schools will never have the broadband capacity to implement *Nevada Ready 21*. However, *Nevada Ready 21* could serve as the impetus behind these much needed improvements.

RATIONALE

NEVADA READY 21: BUILDING A PREPARED NEVADA

If Nevada's students are going to compete in the global marketplace our education system must ensure students have the necessary skills to thrive in the digital age. Information technology is transforming the global economy and drastically changing the way business and society operates. Learning how to locate and evaluate data in a sea of digital information, and then be able to use that information to learn independently, solve problems and make good decisions are critical skills for future success. Also learning to be flexible and creative in one's thinking, and to be able to effectively collaborate and work in teams are essential skills needed in the rapidly changing world. These are the 21st century skills that will be crucial for students to thrive in the digital age. Without serious and significant investment in curricula, long-term professional development, and the technology and infrastructure that support the development of these skills, our schools face the impossible challenge of developing 21 century students within a 20th century educational system.

Nevada Ready 21 transforms K-12 education by engaging all students in a personalized, learner-centered education. By purposefully infusing technology into students' daily experience, *Nevada Ready 21* teachers will provide students with a 21st century education that builds a vibrant, diverse economy. Every *Nevada Ready 21* student will have access to the two most important educational opportunities available:

1. Skilled educators who value connected, personalized, student-centered learning, and
2. Continuous access to a personal, portable device that is connected wirelessly to the Internet.

Every *Nevada Ready 21* educator will have on-demand access to sustained professional development, membership to a network of other innovative, *Nevada Ready 21* teachers, and essential tools for delivering an equitable, engaging, technology-rich educational environment that supports all students' learning and Nevada's economic development.

BACKGROUND

THE *NEVADA READY!* INITIATIVE

Nevada Ready! is a statewide initiative led by the Nevada Department of Education and the Nevada Board of Education in partnership with the Nevada System of Higher Education, local school districts, as well as public and private organizations to raise awareness of the state's public school standards. The standards define what students are expected to learn and to be able to do as they move from grade to grade. Although standards are not new to education in Nevada, today's students are being taught under more rigorous standards that prepare them for college and the modern workplace, and places Nevada's education system on par with other high performing states. Virtually all of our state's education initiatives are built upon these standards - with the goal of increasing expectations of what our students will know and master to be college and career ready, and equipped to compete globally. Through a comprehensive communications strategy, *Nevada Ready!* will provide information to help educators, students, parents, community leaders and others understand the standards of education adopted by the Department and Board, the tests that will be given to assess student and teacher performance and ways to use those results to help students, educators, schools and school districts reach these new, rigorous standards.

NEVADA READY 21

Nevada Ready 21 grew out of the *Nevada Ready!* Initiative. An important piece of the *Nevada Ready!* modernization efforts comes from the effective integration of technology into the student learning process, and also the use of technology to achieve efficiencies throughout the education system. In November 2012, the Nevada Commission on Educational Technology approved *Digital-Age Education in Nevada: A Plan for 1:1 Computing in Nevada Schools* as its official plan for implementing a statewide one-to-one student computing program. Although the plan was unfunded, the Commission believed it was their responsibility to raise awareness of the impending and increasing need to offer Nevada students a digital-age, 21st century education. The Commission believes the most cost-effective and educationally transformative way to accomplish this is through a statewide one-to-one program. Since 2012, the need for such a program has only increased as the demand for a technologically literate workforce has increased.

In August 2013, the Department was approached by a cadre of business partners wishing to sponsor the Department to work with advisers at the One-to-One Institute, the world's foremost organization on international one-to-one research and implementation. Although the 2012 plan was a good start, it lacked some key elements – most notably, a budget. After 6 months of strategic planning, nearly 50 representatives from different facets of the public and private sectors converged in Carson City in February of 2014 to begin revising the Commission's one-to-one plan. The following pages contain the product of that endeavor, *Nevada Ready 21*.

NEVADA READY 21: CLARIFYING THE NEED

"Nevada stands at a crossroads, yet it appears ready to remap its future."
Mark Muro, Senior Fellow/Policy Director, Brookings Institute

Mr. Muro's prophetic statement in an economic development report in 2011 seems to echo the current condition of a number of Nevada's systems. In his report, Mr. Muro goes on to say that "the current economic slump has not been just a temporary reversal but a challenge to the state's traditional growth model." Among the key challenges Muro identifies are "spotty and weak innovation and technology…and substantial workforce skills shortfalls."

There are strong connections between the identified economic challenges and the state's education system. According to Education Week's State Report Cards for 2013, Nevada was ranked second to last in "Overall Grades and Scores," and last in students' "Chance for Success."

In a study published by the Education Alliance of Washoe County (2011), investigators found that Nevada has one of the nation's least educated workforces. Nevada ranks 43rd in educational attainment of its population, with only 21% of the state's population over 25 holding a Bachelor's degree or higher. Given Nevada's need for a more educated workforce, its low high school and college graduation rates become a major problem because the state will not produce enough qualified workers to meet demand. Remarkably, of 100 high school freshmen in Nevada today, only 10 will earn a college degree within the next 10 years.

Nevada also continues to face major challenges with closing the academic achievement gap. There is more than a 20 point difference between the achievement levels of black students vs. white students in all four tracked areas: 4^{th} grade reading, 4^{th} grade math, 8^{th} grade reading, and 8^{th} grade math. The results were similar for the achievement gap between Hispanic and white students. Although the state saw a significant closing in the gap in 8^{th} grade math, the gap in all four tracked areas still remains over 20 points.

In the most recent Milken Report of state rankings (Klowden & Wolfe, 2013), Nevada's overall technology rank was 47th. In 2010 Nevada was ranked 46th, 43rd in 2004, and 42nd in 2002. There is an obvious trend that indicates that the State continues to fall farther and farther behind the rest of the country. In addition to the Technology ranking, the level of Research and Development investment in Nevada places the state 49th, and Nevada ranks last in the category of Human Capital Investment.

These findings warrant immediate and dramatic action. The National Educational Technology Plan 2010 (NETP) states, "…we need revolutionary transformation, not evolutionary tinkering, and we know that transformation cannot be achieved through outdated reform strategies that take decades to unfold" (United States Department of Education Office of Educational Technology, 2010, p. 3). Technology can be a driver of this transformation, but only if 1) the appropriate content standards are in place; 2) there is a major shift towards personalization in the instructional pedagogy; 3) the right policies are in place to allow for flexibility and personalization; 4) the teachers are adequately trained in how to transform their practices; and 5) a robust network and infrastructure are in place that allow the students and educators to maximize the potential of the technology.

INFRASTRUCTURE CHALLENGES

One of the most important outcomes that grew out of the *Nevada Ready 21* planning process is the recognition that many Nevada schools lack the external infrastructure to carry out an effective one-to-one program. External infrastructure refers to the way in which a building connects to the internet and is referred to as the wide area network (WAN). Ideally, every school in Nevada would be connected through fiber-optic cable. WAN is different from the local area network (LAN) in that LAN refers to the network within the building and is comprised of such items as routers, switches, and wireless access points.

In October 2013, Nevada schools participated in State School Speed Test Month (SST) that was administered by non-profit Education Superhighway (ES) that tested the bandwidth speed of roughly 75% of Nevada schools. Of participating schools, 28% exhibited internet speeds that are ready for technology-rich, digital learning (Fig. 1) because the school met a minimum threshold of 100 kbps per student, a standards set by the State Educational Technology Directors Association (Fox, Waters, Fletcher & Levin, 2012). Another 39% of schools were identified to be in the *emerging reliance* category that has a capacity of 50-99 Kbps per student. These schools are on the brink of readiness for technology-rich digital learning, and with moderate upgrades would be ready to participate in a program such as *Nevada Ready 21*. The remaining 33% of schools will require many network upgrades to participate in *Nevada Ready 21*.

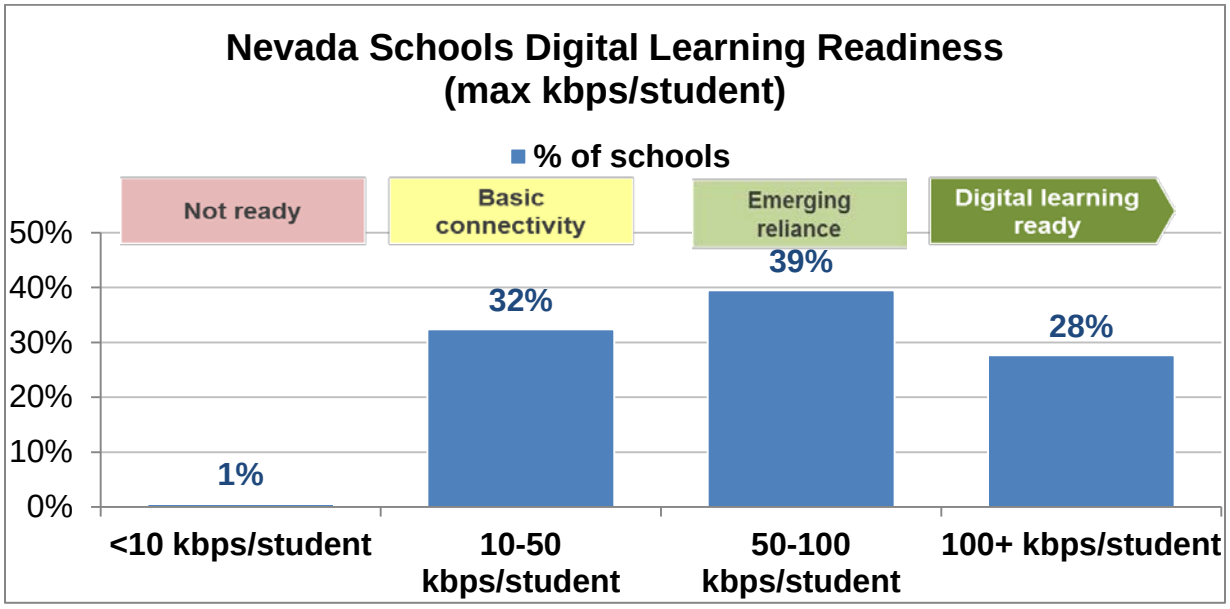

Fig 1. Nevada School Readiness for Digital Learning (Education Superhighway, 2013)

SST data revealed two trends (Education Superhighway, 2013). First, many rural schools lack access to high-speed broadband connectivity. The price of bringing high-speed service to rural and frontier schools is often cost prohibitive. Not only is the cost of installing the fiber-optic cable expensive, but then telecom companies typically lease the line back to the school, and that expense is often costly as well. For instance, one rural school district was quoted over $1 million to run the fiber-optic cable to just two of its schools, and the lease on that cable would have been $14,000 per month until the end of the three-year contract. After three years, that rate would most likely increase.

The second trend revealed through SST data is that large, urban schools may have adequate connections, but due to the sheer number of students accessing the Internet simultaneously, the per student access speed is inadequate for administering technology-rich, digital learning (Education Superhighway, 2013). The student enrollment threshold for this is somewhere around 1,000 students. Although some Nevada schools with enrollments higher than 1,000 offer students adequate connectivity, many do not because the cost of increasing the speed to accommodate large student enrollments is prohibitive.

In short, infrastructure greatly influences whether or not a school can adequately implement a technology-rich program such as *Nevada Ready 21*. Although the solutions are complex, the installation of robust infrastructure across the state is essential to the success of *Nevada Ready 21*, but even more importantly, paramount to the economic development of the state. Nevada's System for Higher Education (NSHE) is but one organization to point this out when they reported "the state's ability to excel in science, technology, engineering, and mathematics is greatly dependent on having good broadband connectivity intra-campus, inter-campus, and to points beyond the state."

ONE-TO-ONE IN OTHER STATES AND LARGE SCHOOL DISTRICTS

MAINE

Currently, the Maine Department of Education is the only state department of education in the nation that administers a statewide one-to-one program (Maine.gov, 2012). Maine's program began in 1999 when the state's governor and legislature, realizing the need for preparing Maine's students for the 21st century, dedicated a one-time state surplus to equip all middle school teachers and students with personal learning devices. The state took two years to plan the implementation of this initiative and in 2001, the program commenced. Since then, the Maine Learning Technology Initiative (MLTI) has grown and now includes all middle and high schools in the state, with plans to begin issuing devices to elementary students in the near future. MLTI transformed the way education is carried out in Maine's classrooms, and the program is linked to increases in students' writing assessment scores, 21st century skills development, geographic spatial awareness, and engagement in classroom activities.

RICHLAND SCHOOL DISTRICT, SOUTH CAROLINA

Richland School District Two is one of the fastest growing districts in South Carolina today serving more than 26,000 students. Fifty-nine percent are African-American; 29% white, 3% Asian, 6% Hispanic and 3% classified as other or multi-racial. The district has seen a significant increase in English Language Learners, with fifty-nine different languages spoken throughout the district. Approximately 46% of Richland Two's students qualify for free and reduced lunch.

Equity for all, increased student achievement, student engagement, and the development of 21st century skills were the main drivers for going one-to-one in this 27,000 student district with high levels of poverty. Now finishing their 2nd year of implementation, Richland has already seen positive results. According to district evaluative data, 65% of teachers and students are seamlessly integrating technology into instruction. They have also witnessed significantly higher student engagement, as measured by learner perseverance, aspirations, study habits, and desire to learn.

SUNNYSIDE UNIFIED SCHOOL DISTRICT, ARIZONA

Sunnyside serves a highly economically disadvantaged community, in a state that has been at, or near the bottom of US per-student funding. Approximately 85% of the district's 17,000 students are eligible for free or reduced lunch, with 6% of the student population being homeless. 16% of students receive English Language Learner (ELL) services, and many students come from Spanish speaking homes. In a 2007 study, Johns Hopkins labeled the district a "dropout factory." Therefore, the one-to-one program in Sunnyside began with a focus on increasing graduation rates. District leadership believed that the technology had the potential to motivate students to come to school, and to help meet the individual needs of struggling students.

Aligning instruction and digital curriculum with the research of Project RED, Sunnyside saw immediate statistically verifiable results of the one-to-one computing program. Student attendance, engagement and achievement improved, resulting in the ultimate goal of keeping students in school and on the path to graduation. Between 2007 and 2010, their graduation rates increased from 71% to 82%. Student discipline instances decreased, and overall student behavior improved. Parent engagement soared. By allowing the laptops to go home the district improved communication with parents through online digital channels for collaboration. Open enrollment

numbers also skyrocketed with the promotion of the one-to-one program, providing an important revenue source to continue the staffing levels needed to support the digital transformation. Sunnyside now is on a path to their greater goal of ensuring their students will be successful when they left school, and can effectively engage and contribute to an ever-changing world.

HUNTSVILLE SCHOOL DISTRICT, ALABAMA

Huntsville began their digital conversion to 'networked' learning by implementing a district-wide one-to-one program to 23,000 students three years ago. District student demographics include: 48% white, 43% black; 6% Hispanic, 3.2% Asian or Pacific Islander and Native American. 46% of the district's students are considered economically disadvantaged.

The district has witnessed great results since the one-to-one program was put in place. Teachers and students are connected and communicating anytime and anywhere. They collaborate; teachers personalize students' learning in highly engaged environments that are available 24/7. Since the one-to-one implementation, student grade level proficiency in math and reading has increased 20%. Graduation rates have increased 14%. Students' increased engagement is demonstrated by a 29% decrease in student in-school suspensions, and 27% decrease in out-of-school suspensions. Huntsville has closed the digital divide for all learners. In tandem with their benchmark assessments, the district saw 5th grade ELA students' increased achievement. Teachers from these schools will collaborate with other teachers, cross district, to ensure all 5th graders reach these standards of success.

ONE-TO-ONE IN NEVADA

One-to-one student computing is not new to Nevada and the majority of school districts are implementing programs in a number of ways. Below are examples of three Nevada schools district programs.

CARSON CITY SCHOOL DISTRICT

In 2012, the Carson City School District in partnership with community stakeholders developed *Empower Carson City*, a 5-year strategic plan with a mission to empower students with the skills, knowledge, values and opportunities to thrive. One of the goals of the plan is to provide every student with access to one-to-one mobile technology**.** To achieve this goal, Carson CSD provided every middle school student with their own netbook, and equipped all middle school teachers with the ongoing professional development needed to fully utilize this technology (view video of Carson's program). In 2014, they will begin to move this program into elementary schools as well. Carson CSD received much attention for their program including news coverage from KTVN Channel 2 (click here to view the story). Teachers created their own YouTube channel where they post lessons that any teacher in the world may access.

LINCOLN COUNTY SCHOOL DISTRICT

In 2009, Lincoln CSD won a 2-year $245,000 competitive grant through the Nevada Commission on Educational Technology to implement a one-to-one program at one middle school. By leveraging the successes of this project, the district expanded the program to five campuses covering all middle schools in the district. The following year, the district implemented one-to-one computing in all grades 4-12. Substantial student gains were found in four

areas: increased student engagement in classroom activities, increased motivation of low-achieving students, increased use of technology, and increased anytime-anywhere learning. A recent student survey revealed that 79% of students found the integration of netbooks into their classroom activities beneficial to their learning experience.

CLARK COUNTY SCHOOL DISTRICT

In 2012, the Clark County School District launched the e3: Engage, Empower, Explore Project that brought students 24/7 access to iPads. The project goals targeted student achievement, parental involvement, and resource efficiencies, and although all goals were not met during the first year, the schools made positive movement toward reaching them. Several lessons were learned in the first year of this project. First, wifi infrastructure needed to be much more robust than expected, and much of the first year was spent accomplishing that. Wifi enhancements were made before they entered the second year of the program. Additionally, Clark CSD is enhancing their professional development efforts to include more subject-specific teacher training. They found that school administrators are critical to leading change in classroom practices and Clark CSD is ramping up their administrator professional development as well. Principals and teachers alike believe that the program has great potential to effectively transform classroom practices. As one teacher explained, "This year has been a learning experience. Overall, I do not believe that the iPads have significantly enhanced student learning in my class this year. However, I do think that if I continue to work with the iPads next year, I can improve and get more out of them" (Pearson, 2013, p. 1). This is an important point. Technology programs require time for educators and students to internalize and manifest the cultural shift necessary to bring about marked improvements. In time, the e3 Project has great potential to meet their goals and to transform student learning in CCSD.

NEVADA READY 21: A VISION FOR PERSONALIZED LEARNING

Personalizing learning through the appropriate integration of technology will be one of the key drivers of Nevada's success. As was found in the examples of one-to-one above, personalization through the integration of technology increases student engagement, lowers dropout rates, and can lead to the development of important 21st century skills, and ultimately higher student achievement. The example below illustrates a potential vision for personalization.

> Eighth grader Selena awakens early to the sound of her phone alarm and remembers that today is the day for her live video link with students in Japan, Russia and Canada. Her team has been working collaboratively on a cultural exchange project and today they will debate the issues. She sends a group text to her team and their teacher to remind them to review their collaborative paper on their wiki before they meet later today. During Selena's bus journey to school, she connects to the bus' Wi-Fi hotspot from her laptop to listen to the podcast her math teacher updated overnight. While listening, she adds her thoughts to a collaborative notebook on Google Docs. She sees another classmate is also adding notes and uses the chat feature to help him figure out one of the problems. Selena receives an email notification from her English teacher with a download code for the novel they will begin reading next week. She accesses her account and downloads it before her bus drops her off at school.
>
> Once at school, Selena checks her calendar and task list on her laptop to see what needs attention first. She receives her weekly notification from the personal learning planner portal with her

recommended lessons. Selena loves that she can work on the specific skills she missed on her assessments instead of sitting through instruction on concepts she has already mastered.

Selena heads over to the problem solving lab for her next hour. Each of the ten workstations has different problems to solve. Once she logs in, she starts to work on a problem and notices there are five other students, each from a different country, who are working on the same problem. She joins the chat and asks what she can do to help. The students tell her to review the collaborative lab notebook and see if they missed something and in this way, the students work together to solve the problem. Since her assignments are submitted electronically and digitally time stamped, the teacher knows exactly when they are submitted. Her parents also get a notification when the assignments are graded.

Selena's team uses the group videoconference room for their link-up to the Japanese, Russian, and Canadian students. Hundreds of other students around the world will access the video stream that will be put on the school's website after the event. Later that evening, Selena refers back to the video stream before she submits her assigned reflection paper to her teacher's page on the school's learning management system. While this scenario may seem outlandish or unattainable, it's becoming a prevalent reality for many students across the country. To read further about Selena and her family, click here.

Now is the time to transform education in Nevada to promote student success, to support economic growth, and to build a 21st century workforce. Nevada's success in the years ahead will require all public and private sector organizations to work together in a focused manner to build out the needed technology infrastructure. It will require making difficult choices, and will require sacrifices of less-important initiatives to focus on the critical challenges facing the State.

KEY ELEMENTS OF *NEVADA READY 21*

Nevada Ready 21 utilizes research findings and addresses Nevada's unique educational landscape to generate bold, focused educational transformation. The team that created this plan was divided into three workgroups. Each workgroup focused on a set of key implementation factors identified by the One-to-One Institute as essential to effective one-to-one project planning: infrastructure, professional development, communication, leadership, evaluation, assessment, and finance (Project Red, 2010). The three workgroups focused on the key elements below.

Workgroup 1: Infrastructure

Workgroup 2: Professional Development, Instruction, Assessment

Workgroup 3: Leadership, Communication, Finance, Evaluation

SEAT PRICE DEFINED

Each workgroup was tasked with designing the components of their key elements and then to assign a *seat price* to those components. The ultimate goal of the committee was to arrive at a final, comprehensive seat price that included all of the components necessary to implement *Nevada Ready 21* at a school that already had adequate, external infrastructure. Seat prices were based on the typical price districts spend on components. The seat price can be multiplied by the number of students at a school to arrive at the estimated cost for implementation at that school.

KEY ELEMENTS DESCRIBED

INFRASTRUCTURE

Technology infrastructure is the foundation of *Nevada Ready 21*. Simply put, *Nevada Ready 21* goals cannot be accomplished without adequate internal (local area network or LAN) or external (wide area network or WAN) school infrastructure. Infrastructure is often overlooked during the planning of technology programs possibly because it is invisible and confusing to most people. Nonetheless, infrastructure is arguably the most critical element of *Nevada Ready 21*.

The following table lists the components factored into the seat price for infrastructure, which also includes student and teacher devices. The seat price and, thus, the list does not include infrastructure outside of the building, but it does include everything needed for a school that is already connected through fiber-optic cable.

Internal Infrastructure, Devices, and Software		
Routers	Servers	Switches
Wireless LAN Controllers	Wireless Access Points	Storage
Blade Servers	Data Center Equipment	UPSs
Student Devices with Warranties and Insurance	Laptop Carts for Charging	Protective Backpacks
Teacher Devices with Warranties and Insurance	Batteries	Battery Chargers
Learning Management System	Implementation Services	Productivity Software

INSTRUCTION

The instructional goal of *Nevada Ready 21* is to create a personalized, learner-centered educational experience for all students that focuses on equipping students with 21st century skills such as communication, collaboration, creativity, and critical thinking. These goals are achieved by concentrating classroom instruction on the Nevada Academic Content Standards and the instructional strategies that foster students' 21st century skills development.

Statewide, half of Nevada's students are enrolled in a free or reduced lunch program, 15% are English language learners, and 11% are enrolled in a special education program. A statewide goal is to help these learners achieve at higher rates and ensure equity of learning experiences for all. The instructional component of *NV Ready 21* hones in on creating strategies and personalized learning experiences, powered up through technologies, to ensure these students achieve their greatest potential.

Equipping students to stay on the cutting edge in a rapidly changing world requires preparing students to continue their learning beyond K-12 schooling. The Nevada Academic Content Standards (NVACS) emphasize student technology skill development in the context of content. For instance, K-5 writing standards require students to be able to "…use a variety of digital tools to produce and publish writing, including in collaboration with peers" (Nevada Department of Education, 2010, p. 19). The 6-12 writing standards require students to "…[u]se technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information" (Nevada Department of Education, 2010, p. 43). Similar to the writing standards, NVACS in mathematics and science also develop students' 21st century

skills, and require students to learn how to learn with technology. Overall, NVACS clearly emphasize the importance of student technology literacy for the purpose of preparing college- and career-ready students.

Nevada Ready 21 includes two Instructional Integration Experts (See description under *Leadership*) who are members of the State Program Team and will facilitate digital classroom instruction that is aligned to the NVACS. The role of the Integration Experts will be to work closely with the Professional Development Experts (See description under *Leadership*) to bring about the instructional changes necessary to create a world-class, 21st century learning environment for all Nevada students. As the role of teacher changes from disseminator-of-knowledge to facilitator, communicator, and collaborator, so must instruction and learning experiences.

PROFESSIONAL DEVELOPMENT

Next to infrastructure, professional development is the most critical element of *Nevada Ready 21*. Educators are the most essential agents of transformation in the educational system. To become those agents, they must have the support necessary to engage their transformative power. That assistance comes in the form of ongoing, sustained, high-quality professional development. *Nevada Ready 21* provides on-demand, online professional learning opportunities to teachers and administrators in Nevada's urban, rural, and frontier schools. *Nevada Ready 21* professional learning is targeted to educators' specific needs, regardless of their skill levels. As one component of the professional development plan, educators select courses based upon professional values, learn at their own pace, and communicate with other innovative colleagues.

The *Nevada Ready 21* professional development model creates a cadre of coaches who support 25-30 teachers in a face-to-face, online, or blended environment. As such, schools and districts can tailor their opportunities to their specific needs. This model takes into consideration the varying needs of Nevada school districts. Below is a description of the key players' roles in the *Nevada Ready 21* professional development model.

Nevada Ready Professional Development Model

State Leadership Team (see description on *Leadership*)

- Manages statewide learning management system (LMS)
- Develops online modules for teachers
- Populates and disseminates LMS content ; gathers/posts just-in-time resources and examples
- Trains and/or organizes district training for coaches
- Organizes continuing education units (CEUs) that are provided to teachers and administrators
- Provides online instructional course for students, culminating in a " technology driver's license" that certifies the students meet minimum proficiency standards
- Organizes and fosters collaboration among districts
- Develops tools for assessing teacher/administrator PD progress

District Coaches

- Provide professional development and support for 25-30 teachers or administrators that could be face-to-face, online, or both depending on geographic distances, and available, local resources
- Complete a state-run training focused on developing coaching skills
- Work with State Leadership Team to develop a cadre of master educators who will provide support to future cohorts of *Nevada Ready 21* educators
- Work with a new group of educators each year as schools come into the project

Administrators

- Commit to monthly collaborative sessions focused on program vision and leadership
- Commit to mentoring another administrator during second year of implementation.
- Receive CEUs for their participation

Teachers

- All teachers expected to take 15-hour module, either online self-paced, online facilitated, or face-to-face prior to roll-out of student devices
- Percentage of teachers completing the modules may be a factor in choosing schools for roll-out
- Receive devices 3-6 months ahead of students depending on district needs
- During the first year of implementation, each school identifies a cohort of teacher leaders (8 – 10). These teachers are grouped according to content area and receive quarterly PD provided by digital coaches. PD content is framed around 21st century student experiences.
- Digital coaches follow-up and assist teachers in implementing what was planned during the quarterly workshop. This could be done face-to-face or online. (To view an example of online teacher coaching, click here.)
- Teachers in the first cohort will mentor another teacher at the site during the second year.
- Must show a minimum technology proficiency prior to student roll-out.

COMMUNICATION

Central to *Nevada Ready 21*'s success is a well-planned, pointed communication strategy. Stakeholders must be involved every step of the way throughout the planning, roll-out, and maintenance phases of the program. In addition to soliciting input and feedback from stakeholders, the communication strategy must account for sufficient dissemination of information. *Nevada Ready 21* stakeholders are teachers, administrators, parents and caregivers, students, state and district administrators, community members, business representatives, legislators, and the media.

Most important, communication outreach will specifically target parents and caregivers. Schools will hold meetings with parents to ensure they are informed partners of *Nevada Ready 21*. Furthermore, schools will hold optional classes for parents who wish to increase their computer skills and to learn more about their child's safe and appropriate use of the device.

To best accomplish this goal, a communications professional will be hired as part of the state team (See description on *Leadership*). This individual will report to the Program Manager and Program Director and will work closely with the Public Relations Officer at the Department. The seat price of this position is included in the leadership section below.

LEADERSHIP

Nevada Ready 21 leadership occurs at the school, district, and state levels. Research demonstrates that effective leadership is pivotal for successfully leading school transformation and incorporating technologies.

SCHOOL ADMINISTRATORS

School administrators play a key role in fostering school culture. *Nevada Ready 21* school administrators commit to monthly, online professional development that creates a community of leaders who support 21st century teaching and learning. Second-year *Nevada Ready 21* administrators commit to mentoring incoming first-year administrators, thereby, expanding the community of 21st century leaders across Nevada.

DISTRICT ADMINISTRATORS *Nevada Ready 21* accounts for the varying needs of districts and encourages districts to individualize their programs to meet their specific district needs. In so doing, each participating district assigns a district administrator to participate in quarterly, online meetings. This person is responsible for ensuring *Nevada Ready 21* meets the individualized goals of the district.

STATE PROGRAM TEAM *Nevada Ready 21* is administered at the state level by a team of professionals whose positions are described below. One position, Program Director, will a state employee of NDE. The remaining eleven positions included in the seat price and will be contracted through the vendor that is selected through the state procurement process to provide the mobile learning devices. NDE will conduct the interviews to fill the eleven positions that will be housed at NDE. All positions other than the Program Director are factored into the seat price.

STATE PROGRAM TEAM

- PROGRAM DIRECTOR (1 Position, NDE Position) - oversees all operations of the program and ensures its success; directs all other *Nevada Ready 21* program staff
- PROGRAM MANAGER (1 Position, Contracted Position) – Oversees the daily operations of the program to ensure that all benchmarks and goals are met
- COMMUNICATIONS OFFICER (1 Position, Contracted Position) – Oversees, produces, and ensures feedback loops through communications with stakeholders; ensures consistent messaging is reaching stakeholders with opportunities for input
- INTERNAL EVALUATOR (1 Position, Contracted Position) – Provides ongoing formative and summative evaluation of the *Nevada Ready 21* program to ensure program goals are met. Incumbent is integrally involved in the initial planning and roll-out phases of the *Nevada Ready 21* program.
- IT ANALYST (2 Positions, Contracted Positions) - Oversees the analysis of and solutions to IT needs in participating schools specific to the demands of *Nevada Ready 21*. This analysis may include but is not limited to school fiber-optic cabling needs, device needs, and internal infrastructure needs.
- PROFESSIONAL DEVELOPMENT EXPERTS (4 Positions, Contracted Positions) –Work as a collaborative unit in field positions located across Nevada to create and administer professional development that focuses on the Nevada Academic Content Standards and 21st century skills in alignment with the *Nevada Ready 21* Professional Development Model. Incumbents also utilize existing professional development resources such as those offered by Regional Professional Development Programs and existing online professional development programs such as e-Learning for Educators (e4e).
- INSTRUCTIONAL INTEGRATION EXPERTS (2 Positions, Contracted Positions) – Work closely with the PD experts to design and assemble digital classroom content that is aligned with the Nevada Academic Content Standards and is made available to all Nevada educators online.

EVALUATION AND ASSESSMENT

An internal evaluator is a member of the State Program Team to perform formative and summative evaluations that direct State Program Team activities (see description on *Leadership*). The internal evaluator will evaluate at a minimum the items listed below.

NEVADA READY 21 EVALUATION CRITERIA

- Effects on students (summative)
    - Engagement and motivation
    - Discipline/behavior
    - Attitudes toward learning
    - Academic achievement
    - Graduation Rates
    - Course Completion Rates
- Effects on teachers (summative)
    - Attitudes towards teaching with technology
    - Self-efficacy
    - Shift in pedagogy from teacher-centered to student-centered
- Effects on Parents and Caregivers (summative)
    - Involvement and engagement
- Planning and support: identify educational goals; specify implementation goals (formative)
- High quality, sustained professional development (formative)
- Integration of *Nevada Ready 21* goals into curricular framework (formative)
- Return on investment (summative)

In addition to these broad-based evaluation criteria, all *Nevada Ready 21* teachers and administrators will set written, individualized goals of which the results will be included in annual, summative evaluation reports. School districts will be responsible for ensuring these data are collected and reported to the state evaluator.

FINANCE

Technology need not be an additional expense for schools. Other industries look to technology as a cost-saving solution. *Nevada Ready 21* creates opportunities for cost savings, and for students and teachers to innovate in new learning environments, powered by technology. Schools spend much on supplemental print materials (textbooks, paper assessments, handouts, etc.) and those expenses would be avoided in a digital, paperless, *Nevada Ready 21* learning environment. A recent study revealed (Greaves, Hayes, Wilson, Gielniak, & Peterson, 2012):

- The electricity to power one student laptop costs about $11 a year as opposed to $80 per year for a desktop. Netbooks cost even less because they require less power. iPads and Android-based tablets use significantly less power than a netbook. If students charge their laptops at home, the savings are higher;
- Travel expenses are saved through online professional learning;
- Teacher attendance increased at schools with well-implemented one-to-one programs, which translated to a cost-savings associated with hiring substitute teachers;
- A decrease in disciplinary problems that translated into a cost-savings for schools;
- Efficiency and productivity lead to cost avoidance through use of technology tools, applications, software for administrative, data retrieval and archive, communication, and production of resources.

COST SUMMARY

As noted throughout this section, the cost of *Nevada Ready 21* can be measured in terms of a "seat price" that includes all of the key elements described in the previous pages. Below is a summary of that seat price. In addition to the seat price, additional expenses for implementation in the first and second years are listed below.

SEAT PRICE SUMMARY

Key Elements Included in Seat Price	**Seat Price**
Internal Infrastructure Devices Software Professional Development State Program Team	$610

ADDITIONAL YEAR 1 AND YEAR 2 EXPENSES

Elements	**Year 1**	**Year 2**	**Total Cost**
Program Director Salary – NDE Employee	$120,000	$120,000	$240,000
Consultant Fees for Assistance with Contract Negotiations	$10,000	$0	$10,000
Consultant Fees for Year 1 and Year 2 Program Mentoring	$50,000	$50,000	$100,000
Program Operating Expenses (Travel, Meetings, Supplies, Program Director's Office Setup)	$15,000	$10,000	$20,000
Incentives for WAN Upgrades (see *Infrastructure Improvements* on the next page)	$5,000,000	$5,000,000	$2,000,000
Total	**$5,195,000**	**$5,180,000**	**$10,370,000**

NEVADA READY 21 SELECTION CRITERIA

When making a large investment, as is the case for *Nevada Ready 21*, measures should be taken to ensure that the conditions within the participating districts will provide for their success. Participating schools, therefore, will be required to meet rigorous requirements. The following sections outline these requirements and the *Nevada Ready 21*'s selection criteria.

INFRASTRUCTURE IMPROVEMENTS

As was stated in the *Infrastructure Challenges* section of the *Rationale* of this document, one of the most important outcomes that grew out of the *Nevada Ready 21* planning process is the recognition that many Nevada schools lack the external infrastructure to carry out an effective one-to-one program. External infrastructure refers to the way in which a building connects to the internet and is referred to as the wide area network (WAN). Ideally, every school in Nevada would be connected through fiber-optic cable. The *Nevada Ready 21* seat price includes internal infrastructure necessities, but it does not include WAN costs. Incentive matching grants will be made available to a few schools that are within close reach of fiber-optic access and otherwise meet the selection requirements.

A district's Internet connection greatly influences whether or not their schools can effectively implement a technology-rich program such as *Nevada Ready 21*. The solution for this problem is complex, and requires high-level organization and planning. The Commission recommends the following measures be taken.

1. State executive leadership enlists state agencies such as Transportation, Enterprise Services, Health and Human Services, Education, and System of Higher Education along with Nevada counties to map out ways schools and other entities may tap into existing and future fiber-optic infrastructure.
2. The Nevada Department of Education under the leadership of the *Nevada Ready 21* program director works with telecom providers on statewide, scaled pricing to connect all schools in Nevada.
3. The Nevada Department of Education under the leadership of the *Nevada Ready 21* Program Director in conjunction with the Nevada Broadband Taskforce works toward improved school connectivity.
4. The Nevada Department of Education under the leadership of the *Nevada Ready 21* Program Director forms a committee comprised of school district, state, private sector, and non-profit representatives that focuses on improving school connectivity. This committee works with the groups described in 1-3.

NEVADA READY 21 SELECTION REQUIREMENTS

To apply to participate in *Nevada Ready 21*, schools must meet specific selection criteria. These criteria are established to ensure successful implementation.

1. School WAN connections must meet or exceed 100 kbps per student in accordance with SETDA's recommendation for digital learning readiness (Fox, Waters, Fletcher & Levin, 2012).
2. The school principal must commit to participation in *Nevada Ready 21* professional development activities and to create a school culture that promotes students' personalized access to a connected, 21st century education.
3. *Nevada Ready 21* will target entire schools and partial school participation will not be allowed. All the teachers in the school must commit to full participation, which includes participating in all professional

development activities and a willingness to promote students' personalized access to a connected, 21st century education.

4. Schools with high populations of students enrolled in programs of English language learning, special education, and free and reduced lunch will be given preference.
5. First, second, and third-round applications are open only to middle school. Fourth, fifth, and sixth-round applications are open only to high school.

NEVADA READY 21 APPLICATION SELECTION PROCESS

To participate in *Nevada Ready 21*, school districts must submit plans that will be reviewed and approved by the Nevada Commission on Educational Technology. As part of their plans, school districts will map out the steps they intend to take to bring individualized, learner-centered, standards-focused education to the forefront of their students' educational experiences. District plans will clearly define the instructional goals, the steps they will employ to achieve these goals, and the measures they will use to gauge progress. The plans will also include a description of resources they will utilize to implement their plans. The following selection process will be employed.

1. Districts will apply on behalf of schools within their jurisdiction.
2. Districts may apply on behalf of only those schools that meet the selection requirements above.
3. As part of their applications, districts will submit plans that lay out the steps they will take to successfully implement their programs. The plans will address the seven key elements (infrastructure, instruction, professional development, communication, evaluation and assessment, leadership, and finance) and how the elements will be addressed in the district's program. Plans will also address how state and district resources will be utilized to support the success of the project. Furthermore, plans must include measurable objectives and the steps they will take to attain these objectives.
4. The request for applications will be created and approved by the Nevada Commission on Educational Technology.
5. Late applications will not be considered.
6. A seven-member review committee will be appointed by the Commission to review applications and make a funding recommendation to the Commission. The *Nevada Ready 21* Program Director, with the approval of the Commission, will select the members of this committee. This committee will be comprised of representatives from NDE, the Commission, private sector, Program Mentors, non-applicant schools and school districts, and any other entity the Program Director and Commission see fit.
7. The Commission must approve the recommendations of the review committee for the funds to be approved for distribution.

NEVADA READY 21 TIMELINE

Nevada Ready 21 is intended to be an ongoing program with proven successes for many years to come. The timeline below offers a framework for roll-out, implementation, and maintenance. The timeline takes into account that the funding becomes available in July of the first year of the biennium. Each year coincides with a fiscal year (July 1-June 30).

	Timing	Description
Year 1	July 1	Funds are released and the program begins
	July	Begin search for Program Director
	August	Program Director selected
	September	RFA is released to find a vendor that will provide the NR21 package (LAN infrastructure, student and teacher devices, teacher and administrator professional development, 11 State Program Team members, and possibly instructional content)
	October	NDE begins search to fill state program team positions
	November	State program team begins working toward roll-out of NR21
	November	Program Director begins working toward statewide broadband improvements
	February	Commission-approved RFA to select the first-round middle schools is released to school districts
	April	First-round schools are selected for the program by the review committee and approved by the Commission
	April	Devices and infrastructure are ordered for first-round schools
	June	Teachers receive their devices. Infrastructure and student devices are delivered to districts.
	June	First-round teacher and administrators begin NR21 professional development programs
	June	Year 1 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 1 Ends

Year 2	July 1	Year 2 Begins
	Summer	Devices are delivered to districts and infrastructure installed
	September	*Nevada Ready 21* first-round schools start program
	January	Commission-approved RFA to select the second-round middle schools is released to school districts
	February	Second-round schools are selected for the program by the review committee and approved by the Commission
	February	Devices and infrastructure are ordered for second-round schools
	March	First-round administrators are selected to become mentors for the second round administrators
	June	Second-round teacher and administrators begin NR21 professional development programs
	June	Year 2 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 2 Ends

Year 3	July 1	Year 3 Begins
	Summer	Devices are distributed and infrastructure installed
	September	*Nevada Ready 21* first-round schools start program
	January	Commission-approved RFA to select the third-round middle schools is released to school districts
	February	Third-round schools are selected for the program by the review committee and approved by the Commission
	February	Devices and infrastructure are ordered for third-round schools
	March	First-round and second-round administrators are selected to become mentors for the third-round administrators
	June	Third-round teacher and administrators begin NR21 professional development programs
	June	Year 3 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 3 Ends

Year 4	July 1	Year 4 Begins
	Summer	Devices are distributed and infrastructure installed
	September	*Nevada Ready 21* first-round schools start program
	January	Commission-approved RFA to select the fourth-round high schools is released to school districts
	February	Fourth-round schools are selected for the program by the review committee and approved by the Commission
	February	Devices and infrastructure are ordered for fourth-round schools
	March	First-, second-, and third-round administrators are selected to become mentors for the fourth-round administrators
	June	Fourth-round teacher and administrators begin NR21 professional development programs
	June	Year 4 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 4 Ends

Year 5	July 1	Year 5 Begins
	Summer	Devices are distributed and infrastructure installed
	September	*Nevada Ready 21* first-round schools start program
	January	Commission-approved RFA to select the fifth-round high schools is released to school districts
	February	Fifth-round schools are selected for the program by the review committee and approved by the Commission
	February	Devices and infrastructure are ordered for fifth-round schools
	March	First-, second-, third-, and fourth round administrators are selected to become mentors for the fifth-round administrators
	June	Fifth-round teacher and administrators begin NR21 professional development programs
	June	Year 5 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 5 Ends

Year 6	July 1	Year 6 Begins
	Summer	Devices are distributed and infrastructure installed
	September	*Nevada Ready 21* first-round schools start program
	January	Commission-approved RFA to select the sixth-round high schools is released to school districts
	February	Sixth-round schools are selected for the program by the review committee and approved by the Commission
	February	Devices and infrastructure are ordered for sixth-round schools
	March	First-, second-, third-, fourth-, and fifth round administrators are selected to become mentors for the sixth-round administrators
	June	Sixth-round teacher and administrators begin NR21 professional development programs
	June	Year 6 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 6 Ends

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