December 21, 2016 Meeting Agenda

Wednesday, December 21 at 9:00 AM CT

Host Location: Varner Hall Lower Level Videoconferencing Room, 3835 Holdrege Street, Lincoln, NE and Videoconferencing Locations: A) ESU 13, Video Room, 4215 Avenue I, Scottsbluff, NE 69361; B) Northeast Community College, Maclay Bldg 167A, 801 E. Benjamin Ave., Norfolk, NE 68701; C) Schuyler Community Schools, 401 Adam St., Schuyler, NE 68661

Open Meetings Act (PDF - 7 pgs, 81kb)

Meeting Documents (PDF)

9:00 AM	**1.** Call to Order, Electronic Posting, Location of Open Meeting Law Documents, Roll Call, Introductions	Co-Chair
9:05 AM	**2.** Consider approval of the Agenda for the December 21, 2016 meeting*	Co-Chair
9:08 AM	**3.** Consider approval of the Minutes from the 10/19/2016 meeting*	Co-Chair
9:10 AM	**4.** Public Comment	Co-Chair
9:15 AM	**5.** Presentation: Accessibility for Digital Learners	Dr. Christy Horn
	A. Slide Presentation	
	B. Handout: DCMP Captioning Key	
	C. Handout: WebAim Checklist	
10:15 AM	**6.** Network Nebraska Initiative Update	Co-Chairs & Council members
	A. Action Items and Task Groups	
	1.1 Develop strategy to accommodate community affiliate connections	
	1.2 Use automated tools to monitor the network	
	1.3 Implement incident management and change control	
	1.4 NNAG, CAP guide OCIO's network decisionmaking (Draft Backbone Document)	
	1.5 Review and update security services and practices	
	2.1 Develop and implement a communications strategy	
	2.2 Conduct annual survey of NN Participants	

10:50 AM	**7.** Digital Education Initiative Update	Co-Chairs & Council members
	A. Action Items and Task Groups	
	1.1 Partner with K-20 entities to establish communities of practice	
	2.1 Conduct a collaborative research project of infratructure and pedagogy	
	2.2 Identify opportunities for institutional collaboration	
	2.3 Identify and mitigate challenges for student transitions	
	2.4 Create guide of flexible learning technologies	
	2.5 Encourage vendors to implement data exchange standards	
	3.1 Form a joint study group to advance students' equity of access	
	3.2 EC/CC collaboration for affordable and accessible Internet access (Briefing Document)	
	3.3 Promote accessible products and services to achieve equity of access	
11:20 AM	**8.** Other Business	Co-Chair
11:25 AM	**9.** Agenda Items for the 2/15/2017 Meeting	Co-Chair
11:28 AM	**10.** Consider location(s) for the 2/15/2017 Meeting	Co-Chair
11:30 AM	**11.** Adjournment	Co-Chair

* Indicates an expected action item.

The Council will attempt to adhere to the sequence of the published agenda, but reserves the right to adjust the order of items if necessary and may elect to take action on any of the items listed.

The NITC Education Council wishes to thank staff of the University of Nebraska Online Worldwide and UN-I.T. Enterprise for helping to arrange the December 21, 2016 meeting.

NITC/Education Council Homepage
Meeting Notice Posted to the Nebraska Public Meeting Calendar 10/21/2016
Agenda Posted to the NITC Web site 10/21/2016

EDUCATION COUNCIL
Nebraska Information Technology Commission
Wednesday, October 19, 2016, 9:00 A.M. CT
Location: Varner Hall Lower Level Board Room, 3835 Holdrege Street, Lincoln, NE
Open Meetings Act

MEMBERS PRESENT:
Mr. Mark Askren, University of Nebraska
Mr. Derek Bierman, Northeast Community College
Mr. Burke Brown, Palmyra School District
Mr. Mike Carpenter, Doane University
Mr. Matt Chrisman, Mitchell Public Schools
Dr. Ted DeTurk, ESU 02
Mr. John Dunning, Wayne State College
Mr. Steve Hamersky, Omaha Gross Catholic High School
Dr. Dan Hoesing, Schuyler Public Schools
Mr. Steve Hotovy, Nebraska State College System
Mr. Greg Maschman, Nebraska Wesleyan University
Mr. Gary Needham, ESU 09
Ms. Mary Niemiec, University of Nebraska
Mr. Tom Peters, Central Community College
Mr. Alan Moore, ESU 3 Board Member

LIAISONS/ALTERNATES PRESENT: Ms. Cassandra Joseph, Alt. for Mr. Matt Chrisman; Mr. Steven Stortz, Alt. for Mr. Steve Hamersky; Mr. Gary Targoff, NET; Ms. SuAnn Witt, NDE; and Dr. Kathleen Fimple, CCPE

MEMBERS/LIAISONS ABSENT: Dr. Mike Lucas, York Public Schools; and Mr. Ed Toner, OCIO

CALL TO ORDER, ELECTRONIC POSTING, LOCATION OF OPEN MEETING LAW DOCUMENTS, ROLL CALL, INTRODUCTIONS

Co-Chair, Mary Niemiec, called the meeting to order at 9:02 am CT. Roll call was taken and found 13 voting members present. A quorum was reached in order to conduct official business. The meeting notice was posted to the Nebraska Public Meeting Calendar October 13, 2016. The agenda was posted to the NITC Web site October 13, 2016. The Open Meeting Law document was located on the south wall of the Board Room.

CONSIDER APPROVAL OF THE AGENDA FOR THE OCTOBER 19, 2016 MEETING*

Mr. Carpenter moved to approve the October 19, 2016 meeting agenda. Mr. Brown seconded. All were in favor 13-0-0. Motion carried.

CONSIDER APPROVAL OF THE MINUTES FROM THE 8/31/2016 MEETING*

Mr. Hamersky moved to approve the August 31, 2016 minutes with the stated correction. Mr. Moore seconded. All were in favor 13-0-0. Motion carried.

PROJECT PROPOSALS - 2017-2019 BIENNIAL BUDGET - RECOMMENDATIONS TO THE NITC*

Mr. Rolfes reviewed the IT project proposal review process with the Council. Dr. Dean Folkers, Nebraska Department of Education (NDE), joined the meeting via videoconference to provide information and answer questions about the projects. SuAnn Witt and Atwell Mukusha from NDE were also present. Mr. Rolfes encouraged the Council members to provide input and construct comments to the NITC as part of their recommendations. These comments are reviewed and appreciated by the NITC and the Legislature.

13-01 Shared Systems and Supports Project Text and 13-01 Shared Systems and Supports Technical Review

Dr. Folkers stated that the project's goals are to support learning in Nebraska, save resources, and to have uniformity in use of student data.

Council members expressed concern about those school districts that have already made investments to improve their instructional environments. The question was raised as to whether there will be a requirement or incentive to switch to whatever NDE proposes. Dr. Folkers replied that there is no mandate intended for local school districts to use the system. NDE is proposing shared services and to use the collaborative purchasing of the ESUCC marketplace to provide a low-cost system so that districts can decide which is most effective for them. Council members stated that this was not made clear in the project proposal and strongly recommended a clarification in the Agency response comments. Council members cautioned that this misperception may affect support for the project. The Council members had questions as to what expenses are covered under "Other" costs, and requested more detail. NDE will get this information to Mr. Rolfes to distribute to the Council members. Dr. Folkers explained that the cost savings will come over time and will give districts more time to make transitions. Life cycle costs and change management plans were not included in the project proposal. Council members also raised concerns about the sustainability of state general funding and how it will affect the funding to local school districts and ESUs. Dr. Folkers indicated that it is not the intention of the project to cut funding to districts.

The question was raised if any consideration had been given to the availability of Internet access for students at home. Not all students have internet at home. Dr. Folkers recognized that this is an important state and national issue but that it was outside the scope of the project. NDE is still looking at options to encourage school districts to increase their Internet access and wants to work with the FCC and the E-rate program to increase home access without violating program rules. NDE plans to involve the key stakeholders in the decision-making related to this project. In addition, NDE wants to insure that the NITC and the Education Council are involved as the project progresses.

Dr. Dan Hoesing moved to recommend Project 13-01 as a Tier 2 project with the Education Council comments included. Burke Brown seconded. Bierman-Yes, Brown-Yes, Carpenter-Yes, Chrisman-Yes, DeTurk-Yes, Dunning-Yes, Hamersky-Yes, Hoesing-Yes, Hotovy-Yes, Maschman-Yes, Moore-Yes, Needham-Yes, Niemiec-Yes, Peters-Yes, Results: 14-0 Yes, 0 No, 0 Abstain. Motion carried.

Education Council Comments:

1. Additional Budget Detail is requested, specifically "Other Contractual Services".
2. Sustained funding will be needed. Additional explanation of sustainability beyond FY19 is requested.
3. I.T. Operations are not included in the budget request.
4. Project 13-01 reads more like a strategic plan than an I.T. project proposal. Please detail each project component in the category of software selection for the marketplace versus a component to be purchased or developed in house. Those components being purchased or developed in house have a greater budgetary impact, while those in the marketplace will have little or no budget impact and will still allow for local control.
5. Recommend that NDE take the path described of populating the Software as a Service (SaaS) Marketplace by using collaborative procurement to help drive data standards in all data sets where that is possible.
6. Recommend that NDE collaborate with NITC Education Council on the Digital Education Initiative Action Items.

13-02 Teacher Certification Upgrade Project Text and 13-02 Teacher Certification Upgrade Technical Review

The current Teacher Certification System was built using Delphi software and is reaching end of life. The project would be partially or fully funded through teachers and administrators applying for certification and contributing cash funds. The project plans to hire a consultant to provide software system options.

Mr. Moore moved to recommend Project 13-02 as a Tier 1 project with the Education Council comments included. Dr. Dan Hoesing seconded. Bierman-Yes, Brown-Yes, Carpenter-Yes, Chrisman-Yes, DeTurk-Yes, Dunning-Yes, Hamersky-Yes, Hoesing-Yes, Hotovy-Yes, Maschman-Yes, Moore-Yes, Needham-Yes, Niemiec-Yes, Peters-Yes, Results: Yes-14, No-0, Abstain-0. Motion carried.

Education Council comments:

1. More budget detail is requested for "Other Contractual Services".

NETWORK NEBRASKA AND DIGITAL EDUCATION ACTION ITEMS

Action Items Document

A grid of Task Groups and their membership was distributed for members to sign up for a task group to continue work on the action items and to make measurable progress.

The Network Nebraska and Digital Education work groups had not met since the last Education Council meeting.

Network Nebraska Update

Mr. Rolfes reported that at the last Collaborative Aggregation Partnership (CAP) meeting Ben Mientka of UNCSN provided the first demonstration of Action Item 1.2. The software system automatically records downtime. CAP and the Network Nebraska Advisory Group (NNAG) are discussing what information should be made public and which information should be password-protected. The Council will receive a demonstration at a future meeting.

OTHER BUSINESS

Mr. Burke wanted to comment about the cost savings ZOOM has given the participants. Mr. Dunning stated the Wayne State faculty are finding innovative ways to use it. Currently, the cost is $2/per year/per participant. More and more participants are subscribing which will result in even more statewide collaboration.

AGENDA ITEMS AND LOCATION FOR THE 12/21/2016 MEETING

The December meeting can be conducted by videoconferencing. If any members are interested in being the host site, they are to contact Mr. Rolfes.

Some ideas for agenda topics included:

- Accessibility, Christy Horn (30 min)
- Follow-up discussion of shared services

ADJOURNMENT

Mr. Rolfes commended the council for having 15 out of 16 voting members plus alternates and liaisons at the meeting today. The Office of the CIO and the NITC appreciate the Council members' dedication and involvement.

Mr. Dunning moved to adjourn. Mr. Carpenter seconded. All were in favor. Motion carried by voice vote.

The meeting was adjourned at 11:19 a.m.

Meeting minutes were taken by Lori Lopez Urdiales and reviewed by Tom Rolfes, Office of the CIO.

Accessibility for Digital Learners K-20

Christy A. Horn, PhD
University of Nebraska
December 21, 2016

State and Federal Requirements
ADA and Section 504

- All public schools(K-20) are subject to Sections 504 and 508 of the Rehabilitation Act and the Americans with Disabilities Act.
  - There have been no revisions of the 508 standards or official ADA accessible technology guidelines.
  - However, it has been made official by the United States Department of Justice that they will adopt the Web Content Accessibility Guidelines (WCAG).
  - Currently K-12 schools in Arizona, North Carolina, Texas, Virginia and Washington State are in litigation over the accessibility of their websites.
  - There also have been a significant number of settlement agreements across the country with both public and private colleges and universities (ex., Montana, Penn State, Miami University, Ohio State, University of Cincinnati).
- Private schools are covered under Title III of the Americans with Disabilities Act which is also under the jurisdiction of the Department of Justice.

The Rehabilitation Act

- Section 504

  Is an anti-discrimination measure comparable to The Americans with Disabilities Act that addresses an individual student's needs. It requires that an individual with a disability must have equal access to all programs, services, and activities in all institutions receiving federal subsidy. Web-based communications for public educational institutions are covered by 504 as are the provision of accessible materials such as electronic text, braille, captioned video and other classroom materials.

- Section 508

  Mandates that federal agencies make electronic information accessible to members of the public and employees with disabilities. Section 508 applies to public schools at all levels receiving federal funding.

Americans with Disabilities Act

Title II

Prohibits disability discrimination for all public entities at the local and state level. School, courts, police departments, and any government entity must comply regardless of whether they receive federal funds. Both Section 504 and Title II are enforced by the U.S. Department of Education, Office of Civil Rights(OCR).

Title III

Applies to commercial entities and "public accommodations," which includes private educational institutions. As under Title II, no individual with a disability may be discriminated against with regard to full and equal enjoyment of the goods, services, facilities, or accommodations of any place of public accommodation. This includes websites and accessible educational materials.

Who do we need to accommodate?

- Cognitive or learning disabilities
  - Examples: traumatic brain injury, autism, processing disorders, epilepsy
  - Access barriers: small print, timed responses, sensitivity to flashing or other screen animations
- Auditory disabilities
  - Examples: deafness, tinnitus, difficulty with auditory processing
  - Access barriers: lack of captioning, software dependent on sound, and sound overload.
- Visual disabilities
  - Examples: blindness, uncorrectable vision such as tunnel vision, and color blindness
  - Access barriers: requires mouse navigation, small print, low contrast, no screen reader access, color used as an identifier, no audio descriptions for video
- Motor disabilities
  - Examples: arthritis, spinal cord injury, muscular dystrophy, amputation
  - Access barriers: software products that require navigation by mouse or quick response on the keyboard

What is most likely to be out of compliance?

- Page titles
- Images
- Headings
- Menus
- Contrast ratio
- Text re-sizing flexibility
- Keyboard access and visual focus
- Forms, labels, and error interaction
- Multimedia
- Basic navigational structure

Practical Advice: Lessons Learned from Lawsuits, Resolution Agreements and Settlements

- There is protection in creating Educational Information Technology (EIT) accessibility policies and accompanying procedures.
- Policies (or work plans) that specifically reference timelines for achieving accessibility are valuable.
- Critical EIT for students
  - Learning management systems (LMS)
  - Class assignments and course materials within the LMS
  - Instructional materials such as textbooks, handouts, and anything that is delivered in an electronic manner
  - Live chat functions in key applications
  - EIT in the classroom such as clickers, emails, blogs, web conferencing, etc.
  - Accessible video including captioning and visual description

Practical Advice: Lessons Learned from Lawsuits, Resolution Agreements and Settlements

- Website
  - All images should have useful alternative text
  - Documents, such as PDFs or other image-based documents must be accessible
  - All video must be captioned or transcripted (transcriptions are only acceptable if the video only includes a speech or lecture.
  - Tables must be properly structured
  - Frames must be titled to support navigation and identification
  - Properly labeled and formatted form fields
  - Proper contrast between background or foreground colors
  - All aspects must be usable by a keyboard only use

How to make your website compliant

Contrast and colors http://webaim.org/resources/contrastchecker

Semantics for formatting HTML http://webaim.org/techniques/semantic structure

Text alternatives- http://webaim.org/techniques.alttext

Ability to navigate with the keyboard

www.nngroup.com/articles/keyboardaccessibility

http://webaim.org/techniques/skipnav

Easy to navigate and find information – http://webaim.org/techniques/sitetools/

Properly formatting tables– http://webaim.org/techniques/tables/data

Making PDFs accessible- http://webaim.org/techniques/acrobat/acrobat

How to make your Website compliant

- Accessible videos-- http://webaim.org/techniques/captions
- Making forms accessible-- http://webaim.org/techniques/forms
- Alternate versions of key pages– only when there is no way (legally, technically) to create accessibility. Not an option for new content.
- Feedback for users– The website must provide an easy way for users to let you know that there are problems with your website and someone must be the designated expert.
- Other related issues
  - No flashing
  - Timed connections can create barriers
  - Fly-out menus are often not navigable on the keyboard
  - Pop-up windows create a range of obstacles

Misconceptions

- We can wait until the accommodation is requested to make our websites or materials online accessible.
- YouTube or Vimeo automatic captioning third party hosting services are viable solutions. If used, the faculty or designers must edit them to comply with the standards.
- The only way to comply is to create text-only websites.
- The federal government won't come after us. We can claim lack of resources or funding.
- Designing curriculum according to Universal Design standards will insure accessibility.

Legal implications for failing to accommodate

- Settlements with strict timelines for compliance
- If the DOJ files against you, it can cost substantial legal fees and there can be judgments that include fines and money to the complainants.
- Ultimately, federal funding can be withheld if an institution doesn't comply.

Seven Universal Design Principles

- Equitable use: design provides the same means of use for everyone
- Flexibility in use: design accommodates a wide range of individual preferences
- Simple and intuitive use: design is easy to understand and navigate regardless of the user's experience, knowledge, language skills or ability to concentrate
- Perceptible information: design communicates necessary information effectively regardless of the user's sensory abilities
- Tolerance for error: design minimizes hazards and the adverse consequences of accidental or unintended actions
- Low physical effort: reduce eye strain and restrict large amounts of online reading
- Size and space for approach and use: design takes into account physical limitations, need to use assistive technologies such as screen readers or alternative access devices

Questions?

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DCMP *Captioning Key*

Quality Captioning

1. A Definition of Captioning
2. The DCMP Captioning Philosophy
3. Elements of Quality Captioning

A Definition of Captioning

Captioning is the key to opening up a world of information for persons with hearing loss or literacy needs. There are more than 30 million Americans with some type of hearing loss. Millions of others are illiterate, learning to read, or use English as a second language.

Captioning (http://www.dcmp.org/equalaccess/c.html) is the process of converting the audio content of a television broadcast, webcast, film, video, CD-ROM, DVD, live event, or other production into text and displaying the text on a screen or monitor. Captions not only display words as the textual equivalent of spoken dialogue or narration, but they also include speaker identification, sound effects, and music description. Captioning is critical for students who are deaf or hard of hearing, but it also aids the reading and literacy skills development of many others.

It is important that the captions are (1) synchronized and appear at approximately the same time as the audio is delivered, (2) equivalent and equal in content to that of the audio, including speaker identification and sound effects; and (3) accessible and readily available to those who need or want them.

The DCMP Captioning Philosophy

The DCMP believes that all captioning should include as much of the original language as possible; words or phrases which may be unfamiliar to the audience should not be replaced with simple synonyms. However, editing the original transcription may be necessary to provide time for the caption to be completely read and for it to be in synchronization with the audio.

Elements of Quality Captioning

Accurate

Errorless captions are the goal for each production.

Consistent

Uniformity in style and presentation of all captioning features is crucial for viewer understanding.

Clear

A complete textual representation of the audio, including speaker identification and non-speech information, provides clarity.

Readable

Captions are displayed with enough time to be read completely, are in synchronization with the audio, and are not obscured by (nor do they obscure) the visual content.

Equal

Equal access requires that the meaning and intention of the material is completely preserved.

The above guidelines are consistent with the 2014 mandates by the Federal Communications Commission (FCC).

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About DCMP

The Described and Captioned Media Program (https://dcmp.org/) is funded by the U.S. Department of Education and administered by the National Association of the Deaf.

Contact Us (captioning_contact.html)

Links

DCMP Home (https://dcmp.org/)

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Media Library (https://dcmp.org/topics)

Learning Center (https://dcmp.org/learning-center)

Service Vendors (https://dcmp.org/vendor-info)

Public Relations (https://dcmp.org/public-relations)

Partner Sites

National Association of the Deaf (https://nad.org/)

U.S. Department of Education (http://www.ed.gov/)

Related Resources

"Keys to Access" Landing Page (https://www.dcmp.org/keystoaccess)

DCMP's *Equal Access in the Classroom* (https://www.dcmp.org/equalaccess)

DCMP's *Description Key* (https://www.dcmp.org/descriptionkey)

DCMP's Caption It Yourself (CIY) (https://www.dcmp.org/ciy)

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Welcome to the *Description Key*

1. A Definition of Description
2. The DCMP Description Philosophy

Description is the key to opening a world of information for persons with a vision loss, literacy needs, or loss of cognitive abilities. The American Foundation for the Blind reports that 21.5 million adults have vision loss (http://www.afb.org/section.aspx?SectionID=15&TopicID=413&DocumentID=4900) and 94,000 children with a vision loss are being helped by some kind of special education (http://www.afb.org/section.aspx?SectionID=8). While description was developed for people who are blind or visually impaired, sighted children may also benefit from description's concise, objective translation of media's key visual components. Specialized learners, such as students with learning differences, English language learners, and children on the autism spectrum, benefit from its value in literacy development (e.g., vocabulary and reading) and content learning. DCMP's Listening Is Learning campaign focuses on these benefits (http://listeningislearning.org/background_description-no-bvi.html).

These guidelines are a key for those performing description, and cover a range of topics from preparing to describe (http://descriptionkey.org/preparation.html) to determining both what (http://descriptionkey.org/what_to_describe.html) information needs to be described and how to describe (http://descriptionkey.org/how_to_describe.html) it. The information is also applicable to vendors and other businesses (http://www.dcmp.org/ai/179/) that provide description for broadcast television, movies, and other media. Thus, it will also be useful to media producers/distributors and others who are considering describing their products or learning about description. Some background information and rationale are included for the novice, as well as an evolving list of description resources (http://descriptionkey.org/description_resources.html) to help improve the quality and efficiency of one's description.

For those interested in a condensed version of these guidelines, a "Description Tip Sheet (http://www.dcmp.org/caai/nadh227.pdf)" is available from the DCMP Learning Center (http://www.dcmp.org/About/Info/Default.aspx). In addition, this YouTube video (http://www.youtube.com/watch?v=cuaSu1ZxZDY#t=8m05s) from a Video Description Research and Development Center (VDRDC) webinar presented in October, 2012 summarizes important considerations.

A Definition of Description

Description is the verbal depiction of key visual elements in media and live productions. Also known as "audio description" or "video description," the description of media involves the interspersion of these depictions with the program's original audio.

The vocabulary and language structure used in the description (http://descriptionkey.org/how_to_describe.html#4) of educational media should be consistent with that used in the program being described. It is also important to make a distinction between media that is

produced for educational purposes and that which is produced purely for entertainment—the "key visual elements" of an educational program should be those that serve in conveying a specific learning goal.

DCMP Description Philosophy

It is vital that media be described in such a manner that an individual program's educational content is accessible to students with a wide range of visual impairments. It is important to ensure that description does not distract viewers from the educational content of a production by being overly complex or, on the other hand, overly simplistic. It's been long said that "pictures are worth a thousand words," and it's in choosing which of those words best convey otherwise inaccessible images to students with vision loss that the true skill of a describer is practiced.

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DCMP's Caption It Yourself (CIY) (https://www.dcmp.org/ciy)

WebAIM
web accessibility in mind

WCAG 2.0 Checklist

Perceivable
Web content is made available to the senses - sight, hearing, and/or touch

Guideline 1.1
Text Alternatives: Provide text alternatives for any non-text content

Success Criteria	Recommendations
1.1.1 Non-text Content (Level A)	☐ All images, form image buttons, and image map hot spots have appropriate, equivalent alternative text. ☐ Images that do not convey content, are decorative, or with content that is already conveyed in text are given null alt text (alt="") or implemented as CSS backgrounds. All linked images have descriptive alternative text. ☐ Equivalent alternatives to complex images are provided in context or on a separate (linked and/or referenced via longdesc) page. ☐ Form buttons have a descriptive value. ☐ Form inputs have associated text labels. ☐ Embedded multimedia is identified via accessible text. ☐ Frames are appropriately titled.

Guideline 1.2
Time-based Media: Provide alternatives for time-based media

NOTE: If the audio or video is designated as an alternative to web content (e.g., an audio or sign language version of a web page, for example), then the web content itself serves as the alternative.

Success Criteria	Recommendations
1.2.1 Prerecorded Audio-only and Video-only (Level A)	☐ A descriptive text transcript (including all relevant visual and auditory clues and indicators) is provided for non-live, web-based audio (audio podcasts, MP3 files, etc.). ☐ A text or audio description is provided for non-live, web-based video-only (e.g., video that has no audio track).
1.2.2 Captions (Prerecorded) (Level A)	☐ Synchronized captions are provided for non-live, web-based video (YouTube videos, etc.)
1.2.3 Audio Description or Media Alternative (Prerecorded) (Level A)	☐ A descriptive text transcript OR audio description audio track is provided for non-live, web-based video
1.2.4 Captions (Live) (Level AA)	☐ Synchronized captions are provided for all live multimedia that contains audio (audio-only broadcasts, web casts, video conferences, Flash animations, etc.)
1.2.5 Audio Description (Prerecorded) (Level AA)	☐ Audio descriptions are provided for all video content NOTE: Only required if the video conveys content visually that is not available in the default audio track.
1.2.6 Sign Language (Prerecorded) (Level AAA)	☐ A sign language video is provided for all media content that contains audio.
1.2.7 Extended Audio Description (Prerecorded) (Level AAA)	☐ When an audio description track cannot be added to video due to audio timing (e.g., no pauses in the audio), an alternative version of the video with pauses that allow audio descriptions is provided.

1.2.8 Media Alternative (Prerecorded) (Level AAA)	☐ A descriptive text transcript is provided for all pre-recorded media that has a video track.
1.2.9 Audio-only (Live) (Level AAA)	☐ A descriptive text transcript (e.g., the script of the live audio) is provided for all live content that has audio.

Guideline 1.3

Adaptable: Create content that can be presented in different ways (e.g., simpler layout) without losing information or structure

Success Criteria	Recommendations
1.3.1 Info and Relationships (Level A)	☐ Semantic markup is used to designate headings (<h1>), lists (, , and <dl>), emphasized or special text (, <code>, <abbr>, <blockquote>, for example), etc. Semantic markup is used appropriately. ☐ Tables are used for tabular data. Headings, where necessary, are used to associate data cells with headers. Data table captions and summaries are used where appropriate. ☐ Text labels are associated with form input elements. Related form elements are grouped with fieldset/legend.
1.3.2 Meaningful Sequence (Level A)	☐ The reading and navigation order (determined by code order) is logical and intuitive.
1.3.3 Sensory Characteristics (Level A)	☐ Instructions do not rely upon shape, size, or visual location (e.g., "Click the square icon to continue" or "Instructions are in the right-hand column"). ☐ Instructions do not rely upon sound (e.g., "A beeping sound indicates you may continue.").

Guideline 1.4

Distinguishable: Make it easier for users to see and hear content including separating foreground from background

Success Criteria	Recommendations
1.4.1 Use of Color (Level A)	☐ Color is not used as the sole method of conveying content or distinguishing visual elements. ☐ Color alone is not used to distinguish links from surrounding text unless the luminance contrast between the link and the surrounding text is at least 3:1 and an additional differentiation (e.g., it becomes underlined) is provided when the link is hovered over or receives focus.
1.4.2 Audio Control (Level A)	☐ A mechanism is provided to stop, pause, mute, or adjust volume for audio that automatically plays on a page for more than 3 seconds.
1.4.3 Contrast (Minimum) (Level AA)	☐ Text and images of text have a contrast ratio of at least 4.5:1. ☐ Large text - at least 18 point (typically 24px) or 14 point (typically 18.66px) bold has a contrast ratio of at least 3:1.
1.4.4 Resize text (Level AA)	☐ The page is readable and functional when the text size is doubled.
1.4.5 Images of Text (Level AA)	☐ If the same visual presentation can be made using text alone, an image is not used to present that text.
1.4.6 Contrast (Enhanced) (Level AAA)	☐ Text and images of text have a contrast ratio of at least 7:1. ☐ Large text - at least 18 point (typically 24px) or 14 point (typically 18.66px) bold has a contrast ratio of at least 4.5:1.

1.4.7 Low or No Background Audio (Level AAA)	☐ Audio of speech has no or very low background noise so the speech is easily distinguished.
1.4.8 Visual Presentation (Level AAA)	Blocks of text over one sentence in length: ☐ Are no more than 80 characters wide. ☐ Are NOT fully justified (aligned to both the left and the right margins). ☐ Have adequate line spacing (at least 1/2 the height of the text) and paragraph spacing (1.5 times line spacing). ☐ Have a specified foreground and background color. These can be applied to specific elements or to the page as a whole using CSS (and thus inherited by all other elements). ☐ Do NOT require horizontal scrolling when the text size is doubled.
1.4.9 Images of Text (No Exception) (Level AAA)	☐ Text is used within an image only for decoration (image does not convey content) OR when the information cannot be presented with text alone.

Operable

Interface forms, controls, and navigation are operable

Guideline 2.1

Keyboard Accessible: Make all functionality available from a keyboard

Success Criteria	Recommendations
2.1.1 Keyboard (Level A)	☐ All page functionality is available using the keyboard, unless the functionality cannot be accomplished in any known way using a keyboard (e.g., free hand drawing). ☐ Page-specified shortcut keys and accesskeys (accesskey should typically be avoided) do not conflict with existing browser and screen reader shortcuts.
2.1.2 No Keyboard Trap (Level A)	☐ Keyboard focus is never locked or trapped at one particular page element. The user can navigate to and from all navigable page elements.
2.1.3 Keyboard (No Exception) (Level AAA)	☐ All page functionality is available using the keyboard.

Guideline 2.2

Enough Time: Provide users enough time to read and use content

Success Criteria	Recommendations
2.2.1 Timing Adjustable (Level A)	☐ If a page or application has a time limit, the user is given options to turn off, adjust, or extend that time limit. This is not a requirement for real-time events (e.g., an auction), where the time limit is absolutely required, or if the time limit is longer than 20 hours.
2.2.2 Pause, Stop, Hide (Level A)	☐ Automatically moving, blinking, or scrolling content that lasts longer than 5 seconds can be paused, stopped, or hidden by the user. Moving, blinking, or scrolling can be used to draw attention to or highlight content as long as it lasts less than 5 seconds. ☐ Automatically updating content (e.g., automatically redirecting or refreshing a page, a news ticker, AJAX updated field, a notification alert, etc.) can be paused, stopped, or hidden by the user or the user can manually control the timing of the updates.
2.2.3 No Timing (Level AAA)	☐ The content and functionality has no time limits or constraints.
2.2.4 Interruptions (Level AAA)	☐ Interruptions (alerts, page updates, etc.) can be postponed or suppressed by the user.

2.2.5 Re-authenticating (Level AAA)	☐ If an authentication session expires, the user can re-authenticate and continue the activity without losing any data from the current page.

Guideline 2.3

Seizures: Do not design content in a way that is known to cause seizures

Success Criteria	Recommendations
2.3.1 Three Flashes or Below Threshold (Level A)	☐ No page content flashes more than 3 times per second unless that flashing content is sufficiently small and the flashes are of low contrast and do not contain too much red. (See general flash and red flash thresholds)
2.3.2 Three Flashes (Level AAA)	☐ No page content flashes more than 3 times per second.

Guideline 2.4

Navigable: Provide ways to help users navigate, find content, and determine where they are

Success Criteria	Recommendations
2.4.1 Bypass Blocks (Level A)	☐ A link is provided to skip navigation and other page elements that are repeated across web pages. ☐ If a page has a proper heading structure, this may be considered a sufficient technique instead of a "Skip to main content" link. Note that navigating by headings is not yet supported in all browsers. ☐ If a page uses frames and the frames are appropriately titled, this is a sufficient technique for bypassing individual frames.
2.4.2 Page Titled (Level A)	☐ The web page has a descriptive and informative page title.
2.4.3 Focus Order (Level A)	☐ The navigation order of links, form elements, etc. is logical and intuitive.
2.4.4 Link Purpose (In Context) (Level A)	☐ The purpose of each link (or form image button or image map hotspot) can be determined from the link text alone, or from the link text and it's context (e.g., surrounding paragraph, list item, table cell, or table headers). ☐ Links (or form image buttons) with the same text that go to different locations are readily distinguishable.
2.4.5 Multiple Ways (Level AA)	☐ Multiple ways are available to find other web pages on the site - at least two of: a list of related pages, table of contents, site map, site search, or list of all available web pages.
2.4.6 Headings and Labels (Level AA)	☐ Page headings and labels for form and interactive controls are informative. Avoid duplicating heading (e.g., "More Details") or label text (e.g., "First Name") unless the structure provides adequate differentiation between them.
2.4.7 Focus Visible (Level AA)	☐ It is visually apparent which page element has the current keyboard focus (i.e., as you tab through the page, you can see where you are).
2.4.8 Location (Level AAA)	☐ If a web page is part of a sequence of pages or within a complex site structure, an indication of the current page location is provided, for example, through breadcrumbs or specifying the current step in a sequence (e.g., "Step 2 of 5 - Shipping Address").
2.4.9 Link Purpose (Link Only) (Level AAA)	☐ The purpose of each link (or form image button or image map hotspot) can be determined from the link text alone. ☐ There are no links (or form image buttons) with the same text that go to different locations.

2.4.10 Section Headings (Level AAA)	☐ Beyond providing an overall document structure, individual sections of content are designated using headings, where appropriate.

Understandable
Content and interface are understandable

Guideline 3.1
Readable: Make text content readable and understandable

Success Criteria	Recommendations
3.1.1 Language of Page (Level A)	☐ The language of the page is identified using the HTML lang attribute (<html lang="en">, for example).
3.1.2 Language of Parts (Level AA)	☐ When appropriate, the language of sections of content that are a different language are identified, for example, by using the lang attribute (<blockquote lang="es")>
3.1.3 Unusual Words (Level AAA)	☐ Words that may be ambiguous, unknown, or used in a very specific way are defined through adjacent text, a definition list, a glossary, or other suitable method.
3.1.4 Abbreviations (Level AAA)	☐ Expansions for abbreviations are provided by expanding or explaining the definition the first time it is used, using the <abbr> element, or linking to a definition or glossary. NOTE: WCAG 2.0 gives no exception for regularly understood abbreviations (e.g., "HTML" on a web design site must always be expanded).
3.1.5 Reading Level (Level AAA)	☐ A more understandable alternative is provided for content that is more advanced than can be reasonably read by a person with roughly 9 years of primary education.
3.1.6 Pronunciation (Level AAA)	☐ If the pronunciation of a word is vital to understanding that word, its pronunciation is provided immediately following the word or via a link or glossary.

Guideline 3.2
Predictable: Make Web pages appear and operate in predictable ways

Success Criteria	Recommendations
3.2.1 On Focus (Level A)	☐ When a page element receives focus, it does not result in a substantial change to the page, the spawning of a pop-up window, an additional change of keyboard focus, or any other change that could confuse or disorient the user.
3.2.2 On Input (Level A)	☐ When a user inputs information or interacts with a control, it does not result in a substantial change to the page, the spawning of a pop-up window, an additional change of keyboard focus, or any other change that could confuse or disorient the user unless the user is informed of the change ahead of time.
3.2.3 Consistent Navigation (Level AA)	☐ Navigation links that are repeated on web pages do not change order when navigating through the site.
3.2.4 Consistent Identification (Level AA)	☐ Elements that have the same functionality across multiple web pages are consistently identified. For example, a search box at the top of the site should always be labeled the same way.

3.2.5 Change on Request (Level AAA)	☐ Substantial changes to the page, the spawning of pop-up windows, uncontrolled changes of keyboard focus, or any other change that could confuse or disorient the user must be initiated by the user. Alternatively, the user is provided an option to disable such changes.

Guideline 3.3
Input Assistance: Help users avoid and correct mistakes

Success Criteria	Recommendations
3.3.1 Error Identification (Level A)	☐ Required form elements or form elements that require a specific format, value, or length provide this information within the element's label. ☐ If utilized, form validation cues and errors (client-side or server-side) alert users to errors in an efficient, intuitive, and accessible manner. The error is clearly identified, quick access to the problematic element is provided, and user is allowed to easily fix the error and resubmit the form.
3.3.2 Labels or Instructions (Level A)	☐ Sufficient labels, cues, and instructions for required interactive elements are provided via instructions, examples, properly positioned form labels, and/or fieldsets/legends.
3.3.3 Error Suggestion (Level AA)	☐ If an input error is detected (via client-side or server-side validation), provide suggestions for fixing the input in a timely and accessible manner.
3.3.4 Error Prevention (Legal, Financial, Data) (Level AA)	☐ If the user can change or delete legal, financial, or test data, the changes/deletions are reversible, verified, or confirmed.
3.3.5 Help (Level AAA)	☐ Provide instructions and cues in context to help in form completion and submission.
3.3.6 Error Prevention (All) (Level AAA)	☐ If the user can submit information, the submission is reversible, verified, or confirmed.

Robust
Content can be used reliably by a wide variety of user agents, including assistive technologies

Guideline 4.1
Compatible: Maximize compatibility with current and future user agents, including assistive technologies

Success Criteria	Recommendations
4.1.1 Parsing (Level A)	☐ Significant HTML/XHTML validation/parsing errors are avoided.
4.1.2 Name, Role, Value (Level A)	☐ Markup is used in a way that facilitates accessibility. This includes following the HTML/XHTML specifications and using forms, form labels, frame titles, etc. appropriately.

Network Nebraska Initiative—2015-17 Action Items

1. **Action: Prepare for the future of Network Nebraska as a statewide, multipurpose, high capacity, scalable telecommunications network that shall meet the demand of state agencies, local governments, and educational entities as defined in section 79-1201.01.**

   Lead: Education Council

   Participating Entities: Collaborative Aggregation Partnership (CAP); Network Nebraska Advisory Group (NNAG)

   Timeframe: 2015-17

   Funding: Additional funding and/or resources will be required for this action item out of the Network Nebraska Participation Fee, which is a participant-funded budget.

   Targets/Deliverables:

   1.1. The NNAG Participant Criteria subcommittee will develop a strategy to accommodate community affiliate connections into Network Nebraska.
   1.2. The UNCSN team will use automated tools to monitor network utilization and uptime and develop a web-based graphic for real-time depiction of WAN circuits, backbone and Internet.
   1.3. UNCSN will implement incident management and change control frameworks appropriate to the staffing of Network Nebraska.
   1.4. NNAG and CAP will guide Office of the CIO (OCIO) decisions regarding network capacity, services, and reliability.
   1.5. Review and update existing security services and practices and develop a strategy for potential services.

2. **Action: The Education Council and NITC staff will serve as the communication hub for existing and potential new Network Nebraska Participants.**

   Lead: Education Council/NITC Staff

   Participating Entities: Collaborative Aggregation Partnership (CAP); Network Nebraska Advisory Group (NNAG)

   Timeframe: 2015-17

   Funding: Additional funding and/or resources will be required for this action item out of the Network Nebraska Participation Fee, which is a participant-funded budget.

   Targets/Deliverables:

   2.1. Develop and implement a communications strategy.
   2.2. Conduct an annual survey of Participants to guide direction and service development.

NETWORK NEBRASKA--RECOMMENDED MEASURABLES:

- Network Nebraska backbone uptime
- Network Nebraska Internet access uptime
- Network Nebraska backbone bandwidth utilization (actual)
- Network Nebraska membership growth
- Network Nebraska Internet growth (purchased and actual)
- Network Nebraska unit cost of Internet
- Number of public and non-profit, non-education entities (e.g., libraries) connected to Network Nebraska

Digital Education Initiative—2015-17 Action Items

1. **Action: Create Professional development opportunities for all Nebraska educators to maximize student success through the innovative uses of technology in teaching.**

   Lead: Education Council

   Participating Entities: K-12 and Higher Education professional and advisory groups

   Timeframe: 2015-17

   Funding: Additional funding may be required for this action item

   Targets/Deliverables:

   1.1 Partner with K-20 entities and organizations to establish communities of practice for curriculum development, effective pedagogical practices and shared experiences using multiple delivery modalities across all levels of education in Nebraska.

2. **Action: Address technical challenges for students in the transition from secondary to post-secondary education.**

   Lead: Education Council

   Participating Entities: K-12 and Higher Education professional and advisory groups

   Timeframe: 2015-17

   Funding: Additional funding may be required for this action item

   Targets/Deliverables:

   2.1 Conduct a collaborative research project to identify existing infrastructure and pedagogical efforts in both secondary and post-secondary institutions.
   2.2 Based on the results of the research project and other available resources, identify opportunities for collaboration to ease transition for students.
   2.3 Identify key challenges for transitioning students and conduct an environmental scan to identify successful approaches to mitigate those challenges.
   2.4 Create a guide for effective practices in the use of flexible learning technologies.
   2.5 Develop a strategy to encourage vendors to implement data exchange standards in their products and services.

3. **Action: Expand awareness and address the need for equity of access as it relates to digital education.**

   Lead: Education Council

   Participating Entities: NITC Community Council, K-12 and Higher Education professional and advisory groups

   Timeframe: 2015-17

   Funding: Additional funding may be required for this action item

   Targets/Deliverables:

   3.1 Form a joint study group comprised of stakeholders from across the state to identify opportunities and actions to ensure equitable access for students.
   3.2 Education Council will work in collaboration with other Nebraska stakeholders, such as the Community Council Broadband Initiative to find solutions for available, accessible, reliable, secure and affordable Internet access as related to academic success.
   3.3 Identify and promote the use of accessible products and services in achieving equity of access.

DIGITAL EDUCATION--RECOMMENDED MEASURABLES:

- Number of professional development opportunities provided
- Number of educators impacted by professional development opportunities
- Published research regarding infrastructure, pedagogy, equity of access, and impact on learning.

NITC Statewide Technology Plan--EC Task Group Rosters																
12/21/2016 Version	Network Nebraska							Digital Education								
	1.1	1.2	1.3	1.4	1.5	2.1	2.2	1.1	2.1	2.2	2.3	2.4	2.5	3.1	3.2	3.3
Post Secondary																
Mark Askren	Y	Y	Y	Y	Y	Y	Y									
Bret Blackman (Alt.)																
Derek Bierman	Y	Y	Y	Y	Y	Y	Y									
Carla Streff (Alt.)								Y	Y	Y	Y	Y	Y	Y	Y	Y
Mike Carpenter					Y			Y	Y	Y	Y	Y	Y	Y	Y	Y
Chuck Lenosky (Alt.)																
John Dunning	Y	Y	Y	Y	Y	Y	Y									
Ann Burk (Alt.)	Y	Y	Y	Y	Y	Y	Y									
Steve Hotovy	Y	Y	Y	Y	Y	Y	Y									
Stan Carpenter (Alt.)																
Greg Maschman								Y	Y	Y	Y	Y	Y	Y	Y	Y
TBA (Alt.)																
Mary Niemiec								Y	Y	Y	Y	Y	Y	Y	Y	Y
TBA (Alt.)																
Tom Peters	Y	Y	Y	Y	Y	Y	Y									
TBA (Alt.)																
K-12																
Burke Brown	Y	Y		Y								Y	Y	Y	Y	Y
Cassandra Joseph (Alt.)								Y	Y	Y	Y	Y	Y	Y	Y	Y
Matt Chrisman								Y	Y	Y	Y	Y	Y	Y	Y	Y
Emily Tobias (Alt.)																
Ted DeTurk								Y	Y	Y	Y	Y		Y		
Wayne Bell (Alt.)																
Stephen Hamersky						Y	Y		Y	Y	Y	Y	Y			
Steven Stortz (Alt.)		Y						Y	Y	Y	Y	Y	Y	Y	Y	Y
Dan Hoesing	Y	Y	Y	Y	Y	Y	Y									
TBA (Alt.)																
Mike Lucas								Y		Y	Y	Y				
Elizabeth Ericson (Alt.)																
Alan Moore			Y		Y			Y	Y	Y	Y	Y	Y	Y	Y	Y
Tracy Popp (Alt.)																
Gary Needham	Y	Y	Y	Y	Y	Y	Y									
Scott Jones (Alt.)	Y	Y	Y	Y	Y	Y	Y									
Liaisons																
Mike Baumgartner																
Kathleen Fimple (Alt.)																
Brent Gaswick																
SuAnn Witt (Alt.)																
Ed Toner																
TBA (Alt.)																
Gary Targoff								Y								Y
Michael Winkle (Alt.)																

Network Nebraska

Northeast Nebraska Fiber Loop Project

Executive Briefing

The year 2016 represented a turning point in both Nebraska's economy and its public telecommunications infrastructure.

The governor convened an economic summit on July 12th, 2016 to discuss the results of an SRI International[i] study[ii] regarding the state's existing economic programs. The study identifies Nebraska's current strong and enviable position of high workforce participation and low unemployment. The study did, however, identify that wages are well below the national average, leading to challenges in recruiting and retention of workers.

On April 13th, 2016 Network Nebraska celebrated its official 10th birthday as a statewide network. Network Nebraska has established itself as a vital resource for technology infrastructure in the government and higher education sectors. Since its inception, the network has lowered the price of commodity internet access through aggregated demand and collaborative purchasing, from a high of $87/Mbps/month to under $1/Mbps/month[iii], resulting in accumulated cost avoidance for the state of $YYY million dollars over 10 years and providing opportunities for technology infused education that could not have been envisioned when the network was created. The governance bodies which guide the collaborative project now turned their eyes to what opportunities may lie ahead in the next decade of service.

The SRI report identified four interrelated, strategic investments to help transition Nebraska to a high-wage/high-value economy (*SRI report page 4)*:

- High skill, high wage jobs
- Technology intensive investment
- Innovation
- High quality communities

As cloud computing becomes the predominant delivery method for innovation, education, workplace, and consumer technology solutions, network infrastructure continues to be a foundational and critical technology investment for achieving these goals.

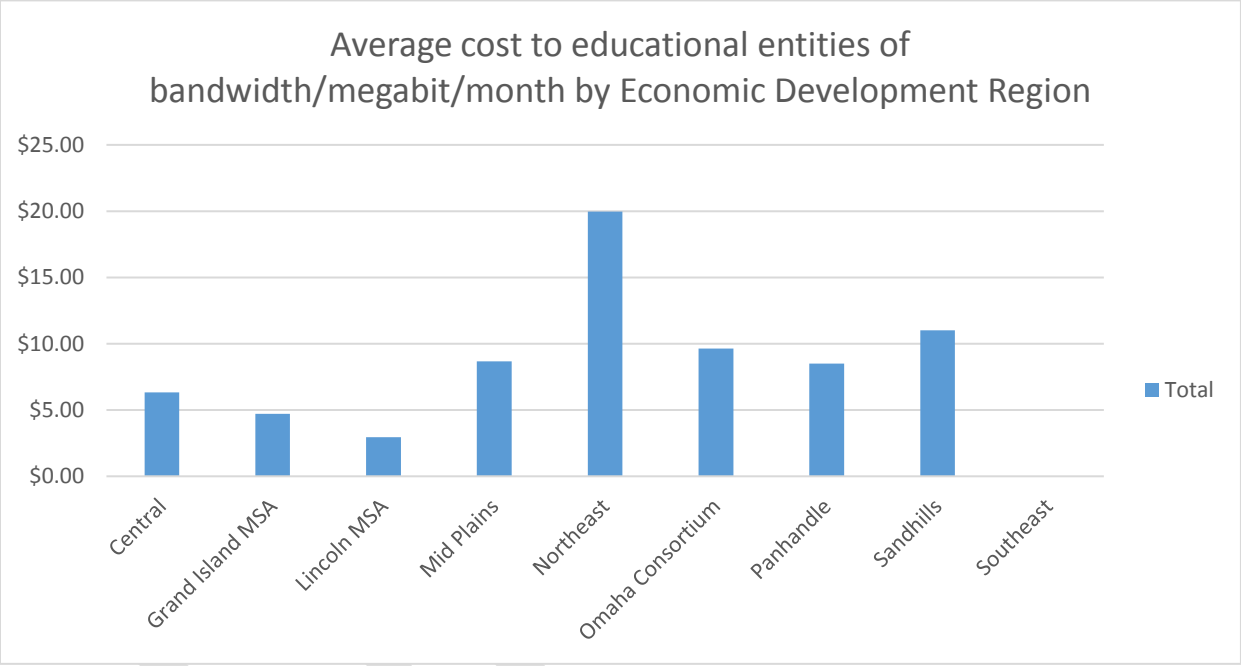
Additionally, enhanced in-state network connectivity will be required to fulfill a number of the SRI report recommendations for the educational sector, including support for the high school career academies and specific programs such as the Interface Web School in Omaha.

Further, in-state network connectivity facilitates the kind of inter-agency shared services projects currently recommended by the office of the OCIO. These projects, like the inter-local agreement between Wayne State College and Northeast Community College, can provide data center consolidation, disaster recovery, and improved service quality at lower costs.

Access to low cost, high bandwidth network infrastructure required for these innovative approaches, is not, however, universally available outside the urban core.

> *The federal map of high speed internet indicates general availability outside the metro areas along Interstate 80 and the Platte River. However, some interviewees indicated gaps in coverage that were burdensome for business connectivity, as well as high prices. … Addressing these deficiencies is critical for the future of the state outside the metro areas, the equivalent of adequately providing and maintaining roads. – SRI report page 45*

This observation through interviews validates data collected by Network Nebraska on telecommunications circuit pricing and availability in rural Nebraska, particularly in the Northeast economic development region:



This inequity creates barriers to collaboration for key resources located throughout the Northeast region of the state.

The communities of Columbus, Norfolk, Wayne, South Sioux City, and Fremont serve as homes to a number of businesses in economic development sectors identified as growth sectors by the SRI report:

- Agriculture & Food Processing
- Automotive & Transportation Equipment
- Materials & Chemicals
- Precision Metals

Further, these communities host post-secondary institutions with strong academic programs preparing students to work in economic sector clusters identified by the report as of interest to Nebraska's future economy:

- Agribusiness & Food Processing
- Advanced Manufacturing
- Biosciences (both medical and agricultural)
- Financial Services
- Health and Medical Services
- IT and Data Services
- Renewable Energy
- Transportation and Logistics

**A LIST OF THE SPECIFIC INSTITUTIONS, ACADEMIC PROGRAMS, AND INDUSTRIES SERVING THESE CLUSTERS CAN BE FOUND IN APPENDIX I OF THIS DOCUMENT.

These anchor cities of the rural community, given the right conditions, have the opportunity to utilize the attractions of small town life identified by the study to attract and retain talent; the key to 21st century economic development. One of the critical conditions to realize this is network connectivity:

> *Further, the nature of work is changing so that working at home from locations outside urban areas is much more practical, as long as connectivity is good. For example, it is important that download speeds of 10 – 25 Mbps are available in the Omaha and Lincoln metro areas, in towns in the Northeast, and in towns along I-80 and the Platte River. Access to this key infrastructure is comparable to proximity to the railroad in the 19th century (however, tariffs are very high in some places). – SRI Report page 11*

Network Nebraska issued a RFP (bid) in late 2016 for a collection of dark fiber network segments which would connect all of these communities in a loop running from Grand Island to Omaha. Dark fiber leases would allow Network Nebraska to provide multiple, parallel high speed connections in each of these communities, facilitating cooperation between the education, government, and health care sectors and establishing multiple regional points of attachment to a high bandwidth redundant network backbone. While not directly serving business and industry, such a capital investment would serve as an anchor tenant, providing local carriers with a stable foundation from which to enhance local telecommunications facilities to support economic growth. This investment would also provide the required connectivity for educational institutions to train the workforce needed in the region.

While Network Nebraska has traditionally used leased circuits to deliver bandwidth, the use of dark fiber leases for Network Nebraska in the Urban core has provided greater flexibility and long term lower costs for Network Nebraska and University of Nebraska centric services. While initially more expensive, return on investment for high bandwidth is typically under 5 years. Such investments are key to long term economic development and the ability of the education and health care sectors to support that development:

> *High skill and high technology jobs are generally associated with capital intensive activities. Capital intensive investments are an important goal in order to make the*

transition towards Nebraska's next economy. Technology intensive and capital intensive investments may not always have a direct impact on jobs, but they are associated with higher wages, and make an important long-term contribution to overall growth (such investments tend to generate significant productivity spillovers into the rest of the regional economy). Where employment of any kind is no longer the priority, policy instruments can be aligned with technology- and capital-intensive investments with less regard to an immediate impact on new jobs, but rather with a view to faster growth that builds the tax base and has powerful indirect, long term effects on the quality of jobs. -- SRI report page 10

The Northeast Nebraska Fiber Loop Project, if supported with the required funding to complete the network segment, will represent a watershed moment for Network Nebraska as well as a significant step forward in implementing the recommendations of the SRI report to transition this rural area of Nebraska to high-wage/high-value jobs.

The project has a number of next steps, beginning with the RFP. The results of that process will inform strategies on how to fund the project, with a number of potential sources:

1) Shared, postalized backbone fees collected through Network Nebraska
2) Federal E-rate support on the eligible portion of the backbone costs
3) Re-investment of existing network connectivity budgets from agencies attached to the loop
4) Direct investment of State funding
5) A combination with the above stakeholders and sources

Appendix I – Economic development cluster mapping for Northeast Nebraska Fiber Loop communities

- Columbus
  - Central Community College
  - Business and Industry
    - 79 manufacturing plants employing 6400 workers, including Behlen manufacturing
- Norfolk
  - Northeast Community College (NCC)
    - Aspen top 10 of Community Colleges serving 17,945 students in three locations
    - Applied Technology and Applied Research programs such as Agriculture, Water, and Energy
    - Business and Industry Training
    - The joint UNMC-NCC nursing program
  - Business and Industry
    - Nucor Steel
    - Norfolk Iron and Metal
    - Faith Regional Health Services
- Wayne
  - Wayne State College (WSC)
    - WSC has the state's highest capacity applied technology teacher education program, providing faculty for High School career academies. The new Center for Applied Technology facility will further build capacity for the teacher pipeline in this critical area, as well as employee training, applied research, and pipelines for management in advanced manufacturing and construction trades.
    - The WSC Rural Health Opportunities Program is a key feeder for rural students to the University of Nebraska Medical Center. Not only are WSC students among UNMC's best prepared applicants, but the RHOP program also helps support graduates who commit to staying in-state and serve rural communities, one of the SRI report's workforce recommendations.
  - Business and Industry
    - Great Dane trailer manufacturing
    - Sand Creek Post and Beam
    - Heritage Industries
- South Sioux City
  - College Center (joint NCC & WSC facility)
  - Little Priest Tribal College
  - Nebraska Indian Community College
  - Business and Industry
    - Tyson
- Fremont
  - Midland University
  - Metropolitan Community College Campus
  - Business and Industry

[i] SRI International is an independent, nonprofit research center. https://www.sri.com/about

[ii] http://neded.org/governor-s-summit-sri

[iii] http://www.govtech.com/pcio/articles/How-Nebraska-Built-a-Network-with-the-Lowest-Internet-Costs.html

Assessing and Treating Impediments to Internet Access for Economically Challenged Students and those who reside in Unserved and Underserved Areas

Introduction

K-12 education and postsecondary education resources are becoming increasingly digital and more and more web-based. Learning management systems, student information systems, and content management systems all require students, parents, teachers, and administrators to have constant and convenient access to the Internet at ample speeds to download, upload, view, and interact with content, learning activities, grades, formative assessments, and records. Never before in the history of education has it been more necessary for all students to have 24/7 access using an Internet-connected computer or tablet with viewable screen and keyboard.

Equity of Access

Since the advent of the Internet and use of the computer for learning activities, there has always been a digital divide. Originally, it was the discrepancy between no access and dial-up access. It evolved into the gap between dial-up access and always on (cable modem/DSL) access. Today, it is regarded as the chasm between no access and gigabit access. Unfortunately, the fast have become faster, and many of the no access households have remained with no access or grossly underserved access. So, the division between the "haves" and the "have nots" is only growing wider.

Causal Factors

There are many factors or impediments that may contribute to the lack of adoption of broadband access in households with students: Comparatively high monthly cost, multi-year contract requirements, geographically inaccessible locations, customer mobility, personal choice, lack of computer, fear of inappropriate content, and others. Research is showing that cell phone and mobile access is actually contributing to a modest decline in home wired broadband services.

Broadband Adoption Data

Census data from 2013 revealed that 25 million households (21%) have no regular Internet access at all, either at home or elsewhere. Overall, 84% of U.S. households own a computer, and 73% of U.S. households have a computer with a broadband connection to the internet, the bureau reported. The Pew Research Center found that 70% of Americans have broadband access. Among households with incomes below $20,000, most do not have an internet subscription for a computer, cell phone or other device, though they may have free access at a local library or elsewhere. Among households with incomes of $20,000 and higher, most households have their own broadband subscriptions. The Nebraska Rural Poll found that 82% of Nebraskans subscribe to a high-speed Internet service at home, other than a cellular data plan. Nine percent (9%) have no Internet access.

Recommendations

RECOMMENDATION 1: Public and private schools that rely heavily on digital curriculum resources, and who expect students to connect to the Internet in order to complete homework assignments, should take steps to assess which students have sufficient wired Internet speeds at home.

RECOMMENDATION 2: Public and private schools should take steps to assist student households that have inadequate Internet access to achieve equity of access.

Interventions to Achieve Equity of Access

Public Wi-Fi Centers. One interim strategy to achieving more accessible Internet for economically challenged students is to open up free Internet access points at public or private locations:

- School buildings
- Library buildings
- Municipal recreation centers
- Churches
- Cultural centers
- Restaurants and coffee shops

Check-out of Portable Wi-Fi Hotspots. Growing in popularity is a cellular-based appliance or antenna known as a hotspot that can be borrowed or purchased and permits one or more laptops or tablets to connect to the Internet using a cellular service or data plan. Increasingly, schools and libraries have begun pilot programs making these devices available for check out via their student library credentials. Most cellular smartphones can double as Wi-Fi hotspots. Portable Wi-Fi hotspots work best in areas that have strong cellular signals.

Entry Level Internet Service. Most Internet Service Providers offer an option for an entry level subscription Internet service known by such terms as Basic, Standard or DSL Lite. With lower bandwidth and a lower monthly cost, it may provide a suitable alternative for households where only one or two computers or smartphones are connected at one time. However, like the higher bandwidth plans, providers will prefer (usually not require) that the customer sign a contract for at least 12-24 months, and also provide access to a checking, savings, or credit card account for automatic withdrawal every month. These last two items (i.e. lengthy contracts and automatic withdrawal) often inhibit participation from mobile families.

Satellite Internet Service. Satellite Internet service is available almost everywhere in the continental United States. With plans ranging from $40 to $60 per month, typical transmission speeds are up to 1Mbps upload, and up to 15Mbps download, with a .25-.5 second delay (latency). With most plans, there is a monthly data allowance of 5GB to 10GB, and then once the data allowance is reached, the transmission speed is reduced. Subscribers must have a VSAT (Very Small Aperture Terminal or satellite dish) un-obstructively aimed at a geostationary satellite in the southern sky and a satellite modem in order to receive the service. Satellite Internet may not be appropriate for time-sensitive applications such online gaming and videoconferencing.

Educational Broadband Service (EBS). EBS, formerly known as the Instructional Television Fixed Service (ITFS), is an educational service that has generally been used for the transmission of instructional material to accredited educational institutions and non-educational institutions such as hospitals, nursing homes, training centers, and rehabilitation centers using high-powered systems. The FCC's recent revamping of the EBS spectrum will now make it possible for EBS licensees to continue their instructional services utilizing low-power broadband systems while also providing students with high-speed internet access with a radius of up to 35 miles. Nebraska education entities had 32 active EBS licenses at the time of this writing. (FCC 47 C.F.R., Part 27)

TV White Space (TVWS) Internet. The use of TV White Space channels, portions of licensed UHF radio spectrum that licensees do not use, provides an opportunity to deliver ubiquitous broadband services. UHF radio frequencies are non-line-of sight (NLOS) and are able to penetrate trees and buildings. By positioning a base station and tower connected to a source of Internet, multiple channels are able to transmit Internet access omni-directionally with a radius of up to 9 miles. Each customer premise interacting with the base station must also have a UHF antenna, customer converter, and Wi-Fi router.

Resources

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Nebraska Statutes affecting Public Wi-Fi and TV White Space deployments

Neb. Rev. Stat. 86-594. Agency or political subdivision of state; limitation on power (excerpt)

(1) Except as provided in the Educational Service Units Act and sections 79-1319, 81-1120.01 to 81-1120.28, 85-401 to 85-418, 85-1501 to 85-1542, and 86-575, an agency or political subdivision of the state that is not a public power supplier shall not provide on a retail or wholesale basis any broadband services, Internet services, telecommunications services, or video services.

Neb. Rev. Stat. 86-597. Retail or wholesale service; how construed.

(1) For purposes of sections 86-594 and 86-595, providing a service on a retail or wholesale basis shall not include an agency or political subdivision of the state, whether or not a public power supplier, deploying or utilizing broadband services, Internet services, telecommunications services, or video services, for its own use either individually or jointly through the Interlocal Cooperation Act, the Joint Public Agency Act, or the Municipal Cooperative Financing Act for the internal use and purpose of the agency, political subdivision, or public power supplier or to carry out the public purposes of the agency, political subdivision, or public power supplier.

(2) Nothing in sections 86-593 to 86-598 prohibits or restricts the ability of an agency, political subdivision, or public power supplier from deploying or utilizing broadband services, Internet services, telecommunications services, or video services for the internal use and purpose of the agency, political subdivision, or public power supplier, or to carry out the public purposes of the agency, political subdivision, or public power supplier.

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