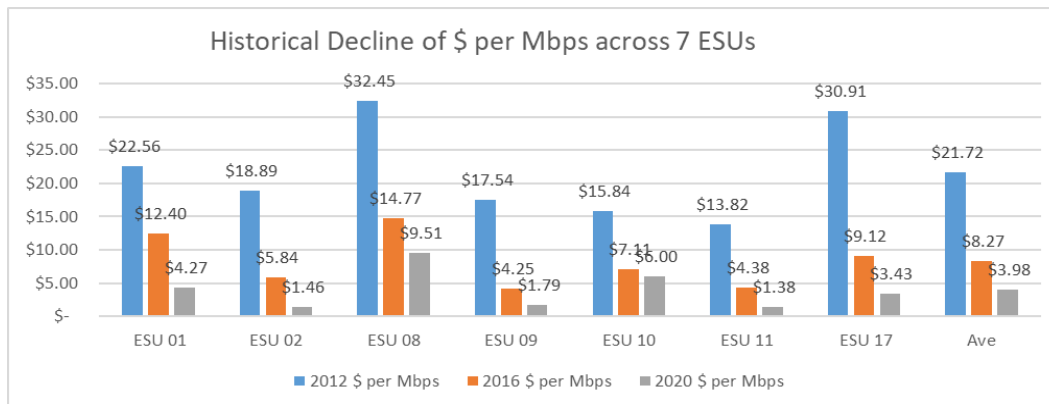


# Network Nebraska Aims to Increase Bandwidth and Lower Costs

Network Nebraska began as a statewide network in 2007 with 88 educational entities and has grown to 293 participants in 2022. Over the course of its history, the State Purchasing Bureau has conducted over 20 RFPs for internet and fiber Ethernet circuits, with the objective to “aggregate demand and reduce costs whenever feasible” (N.R.S. 86-5,100). By synchronizing the service term and expirations of state contracts, it means that a “mega-RFP” occurs every four years. Next year, 2023, will be one of those years, with over 250 fiber circuits out for bid.

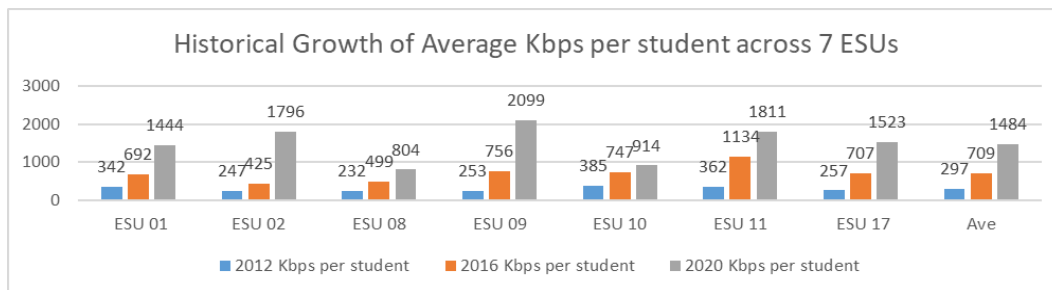
The historic trend lines of Dollars per Megabit (\$ per Mbps) are presented below with a sampling of historical cost data from school districts within Educational Service Units 01 (Wakefield), 02 (Fremont), 08 (Neligh), 09 (Hastings), 10 (Kearney), 11 (Holdrege), and 17 (Ainsworth).

In general, when two or more companies compete for a circuit, the cost decreases dramatically. If more



than one company is required (last mile + middle mile carrier) to connect the school district to Network Nebraska, then the cost is generally higher. As the level of bandwidth increases, the cost per Mbps generally decreases.

As the number of computing devices increases, and as more and more content is digitized and moved to the cloud, the amount of bandwidth needed per student increases. Below is a chart of the historic trend lines related to Kbps per student across the same seven ESUs, showing a doubling or tripling every four years.



More detailed Network Nebraska circuit data from 2019-20 is available at [NebraskaMap](#).

## Network Nebraska

### Overview

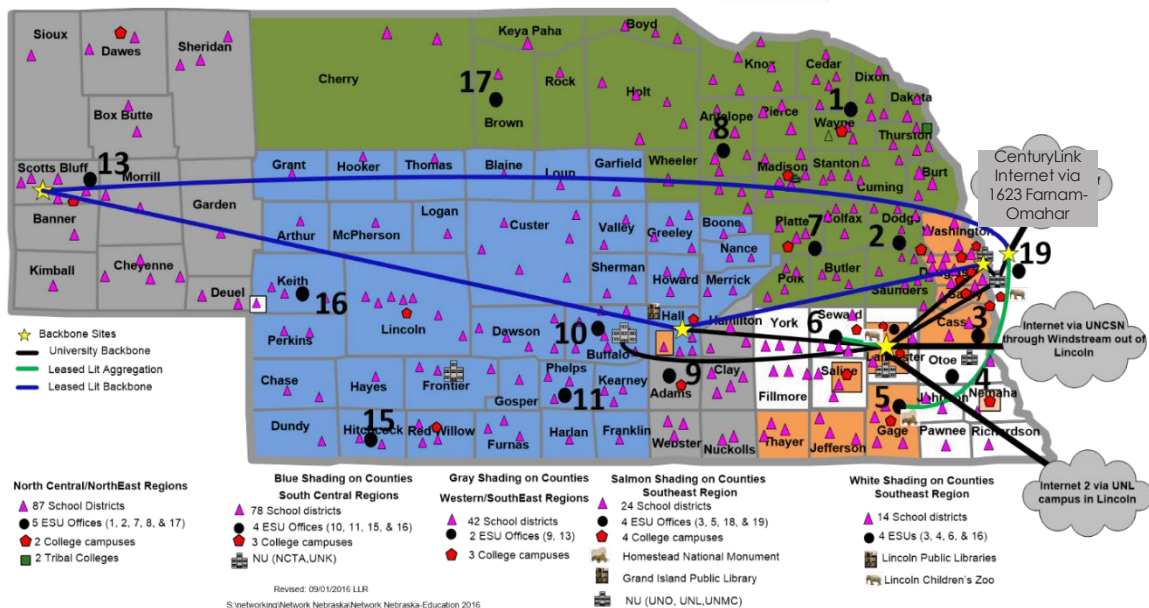
#### Objective:

To develop a broadband, scalable telecommunications infrastructure that optimizes the quality of service to every public entity in the State of Nebraska.

#### Description:

Network Nebraska interconnects several hundred education entities to a multipurpose core backbone extending from Omaha to Lincoln to Grand Island and Scottsbluff, and provides aggregated Internet and commercial peering services extending out to the furthest corners of the state.

Network Nebraska - Education 2022



#### Collaborators:

- Collaborative Aggregation Partnership: Office of the CIO, University of Nebraska, Nebraska Public Media, Public Service Commission, Nebraska Department of Education, Nebraska Information Technology Commission, Network Nebraska Advisory Group.

- Network Nebraska Advisory Group: 8 K-12 members; 8 higher education members
- Educational Service Unit (ESU) Coordinating Council, ESU-Network Operations Committee, ESU-Distance Education Advisory Committee, higher education chief technology officers

### **Strengths/Assets:**

- Nearly every K-12 public school district, educational service unit, and public college and university participate in Network Nebraska and share in its annual costs.
- Network Nebraska is a completely voluntary, self-funded project, which contributes to its resilience, sustainability and focus on customer service.
- Shared personnel support within the Office of the CIO, Administrative Services, and the University of Nebraska contribute to its ultra-low operational costs and affordability.
- Having all K-20 education entities on Network Nebraska provides not only a sense of pride in ownership of the network, but the daily offsets in Internet access peaks between K-12 and higher education also saves on the cost of Internet access.

### **Challenges/Issues:**

- The absence of full-time network employees reduces the capacity for such services as marketing, communications, research & development, and customer follow-up.
- The Network Nebraska cost recovery rates, although small in comparison to other state networks, are still above what small rural public libraries and private K-12 schools are accustomed to paying for Internet service provision alone.

### **Recent Accomplishments:**

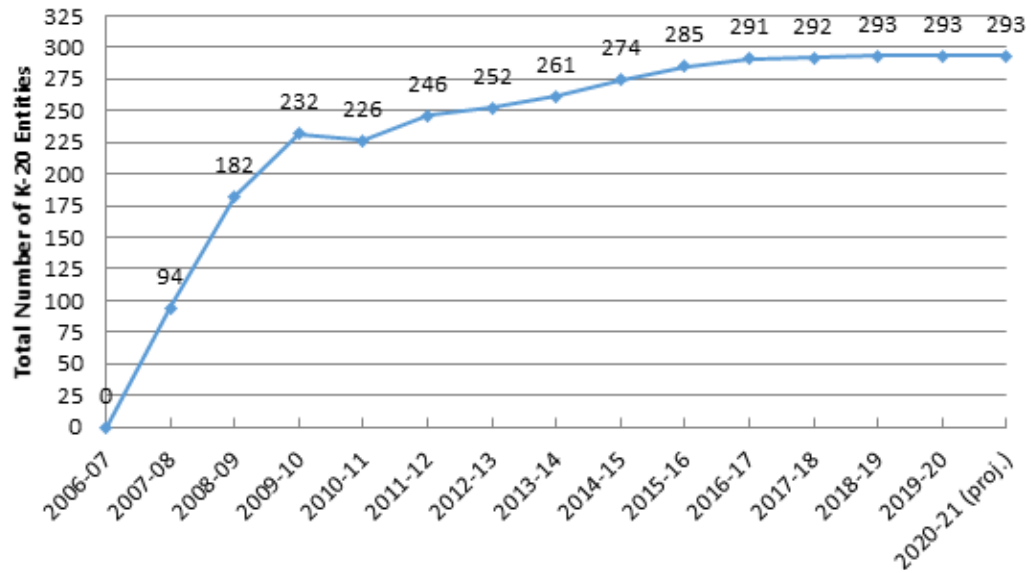
- Maintained public school district participation at 99.6%
- Achieved 100% membership among public and tribal colleges and universities
- Provisioned thousands of Zoom videoconferencing licenses to education entities in the midst of the COVID-19 pandemic response
- Achieved one of the lowest commodity Internet rates in the entire country, made possible through aggregation of demand and statewide bidding
- Achieved 100% retention of voluntary membership, now reaching 292 entities

### **Recommendations:**

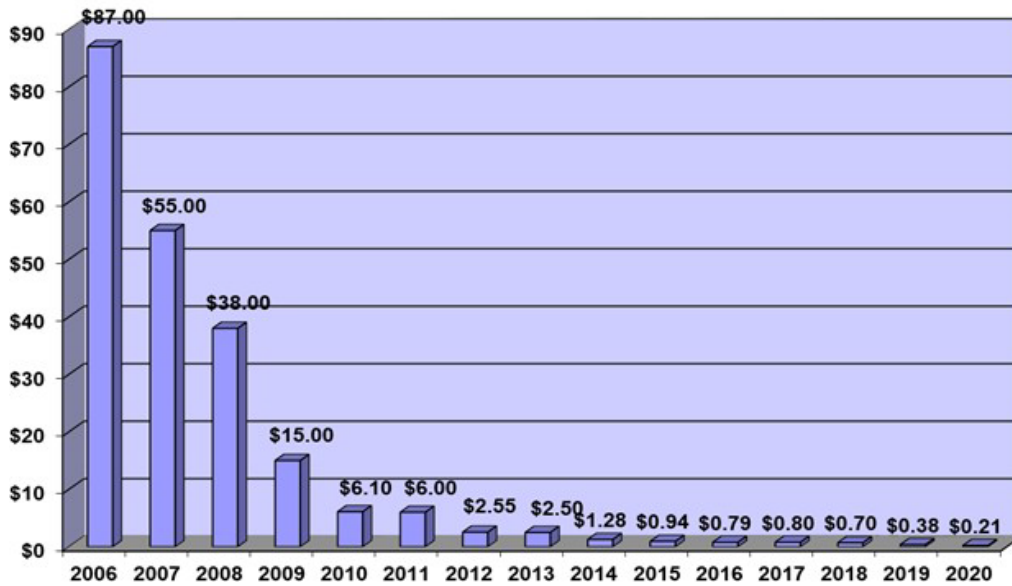
- Continue this initiative.
- Position Network Nebraska to provide services such as network monitoring and management, mitigation of Distributed Denial of Service (DDoS) attacks, statewide 24/7 helpdesk, aggregated invoicing, and coordinated E-rate filing

# Metrics

## Network Nebraska-Education Membership by Year



## Network Nebraska Internet Access Cost (Average \$\$ per Mbps/month)



## Action Items

### 1. **Action: Prepare for the future of Network Nebraska as a statewide, secure, 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), OCIO/NITC staff

Timeframe: 2022-24

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** NNAG and CAP will guide Office of the CIO (OCIO) decisions regarding network capacity, services, and reliability.

**1.1.1 Measurables:** A) NNAG co-chairs will attend monthly CAP meetings and share information. B) CAP liaisons will attend bi-monthly NNAG meetings and share information.

**1.2** Evaluate the effectiveness of the current Network Nebraska fee structures and address changes related to the associated business models as related to core functions and additional services.

**1.2.1 Measurable:** A) NNAG will convene a retreat and present suggested modifications to the Education Council's Network Nebraska task group and to the Chief Information Officer

### 2. **Action: The Education Council, OCIO/NITC staff, and Network Nebraska support staff will sufficiently and appropriately communicate to, and in support of, current and potential Network Nebraska Participants.**

Lead: Education Council; OCIONITC Staff, Network Nebraska support staff

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

Timeframe: 2022-24

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.

**2.1.1 Measurables:** A) Specific data and reports in an online newsletter or other form of communication to members outside of the annual fee memo. B) Designated representatives send timely notifications of changes in procedures affecting member relations with the Network Nebraska Support Team.

**2.2** Conduct a periodic survey of Participants to guide direction and service development.

**2.2.1 Measurable:** A) Survey is conducted, and data from the survey is compiled for sharing with NNAG, CAP, and the NITC Education Council.

**2.3** Develop, publish, and maintain a catalog of Network Nebraska services comprised of services offered directly by Network.

**2.3.1 Measurable:** Catalog of services is published and updated annually

**2.4** Enhance communications regarding change control events affecting Network Nebraska membership.

**2.4.1 Measurable:** The Network Nebraska Support Team use AlertSense and NN\_INFO listserv to communicate change control events to Network Nebraska members.

**3. Action: Identify needs and deliver advanced services to Network Nebraska members, including security, cloud computing, and education infrastructure, to meet the growing needs of its membership.**

Lead: Education Council; CAP; NNAG; NU-ITS Staff

Participating Entities: ESU-NOC; Higher Education CIOs

Timeframe: 2022-24

Funding: Additional funding and/or resources will be required for this action item out of the Network Nebraska Participation Fee, or from consumption-based billing.

Targets/Deliverables:

**3.1** Develop applicable practices and strategies for advanced services to be delivered across Network Nebraska in educational environments and determine how to incorporate them into the Network Nebraska business model.

**3.1.1 Measurable:** A) Formulation of a Strategy document

**3.2.** Select and implement additional services for Network Nebraska members.

**3.2.1 Measurable:** A) Additional services added to Network Nebraska services list or provided by member "centers of excellence" throughout the Network Nebraska framework.

**4. Action: Promote the adoption of statewide cybersecurity practices for Nebraska K-20 education.**

Lead: Education Council; CAP; NNAG; NU-ITS Staff

Participating Entities: ESU-NOC; Higher Education CIOs

Timeframe: 2022-24

Funding: Additional funding and/or resources will be required for this action item out of the Network Nebraska Participation Fee, or from consumption-based billing.

Targets/Deliverables:

**4.1** Actively support the formation of, and educational representation on, the statewide cybersecurity advisory committee and development of the statewide cybersecurity action plan under the authority of the Nebraska Emergency Management Agency.

**4.1.1 Measurable:** A) Identify experts and key stakeholders among the K-20 community and promote involvement.

**4.2** Encourage and promote best practices in cybersecurity to ensure adoption by all Nebraska K-20 entities.

**4.2.1 Measurable:** A) Review and recommend best practices relevant to cybersecurity in K-20 education. B) Identify communication avenues to disseminate information to stakeholders.

**4.3** Encourage K-20 membership to actively participate in cyber-related community and industry events to broaden and share knowledge and experience

**4.3.1 Measurable:** A) Identify events and communicate availability to members.



## Other 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, non-public, and non-education entities connected to Network Nebraska



## Nebraska Public Service Commission approves Special Construction Matching Funds for Libraries and Schools



Nebraska Public Service Commission public meeting

Long before the COVID-19 pandemic confined citizens to their homes for work, school, and telehealth, the Rural Broadband Task Force (RBTF) was hard at work deliberating and making recommendations to improve the broadband environment in rural Nebraska. Created by the Legislature in 2018 (N.R.S. 86-1102), the Nebraska RBTF presented its first seminal report to the Executive Board of the Legislative Council on November 1, 2019. (<https://ruralbroadband.nebraska.gov/reports/index.html>)

Chock full of data about Nebraska, and comparisons with neighboring states, over 20 recommendations were presented by the RBTF, including six that helped address the “Homework Gap” (defined as the inequitable opportunities afforded students with, and without, home internet). One of the six recommendations reads, “Encourage the Nebraska Public Service Commission to implement an E-Rate Special Construction matching fund program with funding from the Nebraska Universal Service Fund to incentivize new fiber construction to public libraries and schools, starting in FY 2021- 22.”

Public comment and RBTF discussions substantiated the role that rural public libraries play in student internet access when away from school. Many villages and towns in rural Nebraska lack advanced telecommunications services to public libraries, whereas nearly all public schools are connected by fiber to Network Nebraska.

The *Special Construction Matching Fund* program was created by the Federal Communications Commission (FCC), for states to incentivize new fiber construction by matching, dollar for dollar, an additional 10% E-rate discount for schools and libraries if a state funding source would contribute the additional 10%. For example, a public library with a 70% E-rate discount could receive an additional 20% in state and federal support, and only have to pay for 10% of the construction costs (instead of 30%) when installing new fiber. “Special

Construction” is defined by the FCC as including: A) Construction of network facilities; B) design and engineering; and C) project management. Nebraska will become the 26th state to be considered eligible for this program: <https://www.usac.org/e-rate/applicant-process/before-you-begin/fiber-summary-overview/additional-discount-to-match-state-tribal-funding-for-special-construction/>

Other states have used their community anchor institutions to act as anchor tenants for new fiber construction in rural areas, allowing telecommunications providers to pick up additional customers along the way.

The Nebraska Public Service Commission (PSC), chaired by Commissioner Mary Ridder, originated docket NUSF-117 to explore the matching fund program and solicit comments from interested stakeholders. The PSC issued the final order approving the program on May 19, 2020. The PSC will make available one million dollars to be allocated over the four years of the program to school and public library applicants approved by both the state and federal programs. Ridder said, “We encourage any libraries and schools that lack a fiber connection to consider participating in this effort as we work to provide broadband to the unserved and underserved in our state.” Applications must be submitted by mid-December, with the PSC issuing notices of approval by mid-January, 2021, and the first projects to be completed by July 1, 2021.

Rod Wagner, Director of the Nebraska Library Commission, stated, “We welcome this matching fund program as a way to improve the connectivity to our rural public libraries and we commend the PSC for creating and funding this program to the benefit of all Nebraskans.”

For more information about the Nebraska Special Construction Matching Fund program, contact Cullen Robbins, PSC Director of Telecommunications & NUSF, [Cullen.robbs@nebraska.gov](mailto:Cullen.robbs@nebraska.gov), or 402-471-3101.



# Digital Education

## Overview

### **Objective:**

*To promote the effective and efficient integration of technology into the instructional, learning, and administrative processes and to utilize technology to deliver enhanced digital educational opportunities to students at all levels throughout Nebraska on an equitable and affordable basis.*

### **Description:**

The Digital Education initiative will involve the coordination and promotion of several major systems and applications that heretofore have either been developed mostly at the local level or have not been replicated statewide.

Initiative progress will be dependent upon adequate Internet connectivity and transport bandwidth for learners, instructors, administrators, and for educational attendance sites. A minimum acceptable level of classroom technology will have to be established for the initiative to be successful.

### **Collaborators:**

- Educational Service Unit (ESU) Coordinating Council and advisory groups
- Public and private K-12 schools
- Nebraska Department of Education
- University of Nebraska
- Nebraska State College System
- Nebraska Community College System
- Council of Independent Nebraska Colleges Foundation

### **Strengths/Assets:**

- The enhancement of Digital Education is the combined focus of public and private K-12 entities and public and private higher education entities working together through Network Nebraska.
- The recent developments in learning management software, content management software, and longitudinal data tracking and depiction make it a particularly important time to improve on the statewide deployment of these systems.
- The high bandwidth transport and Internet capacity of Network Nebraska makes it possible to implement private cloud and public cloud applications to every education entity on Network Nebraska.

## Challenges/Issues:

While collaboration among entities is strong, the initiative lacks a “champion” and any additional implementation funding is a scarce commodity.

## Recent Accomplishments:

- ESU collaborators have developed BlendEd briefing materials and the TLT Learning Group.
- The Nebraska Department of Education has made progress on the Adviser project involving all but four Nebraska school districts.
- The Nebraska Department of Education's Future Ready Nebraska Digital Learning Plan was developed by a statewide committee and a Digital Profile is maintained on every school district.
- NITC Education Council and Community Council have collaborated on the design of several technology solutions that may reduce the Homework Gap and improve digital equity among economically challenged students.
- The Nebraska Library Commission, in partnership with the State Office of the CIO, has assisted the Nebraska Public Service Commission with the development of the Nebraska Special Construction Matching Fund grant program to incentivize new fiber construction for schools and libraries.
- The Nebraska Department of Education and ESU Teaching and Learning with Technology group have launched the Nebraska OER Hub with open education resources for teaching and learning.

## Recommendations:

- Continue and refocus this initiative.
- Encourage and/or incentivize collaborators and stakeholders to be more results-oriented using project management techniques.
- Build on the excellent foundation and success of Network Nebraska to deliver high quality digital educational opportunities that provide a framework for student success.

## Action Items

### 1. Action: Help insure the success of Nebraska digital education.

Lead: Education Council

Participating Entities: K-12 and Higher Education professional and advisory groups , Nebraska Department of Education, and the Coordinating Commission for Postsecondary Education.

Timeframe: 2022-24

Funding: Additional funding may be required for this action item

Targets/Deliverables:

**1.1** Inventory the use of learning technologies in Nebraska K-12 schools and promote the effective practices in the use of those technologies (e.g. flipped classroom, blended learning, learning management systems, OER, fully online instruction, etc....)

**1.1.1 Measurable:** Flexible learning technologies have been inventoried and a report has been written and distributed.

**1.2** Make efforts to connect constituencies to improve the state of digital education in Nebraska.

**1.2.1 Measurable:** Use conferences and other gatherings to encourage human networking.

## **2. 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: 2022-24

Funding: Additional funding may be required for this action item

Targets/Deliverables:

**2.1** 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 to support academic success.

**2.1.1 Measurable:** NITC Education Council members meet regularly with Community Council Broadband Initiative members and other stakeholders.

**2.2** Identify opportunities and actions to address equitable access for students when away from school or campus.

**2.2.1 Measurables:** A) Members of the NITC Education Council will work with the Nebraska Department of Education and the Nebraska Rural Broadband Task Force to explore telecommunications services and technologies to reach unserved and underserved students. B) The Nebraska Special Construction Matching Fund grant program will provide resources for affordable access through Nebraska public libraries.

### **Other Recommended Measurables:**

- Number of K-12 students who have gained home Internet access through Digital Inclusion initiatives
- Number of public libraries that have gained faster Internet access by reaching Network Nebraska, either directly or indirectly