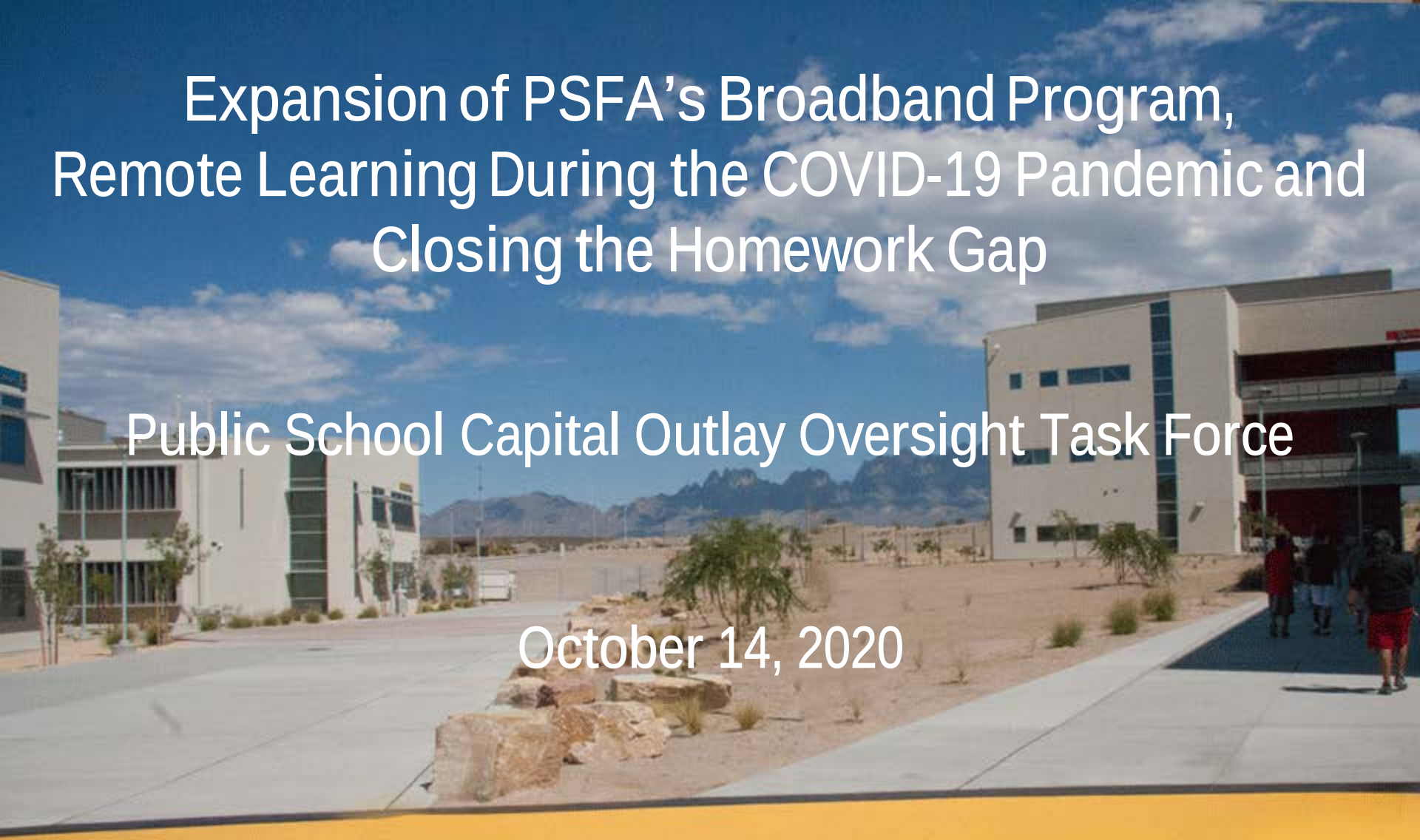


Expansion of PSFA's Broadband Program, Remote Learning During the COVID-19 Pandemic and Closing the Homework Gap

Public School Capital Outlay Oversight Task Force

October 14, 2020

Partnering with New Mexico's communities to provide quality, sustainable school facilities for our students and educators.

Agenda

- Broadband in the Public School Capital Outlay Act
- PSFA's Broadband Program Since 2015
- Upcoming Challenges
- Remote Learning During COVID-19 Pandemic
- Renewing and Evolving District Internet Networks
- Regional Consortia to Speed Progress
- Closing the Homework Gap
- Strategies to Build a Statewide Education Network

Public School Capital Outlay Act

Education Technology Infrastructure and Education Technology Infrastructure Deficiency Corrections Initiative

- Section 2. Paragraph M: "Up to ten million dollars ($10,000,000) of the fund may be expended each year for an education technology infrastructure deficiency corrections initiative pursuant to Section 4 of this 2014 act; provided that funding allocated pursuant to this section shall be expended within three years of its allocation."

Broadband and Ed Technology Components

School-based Capital Project Infrastructure

- Category 1 projects: Fiber-optic cable.
- Category 2 projects: Network equipment.

PSFA's Scope of Work

Student Connectivity and Operations

- Internet service agreements for the school sites.
- Purchase of user devices.
- Vouchers for internet service at homes.
- Service and support for software/hardware.
- Network security and content filtering (hardware and expertise).

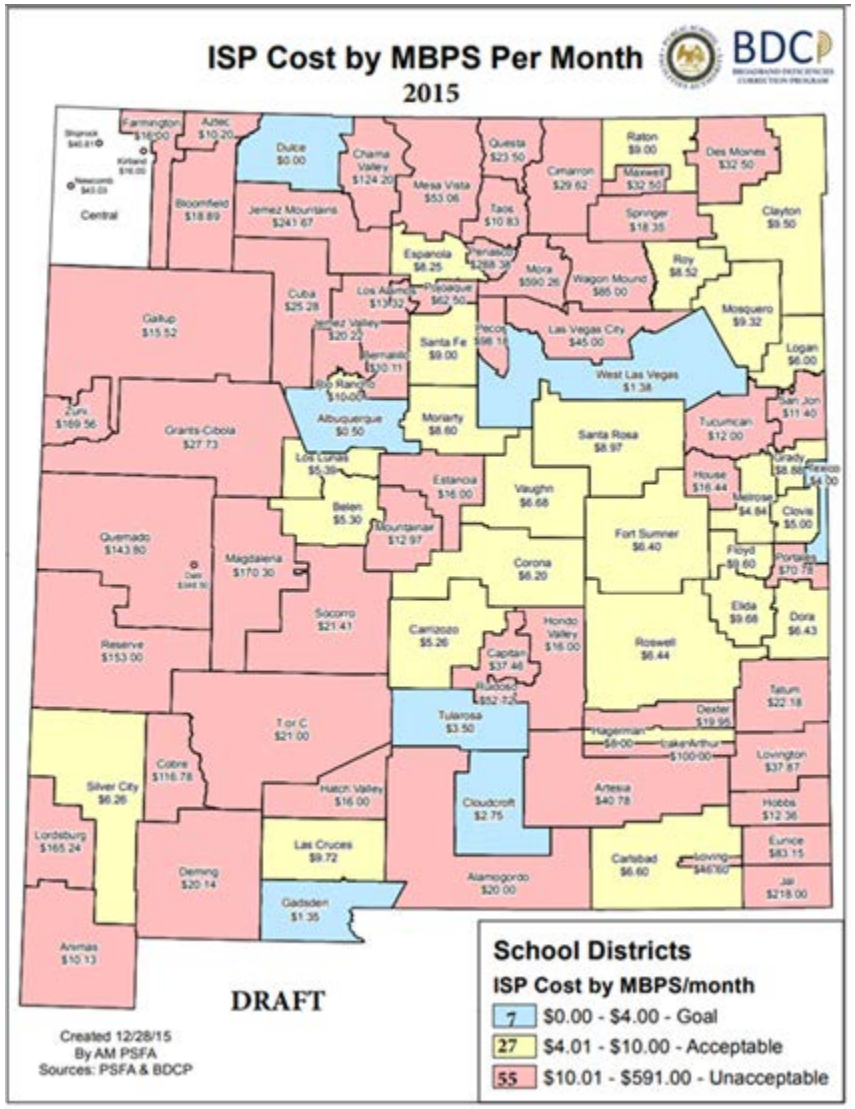
District's Scope of Work

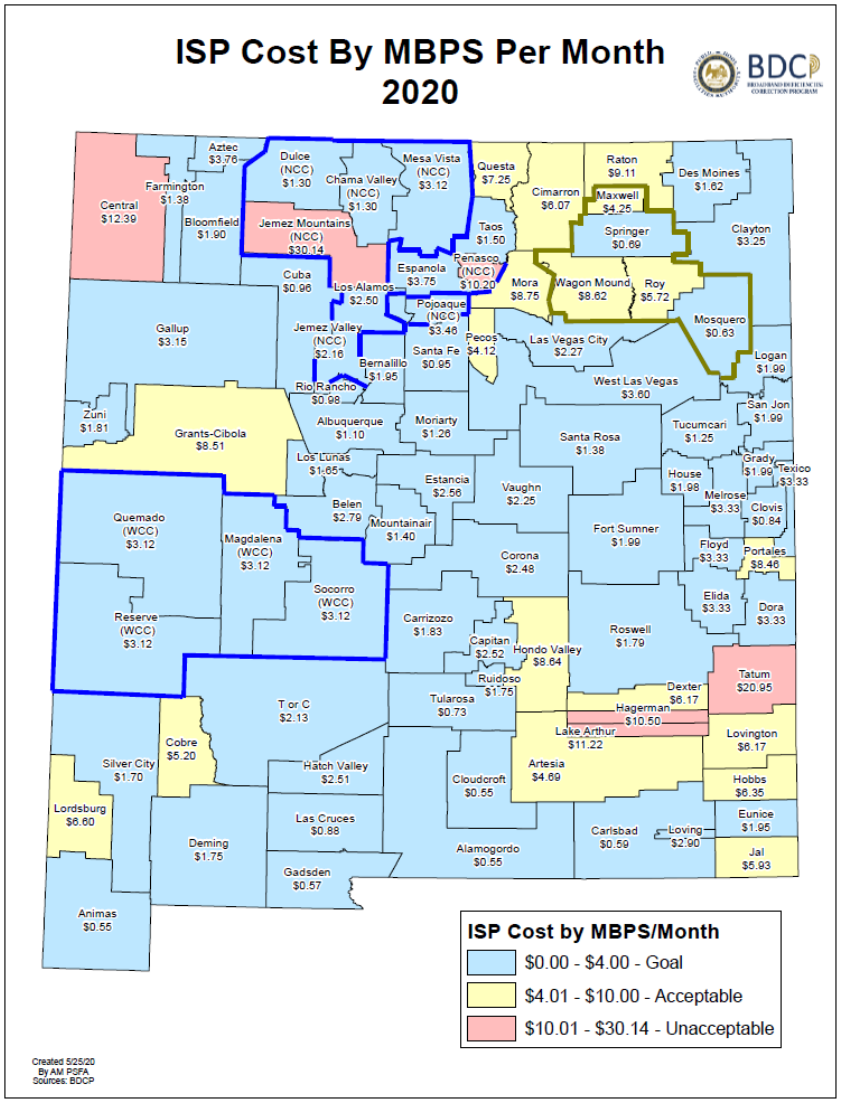
How PSFA/Districts Connected Schools

PSFA has made progress getting schools connected to high speed fiber optic internet utilizing the following mechanisms:

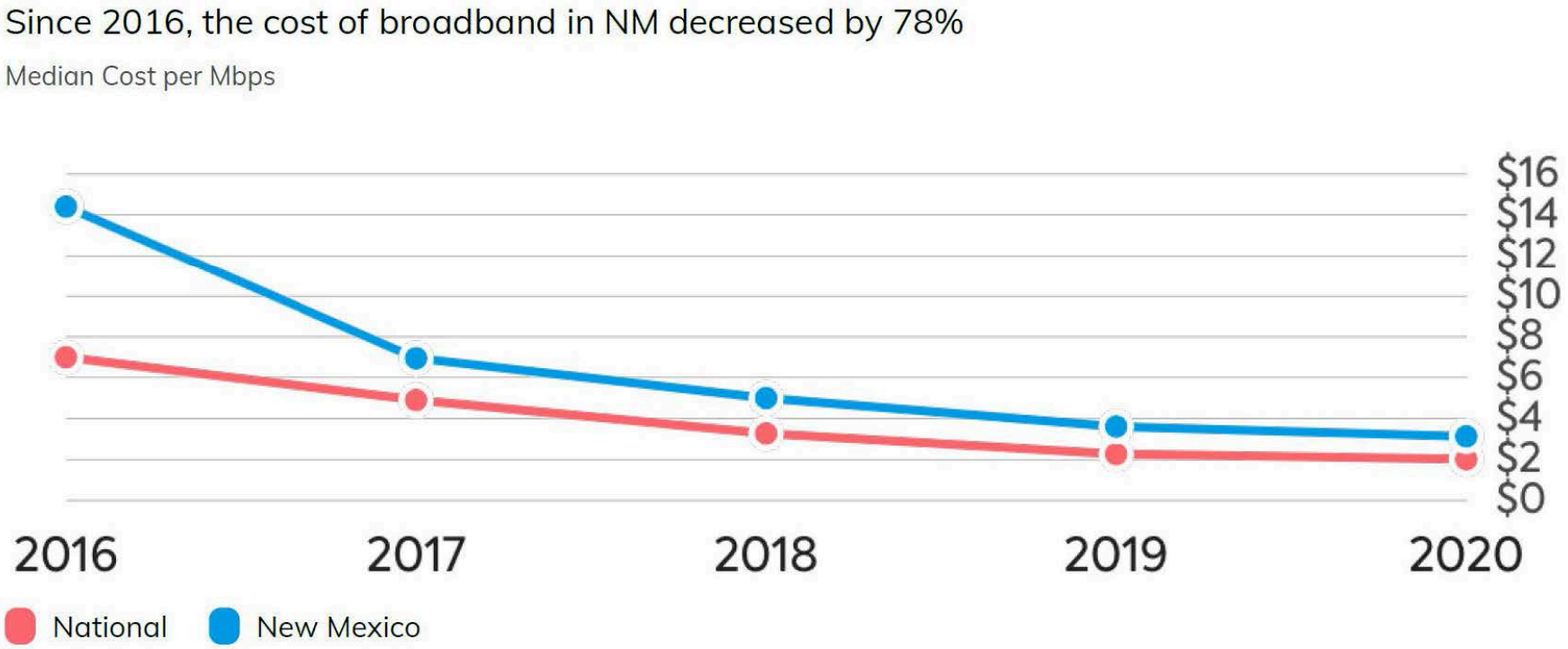
1. Contracted service with an e-Rate consultant to help districts apply for federal funding.
   - This federal funding was vital to get all schools connected to high speed internet within 5 years.
2. State funding, $3 M per year, has been the state funding match for projects and has funded a small group of project developers/managers at PSFA.
3. Small team of 3-4 project developers/managers at PSFA has provided direct support to school districts to help them understand how to request federal funding and what the options are for network configuration in their district and regionally.

Progress Since 2015



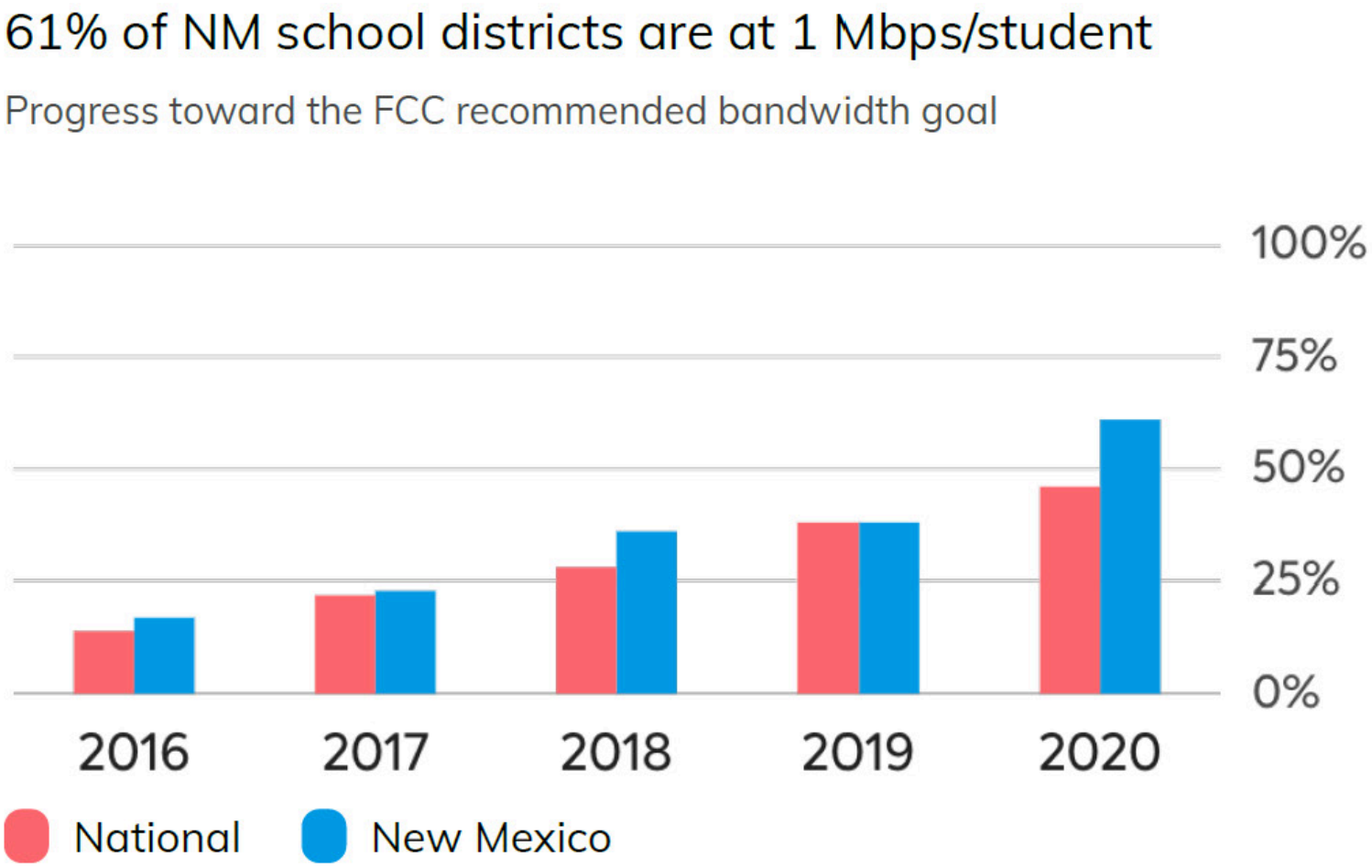


NM K-12 Broadband Progress Lowering Cost



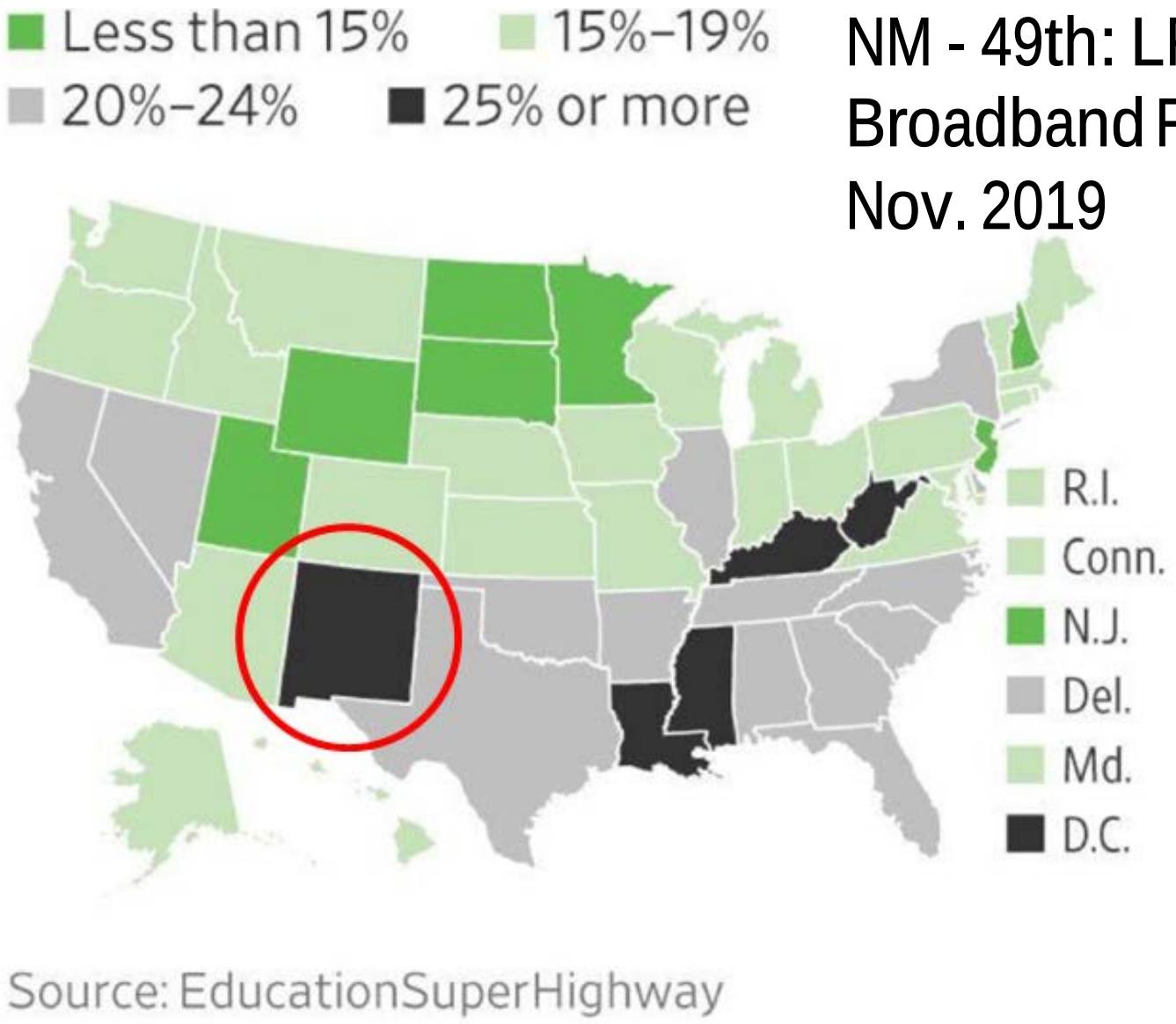
*Connect K12 Report

NM K-12 Broadband Progress Increasing Speed



*Connect K12 Report

Percentage of Students without Broadband



NM - 49th: LFC Broadband Report Nov. 2019

Upcoming Challenges

1. Providing internet access for remote learning during COVID.
2. Renewing school networks.
   - Need to continue to upgrade and optimize district network infrastructure and develop shared infrastructure and operational support for smaller districts.
3. Sharing digital resources.
   - Need to consolidate network infrastructure and human expertise to manage networks at centralized locations rather than at each individual district.
4. Reducing digital opportunity gap.
   - Ensure that students have uniform access to internet resources at school and at home, with an expanded definition of school networks to reach beyond the school site to students' homes.

Remote Learning During COVID

PED, Department of Information Technology (DoIT), and PSFA are currently working with school districts to provide immediate internet access to all students without high-speed internet.

- PED and DoIT completed a statewide survey in September to determine how many students lack high-speed internet access and where these students are located.
- DoIT issued a statewide RFQ/RFI, soliciting the market to provide proposals to connect 12,000 students as soon as possible.
- PSCOC approved funding for consultants to work with individual school districts to identify and work with local internet providers to connect students as soon as possible.

Remote Learning During COVID

- Solutions to provide immediate internet access for students to provide remote learning during the pandemic may not be sustainable.
- All options should be considered for short-term connectivity.
- Operational funding to subsidize service contracts with leased equipment will be most effective.

More Effective ⟷ ***Less Effective***

	Fiber optic, Cable	**Cellular LTE, DSL**	**Other Wireless Internet Service**	**Satellite**
Speed, capacity	High	Moderate	Moderate	Low
Cost (Service)	Moderate	Moderate	High	Very High

Renewing and Improving School Networks

- Most network equipment (category 2 projects) needs to be replaced every 5 years.
  - PSFA will continue to help districts keep up with this replacement cycle with planning and funding, focused on continued improvement and optimization, rather than simple replacement.
- Regional consortia involving multiple school districts, tribal entities, rural public libraries, and other participants are successfully accomplishing key objectives:
  - Lowering internet access costs at a regional level.
  - Building more regional capacity for new high speed internet connections in the future, including homes.
  - Centralizing network management and security, based on available, qualified personnel and funding.

Benefits of Regional Consortia

Regional collaboration that connects schools and libraries together:

- To increase buying power and create economies of scale.
- **Typically led by RECs** - Eliminate duplications, sharing procurement, contracting and E-rate applications.
- Improved operational implementation:
  - Network security, monitoring, and filtering.
  - Integration of technology into the classroom and curriculum.
- Efficient network configuration to serve the district.
- Share specialized technology resources.
- Build a foundation for sharing applications and educational content (Learning Management System (LMS), digital books and content).
- Increase the broadband capacity in the region for all users, including residences.

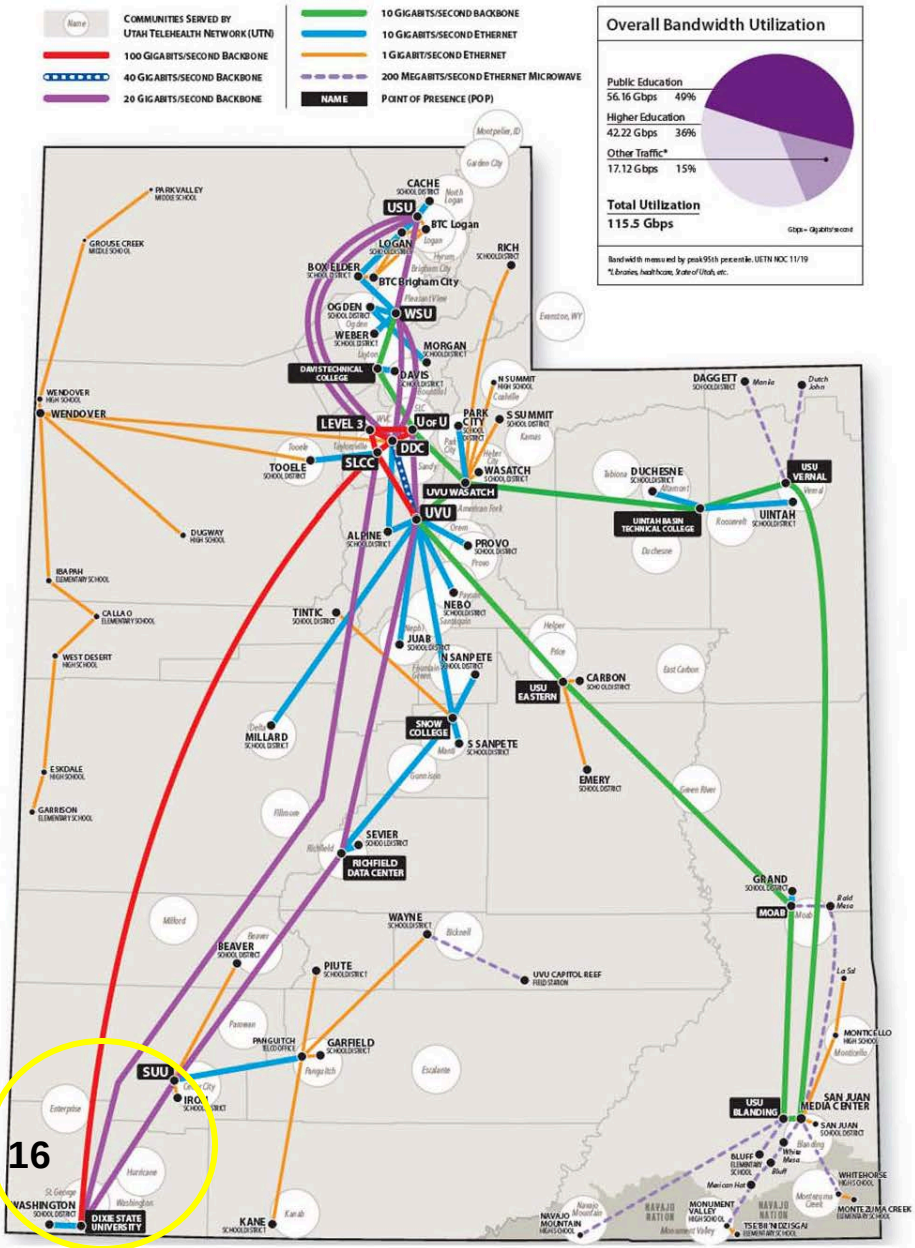
Benefits of a Comprehensive, Statewide Approach

Utah Education Network Summary

- Non-profit overseen by a board, established in 1989.
- Connects **16,000** K12, Libraries, Higher Ed (& telehealth) locations to a robust network, developed in partnership with private telco providers.
- Coordinates and maximizes E-rate and other federal funding.
- Ensures highly skilled tasks (network engineering & security, monitoring, etc) are covered for all members.
- Provides high quality applications and content, professional development programs… for all members.
- Brings high capacity connectivity in several regions of the state.
- **Purchases ~30% less Internet Access compared to all New Mexico districts combined, while serving all Utah K12, libraries, Higher Ed, rural clinics and the entire state of Utah government.**

UETN Infrastructure Map

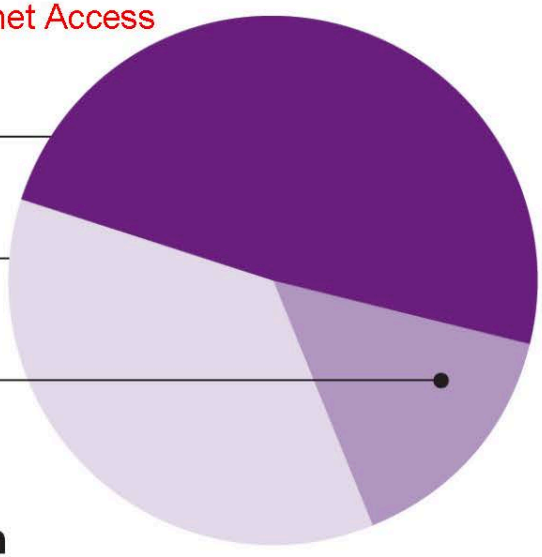
Connecting 1600+ locations throughout Utah



Benefits of a Comprehensive Approach

Overall Bandwidth Utilization

~1/3 of NM K12 Internet Access



Public Education
56.16 Gbps 49%

Higher Education
42.22 Gbps 36%

Other Traffic*
17.12 Gbps 15%

Total Utilization

115.5 Gbps

~70% of NM K12 Internet Access

Gbps = Gigabits/second

Bandwidth measured by peak 95th percentile. UETN NOC 11/19

*Libraries, healthcare, State of Utah, etc.

Closing the Homework Gap

Problem:

- Approximately 76,000 students in NM (23%) do not have high-speed internet at home (PSFA/PED survey March-April 2020), which is necessary to participate in at-home online learning.

Solution:

- Work with each district to identify the need, create a plan to address the need, and begin executing the plan.

Challenges:

- High level of effort to coordinate and manage, to make any measurable progress.
- Will require additional state funding.
- Will take several years to make sustainable improvements state-wide.
- Need to prioritize districts to focus efforts on the most needy.

Requirements:

- Support (authorization and funding support from PSCOC to PSFA).
- Changes in PSCOA to expand PSFA's work to build district networks.

Connectivity Barriers for the Homework Gap

Two categories of students without internet access at home*:

1. Homes that could be connected with a voucher for service.
   - Wired (cable or DSL) connectivity available, but with service that is too expensive.
   - Wireless (LTE cell-data from Verizon, T-Mobile, etc) connectivity available, but with service that is too expensive.

2. Homes located in remote areas without any adequate options for internet access.

   * Statewide survey needed to determine an estimated number of students in each of these categories.

Connectivity Goals to Close the Homework Gap

Internet service speed:

- 30 MB = Adequate residential service for homework, videoconferencing.
- 100 MB = Target residential service speed.

Examples of internet service offerings **below adequate speed**:

- Satellite (multiple problems but available everywhere).
- DSL (sometimes too slow).
- Wireless Internet Service Provider (WISP) (sometimes too slow).
- Wireless cell phone service (sometimes too slow).

Examples of internet service offerings **at adequate speed**:

- DSL (speed varies widely, often not adequate).
- WISP (speed depends on location of home related to tower).
- Wireless cell phone service (LTE with strong signal is required).

Examples of internet service offerings **at target speed**:

- Cable internet (e.g. Comcast) -- almost always adequate, limited to high population areas
- Fiber-optic -- always the best choice, currently in very limited locations (Kit Carson, Plateau, Continental Divide (Grants, etc), La Jicarita (Mora) - some parts of all their service areas)

Estimates for Vouchers to Subsidize Service

Assumptions:

- 38,000 students could be connected, if a voucher for service is provided (50% of the estimated 76,000 students without service at home).
- $150 installation cost.

Low estimate: $18.24 M per year recurring

35,000 (Locations) x $40/Mo x 12 Months = **$18.24 M** / year recurring.

35,000 (Locations) x $150 = **$5.7 M** non-recurring installation cost.

High estimate: $72.96 M per year recurring

35,000 (Locations) x $160/Mo x 12 Months = **$72.96 M** / year recurring.

35,000 (Locations) x $150 = **$5.7 M** non-recurring installation cost.

*Can go up to $500 / Month for Satellite (unlimited data).

Short-Term Strategies for Improving Internet Access

Strategies that could be funded by PSCOC:

- Coordination to help districts identify effective connectivity solutions.
- Continue to improve school site WiFi strength and capacity for after-hours, parking lot connectivity.
- Purchase and install equipment to support school bus WiFi connectivity.
- Purchase devices and home-based connectivity equipment for students.
  - PSFA expects high-demand for this type of capital purchase through the $18.867 M appropriation for impact aid districts.
  - PSCOF funding participation in this type of capital purchase could be allowed, with changes to the Educational Technology Initiative.

Strategies that cannot be funded by PSCOC:

- District contracts with Wireless Internet Service Providers for district-wide WiFi broadcast systems.
- Vouchers for residential internet service to students where possible.

Long-Term Strategies for Improving Internet Access

Strategies that could be funded by PSCOC:

- PSCOC support to regional consortia for fiber installation projects, centralized network equipment, and shared internet access service agreements.
  - Regional installation of high-speed internet fiber optic cable to service multiple remote school sites, libraries, tribal facilities, and other entities is improving access to wired connectivity for all users in these regions, including residential service.
- PSCOC support for the development of a statewide educational network, to include continued fiber-optic construction and regional hubs for network equipment and services (service agreements, network configuration, security, and content filtering).
- PSCOC commitment to construction of a statewide education network that:
  - Provides centralized network infrastructure for smaller school districts.
  - Improves market options for wired connectivity in all areas.
  - Offers shared agreements that can be used by groups of small districts for service connections and network support (expertise to configure hardware, manage security, filter content, etc).
  - District networks → regional networks → statewide network.

Implementation Plan

1. **PSFA can advise applicants for Capital Projects in Impact Aid Districts Appropriation to identify effective, relevant and feasible short-term expenditures to improve student connectivity on and off school sites.**
2. **PSFA staff and/or consultants begin working with PED, DoIT and individual districts, and coordinating regionally to:**
   a. Document the need in each district.
      - How many students can be connected now with a voucher vs how many need a long-term network improvement in their area?
   b. Form a plan with each district to define relevant short-term and long-term strategies to begin building a statewide education network.
   c. Begin executing the plans, starting with the districts with the greatest need.
3. **Implement long-term strategies to achieve long-term goals:**
   a. Close the homework gap, with home-based connections as an extension of school networks, including connectivity equipment and service to accompany student devices.
   b. Ensure 100 MB per home to 100% of student residences in NM.
   c. Completion of a statewide K-12 education network.
   d. PSFA needs a staffed and funded partner at the state level to develop and manage projects beyond school sites for tribal, city, county, and other entities.

Questions

Jonathan Chamblin
Director, PSFA
505-469-0968
jchamblin@nmpsfa.org

Ovidiu Viorica
Broadband and Technology Program Manager, PSFA
505-270-1355
oviorica@nmpsfa.org

Thank You!