



DE Plan Primer

Digital Opportunity Department

South Carolina Office of Regulatory Staff |

Video that illustrates the need and value of broadband and digital education



[Click here to play](#)

<https://ors.sc.gov/broadband/digitalopportunity>

About the SCBBO...

“Our vision is for all South Carolinians to have access to affordable, reliable, highspeed internet, and to gain the necessary skills to benefit from this technology.”

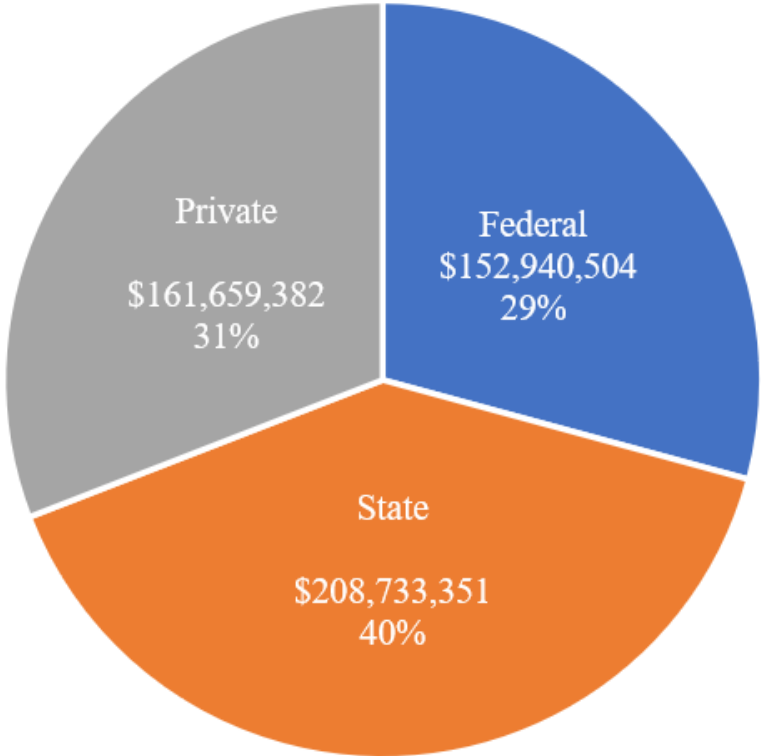
– SCBBO –



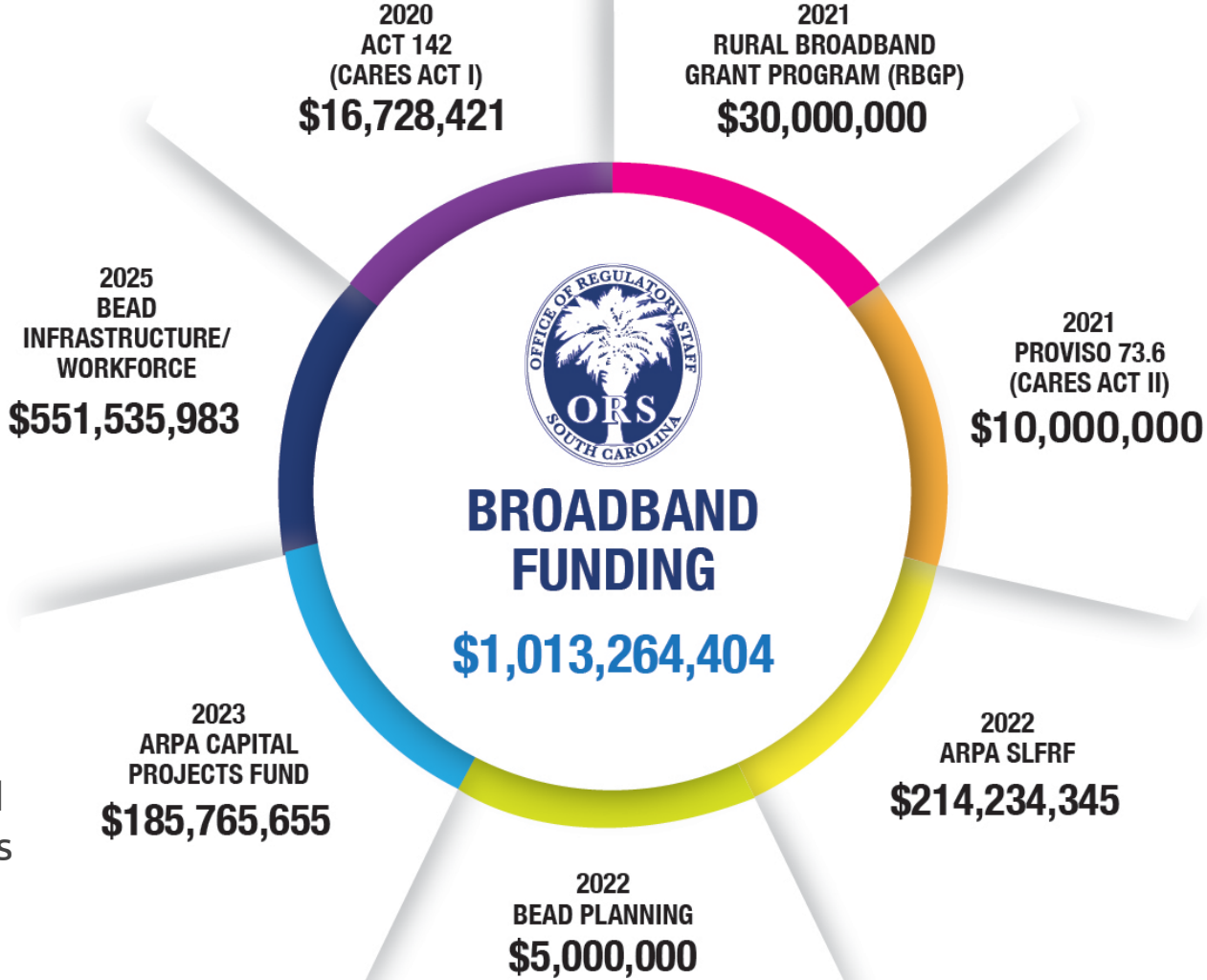
<https://ors.sc.gov/broadband>

- ✓ **Office created July 2021**
 - ✓ 2021-22 Budget Proviso Ratified by SC General Assembly
 - ✓ Sections 73.6-73.7
- ✓ **Administering Broadband Deployment Grants**
 - ✓ Established Broadband Advisory Council (BBAC)
 - ✓ Map/Model statewide broadband availability twice a year
 - ✓ Evaluate grant applications, issue grant awards
 - ✓ Provide management and oversight of funded projects
 - ✓ Eligible Applicants are Internet Service Providers (ISPs)
 - ✓ Financial match is required by the ISP
 - ✓ Prioritize Fiber to the Premise (FTTP)

Overview of Broadband Investment in SC



Dollar amount and percentage of investment in broadband deployment funds across Federal, State, and Private sectors in South Carolina from June 2020 to June 2023



2023

- Initial Proposal submittal (Volume 1 & 2)
- Establish framework for affordability (low-cost plans & middle-class affordability plan)
- NTP for Capital Projects Fund (CPF)-funded projects (Q4)
- Deploy remaining state funds
- Initiate procurement for software solution for BEAD challenge process

2024

- Initial Proposal approval and Digital Equity Plan submittal
- Run Challenge Process (Q2/Q3) and Deduplication Process
- Subgrantee Selection Process (Q2 - Q4)
- Begin spending eligible Broadband-related workforce deployment (Initial 20% of eligible funds)
- Begin deployment of Extremely High-Cost locations
- Deployment of remaining ARPA funds

2025

- Deploy full BEAD funding
- Final Proposal submittal (including full selection of subgrantees, Q1)
- Project completion of CPF and SLFRF funded projects (Q4)

2026

- Finish construction at remaining unserved locations
- Start of construction at CAI locations
- Construction evaluation on BEAD related projects

2027

- Construction evaluation on BEAD related projects

2028

- Finish construction of remaining underserved locations
- Establish access for all Extremely High-Cost locations
- Construction evaluation on BEAD related projects

Estimated Timeline for Universal Service

SCBBO goal that all South Carolinians have access to reliable, resilient high-speed Internet at 25/3 Mbps by 2026 and 100/20 Mbps by 2028

Resources for Access



SOUTH CAROLINA DIGITAL DRIVE

Tools and resources to inform consumers and stakeholders

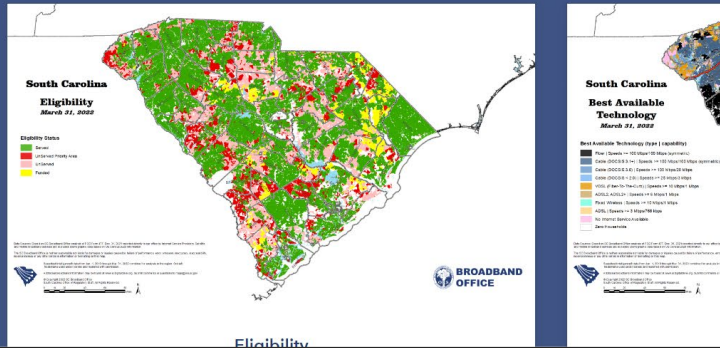
Don't have access to internet? Take the [Need Internet](#) survey

Search for maps by county and type

Current Total Housing Units
With At Least
25↓ Mbps / 3↑ Mbps Service
2,164,673*

Current Total Housing
Without
25↓ Mbps / 3↑ Mbps S
181,715*

Explore Maps



SC Broadband County Dashboard March 2022

Private Member | Private Organization

Summary
The Dashboard allows users to view general broadband statistics at the SC county level. Much of the data reflected in the Dashboard is based on Federal Communication Commission data submissions. The Dashboard uses data from Internet Service Providers (ISPs). Dashboard data is updated periodically - At a minimum 2 times per year. For questions about the Dashboard data, please contact the Broadband Office via mapping@ors.sc.gov.

Read More

View Full Details

Details

- Dashboard Dashboard
- June 17, 2022 Date Updated
- June 15, 2022 Published Date
- Public Anyone can see this content
- No License Provided Request permission to use

SC Broadband Dashboard March 2022 Data

Percent of Housing Units in a Census Tract 03/2022
Meet (25mbps/ 3mbps)
 > 99.01% - 100%
 > 97.01% - 99.00%
 > 75.01% - 97.00%
 > 60.01% - 75.00%
 0% - 60.00%

Percent of Residential Addresses Served by Fiber in Statewide
39.26%

Percent of Residential Addresses Served by Cable in Statewide
54.09%

Estimated number K-12 Students
44,041
That do not have at least 25 Mbps / 3 Mbps broadband

Total number of Funded Households
56,218

Total number of Unserved Households
181,715
That DON'T meet 25 Mbps / 3 Mbps

Total number of Served Households
2,164,673
That meet the Min 25 Mbps / 3 Mbps

Percent of Residential Addresses Served by Copper in Statewide
4.22%

*Note copper technology is considered Unserved

Percent of Residential Addresses Unserved in Statewide
7.74%

Powered by Esri



Digital Opportunity Department



DOD Vision

All South Carolinians have access to affordable, reliable, high-speed internet and the necessary skills to benefit from this technology.

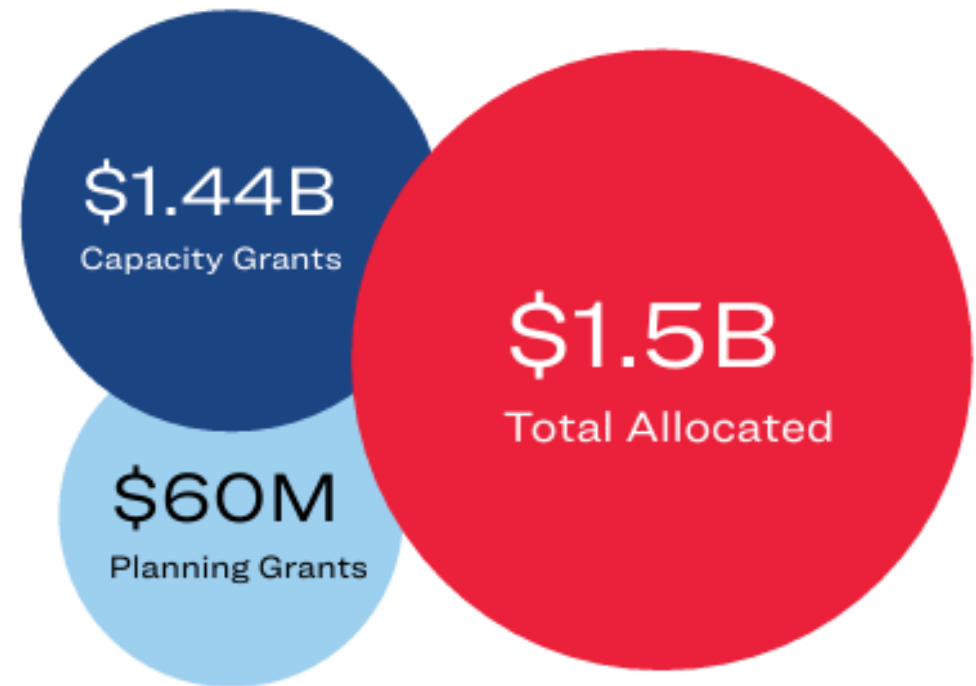


Funding

Infrastructure Investments & Jobs Act (IIJA) is a \$65 Billion investment to develop and implement systemic solutions to bridge the digital divide.

- **Broadband Equity, Access, and Deployment (BEAD)** provides \$42.45 billion for infrastructure development and adoption programs.
- **Digital Equity Act (DEA)** allocated \$2.75 billion for Digital Equity adoption and use.

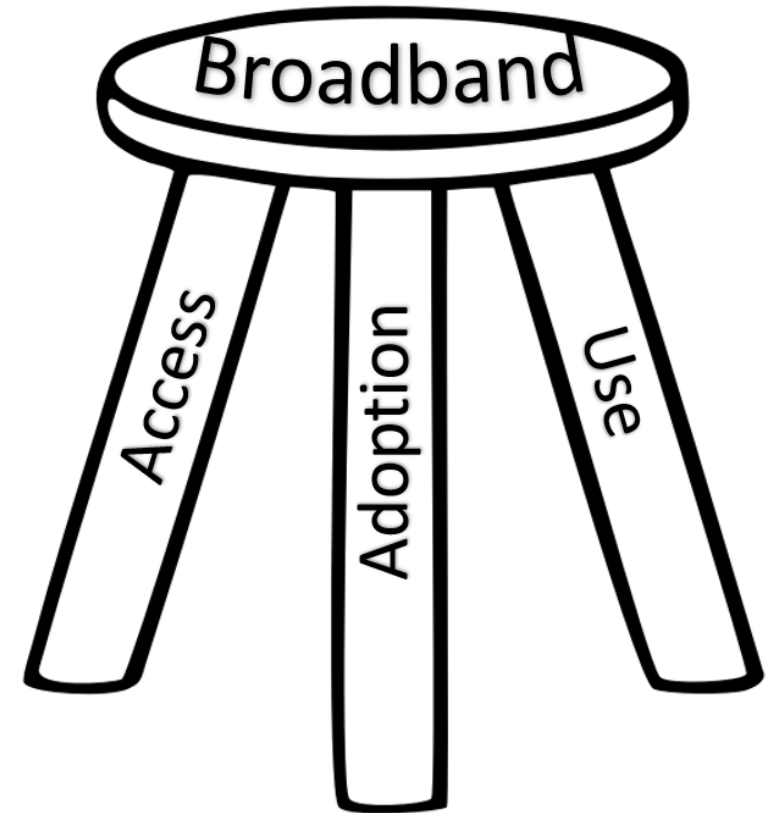
Funding Allocations



Total Allocated: \$1.5 billion
(\$60 million planning grants + \$1.44 billion capacity grants)

Digital Equity Act Grant Programs

- **Planning Grant**
 - Approved April 2, 2024
- **Capacity Grant**
 - Submitted May 24, 2024
 - Expected \$12.8 million in late Fall 2024
- **Competitive Grant**
 - Released July 24, 2024



Digital Equity Plan

- Outlines goals for Digital Opportunity in SC
- Identifies target populations in SC
- Categorizes existing resources for digital literacy in SC
- Develops framework for Digital Opportunity Department initiatives



DIGITAL
OPPORTUNITY

DIGITAL EQUITY PLAN

South Carolina
Office of Regulatory Staff:
Digital Opportunity Department

Digital Equity Outcomes

- **Economic and workforce development**

- Possible metrics include: size of workforce; number of digital navigators providing training; number of available technology jobs

- **Education**

- Possible metrics include: number of institutions teaching digital literacy; digital navigators receiving training; number of devices available in correlation to number of students; digital literacy courses held

- **Health**

- Possible metrics include: number of telehealth users; rate of telehealth use in rural communities; availability of online forms

- **Civic and social engagement**

- Possible metrics include: number of minigrants deployed; number of people reached by minigrant recipients; number of digital literacy events held; percentage of households with a broadband subscription

- **Delivery of other essential services**

- Possible metrics include: number of people receiving emergency alerts; number of people who can receive reverse 911 calls; number of people reached by the Emergency Management Division through social media and online services

As identified at 47 U.S.C. 1723 (c)(1)(C)

Covered Populations

- **Low-income individuals**
- **Aging individuals**
- **Racial/ethnic minorities**
- **Rural residents**
- **Veterans**
- **Individuals with disabilities**
- **Individuals with a language barrier**
- **Incarcerated individuals**

Based upon guidance by the National Telecommunications and Information Administration (NTIA), the DOD will focus on assisting several target populations.



Digital Equity Plan Implementation



Goal 1: Broadband Affordability

Objective: All households and businesses in South Carolina can subscribe to Broadband service at an affordable rate.



Goal 2: Online Accessibility and Inclusivity

Objective: Every resident of South Carolina has access to reliable high-speed Broadband service in their home and business.



Goal 3: Digital Literacy

Objective: Every resident of South Carolina has access to education and training necessary to use Broadband to advance their personal goals and increase South Carolina's technology workforce competitiveness.



Goal 4: Online Privacy and Cybersecurity

Objective: Every resident of South Carolina can safely and securely utilize Broadband services.



Goal 5: Device Availability and Affordability

Objective: Every resident of South Carolina can access a desktop or laptop computer at home or in an accessible location.

Digital Equity Plan Initiatives



1. Secure SC



2. Digital Navigators



3. Minigrants



4. Device Recycling



5. BBAC





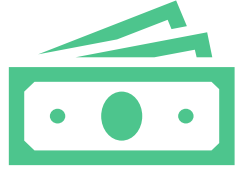
SecureSC

- Cybersecurity month in October
- SecureSC website
- Toolkits for community organizations to host events
- Cybersecurity and privacy resources for South Carolinians
- Digital literacy resources for South Carolinians



Digital Navigators

- “Trusted guides who assist community members with ongoing, individualized support for accessing affordable and appropriate connectivity, devices, and digital skills” (NDIA)
- Train the trainer programs
- Create statewide “best practices” for Digital Navigator curriculum
- Create statewide certification program
- Create statewide database of trusted Digital Navigators



Minigrants

- Small funding pools
- For programs led by trusted community organizations
- Funding across every part of South Carolina
- Renewal of funding every 6 months if certain benchmarks are met
- Mid-performance period and final reports to evaluate efficacy



Device Recycling

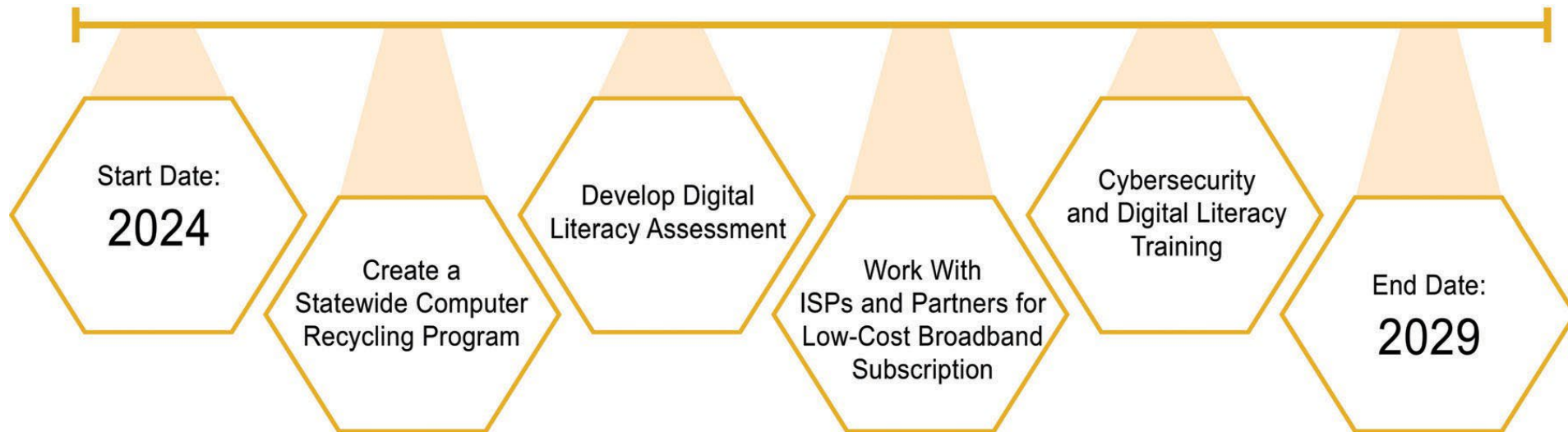
- Infrastructure is in place – now everyone needs devices to be able to utilize it
- Device availability at low or no cost
- Evaluation of existing device refurbishment and recycling
- Establishing best practices, distribution channels, and pricing structure



Broadband Advisory Council

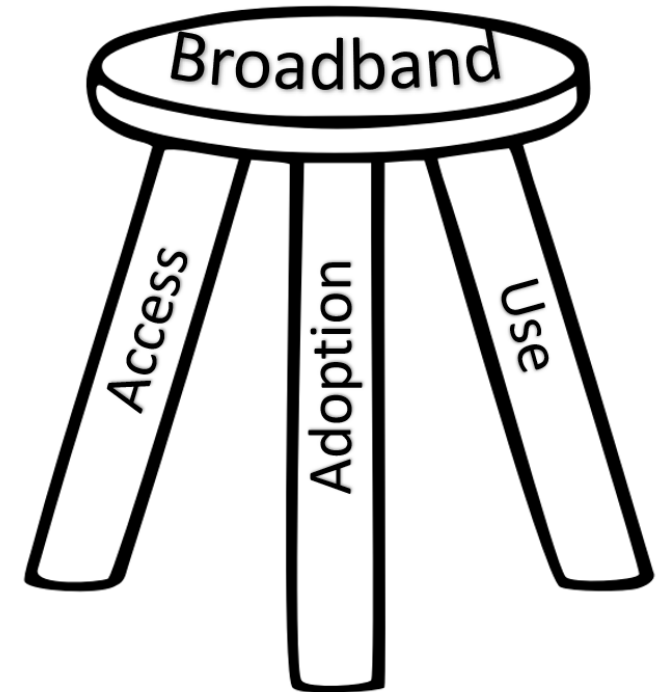
- Community organizations, government agencies, and related companies working together to address digital literacy concerns, align resources, and serve as a trusted voice between Digital Equity programs and the communities they serve
- Board members and consulting members
- Quarterly meetings in-person in different parts of the State

Timeline



Digital Equity Competitive Grant

- **NOFO Released July 24, 2024**
 - \$1.25 billion/\$5-12 million per award
 - 10% match
 - PPP encouraged
- **DOD Ineligible for Competitive Grant**
- **Eligible Entities**
 - State/County Agency, Tribal, Non-profit, CAI, Local Educational Agency, Workforce Development Entities
- **Support efforts in digital equity, digital inclusion and spur adoption and use of broadband in Covered Populations**



Subscribe to
the DOD
Newsletter

The screenshot shows the ORS SC.GOV website. At the top, there is a navigation bar with links for ABOUT, CONSUMERS, REGULATED UTILITIES, SAFETY, BROADBAND, and NEWS, along with a search bar. A dropdown menu is open, listing: Broadband Office, State Managed Programs, Broadband Grant Notifications, **Digital Opportunity Department** (circled in red), and Broadband Advisory Council. Below the navigation, there is a banner for the Digital Opportunity Department with the ORS logo and the text "Digital Opportunity Department". A notification box is present with the text "Sign Up for Digital Opportunity Email Updates" (circled in red) and "The Vehicle Registration Portal is now live for passenger carriers." Below the banner, there is a section titled "Digital Opportunity Department" with a video player showing "ORS / SC Broadband Office Impact Video (4 min ve...)" and a "Digital Opportunity Department Quick Links" section. The quick links include: Digital Equity (DE) Plan as Approved by NTIA on April 2, 2024 (PDF), SC Digital Drive [?], and **Sign Up for Digital Opportunity Email Updates [?]** (circled in red).

<https://ors.sc.gov/broadband/digitalopportunity>

Tom Allen

TAllen@ORS.SC.GOV

(803) 737-0974

Cami Aull

CAull@ORS.SC.GOV

(803) 737-8411

Mary Dell Hayes

MHayes@ORS.SC.GOV

(803) 730-7785



What is the Internet?



South Carolina Office of Regulatory Staff | 8.21.2024

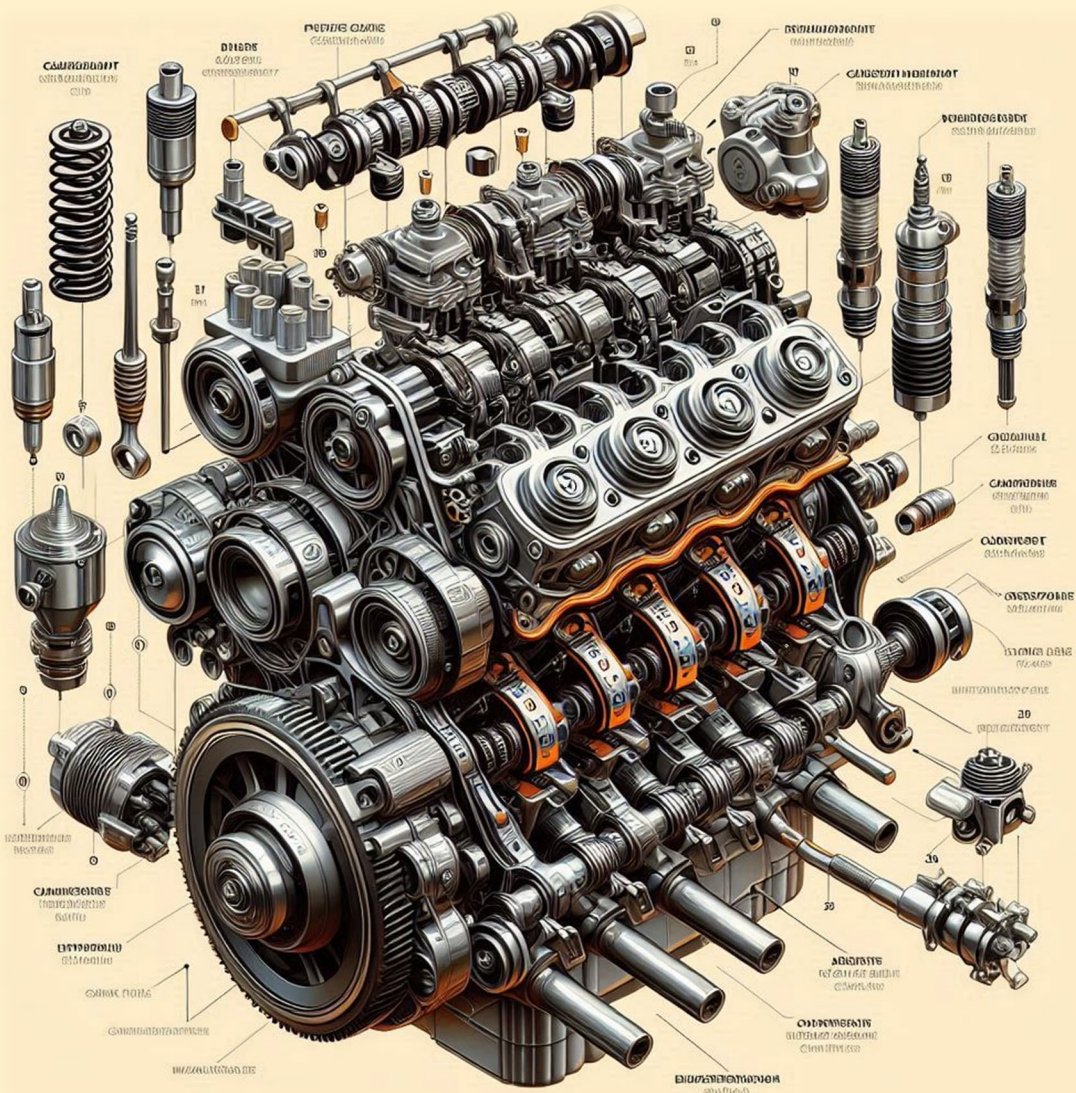
AI Use Disclosure

Portions of this presentation including various text and graphics were compiled using a Generative AI – Specifically:

- Microsoft Co-Pilot version 1.0
- Google Gemini version 1.0 Pro



South Carolina Office of Regulatory Staff |







Source: Microsoft Co-Pilot Generated using DALL-E-3

Network of Networks

The Internet is a vast global network of interconnected computers. Imagine it as a massive highway system for data.....capable of sending and receiving information almost instantaneously 24/7 365 days a year!



History of the Internet

The internet has been around for decades, with its origins dating back to the 1960s. Here are some key events in the internet's history:

- 1964: Paul Baran, an American think tank researcher, proposed a distributed network that could communicate without a central command point.

- 1971: The first email was sent.

- 1970s: File sharing began.

- 1982: TCP/IP was standardized, allowing different computer networks to communicate with each other.

- 1983: The US Department of Defense incorporated TCP/IP into its ARPANET network, which was then renamed ARPANET Internet. This is often considered the official birthday of the internet.

- 1989: Tim Berners-Lee, a British scientist working at CERN, invented the World Wide Web, which allowed users to create websites and share information through a network of computers.

- 1990: The World Wide Web became more widely available to the public, helping to popularize the internet.

- 1992: Students and researchers at the University of Illinois created Mosaic, a browser that allowed users to see words and pictures on the same page. Mosaic later became Netscape.

Today, the internet is used by more than five billion people and is considered one of the most important inventions of all time.

Source: Google Search Labs | AI Overview – Question Posed: How long has the internet been around?

How does the Internet work?

- **Data Packets:** When you send/receive information (like an email or a web page), it's broken down into smaller chunks called "packets." These packets travel independently across the network.
- **Packet Switching:** Instead of following a fixed route, packets take different paths to reach their destination. Routers and switches decide the best route for each packet dynamically.
- **Protocols:** The Internet relies on standardized protocols. Two key ones are:
 - **TCP (Transmission Control Protocol):** Ensures reliable data delivery by managing packet sequencing and error correction.
 - **IP (Internet Protocol):** Assigns unique addresses (IP addresses) to devices and routes packets based on these addresses.
- **Clients and Servers:**
 - **Clients:** These are your devices (like your computer or phone) that request information from servers.
 - **Servers:** These powerful computers store and provide data (like websites or emails) to clients.
- **DNS (Domain Name System):** When you type a web address (like "www.example.com"), DNS translates it into an IP address. This allows your device to find the correct server.
- **World Wide Web (WWW):** The Web is just one part of the Internet. It's where you browse websites, access information, and interact with services.

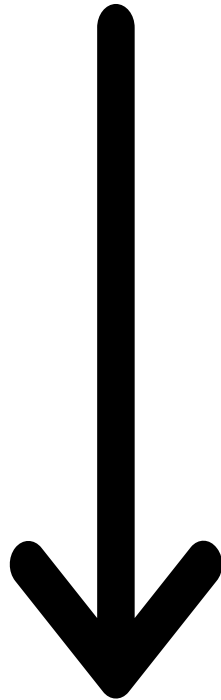


Types of Last-Mile Connections

1. **Fiber:** Fiber-optic connections offer high-speed internet, often exceeding 1 Gbps (gigabit per second) symmetric service. These connections use thin glass or plastic fibers to transmit data using light signals.
2. **Cable:** Cable internet provides speeds ranging from 25 Mbps (megabits per second) to 1 Gbps. It uses coaxial cables to deliver data.
3. **Fixed Wireless:** Fixed wireless connections use radio signals to deliver internet. Speeds can vary but typically range from 10 Mbps to 100 Mbps.
4. **DSL (Digital Subscriber Line):** DSL connections use telephone lines and offer speeds from 1 Mbps to 100 Mbps.
5. **Satellite:** Satellite internet is available in remote areas. Speeds can be around 25 Mbps, but latency is higher due to the signal traveling to and from satellites in space.
6. **4G LTE Home:** This wireless technology provides speeds similar to fixed wireless, ranging from 10 Mbps to 100 Mbps.

Actual speeds may vary based on location and service provider

Speed
Mbps ↓↑

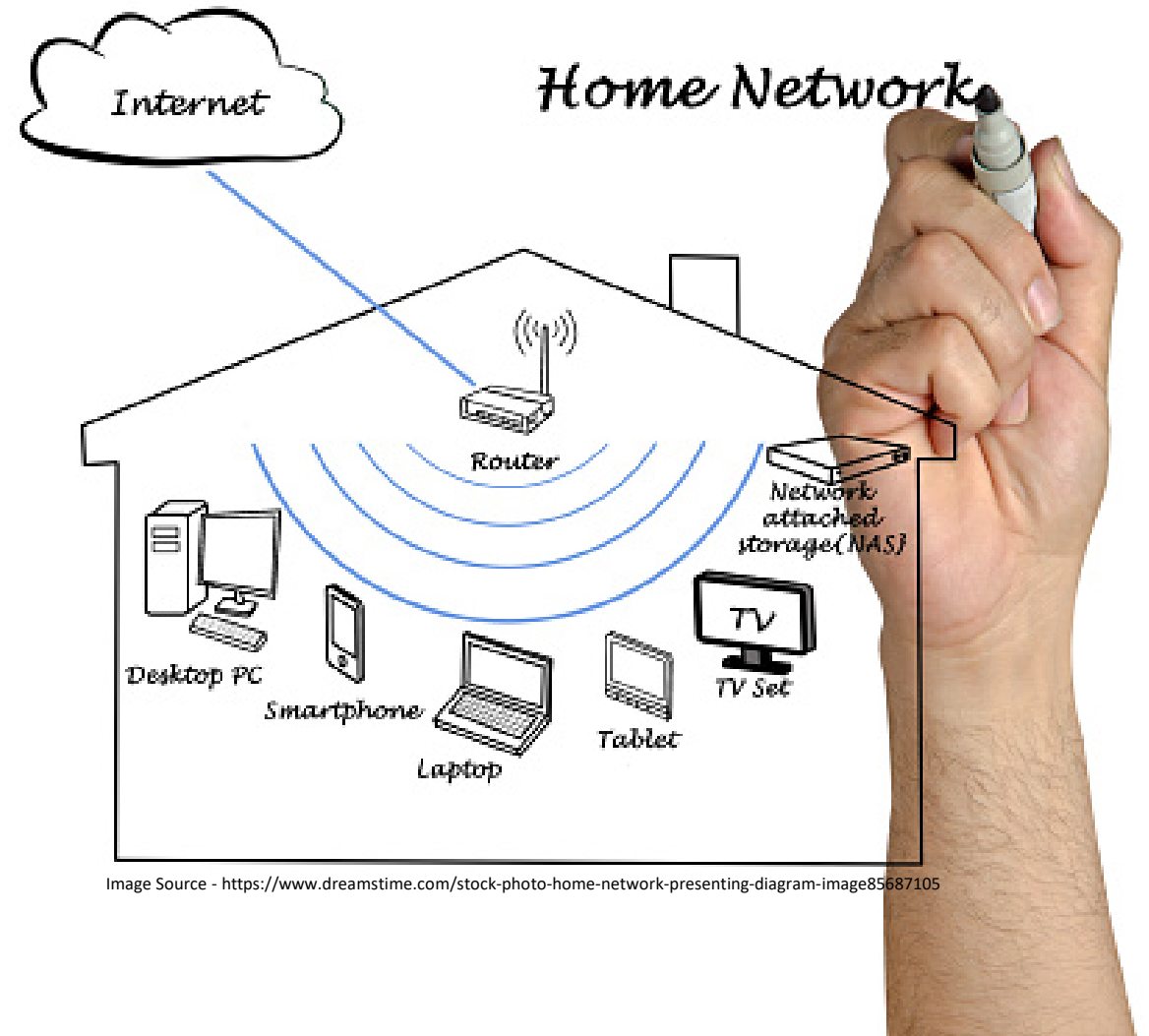


Latency – Time it takes for data to move between client and server – Expressed in Milliseconds – Lower the number, faster the connection! <100 ms is good!

Value of High-Speed Internet (a.k.a. Broadband) in the home?

Allows simultaneous use of:

- ✓ Phone/Video Calls
- ✓ Work and School Online
- ✓ Home Security Systems
- ✓ Smart Thermostats
- ✓ Smart Appliances
- ✓ Gaming Consoles
- ✓ Movie/TV Streaming



What is Broadband?

1. **Definition: Broadband = High-Speed Internet Access.**
2. **Speed:** In the United States, broadband is defined by the Federal Communications Commission (FCC) as a connection with at least 100 Mbps download speed and 20 Mbps upload speed ¹.
3. **Usage:** With broadband, you can shop online, stream videos, play games, use social media, and even engage in video chat for online education and telehealth.
4. **Importance:** Broadband access is crucial for jobs, education, health care, entertainment, and civic engagement.

Slower Internet:

1. **Speed:** Slower internet connections fall below the broadband threshold. These might include older technology like a DSL connection.
2. **Limitations:** Slower internet can hinder activities that require faster speeds, impacting economic stability, education, and overall well-being.
3. The difference between broadband and slower internet connections is the speed of the part that connects your home to the wider internet. This connection, often referred to as the “last mile,” is the bottleneck between your home network and the servers of companies like Google and Amazon. So if that connection is faster, your overall experience on the internet will be better.

<https://www.highspeedinternet.com/resources/what-is-broadband>



Image Source: Microsoft Co-Pilot Generated using DALL-E- 3



Fiber Optic Network

- 1. Computer System:** Represents your device (e.g., laptop, smartphone).
- 2. Router:** Connects your device to the local network.
- 3. ONT (Optical Network Terminal):** Converts optical signals from fiber optic cables to electrical signals.
- 4. OLT (Optical Line Terminal):** Aggregates data from multiple ONTs and connects to the service provider's network.
- 5. Server:** Stores and serves web pages, files, or applications.
- 6. Internet:** Represents the global network connecting servers worldwide.





What's New?

Generative AI

Cognitive System	is a natural or artificial system consisting of connected components that process informational input and transform it into observable output (i.e., a set of systems that interact with the world, understand, reason and learn).									
	Artificial Intelligence	<p>is a computer engineering discipline — a series of mathematically or logic-based techniques, uncovering, capturing, coding knowledge and leveraging sophisticated and clever mechanisms to solve problems (i.e., a simulation of cognitive processes by means of computer programs).</p> <table border="1"> <tr> <td data-bbox="639 611 996 722">Machine Learning</td> <td data-bbox="1003 611 1709 722">at its most basic is the practice of using algorithms to parse data, capture knowledge, learn from it, and then make a determination or prediction.</td> </tr> <tr> <td data-bbox="639 726 996 879">Deep Learning</td> <td data-bbox="1003 726 1709 879">is a subset of machine learning composed of algorithms that create knowledge from multiple layers of information processing.</td> </tr> <tr> <td data-bbox="639 883 996 1005">Computer Vision</td> <td data-bbox="1003 883 1709 1005">is a scientific discipline that extracts information from images or videos; seeks to extract high-dimensional data from images, emulating human visual system.</td> </tr> <tr> <td data-bbox="639 1009 996 1133">Natural Language Processing</td> <td data-bbox="1003 1009 1709 1133">is a technology that has the ability to turn text or audio speech into encoded, structured information, based on an appropriate ontology.</td> </tr> </table>	Machine Learning	at its most basic is the practice of using algorithms to parse data, capture knowledge, learn from it, and then make a determination or prediction.	Deep Learning	is a subset of machine learning composed of algorithms that create knowledge from multiple layers of information processing.	Computer Vision	is a scientific discipline that extracts information from images or videos; seeks to extract high-dimensional data from images, emulating human visual system.	Natural Language Processing	is a technology that has the ability to turn text or audio speech into encoded, structured information, based on an appropriate ontology.
Machine Learning	at its most basic is the practice of using algorithms to parse data, capture knowledge, learn from it, and then make a determination or prediction.									
Deep Learning	is a subset of machine learning composed of algorithms that create knowledge from multiple layers of information processing.									
Computer Vision	is a scientific discipline that extracts information from images or videos; seeks to extract high-dimensional data from images, emulating human visual system.									
Natural Language Processing	is a technology that has the ability to turn text or audio speech into encoded, structured information, based on an appropriate ontology.									

Generative Artificial Intelligence

is a technique that learns from vast amounts of data to produce new, novel content.



Benefits of AI for SC

Use of State Resources

- Intelligent workflow and automations to better optimize resource allocation.
- Predictive identification of issues before they arise, improving quality of services.

Citizen Experience

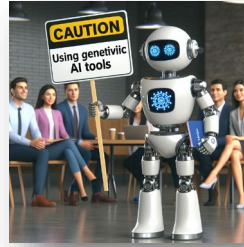
- Increased responsiveness through effective self-service options, extension of service availability and expanded response capacity to reduce queuing.
- Greater accessibility across languages, interaction methods and modalities.

Workforce Benefits

- Decision support and enhanced information delivery to assist employees as they service citizens.
- Personalized upskilling and training to provide access to new skills.

<https://admin.sc.gov/sites/admin/files/Documents/OED/Final%20SC%20AI%20Strategy.pdf>

Word of Caution @AI



Data Governance is Key!

When using generative AI tools, it's crucial to be cautious about **confidential data** and **intellectual property**. Here are some key points to consider:

1.Data Protection:

- **Avoid submitting confidential or sensitive information** (such as [Personally Identifiable Information, proprietary data, or export-controlled data](#)) [to generative AI tools like OpenAI's ChatGPT or Google's Bard](#)¹.
- **Obtain documented approval** from relevant parties before using such data in generative AI tools.

2.Intellectual Property Risks:

- When training generative AI tools using confidential information, there's a risk of that information becoming public. [Techniques like "prompt injection" could expose sensitive data](#)².
- [Be aware of unresolved intellectual property issues, including claims related to novel images derived from original sources or the role of third-party tools in technology development](#)¹.

3.Best Practices:

- **Limit exposure:** Use generative AI tools for non-sensitive/public inputs.
- **Review licensing agreements:** Ensure software suppliers comply with data security and privacy practices.
- **Stay informed:** [Keep up with best practices and lower-risk use cases for generative AI](#)³.

Remember, responsible deployment of generative AI requires vigilance and adherence to data protection and IP guidelines.



Internet-of-Things (IoT)

The number of **Internet of Things (IoT)** devices worldwide is forecast to almost double from **15.9 billion in 2023** to more than **32.1 billion IoT devices in 2030**¹.

Source: Microsoft Co-Pilot AI Assistant

The **Internet of Things (IoT)** refers to a network of everyday devices, appliances, and other objects equipped with computer chips and sensors. These devices can collect and transmit data through the internet¹. In simpler terms, it means taking all the things in the world and connecting them to the internet. Here are the key points:

- 1.Sensors:** These collect information and then send it.
- 2.Computers:** They receive information and then act on it.
- 3.Things:** Some can do both—collect and send data¹.

Imagine your smart thermostat adjusting the temperature based on weather data or your fitness tracker syncing data to your phone. That's IoT in action! 😊🌐



Emerging Trends

Source: Microsoft Co-Pilot AI Assistant

Queued Language: *Besides IoT and generative AI what's the next hot topic in all things broadband and internet related?*

Co-Pilot Response:

Certainly! Here are some emerging trends in broadband and internet-related technologies:

1. Digital Health and Wellness: Connected health is growing, with technologies like augmented reality applications helping seniors age in place. Health wearables have evolved beyond smartwatches to include rings, sleep masks, and screenless watches. [High-speed broadband networks are crucial for supporting these innovations¹.](#)

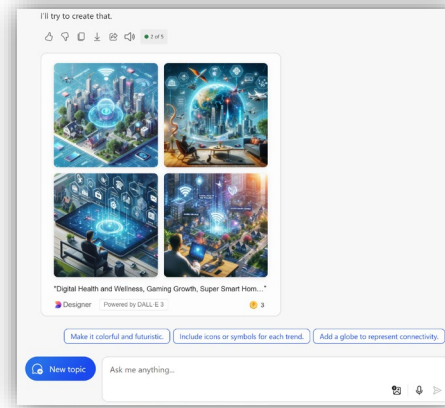
2. Gaming Growth: The gaming industry continues to expand, with mobile gaming being a hot trend. [High-speed broadband networks enable seamless online gaming experiences, connecting players across the globe¹.](#)

3. Super Smart Homes: Engineers are simplifying smart home setups, and the recent release of the open-source smart home protocol called Matter allows better compatibility with voice assistants. [Expect more smart lights, plugs, roller blinds, and connected devices adhering to this Wi-Fi-based standard¹.](#)

4. Enterprise Technology Boom: AI, robotics, and the metaverse are driving innovation in business processes. [These technologies help address shortages of skilled workers post-COVID and require robust internet connectivity¹.](#)

5. Standalone 5G Networks: The next wave of 5G networks will involve standalone networks for broader coverage and lower latency. [These networks are essential for supporting IoT devices and other applications².](#)

Remember that high-speed broadband networks play a crucial role in enabling these trends and ensuring a connected future! 🌐🚀¹²



Queued Language: *Create an image to represent these 5 trends*

Co-Pilot Response:





Source: Microsoft Co-Pilot Generated using DALL-E- 3