

# Broadband 101

Presentation for the House Committee on Environment and Energy

Prepared by Maria Royle, VT Legislative Counsel

January 10, 2023 (edited)



# Table of Contents

- What is Broadband?
- Broadband Connection Types
- Network Architecture
- Universal Connectivity in VT
  - State Goal
  - Challenges
- State Actors
  - Vermont Community Broadband Board
  - Communications Union Districts
- Federal Actors
- Regulatory Landscape
- Brief Timeline of VT Broadband Initiatives
- Emerging Issues

# What is Broadband?

---



“Broadband” is the transmission of wide bandwidth data over a high-speed internet connection (not dial up; always on)



“High-speed internet connection” is defined by the FCC as at least 25/3 Mbps

25 Megabits per second download

3 Megabits per second upload

Evolving metric



Often the terms are used interchangeably

# Broadband Connection Types

## Wired

- DSL
- Cable modem
- Fiber optic cable
- Hybrid fiber coaxial

## Wireless

- Fixed
  - Terrestrial
  - Satellite – geostationary and LEO
- Mobile

# Network Architecture

[Graphic from NTIA Broadband USA](#)



## Network Types:

**Last mile** (end user to node)

**Middle mile** (node to core)

**Internet Backbone core**

# Universal Connectivity – Statutory Goal

- **By the end of 2024 every E-911 business and residential location in VT has access to broadband capable of at least 100/100 Mbps** (Act 190; 2014)
- 313,062 locations in VT
  - 18.6 percent of addresses (58,314 locations) lack access to 25/3 Mbps
  - 69.7 percent of addresses (218, 272 locations) lack access to 100/100 Mbps
- [Department of Public Service Broadband Availability Data](#)

# Challenges to Universal Connectivity



Infrastructure costs (money and time)



Affordability (cost of service)



Lack of digital literacy



Regulatory Impediments?

# State Actors

## Internet Service Providers

- Communications Union Districts
- Other municipalities
- Private companies

## Department of Public Service

- Mapping
- Planning
- VT Universal Service Fund

## Vermont Community Broadband Board

## Other

- Municipalities and utilities
- Attorney General's Office
- FirstNet/E-911/AoT/ANR/AoA/DOL

## Public Utility Commission

- Pole attachments
- Cable line extensions
- Siting (248a)



# Vermont Community Broadband Board

- **Mission (Act 71 of 2021)**
  - *It is the purpose of the VCBB and Vermont Community Broadband Fund to support policies and programs designed to accelerate community efforts that advance the State's goal of achieving universal access to reliable, high-quality, affordable, and fixed broadband. The VCBB was created to coordinate, facilitate, support, and accelerate the development and implementation of universal community broadband solutions.*
- **Grant programs** (preconstruction and construction) – 100/100 Mbps
- **Eligible entities** – (CUDs, small telecom providers; ISPs working with CUDs)
- **Intent** – all projects become financially self-sustainable (private/muni bond market)
- **Communications Union Districts**
  - Municipal organizations that deploy broadband in unserved areas through revenue bonds, loans, and grants



# Federal Actors

## Federal Communications Commission (FCC)

- Universal Service Fund
  - Lifeline/Affordable Connectivity Program
  - Rural Digital Opportunity Fund and other programs
- National Broadband Map

## U.S. Department of Commerce, National Telecom. and Info. Admin. (NTIA)

- **Broadband Equity, Access, and Deployment (BEAD) Program**
  - \$100M each state plus formula allocation (based on Map)
- Middle Mile Infrastructure Grant Program
  - 30% match requirement

## U.S. Department of Agriculture, Rural Utilities Service (RUS)

- ReConnect Program

## Federal Trade Commission

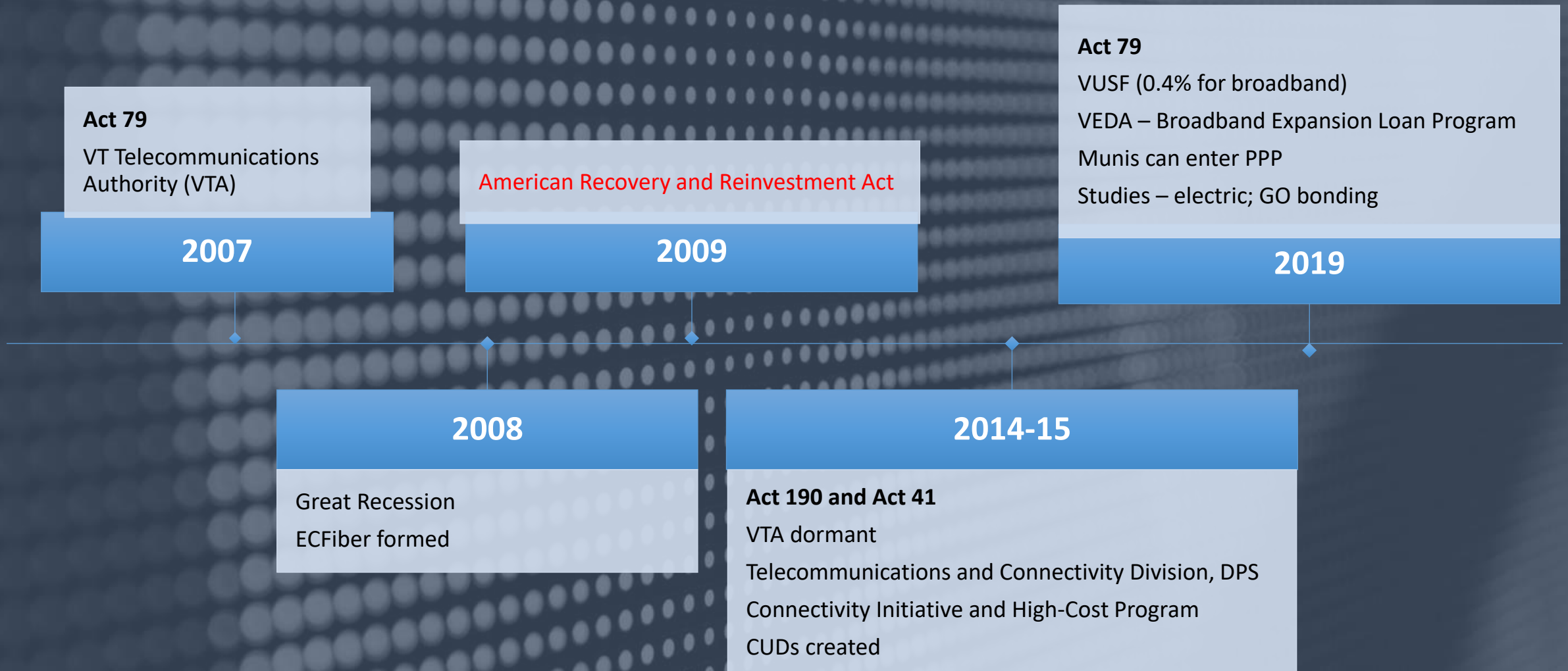
- Antitrust and unfair competition

# Regulatory Landscape

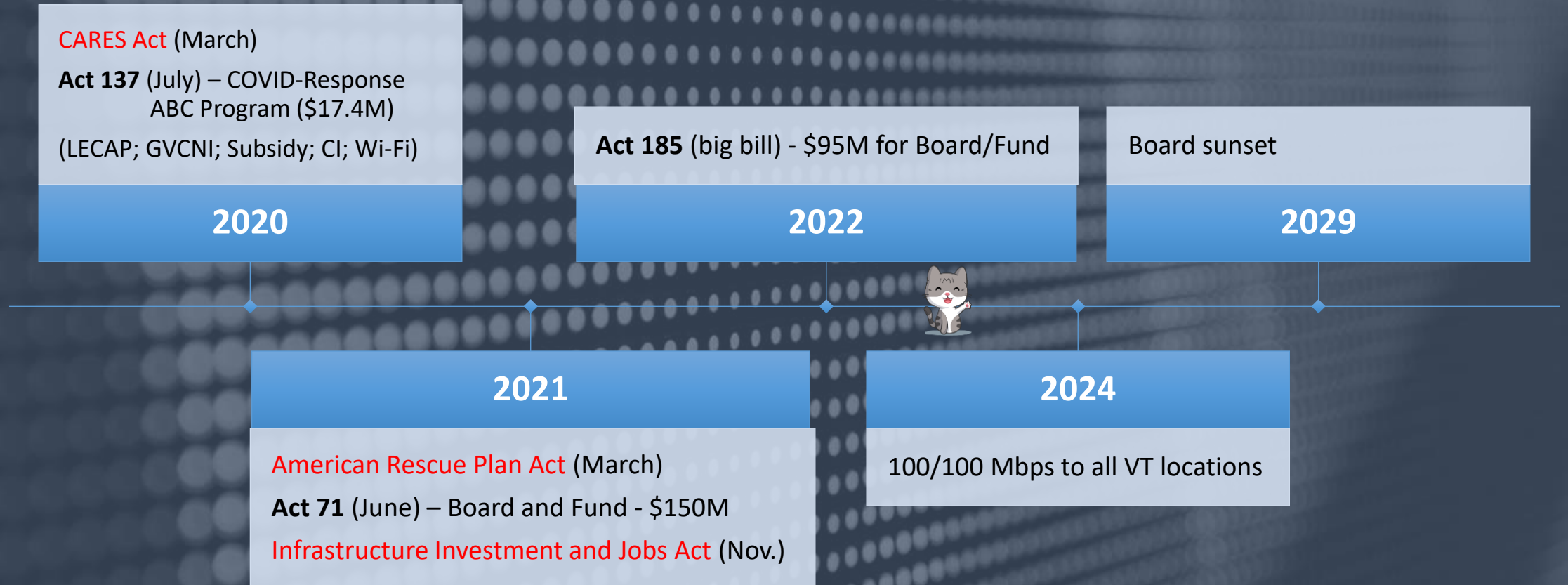
## Communications Act of 1934

- Established the FCC
- Cooperative federalism (interstate/intrastate)
- Telecommunications Act of 1996
- FCC determines how broadband is classified
  - Title I “**information service**” – light-touch
  - Title II “telecommunications service” – utility
- Preemption (impossibility and conflict)
- ACA Connects v. Bonta (9<sup>th</sup> Cir. January 2022)

# Broadband Timeline (2007 - 2019)



# Broadband Timeline (2020-2029)



# Emerging Issues

- National Broadband Map (BEAD Program)
- NTIA Middle Mile Program – Gov’s Rec.
- 248a sunset July 1, 2023
- Vermont Universal Service Fund (VUSF)
- Confirmation of Fifth FCC Commissioner?