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April 26, 2019

The Honorable Ann Cummings, Chair
Senate Committee on Finance

The Honorable Tim Briglin, Chair
House Committee on Energy and Technology

The Honorable Christopher Bray, Chair
Senate Committee on Natural Resources and Energy

Re: Connectivity Division Annual Report; 30 V.S.A. §202e(e)

Dear Honorable Senators and Representatives:

I am pleased to submit this annual report of the Connectivity Division for fiscal year 2018, pursuant to 30 V.S.A. § 202e(e).

If you have any questions about this report, please do not hesitate to contact me or Clay Purvis, Director for Telecommunications and Connectivity.

Very Truly Yours,



June E. Tierney
Commissioner



Report to the General Assembly on the Activities of the Connectivity Division for Fiscal Year 2018

April 26, 2019

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¹ Appendix 5 is formatted for tabloid (11"x17") size paper.

Introduction

This is the annual report to the General Assembly of the Division for Telecommunications and Connectivity (“Division”) of the Department of Public Service (“Department”). This report is completed in conjunction with the Telecommunications and Connectivity Advisory Board and Regional Planning Commissions.

This report includes the following:

1. Financial statements covering the Division’s operations during the year including:
 - a. A summary of all grant awards
 - b. Contracts and agreements entered into by the Division
2. The areas served and the areas not served by broadband that has a download speed of at least 4 Mbps download and an upload speed of at least 1 Mbps
3. The areas served and the areas not served by broadband that has a download speed of at least 25 Mbps download and an upload speed of at least 3 Mbps
4. The areas served and the areas not served by broadband that has a combined download and upload speed of at least 100 Mbps
5. If monetarily feasible, the areas served and the areas not served by wireless communications
6. Cost estimates to provide such service to the areas not served in the four levels of service listed above

In addition, the report shall include, “with the assistance of the Telecommunications and Connectivity Board and with input from the regional planning commissions, an action plan that conforms with the State Telecommunications Plan along with goals stated in 30 V.S.A. § 202e(a).” The Division presented the Action Plan to the Regional Planning Commissions on January 4th, 2018. Division presented the Action Plan to the Telecommunications and Connectivity Advisory Board on April 18, 2019. The Broadband Action Plan is included in Appendix 1. The report also includes findings and recommendations relating to remote workers pursuant to Act 197 of 2018.

Telecommunications and Connectivity Division

The Division works to improve access to affordable telecommunications technology for all Vermonters, supports universal availability of voice and broadband, and leads the state’s telecommunications policy and regulatory efforts. The Division is led by a division director and has three full time staff members. The Division oversees the telephone and cable industries, and advocates for the public interest in telecommunications matters before the Public Utilities Commission, including review of mergers, tariffs, and licenses. The Division is responsible for the preparing the state Telecommunications Plan. The Division annually gathers broadband availability information to identify underserved locations statewide and prepares maps and statistics depicting information at three speed tiers. The Division meets with communities throughout the state in an effort to promote and expand access to high speed Internet at underserved locations. The Connectivity Division awards broadband development grants from the Connectivity Initiative as part of its effort to bring high speed Internet to Vermont's hardest

to reach locations. The Division manages and leases roughly 340 route miles of state-owned open access fiber optic cable located throughout Vermont. The Division also administers the Vermont Telecommunication Relay Service, connecting individuals who are deaf, deaf-blind, hard-of-hearing, or have a speech disability, with users of standard telephones.

Operating and Financial Statements

Summary of Grant Awards

The Division administers a grant program established under 30 V.S.A. §7515b designed “to provide each service location in Vermont access to Internet service that is capable of speeds of least 10 Mbps download and 1 Mbps upload, or the FCC speed requirements established under Connect America Fund Phase II...” The program is funded through the Vermont Universal Service Fund. Two rounds of grants have been awarded, see tables 1 and 2 below. Awards for a third round of grants are pending.

At the close of the 2018 Fiscal year on June 30, 2018, the Vermont USF Fiscal Agent reported to the Division that \$220,000 would be available to the Connectivity Initiative. On December 7, 2018, the Division announced the 2018 Connectivity Initiative Request for Proposals. Proposals were initially due on January 25, 2019, but the deadline was extended through February 1, 2019. Several proposals were received and are currently under consideration by Division staff.

Table 1
Round: CI 2015
Date of Award: May 5, 2015

Company	Amount Awarded	Number Underserved	Cost per Address	Town	Technology	Actual Amount
Comcast	\$1,425	1	\$1,425	Jamaica	Cable	\$ 953.00
Comcast	\$215,163	13	\$16,551	Norwich	Cable	\$ 58,897.00
ECFiber	\$49,984	17	\$2,940	Randolph	FTTP	\$ 49,984.00
ECFiber	\$267,944	67	\$3,999	Royalton	FTTP	\$ 267,944.00
ECFiber	\$39,976	20	\$1,999	Pittsfield	FTTP	\$ 39,976.00
ECFiber	\$1,500	2	\$750	Norwich/Thetford	FTTP	\$ 1,500.00
FairPoint	\$200,000	36	\$5,556	Reading	DSL	\$ 164,488.00
FairPoint	\$90,000	16	\$5,625	Bradford	DSL	\$ 90,000.00
Non-Standard Drops	\$19,951					\$ 4,000.00
Total:	\$885,943	172	\$4,855	9 Towns		\$ 677,742.00

Table 2
 Round: CI 2016-01
 Date of Award: October 16, 2016²

Company	Amount Awarded	Number Underserved	Cost per Address	Town	Technology	Actual Amount
FairPoint	\$90,000.00	108	\$833.33	Peru	DSL	\$90,000.00
FairPoint	\$87,500.00	57	\$1,535.09	Lowell	DSL	\$84,622.00
FairPoint	\$90,000.00	50	\$1,800.00	Canaan	DSL	\$90,000.00
EC Fiber	\$13,500.00	13	\$1,038.46	Stockbridge	FTTP	\$13,500.00
EC Fiber	\$43,500.00	38	\$1,144.74	Norwich	FTTP	\$43,500.00
EC Fiber	\$12,000.00	9	\$1,333.33	Sharon	FTTP	\$12,000.00
EC Fiber	\$24,000.00	14	\$1,714.29	Randolph	FTTP	\$24,000.00
EC Fiber	\$10,500.00	6	\$1,750.00	Royalton	FTTP	\$10,500.00
EC Fiber	\$17,000.00	9	\$1,888.89	Norwich	FTTP	\$17,000.00
EC Fiber	\$36,000.00	19	\$1,894.74	Chelsea	FTTP	\$31,926.00
Pear Networks	\$22,695.00	14	\$1,621.07	W. Craftsbury	FTTP	\$22,695.00
Pear Networks	\$27,795.00	15	\$1,853.00	S.W. Craftsbury	FTTP	\$27,795.00
WCVT	\$61,638.00	28	\$2,201.36	Charlotte	FTTP	\$61,638.00
Total:	\$536,128.00	380	\$1,410.86	13 Towns		\$529,176.00

Table 3
 Round: CI 2016-02
 Date of Award: August 2, 2017

Company	Amount Awarded	Number Underserved	Cost per Address	Town	Technology	Actual Amount
FairPoint	\$55,000.00	53	\$1,037.74	Reading/Woodstock	DSL	\$55,000.00
FairPoint	\$120,000.00	109	\$1,100.92	Whitingham	DSL	\$120,000.00
EC Fiber	\$13,300.00	7	\$1,900.00	Royalton	FTTP	\$13,300.00
EC Fiber	\$28,000.00	13	\$2,153.85	Stockbridge	FTTP	\$28,000.00
EC Fiber	\$31,200.00	11	\$2,836.36	Randolph	FTTP	\$31,200.00
Comcast	\$300,000.00	114	\$2,631.58	Cavendish	Cable	(in process)
Total:	\$547,500.00	307		6 Towns		\$247,500.00

Connectivity Fund

The Vermont Universal Service Fund (VUSF) is a special fund supported through an assessment on retail telecommunications services provided within Vermont. The VUSF is managed by a fiscal agent, Solix, Inc., under contract with the Department of Public Service. In accordance

² The initial 2016 round 1 grant announcement included an award to the Southern Vermont Broadband Coop (SVBC) for \$22,505 to serve 71 addresses in Stamford, VT. The Department and SVBC were not able to execute an agreement so the funds have reverted to the Connectivity Initiative for future awards.

with 30 V.S.A. § 7511, monies collected by the fiscal agent are deposited into the VUSF and are used to support the following costs and programs, ranked in order of priority:

- (A) Costs payable to the fiscal agent under its contract with the Commissioner;
- (B) The Vermont Telecommunications Relay Service (and the Equipment Distribution Program);
- (C) The Vermont Lifeline program;
- (D) Enhanced-911 services;
- (E) The Connectivity Fund (comprised of the Connectivity Initiative and the High Cost Program).

In Act 190 of 2014, the legislature set the VUSF assessment rate at a flat 2%. Act 41 of 2015 transferred oversight responsibility of the VUSF to the Department of Public Service. The current 2% charge is assessed on telecommunications services that include telephone, mobile wireless voice, and prepaid wireless. Voice over Internet Protocol (VoIP) providers also contribute to the VUSF. The rate is collected on telecommunications services only; broadband internet service revenues are not subject to the assessment.

Funds designated for use by the Connectivity Fund are apportioned as follows: 55% of funds support the Connectivity Initiative, and 45% of the funds support the High Cost Program. The High Cost Program provides financial support to Vermont Eligible Telecommunications Carriers (VETC) for lines operating in designated high cost areas. The Connectivity Initiative is a grant program administered by the Division for the purpose of expanding broadband technologies to underserved areas. Activities under this program are discussed on pages 2-3 of this report.

FY2016 Funds Designated for Use by the Connectivity Fund

Pursuant to its authority under 30 V.S.A. § 7516, VUSF fiscal agent Solix designated the amount of \$1,140,665 for use by the Connectivity Fund in fiscal year 2016. Of the \$1,140,665, \$270,000 was appropriated to the Department of Public Service, \$391,799.25 was allocated to the High Cost Program, and \$478,865.75 was allocated to the Connectivity Initiative. \$77,407 of unspent grant funds are applied to this year's Connectivity Initiative award, bringing the total to \$556,273.

FY2017 Funds Designated for Use by the Connectivity Fund

Pursuant to their authority under 30 V.S.A. § 7516, the fiscal agent designated the amount of \$461,000 for use by the Connectivity Fund in fiscal year 2017. Of the \$461,000 designated, \$253,550 was made available to the Connectivity Initiative grant program and \$207,246 was made available to the High Cost Program. In addition, the Connectivity Initiative grant program of the Connectivity Fund received a one-time appropriation of \$300,000 in fiscal year 2017 as

part of the FY17 Capital Construction Budget Adjustment Act 160. The total designated for disbursement in 2017 is \$553,550.

FY2018 Funds Designated for Use by the Connectivity Fund

This year, the VUSF fiscal agent determined that there was \$400,000 available to the Connectivity Fund for Fiscal Year 2018. This money was apportioned to the connectivity programs in accordance with state law. Fifty-five percent, or \$220,000, was apportioned to the Connectivity Initiative. Forty-five percent, or \$180,000, was dedicated to the High Cost Program.

Connectivity Fund Financials Ending June 30, 2018

		(In Thousands)	
		2018	
	<u>YTD Total</u>	<u>Connectivity Initiative</u>	<u>High Cost</u>
Disbursements			
Connectivity initiative	\$ (667)	\$ (667)	\$ -
High cost	(1,062)	-	(1,062)
	<u>(1,729)</u>	<u>(667)</u>	<u>(1,062)</u>
Interest income	24	13	11
Appropriations			
FY18 Connectivity fund from VUSF	400	220	180
	<u>400</u>	<u>220</u>	<u>180</u>
Change in fund balance	<u>\$ (1,305)</u>	<u>\$ (434)</u>	<u>\$ (871)</u>
Fund balance, beginning of year, including \$300 unfunded due from FY17 Capital Bill	\$ 2,673		
Total fund balance, end of year	<u>\$ 1,368</u>		
Fund balance, uncommitted	\$ 928		
Fund balance, committed	\$ 440		

Broadband Availability Data

Areas served at 4 Mbps down and 1 Mbps upload speed or better

Data on broadband availability as of June 30th, 2017, indicates that of the 303,835 business and residential locations (E911 building locations) in the state, broadband service of at least 4/1 Mbps or better is presently available from an Internet service provider at all but 16,899 locations. The previous report showed 20,898 underserved locations; an improvement of 3,999 locations. Information showing the number of locations that are served and underserved on a town and county basis is included in Appendix 5 and depicted as a map in Appendix 2.

A very high-level attempt has been made to identify the cost to deploy networks that can provide broadband with speeds of 4/1 Mbps based on estimate information received during the Connectivity Grant rounds that have occurred. The average cost is approximately \$1,600 per site which means, for 16,899 locations, the cost would be upwards of \$27 million.

Areas served at 25 Mbps down and 3 Mbps upload speed or better

Internet service provider data of broadband availability, as of June 30, 2017, indicates that of the 303,835 business and residential locations (E911 building locations) in the state, broadband service of at least 25/3 Mbps or better is presently available from a service provider at all but 80,800 locations. The previous report showed 81,795 underserved locations; an improvement of 995 locations. Information showing the number of locations that are served and underserved on a town and county basis is included in Appendix 5 and depicted as a map in Appendix 2.

A very high-level attempt has been made to identify the cost to deploy networks that can provide broadband with speeds of 25/3 Mbps based on estimate information received during the three Connectivity Grant rounds that have occurred. The average cost is approximately \$2,800 per site, which means, for 80,800 locations, the cost would be upwards of \$230 million.

Areas served at 100 Mbps down and 100 Mbps upload speed

As of June 30th, 2017, based on information provided to the Department (DPS) by Internet service providers, the data indicates that of the 303,835 business and residential locations (E911 building locations) in the state, broadband service of 100/100 Mbps is presently available from a service provider for only 41,631 locations. Another 262,204 do not have this access. The previous report showed 40,838 served locations; an improvement of 893 locations. Information showing the number of locations that are served and underserved on a town and county basis is included in Appendix 5 and depicted as a map in Appendix 2.

A very high-level attempt has been made to identify the cost of deploying networks that can provide broadband with speeds of 100/100 Mbps. The average cost is approximately \$2,300 per site which means, for 262,204 locations, the cost would be upwards of \$600 million. This estimate is based on average cost per location of all proposals submitted during the past three Connectivity Initiative grant rounds.

Wireless Communications

The Department conducted a drive test to gather information about the availability of mobile wireless data services throughout the state. A report about this initiative is attached as appendix 3.

Broadband Availability for Remote Workers

This section is submitted pursuant to Section 7 of Act 197 from 2018 which requires the Connectivity Division to prepare findings and recommendations concerning:

- (1) The current availability of broadband service in municipal downtown centers that do, or could at reasonable cost, support one or more co-working spaces or similar venues for remote workers and small businesses; and
- (2) Strategies for expanding or enhancing broadband availability for such spaces.

Municipal Downtown Centers

Vermont law defines a downtown as “the traditional central business district of a community that has served as the focus of socio-economic interaction in the community, characterized by a cohesive core of commercial and mixed use buildings, some of which may contain mixed use spaces, often interspersed with civic, religious, residential, and intersecting side streets that are within walking distance for residents who live within and surrounding the core and that are served by public infrastructure such as sidewalks and public transit.” (24 V.S.A. § 2793)

The Vermont Agency of Commerce and Community Development (ACCD) manages the state designation programs, including the Designated Downtown program. The boundaries of designated downtowns vary in size and are largely driven by the historic development pattern in the community. Poultney and Wilmington have relatively small downtown districts while Rutland and Bennington’s districts are substantially larger. Act 197 refers to “municipal downtown centers”. For the purposes of this report, the municipal downtown centers are the territories identified as Designated Downtowns by ACCD.

According to the results of the broadband availability analysis conducted by the Connectivity Division in 2018, each of the 4,153 business and residential buildings located within the Designated Downtowns has broadband service at 25/3 Mbps or better available. Generally, but not exclusively, broadband services in this tier are delivered by cable television operators. Typically cable operators offer services that provide download speeds in excess of 100 Mbps but typically these do not support 100 Mbps upload speeds. The majority of these locations can obtain “gigabit” service (1,000 Mbps).

Of these 4,153 buildings in these areas, 639 buildings have broadband service at 100/100 Mbps available. Generally, services in this tier are delivered by retail fiber-to-the-home (FTTH) operators. The Connectivity Division broadband availability analysis relies on voluntary participation from broadband service providers. The primary focus of the broadband availability analysis is to identify locations that lack service at lower speeds. The Connectivity Division is aware that many service providers are active in the robust broadband marketplace in these downtown centers. Some providers believe that the information about the locations they can serve is competitively sensitive. They claim that the fact that they serve a particular building would suggest to other competitors that the building has valuable clients, which could put their initial investment to serve these buildings at risk. It is therefore certain that a large

number of locations in these designated downtown territories have access to broadband services from many providers in excess of 100/100 Mbps, but are not depicted as such.

The quantities of buildings are broken down by town in the table below:

Downtown	100/100	25/3
Barre City		172
Bennington		218
Brandon		96
Brattleboro		226
Bristol	49	63
Burlington	490	540
Hartford		112
Middlebury		259
Montpelier		294
Newport City		153
Poultney		109
Randolph		113
Rockingham		136
Rutland City		251
Springfield	98	98
St. Albans City		286
St. Johnsbury		213
Stowe		91
Vergennes		96
Waterbury		109
Wilmington		88
Windsor		325
Winooski	2	105
Total	639	4153

Maps of the individual Designated Downtown are presented in Appendix 4. The territory of each Designated Downtown are depicted with a red border. Roads that have access to service from cable television providers are depicted in blue. Roads with service from retail FTTH providers are depicted in green. Business and residential buildings are depicted as green dots. Roads that lack access to cable or fiber service are depicted in yellow.

Strategies

The availability of and price of broadband service should be considered before development of coworking spaces or similar venues. There are several broadband service providers to consider in these markets. At a minimum, this includes the incumbent telephone company (such as Consolidated), the cable company (such as Comcast), and competitive carriers such as CenturyLink, FirstLight, Verizon, and VTel. In the case of most of these downtown centers, multiple carriers will have facilities nearby which could be

deployed to the building. The developer should consider the deployment cost as well as the ongoing operating costs when considering which service to choose.

Members of the Connectivity Advisory Board recommend that a fully subscribed co-working facility ideally should subscribe to broadband Internet access service with a minimum speed of 100/100 Mbps.

When considering deployment of service to support multiple users simultaneously, the developer should carefully consider the equipment and terms and conditions of service. Mass-market broadband services are typically marketed for individual retail sales, with prices and subscriber equipment geared for occasional use. Terms of service can prohibit shared use. Services with an expectation for sustained high-throughput use require more robust equipment and are typically substantially more expensive.

Developers should consider other technology services beyond just broadband. This should include voice service, including traditional voice and voice over IP (VoIP). It should also include cloud computing, from simple services like email and web hosting, to more advanced services as well.

Developers of coworking spaces are generally not inhibited by a lack of available broadband in the studied downtown centers, but instead are inhibited by the high cost of providing the needed service to multiple high intensity users the use coworking spaces. Multiple developers have sought assistance from ACCD on overcoming this hurdle. There are currently no state or federal resources available to subsidize the ongoing broadband subscriptions for coworking spaces. Each space has had to create business models that accommodate this high cost of doing business.