Vermont Broadband Equity

Analysis of broadband deployment and income
Developed by the Vermont Public Service Department
1/4/22
Key Findings

• A majority of low-income households have existing access to 25/3 Mbps broadband service
  • 68% of households earning less than $25K/yr are in areas where more than 90% have access to 25/3 Mbps

• A significant portion of those that lack access to 25/3 broadband service are low and moderate income households
  • 41% of households in CBGs where less than 75% have access to 25/3 Mbps earn less than $50K/Yr
  • These households will struggle to afford $100/mo broadband services, a challenge to FTTH business model
20% of Vermont E-911 locations (61K) lack access at 25/3 Mbps
Income Distribution

19% of households earn less than $25K/year (blue)
Different Geographies

- Broadband deployment data is reported by speed tier for each E-911 location
  - Percentages calculated for four speed tiers for each CGG
- Household income data is reported on a census block group (CBG) basis
  - Percentages calculated for four income tiers for each CBG
- Small, urban CBGs have high percentage of 25/3 deployment, making conclusions easier
- Large, rural CBGs have a lower percentage of 25/3 deployment, making conclusions complicated
- Data for Montpelier and Middlesex illustrate the effects of different geographies for reporting data
Montpelier: 1 of 8 CBGs

Broadband
By E911 location

- Lack 4/1: 0
- 4/1: 0
- 25/3: 12
- 100/100: 295
- Total: 307

>25/3: 100%

Income
By Household

- <$25K: 120
- $50K: 70
- $75K: 122
- >$75K: 208
- Total: 520

< $25K: 23%

120 households earn less than $25K, all have access to 25/3
Middlesex: just one CBG

Broadband E911 locations
- Lack 4/1: 63
- 4/1: 347
- 25/3: 414
- 100/100: 31
- Total: 855

>25/3: 52%

Income Households
- <$25K: 103
- $50K: 84
- $75K: 122
- >$75K: 380
- Total: 689

< $25K: 15%

103 households earn less than $25K, but we cannot tell which locations, so we cannot determine exact broadband deployment by household income
38% of households are in CBGs where more than 99% of locations have access to broadband at 25/3 Mbps (light blue)
68% of households with less than $25K/yr are in CBGs where more than 90% have access to 25/3 Mbps
Broadband vs Income

Percent with 25/3 Broadband by income tier

<table>
<thead>
<tr>
<th>Income Tier</th>
<th>LessThan50%</th>
<th>50%-75%</th>
<th>75%-90%</th>
<th>90%-99%</th>
<th>99%-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoreThan75K</td>
<td>11871</td>
<td>13747</td>
<td>13476</td>
<td>30075</td>
<td>37597</td>
</tr>
<tr>
<td>50Kto75K</td>
<td>5684</td>
<td>6084</td>
<td>5350</td>
<td>12680</td>
<td>18700</td>
</tr>
<tr>
<td>25Kto50K</td>
<td>6993</td>
<td>7226</td>
<td>5904</td>
<td>13352</td>
<td>21949</td>
</tr>
<tr>
<td>LessThan25K</td>
<td>5415</td>
<td>5740</td>
<td>4497</td>
<td>11810</td>
<td>21879</td>
</tr>
<tr>
<td>TotalHouseholds</td>
<td>29963</td>
<td>32797</td>
<td>29227</td>
<td>67917</td>
<td>100125</td>
</tr>
</tbody>
</table>

18% 18% 15% 17% 22% 23% 22% 20% 20% 22%
# Broadband vs Income: NO CUD

## Percent with 25/3 Broadband by income tier

<table>
<thead>
<tr>
<th>Income Tier</th>
<th>LessThan50%</th>
<th>50%-75%</th>
<th>75%-90%</th>
<th>90%-99%</th>
<th>99%-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MoreThan75K</td>
<td>805</td>
<td>2114</td>
<td>4607</td>
<td>13186</td>
<td>23497</td>
</tr>
<tr>
<td>50Kto75K</td>
<td>361</td>
<td>617</td>
<td>1537</td>
<td>4276</td>
<td>10601</td>
</tr>
<tr>
<td>25Kto50K</td>
<td>491</td>
<td>696</td>
<td>1443</td>
<td>3719</td>
<td>11660</td>
</tr>
<tr>
<td>LessThan25K</td>
<td>402</td>
<td>392</td>
<td>714</td>
<td>3128</td>
<td>11829</td>
</tr>
<tr>
<td>Total Households</td>
<td>2059</td>
<td>3819</td>
<td>8301</td>
<td>24309</td>
<td>57587</td>
</tr>
</tbody>
</table>

- MoreThan75K: 21% (41% of Total Households)
- 50Kto75K: 18% (20% of Total Households)
- 25Kto50K: 17% (18% of Total Households)
- LessThan25K: 15% (18% of Total Households)
Broadband vs Income: YES CUD

Percent with 25/3 Broadband by income tier

<table>
<thead>
<tr>
<th>Income Tier</th>
<th>LessThan25K</th>
<th>25Kto50K</th>
<th>50Kto75K</th>
<th>MoreThan75K</th>
<th>Total Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>27904</td>
<td>28978</td>
<td>20926</td>
<td>43608</td>
<td>42538</td>
</tr>
<tr>
<td>LessThan50%</td>
<td>11066</td>
<td>11633</td>
<td>8869</td>
<td>16889</td>
<td>21909</td>
</tr>
<tr>
<td>50%-75%</td>
<td>5323</td>
<td>5467</td>
<td>3813</td>
<td>8404</td>
<td>15073</td>
</tr>
<tr>
<td>75%-90%</td>
<td>6502</td>
<td>6530</td>
<td>4461</td>
<td>9633</td>
<td>16996</td>
</tr>
<tr>
<td>90%-99%</td>
<td>5013</td>
<td>5348</td>
<td>3783</td>
<td>8682</td>
<td>14114</td>
</tr>
<tr>
<td>99%-100%</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Total Percent with 25/3 Broadband: 18% 19% 19% 19% 18% 20% 22% 24% 24% 24%
Public Assistance

Households with Public Assistance by CUD
Data Sources

- Vermont state broadband data
  - Lists broadband status at each Vermont E-911 location
- The US Census issues data on three levels of aggregation (2010 geography):
  - 32,580 census blocks
  - 522 census block groups (CBG)
  - 255 County Subdivisions (Vermont Towns)
- Census estimated annual household income on CBG and Town basis from 2019
Methodology

• Census Block Group and Town boundaries
  • 29 of 522 CBG do not align with town boundaries
  • These CBGs contain 62 towns
  • Total 555 non-overlapping areas (522 – 29 + 62)

• For each area:
  • Aggregate Census household income data into 4 tiers
  • Calculate percentage of locations with access to 25/3 broadband
  • Summarize broadband access percentage in five tiers
Assumptions

• Analysis assumes uniform distribution of both household income and broadband deployment throughout each of 555 areas

• Vermont E-911 locations data is not directly correlated to estimated Census household quantities
  • E-911 data includes business and residential locations
  • E-911 data treats multi-unit dwellings as one location
Overlapping territories of Town Boundaries and Census Block Groups