Member Resources

**BEAD Implementation Tracker**
Up-to-date information about requirements and actions for each state/territory.

**Broadband Infrastructure Playbook**
A detailed overview of the statutory requirements in the new infrastructure law.

**Federal Broadband Funding Guide**
A summary of recent Federal broadband funding programs created by Congress.
75.6% of NTCA members’ customers have access to downstream speeds greater than/equal to 100 Mbps.

75% of customers are served by fiber-to-the-home connections.

55.4% of customers have access to Gigabit downstream speed.

37% of customers subscribe to 100 Mbps broadband or better.
The digital divide is both an availability problem and an adoption problem
Approximately 12M households do not have access to 25/3 Mbps broadband service (the FCC’s current definition), and about 30M do not subscribe to such service when it is available.

Policymakers can address both broadband needs with funding under discussion
This analysis offers a framework that policymakers can use to help determine the proper allocation of funding to maximize both the availability of robust broadband service and the number of low-income households that subscribe.

More ambitious goals require broadband infrastructure funding amounts to be set at higher levels than what has so far been proposed
For example, building future-proof networks to all locations with less than 100/100 Mbps service would cost approximately $106B - $179B.
### U.S. Households (HH)\(^1\) by Census Block (CB) Max Speed\(^2\) (as of June 2020)

Based on FCC Form 477 Reported Maximum Speeds Available to Each Census Block – Assumes Fully Served Census Blocks

<table>
<thead>
<tr>
<th>FCC Tier by Speed (Mbps)(^4)</th>
<th>Unserved</th>
<th>Baseline</th>
<th>Above Baseline</th>
<th>Gigabit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Service</td>
<td>&lt;25/3</td>
<td>25/3-100/20</td>
<td>100/20-100/100(^3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Num. HHs</th>
<th>% of HHs</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8M</td>
<td>0.7%</td>
</tr>
<tr>
<td>3.0M</td>
<td>2.4%</td>
</tr>
<tr>
<td>6.8M</td>
<td>5.4%</td>
</tr>
<tr>
<td>54.3M</td>
<td>43%</td>
</tr>
<tr>
<td>14.0M</td>
<td>11%</td>
</tr>
<tr>
<td>46.8M</td>
<td>37%</td>
</tr>
</tbody>
</table>

| Cumulative Share HHs | 0.7% | 3% | 9% | 52% | 63% | 100% |

**Unserved Households in Partially Served Census Blocks**

There are an additional estimated **8.2M households** in census blocks that are reported as ‘served’\(^5\) that do not have broadband service available.

**12M Total HHs without 25/3 Mbps**

Accounting for partially served census blocks, an estimated 12M households nationwide do not have access to 25/3 Mbps service.

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1. Includes all households in the U.S., irrespective of federal or state subsidy status (e.g., including 5.2M locations recently awarded funding through the Rural Digital Opportunity Fund (RDOF)).
2. Based on FCC Form 477 data that considers all households in a census block to have access to a given speed tier if any household in the block has access to that speed.
3. 95% of the 100/20–100/100 Mbps group have gigabit or near-gigabit download speeds but below 100 Mbps upload speeds, as a result of being served by cable.
4. Speed tiers include all households passed by at least the bottom of the range (i.e., inclusive) without access to the speed at the top of the range (i.e., exclusive).
5. Reflects known issue in FCC Form 477 reporting where a census block is reported with a given speed if a single household in the block is served with that speed, estimated from a BroadbandNow study (see appendix).

Source: FCC Form 477 June 2020 (Apr 7 2021 release), U.S. Census, BroadbandNow, ACA Connects, Cartesian

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Affordability is a significant barrier for lower-income households to adopt fixed broadband

An estimated **30 million households** do not subscribe to fixed broadband at home for “reasons other than network availability”¹

— National Urban League

Household income is highly correlated with internet adoption – **36% of all households without a fixed broadband connection make below $20K/year, and 14% make above $75K/year**³

— American Community Survey (ACS) 2019³

Broadband adoption is a concern in both rural and non-rural areas – **29% of rural homes and 28% of non-rural homes do not subscribe** to fixed broadband when it is available⁴

— Cartesian Analysis of 2019 ACS³ and Census Data

Age does not seem to be correlated with broadband adoption – **adoption is approximately 28% in areas with and without higher proportions of senior citizens** (i.e., age 65+⁵)

— Cartesian Analysis of 2019 ACS³ and Census Data

In addition to affordability, studies suggest that digital readiness and perceived lack of relevance are also barriers to broadband adoption⁵

1 Approximation from the National Urban League, which assumes that 80-90% of ACS’ 36M non-adoption households have access to at least one available fixed terrestrial service. NUL approximation is based on American Community Survey tally of households with “broadband such as cable, fiber optic or DSL” – this excludes households whose only connectivity is through a mobile provider, but may include a small number of households with a sub-25/3 connection (refer to appendix for further detail)

2 The federal poverty line for a 3-person household in 2020 was $21,720 | 3 Based on American Community Survey 2019 5-year rolling average estimate of households without access to home internet through any technology (e.g., fixed broadband, mobile, satellite, etc.)

4 Around 10% of total households subscribe only to a cellular data plan, which provides some connectivity but is unsuitable for many of the use cases enabled by fixed broadband

5 Higher 65+ population = at least 25% of the census block group as 65+ (see appendix) | 6 Based on the Lewis Latimer Plan For Digital Equity And Inclusion, published by the National Urban League

Prioritizing Broadband Funding

Given the finite – albeit substantial – funding available, how might policymakers set priorities?

Funding Goal: Maximize the number of Americans that can access essential digital resources

Key Questions: How should funding be allocated between programs to address the availability and adoption gaps?

1. Availability Gap
   - What threshold should constitute ‘unserved’ areas that are prioritized for funding?
   - What mechanisms\(^1\) should be utilized to allocate funds?
   - How should new deployment program(s) coordinate with existing federal and state programs?

2. Adoption Gap
   - What households should be eligible for support?
   - What per-month subsidy amount should be provided to each eligible household?
   - How many eligible households are likely to participate in the program?
   - How long should the program last?

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\(1\) E.g., Reverse auctions (as seen in RDOF Phase I) prioritize providers that can connect locations the most cheaply, resulting in a subsidy-efficient mix of new builds and upgrade to existing networks

Source: ACA Connects, Cartesian

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## Estimated Costs | Gigabit Deployment

Estimated deployment costs increase as the ‘unserved’ threshold increases to higher levels of service.

<table>
<thead>
<tr>
<th>Cumulative Costs to Fund Gigabit for:</th>
<th>All Locations(^1) with &lt;25/3 Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current FCC Definition of Broadband</td>
</tr>
<tr>
<td>Unfunded, Unserved Census Blocks(^3)</td>
<td>$4B – $7B 2.2M locations</td>
</tr>
<tr>
<td>Partially Served Census Blocks(^4)</td>
<td>$14B – $25B 7.7M locations</td>
</tr>
<tr>
<td>Unserved Areas Receiving Sub-Gbps FCC Funding(^5)</td>
<td>$3B – $5B 1.0M locations</td>
</tr>
<tr>
<td><strong>Total (Cumulative)</strong></td>
<td><strong>$20B – $37B 11M locations</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cumulative Costs to Fund Gigabit for:</th>
<th>All Locations(^1) with &lt;100/20 Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RDOF “Above Baseline” Threshold</td>
</tr>
<tr>
<td>All Locations(^1) with &lt;100/100 Mbps</td>
<td>$16B – $31B 8.8M locations</td>
</tr>
<tr>
<td>All Locations(^1) with &lt;Gigabit(^2)</td>
<td>$7B – $12B 3.9M locations</td>
</tr>
<tr>
<td><strong>Total (Cumulative)</strong></td>
<td><strong>$35B – $67B 19M locations</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cumulative Costs to Fund Gigabit for:</th>
<th>All Locations(^1) with &lt;Gigabit(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RDOF Gigabit Threshold</td>
</tr>
<tr>
<td>All Locations(^1) with &lt;Gigabit(^2)</td>
<td>$10B – $17B 91M locations</td>
</tr>
<tr>
<td><strong>Total (Cumulative)</strong></td>
<td><strong>$117B – $198B 99M locations</strong></td>
</tr>
</tbody>
</table>

### Note:
- Range reflects an approximate subsidy amount based on historical gigabit support amounts awarded in RDOF at the low end, and an approximate fiber build cost at the high end. Both estimates are based on household densities, and costs for both the low end and high end are approximated at 10% of density-based costs in cases where fiber is available, but speeds listed are below gigabit (typically due to constraints that are less expensive to mitigate than laying new fiber, such as upgrading electronics)
- 1 Including areas that received funding under RDOF Phase I, as nearly all locations were bid at 100/100 Mbps or Gigabit speeds | 2 Reflects speeds of below 900/500 Mbps | 3 Including household locations, businesses, and anchor institutions – see appendix for methodology
- 4 Based on a study that estimated unserved households by BroadbandNow – see appendix for methodology. As the threshold increases, the number of potentially unserved households that are missed in other funding categories decreases

The cost to build to all locations <100/100 Mbps is ~90% the cost of building to all locations <gigabit. In most cases, locations with at least 100/100 Mbps available already have fiber available, and upgrades to provide gigabit (i.e., upgrades to electronics) are significantly less expensive than laying new fiber.
For $61B-$118B, the U.S. could make gigabit available to 19M locations with less than 100/20 Mbps service and substantially increase broadband adoption

### Example Funding Approach | Cost Assessment

<table>
<thead>
<tr>
<th>Availability</th>
<th>Adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ensure that the U.S. has adequate infrastructure to enable all households, businesses, and anchor institutions to access speeds of at least 100/20 Mbps</em></td>
<td><em>Provide support to low-income households to increase broadband adoption rates</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unfunded, Price Cap Areas¹</th>
<th>Areas Receiving Sub-Gigabit FCC Funding²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unfunded, Unserved CBs</strong></td>
<td><strong>Areas Receiving Sub-Gigabit FCC Funding²</strong></td>
</tr>
<tr>
<td><em>All locations in census blocks reported as not receiving 100/20 Mbps service</em></td>
<td><em>ROR/ACAM All locations in ROR/ACAM census blocks that lack access to 100/20 Mbps service</em></td>
</tr>
<tr>
<td><strong>$16B-$31B 8.8M locations</strong></td>
<td><strong>$4.4B-$9.1B 1.8M locations</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partially Served CBs²</th>
<th>CAF II Auction</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Households lacking 100/20 Mbps service, in census blocks reported as receiving such service</em></td>
<td><em>All locations in CAF II auction census blocks that lack access to 100/20 Mbps service</em></td>
</tr>
<tr>
<td><strong>$13B-$24B 7.4M locations</strong></td>
<td><strong>$1.4B-$2.9B 522K locations</strong></td>
</tr>
</tbody>
</table>

### Total Cost of $61B-$118B to Ensure Available, Affordable High-Speed Broadband

| $35B-$67B, 19M Locations | $26B-$51B |

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¹ Not including areas that received funding under RDOF Phase I Auction, as nearly all locations were won at 100/20 Mbps or greater
² Estimate based on a study by BroadbandNow – data from the FCC around broadband availability will be needed to more precisely assess the number of households impacted by partially served CBs
³ Includes $50/month service subsidy and $100 one-time connected device subsidy for participating households

Source: FCC Form 477 June 2020 (Apr 7 2021 release), U.S. Census, BroadbandNow, ACA Connects, Cartesian

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Conclusion

The digital divide is both an availability problem and an adoption problem.

Policymakers can address both broadband needs with funding under discussion.

More ambitious goals require broadband infrastructure funding amounts to be set at higher levels than what has so far been proposed.

See appendix for additional material documenting approaches, calculation methodologies, and supplemental detail.
Fiber Broadband Now Passes Over 60 Million U.S. Homes
RVA Provider Study 2021

- 60.5 M Homes Marketed
- 12% Growth in 2021
- 25.1 M Homes Connected *

* 24.3 M Internet homes connected plus 0.8 M television or landline connected
2021 Had The Second Highest Annual Growth
Annual Homes-Marketed (All Years Ending Q3)
RVA Provider Study 2021

6.9 Million homes newly passed by network operators in 2021.
(5.7 Million unique newly passed homes)
More New Fiber Is Expected In This 5-Year Period Than All To Date
Preliminary Homes Marketed Long-Term Forecast
RVA Whitepaper 2021

*This 21-25 forecast could be somewhat optimistic given potential supply constraints, federal infrastructure moneys going to non fiber etc.
Estimated Route Miles Of Fiber Needed To Complete The FTTH Build By State*
RVA Broadband Consumer Study 2021/ RVA Provider Study

* At least one fiber to the home
Material Shortages May Be The Greatest Currently Perceived Challenge
Perceptions Of Mid-Size and Smaller Providers: RVA Provider Study (Nov.) 2021

Materials:
- Significant Concern: 68%
- Slight Concern: 24%
- No Concern: 8%

Labor:
- Significant Concern: 34%
- Slight Concern: 45%
- No Concern: 21%
Material Shortages May Be Solvable
RVA Whitepaper 2021

- Glass fiber supply can be shifted from export to domestic use
- Additional fiber cable plants are underway and can be built in less than 1 year
- Resin shortages for cable should abate in the next 16 months based on new plant announcements
- Electronic chip shortages should abate in the next 12 months
Labor Needs Correlate With Linear Miles Of New Fiber Needed
Preliminary Homes Marketed Long-Term Forecast
RVA Whitepaper 2021

Linear Miles Of fiber

- Federal Investment (If In Fiber)
- Base Forecast

2011-2015: 156 feet per home
2016-2020: 384 feet per home
2021-2025: 1,336 feet per home

- 230 feet per home
- 75 feet per home