Faster broadband speeds enables data consumption to grow rapidly

**Avg. plan speed Mbps**

- 2015: 26 Mbps
- 2016: 30 Mbps
- 2017: 34 Mbps
- 2018: 39 Mbps
- 2019: 45 Mbps
- 2020: 52 Mbps
- 2021: 60 Mbps
- 2022: 69 Mbps
- 2023: 80 Mbps
- 2024: 92 Mbps
- 2025: 106 Mbps

Speeds increase steadily and consistently over time

**Avg. download data consumption GB/ Month/ Household**

- 2015: 79 GB
- 2016: 97 GB
- 2017: 118 GB
- 2018: 144 GB
- 2019: 176 GB
- 2020: 215 GB
- 2021: 262 GB
- 2022: 320 GB
- 2023: 390 GB
- 2024: 476 GB
- 2025: 581 GB

Driven by more video consumption and shift to HD and ultra HD

SOURCE: Cisco
Broadband speed available by technology

- **Cable versus Legacy DSL (32% of U.S.)**
  - Cable DOCSIS 3.1

- **Cable versus IP-DSLAM (20% of U.S.)**
  - IP-DSLAM (ADSL2+)

- **Cable versus FTTN (13% of U.S.)**
  - FTTN (VDSL) ... with pair bonding and vectoring

- **Cable versus Fiber (31% of U.S.)**
  - TelCo [and Google Fiber]

**Achievable speeds (Mbps, log scale)**

- **Legacy DSL**
  - (TelCo speeds 1-10 Mbps)

- **Cable**
  - (TelCo speeds 15-25 Mbps)
  - (TelCo speeds 25-100 Mbps)

**Speeds over 1 Gbps**

**Rural/unserved**

**Cumulative frequency distribution (U.S. Households)**

**SOURCE:** FCC, Company reports, MoffettNathanson estimates and analysis
### US residential broadband connectivity by technology

#### US internet connectivity, Millions of households

<table>
<thead>
<tr>
<th>Technology</th>
<th>Households</th>
<th>No internet</th>
<th>Internet</th>
<th>FTTH</th>
<th>Cable</th>
<th>FTTN &amp; IP-DSLAM</th>
<th>Legacy DSL</th>
<th>Satellite / other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households</td>
<td>123</td>
<td>16</td>
<td>107</td>
<td>9</td>
<td>67</td>
<td>14</td>
<td>15</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Cableco market

<table>
<thead>
<tr>
<th>Cableco</th>
<th>BB connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comcast</td>
<td>27M</td>
</tr>
<tr>
<td>Charter</td>
<td>24M</td>
</tr>
<tr>
<td>Cox</td>
<td>4M</td>
</tr>
<tr>
<td>Altice</td>
<td>4M</td>
</tr>
<tr>
<td>Other</td>
<td>6M</td>
</tr>
</tbody>
</table>

- Mostly Verizon FiOS (6M)
- Some AT&T, Frontier, Google
- Mostly AT&T
- CenturyLink, Frontier, Windstream, small amount of Verizon and AT&T; others
- Other

SOURCE: US Census, FCC, Telegeography, SNL Kagan, Analysys Mason; IHS; Cisco; Ovum, SEC filings, press search, analyst reports