

Appendix C

Typical Bandwidth Requirements by Application

There are a number of ways to determine acceptable broadband internet speeds. A typical way to measure necessary broadband traffic in a per-office or per-home situation is to determine the number of concurrent operators on the local network and then to classify the users as either light-, moderate-, or high-use. Then you can aggregate the number of users and the type of network usage and come up with some ideas about necessary speed requirements to make the local network remain effective. For mobile wireless users, it is more appropriate to measure broadband speed requirements based on any user's particular dominant activity online.

The Federal Communications Commission has guidelines on minimum sustained download throughput speeds, which are summarized below:

<i>Activity</i>	<i>Minimum Download Speed (Mbps)</i>
General Usage	
General Browsing and Email	1
Streaming Online Radio	Less than 0.5
VOIP Calls	Less than 0.5
Student needs	5-25
Telecommuting	5-25
File Downloading	10
Social Media	1
Watching Video	
Streaming Standard Definition Video	3-4
Streaming High Definition (HD) Video	5-8
Streaming Ultra HD 4k Video	25
Video Conferencing	
Standard Personal Video Call (e.g., Skype)	1
HD Personal Video Call (e.g., Skype)	1.5
HD Video Teleconferencing	6
Gaming	
Game Console Connecting to the Internet	3
Online Multiplayer	4

From <https://www.fcc.gov/reports-research/guides/broadband-speed-guide>