

Over the past 23 years, KingsNet has been providing best-effort Internet access to our customers throughout Kings County. Beginning with dial-up service in the late 1990's, to our Massive MIMO 4G LTE we offer today. Our customer base has grown from a handful, to over 2,000 subscribers. Our county-wide daily Internet Access download rates have increased from several hundred Kilobits per second (200,000 bits per second) during dial-up service to where we are today at 4.2Gbps (4,200,000,000 bits per second).

As a customer, what does this mean to me? It means we are demanding great amounts of Internet data across our network, 24 hours a day, 7 days a week, most of which are resource intensive applications, such as:

- * Video Cameras
- * Smart TV's
- * Gaming Consoles (Xbox, PlayStation, etc.)
- * Wi-Fi Calling
- * Surveillance Systems (Cameras, Ring, etc.)
- * Home Office (Client-Server Applications, VPN's, etc.)

As a reminder, Kings County Office of Education's first mission is to "Support Student Learning". At KingsNet, this means providing best effort Internet service for students and staff as we assist to enhance the learning experience. KingsNet is a shared resource that, when available, provides a positive user experience for everyone. When congested with bandwidth intensive applications, it does not.

As a best-effort service, KingsNet does not provide a guaranteed minimum download nor upload rate. Since each user experience is different, based on factors such as signal quality, tower distance, type of data, quantity of users in the home, etc., we do not provide this information. What may be suitable for a customer who uses the service strictly for e-mail and homework (1Mbps), will not be for one who is expecting to watch Ultra HD 4K video (up to 25Mbps).

The needs of each household depend on several factors:

- * How many devices are connected and in use simultaneously?
- * How many users are streaming video, such as Netflix, YouTube, etc.?
- * Is Home WiFi being used for competitive gaming?
- * Do you need to send/receive large files from/to work?
- * Do you stream 4K video?
- * Do you get frustrated when your game lags or web pages take long to load? ¹

¹ How much Internet speed do you need? BroadbandNow®, Web: <https://broadbandnow.com/guides/how-much-internet-speed-do-i-need>

As you can see, many factors contribute to our internet-use experience. The following FCC Guideline helps to clarify the required amount of bandwidth for particular applications:

FCC	Consumer Guide
Broadband Speed Guide	
Compare typical online activities with the minimum download speed (Megabits per second, or Mbps) needed for adequate performance for each application. Additional speed may enhance performance. Speeds are based on running one activity at a time.	
For household broadband needs, use our Household Broadband Guide to compare minimum Mbps needs for light, moderate and high household use with one, two, three or four devices at a time (such as a laptop, tablet or game console).	
For more information on broadband speeds, see our Measuring Broadband America report .	
These numbers are rough guidelines and are not based on surveys or experiments conducted by the FCC. You should use your best judgment when choosing your broadband service.	
Activity	Minimum Download Speed (Mbps)
General Usage	
General Browsing and Email	1
Streaming Online Radio	Less than 0.5
VoIP Calls	Less than 0.5
Student	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

For Example, if a home expects to watch 2 sessions of Netflix (HD), play an online game, while starting a FaceTime® session with distant relatives, according to the FCC guide, the user can expect to require up to ~25Mbps, not mentioning the phones and tablets always connected to the network, (and cameras).

The two KingsNet users below depict typical usage for any given day. The first user would require approximately 20 -25 Mbps to support the three video applications

▼ 2.4GHz WiFi

Device Name	IP Address	MAC Address	Mode	RSSI	Speed
I:Amazon	192.168.15.41	D4:91:0F:10:23:B2	802.11n	-6	72.2
Living-Room	192.168.15.190	D0:03:4B:00:F0:6A	802.11n	-50	144.5
55TCLRokuTV	192.168.15.22	1C:30:08:28:55:D7	802.11n	-46	144.5

The second would require approximately 32Mbps to sustain the application shown below

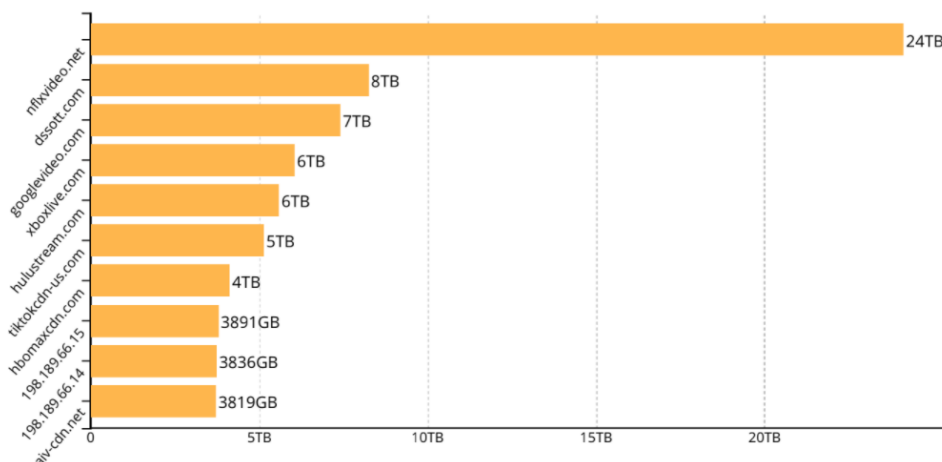
▼ 2.4GHz WiFi

Device Name	IP Address	MAC Address	Mode	RSSI	Speed
RokuMB	192.168.15.187	84:EA:ED:87:48:69	802.11n	-56	58.5
amazon-267cdf7c6	192.168.15.226	0C:47:C9:EC:B3:AD	802.11n	-43	144.5
*	192.168.15.245	70:F0:88:F6:AF:82	802.11n	-50	6.5
amazon-07a1c946d	192.168.15.32	10:AE:60:E1:94:D3	802.11n	-72	104
XboxOne	192.168.15.106	B4:AE:2B:9C:90:9C	802.11n	-60	144.5

Given these typical usage patterns, the KingsNet Network will exhibit signs of congestion at tower locations that are at, or nearing resource capacity (High latency[PING times], buffering). Reducing the amount of devices connected to the network can help mitigate the buffering and latency. For example, disconnecting any devices not in use from the router, etc.

And finally, the graph below illustrates the usage patterns of our customers over the past week, with the top destination sites being Netflix®, Disney +®, YouTube®, Xbox Live®, Hulu®, Tik Tok®, and HBO Max®

Top Destinations by Bandwidth Bar



KingsNet speeds, on average, range between 2Mbps – 30Mbps +. This is greatly reduced when resources are depleted due to congestion (too many connected devices, high bandwidth-intensive applications).

We at KingsNet strive to exceed the requirements needed to provide a positive student-learning experience throughout Kings County. We are continually looking for ways to improve our product.

We thank you for your support and patronage and understand many of you have alternative solution choices.

The KingsNet Team