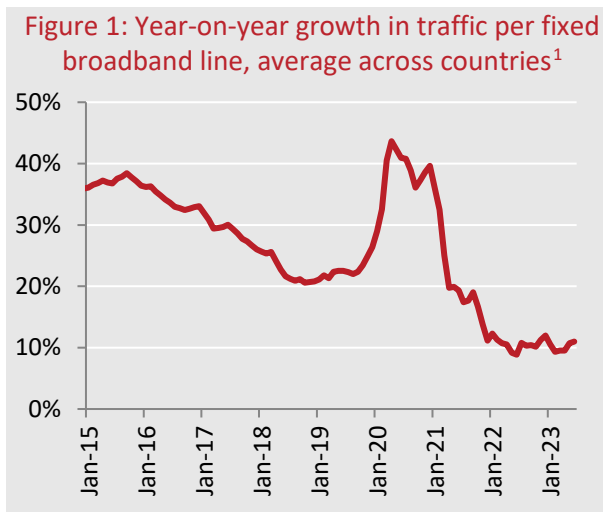


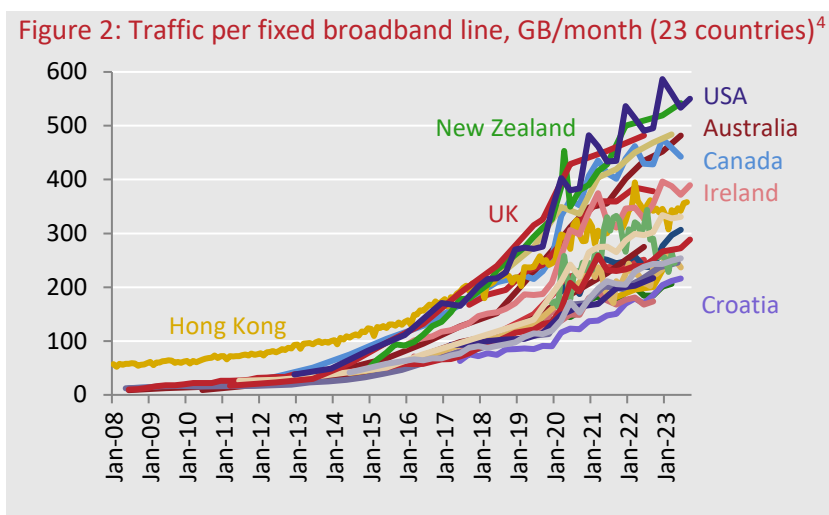
Patterns of fixed traffic growth, 2023

This note² considers the growth of broadband traffic per fixed line in various countries³ around the world. In summary, we find that the pattern of declining traffic growth, already evident before the pandemic, has continued since the pandemic passed (Figure 1). Average growth of around 10% appears to be ‘the new normal’, albeit with material variation between countries. Slowing VOD adoption and natural limits on the number of hours that can be spent online in a day are likely key factors in this more modest growth.



Traffic levels

We begin by looking at absolute levels of traffic. It is no surprise that (broadly) traffic per line continues to grow:



Multiple countries now exceed 400 GB per line per month, roughly equivalent to 10 hours of streamed HD video per day per household. The US and New Zealand are over 500 GB. These are average figures, and individual households will be well above this.

¹ See Footnotes 4 and 8 for sources and caveats

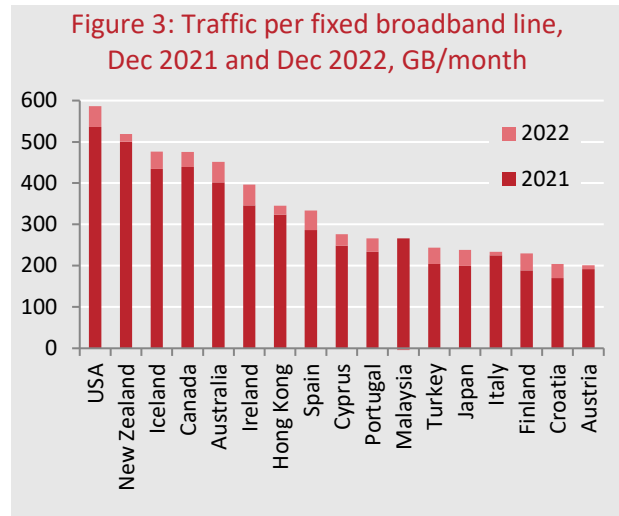
² Previous analyses are available at Communications Chambers, [Patterns of internet traffic growth](#), April 2018; [Patterns of internet traffic growth 2021](#), October 2021; and [Patterns of fixed traffic growth, 2022](#), October 2022

³ Countries are those for which relevant data could be identified, which are primarily more developed countries

⁴ Sourced from relevant national regulatory authorities or government statistical services, with the exception of New Zealand (sourced from Chorus) and the US (from OpenVault). Figures are average for both business and residential lines, except for the UK which (from 2015) is residential only. Traffic is upload+download, except Australia which is download

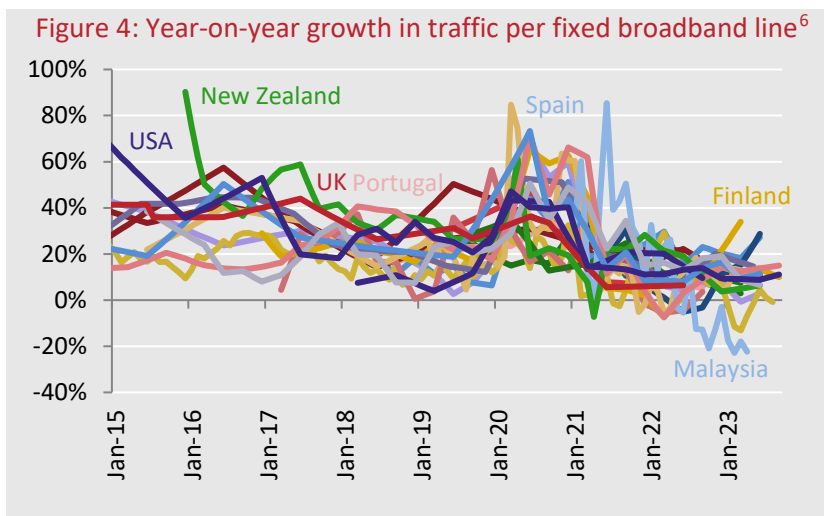
There are of course significant differences in traffic levels and rates of growth between countries. Figure 3 shows the traffic per line as of December 2022.⁵

English-speaking markets continue to dominate the top of the rankings. (While UK data is not yet available for end-2022, at end-2021 it ranked third in our data set). As we have noted before, this may be because the US is a key source of internet innovation, and other English-speaking countries may be quickest to adopt or imitate (alongside their own innovations). There is probably also a larger pool of English language content available than for most languages.



Growth rates

We now turn to growth rates. Figure 4 shows year-on-year growth in traffic. There is significant variation, both between countries and for any given country over time.



While the data is noisy, it is clear that there is a long run trend of slowing growth, punctuated by the pandemic. For the countries for which we have data, no country has recorded a year-on-year growth rate of higher than 34% since October 2021, and median growth in this period has been just 11%. Eight countries have reported periods of negative growth in this time.

⁵ Note that reporting periods vary (eg monthly vs annually). Data for specific months have been interpolated where necessary, to enable comparisons. Malaysia saw slightly negative growth in 2022, not shown on the chart

⁶ Per FN 4. Communications Chambers analysis. Data interpolated where necessary

Immediately following the pandemic, there was an expectation that growth might have been ‘pulled forward’ by lockdowns, and that slower growth might represent a hang-over from this acceleration. However, as the period of lockdowns recedes into the past, this looks less likely as an explanation of continued slow growth.

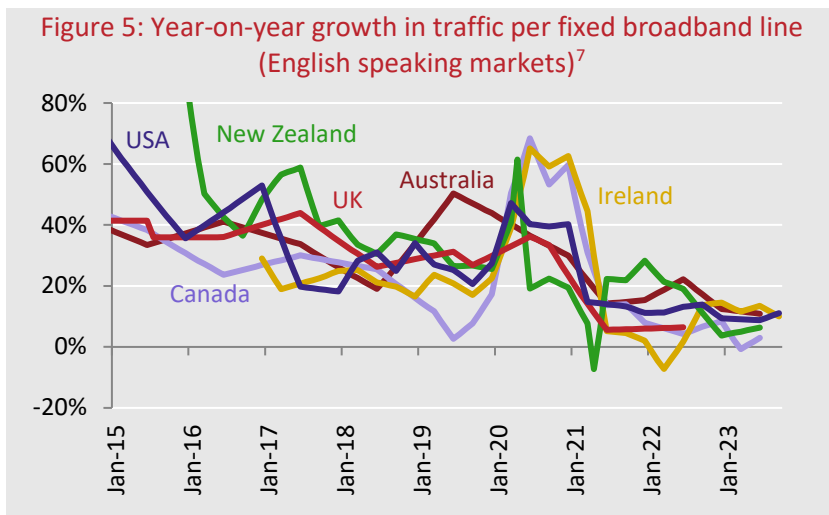
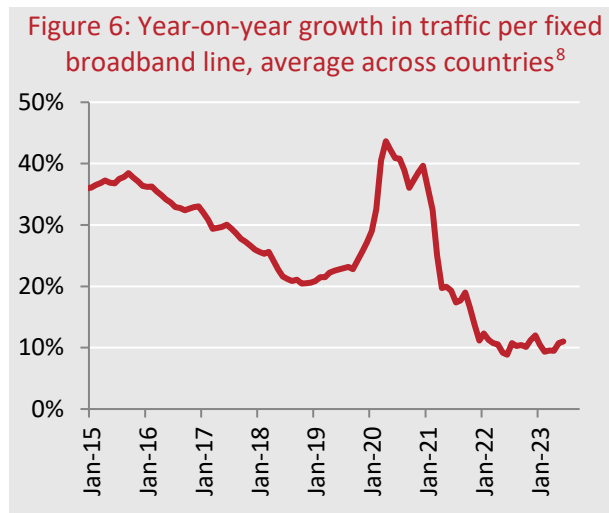


Figure 5 shows the same data for English speaking markets only. The pattern is similar, with declining growth to 2019, followed by a pandemic surge and then modest growth since. Post-pandemic, median growth for this group has been around 10%.

To better understand the global trends, we consider averaged growth across the set of countries for which we have data (Figure 6). Again, the pattern is clear – declining growth pre-pandemic, a pandemic then caused a significant spike and then a rapid decline. The ‘new normal’ 11% year-on-year growth we see for June 2023 is far below the 30% figure typically cited for traffic growth.⁹



If traffic growth is slowing, why?

What lies behind this pattern of slowing growth? One issue is simply that as absolute volumes of traffic rise, it is almost inevitable that *percentage* growth

⁷ Ibid

⁸ Per FN 4. Communications Chambers analysis. Data interpolated where necessary. Notes: (i) The countries within the set varies somewhat over time, based on when countries started reporting and when they most recently published data. However, this variation does not appear to have material impacts on the trends shown. (ii) Because new historic data has become available, the figures in this chart do not exactly match those in the equivalent chart from our report a year ago

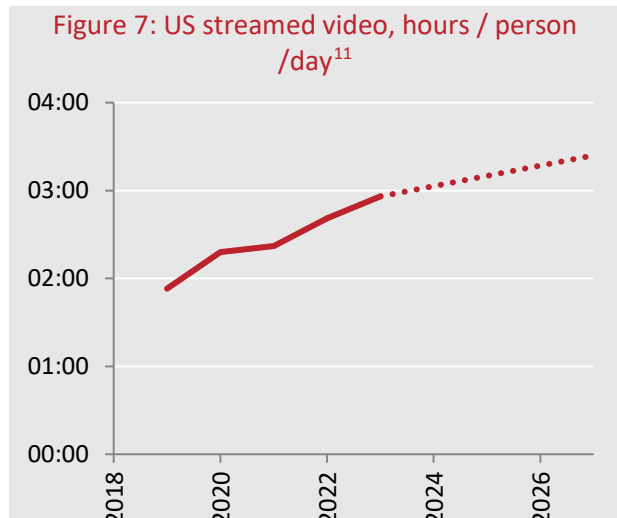
⁹ Strictly the 30% figure is usually discussed in the context of network growth rather than per-line growth, but as fixed broadband is at or near saturation in most markets, this distinction is not material. For an example of use of this figure see Telefónica, [Impact of traffic growth on networks and investment needs](#), 23 May 2023

rates will fall, given the large base. In absolute terms (gigabytes), growth does remain substantial. But there are also more fundamental factors at work. Crucially, video growth is slowing.

Video represents 66% of traffic globally, and even more in some markets – 74% in the Americas, for example.¹⁰ Thus overall traffic growth is strongly linked to video traffic growth. This in turn is driven by three factors – hours of consumption, increases in video resolution, and offsetting improvements in video compression.

However, growth in hours of consumption is inevitably slowing. In the US, for example, streamed video consumption has already passed linear viewing, giving a diminishing pool of hours into which to grow. Activate Consulting expects streamed hours per person to grow just 4% annually, 2023-27, down from 11% in the last two years (Figure 7).

Despite slowing growth in hours, video traffic growth could still surge if there was increased uptake of higher resolutions – for instance, viewers shifting from HD to 4K. As far as we are aware, there is not public domain information on the mix of video streams by resolution, but anecdotal data suggests limited – and flat – adoption of 4K. One operator reports that less than 2% of streaming time is in 4K resolution.¹² In part this may be due to 4K content being entirely unavailable on standard streaming plans, or a lack of content in 4K even in premium plans. The benefits of 4K may simply not be apparent to consumers for many types of content.



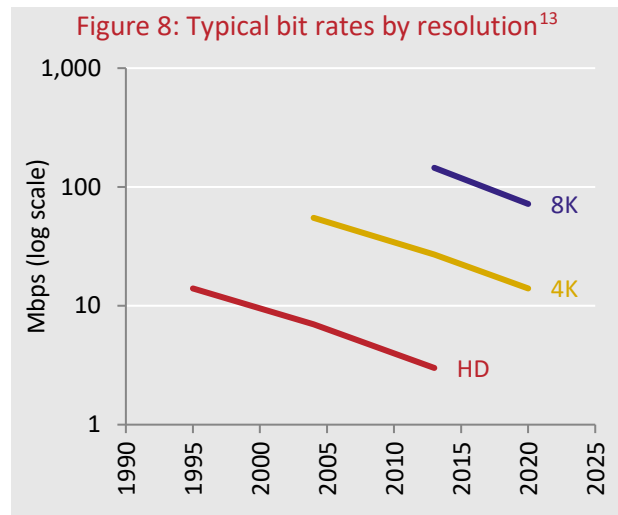
¹⁰ Figures for H1 2022. Sandvine, [Global Internet Phenomena Report 2023](#), January 2023

¹¹ Activate Consulting, [Activate Technology & Media Outlook 2024](#), 6 November 2023; [Activate Technology & Media Outlook 2023](#), 18 October 2023

¹² Streaming Media, [Rate of Video Traffic Growth Declining Across CDNs and ISPs As OTT Services Optimize Encoding Bitrates, See Little Demand for 4K Quality](#), 24 August 2023

Offsetting (limited) migration to 4K are improvements in video compression. For many years, the bandwidth required for a given video resolution has halved roughly every eight years. This continues to be a major area of investment for streamers, as they seek to reduce their traffic costs and improve quality for consumers.

The combination of limited resolution growth and offsetting compression mean that the average video stream does not appear to be getting any 'heavier'. Average Netflix streams have been consistently in the range of 3-4 Mbps in the US for the last several years, for example.¹⁴



What then could reignite growth? Virtual reality has been seen as a driver, but sales of VR headsets have fallen by 45% over the last year, albeit with a return to growth expected in the years ahead.¹⁵ Attention has shifted to AI as the leading tech trend. However, the bandwidth needs of AI are extremely modest. From a network perspective, the use of Chat GPT (say) it is simply another form of basic web browsing.

Conclusion

While there is still the possibility of a recovery in traffic growth, the lengthening period of slow growth post-pandemic increasingly suggests that this is the 'new normal' rather than a hangover effect.

For thirty years, a fundamental assumption of the sector has been rapid and sustained traffic growth, but this assumption is no longer safe.

This has important implications in a number of areas. For example, it changes which access technologies are likely to be competitive and meet consumer needs – technologies such as satellite and LEO, with higher marginal cost of traffic, may be more competitive if traffic growth is slowing.

Companies, regulators and policy makers need to think carefully about this profound change in the market.

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December 2023

¹³ Hiroaki Nishimoto, *Evolution of Video Communication and Sumitomo Electric's Mission*, October 2023

¹⁴ Netflix, *ISP Speed Index / United States* [accessed 16 December 2023]

¹⁵ IDC, *Another Slow Year Expected for AR/VR Headsets Before 2024 Rebound, According to IDC*, 19 September 2023

Annex – Traffic by country (GB per fixed line per month)

