



Cabinet Office

Matt Hobbs

Head of Frontend, Lead Frontend Developer
Government Digital Service



@TheRealNooshu

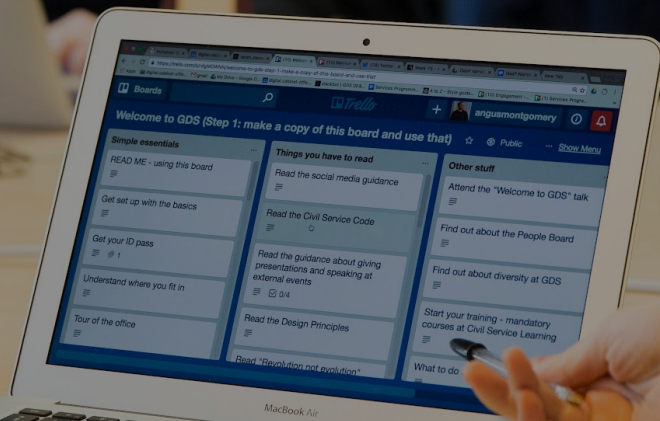
<https://hachyderm.io/@TheRealNooshu>

A modern office interior with glass walls, colorful furniture, and people working. The scene is viewed from an elevated position, looking down into the office space. The office is bright and open-plan, with various workstations and collaborative areas. A man is sitting on a green platform in the upper left, working on a laptop. Another man is sitting on a green platform in the lower center, also working on a laptop. The office is decorated with colorful bunting and a large wall of sticky notes. The text "I work at the Government Digital Service" is overlaid in large white letters across the center of the image.

I work at the Government Digital Service

**Why does frontend
performance
matter?**

Who are GDS?



Services:

- GOV.UK One Login
- GOV.UK Notify
- GOV.UK Pay
- GOV.UK Platform as a Service (PaaS)
- GOV.UK Forms
- GOV.UK Design System

Tell us what you think of GOV.UK

[Take the 3 minute survey](#). This will open a short survey on another website.

Welcome to GOV.UK

The best place to find government services and information
Simpler, clearer, faster

Search GOV.UK

Power to the people
Internal Affairs
Home Office
Law
Local Government
Ministry of Justice
Ministry of Labour
Ministry of Health
Ministry of Education
Ministry of Agriculture
Ministry of Environment
Ministry of Transport
Ministry of International Trade
Ministry of Culture
Ministry of Science
Ministry of Digital
Ministry of Communities
Ministry of Housing
Ministry of Pensions
Ministry of Veterans
Ministry of Defence

GOV.UK

[Benefits](#)

Includes tax credits, eligibility and appeals

[Birth, death, marriage and civil partnerships](#)

Includes civil partnerships, Lasting Power of Attorney

[Business and self-employed](#)

Tools and guidance for businesses

[Citizenship and living in the UK](#)

Voting, community participation, life in the UK, international projects

[Crime, justice and the law](#)

Legal processes, courts and the police

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[Driving and transport](#)

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[Education and learning](#)

Includes student loans, admissions and apprenticeships

[Employing people](#)

Includes pay, contracts and hiring

[Environment and countryside](#)

Includes flooding, recycling and wildlife

[Housing and local services](#)

Includes housing and council services

[Money and tax](#)

Includes bank and bill payments

[Passports, travel and living abroad](#)

Includes renewing passports and travel advice by country

[Visas and immigration](#)

Visas, asylum and sponsorship

[Working, jobs and pensions](#)

Includes holidays and finding a job

695,000 pages, 25 ministerial departments

Source: GOV.UK Content Data (January 2023)

[Home](#) > [Passports, travel and living abroad](#) > [Passports](#)

Renew or replace your adult passport

Contents

- [Overview](#)
- Renew
- [Replace a lost, stolen or damaged passport](#)

Renew

You must renew your passport before you can travel if either:

- your passport has expired
- you do not have enough time left on it

How much time you need on your passport depends on the country you're visiting. [Check the entry requirements of the country you want to travel to.](#)

Related content

- [Cancel a lost or stolen passport](#)
- [Getting your first adult passport](#)
- [Get a passport urgently](#)
- [Get a passport for your child](#)
- [Passport fees](#)

Part of

[Report treasure, wreck material or archaeological finds](#)

Report treasure

You must [report treasure to the local coroner](#) within either:

- 14 days of first finding it
- 14 days of realising an item might be treasure, even if you've had it for longer

You only need to report [items officially defined as treasure](#).

! There's an unlimited fine or up to 3 months in prison for not reporting treasure.

You can get help reporting treasure to your local coroner in Wales by contacting the curators at the Amgueddfa Cymru – National Museum Wales.

National Museum Wales

Part of

[Report treasure, wreck material or archaeological finds](#)

[!\[\]\(b4eeff342f60cc7bcd67d869b4fedca2_img.jpg\) Show all steps](#)

1 Check if the item you've found is treasure or wreck

[!\[\]\(3342c215b2a8b663596a81468d5dc314_img.jpg\) Show](#)

2 Report treasure to the local coroner

[!\[\]\(1f56542a42e2413e44a2b2023033aa2e_img.jpg\) Hide](#)

[Home](#) > [Environment](#) > [Wildlife, animals, biodiversity and ecosystems](#)

Guidance

Keeping a pet pig or 'micropig'

Find out how to register your land and animals, how to get a pig walking licence and what you can feed pet pigs.

From: [Department for Environment, Food & Rural Affairs](#) and [Animal and Plant Health Agency](#)

Published 31 December 2014

Last updated 24 January 2023 — [See all updates](#)

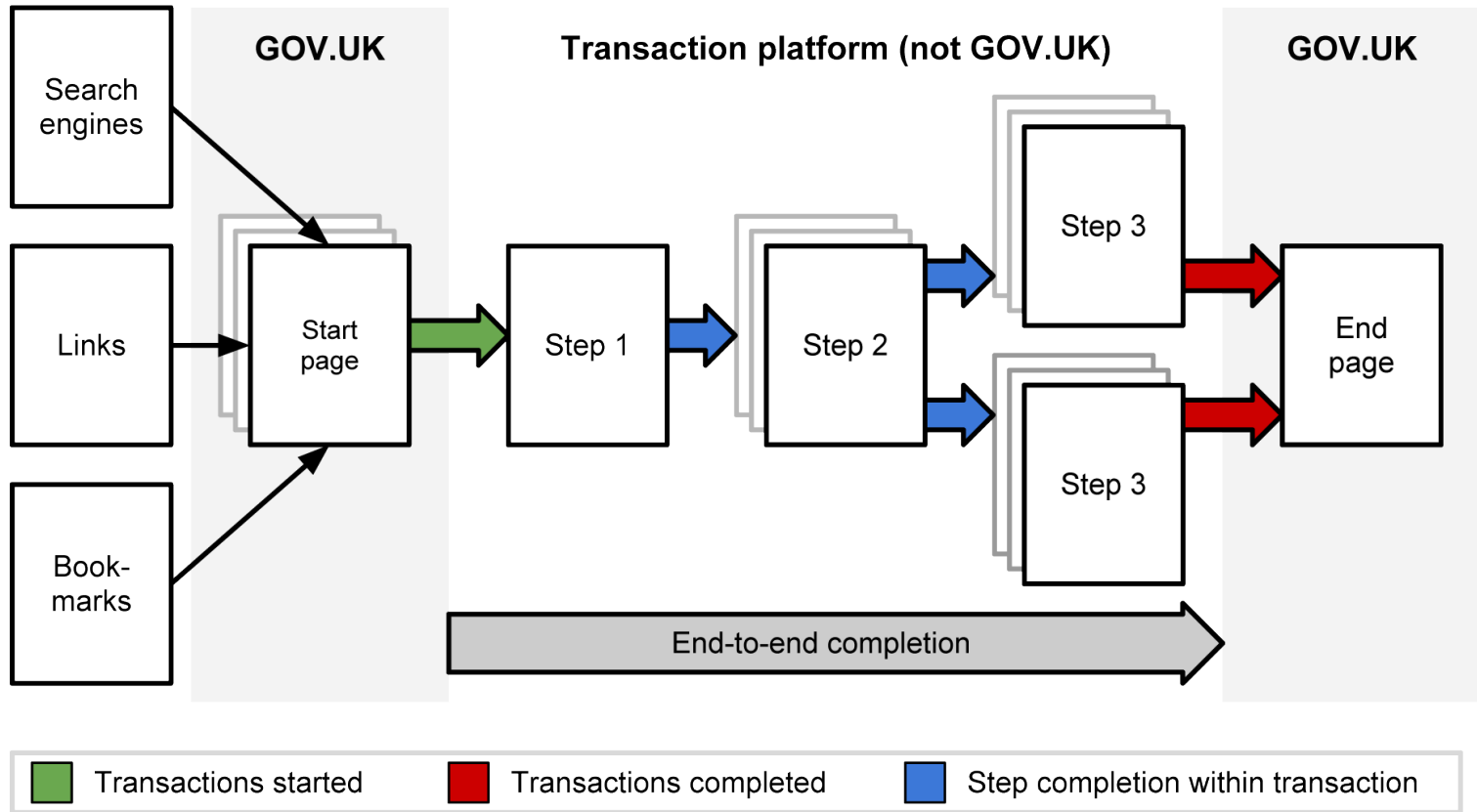
 [Get emails about this page](#)

Applies to England

[Guidance for Wales](#)

Related content

[Pigs movement general licence](#)



Our Users

The background of the image is a dense, overlapping pattern of stickers. Each sticker is dark blue with a gold border and features the text "Users First" in a gold, sans-serif font. The stickers are arranged in a way that creates a sense of depth and repetition, with some appearing more prominent than others due to perspective and focus.

40-50 million user visits per month

Source: GOV.UK Google Analytics (January 2023)

80% of visits are from the United Kingdom

Source: GOV.UK Google Analytics (January 2023)

Chrome is the most popular browser

Source: GOV.UK Google Analytics (January 2023)

		Acquisition
<input type="checkbox"/>	Browser [?]	Users [?] ↓
		39,350,918 % of Total: 100.00% (39,350,918)
<input type="checkbox"/>	1. Chrome	16,093,966 (40.82%)
<input type="checkbox"/>	2. Safari	15,839,456 (40.17%)
<input type="checkbox"/>	3. Edge	3,868,387 (9.81%)
<input type="checkbox"/>	4. Samsung Internet	1,987,240 (5.04%)
<input type="checkbox"/>	5. Firefox	495,334 (1.26%)
<input type="checkbox"/>	6. Android Webview	418,072 (1.06%)
<input type="checkbox"/>	7. Safari (in-app)	417,229 (1.06%)
<input type="checkbox"/>	8. Opera	106,007 (0.27%)
<input type="checkbox"/>	9. Amazon Silk	92,129 (0.23%)
<input type="checkbox"/>	10. Internet Explorer	54,201 (0.14%)

Mobile is the most popular browsing device

Source: GOV.UK Google Analytics (January 2023)

Demographics: ??

Source: [ONS Principal projection data \(2023\)](#)

A woman with her hair in intricate braids is sitting on a grey corduroy couch. She is wearing a white, textured knit sweater and has red nail polish. She is holding a bright green smartphone in her right hand and looking at the screen with a slight smile. The background shows a wooden shelving unit with various items, including blue storage boxes and a black bag hanging on the left. The overall lighting is soft and indoor.

User Stories



St George's Channel

Bristol Channel

Birmingham

London

Shropshire Hills AONB

Brecon Beacons National Park

Cotswolds AONB

Chiltern Hills AONB

North Wessex Downs AONB

Surrey Hills Area of Outstanding Natural Beauty

Kent Downs AONB

High Weald AONB

South Downs National Park

Dorset AONB

Dartmoor National Park

Pembrokeshire Coast National Park

Exmoor National Park

Tintagel

Plymouth

Weymouth

Bournemouth

Portsmouth

Brighton

Eastbourne

Hastings

Boulogne-sur-Mer

Margate

Southend-on-Sea

Colchester

Felixstowe

Ipswich

Bury St Edmunds

King's Lynn

Norwich

Peterborough

Leicester

Burton upon Trent

Loughborough

Wolverhampton

Shrewsbury

Aberystwyth

Cardigan

Fishguard

Carmarthen

Tenby

Pembroke Dock

Swansea

Llanelli

Newport

Bridgend

Weston-super-Mare

Bristol

Bath

Chippenham

Swindon

Basingstoke

Reading

Croydon

Maidstone

Canterbury

Dover

Cardiff

Merthyr Tydfil

Gloucester

Cheltenham

Hereford

Worcester

Stratford-upon-Avon

Leamington Spa

Royal Leamington Spa

Coventry

Northampton

Kettering

Corby

Ely

Thetford

Bury St Edmunds

Fakenham

King's Lynn

Norwich

Yarmouth

Southern

Southampton

Southend-on-Sea

Clacton-on-Sea

Ipswich

Felixstowe

Colchester

Chelmsford

Southend-on-Sea

Margate

Canterbury

Dover

High Weald AONB

Hastings

Eastbourne

Brighton

Portsmouth

Bournemouth

Weymouth

Torquay

Exmouth

Exeter

Bodmin

Newquay

St Austell

Torquay

Plymouth

Exmouth

Bideford

Barnstaple

Woolacombe

Ilfracombe

Minehead

Glastonbury

Salisbury

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Southampton

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Pembrokeshire Coast National Park

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Bristol Channel

Milford Haven

Fishguard

Cardigan

Aberystwyth

National Park

Shrewsbury

Wolverhampton

Birmingham

Burton upon Trent

Loughborough

Leicester

Corby

Kettering

Peterborough

King's Lynn

Norwich

Thetford

Bury St Edmunds

Ipswich

Colchester

Clacton-on-Sea

Chelmsford

Cambridge

Bedford

Milton Keynes

Luton

Oxford

Swindon

Gloucester

Hereford

Newport

Swansea

Llanelli

Carmarthen

Fishguard

Milford Haven

Tenby

Pembroke Dock

Cardiff

Bridgend

Bristol

Weston-super-Mare

Bath

Chippenham

Glastonbury

Minehead

Woolacombe

Ilfracombe

Barnstaple

Bideford

Yeovil

Taunton

Exeter

Exmouth

Bude

Tintagel

Newquay

St Austell

Bournemouth

Weymouth

Southampton

Portsmouth

Poole

Worthing

Brighton

Eastbourne

Hastings

Boulogne-sur-

Margate

Southend-on-Sea

Chelmsford

London

Croydon

Reading

Basingstoke

Guildford

Salisbury

Winchester

Southampton

Portsmouth

Poole

Worthing

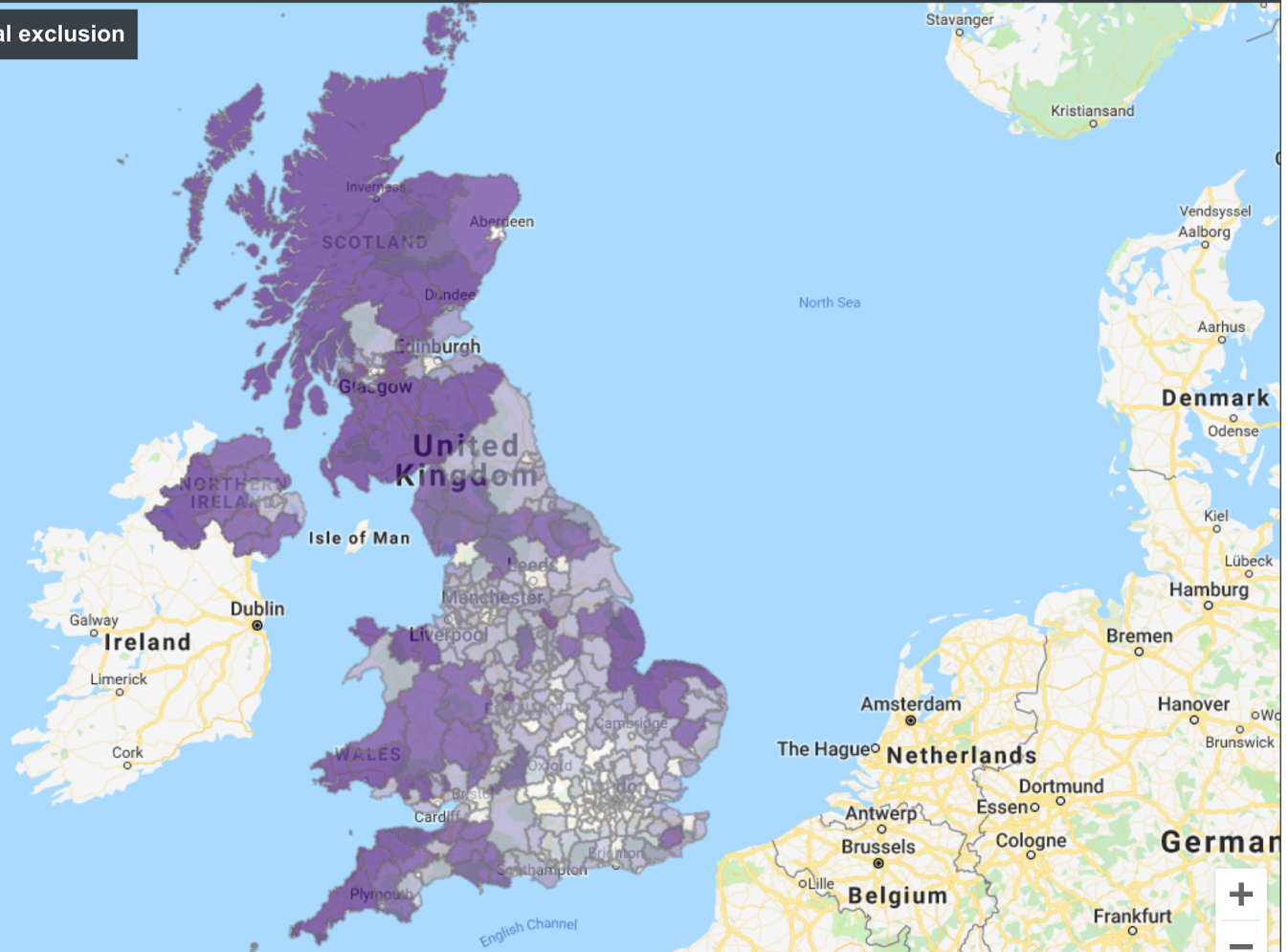
Brighton

Eastbourne

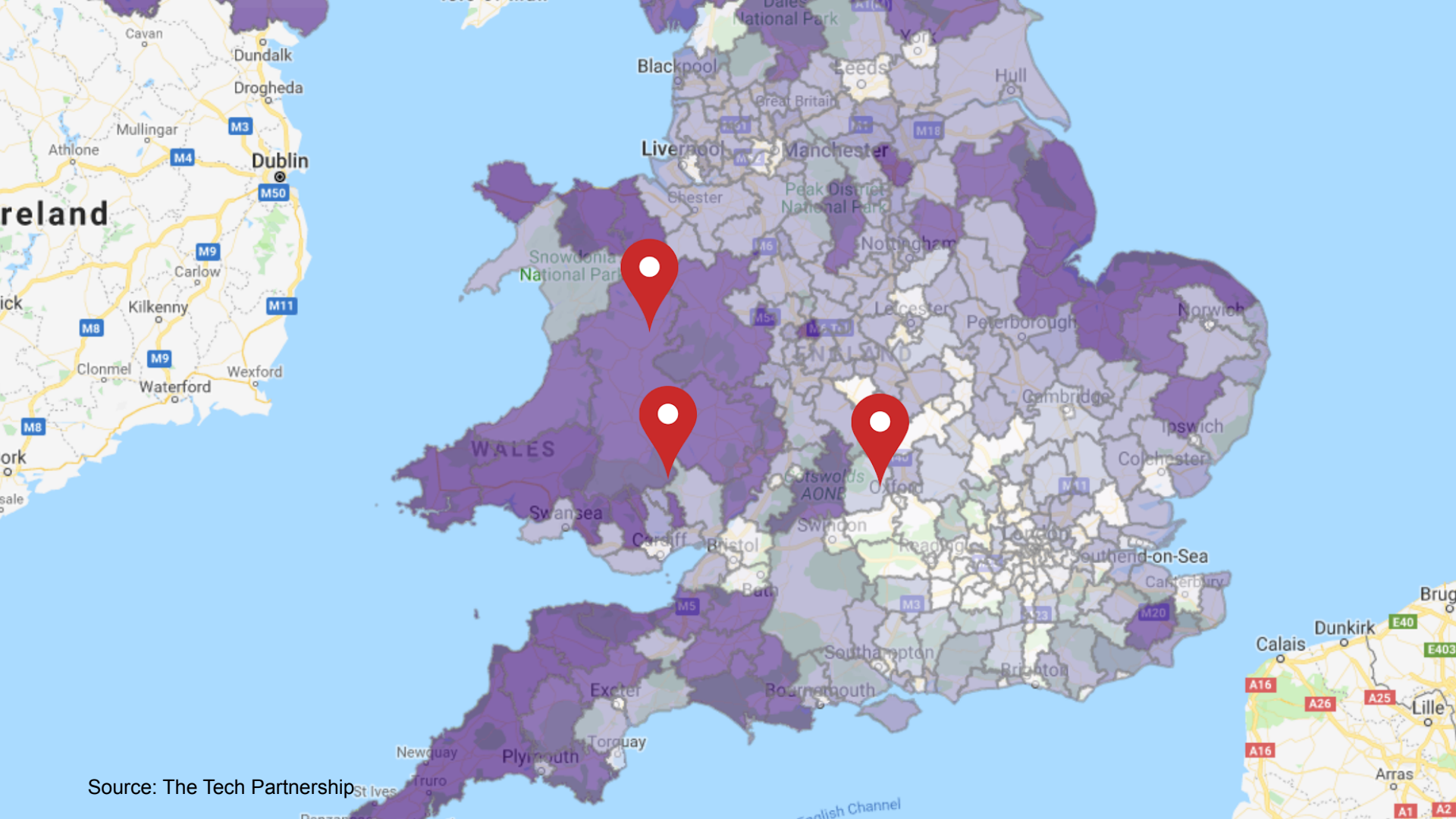
Hastings

Exclusion unlikely  Exclusion likely

2017 map showing the overall likelihood of digital exclusion



Source: The Tech Partnership



Source: The Tech Partnership

Jump to postcode...



Broadband Speed Ultrafast (UFBB) Availability

The average wired broadband download speeds for local authority areas (residential and business), and estimated proportion with access to ultrafast (300Mb/s+) service.

Data story: [The UK's Broadband hotspots and notspots](#)

[Download the data](#)

[Download PDF report](#)

Legend

Filter

2020 Speed

- Under 10 Mbps
- 10-20 Mbps
- 20-30 Mbps
- 30-40 Mbps
- 40-50 Mbps
- 50-60 Mbps
- 60-70 Mbps
- 70-80 Mbps
- 80-90 Mbps
- 90-100 Mbps
- Over 100 Mbps

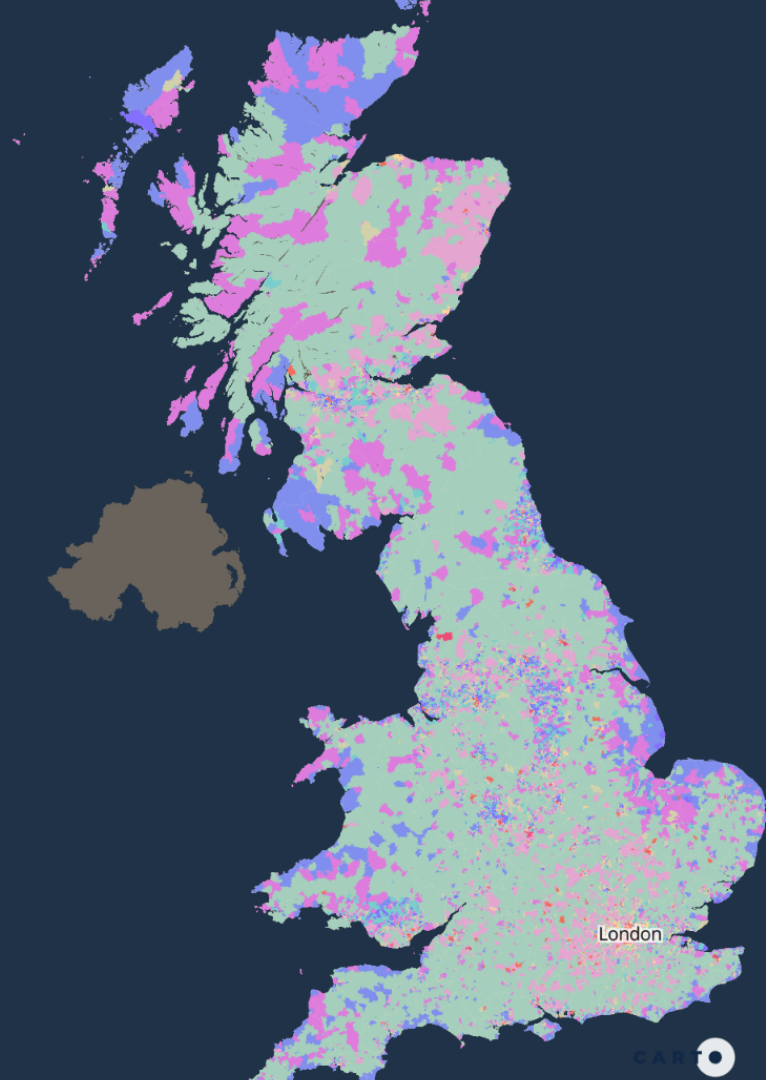
Map Layers

- Region
- Local Authority
- Combined Authority
- Retail Centres
- Place Names
- Map details
- Urban / Buildings

London

200 km

Jump to postcode...



Internet User Classification

How people living in different parts of Great Britain interact with the Internet.

Data story: [The Great geography of Internet engagement](#)

[Download the data](#)

[Download PDF report](#)

Legend

Filter

- e-Cultural Creators
- e-Professionals
- e-Veterans
- Youthful Urban Fringe
- e-Rational Utilitarians
- e-Mainstream
- Passive and Uncommitted Users
- Digital Seniors
- Settled Offline Communities
- e-Withdrawn

Map Layers

- Region
- Local Authority
- Combined Authority

Retail Centres

- Place Names
- Map details
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Law ?

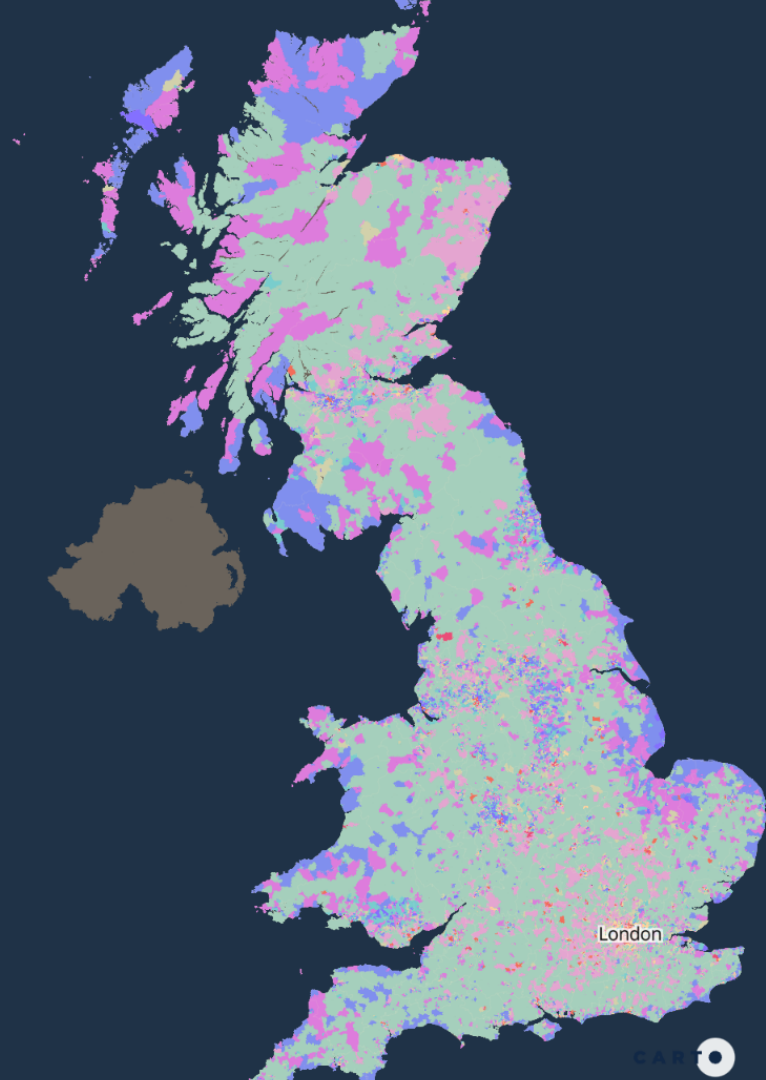


e-Rational Utilitarians

Within rural areas, the most common group is the “e-Rational Utilitarians”. These residents more prevalently use the Internet for service applications such as e-banking and online shopping, rather than entertainment and communication. This may be as a result of these areas having constrained Internet speeds which limits use of those websites or services requiring faster connections.

[CDRC - The Great British geography of Internet use and engagement \(2018\)](#)

Jump to postcode...



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Ministry of Housing
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Ministry of Culture, Media and Sport
Ministry of Women and Equalities
Ministry of Pensions
Ministry of Business, Energy and Industrial Strategy
Ministry of the Cabinet Office
Ministry of the Prime Minister and Cabinet

GOV.UK

Benefits

Includes tax credits, eligibility and appeals

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Includes holidays and finding a job

MacBook Pro



User Devices


~9,000 mobile devices listed

Source: GOV.UK Google Analytics (January 2023)

~16,000 mobile device & operating system
version combinations

Source: GOV.UK Google Analytics (January 2023)

Top 10 mobile devices

Mobile Device Info ?	Acquisition
	Users ? 
	25,536,505 % of Total: 64.89% (39,350,918)
1. Apple iPhone	14,307,176 (56.48%)
2. Apple iPad	513,656 (2.03%)
3. Samsung SM-G991B Galaxy S21 5G	434,893 (1.72%)
4. Samsung SM-S908B Galaxy S22 Ultra	291,963 (1.15%)
5. Samsung SM-S901B Galaxy S22	278,748 (1.10%)
6. Samsung SM-A528B Galaxy A52s 5G	238,442 (0.94%)
7. Samsung SM-G973F Galaxy S10	233,638 (0.92%)
8. Samsung SM-G998B Galaxy S21 Ultra 5G	214,968 (0.85%)
9. Samsung SM-A125F Galaxy A12	191,786 (0.76%)
10. Samsung SM-G960F Galaxy S9	178,102 (0.70%)

Source: GOV.UK Google Analytics (January 2023)

Not all users can afford high-end devices

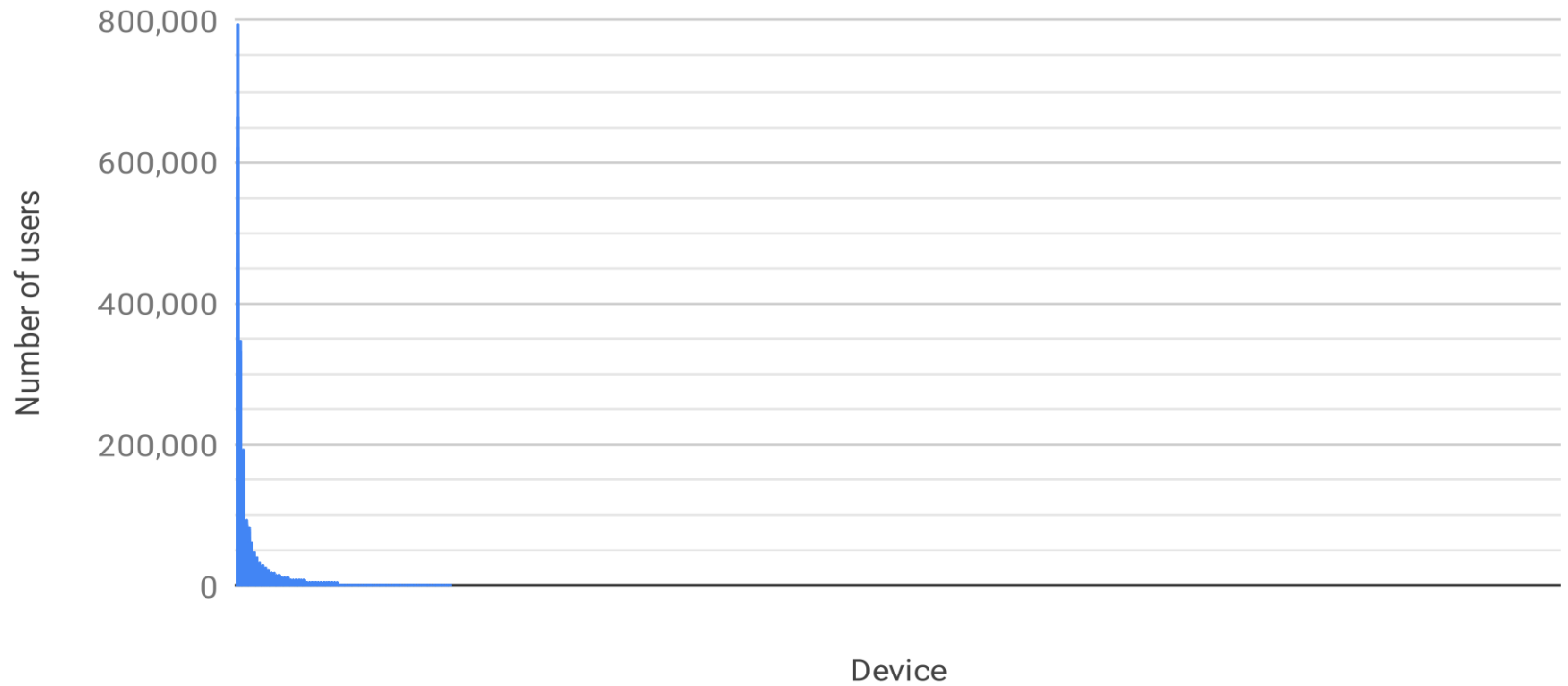
Definition

1. device is no longer supported by the manufacturer
2. default browser isn't an "evergreen" browser

A	B	C	D	E	F
Mobile Device Branding	Mobile Device Model	Mobile Device Info	Operating System Version	Users	Mobile Device Marketing
Apple	iPhone	Apple iPhone	12.0.1	4,922,638	(not set)
Apple	iPhone	Apple iPhone	12	2,177,496	(not set)
Apple	iPhone	Apple iPhone	11.4.1	1,923,384	(not set)
Apple	iPad	Apple iPad	12.0.1	795,495	(not set)
Samsung	SM-G950F	Samsung SM-G950F Galaxy S8	8.0.0	666,107	Galaxy S8
Apple	iPhone	Apple iPhone	12.1	621,490	(not set)
Apple	iPhone	Apple iPhone	11.4	474,255	(not set)
Apple	iPad	Apple iPad	9.3.5	448,296	(not set)
Apple	iPad	Apple iPad	11.4.1	405,302	(not set)
Samsung	SM-G930F	Samsung SM-G930F Galaxy S7	8.0.0	394,756	Galaxy S7
Apple	iPhone	Apple iPhone	11.3	381,574	(not set)
Samsung	SM-G935F	Samsung SM-G935F Galaxy S7 Edge	8.0.0	347,199	Galaxy S7 Edge
Samsung	SM-G960F	Samsung SM-G960F Galaxy S9	8.0.0	334,219	Galaxy S9
Apple	iPad	Apple iPad	12	320,125	(not set)
Apple	iPhone	Apple iPhone	10.3.3	317,488	(not set)
Apple	iPad	Apple iPad	10.3.3	293,253	(not set)
Microsoft	Windows RT Tablet	Microsoft Windows RT Tablet	10	288,487	(not set)
Samsung	SM-G920F	Samsung SM-G920F Galaxy S6	7	243,769	Galaxy S6
Samsung	SM-G955F	Samsung SM-G955F Galaxy S8+	8.0.0	210,003	Galaxy S8+
Samsung	SM-J320FN	Samsung SM-J320FN Galaxy J3 Duos	5.1.1	194,792	Galaxy J3 Duos
Samsung	SM-A520F	Samsung SM-A520F Galaxy A5 (2017)	8.0.0	193,373	Galaxy A5 (2017)
Apple	iPhone	Apple iPhone	11.2.6	172,484	(not set)
Samsung	SM-G965F	Samsung SM-G965F Galaxy S9+	8.0.0	161,837	Galaxy S9+
		Samsung SM-G955F Galaxy S8			

Mobile device long-tail

Top 3 devices omitted for better scaling





Results

3.3 million user visits on “legacy” devices

Source: GOV.UK Google Analytics (12 January 2023 - 11 February 2023)

6% of all user visits or 10% of mobile user visits

Source: GOV.UK Google Analytics (12 January 2023 - 11 February 2023)

Top 10 legacy devices

Legacy Mobile Device	OS Version	Users
Apple iPad	9.3.5	286,850
Apple iPad	10.3.3	220,197
Samsung SM-G920F Galaxy S6	7	182,633
Samsung SM-J320FN Galaxy J3 Duos	5.1.1	144,563
Apple iPhone	10.3.3	130,019
Samsung SM-G925F Galaxy S6 Edge	7	85,625
Samsung SM-J510FN Galaxy J5 (2016)	7.1.1	70,448
Sony G3311 Xperia L1	7	62,859
Samsung SM-G900F Galaxy S5	6.0.1	61,594
Microsoft Windows RT Tablet	8.1	56,788

Source: GOV.UK Google Analytics (12 January 2023 - 11 February 2023)

“Legacy” iPad usage has fallen by 32% in 10 months.

Source: GOV.UK Google Analytics (January 22 vs February 2023), iPads on iOS 9.3.5 & iOS 10.3.3

iPad 2 vs Microsoft Corporation Surface Go

Geekbench Scores

	iPad 2	Microsoft Corporation Surface Go
Single-Core Score	342	1865
Multi-Core Score	589	3343
	Geekbench 4.2.2	Geekbench 4.4.1 Tryout

Source: Geekbench 4 (<https://browser.geekbench.com/v4/cpu/compare/14581700?baseline=14594636>)

	iPad			iPhone		
	iPad (2nd generation)	iPad Pro (11-inch)	Times more powerful	iPhone 5c	iPhone 8 Plus	Times more powerful
Single-core	342	2,271	15	771	8,528	12
Multi-core	589	8187	32	1,267	21,082	17

Source: Geekbench 4 Browser (January 2023)

“Modern” devices

“There is a growing gap between what a high-end device can handle and what a middle to low-end device can handle.”

Source: Tim Kadlec - The Ethics of Web Performance

Mid to low-end device performance

	Alcatel 1x (2018)	Pixel 2 (2017)	Times more powerful
Single-core	584	1,813	4
Multi-core	1,517	6,310	5

Source: Geekbench 4 Browser (January 2023)

Identify and test on low spec devices



User connections

UK average broadband speed in 2019: 22.37 Mbps

Source: Worldwide broadband speed league 2019

‘Not-spots’ in London reported as low as 0.26 Mbps

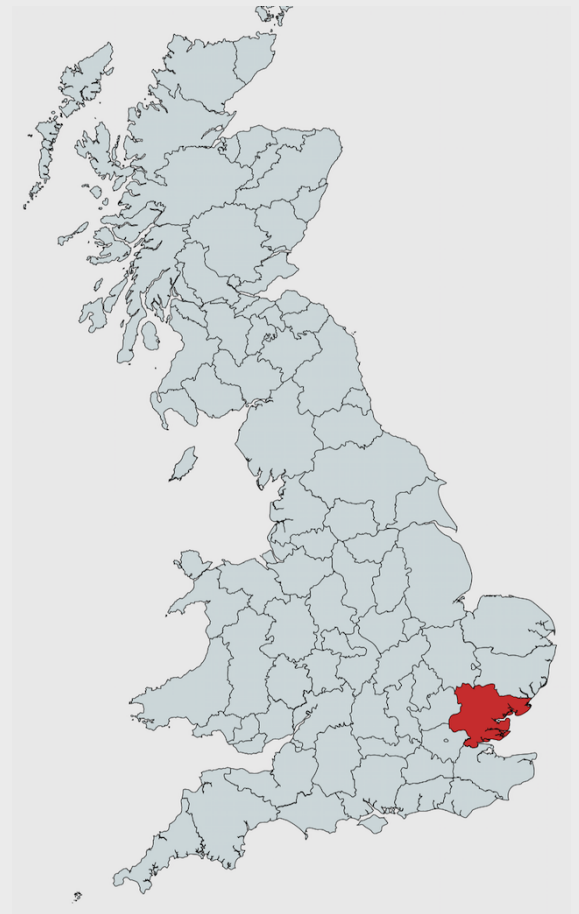
Source: London Digital Connectivity Report 2017

8% of indoor spaces in the UK have no mobile data coverage

Source: Ofcom Connected Nations Report - January 2019

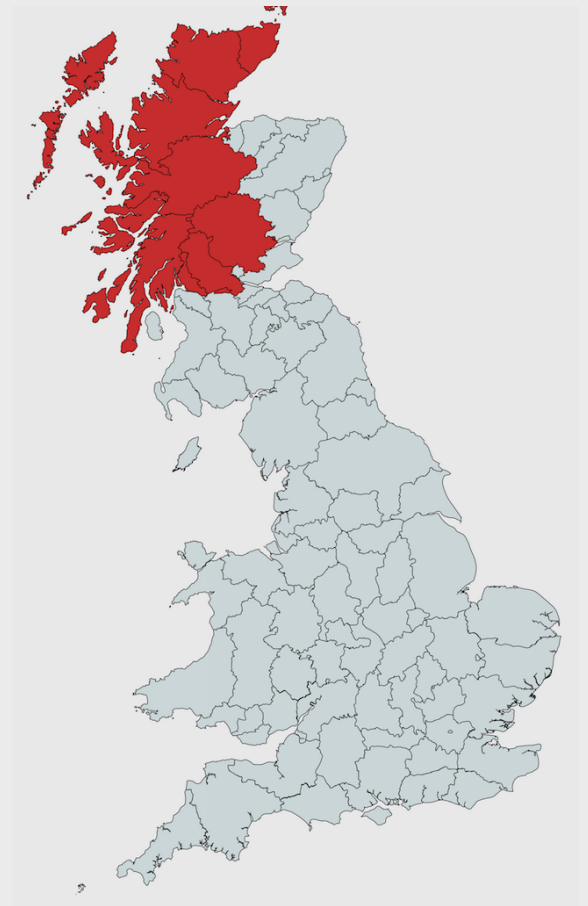
“I still have to walk around my Essex garden trying to obtain a phone line [signal] let alone 5G.”

Source: BBC 5G: EE launches UK's next-generation mobile network - 30 May 2019



“It would be nice if the Highlands of Scotland, and other ‘not spots’ were targeted first - so that we can actually get broadband!”

Source: BBC 5G: EE launches UK's next-generation mobile network - 30 May 2019



Average monthly mobile data plan in the UK costs
£18.36 for 1.9GB of data per month

Source: Ofcom Pricing Report 2018

Total Kilobytes

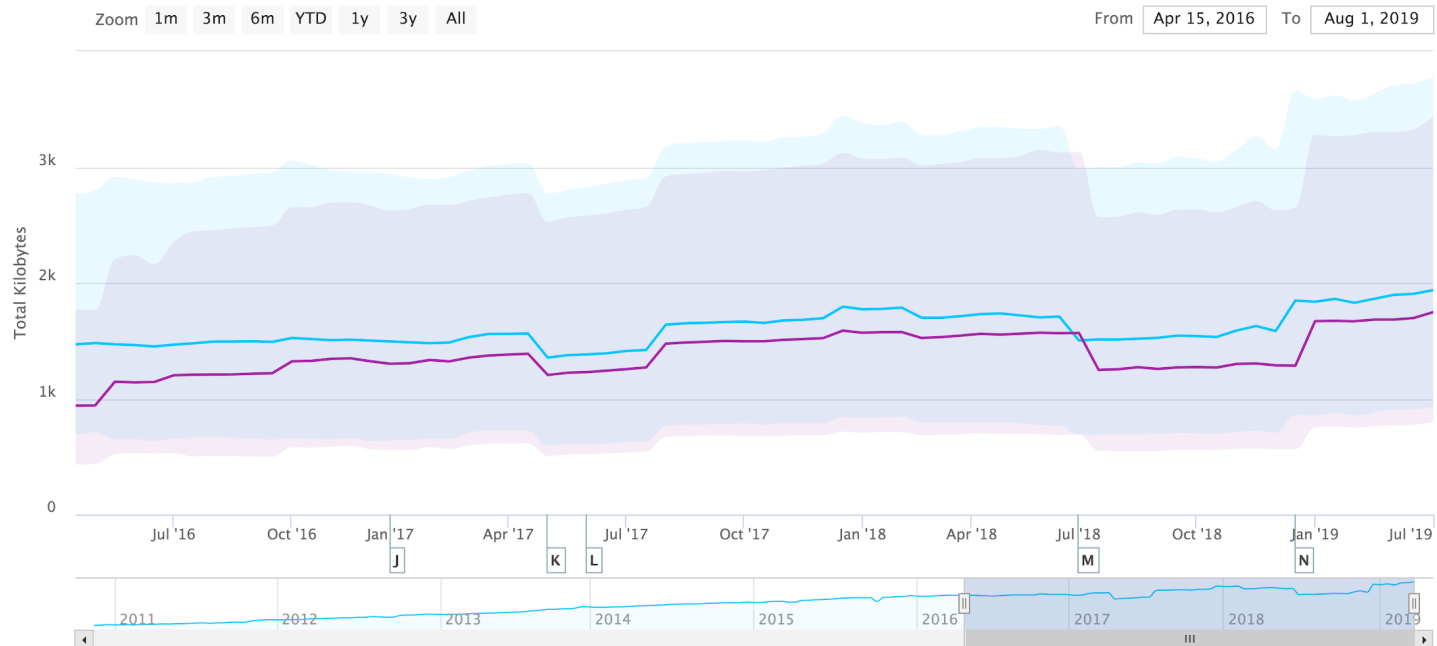
The sum of [transfer size](#) kilobytes of all resources requested by the page.

See also: [Page Weight](#)

MEDIAN DESKTOP **1936.7 KB** ▲31.8%
MEDIAN MOBILE **1747.5 KB** ▲85.9%

Timeseries of Total Kilobytes

Source: httparchive.org



Source: HTTP Archive State of the Web report - Aug 2019

— Desktop — Mobile

MEDIAN DESKTOP
1936.7 KB

MEDIAN MOBILE
1747.5 KB

▲28.1%

▲39.4%

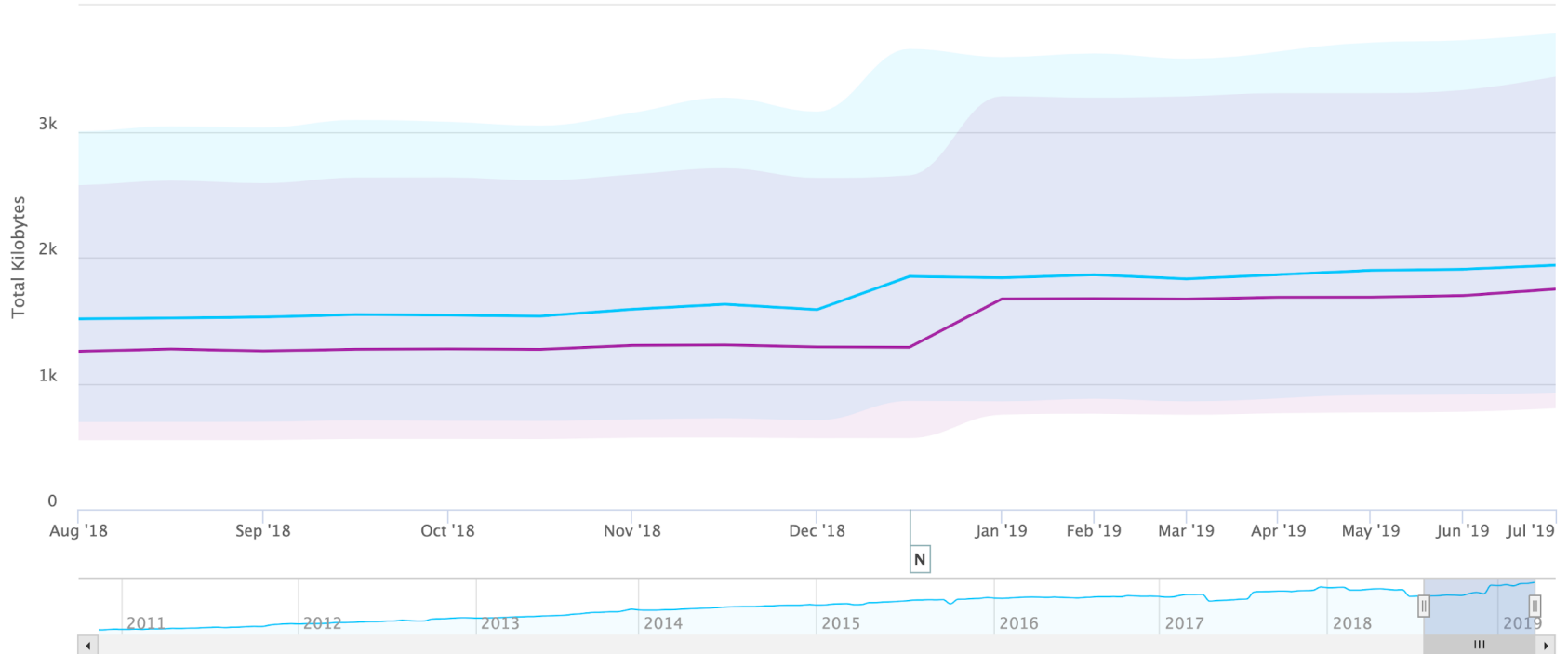
Timeseries of Total Kilobytes

Source: httparchive.org



Zoom 1m 3m 6m YTD 1y 3y All

From Aug 1, 2018 To Aug 1, 2019



Source: HTTP Archive State of the Web report - Aug 2019

— Desktop — Mobile

Connection Distribution

SOURCE: CHROME USER EXPERIENCE REPORT

4G

95.28%

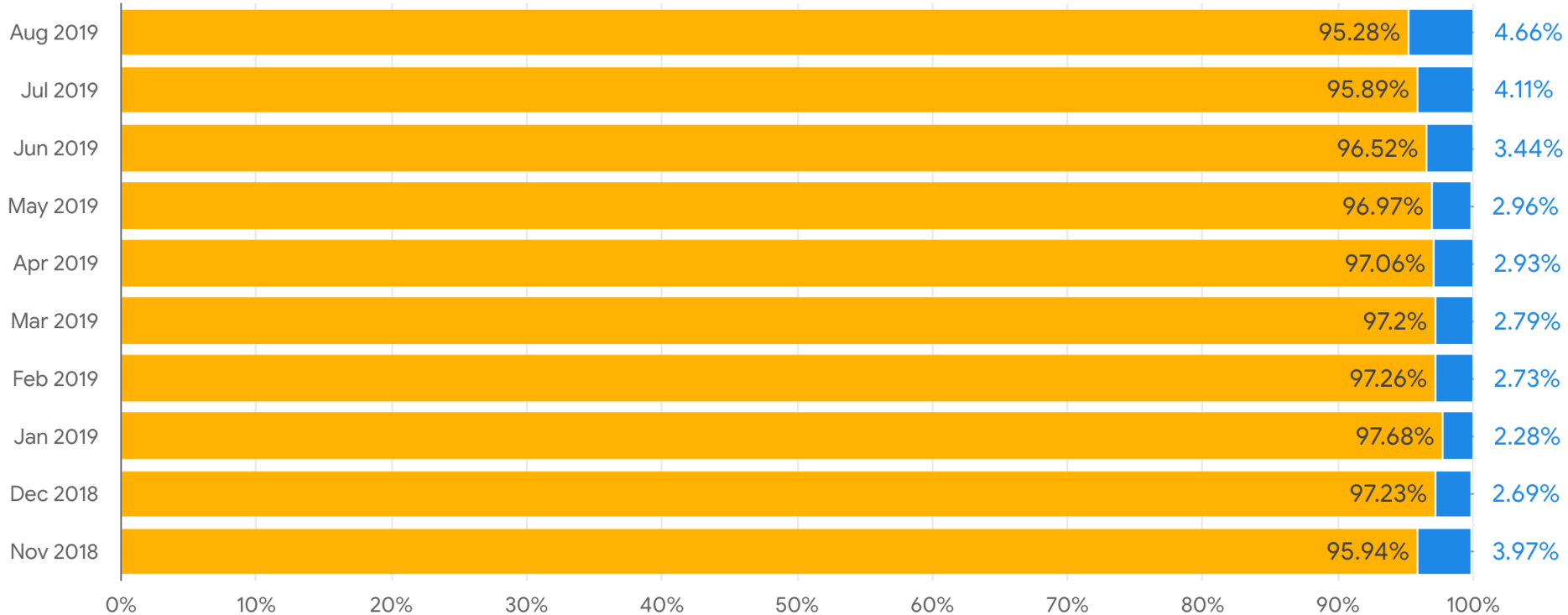
↓ -0.6%

3G

4.66%

↑ 13.4%

4G 3G



Source: Chrome User Experience Report - Sept 2019

Test websites on poor connections

A close-up photograph of a wooden Scrabble board. The word "STRESS" is spelled out in a row of seven wooden tiles. Each tile has a letter and a point value: S (1), T (1), R (1), E (1), S (1), S (1). Several other tiles are scattered around, including 'E' (1), 'H' (4), 'A' (1), 'D' (2), and 'R' (1). The background is a wooden surface.

User stress

- Applying for a passport
- Register a death
- Applying for benefits
- Filing a tax return
- Applying for a divorce
- Applying for a blue badge

[@GOVUK](#) tried renewing my blue badge via the website today - it no longer allows you to save your progress so 3 hrs work wasted when it decided it had waited long enough for me to finish - as there is a complex medical history that is a lot of work to redo 🙄



Photography for Fun [@photographyforfun](#)
11th Apr '23 10:45 AM

Users have to concentrate 50% more when trying to complete a simple task on a badly performing website

Source: Web Stress: A Wake-Up Call for European Business

A wide-angle photograph of a solar farm at sunset. The sky is a mix of orange, yellow, and blue, with silhouettes of mountains in the distance. The foreground and middle ground are filled with rows of solar panels, each tilted at an angle. The word "Sustainability" is overlaid in large white text across the center of the image.

Sustainability

[Home](#)

News story

UK becomes first major economy to pass net zero emissions law

English | [Русский](#)

New target will require the UK to bring all greenhouse gas emissions to net zero by 2050.

Published 27 June 2019

From: [Department for Business, Energy & Industrial Strategy](#) and [Chris Skidmore MP](#)



Chris Skidmore signs legislation to commit the UK to a legally binding target of net zero emissions by 2050

Related content

[Law for net zero emissions begins passage through Parliament](#)

[Committee on Climate Change 'Net Zero'](#)

“We will need to be sure that we are using clean and green digital and technology services and practices”

Source: The Greening Government Sustainable Technology Strategy 2016-2020

“ICT currently accounts for around 3.6% of global electricity use and 1.4% of greenhouse gas emissions”

Source: The Energy and Carbon Footprint of the Global ICT and E&M Sectors 2010–2015, Malmodin and Lunden

GDS estimates running all our services produce up to 4,000 tonnes of CO2 a year

Source: GDS Sustainability Network - <https://gds.blog.gov.uk/2019/10/03/measuring-the-climate-impact-of-our-digital-services-at-gds/>



Watlington Primary School

Watlington Cricket Club

Icknield Community College

Wild Thyme

The Chequers

Technical Moulding Projects

Counter Production

MKO ENGINEERING

Watlington Parish Council

The Fat Fox Inn

Co-op Food

The Carriers Arms

Watlington Service Station

St Edmunds Campion RC Church

The Black Pig Chiltern Hills - Hog Roast

Peter Osborne Fine Wines

Jones & Jacob

The Chiltern Surgery

White Mark Farm

- Larger assets = more hosting required
- More hosting = more computing power required
- More computing = more electricity required
- More electricity = more CO₂

The WWW is the greatest infrastructure mankind has ever created, but it comes at a cost



#webperf matters

Users on poor connections and older devices are excluded

Users can't get the information and guidance they need

Policy?

EU Directive on the accessibility of public sector websites and mobile applications.

Moral obligation to make sure our websites perform well on as many user devices as possible



Always improving

HTTP/2

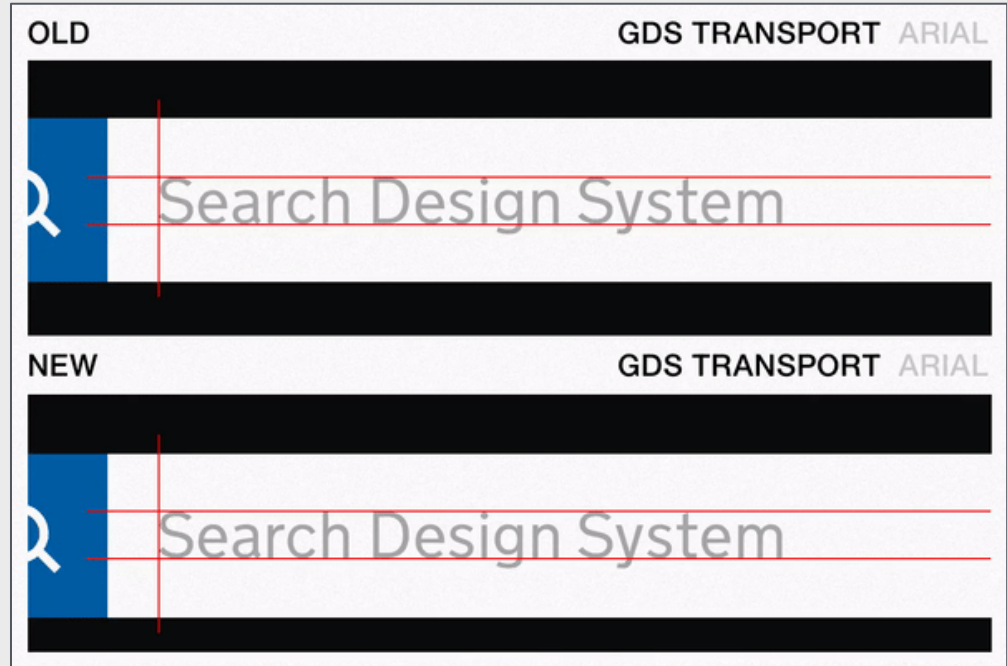
Browser / Connection	Homepage	Past PM page	Start page	Speech page	Organisation page
Chrome 69 Desktop / Native	h1	h1	h1	h1	h1
Chrome 69 Mobile / 3G	h1	h2	h2	h1	h1
Chrome 69 Mobile / 3G Slow	h1	h1	h2	h1	h1
Firefox 62 Desktop / Native	h1	h1	h1	h1	h2
Firefox 62 Mobile / 3G	h1	h1	h1	h1	h2
Firefox 62 Mobile / 3G Slow	h1	h1	h1	h1	h2
Nexus 5 Chrome Mobile / 3G	h1	h1	h1	h1	h1
iPhone 5C / 4G	h2	h2	h2	h2	h1/h2
Nexus 5X / 3G Fast	h1/h2	h2	h1/h2	h1/h2	h1

Source: Sitespeed.io 7.5.0 - Comparing First Visual Change, Visual Complete 95%, Last Visual Change, Fully loaded, Speed Index.

New webfont

Font	v1	v2	Difference
Bold WOFF2	55KB	32KB	-42%
Bold WOFF	73KB	41KB	-44%
Bold EOT	72KB	57KB	-21%
Light WOFF2	68KB	33KB	-51%
Light WOFF	96KB	43KB	-55%
Light EOT	92KB	57KB	-38%

Font EM box adjustment



Font-display property

```
.font-adjustments {  
  font-display: auto;  
  font-display: block;  
  font-display: swap;  
  font-display: fallback;  
  font-display: optional;  
}
```

Brotli compression

File Type	Size (bytes)	Compression type	Saved	Saved(%)	Diff to gzip (zlib) (%)
All HTML uncompressed	209,835	none	0	0	0
All HTML gzip (zlib)	48,303	zlib	161,532	76.98	0
All HTML gzip (zopfli)	45,689	zopfli	164,146	78.23	5.41
All HTML Brotli	33,246	brotli	176,589	84.16	31.17
All CSS uncompressed	1,024,257	none	0	0	0
All CSS gzip (zlib)	130,122	zlib	894,135	87.30	0
All CSS gzip (zopfli)	122,560	zopfli	901,697	88.03	5.81
All CSS Brotli	96,622	brotli	927,635	90.57	25.75
All JS uncompressed	458,132	none	0	0	0
All JS gzip (zlib)	122,452	zlib	335,680	73.27	0
All JS gzip (zopfli)	118,730	zopfli	339,402	74.08	3.04
All JS Brotli	106,306	brotli	351,826	76.80	13.19
All assets uncompressed	1,482,389	none	0	0	0
All assets gzip (zlib)	252,574	zlib	1,229,815	82.96	0
All assets gzip (zopfli)	241,290	zopfli	1,241,099	83.72	4.47
All assets Brotli	202,928	brotli	1,279,461	86.31	19.66

Image lazy loading

History

Past Prime Ministers

76

Past Prime Ministers

The Rt Hon Theresa May MP

The Rt Hon David Cameron

The Rt Hon Gordon Brown

The Rt Hon Tony Blair

The Rt Hon Sir John Major KG CH

Baroness Margaret Thatcher

James Callaghan

Harold Wilson

Sir Edward Heath

Harold Wilson

Sir Alec Douglas-Home

Harold Macmillan

Sir Anthony Eden

Sir Winston Churchill

Clement Attlee

Sir Winston Churchill

Neville Chamberlain

Stanley Baldwin

James Ramsay MacDonald

Stanley Baldwin

James Ramsay MacDonald

Stanley Baldwin

Andrew Bonar Law

David Lloyd George

20th & 21st centuries



The Rt Hon Theresa May MP

2016 to 2019



The Rt Hon David Cameron

Conservative 2010 to 2016



The Rt Hon Gordon Brown

Labour 2007 to 2010



The Rt Hon Tony Blair

Labour 1997 to 2007

19th century



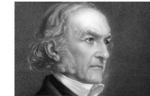
Robert Gascoyne-Cecil, 3rd Marquess of Salisbury

Conservative 1895 to 1902



Archibald Primrose, 5th Earl of Rosebery

Liberal 1894 to 1895



William Ewart Gladstone

Liberal 1892 to 1894



Robert Gascoyne-Cecil, 3rd Marquess of Salisbury

Conservative 1886 to 1892

18th century



William Pitt 'The Younger'

Tory and Whig 1783 to 1801



William Cavendish-Bentinck Duke of Portland

Whig 1783 to 1783



William Petty, 2nd Earl of Shelburne

Whig 1782 to 1783



Charles Watson-Wentworth, 2nd Marquess of Rockingham

Whig 1782 to 1782

User-centric performance metrics

Metric	Without LL	With LL	diff
First Contentful Paint	3271 ms	2520 ms	-22%
First Meaningful Paint	3393 ms	2578 ms	-24%
Time to Interactive	3325 ms	2840 ms	-15%
Speed Index	3564 ms	3240 ms	-9%
Fully Loaded	7280 ms	5821 ms	-20%
Total Bytes	1011 KB	761 KB	-25%

Source: Web Page Test, 3G Fast, Chrome 78.0.3880.4

Guidance



GOV.UK Service Manual



BETA Complete our quick 5-question survey to [help us improve our content](#).

[Service manual](#) > [Technology](#) > [How to test frontend performance](#)

Technology

[Give feedback about this page](#)

How to test frontend performance

From: [Technology community\(frontend development\)](#)

Last updated: 7 months ago

Page contents:

- [Why frontend performance matters](#)
- [Use performance as a metric](#)
- [Set a performance budget](#)
- [How to run performance tests](#)

Websites that perform badly can frustrate users and drain their data plans and battery life. You can address this by making sure your service frontend is as fast and lightweight as possible.

This will also mean your service works well on a range of devices.

Why frontend performance matters

By focusing on frontend performance, you can improve both the speed and

Service Standard

1. Understand users and their needs
2. Solve a whole problem for users
3. Provide a joined up experience across all channels
4. Make the service simple to use
5. Make sure everyone can use the service
6. Have a multidisciplinary team
7. Use agile ways of working
8. Iterate and improve frequently
9. Create a secure service which protects users' privacy
10. Define what success looks like and publish performance data
11. Choose the right tools and technology
12. Make new source code open
13. Use and contribute to open standards, common components and patterns
14. Operate a reliable service

GOV.UK Design System

BETA This is a new service – your [feedback](#) will help us to improve it.

[Get started](#) [Styles](#) [Components](#) [Patterns](#) [Community](#)

Design your service using GOV.UK styles, components and patterns

Use this design system to make your service consistent with GOV.UK. Learn from the research and experience of other service teams and avoid repeating work that's already been done.

[Get started >](#)

Styles

Make your service look like GOV.UK with guides for applying layout, typography, colour and images.

Components

Save time with reusable, accessible components for forms, navigation, panels, tables and more.

Patterns

Help users complete common tasks like entering names and addresses, filling in forms and creating accounts.

Digital, Data and Technology Profession

Collection

Digital, Data and Technology Profession Capability Framework

Digital, data and technology (DDaT) roles in government and the skills needed to do them.

Published 23 March 2017

Last updated 5 August 2019 — [see all updates](#)

From: [Digital, Data and Technology Profession](#)

Contents

- [Data: data analyst](#)
- [Data: data engineer](#)
- [Data: data scientist](#)
- [Data: performance analyst](#)
- [IT operations: business relationship manager](#)
- [IT operations: change and release manager](#)
- [IT operations: command and control centre manager](#)
- [IT operations: engineer - application operations](#)
- [IT operations: engineer - end user computing](#)

Related content

[Senior product manager: skills they need](#)

[Senior business analyst: skills they need](#)

[Head of \(agile\) delivery management: skills they need](#)

[Principal business analyst: skills they need](#)

[Business analyst: skills they need](#)

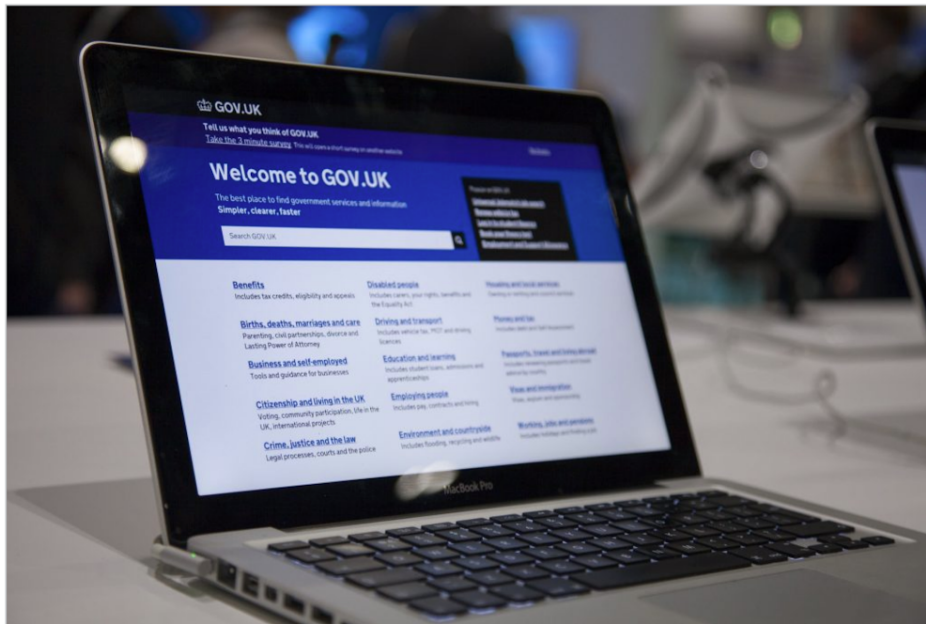
Web Performance Optimisation

Understands the delivery of assets can have a large impact on user experience. Can apply technical knowledge and experience to remove bottlenecks to improve performance. Can use various sources of data to monitor and identify performance issues. Explores different approaches to solving performance problems.

Technology Blogging

Why we focus on frontend performance

Matt Hobbs, GDS, Head of Frontend, 18 April 2019 - GOV.UK Performance, Transformation



We've recently updated the [Service Manual guidance](#) to help developers across government identify and test performance issues before they become a problem for users.

Technology in government

This is for everyone: documenting how we're building, assembling and running digital and technology projects across the UK government. [Find out more.](#)

Categories

Select Category

Work with us

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 [Atom](#)

Find out more

NHS Website:

- 70-80% of users on mobile
- 45% reduction in CSS size
- 10% reduction in JavaScript size
- 32% reduction in page weight (700KB)
- Saving mobile network users ~7,420GB per month

Source: Improving the NHS website using the frontend library - Dave Hunter (https://youtu.be/Bzs_qJtuxE4?t=1076)

Final thoughts



MEDIAN DESKTOP

1936.7 KB

▲31.8%

MEDIAN MOBILE

1747.5 KB

▲85.9%

- Who are your users?
- What are their stories?
- What devices are your users using?
- What connection speeds do they have?
- What core service are they there for?
- Have you tested on real devices, real connections?
- Have you tested with users to minimise their stress?

Be inclusive, not exclusive

Empathy



“Make people’s lives better...

Source: Charlie Owen - Dear developer, the web isn't about you

...or at least not make it worse!”

Source: Charlie Owen - Dear developer, the web isn't about you



Cabinet Office

Thanks for listening!

Matt Hobbs

Twitter: @TheRealNooshu