

Surveillance on UK council websites

Brave's report on surveillance of UK citizens by private companies embedded on council websites



Foreword

People visit council websites to seek help and services. When you have a baby, move household, extend your house, get married or lose a loved one, UK law requires that you register these events with your council. Generally, you do so through the council website.

But companies embedded on council websites learn about you. This happens even on the most sensitive occasions, when you might be seeking help from your council for a health disability, drug problem, or financial distress.

Companies that you have never heard of build dossiers about you. They tie together your activity on websites and apps over time to calculate what you are interested in and what problems you struggle with. In short, by spying on your browsing, they can understand what makes you tick.

This gives these companies enormous power. Their profiles of you can be shared and sold. This exposes virtually everyone in the UK to the threat of profiling, manipulation, and discrimination at the hands of algorithms. This may determine whether an algorithm selects you for your next job interview, or perhaps the outcome of your next insurance application.

The effect might be mundane: setting the price of the next airline ticket you purchase. Or it could be profound: data collectors' dossiers might help political groups try to manipulate you with misleading messages.

Brave is designed to protect you from tracking and profiling on all websites. I invite you to visit your app store or **brave.com** to install it. Brave is faster, safer, and more secure than the alternatives. You can use it for free.

Few people realise that data companies profile them at every turn. Citizens are entitled to expect that public services do not allow private companies to surveil them on their websites. I hope that this report will alert UK citizens to this hazard, and prompt reflection at councils across the UK on their duty to protect people from surveillance capitalism.

This report should also **spur Elizabeth Denham, the UK Information Commissioner**, to enforce the law and force data companies to cease the widespread broadcast of personal data. It is **17 months** since evidence from Brave and complaints about breaches of data protection laws were filed before the ICO. The time to act is now.

Brendan Eich
CEO & Co-founder, Brave
February 2020



Contents

In this report, Brave reveals that people are extensively tracked by third party data collecting companies on their local councils websites. This applies with varying degrees of severity across the United Kingdom. The UK map (page 4) and tables (pages 17-21) show the number of third party data collectors in each council area. At its most dangerous, data brokers learn directly from council sites when individuals read about alcoholism and substance abuse assistance, as shown on page 13.

Introduction

1. Foreword
2. Table of contents
3. Key insights

Data

4. Council Data Leaks Map
5. Your data trail
6. Big councils with the most trackers
7. Real-time bidding: the UK's worst data breach
8. Regulatory failure to protect UK citizens against RTB
9. Data brokers are listening
10. Share Buttons that spy
11. The consent scam

Examples

12. Profiling you as a "Budgeter on benefits"
13. Data companies know who is an alcoholic
14. Targeting disabled children and their parents

Appendices

15. How to protect yourself
16. Methodology, caveats, and references
17. Tables

Key insights

People in the UK are profiled by multiple companies when they visit council websites to register the birth of their baby, move of house, marriage, or a death in the family.

- **Nearly all council websites permit at least one company** to learn about the behaviour of people who visit them. People seeking information about **disability, poverty, drugs and alcoholism** services are profiled by data brokers on some council websites.
- **198 council websites in the UK** use the “real-time bidding” (RTB) form of advertising. Real-time bidding is **the biggest data breach ever recorded in the UK**. Though illegality is not in dispute, **the UK Information Commissioner (ICO) has failed to act**.
- Google operates systems used behind the scenes on many Council sites. **Google owns all five of the top embedded elements loaded by council websites, giving it the power to know what virtually anyone in the UK views on council sites**.
- **Over a quarter of the UK population** is served by councils that embed **Twitter, Facebook, and others** on their sites, leaking the sensitive issues people read about to these companies.
- **6.9 million** people are served by councils that allow data broker LiveRamp to track people on their sites. Until recently it was part of the Acxiom Group, which **sold data to Cambridge Analytica**.
- **None of the data collecting companies recorded in this study had received consent** from the website visitor to lawfully process data.
- Data leakage from council websites is a “**data breach**”, under Article 5(1)f of **the GDPR**.

198

Councils permit “real-time bidding” data breaches.

409

Council sites expose visitor data to private companies.

98%

Councils use Google systems, exposing visitors to Google.

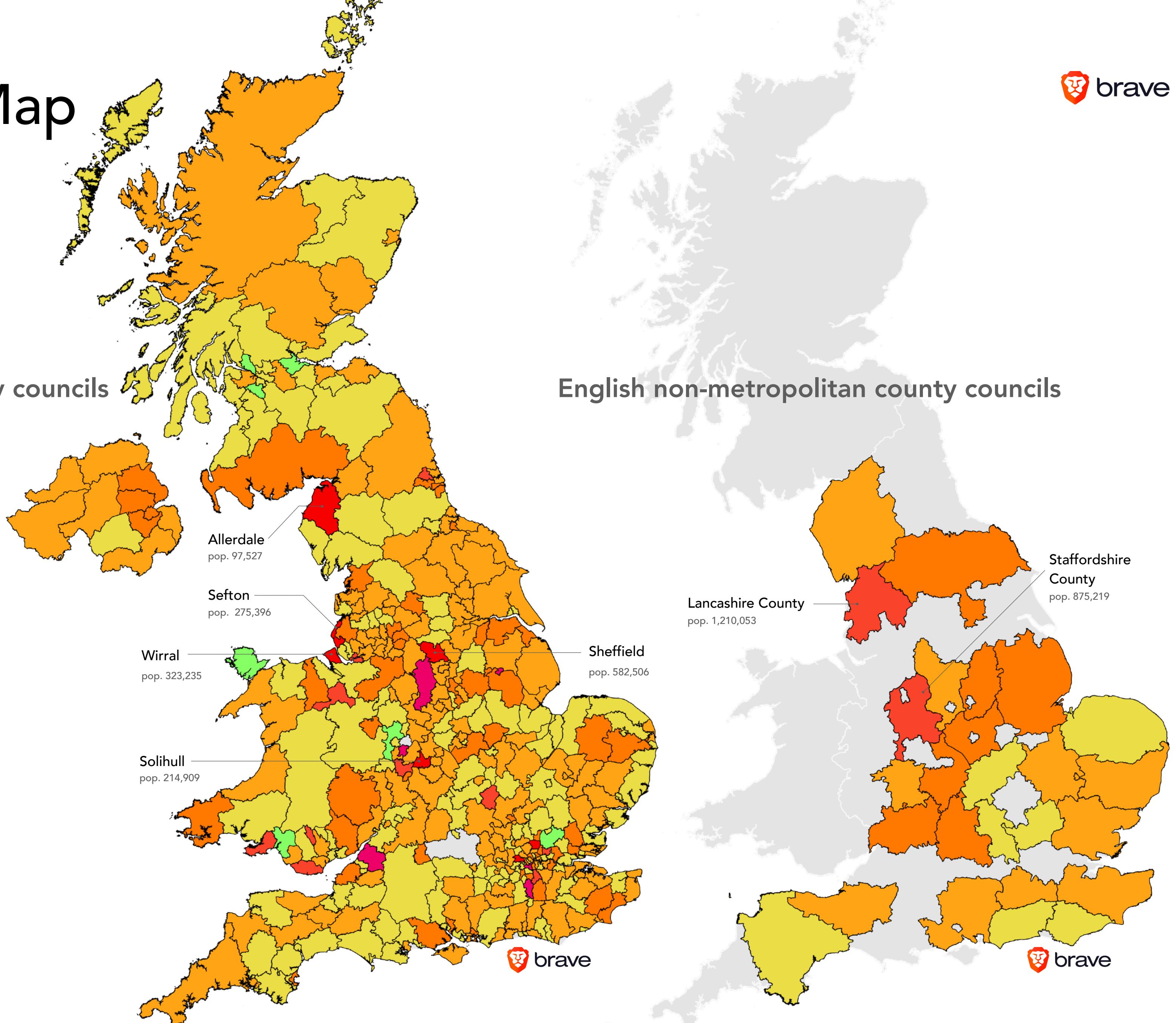
23

Councils allow data brokers to profile their users.

Council Data Leaks Map



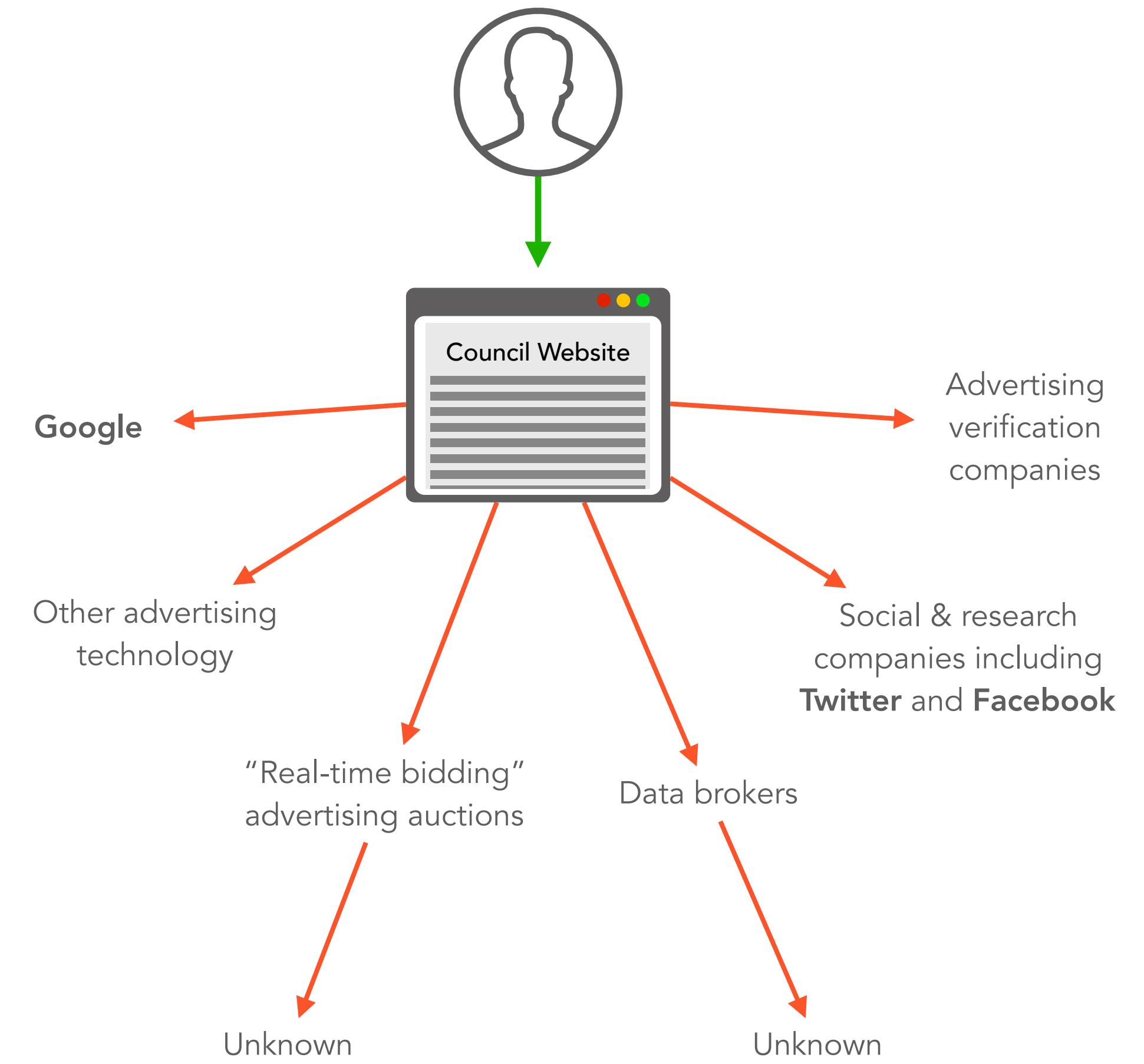
Number of private company data
collectors discovered on council websites



Your data trail

Every single time you load a web page, private companies receive the following data from any council websites that they are embedded on:

- The **URL (address) of each page** you visit. This can reveal sensitive things about you. For example, visits to a council page to apply for school places, or find school term dates, suggests you are a parent. If your child has a disability, you might visit the specific council page where you can apply for a disabled parking permit at your child's school. Similarly, the URLs of council pages for senior citizen parking, free public transport, home care, etc. reveal one's circumstances.
- **ID codes** that are specific to you, and that identify you as the person who loaded a specific page at a specific time.
- Your **location**.
- Your **device's details**, including its type, web browser and version, operating system and version, and in some cases the apps being used, screen resolution and preferred language.
- Your IP address (not always included in a real-time bidding broadcast).
- These ID codes, timestamp, and device details allow private companies to **tie what you do on one website or app together with what you view across the Internet**.



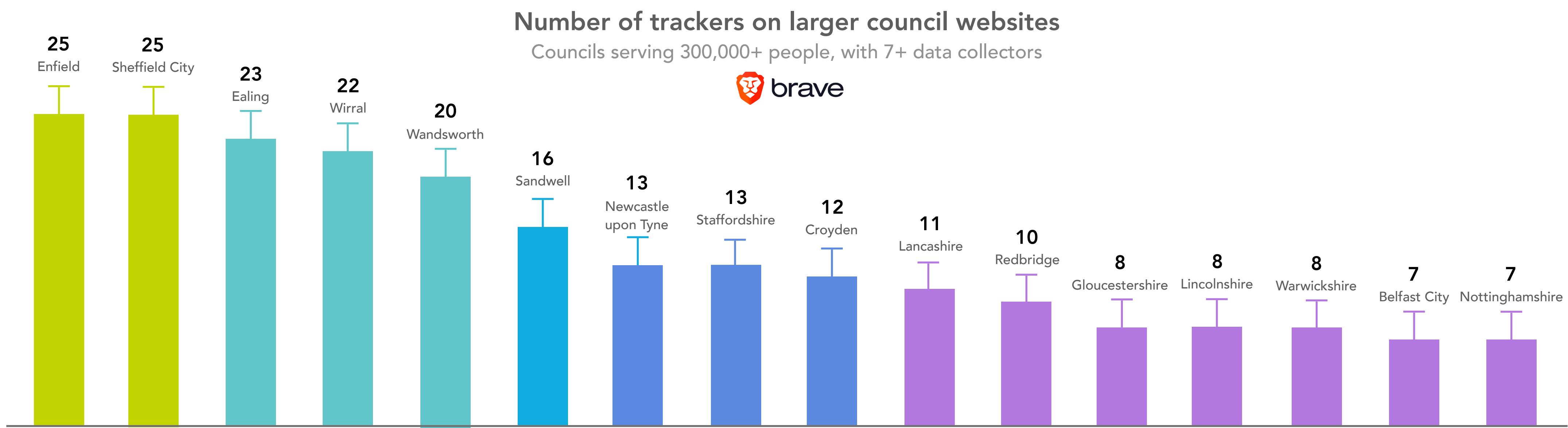
Big councils with the most trackers

The findings

- Many large councils (serving 300,000 or more people) expose citizens visiting their websites to extensive tracking and data collection by private companies.
- The most egregious examples involve **25 data collectors** operated by private companies on a single council website.

The bottom line

In the private sector, advertising is a legitimate and useful method of raising revenue. However, online advertising often uses tracking and profiling, even though this is not necessary to show useful ads. The result is a dangerous data “free for all” in which websites compete to load the most trackers onto their pages. The councils serving the most people appear to expose visitors to the most severe risk.



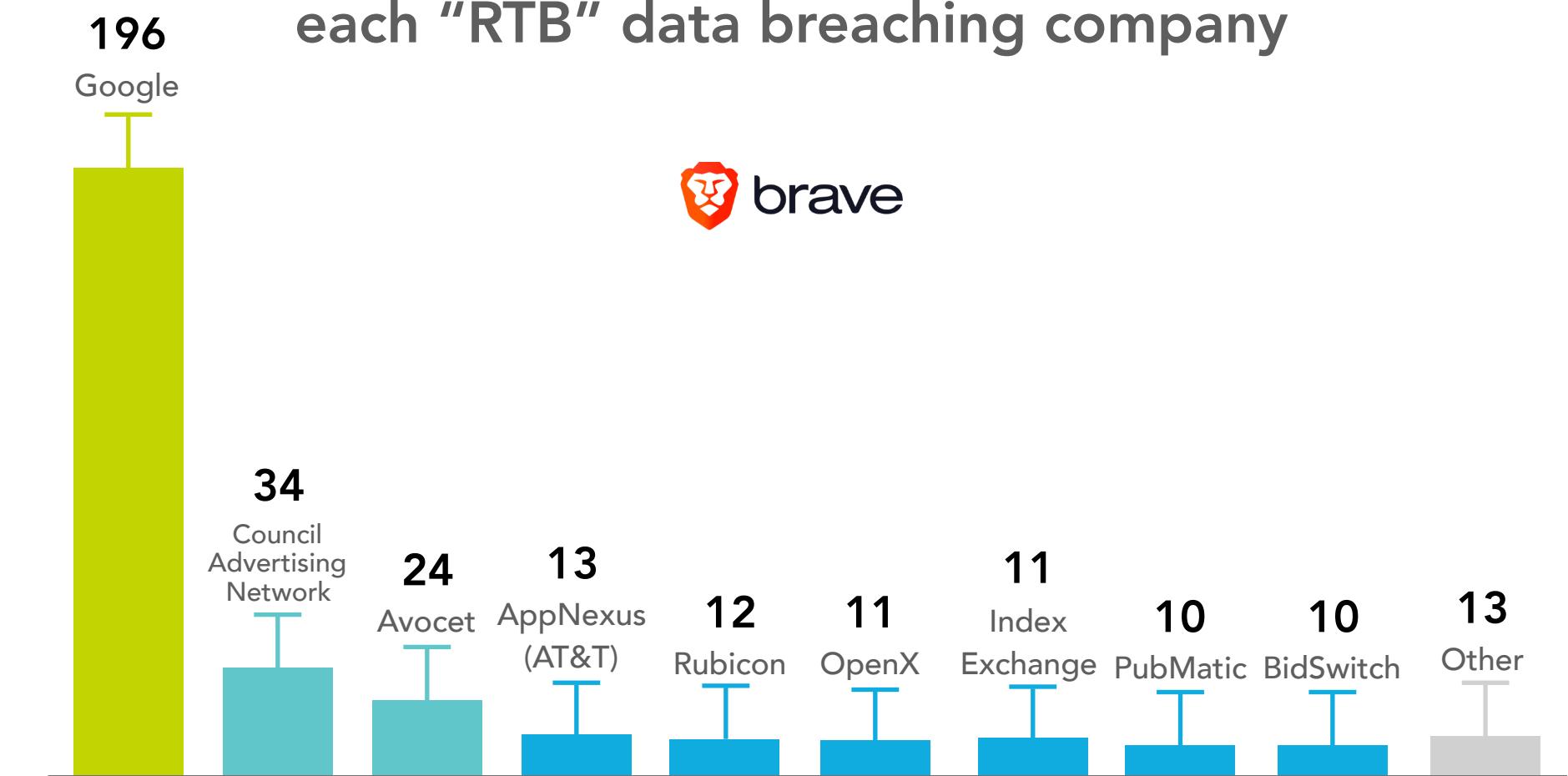
Real-Time Bidding: the UK's worst data breach

Many councils use “RTB” online advertising auctions to run ads on their websites. This is an enormous data breach, exposing people to profiling by innumerable companies, billions¹ of times a day.

The findings:

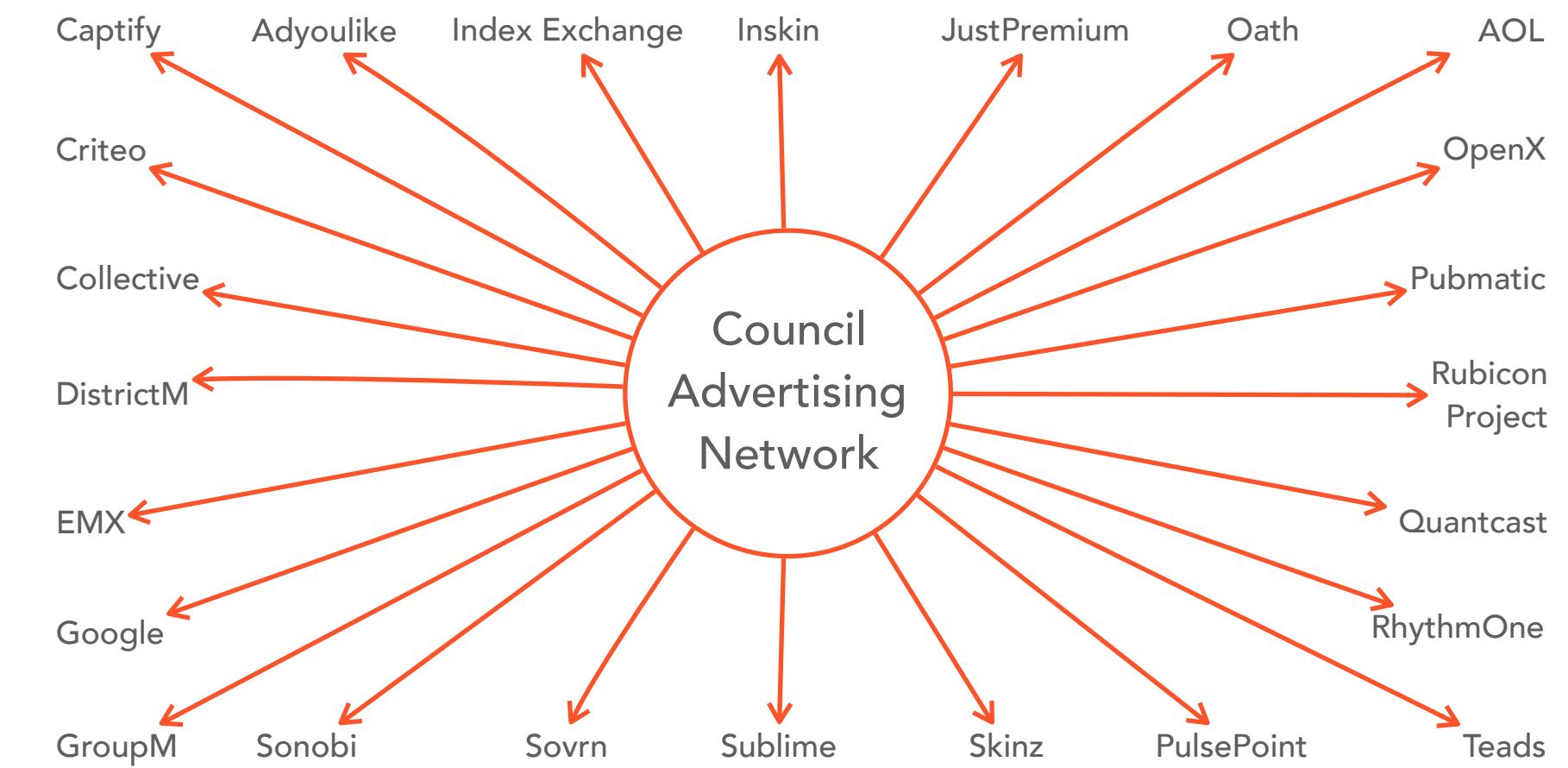
- **More than half** of council websites use “real-time bidding” (RTB) ad auctions. **RTB faces multiple GDPR investigations** for systematic data breaches, because it broadcasts people’s personal data to countless companies.²
- Often, **this information is extremely sensitive**: it can include unique ID codes to identify who is loading the page, their location, interests, and what they are reading or watching.³ These data can be tied together over time to build detailed profiles.
- **196 council** websites use Google’s RTB system. Google’s RTB shares data with **hundreds of companies**, without any assurance of who that data is then shared with or how it will be used.
- **34** councils use the Council Advertising Network. It shares people’s profile data with 22 other businesses including Google.⁴

Number of council sites that load each “RTB” data breaching company



Example: Council Advertising Network shares personal data with 22 partners

Ad exchanges can then broadcast the data on to 1000s of other companies.



Regulatory failure to protect the UK against RTB

Real-time bidding is the biggest data breach ever recorded in the UK.¹ Though illegality is not in dispute, the UK's privacy regulator (the ICO) has failed to act.

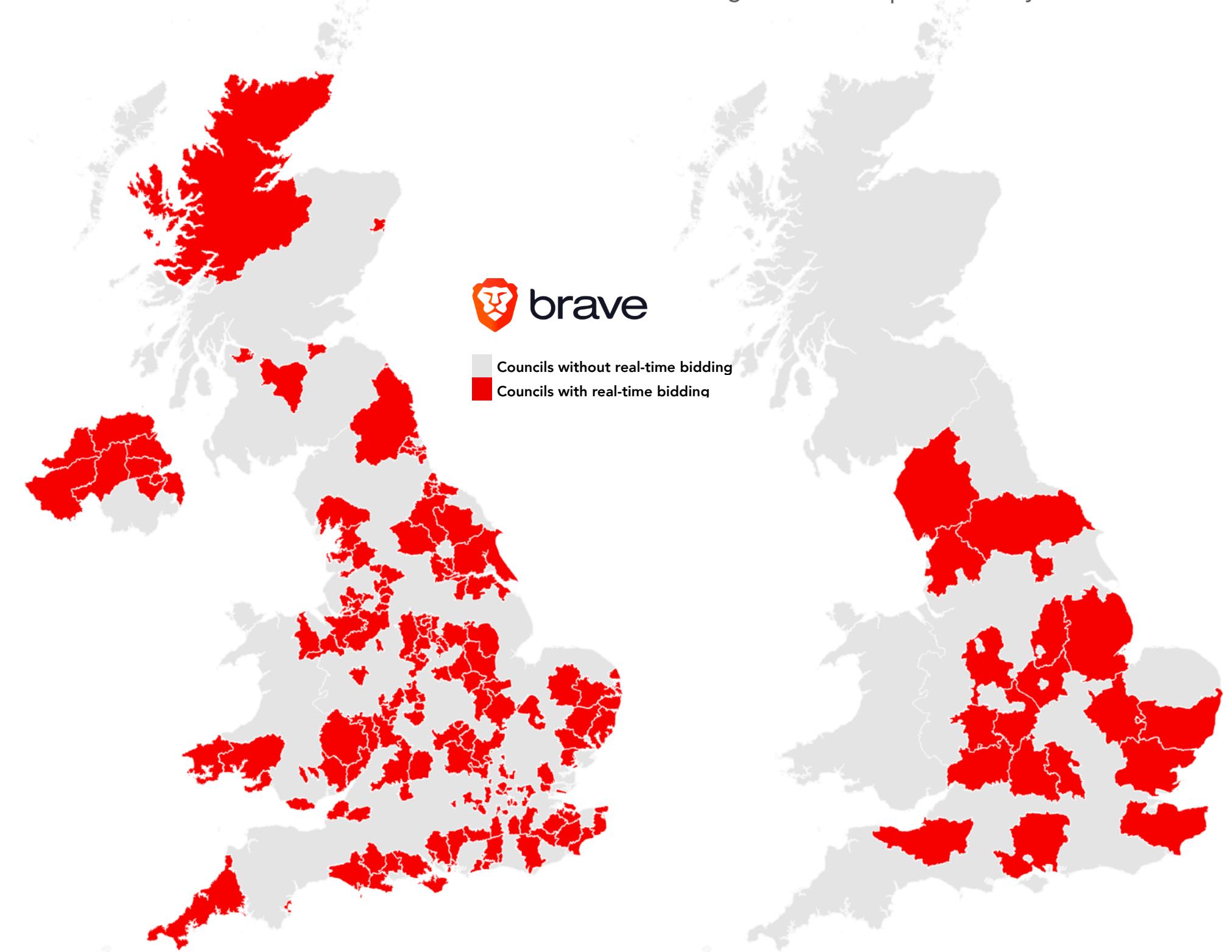
Timeline of ICO inaction:

- **January 2018** The ICO is contacted by Dr Johnny Ryan, then an industry whistle blower, about the RTB data breach.
- **September 2018** Brave initiates a campaign of formal GDPR complaints to stop the RTB data breach. The ICO receives Brave's evidence in GDPR complaints from Jim Killock of the Open Rights Group and Dr Michael Veale.
- **June 2019** The ICO announces that RTB is currently unlawful, and gives the industry six months to clean up.
- **December 2019** The ICO's six month grace period for the RTB industry ends. No substantive action is proposed by industry.
- **January 2020** The ICO announces it accepts the RTB industry's gestures, and will take no immediate action to stop the continuing RTB data breach.

198 Councils use "real-time bidding" advertising on their sites

UK local and unitary councils

English non-metropolitan county councils



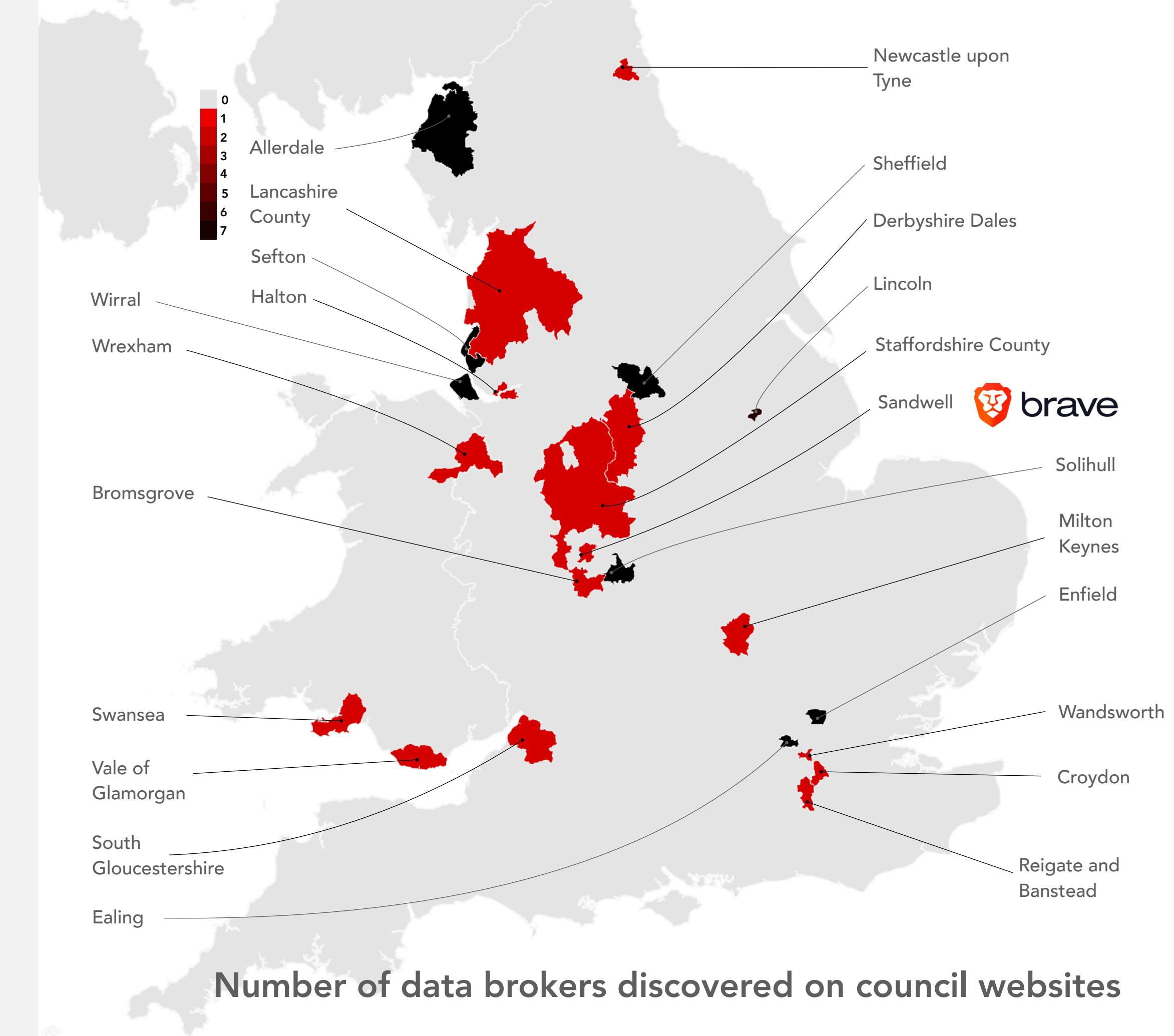
The Information Commissioner's Office is responsible for enforcing data protection and privacy law in the UK.

Data Brokers are listening

Data brokers build dossiers of information about people in order to sell information about them. This is a shadowy industry, and there is little transparency about how information about you is used, or by whom.

The findings:

- **23 council websites** allow data broker companies to learn about what a person does when they visit their site. This can reveal very sensitive characteristics about a person's financial circumstances, and health.
- **8 councils** allow **five or more data brokers** to profile people visiting their websites.
- LiveRamp, a data broker, is active **on 9 council websites**. Until recently it was **part of the Acxiom Group, which sold data to Cambridge Analytica**.⁵ These councils serve **6.9 million people**.
- **LiveRamp claims to have profiles of 67% of the entire UK population** (over 45 million people), "based on touchpoints from the real world that are ... tied with online identifiers".⁶



These data broker companies were discovered



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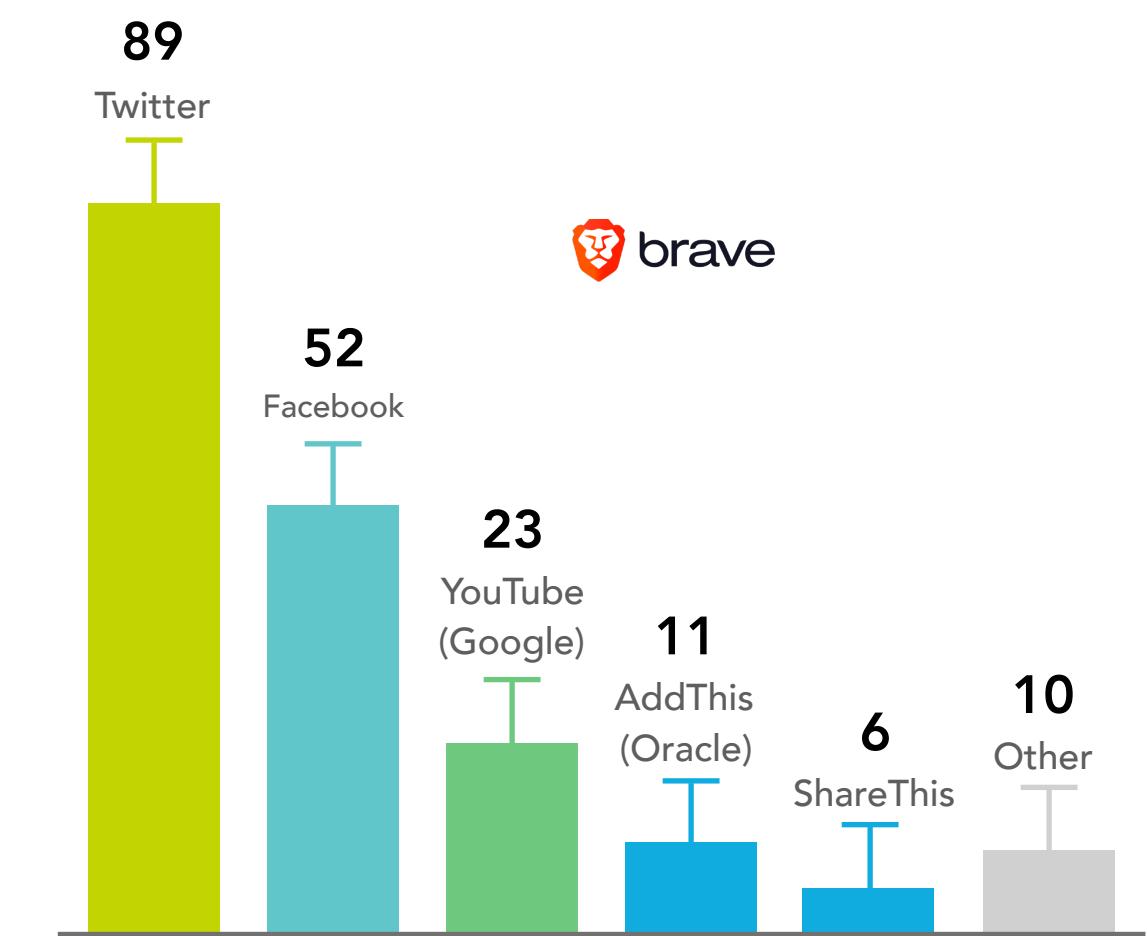
Share buttons that spy

Facebook, Twitter, and many other companies are able to learn about people because of social sharing buttons that appear on council websites.

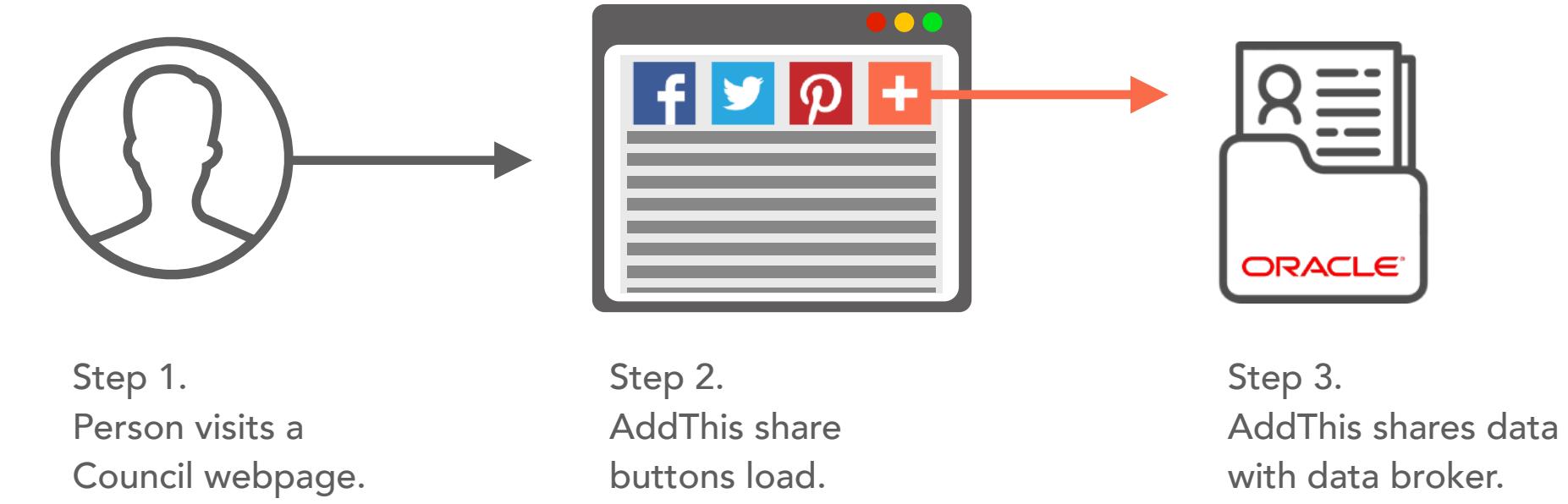
The findings:

- **More than a third (38%) of council sites** have a social plug-in that tells social platforms or “audience research” companies what people are reading.
- **89 council websites** use **Twitter** tools that leak people’s behaviour on their sites to the social platform. These councils serve **19 million people**.
- **52 council websites** use **Facebook** tools. These councils serve **14.2 million people**.
- **23 council websites** are using YouTube, potentially exposing **5.7 million** people to Google.
- In addition, other social tools are on **50 council websites**.

Social tools and plug-ins on council sites



Example: AddThis share buttons



Step 1.
Person visits a
Council webpage.

Step 2.
AddThis share
buttons load.

Step 3.
AddThis shares data
with data broker.

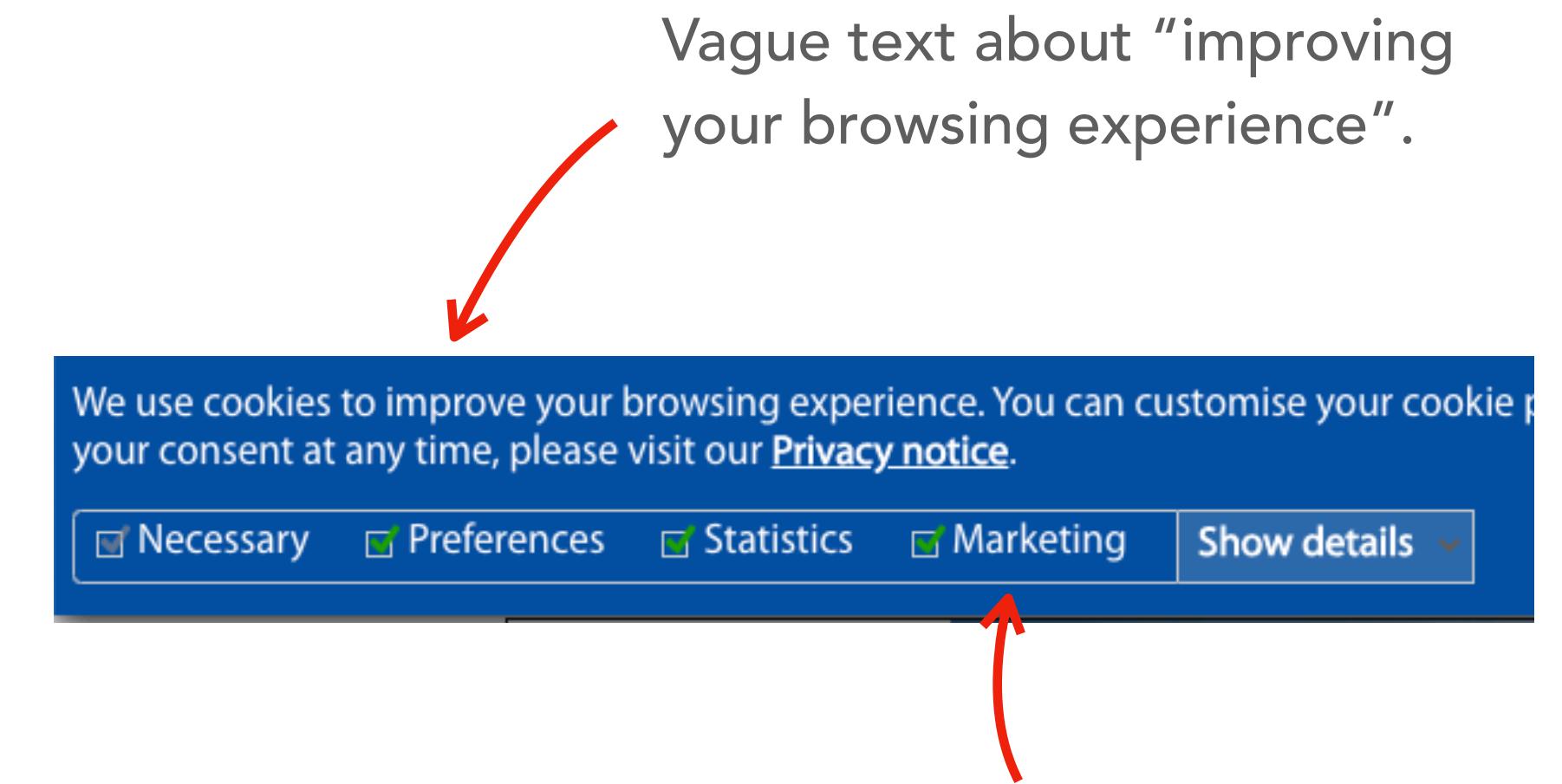
“AddThis” is a free tool for websites to let their users share on social networks. It is owned by Oracle, a data broker.⁷

The consent scam

The consent requests shown on many council websites purport to comply with the GDPR, but are in reality an attempt to obfuscate what is really happening to the visitor's data. In any case, the user's answer was generally ignored.

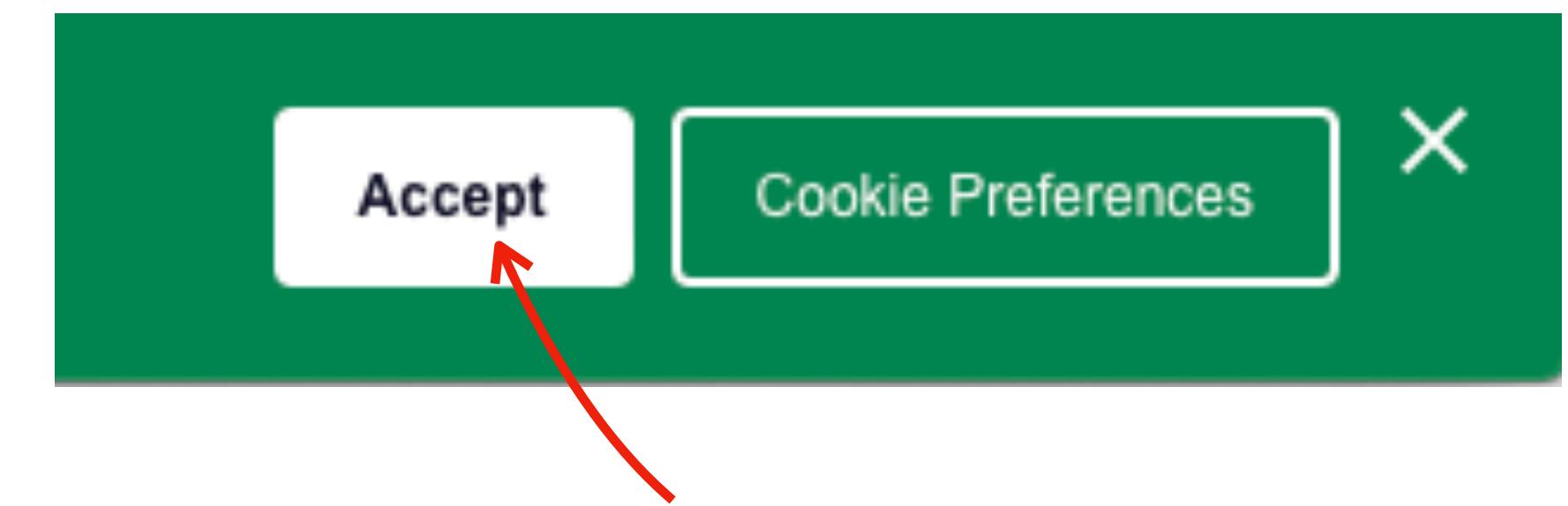
The findings:

- **Despite no consent button being clicked**, data collecting companies continued to process personal data.
- The consent system used by these companies has no effective auditing that ensures the data are not misused. The UK Information Commissioner says it is "**insufficient to provide for free and informed consent**".⁸
- **The data leakage revealed in this report is a "data breach"** under Article 5(1)f of the GDPR. Personal data must be protected "against unauthorised or unlawful processing and against accidental loss, destruction or damage, using appropriate technical or organisational measures". This makes it impossible to correctly obtain or give consent.



Vague text about "improving your browsing experience".

No indication of what is happening to the data, even if one clicks for more information. The options are pre-ticked default.



No immediately visible way to opt-out

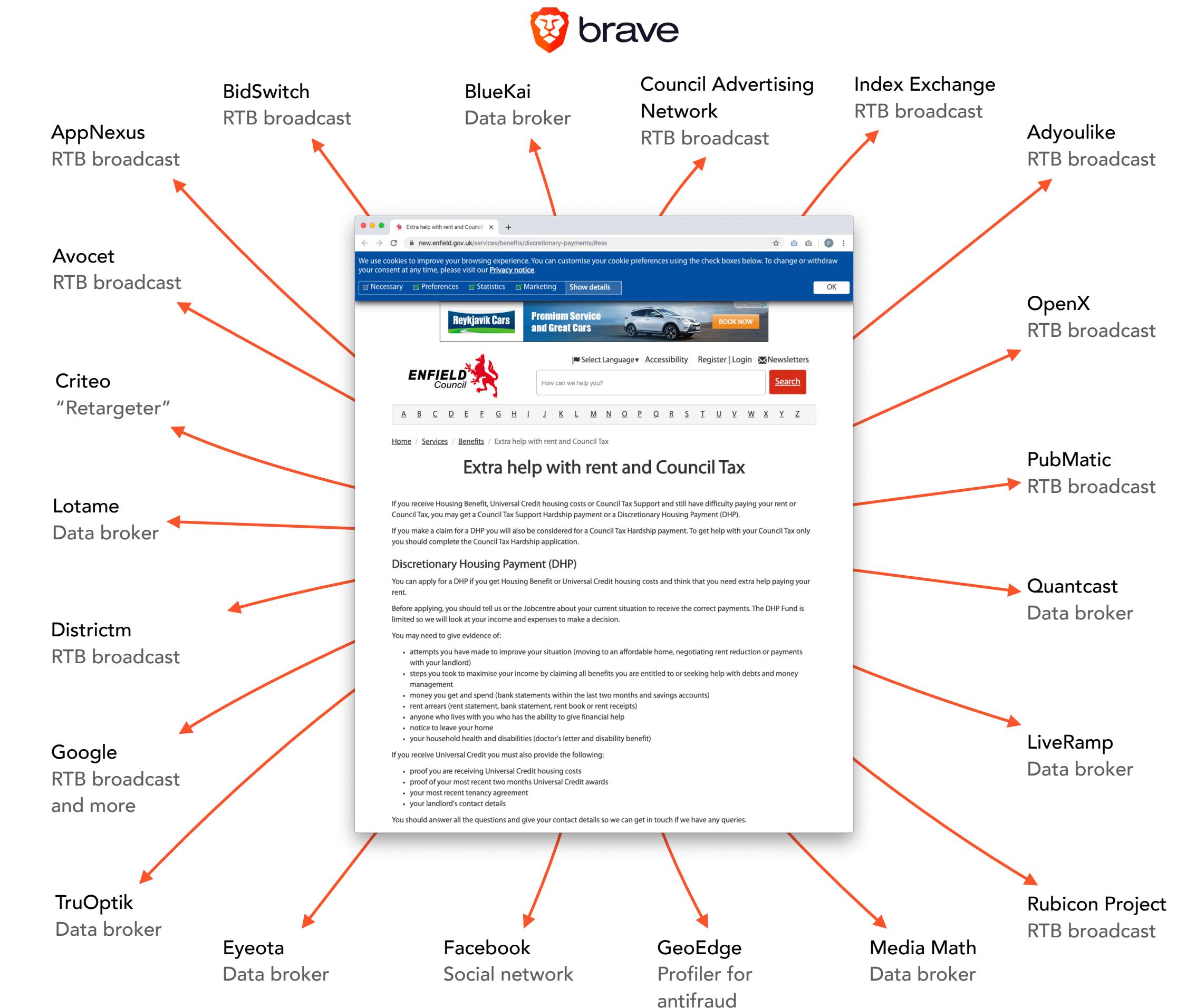
Profiling you as a “Budgeter on benefits”

Some councils allow data brokers, advertising technology companies, and other private firms to profile financial distressed citizens.

Example: Enfield London Borough Council financial assistance page.

- This page is for people who need financial support for accommodation and food. Enfield London Borough Council serves **333,869 people**.
- **11 advertising auction companies**, including Google, broadcast data about visitors to this page to tens or hundreds of business partners.
- The “Council Advertising Network” uses visits to pages like this to profile people as “**Budgeters on benefits**”.⁹ It claims an audience of **875,000 unique individuals from low income families** on council websites per month.¹⁰
- Among the **21 data collecting companies** that track visitors to this page, **7 are data broker companies** whose business model is to sell profile data about people to other companies.

Enfield London Borough Council
financial assistance and emergency support page
21 data collectors



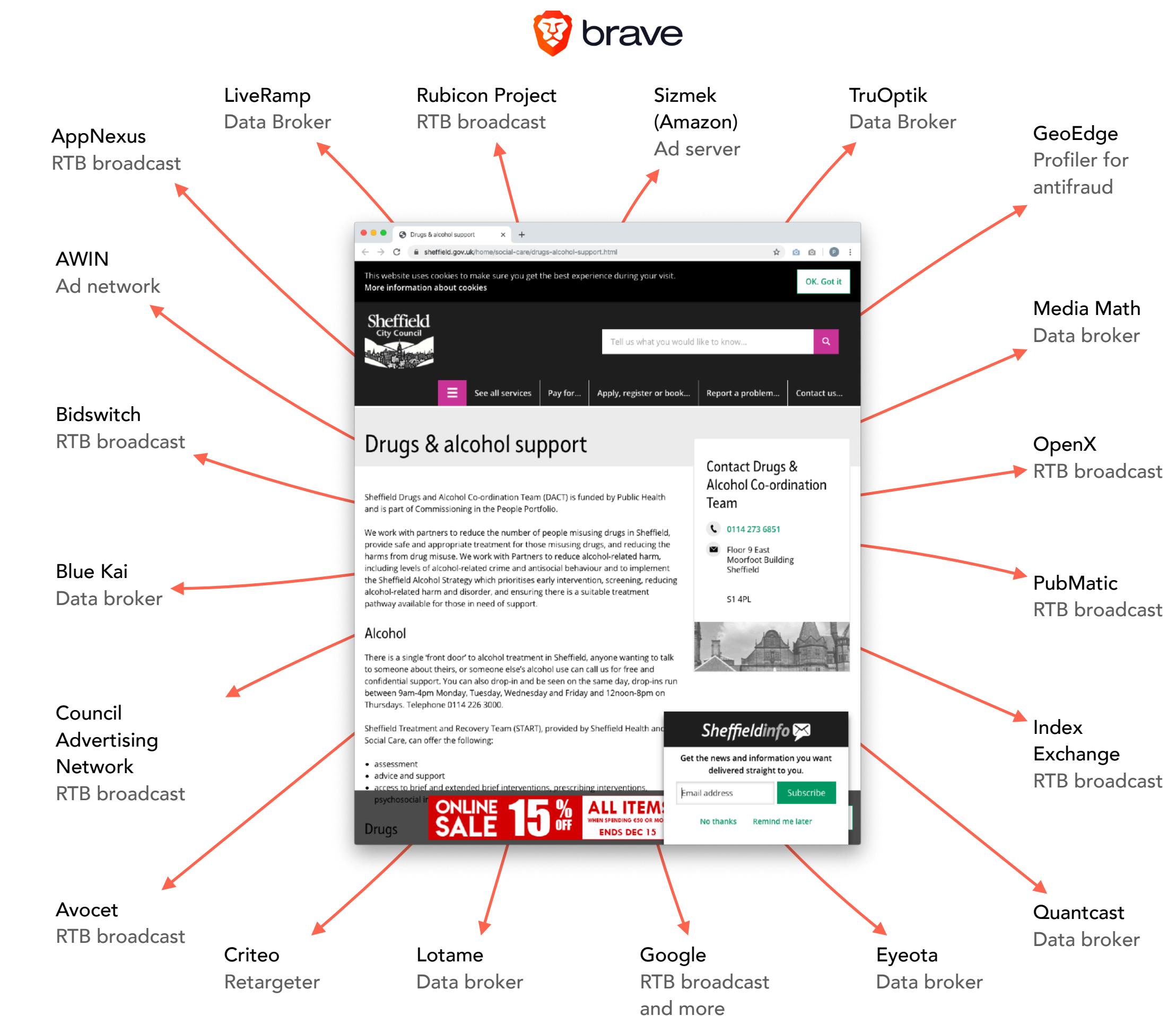
Data companies know who is an alcoholic

Citizens are subject to extensive profiling by shadowy data companies even when they visit highly sensitive pages on some council websites.

Example: Sheffield City Council drugs & alcohol support page

- This page is for people seeking support for substance abuse. Sheffield City Council serves **582,506** people.
- Sheffield City Council enables **at least 20 data collecting companies** to receive data about people visiting this highly sensitive page.
- This includes **8 data brokers**. These are companies whose business model is to profile people and sell data about them to other companies.
- In addition, **9 advertising auction companies, including Google**, leak profile data about the person reading this webpage, through "RTB" broadcasts.

Sheffield City Council
"Drugs & alcohol support" page
20 data collectors



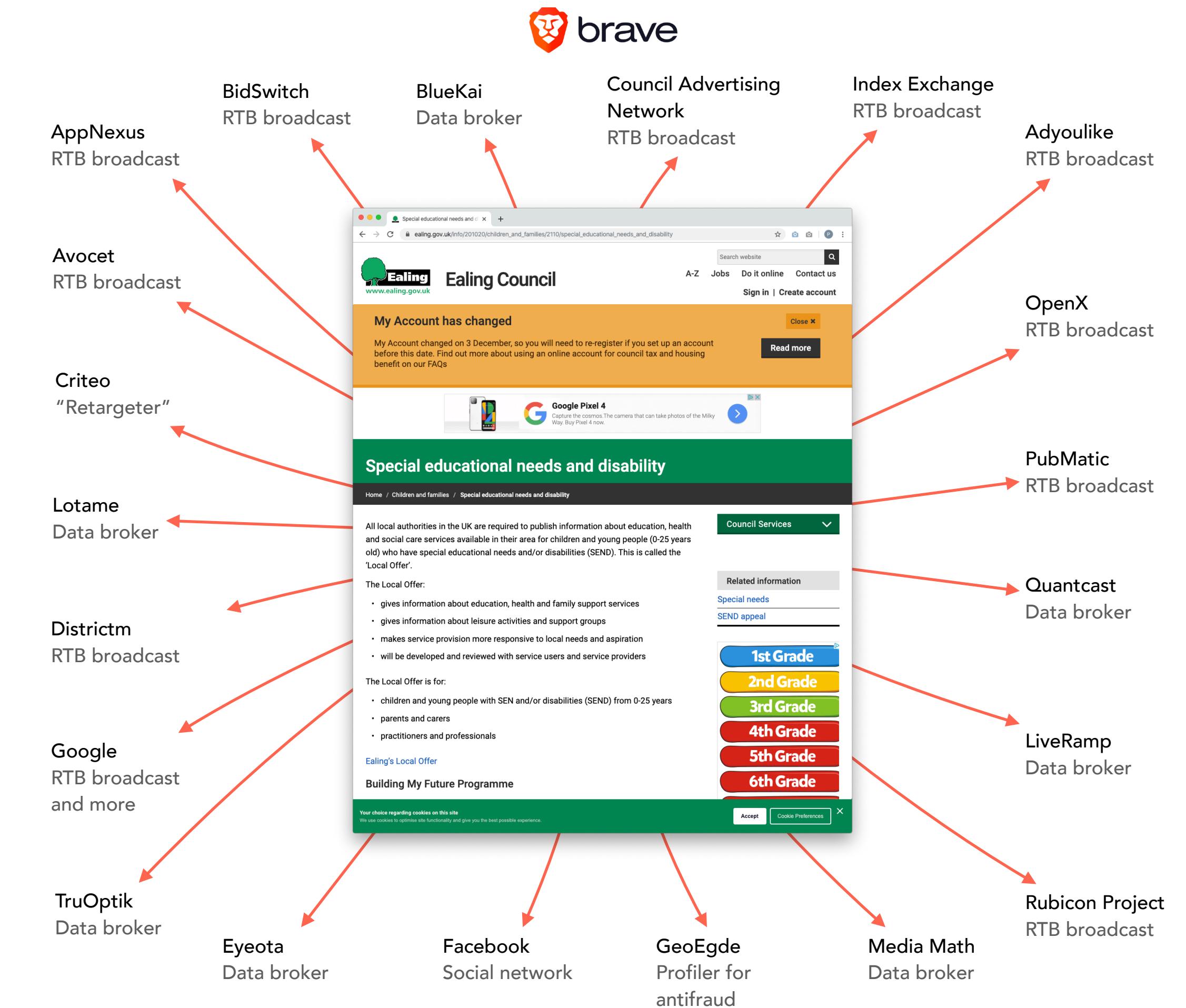
Targeting disabled children and their parents

Data collectors are able to snoop on people reading about their child's disability on some council websites.

Example: Ealing London Borough Council "special educational needs and disability" page.

- This page contains information to help young people aged 11-25 years. Ealing London Borough Council serves **341,982 people**.
- **At least 21 data collecting companies** are allowed to snoop on a person who loads this page. This includes **7 data brokers** and **12 advertising auction companies**.
- This is particularly alarming because the page concerns the welfare of vulnerable children.
- The Council Advertising Network claims to have a "disability" audience of **1 million unique individuals per month** on council websites.¹¹

Ealing London Borough Council
"Special educational needs and disability" page
21 data collectors



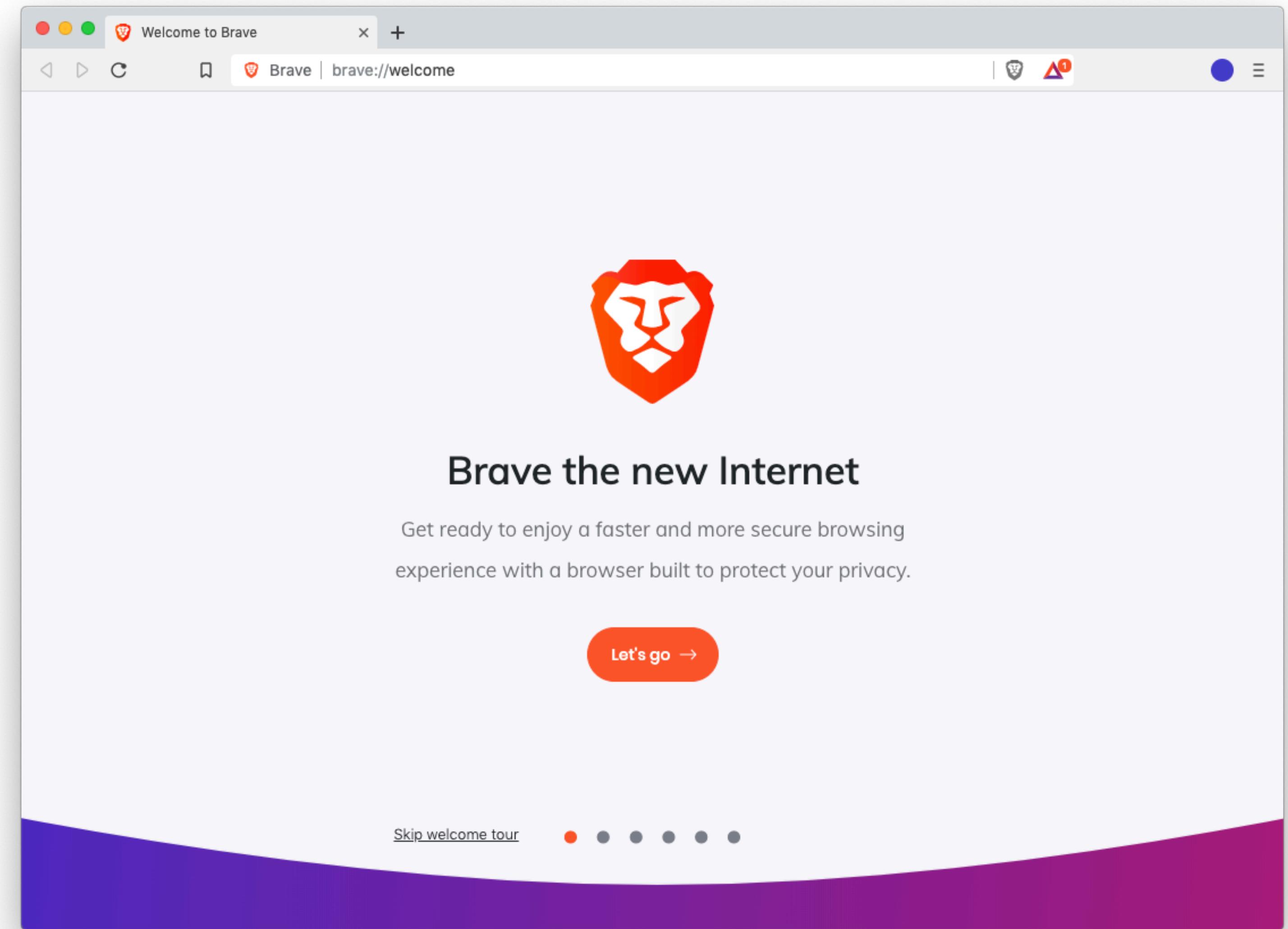
How to protect yourself

Brave is a new, private web browser. It brings unmatched speed and battery life. And it also blocks data-grabbing ads and trackers.

10 million people use Brave to make the web quicker and safer. You can download it for your phone or computer at Brave.com and browse the web with confidence.

Brave's CEO is Brendan Eich, inventor of JavaScript, and co-founder of Mozilla/Firefox.

Read about Brave's campaign to stop the RTB data breach at brave.com/rtb-updates/



Methodology, caveats, and references

Acknowledgements

Tim Libert of Carnegie Mellon University, who developed webxray and makes this useful tool available free of charge.

Eliot Bendinelli, of Privacy International, whose work on the report "Your mental health for sale" provided the template for this study.

At Brave, Dr Johnny Ryan, who led the study, and Pete Snyder, Ryan Brown, and Luke Mulks, who contributed valuable insights.

Methodology

1. A list of local, county, and unitary councils was collected for England and Wales from [local.gov.uk](#); for Scotland from [COSLA](#), and for Northern Ireland from [NI Direct](#).
2. A list of URLs for each website associated with each council was created.
3. [Population figures](#) were collected for each council area from the UK Office for National Statistics, and from [Dorset Council](#).
4. Mapping data was collected for each council area at local administrative district level, and at county region level, from [data.gov.uk](#) and the [UK ordinance survey](#).
5. Tim Libert's [webxray](#) tool was used.
 - a. Tim Libert's third party detection list was supplemented with additional trackers known to Brave.
 - b. Webxray was set to visit each site for 30 seconds.
 - c. No consent requests were accepted.
 - d. In late December 2019, statistics were collected by webxray about items loaded from third party domains.
6. Results from each URL were cross referenced with population figures, and mapped. Some councils serve several areas, and some sites serve more than one administrative area.

Caveat 1: focus on risk

This is not a complete study. Third party tools commonly used by websites for chat bots, designing the page, soliciting email subscription, profiling visitors for the Council's own user data base, text to speech, CDN, fonts, non-Google analytics, etc. are not counted in this study. (See "table notes" on page 20 for a list of what is counted).

While these do expose a user's behaviour to the companies concerned, we exclude them here in order for simplicity. This study highlights what we view as the most dangerous third party data collection and profiling.

Caveat 2: the problem is likely to be more acute than this report indicates

The number of third party data collectors in this study should be understood as a floor, or a minimum, for three reasons.

First, only the landing page of each site was measured, and the page was not interacted with the way actual web users would interact with the site. Normal web users who visit more pages (and click on consent buttons) may encounter more trackers.

Second, what is measured here are "known knowns". Online tracking is an extremely quickly moving space, with trackers constantly trying to avoid detection through a wide variety of methods. There are tracking scripts and parties operating on the web that have not been identified yet, and that are not counted here.

Third, this study examined only the data collection that is visible to one's own computer. It does not examine what might be occurring between company owned servers.

The floor, therefore, is a low one. The situation is likely to be more acute than this report indicates.

End notes:

1. For the scale of the RTB data breach see evidence gathered for regulators by Brave (URL: <https://brave.com/wp-content/uploads/2019/07/Scale-billions-of-bid-requests-per-day-RAN2019061811075588.pdf>).
2. See details of investigation of Google and IAB real-time bidding systems by Irish and Belgian GDPR regulators at "Updates & timeline for Brave's work to fix "RTB" adtech", Brave (URL: <https://brave.com/rtb-updates/>).
3. Two technical documents specify what personal data are broadcast by the real-time bidding system. See "RTB 3.0, AdCOM v1.0", IAB Tech Lab, November 2019 (URL: <https://github.com/InteractiveAdvertisingBureau/AdCOM/blob/master/AdCOM%20v1.0%20FINAL.md>); and "Authorized Buyers Real-Time Bidding Proto v.169", Google (URL: <https://developers.google.com/authorized-buyers/rtb/realtime-bidding-guide>).
4. The Council Advertising Network lists its advertising partners in "CAN Privacy Policy", Council Advertising Network (URL: <https://can-digital.net/can-privacy-policy/>).
5. Brittany Kaiser's slidedeck at 54:16, in "The Great Hack" (2019).
6. "Identity Graph: Connecting Data for Better Customer Relationships", LiveRamp (URL: <https://liveramp.uk/our-platform/identity-graph/>).
7. Oracle uses this data to enable "Oracle Marketing & Data Cloud customers and partners to market products and services to you". See "AddThis Privacy Policy", Oracle (URL: <https://www.oracle.com/legal/privacy/addthis-privacy-policy.html#responsible>).
8. "Adtech Report", Information Commissioner's Office, June 2019, p. 23 (URL: <https://ico.org.uk/media/about-the-ico/documents/2615156/adtech-real-time-bidding-report-201906.pdf>).
9. "CAN Premium", Council Advertising Network (URL: <https://can-digital.net/can-premium/>)
10. "Budget conscious DM", Council Advertising Network media pack, p. 12 (URL: <https://can-digital.net/can-media-pack/>).
11. "Disability", ibid., p. 10.

Appendix: tables



Area	Total	Real-time bidding	Other adtech	Verification	Data brokers	Social	Google systems	Area	Total	Real-time bidding	Other adtech	Verification	Data brokers	Social	Google systems
Aberdeen City	4	1					4	Buckinghamshire	3	1					3
Aberdeenshire	1						1	Burnley	4	1					4
Adur	1						1	Bury	4						4
Allerdale	24	10	3	2	7		5	Caerphilly	4					1	3
Amber Valley	5	1					5	Calderdale	4	1					4
Angus	4					1	3	Cambridge	3						3
Antrim and Newtownabbey	6	1				1	5	Cambridgeshire	4	1					4
Ards and North Down	5	1					5	Camden	6	1				1	5
Argyll and Bute	3						3	Cannock Chase	3						3
Armagh City, Banbridge and Craigavon	2						2	Canterbury	2						2
Arun	4	1					4	Cardiff	4					1	3
Ashfield	6	1				1	5	Carlisle	5					2	3
Ashford	6	1				1	5	Carmarthenshire	2	1					2
Aylesbury Vale	4	1					4	Castle Point	2						2
Babergh	5	1				1	4	Causeway Coast and Glens	5	1					5
Barking and Dagenham	3					1	3	Central Bedfordshire	5	1					5
Barnet	5	1				1	4	Ceredigion	4						4
Barnsley	2						2	Charnwood	4	1					4
Barrow-in-Furness	3						3	Chelmsford	6	1				1	5
Basildon	6	1				1	5	Cheltenham	3						3
Basingstoke and Deane	4						4	Cherwell	3						3
Bassetlaw	2						2	Cheshire East	6	1				2	4
Bath and North East Somerset	4	1					4	Cheshire West and Chester	3	1					3
Bedford	3						3	Chesterfield	5	1				1	4
Belfast	7	1		1		1	5	Chichester	1						1
Bexley	6	1	1			2	4	Chiltern	4					1	3
Birmingham	4	1					4	Chorley	1						1
Blaby	4						4	Christchurch	2						2
Blackburn with Darwen	3						3	City of Edinburgh	5	1					5
Blackpool	5					1	4	City of London	2	1					2
Blaenau Gwent	3	1					3	Clackmannanshire	2						2
Bolsover	4	1					4	Colchester	5	1					5
Bolton	4						4	Conwy	2					1	1
Boston	4						4	Copeland	1						1
Bournemouth, Christchurch and Poole	4	1				1	3	Corby	3					1	2
Bracknell Forest	3						3	Cornwall	4	1					4
Bradford	6					2	4	Cotswold	4	1					4
Braintree	4					1	4	County Durham	3						3
Breckland	6	1				1	5	Coventry	5	1					5
Brent	5	1					5	Craven	1						1
Brentwood	1						1	Crawley	2						2
Bridgend	4					1	3	Croydon	12	6	1			1	6
Brighton and Hove	4						4	Cumbria	5	1				1	4
Bristol, City of	3						3	Dacorum	5	1					5
Broadland	3						3	Darlington	3					1	2
Bromley	5		1				5	Dartford	1						1
Bromsgrove	13	3	3	1	1	1	7	Daventry	3						3
Broxbourne	6	1				1	6	Denbighshire	7	1	1			2	5
Broxtowe	3						3	Derby	4	1					4

Appendix: tables



Area	Total	Real-time bidding	Other adtech	Verification	Data brokers	Social	Google systems
Derbyshire	4						4
Derbyshire Dales	16	3	4	1	1	3	7
Derry City and Strabane	5	1					5
Devon	2					1	2
Doncaster	4					1	4
Dorset	3	1					3
Dover	5	1					5
Dudley	4	1					4
Dumfries and Galloway	6			1		1	4
Dundee City	5					2	3
Ealing	23	10	2	1	7		6
East Ayrshire	1						1
East Cambridgeshire	4	1					4
East Devon	1						1
East Dorset	3	1					3
East Dunbartonshire	3					1	2
East Hampshire	5	1				1	4
East Hertfordshire	3						3
East Lindsey	4					1	3
East Lothian	4						4
East Northamptonshire	4	1					4
East Renfrewshire							
East Riding of Yorkshire	5	1					5
East Staffordshire	4						4
East Sussex	3						3
Eastleigh	7	1		1		1	5
Eden	1						1
Elmbridge	3						3
Enfield	25	11	2	1	7	1	6
Epping Forest							
Epsom and Ewell	2						2
Erewash	5					2	3
Essex	5	1					5
Exeter	2						2
Falkirk							
Fareham	1						1
Fenland	2						2
Fermanagh and Omagh	5	1					5
Fife	3						3
Flintshire	1						1
Folkestone and Hythe	6	1				1	5
Forest Heath	4						4
Forest of Dean	4	1					4
Fylde	3						3
Gateshead	6	1				1	5
Gedling	5	1					5
Glasgow City	1						1
Gloucester	5					1	4
Gloucestershire	8	1	1			2	6

Area	Total	Real-time bidding	Other adtech	Verification	Data brokers	Social	Google systems
Gosport	3						2
Gravesham	4						4
Great Yarmouth	4			1			4
Greenwich	4						4
Guildford	4						3
Gwynedd	4						4
Hackney	6						4
Halton	13	3		3	1	1	7
Hambleton	4			1			4
Hammersmith and Fulham	6						4
Hampshire	5			1			5
Harborough	6						4
Haringey	5			2			3
Harlow	2						2
Harrogate	4			1			4
Harrow	2						2
Hart	2						1
Hartlepool	4			1			4
Hastings	3						3
Havant	6			1			5
Havering	6			2			5
Herefordshire, County of	7			1	1		6
Hertfordshire	3						3
Hertsmere	5						4
High Peak	5						4
Highland	5			1			5
Hillingdon	4			1			4
Hinckley and Bosworth	3						3
Horsham	4			1			4
Hounslow	3						3
Huntingdonshire	5			1			5
Hyndburn	3						3
Inverclyde	2						2
Ipswich	1						1
Isle of Anglesey							
Isle of Wight	4			1			4
Isles of Scilly	2						2
Islington	2						2
Kensington and Chelsea	1						1
Kent	5			1			4
Kettering	4						4
King's Lynn and West Norfolk	2						2
Kingston upon Hull, City of	1						1
Kingston upon Thames	7			2	1		4
Kirklees	4						4
Knowsley	1						1
Lambeth	6			1			5
Lancashire	11			3	2	1	3
Lancaster	7			1			5

Appendix: tables



Area	Total	Real-time bidding	Other adtech	Verification	Data brokers	Social	Google systems
Leeds	3					1	3
Leicester	5					4	
Leicestershire	6	2				2	3
Lewes	2						2
Lewisham	3	1					3
Lichfield	4						4
Lincoln	20	8	2	1	6		6
Lincolnshire	8	1	1			2	7
Lisburn and Castlereagh	6	1				1	5
Liverpool	2					1	1
Luton	6	1				1	5
Maidstone	5	1					5
Maldon	3						3
Malvern Hills	4	1					4
Manchester	4					1	4
Mansfield	5					1	5
Medway	4						4
Melton	3	1					3
Mendip	2					1	1
Merthyr Tydfil	12	3	3	1		1	6
Merton	1						1
Mid and East Antrim	6	1				2	4
Mid Devon	4						4
Mid Suffolk	5	1				1	4
Mid Sussex	4					2	2
Mid Ulster	5	1					5
Middlesbrough	6	1				2	4
Midlothian	2						2
Milton Keynes	12	3	3	1	1	1	5
Mole Valley	3	1					3
Monmouthshire	6	2				1	4
Moray	2						2
Na h-Eileanan Siar	2						2
Neath Port Talbot							
New Forest	6	1		1		1	4
Newark and Sherwood	6	1				2	4
Newcastle upon Tyne	13	3	2	1	1	2	6
Newcastle-under-Lyme	3					1	2
Newham	3						3
Newport	3					1	2
Newry, Mourne and Down	5					1	4
Norfolk	2						2
North Ayrshire	3					1	2
North Devon	3						3
North Dorset	3	1					3
North East Derbyshire	5	1				1	4
North East Lincolnshire	7	2	1				6
North Hertfordshire	5					1	4
North Kesteven	7	1				2	5

Area	Total	Real-time bidding	Other adtech	Verification	Data brokers	Social	Google systems
North Lanarkshire	4						1
North Lincolnshire	7	2					5
North Norfolk	2						2
North Somerset	6	1					5
North Tyneside	4						4
North Warwickshire	4	1					4
North West Leicestershire	3						3
North Yorkshire	6	1					5
Northampton	5	1					5
Northamptonshire	3						3
Northumberland	5	1					5
Norwich	3						3
Nottingham	6	1					5
Nottinghamshire	7	1					5
Nuneaton and Bedworth	5	1					4
Oadby and Wigston	3						3
Oldham	6	1					5
Orkney Islands	2						2
Oxford	3						3
Oxfordshire	6	1	1				6
Pembrokeshire	6	1	1				6
Pendle	4						4
Perth and Kinross	4						4
Peterborough	4	1					4
Plymouth	4						3
Poole	4						4
Portsmouth	5	1				1	3
Powys	3						3
Preston	4						4
Purbeck	3	1					3
Reading	5	1					5
Redbridge	10	3	2				4
Redcar and Cleveland	5	1					5
Redditch	7	2	1				5
Reigate and Banstead	19	10	2			1	5
Renfrewshire	4	1					3
Rhondda Cynon Taf	3						2
Ribble Valley	5	1					4
Richmond upon Thames	3						3
Richmondshire	4						4
Rochdale	7	1					4
Rochford	4						3
Rossendale	3						3
Rother	5					1	3
Rotherham	4						4
Rugby	5						4
Runnymede	3	1					3
Rushcliffe	3						3
Rushmoor	3						3

Appendix: tables



Area	Total	Real-time bidding	Other adtech	Verification	Data brokers	Social	Google systems
Rutland	6	1			1	6	
Ryedale	4	1				4	
Salford	4	1				4	
Sandwell	16	7	3	1	1		6
Scarborough	5				2	4	
Scottish Borders	3					3	
Sedgemoor	3					3	
Sefton	24	10	2	1	7	1	6
Selby	5	1			1	4	
Sevenoaks	5	1				5	
Sheffield	25	10	3	2	7		6
Shetland Islands	1					1	
Shropshire	2					2	
Slough	3					3	
Solihull	22	10	2	1	7		5
Somerset	5	1				5	
Somerset West	4					4	
South Ayrshire	1					1	
South Bucks	4				1	3	
South Cambridgeshire	2					2	
South Derbyshire	4	1			1	3	
South Gloucestershire	16	7	4	1	1		5
South Hams	3				1	2	
South Holland	3				1	2	
South Kesteven	2	1				2	
South Lakeland	2	1				2	
South Lanarkshire	3	1				3	
South Norfolk	7	1	1		1	6	
South Northamptonshire	3	1				3	
South Ribble	4	1				4	
South Somerset	4					4	
South Staffordshire							
South Tyneside	4	1				4	
Southampton	1					1	
Southend-on-Sea	4	1				4	
Southwark	4	1			1	3	
Spelthorne	4				1	3	
St Albans	2					2	
St Edmundsbury	4					4	
St. Helens	4	1				4	
Stafford	2					2	
Staffordshire	13	3	4	1	1	1	5
Staffordshire Moorlands	5				1	4	
Stevenage	3	1				3	
Stirling	2					2	
Stockport	5	1				5	
Stockton-on-Tees	5	1			1	4	
Stoke-on-Trent	4	1				4	
Strabane	1				1	1	

Area	Total	Real-time bidding	Other adtech	Verification	Data brokers	Social	Google systems
Stratford-on-Avon	4						4
Stroud	2						2
Suffolk	5	1				1	4
Suffolk Coastal	3	1				1	2
Sunderland	6	1				1	5
Surrey	4						4
Surrey Heath	2						2
Sutton	9	2		2	1	1	5
Swale	4	1					4
Swansea	13	3		4	2	1	4
Swindon	7	1		1		1	6
Tameside	6	1		1			4
Tamworth	5	1				1	4
Tandridge	6	1				1	5
Taunton Deane	4						4
Taunton Deane	4						4
Teignbridge	2						2
Telford and Wrekin	6	1		1			4
Tendring	3					1	2
Test Valley	1						1
Tewkesbury	3						3
Thanet	5	1					5
Three Rivers	1						1
Thurrock	2					1	1
Tonbridge and Malling	3						3
Torbay	6	1		1		1	5
Torfaen	2						2
Torridge	5					2	3
Tower Hamlets	5					1	4
Trafford	4						4
Tunbridge Wells	3	1					3
Uttlesford	3						3
Vale of Glamorgan	11	3		3	1	1	4
Wakefield	2					1	1
Waltham Forest	6					2	5
Wandsworth	20	7		5	1	1	7
Warrington	4	1					4
Warwick	5	1					5
Warwickshire	8	1		1			2
Watford	5	1					5
Waveney	3	1				1	2
Waverley	5	1				1	4
Wealden	4	1				1	3
Wellingborough	2						2
Welwyn Hatfield	3	1					3
West Berkshire	2						2
West Devon	3					1	2
West Dorset	3	1					3
West Dunbartonshire							

Appendix: tables



Area	Total	Real-time bidding	Other adtech	Verification	Data brokers	Social	Google systems
West Lancashire	8			1		3	4
West Lindsey	5					1	5
West Lothian	3						3
West Oxfordshire	4	1					4
West Suffolk	4						4
West Sussex	3						3
Westminster	4					1	3
Weymouth and Portland	3	1					3
Wigan	4	1				1	3
Wiltshire	3						3
Winchester	4	1					4
Windsor and Maidenhead	5	1					5
Wirral	22	10	2	1	7		5
Woking	1					1	
Wokingham	3						3
Wolverhampton	3						3
Worcester	4	1					4
Worcestershire	4	1					4
Wrexham	14	3	4	1	1	1	6
Wychavon	4	1					4
Wycombe	4					1	3
Wyre	4	1				1	3
Wyre Forest	2						2
York	5					1	4

Area	Notes
Vale of White Horse	Website failed to load
South Oxfordshire	Website failed to load

Table notes

"Total" refers to the combined number of companies from each category. Although MediaMath and YouTube are each in two categories, they are not double counted in the "total" column. As a result, the number in the total column may be lower than the sum of the other columns.

"Real-time bidding" includes AdRoll, AppNexus, Avocet, BidSwitch, Bizo, Council Advertising Network, DoubleClick ("Authorized Buyers"), IndexExchange, MediaMath, One by AOL, OpenX, PubMatic, Rubicon Project, TripleLift, Adyoulike.

"Other adtech" includes AdSense, Amazon Marketing, AWIN, OneTag, Criteo, Outbrain, Taboola.

"Verification" includes GeoEdge, Integral Ad Science, Moat.

"Data brokers" includes Blue Kai, Eyeota, LiveRamp, Lotame, MediaMath, Quantcast, TruOptik.

"Social / research" includes AddThis, AddToAny, Disqus, Flickr, Scorecard Research, ShareThis, LinkedIn, Twitter, Facebook, Instagram, YouTube.

"Google" includes AdSense, Google, Google Analytics, Google API, Google Tag Manager, Doubleclick ("Authorized Buyers"), YouTube.