**Google's Shadow Profile:**
**A Dossier of Consumers Online and Real World Life**

*February 2019*

**Executive Summary**

> *A consumer sees an ad that is unnervingly, pointedly accurate. It seems to target information – so personal, so specific – that only this consumer would know the information. Maybe the ad targets a secret interest or hobby, a special place, or intimate lifestyle details. Is the microphone on? Is the camera activated? No –but they might as well be. In fact, Google is using massive amounts of consumer data, not all of which it discloses to consumers, to micro-targeting advertising. All without the consumers knowledge or consent.*

Google's corporate mission is "to organize the world's information and make it universally accessible and useful." What it does not widely acknowledge is that this mission is as much about collecting data as it is about categorizing information. Google acknowledges certain data collection activities, and even purports to grant consumers control over what is collected and how it is used. However, the scope and extent of Google's data collection extends far beyond what is acknowledged or widely known, and its controls fail to address most of this data. As a result, consumers cannot fully understand – much less control – all of the data that Google holds on them.

While Google touts "improved" consumer control over the data it collects (as a result of the EU's General Data Protection Regulation), this is misleading.  A close reading of Google's statements and policies indicates the company does not disclose the full extent of the information it collects on consumers, nor the valuable inferences it draws from this data. Analysis of communications from an Android smartphone suggests Google keeps hidden far broader profiles on billions of consumers around the world – removed from individual view or access, and public accountability. For example Google's "My Activity" page contains a history of what the consumer viewed, searched for, and browsed.[1] However, it *omits* much of the data the company collects, which is often far more invasive and revealing.

This *omitted* data is a consumer's "shadow profile" – massive, largely hidden datasets of online and offline activities. This information is collected through an extensive web of Google services, which is difficult, if not impossible to avoid. It is largely collected invisibly and without consumer consent. Processed by algorithms and artificial intelligence, this data reveals an intimate picture of a specific consumer's movements, socio-economics, demographics, "likes," activities and more. It may or may not be associated with a specific users' name, but the specificity of this information defines the individual in such detail that a name is unnecessary.

Google offers a "Takeout"[2] page that purports to offer a complete view of the data Google collects on a consumer. Consumers can download a file including "Takeout data," which

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[1] https://myactivity.google.com
[2] https://takeout.google.com

includes the content that Google scans to infer personality and interests, such as emails, interactions with other consumers, ad clicks, location, uploaded documents, and physical activity data. However, this file, which can contain years of personal information, omits *entire categories* of other data collected by Google.[3] While purporting to provide a complete picture of the data Google holds on a consumer, it is only a fraction of Google's actual online tracking.

Notably, "Takeout" data excludes a consumer's interest profiles, the most critical information that Google stores. Google only shows users the interests that it ascribes based on their personal data *if the consumer elects to see personalized ads* from Google. Yet Google's data set is so immense and its collection so pervasive that it can profile the interests of, and deliver ads to, consumers who have "opted-out" or deleted their data *just as effectively* as it can consumers who remain inside Google's ecosystem. This information is not included in "Takeout" data, leaving consumers in the dark.

Furthermore, the Takeout service only works for consumers who have a Google Account. Consumers who are *not signed into, or do not even have,* a Google Account may still have data collected on them and remain subject to Google's privacy policy and terms of service. A consumer visiting a website using Google Analytics is automatically subject to Google's privacy policy (data collection policies), allowing Google to collect unique identifiers on their device, their location, "cookie" data and metadata. None of this data is accessible or known to the consumer.

This data collection keeps Google in business. Google directly monetizes both "Takeout" and "shadow profile" data through digital advertising. For example, in communications to advertisers and publishers, Google highlights their ability to target ads based of Internet Protocol (IP) Address. Google also admitted that it *infers demographic data* from a consumer's IP Address.[4] Google tells advertisers it is able to tie this profile to consumers via cookies.[5] As a result, in 2018, Google's advertising revenue totaled $116 billion, or 85% of its total. The more data Google collects on consumers, the better it can target ads and the more money it makes.


**Google's Android Data Collection Platform**

One of the most *invasive and pervasive* tools in Google's data collection arsenal is the Android smartphone. Smartphones are so integrated in consumers' everyday life that it is literally an extension of a consumer's personality. For sure, a smartphone is a phone, a calendar, a web browser, a music player, a camera and an access point for social media, but it is also an invasive tracker of health, precise movements, location, interests, and places frequented. Further, smartphones are also surveillance tools for Google to collect important information about one's physical environment, such as nearby Wi-Fi base station or Bluetooth beacons, in both public

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[3] Including people's webpage interactions, ad interactions, device sensor data (eg: from their Android phones), search results clicked, Chromecast usage data, Google Docs keywords, Email keywords, and social graph.
[4] Letter from Google to US Senate (Page 5, Paragraph 3)
https://www.blumenthal.senate.gov/imo/media/doc/05.11.2018%20-%20FTC%20-%20Google%20Location%20History.pdf
[5] https://support.google.com/google-ads/answer/2580383?co=ADWORDS.IsAWNCustomer%3Dfalse&hl=en

and private places.  Google not only constantly tracks the location of Android users, but also links the data collected by an Android smartphone to unique device and account identifiers. (Table 1)

| Unique Identifier | Description | Scope |
|---|---|---|
| Name and Email Address | Individual's ID and user name in the Google ecosystem | Account |
| Advertising ID | ID for advertising, provided by Google Play Services | |
| Android Certificate | Signifies a Google account on a device is verified[6] | |
| International Mobility Equipment Identity (IMEI) | Universal hardware identifier for mobile phone | Device |
| Media Access Control (MAC) | Hardware identifier for devices on a network | |
| Internet Protocol (IP) Address | Every device connected to the internet is assigned an IP address[7]; can be used to establish a device's location | |
| Serial Number | A manufacturer specific hardware identifier | |

Table 1: Unique Identifiers Associated with Devices and Google Accounts

One particular Google service on Android smartphones – "checkin" – ties together many unique identifiers Google collects about a consumer and their device(s). With this data Google can readily combine multiple sets of data into a large super profile of a consumer. For example, Google's Android tracks a mobile phone's unique IMEI, linking it in the same file communicated to Google's servers to account identifiers such as an Android ID, (Figure 1) which begs the question whether is it more important to know a consumer's name or their unique set of IDs.

| | |
|---|---|
| conv ID | 621864 |
| test name | 0107WeatherChannelTest |
| phone | Sony Xperia A |
| host | android.googleapis.com |
| api | checkin |
| src file | |
| timestamp | 2019-01-16 14:00:05 |

| | |
|---|---|
| — from req — | |
| imei | 357008084578329 |
| wifi_mac | 84c7ea832819 |
| android_id | 3ff08958e43ca784 |
| email/acct | [andrea.x.tester@gmail.com] |

| | |
|---|---|
| — from req — | |
| model | G8142 |
| device | G8142 |
| serial | CB512F35YH |
| fingerprint | Sony/G8142/G8142:8.0.0/4... |
| manufacturer | Sony |

Figure 1: Example Data elements reported by Google Android via "CheckIn" service

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[6] https://developers.google.com/android/guides/client-auth
[7] https://policies.google.com/privacy?hl=en

Reviewing network communications between an Android phone and Google servers, at least four different types of identifiers are transmitted, collecting at least 18 different data elements. (Table 2) Google combines the data it collects about account and device identifiers with accurate and specific location information of a consumer. Location data linked with an Android ID and/or other unique identifiers including a consumer's Google account is personally identifiable. Over time, this data creates a detailed profile about a consumer; where they live, work, shop, eat, socialize with, and many other revealing insights about their pattern of life, for Google's use in providing detailed advertising profiles.

| Type of Data | Data Elements Collected |
|---|---|
| Device Identifiers | Make, Model, Manufacturer, Android Version |
| Unique Device Identifiers | Serial Number, International Mobility Equipment Identity (IMEI), Media Access Control (MAC) Address, Internet Protocol (IP) Address |
| Google Account Identifiers | Email Address, Android ID, Advertising ID |
| Location and Environment | GPS, Wi-Fi Access Points, Bluetooth Beacons, Barometric Pressure, Activity Readings (Motion Sensors) |

Table 2: Key Data Types and Elements Collected by Google Android

Through constant tracking of consumers in the physical world and on the internet across various devices, Google is able to create a virtual dossier on nearly every internet user for the purposes of digital advertising and developing new products and services. The myriad of app level, device level, account level collection, combined with numerous *redundant* ID's creates a cat and mouse game where consumers – even the most sophisticated consumers – reveal far more data than they intend. Google's vast data set on consumers is critical to its ability to generate revenue via advertising.

**Data Missing from Google Takeout**

Google claims consumers have control of their data via Google Takeout, a service available to Google Account holders to "create an archive with your data from Google products."[8] As stated above, the data Google makes available to consumers through this process is a limited portion of the larger super-profile that Google maintains on consumers. (Table 3) As evidenced by network transmission logs from Android devices, there are specific gaps between what a Google Android user's device collects and the information Google reveals in a consumer's Takeout data. Missing data includes information on nearby Wi-Fi base stations and Bluetooth beacons used to establish location, despite the fact this data is directly linked to a Google account at the time of collection. This missing information provides essential data for Google's "shadow profile" on consumers.

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[8] https://takeout.google.com/settings/takeout

| Location Data Element | Collected by Google? | Tied to Unique Identifier? | Type of Unique Identifier | In Takeout? |
|---|---|---|---|---|
| GPS Coordinates + Accuracy | YES | YES | Android ID | YES |
| Altitude | YES | YES | Android ID | YES |
| Wi-Fi Scans | YES | YES | Android ID | NO |
| • MAC Address | YES | YES | Android ID | NO |
| • Signal Strength + Frequency | YES | YES | Android ID | NO |
| Bluetooth Beacon Scans | YES | YES | Android ID | NO |
| • MAC Address | YES | YES | Android ID | NO |
| • Signal Strength + Frequency | YES | YES | Android ID | NO |
| Cell Tower Readings | YES | YES | Android Cert | NO |
| Barometric Pressure Readings | YES | YES | Android ID | NO |
| Activity Readings + Confidence Level | YES | YES | Android ID | NO |
| Source of Location Reading (Cell or Wi-Fi) | YES | YES | Android ID | NO |
| Connection to Wi-Fi Access Points | YES | YES | Android ID | NO |
| IP Address | YES | YES | Various | NO |
| PlaceIDs | YES | YES | Android Cert | NO |
| Rate + Change in Rate of Collection | YES | YES | Android ID | NO |

Table 3: Data Missing From Google Takeout

Google's Privacy Policy details how Google makes use of data collected from Wi-Fi Access Points, Bluetooth Beacons, and even a consumer's IP Address to accurately locate a consumer.[9] To collect this data, _Google opts consumers into_ extensive location tracking by default (Figure 2) when creating an account. Yet when an individual requests their data through the Google Takeout process, Google does not acknowledge or report the Wi-Fi, Bluetooth, and IP address data that Google collects.

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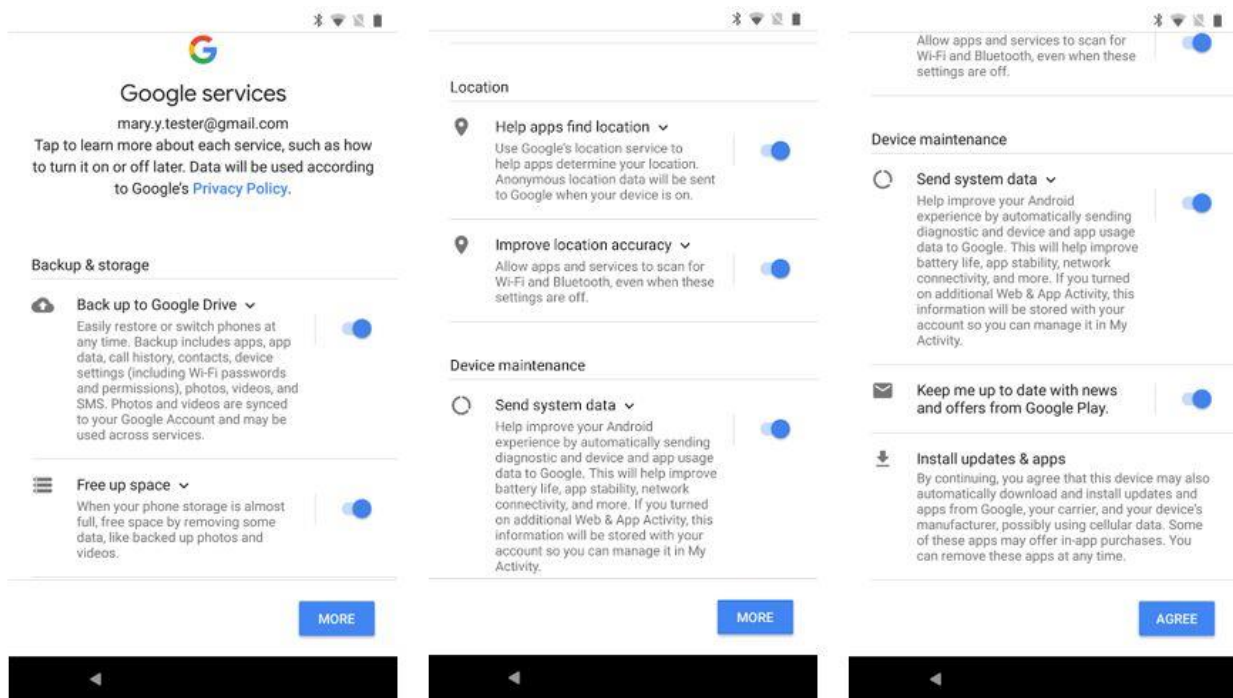[9] https://policies.google.com/privacy?hl=en#infocollect

Figure 2: Screenshots of Google Services Defaults During Android Device Setup

For example, in the Location History file contained within the Takeout documents provided to a consumer, Google reports a list of GPS Coordinates and altitude readings accompanied by an accuracy range of that location in meters and timestamp. (Figure 3) While this information is some of the data Google collected about the device, it is not a comprehensive list of the location data and metadata associated with a consumer.

Figure 3 compares the information presented to the consumer from Google's Takeout documents, with a copy of the network communication to Google servers from the same Android device during this same time period. While Google collects, scans, and stores barometric pressure readings, Wi-Fi base stations and Bluetooth beacons via Android devices to determine the location of a consumer,[10] it does not make that data available, even though the information is directly tied to a consumer's Google Account. Figure 3 reveals details on the location event recorded by an Android device via a Wi-Fi Scan, yet in the Takeout documents Google does not reveal the source of location or the list of Access Points used to pinpoint the location.

Location information is valuable to Google for the purposes of targeted advertising. Exact GPS coordinates are a very precise way to locate a consumer, but GPS is both taxing on the battery of a device and does not work indoors (for example, shopping malls). By scanning and collecting unique identifiers (in this case an Android ID) and the signal strength of Wi-Fi base stations near the device, Google can precisely calculate a consumer's location wherever they move in the world.

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[10] Barometric pressure readings inform the altitude of the device and Wi-Fi scans inform the location reading, 38.877215, -76.9975140.

The Google Takeout list of data you can download makes it seem like you have access to a huge amount of data that Google collects on you.

But, when you download and dive into the Google Takeout "Location History," for example, you are only given your latitude, longitude, and altitude at any given "timestamp."

A readout of the actual data Google collected in the same timeframe includes things like precise barometric pressure readings, Wi-Fi scans, and activity readings. Google also collects the locations of Bluetooth beacons around you. None of that data is available to you through Google Takeout.

```
        } ]
    }, {
        "timestampMs" : "1548236129297",
        "latitudeE7" : 388772144,
        "longitudeE7" : -769975140,
        "accuracy" : 17,
        "altitude" : -18,
        "verticalAccuracy" : 2
    }, {
```

```
"locationReadings": [

    "batchDeliveryTimestampMs": 1548236129322,
    "isOversampled": false,
    "location": {
        "altitudeMetersAboveSeaLevel": -18,
        "approximatelyStationary": true,
        "horizontalAccuracyMeters": 17,
        "latitudeE7": 388772144,
        "longitudeE7": -769975140,
        "verticalAccuracyMeters": 2
    },
    "readingInfo": {
        "batteryCondition": {
            "charging": "notCharging",
            "level": 66,
            "scale": 100,
            "voltage": 3945
        },
        "source": "wifi",
        "wifiScans": [
            {
                "frequencyMhz": 2437,
                "mac": 150277747713112,
                "strength": -37
            },
            {
                "frequencyMhz": 5745,
                "mac": 150277747713120,
                "strength": -51
            },
            {
                "frequencyMhz": 2437,
                "mac": 27310743135055,
                "strength": -53
            },
            {
                "frequencyMhz": 2437,
                "mac": 36010201230008,
                "strength": -66
            },
            {
                "frequencyMhz": 5180,
                "mac": 159006096917174,
                "strength": -74
            },
            {
                "frequencyMhz": 2462,
                "mac": 79565177801392,
                "strength": -77
            },
            {
                "frequencyMhz": 2452,
                "mac": 193760308548339,
                "strength": -77
            },
            {
                "frequencyMhz": 2462,
                "mac": 159006096917173,
                "strength": -79
            }
        ]
    },
    "rebootSequence": 6461,
    "sequence": 4,
    "timestampMs": 1548236129297

"barometerDatas": [
    {
        "pressureHpaE3": 1027939,
        "timestampMs": 1548236616379
    },
    {
        "pressureHpaE3": 1028219,
        "timestampMs": 1548236430738
    },
    {
        "pressureHpaE3": 1029556,
        "timestampMs": 1548236190536
    },
    {
        "pressureHpaE3": 1031563,
        "timestampMs": 1548236129613
    }

"activityReadings": [
    {
        "activities": [
            {
                "confidence": 100,
                "type": "still"
            }
        ],
        "timestampMs": 1548236129394
    }
```
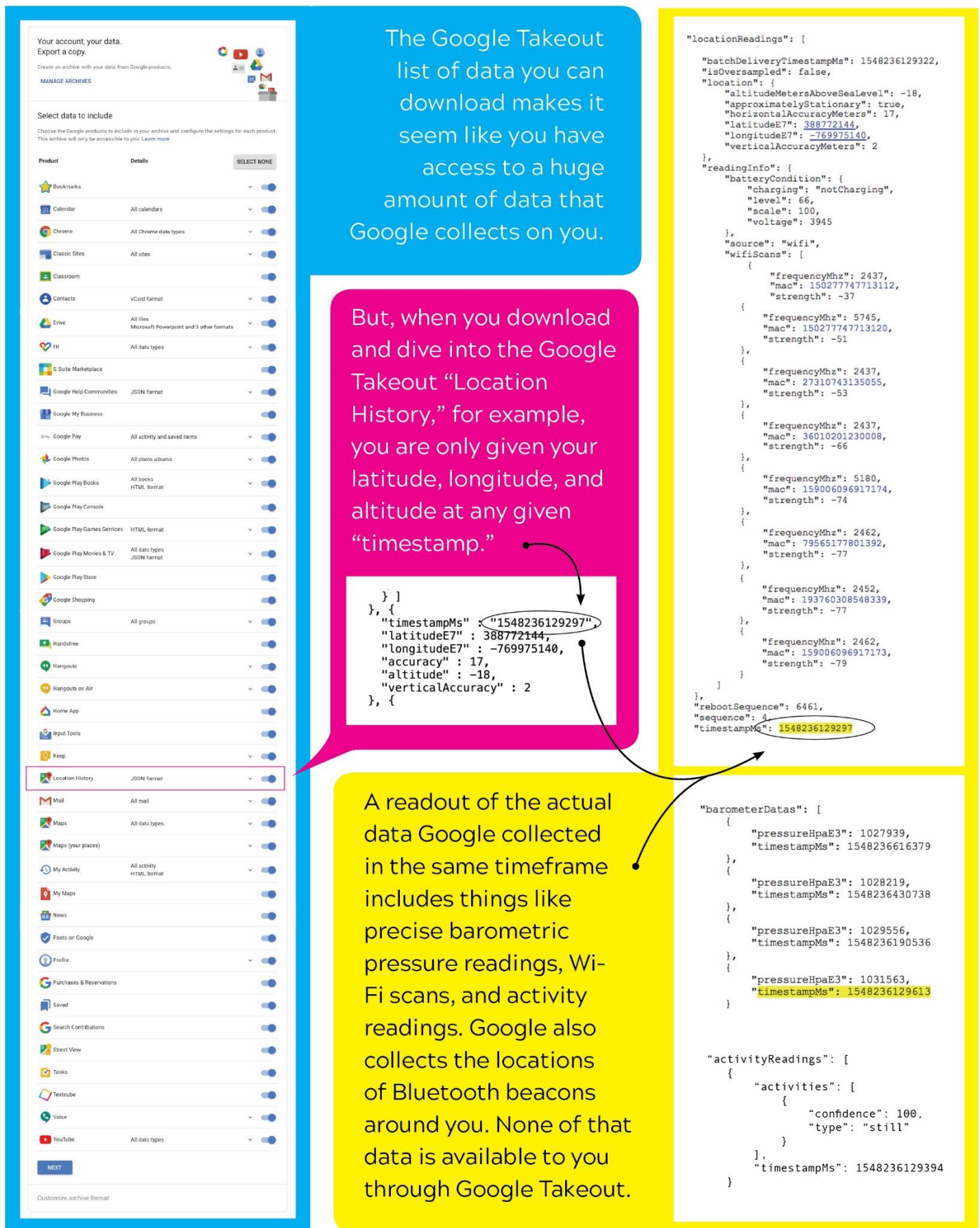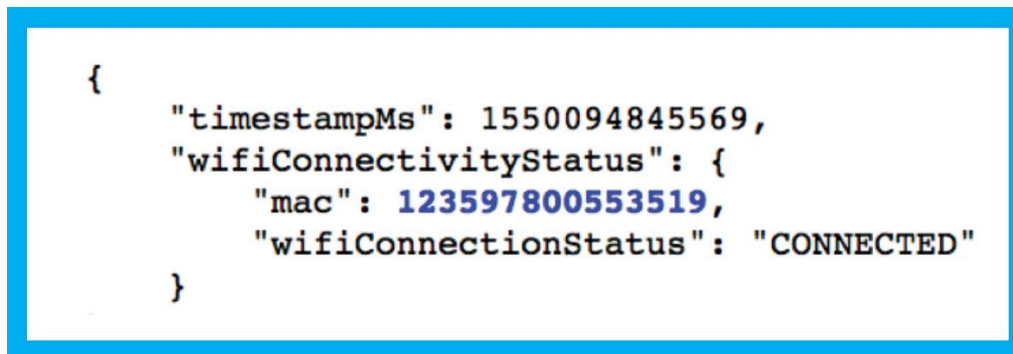
**Figure 3: Google Takeout Data vs Data Transmitted to Google**

Creating an up-to-date map of Wi-Fi base stations globally sounds daunting, but with more than 2 billion[11] active global Android users, Google can maintain a detailed database of access points updated constantly by the movements of unwitting consumers. Google's Bluetooth beacon database works in the same manner. And to ensure devices are located on the correct floor of a multi-story mall, Google uses the barometer data from Android devices to determine consumers' altitude. Clearly this data is valuable for Google, and it is collected directly from consumers' Android smartphones – however this data is missing from the Google Takeout documents.

Data about a consumer's movement and pattern of life allows Google to infer sensitive and unique information about consumers. Figure 4 is an example of a small amount of data collected by Google that initially seems benign (a record listing the Wi-Fi base station an Android device is connected to, along with a timestamp). Yet, if a consumer connects to the same Wi-Fi access point at 9 AM Monday-Friday, the Wi-Fi base station likely represents the consumer's place of work. Similarly, if a consumer connects to the same Wi-Fi base station every day at 7 PM and stays connected through the evening, the Wi-Fi base station is likely in located in the consumer's home.

```
{
    "timestampMs": 1550094845569,
    "wifiConnectivityStatus": {
        "mac": 123597800553519,
        "wifiConnectionStatus": "CONNECTED"
    }
}
```

Figure 4: Andrea Tester's Android Device reporting Wi-Fi connection to Google

Google also records when the data collection rate on an Android device changes – an indication when a consumer is using or moving with the device. Figure 5 highlights two types of rate change records – an average or "Normal" rate (left), and a "stationary" rate (right). Just as with Wi-Fi base stations, Google can infer useful information from this seemingly benign data collection. If an Android smartphone phone is set for a normal rate of data collection until 10 PM every day, but then switches to a stationary rate of data collection until 5 AM, the consumer is likely asleep between these hours. When combined with data on Wi-Fi base stations (Figure 4), patterns of life can be readily inferred. However, Google does not provide the data it collects about connections to Wi-Fi base stations or changes in data collection rate to a consumer via its "Takeout" service.

The fact is that notwithstanding Google "takeout," the information Google retains for itself is redundant such that it is as valuable for Google in targeting and tracking consumers for ads.

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[11] https://www.theverge.com/2017/5/17/15654454/android-reaches-2-billion-monthly-active-users

```
{
    "rate": {
        "description": "Normal",
        "timestampMs": 1549232208574,
        "uploadPeriodMs": 600000,
        "uploadReason": "default",
        "uploadSource": "internal"
    .
```
```
{
    "rate": {
        "description": "stationary",
        "newRequest": false,
        "samplePeriodMs": 2160000,
        "sampleReason": "stationary",
        "sampleSource": "internal",
        "timestampMs": 1549231848192
```

**Figures 5: Andrea Tester's Android Device reporting rate of data collection to Google**

## In or Out - Google Collects and Uses Data at All Times

According to Google's privacy policy, "you can use many Google services when you're signed out or without creating an account at all."[12] Importantly, Google collects data on consumers even if the consumer does not have an account or is signed out:

> when you're not signed in to a Google Account, we store the information we collect with unique identifiers tied to the browser, application, or device you're using.[13]

If a consumer with a Google Account signs out of Google services or attempts to use a feature of a Google Chrome web browser known as "Incognito Mode" (a supposedly privacy protective browsing mode Google markets), Google still tracks the consumer. In a letter to the United States House of Representatives Judiciary Committee Google CEO Sundar Pichai explains: "When a user conducts a search on Google in Chrome Incognito and signed-out modes, we set a cookie to correlate searches conducted in the same Incognito window during the same browsing session."[14] Pichai continues, "We will, however, use certain factors" … "such as the browser type, language, time of search, location (or an estimation of location), and prior browser session searches, to improve Search ranking relevance for the user's query."[15] Google is still tracking the consumer via unique identifiers as outlined in their Privacy Policy, but never makes this data available to the consumer using Takeout.

## How Google Collects and Uses Data on Consumers without a Google Account

Mr. Pichai's explanation of how Google tracks consumers signed out of their Accounts or in incognito mode also provides insight into how Google tracks consumers who may not have a Google Account at all. Google still tracks these consumers when they interact with Google Services that do not require an account, such as Search or YouTube.

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[12] https://policies.google.com/privacy?hl=en#infocollect
[13] https://policies.google.com/privacy?hl=en#infocollect
[14] Google CEO Sundar Pichai's response to US House Judiciary Questions for the Record. Page 3, Question 5.
[15] Google CEO Sundar Pichai's response to US House Judiciary Questions for the Record. Page 3, Question 6.

Google profits from a number of services and products that are not directly consumer facing and do not require a Google Account to use all of which are governed by Google's Privacy Policy.[16]  For example, by shopping on JCrew.com[17] or reading the news at NewYorkPost.com,[18] a consumer's behavior is now – unknowingly – governed by the Google Privacy Policy as those websites use Google Analytics. It is difficult, if not impossible, to use the internet without encountering Google Analytics as approximately 75% of the top 100,000 websites on the internet use Google Analytics.[19] In other words, consumers merely visiting websites on the internet have a 75% chance of being captured by Google's privacy (data collection) policy even if they have no other direct link to Google. Per its 2016 change in privacy policy, Google can then combine all of the data from its analytic properties with data generated by consumers using Google services to create a super-profile.[20]

Google explains to advertisers how this process occurs on its "demographic targeting" help page for ads:

> *"For people who aren't signed in to their Google Account, we sometimes estimate their demographic information based on their activity from Google properties or the Display Network. For example, when people browse YouTube or sites on the Display Network, Google may store an identifier in their web browser, using a "cookie." That browser may be associated with certain demographic categories, based on sites that were visited.[21] "*

Google tracks a consumer across sessions and stores the data they generate.  For example, one of the features for Google Developers is a function called PlaceIDs.[22] (Figure 6) Consumers using Google Maps see different places populating the map, depending on the demographic data Google has collected about them. Google plainly explains to developers how invasive and profound Google's data collection is by remarkably stating on its Maps API documentation:

> *"Every visitor to your site sees a Google Map tailored just for them"[23]*

Regardless of a consumer's Google account status or Location History setting, Google's algorithms determine which places to show each consumer based on a super-profile informed by the data Google collects.  For example, if a signed-out user opens Google Maps and searches for Breckenridge, Vail and finally Tahoe, the user is likely to see a specific ski resort populate the map.

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[16] Google's CEO Sundar Pichai's testimony to the U.S. House Judiciary Committee https://www.c-span.org/video/?455607-1/google-ceo-sundar-pichai-testifies-data-privacy-bias-concerns&start=11932 (3:18:52)
[17] https://www.jcrew.com/help/cookie_policy.jsp
[18] https://nypost.com/privacy/
[19] https://trends.builtwith.com/analytics/Google-Analytics
[20] https://www.google.com/intl/en_US/policies/privacy/archive/20160325-20160628/
[21] https://support.google.com/google-ads/answer/2580383?co=ADWORDS.IsAWNCustomer%3Dfalse&hl=en
[22] https://developers.google.com/places/place-id
[23] https://developers.google.com/maps/documentation/embed/guide

This data is linkable to an individual via "unique identifiers" such as an Advertising ID or an IMEI[24] or the cookies described by Google above. This data can also be tied to the consumer's location at the time of the search via their IP Address.[25]

In addition to being linked to a consumer through various unique identifiers, highly specific location data is unique to an individual over time.  Google affirms this conclusion by offering advertisers the ability to serve highly targeted digital ads based on consumers' location, regardless of those consumers' Google account status.



Figure 6: Google PlaceID for Sydney Opera House

**Data Google Collects about the World (via Consumers)**

When a mobile Android device sends Google a consumer's location, Google is able to maintain a self-updating and highly accurate map of devices moving throughout the world which can locate consumers in relation to various PlaceIDs on a map.  Google claims to tell with 99% accuracy if, after seeing a digital advertisement for a store, a consumer enters the physical store location.[26] They can make this claim because Google has a detailed map of consumers' movements, data on the dimensions of millions of retail locations,[27] and a database of PlaceIDs.

Evidence of Google's constant location tracking are apparent in some of its consumer-facing products, such as Google reviews. (Figure 7)  For example, the Google reviews of Sydney Opera

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[24] https://policies.google.com/privacy?hl=en#footnote-unique-id
[25] https://support.google.com/google-ads/answer/2453995?hl=en
[26] https://static.googleusercontent.com/media/www.google.com/en/us/adwords/start/marketing-goals/pdf/white-paper-bridging-the-customer-journey.pdf
[27] https://adwords.googleblog.com/2016/09/New-Digital-Innovations-to-Close-the-Loop-for-Advertisers.html

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House indicate the busiest times to visit are Friday and Saturday nights between 7 and 9 PM; this data is based off of visits to the location tracked surreptitiously on a consumer's smart phone, aggregated with the history of all consumers who have visited this location.  Because Google has the world's most extensive database of places corresponding with specific locations, Google can link information about multiple devices at one location to assess busiest or most popular times for a given place.
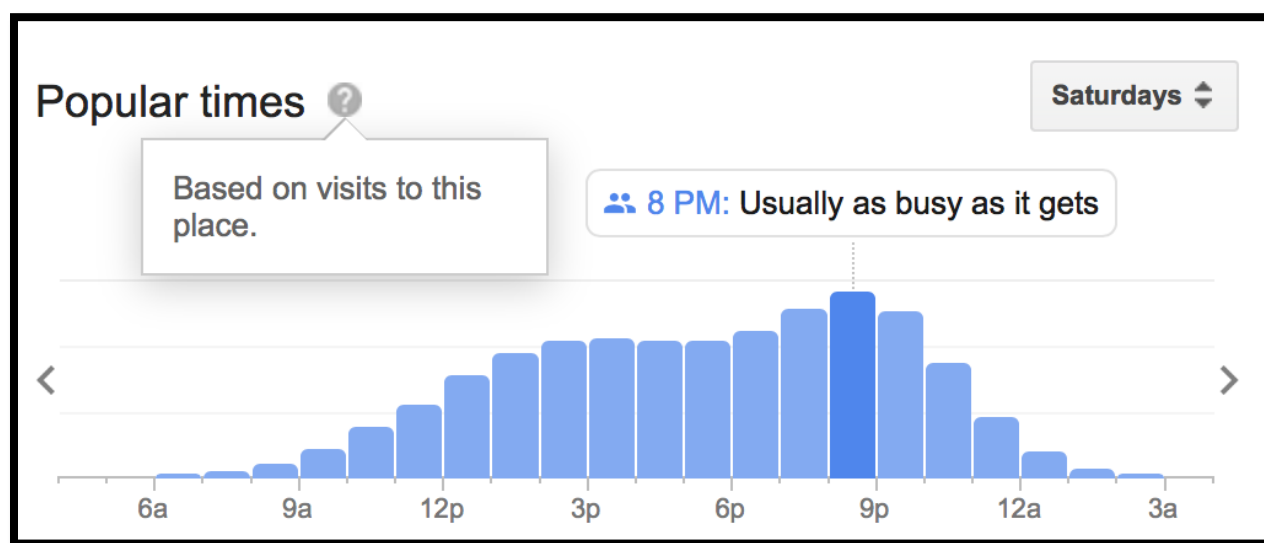


Figure 7: Google Reviews of Sydney Opera House

**Google Promotes its Consumer Location Tracking Capabilities to Advertisers**

Despite public claims that Google "builds privacy that works for everyone,"[28] Google's business model works to provide *everything but privacy* for the consumer. Google generates the majority of its revenue through advertising, powered by its ability to generate and combine large amounts of specific consumer data about consumer behavior on the internet with real time consumer activity and location data from mobile phones, as well as a myriad of other surreptitious collection points, such as internet cookies and application metadata. Google uses the location data it collects from mobile devices over time to establish patterns of life for consumers and acknowledges tracking both signed in and signed out consumers to infer interest in a location and inform a profile for the purposes of selling ads.

Google promotes its capability to target advertisements to a specific location in the world via IP Address and device location.[29] (Figure 8) In order for Google to target advertisements by a user's

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[28] https://safety.google/privacy/
[29] https://support.google.com/google-ads/answer/2453995?hl=en

IP Address or the location of a device, it is reasonable to conclude Google must collect and tie this data back to individual consumers, feeding the result into digital advertising profiles.

Even though consumers are told they are "in control" of how Google collects and uses their data,[30] there is no way to disable location tracking via IP Address. Despite its relevance to consumers and advertisers, historical IP Address-based location information is not available to consumers via the Google Takeout service. Similarly, the catalogue of GPS and Cell Tower location data, Wi-Fi base station and Bluetooth beacon scans Google uses to locate consumers is not available via Takeout. And of course, none of this information is available to consumers who do not have a Google Account, but are uniquely identified and tracked by Google.

Figure 8: Google Ads Help Explanation Targeted Ads by Geolocation

Google also allows advertisers to target consumers based on their interest in a location, and highlights the value of tracking consumer location over time. (Figure 9).[31]  Among other factors,

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[30] https://safety.google/privacy/privacy-controls/
[31] https://support.google.com/google-ads/answer/2453995?hl=en

Google infers a consumer's interest in a location based on their physical history at a particular location as well as searches on Google Maps.



**Locations your users showed interest in (location of interest)**

If the Google Ads system detects geographic areas that someone is interested in, we may show appropriate ads targeted to that area or surrounding areas (known as "location of interest").

Some of the ways that we might detect a location of interest are based on:

- Terms used in searches that indicate a location.
- Past searches that indicated a location of interest.
- A person's past physical locations.
- The content and context of a website where an ad is displayed. Keep in mind that the mention of a location on a page doesn't always indicate an interest in that location.
- Searches on Google Maps or Google Maps for Mobile.
- If someone sets a custom location for Google search results ☑.

On the Google Display Network, we may infer a location associated with a page or site when we believe it will be useful for targeting your ads. A location mentioned on a page may not always indicate interest in that location. For example, someone who is reading news about San Francisco isn't necessarily interested in ads for San Francisco florists. Similarly, we might infer an interest in a location, even if that location isn't specifically mentioned on a page, but the context of the entire site indicates an interest in that place.

Location of interest isn't restricted to a person's country, or the Google search domain the person is searching on. For example, if someone in Paris, France searches for *Los Angeles taxi* on google.fr (France), we'll still identify Los Angeles as a location she's interested in.

Figure 9: Google Ads Help Explanation Targeted Ads by Geolocation

**From Data to Dollars**

A consumer's pattern of life – the daily rhythm of the people and places individuals spend time in the real world – combined with online web browsing, search history and a myriad of other data points creates an intimate dossier of a consumer's lifestyle. Google uses this data to develop and continuously update its super-profile on consumers. Combining multiple sources of user data across its products, services devices and accounts, the pool of data is used to power Google's digital advertising, responsible for 86% of Google's revenue.[32]

Through its various digital services, Google is able to track consumers across the internet. These services include what a consumer can directly link to their Google Account, (Search, YouTube, Gmail, Hangouts, etc.) as well as various AdTech and Analytic Products where a consumer may

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[32] https://abc.xyz/investor/static/pdf/20171231_alphabet_10K.pdf?cache=7ac82f7

not have a direct relationship (Google Ads, DoubleClick, Google Analytics, etc). Google does not claim to target individual consumers with specific ads, rather, Google works at a larger scale - targeting *all* consumers based off of their individual demographics, location, and intent. Within Google's ad products, there are multiple ways to target specific advertising "audiences." According to Google, audiences are "groups of people with specific interests, intents, and demographics, *as estimated by Google*" (emphasis added).[33] Most broadly, an advertiser can target an ad campaign based on various demographic data points.[34] In a letter to the US Senate, Google explains how it infers demographic data based on a consumer's location for the purposes of advertising.[35]

Audience specific targeting allows advertisers to reach consumers based on their individual interests, a feature Google calls "affinity audiences"[36] (Figure 10), as well as their intent, called "in-market audiences".[37] (Figure 11) Google makes assessments of a consumer's affinity and / or intent based off of the data collected on consumers via their interaction with Google's Services (such as Android or websites that use Google's advertising or analytic products). To further refine an audience, an advertiser can target websites related to varying subjects, called "targeted topics".[38] (Figure 12)
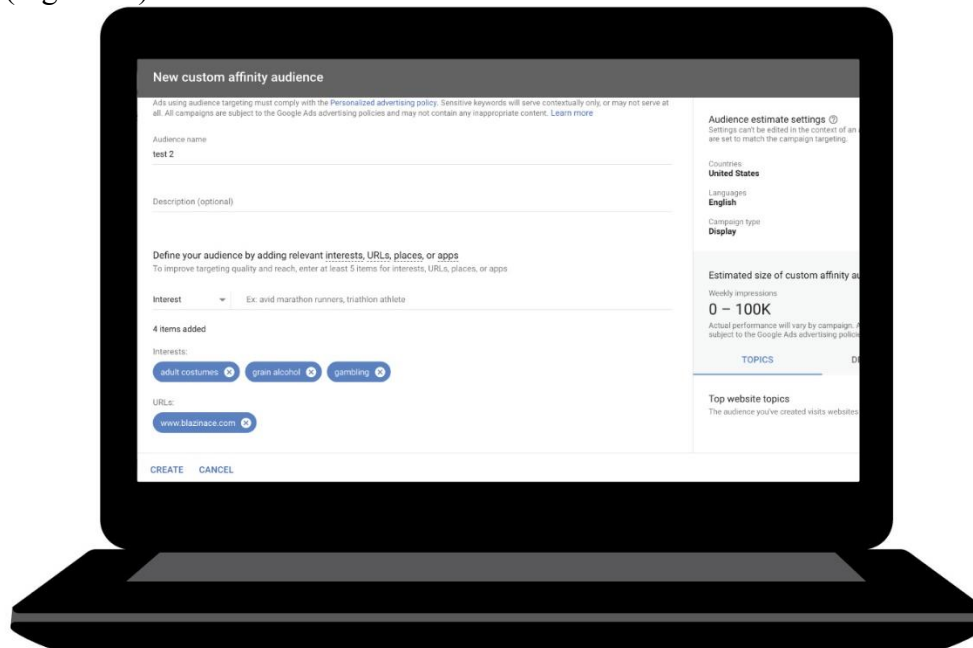


Figure 10: Sample Affinity Audiences on Google Ads Platform

[33] https://support.google.com/google-ads/answer/2497941?hl=en

[34] https://support.google.com/google-ads/answer/2580383?co=ADWORDS.IsAWNCustomer%3Dfalse&hl=en&oco=0

[35] Letter from Google to US Senate (Page 5, Paragraph 3) https://www.blumenthal.senate.gov/imo/media/doc/05.11.2018%20-%20FTC%20-%20Google%20Location%20History.pdf

[36] https://developers.google.com/adwords/api/docs/appendix/affinity_categories.csv

[37] https://developers.google.com/adwords/api/docs/appendix/in-market_categories.csv

[38] https://support.google.com/google-ads/answer/2497832?hl=en
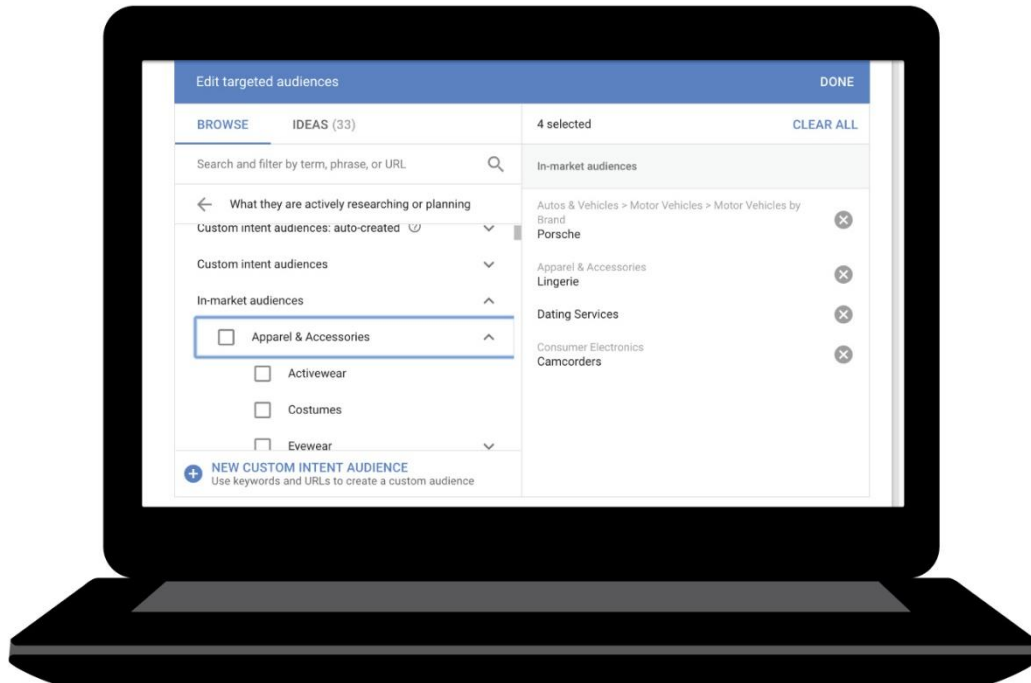
Figure 11: Sample In-Market Audiences on Google Ads Platform
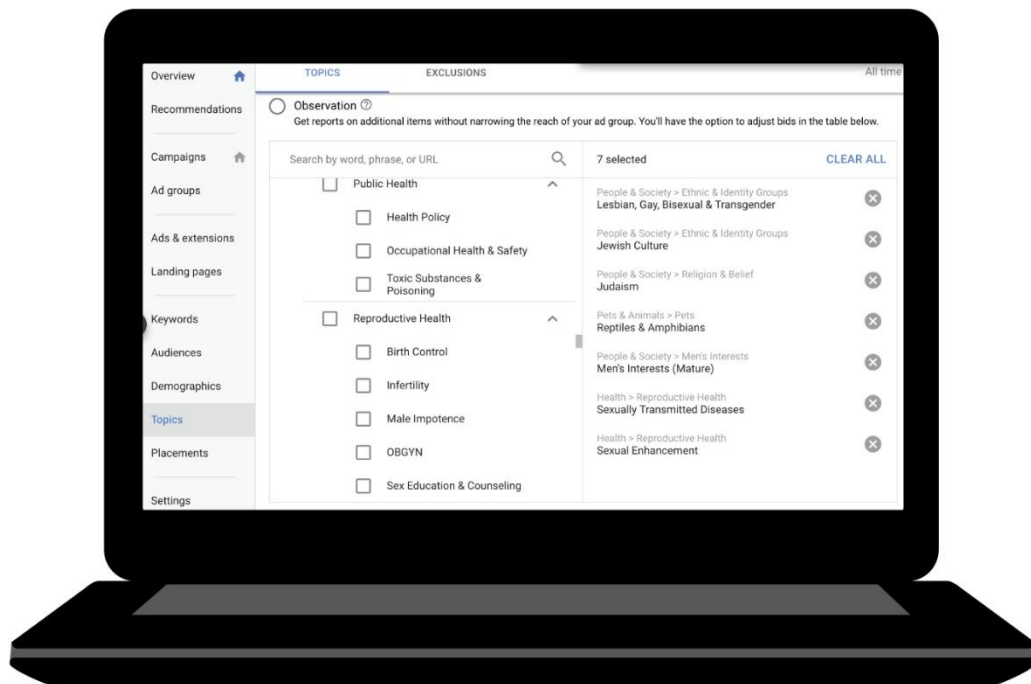


Figure 12: Sample Targeted Topics of Google Ads Platform

Advertisers have the ability to combine data sets across demographic, affinity, and intent audiences.  For instance, an advertiser could target a 40-year-old married male with children that makes $50k a year whose interests are:

> "adult costumes"
> "grain alcohol"
> "gambling"

The same advertiser could then combine this profile with an intent such as:

> "gentlemen's club"
> "infectious diseases"
> "male enhancement"

To build upon the above example, an advertiser could combine the outlined profile of an individual with topics that same consumer might interact with on the internet. Google's ad product provides options for topics such as:

> "divorce & separation"
> "depression"
> "male impotence"

By targeting against websites with specific topics, an advertiser can also indirectly target an audience. Any consumer's interaction with a "topic" would also feed their "audience" profile. If the hypothetical consumer described above interacts with advertisements Google served against their interests, intent, and online activity, the interaction itself will add to the profile of this consumer, data that Google can use to improve targeting for advertisers.

Once a consumer interacts with an advertisement, the advertiser can add that individual to a "remarketing list," allowing direct targeting of the individual in subsequent ad campaigns. Google also offers the ability to target "similar audiences" "to people who share characteristics with people on your existing remarketing lists".[39] Google's data collection can reveal individuals who just *may* be interested in a product or service simply because that consumer is *similar* to another consumer who has demonstrated interest in a product.


**Summary**

Google's business is designed to collect as much data as possible about as many consumers as possible. Yet only a small amount of the data Google collects is made available to Google account holders even though Google claims to provide an exhaustive list of the data collected.  In reality, Google collects and stores significantly more data about each consumer, if they have a Google account or not, and ties this data to unique identifiers which enable it to link information back to an individual. The information that Google does not reveal to a consumer is that consumer's shadow profile.  As a result consumers do not fully understand all of the data Google holds, which Google uses to target consumers at any moment across various products and services and is continuously updated as consumers navigate the internet and the real world.

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[39] https://support.google.com/google-ads/answer/7139569?co=ADWORDS.IsAWNCustomer%3Dtrue&hl=en&oco=0