

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA**

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and

STATE OF TEXAS
P.O. Box 12548
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Plaintiffs,

v.

GOOGLE LLC
1600 Amphitheatre Parkway
Mountain View, CA 94043

Defendant.

COMPLAINT

The United States of America, acting under the direction of the Attorney General of the United States, and the States of Arkansas, Florida, Georgia, Indiana, Kentucky, Louisiana, Mississippi, Missouri, Montana, South Carolina, and Texas, acting through their respective Attorneys General, bring this action under Section 2 of the Sherman Act, 15 U.S.C. § 2, to restrain Google LLC (Google) from unlawfully maintaining monopolies in the markets for general search services, search advertising, and general search text advertising in the United States through anticompetitive and exclusionary practices, and to remedy the effects of this conduct.

I. NATURE OF THIS ACTION

1. Two decades ago, Google became the darling of Silicon Valley as a scrappy startup with an innovative way to search the emerging internet. That Google is long gone. The Google of today is a monopoly gatekeeper for the internet, and one of the wealthiest companies on the planet, with a market value of \$1 trillion and annual revenue exceeding \$160 billion. For many years, Google has used anticompetitive tactics to maintain and extend its monopolies in the markets for general search services, search advertising, and general search text advertising—the cornerstones of its empire.

2. As in many other businesses, a general search engine must find an effective path to consumers for it to be successful. Today, general search engines are distributed primarily on mobile devices (smartphones and tablets) and computers (desktops and laptops). These devices contain web browsers (software applications for accessing information on the internet) and other “search access points” that call on a general search engine to respond to a user’s query. Over the last ten years, internet searches on mobile devices have grown rapidly, eclipsing searches on computers and making mobile devices the most important avenue for search distribution in the United States.

3. For a general search engine, by far the most effective means of distribution is to be the preset default general search engine for mobile and computer search access points. Even where users can change the default, they rarely do. This leaves the preset default general search engine with *de facto* exclusivity. As Google itself has recognized, this is particularly true on mobile devices, where defaults are especially sticky.

4. For years, Google has entered into exclusionary agreements, including tying arrangements, and engaged in anticompetitive conduct to lock up distribution channels and block rivals. Google pays *billions* of dollars each year to distributors—including popular-device

manufacturers such as Apple, LG, Motorola, and Samsung; major U.S. wireless carriers such as AT&T, T-Mobile, and Verizon; and browser developers such as Mozilla, Opera, and UCWeb—to secure default status for its general search engine and, in many cases, to specifically prohibit Google’s counterparties from dealing with Google’s competitors. Some of these agreements also require distributors to take a bundle of Google apps, including its search apps, and feature them on devices in prime positions where consumers are most likely to start their internet searches.

5. Google’s exclusionary agreements cover just under 60 percent of all general search queries. Nearly half the remaining queries are funneled through Google owned-and-operated properties (e.g., Google’s browser, Chrome). Between its exclusionary contracts and owned-and-operated properties, Google effectively owns or controls search distribution channels accounting for roughly 80 percent of the general search queries in the United States. Largely as a result of Google’s exclusionary agreements and anticompetitive conduct, Google in recent years has accounted for nearly 90 percent of all general-search-engine queries in the United States, and almost 95 percent of queries on mobile devices.

6. Google has thus foreclosed competition for internet search. General search engine competitors are denied vital distribution, scale, and product recognition—ensuring they have no real chance to challenge Google. Google is so dominant that “Google” is not only a noun to identify the company and the Google search engine but also a verb that means to search the internet.

7. Google monetizes this search monopoly in the markets for search advertising and general search text advertising, both of which Google has also monopolized for many years. Google uses consumer search queries and consumer information to sell advertising. In the United States, advertisers pay about \$40 billion annually to place ads on Google’s search engine results

page (SERP). It is these search advertising monopoly revenues that Google “shares” with distributors in return for commitments to favor Google’s search engine. These enormous payments create a strong disincentive for distributors to switch. The payments also raise barriers to entry for rivals—particularly for small, innovative search companies that cannot afford to pay a multi-billion-dollar entry fee. Through these exclusionary payoffs, and the other anticompetitive conduct described below, Google has created continuous and self-reinforcing monopolies in multiple markets.

8. Google’s anticompetitive practices are especially pernicious because they deny rivals scale to compete effectively. General search services, search advertising, and general search text advertising require complex algorithms that are constantly learning which organic results and ads best respond to user queries; the volume, variety, and velocity of data accelerates the automated learning of search and search advertising algorithms. When asked to name Google’s biggest strength in search, Google’s former CEO explained: “Scale is the key. We just have so much scale in terms of the data we can bring to bear.” By using distribution agreements to lock up scale for itself and deny it to others, Google unlawfully maintains its monopolies.

9. Google’s grip over distribution also thwarts potential innovation. For example, one company recently started a subscription-based general search engine that does not rely on advertising profits derived from monetizing user information. Another, DuckDuckGo, differentiates itself from Google through its privacy-protective policies. But Google’s control of search access points means that these new search models are denied the tools to become true rivals: effective paths to market and access, at scale, to consumers, advertisers, or data.

10. Google’s practices are anticompetitive under long-established antitrust law. Almost 20 years ago, the D.C. Circuit in *United States v. Microsoft* recognized that

anticompetitive agreements by a high-tech monopolist shutting off effective distribution channels for rivals, such as by requiring preset default status (as Google does) and making software undeletable (as Google also does), were exclusionary and unlawful under Section 2 of the Sherman Act.

11. Back then, Google claimed Microsoft's practices were anticompetitive, and yet, now, Google deploys the same playbook to sustain its own monopolies. But Google did learn one thing from Microsoft—to choose its words carefully to avoid antitrust scrutiny. Referring to a notorious line from the *Microsoft* case, Google's Chief Economist wrote: "We should be careful about what we say in both public and private. 'Cutting off the air supply' and similar phrases should be avoided." Moreover, as has been publicly reported, Google's employees received specific instructions on what language to use (and not use) in emails because "Words matter. Especially in antitrust law." In particular, Google employees were instructed to avoid using terms such as "bundle," "tie," "crush," "kill," "hurt," or "block" competition, and to avoid observing that Google has "market power" in any market.

12. Google has refused to diverge from its anticompetitive path. Earlier this year, while the United States was investigating Google's anticompetitive conduct, Google entered into agreements with distributors that are *even more* exclusionary than the agreements they replaced. Also, Google has turned its sights to emerging search access points, such as voice assistants, ensuring that they too are covered by the same anticompetitive scheme. And Google is now positioning itself to dominate search access points on the next generation of search platforms: internet-enabled devices such as smart speakers, home appliances, and automobiles (so-called internet-of-things, or IoT, devices).

13. Absent a court order, Google will continue executing its anticompetitive strategy, crippling the competitive process, reducing consumer choice, and stifling innovation. Google is now the unchallenged gateway to the internet for billions of users worldwide. As a consequence, countless advertisers must pay a toll to Google's search advertising and general search text advertising monopolies; American consumers are forced to accept Google's policies, privacy practices, and use of personal data; and new companies with innovative business models cannot emerge from Google's long shadow. For the sake of American consumers, advertisers, and all companies now reliant on the internet economy, the time has come to stop Google's anticompetitive conduct and restore competition.

II. JURISDICTION, VENUE, AND COMMERCE

14. The United States brings this action pursuant to Section 4 of the Sherman Act, 15 U.S.C. § 4, to prevent and restrain Google's violations of Section 2 of the Sherman Act, 15 U.S.C. § 2.

15. Plaintiffs Arkansas, Florida, Georgia, Indiana, Kentucky, Louisiana, Mississippi, Missouri, Montana, South Carolina, and Texas by and through their respective Attorneys General, bring this action in their respective sovereign capacities and as *parens patriae* on behalf of the citizens, general welfare, and economy of their respective States under their statutory, equitable, or common law powers, and pursuant to Section 16 of the Clayton Act, 15 U.S.C. § 26, to prevent and restrain Google's violations of Section 2 of the Sherman Act, 15 U.S.C. § 2.

16. This Court has subject matter jurisdiction over this action under Section 4 of the Sherman Act, 15 U.S.C. § 4, and 28 U.S.C. §§ 1331, 1337(a), and 1345.

17. The Court has personal jurisdiction over Google; venue is proper in this District under Section 12 of the Clayton Act, 15 U.S.C. § 22, and under 28 U.S.C. § 1391 because Google transacts business and is found within this District.

18. Google is a limited liability company organized and existing under the laws of the State of Delaware, and is headquartered in Mountain View, California. Google is owned by Alphabet Inc., a publicly traded company incorporated and existing under the laws of the State of Delaware and headquartered in Mountain View, California. Google engages in, and its activities substantially affect, interstate trade and commerce. Google provides a range of products and services that are marketed, distributed, and offered to consumers throughout the United States, in the plaintiff States, across state lines, and internationally.

III. INDUSTRY BACKGROUND

A. Search Engines, Search Advertising, and General Search Text Advertising

19. In the early 1990s, computer scientists and entrepreneurs explored different ways to search and index the growing number of internet sites. The first computer program or general “search engine” that could perform this task was designed in 1990 by a student at McGill University in Montreal and called “Archie.” Other early general search engines emerged, with different methods of gathering, organizing, and presenting information about internet sites. Google’s founders launched their research project “Backrub” on Stanford University’s network in 1996.

20. Most modern general search engines use software to “crawl” the internet, indexing webpages and the information within them. As Google explains, “The web is like an ever-growing library with billions of books and no central filing system. We use software known as web crawlers to discover publicly available webpages. Crawlers look at webpages and follow

links on those pages, much like you would if you were browsing content on the web. They go from link to link and bring data about those webpages back to Google's servers.”

21. When a search user enters a query into a general search engine, the software uses algorithms to evaluate the relevance of information on any given webpage to the user's query. Depending on the query, some general search engines may also search selected proprietary databases for pertinent information to offer additional “specialized” search results. The general search engine then delivers the results on the SERP, with links to, and short descriptions of, webpages the algorithm has curated and ranked. Sometimes, the general search engine will serve ads with the search results.

22. Given the internet's enormous breadth and constant evolution, establishing and maintaining a commercially viable general search engine is an expensive process. Google's search index contains hundreds of billions of webpages and is well over 100,000,000 gigabytes in size. Developing a general search index of this scale, as well as viable search algorithms, would require an upfront investment of billions of dollars. The costs for maintaining a scaled general search business can reach hundreds of millions of dollars a year.

23. General search engines are “one-stop shops” consumers can use to search the internet for answers to a wide range of queries. The United States has only three general search engines that crawl the internet: Google, Bing, and, to a lesser extent, privacy-focused search provider DuckDuckGo. DuckDuckGo combines search results from different sources (including Bing) depending on the search query. A fourth general search engine, Yahoo!, does not currently crawl the internet and instead purchases search results from Bing.

24. Consumers can find certain specialized information online using sources other than general search engines. For example, consumers can search retail marketplaces such as

Amazon or eBay to shop for products, or go to Expedia or Priceline to compare airfares. Search sites that offer users a narrower, focused set of answers to queries are “specialized search engines.” Specialized search engines are often able to give users deeper topical results than general search engines by using specialized data or information gathered from users or supplied by third parties.

25. Most general search engines do not charge a cash price to consumers. At least one, Bing, even offers to pay consumers rewards for using its general search engine. That does not mean, however, that these general search engines are free. When a consumer uses Google, the consumer provides personal information and attention in exchange for search results. Google then monetizes the consumer’s information and attention by selling ads.

26. Search advertising first appeared on Google in 2000. During that same year Google launched AdWords, its buying platform for search ads. Two years ago, Google rebranded AdWords as Google Ads.

27. To sell ads on its SERP, in 2002, Google adopted auctions for keywords; advertisers would bid on selected keywords, and when those keywords arose in a query, the winning bidder’s ad was shown. At that time, Google also started using a compensation scheme where advertisers pay only when the user clicks on the ad, known as cost-per-click pricing. Some SERP displayed multiple ads. Eventually, Google discovered that it could increase the number of clicks—and its own profits—by ranking ads to promote those with greater relevance and therefore higher expected click-through rates. To help determine placement of ads, Google still uses a “quality score” based on various factors.

28. Advertisers use various types of ads to achieve different objectives. Marketers and advertisers typically refer to a “purchase funnel” or “customer acquisition funnel” to describe the

average consumer’s various states of mind leading up to a potential purchase, and the type of advertising most effective at each state. The following is an illustration of the purchase funnel:

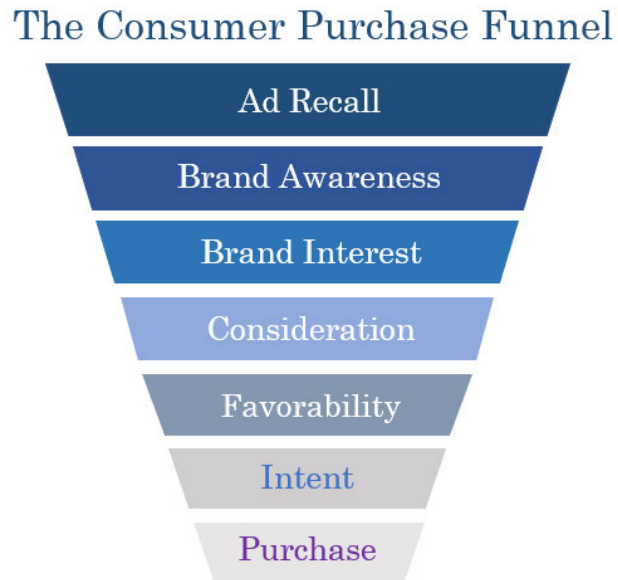


Figure 1

29. Search ads enable advertisers to target potential customers based on keywords entered by these users, at the exact moment users express interest in the topic of the queries. For this reason, search ads are lower in the purchase funnel—closer to the consumer’s ultimate intent to make a purchase—than other types of ads that are primarily intended to drive brand awareness. The ability of search ads to provide advertising based on a consumer’s self-disclosed interests, when the consumer is actively seeking information, makes search ads uniquely valuable to advertisers.

30. Historically, general search engines such as Google sold only general search *text* ads. General search text ads resemble the organic search results that appear on a SERP—what Google refers to as the “10 blue links”—but with a subtle notation that they are “ads” or “sponsored.” Google describes its text ads as follows:

Text ads on the Search Network show above and below Google search results. It has three parts: headline text, a display URL, and description text.

Comprehensive Insurance | Protect Yourself on a Budget | Get Your Free Quote Today
 [Ad] www.example.com/insurance
 Get affordable & trustworthy insurance. 10% discount on all online quotes. Easily compare insurance plans side-by-side in just a few seconds.

Figure 2

31. Over time, general search engines also began to sell some specialized search ads, which promoted specific categories of goods and services such as retail products, hotel rooms, or local services such as locksmiths and plumbers. Figure 3 shows a Google SERP that includes, from top to bottom, specialized search ads (in this case, Google “Shopping Ads” designed specifically to sell retail products), a general search text ad, and an organic search result.

The screenshot shows a Google search for "best Brown Shoe". The results are categorized into three sections:

- Shopping Ads:** A row of five shoe listings with images, brand names (Cole Haan, Allen Edmonds, Banana Republic), prices (\$131.99, \$245.00, \$158.00, \$199.97, \$98.00), and star ratings.
- Text Ad:** An advertisement from www.toboot.com for "To Boot New York - Handcrafted Men's Dress Shoes" with a description: "Look Your Best With Our Handcrafted Shoes, Boots, And Sneakers. Free Shipping Available. Dress Up With Our Handcrafted Shoes, Boots, And Sneakers. Free Shipping On All Orders."
- Organic Result:** A search result from www.businessinsider.com titled "10 of the best brown dress shoes guys can buy right now ..." with a date of Sep 20, 2017 and a list of shoe brands like Wolf & Shepherd, Chukka, and Magnanni.

Figure 3

32. Some specialized search providers also sell search ads. For example, advertisers can buy specialized search ads for goods sold on Amazon, hotels presented on Expedia, and local services listed on Yelp.

33. As the number of users of a general search engine grows, advertisers benefit because they want their marketing campaigns to reach large groups of consumers. But users do not benefit from indirect network effects in an equivalent way. As Google’s Chief Economist has explained, “users do not decide which search engine to use based on the number of advertisers.”

34. Today, the search advertising business in the United States is enormous—over \$50 billion per year—and dominated by Google. Because of Google’s user base and scale, the company’s search ads have become a “must have” for many advertisers. Advertising agencies and larger companies often have entire groups that manage search advertising, mostly focused on Google.

B. Importance of Scale

35. Scale is of critical importance to competition among general search engines for consumers and search advertisers. Google has long recognized that without adequate scale its rivals cannot compete. Greater scale improves the quality of a general search engine’s algorithms, expands the audience reach of a search advertising business, and generates greater revenue and profits.

36. The additional data from scale allows improved automated learning for algorithms to deliver more relevant results, particularly on “fresh” queries (queries seeking recent information), location-based queries (queries asking about something in the searcher’s vicinity), and “long-tail” queries (queries used infrequently).

37. Scale is also important for search advertising because advertisers pay more to buy ads from a search provider with a large audience of potentially interested customers. Google can

deliver enormous audiences, especially in mobile, which its competitors cannot. Google's scale also enables it to better discern which ads are most relevant for which queries.

38. Further, to recoup the large investment in creating and maintaining a general search engine, scale is critical to generating the necessary revenues and profits. Even a competitor that syndicates its search results from other general search engines must make substantial investments to compete. The most effective way to achieve scale is for the general search engine to be the preset default on mobile devices, computers, and other devices, as described in more detail below.

C. General Search Engine Distribution and Default Status

39. Search is like many other businesses in that the owners of general search engines can benefit greatly from a network of distributors to get their products to consumers. Distribution of general search engines takes place primarily through search access points, such as browsers and search apps, typically located on mobile devices and computers. More recently, searches have become available on IoT devices.

40. General search service providers can enter into agreements with various distributors, including computer and mobile-device manufacturers, cell phone carriers, and browser developers, to secure preset default status on computer and mobile-device search access points.

41. New computers and new mobile devices generally come with a number of preinstalled apps and out-of-the-box settings. Computers and mobile devices generally have apps preinstalled that include search access points, such as browsers, search apps and widgets, and voice assistants. Mobile devices may also have hardware features—such as a home button triggering a voice assistant—that a consumer can use to invoke apps with search functionality. Each of these search access points can and almost always does have a preset default general

search engine. Being the preset default general search engine is particularly valuable because consumers rarely change the preset default.

1. The Mobile Search Distribution Channel

42. With roughly 60 percent of searches, mobile devices represent the largest and, over the last five years, fastest growing search distribution channel.

43. In the United States, Apple iOS devices—those running on Apple’s proprietary mobile operating system—account for roughly 60 percent of mobile-device usage. Apple’s iOS is a closed ecosystem; Apple does not license iOS to third-party mobile-device manufacturers. Another roughly 40 percent of mobile-device usage comes from devices that use Android, an open-source mobile operating system controlled by Google. Unlike iOS, Android is licensable, which means third-party mobile-device manufacturers can use it as the operating system for their devices. All other mobile operating systems, combined, account for less than one percent of mobile-device usage in the United States.

44. General search services can be delivered to mobile-device users through a variety of search access points, including: (1) a browser, (2) a static search bar (search widget, referred to in Figure 4 as the QSB or quick search box) on the device’s home screen, (3) a search app, (4) artificial intelligence software (voice assistants) accessed by a button or voice command and designed to answer voice-initiated queries, and (5) other apps that link to general search engines, such as smart keyboards. Figure 4, from a 2018 Google strategy deck, provides a more specific breakdown of how Google delivers its general search service on Android devices.

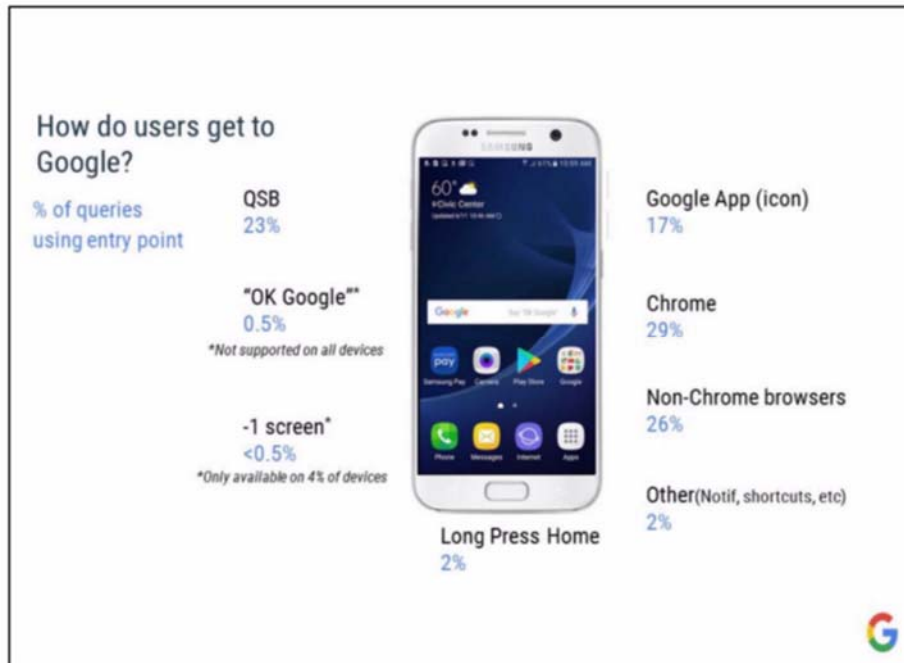


Figure 4

45. In the United States, both cell phone carriers and manufacturers sell mobile devices. As discussed above, these phones or tablets typically have search access points preset with a general search engine as the default. These preset defaults are usually governed by a distribution or licensing agreement. For instance, Google has contracted with Apple for many years to preset Google's search engine as the default for Apple's Safari browser and, more recently, other search access points on Apple's mobile devices. When a consumer takes a new iPhone or iPad out of its box, all the significant access points default to Google as their general search provider. Indeed, Google has preset default status for an overwhelming share of the search access points on mobile devices sold in the United States.

46. For mobile browsers, Google is the default search provider for both Apple Safari (approximately 55 percent share) and Google Chrome (over 35 percent share), which together account for over 90 percent of the browser usage on mobile devices in the United States.

47. Consumers typically do not change their mobile device’s default search functions, making securing preset default status for search access points important for effective distribution of general search engines (and delivery of search ads). As one search competitor noted in 2019, “For the most part, despite the simplicity of changing a default setting to enable customer choice, experience shows us that users accept the default search experience that comes with their device or the browser.” This fact is especially true on mobile devices; as Google observed in a 2018 strategy document, “People are much less likely to change [the] default search engine on mobile.” Alternative methods of obtaining search access points or encouraging general search engine usage—such as direct marketing to consumers—are not nearly as effective as preinstalling search access points on mobile devices and computers.

2. *The Computer Search Distribution Channel*

48. When using a computer, most consumers access a general search engine through a browser, either by (1) typing a query directly into the address bar at the top of the browser, or (2) visiting a general search engine web page and entering a query. Many browsers default to a general-search-engine web page as the home or start screen each time a user activates the browser; this offers users a convenient way to start their search experience.

49. In the United States, Google Chrome is the leading computer browser, with almost 60 percent market share. Apple’s Safari browser has approximately 16 percent share on computers. Mozilla’s Firefox has approximately 7 percent share, and Microsoft’s Edge and Internet Explorer together have approximately 15 percent share. Other small browsers have a combined share of less than 4 percent. With the exception of Microsoft, most browser developers have agreed with Google to preset its search engine as the default search provider.

50. Preset default settings are important for computers. Consumers may not understand that they can change the browser's preset default general search engine, or consumers may not bother to invest the time to make such a switch.

51. For both mobile and computer search access points, being preset as the default is the most effective way for general search engines to reach users, develop scale, and become or remain competitive.

D. Distribution Agreements in Mobile and Computer Channels

52. General search services providers typically enter into licensing and distribution agreements with manufacturers and carriers that distribute mobile devices with search access points. In the United States, roughly 60 percent of all search queries are covered by Google's exclusionary agreements. On mobile devices, Google's exclusionary agreements cover more than 80 percent of all U.S. search queries.

53. Of the remaining search queries not covered by Google's exclusionary contracts, almost half take place on search access points owned by Google. Google is a vertically integrated search provider and distributes search in part through several of its own properties, including for example its browser (Chrome) and phone (Pixel). Between its exclusionary contracts and owned-and-operated properties, Google effectively owns or controls search distribution channels accounting for roughly 80 percent of the general search queries in the United States.

54. Google's distribution agreements come in three basic types, with the specific terms of each agreement depending upon the counterparty and the search access points at issue. First, Google requires Android device manufacturers that want to preinstall Google's proprietary apps to sign an anti-forking agreement; these agreements set strict limits on the manufacturers' ability to sell Android devices that do not comply with Google's technical and design standards.

55. Next, for Android device manufacturers that sign an anti-forking agreement, Google provides access to its vital proprietary apps and application program interfaces (APIs) for preinstallation, but only if the manufacturers contractually agree to (1) take a bundle of other Google apps, (2) make certain apps undeletable, and (3) give Google the most valuable and important real estate on the default home screen.

56. Finally, Google provides a share of its search advertising revenue to Android device manufacturers, mobile phone carriers, competing browsers, and Apple; in exchange, Google becomes the preset default general search engine for the most important search access points on a computer or mobile device. As a practical matter, users rarely switch the preset default general search engine. In many cases, the agreements relating to mobile devices go even further, expressly prohibiting (1) the preinstallation of any rival general search services, and (2) the setting of other defaults to rival general search engines. This means that Google is the only preset default search provider preinstalled on the device.

57. These agreements work exactly as Google designed them—to foreclose distribution to Google’s search rivals, weakening them as competitive alternatives for consumers and advertisers by denying them scale.

1. Background on Mobile Strategy and Development of Android Ecosystem

58. Google’s anticompetitive agreements must be understood against the backdrop of Google’s overall business strategy. When Google was formed and achieved initial success in the late 1990s and early 2000s, internet searches were almost exclusively performed through browsers on computers. But as Google told investors in its 2007 Form 10-K: “More individuals are using non-desktop devices to access the internet. If users of these devices do not widely adopt versions of our web search technology, products or operating systems developed for these devices, our business could be adversely affected.”

59. In a mobile world, Google had to deal with mobile device manufacturers (such as LG, Motorola, and Samsung), and carriers (such as AT&T, T-Mobile/Sprint, and Verizon) that would hold sway over distribution of search and search ads. Google thus asked internally, “How can we conquer the world’s major wireless markets simultaneously?”

60. The answer started with Android, a mobile operating system that Google purchased in 2005. In 2007, Google released the Android code for free under an open-source license. Being “open source” means that anyone can access the source code and use it to make their own, modified operating system—a “fork.” This was key to Android’s adoption.

61. First, Google’s apparent lack of control over an open-source operating system attracted skeptical manufacturers and carriers of mobile phones to use Android instead of the other choices then available. As the Android team leader observed to Google’s board of directors, “Google was historically seen as a threat” to these distributors. But an open-source model suggested that they—and not Google—would ultimately retain control over their devices and the app ecosystem on those devices.

62. Second, once enough major distributors agreed to use Android, the operating system attracted developers looking for wide distribution of their apps. As more app developers focused their efforts on designing Android apps, Android became more attractive to consumers, which in turn led even more developers to design for Android. The result was a must-have ecosystem of Android apps.

63. Third, to help the Android ecosystem achieve critical mass and to advance the network effects, Google “shared” its search advertising and app store revenues with distributors as further inducement to give up control. As one senior executive explained about Android Market, an earlier name for Google’s app store, “Android Market is a bitter pill for carriers, and

a generous revenue share is the sugar that makes it go down smoother.” In other words, beginning over ten years ago, Google used revenue sharing to attract partners to Android; as discussed below, Google uses revenue sharing to keep them locked in today.

64. By 2010, the Android team leader noted that “Android is poised for world domination—the success story of the decade.” He was right; the strategy worked. The “Google Play” app store has a massive library of apps, making it essential for Android distributors to have on their devices. As for the operating system itself, it quickly became the dominant licensable mobile operating system in the United States. In the four years between 2009 and 2012, Android’s share of licensable mobile operating systems on smartphones in the United States more than tripled, reaching about 80 percent. Today, Android represents over 95 percent of licensable mobile operating systems for smartphones and tablets in the United States and accounts for over 70 percent of *all* mobile device usage worldwide. The only other mobile operating system with significant market share in the United States is Apple’s iOS, which is not licensable.

65. Control over Android has always been a critical issue. As Google’s Android team leader asked at the time: “How do we retain control of something we gave away?” Google’s answer is the set of contractual “carrots” and “sticks” discussed below that empower Google to “[o]wn the ecosystem” and help thwart any alternative mobile ecosystem from developing that could support a different search provider.

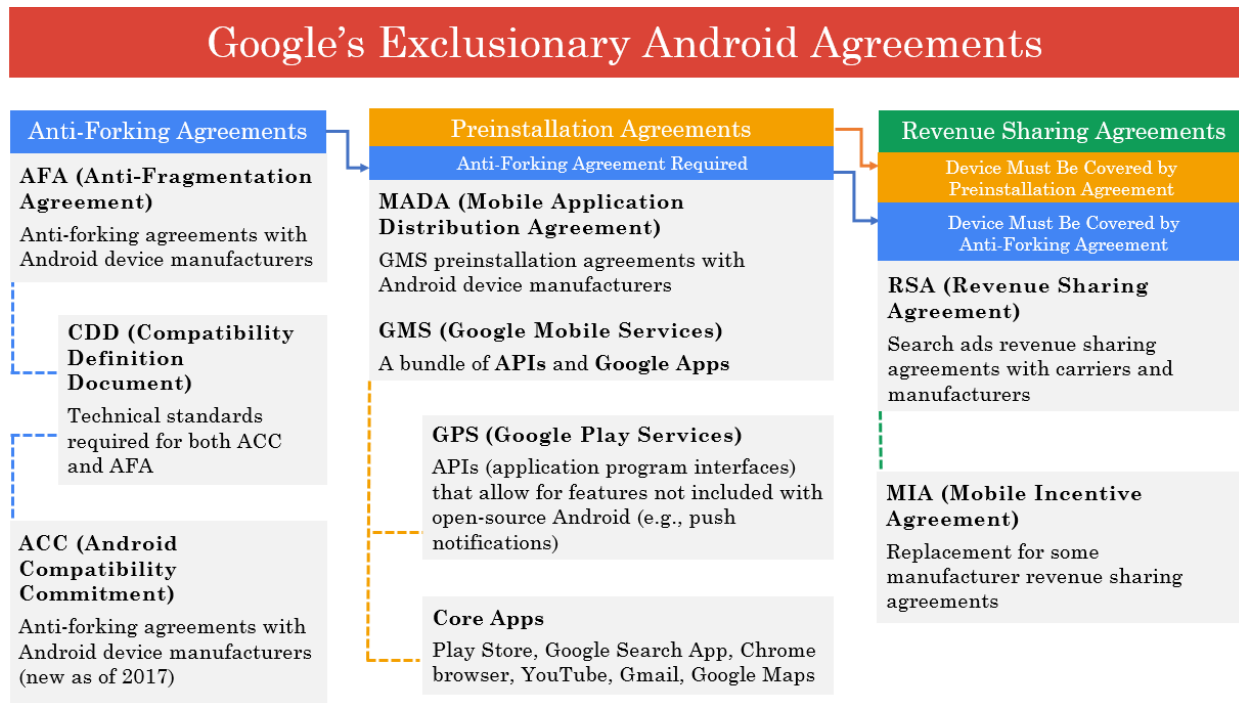


Figure 5

2. *Anti-Fragmentation Agreements and Compatibility Commitments (Android Mobile Devices)*

66. The Android operating system is open source; Google updates the Android code periodically and makes it publicly available. But Google takes steps to minimize the risk that a developer creates an Android fork to compete with the Android ecosystem controlled by Google. By limiting the existence of devices running Android forks, Google limits possible distribution channels available to its search rivals.

67. One way Google retains control of the Android ecosystem is through anti-forking agreements. These agreements broadly prohibit manufacturers from taking “any actions that may cause or result in the fragmentation of Android.” Notably, “fragmentation” is left undefined, giving Google wide latitude in practice.

68. Google's anti-forking agreements specifically forbid manufacturers from developing or distributing versions of Android that do not comply with Google-controlled technical standards, as defined in its Android Compatibility Definition Document (CDD).

69. Two types of anti-forking agreements exist. Before 2017, Google required distributors to sign Anti-Fragmentation Agreements (AFAs). In 2017, while being investigated by the European Commission (and long after Google had locked up its monopoly status), Google began shifting its anti-forking restrictions from AFAs to new Android Compatibility Commitments (ACCs). Today, Google has an AFA or ACC with the leading Android device manufacturers, including LG, Motorola, and Samsung.

70. ACCs are marginally less onerous than AFAs because they allow manufacturers to build devices or components for third parties to sell to consumers, even if those devices or components do not comply with Google's technical standards. But ACCs, like AFAs, prohibit signatories from manufacturing Android forks of their own, distributing devices with Android forks, or using their powerful brands to market forks on behalf of third parties. Most well-known Android manufacturers are bound by AFAs or ACCs.

71. The AFAs and ACCs do not just restrict manufacturers' ability to build and distribute innovative versions of mobile phones. Over time, Google has extended the Android CDD such that its specifications apply to tablets and emerging technologies such as smart TVs, watches, and automotive devices. Manufacturers that hope to release Android-based versions of these products must comply with Google's standards as well.

3. *Mobile Application Distribution Agreements (Android Mobile Devices)*

72. Manufacturers agree to anti-forking agreements in part because they are a precondition to receiving a license to distribute devices with must-have proprietary Google apps and APIs (the set of technical specifications that enable software applications to communicate

with each other, operating systems, and hardware). This license is provided only through preinstallation agreements—called Mobile Application Distribution Agreements, or MADAs. Leading Android device manufacturers, such as LG, Motorola, and Samsung, are MADA licensees.

73. Over time, Google has chosen to include important features and functionality in Google’s own ecosystem of proprietary apps and APIs, rather than the open-source Android code. Google refers to this proprietary layer as “Google Mobile Services” (GMS). GMS includes many popular apps, such as Google’s search app, Chrome, YouTube, and Google Maps. GMS also includes Google Play, Google’s app store. An app store is one of the most valuable features of a mobile device because it offers access to compatible apps that do not come preinstalled on the device. Google Play offers about three million apps, more than any other app store (including Apple’s App Store, which is compatible only with Apple devices). More than 90 percent of apps on Android devices are downloaded through Google Play. For years, Google Play has been the only commercially significant app store option for Android manufacturers.

74. Another key part of GMS is the set of APIs that allow developers to access certain important features. The APIs available within GMS are part of “Google Play Services” (GPS). GPS allows apps, including third-party apps, to perform functions that are not possible using the open-source version of Android. For example, using the open-source Android system, third-party apps cannot provide basic “push notifications,” enable in-app purchases through Google Play, or use data from Google Maps; to have these functionalities, third-party apps must use GPS.

75. The integration of key functions with GPS makes it more difficult for third-party Android developers to port their apps to Android forks because the apps are designed to interact

with Google's proprietary APIs. And as the functionality gap between open-source Android apps and Google's proprietary apps grows, developers are more dependent on GPS.

76. Signing a preinstallation agreement is the only way for an Android device manufacturer to preinstall any Google app, including Google Play. It is also the only way an Android device manufacturer can gain access to GPS and the APIs many developers need for their apps to work properly, at least without expensive and time-consuming reprogramming. But any manufacturer installing Google Play or GPS must preinstall a full suite of apps identified by Google, including the search access points most frequently used by consumers: Chrome, Google search app, Google search widget, and Google Assistant. Google's search engine is the default on all these search access points. Indeed, Google uses the MADAs to control the appearance of Android devices, requiring the manufacturer to place the Google search widget on the home screen, and to preinstall Chrome, the Google search app, and other apps in a way that makes them undeletable by the user.

77. Moreover, before 2017, most MADAs also required manufacturers to set Google as the default general search engine for all key search access points on any device with preinstalled Google apps—these requirements are now found in the revenue sharing agreements discussed below.

4. *Revenue Sharing Agreements (Android Mobile Devices)*

78. Google enters into search revenue sharing agreements (RSAs) with Android manufacturers and carriers. Google generally requires exclusive distribution as the sole preset default general search service on an ever-expanding list of search access points; in exchange, Google remits to these companies a percentage of search advertising revenue. Google offers revenue share to Android device manufacturers only if they are MADA licensees, and Google offers revenue share to carriers only for devices built by manufacturers that are MADA

licensees. The leading U.S. carriers (AT&T, T-Mobile, and Verizon) and the leading Android device manufacturer (Samsung) have RSAs with Google.

79. Some of Google’s revenue sharing agreements require blanket coverage for all Android devices sold by Google’s counterparty. Under this version of the revenue sharing agreements, the distributor receives a payment from Google only if *all* the distributor’s Android devices comply with the exclusivity requirements. Other revenue sharing agreements provide for a model-by-model choice. Under this version of the agreements, for the distributor to receive a cut of the advertising revenue from any units of a model, every unit of that model must comply with the exclusivity requirements.

80. As innovation has increased the number of search access points on mobile devices—including smart keyboards and voice assistants—Google has expanded its RSAs to close off these avenues to search rivals.

5. *Mobile Incentive Agreements (Android Mobile Devices)*

81. In Google’s latest round of negotiations with some Android manufacturers, Google has replaced RSAs with mobile incentive agreements (MIAs), under which Google pays manufacturers to (1) forego preinstalling rival general search services on their Android devices and (2) comply with a significant number of “incentive implementation requirements”—including preloading up to fourteen additional Google apps. LG and Motorola have MIAs with Google.

82. To maximize payments under the MIAs, the manufacturers must also set Google as the default for all search access points on nearly all of their devices. Moreover, Google generally retains “sole discretion” to determine what constitutes a “search access point,” and thus controls the coverage of its exclusive contracts. Although the MIAs change the payment

structure for certain manufacturers, the agreements achieve the same end as their predecessors: search exclusivity for Google.

83. Today, Google has revenue sharing agreements (RSAs or MIAs) with all major U.S. carriers and Android device manufacturers, as well as a number of smaller carriers and manufacturers. Google's revenue sharing agreements (and preinstallation agreements) with Android device manufacturers, together, account for more than 30 percent of mobile device usage in the United States.

6. Revenue Sharing Agreements (*Apple and Others*)

84. Google's revenue sharing agreements are not limited to its Android partners. Google has entered into revenue sharing agreements with rival browsers and other device manufacturers, further blocking off search access points from competition.

85. Most significantly, Google has had a series of search distribution agreements with Apple, effectively locking up one of the most significant distribution channels for general search engines. Apple operates a tightly controlled ecosystem and produces both the hardware and the operating system for its popular products. Apple does not license its operating systems to third-party manufacturers and controls preinstallation of all apps on its products. The Safari browser is the preinstalled default browser on Apple computer and mobile devices. Apple devices account for roughly 60 percent of mobile device usage in the United States. Apple's Mac OS accounts for approximately 25 percent of the computer usage in the United States.

86. In 2005, Apple began using Google as the preset default general search engine for Apple's Safari browser. In return, Google gave Apple a significant percentage of Google's advertising revenue derived from the search queries on Apple devices. Two years later, Google extended this agreement to cover Apple's iPhones. In 2016, the agreement expanded further to cover additional search access points—Siri (Apple's voice-activated assistant) and Spotlight

(Apple’s system-wide search feature)—making Google the preset default general search engine for both services. Today, Google’s distribution agreement with Apple gives Google the coveted, preset default position on all significant search access points for Apple computers and mobile devices.

87. Today, Google has RSAs with nearly every significant, non-Google browser other than those distributed by Microsoft, including Mozilla’s Firefox, Opera, and UCWeb. These agreements generally require the browsers to make Google the preset default general search engine for each search access point on both their web and mobile versions.

IV. RELEVANT MARKETS

A. General Search Services in the United States

1. General Search Services in the United States Is a Relevant Antitrust Market

88. General search services in the United States is a relevant antitrust market. General search services allow consumers to find responsive information on the internet by entering keyword queries in a general search engine such as Google, Bing, or DuckDuckGo.

89. General search services are unique because they offer consumers the convenience of a “one-stop shop” to access an extremely large and diverse volume of information across the internet. Consumers use general search services to perform several types of searches, including navigational queries (seeking a specific website), informational queries (seeking knowledge or answers to questions), and commercial queries (seeking to make a purchase).

90. Other search tools, platforms, and sources of information are not reasonable substitutes for general search services. Offline and online resources, such as books, publisher websites, social media platforms, and specialized search providers such as Amazon, Expedia, or Yelp, do not offer consumers the same breadth of information or convenience. These resources

are not “one-stop shops” and cannot respond to all types of consumer queries, particularly navigational queries. Few consumers would find alternative sources a suitable substitute for general search services. Thus, there are no reasonable substitutes for general search services, and a general search service monopolist would be able to maintain quality below the level that would prevail in a competitive market.

91. The United States is a relevant geographic market for general search services. Google offers users in the United States a local domain website with search results optimized based on the user’s location in the United States. General search services available in other countries are not reasonable substitutes for general search services offered in the United States. Google analyzes search market shares by country, including the United States. Therefore, the United States is a relevant geographic market.

2. *Google Has Monopoly Power in the General Search Services Market in the United States*

92. Google has monopoly power in the United States general search services market. There are currently only four meaningful general search providers in this market: Google, Bing, Yahoo!, and DuckDuckGo. According to public data sources, Google today dominates the market with approximately 88 percent market share, followed far behind by Bing with about seven percent, Yahoo! with less than four percent, and DuckDuckGo with less than two percent.

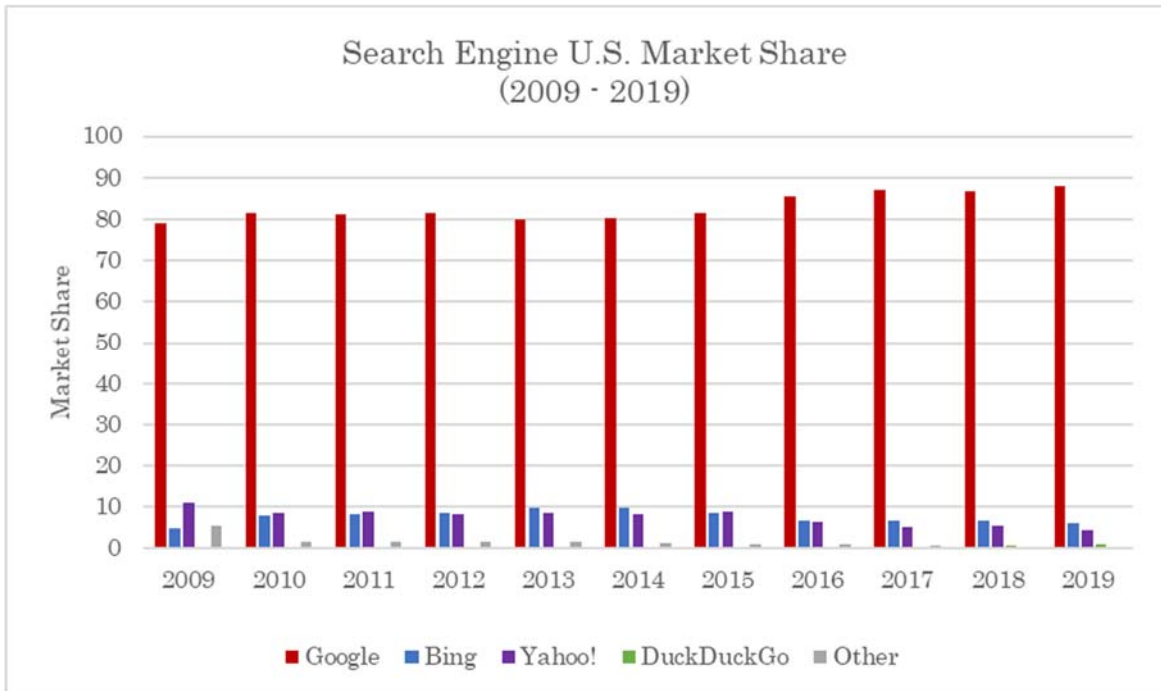


Figure 6

93. Over the years, Google has steadily increased its dominant position in general search services. In July 2007, Google estimated its general search services market share at 68 percent. By June 2013, Google estimated that its share in the United States had already increased to 77 percent on computers. By April 2018, Google estimated that its share was 79 percent on computers and 93.5 percent on mobile. More recently, Google has accounted for almost 90 percent of all general search engine queries in the United States, and almost 95 percent of queries on mobile devices. Recent share estimates are in Figures 7 and 8.

Mobile Search Engine U.S. Market Share
including tablet and mobile
(September 2020)

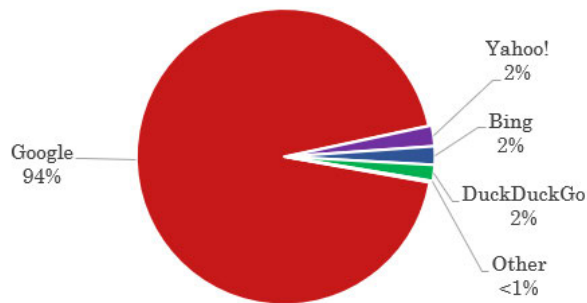


Figure 7

Computer Search Engine U.S. Market Share
including desktop and laptop
(September 2020)

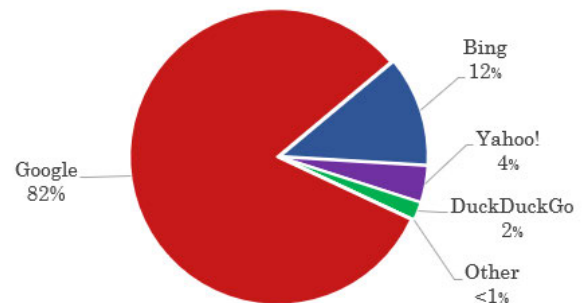


Figure 8

94. There are significant barriers to entry in general search services. The creation, maintenance, and growth of a general search engine requires a significant capital investment, highly complex technology, access to effective distribution, and adequate scale. For that reason, only two U.S. firms—Google and Microsoft—maintain a comprehensive search index, which is just a single, albeit fundamental, component of a general search engine.

95. Scale is also a significant barrier to entry. Scale affects a general search engine's ability to deliver a quality search experience. The scale needed to successfully compete today is greater than ever. Google's anticompetitive conduct effectively eliminates rivals' ability to build the scale necessary to compete.

96. Google's large and durable market share and the significant barriers to entry in general search services demonstrate Google's monopoly power in the United States.

B. Search Advertising in the United States and General Search Text Advertising in the United States Are Relevant Antitrust Markets

1. Search Advertising Is a Relevant Product Market

97. Search advertising in the United States is a relevant antitrust market. The search advertising market consists of all types of ads generated in response to online search queries, including general search text ads (offered by general search engines such as Google and Bing)

and other, specialized search ads (offered by general search engines and specialized search providers such as Amazon, Expedia, or Yelp).

98. Search ads enable advertisers to target marketing messages in real time in response to queries entered by a consumer. Thus, a user's general search query has the important function to an advertiser of revealing the searcher's intent. The ability of search ads to respond to consumer inquiries, at the moment the consumer is investigating a subject relevant to an advertiser's product or service, makes these ads highly valuable to advertisers and distinguishes them from other types of advertising that cannot be similarly targeted, whether online or offline.

99. Other forms of advertising are not reasonably substitutable for search ads. For example, "offline" ads such as newspaper, billboard, TV, and radio ads cannot be targeted at a specific consumer based on the consumer's real-time, self-disclosed interests. Similarly, other forms of online ads, such as display ads or social media ads, do not enable advertisers to target customers based on specific queries and are generally aimed at consumers who are further from the point of purchase. As Google's Chief Economist explained: "One way to think about the difference between search and display/brand advertising is to say that 'search ads help satisfy demand' while 'brand advertising helps to create demand,'" and "[d]isplay and search advertising are complementary tools, not competing ones."

100. Few advertisers would find alternative sources a suitable substitute for search advertising. Thus, there are no reasonable substitutes for search advertising, and a search advertising monopolist would be able to maintain prices above the level that would prevail in a competitive market.

2. General Search Text Advertising Is a Relevant Product Market

101. There also is a relevant product market for general search text advertising that is wholly contained within the broader search advertising market. General search text ads are sold

by general search engines, typically placed just above or below the organic search results on a SERP, and resemble the organic results that appear on a general search engine's SERP, with a subtle notation that they are "ads" or "sponsored." In contrast, other types of search ads—specifically, specialized search ads—typically are visually different from general search text ads and convey different types of information. For example, a Google Shopping Ad normally includes an image of the product, its price, and star-based ratings (see Figure 3). In 2018, general search text ads accounted for close to 85 percent of Google's search ad revenue.

102. General search text ads are distinct from specialized search ads in ways that limit their substitutability for most purposes, including their scope of coverage, purpose, format, and sales process. Indeed, for many advertisers that purchase general search text ads, there are no reasonable alternatives for these ads, which renders these advertisers particularly vulnerable to targeted price increases. General search text ads on Google are vitally important for many different types of advertisers, including companies that prefer to sell directly to consumers from their own websites and companies that want to protect their brand names on Google.

103. General search text ads can be delivered in response to search queries related to any subject that users explore on the internet. General search text ads are offered predominantly by the two companies that operate general search engines: Google and Microsoft (Bing); Bing also syndicates general search text ads for Yahoo! and DuckDuckGo. By contrast, other kinds of search ads are provided by specialized search providers in response to narrower and deeper searches in their areas of specialization, such as retail (e.g., Amazon), travel (e.g., Kayak), or local (e.g., Yelp).

104. General search text ads often target consumers further from an actual sale or "conversion" than specialized search ads. Users often rely on a general search engine such as

Google to start a search of the entire web to explore an interest, consider options, and form a preference, often about a purchase. An advertiser often will buy a general search text ad to drive these searchers down the purchase funnel to the advertiser's website to shop for a product or service. In part for this reason, specialized search providers, such as Amazon, Expedia, and eBay, are among Google's largest *customers* for general search text ads—i.e., they *buy* general search text ads to drive consumers to their specialized search sites, where they then *sell* specialized search ads to advertisers who want to reach those interested consumers at or near the point of purchase. Because general search text ads and specialized ads serve different functions, advertisers often view these ads as complements.

105. General search text ads link to the advertiser's website, so the user can “click out” to that site. By contrast, ads by specialized search providers often link to webpages on that specialized search provider's own website. For example, if a company sells a product on Amazon and buys an ad on Amazon to promote its product, the ad links to the Amazon page on which the advertised product can be purchased—not the seller's own website. This kind of search ad is called a “click in” ad. Thus, general search text ads can be purchased by advertisers that do not sell their products or services on specialized search sites (such as Amazon) as well as advertisers that prefer to sell their products or services directly to consumers.

106. Few general search text advertisers would find alternative sources a suitable substitute for general search text advertising. Thus, there are no reasonable substitutes for general search text advertising, and a general search text advertising monopolist would be able to maintain prices above the level that would prevail in a competitive market.

3. The United States Is a Relevant Geographic Market

107. The United States is a relevant geographic market for both the search advertising and the general search text advertising markets. Market participants recognize this in the

ordinary course of business. For example, Google offers advertisers the ability to target and deliver ads based on the location of consumers in the United States, and Google search is customized for particular countries. Google also separately tracks revenue for the United States.

4. *Google Has Monopoly Power in the Search Advertising and General Search Text Advertising Markets in the United States*

108. Google has monopoly power in the search advertising market. Based on public estimates of total search advertising spending in the United States, Google's share of the U.S. search advertising market is over 70 percent. This market share understates Google's market power in search advertising because many search-advertising competitors offer only specialized search ads and thus compete with Google only in a limited portion of the market.

109. Google also has monopoly power in the general search text advertising market. Google's market share of the U.S. general search text advertising market also exceeds 70 percent. Google's share of the general search text advertising market well exceeds its share of the search advertising market.

110. There are barriers to entry in these advertising markets that protect Google's advertising monopolies. Most critically, search advertising of any kind requires a search engine with sufficient scale to make advertising an efficient proposition for businesses. Specialized search engines require significant investment, including the cost of populating and indexing relevant data, distribution, developing and maintaining a search algorithm, and attracting users. Search advertising of any kind also requires (1) a user interface through which advertisers can buy ads, (2) software to facilitate the sales process, and (3) a sales and technical support staff. The same barriers to entry that apply to general search services also protect Google's general search text advertising monopoly.

V. ANTICOMPETITIVE CONDUCT

111. Google is a monopolist in the general search services, search advertising, and general search text advertising markets. Google aggressively uses its monopoly positions, and the money that flows from them, to continuously foreclose rivals and protect its monopolies.

112. Google has unlawfully maintained its monopolies by implementing and enforcing a series of exclusionary agreements with distributors over at least the last decade. Particularly when taken together, Google's exclusionary agreements have denied rivals access to the most important distribution channels. In fact, Google's exclusionary contracts cover almost 60 percent of U.S. search queries. Almost half the remaining searches are funneled through properties owned and operated directly by Google. As a result, the large majority of searches are covered by Google's exclusionary contracts and own properties, leaving only a small fraction for competitors.

113. Google's continued use of the exclusionary agreements over many years, long after there was any real competition in general search, has denied its rivals access to the scale that would allow rivals to increase quality. By depriving them of scale, Google also hinders its rivals' ability to secure distribution going forward, insulating Google from competition.

114. Google's exclusionary motives influence its negotiations with distributors. Some of these exclusionary agreements have been described by Google as an "[i]nsurance policy that preserves our search and assistant usage." To preserve its dominance, Google has developed economic models to measure the "defensive value" of foreclosing search rivals from effective distribution, search access points, and ultimately competition. Google recognized it could pay search distributors to "protect [its] market share from erosion." Google continues to focus on the exclusionary defensive value of its distribution contracts as it tries to expand its search dominance into new distribution channels, such as smart home speakers. Here, Google's

defensive value “is attributable to protecting access to Search and other Google services that may otherwise be blocked in a given household” if a user chooses a rival.

115. In sum, Google deprives rivals of the quality, reach, and financial position necessary to mount any meaningful competition to Google’s longstanding monopolies. By foreclosing competition from rivals, Google harms consumers and advertisers.

A. Google’s Agreements Lock Up Mobile Distribution of Search

116. Launched in the infancy of mobile smartphones, Google’s strategy to ward off competition for mobile search distribution had two parts. First, Google expanded its existing search deal with Apple to cover mobile. Second, for other mobile distributors, Google offered its Android operating system for “free” but with a series of interlocking distribution agreements to ensure its search-engine dominance in the Android ecosystem.

117. Google’s strategy worked. Google has almost completely shut out its competitors from mobile distribution. As one executive for a competing search product recognized in frustration last year: “Google essentially [has] locked up ALL DISTRIBUTION” with its Apple deal and restrictive Android licensing terms, leaving the competitor’s product with “no mobile volume.”

1. Distribution on Apple iOS Devices

118. Apple has not developed and does not offer its own general search engine. Under the current agreement between Apple and Google, which has a multi-year term, Apple must make Google’s search engine the default for Safari, and use Google for Siri and Spotlight in response to general search queries. In exchange for this privileged access to Apple’s massive consumer base, Google pays Apple billions of dollars in advertising revenue each year, with public estimates ranging around \$8–12 billion. The revenues Google shares with Apple make up approximately 15–20 percent of Apple’s worldwide net income.

119. Although it is possible to change the search default on Safari from Google to a competing general search engine, few people do, making Google the *de facto* exclusive general search engine. That is why Google pays Apple billions on a yearly basis for default status. Indeed, Google's documents recognize that "Safari default is a significant revenue channel" and that losing the deal would fundamentally harm Google's bottom line. Thus, Google views the prospect of losing default status on Apple devices as a "Code Red" scenario. In short, Google pays Apple billions to be the default search provider, in part, because Google knows the agreement increases the company's valuable scale; this simultaneously denies that scale to rivals.

120. Apple's RSA incentivizes Apple to push more and more search traffic to Google and accommodate Google's strategy of denying scale to rivals. For example, in 2018, Apple's and Google's CEOs met to discuss how the companies could work together to drive search revenue growth. After the 2018 meeting, a senior Apple employee wrote to a Google counterpart: "Our vision is that we work as if we are one company."

121. The current version of the Google–Apple agreement substantially forecloses Google's search rivals from an important distribution channel for a significant, multi-year term. This agreement covers roughly 36 percent of all general search queries in the United States, including mobile devices and computers. Google estimates that, in 2019, almost 50 percent of its search traffic originated on Apple devices.

122. Particularly when considered with the other exclusionary distribution agreements discussed below, Google's hold on Apple's distribution channel is self-reinforcing, impairing rival general search engines' ability to offer competitive products and making Google's monopolies impenetrable to competitive discipline. By paying Apple a portion of the monopoly rents extracted from advertisers, Google has aligned Apple's financial incentives with its own

and set the price of bidding for distribution extraordinarily high—in the billions. And, even if a rival was willing to make no money from a distribution relationship or could afford to lose money indefinitely, the rival would likely still fall short because the existing distribution agreements have for more than a decade denied rivals the benefits of scale, thus limiting (1) the quality of their general search and search advertising products, as well as (2) the audience to attract advertisers. In other words, because of the longtime deprivation of scale, no other search engine can offer Apple (or any other partner) the mix of quality, brand recognition, and economics that market-dominant Google can.

2. *Distribution on Android Devices*

123. Google controls the Android mobile distribution channel with its distributor agreements and owned-and-operated distribution properties.

124. Even though Android is open source, Google has used Android to protect Google's lucrative general search and search advertising monopolies. Google sets the rules through anti-forking agreements, preinstallation agreements, and revenue sharing agreements. Notably, each of these agreements builds on the others to preserve control. Thus, Google will not pay a revenue share or financial incentive payment on a mobile device unless it is covered by (1) an anti-forking agreement, (2) a preinstallation agreement ensuring that Google's search access points are preinstalled and given prominent placement, and (3) a revenue sharing or mobile incentive agreement that entitles Google to preset default status and, in most cases, prohibits preinstallation of search access points with rival general search providers.

125. Through these interlocking, anticompetitive agreements, Google insulates and protects its monopoly profits. One internal Google analysis of these restrictive agreements concluded that only one percent of Google's worldwide Android search revenue was currently at

risk to competitors. This analysis noted that the growth in Google’s search advertising revenue from Android distribution was “driven by increased platform protection efforts and agreements.”

a) Anti-Forking Agreements

126. An alternative operating system could serve as a pathway for distribution of general search services other than Google. However, Google’s anti-forking agreements inhibit the development of an operating system based on an Android fork that could serve as a viable path to market for a search competitor.

127. Developing an operating system from scratch is extremely expensive, but a manufacturer could start with existing Android open-source code for a fraction of the cost. Moreover, the costs to app developers of “porting” GMS-compatible Android apps to an Android fork are substantially less than developing apps for an entirely new operating system.

128. Google’s anti-forking agreements, however, have inhibited operating system innovation through forking, ensuring that manufacturers and distributors are beholden to Google’s version of Android. Distributors know that any violation of an anti-forking agreement could mean excommunication from Google’s Android ecosystem, loss of access to Google’s must-have GPS and Google Play, and millions or even billions of dollars in lost revenue sharing. Thus, distributors avoid anything that Google might deem “fragmentation”—a term that Google “purposely leave[s] . . . very vague” and interprets broadly.

129. Pursuant to the preinstallation agreements discussed below, Google also has final say over whether a device is found to be compatible with the technical specifications Google requires manufacturers to meet before they can preinstall GMS. As a Google engineer noted, it must be “obvious to the [manufacturers] that we are using compatibility as a club to make them do things we want.” Google views its anti-fragmentation mandate, and its final approval of

devices before they launch, as a “poison pill” to prevent deviation from the Google-controlled Android ecosystem.

130. Google’s broad interpretation of the anti-forking agreements, and the reluctance it creates among Android distributors to support alternative versions of Android, presents barriers to entry. These were on display when Amazon developed its Fire OS operating system, a competing fork of Android. Rather than preinstall Google’s search engine, GPS, Google Play, or other Google apps on Fire devices, Amazon preinstalled its own proprietary apps and agreed to make Microsoft’s Bing the preset default general search engine. Amazon originally sold only Fire OS tablets, but in 2014 it launched a phone that ran on Fire OS. The phone was not a commercial success and Amazon quickly exited the phone business. Amazon continues to sell Fire tablets, which account for less than two percent of mobile device usage in the United States.

131. Google’s anti-forking provisions and policies limited the growth of Amazon’s mobile phone, and of Fire OS, because major manufacturers declined to support Amazon’s phone out of fear doing so would risk their lucrative deals with Google. Manufacturers willing to work with Amazon did not have the same marketing and logistics capabilities as top manufacturers. Despite hundreds of millions of dollars in investment over nearly ten years across tablets and phones, Fire OS still has not reached sufficient critical mass to challenge Google’s version of Android and provide a significant alternative path to market for search rivals.

132. No Android fork has made significant inroads to challenge Google for mobile devices, and there is no meaningful operating system alternative for manufacturers and carriers to license. These manufacturers and carriers are beholden to Google’s Android ecosystem, which Google uses to preserve its monopolies in general search, search advertising, and general search text advertising. Google’s anti-forking agreements further inhibit the development of alternative

Android operating systems for the next generation of search distribution channels, such as smart watches, smart speakers, smart TVs, and connected automobiles.

b) Preinstallation Agreements

133. Google uses preinstallation agreements—MADAs—to ensure that its entire suite of search-related products is given premium placement on Android GMS devices. Consumers naturally and regularly turn to these prominently placed search access points to conduct searches. Preinstallation agreements also reinforce Google’s anti-forking requirements, either by including an anti-forking clause of their own or, more commonly, requiring device manufacturers to be signatories to an anti-forking agreement.

134. If a manufacturer wants even one of Google’s key apps and APIs, the device must be preloaded with a bundle of other Google apps selected by Google. The six “core” apps are Google Play, Chrome, Google’s search app, Gmail, Maps, and YouTube. Manufacturers must preinstall the core apps in a manner that prevents the consumer from deleting them, regardless of whether the consumer wants them. These preinstallation agreements cover almost all Android devices sold in the United States.

135. Google’s preinstallation agreements effectuate a tie, that is, they condition the distribution of Google Play and GPS to the distribution of these other apps. This tie reinforces Google’s monopolies. The preinstallation agreements provide Android device manufacturers an all-or-nothing choice: if a manufacturer wants Google Play or GPS, then the manufacturer must also preinstall, and in some cases give premium placement to, an entire suite of Google apps, including Google’s search products. The forced preinstallation of Google’s apps deters manufacturers from preinstalling those of competitors. This forecloses distribution opportunities to rival general search engines, protecting Google’s monopolies.

136. Google recognizes it could “make [the] phone experience better for user[s] by ensuring . . . preloaded apps are deletable.” In large part, this is because “[u]sers can free up space by deleting apps they don’t want.” Consumers desiring to use non-Google search access points thus suffer because they cannot save storage space on their devices by deleting unwanted Google apps. In this way, manufacturers must agree to make their phones less attractive to consumers to accommodate Google’s efforts to lock up search distribution.

137. Once the manufacturer adopts the necessary suite of Google apps, the search access points of those apps are preset to default to Google’s search engine. For example, the preinstalled version of Chrome is preset to default to Google search. A senior executive at Google referred to changing Chrome’s preset search default as “totally off the table” and insisted that if a manufacturer “values their MADA, they cannot modify Chrome’s settings.” The result is that Google locks up the access points to general search on Android phones, as shown in

Figure 9:

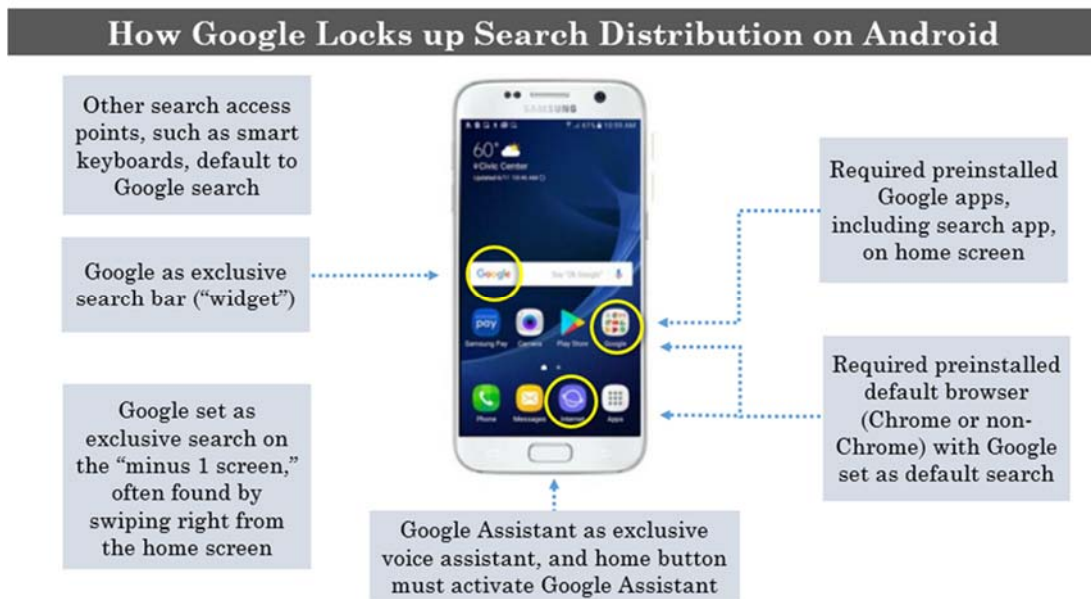


Figure 9

138. The preinstallation agreements are even more pernicious than basic ties because these agreements force distributors to configure the appearance of their phones to Google's specifications. For example, they require manufacturers to put the Google search widget on the device's default home screen. Google considers the search widget "an essential part of the Google brand" and rejects requests by manufacturers to waive the preinstallation agreement's search-widget requirement. This locks up another search access point, as it would be impractical for a manufacturer to preinstall two search widgets on the same home screen.

139. Google's preinstallation agreements also impose voice-search preferencing. In addition to requiring the preinstallation of Google Assistant, preinstallation agreements require manufacturers to (1) implement a Google hotword, which activates Google Assistant, and (2) ensure certain touch actions on the device's home button directly access Google Assistant or Google. Google's agreements with most manufacturers also (3) set Google Assistant as the default assistant app.

140. Rivals to Google Assistant are deprived of the same opportunities. Most of Google's preinstallation agreements prevent rival assistants from being the preset default or using a home button. Google also handicaps rival assistants by limiting the APIs that non-Google apps can use, ensuring that the useful features, such as "always on" microphone access that would enable the use of a hotword or the initiation of phone calls, are available only to Google Assistant. Even Google Assistant's chief rival—Amazon's Alexa—is unable to navigate these disincentives to get significant preinstallation or functional integration on Android devices.

141. Voice search is an important, emerging access point. Internal Google documents have recognized that the "[v]oice platform will become the future of search" and financial projections for the assistant category recognize "search defensive value."

142. Partners that depart from the preinstallation agreements risk discipline from Google. For example, in 2011, one major electronics manufacturer considered giving a group of consumers outside the United States a choice between two home screen experiences for their device: one home screen with the Google search widget and a second home screen with a rival search widget. Discussing this proposal with colleagues, one Google employee noted “[a]llowing a mode that does not have Google as the default search provider and completely changes the home screen” would violate Google’s terms and risk breach.

143. In 2015, Google was concerned that a major United States carrier would ask manufacturers to install a search widget powered by the carrier’s in-house search engine. Google’s Vice President of Partnerships wrote to a colleague that Google needed to make clear to manufacturers that “[these] customization requests will not go far” and replacing the Google search widget with a different search box would violate the preinstallation agreement. Termination of this default agreement would, in turn, prohibit access to the entire GMS suite, including Google Play and GPS, and forfeit any potential cut of Google’s search advertising revenue under a revenue sharing agreement. In short, as the above examples illustrate, Google’s documents show its efforts to discipline its counterparties, including major electronics companies and carriers.

c) Revenue Sharing Agreements


144. In exchange for a substantial portion of Google’s search advertising revenues, Android distributors agree to make Google the preset default general search engine for all significant search access points on the device. In addition, these agreements typically contain an exclusivity provision prohibiting the preinstallation of a competing general search service.

145. Google has recognized for some time that its revenue sharing agreements with Android device manufacturers and carriers provide exclusivity for its general search service on

those devices. As stated explicitly in a draft 2014 Google strategy deck in Figures 10 and 11 below, Google’s revenue sharing arrangements with Android manufacturers or OEMs “provide exclusivity of Search” and its deals with carriers similarly “prevent[] the pre-installation of other Search engines or browsers,” thus enabling Google “to protect Search exclusivity on the device as it makes its way to the user.”

Google In 2014, we paid \$217M to Android OEMs to distribute search

MADA (Mobile Application Distribution Agreement): Provides OEM's with the license to distribute/pre-load Google services on their Android-based smartphones



Top search bar: Google default search on top search bar, powered by GSA

Primary home screen: Placement of Google folder with specified set of apps; Play Store placement, Chrome Browser

Within Google folder: Placement of specific apps, including Maps, Gmail, Google+, Photos, YouTube, Hangouts

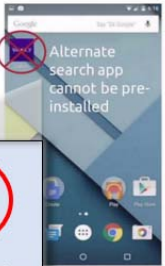
“Revshare deals provide **exclusivity of Search** on devices – can provide **more stringent requirements** as a result of payment . . . since 2012 renegotiation of deals have brought revshare % down substantially” *(emphasis added)*

- MADA ensures placement and discoverability of Google search and Play Store on the device (through GSA or Chrome) and does not provide exclusivity (OEM is free to pre-load anything else on the phone)
- **Revshare deals** provide exclusivity of Search on devices - can provide more stringent requirements as a result of payment
- Our current standard revshare is 16% on Search - since 2012, renegotiation of deals have brought revshare % down substantially; most of our partners have agreed to match this baseline
- OEM revshare deals are global - however we only pay OEMs if we do not have a competing deal with a carrier (next slide)

Google Confidential and Proprietary 33

Figure 10 (Android manufacturers)

Google In 2014, we paid \$460M to Carriers to distribute search



Alternate search app cannot be pre-installed

“Alternate search app **cannot** be pre-installed” *(emphasis added)*

Carrier Revshare Deals: As part of our carrier deals, Android devices distributed by the carrier will have exclusivity of Google search on the device, preventing the pre-installation of other Search engines or browsers (see left)

By having these deals in place (especially in markets that are dominated by carrier retail distribution, such as the US) we are able to protect Search exclusivity on the device as it makes its way to the user

Similar to OEM revshare deals, our current standard revshare is 16% on Search - renegotiation of these deals have also brought revshare % down on carrier devices
We also pay carriers on Play purchases through the Direct Carrier Billing payment method - current revshare is 15% on Apps, and 6% on Content (music, movies, books)

“**Carrier Revshare Deals:** As part of our carrier deals, Android devices distributed by the carrier will have **exclusivity** of Google search on the device, **preventing the pre-installation of other Search engines** or browsers . . . By having these deals in place (especially in markets that are dominated by carrier retail distribution, such as the US) we are able to **protect Search exclusivity** on the device as it makes its way to the user” *(emphasis added)*

Google Confidential and Proprietary 34

Figure 11 (Android carriers)

146. Similarly, one Google executive acknowledged that exclusivity is “the general philosophy of the RSA or one of the tenets of the value exchanged in the RSA.” Another Google executive noted, “our philosophy is that we are paying revenue share *in return for* exclusivity.” These agreements are, as that executive further explained, “really important” because “otherwise Bing or Yahoo can come and steal away our Android search distribution at any time.”

147. As Google’s documents recognize, the preinstallation agreements and revenue sharing agreements work together as a belt-and-suspenders strategy for driving searches to Google (and therefore away from competitors) on Android devices. As one Google executive explained in 2017, Google uses revenue sharing agreements “as a lever for motivating partner behavior that is consistent with our goals for Google and the ecosystem,” and to “drive incremental revenue (securing search defaults not covered by MADA).” By using its monopoly profits, Google is able to secure even “more stringent requirements” on manufacturers and carriers to obtain the preset default position on search access points not covered by the preinstallation agreements. The combined result of Google’s preinstallation and revenue sharing agreements is to lock up all the main pathways through which consumers access search on Android devices, thus foreclosing rivals and protecting Google’s monopoly positions.

148. The size of Google’s payments to Android distributors demonstrates the enormous value of default status and exclusivity provided by the agreements. Last year, Google paid major U.S. carriers, collectively, more than a billion dollars.

149. Other channels of distribution left for competitors are far inferior to those paid for by Google and protected by its agreements. For example, a consumer can in theory download a competing search app on his or her own. But as one of Google’s executives bluntly put it, “most

users just use what comes on the device” and do not attempt to download or use other general search services.

150. Google’s revenue-sharing partners turn down opportunities to preinstall or otherwise enable innovative, search-related apps because those new partnerships could violate Google’s demand for exclusivity.

151. Google also uses its agreements to ensure that new search access points are not available to competitors. For example, Google developed a smart keyboard—a mobile app that can be used as an alternative for the standard-issued keyboards on smart phones—with the recognition that such keyboards might be “the next big search access point.” Google relies on its preinstallation and default restrictions in its revenue sharing agreements as a “strategic defense” against rival keyboards that might provide a “[b]ridge” to rival general search engines. Thus, search queries cannot leak out to Google’s rivals even in niche areas.

152. Google likewise structures its agreements to penalize any distributor that might walk away, tying them to Google. The typical term of the carrier and manufacturer revenue sharing agreement is two to three years. If a carrier or manufacturer does not renew its revenue sharing agreement with Google, the distributor loses out on revenue share not only for new mobile devices but also for the phones and tablets previously sold and in the hands of consumers. This provision is punitive to the carrier or manufacturer and helps to ensure that carriers and manufacturers will not stray from Google.

153. To be attractive to a carrier or manufacturer, a rival search provider’s offer for preset default status would need to cover not only the revenue the carrier or manufacturer would have earned from Google for new devices, but also the revenue that the carrier or manufacturer would have earned on all the devices that are currently in the hands of consumers. Google will

continue to benefit from those devices with defaults previously set to Google. A rival search provider is left with no practical way to ensure that it will generate revenues from those devices, regardless of how competitive its general search service might otherwise be.

154. In roughly a decade, no other general search provider has secured preset default search status on any preinstalled search access point on GMS Android devices. As with the Apple distribution agreements, the Android distribution agreements—taken together—are self-reinforcing, depriving rivals of the quality, audience, and financial benefits of scale that would allow them to mount an effective challenge to Google.

155. Particularly for newer entrants, the revenue sharing agreements present a substantial barrier to entry. These entrants cannot pay the billions of dollars that Google does for the most effective forms of distribution—premium placement and default status. Instead, they are relegated to inferior forms of distribution that do not allow them to build scale, gain brand recognition, and generate momentum to challenge Google.

B. Google Agreements Lock Up Browser Distribution

156. Beyond its agreements locking up distribution on Android and Apple devices, Google also has entered into exclusive revenue sharing agreements with browsers. Google has recognized it is “crucial to retain web browser partnerships.” Google’s agreements with browsers generally require the browsers to make Google the preset default general search engine for search access points in both the browser’s computer and mobile versions.

157. In exchange for being the preset default general search engine, Google shares up to 40 percent of the advertising revenue it generates from these search access points with Google’s browser rivals. Browser revenue sharing agreements typically last at least two years and are routinely extended.

158. Browsers are one of the most important distribution channels for general search services because they are the gateway to the internet for most consumers. Many search queries on mobile devices and computers are performed through the device's browser. Today, Google has revenue sharing agreements with the most widely used browsers in the United States, such as Apple's Safari browser and Mozilla's Firefox browser; Microsoft's browsers are the only notable exceptions. Over 85 percent of all browser usage in the United States occurs on Google's own Chrome browser or on one of the browsers covered by these revenue sharing agreements.

159. In a competitive market, rivals could compete to be the preset default general search engine on a browser. The general search services market has not, however, been competitive for many years. When considered with Google's other exclusionary agreements and its monopoly power, Google's conduct forecloses a critical avenue for search competitors to enter the market or increase distribution. In the absence of these agreements, rival browsers would have the ability to consider making other general search engines the preset default for some or all search access points, spurring greater competition in the general search services market and offering additional choices to consumers. As a Google employee once noted, Google's browser agreements can be "a good way to keep [a browser] away from Bing."

C. Google Is Positioning Itself to Control the Next Generation of Search Distribution Channels

160. Although mobile phones and computers account for the vast majority of general searches on the internet today, in the future, an increasing number of searches will likely be conducted on next generation devices such as smart watches, smart speakers, smart TVs, and connected automobiles. Google is positioning itself to control these emerging channels for search distribution, excluding new and established rivals.

161. As noted above, Google has interpreted its anti-forking agreements (AFAs and ACCs) with Android mobile partners to cover next generation devices. Additionally, Google uses other points of leverage in the mobile channel to discourage mobile partners from working with rival operating systems on next generation devices. The result is that Google is positioned to retain control over the operating systems that power next generation devices manufactured by mobile partners and to inhibit adoption of alternative search services on those devices.

162. Google also requires connected-device manufacturers that do not sell Android mobile phones to agree to restrictive contract terms that mirror the effects of the mobile distribution agreements. For instance, Google partners with automobile manufacturers on the condition that they not preinstall rival search-related apps. Google has similarly restrictive agreements with smart watch manufacturers: its agreements to license Google's "free" smart watch operating system (Wear OS) prohibit manufacturers from preinstalling *any* third-party software, including any rival search services.

163. Additionally, Google refuses to license its Google Assistant to IoT device manufacturers that would host another voice assistant simultaneously—a feature commonly known as "concurrency." Through concurrency, a rival voice assistant could grow in popularity to challenge Google for control over the way that consumers access the internet generally, even on more established devices such as mobile phones. Google recognizes that concurrency is a feature that consumers would value, but it sees too great a competitive risk from allowing consumers to decide which voice assistant to use on a case-by-case basis.

164. Finally, Google uses its control over hardware products—including smart speakers and Google Nest smart home products—to protect its general search monopoly. Google recognizes that its "[h]ardware products also have HUGE defensive value in virtual assistant

space AND combatting query erosion in core Search business.” Looking ahead to the future of search, Google sees that “Alexa and others may increasingly be a substitute for Search and browsers with additional sophistication and push into screen devices.”

165. Google therefore aims to control emerging search access points to protect its monopolies in the general search services, search advertising, and general search text advertising markets in the present and the future. Google is poised to ensure that history repeats itself, and that all search access points funnel users in one direction: toward Google.

VI. ANTICOMPETITIVE EFFECTS

166. Google has maintained unlawful monopolies in the general search services, search advertising, and general search text advertising markets through its many exclusionary agreements and other conduct that have separately and collectively harmed competition by:

- a. Substantially foreclosing competition in general search services and protecting a large majority of search queries in the United States against any meaningful competition;
- b. Excluding general search services rivals from effective distribution channels, thereby denying rivals the necessary scale to compete effectively in the general search services, search advertising, and general search text advertising markets;
- c. Impeding other potential distribution paths for general search services rivals;
- d. Increasing barriers to entry and excluding competition at emerging search access points from nascent competitors on both computers and mobile devices;

- e. Stunting innovation in new products that could serve as alternative search access points or disruptors to the traditional Google search model; and
- f. Insulating Google from significant competitive pressure to improve its general search, search advertising, and general search text advertising products and services.

167. By restricting competition in general search services, Google's conduct has harmed consumers by reducing the quality of general search services (including dimensions such as privacy, data protection, and use of consumer data), lessening choice in general search services, and impeding innovation.

168. Google's exclusionary conduct also substantially forecloses competition in the search advertising and general search text advertising markets, harming advertisers. By suppressing competition, Google has more power to manipulate the quantity of ad inventory and auction dynamics in ways that allow it to charge advertisers more than it could in a competitive market. Google can also reduce the quality of the services it provides to advertisers, including by restricting the information it offers to advertisers about their marketing campaigns.

169. Google's conduct also has harmed competition by impeding the distribution of innovative apps that offer search features that would otherwise challenge Google. Google has also harmed competition by raising rivals' costs and foreclosing them from effective distribution channels, such as distribution through voice assistant providers, preventing them from meaningfully challenging Google's monopoly in general search services.

170. Google's monopoly in general search services also has given the company extraordinary power as the gateway to the internet, which it uses to promote its own web content and increase its profits. Google originally prided itself as being the "turnstile" to the internet,

sending users off its results pages through organic links designed to connect the user with a third-party website that would best “answer” a user query. Over time, however, Google has pushed the organic links further and further down the results page and featured more search advertising results and Google’s own vertical or specialized search offerings. This, in turn, has demoted organic links of third-party verticals, pushing these links “below-the-fold” (i.e., on the portion of the SERP that is visible only if the user scrolls down) and requiring them to buy more search advertising from Google to remain relevant. This raises their costs, reduces their competitiveness, and limits their incentive and ability to invest in innovations that could be attractive to users. Not surprisingly, investors also report being unwilling to provide funding to vertical startups with business models similar to or potentially competitive with Google’s search advertising monopoly.

171. Absent Google’s exclusionary agreements and other conduct, dynamic competition for general search services would lead to higher quality search, increased consumer choice, and a more beneficial user experience. In addition, more competitive search advertising and general search text advertising markets would allow advertisers to purchase ads at more attractive terms, with better quality and service. Finally, the incentives and abilities for companies to develop and distribute innovative search products would be restored, resulting in more options, better products, and higher consumer welfare overall.

172. The anticompetitive effects flowing from Google’s distribution agreements, particularly when considered collectively, have allowed Google to develop and maintain monopolies in the markets for general search services, search advertising, and general search text advertising; these anticompetitive effects outweigh any benefits from those agreements, or those benefits could be accomplished by less restrictive means.

VII. VIOLATIONS ALLEGED

First Claim for Relief: Maintaining Monopoly of General Search Services in Violation of Sherman Act § 2

173. Plaintiffs incorporate the allegations of paragraphs 1 through 172 above.

174. General search services in the United States is a relevant antitrust market and Google has monopoly power in that market.

175. Google has willfully maintained and abused its monopoly power in general search services through anticompetitive and exclusionary distribution agreements that lock up the preset default positions for search access points on browsers, mobile devices, computers, and other devices; require preinstallation and prominent placement of Google's apps; tie Google's search access points to Google Play and Google APIs; and other restrictions that drive queries to Google at the expense of search rivals.

176. Google's exclusionary conduct has foreclosed a substantial share of the general search services market.

177. Google's anticompetitive acts have had harmful effects on competition and consumers.

178. The anticompetitive effects of Google's exclusionary agreements outweigh any procompetitive benefits in this market, or can be achieved through less restrictive means.

179. Google's anticompetitive and exclusionary practices violate Section 2 of the Sherman Act, 15 U.S.C. § 2.

Second Claim for Relief: Maintaining Monopoly of Search Advertising in Violation of Sherman Act § 2

180. Plaintiffs incorporate the allegations of paragraphs 1 through 172 above.

181. Search advertising in the United States is a relevant antitrust market and Google has monopoly power in that market.

182. Google has willfully maintained and abused its monopoly power in search advertising through anticompetitive and exclusionary distribution agreements that lock up the preset default positions for search access points on browsers, mobile devices, computers, and other devices; require preinstallation and prominent placement of Google's apps; tie Google's search access points to Google Play and Google APIs; and other restrictions that benefit Google at the expense of search advertising rivals.

183. Google's exclusionary conduct has foreclosed a substantial share of the search advertising market.

184. Google's anticompetitive acts have had harmful effects on competition, advertisers, and consumers.

185. The anticompetitive effects of Google's exclusionary agreements outweigh any procompetitive benefits in this market, or can be achieved through less restrictive means.

186. Google's anticompetitive and exclusionary practices violate Section 2 of the Sherman Act, 15 U.S.C. § 2.

Third Claim for Relief: Maintaining Monopoly of General Search Text Advertising in Violation of Sherman Act § 2

187. Plaintiffs incorporate the allegations of paragraphs 1 through 172 above.

188. General search text advertising in the United States is a relevant antitrust market, and Google has monopoly power in that market.

189. Google has willfully maintained and abused its monopoly power in general search text advertising through anticompetitive and exclusionary distribution agreements that lock up the preset default positions for search access points on browsers, mobile devices, computers, and other devices; require preinstallation and prominent placement of Google's apps; tie Google's

search access points to Google Play and Google APIs; and other restrictions that benefit Google at the expense of general search text advertising rivals.

190. Google's exclusionary conduct has foreclosed a substantial share of the general search text advertising market.

191. Google's anticompetitive acts have had harmful effects on competition, advertisers, and consumers.

192. The anticompetitive effects of Google's exclusionary agreements outweigh any procompetitive benefits in this market, or can be achieved through less restrictive means.

193. Google's anticompetitive and exclusionary practices violate Section 2 of the Sherman Act, 15 U.S.C. § 2.

VIII. REQUEST FOR RELIEF

194. To remedy these illegal acts, Plaintiffs request that the Court:

- a. Adjudge and decree that Google acted unlawfully to maintain general search services, search advertising, and general search text advertising monopolies in violation of Section 2 of the Sherman Act, 15 U.S.C. § 2;
- b. Enter structural relief as needed to cure any anticompetitive harm;
- c. Enjoin Google from continuing to engage in the anticompetitive practices described herein and from engaging in any other practices with the same purpose and effect as the challenged practices;
- d. Enter any other preliminary or permanent relief necessary and appropriate to restore competitive conditions in the markets affected by Google's unlawful conduct;
- e. Enter any additional relief the Court finds just and proper; and

- f. Award each Plaintiff an amount equal to its costs incurred in bringing this action on behalf of its citizens.

Respectfully submitted,

October 20, 2020

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