UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

UNITED STATES OF AMERICA et al., **Plaintiffs,** **v.** **GOOGLE LLC,** **Defendant.**	**Case No. 20-cv-3010 (APM)**
STATE OF COLORADO et al., **Plaintiffs,** **v.** **GOOGLE LLC,** **Defendant.**	**Case No. 20-cv-3715 (APM)**

MEMORANDUM OPINION

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INTRODUCTION

Last year, this court ruled that Defendant Google LLC had violated Section 2 of the Sherman Act: "Google is a monopolist, and it has acted as one to maintain its monopoly." The court found that, for more than a decade, Google had entered into distribution agreements with browser developers, original equipment manufacturers, and wireless carriers to be the out-of-the box, default general search engine ("GSE") at key search access points. These access points were the most efficient channels for distributing a GSE, and Google paid billions to lock them up. The agreements harmed competition. They prevented rivals from accumulating the queries and associated data, or scale, to effectively compete and discouraged investment and entry into the market. And they enabled Google to earn monopoly profits from its search text ads, to amass an unparalleled volume of scale to improve its search product, and to remain the default GSE without fear of being displaced. Taken together, these agreements effectively "froze" the search ecosystem, resulting in markets in which Google has "no true competitor."

Much has changed since the end of the liability trial, though some things have not. Google is still the dominant firm in the relevant product markets. No existing rival has wrested market share from Google. And no new competitor has entered the market. But artificial intelligence technologies, particularly generative AI ("GenAI"), may yet prove to be game changers. Today, tens of millions of people use GenAI chatbots, like ChatGPT, Perplexity, and Claude, to gather information that they previously sought through internet search. These GenAI chatbots are not yet close to replacing GSEs, but the industry expects that developers will continue to add features to GenAI products to perform more like GSEs.

The emergence of GenAI changed the course of this case. No witness at the liability trial testified that GenAI products posed a near-term threat to GSEs. The very first witness at the

remedies hearing, by contrast, placed GenAI front and center as a nascent competitive threat. These remedies proceedings thus have been as much about promoting competition among GSEs as ensuring that Google's dominance in search does not carry over into the GenAI space. Many of Plaintiffs' proposed remedies are crafted with that latter objective in mind.

The question now is what to do about Google's violations. Precedent requires fashioning antitrust remedies that "effectively pry open to competition a market that has been closed" by a monopolist's "illegal restraints." *Int'l Salt Co. v. United States*, 332 U.S. 392, 401 (1947). Denying the fruits of the violation is a valid objective, and so, too, is ensuring that anticompetitive behavior will not recur in the same or related ways. The court has broad discretion to impose remedies to accomplish those aims.

Notwithstanding this power, courts must approach the task of crafting remedies with a healthy dose of humility. This court has done so. It has no expertise in the business of GSEs, the buying and selling of search text ads, or the engineering of GenAI technologies. And, unlike the typical case where the court's job is to resolve a dispute based on historic facts, here the court is asked to gaze into a crystal ball and look to the future. Not exactly a judge's forte.

Because of what is at stake, the remedies phase has been contentious. The parties have seen eye-to-eye on very little. In Google's view, there is little work to be done. The only appropriate remedy is to enter an injunction that prohibits it from entering into exclusive distribution agreements, which would include its GenAI products, the Gemini app and Google Assistant. Google says it has already stripped from its existing contracts the provisions that the court found had an exclusionary impact, so the market is now effectively unfettered and open to competition. It also urges the court to do nothing more because the GenAI technology space is

highly competitive, and any further restrictions would unfairly hobble it in that fight. Google asks that the final judgment be for a term of three years.

Plaintiffs believe that far more must be done. Simply enjoining Google's bad acts, as Google insists, would maintain the status quo. Plaintiffs therefore have put forward a comprehensive slate of remedies, whose component parts, they claim, work together both to revive competition in the general search market and to protect the GenAI market from suffering the same fate as search. Plaintiffs' proposals can be collected into three general categories: (1) structural remedies; (2) behavioral remedies; and (3) administrative, anti-retaliation, and anti-circumvention remedies. Plaintiffs ask that the judgment remain in place for up to 10 years.

Because of the number and complexity of the parties' proposed remedies, the court does not recite its conclusions and reasoning in detail in this introduction. But here are the top-line determinations:

- Google will be barred from entering or maintaining any exclusive contract relating to the distribution of Google Search, Chrome, Google Assistant, and the Gemini app. Google shall not enter or maintain any agreement that (1) conditions the licensing of the Play Store or any other Google application on the distribution, preloading, or placement of Google Search, Chrome, Google Assistant, or the Gemini app anywhere on a device; (2) conditions the receipt of revenue share payments for the placement of one Google application (e.g., Search, Chrome, Google Assistant, or the Gemini app) on the placement of another such application; (3) conditions the receipt of revenue share payments on maintaining Google Search, Chrome, Google Assistant, or the Gemini app on any device, browser, or

search access point for more than one year; or (4) prohibits any partner from simultaneously distributing any other GSE, browser, or GenAI product.

- Google will not be required to divest Chrome; nor will the court include a contingent divestiture of the Android operating system in the final judgment. Plaintiffs overreached in seeking forced divesture of these key assets, which Google did not use to effect any illegal restraints.
- Google will not be barred from making payments or offering other consideration to distribution partners for preloading or placement of Google Search, Chrome, or its GenAI products. Cutting off payments from Google almost certainly will impose substantial—in some cases, crippling—downstream harms to distribution partners, related markets, and consumers, which counsels against a broad payment ban.
- Google will have to make available to Qualified Competitors certain search index and user-interaction data, though not ads data, as such sharing will deny Google the fruits of its exclusionary acts and promote competition. The court, however, has narrowed the datasets Google will be required to share to tailor the remedy to its anticompetitive conduct.
- Google shall offer Qualified Competitors search and search text ads syndication services to enable those firms to deliver high-quality search results and ads to compete with Google while they develop their own search technologies and capacity. Such syndication, however, shall occur largely on ordinary commercial terms that are consistent with Google's current syndication services.

- Google will not have to present users with choice screens on its products or encourage its Android distribution partners to do the same. Precedent requires courts to avoid remedies that compel product design requirements, and in any event, choice screens have not been shown to enhance competition among GSEs.
- Google will not be required to share granular, query-level data with advertisers or provide them with more access to such data. Nor will it have to restore an "exact match" keyword bidding option. Plaintiffs did not establish that these remedies would promote competition in the search text ads market.
- Google will be compelled to publicly disclose material changes it makes to its ad auctions to promote greater transparency in search text ads pricing and to prevent Google from increasing prices by secretly fine-tuning its ad auctions.
- Google will not have to underwrite a nationwide public education campaign. That remedy does not fit Google's violations and its terms are too indefinite.
- Google will not have to modify its policies to offer website publishers more choice in how Google uses their content. This remedy bears no relationship to Google's unlawful acts and is an improper demand to implement overly regulatory requirements.
- Google will not be subject to an investment reporting requirement. It, too, bears no relationship to Google's anticompetitive conduct.

- Google will not be subject to anti-retaliation, anti-circumvention, or self-preferencing provisions. The first two restrictions are too vague and do not comport with the requirements of Federal Rule of Civil Procedure 65(d). There is no legal or factual basis for the last.

The court will establish a Technical Committee to assist Plaintiffs and the court in implementing and enforcing the final judgment. The term of that judgment will be six years, and it will become effective 60 days after entry, except for those provisions relating to the Technical Committee, which will go into effect immediately.

This opinion is organized as follows: The court begins by recounting the liability- and remedial-phase histories of this case. In that same section the court sets forth the parties' competing remedies proposals. The court then makes its Findings of Fact. Those factual findings were drafted with the primary objective of updating the reader on market developments since the close of the liability phase and therefore are less detailed than those in the liability opinion. The court then turns to explaining its Conclusions of Law. That section sets forth the general antitrust principles that will guide the court's evaluation of remedies and addresses various remedies-related disputes of law. Next are Remedy-Specific Conclusions of Law. That section will detail the court's rationale for adopting, rejecting, or modifying the parties' proposed remedies. The court makes extensive findings of fact in that section as well. Finally, the court concludes with a directive to the parties to meet and confer and present by September 10, 2025, a joint revised final judgment that is consistent with this Memorandum Opinion. As with the liability opinion, the court includes as an Appendix a list of the names and titles of all witnesses whose remedies-phase trial or deposition testimony is cited in this decision.

The court is grateful to all counsel for their professionalism and zealous advocacy during these remedies-phase proceedings.

PROCEDURAL HISTORY

I. PRETRIAL LIABILITY PHASE

This case began on October 20, 2020, when the U.S. Department of Justice and 11 states ("U.S. Plaintiffs") filed an antitrust complaint against Google pursuant to authority conferred by Section 4 of the Sherman Act, 15 U.S.C. § 4. *See* Compl., ECF No. 1; *see also* Am. Compl., ECF No. 94 [hereinafter Am. Compl.] (including 14 states). U.S. Plaintiffs asserted three violations of Section 2 of that law, each corresponding to an alleged product market in the United States. Am. Compl. ¶¶ 173–193. Those markets were general search services, search advertising, and general search text advertising. *Id.* ¶¶ 88–107. The crux of U.S. Plaintiffs' complaint was that Google illegally maintained a monopoly in these markets by entering into exclusive agreements to secure default distribution for its GSE on nearly all desktop and mobile devices in the United States. *See id.* ¶¶ 111–165. U.S. Plaintiffs sought a finding of liability, an injunction against the challenged conduct, and structural relief necessary to cure any resulting anticompetitive effects. *Id.* ¶ 194.

Roughly two months later, 38 additional states and territories ("Plaintiff States"), filed *State of Colorado v. Google*, 20-cv-3715 (APM) [hereinafter *Colorado v. Google* Docket], under Section 16 of the Clayton Act, 15 U.S.C. § 26. Compl., *Colorado v. Google* Docket, ECF No. 3 [hereinafter Colorado Compl.], ¶¶ 21–23. Their complaint largely mirrored U.S. Plaintiffs' but supplemented it in three primary ways. Plaintiff States: (1) alleged an additional advertiser-side market for general search advertising but did not adopt U.S. Plaintiffs' broader market for search advertising, *id.* ¶¶ 56 n.3, 82–89; (2) asserted exclusionary conduct by Google that targeted

specialized vertical providers, which are internet companies that provide search services focused on niche markets such as travel (e.g., Expedia or TripAdvisor), restaurant reservations (e.g., OpenTable), or shopping (e.g., Amazon or eBay), *id.* ¶¶ 168–199; and (3) claimed that Google had engaged in additional exclusionary conduct by using its proprietary advertising tool, SA360, to harm competition in the relevant markets, *id.* ¶¶ 144–167. Plaintiff States likewise sought declaratory and injunctive relief. *Id.* ¶ 233.

The court consolidated the two cases for both pretrial and trial proceedings. Order, *Colorado v. Google* Docket, ECF No. 67; Status Conf. Tr., ECF No. 609, at 10–14. At the parties' request, the court bifurcated the proceedings into liability and remedies phases. *See* Order, ECF No. 264.

Following a lengthy period of merits discovery, the court granted in part and denied in part Google's motions for summary judgment in both cases. *See generally United States v. Google LLC*, 687 F. Supp. 3d 48 (D.D.C. 2023). In *United States v. Google*, the court entered judgment in Google's favor with respect to those portions of U.S. Plaintiffs' claims that related to Android Compatibility Commitments and Anti-Fragmentation Agreements, Google's voice-activated assistant and other "Internet-of-Things" devices, and the Android Open-Source Project. *Id.* at 85–87. In *Colorado v. Google*, the court found in Google's favor with respect to Plaintiff States' theory that Google's exclusionary acts directed at specialized vertical providers—namely, placing restrictions on the visibility of their content on Google's search engine results page ("SERP") and coercing them to share data—had not caused anticompetitive effects in the proposed markets. *Id.* at 78–83. The remaining claims proceeded to trial.

II. LIABILITY DETERMINATION

The liability trial commenced on September 12, 2023, and concluded on November 16, 2023. After receiving testimony from dozens of witnesses; reviewing thousands of pages of exhibits and deposition designations; considering the parties' post-trial briefs, proposed findings of fact, and proposed conclusions of law; and hearing from the parties at closing arguments over two days, the court issued its liability findings on August 5, 2024. The court held that Google had violated Section 2 of the Sherman Act by maintaining a monopoly in certain product markets through exclusionary conduct. *See generally United States v. Google LLC*, 747 F. Supp. 3d 1 (D.D.C. 2024) [hereinafter *Google*].

The court identified three relevant product markets: general search services, search advertising, and general search text advertising.[1] *Id.* at 109–16, 125–33, 136–38. The court did not find a separate general search advertising market, as alleged by Plaintiff States. *Id.* at 139–42. The court determined that Google had monopoly power in the general search services and general search text advertising markets but not the search advertising market. *Id.* at 117–24, 133–36, 138–39.

Having found that Google had monopoly power in two relevant product markets, the court's Section 2 inquiry proceeded to analyze whether Google engaged in exclusionary conduct in those markets. *See id.* at 142–52. Plaintiffs challenged certain contracts between Google and other companies as unlawful exclusive agreements. The court held that (1) agreements between Google and browser developers, such as Apple and Mozilla, were exclusive insofar as they established Google as the out-of-the-box default search engine; (2) mobile application distribution agreements ("MADAs") between Google and Android original equipment manufacturers

[1] The parties agreed that the United States is the relevant geographic market. *See Google,* 747 F. Supp. 3d at 107.

("OEMs") were exclusive in practice; and (3) revenue share agreements ("RSAs") between Google and Android device distributors—both OEMs and wireless carriers—formalized the practical exclusivity of the MADAs. *Id.* at 146–52.

Because merely characterizing Google's challenged contracts as "exclusive" did not answer whether those agreements violated Section 2, the court next evaluated whether they caused anticompetitive effects in the relevant markets—they did. *See id.* at 152–81. First, the court held that the agreements caused significant anticompetitive effects in the general search services market. *Id.* at 152–71. The court found that Google's distribution agreements (1) foreclosed a substantial portion of the general search services market and impaired rivals' opportunities to compete, *id.* at 153–59; (2) denied rivals access to the volume of user queries and the resulting data, or "scale," needed to compete effectively, *id.* at 159–64; and (3) reduced other companies' incentive to invest and innovate in search, *id.* at 165–71.

The court rejected Google's procompetitive justifications for the distribution agreements. It concluded that the contracts did not "(1) enhance the user experience, quality, and output in the market for general [search] services, (2) incentivize competition in related markets that redounds to the benefit of the search market, [or] (3) produce consumer benefits within the related markets." *Id.* at 171; *see also id.* at 171–77. Accordingly, the court held that Google violated Section 2 of the Sherman Act by maintaining its monopoly in the general search services market through exclusive distribution agreements. *Id.* at 177.

As for the general search text advertising market, the court reached similar conclusions. It found that the exclusive agreements (1) foreclosed a substantial share of the market; (2) allowed Google to increase text ads prices without any meaningful competitive constraint; (3) permitted Google to degrade the quality of its text ads offerings; and (4) capped rivals' advertising revenue,

thereby decreasing their ability to reinvest in quality improvements and attract more users and ad dollars. *Id.* at 177–82. Google did not offer any procompetitive justifications beyond those the court had already rejected in the general search services market. *Id.* at 181. The court therefore held that Google's exclusive agreements also violated Section 2 of the Sherman Act in the general search text ads market. *Id.*

That left Plaintiff States' additional claim concerning Google's use of its search engine management tool, SA360. SA360 allows advertisers to run online marketing campaigns across multiple platforms all in one place. *Id.* at 181. According to Plaintiff States, Google promised that it would not self-preference its own proprietary ad platform, Google Ads, on SA360, but it did just that when it implemented certain features for Google Ads but not for Microsoft's ad platform, Microsoft Ads. *Id.* This lack of feature parity, Plaintiff States asserted, placed Microsoft at a competitive disadvantage in the relevant markets. *See id.*

The court found in favor of Google. It concluded that, under Supreme Court precedent, Google had no duty to deal with its rival Microsoft, and in any event, Plaintiff States had failed to demonstrate the SA360 conduct resulted in any anticompetitive harm in the relevant markets. *Id.* at 181–85.

Lastly, the court declined to make a finding of anticompetitive intent, as it is not an element of a Section 2 violation, and it did not sanction Google for its failure to preserve certain evidence. *Id.* at 186–88.

III. REMEDIAL PHASE

A. Remedial-Phase Filings and Pretrial Proceedings

The remedial phase began September 18, 2024, with entry of a scheduling order that set aside approximately six months for discovery to be followed by a three-week evidentiary hearing.

See Order, ECF No. 1043. At the outset, the court ordered Plaintiffs to submit a high-level framework of potential remedies, *see id.*, which they did on October 8, 2024, *see* Notice of Pls.' Proposed Remedy Framework, ECF No. 1052. Thereafter, Plaintiffs filed their initial proposed final judgment on November 20, 2024. *See* Notice of Pls.' Proposed Final J., ECF No. 1062. Google submitted its initial proposed final judgment on December 20, 2024. *See* Notice of Def.'s Proposed Final J., ECF No. 1108. Both parties then submitted revised proposed final judgments in anticipation of the remedies trial. *See* Pls.' Revised Proposed Final J., ECF No. 1184-1 [hereinafter Pls.' RPFJ]; Def. Google LLC's Proposed Final J., ECF No. 1185 [hereinafter Google's RPFJ]. Discovery concluded on April 9, 2025. *See* Order, ECF No. 1043.

The evidentiary hearing ran from April 22, 2025, to May 9, 2025. Each side presented hundreds of exhibits, *see, e.g.*, ECF Nos. 1220, 1228, 1233, 1234, 1238, 1268, 1283, 1339, 1340, and the court heard from nearly 50 witnesses via live testimony and deposition designations, *see* List of Anticipated Live Witnesses, ECF No. 1210-1; List of Anticipated Witnesses by Dep. Designation, ECF No. 1210-2.

Following the evidentiary presentation, the parties made extensive post-hearing submissions, including proposed findings of fact and conclusions of law and replies in support. *See* Def.'s Proposed Findings of Fact, ECF No. 1346 [hereinafter Google's PFOF]; Def.'s Proposed Conclusions of Law, ECF No. 1347 [hereinafter Google's Br.]; Pls.' Remedies Post-Trial Br., ECF No. 1348 [hereinafter Pls.' Br.]; Pls.' Remedies Proposed Findings of Fact, ECF No. 1349 [hereinafter Pls.' PFOF]; Pls.' Remedies Responsive Proposed Findings of Fact, ECF No. 1364 [hereinafter Pls.' RPFOF]; Pls.' Remedies Responsive Post-Trial Br., ECF No. 1365 [hereinafter Pls.' Reply]; Def.'s Responsive Proposed Findings of Fact,

ECF No. 1366 [hereinafter Google's RPFOF]; Def.'s Responsive Proposed Conclusions of Law, ECF No. 1367 [hereinafter Google's Reply].

The court heard closing arguments on May 30, 2025. *See* Order, ECF No. 1362.

B. The Parties' Remedies Proposals

Not surprisingly, the parties' proposed remedies are dramatically different. The wide gulf separating them reflects a fundamental disagreement over the scope of appropriate antitrust remedies and the court's authority to impose them.

Plaintiffs have offered what they say is a "comprehensive and unitary framework" of remedies that will "reinforce each other to restore competition." Remedies Hr'g Tr. at 13:20-24 (Opening Arg.) [hereinafter Rem. Tr.]. Their proposed final judgment covers the full spectrum of equitable remedies available under the case law.

Most significantly, Plaintiffs demand structural relief. They seek an immediate forced divesture of Google's web browser Chrome. Pls.' RPFJ § V.A. They also ask the court to include a contingent divestiture of Google's operating system, Android, in the event the initial remedies fail or Google circumvents them. *Id.* § V.C.

Plaintiffs' next class of proposed remedies, broadly speaking, are behavioral remedies. These are remedies that would compel Google to undertake affirmative acts or bar it from certain conduct beyond restrictions on contracting. The proposed remedies in this category are many. They include (in order of their appearance in Plaintiffs' RPFJ):

1. prohibiting Google from making any search-related payments to distribution partners, with one limited exception, *id.* § IV.A–G;
2. requiring Google to provide advance notice of certain acquisitions and investments, *id.* § IV.H–I;

3. forbidding Google from using proprietary assets like YouTube, Android, and Gemini to self-preference its own search or advertising products, *id.* § V.B;

4. compelling Google to share search index data and certain user and advertising data with "Qualified Competitors," *id.* § VI.A, C–F;

5. ordering Google to allow website publishers and content creators to opt out of Google crawling their web pages and domains for inclusion in Google's search index and for training its GenAI models and products, *id.* § VI.B;

6. requiring Google to grant licenses to "Qualified Competitors" to syndicate search results and general search text ads from Google, *id.* §§ VII.A–G, VIII.E;

7. compelling Google to provide advertisers enhanced performance data and a bidding-control feature known as "exact match," as well as disclose material changes to its ad auctions, *id.* § VIII.A–D;

8. mandating choice screens on Google products that would allow users to select the GSE they wish to use, and permitting Google to pay device distributors (other than Apple) for offering choice screens on existing devices, *id.* § IX.A–D; and

9. launching a nationwide public education campaign, underwritten by Google, that would inform consumers about different GSE options and how to switch GSEs. (This last remedy is sought solely by Plaintiff States, *id.* § IX.E.)

Plaintiffs also ask the court to establish a Technical Committee that would assist them in enforcing the judgment and to require Google to appoint an internal compliance officer. *Id.* § X.A–D. They additionally seek a general prohibition against retaliatory acts by Google, *id.* § X.E, and a prohibition on conduct designed to circumvent the terms of the judgment, *id.* § X.F. Plaintiffs propose that the judgment last for up to 10 years and that the court retain jurisdiction to enforce it. *Id.* §§ XI–XII.

Google's proposed remedies are far narrower. Google says the court can do little more than enter a prohibitory injunction that bars it from entering or maintaining any unlawful exclusive distribution agreement for the term of the judgment. *See* Google's Br. at 3–4. Such an injunction "ensures that partners and consumers get the benefit of competition, while prohibiting the forms of contractual provisions the Court deemed exclusive." *Id.* at 3. Google would have the court enter an order that:

1. prohibits Google from bundling Google Search, Chrome, Google Assistant, or the Gemini app with Google Play or other Google apps in their OEM agreements, Google's RPFJ § III.A–D;
2. bars Google from entering any contract with an OEM or wireless carrier that prevents the partner from preloading or otherwise promoting alternative GSEs, browsers, or AI assistants, *id.* § III.E–G;
3. prevents Google from conditioning payments to OEMs and wireless carriers on the required installation of Google Search, Chrome, Google Assistant, or Gemini on more than one search access point or device, *id.* § III.H–J; and
4. allows browser developers like Apple and Mozilla to set different GSEs as defaults across various modes and platforms and to promote other search

services, and grants them the option to change default search settings annually, *id.* § III.K–L.

Notably, Google also includes provisions to prevent exclusive distribution of two GenAI products, Google Assistant and the Gemini app, on Android devices. *See id.* § III.C–D, G–J. Google also proposes a compliance regime with annual reporting and an internal compliance officer. *Id.* § IV. It would have the judgment expire in three years. *Id.* § V.

Plaintiffs agree that Google's prohibitory equitable remedies are appropriate and generally propose the same, *see* Pls.' RPFJ § IV, but contend that such minimal relief will merely "maintain the status quo" and do nothing to restore competition, Pls.' Br. at 3.

FINDINGS OF FACT

The court's primary purpose in this Findings of Fact section is to update the reader on developments that have affected the relevant product markets since the liability trial concluded. These findings are therefore far less extensive and detailed than those contained in the court's liability opinion. The court's main factual findings are woven into the Remedy-Specific Conclusions of Law section, as that is the more natural place to evaluate and weigh the evidence.

In this section, the court focuses on three main topics: (1) GenAI technology and products; (2) new search access points; and (3) changes to Google's search distribution agreements. As to the first topic, the court covers the basics of GenAI technology, GenAI products that perform functions akin to GSEs, and the main players in the GenAI space and the competition among them. The court then discusses Google's Gemini app as a search access point, as well as two new search access points, Circle to Search and Google Lens. Last, the court updates the record as to Google's distribution contracts.

I. GENERATIVE ARTIFICIAL INTELLIGENCE

A. Key Terms

1. "Artificial intelligence is the science and engineering of getting machines, typically computer programs, to exhibit intelligent behavior." *Google*, 747 F. Supp. 3d at 52 ¶ 107 (citation omitted).

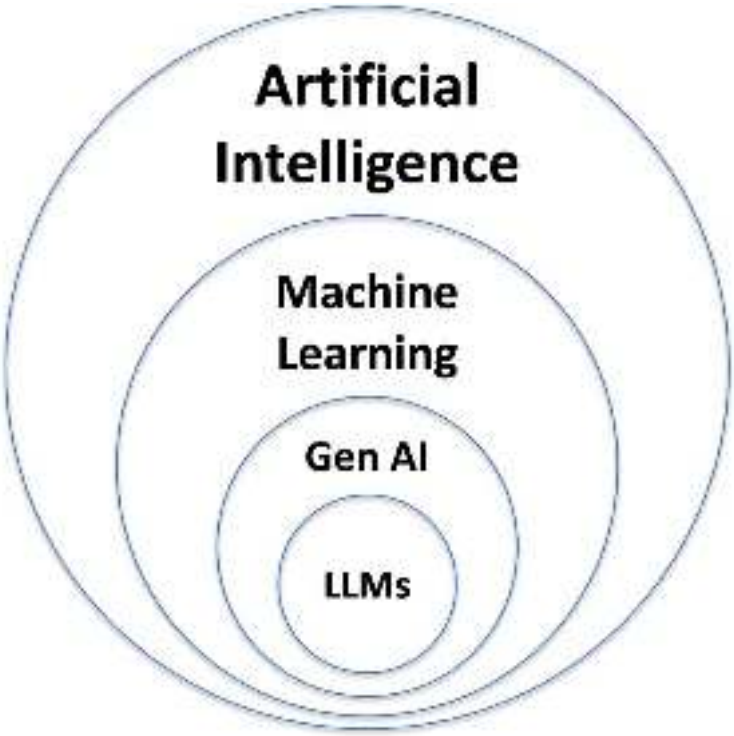
2. Generative artificial intelligence ("GenAI") is a type of artificial intelligence that uses machine-learning techniques to generate new data, including text, images, sound, code, and other media. *See* Rem. Tr. at 149:8-12 (Durrett) (GenAI is "a sort of sub-field of artificial intelligence that uses machine-learning techniques to generate structured outputs, which might be, for example, long chunks of text or images."); *id.* at 3315:23–3316:2 (Collins) ("Generative AI is about producing information, so producing content."); *id.* at 4057:16-19 (Hitt) (stating that people use GenAI to "generate some kind of new content or give [them] a new idea"); PXR0102 at -700 ("Generative AI goes a step further" than traditional AI "by creating new data (e.g., text, image, sound) similar to its training data—pattern creation.").[2] Machine learning blends computer science with statistics to learn how to solve problems based on exposure to data. *See* Rem. Tr. at 148:25–149:7 (Durrett) (discussing PXRD003 at 6).

3. Large language models ("LLMs") are a type of GenAI model that takes text or other types of data as inputs and then generates text or other outputs based on predictions. *See id.* at 149:13-16 (Durrett). Language modeling is "the task of predicting the most likely next token in a sequence given a prior sequence of tokens," where one can think of a "token" as a short word or

[2] This opinion uses the last three digits of Bates numbers on an exhibit to cite the specific pages that support a finding of fact. The parties' demonstratives are cited in the manner that they appear in the parties' respective proposed findings of fact. *See* Pls.' PFOF; Google's PFOF.

small unit of language. *Id.* at 152:16–153:8 (Durrett). The ability to predict the next token relies on both the quality of the model and the amount of input data. *See id.* at 154:20–155:3 (Durrett).

4. The relationship among the above-discussed types of AI can be visualized as follows:



PXRD003 at 6; *see also* Rem. Tr. at 148:16–149:16 (Durrett) (discussing this slide).

5. Most LLMs are "transformer" models. Rem. Tr. at 155:4-9 (Durrett) ("[T]he most typical method of implementing large language models these days is a model called the transformer."). Transformers are a neural model—a computational model that attempts to mimic the way the human brain works—that uses billions of parameters to predict the probability of the next token. *Id.* at 155:9-22 (Durrett). Google released a paper in 2017 that ushered in the use of transformers, and Google's transformer architecture is now the backbone of modern LLMs. *See id.* at 3318:17–3319:7 (Collins) ("Transformers was a model, an AI model architecture that Google invented in 2017 that all modern AI models are based on."); *id.* at 2447:25–2448:13 (Pichai)

("[A]bout a decade ago, Google invented transformers and . . . they are now the backbone of what are called large language models.").

B. AI and Search

1. Integrating AI Features into Search

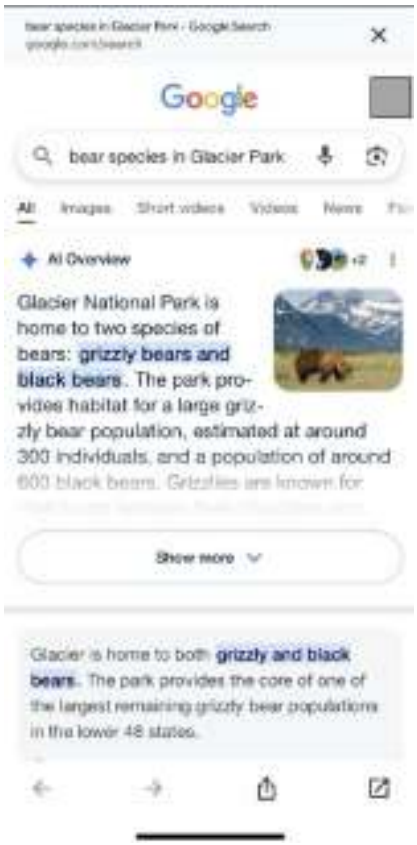
6. GenAI technologies have increasingly become incorporated into search products. *See Google*, 747 F. Supp. 3d at 53–54 ¶¶ 109–113 (describing how AI technology has influenced and invigorated search processes); Collins Rem. Dep. at 24:11–25:9 (discussing how Gemini GenAI models are incorporated into Search-related features and Search-related enhancements); *id.* at 28:20-21 ("Google Search will deploy Gemini models as part of building their product . . . ."). Google and other companies incorporate GenAI technologies into their search products today. *See* Parakh Rem. Dep. at 25:13–26:1 (describing Google's effort to incorporate "a large number of GenAI ideas" into Search through Project Magi, which eventually became AI Overviews); Rem. Tr. at 3601:4-9 (Reid) (agreeing that Google is incorporating and has incorporated AI technology and LLM technology into Google Search); *id.* at 2455:16-18 (Pichai) ("[W]e have deeply used AI technologies for well over a decade across our most important products. Obviously Search."); *id.* at 1020:23–1021:5, 1024:16–1025:22 (Schechter) (describing how Microsoft has incorporated GenAI technologies into Bing); *see also id.* at 2458:12–2459:5 (Pichai) (predicting that "AI technology is going to deeply transform Google Search").

7. One way Google incorporates GenAI technologies in Search is through a feature known as "AI Overviews." Rem. Tr. at 2456:25–2457:4 (Pichai) ("And recently we have launched something called AI [O]verviews. It uses a custom Gemini-based model to give users for any query overall context, a summary, and then helps them explore sources on the web, and it's been one of the most popular features we've launched in Google Search."); *id.* at 3609:2-6 (Reid)

(agreeing that AI Overview incorporates GenAI into Search). It was introduced in 2024. *See* PXR0037 at -229.

8. When a user enters a query in Google Search, AI Overviews "will take the search results that come back and use a[n] [LLM] to produce a summary of those results" that can be seen at the top of the SERP "as a kind of brief natural language description of what the search engine found." Rem. Tr. at 149:21–150:4 (Durrett); *see also id.* at 4539:11-14 (Jerath) (describing AI Overviews as "a new kind of section that Google has included in its search engine results page, and it shows basically an AI summary response to a query"); *id.* at 3550:2-8 (Reid) (discussing how AI Overviews is part of the main search results page and includes "an overview in response to the user's question and pulls together relevant webpages about it").

9. A depiction of AI Overviews on a mobile Google SERP is illustrated below:



PXRD005 at 10; Rem. Tr. at 646:14–647:19 (Hsiao) (discussing this slide).

10. AI Overviews are not triggered in response to every search query. *See* Rem. Tr. at 3550:5-15 (Reid) (stating that an AI Overview appears "whenever we think that it is both high quality information and a net add to the page"); Parakh Rem. Dep. at 81:1–83:8, 83:13–84:7 (whether AI Overviews appears on a page depends on relevance signals and other signals generated from Search results); *see also* N. Fox Rem. Dep. at 188:17–192:22 (discussing AI Overview–eligible queries); *accord* Rem. Tr. at 3617:22–3618:16 (Reid) (agreeing that she believes the percentage of queries triggering an AI Overview response "will continue to increase over time" and that she reported as much to Google's Board of Directors). Their introduction has had a generally positive effect on Search—Google has seen an increase in both consumer satisfaction and volume of queries. Rem. Tr. at 3615:12–3616:2 (Reid) (agreeing that people who use AI Overviews use Search more and are more satisfied with their results); *id.* at 3616:6–3617:4 (Reid) (stating that Google Search queries in the United States have increased 1.5% to 2% since the introduction of AI Overviews); PXR0038 at -303 ("[P]eople who use AI Overviews actually use Search more and are more satisfied with their results."); *see also* Rem. Tr. at 2459:6-13 (Pichai) (observing that users are now asking "longer" and "more complex" questions due to Google's incorporation of GenAI search features). Some evidence suggests that placement of features like AI Overviews on the SERP has reduced user interactions with organic web results (i.e., the traditional "10 blue links"). *See* Parakh Rem. Dep. 193:19–194:15, 194:18-25, 195:16-20 (agreeing that there is a sentiment within Google that Google's first-party search features reduce users' interactions with third-party results); PXR0158 at -910 ("[W]hen AI Overviews appear, pages that appear as a corroborating link [in AI Overviews] get more clicks than if the page had appeared as a traditional 'blue link' listing for that query."); *see also* PXR0001 at -612 to -613

(discussing a drop in interactions with organic web results where Google's WebAnswers appears on the SERP); Parakh Rem. Dep. 21:12-14 (describing WebAnswers as another GenAI product).

11. Google recently integrated a new GenAI feature in Search called "AI Mode." Rem. Tr. at 2490:14–2491:21 (Pichai); *see also id.* at 3352:4–3355:12 (Reid) (describing AI Mode as one of the "modes on Search that allow people to sort of dig deeper on some aspect of Search"). Google's early experience with AI Mode shows that consumers are asking longer questions than in traditional Search. *Id.* at 2490:25–2491:5 (Pichai). Google "expect[s] it to . . . become a deeper part of the Search experience." *Id.* at 2491:9-21 (Pichai).

2. AI Chatbots

12. Another type of GenAI consumer-facing product is a "chatbot," which is available on both desktop and mobile devices. *See id.* at 2461:21-23 (Pichai) ("There are many companies, both big and small, which are both building models, as well as using models to build chatbots or Generative AI applications."); *id.* at 1025:23–1026:5 (Schechter) (discussing how Microsoft's Copilot is accessible both on mobile and desktop); *id.* at 4062:25–4064:13 (Hitt) ("[A]t least for the data we've seen from OpenAI, desktop is—I think at least the majority of the queries come through desktop."). Some examples include OpenAI's ChatGPT, Anthropic's Claude, xAI's Grok, Microsoft's Copilot, and Google's Gemini. *Id.* at 4044:18–4045:19 (Hitt) (discussing RDXD-32.020).

13. Chatbots are based on the LLMs described above. They serve different purposes than GSEs albeit with some overlap. *Id.* at 2457:5–2458:9 (Pichai) (describing the "areas of overlap" between AI chatbots and Google Search but noting that there are "entirely different use cases as well"); *id.* at 385:18–388:8 (Turley) (describing the relationship between Google Search and ChatGPT as a Venn diagram (discussing PXR0176 at -126)); *id.* at 3541:18–3543:15 (Reid)

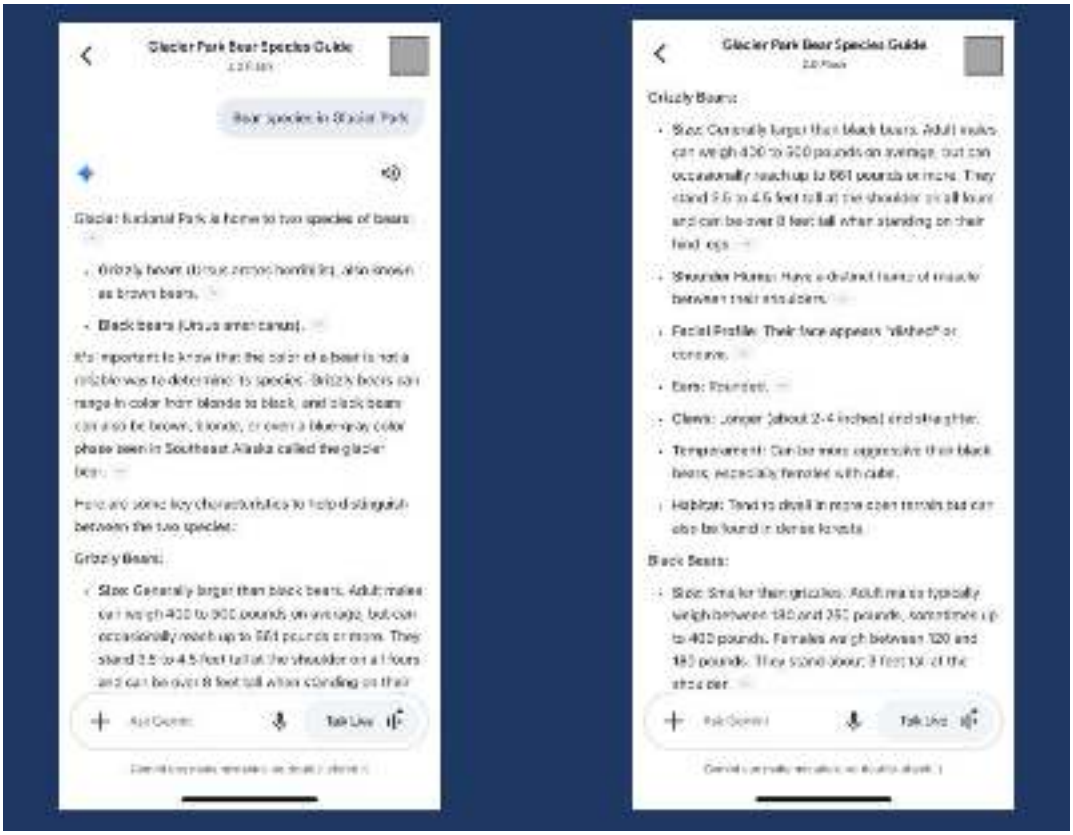
(recognizing that the use cases for GSEs and GenAI chatbots "are not identical but they do overlap in a number of places" like "a Venn diagram"); N. Fox Rem. Dep. at 74:20–76:8, 76:20-21, 76:23–77:11 (describing the relationship between GSEs and GenAI chatbots as "a Venn diagram" that is "quite overlapping" but not "fully overlapping"); *see also* Rem. Tr. at 3373:16–3376:2 (Collins); *id.* at 205:10–206:15 (Durrett). When a user submits a query to a chatbot, the underlying GenAI model makes a prediction about the answer, drawing upon the data used to train the model. *Compare* Rem. Tr. at 155:4-22 (Durrett) ("[The transformer] takes as input this sequence of tokens and outputs this probability distribution over all of these words in the vocabulary."), *with Google*, 747 F. Supp. 3d at 38–39 ¶¶ 27–32 (describing how a GSE works by responding to queries via retrieving and ranking websites responsive to the query from an information index).

14. Like a GSE, consumers can interact with AI chatbots by entering information-seeking queries. *See Google*, 747 F. Supp. 3d at 39–41 ¶¶ 33–39 (discussing types of queries presented to GSEs); Rem. Tr. at 382:5-17 (Turley) (stating that "asking questions" is "one of the core-use cases that people came to ChatGPT for"); *id.* at 2457:12-14 (Pichai) ("[F]or certain types of queries, you can look—you can either ask a search engine or you can go to a chatbot and ask a similar question."); *id.* at 656:8-13 (Hsiao) ("There is definitely truth to the fact that people use [GenAI] products to do what we would call informational tasks."). Thus, chatbots perform an information-retrieval function like that performed by GSEs. *Compare Google*, 747 F. Supp. 3d at 38–39, 41 ¶¶ 27–32, 41–42 (explaining how a GSE works and depicting a sample SERP), *with* Rem. Tr. at 636:8–647:23 (Hsiao) (walking through how a sample query and response would look in the Gemini app (discussing PXRD005)); *id*. at 695:16–700:5, 701:7–704:3, 706:23–707:22 (Shevelenko) (walking through a sample query and response on Perplexity's website (discussing

PXRD006)); *see also infra* Findings of Fact [hereinafter FOF] ¶¶ 36–46 (discussing "grounding" an LLM in search data).

15. Chatbots often include citations and links to websites when responding to information-seeking queries. Rem. Tr. at 405:8–406:18 (Turley) ("We do that by allowing users to see high-quality links inside ChatGPT for areas that they may want to read more about."); *id.* at 696:13-25, 698:15–699:7, 701:7–702:11 (Shevelenko) (Perplexity's answer engine responses present users with LLM-generated responses, and within those responses, Perplexity provides weblink citations and a list of web sources).

16. A sample chatbot response to a query is illustrated below.



PXRD005 at 3; Rem. Tr. at 637:23–638:5 (Hsiao) (discussing the Gemini results page displayed on this slide).

17. But chatbots have many use cases that traditional GSEs do not, including composing text, generating code, and creating novel images and video. *See* Rem. Tr. at 4058:1-4 (Hitt) ("There's a lot of applications that GenAI can do that are not suitable for Search, and a lot of things Search does that may not be well suited for GenAI, at least the way [that] consumers are using it now."); *id.* at 2457:5–2458:9 (Pichai) (observing that "there are areas of overlap" between Google Search and GenAI chatbots but that "there are completely . . . different use cases as well," and identifying coding, image generation, and video generation as "typical use cases which Search hasn't done in the past"); *id.* at 3541:18–3543:15, 3629:19-24 (Reid) (explaining that "what is the right tool for a question evolves over time," and listing homework help, companionship, and brainstorming as use cases for which people typically choose chatbots over search). A person may enter a short prompt and receive various forms of media rather than the traditional "10 blue links" returned by a GSE. *Compare Google*, 747 F. Supp. 3d at 41–42 ¶¶ 41–46 (explaining what appears on a SERP and depicting a sample SERP), *with* Rem. Tr. at 2457:17–2458:2 (Pichai) ("If you're a developer trying to build an application, you can go on and have these chatbots write you large sections of code . . . . In the Gemini app, you can go type in a short prompt and it will create a video for you, it will generate a whole video for you, and those are novel use cases. You can go to Chat GPT and generate images."); PXR0176 at -125 ("ChatGPT already provides answers without 10 blue links, in a simple experience, with natural contextual conversational follows ups.").

3. AI Assistants

18. In an earlier phase of this case, the court discussed Google's voice assistant product. *See United States v. Google LLC*, 687 F. Supp. 3d at 86 (explaining at summary judgment that Google Assistant "is a virtual assistant that can respond to voice commands to perform various tasks" (internal quotation marks and citation omitted)). Google has been upgrading that product

to the Gemini Assistant, which incorporates LLM technology and GenAI functionality. *See* Rem. Tr. at 668:15–670:13 (Hsiao) (discussing the upgrade of Google Assistant to Gemini Assistant). The Gemini Assistant comes preloaded on certain Android devices. *Id.* at 3900:14-20 (Samat).

19. Other companies have voice-assistant capabilities built into their chatbots. *See, e.g.*, *id.* at 744:3-25 (Shevelenko) (discussing voice-assistant capabilities built into Perplexity's app).

20. Google's GenAI Assistant can be accessed on a smartphone through both a voice command (a "wake word" or "hot word" like "hey Google") or a "long press" of the power button for several seconds. *See id.* at 635:6-20 (Hsiao) (explaining what a hot word is and that it can activate the Gemini app on Android devices); PXR0571 at -389 (Gemini–Samsung Commercial Agreement calling out "Hey Google" and "Hey Gemini" as hot word invocations); Kim Rem. Dep. at 173:14–174:2.

21. Today, new Android devices come with a default assistant, which gets triggered when a user hits a hardware button known as the action button. Rem. Tr. at 710:17-19 (Shevelenko).

22. Over the longer term, GenAI companies are striving to transform chatbots into a kind of "[s]uper [a]ssistant." *Id*. at 375:2-8, 375:22-24 (Turley). A super assistant would be able to help perform "any task" requested by the user. *Id.* at 375:2-8 (Turley); *id.* at 387:12–388:8 (Turley) (providing example of a request to buy shoes and the super assistant identifying options and completing the transaction); *id.* at 666:22–667:12 (Hsiao) (Google developing the Gemini app as an AI assistant to "help people solve their everyday problems"). Search is a necessary component of this product vision. *Id.* at 388:9–389:6, 424:3-8 (Turley).

4. On-Device AI

23. AI functionality on a smartphone can be delivered through a cloud-based AI model or an on-device AI model (or both). *Id.* at 2518:5–2519:24 (Nieh). An on-device AI model is stored entirely on a device and data is not transmitted to the cloud, meaning that an application running an on-device model can provide faster responses and enhanced privacy. *See id.* Google's on-device LLM is called Gemini Nano. *Id.* at 3956:10-15 (Samat). Google's Gemini app runs on cloud-based models, not Gemini Nano. *Id.* at 3956:16-19 (Samat).

24. AICore is an Android software module developed by Google that supports the use of on-device LLMs such as Gemini Nano. *Id.* at 3955:25–3956:4 (Samat); Collins Rem. Dep. at 55:1–56:12. AICore currently only supports Google's on-device Gemini Nano model. Rem. Tr. at 1557:6–1558:1 (Mickens) (opining that models running inside AICore "have to be blessed by Google"); Collins Rem. Dep. at 56:13-22; *see also* Rem. Tr. at 3966:19-23 (Samat) (describing AICore as "kind of a container around Google's Gemini Nano model"). To run Gemini Nano on-device in an accelerated way, AICore takes advantage of specialized smartphone hardware accelerators known as tensor processing units ("TPUs") and neural processing units ("NPUs"), which can execute the necessary mathematical computations with efficiency and speed. Rem. Tr. at 3961:13–3964:2 (Samat); *see also id.* at 1553:5–1554:19 (Mickens) (explaining that NPUs/TPUs result in "an increase in model execution efficiency").

25. AICore does not prevent other models from accessing a device's NPU or TPU. *Id.* at 3964:19–3965:19 (Samat). Other on-device model providers could work with OEMs and chip manufacturers to access a device's accelerators. *Id.* at 3965:23–3966:11 (Samat). But an OEM may not want to add a second system service alongside AICore and may prefer "to simply ship with a system service that allowed for plug-and-play use of models." *Id.* at 1558:2-9 (Mickens).

26. The capacity to run multiple on-device AI models can be limited by the device's storage and random-access memory ("RAM"). *See id.* at 3966:12–3968:6 (Samat) (stating that "how many different models can exist [on a single device] kind of depends on how big the models are" but that "right now there would be no problem on these premium devices having multiple models on storage" and that "practically speaking, . . . when you're using one, you have it in RAM, and then when you're not using it, you swap it out and you swap the other one in"). A single device may still have multiple on-device models—Samsung devices, for example, have both Gemini Nano and Samsung's own model, Gauss, on the device. Kim. Rem. Dep. at 69:24–70:13; Rem. Tr. at 3959:19–3960:3, 3968:7-15 (Samat).

C. LLMs

1. How LLMs Work (Greatly Simplified)

27. As discussed, language modeling is "the task of predicting the most likely next token in a sequence given a prior sequence of tokens," where one can think of a "token" as a short word or small unit of language. Rem. Tr. at 152:16–153:8 (Durrett). As an example, a user may enter a query into an LLM that asks it to complete a sentence, such as "Once upon a time, there was a ____," or to answer a specific question, such as "When was Abraham Lincoln born?" *Id.* at 154:3-19 (Durrett) (discussing PXRD003 at 10). Without human supervision, the model can predict the next token—for example, that "Once upon a time, there was a <u>war between two kingdoms</u>" or that Abraham Lincoln was born in 1809. *See id.* (Durrett) (discussing PXRD003 at 10 (noting these answers)). The ability to predict the next token relies on both the quality of the model and the amount and quality of the data inputs. *See id.* at 154:20–155:3 (Durrett); *id.* at 163:15-17 (Durrett) ("One very important process of the training process for base large language models is to remove a lot of . . . data that is not helpful.").

28. The development of a successful LLM begins with an untrained model. *See id.* at 156:1-6 (Durrett). Such a model is "pre-trained" by exposing it to large amounts of data. *See id.* at 155:23–156:16 (Durrett); *id.* at 4024:24–4026:9 (Hitt). By exposing the model to so much data, the parameters of the model can be updated to enable it to make predictions that reflect the information in that data. *See id.* at 156:12-15 (Durrett). That pre-training creates a base (or foundation) model. *See, e.g., id.* at 155:23–156:16 (Durrett) (discussing PXRD003 at 12–13); *id.* at 3348:3-12 (Collins); *id.* at 4017:8–4018:25 (Hitt) (discussing RDXD-32.006)

29. Data for pre-training LLMs is gathered from many sources, primarily from public web pages. *See id.* at 4025:6–4028:22 (Hitt) (discussing RDXD-32.009 (identifying "[p]ublicly accessible data," "[l]icensed data from third parties," and "[h]uman evaluation data" as data used by Google and its competitors to pre-train models)); *id.* at 156:1-6 (Durrett) ("So starting from a[n] essentially untrained version of the transformer model, we can expose it to large amounts of text which are typically gathered from the web."). For example, Google uses its Google Common Corpus ("GCC") to pre-train its Gemini GenAI models. *See id.* at 184:10-15 (Durrett); *id.* at 3346:8-17 (Collins). GCC is a dataset that involves large amounts of information scraped from the web and stored in a repository called Docjoins, which is "a data structure that Google uses to store URLs." *See id.* at 183:25–185:6 (Durrett) (discussing PXRD003 at 38); *see also* PXR0185 at -116 to -117 ("The main corpus of Docjoins is a large repository of the documents publicly available on the web and visited at least once by Googlebot in the last few months. It currently consists of over [redacted] documents. . . . By comparison, the external Common Crawl corpus is much smaller, with only a bit over 3 B in the latest release."); Rem. Tr. at 224:18–227:13 (Durrett) (discussing PXR0185).

30. After a model is pre-trained, "[t]here is a second stage called post-training where models are exposed to data that imparts the different capabilities that [the creators] want them to have." Rem. Tr. at 159:21-23 (Durrett); *id.* at 3341:12-15 (Collins) ("Pretraining is the first process in model training. And so—it occurs once. And the subsequent training process is called post training which is modifying, further modifying that pretrained model."). For instance, if the model's creators want the model to be good at writing code or answering questions, then they can post-train the model on data particular to these areas. *Id.* at 159:23–160:15 (Durrett) (discussing PXRD003 at 15); *id.* at 3350:24–3351:2 (Collins) (agreeing that "an example" of post-training "would be fine-tuning a foundation model to be able to answer Q and A"). All-purpose models can be post-trained to accomplish more than one task through exposure to large numbers of datasets encompassing broad collections of information. *See id.* at 160:18–161:1 (Durrett) (discussing PXRD003 at 16).

31. One way to ensure high-quality training data is to filter it or remove unnecessary or unhelpful data. *Id.* at 4028:13-22 (Hitt) ("[N]ot all data that's out there winds up being useful for training. It is a common business practice to filter your models in various ways, remove duplicates, remove spam, garbage, inappropriate content. There's a lot of stuff out there that you don't want to put into your models . . . ."); *id.* at 163:15–165:15 (Durrett) (describing how one data corpus was filtered down to only .14% of open-source data); *id.* at 165:25–166:25 (Durrett) (describing how filtering improves model performance).

2. The Limitations of LLMs

32. Even with high-quality filtered data, there are still limitations as to how accurately an LLM can respond to prompts. *Id.* at 167:6–168:11, 172:23–173:21 (Durrett) (discussing limitations of LLMs); *id.* at 382:18–383:14 (Turley) (discussing limitations with ChatGPT's

functionality). The capabilities of an LLM are limited by the content of its training data and when that training occurs, and their accuracy is similarly circumscribed by content and timing. Importantly, (1) if information is not in an LLM's training data, it will not be able to produce a factual response to a query that seeks such information; (2) LLMs can provide reasonably accurate responses for frequently seen data but struggle to do so for lesser-known information; and (3) LLMs can forget the content of data they have previously been exposed to and thus cannot store information in a "lossless way." *See id.* at 158:24–159:19, 161:5–162:6, 171:13–172:21 (Durrett) (discussing these issues).

33. As noted, one key limitation is that LLMs have a knowledge cutoff. *Id.* at 167:9–168:7 (Durrett) (discussing PXRD003 at 21). An LLM trained on data last updated in October 2024, for example, could not answer queries asking about Taylor Swift's 2025 engagement to Travis Kelce. *See, e.g.*, *id.*; *see also id.* at 384:4-13 (Turley) (discussing how LLMs "do not contain current events" as "[t]hey're only ever limited to things that were . . . present in the training data at the time of its training, and they don't update live"). Retraining an LLM on an updated dataset "takes weeks or months" and thus the LLM would be unable "to answer a user's query about stuff that had happened the same day using this kind of mechanism." *Id.* at 167:24–168:7 (Durrett). Moreover, training is costly. *See id.* at 167:9–168:7 (Durrett) (discussing PXRD003 at 21 (noting that adding more recent documents to pre-training data is expensive)).

34. Another limitation is the problem of so-called "hallucinations," facts made up by GenAI products "that are maybe probable to be true but not actually true." *Id.* at 383:2-9 (Turley); *id.* at 1035:13-15 (Schechter) ("A hallucination is essentially a statement that might sound factual but is really just generated by the language model."). If a user poses a query that asks for information outside of its training data, the LLM can generate an incorrect response based on what

it views to be the most probabilistic response. *Id.* at 172:23–173:21 (Durrett) (discussing this phenomenon); *id.* at 1036:1-9 (Schechter) (noting that if an LLM "doesn't have access to the right tools such as search or, you know, it was just told to give a response even if you don't know the answer, it will do its best to give a response and generate a response that it thinks you'd be satisfied with").

35. In summary, an LLM "is great at generating content and can generate novel content but might include mistakes. It is also retrained infrequently, so it won't have [any] up-to-the-minute factual information anyway." *Id.* at 174:5-8 (Durrett). These limitations can be termed "factuality" and "recency" issues. *See id.* at 383:10-14 (Turley).

3. Grounding

36. "Grounding" and retrieval-augmented generation ("RAG") provide a solution to problems of factuality and recency. *See id.* at 168:13–169:17, 170:14–171:12 (Durrett); *id.* at 2853:6–2854:1, 2933:18-23 (Allan); *id.* at 3366:19–3367:10 (Collins).

37. "[G]rounding is anchoring the output of a model on factual information or [an] external database." *Id.* at 3336:4-7 (Collins); *see also id.* at 3511:9-25 (Reid) (describing grounding as an LLM "ask[ing] for web results . . . to maybe fill in information it doesn't have, to correct information"); *id.* at 3634:11-14 (Reid) (agreeing that "grounding is when an LLM model uses some class of data, often from the web, in order to improve the accuracy of its response"). RAG is "[t]he process of accessing additional knowledge through a kind of information retrieval." *Id.* at 168:18-20 (Durrett); *id.* at 3835:11–3836:13 (Cue) (describing generally how through RAG techniques a chatbot can produce responses from identified relevant weblinks). RAG is a grounding technique, and the terms are sometimes used interchangeably. *Id.* at 170:14–171:12 (Durrett); *see also id.* at 2853:6–2854:1 (Allan).

38. An LLM is grounded by taking the query the user enters and referring to an outside database such as a search index. *See id.* at 169:5-17 (Durrett); *id.* at 3366:24–3367:2 (Collins); *id.* at 2853:6–2854:1 (Allan); *id.* at 3634:11-14 (Reid). The grounding model then surfaces that information from the outside database and feeds that information into the LLM to generate a response to the query. *Id.* at 169:5-17 (Durrett). Through grounding, LLMs can "pull[] in material that is relevant to the query, or at least believed to be relevant to the query, and then instruct[] the [GenAI] model to use that information to make references to that, and so that's where you might see the equivalent of links in a [GenAI] output." *Id.* at 2853:6–2854:1 (Allan).

39. Grounding reduces an LLM's hallucinations and improves its factuality. *Id.* at 3370:15–3371:1 (Collins); *id.* at 3634:8-25 (Reid); *id.* at 170:14–171:12 (Durrett); *see also* PXR0040 at -177 to -178, -202 to -203; PXR0105 at -305. LLMs can receive grounded information from the web to generate a response. Grounding also allows an LLM to "validate its responses, fact-check information, or even perform more complex tasks like analyzing sentiment across the web to tailor its responses." PXR0040 at -203; *see also* Rem. Tr. at 169:24–174:22 (Durrett) (explaining that, since LLMs have issues storing information in a lossless way and can more accurately predict answers based on more common information, grounding allows them to invoke a search engine and anchor the responses in reality (discussing PXRD003 at 23–26)); *see also id.* at 3530:16–3631:3 (Reid) (agreeing that GenAI chatbots "need to incorporate aspects of a search engine" in order to "answer[] a wide range of information needs").

40. Grounding likewise provides a solution to the recency issue, because the LLM can pull from and incorporate up-to-date information. *See* Rem. Tr. at 168:13–169:17 (Durrett) (explaining that by querying a GSE through grounding, an LLM can provide an answer to a question not in its training data); *id.* at 4155:4-7 (Hitt) (stating that "one of the applications of

grounding" is "to bring in facts . . . that are real time and could not have been . . . in the training dataset").

41. Grounding provides LLMs an opportunity to integrate search capabilities into the models as it permits LLMs to access content beyond its training data, such as web pages in a search index. *See id.* at 3835:11–3836:13 (Cue); *see also id.* at 640:1–641:20 (Hsiao) (describing how the Gemini model calls upon Search to ground its response with web content and also provides links to the underlying web content); *id.* at 3638:23–3640:19 (Reid) (discussing PXR0105); PXR0105 at -305 (discussing "Search grounding," which "allows the Gemini model to check Search results before generating an answer" or "[i]n other words: Gemini model treats Google Search like a corpus for [RAG]").

42. Through grounding, GenAI products can translate user prompts into search queries, send those queries to a search engine, and then incorporate information from the retrieved search results into their AI-generated responses. *See, e.g.*, Rem. Tr. at 399:21–401:11 (Turley) (describing how ChatGPT could incorporate search results); *id.* at 1022:16–1023:8 (Schechter) (explaining that Microsoft's chatbot "will write a query," send that query to Bing, "[a]nd then just as if you were a human, the results are then returned, and then the chat is able to read those results"); *id.* at 1025:23–1026:5, 1030:13–1031:10 (Schechter) (further explaining how Microsoft GenAI products incorporate Bing search results); *id.* at 3835:21–3836:2 (Cue) ("And what happens is when you type something in to Search, it uses a search index to retrieve what are the first 10 hits, let's call it, that you would typically see that are linked. The LLM now reads all of those 10 links and goes out and gathers all of the information, this is the RAG concept, . . . and it's now able to provide the answer or the results.").

43. Successful grounding in search requires a high-quality search application program interface, or API. *See id.* at 392:11–394:16 (Turley) (discussing quality issues with third-party search providers, which compelled OpenAI to build its own search index); *id.* at 1022:6–1023:8, 1039:5-20 (Schechter) (explaining that GenAI products treat search results as fact, so the quality of search results directly impacts the quality of GenAI responses); Pls.' Cromwell Rem. Dep. at 74:25–75:20 (explaining that "Copilot relies heavily on how Bing is ranking the results of the search, so the quality of the Bing index . . . will determine the ordering of . . . the citations that are going into . . . Copilot"). An API is a connection between computers or software programs that allows them to communicate and interact. Liab. Tr. at 784:10-20 (Kolotouros); *id.* at 1234:11-18 (Dischler).

44. To ground its Gemini models, Google uses a proprietary technology called FastSearch. Rem. Tr. at 3509:23–3511:4 (Reid). FastSearch is based on RankEmbed signals—a set of search ranking signals—and generates abbreviated, ranked web results that a model can use to produce a grounded response. *Id.* FastSearch delivers results more quickly than Search because it retrieves fewer documents, but the resulting quality is lower than Search's fully ranked web results. *Id.*

45. Google does not make FastSearch directly available to third parties through an API. *Id.* at 3512:1-5 (Reid). Rather, the technology is integrated into a Google Cloud offering called Vertex AI, which is available to third parties to ground on Google Search results or other data sources. *Id.* at 3339:5–3340:13 (Collins); *id.* at 3512:1-5 (Reid); *id.* at 3637:18–3646:12 (Reid) (discussing PXR0105 at -305 and PXR0153 at -478). Vertex customers do not, however, receive the FastSearch-ranked web results themselves, only the information from those results. *Id.* at 3512:18–3513:4 (Reid). Google limits Vertex in this manner to protect its intellectual property.

Id. at 3513:6-12 (Reid). Google has multiple Vertex grounding agreements with third parties. *Id.* at 3647:5–3648:4 (Reid) (discussing PXR0153 at -488).

46. Google also uses the Vertex service to ground web results for the Gemini app. *Id.* at 3640:1–3641:12 (Reid). The Gemini app, however, receives through Vertex access to portions of other Search features, like the Knowledge Graph, *see infra* Remedy-Specific Conclusions of Law [hereinafter RCOL] § III.B.3, that are not available to third parties. *Id.* at 3648:5–3649:20 (Reid) (discussing PXR0153 at -481).

D. The GenAI Market

1. Participants

47. **Google** has incorporated AI technologies into its most important products, including Search. *See id.* at 2455:16-18 (Pichai) ("[W]e have deeply used AI technologies for well over a decade across our most important products. Obviously Search."); *id.* at 3329:13-16 (Collins) ("Q. At this point in time, Mr. Collins, are there any products at Google of significance that generative AI has not been integrated into? A. No."); *id.* at 3601:4-9 (Reid) (agreeing that Google has been incorporating AI and LLM technology into Search for years). In February 2023, Google released its own GenAI chatbot, Bard. *See id.* at 2498:19-25 (Pichai). Bard has since transformed into the Gemini app, which is a GenAI chatbot product that relies on Gemini LLM models to produce results. *See id.* at 3627:22–3628:12 (Reid); Pancholi Rem. Dep. at 51:14-23; Rem. Tr. at 625:6-15 (Hsiao). AI Overviews is a GenAI search feature based on a branch of the Gemini LLM family. N. Fox Rem. Dep. at 36:9-14, 36:17-19, 36:21-23.

48. **Anthropic** is an American AI technology company that builds and pre-trains its own GenAI foundational model. Rem. Tr. at 794:1-6 (Shevelenko); *id.* at 3334:12-21 (Collins). Its consumer-facing chatbot application is known as Claude. *Id.* at 4044:25–4045:15 (Hitt); N. Fox

Rem. Dep. at 275:11-18. Google has invested in Anthropic. Rem. Tr. at 3641:12–3642:5 (Reid); Br. of Anthropic PBC et al. as *Amici Curiae*, ECF No. 1279-1, at 6–8.

49. **DeepSeek** is a Chinese technology company that released its eponymous chatbot to much fanfare and explosive growth in December 2024. Rem. Tr. at 2459:24–2460:2 (Pichai) ("Last December, DeepSeek launched from China within a month, you know. Literally, I mean, there have been tens of millions of users downloading them on Android and iOS and using them."); *id.* at 4038:23-25 (Hitt) ("You see entrants like Grok or DeepSeek, that may not have existed six months ago, are now able to reach the level of performance to wind up in the top ten of these models."); *id.* at 685:4-23 (Hsiao) ("It's explosive growth. There's new entrants . . . . You know, Grok, DeepSeek, all sort of new emerging models that are really, really strong." (discussing RDXD-04.007 to .008 and RDX0048)). DeepSeek has open-sourced a pre-trained foundation model, which at least one company, Perplexity, has used to post-train and develop its GenAI offerings. *Id.* at 798:22–799:10 (Shevelenko).

50. **Meta** is an American technology company that builds and pre-trains its own GenAI models in the "Llama" family. *Id.* at 3334:16-18 (Collins) ("Meta produces a competitive model called Llama that . . . recently surpassed a billion downloads . . . ."); *see also id.* at 794:1-6 (Shevelenko). The Llama models are trained on data derived from open sources. *See id.* at 165:10-15, 167:1-5 (Durrett). Meta's standalone chatbot offering is Meta AI. *See id.* at 4044:18–4045:19 (Hitt) (discussing RDXD-32.020); *see also id.* at 2461:24–2462:2 (Pichai). Meta integrates its GenAI into its proprietary platforms, such as Facebook, Instagram, and WhatsApp. *Id.* at 506:23–508:12 (Turley); RDX0091 at -016; RDX0151 at -007; RDX0355 at -029; Rem. Tr. at 4045:22–4046:24 (Hitt) ("Meta, who primarily distributes their GenAI products through their other properties like Instagram and WhatsApp and Facebook has also had success in getting these

products into consumers' hands."). Google has partnered with Meta to provide a Search API for Meta to ground its LLMs. *See* Pancholi Rem. Dep. at 69:8–70:11; N. Fox Rem. Dep. at 278:7-16; *see also* PXR0101.

51. **Microsoft Corporation** is an American technology company whose offerings include GenAI products in addition to its Windows operating system, Edge browser, and Bing GSE. *See Google*, 747 F. Supp. 3d at 36 ¶ 10; Rem. Tr. at 1020:23–1021:59, 1021:19-23 (Schechter) (describing "New Bing," which incorporates LLM technology into Bing's existing search technology); *id.* at 1024:16–1025:5 (Schechter) (describing Copilot Answers, which uses "LLM technology to . . . summarize the results that are on the" Bing SERP); *id.* at 1025:6-22 (Schechter) (describing Bing's "Copilot Search" feature, which uses an LLM to present search results in a magazine format with a combination of images, text, and links); *id.* at 1025:23–1026:5 (Schechter) (describing Microsoft's consumer AI application "Copilot"). Microsoft has integrated Copilot into Edge and Bing, both as a vertical and through Copilot Answers, which is Microsoft's AI-powered search feature analogous to Google's AI Overviews. Rem. Tr. at 1024:5–1025:22, 1076:17-19 (Schechter). Microsoft licenses some AI models from OpenAI for Bing and Copilot that it fine-tunes when needed but uses other AI models as well. *See id.* at 1038:17–1039:2, 1044:1-9, 1081:9-17 (Schechter). Microsoft grounds some of the queries made through its Copilot products on Bing search results. *See id.* at 1026:6-11, 1030:13–1032:17 (Schechter).

52. **OpenAI** is an American AI company that offers both a user-facing AI chatbot, known as ChatGPT, as well as a developer API for building AI applications on top of OpenAI's models. *Id.* at 373:2-10, 374:10–375:21 (Turley). OpenAI pre-trains its own foundation model. *Id.* at 794:1-6 (Shevelenko). ChatGPT offers a free version of its product and a paid subscription version that gives the user access to more sophisticated AI models. *Id.* at 376:14–379:3 (Turley).

OpenAI previously sought out a partnership with Google for grounding, but Google declined. *Id.* at 413:1–416:3 (Turley) (discussing PXR0181). ChatGPT has proven to be an immensely popular and fast-growing product, with over 100 million daily active users as of the end of 2024. *See id.* at 491:18–494:8 (Turley) (discussing PXR0072); *id.* at 512:22–513:4 (Turley) (agreeing that, among other strengths, OpenAI has "one of the fastest-growing products of all time" (discussing RDX0355 at -005)); *id.* at 3827:13–3828:11 (Cue) (discussing the growth of ChatGPT). In December 2024, Apple began integrating ChatGPT and OpenAI technology into its devices to power Apple Intelligence, Apple's AI experience integrated into its devices, in exchange for revenue share payments. *Id.* at 3832:4–3833:11, 3838:17–3839:18 (Cue); *id.* at 468:1-18, 468:23–469:7, 499:12-25 (Turley); *id.* at 500:1-24 (Turley) (discussing RDX0148 at -001).

53. **Perplexity** is an American AI company that seeks to provide users an "answer machine." *Id.* at 694:8-21 (Shevelenko) (describing Perplexity's product as "an answer machine" where users first "ask questions in natural language"; then Perplexity "run[s] a search, identify[ing] high-quality sources from across the Internet that are relevant to that query," "retrieve[s] those snippets," "rank[s] them," and "use[s] different large language models to synthesize the information in a way that's responsive to the original query"; and finally the user receives "an answer in text form with citations showing where the information comes from"). Perplexity does not train its own foundational model but rather relies on foundational models pre-trained by other GenAI companies (like Meta and DeepSeek) and post-trains them from there. *Id.* at 794:1-12, 798:16–799:10 (Shevelenko). Perplexity's consumer-facing products include its website (Perplexity.ai), a web app, mobile apps, and a recently launched web browser that integrates its GenAI. *Id.* at 694:22–695:5, 748:21–749:7 (Shevelenko). Though most of Perplexity's consumers use the company's free chatbot through which it earns some revenue through ads placed below

query responses, it also offers a paid subscription version. *Id.* at 703:8–705:5 (Shevelenko). Like other GenAI companies, Perplexity's valuation has surged over the past couple of years. *Id.* at 731:24–733:12 (Shevelenko) (discussing Perplexity's $1 billion valuation in spring 2024 and $9 billion valuation in December 2024).

54. **xAI** is an American AI company associated with X (formerly Twitter) that recently released its Grok GenAI product. *Id.* at 2461:14-25, 2478:16-24 (Pichai); *id.* at 3334:12-24 (Collins); *id.* at 4045:4-15, 4048:1-10 (Hitt). Grok is trained on xAI's own foundation model. *Id.* at 794:1-6, 798:22-25 (Shevelenko). xAI integrates Grok into X. *Id.* at 4050:21-22 (Hitt).

55. **Other companies** in the GenAI space include DuckDuckGo, which offers a "Duck.ai" chat service where users can interact with third-party GenAI offerings like ChatGPT, Claude, or Meta AI. *See id.* at 1005:13–1007:23 (Weinberg).

2. Competition Among GenAI Companies

56. The GenAI space is highly competitive. *See id.* at 503:25–504:4 (Turley) (Q. And let's talk about the [GenAI] space . . . . You consider that space to be very competitive; correct? A. Yes, absolutely."); *id.* at 3335:19-23 (Collins) ("[Q.] How would you describe the current level of competition with respect to foundation models as compared to the course of competition over the years that you've seen? A. [It] is the most competitive market I've ever worked in."); *id.* at 685:4-8 (Hsiao) ("Q. How would you describe the competitive space that the Gemini app occupies? A. I would say I don't think I've seen a more fierce competition ever in my 20-some years of working in technology.").

57. There have been numerous new market entrants. *See id.* at 685:9-13 (Hsiao) ("It's explosive growth. There's new entrants. . . . You know, Grok, DeepSeek, all sort of new emerging models that are really, really strong." (discussing RDXD-04.007 to .008)); *id.* at 4038:22–4039:4

(Hitt) ("You see entrants like Grok or DeepSeek, that may not have existed six months ago, are now able to reach the level of performance to wind up in the top ten of these models."); *id.* at 2459:21-23 (Pichai) ("You have seen over the last few months as many people have launched chatbots. Very quickly, these chatbots reach tens of millions of users.").

58. GenAI firms have access to a lot of capital. *See id.* at 4048:15–4049:20 (Hitt) ("[A] lot of firms have demonstrated they've been able to raise resources, you know, resources that might be substantial. . . . So in terms of capital, I think that seems to be, at the moment, plentiful."); *see, e.g.*, *id.* at 498:8-14 (Turley) (agreeing that OpenAI recently announced that it has raised an additional $40 billion in capital at a valuation of $300 billion); Liab. Tr. at 3599:10–3600:21 (Nadella) (agreeing that, as of the liability phase, Microsoft had invested over $13 billion in OpenAI).

59. There is constant jockeying for a lead in quality among GenAI products and models. *See* Rem. Tr. at 3334:25–3335:9 (Collins) ("The top labs and companies are always leapfrogging each other and kind of jockeying for the top position. And then the models also compete on individual capability . . . . [T]he model competition happens both in terms of the best kind of overall model as well as the best model for specific-use cases."); *id.* at 687:15–688:2 (Hsiao) ("[N]o model ever demonstrates a significant lead over the others. If it is better, it's sort of a little better, and then another provider will come and make their model like a little bit better than the previously best one. So it's very—it's very tight."); *id.* at 4036:22–4039:4 (Hitt) (opining, in sum, that this is a "very active space, constantly changing position" with "[n]ewer models tend[ing] to outperform others" and "different models perform[ing] differently"). Today, Google's models do not have a distinct advantage over others in factuality or other technical benchmarks. *Id.* at 4037:9–4040:13 (Hitt) (discussing RDXD-32.015 to .016); *cf. id.* at 212:24–214:23, 216:9–

218:17 (Durrett) (declining to opine on whether Google's models are superior to the models produced by its competitors).

60. A variety of GenAI products have achieved widespread usage. For instance, OpenAI calculated its share of the U.S. market as of December 2024 to be approximately 85%, with Claude at 3%, Gemini at 7%, and Perplexity and Copilot making up the remainder. *Id.* at 485:22–490:14 (Turley) (discussing RDX0355 at -029); *see also id.* at 512:22–513:4 (Turley) (OpenAI has "one of the fastest-growing products of all time."). Google estimated that as of March 28, 2025, its Gemini app had roughly 140 million daily queries, with ChatGPT at 1.2 billion, MetaAI at over 200 million, Grok at 75 million, DeepSeek at 50 million, and Perplexity at 30 million. *See id.* at 684:9-22 (Hsiao) (discussing RDXD-04.008).

61. Rival GenAI products have had some success in obtaining distribution with OEMs and other companies. OpenAI, for instance, has partnered with Apple, T-Mobile, Yahoo, DuckDuckGo, and Microsoft. *See id.* at 468:1-18, 468:23–469:7, 499:12-25 (Turley) (describing OpenAI's partnership with Apple); *id.* at 3838:21–3839:18 (Cue) (discussing Apple's evaluation of GenAI products and how it chose OpenAI); Giard Rem. Dep. at 51:18–52:5 (discussing T-Mobile's partnership with OpenAI); Rem. Tr. at 1278:1-6 (Provost) (stating that Yahoo "work[s] with OpenAI . . . on AI summarization"); *id.* at 1005:22–1006:1 (Weinberg) (discussing Duck.ai's incorporation of models developed by OpenAI, Anthropic, or Meta); *id.* at 1044:1-9 (Schechter) (confirming that Microsoft licenses LLMs from OpenAI to incorporate into Bing). Perplexity has a distribution deal with Motorola under which Motorola will preload Perplexity's application onto new smartphones, although the agreement is not exclusive, the application will not be on the home screen, and it will not be available via a wake word. *See* Rem. Tr. at 717:18–719:18 (Shevelenko); *see also id.* at 3905:3-19 (Samat) (stating that Motorola will have its own assistant called "MotoAI,

which includes Perplexity and CoPilot accessible on the device, invoked by a dedicated hardware button."). Perplexity continues to negotiate with other OEMs and browser developers. *See id.* at 714:14-17, 749:17-23 (Shevelenko). Motorola has also agreed to partner with Microsoft's Copilot. *See id.* at 363:18-22 (Fitzgerald).

62. Google has entered into distribution and promotion agreements for the Gemini app. *See* RDX0432 (Google–Samsung Gemini Commercial Agreement); RDX0423 (Google–Motorola Google One AI Premium OEM Promotion Agreement); RDX0428 (Google–Lenovo Marketing Agreement).

3. GenAI's Impact on GSE Usage

63. GenAI products may be having some impact on GSE usage. *See* Rem. Tr. at 3818:20–3819:4, 3827:23–3828:11, 3846:25–3847:3 (Cue) (testifying that the volume of Google Search queries in Apple's Safari web browser declined for the first time in 22 years perhaps due to the emergence of GenAI chatbots). But GenAI products have not eliminated the need for GSEs. PXR0176 at -123 ("ChatGPT already expanded what is possible for parts of Search, but users don't yet use ChatGPT for the full range of Search needs."); Rem. Tr. at 648:2–649:21 (Hsiao) (testifying that Google tracks so-called "cannibalization" of Google Search by GenAI chatbots and the Gemini app is not diverting queries from Google Search to a significant degree today); *id.* at 3846:25–3847:17 (Cue) (attributing the recent decline in Safari's search volume to increasing usage of GenAI apps but recognizing these apps must improve to compete with Google Search); *id.* at 21:2-5 (Opening Arg.) (Plaintiffs' counsel acknowledging that general search and GenAI "are different but overlapping products" and that GenAI "is not a replacement for [s]earch today); *see also Google*, 747 F. Supp. 3d at 53 ¶¶ 111, 114 (finding during the liability phase that "AI

technologies have the potential to transform search" but "AI has not supplanted the traditional ingredients that define general search").

64. AI Overviews has potentially strengthened Google's position in the GSE market. Since its introduction, Google Search queries in the United States have increased 1.5 to 2%. Rem Tr. at 3616:6–3617:4 (Reid) (conceding this); *see also* PXR0033 at -244 ("With our AI advancements across Search, including . . . AI Overviews . . . we've already increased Search usage by more than hundreds of millions of queries a month in the U.S. alone."). At present, more than ▇% of Search queries trigger an AI Overviews response. N. Fox Rem. Dep. at 188:23–189:15 (as of October 2024, approximately ▇▇% of U.S. Search queries trigger an AI Overviews response (discussing PXR0033 at -244)); Parakh Rem. Dep. at 76:22–77:2 (stating roughly "▇, ▇ percent" of U.S. queries triggered an AI Overviews response); *see also* Rem. Tr. at 2490:19-21 (Pichai) (agreeing that 1.5 billion Search users interact with AI through AI Overviews); Parakh Rem. Dep. at 64:6-14 (AI Overviews "serve[s] answers at scale to billions of people.").

65. Certain types of queries with commonplace usage in GSEs are not within the current use cases of GenAI products. This includes navigational queries. *Compare* Rem. Tr. at 702:13–703:1 (Shevelenko) ("[N]avigational queries are not a core use case of Perplexity."), *with Google*, 747 F. Supp. 3d at 40 ¶ 39 ("Google's top five queries by query volume are navigational queries and nearly 12% of all Google queries are navigational queries." (internal citations omitted)). Further, commercial queries are not, at present, a common use case for GenAI applications and thus far have not cannibalized commercial queries on GSEs. Rem. Tr. at 657:5–662:3 (Hsiao) (discussing the absence of cannibalization today but believing future cannibalization may occur based on the quality of a model, its pre-training data, and its grounding capabilities);

id. at 3837:12–3838:15 (Cue) (AI chatbots have not mastered commercial queries, but chatbot developers are increasingly introducing commercial concepts).

66. Even so, "there's nothing which is fundamentally different between commercial and non-commercial queries." *Id.* at 2460:16–2461:11 (Pichai). GenAI companies hope to attract more commercial queries, which could be monetized with ads. *See, e.g.*, *id.* at 658:13–659:15 (Hsiao) ("[T]he providers will try to build great shopping experiences or commercial experiences."); *id.* at 2460:16–2461:11 (Pichai) (referencing ChatGPT's launch of a shopping experience to support the prediction that commercial use of chatbots will increase); *id.* at 662:5–663:21 (Hsiao) (discussing Google's desire to kick Gemini to Search with respect to commercial queries to monetize on the ads served on Search); *see also id.* at 256:11-22 (Fitzgerald) (Gemini does not currently serve ads or receive ad revenue with its query responses). The expectation is that GenAI products will come to serve these needs. *See id.* at 2460:19–2461:11, 2492:24–2494:4 (Pichai) (predicting that GenAI products will "undoubtedly" be used to answer more commercial queries, citing ChatGPT's launching a shopping experience as an example, and that the Gemini app "will overall expand [Google's] ability to serve users' information needs"); *id.* at 3837:21–3838:15 (Cue) (observing that "you're already starting to see" GenAI chatbots answer commercial queries and launch shopping experiences and that "it's clear that [companies] have to go in those directions, and they will," because that's "where there's financial opportunity"); *id.* at 3543:19–3544:9 (Reid) ("[W]e have signs that [GenAI chatbots] want to get more and more in [the] business [of commercial searches]."); *see also id.* at 3544:1-9 (Reid) (shopping features in Perplexity); *accord id.* at 659:16–661:13 (Hsiao) (explaining that a GenAI chatbot would likely need to be grounded with a search index or with retailers' databases in order to answer commercial queries,

so that it "know[s] actively what are the current products available for sale and what are their prices").

II. SEARCH ACCESS POINTS

A. Access to Search Through GenAI Products

67. GenAI products have the potential to provide access points to GSEs. Smutny Rem. Dep. at 23:8-13 (identifying GenAI products such as Copilot that are "grounded in search" as "potential future search entry points"). That prospect, however, has not yet fully materialized given GenAI's myriad other use cases. Pls.' Cromwell Rem. Dep. at 40:15-17 ("Q. Mr. Cromwell, is Copilot's purpose to drive traffic to Bing? A. No."); *see also* Rem. Tr. at 672:2–674:1 (Hsiao) (describing the other use cases for Gemini and the fact that content on the Gemini app is often entirely newly generated); *cf. id.* at 3546:13–3547:3 (Reid) (stating that she did not believe the Gemini app to be a search access point because it "doesn't really cause a user to build up this mental model, [to] go to the Gemini app in order to get to Search").

68. Google has contemplated developing GenAI products to serve as search access points as a business strategy. *See* PXR0113 at -844 (Google presentation recognizing that "[t]he Search landscape is changing," pointing to "[n]ew AI access points" such as "chatbots LLM" and stating that "[t]o continue to drive Search growth & diversification in this new environment, we must introduce new user access points" including by "embedd[ing] [a] Search experience" in "Browsers/Search Engines (alongside AI chatbots) and Mobile Apps (AI/non-AI)"); Rem. Tr. at 3608:21–3609:1 (Reid) (agreeing that Google is exploring and testing new Search entry points); *id.* at 662:5–665:8 (Hsiao) (discussing commercial queries and a desire for Gemini to kick back to Search as it relates to these queries for monetization purposes).

69. Within the Gemini app, as of the evidentiary hearing, users can access Search via the "related search" function, which is accessible via a "G" icon that appears in response to certain queries. *See* Rem. Tr. at 641:21–647:20 (Hsiao) (explaining what the "G" button in the Gemini app does, including corroborating answers and providing search-related topics). After the Gemini app generates a response to a query, one typically grounded in Search, a user can click the "G" icon and will be presented with "Search related topics." *See id.* (Hsiao) (discussing PXRD005 at 7–10). Should the user click one of those Search related topics, the user will "get a screen" that is "sort of a traditional Google Search results page." *Id.* at 647:15-20 (Hsiao) (discussing PXRD005 at 7–10).

70. This functionality was built "as an early feature that was really around trying to help with hallucinations" but has not always been present and is "very rarely clicked." *Id.* at 665:3–6 (Hsiao); *id.* at 642:2-5 (Hsiao) (stating that Google had previously removed the "G" button).

71. Today, the Gemini app drives little traffic to Google Search. *Id.* at 665:7-8 (Hsiao) ("I would say Gemini does not drive much, if any, meaningful traffic to Search today."); *id.* at 4059:24–4061:8 (Hitt) (stating that "[o]nly a very small fraction" of queries yield the "G" button and lead the user to "actually even consider going to Search, and then only a small fraction of those actually wind up in Search" (discussing RDXD-32.030)); *see also id.* at 664:16–665:2 (Hsiao) ("I actually think if the user has to search after using Gemini, it's a failure of the product. Like, the point of Gemini is to help you answer the question and help you get things done with the AI. If you then have to use another tool, you know, that's not our desired outcome . . . .").

B. Circle to Search

72. "Circle to Search" is a recently launched search access point by Google for Android devices. It allows a user to execute a query by simply drawing a circle on a device's display screen. *See id.* at 243:10–244:14 (Fitzgerald); *id.* at 2494:5-16 (Pichai); *id.* at 3553:13–3555:16 (Reid); *id.* at 3907:17–3908:22 (Samat). Circle to Search returns a SERP in response to the "circled" query. *Id.* at 244:9-14 (Fitzgerald); 2494:8-16 (Pichai); 3554:16-24 (Reid); *see also id.* at 3602:21-23 (Reid) (agreeing that a user "can access Search through Circle to Search").

73. An OEM must modify its user interface to allow Circle to Search to operate, but the search functionality itself is built on the open-source Android platform. *Id.* at 3908:25–3910:24, 3979:19-24 (Samat). An OEM can select the default search engine that will answer the query, which may be Google or some other search product that has the capacity to execute a "circle" query. *See id.* at 3908:25–3910:24 (Samat) (confirming that Circle to Search can be used with a search application other than Google and discussing Perplexity's visual search offering).

C. Google Lens

74. "Google Lens" is a recent visual search capability built into Chrome. *See id.* at 1639:10–1640:7 (Tabriz) (stating that Google Lens "uses AI" and is "built by the [S]earch team" and agreeing that "Google Lens and Circle to Search" can be viewed as "search features or search products"). "[I]nstead of searching using text," a user "take[s] an image and search[es] based on that image" with Search "providing results based on what that image is." *Id.* at 3823:11-21 (Cue) ("So if I were to search [using Google Lens], for example, I could take an image of this water, it's called 'Deer Park,' and it would search for Deer Park Water and give the results."); *see also id.* at 1657:3-14 (Tabriz).

75. Google Lens's current integration in Chrome only works if Google Search is set as the default GSE in the browser. *Id.* at 1656:22–1659:9 (Tabriz) (describing how visual search works with and without Google Search as the default GSE).

76. Apple and Google entered into an agreement to bring Google Lens functionality to Apple devices in August 2024, with Google paying a revenue share on ads clicked on Google Lens-generated SERPs. *Id.* at 3823:22–3825:2 (Cue).

III. GOOGLE'S DISTRIBUTION CONTRACTS: AMENDMENTS & WAIVERS

77. Since the conclusion of the liability trial, Google has entered into several additional agreements, amended agreements, or extended agreements to distribute its Search and GenAI products. *See Google*, 747 F. Supp. 3d at 89–106 ¶¶ 289–396 (chronicling the at-issue browser agreements, MADAs and RSAs); PXR0567 (June 2024 amendment to Google–Samsung Google Mobile RSA); PXR0515 (December 2024 amendment to the Google–AT&T Google Mobile RSA); PXR0571 (January 2025 Google–Samsung Gemini Commercial Agreement); PXR0535 (June 2024 Google–Motorola Google One AI Premium OEM Promotion Agreement); PXR0541 (February 2025 amendment to Google–Motorola/Lenovo Google Mobile Incentive Agreement); PXR0543 (February 2025 Google–Motorola Gemini Fund Agreement); PXR0370 (March 2024 Google–Mozilla contract extension); PXR0610 (March 2024 Google–T-Mobile RSA notice of renewal).

A. OEMs

1. Samsung

78. On July 1, 2024, Google and Samsung entered into an agreement amending the Google Mobile RSA. *See* Rem. Tr. at 237:17–240:14 (Fitzgerald); *see* PXR0567; RDX0424. This amendment merely extended the provisions of the original RSA through March 31, 2025.

See PXR0567; *see also Google*, 747 F. Supp. 3d at 103 ¶¶ 380–383 (discussing the Google–Samsung RSA).

79. On April 19, 2025, mere days before the start of the remedial hearing, Google and Samsung entered into an RSA lasting until September 30, 2025, with a retroactive effective date of April 1, 2025. Rem. Tr. at 317:8–319:11 (Fitzgerald); *see also* PXR0608. This agreement covers the United States only. *See* Rem. Tr. at 347:9-11 (Fitzgerald) (discussing PXR0608 and RDXD-02.002); PXR0608 at -046 § 1.69. It provides for revenue share payments on an access-point-by-access-point and device-by-device basis for both new devices and installed-base devices (i.e., devices already in circulation). *See* Rem. Tr. at 347:12–348:8 (Fitzgerald) (discussing RDXD-02.002); PXR0608 at -044 § 1.49. This means that "Samsung has the choice device by device whether it wants to meet . . . the requirements that would open them up for promotional payment" and can choose which "access points" are set to Google Search. *See* Rem. Tr. at 347:12–348:8 (Fitzgerald) (discussing RDXD-02.002). Under this RSA, access points include the Google Search widget on the device's default home screen and the Chrome browser in the "hot seat," the application dock at the bottom of the device's screen. *Id.* at 347:23–348:4 (Fitzgerald); *see also* PXR0608 at -064 to -065 (Attach. C-1). Revenue share payments depend on device category, can apply to new and installed-base devices, and range between [redacted]% to [redacted]%. *See* PXR0608 at -060 to -062 (Attach. A).

80. Under the April 2025 RSA, Samsung is not required to exclusively distribute any Google product or service, and the agreement explicitly states that Samsung may work with another GSE, assistant, or GenAI service. *See* Rem. Tr. at 348:9–349:14 (Fitzgerald) (discussing PXR0608 at -049 § 9.1, and RDXD-02.002). Further, the RSA contains no Gemini promotion requirements, which is covered by a separate agreement. *Id.* at 349:12-18 (Fitzgerald).

81. That separate agreement is the Gemini Commercial Agreement, a worldwide agreement between Google and Samsung governing GenAI services. *See id.* at 349:15-21 (Fitzgerald); *see also* PXR0571; RDX0432. The agreement went into effect on January 1, 2025, and continues through December 31, 2027, with an automatic one-year renewal through December 31, 2028. *See* Rem. Tr. at 245:14–246:4 (Fitzgerald); PXR0571 at -363.

82. Pursuant to the Gemini Commercial Agreement, Google agrees to make revenue share payments from Samsung's "implementation of a certain Gemini experience on its Android phones and tablets" for consumers. PXR0571 at -364 ("Background" section); *see also* Rem. Tr. at 246:7–247:1 (Fitzgerald). Samsung only receives payments on "Gemini Qualified Devices," which must meet certain preinstallation, placement, default, and usage requirements. Rem. Tr. at 247:7–249:4, 251:4-12, 253:15–256:10 (Fitzgerald); PXR0571 at -368 to -369 § 2.3; *id.* at -384 to -389 (Attach. A, A-1, A-2, and B).

83. To qualify as a Gemini Qualified Device, a new Samsung device must be preinstalled with the Gemini app placed in the App Tray, either in alphabetical order or next to the Play Store Icon. *See* Rem. Tr. at 255:9-18 (Fitzgerald); *see also* PXR0571 at -389 (Attach. B). As for installed-base devices, the Gemini app must be installed at the end of the Samsung App Tray. Rem. Tr. at 255:9-20 (Fitzgerald); *see also* PXR0571 at -389 (Attach. B); Rem. Tr. at 256:5-8 (Fitzgerald) (confirming that installed-base devices are devices already in circulation). Further, Samsung must set the long-press side key and the "hot word" to invoke the Gemini app by default. *See* Rem. Tr. at 254:18–255:5, 255:21–256:4 (Fitzgerald); *id.* at 255:24–256:4 (Fitzgerald) (discussing how invocation of Gemini via "Hey Google" or "Hey Gemini" is required to receive a revenue payment); PXR0571 at -389 (Attach. B). Google may choose other Gemini entry-point offerings during device setup, and Samsung must install AICore and Gemini Nano if the device

meets applicable technical requirements. Rem. Tr. at 247:22–248:23 (Fitzgerald); *id.* at 248:24–250:8 (Fitzgerald) (explaining that AICore is a way to run an on-device LLM and Gemini Nano is the on-device LLM); PXR0571 at -368 to -369 § 2.3(c)(i), (d).

84. Under the Gemini Commercial Agreement, Google makes fixed payments, bounty payments, and revenue share payments to Samsung. *See* Rem. Tr. at 250:11–253:14 (Fitzgerald); PXR0571 at -384 to -385 (Attach. A).

85. Samsung can receive fixed payments that total up to $[redacted] million per month if the Gemini Qualified Devices meet certain "Key Performance Indicators" ("KPIs") based on usage. *See* Rem. Tr. at 250:22–251:12 (Fitzgerald); PXR0571 at -384 (Attach. A), -386 to -387 (Attach. A-1). These payments can vary based on whether KPIs are met. *See* Rem. Tr. at 251:4-9 (Fitzgerald); PXR0571 at -384, (Attach. A); *see also* Kim Rem Dep. at 173:7-9, 173:12 (agreeing that Samsung receives more money when it preinstalls Gemini on more devices).

86. As for bounty payments, Samsung receives up to $[redacted] per device for activation of Gemini Qualified Devices in the United States. *See* Rem. Tr. at 251:14–252:9 (Fitzgerald); PXR0571 at -384 (Attach. A), -388 (Attach. A-2). The amount of the bounty payment depends on the geographic location of the device and whether the device is new or part of the installed base. *See* PXR0571 at -388 (Attach. A-2).

87. As for revenue share payments, Samsung receives [redacted]% of "Net Gemini Ad Revenue" and "Net Gemini Subscription Revenue" per month. *See* Rem. Tr. at 252:10–253:14 (Fitzgerald); *see* PXR0571 at -384 to -385 (Attach. A). "Net Gemini Ad Revenue" is defined as [redacted]% of all ad revenue generated on Gemini Qualified Devices. *See* PXR0571 at -364 to -365 §§ 1.9, 1.19; *id.* at -367 § 1.39. "Net Gemini Subscription Revenue" is defined as [redacted]% of all subscription revenue generated on Gemini Qualified Devices. *See id.* at -364 to -365 § 1.9; *id.* at

-367 §§ 1.40, 1.50; *see also* Rem. Tr. at 256:11-18 (Fitzgerald) (stating that Google receives subscription revenue on the advanced version of Gemini).

88. The Gemini Commercial Agreement does not limit Samsung's ability to work with GenAI services other than Gemini. *See* Rem. Tr. at 350:21–351:12 (Fitzgerald); PXR0571 at -371 § 4.7. Further, other device entry points remain available to other GenAI services, including additional side-key buttons, hot words, or placement in the hot seat or on the default home screen. Rem. Tr. at 351:21–353:13 (Fitzgerald). Finally, the Gemini Commercial Agreement provides a mechanism for the parties to exit annually. *Id.* at 350:4-20 (Fitzgerald); PXR0571 at -375 to -376 § 8.4(a); *see also* RDXD-02.002.

89. As of the evidentiary hearing, the Samsung-Google MADA has lapsed in the United States. *See* Rem. Tr. at 353:15–354:15 (Fitzgerald) (stating that Samsung has no obligation to put either the Google Search widget or Chrome on devices in the United States to receive revenue payments under the RSA); *see also Google*, 747 F. Supp. 3d at 97–99 ¶¶ 348–358 (discussing the Samsung-Google MADA).

2. Motorola

90. Google has entered additional agreements with Motorola and its parent company, Lenovo. *See* Rem. Tr. at 258:4–261:16 (Fitzgerald) (discussing PXR0535); *id.* at 354:16–359:2 (Fitzgerald) (discussing RDXD-02.003); *see also* PXR0541 (February 2025 amendment to Google–Motorola/Lenovo Google Mobile Incentive Agreement); RDX0442 (same); PXR0535 (June 2024 Google–Motorola Google One AI Premium OEM Promotion Agreement); PXR0537 (June 2024 Google–Lenovo Marketing Agreement); PXR0543 (February 2025 Google–Motorola Gemini Fund Agreement).

91. In June 2024, Google and Motorola signed a marketing agreement, whereby Motorola received $[redacted] million from Google to promote Google services, including Gemini, in the United States and elsewhere with respect to Motorola's Razr and Edge devices. Laflamme Rem. Dep. at 43:11–45:2, 45:4-10, 45:13–47:1, 47:5–48:5; PXR0537 at -280 to -281 (Attach. A). During the term of the agreement, which lasted from June 1, 2024, to December 31, 2024, Motorola was restricted from using the funds to market non-Google assistive services, including other GenAI assistive services. *See* Laflamme Rem. Dep. at 46:21–47:1, 47:5–48:5; PXR0537 at -280 (Attach. A). Motorola viewed the additional funding received from Google as bringing it closer to where Motorola sought to be with revenue share payments. Laflamme Rem. Dep. at 49:16-20, 50:1-6.

92. Also in June 2024, Google and Motorola entered into an agreement to offer "AI Premium," with an end date of September 30, 2025. Rem. Tr. at 259:14-16 (Fitzgerald); PXR0535 at -164. Under this agreement, Motorola is required to preinstall the Gemini app and Google One, which is a cloud storage solution, on the default home screen of four devices. *See* Rem. Tr. at. 259:22–261:14, 357:13–358:15 (Fitzgerald); PXR0535 at -067 to -068 § 2.2. Google agreed to pay Motorola a bounty for Gemini app subscriptions pursuant to this agreement. PXR0535 at -069 to -070 § 4.1. The agreement is also non-exclusive, meaning that it does not restrict or limit Motorola from preloading or determining the placement of third-party apps beyond the placement and setup requirements listed. Rem. Tr. at 358:19–359:2 (Fitzgerald); PXR0535 at -068 § 2.3.

93. In February 2025, Google and Motorola signed a Gemini funding agreement lasting from January 1, 2025, to December 31, 2025. *See* Laflamme Rem. Dep. at 71:6–72:1; PXR0543 at -653, -667. This agreement allocates $[redacted] million for Gemini-related marketing activities. *See* Laflamme Rem. Dep. at 72:9–73:3; PXR0543 at -656 § 4.1; *id.* at -668 (Attach. A).

94. Around the same time, Google and Motorola also amended their RSA with an effective date of January 1, 2025. *See Google*, 747 F. Supp. 3d at 103 ¶¶ 380, 384 (discussing Motorola's RSA with Google); PXR0541; RDX0442; Laflamme Rem. Dep. at 34:13-16.

95. In amending the RSA, Motorola sought to both increase its revenue share payments and gain flexibility in partnering with other companies. Laflamme Rem. Dep. at 36:9–38:13. The amended RSA increases some of the revenue share payments, provides for revenue share payments on an access-point-by-access-point and device-by-device basis for devices sold in the United States, removes Search widget and Chrome placement obligations for devices sold in the United States, and provides no restrictions on preloading alternative search or GenAI services, meaning that Motorola could still receive payments under the RSA while having other GSE or GenAI providers on the same device. *See* Rem. Tr. at 355:18–357:2 (Fitzgerald); PXR0541 at -196 to -197 §§ 2.3, 2.9, 2.10; *id.* at -199 to -200 §§ 2.17, 2.18; *see also* Laflamme Rem. Dep. at 56:18–57:2, 57:5–58:4. That said, Motorola receives less revenue share if it does not fulfill certain placement requirements, such as Chrome as the default browser in the application dock or the Google Search widget on the default home screen. *See* Laflamme Rem. Dep. at 69:15–70:11, 70:14-18; PXR0541 at -199 to -200 § 2.18.

B. Carriers

96. Google has also extended RSAs with U.S. carriers, including AT&T, Verizon, and T-Mobile. *See* Ezell Rem. Dep. at 24:20–25:6 (stating that AT&T entered into a short-term extension from December 2024 to September 2025); PXR0515 (December 2024 amendment to Google–AT&T Mobile RSA); RDX0438 (same); PXR0597 (January 2025 amendment to Google–Verizon RSA); RDX0440 (same); PXR0610 (March 2024 Google–T-Mobile RSA notice of renewal).

97. The December 2024 AT&T amendment provides for revenue share payments on an access-point-by-access-point and device-by-device basis. *See* Rem. Tr. at 361:1–7 (Fitzgerald); Ezell Rem. Dep. at 27:5–28:15 ("[T]he biggest change in the new extension is that . . . [AT&T] can elect to work with Google on a particular search entry point, but that doesn't obligate [it] to work with Google on another search entry point."); PXR0515 at -119 to -120 § 2.5, -123 (Attach. B). Further, the agreement places no restrictions on promoting alternative search services. *See* Rem. Tr. at 361:1-4 (Fitzgerald); PXR0515 at -120 § 2.8. To receive a revenue share payment for a particular device, AT&T must satisfy certain requirements, such as placement obligations or Chrome as a default browser. Ezell Rem. Dep. at 28:16–29:1; *see also* PXR0515 at -123 to -124 (Attach. B).

98. Verizon and Google amended its RSA in January 2025, effective from January 1, 2025, through September 30, 2025. *See* PXR0597 at -320, -323; Rem. Tr. at 359:8-13 (Fitzgerald). Like AT&T's amended RSA, Verizon's amendment provides for revenue share payments on an access-point-by-access-point and device-by-device basis and no restrictions on alternative search services. *See* Rem. Tr. at 359:14-20 (Fitzgerald); PXR0597 at -321 to -322 §§ 2.4, 2.5, 2.9; *id.* at -324 (Attach. B).

99. T-Mobile had previously exercised an option to extend its RSA for an additional year through June 2025. *See* PXR0610 (March 2024 email exercising extension option); *see also Google*, 747 F. Supp. 3d at 102–03 ¶¶ 378–379 (describing the T-Mobile RSA). By the time of the evidentiary hearing, Google and T-Mobile were in discussions regarding a new agreement. *See* Rem. Tr. at 361:23–362:10 (Fitzgerald). Consistent with the Verizon and AT&T agreements, Google proposed that the revenue share payments be access point by access point and device by device and that there be no restrictions on alternative search, assistant, or GenAI services. *Id.* at

362:11-19 (Fitzgerald) (discussing RDXD-02.006). Further, Google proposed that there need not be any Assistant preinstallation requirements. *Id.* at 362:11-21 (Fitzgerald) (discussing RDXD-02.006). Under Google's proposal, T-Mobile could configure its device to preinstall alternatives to Google Search and Gemini and still receive revenue payments. *Id.* at 363:1-5 (Fitzgerald).

C. Mozilla

100. Mozilla exercised an option under its existing RSA with Google to extend it for an additional year, with an expiration date of December 1, 2026. *See id.* at 3166:10–3167:4 (Mullheim); PXR0370 (March 13, 2025, email); *see also Google*, 747 F. Supp. 3d at 96 ¶¶ 334–336 (discussing the Google–Mozilla RSA whereby Mozilla earns revenue share payments in exchange for Google's default search placement on the Firefox browser).

D. Waiver Letters

101. Right before the evidentiary hearing, Google sent letters waiving certain obligations contained in its agreements with Motorola, AT&T, and Verizon. *See* Rem. Tr. at 357:3-12, 359:21–360:3, 361:9-17, 369:3-10 (Fitzgerald); PXR0607 (April 17, 2025, waiver letter to Motorola); PXR0606 (April 17, 2025, waiver letter to AT&T); PXR0609 (April 17, 2025, waiver letter to Verizon).

102. The Motorola letter waived Google Assistant requirements in Motorola's RSA and clarified that there are no restrictions in the RSA on alternative assistive services. *See* Rem. Tr. at 357:3-12 (Fitzgerald); PXR0607; *see also* Laflamme Rem. Dep. at 64:5–65:19 (Motorola wanted the February 2025 extension to resolve ambiguity around whether partnership with other GenAI products would violate the RSA).

103. The AT&T and Verizon letters waived restrictions on alternative assistive and GenAI services and changed Google Assistant to an "à la carte" access point, meaning that the

carriers could decide whether to have Assistant and receive revenue share payments, rather than be subject to an all-or-nothing requirement. *See* Rem. Tr. at 359:21–360:18, 361:9-17 (Fitzgerald); *see also* PXR0606; PXR0609. These waiver letters made clear that partners could preinstall alternative search or GenAI products and still receive revenue share payments. *See* Rem. Tr. at 360:1-6, 361:18-21 (Fitzgerald).

CONCLUSIONS OF LAW

In this section, the court sets forth conclusions of law that will frame its later evaluation of the parties' proposed remedies. The court here covers: (1) the general legal principles of antitrust remedies; (2) the sufficiency of the liability-phase factual findings to support the proposed remedies; (3) the "fruits" of Google's exclusionary conduct; and (4) the propriety of including GenAI firms and products within the scope of remedies.

I. LEGAL FRAMEWORK

A. General Principles

It is the duty of the district court, upon finding a violation of the antitrust laws, to redress the violation and restore competition. *See United States v. U.S. Gypsum Co.*, 340 U.S. 76, 88 (1950); *Ford Motor Co. v. United States*, 405 U.S. 562, 573 (1972). The remedy in a Section 2 enforcement action "must seek" to "unfetter a market from anticompetitive conduct," "deny to the defendant the fruits of its statutory violation, and ensure that there remain no practices likely to result in monopolization in the future." *United States v. Microsoft Corp.*, 253 F.3d 34, 103 (D.C. Cir. 2001) [hereinafter *Microsoft III*] (en banc) (internal quotation marks and citations omitted).[3]

[3] The D.C. Circuit, quoting Supreme Court precedent, has identified a fourth remedial objective: "terminate the illegal monopoly." *Microsoft III*, 253 F.3d at 103 (quoting *United States v. United Shoe Mach. Corp.*, 391 U.S. 244, 250 (1968)). On remand, the district court deemed this an improper objective in that case. *New York v. Microsoft Corp.*,

An appropriate remedy "restor[es] conditions in which the competitive process is revived," *Massachusetts v. Microsoft Corp.*, 373 F.3d 1199, 1231 (D.C. Cir. 2004), and is "tailored to fit the wrong creating the occasion for the remedy," *Microsoft III*, 253 F.3d at 107; *see Ford*, 405 U.S. at 575 (emphasizing that the relief ordered "must fit the exigencies of the particular case" (internal quotation marks and citation omitted)); *accord* 3 PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 650a(2)(D) (5th ed. & Supp. 2025) [hereinafter AREEDA & HOVENKAMP] ("[T]he relief must be reasonably tailored to prevent a recurrence of the challenged practices and, to the extent practicable, to restore competitive conditions to the dominated market."). The district court is vested with broad discretion in crafting the remedial decree. *Ford*, 405 U.S. at 573 (collecting cases); *Microsoft III*, 253 F.3d at 105 ("[A] district court is afforded broad discretion to enter that relief it calculates will best remedy the conduct it has found to be unlawful.").

The ordinary starting point is an injunction terminating the anticompetitive conduct. *See Ford*, 405 U.S. at 575 (stating that the relief ordered should "assure the public freedom from" continuation of the exclusionary acts (citation omitted)); *see also Microsoft III*, 253 F.3d at 106. But "relief, to be effective," must often "go beyond the narrow limits of the proven violation." *Gypsum*, 340 U.S. at 90; *see New York v. Microsoft Corp.*, 224 F. Supp. 2d 76, 148 (D.D.C. 2002) [hereinafter *New York I*] (recognizing that "equitable relief beyond a mere injunction against repetition of the act is generally appropriate" where "a monopolist has consummated an exclusionary act" (quoting 3 PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 653c (2d ed. 2000))), *aff'd*, *Massachusetts*, 373 F.3d 1199. Accordingly, "the district court is 'empowered to fashion appropriate restraints on [the defendant's] future activities both to avoid a

224 F. Supp. 2d 76, 100–01 (D.D.C. 2002). This court, however, need not decide this issue, because there are independent reasons that remedies designed to eliminate the defendant's monopoly—i.e., structural remedies—are inappropriate in this case. Moreover, Plaintiffs are not advocating for monopoly termination as a rationale to support their remedies. *See* Pls.' Reply at 3; Rem. Tr. at 4756:11–4757:1 (Closing Arg.).

recurrence of the violation and to eliminate its consequences.'" *Massachusetts*, 373 F.3d at 1216 (quoting *Nat'l Soc'y of Pro. Eng'rs v. United States*, 435 U.S. 679, 697–98 (1978) [hereinafter *NSPE*]); *see United States v. Bausch & Lomb Optical Co.*, 321 U.S. 707, 724 (1944) ("Equity has power to eradicate the evils of a condemned scheme by prohibition of the use of admittedly valid parts of an invalid whole."); *accord* 3 AREEDA & HOVENKAMP ¶ 653f ("[E]quitable relief properly goes beyond merely 'undoing the act'; the proper relief is eradicating all the consequences of the act and providing deterrence against repetition; and any plausible doubts should be resolved against the monopolist.").

Consistent with that authority, the court may prohibit "practices connected with acts actually found to be illegal," *Gypsum*, 340 U.S. at 89, including practices "which are of the same type or class as unlawful acts," *Zenith Radio Corp. v. Hazeltine Rsch., Inc.*, 395 U.S. 100, 132 (1969) (citation omitted); *see Massachusetts*, 373 F.3d at 1233 (concluding that the district court "did not abuse its discretion by adopting a remedy that denie[d] Microsoft the ability to take the same or similar actions to limit competition in the future"); *accord* 3 AREEDA & HOVENKAMP ¶ 653f ("[I]njunctive relief must be tailored with sufficient breadth to ensure that a certain 'class' of acts, or acts of a certain type or having a certain effect, not be repeated."). It may even impose affirmative obligations on the defendant. *See Massachusetts*, 373 F.3d at 1215 (approving "forward-looking" provisions requiring Microsoft to disclose certain APIs and communications protocols, even though "non-disclosure of this proprietary information had played no role in our holding Microsoft violated the antitrust laws").

Behavioral remedies, then, need not be confined to "end[ing] specific illegal practices." *Int'l Salt Co.*, 332 U.S. at 401; *see New York I*, 224 F. Supp. 2d at 107 (acknowledging "unquestionable legal authority which indicates that the Court may address conduct beyond the

precise parameters of that found to violate the antitrust laws"). Nor must they be narrowly directed at "restor[ing] the status quo ante." *Ford*, 405 U.S. at 573 n.8. Rather, they must "represent[] a reasonable method of eliminating the consequences of the illegal conduct." *NSPE*, 435 U.S. at 698 (upholding an injunction "go[ing] beyond a simple proscription against the precise conduct previously pursued"); *see Massachusetts*, 373 F.3d at 1216, 1218 (applying *NSPE*'s "reasonable method" standard to "forward-looking" mandatory disclosure provisions); *see also Bausch & Lomb*, 321 U.S. at 726 (summarizing Supreme Court precedents as "uphold[ing] equity's authority to use quite drastic measures to achieve freedom from the influence of the unlawful restraint of trade," provided such measures "reasonably tend[] to dissipate the restraints and prevent evasions").

Structural relief, such as divestiture or dissolution, is also available to redress a Section 2 violation. The "most drastic, but most effective, of antitrust remedies," *United States v. E. I. du Pont de Nemours & Co.*, 366 U.S. 316, 326 (1961), and perhaps "the most important," *id.* at 331, structural measures are "designed to eliminate the monopoly altogether" and therefore "require[] a clearer indication of a *significant causal connection* between the conduct and creation or maintenance of the market power," *Microsoft III*, 253 F.3d at 106 (quoting 3 PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 653b (1st ed. 1996)). Courts have traditionally ordered such remedies where the monopoly arose by merger or acquisition, *see Microsoft III*, 253 F.3d at 105, and where "other measures will not be effective to redress a violation," *E. I. du Pont*, 366 U.S. at 327; *see also Microsoft III*, 253 F.3d at 49 (observing that "[c]onduct remedies may be unavailing" in cases involving technologically dynamic markets "because innovation to a large degree has already rendered the anticompetitive conduct obsolete"); *accord* 3 AREEDA & HOVENKAMP ¶ 653c1 (explaining that "[t]he rationale for a 'structural' remedy is that injunctive

relief is inadequate" and "[t]he case for a breakup remedy is strongest with respect to acquired assets").

The harshness of a remedy is not reason alone to reject it. *See E. I. du Pont*, 366 U.S. at 327. On the contrary, those who violate the antitrust laws cannot "avoid an undoing of their unlawful project on the plea of hardship or inconvenience." *Id.* at 326–27 (citation omitted); *see FTC v. Whole Foods Mkt., Inc.*, 548 F.3d 1028, 1033 (D.C. Cir. 2008) ("Even remedies which 'entail harsh consequences' would be appropriate to ameliorate the harm to competition from an antitrust violation." (quoting *E. I. du Pont*, 366 U.S. at 327)). Antitrust actions would be "futile exercise[s]" indeed "if the Government prove[d] a violation but fail[ed] to secure a remedy adequate to redress it." *E. I. du Pont*, 366 U.S. at 323.

Of course, the district court's equitable powers are not without limits. As the Supreme Court has made clear, the ends of equity are ill-served by punishing the monopolist for past transgressions, *Int'l Salt*, 332 U.S. at 401; prohibiting "all future violations of the antitrust laws," *Zenith Radio*, 395 U.S. at 133; or providing aid to a particular competitor, *Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 224 (1993). Further, the "[m]ere existence of an exclusionary act does not itself justify full feasible relief against the monopolist to create maximum competition." *Microsoft III*, 253 F.3d at 106 (quoting 3 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 650a (1st ed. 1996)). And the court must be sensitive to remedies that risk substantially stifling technological innovation or impairing consumer welfare. *See Massachusetts*, 373 F.3d at 1219 (affirming the district court's rejection of a remedy that would work a "substantial" effect upon Microsoft's incentive to innovate and thereby harm consumers); *see also United States v. Am. Tobacco Co.*, 221 U.S. 106, 185 (1911) (counseling that antitrust violations should be remedied with "as little injury as possible to the interest of the general public" and with

"proper regard" for relevant private interests); *New York I*, 224 F. Supp. 2d at 100 ("Equitable relief in an antitrust case should not 'embody harsh measures when less severe ones will do . . . .'" (quoting 2 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 325a (2d ed. 2000))).

Ultimately, when crafting a remedial decree, judges must "be mindful . . . of their limitations" and approach the task with "a healthy dose of judicial humility." *Nat'l Collegiate Athletic Ass'n v. Alston*, 594 U.S. 69, 106–07 (2021). After all, judges "are neither economic nor industry experts," and "[a]n antitrust court is unlikely to be an effective day-to-day enforcer of a detailed decree." *Id.* at 102 (internal quotation marks and citation omitted). Thus, "[w]hen it comes to fashioning an antitrust remedy, . . . caution is key." *Id.* at 106.

B. Causation

Causation plays an important role in calibrating the scope of a remedial decree. The relief granted should not "exceed[] evidence of a causal connection" between the defendant's anticompetitive behavior and its dominant position in the relevant market. *Massachusetts*, 373 F.3d at 1234.

To make that determination in this case, the court must resolve two threshold issues: (1) the strength of the causal connection required to impose certain remedies and (2) the types of remedies to which that standard applies. Both sides agree that an order enjoining Google's exclusionary practices is appropriate where the requisite causal connection is found only through inference. *See* Pls.' Br. at 10–11; Google's Br. at 12. Turning to the decree's outer limits, the parties further agree that structural remedies must satisfy a heightened causation standard—namely, the standard set forth in *Microsoft III*: "a clearer indication of a *significant causal connection* between the conduct and creation or maintenance of the market power." *Microsoft III*, 253 F.3d at 106 (quoting 3 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 653(b) (1st ed. 1996)); *see* Pls.' Br. at 10–12;

Google's Br. at 17, 24–25. The rub, then, is how to evaluate more robust behavioral remedies that fall between these two poles.

1. The Strength of the Causal Connection

In a redux of its liability-phase defense, Google contends that *Microsoft III* demands a showing of but-for causation as to every remedy except the narrowest one—an injunction against the specific conduct held unlawful. Google's Br. at 5–7, 17–24; Google's Reply at 3–5; *see also Google*, 747 F. Supp. 3d at 152–55 (discussing Google's but-for argument at the liability phase). According to Google, "a clearer indication of a significant causal connection" is synonymous with a showing of but-for causation, and this court cannot grant any additional relief unless it finds that Google would not have maintained its monopoly in the relevant markets absent its exclusive distribution agreements. Google's Br. at 5–7, 17–24; *see also id.* at 23 ("The but-for analysis in this case is more straightforward than in many cases because the exclusionary conduct is limited to specific terms of identifiable contracts."). To justify greater relief, Plaintiffs had to show that Google's market dominance would have declined or that Google would not have enjoyed market advantages "but for" the exclusive distribution agreements, which they failed to do. *See id.* at 21 (arguing that Plaintiffs failed to establish a causal link because they "did not attempt to identify the market share that purportedly would have shifted to other search engines if Google had entered only non-exclusive agreements, the amount of data that rivals purportedly would have needed to improve their quality or monetization, or the scale that rivals supposedly would have obtained if not for the exclusionary conduct").

Google's reliance upon *Microsoft III* for this proposition is misplaced. An extended discussion of that case is necessary to understand why.

In *Microsoft III*, the trial court found that Microsoft had violated Section 2 of the Sherman Act in part because it had closed off distribution channels for nascent Netscape and Java technologies, which Microsoft perceived as threats to its dominance in the operating systems market. *Microsoft III*, 253 F.3d at 68–70, 75–76. On appeal, Microsoft urged the D.C. Circuit sitting en banc to reject that liability finding because the necessary causal link between Microsoft's foreclosure of distribution channels and its maintenance of an operating system monopoly was missing. *Id.* at 78. To support that contention, Microsoft pointed to the trial court's factual finding that "[t]here is *insufficient* evidence to find that, absent Microsoft's actions, Navigator and Java already would have ignited genuine competition in the market for Intel-compatible PC operating systems." *Id.* (emphasis added).

The court rejected Microsoft's argument. It explained that no authority stood for the "proposition that, as to § 2 *liability* in an equitable enforcement action, plaintiffs must present direct proof that a defendant's continued monopoly power is precisely attributable to its anticompetitive conduct." *Id.* at 79. Instead, causation based on inference—that is, whether the exclusionary conduct "reasonably appears capable of making a significant contribution to maintaining monopoly power"—was an appropriate standard to establish liability in those cases. *Id.* (citations omitted) (cleaned up). Such inference is appropriate, the court said, whether (as in this case) the conduct was "aimed at producers of established substitutes" or (as in *Microsoft III*) directed at "nascent threats." *Id.* But in no event did government enforcers need to make a but-for showing to establish liability. "To require that § 2 liability turn on a plaintiff's ability or inability to reconstruct the hypothetical marketplace absent a defendant's anticompetitive conduct would only encourage monopolists to take more and earlier anticompetitive action." *Id.* The court also pointed to the practical problem of proof. "Neither plaintiffs nor the court can confidently

reconstruct a product's hypothetical technological development in a world absent the defendant's exclusionary conduct." *Id.* A more relaxed causation standard for establishing liability was thus appropriate, as the defendant should be "made to suffer the uncertain consequences of its own undesirable conduct." *Id.* (quoting 3 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 651c (1st ed. 1996)).[4]

But the court did not end its discussion of causation there. It reminded that causation is also relevant for determining antitrust remedies. *See id.* at 80 ("Microsoft's concerns over causation have more purchase in connection with the appropriate remedy issue, *i.e.*, whether the court should impose a structural remedy or merely enjoin the offensive conduct at issue."). That is not something the trial court had appreciated. It had ordered splitting Microsoft into an applications company and an operating systems company, without either holding an evidentiary hearing or providing an adequate explanation. *Id.* at 48, 101–03. These procedural deficiencies required a remand. *Id.* at 103. The trial court would have to consider anew whether "it should impose a structural remedy or merely enjoin the offensive conduct at issue." *Id.* at 80. In that context, the Court of Appeals explained that the standard of proof to sustain a structural remedy was more demanding than establishing causation by inference. "[S]tructural relief . . . 'requires a clearer indication of a *significant causal connection* between the conduct and creation or maintenance of the market power.'" *Id.* at 106 (alteration omitted) (quoting 3 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 653b (1st ed. 1996)). The Court of Appeals then observed that

[4] AREEDA & HOVENKAMP continues to support the "reasonably appears capable" standard and the underlying proposition that "the defendant is made to suffer the uncertain consequences of its own undesirable conduct." 3 AREEDA & HOVENKAMP ¶ 651g. Moreover, this proposition applies at both the liability and remedies stages. *See id.* at ¶ 653f ("It is thus proper to invoke again the proposition that the monopolist bears the risk of the uncertain consequences created by its exclusionary acts. . . . [T]he proper relief is eradicating all the consequences of the act and providing deterrence against repetition; and any plausible doubts should be resolved against the monopolist."); *id.* at ¶ 650a(2)(B) ("[I]t is always appropriate to deprive the defendant of the continuing benefits of past misbehavior. In devising the 'tailored' remedies for this purpose, reasonable doubts will ordinarily be resolved against the defendant.").

the trial court "expressly [had] not adopt[ed] the position that Microsoft would have lost its position in the [operating system] market but for its anticompetitive behavior." *Id.* at 107. "If the court on remand is unconvinced of the causal connection between Microsoft's exclusionary conduct and the company's position in the [operating system] market, it may well conclude that divestiture is not an appropriate remedy." *Id.*

Google reads *Microsoft III* as effectively requiring a showing of but-for causation for any remedy greater than "an injunction against continuation of [the unlawful] conduct." Google's Br. at 23–24 (quoting *Microsoft III*, 253 F.3d at 106). It urges the court to reject Plaintiffs' remedies for a failure of proof "because the record does not show that Google 'would have lost its position in the relevant markets but for its anticompetitive behavior.'" *Id.* at 23 (quoting *Microsoft III*, 253 F.3d at 107) (alterations omitted)). But Google's interpretation stretches *Microsoft III* beyond recognition.

To state the obvious, the Court of Appeals did not use that simple, familiar phrase "but for" when describing the remedies causation standard. (Nor did the AREEDA & HOVENKAMP treatise on which it relied, for that matter.) Importantly, the court remanded the matter for further proceedings, even though it acknowledged "the District Court expressly did not adopt the position that Microsoft would have lost its position in the [relevant] market but for its anticompetitive behavior." *Microsoft III*, 253 F.3d at 107. In other words, the plaintiffs had not established but-for causation at the liability phase. If divestiture was dead on arrival for want of such connection, a remand would have been unnecessary. The Court of Appeals simply could have directed the trial court to enter a prohibitory injunction. But that is not what it did. Presumably, the structural remedy, as well as the other "conduct remedies," *see id.* at 48, remained available even without proof of but-for causation.

Google's reading of *Microsoft III* is further undercut by the D.C. Circuit's reasoning. When it comes to analyzing causation, the Court of Appeals explained, plaintiffs and courts alike face a fundamental "proof problem": the "inability to reconstruct the hypothetical marketplace absent a defendant's anticompetitive conduct." *Id.* at 79. The D.C. Circuit is not alone in recognizing this evidentiary predicament. The Supreme Court has likewise concluded that but-for causation "would be a standard of proof if not virtually impossible to meet, at least most ill-suited for ascertainment by courts" in exclusive dealing cases. *Standard Oil Co. of Cal. v. United States*, 337 U.S. 293, 309–10 (1949). So, too, have leading scholars. Since *Microsoft III*, Areeda and Hovenkamp have continued to endorse the "reasonable inference" standard on the ground that "[m]any exclusionary practices, just like many negligence torts, are one-of-a-kind situations in which it is impossible to prove that an outcome would have been different absent the violation." AREEDA & HOVENKAMP ¶ 657a2. "Once the challenged events have occurred, the alternative reality can never be re-created." *Id.* "For this reason," the authors submit, "the government suitor need not show that competition is in fact less than it would be in some alternative universe in which the challenged conduct had not occurred. It is enough to show that anticompetitive consequences are a naturally-to-be-expected outcome of the challenged conduct." *Id.*

This problem is no less intractable at the remedies stage than it was at the liability stage. (Google does not say otherwise.) To reconstruct the but-for world would require the court to determine how Google Search and its rivals would have evolved had Google not secured exclusive default placement for more than 10 years across the most effective channels of distribution. Such an exercise is even more challenging in cases, like this one, involving technology markets. As the D.C. Circuit observed in *Microsoft III*, even "six years seems like an eternity in the computer industry"; during that period, "firms, products, and the marketplace are likely to have changed

dramatically." 253 F.3d at 49. If judges could accurately chart the path innovation would have taken, we would work on Wall Street (or the Las Vegas Strip), not Constitution Avenue. Of course, judicial decision-making is informed by the opinions of economic experts. But not even Google's expert claimed "to be able to precisely specify a but-for world" "in a case like this." Rem. Tr. at 4215:16-18 (Murphy); *see id.* at 4215:9-12 (Murphy) ("The idea that I could tell you, and the world will look just like this, nobody is going to do that. And nobody is going to do that in this case, nobody is going to do it in most cases.").

Lest any doubts remain, the decisions implementing *Microsoft III*'s remedial directives laid them to rest. On remand, Microsoft pressed a virtually identical argument to the one Google raises here. *Compare New York I*, 224 F. Supp. 2d at 147 (Microsoft claiming that the plaintiffs were "entitled to no more than a simple proscription against the offensive conduct" because there was no proof that Microsoft's rivals "would have achieved near ubiquitous distribution," evolved into viable platform substitutes, and "thereby eliminated Microsoft's monopoly" "absent the 12 Microsoft acts found to be anticompetitive"), *with* Google's Br. at 17 (Google claiming that the record evidence does not justify relief beyond a prohibitory injunction because Plaintiffs have not shown that Google's rivals "would have achieved [sufficient] scale" to "displace[]" Google's monopoly position "in the absence of its search distribution agreements"). The district court unequivocally rejected Microsoft's argument. Its position, the district court reasoned, "demand[ed] of Plaintiffs precisely what the appellate court deemed to be largely unattainable" and overlooked the fact that the appellate court "was well aware of [the liability-phase] finding" that but-for causation had not been established, yet "did not indicate that Plaintiffs must overcome it in order to obtain a remedy exceeding a mere proscription of the illegal conduct." *New York I*, 224 F. Supp. 2d at 147–48. On appeal, the D.C. Circuit, again sitting en banc, unanimously

"affirm[ed] the district court's remedial decree in its entirety." *Massachusetts*, 373 F.3d at 1204. At no point did it question the district court's causation analysis.

Google contorts these decisions to tease out its desired standard. With respect to *New York I*, Google trains its focus on the lone instance in which the district court mentioned but-for causation. It asserts that "the district court rejected a proposed remedy that would have 'place[d] the Java technology "on equal footing" with Microsoft's technology' because '[t]here is no evidence that Java would today possess "equal footing," in terms of distribution, with Microsoft, *but for* Microsoft's anticompetitive conduct.'" Google's Br. at 6 (alterations in original) (emphasis added by Google) (quoting *New York I*, 224 F. Supp. 2d at 262). That finding, however, came amidst a discussion of the plaintiffs' proposal on remand that Microsoft be ordered to distribute Java, a victim of Microsoft's exclusionary conduct. *New York I*, 224 F. Supp. 2d at 260. The district court declared this remedy inappropriate because it amounted to "nothing more than 'market engineering.'" *Id.* at 262 (citation omitted). Far from "facilitating entry," the district court explained, mandatory Java distribution would "manipulat[e]" the market, *id.* at 262, and "single[] out" a particular competitor by "anoint[ing] [it] with special treatment not accorded to other competitors in the industry," *id.* at 189. Such "favoritism" was clearly antithetical to both the purpose of the antitrust laws and binding precedent. *Id.* at 189 (collecting cases); *see Brooke Grp.*, 509 U.S. at 224 ("It is axiomatic that the antitrust laws were passed for 'the protection of *competition*, not *competitors*.'" (emphasis in original) (quoting *Brown Shoe Co. v. United States*, 370 U.S. 294, 320 (1962))). The D.C. Circuit agreed. *See Massachusetts*, 373 F.3d at 1231 ("There is a real difference. . . between redressing the harm done to competition by providing aid to a particular competitor and redressing that harm by restoring conditions in which the competitive process is revived and any number of competitors may flourish (or not) based upon

the merits of their offerings."). Thus, the "significant causal connection" standard played no role in either court's rejection of the "Java Distribution" remedy. The finding highlighted by Google merely reinforced the district court's conclusion that opening the unlawfully foreclosed channels of distribution to competition on the merits does not mean filling them with a rival product, especially where the record did not support such an outcome.

Google's reading of *Massachusetts* fares no better. As Google tells it, the D.C. Circuit squarely rejected the argument that "the district court erred in applying a 'stringent but-for test' of causation in determining whether 'advantages gained by Microsoft could be considered a fruit of Microsoft's illegality.'" Google's Br. at 6 (quoting *Massachusetts*, 373 F.3d at 1233). But it was the appellants (a group of states led by Massachusetts)—not the district or appellate court—that characterized the district court's causation standard in this way. *See Massachusetts*, 373 F.3d at 1233 ("Massachusetts also complains the district court erred in applying a 'stringent but-for test' of causation in determining whether 'advantages gained by Microsoft could be considered a fruit of Microsoft's illegality.'"); Br. for Pls.-Appellants, *Massachusetts v. Microsoft Corp.*, 373 F.3d 1199 (D.C. Cir. 2004) (Nos. 02-7155 & 03-5030), 2003 WL 22340413 ("The district court erred as a matter of law in the causation burden it applied to analyzing the fruits of Microsoft's illegality, imposing a stringent but-for test before the advantages gained by Microsoft could be considered a fruit of Microsoft's illegality."). In any event, the D.C. Circuit nowhere discredited the district court's approach to analyzing causation or its findings as to the strength of the causal connection established—a point Google does not contest. *See* Google's Br. at 6 (emphasizing that "an *en banc* D.C. Circuit unanimously 'affirmed the district court's remedial decree in its entirety'" (alteration and citation omitted)). Against that backdrop, this court is hard-pressed to conclude that *Microsoft III* and its progeny require plaintiffs to satisfy such a demanding standard.

2. Causation Standard Applicable to Certain Remedies

Having determined that "significant causal connection" is not tantamount to but-for causation, the court turns to the second threshold issue—the types of remedies to which the former standard applies. Google accords substantial weight to *Microsoft III*'s instruction that "the antitrust defendant's unlawful behavior should be remedied by 'an injunction against continuation of that conduct'" absent evidence of a significant causal connection. *Microsoft III*, 253 F.3d at 106 (quoting 3 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 650a (1st ed. 1996)); *see* Google's Br. at 5–7, 23–24. With that language, Google says, the D.C. Circuit drew a sharp line between a simple proscription of exclusionary practices and all other remedies. Google's Br. at 5–7; Google's Reply at 3–5. Whereas the former may be imposed based on inference—what the D.C. Circuit characterized as a "rather edentulous" standard of causation, *Microsoft III*, 253 F.3d at 79—the latter are justified only when a plaintiff has met the heightened "significant causal connection" test. Google's Reply at 3–5.

Here again, Google divorces the quotation from its context. *Microsoft III* did not address any remedies beyond "the structural remedy of divestiture" and "an injunction against continuation of [the defendant's illegal] conduct." *Microsoft III*, 253 F.3d at 105–07 (citation omitted). *New York I* did on remand, and it did not adopt the rigid dichotomous framework Google espouses.

By the district court's own account, the remedial decree in that case "exceed[ed] a mere proscription of the precise conduct found to be anticompetitive and [was] forward-looking in the parameters of the relief provided." *New York I*, 224 F. Supp. 2d at 193. It even included "affirmative measures." *Id.* at 194. The court adopted such greater measures even though it also found that the significant causal connection needed to support structural remedies was lacking. *Id.* at 185–86 (rejecting proposal to make Internet Explorer open source, which the court viewed as a

structural remedy, because "the court is unconvinced that there exists a sufficient relationship between the liability findings and" the proposed "open-sourcing of IE"), *id.* at 177–78 (imposing a reasonable royalty as a condition to receiving Microsoft's APIs, communications protocols, and related technical information, because a royalty-free disclosure of Microsoft's intellectual property was tantamount to a divestiture, for which the required causal connection was lacking).

Rather than apply the "significant causal connection" test to all but the narrowest behavioral remedies, as Google urges here, the district court considered the "proportionality between the strength of the evidence of the causal connection and the severity of the remedy." *New York I*, 224 F. Supp. 2d at 102. Its task was to "assess the strength of the causation evidence that established liability and tailor the relief accordingly." *Id.* The district court thus viewed the potential remedies along a spectrum, with an injunction against the unlawful conduct on one end (the least severe) and structural remedies such as divestiture on the other (the most severe). Consistent with that approach, the standard of causation applied must be commensurate with the nature of the relief sought: The more drastic the remedy, the greater the causal connection required to support it. Put another way, the applicable causation standard reflects the court's level of confidence that the challenged conduct significantly contributed to the defendant's maintenance of its monopoly. *See id.* at 102–03.

This court will follow *New York I*'s sound approach. It comports with the element of proportionality underlying the core tenets of antitrust remedies and equitable relief more broadly. *See, e.g.*, *Ford*, 405 U.S. at 575 (instructing district courts to model their remedial decrees to "fit the exigencies of the particular case" (citation omitted)); *Salazar v. Buono*, 559 U.S. 700, 718 (2010) (plurality op.) ("A court must find prospective relief that fits the remedy to the wrong or injury that has been established."); *Hammon v. Barry*, 813 F.2d 412, 425 (D.C. Cir. 1987) (stating

that "the remedy crafted to address a violation must be tailored to fit that violation" and observing that this principle "is rooted in the rich traditions of equity" and "holds true in remedying violations of statutory and constitutional rights, as well as rights protected at common law"). And it was not disturbed on appeal. *See Massachusetts*, 373 F.3d at 1204 ("affirm[ing] the district court's remedial decree in its entirety").

II. SUFFICIENCY OF THE LIABILITY-PHASE FINDINGS

The court now turns to the parties' dispute over the sufficiency of the liability-phase findings to support the various proposed remedies. All agree that those findings are sufficient to enjoin Google's continued use of exclusive agreements to distribute its GSE. *See* Google's Br. at 12; Pls.' Br. at 4; *see also Microsoft III*, 253 F.3d at 106. Where they diverge is whether those findings support the greater remedies sought by Plaintiffs.

According to Plaintiffs, no more is needed than the liability findings to support each of their proposed remedies, including the divestiture of Chrome. Those findings, Plaintiffs say, establish that "Google's conduct contributed significantly and substantially to Google's monopoly power." Pls.' Br. at 9. Quoting from the liability opinion, Plaintiffs point to various passages in which the court wrote that the exclusive agreements "significantly contributed," had a "significant effect," or "substantially contributed" to Google's ability to preserve its monopoly. *Id.* at 9–10 (quoting *Google*, 747 F. Supp. 3d at 145, 153, 163). Thus, additional factual findings are unnecessary to establish the requisite "significant causal connection" for any proposed remedy. *Id.* at 10.

Google thinks otherwise. It maintains that "the Court's liability opinion expressly applied only a more 'relaxed' causation standard, not the more stringent standard required for Plaintiffs' sweeping *remedies*." Google's Br. at 18 (internal citation omitted). By relying on the "edentulous"

"reasonably appears capable" standard, Google argues, the court's liability findings support no more than an inference that Google's exclusive distribution contracts significantly contributed to maintaining Google's monopoly power. *Id.* at 18–19; *see Microsoft III*, 253 F.3d at 79, 106–07 (recognizing that the "reasonably appears capable" standard is equivalent to an inference of causation). The court therefore would have to make additional factual findings to establish the "significant causal connection" required to impose structural or behavioral remedies, and Plaintiffs have failed to carry that burden. Google's Br. at 17–24.

The court thinks that neither side has it quite right. Plaintiffs' suggestion that the court can simply pluck sentences from the liability opinion without further scrutiny fails to acknowledge that the court did apply an "edentulous" causation standard at the liability stage, consistent with the legal principles articulated in *Microsoft III*. *Google*, 747 F. Supp. 3d at 153 (identifying the "key question" as whether "Google's exclusive distribution contracts reasonably appear capable of significantly contributing to maintaining Google's monopoly power in the general search services market"). The reality is that the court did not make factual findings with an eye towards meeting a stricter remedies causation standard—that was not the task at hand.

At the same time, Google presents the court with a false premise: that the liability findings are frozen within the confines of the edentulous test. Google cites no authority that prevents the court from returning to its liability decision and the underlying factual record to determine whether the evidence presented established causation by a strong inference or a weak one, or even by direct evidence.

In that sense, *Microsoft III* does not provide an analogous evidentiary template. There, proof of causation was hard to come by because Microsoft targeted its exclusionary conduct at emerging technologies outside the relevant product market. That fact "added uncertainty" about

a causal connection "inasmuch as nascent threats are merely *potential* substitutes." *Microsoft III*, 253 F.3d at 79. Here, by contrast, Google's exclusionary conduct was "aimed at producers of established substitutes"—including new entrants—thereby creating greater certainty that the exclusive agreements contributed to Google's maintenance of its monopoly. *See id.* (suggesting there is "added uncertainty" present in inferring causation when conduct is directed at a "nascent" competitor but expressing no similar misgivings when directed at "established substitutes"); *Google*, 747 F. Supp, 3d at 113 ("[U]sers see Google and other GSEs as substitutes . . . ."). This court therefore can more easily look to its liability findings for a stronger causal relationship than could the courts in *Microsoft III*.

Google disputes this distinction from *Microsoft III*. Google's Reply at 3. It says that Plaintiffs' failure of proof is even *more* evident here because it requires no guesswork about the future of "nascent" competition. *Id.* Google points out that Plaintiffs offered no evidence that any browser developer, OEM, or wireless carrier wanted to set any GSE other than Google as the preloaded default, and adds that there is "zero evidence" that Apple would have entered the GSE fray if only its agreement with Google were non-exclusive. *Id.* Google continues that the circumstances that led to its legal *acquisition* of market power preceded and persisted into the unlawful monopoly period, thereby making its *maintenance* of a dominant position attributable to factors other than the exclusive deals. Among other things, Google asserts that, before the start of the maintenance period, it already possessed a significant share advantage (80% of all search queries); "natural barriers to entry . . . were already in place"; it had acquired greater scale than its rivals; and it had developed the technologies that made it the world's best GSE. Google's Br. at 20.

Google's critique of the liability findings goes too far. Some of it can be dismissed as demanding more than the law requires. As already discussed, Plaintiffs were not required to establish anticompetitive effects by hypothesizing a but-for world. But Google also ignores that a "monopoly will almost certainly be grounded in part in factors other than a particular exclusionary act." 3 AREEDA & HOVENKAMP ¶ 651g. Only rarely will anticompetitive conduct be the sole or primary explanation for the maintenance of monopoly power. A monopolist cannot avoid stiffer remedies simply because it can point to lawful reasons for its market success.

By finding Google liable for violating Section 2 of the Sherman Act, the court has already determined that Google's exclusive distribution agreements significantly contributed to the maintenance of its monopoly power. *Google*, 747 F. Supp. 3d at 153. The question, then, is how much confidence the court has in that assessment. Ultimately, the remedy selected, and the way in which it is tailored, must reflect the strength of the causal connection between the anticompetitive behavior and the maintenance of monopoly power.

With these principles in mind, the court looks to its liability opinion and the underlying record to assess the strength of the causation evidence. At the outset, the court can dispatch with the notion that the distribution agreements were the sole reason Google maintained its monopoly. The court reaffirms what it wrote in its liability decision:

> Google has not achieved market dominance by happenstance. It has hired thousands of highly skilled engineers, innovated consistently, and made shrewd business decisions. The result is the industry's highest quality search engine, which has earned Google the trust of hundreds of millions of daily users.

Google, 747 F. Supp. 3d at 31. The court also recognized that Google's overwhelming market share in mobile search is attributable, at least in part, to Microsoft "missing" the mobile revolution, placing it on the back foot in competing against Google. *Id.* at 165–66.

Notwithstanding its innovation and successful business strategy, Google still used illegal restraints to maintain its monopoly. It was "'not entitled to maintain and magnify' the relevant network effects by entrenching its dominance through anticompetitive conduct." *See In re Google Play Store Antitrust Litig.*, Nos. 24-6256, 24-6274, 25-303, 2025 WL 2167402, at *18 (9th Cir. July 31, 2025). That is precisely what the liability-phase record established.

The court found that the agreements had four main anticompetitive effects: they (1) foreclosed a substantial portion of the relevant markets, thus "impair[ing] rivals' opportunities to compete," *Google*, 747 F. Supp. 3d at 159; (2) "den[ied] rivals access to user queries, or scale, needed to effectively compete," *id.*; (3) "reduced the incentive to invest and innovate in search," *id.* at 165; and (4) "enabled Google to increase text ads prices without any meaningful competitive constraint," thereby allowing Google to earn "monopoly profits to secure the next iteration of exclusive deals through higher revenue share payments," *id.* at 178; *see also id.* at 162 (image of "network effects" flywheel). These effects did not persist independently. Together, they enabled Google to widen the moats and pull up the drawbridges to ward off competition.

Start with market foreclosure. "Substantial foreclosure allows the dominant firm to prevent potential rivals from ever reaching 'the critical level necessary' to pose a real threat to the defendant's business." *ZF Meritor, LLC v. Eaton Corp.*, 696 F.3d 254, 286 (3d Cir. 2012) (quoting *United States v. Dentsply Int'l, Inc.*, 399 F.3d 181, 191 (3d Cir. 2005)). At the liability phase, the court found that half of all user queries in the United States run through the defaults secured by the distribution agreements and that the agreements contained terms that protected Google from competition. *See Google*, 747 F. Supp. 3d at 153. Some contract terms did so directly. For example, through their RSAs, Android partners were generally barred from preloading, marketing, or suggesting rival search services. *Id.* at 103–04 ¶¶ 385–390. Other terms were less direct. The

agreements were multi-year deals that gave partners limited flexibility to exit them. *Id.* at 157–58. The result was a market in which the "more common story [was] Google's partners renewing the agreements without genuine consideration of an alternative," *id.* at 158, and where "there [was] no genuine 'competition for the contract,'" *id.* at 144.

Google's scale advantage—discussed in more detail below, *see infra* Conclusions of Law [hereinafter COL] § III.B—played an important role in entrenching Google's dominance. Google did not dispute during the liability phase that, by locking up the defaults, it received more queries than it would have without them, or that the user-interaction data it acquired "[had] some utility for search quality." *Google*, 747 F. Supp. 3d at 159. Rivals had no hope of accessing default queries (except Bing on Windows desktop devices), thereby allowing Google to grow its data advantage. *Id.* at 160. The resulting divide is enormous. Google receives nine times more queries each day than its rivals combined, and 19 times more on mobile. *Id.* at 49–50 ¶ 87. The volume of click-and-query data that Google acquires in 13 months would take Microsoft 17.5 *years*. *Id.* at 51 ¶ 96, 161. To be fair, that scale advantage cannot be fully explained by exclusive search distribution. The record is clear that many users access Google through channels other than contracted-for defaults (largely through user-downloaded Chrome), *see id.* at 45 ¶¶ 63–64, and some users would switch back to Google if another GSE were set as the default, *see id.* at 97 ¶¶ 340–345, 148. Still, Google's data advantage is so great that it would blink reality to characterize the agreements' contribution to that disparity as only marginally impactful. The agreements allowed Google to persistently widen the data moat, ensuring that rivals could not achieve a degree of quality that would pose a threat to Google.

The distribution agreements also discouraged investment by existing market actors and new entrants. Microsoft executives said that they would invest even more in search if Microsoft

had more opportunities for default distribution on mobile. *Id.* at 165–66. To be sure, Microsoft was late to the mobile revolution, *id.*, but Google's stranglehold on default distribution enshrined that decision as a fatal error from which Microsoft would never recover. That is not how a competitive market should work. Google also did not have to worry about new market entrants. Silicon Valley venture capital funds viewed search as a "no fly zone." *Id.* at 165 (quoting Liab. Tr. at 3510:24–3512:7 (Nadella)). Some of that reluctance to invest, although by no means all, can be attributed to Google's exclusive agreements. In a market already protected by high barriers to entry, Google's tying up of the most efficient channels of distribution on multi-year contracts almost certainly discouraged new entrants from trying to surmount them.

And then there is Apple. The court found that "[t]he prospect of losing tens of billions in guaranteed revenue from Google—which presently come at little to no cost to Apple—disincentivizes Apple from launching its own search engine when it otherwise has built the capacity to do so." *Id.* at 168. Remedies-phase testimony from Eddy Cue, Apple's Senior Vice President of Services, confirmed that finding. Cue testified that he couldn't say he "would disagree with" the court's statement "that it was a disincentive for [Apple] to do a search engine based on the payments that [Apple was] receiving from Google. . . . It's a significant amount of money." Rem. Tr. at 3825:15-20 (Cue). Cue added that Apple still was unlikely to enter the search business because "Google does an amazing job." *Id.* at 3826:9-10 (Cue). Even so, Cue's testimony establishes that Google's high revenue share payments deterred Apple from trying to capture for itself all the advertising rents that flow through the Safari browser's default search box.

Finally, default status meant default monopoly profits, which Google used to lock in the next round of distribution agreements. *Google*, 747 F. Supp. 3d at 161, 177–78. As Neeva founder and former Google Senior Vice President of Ads and Commerce, Dr. Sridhar Ramaswamy, put it:

the revenue share payments "provide an incredibly strong incentive for the ecosystem to not do anything"; they "effectively make the ecosystem exceptionally resist[ant] to change"; and their "net effect . . . [is to] basically freeze the ecosystem in place." *Id.* at 145 (alterations in original) (quoting Liab. Tr. at 3796:8–3798:22 (Ramaswamy)). Microsoft's CEO, Satya Nadella, similarly described Google's distribution advantage as creating a "vicious cycle that [Microsoft is] trapped in" because the "defaults get reinforced." *Id.* at 159 (alteration in original) (quoting Liab. Tr. at 3513:1-3 (Nadella)). Google's high revenue share payments, a clear by-product of the exclusive agreements, only reinforced a marketplace "exceptionally resistant to change." *Id.* No evidence presented during the remedies phase contradicted this finding. If anything, in their *amicus* submissions, Google's partners uniformly emphasized the importance of Google's revenue share payments to their own product innovation and operations and strongly opposed Plaintiffs' proposed payment ban. *See generally* Apple Inc.'s Amicus Br., ECF No. 1303; Br. of *Amicus Curiae* Mozilla Corp. in Support of Neither Party, ECF No. 1296-2; Br. of *Amicus Curiae* Motorola Mobility, LLC, ECF No. 1306-1; Br. of Amicus Curiae Samsung Electronics Co., LTD. in Support of Def.'s Opp'n to Certain Proposed Remedies, ECF No. 1293-2.

This summary recitation of the court's findings demonstrates that the court's liability determination was supported by more than the barest of inferences. The evidence presented required no guesswork about the exclusive agreements' impacts on competition—they "froze" the search ecosystem in place. In that way, the liability findings here support a stronger causal connection than the one sustained in *Microsoft III* and on remand in *New York I*. There was no similar finding that Microsoft's actions "froze" the market in place. In this case, by contrast, Google's exclusive agreements made certain that no competitor would try to lay siege to the castle.

The court is thus satisfied that its liability findings support at least some of the proposed behavioral remedies. But, as explained later, those findings do not support the requested structural relief. *See infra* RCOL § II.

III. FRUITS OF GOOGLE'S UNLAWFUL CONDUCT

Antitrust remedies must "deny to the defendant the fruits of its statutory violation." *Microsoft III*, 253 F.3d at 34 (citations omitted); *see supra* COL § I.A. "[T]he fruits of a violation," however, "must be identified before they may be denied." *Massachusetts*, 373 F.3d at 1232. The court identifies those fruits in this section. Google's anticompetitive behavior produced at least three: (1) freedom from threats; (2) scale; and (3) revenue. After addressing each, the court responds to Google's objection.

A. Freedom from Threats

Google's exclusive distribution agreements have allowed it to operate free of any genuine competition for more than 10 years. *See* Pls.' Br. at 5 (identifying freedom from threats as a fruit); Rem. Tr. at 4732:12-22 (Closing Arg.) (Google's counsel identifying freedom from threats as a fruit without waiving objection to liability determination). The Court of Appeals reached a similar conclusion in *Massachusetts*. *See* 373 F.3d at 1233 (affirming the district court's finding that the fruit of Microsoft's anticompetitive conduct, which foreclosed avenues of distribution for nascent middleware products, was its "freedom from the possibility [that] rival middleware vendors would pose a threat to its monopoly of the market for Intel[-]compatible PC operating systems").

Google's distribution agreements have helped to entrench Google as the default search engine on hundreds of millions of desktop and mobile devices throughout the United States. They accomplish this directly by locking up "the most efficient and effective channels of distribution"—namely, the out-of-the-box default search access points—for years at a time. *Google*, 747 F. Supp.

3d at 120 (concluding that "Google controls the most efficient and effective channels of distribution for GSEs" because "[i]t is the exclusive preloaded GSE on all Apple and Android mobile devices, all Apple desktop devices, and most third-party browsers"); *id.* at 44 ¶ 59 (listing the out-of-the-box default search access points by device and browser); *id.* at 157–58 (determining that Google's contracts foreclose a substantial share of the general search market in part because they last between two and five years, with opportunities for renewal, and Google's partners cannot easily terminate them). Taken together, the search access points covered by the challenged agreements account for roughly 50% of all search queries issued in the United States. *Id.* at 44 ¶ 62, 153.

To appreciate the full effect of these contracts, however, one must look beyond their express terms. Google's unlawful agreements allowed it to capitalize on two powerful forces within the general search services market: default bias and network effects. *Id.* at 45 ¶ 65 (finding that default bias partially explains why users overwhelmingly use Google through preloaded search access points); *id.* at 161–62 (describing how Google benefits from network effects).

Start with default bias: Because most users (often unknowingly) act out of habit, habituating users to a particular option makes them unlikely to deviate from it. *Id.* at 45 ¶¶ 66–67. Search engines are no exception, as behavioral economists and Google itself have long recognized. *See id.* at 45–47 ¶¶ 65–74 (discussing evidence of default bias, including testimony from U.S. Plaintiffs' expert in behavioral economics, Dr. Antonio Rangel, and Google's own assessments); *id.* at 121 (crediting testimony from Dr. Ramaswamy that getting users into the "habit" of using a new product is "tricky" (quoting Liab. Tr. at 3699:22 (Ramaswamy))); Hunt Allcott et al., *Sources of Market Power in Web Search: Evidence from a Field Experiment* 2–3 (Nat'l Bureau of Econ. Rsch., Working Paper No. 33410, 2025), https://perma.cc/D528-U2U8

[hereinafter Allcott Study] (finding that 44% of users who accepted a small payment to change their default GSE from Google to Bing for two days and continued to use Bing thereafter did so because "they forgot to switch back or were too lazy to do so"). Indeed, many users are not even aware that there is a default search engine, much less how to change it. *Google*, 747 F. Supp. 3d at 45–46 ¶ 68.

Were they to try to change the default, moreover, they may not succeed. The more "choice friction"—i.e., obstacles—a user encounters when switching the default, the less likely they are to implement that change. *Id.* at 46–47 ¶¶ 69–73. Even seemingly minor obstacles, such as using a smaller interface, clicking through multiple screens, or downloading a new app, can discourage users from switching the default and accessing a rival search engine. *Id.* at 46–48 ¶¶ 69, 71–73, 78, 80–81; *see* UPX0103 at -214 ("Seemingly small friction points in user experiences can have a dramatically disproportionate effect on whether people drop or stick."). Choice friction thus bolsters the power of defaults. *Google*, 747 F. Supp. 3d at 46 ¶ 73 (finding that Google understands "increased choice friction discourages users from changing the default"); *see* UPX0172 at -731 ("[O]f the tiny fraction of end users who try to change the default, many will become frustrated and simply leave the default as originally set . . . ."). In short, people tend to stick with the status quo because it represents the path of least resistance.

The evidence presented at the remedial hearing identified yet another way in which default placement matters: it limits users' exposure to alternatives, leading them to underestimate the quality of rival products. Allcott Study at 1, 5–6. In a recent academic study, users were offered a small payment to change their default GSE from Google to Bing on their desktop web browsers[5] for 14 days. *Id.* at 2 (discussing the "Switch Bonus" treatment group). Of those who accepted,

[5] During the liability phase, the court found that "Bing's search quality on desktop measures up to Google's" and that "switching on mobile is more challenging than on desktop." *Google*, 747 F. Supp. 3d at 46 ¶ 72, 56 ¶ 127.

one-third (33%) affirmatively opted to keep using Bing after the test period ended. *Id.* Nearly two-thirds (64%) of those new Bing users reported that the product was better than expected, while 59% said that they had grown accustomed to using it. *Id.* at 2–3. According to the authors of the study, "[t]hese answers suggest that Google users' lack of experience with Bing is a significant driver of Google's large share at baseline in our sample." *Id.* at 3; *see id.* at 5 (concluding that "our findings confirm that defaults play an important role" in maintaining Google's market dominance and explaining that "Google's default position is effective because it ensures that users are never exposed to Bing, and hence never learn about it"). Plaintiff States' behavioral economics expert Dr. Michael Luca similarly testified that "[s]earch engines are at least, in part, an experience good," meaning a consumer "need[s] to have experience with the good to fully understand [its] quality." Rem. Tr. at 1891:12-17 (Luca); *see also id.* at 587:19-23 (Rangel) ("[T]here's strong evidence in the Allcott study . . . that there [is] a sizeable number of Google users who don't have well-formed preferences . . . with alternative options because they have not been exposed to them."); *id*. at 1894:6-10 (Luca) ("[P]eople didn't tend to know as much about Bing. So just giving them a couple days of experience seemed to have an impact on their beliefs, leading them to more favorably view Bing after gaining experience with it relative to before." (discussing Allcott Study)).

To be sure, default bias can be weakened by various factors. *Google*, 747 F. Supp. 3d at 46 ¶¶ 70–71 (observing diminished default effects on desktop devices and with products that are of poor quality or that have low brand recognition). But the fact remains that a GSE's placement as the default drives query volume through that search access point. *Id.* at 47 ¶ 74. And when the search access point in question is "by far" the best avenue for reaching users, the volume of queries it commands is, unsurprisingly, "significant." *Id.* at 44 ¶ 59 ("The most efficient channel of GSE

distribution is, by far, placement as the preloaded, out-of-the-box default GSE."); *id.* at 160 ("[D]efault placements drive significant traffic to Google."). At the time of the liability trial, default placements drove 70% of all U.S.-based queries to Google. *Id.* at 44–45 ¶¶ 62–64 (totaling the percentage of U.S.-based queries entered into the search access points covered by the challenged contracts (50%) and user-downloaded Chrome (20%),[6] all of which default to Google); *id.* at 160 (underscoring that default placements "supply Google with unequalled query volume that is effectively unavailable to rivals"); *see id.* at 47 ¶ 74, 89 ¶ 296, 160 (finding that a substantial majority of queries on Apple and Android devices are submitted through search access points that default to Google); *see also id.* at 159 (noting Google's admission that a "search engine in the default position receives additional search volume beyond what it would otherwise receive" (citation omitted)).

In a market where queries are currency, this feature makes default placements "extremely valuable" real estate—a reality Google well understands. *Id.* at 47 ¶ 75, 160 (finding that Google recognizes that "securing the default placement is extremely valuable for monetizing search queries" and "losing defaults would dramatically impact its bottom line").

Google, like other GSEs, primarily monetizes search queries through the sale of search ads. *Id.* at 63 ¶ 172. More search queries means more ad auctions means more ad revenue. *Id.* ¶ 173. By driving query volume, then, default placements directly drive revenue—in Google's case, to the tune of tens of billions of dollars each year. *Id.* ("There is a direct relationship between a GSE's scale and its monetization of search advertising."); *id.* at 47 ¶ 75 (Google estimating that over half (54%) of its overall search revenue flowed through its default placements in 2017); *id.*

[6] Chrome is Google's web browser, and its out-of-the-box default search access point—the address bar, also known as the omnibox—is set to Google Search. *Google*, 747 F. Supp. 3d at 35 ¶ 6, 44 ¶ 59. As the court noted in its liability opinion, "[t]hough the Chrome default is not alleged to be exclusionary conduct, it is a market reality that significantly narrows the available channels of distribution and thus disincentivizes the emergence of new competition." *Id.* at 120.

at 160 (Google projecting that losing the Safari and Android defaults would cost it billions of dollars in lost revenue).

Revenue is not the only advantage default placement confers. Greater query volume also yields greater user data, or "scale." *Id.* at 49–50 ¶ 87; *see* UPX0227 at -134 ("Every [user] interaction gives us another example, another bit of training data: for *this* query, a human believed *that* result would be most relevant."). And scale, it is well established, directly improves both the quality and monetization of a GSE. *Google*, 747 F. Supp. 3d at 50 ¶ 90 ("[U]ser data is a critical input that directly improves [search] quality."); *id.* at 161 ("Scale also improves search ads monetization."); *see also id.* at 52 ¶ 104 (noting that "there are diminishing returns to user data," but "that inflection point is far from established" and "user data does not become worthless even after the point of diminishing returns"). Google utilizes user data "[a]t every stage of the search process," from crawling and indexing to retrieval and ranking. *Id.* at 50–52 ¶¶ 86–106, 161. User data further helps Google understand which ads capture users' attention, enabling it to better evaluate ad quality and serve more relevant ads in the future. *Id.* at 161; *see id.* at 55 ¶ 121 (finding that users' sessions data "helps to tailor the advertisements that Google delivers to [them]"). These improvements in search quality and ad monetization ultimately translate into higher revenue, as superior search results attract additional users and more targeted ads generate more clicks. *Id.* at 161–62; *see id.* at 65 ¶ 181, 66–67 ¶ 186, 77 ¶ 239 (finding that text ads constitute "the predominant form of advertising on Google, whether measured by revenue or number of advertisers" and are sold on a cost-per-click basis, meaning the advertiser pays only if the user clicks on the ad).

This interplay among queries, data, quality, and revenue creates a positive feedback loop, known as "network effects." *Id.* at 161–62. In the market for general search services, this phenomenon manifests as follows: "(1) More user data allows a GSE to improve search quality,

(2) better search quality attracts more users and improves monetization, (3) more users and better monetization attract more advertisers, (4) more advertisers mean higher ad revenue, and (5) more ad revenue enables a GSE to expend more resources on traffic acquisition costs (i.e., revenue share payments) and investments, which enable the continued acquisition of scale." *Id.* at 161.

To be clear, default bias and network effects are features of the general search market; they did not arise because of Google's exclusive dealing. But the challenged contracts, which blocked rivals' access to key distribution channels and steered half of all U.S.-based queries to Google, ensured that Google would reap the greatest benefit from these market forces. While Google amassed an arsenal of user data, its rivals were starved of scale—"the essential raw material for building, improving, and sustaining a GSE." *Id.* at 159. Without an efficient means of reaching users, and thus no real prospect of acquiring scale, rivals and other market players have largely refrained from investing in general search, despite the promise of high profit margins. *Id.* at 165.

The upshot of this exclusionary regime is that "Google's dominance has gone unchallenged for well over a decade." *Id.* at 31; *see id.* at 145 ("Like Microsoft before it, Google has thwarted true competition by foreclosing its rivals from the most effective channels of search distribution. The result is that consumer use of rival GSEs has been kept below the critical levels necessary to pose a threat to Google's monopoly." (internal cross-reference omitted)); *id.* at 163 ("Google's distribution agreements have constrained the query volumes of its rivals, thereby inoculating Google against any genuine competitive threat."). As in *Massachusetts*, this "freedom from the possibility" other GSEs "would pose a threat to its monopoly" justifies the remedies discussed below that seek to "pry open" the channels of distribution Google has long had all to itself. 373 F.3d at 1233 (alteration and citation omitted).

B. Scale

As set out above, the fact that Google has received substantially more queries than its rivals due in part to its exclusive distribution agreements means that Google has acquired significantly more scale. *Google*, 747 F. Supp. 3d at 159 ("For more than a decade, the challenged distribution agreements have given Google access to scale that its rivals cannot match."). In this subsection, the court dives further into the importance of scale as a fruit of Google's exclusive distribution arrangements.

The record confirms Google's "massive" scale advantage. *Id.* at 162. As of 2020, nearly 90% of all U.S.-based queries are entered through search access points that flow to Google. *Id.* at 38 ¶ 23. Google's share is even higher (95%) on mobile devices, *id.* ¶ 24, which experience stronger default effects, *id.* at 46 ¶ 71. That translates into billions of Google searches conducted every day. *Id.* at 31.

When viewed alongside rivals' scale, these figures are even more staggering. "Users enter nine times more queries on Google than on all rivals combined. On mobile devices, that multiplier balloons to 19 times. NavBoost, one of Google's core ranking models, runs on 13 months of Google click-and-query data. That is the equivalent of over 17.5 *years* of Bing data." *Id.* at 161 (internal citations omitted); *see id.* at 49–50 ¶ 87, 51 ¶ 96.

Importantly, Google's scale advantage encompasses more than just volume; it also exhibits extraordinary breadth. An analysis of 3.7 million unique phrases searched on Google and/or its biggest competitor, Bing, over a seven-day period showed that 93% were seen solely by Google while just 4.8% were seen solely by Bing. *Id.* at 50 ¶ 89; Liab. Tr. at 5785:12–5789:13 (Whinston) (discussing UPXD104 at 44). On mobile devices, where Google has greater scale, the disparity was even higher. *Google*, 747 F. Supp. 3d at 50 ¶ 89.

Google's scale advantage is particularly pronounced with respect to long-tail, local, and fresh queries. Long-tail queries refer to queries containing less common, more distinctive phrases. *Id.*; *see* UPX1079 at -996 to -000 (Google document illustrating head, torso, and tail queries and providing examples of each). Any particular long-tail query, by definition, appears only rarely, but collectively, they make up a "significant" portion of overall search traffic. Liab. Tr. at 1811:4-25 (Lehman); *see* UPX1079 at -996 (describing long-tail queries as "the vast number of queries we see rarely or even just once" and identifying them as approximately one-third of total query volume and 90% of all distinct queries); DX0678 at -030 (Microsoft document depicting similar information); Allcott Study at 29 (finding that "more than 38.7 percent of" Bing queries over 12 months in 2021 and 2022 were "for rare queries that are searched less than 100 times"); *see also* Rem. Tr. at 396:4-7 (Turley) (estimating that "a bit more than half of what our users want to do in ChatGPT relies on long-tail queries, on things that don't come up so often").

Local queries, as their name suggests, are limited in geographic scope and "deal[] with information or locations in the real world." Rem. Tr. at 1018:1-5 (Schechter). The results returned in response to such queries thus depend on the user's physical location, which is one of the many datapoints Google collects about users. *Google*, 747 F. Supp. 3d at 55 ¶ 122 ("Google logs IP addresses and uses them to customize search results."); Rem. Tr. at 1018:4-16 (Schechter) (explaining that "contextual information about the user"—e.g., "where they might be, where they typically are, where they work, where they live"—matters when answering local queries); Liab. Tr. at 2660:22–2661:4, 2771:18-20 (Parakhin) (stating that, for local queries, "the results will and have to change depending on where you are" and "even small" shifts in location "can change the results dramatically"); *see, e.g.*, *id.* at 2660:22–2661:2 (Parakhin) (contrasting a search for "President of the United States," whose results would be the same no matter where you are in the

world, with a search for "best restaurants near me," whose results would differ depending on your location); UPX8104 at -170 (Google Search primer stating that the results for "football" would likely differ between U.S.- and U.K.-based users). Given the geographically specific nature of the information they seek, local queries tend to be long-tail queries. Liab. Tr. at 2661:13-16 (Parakhin).

Fresh queries ask about trending topics or recent events. Rem. Tr. at 1016:20–1017:15 (Schechter) (offering the example of why flags at the White House were flying at half-staff on a particular day). Consequently, the meaning of such queries can change over time. *Id.*; UPX0194 at -553 ("For some queries, results are stable over time, whereas for others, Search results can change rapidly. For example, when you search for [us open], you might want different results during different times of the year. In June, you might want the results about the Golf tournament. In September, you might want to see live tennis scores. On the other hand, if your query is [thomas jefferson], you should expect to see roughly the same results, unless Jefferson is the sequel to Hamilton!" (brackets in original)). To answer these questions, then, a search engine must be able to decipher what a user means and "realiz[e] something has changed within the world." Rem. Tr. at 1016:16-17 (Schechter). "[T]he results should change" as well. *Id.*; *see also id.* at 403:11–404:1 (Turley) (discussing the problems associated with "stale" information).

Google is better equipped to handle these types of queries in part because it simply sees more of them. *Google*, 747 F. Supp. 3d at 49–50 ¶¶ 86–90, 161–62. Specifically, Google's scale advantage affords it greater insight into what information users are looking for and which results they find relevant and authoritative. *Id.* at 50 ¶¶ 88–89 (describing the utility of click data and query data); *see also* UPX0227 at -134 ("A central premise of language understanding is that words are defined by the responses that they elicit from people. . . . So, to understand language,

we need to see lots and lots of instances of people reacting to words. Our search logs provide that. . . . Every [user] interaction gives us another example, another bit of training data: for *this* query, a human believed *that* result would be most relevant."); UPX0226 at -483 ("Every time someone does a search, we give out some hopefully useful search results, but we also get back crystal-clear user feedback: this search result is better than that one."); UPX0251 at -872 ("The source of Google's magic is this two-way dialogue with users. With every query, we give a little knowledge, and get a little back."); Liab. Tr. at 2644:20–2645:11 (Parakhin) ("[I]f this query was issued previously and people already clicked on certain results and read them, . . . it gives you a lot of information [about] which results are actually good or not, and you can memorize them."); *id.* at 1772:22–1773:15 (Lehman) ("[K]nowing a person's . . . location can sometimes help understand what it is they're looking for."); UPX0194 at -554 (highlighting "location" as a "great example[]" of a "clue[] about the user to better understand their intent").

Such insight, in turn, enables Google to deliver superior search results. *See Google*, 747 F. Supp. 3d at 39 ¶¶ 30–32, 49–52 ¶¶ 86–106 (recognizing that Google leveraged its insight into user intent into serving quality results); *id.* at 96 ¶ 333 (crediting 2021 Apple study's findings that, as measured by relevance of results, Google outperforms Bing on all but one search access point and Google's lead is "particularly strong for long-tail queries"); UPX0862 at -707 ("[W]e've had a lot of success in using query data to improve our information about geographic locations, enabling us to provide better local search."); *see also* UPX0194 at -556 ("Understanding the meaning of a query is crucial to returning good answers."); UPX0226 at -483 ("Learning from this user feedback is perhaps the central way that web ranking has improved for 15 years."); Liab. Tr. at 2675:14-24 (Parakhin) ("[T]he less frequent [the] query and the more specific it is, like location specific which makes it less frequent, the higher probability that it will benefit from scale."); *id.* at

5786:16–5788:8, 5789:17-23 (Whinston) (concluding that "the differentiator is in the tail" when analyzing the unequal distribution of unique phrases seen by Google versus Bing).

Because Google better understands what information users want, it is also better equipped to build a search index that contains web pages responsive to a wide range of user queries. *See Google*, 747 F. Supp. 3d at 50 ¶¶ 91–92; Rem. Tr. at 4091:2-4 (Hitt) (acknowledging that Google has the largest search index of any GSE). Query data helps a GSE understand what web pages to crawl and how frequently. *See Google*, 747 F. Supp. 3d at 50 ¶ 91. And building and maintaining a comprehensive and fresh search index is essential to answering user queries, especially those of the long-tail variety. Liab. Tr. at 6303:18-25, 6307:18-23, 6308:12–6309:1 (Nayak) ("[C]omprehensiveness of the index is crucial to being able to serve long-tail queries" because such queries seek less common, more specific information.); *Google*, 747 F. Supp. 3d at 50 ¶ 91 ("'Freshness,' or the recency, of information is an important factor in search quality. GSEs 'need to know how to recrawl sites to make sure that they do at all times have a reasonably fresh copy of the web that you are looking at.'" (alterations and citations omitted)); Liab. Tr. at 6304:1-21 (Nayak) ("[I]f you want to search the web effectively, you need to keep your index up-to-date.").

For these reasons, Google incorporates user data into every step of the search process. As the court's liability-phase findings made clear, Google's vast collection of user data has not gathered proverbial dust on Google's servers over the past decade. Just the opposite—Google has continuously deployed user data to, among other things, determine which websites to crawl, in what order, and at what frequency; construct and organize its search index to ensure that it covers a wide range of subject matter and sources (and thus a diverse array of queries); enhance the "freshness" of results (i.e., bring them up to date); create signals and models that assess results'

relevance and establish their ranking; and run large-format experiments to develop new features. *Google*, 747 F. Supp. 3d at 49–52 ¶¶ 86–106, 161; *see, e.g.*, Liab. Tr. at 6316:22–6318:6 (Nayak) (observing that queries issued on mobile devices tend to have "more location-focused intents" than those issued on desktop devices and therefore "one of the signals that does go into Google Search is . . . is it a desktop query or is it a mobile query"); *see also Google*, 747 F. Supp. 3d at 52 ¶ 105 ("Google continues to maintain significant volumes of data—despite the expense of storing it—because its value outweighs that cost."). In the words of one Google presentation, "Search can look like magic . . . . But really it's just about building signals . . . to identify user intent and match it to relevant documents." UPX0194 at -557. Because the knowledge derived from users' data provides "a strong proxy for users' intent," such data supplies "a critical input" for GSEs, including Google. *Google*, 747 F. Supp. 3d at 49–50 ¶¶ 86, 90.

For rival search engines, whose scale pales in comparison to Google's, long-tail, local, and fresh queries pose the greatest challenge. Without a wealth of user data to draw from, they struggle to answer such queries. *See* Rem. Tr. at 1016:11–1020:22 (Schechter) (Bing struggles with long-tail, local, and fresh queries in part because it sees them infrequently); *id.* at 825:25–826:10 (Weinberg) (DuckDuckGo performs worse than Google in part because "most of the queries we see are relatively new to us"). That further jeopardizes their chances of achieving scale, as a search engine's failure to deliver quality search results undermines its ability to attract and retain users. *See id.* at 1017:21-25, 1080:11-17 (Schechter) (stating that "[t]he quality of the experience that users have essentially drives retention" and users lose trust in a search engine when they're not given accurate and relevant information); Parakh Rem. Dep. at 196:1-4 ("[E]very time we've sort of worked on quality in [Google Search], users return. They value it. It provides them with their daily need."); Liab. Tr. at 2251:24–2252:7 (Giannandrea) ("[T]he tail requirement is pretty

onerous" because users "would become suspicious if they knew something existed and they couldn't find it."). Thus, what for Google manifests as a dazzling flywheel of queries and quality has the opposite effect for rivals: it keeps them stuck in place, or worse, causes a downward spiral of scale and revenue.

Scale, then, is more than a mere reflection of Google's size; it is a cornerstone of Google's success. By ensuring that half of all queries—and the legion of user data that accompanies them—flow exclusively to Google, the challenged contracts have directly and significantly contributed to Google's scale advantage.

C. Revenue

Google's exclusive distribution deals have increased not only the amount of data streaming into its servers, but also the amount of revenue pouring into its coffers. The foregoing discussion identified three ways in which these agreements improve Google's monetization of search: (1) Google can serve more ads to users; (2) Google can serve more effective ads to users; and (3) Google can reinvest the revenue generated through (1) and (2) in product development and securing distribution to secure even more users, thereby perpetuating this cycle. *See supra* COL § III.A.

The evidence presented at the liability trial "firmly established" a fourth way in which the challenged contracts enable Google to grow its revenue: by exercising its monopoly power to "increase text ads prices without any meaningful competitive restraint." *Google*, 747 F. Supp. 3d at 177–78. By using so-called "pricing knobs," Google has artificially inflated the prices of text ads for the principal purpose of driving revenue growth. *See id.* at 77–84 ¶¶ 238–267 (explaining how Google has consistently raised prices without considering rivals' pricing decisions, making improvements in ad quality, or providing added value for users or advertisers); *id.* at 178–79

(emphasizing that "Google admits it makes auction adjustments without considering Bing's prices or those of any other rival" and that the "evidence does not reflect a principled practice of quality-adjusted pricing, but rather shows Google creating higher-priced auctions with the primary purpose of driving long-term revenues"). It has even used these price-tuning mechanisms to hit periodic revenue targets. *Id.* at 82 ¶¶ 258–260.

This strategy has been successful because Google took pains to make it virtually imperceptible. Google recognized that its price increases would be hard to explain to advertisers. *Id.* at 82–84 ¶¶ 261–266. So, it simply did not disclose them. Instead, Google raised its prices incrementally—often between 5% and 15% at a time—so that advertisers would attribute these increases to the ordinary price fluctuations, or "noise," generated by the ad auctions, rather than pin them on Google. *Id.* at 83 ¶ 264, 178. The incremental approach worked. According to Google's surveys, advertisers could tell that prices were increasing, but they did not understand those changes to be Google's doing. *Id.* at 84 ¶ 266. Consequently, Google has been able to raise its prices largely without losing advertisers. *Id.* at 178.

Unconstrained by rivals' pricing, the prices of text ads have increased over time. *Id.* As search volume grew alongside ad prices, *see id.* at 41 ¶ 40, Google's revenue growth has been nothing short of astonishing. From 2010 to 2018, Google's ad revenue grew at a steady annual rate of 20% or more. *Id.* at 82 ¶ 259. In 2014, Google booked nearly $47 billion in advertising revenue. *See* UPX7002.A at -001. By 2021, that number had more than tripled to over $146 billion. *Id.*; *see also Google*, 747 F. Supp. 3d at 32, 35 ¶ 8. Google has used these monopoly profits to secure the next iteration of exclusive distribution deals, paying out billions of dollars in revenue share each year. *See Google*, 747 F. Supp. 3d at 88–89 ¶ 289, 178. The result, as witness

after witness attested, is that Google's distribution partners "cannot afford to go elsewhere." *Id.* at 145.

D. Google's Objection

Google insists that the court must go further and *quantify* the portion of scale and revenue attributable to Google's unlawful conduct to establish them as fruits. Google's Reply at 6–8. Google points to no case requiring such mathematical precision, and this court has found none.

The closest Google comes is the D.C. Circuit's acknowledgement in *Massachusetts* that "[t]he district court [in *New York I*] specifically rejected the idea that [Internet Explorer] was the fruit of Microsoft's anticompetitive conduct, finding, 'neither the evidentiary record from the liability phase, nor the record in this portion of the proceeding, establishes that the present success of [Internet Explorer] is attributable entirely, or even in predominant part, to Microsoft's illegal conduct.'" *Massachusetts*, 373 F.3d at 1232 (alteration omitted) (first quoting *New York I*, 224 F. Supp. 2d at 185 n.81; and then citing *id.* at 244 n.121); *see* Google's Br. at 23. But Google makes too much of the district court's statement.

That finding concerned the "Open-Source Internet Explorer" provision, which would have required Microsoft to disclose "all source code" underlying its Internet Explorer web browser and make that code available to competitors on a "royalty-free," "non-exclusive," and "perpetual" basis. *Massachusetts*, 373 F.3d at 1227–28; *see New York I*, 224 F. Supp. 2d at 241 (describing consequence of open-sourcing software). The "attributable entirely, or even in predominant part" text is contained in a footnote and is part of the court's response to the plaintiffs' argument that Internet Explorer's success was a "fruit" of Microsoft's anticompetitive acts. *New York I*, 224 F. Supp. 2d at 185 n.81. But neither the court in *New York I* nor the D.C. Circuit in *Massachusetts* suggested that a market consequence qualifies as a fruit of anticompetitive conduct *only if* it can

be "attributable entirely" or in "predominant part" to such acts. *See id.* at 244 n.121 (noting how Plaintiffs failed to offer *any* testimony "in the remedy phase to establish that [Internet Explorer] was the 'fruit' of the anticompetitive conduct"). Neither set such a high bar for determining fruits. Nor could they, as such a stringent standard would be at odds with the Supreme Court's pronouncement that district courts are "empowered to fashion appropriate restraints" on a defendant "to eliminate [the] consequences of a violation." *NSPE*, 435 U.S. at 697. Requiring that fruits must be "attributable entirely" or in "predominant part" to the unlawful act would allow a monopolist to continue benefitting from its violation simply by merely pointing to *some* lawful factors for its success, and it would hamstring trial courts in the exercise of their equitable authority to restore competition. That cannot be what the *New York I* or the *Massachusetts* courts intended.

In any event, both the district and appellate court ruled that the "Open-Source Internet Explorer" provision was properly analyzed as a structural remedy. *Massachusetts*, 373 F.3d at 1230, 1232–33; *New York I*, 224 F. Supp. 2d at 186. These decisions thus merely confirm the more stringent "clearer indication of significant causal connection" standard applicable to structural remedies and the plaintiffs' failure to satisfy it with respect to their proposed open-source remedy. No authority, therefore, requires the court to calibrate precisely how much additional scale or revenue Google received as a result of the exclusive agreements to treat them as fruits of the violation.

IV. THE INCLUSION OF GENERATIVE AI PRODUCTS

The final question the court must address before analyzing the parties' proposed remedies is whether the remedial decree should encompass GenAI technologies and the companies that create them. The answer is yes, at least in some respects.[7]

For starters, Google itself concedes that imposing restrictions on how it promotes and distributes Google Assistant and the Gemini app is a valid exercise of the court's power to prohibit acts "of the same type or class" as the unlawful acts. Google's Br. at 14–15; *see Zenith Radio*, 395 U.S. at 132. In short, Google cannot use the same anticompetitive playbook for its GenAI products that it used for Search. *See Massachusetts*, 373 F.3d at 1216 (confirming the district court's power "to fashion appropriate restraints on [the defendant's] future activities . . . to avoid a recurrence of the violation" (quoting *NSPE,* 435 U.S. at 697)).

As to the data-sharing and syndication remedies, Pls.' RPFJ §§ VI.A, VI.C–F, VII.A–G, VIII.E, which are available to "Qualified Competitors," *id.* § III.U, there is ample evidence that GenAI chatbots grounded in general search perform an information-retrieval function that is similar to GSEs. *See* FOF ¶¶ 12–16, 36–43. True, they approach this task in different ways, with GenAI chatbots producing text, images, and other content in response to a user query rather than the traditional "10 blue links" returned by a GSE. *Compare Google*, 747 F. Supp. 3d at 38–41 ¶¶ 27–42 (explaining how a GSE works, the different types of queries, and depicting a sample SERP), *with* FOF ¶¶ 12–17 (explaining how a GenAI chatbot works); *accord* FOF ¶ 15 (finding that GenAI products often include citations and links to websites when responding to information-seeking queries). GenAI chatbots can also perform functions that GSEs cannot and vice versa.

[7] There is a separate question as to how Google's scale advantage in Search affects the performance of its GenAI models and products, which the court addresses when tailoring the data sharing and syndication remedies. *See infra* RCOL § III.B, C.

See FOF ¶¶ 17, 63, 65. Because their functionality only partially overlaps, GenAI chatbots have not eliminated the need for GSEs. *See* FOF ¶¶ 63, 65; *see also Google*, 747 F. Supp. 3d at 53–54 ¶¶ 114–115 (finding that "AI has not supplanted the traditional ingredients that define general search" and that GenAI "has not (or at least, not yet) eliminated or materially reduced the need for user data to deliver quality search results").

Nevertheless, the capacity "to fulfill a broad array of informational needs" constitutes a defining feature of both products, as Google implicitly acknowledges. *Google*, 747 F. Supp. 3d at 110–11 (discussing the "peculiar characteristics and uses" of GSEs when defining the relevant product market for purposes of determining liability); *see* Google's RPFJ § VI.N (defining "Third-Party General Search Service" to include "a web search service that can respond to a broad range of search query categories and offers functionality that is substantially similar to Google Search"); *id.* § VI.O (defining "Third-Party Generative AI Assistive Service" to include "a stand-alone mobile software application that is a generative artificial intelligence chatbot that has among its principal functions answering information-seeking prompts across a wide variety of topics using a broad range of publicly available information"). And it is that capacity that renders GenAI a potential threat to Google's dominance in the market for general search services. Indeed, Google's own witness, Apple executive Eddy Cue, testified that the volume of Google Search queries in Apple's Safari web browser had declined for the first time in 22 years likely due to the emergence of GenAI chatbots. Rem. Tr. at 3818:20–3819:4, 3827:23–3828:11, 3846:24–3847:3 (Cue); *see also* FOF ¶ 63. And when asked what it would take for a competitor "to provide genuine competition to Google for Apple's default on Safari," Cue replied, "I don't think the incumbents can do it . . . . The people that have the opportunity to do it are" those "leveraging the new technologies, . . . the Perplexities, the OpenAIs of the world . . . ." *Id.* at 3845:15–3846:2 (Cue);

see id. at 3848:5-15 (Cue) ("[I]f AI had not come about, I don't know what [one] could do" to "aid in the competitive landscape."). As further evidence of how these products are shifting the competitive landscape, Cue revealed that Apple is "actively looking at" adding a GenAI product as a search option in its Safari web browser and expects to do so in the coming year. *Id.* at 3834:21–3835:10 (Cue).

Google protests that GenAI products are neither "part of the relevant markets" nor "tied 'to [Plaintiffs'] theory of liability'" and therefore cannot be included in the remedial decree. Google's Br. at 61 (quoting *New York I*, 224 F. Supp. 2d at 136). But Google's reliance on *New York I* is once again misplaced.

There, the trial court extended its remedies to products that were not strictly the "middleware" that was the focus of the liability proceedings. *See New York I*, 224 F. Supp. 2d at 128–30 (including servers and network computing within the scope of remedies). Middleware in the liability phase included products like Netscape and Java, which were written for multiple operating systems. *See Microsoft III*, 253 F.3d at 53. When crafting the mandatory-disclosure provisions, the court in *New York I* expressly rejected the argument that other "new technologies"—which were not addressed in the court's liability opinion—were not "a proper subject of the remedy in this case because they [were] not truly 'middleware' as that term was used in the liability phase." *New York I*, 224 F. Supp. 2d at 121, 128. The district court instead considered whether the technologies at issue "ha[d] the capacity to function in a manner similar to that of traditional middleware" and "ha[d] been shown to presently have a reasonable possibility of 'dissipating the restraints' on trade imposed by [the defendant]." *Id.* at 128–29 (alteration omitted) (quoting *Bausch & Lomb*, 321 U.S. at 726). Applying that test, the district court expanded the scope of the remedy to "provide substantial protection for server/network computing by

requiring Microsoft to disclose [certain] technical information" to competitors, reasoning that "[s]uch assistance [was] appropriate as it look[ed] toward the new model of the 'platform threat' and [sought] to ensure that the ill effects of Microsoft's conduct [were] not felt in this related area of the industry." *Id.* at 129; *see id.* at 193 ("The mandatory disclosures between Microsoft's monopoly product and server operating systems acknowledge the competitive significance of server/network computing as the newest type of 'platform threat' to Microsoft's dominance in the relevant market. The disclosures mandated by the Court will likely prove beneficial to the development of middleware platforms and the functional equivalent of the middleware platform provided by server operating systems."). The same reasoning applies here.

Google's own product development decisions further undermine its stance on excluding GenAI products from the remedial decree. Since the liability trial, Google has deepened the integration between Search and GenAI by incorporating AI Overviews into its SERP and introducing AI Mode, both of which "are expanding the types of queries [users] are typing into Google Search." Rem. Tr. at 2489:24–2491:21 (Pichai); *see* FOF ¶¶ 6–11. That integration shows no signs of slowing. Rem. Tr. at 3617:22–3618:16 (Reid) (agreeing that she believes the percentage of queries triggering an AI Overview response "will continue to increase over time" and that she reported as much to Google's Board of Directors); *id.* at 2491:14-21 (Pichai) ("[O]ver time, I expect [AI Mode] to . . . become a deeper part of the Search experience."); *id.* at 2458:12–2459:5 (Pichai) (predicting that "AI technology is going to deeply transform Google Search"); *see* FOF ¶¶ 6–11.

Google's reliance on this court's prior treatment of Branch is equally unavailing. *See* Google's Br. at 61. It is true that the court rejected Plaintiffs' contention that "the [challenged] distribution agreements prevent[ed] the emergence of innovative search-adjacent technologies"

like Branch. *Google*, 747 F. Supp. 3d at 169–70. But it did so because "[t]he record [did] not support the conclusion that Branch's technology ha[d] shown potential to become a viable platform substitute for Google." *Id.* at 170. As Branch's own CEO and documents attested, Branch "[did] not conflict with or overlap with web search" and "its search use case [was] totally different and distinct from Google search." *Id.* (internal quotation marks and citations omitted). When it comes to GenAI technologies, however, the evidence overwhelmingly points the other way. Accordingly, the final judgment will reach GenAI technologies and companies.

Before moving forward, one important definitional issue must be addressed. Plaintiffs propose in their RPFJ that the term "Qualified Competitor" mean:

> [A] Competitor who meets the Plaintiffs' approved data security standards as recommended by the Technical Committee and agrees to regular data security and privacy audits by the Technical Committee, who makes a sufficient showing to the Plaintiffs, in consultation with the Technical Committee, of a plan to invest and compete *in the GSE and/or Search Text Ads markets*, and who does not pose a risk to the national security of the United States.

Pls.' RPFJ § III.U (emphasis added). "Competitor" in turn "means any provider of, or potential entrant in the provision of, a General Search Engine (GSE) or of Search Text Ads in the United States." *Id.* § III.G. Because the use case for a GenAI product like ChatGPT is not limited to the GSE market, FOF ¶ 17, OpenAI and similar firms, like Anthropic and Perplexity, arguably would not be "Qualified Competitor[s]," as presently defined. To leave no doubt that the remedies extend to such companies, the court will revise the definition of "Qualified Competitor" in two ways by (1) modifying the term "Competitor" to include "GenAI Product[s]"[8] and (2) adding "or with"

[8] The revised definition would thus read: "'Competitor' means any provider of, or potential entrant in the provision of, a General Search Engine (GSE) or of Search Text Ads in the United States, or a GenAI Product in the United States." *See also* Pls.' RPFJ § III.K (defining "GenAI Product"). Of course, for a "Competitor" to become a "Qualified Competitor," it would have to demonstrate to Plaintiffs and the Technical Committee that it has "a plan to invest and compete in [or with] the GSE and/or Search Text Ads markets . . . ." *Id.* § III.U.

after "plan to invest and compete in," such that an eligible firm must be one with a "plan to invest and compete in or with the GSE and/or Search Text Ads markets." *See* Rem. Tr. at 4899:13-16 (Closing Arg.) (defining "Qualified Competitor" as a competitor who plans to compete "with" Google in the monopolized markets and who satisfies the additional criteria set forth in § III.U of Plaintiffs' RPFJ).

REMEDY-SPECIFIC CONCLUSIONS OF LAW

Having established the appropriate evidentiary and remedial scope for evaluating the parties' RPFJs, the court must now "provide an adequate explanation for the relief . . . ordered" and "explain[] how its remedies decree would accomplish [the] objectives" set forth in *Microsoft III*. *Microsoft III*, 253 F.3d at 103; *see Alston*, 594 U.S. at 102–03 (cautioning that a court should not "impose a duty that it cannot explain or adequately and reasonably supervise" (cleaned up)). Google's proposed prohibitory injunctive relief provides an appropriate starting point, so the court begins there. Those remedies are important insofar as they afford distributors greater flexibility to partner with Google's rivals than they had under the agreements the court found to be anticompetitive. That class of remedies is not, however, sufficient to restore competition in the monopolized markets, so the court then will proceed to consider the extensive slate of relief sought by Plaintiffs.

I. ADEQUACY OF PROHIBITORY INJUNCTIVE RELIEF ONLY

Google would have this court go no further than its proposed remedies, the central feature of which is an injunction against those provisions of the MADAs, the RSAs, and the browser agreements that the court deemed exclusive. Google's Br. at 11–16. Among other things, Google's proposed judgment would bar Google from: (1) conditioning an OEM's licensing of Google Play or any other Google software on that OEM also distributing or preloading Search or

Chrome, Google's RPFJ § III.A–B; (2) entering any agreement with an OEM or wireless carrier that conditions the payment of Consideration[9] or the licensing of any Google software on the partner not preloading or carrying any other GSE or browser, *id.* § III.E–F; and (3) conditioning payments to OEMs and wireless carriers upon their preloading or placement of Search or Chrome on multiple points of access to those products, *id.* § III.H– I. Under its proposal, Google still would be permitted to pay OEMs and wireless carriers for default distribution or other on-device placement of "any Google product or service." *Id.* § III.M. Google also would be permitted to pay Browser Developers, including Apple, to set Search as the default GSE, so long as the Browser Developer (1) can promote other GSEs and (2) is permitted to set a different GSE on different operating system versions or in a privacy mode and makes changes, if desired, on an annual basis. *Id.* § III.K–L.

Taken together, these prohibitions grant GSE distributors far more freedom to partner with firms other than Google. For instance, OEMs would be able to license the Play Store or any other Google software application without having to place Google Search or Chrome on the device. Google's Br. at 13. OEMs and carriers would be able to preload different GSEs on a device-by-device, access-point-by-access-point basis. *Id.* at 13–14. Motorola, for instance, could make different GSEs the search widget default on different devices without putting at risk revenue share from Google. Additionally, RSAs can no longer offer higher revenue share percentages for exclusive tiers. *Id.* at 13. This provision had the practical effect of causing distributors to set all of their device defaults to Google to receive the benefit of a higher revenue share percentage. *See Google*, 747 F. Supp. 3d at 152 ("Nearly all RSA-covered devices are presently enrolled at the highest-revenue tier, thus locking in Google as [the] only preloaded GSE."). And Apple could

[9] Google defines "Consideration" to mean "any monetary payment; provision of preferential licensing terms; technical, marketing, and sales support; or hardware or software certification or approval." Google's RPFJ § VI.C.

preload GSEs on a device-by-device basis (i.e., Safari for Mac versus Safari for Windows), and install different GSEs for different search modes, like private browsing. *Id.* at 15–16.

Google's proposed judgment also reaches beyond its Search, Chrome, and Play Store products. It would bar conditioning the licensing of Search, Chrome, or Google Play on an OEM also preloading or distributing the Google Assistant Application or the Gemini app. Google's RPFJ § III.C–D. Google cannot condition the payment of Consideration or the licensing of Google Play or another Google application on OEMs refraining from distributing a third-party GenAI service. *Id.* § III.G. It would also bar Google from conditioning payment for distribution of Google Assistant Application or the Gemini app on preloading or placement of Search or Chrome and vice versa. *Id.* § III.H–J. Under these provisions, an OEM could license the Google Play Store without any obligation to preload the Google Assistant or Gemini app. Google's Br. at 14. Similarly, an OEM or wireless carrier could simultaneously preinstall Google Search and a non-Google GenAI product, like ChatGPT, Perplexity, or Claude, or a rival GSE and the Gemini app. *Id.* at 13–14.

Google's proposed contracting prohibitions are an important step towards restoring competition to the relevant markets. They will afford distributors the choice to preload, distribute, and feature non-Google products that was largely unavailable under the prior agreements. "By freeing up firms to make substitute choices, an injunction can increase the range of competitive alternatives to a firm." Herbert Hovenkamp, *Structural Antitrust Relief Against Digital Platforms*, 7 J.L. & INNOVATION 57, 101 (2024) [hereinafter *Structural Antitrust Relief*]; *see also id.* at 98 ("[A]n injunction that opens up participant choice can serve to diminish monopoly power significantly."). Such optionality is particularly meaningful in the present moment. GenAI

products have emerged as a competitive threat to the traditional GSE, and Google cannot be permitted to leverage its dominance in general search to the GenAI product space.

These proceedings already have had a prophylactic effect on Google. It has updated its RSAs to align with its proposed remedies. Rem. Tr. at 2471:4–2472:21, 2480:19-23 (Pichai). Its new agreements remove restrictions on the placement and promotion of alternative search services and now permit distributors to select search products on a device-by-device, access-point-by-access-point basis. *See generally* FOF ¶¶ 77–103. They also make clear that GenAI apps are not "alternative search services." *See, e.g.*, FOF ¶¶ 94–95 (discussing February 2025 amendment to Google–Motorola/Lenovo Google Mobile Incentive Agreement). And only weeks before the remedies trial began, Google sent letters to three of its Android distribution partners waiving RSA provisions that constrained their ability to preinstall and promote "Alternative Assistive Products." FOF ¶¶ 101–103. This eve-of-trial waiver removed any uncertainty as to whether partners could preload and promote GenAI products other than Gemini.

All of this is a good start, but Google's proposed remedies do not go far enough. If there is a market that needs to be "pr[ied] open," it is the market for general search services. *See Int'l Salt*, 332 U.S. at 401. As the court found during the liability phase, the general search market has been "frozen" for over 10 years. *See Google*, 747 F. Supp. 3d at 145. Google's distribution agreements have caused substantial market foreclosure. Fifty percent "of all queries in the United States are run through the default search access points covered by the challenged distribution agreements." *Id.* at 153. Another 20% flow through Google on user-downloaded Chrome, which further narrows the portion of the market available to rivals. *Id.* at 45 ¶ 63. What's more, there has been a paucity of market entry, and no genuine rival has emerged. *Id.* at 144–45. Google's dominance in fact *grew* during the maintenance period, with its market share increasing

from 80% in 2009 to 89.2% by 2020. *Id.* at 38 ¶ 23. On mobile, its market share sits at nearly 95%. *Id.* ¶ 24. Still today, "Google has no true competitor." *Id.* at 144.

Merely excising the exclusive provisions from Google's distribution agreements will not unleash competition. Google's remedies fail to address any illegally obtained fruit of those agreements other than the "freedom" from competition that it enjoyed for more than a decade. *See supra* COL § III.A. They do nothing to "eliminate" the *consequences* of its exclusionary acts. *See NSPE*, 435 U.S. at 697. Google simply retains too many advantages that are derived in part from its decade-long vice grip on default distribution, including its quality, data volume, and capacity to monetize search queries. These advantages are particularly pronounced for mobile search. *See Google*, 747 F. Supp. 3d at 46 ¶ 71, 49–50 ¶ 87 (discussing stronger default effects on mobile devices and Google's scale dominance on mobile devices).

Even with newfound flexibility, distributors still are likely to select Google as its primary, if not only, default GSE. *See, e.g.*, Rem. Tr. at 3830:6-10 (Cue) ("So we have to pick what's best for our customers, and today, that is still Google."). That reality is due in large part to the "network effects" that characterize the general search market. *Google*, 747 F. Supp. 3d at 161–62; *see supra* COL § III.A. These network effects reinforced the distribution agreements' exclusivity and Google's dominant position. In such a market, prying open competition is not as simple as prohibiting the exclusionary conduct.

The Ninth Circuit recently recognized as much. It approved remedies in the *In re Google Play Store Antitrust Litigation* case that go beyond a mere prohibition of anticompetitive conduct. Google was ordered to affirmatively grant third-party Android app stores access to the Google Play Store's catalog of apps and to allow such stores or platforms to be distributed through the Play Store. *In re Google Play Store*, 2025 WL 2167402, at *15–20. Central to affirming those

remedies was a record "replete with evidence that Google's anticompetitive conduct entrenched its dominance, causing the Play Store to benefit from network effects." *Id.* at *18. The remedies the court approved were designed "to ameliorate consequences 'intertwined within the network effects' that Google [had] enjoyed as a monopolist," *id.* at *16, and had "unfairly enhanced," *id.* at *18. "Once the [district] court established, based on trial evidence, that network effects were among the consequences of Google's anticompetitive conduct, the court was permitted to shape relief targeted to those effects." *Id.* at *19.

The Ninth Circuit is not alone in this understanding. Professors Areeda and Hovenkamp have stated that, "[w]hen the defendant has acquired and maintained its position by a single practice, such as exclusive dealing, then perhaps we can have some confidence that a prohibition of the practice will result in an increasingly competitive market." 3 AREEDA & HOVENKAMP ¶ 653a. But the same confidence is not warranted when a market exhibits network effects. "[A] 'network' monopoly . . . may have to be forced open by more aggressive means." *Id.* The treatise identifies telecommunications (AT&T) and computer operating systems (Microsoft) as two such markets. *Id.*; *id.* ¶ 653i2. General search is certainly another. *Google*, 747 F. Supp. 3d at 161–62.

Professors Areeda and Hovenkamp do accept that "aggressive means" are unnecessary where "technology renders the existing system obsolete." 3 AREEDA & HOVENKAMP ¶ 653a; *see also Microsoft III*, 253 F.3d at 49 (acknowledging authorities that suggest entrenchment in technologically dynamic markets characterized by network effects "may be temporary, because innovation may alter the field altogether"). Google seemingly shares that view. It believes that the integration of AI technologies into search has made traditional search more competitive. *See* Google's PFOF ¶¶ 988–996. But the market has shown otherwise. Microsoft has incorporated

AI into its search products, leading Microsoft to believe it has closed the quality gap, at least on desktop. *Id.* ¶¶ 992–996; *see also* FOF ¶ 53. But no new distributor has selected Bing as a default GSE, and to the court's knowledge, Bing has not gained market share because of its product development. Neeva provides another example. It built its search engine on AI technology but ultimately could not compete without greater distribution and left the market. *Google*, 747 F. Supp. 3d at 47 ¶ 76, 122–23. AI has unquestionably improved general search, but it has not yet fundamentally altered market dynamics. *See, e.g.*, FOF ¶¶ 6–11 (describing Google's AI innovations in Search); *id.* ¶¶ 63–66 (describing GenAI's impact on GSEs).

Google's distribution agreements have unfairly amplified the powerful network effects that characterize the search market. Stripping away the exclusivity of those contracts is a good start to unwind those advantages, so the court will accept those terms. But those prohibitions will not alone restore competition to a market that has not had any in more than a decade.

Before moving to Plaintiffs' remedies, the court modifies a few aspects of Google's prohibitory injunction. First, as drafted, Google can make revenue share payments to Browser Developers, so long as such agreements allow the Browser Developer to annually set a different GSE at various search access points across different devices. *See* Google's RPFJ § III.K. Google's proposed final judgment, however, contains no similar one-year term for its OEM and wireless carrier agreements. Google explains in a post-hearing memorandum that it did not include such a restriction because its remedies already strip the relevant agreements of those terms that the court determined made them exclusive. Def.'s Resp. to the Court's July 29, 2025 Minute Order, ECF No. 1425. But Google overlooks that the length of those contracts contributed to stifling competition, too. The court found that "[r]ivals cannot presently access [default] channels of distribution without convincing Google's partners to break existing agreements, *all of which* are

binding for a term of years." *See Google*, 747 F. Supp. 3d at 120 (emphasis added). The court made no distinction as between the anticompetitive effects of the durations of the browser agreements and the durations of the MADAs and RSAs. Accordingly, the court will impose the same one-year option as a condition of payments to OEMs and wireless carriers.

Second, at present, Section III.K of Google's RPFJ provides that agreements with Browser Developers shall expressly permit them to "promote any Third-Party General Search Service." That provision is underinclusive: it excludes GenAI products. Just as Google cannot secure on browsers exclusivity for its GSE, it cannot secure exclusivity for its GenAI products on browsers or a Browser Developer's device. Section III.K therefore shall extend to any "GenAI Product," as that term is defined in Section III.K of *Plaintiffs'* RPFJ (as opposed to Google's definition of "Third Party Generative AI Assistive Service," which is limited only to "stand-alone mobile" GenAI "chatbot[s]," Google's RPFJ § VI.O, and not all GenAI products). And to leave no doubt that Apple falls within the revision, Section III.L of Google's RPFJ shall be modified to make clear that Google is prohibited from entering into an exclusive agreement with Apple to distribute any Google GenAI product either in any Safari mode or on any Apple mobile or desktop device.

Third, Google's definition of "Gemini Assistant Application" is too narrow. The definition does not contemplate the possibility that Google may launch a new GenAI product during the judgment period, whose distribution could raise exclusivity concerns. The parties' joint proposed final judgment should address this definitional issue.

II. STRUCTURAL REMEDIES

The court now turns to Plaintiffs' proposed remedies, starting with what is perhaps the most controversial: the immediate divestiture of Chrome. The court addresses the contingent divestiture of Android in this section, as well.

A. Chrome Divestiture

Under Section V.A of Plaintiffs' RPFJ, Google would be compelled to sell its Chrome web browser—as well as Chromium, the open-source platform underlying Chrome and other web browsers—and would be prohibited from "releas[ing] any other Google Browser during the term of this Final Judgment absent approval by the Court." Pls.' RPFJ § V.A; *see also id.* § III.F (defining "Chrome" to include Chromium). This remedy reflects Plaintiffs' concern that Google will be able to maintain its dominant position in the relevant markets through the continued ownership and control of Chrome. *See id.* § V; Pls.' Br. at 32–35.

The case for Chrome divestiture is straightforward: Google sets its own GSE as the default in Chrome. *Google*, 747 F. Supp. 3d at 35 ¶ 6. Chrome is a very popular browser, and its default constitutes a particularly important search access point, accounting for 20% of all searches in the United States. *Id.* at 45 ¶ 63. "Though the Chrome default is not alleged to be exclusionary conduct," the court explained in its liability decision, "it is a market reality that significantly narrows the available channels of distribution and thus disincentivizes the emergence of new competition." *Id.* at 120; *see* PXR0218 at -542 to -543 (Google document stating that Chrome "driv[es] value" by "[s]erv[ing] as a key distribution channel for Search and assistive technologies"); *see also* Rem. Tr. at 1662:18-23 (Tabriz) (stating that Chrome is the most popular web browser in the world today); *id.* at 2153:10-21 (Chipty) ("Chrome has been the most widely used browser in the U.S. in the last ten years, according to StatCounter." (discussing PXRD012 at 22)). Plaintiffs thus believe that ordering Google to divest Chrome would "open a critical, contestable access point to rivals with the aim of counteracting the anticompetitive effects of Google's durable monopolies" and "prevent Google from using Chrome as a tool to unfairly advantage its search product." Pls.' Br. at 35–36. A divestiture is therefore warranted to redress

the harms of Google's antitrust violation and prevent its recurrence. Pls.' Br. at 35–37; Pls.' RPFJ § V.

In a sense, the Chrome divestiture proposed by Plaintiffs is less radical than the break-up proposed in *Microsoft III*. A forced sale of Chrome is not "designed to eliminate the monopoly altogether." *Microsoft III*, 253 F.3d at 106 (citation omitted). Not even Plaintiffs' expert in industrial organization economics, Dr. Tasneem Chipty, believes that the remedy would dislodge Google from its market primacy, at least not in the short term. *See* Rem. Tr. at 2154:11–2155:7 (Chipty) (estimating that Chrome divestiture would result in a 7% share shift from Google to rivals (discussing PXRD012 at 25)). Still, Plaintiffs from the outset have treated the Chrome divestiture as a structural remedy. Rem. Tr. at 30:11–31:4 (Opening Arg.). So, the court does, too.

The Chrome default undoubtedly contributes to Google's dominance in general search. *See Google*, 747 F. Supp. 3d at 120. And under Supreme Court precedent, the fact that neither Google's ownership of Chrome nor its self-preferencing of Google Search in Chrome was found to be anticompetitive is not a per se bar to this remedy. *See, e.g.*, *Int'l Boxing Club of N.Y., Inc. v. United States*, 358 U.S. 242, 256 (1959) (upholding an order requiring the defendants to divest "lawfully acquired" stock because "it may be utilized as part of the conspiracy to effect its ends"); *United States v. Paramount Pictures*, 334 U.S. 131, 152 (1948) ("[E]ven if lawfully acquired, [the defendants' acquisitions] may have been utilized as part of the conspiracy to eliminate or suppress competition in furtherance of the ends of the conspiracy. In that event divestiture would likewise be justified."); *see also Bausch & Lomb*, 321 U.S. at 724 (affirming district courts' "power to eradicate the evils of a condemned scheme by prohibition of the use of admittedly valid parts of an invalid whole" (collecting cases)).

But the complete divestiture of Chrome is a poor fit for this case. For one, the D.C. Circuit has instructed that "divestiture is a remedy that is imposed only with great caution, in part because its long-term efficacy is rarely certain." *Microsoft III*, 253 F.3d at 80; *see also* 3 AREEDA & HOVENKAMP ¶ 653c ("The rationale for a 'structural' remedy is that injunctive relief is inadequate. Even so, a court-induced restructuring of a firm is attended by many uncertainties."). And in cases like this one, which do not implicate the "traditional[]" and "particularly appropriate" justifications for divestiture (terminating monopolies formed by mergers and acquisitions), *Microsoft III*, 253 F.3d at 105 (first quoting *E. I. du Pont*, 366 U.S. at 329; and then quoting *Ford Motor*, 405 U.S. at 573), courts have ordered such relief only after determining that less severe remedies likely would prove inadequate. *See Int'l Boxing Club*, 358 U.S. at 258 (affirming an order of divestiture based on the district court's finding that "this was the only effective means at hand by which competition in championship events might be restored"); *United States v. United Shoe Mach. Corp.*, 391 U.S. 244, 250–52 (1968) (explaining that district courts "may, if circumstances warrant, accept a formula for [restoring competition] by means less drastic than immediate dissolution or divestiture" but ultimately instructing the district court to consider "other, and if necessary more definitive" measures because that objective had not been achieved 10 years after judgment); *E. I. du Pont*, 366 U.S. at 327 ("If the Court concludes that other measures will not be effective to redress a violation, and that complete divestiture is a necessary element of effective relief, the Government cannot be denied the latter remedy because economic hardship, however severe, may result."). Plaintiffs have not shown that their behavioral remedies will be ineffective without the immediate divestiture of Chrome.

What's more, Plaintiffs do not satisfy this Circuit's "clearer indication of a significant causal connection" test for structural remedies. *Microsoft III*, 253 F.3d at 106 (emphasis and

citation omitted). As discussed above, the court's liability findings support a strong inference that Google's exclusive distribution agreements significantly contributed to maintaining its monopoly power. *See supra* COL § II. But the record also contains ample evidence that lawful conduct played an important role in Google's maintenance of its monopoly. That includes its best-in-class search quality, consistent innovations, investment in human capital, strategic foresight, and brand recognition. *See Google*, 747 F. Supp. 3d at 31. The contribution of these factors to Google's success is not disputed. To be sure, in some sense even these attributes can be traced back to Google's exclusive distribution agreements: Google's access to default distribution allowed it to amplify network effects to maintain its market advantages by a means other than competition. *See id.* at 161–63. But the court's task is to discern between conduct that maintains a monopoly through anticompetitive acts as distinct from "growth or development as a consequence of a superior product, business acumen, or historic accident." *United States v. Grinnell Corp.*, 384 U.S. 563, 570–71 (1966). After two complete trials, this court cannot find that Google's market dominance is sufficiently attributable to its illegal conduct to justify divestiture. Because the record does not support the requisite heightened causal connection, "wisdom counsels against adopting radical structural relief." *Microsoft III*, 253 F.3d at 80.

The remedy also extends beyond the conduct Plaintiffs seek to redress. It was Google's control of the Chrome default, not its ownership of Chrome as a whole, that the court highlighted in its liability finding. *See Google*, 747 F. Supp. 3d at 120–21. Ordering Google to sell one of its most popular products, one that it has built "from the ground up" and in which it has invested (and continues to invest) billions of dollars, in the hope of opening a single channel of distribution to competition—and not even one that was unlawfully foreclosed by the challenged contracts—cannot reasonably be described as a remedy "tailored to fit the wrong creating the occasion for the

remedy." *Microsoft III*, 253 F.3d at 107; Rem. Tr. at 2466:23–2468:3 (Pichai); *id*. at 1634:23–1636:2 (Tabriz) (discussing PXR0215 at -257). Further, as a legal matter, the divestiture of Chrome exceeds the proper scope of relief. "All parties agree that the relevant geographic market is the United States." *Google*, 747 F. Supp. 3d at 107. Chrome, however, is not so geographically confined. The vast majority—over 80%—of its monthly active users are located outside the United States. Rem. Tr. at 1619:23–1620:6 (Tabriz). Plaintiffs do not try to make the case that a divestiture of Chrome to just U.S.-based users is feasible. *See generally* Pls.' Br. at 37–40.

Quoting *E. I. du Pont*, Plaintiffs contend that divestiture represents "the 'surer, cleaner remedy.'" Pls.' Reply at 23 (quoting *E. I. du Pont*, 366 U.S. at 334). But this matter bears no resemblance to *E. I. du Pont*. That case involved a vertical acquisition of a large percentage of General Motors stock by E. I. du Pont, which the Supreme Court previously held violated Section 7 of the Clayton Act. *E. I. du Pont*, 366 U.S. at 318–19 (citing *United States v. E. I. du Pont de Nemours & Co.*, 353 U.S. 586, 607–08 (1957)). In that context, the Court observed that "complete divestiture is peculiarly appropriate in cases of stock acquisitions which violate § 7" and that the "very words of § 7 suggest that an undoing of the acquisition is a natural remedy." *Id.* at 328–29. This, of course, is neither a Section 7 case nor one involving a monopoly created via merger or acquisition.

But more to the point, there would be nothing "natural" about a Chrome divesture. It would be incredibly messy and highly risky. *See Microsoft III*, 253 F.3d at 106 ("One apparent reason why courts have not ordered the dissolution of unitary companies is logistical difficulty."); *see also* Rem. Tr. at 1684:20-22 (Tabriz) (agreeing that "attempting to divest Chrome from Google [would] present logistical difficulty"). Chrome does not run as a standalone business. At the most basic level, it depends on Google for a host of administrative functions, such as finance, marketing, and

human resources. Rem. Tr. at 1682:9-16 (Tabriz). It also is deeply reliant on Google's "hyperscale" technical systems and infrastructure. *Id.* at 2525:10-19 (Nieh) (describing Google's underlying infrastructure as an "engineering marvel" that enables "all of Google's products to be able to operate at the enormous scale to service billions of users"). Chrome relies on Google's back-end systems and engineering personnel for, among other things, account sign-in and authentication, data storage and management at a global scale, and cybersecurity. *Id.* at 1682:20–1684:17 (Tabriz); 2532:23–2534:7 (Nieh) ("If you were to, say, spin off Chrome and its functionality and, I think, re-creating the Google infrastructure would be hard, if not impossible."); *id.* at 2540:7–2547:21 (Nieh) (discussing RDXD-17.020 to .024). And then there are the host of Google's private APIs that Chrome is dependent upon and that are critical to its product performance and functionality. These include safe browsing, price tracking, translation, and automatic updates, to name a few. *Id.* at 2536:10–2539:24 (Nieh) (discussing RDXD-17.019). Chrome would be a shell of the product that it is today without access to those APIs. *See id.*

Even if, as Plaintiffs suggest, these dependencies could somehow be re-created or made available to a new owner, *see* Pls.' Br. at 39—and that is a big "if"—the court is highly skeptical that a Chrome divestiture would not come at the expense of substantial product degradation and a loss of consumer welfare. *See* Rem. Tr. at 1688:14–1689:9 (Tabriz) (expressing concern that divestiture of Chrome would at best result in "a product that is a shadow of current Chrome" that has "regressed in quality and security" and thereby impact users). That concern extends to the Chromium open-source project and other Chrome-based products. *See* Rem. Tr. at 2554:12–2557:12 (Nieh).

Put simply, Plaintiffs have not met their heavy burden to warrant the "radical structural" remedy of a forced divestiture of Chrome and the Chromium open-source project. *See Microsoft III*, 253 F.3d at 80.

B. Contingent Android Divestiture

Section V.C of Plaintiffs' RPFJ proposes "contingent structural relief." If five years after entry of judgment "Plaintiffs demonstrate by a preponderance of the evidence that either or both monopolized markets have not experienced a substantial increase in competition," Google would be required to "divest Android unless Google can show by a preponderance of the evidence that its ownership and control of Android did not significantly contribute to the lack of a substantial increase in competition." Pls.' RPFJ § V.C. Plaintiffs could seek other structural relief, as well. *See id.* ("[T]he Court may impose additional structural relief, *including* the divestiture of Android." (emphasis added)).

According to Plaintiffs, a contingent Android divestiture is necessary "to ensure the final judgment effectively accomplishes its fundamental purpose and Google is sufficiently disincentivized not to seek to circumvent the final judgment." Pls.' Br. at 63. Absent such a remedy, Plaintiffs contend, Google will be "incentivized to continue to use Android to preference Google Search and other Google products," and the presence of such contingency will serve as "a necessary backstop to disincentivize attempts at circumvention and ensure that the monopolized markets enjoy a substantial increase in competition." *Id.* at 63–64.

The court does not dwell on this proposed remedy for long. It suffers from similar legal infirmities as the Chrome divestiture. *See supra* RCOL § II.A. Plaintiffs have never alleged that Google's ownership or use of its Android operating system causes anticompetitive effects in the relevant markets, and they have not explained how a future sale of Android would promote

competition in those markets. A sale of Android also would reach beyond the U.S. market. The remedy therefore does not fit the wrong. *See Microsoft III*, 253 F.3d at 107. And, as discussed, Plaintiffs have not satisfied the stricter causal standard required to impose structural relief. *See supra* RCOL § II.A.

Plaintiffs also did not present any evidence to justify a contingent structural remedy. They offered no proof to support the feasibility of a sale of Android or the anticipated market effects of a contingent remedial provision or an actual future sale. And none other than Plaintiffs' own expert expressed skepticism about a contingent divestiture. Though not offering a firm opinion about the remedy, Dr. Chipty agreed that a contingent Android divestiture "seemed to go too far." Rem. Tr. at 2200:19–2201:7 (Chipty). There can be no remedy absent a factual basis to support it.

III. ADDITIONAL "CORE REMEDIES"

The court now turns to what Plaintiffs describe as additional "core remedies" necessary to restore competition. Pls.' Br. at 19. These include: (1) a ban on payments to distributors, (2) data-sharing remedies, (3) syndication requirements, and (4) choice-screen implementation.

A. Payment Ban

The most far-reaching remedy in this category is a prohibition on Google making nearly all search-related payments to distributors. Pls.' RPFJ § IV.A–B, E.[10] That includes any form of consideration for default or preferential placement as well as revenue share payments. *See id.* The dollar amounts at stake are staggering. In 2021, Google paid more than $26 billion in "traffic acquisition costs" to distribution partners. *Google*, 747 F. Supp. 3d at 88–89 ¶ 289. That number has likely grown since. For that reason, this proposal holds the greatest immediate consequence

[10] Plaintiffs allow for one limited exception: payments to Android distributors, for up to a year after the entry of judgment, who opt to display a choice screen on search access points on existing devices. *See* Pls.' RPFJ § IX.A. The court discusses the proposed choice screen remedy in RCOL § III.D below.

for Google's distribution partners. If accepted, it would have profound impacts on them and the related markets in which they operate.

The rationale for a payment ban is straightforward: It would pry open the market to competition. The revenue share payments shape the market for general search services in Google's favor. They "provide an incredibly strong incentive for the ecosystem to not do anything"; they "effectively make the ecosystem exceptionally resist[ant] to change"; and their "net effect [is to] basically freeze the ecosystem in place." Liab. Tr. at 3796:8–3798:22 (Ramaswamy); Rem. Tr. at 816:3-13 (Weinberg) (stating that Google's revenue share payments create "a strong financial incentive to have [distributors] steer users towards Google and away from alternatives").

A payment ban in theory could bring about a much-needed thaw. Distributors would have to look to other GSEs to earn revenue share, thereby stimulating competition among Google's rivals to secure default distribution. Rem. Tr. at 2140:21–2142:19 (Chipty) (predicting 31% potential share shift to competitors attributable to payment ban remedy);[11] *id.* at 792:24–793:8 (Shevelenko) (describing "true freedom" as distributors being able to pick the best GenAI product without "fearing lost revenue or lower rev-share rates"). It also could encourage new entrants, including Apple. *Id.* at 2141:4-15 (Chipty) (concluding that the payment ban "would increase the chance of entry into general search, especially by Apple"); *id.* at 3825:8-20 (Cue) ("I can't say I would disagree with [the court's] statement" that "it was a disincentive for [Apple] to do a search engine based on the payments that [it] w[as] receiving from Google").

[11] Although not essential to its conclusion, the court did not find Dr. Chipty's share-shifting exercise to be persuasive. The potential 31% market shift of queries to competitors struck the court as too speculative and not grounded in realistic assumptions about market behavior. For instance, Dr. Chipty initially stated that her calculations assumed that distributors would switch to a default GSE other than Google to earn some revenue share, Rem. Tr. at 2143:12-14 (Chipty), but she later acknowledged that such a switch might not occur on "day one," *id.* at 2146:12-16 (Chipty). In any event, there are reasons beyond the uncertainty of Dr. Chipty's share-shifting exercise to reject Plaintiffs' complete payment ban.

In addition, as discussed, revenues are a "fruit" of Google's exclusionary conduct. *See supra* COL § III.C. A payment ban would be one way to deny Google the fruits of its statutory violation—it could shift revenues historically enjoyed by Google to other GSEs. *See* Herbert Hovenkamp, *Antitrust and Platform Monopoly*, 130 YALE L.J. 1952, 2017 (2021) [hereinafter *Platform Monopoly*] (suggesting that Google's practice of "making . . . payments" for defaults "could . . . be enjoined").

Though the bases for a payment ban are sound, the court declines to impose such a remedy at this time. Two main reasons counsel against it.

First, if adopted, the remedy would pose a substantial risk of harm to OEMs, carriers, and browser developers. *See Ginsburg v. InBev NV/SA*, 623 F.3d 1229, 1235 (8th Cir. 2010) ("Fashioning appropriate equitable antitrust relief requires that courts balance the benefit to competition against the hardship or competitive disadvantage the remedy may cause."); *see also Am. Tobacco Co.*, 221 U.S. at 185 (stating that antitrust remedies must accord "proper regard" for relevant private interests). Distributors would be put to an untenable choice: either (1) continue to place Google in default and preferred positions without receiving any revenue or (2) enter distribution agreements with lesser-quality GSEs to ensure that some payments continue. Rem. Tr. at 4250:2-17 (Murphy) (describing the "Hobson's choice" faced by Google's distribution partners (discussing RDXD-33.023)). Both options entail serious risk of harm.

The first would not promote competition and in fact would likely advantage Google, at least in the short term. On "day one" post-judgment, distributors will have no real alternative: because Google is the best search provider, they likely will maintain it as the default GSE, if for no other reason than to avoid alienating their customers. *See, e.g.*, Rem. Tr. at 3829:3–3830:10 (Cue) ("I don't see any change that we can do that would satisfy our customers. That's the

fundamental issue with this. So we have to pick what's best for our customers, and today, that is still Google."); *id.* at 2145:20-23 (Chipty) (agreeing that "there might be distributors who decide on day one to keep Google because Google is better and they may not want to disrupt their user experience"). Google thus would continue to receive a disproportionate volume of search queries for a fraction of the cost. Freed of having to pay billions in revenue share, Google's profits would *increase*. Not paying Apple alone would result in a windfall worth tens of billions of dollars. *Google*, 747 F. Supp. 3d at 90 ¶ 299 (finding that Google's revenue share payment to Apple in 2022 was an estimated $20 billion).[12] Google then could use those profits to improve its products and monetization, further propagating the network effects flywheel that has proven so difficult to disrupt. *See id.* at 162.

As for the second option, even if distributors were, at some point, to select a different GSE or a GenAI product to provide search functionality, without Google in the mix, they likely would earn less than they do now for two reasons. For one, a sizeable number of users would switch back to Google, thereby reducing the revenue share a distributor could earn from the new provider. Rem. Tr. at 2139:8-11 (Chipty) (acknowledging that Google "could recover some of the[] lost queries based on historical recovery rates"). Additionally, with Google sidelined from competition, rivals would pay less than Google did to secure default or preferential placement. Both sides' economic experts agreed that such an outcome was likely. *Id.* at 2287:11–2288:5 (Chipty) ("[U]ntil rivals would have the chance to significantly improve their product quality, it is quite possible that in the remedial world payments will be lower. And in the initial years."); *id.* at 4253:18–4254:5 (Murphy) (opining that he would "expect to see lower payments to partners" with

[12] The court recognizes that the Apple payment figure is a worldwide number, *see Google*, 747 F. Supp. 3d at 90 ¶ 299, but Plaintiffs' proposed payment ban makes no distinction between payments to secure domestic versus worldwide distribution of Search, *see* Pls.' RPFJ § IV.B. In any event, Google undoubtedly pays Apple billions of dollars for domestic distribution.

"the highest valued customer for your promotion [(Google)] off the table"). So, too, did industry executives. *See, e.g.*, Kim Rem. Dep. at 46:23–47:1 ("If Google is not paying [Samsung] . . . , I don't think other companies are willing to pay as much or I don't think they are willing to negotiate with us."); Laflamme Rem. Dep. at 82:13–83:2, 83:5–84:14 (preventing Google from paying revenue shares "essentially removes the baseline of what others would need to pay," such that "the value that would come to [Motorola] would decline quite significantly"); Giard Rem. Dep. at 128:1-7 (If Google were barred from competing to place its GSE on T-Mobile devices, "it would reduce the overall revenue [T-Mobile] ha[s] to support the promotion and distribution of Android."); Rem. Tr. at 3135:5-8 (Muhlheim) (stating that Mozilla's U.S.-based revenue "would drop precipitously if we had to go with another provider because there isn't another provider that can provide the compensation for th[e] traffic [it] ha[s]"); Standal Rem. Dep. at 54:16-19 ("So if [Opera (a small browser developer) doesn't] have a competitive situation in the market, it could be hard for us to negotiate an agreement with another provider.").

The complete loss or reduction of payments to distributors is likely to have significant downstream effects on multiple fronts, some possibly dire. They could include:

- Lost competition and innovation from small developers in the browser market. *See, e.g.*, Rem. Tr. at 3134:20–3135:19 (Muhlheim); Standal Rem. Dep. at 55:12-16 (stating that for Opera the loss of payments from Google "would make it hard for [it] to continue to invest in innovative solutions that [it] provide[s] for the US audience"). Mozilla, in particular, fears that lower revenue share payments could "potentially start a downward spiral of usage as people defected from our browser, which . . . could at the end of the day put Firefox out of business." Rem. Tr. at 3135:14-19 (Muhlheim); *see also*

Google, 747 F. Supp. 3d at 96 ¶ 335 ("Mozilla has repeatedly made clear that without these [revenue share] payments, it would not be able to function as it does today.").

- Fewer products and less product innovation from Apple. Rem. Tr. at 3831:7-10 (Cue) (stating that the loss of revenue share would "impact [Apple's] ability at creating new products and new capabilities into the [operating system] itself"). The loss of revenue share "just lets [Apple] do less." *Id.* at 3831:19 (Cue).
- Less investment in the U.S. market by Android OEMs, which would reduce competition in the U.S. mobile phone market with Apple. Kim Rem. Dep. at 43:14-22 ("[I]f [Samsung is] not getting paid from Google in the revenue share that [it's] currently getting, I think it will probably make [Samsung's] position much weaker to innovate and provide . . . the latest technology and better services to our customer. . . . [W]e might face . . . a very difficult situation to continue our business."); Laflamme Rem. Dep. at 77:18–78:19 ("If [Motorola] were not to receive [revenue share payments], it would have significant financial burdens on [its] business. . . . [A]dvanced resources in North America . . . would be put at risk if [it] were to lose this funding."); *see also* Boulben Rem. Dep. 70:2-10 ("It is much more costly for [Verizon] to promote an [Apple] device than an Android device . . . . So the more the Android ecosystem loses share in the Verizon customer base, the more costly it is for Verizon, and that weighs on our [profit and loss].").

- Higher mobile phone prices and less innovative phone features. Kim Rem. Dep. at 44:12-19 ("[S]ome of [Samsung] product[s] could end up increasing prices or defeature our product[s] to manage the profit, which will make our position very weaker in the market and especially in U.S."); Ezell Rem. Dep. at 127:21–128:1 ("[O]ne of the ways [AT&T] can help offset some of the cost of th[e] device subsidy and make the devices more affordable to consumers is to have the ability to seek distribution or revenue share agreements with search, but also other services."); Giard Rem. Dep. at 115:25–116:10 ("[T]hose restrictions would prevent Google from entering into agreements similar to what [T-Mobile] ha[s] with the Android Activation Agreement, . . . the revenues from which [it] use[s] to help prop up the Android ecosystem through subsidies . . . et cetera."); Boulben Rem. Dep. at 44:3-8 (stating that Verizon's RSA with Google "help[s] and fund[s] the promotion of devices and offset[s]" billions in subsidies).

The court cannot predict to any degree of certainty that one or more of these effects will in fact occur. But the risk is far from small, which is reason enough not to proceed with the remedy. *See Alston*, 594 U.S. at 107 ("Courts reviewing complex business arrangements should . . . be wary about invitations to 'set sail on a sea of doubt.'" (quoting *United States v. Addyston Pipe & Steel Co.*, 85 F. 271, 284 (6th Cir. 1898))); *Platform Monopoly* at 2016 ("[N]o antitrust remedy should be compelled without a relatively clear appreciation of the likely effects.").

Plaintiffs acknowledge the possibility of adverse market effects from a complete payment ban but implore the court to focus on the task of restoring competition to the relevant product markets. Rem. Tr. at 4901:15–4906:12 (Closing Arg.). They believe that, although there may be

short-term harm to some market actors, they will benefit in the long run from increased competition. Pls.' Br. at 25–26; *see also* Rem. Tr. at 2287:11–2289:16 (Chipty). Acting in equity, however, the court cannot be so myopic. It must consider the harms that might befall other market actors, even if that means, as here, forgoing a remedy that could help restore competition. *See Microsoft III*, 253 F.3d at 106 ("Mere existence of an exclusionary act does not itself justify full feasible relief against the monopolist to create maximum competition." (quoting 3 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 650a (1st ed. 1996))).

Second, if one or more of these adverse market impacts were to come to pass, it would harm consumer welfare. That could manifest in various ways, including higher prices, less innovation, and less competition. Plaintiffs' expert Dr. Chipty did not dispute that such harms might arise in the short term. Rem. Tr. at 2288:23–2289:5 (Chipty). She believed, however, that consumer welfare would increase in the long run as more product choices emerge, though she could not say how long that might take. *Id.* But "[c]ourts must exercise care to ensure that the cost of correcting the market failure does not exceed the anticompetitive injury visited on consumers." *Ginsburg*, 623 F.3d at 1235 n.4 (quoting E. Thomas Sullivan, *The Jurisprudence of Antitrust Divestiture: The Path Less Traveled*, 86 MINN. L. REV. 565, 613 (2002)); *see also Am. Tobacco Co.*, 221 U.S. at 185 (instructing that antitrust remedies should accomplish their ends with "as little injury as possible to the interest of the general public"). Dr. Chipty's testimony did not give the court that assurance.

The Allcott study provides further support for a cautious approach. The study modeled a scenario that made Bing the default GSE across desktop web browsers. Allcott Study at 34–36. According to the authors, "[t]his approximates proposed bans on Google's payments for default positions, which would likely result in Bing—the second largest search engine—outbidding other

search engines for defaults." *Id.* at 35. The study estimated that such an intervention would lead to Google's market share falling significantly but would come at "the cost of a *large reduction* in consumer surplus,"[13] "as permanently inattentive users, including users with strong preferences for Google, are defaulted into a less-preferred option." *Id.* at 35–36 (emphasis added); *see* Rem. Tr. at 4252:21–4253:17 (Murphy) (discussing this finding). A prediction of a "large reduction in consumer surplus" likewise favors judicial restraint. *See Massachusetts*, 373 F.3d at 1219 ("[N]ot even the broad remedial discretion enjoyed by the district court extends to the adoption of provisions so likely to harm consumers.").

The court well recognizes what eschewing a payment ban may mean for competition. Due to Google's massive financial advantage and its superior monetization, distributors will be incentivized to stick with Google because it can pay more, thus leaving in place the very forces that "effectively [have made] the ecosystem exceptionally resist[ant] to change." *Google*, F. Supp. 3d at 145 (quoting Liab. Tr. at 3796:8–3798:22 (Ramaswamy)). Continuing payments also could blunt the effectiveness of the remedies imposed. *E.g.*, Rem. Tr. at 2179:10–2181:10 (Chipty) (explaining that allowing Google to continue paying for defaults would maintain the "status quo" even when coupled with an injunction against its unlawful conduct).

Still, the court thinks allowing Google to continue making payments is more palatable now than when the liability phase concluded. Then, venture funding in "Internet search" was considered Silicon Valley's "biggest no fly zone." Liab. Tr. at 3512:5-7 (Nadella); *see also Google*, 747 F. Supp. 3d at 43 ¶ 56. Today, established technology companies are making, and start-ups are receiving, hundreds of billions of dollars in capital to develop GenAI products that pose a threat to the primacy of traditional internet search. FOF ¶¶ 56–66 (describing competition

[13] Consumer surplus is "the difference between the price of a good and what consumers would be willing to pay for that good." *Nat'l Rural Telecom Ass'n v. F.C.C.*, 988 F.2d 174, 182 (D.C. Cir. 1993).

in the space and early impact on search products). The money flowing into this space, and how quickly it has arrived, is astonishing. *See, e.g.*, *id.* ¶ 58. These companies already are in a better position, both financially and technologically, to compete with Google than any traditional search company has been in decades (except perhaps Microsoft). They also are moving towards monetizing on commercial queries. *Id.* ¶ 66. These new realities give the court hope that Google will not simply outbid competitors for distribution if superior products emerge. It also weighs in favor of "caution" before disadvantaging Google in this highly competitive space. *See Alston*, 594 U.S. at 106 ("[C]aution is key.").

So, for now, Google will be permitted to pay distributors for default placement. There are strong reasons not to jolt the system and to allow market forces to do the work. *See id.* ("Judges must remain aware that markets are often more effective than the heavy hand of judicial power when it comes to enhancing consumer welfare."). Still, "judges must be open to clarifying and reconsidering their decrees in light of changing"—or unchanging— "market realities." *Id.* at 106–07. The court is thus prepared to revisit a payment ban (or a lesser remedy)[14] if competition is not substantially restored through the remedies the court does impose.

B. Data-Sharing Remedies

Section VI of Plaintiffs' RPFJ contains a multi-faceted set of data-sharing remedies. Plaintiffs believe these remedies will provide Google's rivals and new entrants "the necessary ingredients to not only improve the quality of their existing [search] services but also create new search features and other innovations in the medium to long term." Pls.' Br. at 40. These remedies

[14] One possibility is allowing Google to make payments for distribution but not for default distribution, also referred to as "unconditional revenue share." *See, e.g.*, Rem. Tr. at 4367:21–4368:5 (Murphy). Plaintiffs have not proposed that remedy as an alternative to a payment ban, and the court did not hear fulsome testimony from an expert economist about the incentives such a regime might create. Without a more substantial record on such a remedy, the court is presently ill-equipped to consider it.

are designed primarily to deny Google a key fruit of its anticompetitive conduct—scale—and to help rivals overcome that deficit. *Id.* at 43–46; *see supra* COL § III.B.

The Section VI remedies require Google to make available to Qualified Competitors on a periodic basis: (1) certain Search Index data, Pls.' RPFJ § VI.A; (2) three sets of User-side Data, *id.* § VI.C–D; and (3) certain Ads Data, *id.* § VI.E–F. The court first addresses the justification for the data-sharing remedies and then addresses each category of shared data.

1. Justification for Data Sharing

The rationale for these remedies is tied directly to a key liability finding: the distribution agreements allowed Google to lock in its sizeable scale advantage over its rivals. The court found that, for more than a decade, Google's distribution agreements gave "Google access to scale that its rivals [could not] match." *Google*, 747 F. Supp. 3d at 159. The exclusive nature of those agreements meant that rivals did not have "access to user queries . . . needed to effectively compete." *Id.* Conversely, as even Google conceded, default placements meant that Google "receive[d] additional search volume beyond what it would otherwise receive." *Id.* (citation omitted).

Google put that additional query volume to good use. It "deploy[ed] user data to, among other things, crawl additional websites, expand the index, re-rank the SERP, and improve the 'freshness' of results (i.e., bring them up to date)." *Id.* at 161; *see also id.* at 50–51 ¶¶ 90–94. Aided by powerful network effects, Google was able to super-charge its scale advantage into an insurmountable quality and monetization advantage. *See id.* at 161–62. "Google's massive scale advantage thus is a key reason why Google is effectively the only genuine choice as a default GSE." *Id.* at 162–63. "No current rival or nascent competitor can hope to compete against Google in the wider marketplace without access to meaningful scale, especially on mobile." *Id.* at 163.

These market realities remain today, notwithstanding the emergence of GenAI technology. *See, e.g.*, *id.* at 162 (recognizing that "developments in search technology, including greater reliance on [LLMs], . . . has reduced the need for user data" but that there was no evidence "that LLMs had sufficiently advanced to supplant user data"); FOF ¶ 63 (GenAI products have not eliminated the need for GSEs); *id.* ¶ 43 (search grounding of a GenAI product requires a high-quality search API).

In light of these findings and the strength of the underlying causation evidence, the court agrees with Plaintiffs that data sharing "represents a reasonable method of eliminating the consequences of the illegal conduct," *NSPE*, 435 U.S. at 698, and is "well within the range of ordinary Sherman Act remedies," *Platform Monopoly* at 2011; *see id.* (discussing "information pooling" as possibly "permit[ting] the emergence of more evenly competitive firms undermining scale economies, and could actually increase the range of positive network effects"); 3 AREEDA & HOVENKAMP ¶ 653i2 (discussing "pooling" of data as an antitrust remedy for "search engines that depend on large amounts of user data" and stating that pooling "would improve search results for everyone, and thus consumer welfare"); *see also In re Google Play Store*, 2025 WL 2167402, at *16–17 (affirming a remedy requiring Google to share its catalog of apps with rivals to "overcome" the defendant's "illegally amplified network effects by giving [rivals] a fair opportunity to establish themselves" (internal quotation marks and alteration omitted)); *Massachusetts*, 373 F.3d at 1216–25 (affirming compelled disclosure of APIs and communications protocols to enable interoperability between Microsoft's Windows operating system and rival middleware vendors).

Making data available to competitors would narrow the scale gap created by Google's exclusive distribution agreements and, in turn, the quality gap that followed. *See supra* COL § III.B (explaining how greater scale enables GSEs to answer more queries and improve

search quality); Rem. Tr. at 2163:1-2 (Chipty) ("[T]he data-sharing remedies would directly work to lower the scale barrier."). Data sharing would be particularly helpful to smaller search engines, who would not only "get better, but . . . keep getting better at a faster and faster rate up to some point" at which diminishing returns set in. *Google*, 747 F. Supp. 3d at 52 ¶ 106 (quoting Liab. Tr. at 10347:7-10 (Oard)); *see also id.* at 52 ¶ 104 (noting that the point of diminishing returns to user data "is far from established" and such data "does not become worthless even after [that] point"); *cf.* 3 AREEDA & HOVENKAMP ¶ 653i2 (observing that with a data "pooling" remedy "search engines with smaller databases to begin with would benefit more than those with larger ones").[15]

One clear area where data sharing would help promote more competition is a GSE's ability to respond to "long-tail" queries. As discussed, these are uncommon or unique queries that make up a large percentage of searches, and Google sees long-tail queries in orders of magnitude greater than its next closest rival, Bing. *See supra* COL § III.B. Because it sees such queries far more often, Google is more adept at answering them. *See id.* Data-sharing remedies thus can help to close the sizeable advantage Google has in answering long-tail queries, thereby improving product quality and attractiveness to new users. *See, e.g.*, Smutny Rem. Dep. at 51:17-22 ("[U]nless you're sharing tail queries, the information is not terribly useful for a search engine to improve its own product and bridge the scale-gap.").

[15] Admittedly, compelled data sharing may not benefit an established large GSE like Bing, at least for desktop search. The Allcott study estimated that with access to Google's long-tail data Bing's quality on desktop would improve, as measured by click-through rate, i.e., the ratio of users who click on a specific link or ad as compared to the number of total users who view it. *See* Allcott Study at 29–31; *id.* at 31 ("Our estimates imply that if Bing had access to Google's data, [click through rate] would increase from 23.5 percent to 24.8 percent."). But that quality improvement would translate to only a very modest shift in market share for Bing. In what the authors called a "more speculative exercise," they estimated a change of roughly one percent based on "findings of modest economies of scale . . . and a weak demand response to quality improvements." *Id.* at 36–37. The Allcott study, however, is limited in an important respect. The authors' findings and modeling concerned "desktop search in browsers," *id.* at 5, a platform on which Bing has default distribution and quality comparable to Google, *Google*, 747 F. Supp. 3d at 38 ¶ 26, 56 ¶ 127. Arguably, Bing's quality would increase at a higher rate with more access to long-tail data on mobile, where Bing is far inferior to Google. *See id.* at 38 ¶¶ 24–25 (describing Bing's 1.3% share of search queries on mobile compared to Google's 94.9% share). That could produce a larger overall share shift in favor of Bing.

The need for a data-sharing remedy is heightened by the court's decision not to adopt a payment ban. Qualified Competitors will have to continue to compete with Google on price to gain distribution. So, their competitive advantage will have to come from innovation and differentiating their search services from Google's. *Cf.* 3 AREEDA & HOVENKAMP ¶ 653i2 (discussing "pooling" remedy and stating that "[s]earch engines could continue to compete in search algorithms or other features"). That is not something a Qualified Competitor can reasonably do without access to scale. *See Google*, 747 F. Supp. 3d at 163 ("No current rival or nascent competitor can hope to compete against Google in the wider marketplace without access to meaningful scale, especially on mobile.").

Google makes two overarching objections to the data-sharing remedies, one legal and one factual. The legal objection is Google's attempt to draw parallels to the open-source Internet Explorer remedy rejected by the district court in *New York I*, a decision affirmed by the D.C. Circuit in *Massachusetts*. *See, e.g.*, Google's Br. at 33–39; *see also New York I*, 224 F. Supp. 2d at 185–86, 240–45; *Massachusetts*, 373 F.3d at 1227–31. But the two are not the same. There, the plaintiffs had proposed that Microsoft "disclose and license all source code for all Browser software [and that the license] grant a royalty-free, non-exclusive perpetual right on a non-discriminatory basis to make, use, modify and distribute without limitation products implementing or derived from Microsoft's source code." *Massachusetts*, 373 F.3d at 1227–28 (alteration in original). The district court rejected the open-source remedy for multiple reasons. First, "the open-source IE proposal 'ignore[d] the theory of liability in this case,' which was directed at Microsoft's unlawful 'response to cross-platform applications, not operating systems,'" and thus "the proposed remedy would directly benefit makers of non-Microsoft operating systems" even though their harm "was indirect." *Id.* at 1228 (quoting *New York I*, 224 F. Supp. 2d at 185). "Second, the

proposal would 'provide [a] significant benefit to competitors but [has] not been shown to benefit competition.'" *Id.* (alterations in original) (quoting *New York I*, 224 F. Supp. 2d at 185). And third, the rationale repeatedly invoked by Google, *see, e.g.*, Google's Br. at 35–38, the "proposal would work a 'de facto divestiture' and therefore should be analyzed as a structural remedy," *Massachusetts*, 373 F. 3d at 1228 (quoting *New York I*, 224 F. Supp. 2d at 186).

None of those concerns are present here. To start, Plaintiffs' data-sharing remedies are directly tied to the theory of liability in this case. As already discussed, Google's scale advantage is a fruit of its exclusive distribution agreements, and it is appropriate under the Sherman Act to deny Google that fruit through disclosure of the data it accumulated and used to maintain its monopoly. Furthermore, the sharing of scale-dependent data will enhance other companies' ability to compete with Google in the monopolized markets by enabling them to improve their quality and monetization and thereby take advantage of the network effects phenomenon that has been pivotal to Google's success. In *Massachusetts*, the D.C. Circuit made clear that the disclosure of "proprietary information" at a level that would "bolster" rivals' ability to challenge the monopolist and "potential[ly] . . . increase" rival products' capacity to threaten the monopolist's product does not run afoul of the antitrust laws. *Massachusetts*, 373 F.3d at 1215, 1221 (quoting *New York I*, 224 F. Supp. 2d at 172). Finally, the volume and breadth of data sharing ordered here will not work a de facto divestiture of Google's intellectual property and therefore need not be treated as a structural remedy that must be supported by "a clearer indication of a *significant causal connection* between the conduct and creation or maintenance of the market power." *Microsoft III*, 253 F.3d at 106 (citation omitted). As will be discussed, the court has narrowed Plaintiffs' proposals both to fit the wrong and to address Google's concerns about divulging proprietary components of its

Search infrastructure. *Cf. Massachusetts*, 373 F. 3d at 1231 (stating that the open-source Internet Explorer provision would "divest[] Microsoft of much of the value of its intellectual property").

Google also asserts that Plaintiffs' data-sharing remedies would have market-distorting effects that would not restore competitive conditions. Google's Br. at 34, 39–43. Google's expert in economics and industrial organization, Dr. Kevin Murphy, opined that requiring periodic data disclosures—for up to 10 years—would reduce Google's incentive to innovate because the company would not be able to keep the returns from its Search investments for itself. *See* Rem. Tr. at 4246:2–4248:11 (Murphy) ("Sharing things on an ongoing basis . . . tend[s] to have a greater [dampening] effect, because innovation is about the future, not so much about the past."); *see also id.* at 4241:23–4244:9 (Murphy). At the same time, these measures also would diminish Qualified Competitors' incentives to innovate by allowing them to free ride on Google's innovations rather than apply their own technical prowess. *Id.* at 3200:11–3201:6 (Israel) ("[I]f Google, for the entire length of the [judgment] period, is required to turn over all of its data, [then] that creates this free riding problem . . . ."). According to Dr. Murphy, "progress happens through the competitive process," and what may be perceived as "duplication of effort" is actually a valuable force driving product differentiation and ultimately enhancing consumer welfare. *Id.* at 4210:8–4213:2 (Murphy). By providing a "shortcut," Dr. Murphy added, the proposed data-sharing regime would "speed things up" but with some loss in innovation incentives. *Id.*

The court does not discount the importance of this concern; indeed, it was a key reason why the D.C. Circuit decided against broader disclosure of Microsoft's proprietary information in *Massachusetts*. *See* 373 F.3d at 1219 ("The effect upon Microsoft's incentive to innovate would be substantial; not even the broad remedial discretion enjoyed by the district court extends to the

adoption of provisions so likely to harm consumers."). That said, there are several reasons to believe that the adverse effects of data sharing are not as strong as Google suggests.

Plaintiffs' expert, Dr. Chipty, opined that the proposed data-sharing provisions would stimulate greater competition and thereby motivate Google to continue to innovate, because as competitors improve their products, Google will need to keep pace, even if it means having to disclose some innovations to rivals. Rem. Tr. at 2160:22–2161:13 (Chipty). Dr. Chipty acknowledged the free-rider problem but believed that competitors would have ample incentive to invest to differentiate their products from Google's, both to attract users and to secure distribution. *Id.* at 2166:12–2167:18 (Chipty); *see* 2B AREEDA & HOVENKAMP ¶ 421h ("If network[] [effects] are significant, providing ever increasing returns to firms as users on one or both sides of a platform increase, then undifferentiated entry seems almost impossible. For example, a firm that decided today to compete with Facebook or Google by offering precisely the same services would almost certainly fail."). Furthermore, there is no argument (much less evidence) that Google's profit motive will dissipate, as Search—specifically, search advertising—forms the backbone of Google's revenue stream. *Google*, 747 F. Supp. 3d at 35 ¶ 8. Finally, given the ongoing GenAI arms race, Google will have to continue to invest billions and innovate in this highly competitive space just to keep up. *See* Rem. Tr. at 4034:13–4039:4 (Hitt); FOF ¶¶ 56–62. In this moment of all moments, Google cannot afford to abandon or scale back its investment in search technologies, given the importance of grounding to GenAI products and the integration of GenAI into Search, through AI Overviews and AI Mode, which is likely only to deepen.[16] *See* FOF ¶¶ 6–11, 36–43.

[16] For these reasons, the court disagrees with Dr. Murphy's parsing of Google's incentives between the "Search side of the house" and "the AI dimension." Rem. Tr. at 4255:22–4257:20 (Murphy). The integration of Search and GenAI does not support such a sharp dichotomy.

In any event, as will be discussed in greater detail below, Plaintiffs' data-sharing proposals will be modified to mitigate their impact on Google's and competitors' innovation incentives. For example, provisions directly implicating Google's proprietary ranking technologies can be removed. The number and frequency of disclosures are likewise subject to modification. The court will "tailor[]" the proposed data-sharing remedies "to fit the wrong" committed by Google. *Microsoft III*, 253 F.3d at 107.

2. Search Index

Plaintiffs seek to compel disclosure of certain data contained in Google's Search Index to Qualified Competitors. Pls.' RPFJ § VI.A.1–3. Their RPFJ defines "Search Index" to mean "any databases that store and organize information about websites and their content that is crawled from the web, gathered from data feeds, or collected via partnerships, from which Google selects information to provide results to users in response to general search queries." *Id.* § III.X. Google would be required to make available, "at marginal cost," the following information: (1) the unique identifier (DocID) for each document in the search index and a notation sufficient to denote duplicates of such documents; (2) a DocID to URL map (i.e., data that corresponds the unique DocID to a page's address on the web); and (3) for each DocID "a set of signals, attributes, or metadata associated with each DocID that are derived in any part from User-side Data including but not limited to (A) popularity as measured by user intent and feedback systems including Navboost/Glue, (B) quality measures including authoritativeness, (C) time that the URL was first seen, (D) time that the URL was last crawled, (E) spam score, (F) device-type flag, and (G) any other specified signal the [Technical Committee] recommends to be treated as significant to the ranking of search results." *Id.* § VI.A.1–3. Google would have to make this data available "on a

periodic basis to be determined by Plaintiffs in consultation with the [Technical Committee]." *Id.* § VI.A.

A search index is essentially a database of publicly available web pages that can be returned in response to a user query. *Google*, 747 F. Supp. 3d at 38–39 ¶ 29. A comprehensive and current index is critical to returning high-quality search results. Google has been able to grow its web search index and improve its search results due in part to the high volume of queries that it receives relative to other GSEs. *Id.* at 49–52 ¶¶ 86–106; *see supra* COL § III.B. To understand why, a brief overview on building a search index is helpful.

Google starts by crawling trillions of web pages. Rem. Tr. at 3436:17-18 (Reid). Not all pages are created equal, however. Lots of pages, for example, are filled with spam or are duplicates. *Id.* at 3436:17–3437:2 (Reid). Google assigns a score to the pages it crawls, and it endeavors to exclude from its web search index pages without value to users, such as spam-heavy or pornographic pages. *Id.* at 3440:3-11, 3442:21–3443:14 (Reid). Google also relies on various "ranking signals" to collect information about web pages and differentiate among them. *Id.* at 2786:25–2787:14 (Allan); *id.* at 3440:3-7 (Reid). Signals range in complexity. There are "raw" signals, like the number of clicks, the content of a web page, and the terms within a query. *Id.* at 2854:19–2855:25 (Allan). These signals can be created with simple methods, such as counting occurrences (e.g., how many times a web page was clicked in response to a particular query). *Id.* at 2859:3–2860:21 (Allan) (discussing Navboost signal). At the other end of the spectrum are innovative deep-learning models, which are machine-learning models that discern complex patterns in large datasets. *Id.* at 2856:17–2857:19 (Allan) (discussing UPX0191 at -211); *id.* at 2860:23–2862:3 (Allan) (discussing RankEmbedBERT signal as a deep-learning model); *see also*

UPX0191 at -185 ("Deep models find and exploit patterns in vast data sets. They add unique capabilities at high cost.").

Google uses signals to score and rank web pages. *Id.* at 2793:5-13 (Allan) (discussing RDXD-20.018). Signals are often aggregated to create additional signals, which themselves may be combined to form even more signals. *Id.*; *id.* at 2787:10-14 (Allan). Google has developed various "top-level" signals that are inputs to producing the final score for a web page. *Id.* at 2793:5–2794:9 (Allan) (discussing RDXD-20.018). Among Google's top-level signals are those measuring a web page's quality and popularity. *Id.*; RDX0041 at -001. Signals developed through deep-learning models, like RankEmbed, also are among Google's top-level signals. Rem. Tr. at 2860:23–2862:6 (Allan); *see also* PXR0171 at -097; PXR0172 at -143.

Signals developed on user-interaction data play an important role in search index development. Quality and popularity signals, for instance, help Google determine how frequently to crawl web pages to ensure the index contains the freshest web content. *Google*, 747 F. Supp. 3d at 50 ¶ 91 (citing Liab. Tr. at 2207:7-9 (Giannandrea)); Rem. Tr. at 2874:7–2875:6 (Allan); *id.* at 3437:13–3438:25 (Reid). (So, too, does the spam score. Rem. Tr. at 2874:7–2875:6 (Allan); *id.* at 3436:17–3438:25 (Reid); *id.* at 3442:21–3444:6 (Reid).[17]) Query data is also important to ensuring that the search index contains the pages that are responsive to users' queries. *Google*, 747 F. Supp. 3d at 50 ¶ 92 (citing Liab. Tr. at 2211:13-17 (Giannandrea)). If a web page is not in the index, it likely will not be presented in response to a user query. *Id.* at 38 ¶ 29 (citing Liab. Tr. at 6303:20-25 (Nayak)). *But see* Rem. Tr. at 2876:6-2878:7 (Allan) (discussing the possibility that an un-crawled page could still be represented in a search index through links from a crawled page).

[17] Concededly, the record does not establish the extent to which the spam score involves user-interaction data as an input.

Thus, the more comprehensive the search index, the more likely it is to return useful results. *See Google*, 747 F. Supp. 3d at 38–39 ¶¶ 29–30.

Search index quality is critically important not only for traditional search engines, but also for emerging GenAI products. LLM-driven chatbots now routinely incorporate into their responses fresh information from the internet or other sources through a process known as grounding. FOF ¶¶ 36–46. Retrieval-augmented generation, or RAG, is a grounding technique. FOF ¶ 37. Whereas before, an LLM's response was time-limited by the end date of its training data and prone to hallucinations, FOF ¶¶ 32–35; Rem. Tr. at 172:23–173:15 (Durrett), through grounding an LLM can now access content beyond its training data, such as web pages in a search index, to provide more recent and more accurate information (though it does not fully eliminate the problem of hallucinations), FOF ¶¶ 39–42; *see also* Rem. Tr. at 173:22–174:22 (Durrett); *id.* at 660:17–661:13 (Hsiao) (discussing how through grounding a GenAI chatbot could respond to commercial queries); *id.* at 3835:11–3836:13 (Cue) (describing generally how through RAG techniques a chatbot can produce responses from identified relevant weblinks).

The size of Google's index gives it a key competitive advantage over existing small GSEs, like DuckDuckGo, and emerging companies in the GenAI space, like ChatGPT. Witnesses testified to what is known in the industry as the "80–20 problem." Building a search index that can answer 80% of queries is capital intensive but attainable in the short to medium term. Rem. Tr. at 838:25–839:1 (Weinberg) ("[Y]ou can get to an 80/20 pretty quickly."); *id.* at 394:21–397:7 (Turley) (describing ChatGPT's goal to answer 80% of queries with its own search index and the difficulties associated with answering the remaining 20%). Answering the remaining 20%, which comprises long-tail queries, is particularly challenging because it requires the index to contain very specific and often obscure sources. *See id.* at 395:22–397:7 (Turley); *id.* at 404:2-7

(Turley) ("When sources are less common, we may not know that they even exist, and we may, thus, not discover what makes the best source.").

Granting Qualified Competitors access to Google's search index can help address the 80–20 problem and improve search quality. *See id.* at 840:22–842:3 (Weinberg) (predicting that access to Google's search index would be "very useful" for DuckDuckGo, including to build out its long-tail index); *id.* at 409:11–410:22 (Turley) ("[A]ccess to the data that underlies Google's index . . . would accelerate the development of [OpenAI's] own index."). Apple executive Eddy Cue perhaps explained it best (this time advertently), *see Google*, 747 F. Supp. 3d at 144, when he responded to the court's question, "what would it take for either an existing competitor or a nascent competitor to provide genuine competition to Google for Apple's default on Safari?" Rem. Tr. at 3845:15-18 (Cue). Cue did not believe any existing GSE could dethrone Google but predicted a GenAI product might if it evolved in one important way:

> To me, the only thing that's keeping them from potentially doing that is, again, *growing their search index. They have to get better at the search index part.* They're very good at their LLMs. You know, they've already built large language models that are as good or better than most. What that will do is create a product that gives better results, new capabilities. You know, those are things that people are interested in today.

Id. at 3846:3-10 (Cue) (emphasis added). He continued that, if there were "a way to accelerate [GenAI products'] ability to having bigger search indexes," they could emerge as a competitive threat to Google. *Id.* at 3848:16-18 (Cue).

The search-index data-sharing remedy thus satisfies the governing test—it "represents a reasonable method of eliminating the consequences of the illegal conduct." *NSPE*, 435 U.S. at 698; *see Bausch & Lomb*, 321 U.S. at 726 ("The test is whether or not the required action reasonably tends to dissipate the restraints and prevent evasions."); *In re Google Play Store*, 2025 WL 2167402, at *17 (holding that compelling Google to grant access to its Play Store's catalog of

apps was a "reasonable method of eliminating the consequences of [Google's] illegal conduct" (citation omitted)).

Nevertheless, this court is not prepared to go as far as Plaintiffs request. Plaintiffs' Search Index data demand is overly broad and is not "tailored to fit the wrong creating the occasion for the remedy." *Microsoft III*, 253 F.3d at 107.

To begin, the definition of "Search Index" sweeps in data that is only remotely related to Google's scale advantage. It includes databases that store information "gathered from data feeds" and "collected via partnerships." Pls.' RPFJ § III.X. That is data supplied by third parties. *See* Rem. Tr. at 3445:4-24 (Reid) (describing agreements to provide feeds from social media companies, such as X, Instagram, and TikTok, and real-time information, such as sports scores, flight data, and hotel inventory). Plaintiffs put forward no evidence that Qualified Competitors are unable to acquire such data on ordinary commercial terms. The limited record evidence on this subject strongly suggests that they can. *See Google*, 747 F. Supp. 3d at 166–67 ("As of 2020, Microsoft had entered into *hundreds* of partnerships to obtain structured data."); Rem. Tr. at 408:23–409:3 (Turley) (OpenAI has "partner[ed] with some publishers" to acquire web content); *id.* at 1242:23–1243:6 (Provost) (describing Yahoo's content partnerships with Trip Advisor, Yelp, and Sky Scanner). The final judgment therefore will reflect a definition of Search Index that extends only to "databases that store and organize information about websites and their content that is crawled from the web." *See* Pls.' RPFJ § III.X. This amendment is intended to limit the data shared only to what is contained in Google's web search index. *See* Rem. Tr. at 3447:14–3453:15 (Reid) (discussing Google's other various indexes that include data not crawled from the web, including video, images, and verticals).

Further, the court cannot accept the remedy's indefinite aspects. *See Int'l Salt*, 323 U.S. at 400 ("[I]t is desirable . . . that the decree be as specific as possible, not only in the core of its relief, but in its outward limits, so that parties may know their duties and unintended contempts may not occur."). The RPFJ identifies specific types of data associated with DocIDs but leaves the final dataset open to further addition by preceding that list with the expansive phrase "including but not limited to." *See* Pls.' RPFJ § VI.A.3. It also empowers the Technical Committee at any time during the term of the judgment to designate for sharing other signals "significant to the ranking of search results." *Id.* Google is entitled to know precisely what data from the Search Index it must share and when. These indefinite terms will be excised.

So, too, will the requirement of making available any signal, attribute, or metadata "derived in any part from User-side Data." *Id.* This demand goes too far. Plaintiffs offered no evidence as to what the volume of signals, attributes, or metadata might be. It is almost certainly vast.[18] Rem. Tr. at 2792:2-7 (Allan) ("It's not one signal; it's not two signals. I'm not even sure how many signals it is, but it is many of the signals that are used for ranking."). The remedy is likely to reach highly engineered signals that have only a modest connection to "raw" user data. *Id.* at 2802:2-8 (Allan). Think of it this way. A top-level signal is like a pyramid. The top-level signal itself is the pyramid's capstone, and each supporting level is a group of sub-signals that are inputs that ultimately produce a top-level signal score. Under Plaintiffs' proposal, so long as some foundational-level sub-signal is derived from User-side Data, Google would have to disclose any higher-ranking signal that relies on the sub-signal all the way up to the top-level signal. It would have to do so even if those higher-ranking signals are primarily the product of engineering and

[18] Plaintiffs, in their briefing, represent that their Search Index proposal includes only "three static signals," Pls.' Br. at 43, suggesting that sub-signals are not included. But the way the RPFJ is written ("including but not limited to") indicates otherwise.

innovation. The court will not sanction forced sharing of signals that are so attenuated from raw user data.

For similar reasons, the court declines to mandate sharing of two of the datasets specified by Plaintiffs that rely in part on user-interaction data. They are "popularity as measured by user intent and feedback systems including Navboost/Glue" and "quality measures including authoritativeness" associated with each DocID. *See* Pls.' RPFJ § VI.A.3. Taking the latter first, "quality measures" are constructed largely from sources other than user data. For instance, a key quality signal is PageRank, which captures a web page's quality and authoritativeness based on the frequency and importance of the links connecting to it. *Id.* at 2795:19–2797:21 (Allan); PXR0356 at -744 ("PageRank . . . is a single signal relating to distance from a known good source, and it is used as an input to the Quality score."). PageRank was a key early innovation that separated Google from the competition and is now "widely known." Rem. Tr. at 2795:19–2796:25 (Allan). Concededly, some of Google's quality sub-signals are scale dependent. *See id.* at 2802:5-8 (Allan) (discussing RDXD-20.022); *id.* at 2875:10-15 (Allan). But they are the exception, as Plaintiffs seemed to acknowledge when questioning Google's expert in computer science and information retrieval, Dr. James Allan. *See* Rem. Tr. at 2875:10-11 ("Do you understand that most of Google's quality signal is derived from the webpage itself?"). Requiring Google to share a top-level quality signal merely because some minor sub-component not identified on this record relies on user data exceeds what is appropriate to fit the wrong.

As for the popularity ranking, the case for disclosure suffers from a proof problem. Plaintiffs have not shown to what extent that signal is constructed from user data or how it benefits from Google's scale. Two exhibits suggest that popularity is based on "Chrome visit data" and "the number of anchors," which is a measure that quantifies the number of links between pages

and is used to promote well-linked documents. *See* PXR0171 at -095 to -098; PXR0356 at -744 (popularity signal (P*) "uses Chrome data"). The former appears to be a type of user-interaction data—albeit from Chrome visits, not through key default distribution channels—but the court can say no more, as Plaintiffs offered no testimony on the matter. The court will not force data sharing based on an uncertain record.[19]

What remains, then, of Plaintiffs' proposed Search Index data disclosure requirement is the following: (1) the unique DocID for each document, including a notation as to duplicates; (2) a DocID to URL map; (3) the first time a URL was seen; (4) when the URL was last crawled; (5) spam score; and (6) device-type flag. The compelled disclosure of this data is a reasonable and proportional means of remediating the harm caused by Google's exclusive agreements. Receipt of this narrowed dataset will still enable rivals to overcome the scale gap by allowing them to more quickly build a competitive search index—one that is robust in volume, freshness, and utility. *See, e.g.*, Rem. Tr. at 409:16–410:22 (Turley) (stating that search index data would allow OpenAI to build its search index "faster" and "would allow us to build a better product faster"); *id.* at 3848:5–3949:17 (Cue) (disclosure would "accelerate [competitors'] ability to hav[e] bigger search indexes"); *id.* at 840:22–842:13 (Weinberg) (disclosure of search index information will "jump start building . . . indexes at scale").

The DocID of web pages, the DocID to URL map, and information relating to duplicates will help Qualified Competitors identify and crawl more web pages with valuable content and do so more efficiently. *See* RDX0062 at -006 (stating that "[d]e-duplication" allows Google to

[19] Because the gaps in the evidentiary record counsel against ordering Google to disclose these signals, the court need not consider Google's additional argument that such disclosure would allow competitors to mimic or reverse engineer Google's key ranking signals. *See* Google's Br. at 39–43; Rem. Tr. at 2800:15–2802:18 (Allan) (discussing RDXD-20.021 to .022); *id.* at 2802:19–2803:9 (Allan) (discussing RDXD-20.023); *cf. Massachusetts*, 373 F.3d at 1219 (affirming the trial court's denial of broader API disclosures due to concerns about "cloning" that would allow rivals "to 'mimic' the functionality of Microsoft's products rather than to 'create something new'").

"reduce the 1 trillion web links" that it extracts to the "100 [billion]" that it processes for possible indexing). The information relating to Google's crawl schedule will allow rivals to determine the frequency of crawling a site to ensure the freshest data from a site is stored in the index. *See Google*, 747 F. Supp. 3d at 50 ¶ 91. The spam score will allow rivals to avoid crawling web pages of low value and focus only on those with helpful content. *See, e.g.*, Rem. Tr. at 841:4-10 (Weinberg) (stating that spam scores would "immediately be used to plug holes" and "build out these crawlers to know what sites to prioritize more"). Finally, the device-type flag will enable competitors to close the mobile scale gap by identifying and focusing on mobile-friendly websites in their crawls, to ensure that mobile advertiser–friendly sites are in the index. *See* Liab. Tr. at 2649:15–2650:19 (Parakhin).

Two things are important to note about these narrowed sets of Search Index data. The first is that Google will not be required to produce data that is largely a product of engineering and innovation. As Google suggests, even this limited data will reveal some proprietary information, *see* Rem. Tr. at 3446:15-22 (Reid), but the encroachment will be minimal. *Compare id.* at 3462:10-12 (Reid) (stating that disclosure of the DocIDs would reveal a "smaller amount" of proprietary information), *with id.* at 3462:9–3463:3 (Reid) (describing popularity and quality as "fundamental ranking signals"). Notably, the narrowed Search Index data that Google will be required to disclose is comparable to what it once shared under an agreement with an existing partner, Yahoo Japan. *See id.* at 3084:14–3093:6 (J. Adkins) (comparing terms of § 2.9 of the 2010 Yahoo Japan agreement with Plaintiffs' RPFJ § VI.A); PXR0598 (2010 Google–Yahoo Japan agreement).

The second is that, even with the shared Search Index information, rivals still will have to invest considerable resources in building out their own search index. The actual data crawled is

not subject to disclosure. So, competitors will have to build the crawlers, crawl the web pages, extract the web page information, and process the data to create a competitive search index. *See id.* at 841:17–842:3 (Weinberg); RDX0062 at -004 to -013 (describing process of building a search index). They will have to invest and innovate to compete with Google.

Before moving on, two other aspects of Plaintiffs' Search Index data-sharing proposal warrant the court's attention.

First, there is the frequency of disclosure. Plaintiffs would have Google make the data available on a "periodic basis to be determined by Plaintiffs in consultation with the [Technical Committee]." Pls.' RPFJ § VI.A. Presumably, Plaintiffs want periodic sharing so that Qualified Competitors have the freshest search index data. *See* Rem. Tr. at 3446:23–3447:11 (Reid) (Search Index disclosure on a periodic basis rather than a one-time basis would reveal "more about freshness in various ways.").

The court declines such a remedial requirement. Qualified Competitors will receive a one-time snapshot of the relevant data contained in Google's Search Index at or around the time they are so certified by Plaintiffs. Periodic data disclosure over the course of years goes beyond what is needed to "cure the ill effects of the illegal conduct." *See Ford Motor Co.*, 405 U.S. at 575 (quoting *Gypsum*, 340 U.S. at 88). A one-time disclosure of Google's current Search Index data "will reveal what Google thinks is important and relevant," Rem. Tr. at 4815:4-6 (Closing Arg.) (Google's counsel), and will enable Qualified Competitors to build their own search indexes to answer long-tail queries, thereby giving them the kick start they need to compete. Further, a one-time disclosure minimizes the risk of free riding identified by Google's expert economist and acknowledged by Plaintiffs. *See id.* at 3200:14–3201:6 (Israel); *id.* at 2165:12–2166:11 (Chipty). For Qualified Competitors to compete, they must innovate and differentiate their product from

Google's rather than simply feeding off Google's work. *See id.* at 4211:11–4212:13 (Murphy). The court's limiting of the data disclosure also is consistent with the lessons of *Massachusetts*. *See* 373 F.3d at 1218 (stating that "expanded but not unlimited disclosure 'represents a reasonable method' of facilitating entry of competitors" (quoting *NSPE*, 435 U.S. at 698)).

The last matter concerns the cost of the Search Index data-sharing remedy. Plaintiffs propose that Google make that data available at "marginal cost." *See* Pls.' RPFJ § VI.A. Their RPFJ does not include a definition of that term. During closing arguments, Plaintiffs represented that the term is meant to capture the cost to Google to collect and furnish data to a Qualified Competitor. *See* Rem. Tr. at 4788:20–4789:12 (Closing Arg.) (Plaintiffs' counsel); *see also* RDX0705 at -007 ("The term 'marginal cost' [as used in Plaintiffs' RPFJ] means the ordinary course definition of 'marginal cost,' which is the direct total production cost of producing an additional unit of a good or service, and here would be determined by calculating the change in direct total production cost resulting from Google [] providing the additional unit(s) of services . . . .").

The court believes that this cost provision "fits the exigencies" of this case and is therefore appropriate for four reasons. *See Int'l Salt*, 332 U.S. at 401. First, making Google's Search Index data available at marginal cost ensures that Google will not be able to offer the dataset at an "unreasonably high price." *In re Google Play Store*, 2025 WL 2167402, at *19–20 (approving remedial term allowing Google to receive a "reasonable fee" to implement security and compliance measures to carry out the app-store distribution remedy, because allowing Google to charge more would allow it to charge third-party app stores the "same unreasonably high price"). Second, the court cannot look to ordinary commercial terms to set a price. The court received no evidence about a market for such data—it seemingly does not exist—and Google offered no method of how

to value it. The court thus would bear responsibility for the "ongoing supervision . . . necessary to regulate the price and nonprice terms" of the data transactions. *See* 3 AREEDA & HOVENKAMP ¶ 653b2. The court is ill-suited for such a role. *See Alston*, 594 U.S. at 102 ("Judges must be wary, too, of the temptation to specify 'the proper price, quantity, and other terms of dealing'—cognizant that they are neither economic nor industry experts." (quoting *Verizon Commc'ns Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398, 408 (2004))). Third, the Search Index data that directly implicates Google's proprietary ranking systems—popularity and quality—are no longer part of the remedy, thereby protecting the value of those aspects of Google's investments in Search both now and in the future. Fourth and finally, each Qualified Competitor is entitled only to a one-time disclosure of a finite, closed dataset.

Pricing this data at marginal cost thus does not raise the same concerns as the open-source Internet Explorer provision did during the *Microsoft* litigation. *See Massachusetts*, 373 F.3d at 1230; Google's Br. at 35–37. Whereas the plaintiffs in that case demanded the disclosure of all source code used to build Internet Explorer—Microsoft's core intellectual property—the disclosure ordered here will encompass only web page identifiers and basic information about each web page. This data is no doubt valuable. But for both legal and practical reasons, it need not be priced above marginal cost.

3. Knowledge Graph

In addition to data comprising some of Google's Search Index, Plaintiffs propose requiring Google to share with Qualified Competitors "databases consisting of information sufficient to recreate Google's Knowledge Graph, including local information." Pls.' RPFJ § VI.A.4. Such disclosure would occur "on a periodic basis to be determined by Plaintiffs in consultation with the [Technical Committee]." *Id.* § VI.A.

Google's Knowledge Graph is a database containing useful information about people, places, and things along with what connects them together. *Google*, 747 F. Supp. 3d at 42 ¶ 45; Rem. Tr. at 2804:5-9 (Allan). The database is enormous. It contains five billion entities and 500 billion connections among them. Rem. Tr. at 2805:4-6 (Allan). Google uses the Knowledge Graph to help interpret queries and to return factual results. *Id.* at 2805:22–2806:18 (Allan); *see also id.* at 3477:19–3478:7 (Reid). The data used to create the Knowledge Graph is derived from both structured data—think of data in a table format—and unstructured data, such as a web page. *Id.* at 2879:15–2880:18 (Allan). One of the structured data sources is Google's Geo Index, which contains its local information, such as for restaurants and other small businesses. *Id.* at 2881:15-23 (Allan). An example of such data is the opening and closing times of a store. The local business directly supplies that information, or it might come from a user who submits it to Google. *Id.* at 2884:4–2886:12 (Allan). According to Professor Allan, Google developed the Knowledge Graph in the face of a "huge track record in the research community of fail[ing]" to develop similar products as a search input. *Id.* at 2805:12-21 (Allan).

Plaintiffs say that the compelled disclosure of Knowledge Graph data "is meant to allow rivals to overcome Google's scale advantage in obtaining content to build its Knowledge Graph." Pls.' Br. at 44. Their justification for the remedy is two-fold. "Due to Google's scale, publishers are incentivized to permit Google to crawl web content, while blocking rival's web crawlers." *Id.* Also, "Google's Geo Index benefits from users being incentivized to create content for Google, including information about businesses such as locations, hours, or even richer data such as restaurant menus." *Id.* at 44–45.

The court declines to adopt the Knowledge Graph data proposal because it is not "tailored to fit the wrong creating the occasion for the remedy." *Microsoft III*, 253 F.3d at 107. The "wrong"

committed by Google was to lock up the key channels of distribution to the exclusion of its rivals, thereby affording Google a massive scale advantage. *Google*, 747 F. Supp. 3d at 159–163. "Scale," in this context, means "[g]reater query volume" that translates to "more user data." *Id.* at 49–50 ¶ 87. The Knowledge Graph is not, however, directly derived from user data. Its underlying data comes from over [redacted] data feeds and pipelines, including from third parties. Rem. Tr. at 3470:15–3471:10 (Reid) (discussing RDXD-28.013). Google then undertakes multiple steps to process that data, with the assistance of thousands of employees and contractors, so that the Knowledge Graph can be used to deliver accurate and fresh query responses. *Id.* at 3471:11–3478:7 (Reid) (discussing RDXD-28.013 to .014). The Knowledge Graph is thus not the product of Google's scale advantage, in the sense that it relies on queries or other interaction data that Google collected from users. Rem. Tr. at 3478:8-17 (Reid) (stating that click-and-query data does not play a "particularly meaningful" role in building the Knowledge Graph).

Plaintiffs do not dispute this. They nevertheless contend that the Knowledge Graph data is scale dependent because the size of Google's user base and its ability to direct traffic to web pages incentivize third parties, like publishers and local businesses, to share information with Google that it does not with smaller search engines. Pls.' Br. at 44 (citing Pls.' PFOF ¶ 581); *see* Pls.' PFOF ¶¶ 583–590. Google's exclusive access to such web content, Plaintiffs argue, gives it a comparative advantage in building the Knowledge Graph. Pls.' PFOF ¶¶ 586–588.

The court is unpersuaded. There is some record support for the proposition that Google has broader access to crawl websites than other GSEs and GenAI product developers. *See, e.g.*, Liab. Tr. at 2656:19–2658:24, 2766:8-21 (Parakhin); Rem. Tr. at 404:2–405:6, 406:12–408:12 (Turley). But Plaintiffs produced scant evidence of the prevalence of this phenomenon, *cf.* Rem. Tr. at 3439:1-20 (Reid) (stating that "[i]t's not very common" that a publisher opts out of being

crawled by non-Google firms), and no evidence about how such disparity would impact the development of a rival Knowledge Graph, *id.* at 2880:21–2881:3 (Allan) (acknowledging that "[t]o the extent that Google is using web pages to build Knowledge Graph," it would have an advantage over search engines that do not have access to those pages, but without establishing the extent of such advantage). The compelled disclosure of billions of datapoints within the Knowledge Graph cannot be justified on such a thin record.

Plaintiffs also rely on Google's Geo Index as an example of how Google's scale incentivizes users to supply information to Google, but that, too, misses the mark. Witnesses testified that local businesses have more incentive to send relevant information to Google (e.g., opening and closing times) because it has the most users and therefore is more likely to direct traffic to the business. *See id.* at 832:10–833:13 (Weinberg); *id.* at 1018:17–1019:9 (Schechter). No doubt Google's large user base is due in part to its scale advantage. But the connection between that advantage and how Google acquires Geo Index data is too attenuated to sustain its compelled disclosure. The data comes primarily from vendors, not from Google users entering queries. That Google's popularity has attracted businesses that supply it with information is only remotely related to the exclusionary agreements. The proposed disclosure of Knowledge Graph data is therefore not a proper remedy.

4. User-Side Data Remedies

a. <u>The User-Side Datasets at Issue</u>

Plaintiffs' next data-disclosure proposal involves compelled sharing of "User-side Data." Pls.' RPFJ § VI.C. Plaintiffs define "User-side Data" to mean:

> all data that can be obtained from users in the United States, directly through a search engine's interaction with the user's Device, including software running on that Device, by automated means. User-side Data includes information Google collects when

> answering commercial, tail, and local queries. User-side Data may also include datasets used to train (at all stages of training including pre-training and filtering, post-training, fine-tuning) Google's ranking and retrieval components, as well as GenAI models used for Google's GenAI Products.

Id. § III.BB. In simple terms, User-side Data is data that Google collects from the pairing of a user query and the returned response. It also can be thought of as user-interaction data or "click-and-query" data. Rem. Tr. at 842:20–843:4 (Weinberg); *id.* at 1247:23–1248:4 (Provost). Examples of such data include the web link or vertical information the user clicks on, how long a user hovers over a link, and whether the user clicks back from a web page and how quickly. *Google*, 747 F. Supp. 3d at 50 ¶ 88; Rem. Tr. at 842:20–843:4 (Weinberg). User-interaction data is the raw material that Google uses to improve search services. *Google*, 747 F. Supp. 3d at 50 ¶ 90 ("At every stage of the search process, user data is a critical input that directly improves [search] quality."); *see also* Rem. Tr. at 843:5-12 (Weinberg) (describing "feeding in the clicks and other things" into algorithms to improve search results).

Under the proposed remedy, Google must make available to Qualified Competitors, "at marginal cost" and on a "periodic basis to be determined by the Plaintiffs in consultation with the [Technical Committee]," the following datasets:

> 1. User-side Data used to build, create, or operate the GLUE statistical model(s);
>
> 2. User-side Data used to train, build, or operate the RankEmbed model(s); and
>
> 3. The User-side Data used as training data for GenAI Models used in Search or any GenAI Product that can be used to access Search.

Pls.' RPFJ § VI.C. Google uses the first two datasets to build search signals and the third to train and refine the models underlying AI Overviews and (arguably) the Gemini app. Pls.' Br. at 45–46.[20]

First some background about these datasets. Glue is essentially a "super query log" that collects a raft of data about a query and the user's interaction with the response. Rem. Tr. at 2808:2–2809:6 (Allan). The data underlying Glue consists of information relating to (1) the query, such as its text, language, user location, and user device type; (2) ranking information, including the 10 blue links and any other triggered search features that appear on the SERP, such as images, maps, Knowledge Panel, People also ask, etc.; (3) SERP interaction information, such as clicks, hovers, and duration on the SERP; and (4) query interpretation and suggestions, including spelling correction and salient query terms. *Id.* at 2809:8–2812:20 (Allan) (discussing RDXD-20.026 to .028). An important component of the Glue data is Navboost data. *See id.* at 2808:16-20 (Allan) ("Glue contains . . . Nav[b]oost information."); Liab. Tr. at 6403:3-5 (Nayak) ("Glue is just another name for [N]avboost that includes all of the other features on the page."). Navboost is a "memorization system" that aggregates click-and-query data about the web results delivered to the SERP. Liab. Tr. at 1804:8–1805:22, 1806:8-15 (Lehman). Like Glue, it can be thought of as "just a giant table." *Id.* at 1805:6-13 (Lehman). Importantly, the remedy does not force Google to disclose any models or signals built from Glue data, only the underlying data itself. Rem. Tr. at 2809:3-4 (Allan).

[20] The court says this dataset "arguably" extends to the Gemini app because, even though it is not expressly referenced in Plaintiffs' post-trial brief, Plaintiffs consider Gemini to be a Search Access Point and therefore Gemini is a "GenAI Product that can be used to access Search." Rem. Tr. at 2171:13–2172:5 (Chipty); *see* Pls.' RPFJ § III.V (defining "Search Access Point" to include "GenAI Products that can retrieve and display information from a GSE, including links to websites").

RankEmbed and its later iteration RankEmbedBERT are ranking models that rely on two main sources of data: [redacted]% of 70 days of search logs plus scores generated by human raters and used by Google to measure the quality of organic search results. Liab. Tr. at 6322:15–6325:15, 6448:12-25 (Nayak); *id.* at 6364:23-6365:15 (Nayak) (discussing DXD-17.016); *id.* at 7863:18–7864:1 (E. Fox). The RankEmbed model itself is an AI-based, deep-learning system that has strong natural-language understanding. This allows the model to more efficiently identify the best documents to retrieve, even if a query lacks certain terms. PXR0171 at -086 ("Embedding based retrieval is effective at semantic matching of docs and queries"); RDX0060 at -009; Liab. Tr. at 6355:25–6356:20 (Nayak); *see also* Rem. Tr. at 2819:21–2823:22 (Allan) (discussing how deep-learning models work). RankEmbed particularly helped Google improve its answers to long-tail queries. Liab. Tr. at 6356:21-25 (Nayak). RankEmbed is trained on 1/100th of the data used to train earlier ranking models yet provides higher quality search results. Liab. Tr. at 1846:8-22 (Lehman). Among the underlying training data is information about the query, including the salient terms that Google has derived from the query, and the resultant web pages. Rem. Tr. at 2832:5–2834:11 (Allan) (discussing RDXD-20.042 to .043). Again, the remedy seeks only the underlying data, not the model itself or any ranking signal produced.

The final category of User-side Data is that which trains GenAI models used in Search or in GenAI products. As discussed above, LLMs are type of GenAI model. FOF ¶ 3. LLMs are mainly pre-trained on large amounts of text, typically gathered from the web. FOF ¶¶ 27–29; Pls.' PFOF ¶ 70. That pre-training creates a base (or foundation) model, which is then post-trained (or fine-tuned) on collections of data so that the base model can perform specialized tasks, such as solving math problems, answering questions, or creating computer code. FOF ¶ 30; Rem. Tr. at 159:21–161:4 (Durrett) (discussing PXRD003 at 15–16). Google does not use click-and-query

data to pre-train its base Gemini models. Rem. Tr. at 3342:1-5, 3347:6-8 (Collins). It considered doing so but did not find that the benefits of pre-training on search data to be worth the cost. *Id.* at 3347:9-16 (Collins). (Evidently, Google's competitors do not use click-and-query data to train base models, either. *See* Google's PFOF ¶ 985 (citing testimony to that effect from Microsoft and OpenAI witnesses)).

The Google Search team post-trains Gemini base models for search-specific uses. One such post-training model is MAGIT, which is a generator model used to fine-tune the Gemini base model to produce text responses in the desired format for AI Overviews. Rem. Tr. at 177:6–179:11 (Durrett) (discussing PXRD003 at 30–33). Google uses "Search data" to train its MAGIT model. *Id.* at 179:13–180:1 (Durrett) (citing Parakh Rem. Dep. at 154:13-15).

Google's vast trove of User-side Data is a fruit of its anticompetitive agreements, *see supra* COL § III.B, and for that reason compelled sharing of some of that data is a "reasonable method of eliminating the consequences" of Google's conduct. *NSPE*, 435 U.S. at 698. Witnesses from rival companies testified that access to Google's user-interaction data would allow them to improve their GSE, particularly in responding to long-tail queries. *See, e.g.*, Rem. Tr. at 842:20–845:9 (Weinberg) (stating that access to Google's user-interaction data "would enable [DuckDuckGo to], essentially, probably accelerate by years the ability to create indexes at scale and just improve the quality of DuckDuckGo, especially in the long-tail"); *id.* at 1019:10–1020:18 (Schechter) (agreeing that access to queries that Bing had not seen before potentially would improve pattern-matching recognition); *id.* at 1247:25–1249:5 (Provost) (stating that "[a]ny incremental data is going to be helpful to [Yahoo] in being more successful in building better products for our users"). Higher quality query responses, especially to long-tail queries, would

put rivals in a better position to compete with Google. *See supra* COL § III.B (discussing long-tail queries).

But just as Plaintiffs' Search Index data-sharing remedy goes too far, so too does their User-side Data–sharing proposal in one respect. The court starts with the demand for data used to train GenAI Models, then turns to the Glue dataset, and concludes with the RankEmbed dataset.

Training Data for Gemini Models. Evidence that Google deploys user-interaction data to train Gemini models for Search or the Gemini app was sparse. Plaintiffs established that Google uses "Search data" to train the MAGIT model, which helps deliver AI Overview responses, but never explained what type of "Search data" is used, how much, or its significance in the model's training. Rem. Tr. at 178:6-180:1 (Durrett) (discussing PXRD003 at 33); *id.* at 3366:5-18 (Collins). More fundamentally, Plaintiffs did not establish that Google's scale advantage in Search translates into a quality advantage in GenAI search-assisted responses. *See, e.g.*, Rem. Tr. at 216:21–218:17 (Durrett) (opining only that "there's a logical implication of [his] opinion" that "the ability to retrieve from the search index and then produce results in a RAG context would be better than if a poorer-quality search index were used," and not opining on "whether Google's GenAI products are superior to the GenAI products of its competitors"). The evidence did not show, for instance, that Google's GenAI product responses are superior to other GenAI offerings due to Google's access to more user-interaction data. If anything, the evidence established otherwise: The GenAI product space is highly competitive, and Google's Gemini app, for instance, does not have a distinct advantage over chatbots in factuality and other technical benchmarks. FOF ¶¶ 56–62. So, even if Google uses some "Search data" to post-train Gemini models used in Search or its GenAI products, sharing that data is not warranted to promote competition.

Glue Data. The sharing of the dataset underlying the Glue statistical models, on the other hand, presents a stronger case for inclusion in the final judgment. Again, the data in question is largely raw user-interaction data that associates queries and results with user interactions, such as clicks, hovers, and other aspects of a user's journey on and from the SERP.[21] This is the bread and butter of Google's scale advantage. Recall, Google trains Navboost on 13 months of user data, which is the equivalent of over 17 *years* of data received by Bing. *Google*, 747 F. Supp. 3d at 51 ¶ 96; Liab. Tr. at 6433:15–6434:2 (Nayak) (explaining that training on 13 months of user data means the "queries and clicks" collected from "all users" worldwide); UPX0005 at -811 ("Glue Cache (13 months)"). This scale advantage is attributable in part to the exclusive agreements, and aided by unlawfully amplified network effects, it has enabled Google to maintain its monopoly status. Forcing Google to share this data is an appropriate way to address the harm of its anticompetitive conduct. *See In re Google Play Store*, 2025 WL 2167402, at *16 (affirming remedy requiring Google to grant third-party Android app stores access to the Google Play Store catalog of apps where the district court had "repeatedly emphasized that the catalog-access remedy is intended to ameliorate the consequences 'intertwined with the network effects' that Google has enjoyed as a monopolist in a two-sided platform market").

RankEmbed Data. As for compelled sharing of "User-side Data used to train, build, or operate the RankEmbed model(s)," Pls.' RPFJ § VI.C.2, the court believes such disclosure is appropriate as well. The data underlying RankEmbed models is a combination of click-and-query data and scoring of web pages by human raters. Liab. Tr. at 6448:20-25 (Nayak). Plaintiffs concede that Google would not have to turn over the scoring data. Pls.' RPFOF ¶ 1152. But the

[21] Plaintiffs disclaim that they seek as part of the data underlying the Glue model "the ranking signals, information retrieval scores, the query interpretation that triggers Knowledge Panels[,] and the salient terms for a given user query." Pls.' RPFOF ¶ 1151.

click-and-query data is the fruit of Google's unlawful conduct, which Google uses to build a quality advantage over its rivals. The RankEmbed data is a "small fraction" of Google's overall traffic, Liab. Tr. at 6449:17-25 (Nayak), but the RankEmbed models trained on that data have directly contributed to the company's quality edge over competitors. As Dr. Pandu Nayak, Google's Vice President of Search, testified at the liability trial: "RankEmbedBERT was again one of those very strong impact things, and it particularly helped with long-tail queries where language understanding is that much more important." Liab. Tr. at 6356:21-25 (Nayak). It is important to emphasize again that Plaintiffs do not demand that Google reveal the RankEmbed models themselves or the signals they produced, only the data used to train those models. This is a reasonable method of addressing the consequences of Google's unlawful conduct.

Google will be required to share Glue and RankEmbed data with a Qualified Competitor at least twice. A more than one-time disclosure is reasonable given the importance of updating training data with fresh information. *See* Liab. Tr. at 6449:1-3 (Nayak) (discussing how RankEmbedBERT needs to be retrained to reflect fresh data); *id*. at 7829:1–7832:16 (E. Fox) (discussing DXD-26.004 (discussing frequency of how often ranking components like Navboost and RankEmbedBERT are "refreshed")).[22] The court, however, intends to set a cap on the number of such disclosures that can occur during the term of the judgment. A cap protects against Qualified Competitors free riding on Google's data, and it will lessen the burdens associated with implementing privacy measures that will have to be applied before disclosure occurs. *See* RCOL § III.B.4.b.ii. Consultation with the Technical Committee before setting a cap is

[22] The court, by contrast, limited the Search Index data disclosure to one time, because Qualified Competitors with access to a one-time snapshot of Google's Search Index will be able to use it to develop their own. To be sure, successive disclosures would grant a Qualified Competitor fresher Search Index data. But the court believes that, with the Search Index data, a Qualified Competitor will receive information about websites that Google crawls with greater frequency. With that knowledge, a Qualified Competitor can maintain a fresh search index on its own accord.

critical, however, as that determination will be informed in part by the utility of the datasets disclosed after appropriate privacy-enhancing techniques are applied.

b. Google's Objections

Two of Google's objections merit attention. First, Google asserts that the disclosure of User-side Data will allow Qualified Competitors to train an LLM to mimic Google's ranking of web pages in response to a query. Google's Br. at 42; Google's PFOF ¶ 651. It maintains that a remedy that enables a rival to create a "functional substitute" is untenable under *Massachusetts* and *New York I*. Google's Br. at 42. Second, Google contends that the court must reject the proposed data-sharing remedies, because they fail to spell out the "extensive measures [that] would need to be taken to anonymize the data before it could be disclosed." *Id.* at 43. That lack of specificity, Google claims, will make it "impossible" for "Google or the Court to determine whether Google [is] providing the data required by the 'User-Side Data' provision 'while safeguarding personal privacy and security,' since Plaintiffs have arrogated to themselves the unilateral power to decide what these terms actually mean at some future time." *Id.* (quoting Pls.' RPFJ § VI.C). Neither of these objections warrants forgoing the narrowed User-side Data–sharing remedy.

i. Google's mimicking objection

Google's concern about the mimicking of its search rankings is overstated. It relies on Dr. Allan's testimony that a Qualified Competitor could feed the disclosed User-side Data into an LLM and, through a fine-tuning process, come to "mimic Google's ranking." *See* Rem. Tr. at 2834:12–2836:8, 2843:5-17, 2934:11–2935:21 (Allan). But Dr. Allan qualified his opinion to say that he was not asserting that with User-side Data a Qualified Competitor using an LLM could match Google's quality; rather, his "goal was to look at whether they could improve their systems,

not whether they could be as good as Google." *Id.* at 2946:24–2949:2 (Allan). Helping competitors improve their search engines is precisely what this remedy is designed to accomplish. And that objective is clearly authorized under *Massachusetts*. *See* 373 F.3d at 1215, 1221 (upholding disclosures that would "bolster" rivals' ability to challenge the monopolist and "potential[ly] . . . increase" rival products' capacity to threaten the dominant product).

In any event, mimicking Google Search would be no easy task. For starters, this remedy requires only disclosure of underlying data; it will be up to Qualified Competitors to engineer the technology and develop the infrastructure to make use of it. Those are important variables that Dr. Allan acknowledged would factor into whether a Qualified Competitor could mimic Google. Rem. Tr. at 1550:20–1551:23 (Mickens) (discussing portion of Dr. Allan's deposition contained in PXRD010 at 63). What's more, the models that utilize this data hardly represent the bulk of Google's Search-related technologies. As Dr. Allan explained, he was not opining that a Qualified Competitor could replicate Google's search infrastructure. Some components, perhaps, but "it would be a long slog to get through all of them." *Id.* at 2950:3-2952:8 (Allan) (discussing PXR0172). Additionally, Plaintiffs have clarified that some of the key information underlying Glue and RankEmbed data that Dr. Allan relied on for his opinion—including, query-based and document salient terms—is not included within the definition of User-side Data. Pls.' RPFOF ¶¶ 1151–1152; Rem. Tr. at 2832:22–2834:11 (Allan). The court can only speculate how that narrowing affects the prospect of mimicking Glue or RankEmbed models.

In addition, some of Dr. Allan's mimicking concerns are mitigated by the court's narrowing of the remedy. For instance, Dr. Allan opined that a Qualified Competitor could mimic all of Google's top-level ranking signals using a combination of certain known top-level signals, like quality and popularity, and other data. Rem. Tr. at 2834:12–2836:8, 2956:4-12 (Allan). The court

is not requiring the disclosure of those ranking signals. The court also will cap the number of times a Qualified Competitor can receive datasets. Qualified Competitors therefore will not usually have datasets as fresh and robust as Google's. Google, meanwhile, will continue to update its own datasets with fresh information on a routine basis. *See* Liab. Tr. at 7829:1–7832:16 (E. Fox) (discussing DXD-26.004 (discussing frequency of how often ranking components like Navboost and RankEmbedBERT are "refreshed")).

There is also one other important way in which the actual datasets to be shared dampen mimicking concerns: they will be subject to privacy-enhancing techniques that will diminish their full utility. Rem. Tr. at 1147:10–1148:14, 1164:18–1165:8 (Evans) (discussing the privacy-utility tradeoff); *id.* at 3676:24–3678:18 (Culnane) (same). As discussed further in the next section, applying those techniques to promote user privacy will result in the release of less than the full datasets. *Id.* at 1154:2–1160:20 (Evans) (explaining loss of records when using a privacy-enhancing technique known as k-anonymity, and discussing example of Google's data disclosure under the European Digital Marketing Act where Google's privacy filters resulted in the exclusion of 99% of queries). Dr. Allan did not opine that with a diminished dataset a Qualified Competitor still could effectively mimic Google.

These factors make this remedy different than the disclosure remedy of "extremely broad scope" rejected in *New York I* and affirmed in *Massachusetts*. *Massachusetts*, 373 F.3d at 1219; *see also New York I*, 224 F. Supp. 2d at 173–77, 226–33. In that case, the district court refused to adopt a remedy that sought "vast disclosures and royalty-free licensing of technical information" that the plaintiffs claimed was justified to prevent Microsoft from engaging in *future* conduct that fell outside the conduct determined to be unlawful. *New York I*, 224 F. Supp. 2d at 173–74. The

court found that the proposed disclosures sought to "broadly facilitat[e] interoperation in markets unrelated to the monopoly market" and thus were "without basis." *Id.* at 175.

The court also rejected the "over-broad" remedy because "it [was] likely [to] enable wholesale copying or cloning of Windows . . . ." *Id.* at 175–76. The plaintiffs' proposed disclosure of technical information centered on their conception of "interoperability," which the court found was really "an aspiration of perfect interoperation" that equated "interoperability with 'interchangeability.'" *Id.* at 227. Under the plaintiffs' proposal, a "Windows client would not be 'interoperable' with a non-Microsoft server unless Microsoft's competitors have the information necessary to ensure that their server operating systems can provide Windows clients *with every service* that a Microsoft server operating system provides." *Id.* at 227–28 (emphasis added). The court was concerned that this type of comprehensive sharing of technical information would "enable the cloning of Windows." *Id.* at 228. As the court put it, the plaintiffs sought disclosures that "would likely provide other software companies with the equivalent of *the blueprints* not only to the Windows operating system for PCs, but also the server version of Windows." *Id.* at 229 (emphasis added). "Once provided with the equivalent of the blueprints for Windows, competitors would have little trouble, and comparatively less cost, writing their own implementation of everything valuable in Windows . . . ." *Id.*

The User-side Data remedy is fundamentally different. Importantly, it is tethered to an appropriate remedial objective: the goal of denying Google the fruit of its violations. It also poses no threat to reveal the "blueprints" to Google's search infrastructure and technology. Dr. Allan never testified that disclosure of Glue and RankEmbed data would enable a Qualified Competitor to "writ[e] their own implementation of everything valuable in [Google]." *Id*. Further, the remedy involves no compelled disclosure of intellectual property or trade secrets, such as algorithms,

ranking signals, or post-trained LLMs used to deliver GenAI results. Plaintiffs also have made clear that they are not seeking even modest proprietary data, such as query- and document-salient terms or human-rater scores. The sharing of raw user data does not pose the same risks of "cloning" that were present in *New York I*. And finally, the limited disclosure ordered here will not dampen Google's incentive to innovate, *see supra* RCOL § III.B.1, a consequence the court in *New York I* feared but this court does not. *See New York I*, 224 F. Supp. 2d at 176–77; *see also Massachusetts*, 373 F.3d at 1219–20.

ii. Google's privacy objection

Next, Google opposes release of any User-side Data because of the associated risks to user privacy. Google's Br. at 34–35, 43–44. This is a valid concern. Both sides presented privacy experts who agreed that the disclosure of User-side Data without applying adequate anonymization and privacy-enhancing techniques would reveal sensitive user information. Rem. Tr. at 1136:14–1138:18 (Evans); *id.* at 3680:25–3684:5 (Culnane). Think of a search query from a user in a small town regarding a rare health condition. Even if the user's name is not included in the data, context could reveal their identity. *See id.* at 3682:8-20 (Culnane) ("[I]t doesn't require that personally identifiable information to be there in order to perform a reidentification."); *see also id.* at 3521:13–3522:6 (Reid) (explaining that "users' queries can be very private without containing sort of direct personally identifiable information" and explaining how context of a search could identify a user).

Both experts agreed, however, that user privacy could be preserved with appropriate privacy-enhancing techniques and methods, such as adding noise, generalization, and k-anonymity. *Id.* at 1133:5-15, 1163:20–1165:8 (Evans) (explaining that there are multiple privacy-enhancing techniques that could be used, that they could be used together to preserve privacy, and

that the at-issue data "can be safely shared by Google in a way that assures privacy while providing utility"); *id.* at 3730:2-12 (Culnane) (stating that Google could "share some data" and adequately achieve privacy safeguards); *see also id.* at 1142:12–1146:23 (Evans) (discussing noise); *id.* at 1154:19–1156:10 (Evans) (discussing generalization, suppression, and query-intent grouping to satisfy k-anonymity).

That is not to say that protecting privacy will be easy. Anonymizing and securing datasets as large as those underlying Glue and RankEmbed, while attempting to optimize their usefulness, no doubt will be challenging. *See id.* at 3809:3–3810:4 (Culnane) (discussing privacy issues with query strings and URLs); *see supra* RCOL § III.B.4.b.i. At the same time, the court does not accept that the lack of particulars is fatal to the User-side Data–sharing remedy. It is entirely appropriate for the court (and Plaintiffs) to rely on the Technical Committee to "facilitate the resolution of potentially complex and technologically nuanced disputes between [Google] and others over the practical workings of" the final judgment. *Massachusetts*, 373 F.3d at 1244 (citation omitted). The court therefore is unpersuaded by Google's contention that the User-side Data–sharing remedy is too vague to adopt and implement because it does not precisely spell out important privacy safeguards.

5. Ads Data

The final component of Plaintiffs' data-sharing proposal is Ads Data. Pls.' RPFJ § VI.E. Plaintiffs define "Ads Data" to mean "data related to Google's selection, ranking, and placement of Search Text Ads in response to queries, including any User-side Data used in that process." *Id.* § III.A. The remedy would require Google to

> provide Qualified Competitors, at marginal cost, the following Ads Data, in addition to any data made available by Google via the APIs required under Sections VII and VIII: Ads Data used to operate, build or train AdBrain models or other models used in Ads targeting,

> retrieval, assessing ad relevance, bidding, auctioning (including predicted click-through rates (pCTR)), formatting, or content generation.

Id. § VI.E. Like the User-side Data remedy, Google would be required to "use ordinary course techniques to remove any Personally Identifiable Information" and apply appropriate privacy-enhancing techniques before making the data disclosure. *Id.* § VI.F.

Plaintiffs' Ads Data–sharing remedy is premised on the court's liability determination that "[s]cale also improves search ads monetization." *Google*, 747 F. Supp. 3d at 161; *see* Pls.' PFOF ¶ 713. "Understanding which advertisements users click on (or scroll past) enables Google to evaluate ad quality and serve more relevant ads in the future. The more precisely targeted an ad, the greater likelihood that it will be clicked, which translates into higher revenues that Google uses to make larger revenue share payments." *Google*, 747 F. Supp. 3d at 161 (citation omitted); *see also* Rem. Tr. at 3304:16–3305:4 (Israel) (agreeing that "scale improves search ad monetization," and "all else equal," "more scale improves ads quality"). Based on these findings, Plaintiffs posit that "[t]he Ads Data[–]sharing remedies will increase competition in the [general] search text ads marketplace by enabling rivals to overcome the scale barrier." Pls.' PFOF ¶ 714. Plaintiffs say they seek disclosure only of the "raw Ads Data serving as inputs into the components of Google's Auction and Prediction stack." Pls.' RPFOF ¶ 1169. The court finds that this remedy is both too broad and suffers from a failure of proof.

The parties disagree about the precise scope of the Ads Data remedy, *see, e.g.*, Pls.' RPFOF ¶ 1169, but Plaintiffs concede that it at least includes conversion data from advertisers. *See generally id.* ¶¶ 1169–1184 (not disputing that the Ads Data remedy would require such disclosure); RDX0708 at -005 to -006 (Plaintiffs' interrogatory response stating that Ads Data would include "raw data, from whatever source (e.g. users, advertisers, or Google) that serves as

an input to the models referenced above"); Rem. Tr. at 4410:9-11 (Muralidharan). Google "join[s] up with the clicks" the conversion data it receives to determine if the "ad [had] value or not." Rem. Tr. at 4408:3–4410:17 (Muralidharan). An example of conversion data is whether a user made a purchase or how long the user spent on a web page, even if the user did not get to the site by clicking a Google text ad. *Id.* It also can include information about loyalty programs and actual store visits. *Id.* at 4410:1-6, 4416:5-13 (Muralidharan). Advertisers view their data with Google, especially conversion data, to be "particularly sensitive" because it can provide competitive insight into business strategies and their outcomes. *Id.* at 4418:13–4419:14 (Muralidharan). Google agrees not to share such data with anyone absent the advertiser's consent. *Id.* at 4419:15-18, 4420:25–4421:12 (Muralidharan); RDX0130 at -005 (Google Analytics Terms of Service stating that Google will not share the advertiser's customer data without consent). This type of advertiser-supplied data, which does not come directly from user interaction with Google, is steps removed from the type of data at scale that the court views as the primary fruit of Google's distribution agreements.

Not only is the remedy's scope too broad, but the court lacks basic information about what data is subject to disclosure. Plaintiffs would have Google reveal all data "used to operate, build or train AdBrain models or other models . . . ." Pls. RPFJ § VI.E. The court heard no specific testimony about "AdBrain models," *see* Rem. Tr. at 4402:5–4406:14 (Muralidharan) (Google's counsel mentioning AdBrain when reading the proposed remedy but not eliciting specific testimony), and the term appears nowhere in Plaintiffs' post-trial submissions. Plaintiffs also have not specified what "other models" might be implicated.

Nor have Plaintiffs come forward with sufficient evidence showing how Ads Data–sharing will increase competition in the general search text ads market. Plaintiffs conceded in closing

argument that the lone seller of digital ads that they called to testify—adMarketplace—does not today meet the definition of Qualified Competitor. *Id.* at 4770:10–4771:11 (Closing Arg.) (agreeing that adMarketplace would be eligible for data-sharing remedies only "to the extent [it] was able to build technology and had a plan to build technology that . . . they could use to partner with an entrant or another general search engine").[23] That stands in sharp contrast to the GSE product market, for which Plaintiffs called multiple current competitors (Bing, Yahoo, and DuckDuckGo) and emerging ones (ChatGPT and Perplexity) to advocate for those data-sharing remedies. Notably, Plaintiffs did not ask the only other actor in the search text ads market—Microsoft—to comment on the Ads Data–sharing remedy. *See Google*, 747 F. Supp. 3d at 138–39; Rem. Tr. at 848:22–849:12 (Weinberg) (DuckDuckGo syndicates ads from Microsoft); Liab. Tr. at 61:20-22 (Opening Arg.) (Yahoo syndicates ads from Microsoft).

Lastly, the court agrees with Google's expert in industrial organization economics, Dr. Mark Israel, that competition in the general search text ads market does not stand on its own, but is driven by competitive conditions in the market for GSEs. Rem. Tr. at 3191:24–3192:18 (Israel). Advertisers will go to whichever GSE wins the competition for queries. *Id.* at 3193:19–3195:14 (Israel). Greater competition in the general search text ads market will follow only if there is greater competition in the market for GSEs. *Id.* at 3194:22–3195:3 (Israel). The data bears this out. As the liability-phase evidence showed, advertisers consistently allocate about 90% of their ad spend with Google and 10% with Bing—percentages that almost precisely track each company's share of the GSE market. *Google*, 747 F. Supp. 3d at 76 ¶¶ 232–233; *see also id.* at 138. There is little evidence that competition would be enhanced if, say, with raw ads data from

[23] adMarketplace belatedly seeks to file an amicus brief to rebut this concession. *See* adMarketplace, Inc.'s Mot. for Leave to File Br. as *Amicus Curiae* in Support of Pls., ECF No. 1423. That request comes far too late. The court will deny adMarketplace's request by a separate Minute Order.

Google, Microsoft were able to serve higher quality ads or improve its search text ads monetization. Rem. Tr. at 3196:2–3197:12 (Israel).

Plaintiffs cite some testimony and documents to suggest otherwise, *see, e.g.*, Pls.' PFOF ¶ 721, but that evidence does no more than stand for the unremarkable proposition that better ad quality improves the user experience and poor ad quality can drive users away, *see, e.g.*, Rem. Tr. at 4614:10–4615:16 (Chipty) (discussing PXR0246 at -156 and PXR024 at -033 and -064). It does not establish that Bing would be able to siphon off users from Google or that more advertisers would flock to Bing if only its ad quality or monetization improved.

In sum, given the poor fit and dubious efficacy of the Ads Data remedy, the court declines to adopt it.

C. Syndication Remedies

1. Search Syndication

a. The Remedial Terms

The next category of behavioral remedies that Plaintiffs urge involves the syndication of search results by Google to Qualified Competitors. "Syndication" in this context means an arrangement whereby one GSE provides another GSE the results and content for its SERP. Rem. Tr. at 2957:25–2958:6 (J. Adkins). Section VII of Plaintiffs' RPFJ provides:

> Google must take steps sufficient to make available to any Qualified Competitor, at no more than marginal cost of this syndication service, a syndication license whose term will be ten (10) years from the date the license is signed, and which will require Google, via real-time API(s), to make the following information and data available in response to each query issued or submitted by a Qualified Competitor . . . .

Pls.' RPFJ § VII.A. The data that Google must produce as to each query includes:

1. Data sufficient to understand the layout, display, slotting, and ranking of all items or modules on the SERP, including but not limited to the mainline content and sidebar content and sitelinks and snippets;

2. Ranked organic search results obtained from Google database or index, regardless of whether such web content was obtained by crawling the Internet or by other means;

3. Search features that enable query corrections, modification, or expansion like spelling, synonyms, autocomplete, autosuggest, related search, "did you mean," "people also ask," and any other important query rewriting features identified by the [Technical Committee];

4. Local, Maps, Video, Images, and Knowledge Panel search feature content; and

5. FastSearch results (fast top organic results).

Id. To emphasize the comprehensiveness of the remedy, Plaintiffs state that Google must provide information "the same as if the Qualified Competitor's query had been submitted through Google.com." *Id.* And Google must make the syndicated content available "with latency and reliability functionally equivalent to what Google provides for its own SERP." *Id.* § VII.C.1. Also, Google would have to allow any Qualified Competitor with a pre-existing syndication license with Google to terminate its existing agreement and opt into the remedies available under the final judgment. *Id.* § VII.G.1.

Plaintiffs also propose that Qualified Competitors would be freed of any limitations on the use of the data that they receive from Google. Google "may impose no restrictions on use, display, or interoperability with Search Access Points, including of GenAI Products, provided, however, that Google may take reasonable steps to protect its brand, its reputation, and security." *Id.* § VII.B. Qualified Competitors would have complete discretion over which results and features to display. *Id.* And "Google may not place any conditions on how any licensee may use syndicated

content," and it may not use or retain any queries or information that it receives from a Qualified Competitors for its own products. *Id.*

Plaintiffs recognize that an unlimited syndication right for 10 years could create dependency on Google and disincentivize Qualified Competitors from investing to improve their own GSE. So, Plaintiffs propose that access to syndicated results would "decline over the course of a 10-year period with an expectation that licensees will become independent of Google over time through investment in their own search capabilities." *Id.* § VII.C.2. The applicable rate of decline is to be determined in consultation with the Technical Committee. *Id.*

There is one last important piece to the proposed syndication remedy. Qualified Competitors would be permitted to submit "synthetic or simulated queries" to Google. *Id.* § VII.E. These are essentially made-up queries, by a human or machine, that a Qualified Competitor could ask Google to run to test towards developing its own GSE. Rem. Tr. at 2813:3–2814:3, 2852:5-20 (Allan). Plaintiffs and the Technical Committee would determine a maximum number of allowable synthetic queries. Pls.' RPFJ § VII.E.

b. Evaluating the Search Syndication Remedy

The court agrees with Plaintiffs that a syndication remedy satisfies *NSPE*'s "reasonable method" standard, but it is far too broad as proposed and must be narrowed.

The rationale for the syndication remedy is straightforward. It will take time for a Qualified Competitor to build its own search index and the capacity to deliver high-quality search results. *See* Rem. Tr. at 424:18–425:24 (Turley) (stating that developing a high-quality search index is a multi-year project). But poor results from the start could doom the enterprise before it gets off the ground, as users may not give a competitor a second look if it cannot deliver quality results from the outset. *Id.* at 834:10-19 (Weinberg) (discussing "rage quit queries").

Syndication addresses that problem. It would enable Qualified Competitors to compete in the short term as they work towards developing a GSE that can independently compete against Google. *See id.* at 425:1-10 (Turley) ("The syndicated search results would be helpful now. . . because it allows us to immediately to improve quality of the product on . . . the dimension of real-time information and currency, and allows us to focus on building out the parts on which we can most differentiate . . . ."); *id.* at 828:20–829:1 (Weinberg) (stating syndication "in the short term" would help close "[scale] gaps"). It would aid, in particular, in answering long-tail and local queries and queries for which freshness is important. *See id.* at 425:1-10 (Turley); *id.* at 827:3-12 (Weinberg). Even Google's primary syndication witness, Director of Product Management Jesse Adkins, agreed that "search syndication can provide a bridge until a new search engine can become a fully independent search engine." *See id.* at 3023:16–3024:14 (J. Adkins) (discussing PXR0189); *see id.* at 3027:10-12 (J. Adkins) ("A search engine can use other search services in its early days while it's building its own search engine to augment their own results and to improve."). Syndication therefore is a "reasonable method" of addressing the effects of Google's anticompetitive acts.

But just because the syndication remedy is reasonable does not mean that it is a proper fit in Plaintiffs' proposed form. The court narrows it in multiple ways.

First, the scope of syndication will be restricted. Plaintiffs' syndication requirement is exceedingly broad. It includes not only organic web results, but seemingly all features that appear on the SERP and related data. Google must provide for each query access to "mainline content and sidebar content and sitelinks and snippets" and "Local, Maps, Video, Images, and Knowledge Panel search feature content," with no apparent limitation. Pls.' RPFJ § VII.A. It also must supply

the data that would help understand how *Google* would lay out, display, slot, and rank "all items or modules on the SERP." *Id.*

The forced wholesale sharing of such features and related data goes beyond what is appropriate to close the scale gap. Further, the breadth of information that Google would have to disclose would enable Qualified Competitors to effectively replicate how Google delivers its SERPs. How else to explain Plaintiffs' insistence that Google must provide information that is "the same as if the Qualified Competitor's query had been submitted through Google.com"? *Id.* § VII.A; *see Massachusetts*, 373 F.3d at 1218–19 (addressing "cloning Microsoft's software and mimic[king] its functionality"). Plaintiffs' remedy also has no commercial equivalent. No current Google customer receives such broad syndication services. Rem. Tr. at 3434:13 (Reid) (stating that the search syndication remedy is "not really a standard syndication deal"); *id.* at 3478:20–3479:17 (Reid). And Plaintiffs have offered no proof that any other search syndicator offers anything comparable. *Cf. New York I*, 224 F. Supp. 2d at 137 (rejecting proposed definition of "middleware" because its breadth "threatens to interfere with ordinary and legitimate commercial practices inherent in Microsoft's participation in the software industry").

Even the "[r]anked organic search results" syndication term is too broad. Pls.' RPFJ § VII.A.2. It requires Google to supply those results "regardless of whether such web content was obtained by crawling the Internet *or by other means*." *Id*. (emphasis added). But, as discussed, some of the information that appears on Google's SERP is obtained from third parties and therefore is not scale dependent. *See supra* RCOL § III.B.3. Plaintiffs do not assert (much less demonstrate) that a Qualified Competitor cannot acquire that information on its own for display it on its own SERP. *See* Rem. Tr. at 3482:14–3483:1, 3508:14–3509:7 (Reid) (noting that what is on a third-party SERP is for the third-party to figure out and that Google's syndication contracts allow the

partner to supplement the syndication feed provided by Google to deliver search results). The court thus limits Section VII.A.2 to "ranked organic *web* search results obtained from crawling the web." *Cf. id.* at 3493:1-8 (Reid) (interpreting "organic search results" to "refer to all parts of a page that aren't ads").[24]

Google's syndication obligations under Section VII.A shall be consistent with its current syndication agreements. A Qualified Competitor who opts into the syndication remedies shall receive organic results and features on terms no less favorable than a current licensee as of the date the judgment is entered. That means Google must provide to a Qualified Competitor its Local, Maps, Video, Images, and Knowledge Panel features that it provides under current agreements. *See id.* at 3482:17–3483:1 (Reid) (stating Google syndicates a subset of its Knowledge Graph); *id.* at 3491:12–3492:12 (Reid) (discussing syndication of subunits of Local); *id.* at 3498:21–3499:1 (Reid) (testifying about syndication of video and images in "select cases"). It also must provide user-facing query-rewriting features, but not those on the back end. *See id.* at 3496:3-20 (Reid) (discussing syndication of such features).

Plaintiffs acknowledge that their syndication remedy goes beyond ordinary commercial terms. *See* Pls.' Br. at 40–41. They defend their approach, however, on the ground that, "[u]nlike commercial syndication arrangements, the syndication provisions in Plaintiffs' proposal are designed to help rivals and entrants create independent offerings over the course of the remedial period." *Id.* The court appreciates Plaintiffs' instincts. But the court's must differ. "Judges must be wary . . . of the temptation to specify 'the proper price, quantity, and other terms of dealing'—cognizant that they are neither economic nor industry experts." *Alston*, 594 U.S. at 102 (quoting *Trinko*, 540 U.S. at 408). And although "Congress has been liberal in enacting remedies to enforce

[24] If there are technical feasibility issues with syndicating only crawled web results, Google shall so advise the court.

the antimonopoly statutes[,] . . . in no instance has it indicated an intention to interfere with ordinary commercial practices." *Bausch & Lomb*, 321 U.S. at 728. The court therefore believes that when it comes to a remedy like syndication for which there is an established market and which requires Google to deal with a Qualified Competitor, it is best to hew closely to ordinary commercial terms.

Second, Google will *not* be required to provide syndication services at "no more than . . . marginal cost." *See* Pls.' RPFJ § VII.A. Pricing shall be based on "financial terms no worse than those offered to any other user of Google's search syndication products." *Cf. id.* § VIII.E (pricing term for Search Text Ads Syndication). This change is necessary for the compelling reasons set forth in the *amicus* brief submitted by Brave Software, Inc., a small U.S.-based web browser and GSE developer. Br. of *Amicus Curiae* Brave Software, Inc. in Support of Neither Party, ECF No. 1304-1 [hereinafter Brave Br.]. Brave is the only U.S. company other than Google and Microsoft that "has built the technology to crawl the web and construct a search index capable of generating all of its own search results." *Id.* at 1. As Brave points out, syndication at "marginal cost" for a term of years would create perverse incentives. It would encourage market entry by "white label" GSEs in the short term—that is, a GSE that would seek simply to present Google search results under a different brand name. *See id.* at 5–9. Such entrants could exist for years at nominal cost and will lack the incentive to differentiate and invest for the long term. *See id.* Plaintiffs' expert, Dr. Chipty, recognized this risk, testifying that the syndication remedy could create a free-rider problem, whereby "rivals would [not] have incentives to innovate in the future if [they] could take advantage of Google's innovation." Rem. Tr. at 2165:12–2166:11 (Chipty). By requiring a Qualified Competitor to pay a market rate for syndication, a Qualified Competitor

will be incentivized to invest in its own search index and search technology to lower the marginal cost of a query response. *See* Brave Br. at 22–23.

Ordering Google to syndicate at "marginal cost" also would interfere with a different product market: the one for search syndication. *See* Brave Br. at 9–12. There is such a market in the United States, with at least two suppliers other than Google: Microsoft and Brave. Rem. Tr. at 1084:3-13 (Schechter); *id.* at 4031:23–4032:3 (Hitt). Under Plaintiffs' proposed pricing term, "no independent GSE . . . could sell its search results at or below Google's marginal cost and still cover its own costs, much less earn a profit." Brave Br. at 10. Brave "rel[ies] on this revenue stream" and would lose income, *id.*, and with little prospect of profiting from syndication, independent GSEs like Brave "will cease or decrease investment in maintaining (let alone improving) their search indices," *id.* at 10–11. Syndication with Google at "marginal cost" therefore will reduce, if not eliminate, competition in the market for syndicated search results. Equity cannot countenance such an outcome. *See New York I*, 224 F. Supp. 2d at 136 ("Court[s] must be 'careful to avoid constructions of § 2 [of the Sherman Act] which might chill competition, rather than foster it.'" (quoting *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447, 458 (1993)).

Third, the syndication license shall be for five, not 10 years. Witnesses consistently described syndication as a near-term solution that would enable Qualified Competitors to offer high-quality results while working towards building a search index that could compete with Google's. *See, e.g.*, Rem. Tr. at 424:20–425:24 (Turley); *id.* at 828:20–829:9, 844:19–845:9 (Weinberg); *id.* at 2164:2-13 (Chipty) (describing syndication as "an immediate solution that would give rivals the ability to more rapidly create consumer-facing products"). No witness, however, said that such a solution required a 10-year license. Nick Turley, Head of Product for ChatGPT, thought that if ChatGPT could not build an index within five years that "can stand on

its own feet that we are proud of, that would be something that I'd want to re-evaluate about our strategy." *Id.* at 426:16-25 (Turley). Brave's experience suggests that a Qualified Competitor could become independent of Google perhaps even faster.[25] A five-year license will force Qualified Competitors to wean themselves from Google's syndication services more quickly.

Fourth, Qualified Competitors' use of Google's syndication services in the first year will be capped at 40% of annual queries. Establishing this query cap is consistent with the record evidence that competitors are capable of building search technologies that will allow them to answer 80% of user queries "pretty quickly." *See* Rem. Tr. at 838:25–839:7 (Weinberg); *see also id.* at 394:17–395:21 (Turley) (OpenAI set an initial goal of serving 80% of its traffic from its own search index because "serving 80 percent is a lot more tractable."); *id.* at 796:8-17 (Shevelenko) (Perplexity is approaching the point where increasing the size of its search index that it built for $10 million may help with quality only "somewhat."); *see also Google*, 747 F. Supp. 3d at 36–37 ¶ 14 (Neeva was able to serve responses to 60% of queries within three years). It is the last 20%—long-tail and other rare queries—where Google's scale advantage gives it the competitive edge that is hard to overcome. Rem. Tr. at 395:11-17 (Turley) ("[O]nce you get into the final 20 percent, there are so many queries that our users might be interested in . . . that rely on sources that we see very, very rarely, if at all, or they may require sources we don't even know exist that are on the web . . . ."); *id.* at 989:19-22 (Weinberg) ("I think it's pretty clear that people leave DuckDuckGo for Google because of long tail searches."). Imposing a cap, therefore, is consistent with the notion that Qualified Competitors should rely on syndicating responses with Google only for rare queries. *See* Brave Br. at 19–20.

[25] *Cf. Brave Search Removes Last Remnant of Bing from Search Results Page, Achieving 100% Independence and Providing Real Alternative to Big Tech Search*, BRAVE (Apr. 27, 2023), https://perma.cc/2F5M-SZDY (Brave began delivering 100% of results from its own search index within approximately two years).

The court sets the first-year cap at the higher mark of 40%, however, because the record is not clear as to how rare a query must be to be considered in the long tail. The Allcott study examined all Bing desktop searches over 12 months in 2021 and 2022 and determined that "more than 38.7 percent of searches are for rare queries that are searched less than 100 times." Allcott Study at 29. The court sets a 40% cap in the first year consistent with the study's finding.

The court also intends to adopt a tapering provision that reduces the percentage of queries all Qualified Competitors can annually syndicate from Google. *See* Brave Br. at 16–17. The court is tempted to reduce the cap in equal increments over the license's five-year term (i.e., a 40% cap in year one, a 32% cap in year two, a 24% cap in year three, etc.). But as the developments in this case show, the pace of technological innovation is not so linear. Given the technical nature of this subject (and the humility with which judges must approach crafting a remedial decree), the court will call on the Technical Committee to assist in devising an approach that facilitates competition but incentivizes Qualified Competitors to move promptly to become independent of Google.

Fifth, the court rejects Plaintiffs' demand that "Google may not place any conditions on how any licensee may use syndicated content." Pls.' RPFJ § VII.B. Google's ordinary-course syndication agreements contain restrictions on how a licensee may use search results. Rem. Tr. at 2996:22–2998:14 (J. Adkins); *see Bausch & Lomb*, 321 U.S. at 728 (cautioning against "interfer[ing] with ordinary commercial practices"). For instance, licensees are prohibited from "scraping, indexing, or crawling" the syndicated search results. Rem. Tr. at 2996:22–2998:14 (J. Adkins) (discussing RDX0046 at -003 § 1.4 and RDX0420 at -007 to -008 § 3.1). These types of restrictions are meant to protect Google's intellectual property. *See id.* at 3479:21–3480:17 (Reid). Such use restrictions are common industry practice. *Id.* at 990:10-16 (Weinberg) (Microsoft restricts DuckDuckGo's use of syndicated search results); *id.* at 1071:20–1072:18 (Schechter)

(discussing RDX0380 at -002 to -003 § 4 (Use of the Services term in Microsoft syndication agreement)); *id.* at 1277:10-14 (Provost) (Microsoft limits Yahoo's ability to use search results for "algorithmic training or reverse engineering"). Even Google's agreement with Yahoo Japan contains such restrictions. *Id.* at 3114:10-23 (J. Adkins) (discussing PXR0598 at -734 § 9.4(b)). Also, the purpose of this remedy is to provide a short-term measure for Qualified Competitors to compete as they improve their own search capabilities, not an additional means to facilitate that development. Other remedies serve that latter purpose. Ordinary commercial restrictions on use therefore are consistent with the objective of the search syndication remedy.

Sixth, Google will not be required to receive and respond to synthetic queries. According to Plaintiffs, synthetic queries and storing of their results can improve search quality. Pls.' PFOF ¶¶ 749–754. Such queries can "improve ranking," *id.* ¶ 749, and "will assist Qualified Competitors to improve their quality through experimentation," Pls.' RPFOF ¶ 1189. But these claims suffer from a lack of proof. None of Plaintiffs' industry witnesses testified to the relationship between synthetic queries and quality improvement, or that synthetic queries are ordinarily allowed under U.S.-market syndication agreements to improve search quality. Rem. Tr. at 1277:2-9 (Provost) (stating that under Yahoo's syndication agreement with Microsoft it is permitted to send synthetic queries to perform non-descript "testing"). Also, the theory behind synthetic queries is not consistent with the search syndication remedy. The opportunity to syndicate with Google, once more, is meant to help a Qualified Competitor compete until it becomes an independent GSE, not as a way to improve search results.

Plaintiffs rely on two unpersuasive pieces of evidence to support the synthetic query remedy. They point to DuckDuckGo CEO Gabriel Weinberg's testimony to support a connection between synthetic queries and improved ranking, but the cited testimony refers only to *syndicated*

search results. Pls.' PFOF ¶ 749 (citing Rem. Tr. at 832:2-9 (Weinberg) (responding to a question about the benefit of storing "syndicated responses and corresponding user-side data")). Plaintiffs mainly hang their hat on Google's syndication agreement with Yahoo Japan, which grants Yahoo Japan permission to submit synthetic queries and store their results "to assist in its search quality evaluations." *See* PXR0598 at -723 § 2.7(c). But Plaintiffs offered no evidence as to what "search quality evaluations" means under the agreement. Google, on the other hand, offered testimony that the term exists so that Yahoo Japan can ensure that *Google's* syndicated results conform to Japanese law. Rem. Tr. at 3111:15–3112:15 (J. Adkins). Plaintiffs offered no contrary evidence, and Google's explanation is consistent with the fact that the agreement permits Yahoo Japan to submit synthetic inquiries only "to scrape the sections of Google's Japanese Sites." *See* PXR0598 at -723 § 2.7(c). That is a different purpose for synthetic queries than proposed by Plaintiffs.

Seventh, Google will not be required to syndicate FastSearch results. Pls.' RPFJ § VII.A.5. Recall, FastSearch is a technology that rapidly generates limited organic search results for certain use cases, such as grounding of LLMs, and is derived primarily from the RankEmbed model. FOF ¶ 44. Google does not use FastSearch results for its SERP. Rem. Tr. at 3510:8-11 (Reid). And it does not directly syndicate FastSearch results. FOF ¶ 45. Rather, FastSearch results are delivered through Vertex, Google's cloud-based grounding product. *Id.* Given FastSearch's function, forced syndication of its results is an ill-fitting remedy. That data will not help GSEs improve search results. *See* FOF ¶ 44 (FastSearch results are less reliable than results from the Search product). Its primary use case is grounding for GenAI products, but Plaintiffs have not asked the court for a remedy that would forbid Google from refusing a Qualified Competitor's request to receive services through Vertex. The court will not require Google to create a syndication service for FastSearch results, when it does not do so now.

* * *

The syndication remedy, albeit narrowed, will serve its intended purpose: Qualified Competitors will be able to deliver high-quality web results for five years while they build their own search index and search stack. Google will not be able to refuse a Qualified Competitor's syndication request.[26] *Cf.* Rem. Tr. at 411:21–420:6 (Turley) (discussing PXR0181). At the same time, the narrowed remedy strikes an important balance. It addresses Google's concerns that the forced syndication contemplated by Plaintiffs exceeds ordinary commercial terms and places its intellectual property at risk. It also lays to rest Google's contention that the syndication remedy places the court in the role of a "central planner," as syndication agreements with Qualified Competitors generally will have to follow ordinary commercial terms and therefore will not need to be customized. Google's Br. at 51–52 (quoting *Alston*, 594 U.S. at 103). The final syndication remedy is thus "tailored to fit the wrong creating the occasion for the remedy." *Microsoft III*, 253 F.3d at 107.

2. Search Text Ads Syndication

a. <u>The Remedial Terms</u>

To complement their search syndication remedy, Plaintiffs also propose that Google be required to syndicate Search Text Ads to Qualified Competitors. Pls.' RPFJ § VIII.E. Plaintiffs use the term "Search Text Ads" as shorthand for "a general search text advertisement, which is an ad that resembles an organic link on a SERP." *Id.* § III.Y. This definition aligns with the court's liability findings that Google does not have monopoly power in the broader search ads market,

[26] And to the extent Google argues that the data-sharing and syndication remedies should be rejected as impermissible "[e]nforced sharing" or "compell[ed] negotiation between competitors" under *Trinko*, *see* Google's Br. at 44, 52 (quoting *Trinko*, 540 U.S. at 408, 415), the Ninth Circuit recently rejected that very argument. *See In re Google Play Store*, 2025 WL 2167402, at *17 (clarifying that *Trinko*'s proposition that "forced sharing" creates "tension with the underlying purpose of antitrust law" arose out of a question as to whether the refusal to deal with rivals supported a finding of Section 2 *liability*, not as to the propriety of ordering a defendant already found liable to deal with rivals).

see Google, 747 F. Supp. 3d at 133–136, but that its exclusionary conduct had an anticompetitive effect in the general search text ads market, *see id.* at 177–181.

The Search Text Ads syndication remedy has multiple components: "Google must take steps sufficient to make available to any Qualified Competitor a Search Ads Syndication License whose term will be ten (10) years from the date the license is signed." Pls.' RPFJ § VIII.E. Google must provide "latency, reliability, and performance functionally equivalent to what Google provides for Search Text Ads on its own SERP." *Id.* The syndication service shall extend to all types of Search Text Ads that appear on Google's SERP. *Id.* Google must offer it "on financial terms no worse than those offered to any other user of Google's Search Text Ads syndication product, e.g., AdSense for Search, or any other current or future products offering syndicated Search Text Ads." *Id.* Qualified Competitors also "must have the right to set a minimum [cost per click ("CPC")] for ads syndicated . . . to appear on their website." *Id.*

Google cannot discriminate against Qualified Competitors who opt into this remedy. It "must include Qualified Competitors in its Search Partner Network," which is a collection of Google's ad syndicators' sites. *Id.* It also "must make the purchase of ads syndicated under this Paragraph available to advertisers on a nondiscriminatory basis comparable to, and no more burdensome than, the availability of Google's other Search Text Ads." *Id.*

There is more. Google also must deliver a slew of data associated with a syndicated ad. "For each syndicated ad result, Google must provide to the Qualified Competitor all Ads Data related to the ads provided to the Qualified Competitor, including the identity of the advertiser and CPC paid, and conversion data where available, without restrictions on use of the Ads Data including restrictions on using it to market or solicit advertisers for Qualified Competitors' own advertising products." *Id.* Further, "Google may impose no restriction on use, display, or

interoperability with Search Access Points, including of GenAI products, provided, however, Google may take reasonable steps to protect its brand, its reputation, and security." *Id.* It also "may not place any conditions on how any Qualified Competitor may use or display syndicated [ad] content . . . including on scraping, indexing, or crawling the syndicated results." *Id.* Finally, Google "may not retain or use (in any way) syndicated queries or other information it obtains . . . for its own products and services." *Id.*

As for the advertisers themselves, Plaintiffs' RPFJ enshrines their power to choose. Advertisers must have "the option to appear on each individual Qualified Competitor's sites on a site-by-site basis (i.e. an advertiser can choose to appear as a syndicated result on a Qualified Competitor's site regardless of whether it opts into the Search Partner Network or chooses to appear on any other site, including Google.com)." *Id.* Google already allows advertisers to make these choices. Rem. Tr. at 2959:8-15 (J. Adkins) (agreeing that "Google's advertisers choose whether to advertise on the ad syndicator sites" and stating that "for every search campaign and shopping campaign, there is an opt-out for the search partner network, which includes all of our search partners or publishers"). The court therefore adopts the advertiser-choice aspect of Plaintiffs' remedy but only insofar as such choice is consistent with Google's current advertiser terms and policies.

The rest of the remedy merits more discussion.

b. Evaluating the Search Text Ads Syndication Remedy

Google already offers a search text ads syndication product called AdSense for Search. *Id.* at 2957:18–2958:23 (J. Adkins). When a syndicator receives a user query, its sends Google an ad request, and Google then runs an auction to select the ads for that request and serves the results into an "iframe" on the syndicator's website. *Id.* at 2959:25–2960:14 (J. Adkins). If an ad is

clicked, the advertiser will pay for the click, with Google and the syndicator sharing the revenue. *Id.* at 2958:24–2959:6 (J. Adkins).

Like the search-syndication remedy, the compelled syndication of Search Text Ads is an appropriate short-term measure designed to "pry open" the relevant markets. *See Int'l Salt Co.*, 332 U.S. at 401. As explained in the liability opinion, Google's monetization of general search text ads is a key component in the flywheel that has made its monopoly so durable. *See Google*, 747 F. Supp. 3d at 163. Because Google has more users, it has more advertisers, and with more advertisers, it has more dollars to improve its GSE and pay for distribution. *See id.* at 162. In the face of such formidable headwinds, allowing Qualified Competitors to syndicate Search Text Ads from Google is essential to facilitating competition. It will provide a new entrant a means of serving high-quality ads that it can monetize from the start. Rem. Tr. at 852:15–854:3 (Weinberg). That revenue can be reinvested to improve search quality, gain distribution, and perhaps build a proprietary ad platform. *See id.* It is also possible that an independent ad platform could emerge to compete with Google and Microsoft, which are the only current suppliers of general search text ads in the United States. *Id.* at 849:14-25 (Weinberg) (discussing the "hope" that "there might be more" ad networks to compete with Google and Microsoft); *id.* at 1813:14–1814:9 (Epstein) (discussing possibility of building a "custom solution" for a new search engine).

But as with their search syndication remedy, Plaintiffs' search text ads syndication proposal strays too far from ordinary commercial terms. *See Alston*, 594 U.S. at 102; *Bausch & Lomb*, 321 U.S. at 728. The remedy therefore will be narrowed. The court's changes address many of the concerns about market effects raised by Google's expert, Dr. Israel. Rem. Tr. at 3205:12–3211:12 (Israel).

First, Google may place ordinary-course restrictions on the use or display of syndicated ad content. That includes limitations designed to guard against "trick-to-click" schemes, ensure the proper ordering of ads, guarantee ad quality, protect the advertiser, and prevent ad misuse. *Id.* at 2972:4–2976:3 (J. Adkins) (discussing RDX0066); *id.* at 2979:5–2984:10 (J. Adkins); RDX0420 at -004 to -006 § 2.2. Google also may place restrictions on "scraping, indexing, or crawling" syndicated results. Rem. Tr. at 2988:9–2989:3 (J. Adkins) (discussing RDX0420 at -007 to -008 § 3.1); *id.* at 2990:22–2991:1, 2991:16–2992:10 (J. Adkins) (discussing RDX0047 at -004 § 9). Qualified Competitors still will retain some amount of flexibility in the formatting and display of syndicated ads. *Id.* at 2976:6-12 (J. Adkins).

Second, Google need not grant Qualified Competitors the right to set a minimum cost per click for syndicated ads. That is not an ordinary term of Google's syndication contracts. *Id.* at 2992:11–2993:6 (J. Adkins).

Third, Google will be permitted to retain or use syndicated queries for its own products and services, in the same manner it presently uses such information to "build, improve, and maintain" its ad infrastructure. *Id.* at 2993:16–2994:15 (J. Adkins).

Fourth, Google will not be required to provide the Qualified Competitor "all Ads Data related to the ads provided." This is not data that Google currently provides to ad syndicators. *Id.* at 2968:24–2971:23 (J. Adkins) (Google does not provide this information to preserve the confidential nature of advertisers' proprietary business information). Nor is it clear what competitive purpose the broad data disclosure would serve. The ads data is of benefit to the entity that has the relationship with the advertiser, and that is Google, not the Qualified Competitor. *Id.* at 2958:18-20 (J. Adkins). The effort to analogize the broad disclosure of syndicated ads data to Google's agreement with Yahoo Japan is misplaced. Under that agreement, Yahoo Japan has the

advertiser relationship, not Google. *Compare* Pls.' PFOF ¶¶ 774, 811 (citing PXR0598 at -749 to -750 (App. 2)), *with* Rem. Tr. at 3016:20–3017:3 (J. Adkins) (under agreement with Yahoo Japan, Yahoo Japan has its own ad business and the relationship with advertisers); *id.* at 3093:7–3096:6, 3121:20–3122:2 (J. Adkins) (describing ads data that Google discloses to Yahoo Japan as "Yahoo Japan's advertiser data" that Yahoo Japan uses to prepare performance reports for advertisers).

Fifth, to coincide with the five-year license for search syndication, the Search Ads Syndication license shall be for five years, not 10. Google notes that its typical ads syndication agreement is two years to allow the parties to renegotiate, *id.* at 2963:24–2964:14 (J. Adkins), but in this remedial posture, a longer license is appropriate to afford a Qualified Competitor greater certainty to develop its capacity to compete.

Sixth, Google shall be required to provide on a non-discriminatory basis "latency, reliability, and performance functionality equivalent to what Google provides" to other syndicators of its search text ads, not "equivalent to what Google provides for Search Text Ads on its own SERP." Pls.' RPFJ § VIII.E; Rem. Tr. at 2964:15–2965:22 (J. Adkins).

One term shall remain unchanged. That is, the Search Text Ads License shall be based on "financial terms no worse than those offered to any other user of Google's Search Text Ads syndication products." Pls.' RPFJ § VIII.E. That term is, in effect, a most-favored-nation pricing clause. It will prevent Google from charging an inflated price to Qualified Competitors, and it will provide Qualified Competitors certainty about their costs for a five-year term and facilitate building search capacity in a predictable way. In that sense, the term is pro-competitive. *See* Rem. Tr. at 4067:20–4070:13 (Hitt) (most-favored-nation clauses can involve pricing terms, can have "significant procompetitive benefits," and are common (discussing RDXD-32.038 (illustrating quality and pricing most-favored nation clauses))). *But see id.* at 3210:21–3211:12 (Israel) (most-

favored-nation pricing will discourage Google from offering a better deal to any one syndicator, because Google would have to make the same deal available to all Qualified Competitors).

3. Contingent Search Text Ads Syndication

Plaintiffs also propose a contingent remedy relating to the syndication of Search Text Ads. Pls.' RPFJ § VII.D. That remedy would become available if, after five years, Plaintiffs can prove "by a preponderance of the evidence that either or both monopolized markets have not experienced a substantial increase in competition." *Id.* If the triggering condition occurs, Google would have to syndicate Search Text Ads "at no more than [] marginal cost." *Id.*

The final judgment will not contain the proposed contingent remedy. Plaintiffs have not shown how "marginal cost" syndication will benefit competition. Perhaps the idea is that lowering the cost of delivering ads to near zero will free up capital, which Qualified Competitors can then put toward product innovation or improvements. But there is no guarantee that a Qualified Competitor would use cost savings for such purposes—the Plaintiffs' RPFJ imposes no such requirement.

Even if it did, receiving syndicated ads at marginal cost could "unintentionally suppress procompetitive innovation." *Alston*, 594 U.S. at 102. A new GSE might very well conclude that building a proprietary ads platform is not worth the expense if it can acquire search text ads from Google in the future at marginal cost. Also, new entrants to the search text ads market will be deterred, knowing that they would not be able to compete if Google were ordered to make its search text ads available at marginal cost. Finally, the provision would make it "impossible for anyone else to compete" if it were to come into effect. Rem. Tr. at 3256:21–3257:8 (Israel). Ads syndication customers can purchase search text ads from other platforms. *Id.* at 2993:7-12 (J. Adkins) ("[A]lmost entirely our partners are able to use other search ad providers.").

If Google's text ads were made available at a depressed price, no GSE would look to buy from Microsoft, the only other current supplier of search text ads. Such a competition-impairing effect requires the court to reject the remedy. *See Alston*, 594 U.S. at 102.

D. Choice Screens

The final component of Plaintiffs' "core remedies" is the implementation of choice screens. A "choice screen is fundamentally a user interface that asks the consumer to make an explicit choice among a number of products." Rem. Tr. at 532:11-14 (Rangel). Plaintiffs' Choice Screens remedy consists of three parts.

The first pertains to Google Devices (such as its mobile phone, Google Pixel). For new devices, Google must either display a "Search Access Point Choice Screen" or preinstall a Google Search Access Point that implements a "Default Search Choice Screen." Pls.' RPFJ § IX.B; *see also id.* § IX.D.1–2 (defining "Search Access Point Choice Screen" and "Search Default Choice Screen"). Google must do the same on existing devices or, alternatively, delete the Search Access Point. *Id.* § IX.B. If Chrome is offered as an option on a Search Access Point Choice Screen, then Google must display a Default Search Engine Choice Screen[27] upon selecting the browser. *Id.*

The second part of the remedy is directed at "Google Browsers," namely, Chrome. Pls.' RPFJ § IX.C. "Google must display a Search Default Choice Screen on every new and existing instance of a Google Browser where the user has not previously affirmatively selected a default GSE for that Google Browser . . . ." *Id.*

The third component is directed at third parties. Recognizing that the court cannot compel third parties to act, Plaintiffs would allow Google to offer incentive payments for choice screen

[27] The court assumes that a "Search Default Choice Screen," a "Default Search Choice Screen," and a "Default Search Engine Choice Screen" are one and the same.

adoption. Google must give distributors of "non-Apple, third-party Device[s]" under a current distribution agreement the option to display a Search Access Point Choice Screen or Search Default Choice Screen, in exchange for revenue share payments for the shorter of the remaining life of the device or one year. *Id.* § IX.A.

In simple terms, these provisions would enable users to choose a GSE at various search access points and to select a default GSE on a search access point, where there is one. Pls.' Br. at 28. Users would be asked to make a GSE selection upon first-time device use and then again on an annual basis. *Id.* § IX.D.1.c, 2.c. These choice screens would be designed by Google in the first instance, in accordance with certain specifications; reviewed by the Technical Committee; and approved by Plaintiffs. *Id.* § IX.D.

The purpose behind offering users a choice screen is to blunt the "power of defaults." *See Google*, 747 F. Supp. 3d at 45 ¶ 65, 159–161; Rem. Tr. at 536:10-14 (Rangel) ("[I]ntroducing choice screens will help to reduce the biases in consumer's choice, both in search and search applications, associated with previous defaults."). As the court found, "the combination of user habit, Google's brand, and choice friction creates a powerful default effect that drives most consumers to use the default search access points occupied by Google." *Google*, 747 F. Supp. 3d at 160. The largest percentage of search queries flow through default search access points, making "the defaults extremely valuable." *Id.* In theory, a choice screen could dampen the default effect. It would give the user the option to select Google or a different GSE with minimal choice friction. A remedy that promotes user choice is unquestionably consistent with the goals of antitrust law. *See Nat'l Collegiate Athletic Ass'n v. Bd. of Regents of Univ. of Okla.*, 468 U.S. 85, 102, 107 (1984) (emphasizing that "Congress designed the Sherman Act as a consumer welfare prescription," and viewing actions that "widen consumer choice" as "procompetitive" (internal

quotation marks and citations omitted)); *see also Structural Antitrust Relief* at 98 ("[A]n injunction that opens up participant choice can serve to diminish monopoly power significantly."). And more choice could translate into increased consumer welfare. *See* Rem. Tr. at 556:4–558:4 (Rangel) (concluding that the introduction of choice screens, standing alone, is unlikely to harm consumer welfare and will positively impact consumers who prefer an alternative search engine (discussing PXRD004 at 24–25)); *see also Structural Antitrust Relief* at 82 ("From a welfare standpoint, the optimal remedy in this situation is a choice screen placed on new devices or browsers . . . .").

The court, however, declines to impose the proposed choice screen remedies for multiple reasons.

First, "[t]he case law is unwavering in the admonition that it is not a proper task for the Court to undertake to redesign products." *New York I*, 224 F. Supp. 2d at 158. "Antitrust scholars have long recognized the undesirability of having courts oversee product design . . . ." *Id.* (quoting *United States v. Microsoft Corp.*, 147 F.3d 935, 948 (D.C. Cir. 1998) [hereinafter *Microsoft II*]). Yet, that is what Plaintiffs' proposed remedy would have the court do. By judicial fiat, Plaintiffs would have Google "disclose each Choice Screen" and "its plan for implementing that Choice Screen" to Plaintiffs and the Technical Committee at least 60 days before its display. Pls.' RPFJ § IX.D. The Technical Committee in turn would "consult[] with a behavioral scientist"—presumably to promote optimal choice-screen architecture and implementation—and thereafter advise Plaintiffs on Google's technical compliance. *Id.* It would be left to Plaintiffs to "approve any Choice Screen offered pursuant to [the] Final Judgment." *Id.* The RPFJ does not expressly contemplate a role for the court in this process, but any product change would bear the court's imprimatur, either by judicial mandate or court-ordered financial incentive. Either way, a compelled product design is not an appropriate use of the court's equitable powers.

See Massachusetts, 373 F.3d at 1210 (commending the district court for "remedying the anticompetitive effect of" Microsoft's conduct "without intruding itself into the design and engineering of the Windows operating system").

Second, forcing Google to redesign its *own* products is not an appropriate remedy. This case was always about Google's distribution agreements with third parties, not its product design. The court has broad authority to restrain conduct of "the same type or class" as the acts deemed unlawful. *Zenith Radio*, 395 U.S. at 132 (citation omitted). *Zenith Radio* does not, however, empower courts "to say that clearly *lawful* practices may be enjoined simply because they will weaken the antitrust violator's competitive position." *New York I*, 224 F. Supp. 2d at 109 (emphasis added). Plaintiffs have never asserted that Google's decision to use Google Search as the default for its own products violates the Sherman Act, *see supra* RCOL § II.A; *infra id.* § V.D. Such self-promotion, in fact, appears consistent with industry practice: Microsoft makes Bing the default on Edge, and DuckDuckGo integrates its GSE and browser. *See Google*, 747 F. Supp. 3d at 36 ¶ 12, 38 ¶ 26. True, conduct that is otherwise lawful when committed by a non-monopolist can be deemed anticompetitive when performed by a dominant firm. *See id.* at 145–46. But when it comes to Google installing its own GSE as the default on its own products, Plaintiffs have never even so much as hinted that such conduct is anticompetitive.

Third, choice screens are not likely to change the competitive landscape under current or even near-term market conditions. Plaintiffs' economic experts have acknowledged as much. Liab. Tr. at 6091:3-21 (Whinston) (testifying that choice screens would shift "less than 1 percent of the U.S. market share"); Rem. Tr. at 2187:4-17 (Chipty) ("We know from Europe that when users are given a choice today, they will overwhelmingly choose Google."). And the real world offers proof. The European Commission has mandated the display of choice screens on Android

devices since 2020,[28] yet there has been little shift in market share away from Google. Rem. Tr. at 4224:19–4225:2 (Murphy); *id.* at 537:14-21 (Rangel) (citing recent study finding that choice screen introduction decreased Google's market share in Europe between .5% and 1.5%); Google's PFOF ¶ 35. Academic modeling predicts a similar outcome. *See* Allcott Study at 1, 35 (modeling choice screen scenario in the "U.S. desktop search market" and concluding that "Google's market share declines only slightly (1.3 percentage points), and consumer surplus rises modestly by $0.07"); *id.* at 35–36 ("Choice screens increase consumer surplus, but they barely move the needle in terms of market shares.").

Some of the blame for European choice screen ineffectiveness may lie with its design. *See* Rem. Tr. at 537:22–538:3 (Rangel). But ultimately, until there is a competitive alternative to Google in terms of quality—and there is not today at least for mobile search—a choice screen offers no genuine "choice" to users. *Id.* at 2188:6-11 (Chipty) ("[C]hoice screens don't really create a contest between Google and rivals, because . . . users today have not experienced other search products."); *id.* at 3849:4-7 (Cue) (Apple would "do a choice screen, but it's not going to matter. It's not going to matter until one of the choices is actually really valuable that provides new capabilities."). The court declines to impose a remedy whose prospect of promoting competition is dim.

IV. ADDITIONAL BEHAVIORAL REMEDIES

Plaintiffs urge the adoption of two additional behavioral remedies that they say will "bolster the restoration of competition." Pls.' Br. at 55. The first is a group of four remedies aimed at benefitting advertisers. Pls.' RPFJ § VIII.A–D. The second, sponsored by Plaintiff States alone, is the establishment of a public education campaign. *Id.* § IX.E. Also, within this section, the

[28] *See Your Android, Your Choice*, ANDROID (Mar. 29, 2024), https://perma.cc/9E86-NWNR.

court considers a third group of remedies focused not on advertisers but on Google's relationship with publishers of web content. *Id.* §§ IV.C, VI.B; *see also* Pls.' Br. at 44 n.11.

A. Ad Transparency & Advertiser Control Remedies

Plaintiffs propose a set of four remedies aimed at promoting transparency in Google's sale of search text ads and advertiser control in spending ad dollars. *See* Pls.' Br. at 55–58. The first and third, respectively, would force "Google to provide advertisers with specific, granular performance-related data for their ads . . . and would bar Google from restricting advertisers from exporting the data for use in in-house or non-Google third party tools." Pls.' Br. at 55; *see* Pls.' RPFJ § VIII.A, C. The second requires Google to make a "true exact match" option available to advertisers "when selecting the keyword match type for a particular keyword." Pls.' Br. at 57; *see* Pls.' RPFJ § VIII.B. The last "seeks to make visible Google's changes to its [ad] auction rules." Pls.' Br. at 57; *see* Pls.' RPFJ § VIII.D.

1. Search Query Reports

The first of these remedies is about providing advertisers with individual, query-level ads data. This remedy arises from the court's liability findings about Search Query Reports, or SQRs. SQRs supply advertisers with data that allows them to evaluate the effectiveness of their ad spend on a keyword basis. *Google*, 747 F. Supp. 3d at 84 ¶ 269. In 2020, Google made changes to the SQR, ostensibly on privacy grounds, that reduced the amount of information that advertisers received on keywords that correlated with low-clicked ads. *Id.* at 84–85 ¶¶ 270–271. Advertiser witnesses during the liability phase described how that change had reduced their visibility into the terms triggering their text ads. *Id.* at 85 ¶¶ 272–274; *see also* Rem. Tr. at 1378:23–1380:14 (Vallez) (discussing diminished receipt of keyword-level data from Google). The court found that Google's trimming of the SQR reports was an anticompetitive effect of Google's exclusionary

conduct. *Google*, 747 F. Supp. 3d at 180. Though a small change, the action "reveal[ed] Google as a monopolist unconcerned about product changes that have decreased advertisers' autonomy over the auctions they enter and the ads they purchase." *Id.*

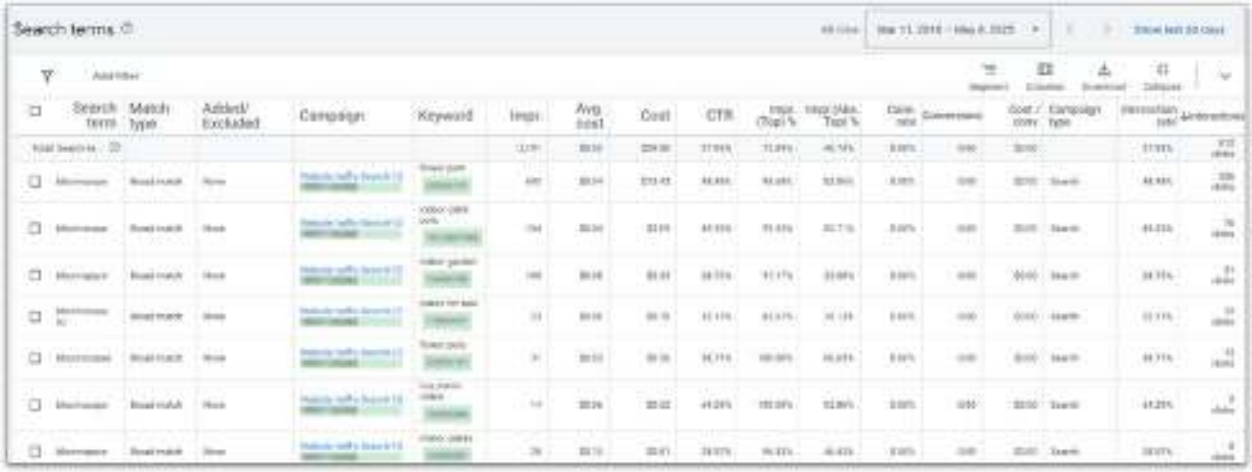
Plaintiffs now ask the court to restore the pre-2020 SQRs, and then some. Plaintiffs' remedy would require Google, "[f]or each Search Text Ad served or clicked, [to] make available to advertisers at the individual ad level for the preceding 18-month period, data showing the query, keyword trigger, match type, cost-per-click (CPC), click-through-rate (CTR), SERP positioning, long-term value (LTV), conversion data, and any other metric necessary for the advertiser to evaluate its ad performance." Pls.' RPFJ § VIII.A. Google would be required to make this data available via "an API that permits advertisers to download raw data in real time, generate reports and summaries, and perform other analytical functions to assess ad spend, ad performance, and in-campaign organization (including the ability to assess incremental clicks generated by Search Text Ads)." *Id.* Google also would have to provide such data at least monthly through "autogenerated summaries accessible through the Google ads system interface." *Id.*

Plaintiffs' desire to rectify what the court found was an anticompetitive effect of Google's exclusionary conduct is understandable. After all, remedial relief should strive to "cure the ill effects of the illegal conduct." *Ford Motor Co.*, 405 U.S. at 575 (quoting *Gypsum*, 340 U.S. at 88). But Plaintiffs' SQR remedy is not "tailored to fit the wrong creating the occasion for the remedy." *Microsoft III*, 253 F.3d at 107.

Google already provides all but one of the ad metrics that Plaintiffs include in their remedy. It does so in aggregated form, meaning query-level data is shared as to all clicked-on ads collectively. Rem. Tr. at 4427:21–4430:25, 4433:17–4434:10 (Muralidharan). A sample SQR is depicted below. It shows that Google provides various advertising metrics as to the query

("Search term" column) and the keyword ("Keyword" column) that triggered the ad. The "Impr." column reflects the number of ads clicked, and the remaining columns provide data across those clicked ads. Rem. Tr. at 4428:1-24, 4429:24–4430:8, 4433:17–4434:10 (Muralidharan) (discussing RDXD-34.017, shown below).

Example Search Query Report



Plaintiffs' remedy would have Google go further. It would be required to provide data as to *each* text ad placement on the SERP, meaning Google would have to disaggregate data and deliver it on a per ad basis. *See* Rem. Tr. at 4433:20–4434:10 (Muralidharan). It also would have to provide data as to an ad that was displayed but not clicked on by the user (and for which Google received no payment). *Id.* at 4430:9–4432:10 (Muralidharan). This would lead to an "explosion of the amount of information" reported to advertisers. *Id.* at 4434:9-10 (Muralidharan). The remedial unbundling of aggregated impression data thus far outstrips the court's limited findings about Google's degradation of SQR reports.

Nor have Plaintiffs convincingly shown that added data disclosure will stimulate competition. Plaintiffs called no expert to opine as to the market effects of the SQR remedy. Rem. Tr. at 2201:16-24 (Chipty) (acknowledging that she offered no opinion on the Section VIII

remedies); *id.* at 4567:5–4570:8, 4577:12–4579:3 (Jerath) (not opining on whether more granular data would stimulate competition in the GSE or search text ads market). They instead relied on the testimony of Paul Vallez, Executive Vice President of Strategic Business Development and Product Partnerships for Skai, a search engine management tool company, for the proposition that the SQR remedy "would also foment competition by increasing advertisers' ability to optimize between search platforms." Pls.' Br. at 56 (citing Pls.' PFOF ¶¶ 875–876). Vallez testified that the SQRs have become "less valuable over time" because of Google's removal of low-volume query data, Rem. Tr. at 1383:12-21 (Vallez), and stated generally that Skai's preference is to get data "at the most granular level" to drive better performance, *id.* at 1377:9–1378:22 (Vallez). He added that more granular data "would give us the ability to make more informed recommendations, and some of those *could lead* to budget shifting, but it's not necessarily geared just for that." *Id.* at 1385:7-11 (Vallez) (emphasis added). Finally, he agreed that having data at the keyword level would "further improve the quality of the products related to reducing friction and shifting spend between search engine platforms." *Id.* at 1378:3-10 (Vallez).

That is not compelling evidence that the SQR remedy would "foment competition by increasing advertisers' ability to optimize between search platforms." Pls.' Br. at 56 (citing Pls.' PFOF ¶¶ 875–876). At most, Vallez said that keyword-level data could help facilitate the shifting of ad spend to a new platform. He did not suggest, however, that having it would materially influence market dynamics. The court determined at the liability stage that advertisers allocate their ad spend to "largely mirror[] the relative market shares" within the GSE market. *Google*, 747 F. Supp. 3d at 76 ¶ 232. Nothing from the remedies-phase hearing affected that finding. So, while advertisers would benefit from more data, the competitive juice from the SQR remedy is not worth the squeeze.

One other point bears brief mention. The SQR remedy provides that "Google *must* make available to advertisers . . . any other metric necessary for the advertiser to evaluate its ad performance." Pls.' RPFJ § VIII.A (emphasis added). Plaintiffs say this term is necessary to "future-proof" the SQR remedy "and build in flexibility to include new metrics." Pls.' PFOF ¶ 866; *see* Rem. Tr. at 4538:1-12, 4573:20–4574:11 (Jerath). Perhaps, but it also is likely to create administrative headaches for the court. It potentially opens the door to advertisers asking for all manner of data, leading to conflicts over disclosure with Google that the court will have to resolve. Rem. Tr. at 1396:13–1398:9 (Vallez) (agreeing the SQR remedy appears "open-ended" and seemingly would allow an advertiser to ask for query-level data regarding, among things, geolocation, email information, and age); *id.* at 4573:12–4576:17 (Jerath) (agreeing the term is likely to spawn conflicts between advertisers and Google). That is not a fate the court wishes to tempt. *See New York I*, 224 F. Supp. 2d at 100 (stating the court should not "adopt overly regulatory requirements which involve the judiciary in the intricacies of business management" (citation omitted)).

2. Keyword Matching

The next ads remedy also arises from a product degradation finding. The court determined that an additional anticompetitive effect of Google's exclusionary acts was its recission in 2014 of advertisers' ability to opt out of expanded keyword matching. *Google*, 747 F. Supp. 3d at 85–87 ¶¶ 275–278, 180. Before 2014, advertisers could elect to purchase ads only on exact keyword matches or minor grammatical variants. *Id.* at 86 ¶ 277. Discontinuing this option, and subjecting advertisers to broader match parameters, had the effect of "thickening" auctions—that is, increasing the number of advertisers who would enter one. *Id.* at 87 ¶ 278. More bidders in an auction led to higher prices, thus generating more revenue for Google. *See id.* The court found

that this, too, was an example of Google disregarding advertiser preferences without suffering any market consequence—an anticompetitive effect of Google's exclusionary conduct. *See id.* at 180.

Plaintiffs now ask the court to reinstate the true match option. *See* Pls.' Br. at 57; Pls.' RPFJ § VIII.B. "Google must make available to advertisers a keyword matching option such that, when an advertiser chooses this matching option for a given keyword, the advertisers' ad will be eligible for the ad auction only when a query's content exactly matches with no variation to the keyword selected by the advertiser." Pls.' RPFJ § VIII.B. Plaintiffs' remedy adds that "[t]his same matching option must also be made available for use with negative keywords," *id.*, that is, keywords selected by the advertiser to signal that it does not wish to enter an auction, *see Google*, 747 F. Supp. 3d at 85 ¶ 274, 87 ¶ 278.

The court declines to adopt the proposed remedy. The court's hesitance is not about fit—the remedy is an "exact match," so to speak—but its currency. *See Microsoft III*, 253 F.3d at 49 (discussing the "enormous practical difficulties for courts considering the appropriate measure of relief in equitable enforcement actions" when years have passed since the conduct occurred, particularly in the technology space).

Google discontinued the advertiser opt-out from expanded match in 2014. It is now more than a decade later. *See id.* (raising concerns about formulating remedies six years after Microsoft had first engaged in the conduct deemed anticompetitive). Plaintiffs offered no non-expert advertising industry witness during the remedies phase to discuss the *current* need for the Keyword Matching remedy. At both trials, Plaintiffs relied mainly on their expert in digital marketing, Dr. Kinshuk Jerath. During the liability phase, he provided factual background about Google's elimination of an exact match option. *See* Liab. Tr. at 5477:15–5480:17, 5482:10-15 (Jerath). The court relied on this testimony to infer that Google's market dominance, reinforced by the exclusive

agreements, allowed it to change its product without concern for advertisers' loss of autonomy. *See Google*, 747 F. Supp. 3d at 180. During the remedies phase, Plaintiffs called Dr. Jerath only in their rebuttal case to respond to Dr. Israel's testimony that autobidding had eliminated or reduced the need for a true exact match option. Rem. Tr. at 4545:4–4547:18 (Jerath). He opined that, even with autobidding, "true exact match still has a role to play" and "would be useful for advertisers," because keywords match ads to queries whereas autobidding focuses on bids. *Id.*

"[S]till has a role" and "would be useful" is a thin reed on which to support a remedial request. And there is strong evidence pointing the other way. *See, e.g.*, *id.* at 4439:1–4442:13 (Muralidharan) (Google's Vice President of Product, Search Ads, doubting whether an exact match option would be "useful" to advertisers and explaining why autobidding largely obviates exact match). The court will not order Google to make a product change absent some persuasive evidence of competitive benefit.

3. Access to Data Reports

Plaintiffs seek to compel Google to make available even more ads data than what the SQR remedy would require. Section VIII.C of the RPFJ ("Access to Data Reports") would prohibit Google from "limit[ing] the ability of advertisers to export in real time (by downloading through an interface or API access) data or information relating to their entire portfolio of ads or advertising campaigns bid on, placed through, or purchased through Google, including data relating to placement or performance (including conversion and conversion value data)." Pls.' RPFJ § VIII.C. Plaintiffs specify that the data must include "all of the information contained in or used by Google in its Google Analytics, Ads Data Hub, Google Ads Data Manager, BigQuery, or Store sales and visitor measurement products, on the most granular and detailed level." *Id.*

This remedy wildly misses the mark. The court's liability opinion nowhere addressed the availability of real-time data to advertisers. Plaintiffs never alleged any unlawful conduct relating to lack of access to such data. Nor did they allege that it was an anticompetitive effect stemming from its exercise of monopoly power. Further, the products at issue were barely mentioned at the liability phase. *E.g.*, Liab. Tr. at 2143:9-14 (Weinberg) (referencing Google Analytics); *id.* at 6603:15–6604:12, 6653:2–6655:13 (Vallez) (discussing "Google Ad Manager" in the context of SA360); *id.* at 6816:13 (Kreuger) (referring to "an advertiser's own data hub"); *see also* Rem. Tr. at 3271:5–3272:2 (Israel) (verifying the absence of testimony). The court received some information about them during the remedies phase, *see* Rem. Tr. at 4435:14–4437:5 (Muralidharan), but that testimony only confirmed a lack of connection to the court's liability findings. The legal and factual predicates for the Access to Data Reports remedy are simply lacking.

4. Search Text Ads Auction Changes

The last of Plaintiffs' ad transparency remedies would require Google to disclose changes to its search text ads auctions. Pls.' RPFJ § VIII.D. Plaintiffs would have Google provide, "[o]n a monthly basis," to them and the Technical Committee "a report outlining all changes made to its Search Text Ads auction in the preceding month" and specifying the changes "Google considers material." *Id.* Google also must supply a copy of its public notice of the change or submit "a statement why no public disclosure is necessary." *Id.* Plaintiffs believe that mandated public reporting of auction changes will help advertisers. It will allow them "both to respond to auction changes and recognize when Google adjusts its pricing knobs to increase search text ad prices." Pls.' Br. at 57.

For its part, Google questions the need for the remedy and emphasizes the heavy administrative burden the disclosure regime would impose. Google's PFOF ¶¶ 1159–1163. It also suggests that forced disclosure might reveal trade secrets, *id.* ¶ 1161, and further criticizes the remedy for allowing Plaintiffs to unilaterally determine when a public disclosure made by Google is inadequate, Google's Br. at 69.

The court agrees that requiring Google to publicize certain auction changes is an appropriate remedy. The liability opinion detailed how for years Google's adjustments of its ad auctions led to higher text ad prices that escaped notice by advertisers. *See Google*, 747 F. Supp. 3d at 79–84 ¶¶ 247–267, 177–78. That practice was intentional. "When it made pricing changes, Google took care to avoid blowback from advertisers," and it "endeavored to raise prices incrementally, so that advertisers would view price increases as within the ordinary price fluctuations, or 'noise,' generated by the auctions." *Id.* at 83 ¶¶ 263–264. Google's surreptitious pricing practices left advertisers in the dark, and it facilitated Google's earning of monopoly profits. *See id.* at 178 ("[T]hrough barely perceptible and rarely announced tweaks to its ad auctions, Google has increased text ads prices without fear of losing advertisers.").

Plaintiffs' disclosure remedy properly seeks to curb Google's shrouding of its pricing practices. *See United States v. AT&T*, 552 F. Supp. 131, 150 (D.D.C. 1982) (stating that antitrust remedies "must leave the defendant without the ability to resume the actions which constituted the antitrust violation in the first place"); *see also Microsoft III*, 253 F.3d at 107 (identifying as an objective of antitrust remedies "ensur[ing] there remain no practices likely to result in monopolization in the future" (quoting *United Shoe*, 391 U.S. at 250)). Advertisers have decried the "black box" that is the pricing of search text ads on Google. *See* Liab. Tr. at 3850:8-18 (Lowcock); *id.* at 5484:14–5485:1, 5495:3-7 (Jerath). Still, even with the limited information they

do receive, advertisers develop bidding strategies based on auction rules and respond to changes when they occur. Rem. Tr. at 4551:2–4552:17, 4596:6-22 (Jerath). Plaintiffs' remedy would increase the flow of information to advertisers, allowing them to make more educated decisions about their ad spend. *See id.* at 4554:18–4555:22 (Jerath) (discussing effect of Section VIII remedies generally). It also would prevent Google from continuing to make pricing changes in darkness.

The court, however, is concerned about the burden that the remedy, as drafted, places on Google. It must report "all changes made to its Search Text Ads auction." Pls.' RPFJ § VIII.D. That could entail thousands of disclosures per year. Rem. Tr. at 4444:16-19 (Muralidharan); *see also id.* at 4444:23–4446:15 (Muralidharan) (discussing the administrative difficulties with determining what a "change" is). *But see* Liab. Tr. at 1206:10-15 (Dischler) (testifying that only a "fraction" of ad-related experiments become actual ad "launches"). The court will task Plaintiffs and the Technical Committee to develop parameters that inform Google what types of auction changes must be brought to Plaintiffs' and the Technical Committee's attention, with the corollary objective of moderating the reporting burden on Google. Those parameters should seek to target "ad launches" or other changes that Google anticipates will exceed some threshold percentage price increase for the typical advertiser. *See, e.g.*, Liab. Tr. at 1205:19–1214:11 (Dischler). Plaintiffs and the Technical Committee also shall ensure any public disclosure of an ad auction change (if not already made by Google) avoids revealing Google's trade secrets.

B. Public Education Fund

Plaintiff States propose a remedy that they alone sponsor: that Google underwrite a public education campaign. Pls.' RPFJ § IX.E. Plaintiff States would have Google "fund a nationwide advertising and education program designed to inform users of the outcome of this litigation, the

remedies in this Final Judgment, the purpose of the remedies to restore competition and improve consumer choice, and the mechanisms available to consumers to exercise choice in the selection of GSEs." *Id.*; Rem. Tr. at 1872:16–1873:4 (Luca) (the public education fund would promote learnings about the "outcomes of the case and the remedies that have been imposed," "alternative search engines," and "how to select and navigate to an alternative search engine"). The Technical Committee would "assess the design and funding level" for approval by Plaintiff States and the court. And there is an added wrinkle: the Technical Committee also would "assess the role of short-term incentive payments in achieving the goals of the Public Education Fund." Pls.' RPFJ § IX.E.

Plaintiff States' proposal has some surface appeal. The liability opinion discussed at length how defaults and habit influence consumers' use of GSEs; "[m]any users do not know that there is a default search engine, what it is, or that it can be changed"; and switching a default GSE can be technically difficult. *Google*, 747 F. Supp. 3d at 45–47 ¶¶ 65–73. By increasing consumer awareness, a public education campaign could stimulate more competition. Moreover, the Allcott Study suggests that modest monetary incentives could encourage users to try, and ultimately switch, to other GSEs. Allcott Study at 19–21.

Still, the court declines to sign off on a public education campaign. That remedy is not "tailored to fit the wrong." *Microsoft III*, 253 F.3d at 107. Plaintiff States have not shown any connection between the distribution agreements and the public's perceptions of other GSEs besides Google or changing the default. Rem. Tr. at 1909:19-22 (Luca) (not offering the opinion "that Google's contracts had any [e]ffect on consumer awareness about the choices they have for search [engines]").

What's more, the lack of specifics is fatal. *See Int'l Salt*, 332 U.S. at 400 (demanding specificity in a remedial decree "so that parties may know[] their duties and unintended contempts may not occur"). Most glaringly, Plaintiff States presented no evidence about how much Google can expect to spend to develop and maintain a nationwide public education campaign, or how long the campaign would last. In closing arguments, counsel suggested—much to the court's surprise—that this would be a "nine-figure campaign." Rem. Tr. at 4996:19–4997:17 (Closing Arg). That amount could ascend to even greater heights if, as Plaintiffs States seem to suggest, Google might have to underwrite the cost of paying users to try other GSEs. The court will not impose a remedy whose price tag is so ill-defined and seemingly boundless.

C. Publisher-Related Remedies

The court now shifts to remedies aimed at Google's relationship with publishers of website content. There are two such remedies. The first would prohibit Google from maintaining an agreement with a publisher that either (1) gives Google exclusive access to the publisher's web content or data or (2) prohibits the publisher from making its content or data available to a rival on more favorable terms (a "most favored nation" clause in favor of Google). Pls.' RPFJ § IV.C. The second would require Google to provide greater flexibility to publishers to opt out of Google's use of their content or domain to develop a Google product. *Id.* § VI.B. This remedy would enable a publisher, for example, to allow Google to crawl its website contents for inclusion in Google's search index but decline to make that content available to train an LLM. Google would be required to offer the right to opt out on a product-by-product basis. *See id.*

Two concerns appear to animate these proposals. Plaintiffs worry that Google will use its financial advantage to block rivals (including GenAI firms) from gaining access to publisher

content or receiving such content on more favorable terms than Google. Plaintiffs want to prohibit Google from cornering the market on content just as it has done with default GSE distribution.

Additionally, Plaintiffs seek to address an increasingly existential problem faced by publishers and digital content creators: diminishing traffic to their websites. GenAI products use online content both to train and fine-tune their LLMs and, through RAG-enabled search, to improve the relevancy and accuracy of their responses to user queries. *See* FOF ¶¶ 28–30, 36–43. Because those responses typically consist of comprehensive narrative summaries that synthesize information from multiple sources rather than an assortment of individual links, users are navigating to publishers' websites less often than through traditional search. *See* FOF ¶¶ 10, 17. Publishers consequently are seeing less traffic on their websites, resulting in reduced monetization and revenue. *See generally* Br. of *Amicus Curiae* News/Media Alliance in Support of Neither Party, ECF No. 1327.

With Google specifically, publishers are caught between a rock and a hard place. Because publishers rely heavily on Google to drive traffic to their sites, they have little choice but to allow Google to crawl their content for inclusion in Google's search index. *See id.* at 7. Publishers, however, might want to deny Google permission to use its content to train and appear in its GenAI offerings, like AI Overviews, unless compensated. *See id.* at 11–14. But Google does not offer such full optionality. Its offering is more limited. It makes available a control option called "Google Extended," which allows publishers to opt out of Google using their content to train its foundation models or to ground the Gemini app and the Cloud product (Vertex AI). Rem. Tr. at 3512:1-17, 3654:7-15 (Reid). Publishers cannot, however, opt out of Google's use of their content to fine-tune Google's Search models or for display in AI Overviews. *Id.* at 3654:16-20, 3660:4-21 (Reid); *see* Pls.' PFOF ¶¶ 605, 610. So, say, a publisher did not want Google to display its

content in AI Overviews. It could accomplish that under Google Extended only by opting out of being crawled altogether. But that is not a tenable choice, as it may mean the publisher's absence from Google's search index and its non-appearance on the SERP, which is critical to directing user traffic to their site. *See* Parakh Rem. Dep. at 215:7–216:17; N. Fox Rem. Dep. at 310:17–311:17.

The court declines to adopt either of Plaintiffs' proposed publisher-related remedies. As to the first, it lacks a factual basis. Plaintiffs presented no evidence that Google has entered into an exclusive content agreement with any publisher. Plaintiffs point only to the testimony of OpenAI executive Nick Turley, *see* Pls.' PFOF ¶ 413 (citing Rem. Tr. at 423:9-15, 462:6-11(Turley)), but he did not say he had ever encountered an *exclusive* agreement between Google and a publisher. Rem. Tr. at 423:9-15 (Turley) (testifying about "content silos" but not exclusive agreements); *id.* at 462:6-11 (Turley) (testifying that Google has been able to "pay a lot . . . more" and secure most-favored-nation status but not identifying any exclusive agreement). On the other hand, Google's expert in the economics of information and information technology, Dr. Lorin Hitt, offered unrebutted testimony that publishers have *not* gravitated toward such agreements. Rem. Tr. at 4025:25–4027:9, 4070:4-13 (Hitt). As he put it, "everybody's working with everybody else." *Id.* at 4070:5 (Hitt). Google has identified multiple publishers that have entered into content agreements with both Google and one or more competitors. Google's PFOF ¶ 1182 (citing RDX0414, RDX0474, RDX0477, RX0416, RDX0410, and RDX0468). As for most-favored-nation clauses, Dr. Hitt testified—again, unrebutted—that such clauses are common in the industry and have some procompetitive benefits. Rem. Tr. at 4068:7–4070:13 (Hitt). There is no factual basis to restrict Google's content agreements with publishers.

The record is similarly lacking as to enhancing publisher control. The court heard evidence about Google's opt-out offerings, but no testimony from a single publisher. The court does not

doubt that publishers face new challenges because of GenAI technologies, but there can be no cure without evidence to support it.

In any event, the conduct and proposed remedy fall well outside the scope of these proceedings. It was Google's contractual arrangements with GSE distributors, not website publishers, that gave rise to liability under the Sherman Act. Directing Google to offer greater optionality to publishers does not fit the wrong; nor is its limiting of publisher opt-out of the same type or class as its exclusionary acts.

V. ANTI-CIRCUMVENTION, ANTI-RETALIATION, AND ADMINISTRATIVE REMEDIES

Plaintiffs have included four remedial measures under the general heading "Anti-Circumvention, Anti-Retaliation, and Administrative Remedies." Pls.' Br. at 65–71. They include (1) separate anti-retaliation and anti-circumvention provisions, Pls.' RPFJ § X.E–F; (2) establishment of a Technical Committee to assist in administering the final judgment, *id.* § X.A; (3) a requirement that Google provide the Technical Committee with notice of acquisitions and investments made by Google in certain categories of companies, *id.* § IV.H–I; and (4) a bar on "self-preferencing" conduct, *id.* § V.B.

A. Anti-Circumvention and Anti-Retaliation Remedies

In Section X.E, Plaintiffs propose a general prohibition against retaliation. "Google must not retaliate in any form against a person because it is known to Google that the person is or is contemplating" various acts. Those acts include: (1) competing against, or facilitating competition against, "a Google-affiliated GSE or a Google-affiliated Search Text Ads product"; (2) "filing a complaint related to Google's compliance with this Final Judgment"; (3) acting in support of any

effort "related to Google's compliance with this Final Judgment"; and (4) "exercising any of the options or alternatives provided for under this Final Judgment." Pls.' RPFJ § X.E.1–4.

In Section X.F, Plaintiffs include a general prohibition against conduct that seeks to circumvent the terms of the final judgment. "Google is enjoined from enforcing or complying with any provision in any existing or future contract, agreement, or understanding which is otherwise prohibited in this Final Judgment." The provision enumerates three categories of prohibited acts: (1) "any conduct designed to replicate the effect of any behavior found by the Court to violate the Sherman Act"; (2) "any conduct substantially similar to conduct prohibited by another Section of this Final Judgment or designed to evade any obligation imposed by this Final Judgment"; and (3) "any conduct with the purpose or effect of evading or frustrating the intended purposes of this Final Judgment." *Id.* § X.F.1. The prohibitions are "worldwide in scope and are applicable to Google's conduct or contracts regardless of where it occurred or purports to apply." *Id.* § X.F.2. Plaintiffs' RPFJ also includes a host of section-specific "mini" anti-circumvention clauses. *Id.* §§ IV.J, V.D, VI.G, VII.H, VIII.F, IX.F, X.G.

Plaintiffs say that these provisions are necessary because, "[a]bsent concrete remedies to prevent Google from repeating its monopolist playbook, Google is likely to repeat it again in the future." Pls.' Br. at 65. As support, Plaintiffs point to testimony from Perplexity's Chief Business Officer Dmitry Shevelenko. *Id.* at 65–66 (citing Pls.' PFOF ¶ 421). He testified about a social media post where he stated that Google operates like a "mob boss" with respect to OEMs and wireless carriers, and further expressed that the distribution agreements are like "a gun to [their] head[s]" insofar as Google can cut off revenue share if they "do anything they don't like." Rem. Tr. at 723:7-21 (Shevelenko) (discussing PXR0314); *id.* at 726:6-21 (Shevelenko). Plaintiffs also point to instances when an OEM (Motorola) feared retaliation from Google if it struck a deal with

Microsoft and a carrier (AT&T) worried that adding Perplexity as an alternative assistant service might breach the RSA. Pls.' Br. at 66 (citing Pls.' PFOF ¶¶ 340, 421, 424); *see* Laflamme Rem. Dep. at 108:14–110:15 (discussing PXR0139 at -177); Ezell Rem. Dep. at 47:3–48:14.

These proposed remedies fail on both legal and evidentiary grounds.

Plaintiffs do not dispute that the final judgment is subject to Federal Rule of Civil Procedure 65(d), which requires that every order granting an injunction must "describe in reasonable detail . . . the act or acts restrained or required." Fed. R. Civ. P. 65(d)(1)(C); *see* Pls.' Br. at 73 (arguing that the Technical Committee provision satisfies Rule 65(d)); Pls.' Reply Br. at 4–5 (arguing that their RPFJ satisfies Rule 65(d)). The Supreme Court has interpreted that rule to require "explicit notice of precisely what conduct is outlawed," *Schmidt v. Lessard*, 414 U.S. 473, 476 (1974), and the D.C. Circuit has "held injunctions to be too vague . . . when they include, as a necessary descriptor of the forbidden contract, an undefined term that the circumstances of the case do not clarify," *United States v. Philip Morris USA Inc.*, 566 F.3d 1095, 1137 (D.C. Cir. 2009). The "meaning" of an injunction's terms "is constrained by the context in which they are actually used in the injunction." *Nat'l Org. for Women v. Operation Rescue*, 37 F.3d 646, 657 (D.C. Cir. 1994).

Neither the anti-retaliation nor the anti-circumvention provisions satisfy the Rule 65(d) standard. The anti-retaliation provision broadly proscribes retaliation "in any form," without providing any specifics about what type of conduct might constitute a retaliatory act. Pls.' RPFJ § X.E. Distinguishing retaliation from sharp-elbowed business conduct cannot be easily determined without some metes and bounds.

The main anti-circumvention provision is likewise too vague. It would bar Google from "conduct designed to replicate the *effect* of any behavior found by the Court to violate the Sherman

Act." *Id.* § X.F.1. (emphasis added). Plaintiffs' focus on "effects" sweeps in a host of possible anticompetitive conduct that bears no resemblance to the exclusive agreements the court found unlawful. The prohibition on "substantially similar" conduct is likewise flawed. *Id.* The D.C. Circuit has rejected that type of comparator language as lacking the necessary detail when unaccompanied by exemplars. *See Philip Morris*, 566 F.3d at 1137 (first citing *Gulf Oil Corp. v. Brock*, 778 F.2d 834, 843 (D.C. Cir. 1985) (order enjoined "substantially similar" conduct without further specification and provided no examples of what would be "similar"); and then citing *Common Cause v. Nuclear Reg. Comm'n*, 674 F.2d 921, 926–27 (D.C. Cir. 1982) (order enjoined conduct "similar in nature" without further specification and provided no examples of what would be "similar")). Finally, a bar on "any conduct with the purpose or effect of evading or frustrating the intended purposes of [the] Final Judgment" is so ambiguous as to offer scant notice of what conduct would violate the judgment. Pls.' RPFJ § X.F.1. And, to top it all off, the anti-circumvention provision is "worldwide in scope," even though the only relevant geographic market is the United States. *Id.* § X.F.2; *see Google*, 747 F. Supp. 3d at 107. The "mini" anti-circumvention provisions fare no better, as they typically contain the same boilerplate text that "Google may not undertake any action or omission with the purpose or effect of circumventing or frustrating the purposes of this Section or any of its provisions." *See, e.g.*, Pls.' RPFJ §§ IV.K, VI.G, VII.H, VIII.F, IX.F, X.G.[29]

The anti-retaliation provision also rests on a shaky evidentiary foundation. Shevelenko's colorful description of Google is no more than lay opinion testimony based on the "spirit" of his conversations with unidentified persons at OEMs and carriers. Rem. Tr. at 723:14-21

[29] The only differently worded provision is Section IV.J, which states that "Google may not make payments permitted under Paragraphs IV.A, B, E, or G with the purpose or effect of circumventing or frustrating the purposes of this section." Other than identifying a category of conduct—making payments—this provision is as ambiguous as the other "mini" anti-circumvention provisions.

(Shevelenko).[30] Such opinion testimony not backed by any actual examples of retaliation carries little weight. The other evidence cited by Plaintiffs—expressions of concern by partners about *possible* retaliation by Google—also does not move the needle. This lack of evidence stands in contrast to the findings of *actual* retaliation by Microsoft that supported the anti-retaliation measures imposed in that case. *See New York I*, 224 F. Supp. 2d at 166–67 ("The factual and liability findings in this case evidence a practice by Microsoft of threatened and actual retaliation against Apple and Intel . . . ."); *id.* at 212 ("The factual and liability findings in this case portray a practice by Microsoft of threatened and actual retaliation against software and hardware vendors for engaging in action which promotes or supports non-Microsoft middleware."). The court therefore rejects both the anti-retaliation and anti-circumvention provisions proposed by Plaintiffs.

B. Technical Committee

Plaintiffs propose that the court establish a Technical Committee to facilitate enforcement of and compliance with the final judgment. *See* Pls.' RPFJ § X.A. Google urges the court not to do so. Google's Br. at 72–74. Its primary complaint is about the Committee's broad responsibilities, which it says runs afoul of its "Due Process rights and Article III." *Id.* at 72. Google also protests the Committee's composition and the selection process. *Id.* at 73. As contemplated by Plaintiffs, the Technical Committee would consist of five members. Pls.' RPFJ § X.A.3. U.S. Plaintiffs and Plaintiff States each would select one member and Google would select a third. *Id.* That trio, known as the "Standing Committee Members," together would choose the other two if not by consensus, then by a majority vote (two of the three must agree on an added member). *Id.* Google says that this process effectively means that it would appoint only one of the five members. Google's Br. at 73.

[30] The court on hearsay grounds did not allow Plaintiffs to elicit the content of those communications for their truth. Rem. Tr. at 723:22–724:5 (Shevelenko).

The establishment of a Technical Committee to assist the plaintiffs and the court in enforcing equitable antitrust remedies is not unusual. The district court overseeing the Microsoft–U.S. consent decree approved such a body to help with enforcement. *See United States v. Microsoft*, 231 F. Supp. 2d 144, 196–200 (D.D.C. 2002) [hereinafter *Microsoft IV*]; *see also Massachusetts*, 373 F.3d at 1243–44 (affirming this approval). More recently, the Ninth Circuit did the same in *In re Google Play Store*. *See* 2025 WL 2167402, at *22. The court there observed that a technical committee "comports with federal courts' long history of utilizing appointed experts and provides a process to review and resolve inevitable disputes between the parties—ideally without further need for judicial intervention." *Id.*

Google's objection that the Technical Committee will wield too much authority is largely mooted by the court's narrowing of some proposed remedies and its rejection of others. The Technical Committee no longer will have responsibilities relating to (1) divestiture, Pls.' RPFJ §§ III.B, F, V.A, C; (2) additional Search Index signals, *id.* § VI.A.3; (3) Ads Data, *id.* § VI.F; (4) the frequency of data disclosures, *id.* § VI.A, C; (5) other query rewriting features, *id.* § VII.A.3; (6) synthetic queries, *id.* § VII.E; (7) choice screens, *id.* § IX.D; or (8) a public education campaign, *id.* § IX.E.

The Technical Committee still will carry out important functions. It will (1) advise Plaintiffs about potential Qualified Competitors, *id.* § III.U; (2) recommend reasonable data security standards applicable to Qualified Competitors, *id.* § X.A.7.b; (3) advise about an appropriate cap on User-side Data disclosure, *id.* § VI.C; (4) consult with Plaintiffs about appropriate User-side Data security and privacy safeguards, *id.* § VI.D; (5) help formulate a tapering rate for search syndication, *id.* § VII.C.2; (6) audit Qualified Competitors' use of search syndication services, *id.* § VII.C.3; and (7) receive disclosures from Google about Search Text

Ads auction changes, *id.* § VIII.D. These are largely process responsibilities. They fall squarely within the Committee's proper "role [of] providing technical competence to the [Plaintiffs] in [their] enforcement of the decree." *Massachusetts*, 373 F.3d at 1244. None are a "substitute for the enforcement authority of [Plaintiffs]" or the court. *Id.* (citation omitted).

Certainly, Plaintiffs and the Technical Committee will have to establish standards and processes. That will be part of the "practical workings" of the final judgment. *Massachusetts*, 373 F.3d at 1244 (citation omitted). In no sense, however, will the Committee be "mak[ing] up the terms [of the final judgment] as they go along." Google's Reply at 23. The court therefore approves forming a Technical Committee as part of the final judgment.

Google's concerns over the Technical Committee's composition and selection process are without merit. Google seems to believe it deserves an equal seat at the table. Google's Br. at 73. But that misconstrues the Committee's purpose. Its role is "to inform and assist the Government in its enforcement efforts," *Massachusetts*, 373 F.3d at 1244, not to act as a "neutral arbiter," Google's Br. at 73; *see also Microsoft IV*, 231 F. Supp. 2d at 197 (describing the Technical Committee as the "enforcement arm of the government"). Google compares this Technical Committee to the one established in *Microsoft*, pointing out that the committee in that case had three members—one member selected by each side and the third selected collectively by the first two. Google's Br. at 73 (citing *Microsoft IV*, 231 F. Supp. 2d at 196–97). But there is nothing sacrosanct about a three-person committee. And Google simply presumes that its chosen member will disagree with the other two as to who will join them. There is no reason to believe that such an outcome is inevitable.

The court will change the Technical Committee proposal in one respect. Section X.A.2 of Plaintiff's RPFJ lists the subject matters of expertise that the Committee members in combination

must possess: "software engineering, information retrieval, artificial intelligence, economics, and behavioral science." To that list the court adds "data privacy and data security." Such expertise will be needed to address the important data privacy and data security issues arising from the Search Index and User-side Data remedies.

C. Investment Notification Requirement

Plaintiffs propose that Google provide them with notice before it completes a broad range of transactions with other firms. Pls.' RPFJ § IV.H–I. Google would have to report to Plaintiffs its intent to "acquire any interest in, or part of, any company; enter into a new joint venture, partnership, or collaboration; or expand an existing joint venture, partnership, or collaboration, with any company that competes with Google in the GSE or Search Text Ads market or any company that controls a Search Access Point or GenAI product." *Id.* § IV.H. Google would have to provide notice 30 days in advance of closing, and its disclosure would have to conform to the regulatory notice requirements under the Hart–Scott–Rodino Antitrust Improvements Act of 1976 ("HSR"), 16 C.F.R. Part 803—though Google would not have to provide notice if the transaction already is subject to HSR reporting. *Id.* § IV.I.1–.2.[31] In effect, the remedy would require reporting of transactions under the relevant HSR reporting thresholds. Rem. Tr. at 5008:25–5009:3 (Closing Arg.) ("[W]e're talking the approach of [HSR], but we're saying . . . the thresholds should not apply."). Google would not be permitted to complete a proposed transaction until 30 calendar days after submitting all requested information. *Id.* § IV.I.2.

[31] The Hart–Scott–Rodino Antitrust Improvements Act of 1976 "establish[ed] notification and waiting requirements for large acquisitions and mergers," in order "to facilitate Government identification of mergers and acquisitions likely to violate federal antitrust laws before the proposed deals are consummated." *Pharm. Rsch. & Mfrs. of Am. v. FTC*, 790 F.3d 198, 199 (D.C. Cir. 2015). For 2025, the "minimum size of transaction threshold" to trigger reporting requirements is $126.4 million. *See New HSR Thresholds and Filing Fees for 2025*, FED. TRADE COMM'N, https://perma.cc/XK22-ZAZN (last visited Aug. 27, 2025).

Plaintiffs defend this notice requirement as an anti-circumvention provision. *See* Pls.' Br. at 68 ("This minimally burdensome provision prevents circumvention of Plaintiffs' remedies by informing Plaintiffs of transactions related to markets that Google has monopolized and products that serve as critical inputs to these monopolized markets."). As Plaintiffs see it, such notice will enable them "to intervene before any acquisition or join[t] venture by Google undercuts the final judgment's efforts to restore competition," *id.* at 70, and "to understand how a marketplace is evolving at a time of great change," Rem. Tr. at 5010:1-2 (Closing Arg.).

The court in *New York I* rejected a similar, albeit significantly broader, reporting remedy. There, the plaintiffs wanted Microsoft "to report its investments, regardless of size or significance, in a wide array of technologies and businesses," which the plaintiffs argued would "assist law enforcement authorities in monitoring Microsoft's investment activities for violations of the antitrust laws." *New York I*, 224 F. Supp. 2d at 191–92; *see id.* at 265 ("Plaintiffs have included in their remedy proposal a provision which requires Microsoft to provide Plaintiffs with written notice of its investments in computer and electronic product manufacturing, computer and computer peripheral equipment and software wholesalers, telecommunications, cable networks and program distribution, finance and insurance, and computer system design, as well as its acquisition of an exclusive license of technology or intellectual property 60 days in advance of such investment."). In declining to impose the remedy, the court observed that this provision "is so far removed from any liability in this case, it is difficult to understand the manner in which Plaintiffs believe such a provision will satisfy the objectives of an antitrust remedy." *Id.* at 192.

The same can be said about Plaintiffs' Investment Notification Requirement. The remedy is not tailored to fit Google's unlawful conduct, as the court's liability determination involved no anticompetitive acquisition or joint venture by Google. Granting Plaintiffs' request would be

tantamount to attempting to restrain future violations of the antitrust laws that are not related to the unlawful acts, which the court cannot do. *See Zenith Radio*, 395 U.S. at 133.

D. Self-Preferencing Prohibitions

In Section V.B of their RPFJ, Plaintiffs ask the court to restrict Google from engaging in a wide array of "self-preferencing" behavior. Under that amorphous label, Plaintiffs would have the court not allow Google to:

> 1. make any GSE, Search Access Point, GenAI Product, or On-Device AI explicitly or implicitly mandatory on Android Devices, for example, by preventing interoperability between Android AICore or a Google Grounding API and Competitor products and services in the GSE or Search Text Ads markets;
>
> 2. reduce, prevent, or otherwise interfere with the distribution of a Competitor['s] GSE, Search Access Point, or GenAI Products;
>
> 3. degrade any aspect of quality, including the features, functionality, or user experience, on a Competitor's GSE, Search Access Point, or GenAI Products;
>
> 4. explicitly or implicitly, directly or indirectly, prevent or discourage manufacturers or other Android partners (e.g., carriers) from working with Competitors' GSE, Search Access Point, or GenAI Products;
>
> 5. explicitly or implicitly, directly or indirectly, punish or penalize manufacturers or other Android partners (e.g., carriers) that work with Competitors' GSE, Search Access Point, or GenAI Products; or
>
> 6. otherwise use its ownership and control of Android to explicitly or implicitly, directly or indirectly, force or coerce manufacturers or other Android partners (e.g., carriers) to (i) work with Google's GSE or GenAI Products or (ii) give Google's products and services any better treatment than given Competitors' products.

Pls.' RPFJ § V.B.

Plaintiffs envision these restrictions as anti-circumvention measures. Pls.' Br. at 70–71; Rem. Tr. at 5011:17–5012:6, 5014:1-7 (Closing Arg.). "With the distribution remedies prohibiting many contractual means of distributing Google Search," they say, "Google may well turn to self-

preferencing, especially with Android, as a substitute." Pls.' Br. at 70. The self-preferencing prohibitions are therefore "necessary to ensure that 'there remain no practices likely to result in monopolization in the future.'" *Id.* (quoting *Microsoft III*, 253 F.3d at 103).

Plaintiffs cite various product integrations as examples of Google self-preferencing its own products. The primary one is Google's development of AICore, an Android software module developed by Google that supports the use of Google's on-device LLM, Gemini Nano. *See id.*; FOF ¶ 24. Plaintiffs offer additional examples of "self-preferencing," too. They include: (1) the availability of Google Lens—a visual search feature that returns results in response to an image or screenshot—only if Google Search is set as the default on Chrome; (2) an integrated shortcut in the Chrome address bar (by typing @Gemini) to run queries through Gemini; (3) making Gemini the primary agent in Chrome; and (4) the integration of Circle to Search into Android—a feature that enables users to initiate a Google search without having to switch apps by circling an object on their screen. *See* Pls.' Br. at 70–71; Pls.' PFOF ¶¶ 551–552, 554–555, 557–558, 560–561; *see also* FOF ¶¶ 72–76 (discussing Circle to Search and Google Lens).

The court rejects Plaintiffs' self-preferencing prohibitions for reasons both legal and factual. First the legal problem. The self-preferencing actions that Plaintiffs seek to preemptively stamp out are not "of the same type or class as [the] unlawful acts" that the court found Google to have committed. *See Zenith Radio*, 395 U.S. at 132 (citation omitted). They are not "other related unlawful acts." *Id.* at 133 (citation omitted). Nor are they "legal conduct which, by [their] relation to the illegal and anticompetitive conduct, perpetuates the antitrust violator's restraint on trade." *New York I*, 224 F. Supp. 2d at 108. The court made no finding in the liability phase that Google's giving preferential treatment to its own search product was unlawful. Such conduct was hiding in plain sight: Google Search is the default search engine on Chrome. Plaintiffs were aware of the

"market reality" that 20% of searches conducted in the United States occur through the Chrome default, *see Google*, 747 F. Supp. 3d at 120, but they never alleged that such self-preferencing was illegal. The court did have before it one alleged anticompetitive act of self-preferencing—Google's leveraging of SA360 to advantage its own ad platform over Microsoft's—but the court found Google not liable for that conduct. *See id.* at 181–85. Plaintiffs may fear that Google will come up with new ways to use other products to enhance the availability of its search offerings and that such behavior *could* prove to be anticompetitive. But the court cannot simply enjoin "all future violations of the antitrust laws." *Zenith Radio*, 395 U.S. at 133; *see Massachusetts*, 373 F.3d at 1223–24 ("[W]hen the district court undertakes to block the untraveled roads by adopting a forward-looking provision, its discretion is necessarily less broad because, without liability findings to mark the way, it is in danger of imposing restrictions that prevent the defendant from forging new routes to serve consumers.").

The bar on self-preferencing also goes too far in that it would hamstring Google's ability to compete. Take, for example, Plaintiffs' proposal to prohibit Google from self-preferencing Gemini in Chrome. Such a restriction would set Google apart from its competitors. It is commonplace for companies in the GenAI space to leverage their own products to distribute their GenAI technologies. Meta, for instance, delivers its GenAI models through Instagram and WhatsApp. FOF ¶ 50. xAI makes Grok available through X. FOF ¶ 54. Microsoft has integrated Copilot into Edge and Bing, both as a vertical and through Copilot Answers (Microsoft's AI-powered search feature analogous to Google's AI Overviews). FOF ¶ 51. And emerging GenAI companies are doing the same. Perplexity, for example, recently launched a web browser that integrates its own answer engine. FOF ¶ 53. The court will not hobble Google's competitiveness by prohibiting self-preferencing of its own GenAI technologies, when that is precisely how the

emerging—and highly competitive—GenAI marketplace operates. *See Bausch & Lomb*, 321 U.S. at 728 (observing that Congress, "in enacting remedies to enforce the antimonopoly statutes," has not "indicated an intention to interfere with ordinary commercial practices"); *see also* FOF ¶¶ 56–61.

Plaintiffs' self-preferencing prohibitions also suffer from a lack of proof. Take Plaintiffs' concerns about AICore. Plaintiffs seem to worry that the presence of AICore on an Android device will crowd out other on-device AI models because AICore blocks access to the specialized hardware needed to run such models, including TPUs and NPUs. *See* Pls.' PFOF ¶¶ 567–573; Pls.' RPFOF ¶¶ 1243–1244; Rem. Tr. at 3962:11-20 (Samat); *id.* at 1556:5-9 (Mickens) ("AICore is a gatekeeper, if you will, for access to the TPU/NPU accelerators . . . ."). But AICore does not block other on-device models from accessing this hardware. FOF ¶ 25; Rem. Tr. at 3964:24–3965:1 (Samat) ("It's not the case that the presence of AICore excludes other on-device models from running on these devices."); *see also id.* at 3966:6-11 (Samat) (Google has not "architected [AICore] in a way that provides any special capabilities" to accessing TPUs or NPUs). And there are devices on the market now that contain more than one on-device AI model. FOF ¶ 26.

Plaintiffs' concerns about Google using Google Lens and Circle to Search anticompetitively exemplify the breadth and ambiguity of the proposed self-preferencing remedy. Google Lens is a feature of Google Search, and if a Chrome user does not have Google Search as the default, the user cannot access Google Lens (except through Google.com). FOF ¶¶ 74–75. Thus, Google Lens is simply a design feature of Google Search. It is not an example of self-preferencing.

Nor is Circle to Search. That new search access point is available through open-source Android and requires an OEM to modify its user interface to permit circling on a screen.

FOF ¶¶ 72–73; Rem. Tr. at 3908:25–3910:25 (Samat). The OEM then selects the search engine that will answer the query (a visual one), which may be Google or some other search product. FOF ¶ 73 (citing Rem. Tr. at 3908:25–3910:24 (Samat) (confirming that Circle to Search can be used with a search application other than Google and discussing Perplexity's visual search offering)). Circle to Search therefore is not a case of Google self-preferencing its own search product. It is another channel of search distribution. Like other channels, the court's remedies are designed to make that channel available to rivals through competition.

This is not to say the court is insensitive to the risk of circumvention given, for example, Google's aggressive efforts to avoid creating a paper trail for regulators and litigants. *See Google*, 747 F. Supp. 3d at 187. The court remains prepared to modify the decree or otherwise act should Google's compliance become an issue.

VI. EFFECTIVE DATE AND TERM OF FINAL JUDGMENT

The parties disagree about the term of the final judgment, as well as its effective date. Plaintiffs propose 10 years, with the possibility of early termination by mutual consent or if Google fully complies and can show that the combined market share of its rivals is greater than 50%. Pls.' RPFJ § XII. Plaintiffs ask that the final judgment become effective 30 days after it is entered. *Id.* Google, on the other hand, asks for a three-year term, Google's RPFJ § V.C, and an effective date 120 days after entry of the final judgment, *id.* § V.A.

The court believes that a six-year term is appropriate. That term accounts for the court's expectation that it will take one year to establish the Technical Committee and the processes necessary for execution. Among the administrative challenges the court envisions include (1) establishing guidelines to identify Qualified Competitors, (2) Google's development of any

infrastructure needed to carry out its data-sharing and syndication obligations, and (3) the all-important application of privacy-enhancing techniques to anonymize User-side Data.

Google's proposed term of three years is simply too short. As Plaintiffs rightly point out, Google's monopoly has endured for more than a decade, with little meaningful market entry. Pls.' PFOF ¶¶ 938, 940–941. Moreover, regulatory efforts in Europe that began five years ago to instill greater competition, such as a forced choice screen and, more recently, compelled data-sharing, have not moved the needle. Rem. Tr. at 2174:23–2175:19 (Chipty). And then there is the expected time, measured in years, it will take for a competitor to develop the capacity to compete with Google. A three-year term, with no dispensation for ramp-up time, is not enough for the remedies to have positive market impacts. It also is too short a timeline for the court to "clarify[] and reconsider[]" the final judgment "in light of changing market realities"—or the lack of such change. *Alston*, 594 U.S. at 106–07; *see also United Shoe*, 391 U.S. at 251 (describing the court's "duty . . . to modify the decree so as to assure the complete extirpation of the illegal monopoly").

On the other hand, the court is mindful that "'continuing supervision of a highly detailed decree' could wind up impairing rather than enhancing competition," *Alston*, 594 U.S. at 102 (quoting *Trinko*, 540 U.S. at 415), and "that markets are often more effective than the heavy hand of judicial power when it comes to enhancing consumer welfare," *id.* at 106. Plaintiffs' proposed 10-year term runs the risk of growing stale in these fast-moving times, where GenAI technologies are breaking barriers seemingly at light speed. For the first time in over a decade, there is a genuine prospect that a product could emerge that will present a meaningful challenge to Google's market dominance. As Apple's Eddie Cue put it:

> [F]or the first time, I think there's an opportunity [to challenge Google] because there's new technology. . . . And until there was some change in technology that kind of revolutionizes or changes something, I don't think there's anything that going to change

> Google being the best. . . . [W]e're seeing some real . . . investment by taking LLMs and search indexes and combining those two things to provide what I think is potentially a better experience. . . . So this is an interesting and, I think, a great time for customers.

Rem. Tr. at 3827:13–3829:2 (Cue). Technological advancement and product differentiation are what will change market dynamics, not a decade-long judicial decree. For that reason, the court believes that a five-year term, plus an additional one year to put the infrastructure and processes in place to implement the remedies, is appropriate.

This term is consistent with the five-year term adopted in *Microsoft*. There, the settling plaintiffs, including the United States, requested a five-year term for the decree, departing from the usual 10 years, "because of the pace of technological change in the computer industry" and because a 10-year term risked "becom[ing] highly regulatory in nature." *Microsoft IV*, 231 F. Supp. 2d at 195. The court agreed with the five-year term in part due to the industry's "constant and rapid change." *See New York I*, 224 F. Supp. 2d at 183–84.

As to the effective date, the final judgment shall take effect 60 days after it is entered, except as to those portions of Section X.A of the Plaintiffs' RPFJ that require the parties to take steps toward forming the Technical Committee and that address the start of its work, which will be effective immediately.

VII. REMAINING PROVISIONS

A. Definition of "Google"

The court directs the parties to a minor issue likely to cause major administrative headaches: Plaintiffs' definition of "Google." Plaintiffs define the term to mean "Defendant Google, LLC, a limited liability company organized and existing under the laws of the State of Delaware, headquartered in Mountain View, California, its parent Alphabet, Inc., their successors and assigns, subsidiaries, divisions, groups, affiliates, partnerships, and joint ventures, and their

directors, officers, managers, agents, and employees." Pls.' RPFJ § III.L. It is hard to conceive of anyone at Alphabet or any Alphabet-related entity excluded from this definition.

The definition's breadth poses problems for implementing parts of the final judgment proposed by Plaintiffs. For example, Google's appointed compliance officer "must supervise the review of Google activities to ensure they comply with this Final Judgment." *Id.* at § X.B.3. Surely, Plaintiffs do not intend for the compliance officer's duties to reach such Alphabet subsidiaries like YouTube, Nest, or Waymo. Additionally, Plaintiffs would have "all officers and employees of Google" receive a copy of the final judgment, trained annually on the final judgment and antitrust laws, and certify that they have read the final judgment. *Id.* § X.B.4.a, c, d, f. Alphabet reportedly now has over 185,000 employees. *See Alphabet Inc. (GOOGL)*, STOCK ANALYSIS, https://perma.cc/2B6A-AEB6 (last visited Sept. 1, 2025). Plaintiffs cannot reasonably believe that such wide-ranging notice and compliance measures are appropriate.

The court takes no position on this issue. It will leave it to the parties in the first instance to constrain the definition of "Google" and to reach—hopefully, mutually agreeable—implementation provisions.

B. Fees and Costs

The court will not include in the final judgment Section XIV of Plaintiffs' RPFJ, which awards fees and costs to Plaintiffs. A request for such an award will have to be made by separate motion.

CONCLUSION

For the reasons discussed, the court accepts, with its modifications, Google's proposed remedies in full and adopts Plaintiffs' proposed remedies in part. The parties shall meet and confer and, by September 10, 2025, submit a revised final judgment that is consistent with this

Memorandum Opinion. That revised final judgment shall reconcile Section III of Google's RPFJ and those portions of Plaintiffs' RPFJ, as modified, that the court has agreed to adopt. Any request for clarification or any dispute that may arise should be set forth in a Joint Status Report filed on that same date, which identifies the issue and sets out the parties' respective positions.

Dated: September 2, 2025

Amit P. Mehta
United States District Court Judge

APPENDIX

I. LIVE WITNESSES

A. Fact Witnesses

Name	Title	Affiliation	Called By
Jesse Adkins	Director of Product Management	Google	Google
Eli Collins	Vice President of Product, Google DeepMind	Google	Google
Eduardo Cue	Senior Vice President of Services	Apple	Google
Adam Epstein	Co–Chief Executive Officer & President	adMarketplace	Plaintiffs
Peter Fitzgerald	Vice President of Platforms & Devices Partnerships, Global Partnerships	Google	Plaintiffs
Sissie Hsiao	*former* General Manager of Gemini App	Google	Plaintiffs
Eric Muhlheim	Chief Financial Officer	Mozilla Corporation	Google
Omkar Muralidharan	Vice President of Product, Search Ads	Google	Google
Sundar Pichai	Chief Executive Officer	Google	Google
Brian Provost	Senior Vice President & General Manager, Yahoo Search	Yahoo	Plaintiffs
Elizabeth Hamon Reid	Vice President of Google Search	Google	Google
Sameer Samat	President of the Android Ecosystem	Google	Google
Michael Schechter	Vice President of Growth, Bing	Microsoft	Plaintiffs
Dmitry Shevelenko	Chief Business Officer	Perplexity	Plaintiffs
Parisa Tabriz	Vice President of Engineering & General Manager for Chrome	Google	Plaintiffs
Nick Turley	Head of Product, ChatGPT	OpenAI	Plaintiffs
Paul Vallez	Executive Vice President, Strategic Business Development & Product Partnerships	Skai	Plaintiffs
Gabriel Weinberg	Chief Executive Officer	DuckDuckGo	Plaintiffs

B. Expert Witnesses

Name	Title	Affiliation	Called By
James Allan	Professor	Manning College of Information and Computer Sciences at the University of Massachusetts Amherst	Google
Tasneem Chipty	Founder & Managing Principal	Chipty Economics, LLC	Plaintiffs
Chris Culnane	Principal & Consultant	Castellate Consulting Ltd.	Google
Greg Durrett	Associate Professor of Computer Science	The University of Texas at Austin	Plaintiffs
David Evans	Professor of Computer Science	University of Virginia	Plaintiffs
Lorin Hitt	Zhang Jindong Professor of Operations, Information & Decisions	University of Pennsylvania	Google
Mark Israel	Founding Partner	Econic Partners	Google
Kinshuk Jerath	Arthur F. Burns Professor of Free & Competitive Enterprise & Professor of Business	Columbia Business School	Plaintiffs
Michael Luca	Professor	Johns Hopkins University Carey Business School	Plaintiffs
James Mickens	Gordon McKay Professor of Computer Science	Harvard University	Plaintiffs
Kevin Murphy	George J. Stigler Professor of Economics (Emeritus)	University of Chicago Booth School of Business and Department of Economics	Google
Jason Nieh	Professor of Computer Science & Co-Director of the Software Systems Laboratory	Columbia University	Google
Antonio Rangel	Bing Professor of Neuroscience, Behavioral Biology & Economics	California Institute of Technology	Plaintiffs

II. DESIGNATED DEPOSITION TESTIMONY

Name	Title	Affiliation	Called By
Frank Boulben	Chief Revenue Officer, Verizon Consumer Group	Verizon	Google
Eli Collins	Vice President of Product, Google DeepMind	Google	Plaintiffs
Robert Cromwell	Vice President of Engineering	Microsoft	Plaintiffs; Google
Jeffrey Ezell	Vice President of Business Development	AT&T	Plaintiffs
Nicholas Fox	Senior Vice President, Knowledge & Information	Google	Plaintiffs
Jeffrey Giard	Vice President of Strategic Partnerships & Business Development	T-Mobile	Plaintiffs
Jay Kim	Head of the Customer Experience Office	Samsung	Google
Francois Laflamme	Chief Marketing & Strategy Officer	Motorola	Plaintiffs
Neal Pancholi	Director, Search Partnerships	Google	Plaintiffs
Phiroze Parakh	Trust Lead, Google Search	Google	Plaintiffs
David Smutny	Associate General Counsel, Competition Litigation	Microsoft	Google
Jan Standal	Senior Vice President of Product Marketing & Communication	Opera	Google