GOOGL gideon lens

Alphabet Inc. (GOOGL) — Gideon Lens Production ER2

Report ID: `er2-googl-20260807T120231+0800` **Report date:** 2026-08-07 **Security:** XNAS:GOOGL Class A common share **Price anchor:** USD 357.75, last completed close on 2026-08-06 **Financial anchor:** TTM ended 2026-06-30; horizon 2031-06-30, exactly five years **Scenario probabilities:** Bear 25% / Base 55% / Bull 20%

What changed from the previous report and why

Previous report: LEGACY-GOOGL-20260427; 2026-04-27; `C:\Users\Admin\OneDrive\GPT\ER 2.0\Alphabet Inc\raw\pulse-cio-20260807T120231+0800\prior_active_snapshot\GOOGL_gideon_lens.md`; SHA-256 `708aad0601e73d14970f71d979737630723338ce9af8839dea76cc679cb6a876` **Current report:** er2-googl-20260807T120231+0800; 2026-08-07; price anchor USD 357.75 as of 2026-08-06

Area	Previous report	Current report	What changed and why	Decision impact
Price anchor	USD 344.40	USD 357.75	Price rose 3.88%; current quote is hash-bound	Raises the return burden
ER2 verdict and gates	PASS; Management PASS; Moat PASS; valuation FAIL	PASS; Management YELLOW; Moat YELLOW; valuation FAIL	Mega-capex returns, founder control, regulation and AI economics received stricter current evidence treatment	PASS remains mandatory
FY+5 valuation bridge	Base EPS USD 15.95 at 2030-12-31; 15x value USD 239.22; cushion -30.5%	Base EPS USD 18.236 at 2031-06-30; 15x value USD 273.54; cushion -23.54%	New TTM and reviewed segment paths improve EPS, but not enough to clear price	Valuation still fails
Shareholder returns	Gross bear/base/bull IRRs -20.4%/-6.9%/-1.6%; no governed weighted-wealth or net-SGD bridge	Gross -16.29%/-2.47%/9.07%; weighted -2.15%; net-SGD weighted -2.16%	Scenario-specific P/Es, distributions and explicit FX/cost overlay replace the old flat-15x diagnostic	Expected return remains inadequate
CIO actionability	Zero size / watchlist conclusion	PASS; portfolio fit unavailable; no sizing ceiling	Base and weighted net-SGD returns are negative	Not actionable
Audited scores	65/100; 64/80; 1/20	57/100; 53/80; 4/20	Current audit caps ROIIC, unit-economics and capital-return evidence	Reject classification remains diagnostic
Methodology or corrections	Calendar-FY horizon and no mandatory weighted/net-SGD return package	Exact TTM horizon; sealed quote/security bridge; weighted-wealth CAGRs; no P/E/net-cash double count	Production method upgraded and source bindings refreshed	Higher confidence in the negative conclusion

Bottom line: Alphabet's operating forecast improved, especially through Cloud, but economic proof did not keep pace with the capital commitment or the price. The decision remains PASS because valuation fails and both qualitative gates are YELLOW. The change is partly economic—higher price, faster Cloud and much heavier capex—and partly methodological: current returns use scenario-specific P/Es, explicit distributions, weighted terminal wealth and a net-SGD overlay rather than a flat 15x diagnostic.

Verdict: PASS

Scorecard:

Gate	Result	Notes
Management	YELLOW	Execution strong; founder control and mega-capex returns remain unresolved
Moat	YELLOW	Current advantages endure; the 2046 interface-ownership test remains YELLOW
P/E <= 15 on confident EPS at TTM + 5 calendar years	FAIL	Base EPS USD 18.236 supports USD 273.54; cushion -23.54%
Compounder Score	Audited 57 / 100	Reject classification; incomplete capital-return proof and failed entry-price case
Business Quality Score	Audited 53 / 80	Strong franchises, but evidence does not prove dream-business quality
20% Return UW Score	Audited 4 / 20	Today's price cannot support 20% underwriting without unsupported outcomes

One-line thesis (or reason to pass): Alphabet combines exceptional Services distribution and rapidly scaling Cloud with unproven AI-capex returns, while USD 357.75 discounts more per-share success than the reviewed five-year base or probability-weighted case supports.

Security return underwriting (mandatory even when the verdict is PASS):

Measure	Result	Notes
Primary valuation method	P/E	One audited method is used for every scenario, probability weighting and net-SGD
Gross local-currency bear / base / bull IRR	-16.29% / -2.47% / 9.07%	Five-year annualized shareholder return in USD
Probability-weighted gross local-currency IRR	-2.15%	CAGR of 25%/55%/20% weighted terminal shareholder wealth, not averaged IRRs
Return bridge	USD 357.75 -> USD 320.831 weighted wealth	2026-06-30 to 2031-06-30; PE applies to terminal EPS, plus distributions; current USD 129.718B net cash is display-only and not added again

The current normalized earnings diagnostic is USD 10.288 per share, implying 34.77x at the price anchor. Bear/base/bull terminal equity values are USD 1,794.98B/USD 3,829.59B/USD 6,627.09B, derived from terminal net income and 14x/17x/20x P/E. These multiples are conservative analyst assumptions anchored below the current normalized valuation, not issuer guidance. Terminal capital-structure paths are unavailable, so P/E—not EV/NOPAT—controls; current cash, debt, leases and preferred stock are displayed diagnostically and never added to terminal equity value.

Bear-case operating and return bridge

Bear case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 445.866B	USD 587.426B	5.67%	AI substitution, remedies and weaker monetization constrain Services; Cloud decelerates
Operating margin	33.11%	26.60%	-6.51 pp	Serving costs, depreciation, regulation and central AI expense overwhelm mix
Operating earnings	USD 147.628B	USD 156.266B	1.14%	Statutory operating income after Alphabet-level activities
Diluted share count	12,309.000M	12,562.627M	0.41%	USD 10B annual repurchases fail to offset USD 28.147B annual SBC
EPS	USD 10.288	USD 10.206	-0.16%	Normalized starting EPS to statutory terminal diluted EPS
Valuation	34.77x	14.00x	-20.77x	Analyst de-rating for slower growth, margin pressure, remedies and dilution
Share value	USD 357.75	USD 142.882	-16.77%	USD 128.213B terminal NI x 14x / 12,562.627M shares

Bear case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Annual dividend	USD 0.84	USD 0.84	0.00%	Conservative flat dividend assumption
Dividend yield	0.23%	0.59%	+0.35 pp	Annual dividend divided by endpoint share value
Five-year dividends	-	USD 4.20	cumulative	Supported flat annual distribution; 30% withholding appears only in net-SGD
Total ending value	USD 357.75	USD 147.082	-16.29% gross USD IRR	Terminal share value plus cumulative distributions; no net-cash add-on

Base-case operating and return bridge

Base case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 445.866B	USD 787.554B	12.05%	Services compounds 9.75%; Cloud compounds 20.93%; Other Bets stays small
Operating margin	33.11%	34.12%	+1.01 pp	Cloud scale offsets central AI costs; Services 42% is explicitly optimistic
Operating earnings	USD 147.628B	USD 268.720B	12.73%	Statutory operating income after USD 39.409B Alphabet-level activities
Diluted share count	12,309.000M	12,352.983M	0.07%	USD 25B annual repurchases approximately offset SBC issuance
EPS	USD 10.288	USD 18.236	12.13%	USD 225.270B terminal NI / 12,352.983M shares
Valuation	34.77x	17.00x	-17.77x	Analyst exit below current statutory and normalized diagnostics
Share value	USD 357.75	USD 310.013	-2.82%	Terminal EPS x 17x; USD 3,829.59B equity value
Annual dividend	USD 0.84	USD 1.353	10.00%	Analyst distribution path; not needed to rescue the conclusion
Dividend yield	0.23%	0.44%	+0.20 pp	Annual dividend divided by endpoint share value
Five-year dividends	-	USD 5.641	cumulative	Sum of the supported annual path
Total ending value	USD 357.75	USD 315.654	-2.47% gross USD IRR	Terminal share value plus distributions; no capital-structure double count

Bull-case operating and return bridge

Bull case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 445.866B	USD 963.100B	16.65%	AI monetization succeeds, Cloud scales rapidly and subscriptions remain durable
Operating margin	33.11%	39.09%	+5.98 pp	Services reaches 45% and Cloud 40%; Other Bets still loses money
Operating earnings	USD 147.628B	USD 376.470B	20.59%	Statutory operating income after central activities
Diluted share count	12,309.000M	12,143.340M	-0.27%	USD 40B annual repurchases exceed modeled SBC issuance
EPS	USD 10.288	USD 27.287	21.54%	USD 331.355B terminal NI / 12,143.340M shares

Bull case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Valuation	34.77x	20.00x	-14.77x	Analyst premium for superior growth, still below current normalized P/E
Share value	USD 357.75	USD 545.739	8.81%	Terminal EPS x 20x; USD 6,627.09B equity value
Annual dividend	USD 0.84	USD 1.690	15.00%	Analyst distribution path under strong cash generation
Dividend yield	0.23%	0.31%	+0.07 pp	Annual dividend divided by endpoint share value
Five-year dividends	-	USD 6.513	cumulative	Sum of the supported annual path
Total ending value	USD 357.75	USD 552.252	9.07% gross USD IRR	Terminal share value plus distributions; below the 10% mandate hurdle

CIO actionability (separate from ER2 underwriting):

Measure	Result	Notes
Status	PASS	Base and weighted net-SGD returns are negative; this is not the ER2 verdict
Bear / Base / Bull net SGD IRR	-17.64% / -2.69% / 9.98%	Five-year annualized after modeled costs, withholding and FX translation
Probability-weighted net SGD IRR	-2.16%	CAGR of 25%/55%/20% weighted terminal SGD wealth
10% mandate hurdle	FAIL	Base and probability-weighted cases both fail
15% stretch hurdle	FAIL	Even the bull diagnostic remains below 15%
Downside and portfolio fit	UNAVAILABLE	Security downside fails; current portfolio context is unavailable
Proposed sizing ceiling	none	No sizing authority or actionable return case; owner approval always required

Net-SGD diagnostics use entry FX of 1.2828 SGD/USD dated 2026-07-31, bear/base/bull exit FX of 1.20/1.2828/1.35, 0.30% entry cost, 0.30% exit-sale cost, 0.20% dividend FX cost and 30% U.S. dividend withholding. These are conservative diagnostics, not personalized tax or broker advice.

Trade execution authorized: NO

Kill / trigger criteria:

- BUY trigger: price below USD 273.54 makes the 15x base-EPS cushion positive; a 15% valuation cushion requires roughly USD 232.51, while the separate 20% return diagnostic supports only USD 126.85.
- PASS trigger: two consecutive quarters with Google Services growth below 10%, Services margin below 39%, and TTM capex above 30% of revenue require a bearward rewrite.
- PASS trigger: TTM free cash flow below USD 50B while annualized buybacks remain below USD 30B requires resetting the share-count path toward dilution.
- Upgrade to BUY conditions: Management and Moat must both reach PASS, reviewed base EPS must exceed USD 23.85 at this price, and base/PW net-SGD returns must clear the mandate without unsupported multiple expansion.

Research sizing if actionable: none. Portfolio context is unavailable and the completed security-return underwriting is not actionable; any future proposal would require explicit owner approval and a fresh quote/ER2 review.

Decision synthesis

The company remains formidable: TTM revenue was USD 445.866B, Google Services produced a 41.89% operating margin, Cloud reached USD 77.617B revenue and USD 24.319B operating income, and current net cash after debt and leases was USD 129.718B. Those facts explain why this is not a broken-business thesis.

The constraint is per-share economics after the AI build. TTM capex reached USD 132.402B and free cash flow fell to USD 53.273B. The audited base requires Cloud to compound 20.93%, Services to retain a 42% margin, and annual repurchases to approximately offset SBC, yet terminal shareholder wealth is still below the entry price. The red team therefore treats those operating assumptions as optimistic, not conservative. Other Bets remains loss-making even in bull, and neither current balance-sheet strength nor exceptional nonrecurring fair-value gains may be used to mask weak recurring owner earnings.

The conclusion is robust to the method change. A flat 15x P/E fails the formal Gideon valuation gate. Separately, scenario-specific 14x/17x/20x P/Es produce negative base and probability-weighted returns. Gross USD and net-SGD results agree on direction. Probability weighting is performed on terminal wealth, not IRRs, and the PE bridge excludes any terminal net-cash add-on. The truthful Production ER2 conclusion is therefore PASS at USD 357.75, with no sizing recommendation and no trade authority.

Appendix A - Company Primer

Alphabet Inc. — Company Primer

Run ID: `pulse-cio-20260807T120231+0800` Ticker / listing: `GOOGL` / Nasdaq Class A common stock Reporting currency: USD Latest reported quarter: Q2 FY2026, ended 2026-06-30 TTM period: Q3 FY2025 + Q4 FY2025 + Q1 FY2026 + Q2 FY2026 Forward analytical horizon: 2031-06-30, exactly five calendar years after the TTM end

Source discipline and scope

This primer is an orientation document for an institutional reader. Every financial figure comes from the cleared `quant_foundation.md`, which reconciled eight of eight required checks and was independently cleared by the quantitative-foundation review. The QF uses live FMP pulls but overrides malformed or misparsed vendor fields with controlling SEC filings. Most importantly, the Q2 FY2026 FMP product-segmentation row contains mechanically impossible Cloud and subscriptions values; none of those malformed observations is used here. The governed prior report is used only as qualitative background on the business model and competitive structure, never as the source for current financial facts.

Amounts are USD millions unless stated otherwise. Segment operating profit means Alphabet's disclosed measure, **operating income (loss)**. Alphabet-level activities are a real corporate/unallocated expense, not a fourth reportable segment. Product-level margins, geographic revenue percentages, customer concentration, Search-AI revenue, and many operating KPIs are not supplied by the current QF; this primer labels those limits rather than back-solving them.

1. Business overview

Alphabet is a holding company whose economic core is Google. It combines consumer internet products, digital advertising, video, mobile operating-system and browser distribution, cloud infrastructure, enterprise software, artificial intelligence, consumer subscriptions, app distribution, devices, and a portfolio of earlier-stage technology businesses. The most useful mental model is not a collection of unrelated apps. It is a system of user surfaces, technical infrastructure, data and developer tools, and commercial relationships that reinforce one another.

Google Search, YouTube, Android, Chrome, Maps, Gmail, Play, Workspace, and Google Cloud place Alphabet at several points in the digital value chain. Consumer products attract attention and intent. Advertising systems turn some of that intent into measurable customer acquisition for merchants and brands. Android, Chrome, Play, and account identity help distribute services and connect users across devices. Cloud sells the underlying compute, data, cybersecurity, productivity, and AI capabilities to enterprises. Shared research, custom infrastructure, and global data centers can be deployed across both consumer and enterprise products.

The paying customer changes by product. In Search and YouTube advertising, the paying customer is the advertiser while the product must first satisfy the user. Search captures explicit information or commercial intent; YouTube captures entertainment, education, creator, and connected-TV attention. Advertisers buy auction-priced access to those audiences and judge the product by conversion, reach, brand safety, and measurable return. Google Network extends Google's advertising tools to third-party publisher and app inventory. These businesses are two-sided: weak user or publisher outcomes eventually reduce the quality of advertiser inventory, while weak advertiser outcomes reduce auction demand.

In Google Cloud, customers are enterprises, governments, software companies, developers, and digital-native businesses. They buy compute, storage, networking, databases, analytics, cybersecurity, AI infrastructure and model access, and Workspace productivity applications. The economic proposition is different from advertising. Cloud customers pay directly for usage, capacity, or subscriptions; buying cycles can be lengthy; sales and implementation costs are meaningful; and technical integration creates switching costs once workloads, data, identity, and governance are embedded.

The non-advertising portion of Google Services monetizes an installed base that was largely acquired through free products. Consumer subscriptions, app and in-app purchases, platform fees, and devices all sit in the disclosed subscriptions/platforms/devices line. The models inside that bucket differ materially. A storage or software subscription can have recurring, asset-light economics; a video or sports bundle can carry content costs; a device carries components, inventory, logistics, support, and channel expense. Alphabet does not disclose the components separately, so a reader should not assign one blended margin to all of them.

Other Bets contains operating businesses that are not individually material enough to report separately. The practical reader model is a funded option portfolio rather than a near-term earnings engine. It includes capital-intensive, regulated, or

technically difficult projects such as autonomous transportation and other long-duration initiatives. Their strategic value may be significant, but current disclosure does not support treating them as a mature, self-funding segment.

2. Revenue architecture and segment shares

Alphabet reported TTM revenue of $445.866 billion through 2026-06-30. Google Services contributed $367.091 billion, Google Cloud $77.617 billion, and Other Bets $1.507 billion; revenue hedging losses reduced consolidated revenue by $0.349 billion. The segment shares below use consolidated revenue as the denominator, so the three business segments sum to slightly more than 100% before the negative hedging reconciliation.

TTM revenue architecture	Revenue ($B)	Share of consolidated revenue	Economic role
Google Services	367.091	82.3%	Consumer products, advertising, subscriptions, platforms, and devices
Google Cloud	77.617	17.4%	Enterprise infrastructure, platform, applications, data, security, and AI services
Other Bets	1.507	0.3%	Earlier-stage businesses and long-duration options
Hedging gains / losses	(0.349)	(0.1)%	Consolidated revenue reconciliation outside reportable segments
Alphabet consolidated	445.866	100.0%	Reported total

The mix has an important analytical implication. Services remains the center of gravity, but Cloud is no longer immaterial diversification. On the TTM figures, Cloud is roughly one-sixth of consolidated revenue and contributes positive segment operating income. Other Bets is too small to diversify current revenue and instead consumes operating profit.

Within Google Services, Alphabet discloses four revenue types on an annual basis. FY2025 is the latest complete, officially controlled product table in the QF. These lines sum exactly to FY2025 Services revenue of $342.721 billion.

FY2025 Google Services revenue type	Revenue ($B)	Share of Services revenue	What the line represents
Google Search & other	224.532	65.5%	Search advertising and related Google-owned properties
YouTube advertising	40.367	11.8%	Advertising sold on YouTube inventory
Google Network	29.792	8.7%	Advertising on network-partner properties through Google tools
Subscriptions, platforms, and devices	48.030	14.0%	Consumer subscriptions, Play/platform activity, and hardware in aggregate
Google Services total	342.721	100.0%	Reportable-segment revenue

Search is therefore not simply one product among equals. It is about two-thirds of Services revenue on the FY2025 disclosed mix and remains the largest identifiable economic engine. Its business purpose is to match a user need with relevant information and, where commercial, connect advertisers to measurable intent. The mechanism has historically been search results plus auction-priced advertising. AI answers and task-oriented interfaces change the presentation layer, but the commercial asset remains trusted access to intent.

YouTube is a separate attention and creator ecosystem. It monetizes long-form video, short-form formats, connected-TV viewing, and other video inventory through advertising, while subscriptions reside in the broader subscriptions/platforms/devices line. This accounting split means YouTube's full economics cannot be reconstructed from the YouTube advertising figure alone. Likewise, the aggregate consumer line cannot be decomposed into YouTube subscriptions, Google One, Play, or devices without unsupported estimates.

Google Network extends Google's ad technology beyond owned properties. It has strategic value because it broadens advertiser reach and publisher monetization, but Alphabet controls the user experience less fully than on Search or YouTube. That makes Network more exposed to privacy changes, open-web traffic shifts, publisher bargaining, and alternative ad-tech routes.

Google Cloud is disclosed only as one aggregate segment. It includes infrastructure and platform services, applications, and other enterprise services. A reader should think of it as a blend of physical infrastructure economics and recurring software/platform economics: rented compute and accelerators, storage and networking, databases and analytics, security,

development tools, AI services, and Workspace seats. Alphabet does not disclose GCP, Workspace, AI infrastructure, or Gemini-related revenue and margins separately.

3. Unit economics and capital intensity by segment

Alphabet's FY2025 segment results show three very different economic profiles. Services produced $139.404 billion of operating income on $342.721 billion of revenue, a 40.7% margin. Cloud produced $13.910 billion on $58.705 billion, a 23.7% margin. Other Bets lost $7.515 billion on $1.537 billion of revenue. Alphabet-level activities then reduced operating income by $16.760 billion, reconciling exactly to statutory FY2025 operating income of $129.039 billion.

FY2025 profit architecture	Revenue ($B)	Operating income / (loss) ($B)	Operating margin
Google Services	342.721	139.404	40.7%
Google Cloud	58.705	13.910	23.7%
Other Bets	1.537	(7.515)	(488.9)%
Alphabet-level activities	n/a	(16.760)	n/a
Alphabet consolidated	402.836	129.039	32.0%

Google Services

Services has a high-fixed-cost, high-scale platform model. A dollar of advertising revenue is reduced by payments to distribution and network partners, creator or content economics where relevant, data-center and serving costs, product engineering, sales, policy and safety operations, marketing, and compliance. Search can generate high incremental margins because an established index, auction, advertiser base, and distribution system serve enormous query volume. Yet the economics are not costless. Default and distribution arrangements can require traffic-acquisition payments, and an AI-generated response can require more compute than a classic ranked-results page.

Search unit economics depend on four interacting variables: query and task volume, commercial intent mix, advertiser demand and auction density, and the cost to serve and acquire traffic. AI may improve relevance and expand the kinds of questions users ask, but it can also reduce clicks, change ad placement, or raise inference cost. The right investor test is not simply whether AI features increase engagement. It is whether monetized commercial tasks and advertiser return grow enough to absorb serving, depreciation, and distribution costs without harming trust.

YouTube has network effects among viewers, creators, and advertisers, but its direct costs differ from Search. Creator revenue sharing, music and other content rights, video storage and delivery, trust-and-safety operations, and premium programming can reduce incremental margin. Connected-TV and subscription growth can strengthen engagement and pricing, while sports or pay-TV products may carry heavier content economics. Because Alphabet does not disclose product profit, the Services margin is the only governed profitability anchor.

The subscriptions/platforms/devices bucket combines structurally different businesses. Platform commissions and digital subscriptions can scale well; hardware has component, logistics, warranty, and inventory risk; video distribution can carry programming cost. This mixture is a disclosure limitation and a modeling warning: growth in the bucket can be strategically attractive without carrying Search-like margins.

Services is capital-light relative to Cloud in its customer proposition, but not independent of Alphabet's infrastructure. Search ranking, AI inference, YouTube delivery, recommendations, advertising systems, and consumer AI products all use data centers and shared research. Segment margin therefore does not capture every centrally managed AI cost. Alphabet-level activities must remain visible when judging the shareholder economics.

Google Cloud

Cloud's revenue comes from usage, contracted capacity, and subscriptions. A revenue dollar must cover server and accelerator depreciation, data-center facilities, power, networking, bandwidth, engineering, security, technical support, sales, partner economics, and customer success. Capacity often must be built before revenue arrives. Low utilization leaves depreciation and operating costs spread over too little revenue; rising utilization and richer platform/software mix can produce strong operating leverage.

The segment's margin progression is evidence that scale economics are real: operating margin improved from 5.2% in FY2023 to 14.1% in FY2024 and 23.7% in FY2025. The TTM through Q2 FY2026 is stronger again on an aggregate basis: $24.319 billion of operating income on $77.617 billion of revenue, or approximately 31.3%. That improvement is economically

significant, but it is not proof of mature owner earnings. Consolidated capex bears the cost of the infrastructure build, and depreciation can lag investment. A Cloud segment can report expanding operating margin while consolidated free cash flow is pressured by servers, data centers, land, energy, and network capacity.

Cloud switching costs are technical and organizational. Data gravity, application architecture, security rules, identity, developer tools, analytics pipelines, employee workflows, and committed contracts make migration expensive. Multi-cloud strategies keep competition intense, however, and customers can bargain over price, portability, and capacity. The attractive version of the business sells differentiated data, AI, security, and application services on well-utilized infrastructure. The less attractive version grows through commodity capacity and discounts while the capital base expands faster than cash returns.

Other Bets and central activities

Other Bets is not profitable at current scale. Autonomous transportation and other frontier projects can require engineering, vehicles or equipment, safety validation, regulatory approvals, insurance, market-by-market launches, and long development periods before stable unit economics. The current loss is too large relative to revenue for the segment margin percentage to be economically useful. The governance question is whether projects meet evidence-based milestones and whether outside capital, customer adoption, or improving unit economics validate continued funding.

Alphabet-level activities are equally important. The TTM expense was $21.541 billion, compared with $16.760 billion in FY2025. These centrally managed costs include corporate/unallocated items and shared initiatives; they cannot be ignored merely because individual segment margins appear strong. A complete operating-profit bridge is Services plus Cloud plus Other Bets less Alphabet-level activities.

4. Customers, channels, and buying motion

Alphabet reaches customers through several distinct motions rather than one sales funnel.

Advertising is highly scalable and often self-serve. Small and medium-sized businesses can create campaigns, choose objectives, set budgets, automate bidding, and measure conversions through Google Ads. Large advertisers and agencies also use direct sales and managed relationships across Search, YouTube, display, applications, shopping, and performance products. Pricing is generally auction-based rather than a simple published rate card. The advertiser is buying an outcome—attention, a lead, an app install, a store visit, or a sale—so retention depends on measurable return and reliable attribution.

Consumer products are mainly distributed through owned digital surfaces and ecosystem placement. Search, YouTube, Chrome, Android, Maps, Play, Gmail, and account identity can cross-promote subscriptions and features without conventional paid customer acquisition. Devices add retail, carrier, and direct e-commerce channels. This distribution breadth is a strength, but default arrangements and product bundling are also key targets of antitrust scrutiny.

Cloud uses a hybrid motion. Developers and smaller customers can start self-service and pay for usage. Large enterprises typically involve direct account teams, solution architects, procurement, security review, implementation partners, system integrators, resellers, and multi-year commitments. Workspace can be bought per seat and expanded across an organization; infrastructure and AI workloads may begin as projects and scale with consumption. The buying process is longer than consumer advertising, but successful deployments can create durable expansion through additional data, users, workloads, and services.

Other Bets generally requires business-specific market development. Autonomous transportation, for example, is a local operations and regulatory motion as much as a software sale. Deployment depends on permits, safety performance, fleet density, vehicles, service areas, and consumer adoption. That makes the business less globally scalable at the outset than a digital product.

5. Competitive landscape

Alphabet competes at multiple layers. In information discovery, competition includes traditional search engines, vertical search, e-commerce destinations, travel and local platforms, social networks, and AI-native answer engines or agents. The emerging contest is not only index quality; it is who controls the interface where the user expresses intent and who can complete the task. Alphabet's advantages are global distribution, product habit, advertiser liquidity, account integration, maps and local information, technical infrastructure, and the ability to deploy AI across existing products. Its incumbent disadvantage is that it has the most profitable legacy workflow to defend.

In digital advertising, Alphabet competes with social platforms, retail-media networks, e-commerce platforms, streaming and connected-TV services, short-video platforms, app ecosystems, and offline media. Search is differentiated by explicit intent; YouTube by video attention, creator supply, and television reach; Network by advertiser tools and publisher reach. Advertiser budgets are mobile, however, and shift toward channels with superior measurable return or first-party commerce data.

In Cloud, the primary competitors are Amazon Web Services and Microsoft Azure, alongside Oracle, data platforms, cybersecurity vendors, enterprise software providers, and specialized AI infrastructure companies. Google Cloud's differentiators include data and analytics, AI research and models, custom accelerator capabilities, Kubernetes heritage, security, and Workspace distribution. Its challenge is that the larger peers have deep enterprise relationships, extensive partner ecosystems, and their own AI stacks. Multi-cloud adoption reduces winner-take-all risk but also restrains pricing power.

In consumer platforms and devices, Alphabet competes with Apple, Microsoft, Amazon, Meta, Samsung, media and music services, streaming platforms, game ecosystems, and many app developers. Android and Chrome provide reach; Play provides developer and transaction economics; devices give Alphabet a direct hardware surface. Hardware is strategically useful but should not be confused with the company's primary profit pool.

The competitive advantage is strongest when multiple assets reinforce one another: consumer distribution improves AI adoption; AI improves Search, YouTube, and Workspace; Cloud monetizes enterprise AI demand; internal infrastructure supports all three. The risk is the reverse loop: competition forces higher capital spending, cheaper Cloud capacity, and more expensive Search responses before new monetization offsets the burden.

6. Regulatory and AI-disruption context

Regulation is embedded in the business model. Alphabet faces antitrust, privacy, data protection, content moderation, consumer protection, copyright, app-store, advertising, AI, and competition rules across many jurisdictions. Potential remedies can affect default distribution, data use, product bundling, ad-tech integration, platform fees, and acquisition flexibility. Compliance scale can disadvantage smaller rivals, but Alphabet is also a particularly visible enforcement target.

AI is both the largest strategic opportunity and the sharpest disruption risk. Alphabet owns research, custom infrastructure, consumer distribution, enterprise distribution, and an enormous advertising business. That makes it unusually capable of integrating generative and agentic AI. It also means the company must defend a high-margin Search model while paying to build the replacement interface.

Three questions organize the AI debate. First, does AI expand useful query and task volume or shift it to a competing assistant? Second, can Alphabet preserve commercial-intent monetization when answers become more complete and fewer external clicks may be needed? Third, do model efficiency, custom silicon, utilization, and new revenue offset the incremental cost of inference and the depreciation from the infrastructure build? Engagement without monetization is insufficient; revenue without attractive incremental cash returns is also insufficient.

Cloud is the principal beneficiary if enterprise AI demand persists, but growth alone does not settle the economics. Scarce capacity can support pricing and utilization; overbuilding or rapid efficiency gains can commoditize capacity. YouTube is less directly replaceable by text or task agents because creator identity, entertainment, live events, and community matter, though synthetic content increases supply competition. Google Network appears structurally more exposed because it depends on third-party web and app inventory that may lose traffic as answers move into closed interfaces.

7. Geography

Alphabet is a global business in users, advertisers, enterprise customers, infrastructure, developers, creators, and regulatory exposure. The United States is an important monetization and enterprise market; Europe is strategically significant and carries substantial regulatory complexity; Asia-Pacific includes large user bases, mobile ecosystems, creator markets, and Cloud demand; Latin America and other regions add growth but can carry lower monetization, currency volatility, and local rules.

The current QF does not provide a governed geographic revenue table, so this primer does not reproduce prior-report regional dollars or percentages. That constraint matters: global user reach is not equivalent to equal revenue per user, and geographic mix can influence advertising yield, Cloud adoption, currency sensitivity, taxes, infrastructure placement, and legal risk. The segment appendices should use geography only where current, source-bound evidence is available.

8. Capital allocation and balance-sheet orientation

Alphabet's balance sheet provides substantial strategic flexibility. At 2026-06-30, cash was $55.911 billion and short-term investments were $186.563 billion, totaling $242.474 billion. Long-term debt was $98.165 billion and operating-lease liabilities were $14.591 billion, for $112.756 billion of debt plus operating leases. On that QF definition, net cash less debt and operating leases was $129.718 billion. The balance sheet also included $18.023 billion of preferred stock; it must be treated consistently in any later enterprise-to-equity bridge.

The capital-allocation debate is therefore about returns, not near-term financing capacity. TTM operating cash flow was $185.675 billion, capex was $132.402 billion, and free cash flow was $53.273 billion. Capex has risen rapidly: $32.251 billion in FY2023, $52.535 billion in FY2024, $91.447 billion in FY2025, and $132.402 billion on the current TTM. The infrastructure build supports Search AI, YouTube, Cloud, consumer AI, and shared technical capacity, but segment capex is not disclosed.

Common-share repurchases were $61.504 billion in FY2023, $62.222 billion in FY2024, $45.709 billion in FY2025, and $17.403 billion on the QF-controlled TTM presentation. Stock-based compensation was $28.147 billion on the TTM. The directional implication is clear: capital spending has taken priority while buybacks have fallen. A later per-share model must evaluate repurchases net of SBC and must not assume that a historic buyback pace continues independently of infrastructure needs.

The current TTM income statement also contains an extraordinary caution. Net income was $244.205 billion, but other income was $151.641 billion compared with operating income of $147.628 billion. Those large non-operating fair-value gains do not flow through operating cash generation and should not be extrapolated as recurring earnings. The recurring business should be underwritten from segment revenue, segment operating income, central costs, normalized below-line items, taxes, capital intensity, and dilution.

9. Key operating KPIs and disclosure limits

The most decision-useful operating indicators are not all reported as clean dollar lines. A disciplined reader should distinguish governed financial anchors from qualitative or partial KPIs.

Area	Governed financial anchor	Useful operating question	Disclosure limit
Search	Search & other revenue is disclosed annually	Are AI features expanding monetizable commercial tasks and advertiser return?	No separate AI Overview, AI Mode, Gemini-search, query, click, or ad-load economics
YouTube	YouTube advertising revenue is disclosed	Are viewing time, creator supply, connected-TV reach, ads, and subscriptions strengthening together?	Subscription revenue and product margin are not separately disclosed
Google Network	Network revenue is disclosed	Is partner inventory retaining traffic, advertiser value, and viable publisher economics?	No detailed inventory, take-rate, or partner-margin disclosure
Consumer subscriptions / platforms / devices	One aggregate revenue line is disclosed	Is recurring digital revenue outgrowing lower-margin hardware/content components?	No component revenue or margin split
Google Cloud	Aggregate segment revenue and operating income are disclosed	Are utilization, backlog conversion, AI workloads, Workspace, and price-performance supporting durable margin?	No GCP, Workspace, AI-infrastructure, backlog-conversion, gross-margin, or segment-capex split
Other Bets	Aggregate revenue and operating loss are disclosed	Are projects reaching adoption, outside validation, and improving unit economics?	No standalone Waymo revenue, cash burn, or unit economics in the QF
Capital intensity	Consolidated OCF, capex, FCF, SBC, and repurchases are disclosed	Is incremental infrastructure generating durable operating cash returns?	No segment capex, invested capital, or depreciation cohort by business

The reporting design creates two common analytical traps. First, product revenue is not product profit. Search, YouTube, subscriptions, devices, and Network all live inside one Services segment margin. Second, segment operating margin is not consolidated owner earnings. Shared AI and corporate costs, capex, depreciation, stock-based compensation, taxes, and below-line items still matter.

The current QF provides strong aggregate anchors: TTM Services revenue and operating income were $367.091 billion and $153.792 billion; Cloud was $77.617 billion and $24.319 billion; Other Bets revenue was $1.507 billion with an $8.942 billion loss; and Alphabet-level activities were a $21.541 billion expense. Those figures reconcile to $147.628 billion of statutory operating income. They establish the starting economics without pretending to answer the product-level questions Alphabet does not disclose.

10. Reader roadmap into the segment appendices

Read the segment work in the following order.

- **Google Services appendix:** begin with Search because it is the largest disclosed revenue line and the primary profit engine. Focus on AI-native query behavior, commercial-intent monetization, traffic-acquisition costs, serving cost, advertiser return, YouTube's creator and connected-TV economics, the decline or resilience of Network, and the mixed margins inside subscriptions/platforms/devices. Require a complete bridge from the four disclosed revenue types to Services revenue, then from Services operating income to the consolidated model.

- **Google Cloud appendix:** treat Cloud as a real second profit engine, not merely optionality. Test revenue durability, utilization, AI and data mix, Workspace contribution, competition, pricing, depreciation, and capital intensity. The TTM margin improvement is material, but the appendix must explain why it is sustainable after the current infrastructure wave rather than extrapolate it mechanically.

- **Other Bets appendix:** treat the segment as an option portfolio whose current loss is fully charged to shareholders. Separate technical promise from disclosed economics. Require conservative treatment where standalone revenue, unit costs, cash burn, or deployment economics are unavailable.

- **Management and moat appendices:** assess whether management is allocating the rising infrastructure budget with evidence-based discipline, and whether the distribution/data/advertiser/creator/enterprise advantages survive an AI-agent interface. The moat test must include the cost of defending the moat.

- **Synthesis and return underwriting:** begin with the exact TTM operating bridge and normalize the unusually large below-line gains. Carry central costs, capex, SBC, share count, debt, operating leases, preferred stock, and cash consistently. The exact horizon is 2031-06-30. Do not allow missing portfolio context to erase security-return underwriting, and do not let segment enthusiasm bypass consolidated free-cash-flow economics.

The governing question for the rest of the ER2 is straightforward: can Alphabet convert its unmatched distribution, advertising engine, AI stack, and growing Cloud platform into durable per-share owner earnings after paying the full cost of infrastructure, central research, regulation, and dilution? This primer supplies the business map; the segment appendices must supply the evidence and operating assumptions.

Quantitative provenance

- All financial figures: `quant_foundation.md`, sections P2 through P6.
- Stage 0 anchor: TTM ended 2026-06-30; horizon 2031-06-30.
- Vendor overrides: official SEC FY2025 and Q2 FY2026 filings control malformed or misparsed FMP observations.
- Reconciliation status: `RECONCILIATION: 8/8 checks PASSED` and QFR cleared for Wave 1.
- Authority boundary: research only; no trade, order, message, ranking, sizing, or portfolio-mutation authority.

Appendix M - Management Assessment

Alphabet Inc. — Management Assessment

Run ID: `pulse-cio-20260807T120231+0800` Assessment date: 2026-08-07 TTM anchor: 2026-06-30 Forward horizon: 2031-06-30 Authority: research only; no trade, ranking, sizing, portfolio-mutation, or messaging authority.

Source discipline

This assessment uses Alphabet's live-fetched 2026 proxy, FY2025 Form 10-K, Q2 FY2026 Form 10-Q, SEC filing index, and live FMP transcripts for the eight calls from Q3 FY2024 through Q2 FY2026. The immutable SEC filing controls dates and reported figures where FMP transcript metadata is defective. The fresh FMP transcript and statement pulls are archived under `raw\pulse-cio-20260807T120231+0800\m_20260807T131200` and mirrored without overwrite to the investing data warehouse. Alphabet's investor-relations governance page failed two identical direct downloads with a Cloudflare challenge; the live SEC proxy and the searchable official Alphabet page were used instead. Capital allocation and corporate actions come from governed Sections 7 and 9 of `data_package.md`, as required.

1. Who is running the company

Sundar Pichai has led Google since October 2015 and Alphabet since December 2019. He joined Google in 2004, previously ran Android, Chrome and Apps, and then all Google products. He therefore owns the current AI-first strategy, Search's transition to generative and agentic interfaces, the Cloud scale-up, the infrastructure surge, and the present Other Bets portfolio—not merely the latest quarter.

Anat Ashkenazi has been Alphabet and Google CFO since July 2024. She was Eli Lilly's CFO from February 2021 to July 2024 after more than two decades in finance, operations, manufacturing, R&D and business-unit roles there. Her tenure is long enough to own the FY2025-FY2026 financing and capital-allocation shift, but not yet long enough to demonstrate the ultimate return on it.

Operational accountability below Alphabet is capable but diffuse. Philipp Schindler has been Google's Chief Business Officer since August 2015 and oversees Google and YouTube sales, support, partnerships, business development and country operations. Thomas Kurian has led Google Cloud since early 2019 after 22 years at Oracle and is the executive most directly associated with Cloud's enterprise commercialization. Google Services does not have one externally identified segment P&L owner; product and monetization responsibility is shared among Pichai, Schindler and product leaders. Waymo is led by co-CEOs Tekedra Mawakana and Dmitri Dolgov. This bench is strong, but the absence of a single disclosed Services owner makes external accountability less clean than the segment reporting suggests.

John Hennessy has been independent chair since 2018 and previously served as lead independent director. There is no separate lead director because the chair is independent. The 2026 proxy lists ten nominees, seven independent. All key committees are independent. The principal board concern is tenure and control, not formal committee composition: Page, Brin and Shriram have served since 1998, Doerr since 1999 and Hennessy since 2004. Deep institutional knowledge is valuable, but five directors with more than two decades of service weakens the claim that independence is fully fresh.

2. Tenure and track record

Pichai's first major decision was to turn an “AI-first” slogan into a full-stack operating commitment spanning proprietary models, TPUs, data centers, Search, YouTube and Cloud. The commercial evidence is real: Google Services revenue rose from $237.529 billion in FY2021 to $367.091 billion TTM, while segment operating income increased from $88.132 billion to $153.792 billion. Search revenue grew 16.8% year over year in Q2 FY2026 despite the incumbent-disruption risk. This is strong execution, but it is not yet proof that generative Search earns an attractive return after inference and depreciation.

Second, Pichai backed Kurian's enterprise transformation of Cloud. Cloud revenue rose from $19.206 billion in FY2021 to $77.617 billion TTM; operating income moved from a $2.282 billion loss to $24.319 billion, a roughly 31.3% TTM margin. That is the clearest quantitative evidence that this team can turn long-duration investment into a second profit engine. The counterweight is capital intensity: consolidated capex supports Cloud, Search and shared AI, so segment margin alone cannot establish owner returns.

Third, management chose to fund the next AI capacity wave at exceptional scale. Capex increased from $24.640 billion in FY2021 to $91.447 billion in FY2025 and $132.402 billion TTM. Management guided FY2026 capex to $175-$185 billion and

said 2027 would increase significantly. TTM operating cash flow was $185.675 billion, yet free cash flow fell to $53.273 billion; Q2 FY2026 alone had negative $5.9 billion FCF. At June 2026, disclosed purchase commitments and contractual obligations were $811.0 billion, primarily technical infrastructure and inventory. This may be prescient capacity building, but the scale makes the investment case contingent on returns management has not quantified.

The less successful portfolio evidence is also material. Other Bets lost $7.515 billion in FY2025 and $8.942 billion TTM. Alphabet funded a significant majority of Waymo's $16 billion February 2026 financing. Verily was deconsolidated after external financing, and GFiber is being contributed to a new entity. Those actions show willingness to change ownership structures rather than fund every project indefinitely, but Alphabet does not disclose project-level cumulative capital or returns, so pruning discipline cannot be fully audited.

Ashkenazi deserves credit for clearly naming the cash consequences of the new strategy. She has also overseen a sharp change in funding: long-term debt reached $98.165 billion, mandatory-convertible preferred stock $18.023 billion, and Alphabet completed a $10 billion private placement to a Berkshire Hathaway affiliate. The balance sheet remains liquid, but her stewardship should be judged on whether this financing produces durable per-share FCF rather than simply preserving the pace of construction.

3. Capital allocation behavior

The governed five-year record is mixed. R&D increased from $31.562 billion in FY2021 to $61.087 billion in FY2025, while capex/revenue rose from 9.6% to 22.7%. Repurchases were $50.274 billion, $59.296 billion, $61.504 billion, $62.222 billion and $45.709 billion in FY2021-FY2025. Dividends began in FY2024 and reached $10.049 billion in FY2025. Diluted shares declined from 13.553 billion in FY2021 to 12.230 billion in FY2025, so historical repurchases created real per-share value rather than merely offsetting awards.

The current record is less comfortable. TTM repurchases were only $17.403 billion versus $28.147 billion of SBC, and there were no common-share repurchases in the first half of 2026 despite $69.5 billion of remaining authorization. Management has subordinated buybacks to infrastructure, Wiz, Intersect and liquidity. That may be rational, but it also shows the program was not explicitly price-sensitive: annual buybacks clustered near $50-$62 billion for four years, then fell as cash demands rose. There is no disclosed valuation hurdle.

The $29.5 billion Wiz and $5.9 billion Intersect acquisitions closed in March 2026. Wiz is consolidated in Cloud; Intersect is allocated across segments. The strategic fit—security, data-center and energy capacity—is coherent with the AI plan. There is not yet evidence of revenue accretion, integration savings or per-share value creation. These deals should remain uncredited until Cloud reports sustained organic economics after acquisition costs and Alphabet discloses enough information to separate bought growth from underlying growth.

4. Compensation alignment

Compensation is equity-heavy, long-dated and protected by a clawback policy, minimum ownership rules, and prohibitions on hedging, short sales, margin accounts and pledging. Those are meaningful positives. Pichai beneficially owned 227,560 Class A shares at April 6, 2026, worth about $81 million at the sealed $357.75 price, above the $35 million ownership requirement. Ashkenazi reported no beneficially owned voting shares in the proxy table and remains within the five-year compliance window for the $7.5 million senior-vice-president requirement.

The design is not sufficient for a high-ROIC gate. Pichai's March 2026 target award included $84 million of time-based Alphabet GSUs, two $63 million Alphabet PSU tranches, approximately $130 million of Waymo performance units and $45 million of Wing performance units: about $385 million at target. Alphabet PSU payout is based on relative TSR; the Bet units depend on increases in unit value. Neither directly measures ROIC, FCF, per-share FCF, capex productivity or regulatory-adjusted cash returns. The structure can reward multiple expansion, financing marks or private-unit valuation without proving owner economics.

Company-wide SBC was $15.376 billion, $19.362 billion, $22.460 billion, $22.785 billion and $24.953 billion in FY2021-FY2025, equal to 6.0%, 6.8%, 7.3%, 6.5% and 6.2% of revenue. Dilution was historically more than offset by repurchases, but that defense has stopped working in the TTM. The 2026 request to add 200 million Class C shares to the stock-plan reserve adds capacity for future dilution. Compensation therefore earns credit for retention and some performance conditioning, but not for capital-return alignment.

5. Disclosure quality and candor

The last eight calls show improved numerical disclosure from Ashkenazi. Management quantified quarterly capex, the server/data-center mix, Cloud revenue and margin, backlog, and the FY2026 capex range. In Q2 FY2026, Ashkenazi explicitly separated $98 billion of other income—primarily unrealized equity-security gains—from operating performance, stated that net income and EPS were inflated by those gains, and disclosed negative quarterly FCF. That is candid handling of the extraordinary FY2026 mark-to-market effect; analysts must still normalize the TTM $151.641 billion of other income.

Question handling is weaker on the variables that determine returns. Management declined a long-term Cloud margin target in Q3 FY2024; declined to quantify a Search advertising headwind in Q4 FY2024; said Q2 FY2025 click metrics should not be overinterpreted; called AI Mode monetization detail “too early” in Q3 FY2025; and did not quantify 2027 capex or TPU product margins in the latest calls. Search-AI revenue, query economics, segment capex, infrastructure utilization, depreciation-cohort returns and acquisition contribution remain undisclosed.

Using a defined test—at least one direct request for a number on capex return, Search-AI monetization, Cloud/TPU margin or forward guidance answered without the requested figure—the hedged-language count is **8 of 8 quarters**. This is not the same as deception: many answers were directionally useful and several later ranges became precise. It does mean disclosure candor is asymmetric: management is specific about demand, usage and growth, but less specific about the cash-return denominator.

Alphabet does not provide conventional revenue or EPS guidance, so a beat/meet/miss score is not meaningful. Capex guidance has repeatedly increased as demand outpaced capacity. The raises were disclosed, but they look more like evolving supply plans than deliberately conservative guidance. The correct monitoring frame is whether each new capex step is followed by quantified revenue, utilization and FCF evidence—not whether Alphabet “beats” a range it never issued.

6. Strategic coherence

The FY2025 10-K retains the mission to “organize the world's information and make it universally accessible and useful” and says Alphabet aims to build advanced, safe and responsible AI through infrastructure, research, models, products and platforms. The investment pattern is coherent with that statement: R&D, data centers, TPUs, Cloud, Wiz, Intersect and AI product hiring all point in the same direction. This is not a sequence of unrelated pivots.

The weakness is not coherence but financial boundary-setting. Management names AI competitors, supply constraints and regulation more directly than in earlier years, yet it has not disclosed a maximum acceptable capex intensity, an aggregate AI return hurdle, or exit criteria for weak projects. A strategy can be coherent and still destroy value if the cost of defending distribution and model leadership permanently absorbs free cash flow.

7. Governance flags

Founder control is the central flag. Each Class B share has ten votes, and Class C has none. At April 6, 2026, Larry Page held 27.4% and Sergey Brin 25.3% of total voting power; together they controlled 52.7%. All directors and executives together held 54.3%. Public Class A holders cannot change control through ordinary voting. The independent chair and seven independent directors mitigate oversight risk, but they do not cure the minority-shareholder power imbalance.

Related-party transactions were small relative to Alphabet but not zero: Alphabet charged a Brin-affiliated entity about $8.43 million for Moffett hangar space, paid a Page/Brin/Schmidt-affiliated entity about $1.58 million for San Jose hangar space, and disclosed GV/CapitalG co-investments involving Kleiner Perkins funds. The audit committee stated arm's-length terms; no material private benefit is evident.

No restatement or material weakness was reported, and Q2 FY2026 controls were effective. Regulatory stewardship is nevertheless a major negative. The Search case produced an adverse judgment and remedies affecting distribution, data sharing and syndication; appeals are pending. The EC Android decision became final and Alphabet paid $5.2 billion in July 2026. Short-term accrued legal and regulatory fines and settlements were $17.4 billion at June 30. Ad-tech, Play and other cases remain. The scale indicates that compliance oversight has not prevented repeated business-model intervention.

Recent Form 4 activity includes Pichai sales under a Rule 10b5-1 plan adopted in December 2024 and executive award/tax transactions. The latest 10-Q reported no non-Rule 10b5-1 arrangements adopted, modified or terminated in Q2. This looks planned rather than a sudden opportunistic exit cluster, but the size and recurrence of executive sales remain a monitor because beneficial ownership outside unvested awards is modest relative to total compensation.

8. Peer comparison

Satya Nadella ranks ahead on five-year stewardship because Microsoft's cloud transition produced durable per-share cash economics before its own AI capex surge, and Microsoft provides somewhat clearer business-line and capital-return framing. Pichai's Cloud turnaround is comparable operationally, but Alphabet's Search transition and current financing wave are less proven.

Mark Zuckerberg is a useful control-founder comparison. Meta's “year of efficiency” demonstrated faster cost correction and its segment disclosure isolates Reality Labs losses more clearly than Alphabet isolates individual Bets. Alphabet has historically diversified earnings better and maintained a stronger balance sheet. Pichai ranks above Zuckerberg on portfolio breadth and below him on willingness to expose a discrete loss center and reset costs publicly.

Andy Jassy is more direct about long-run cash margins and infrastructure trade-offs, while Amazon offers less share-repurchase support. Pichai ranks well on product execution and Cloud profitability, but behind the best peers on capital-return disclosure. Overall, he is an upper-tier operator but not yet a proven steward of this unprecedented capital cycle.

9. Management gate verdict

MANAGEMENT GATE: YELLOW. Pichai has a long, quantitatively strong record in Services and Cloud, Ashkenazi has improved cash-flow candor, and the AI strategy is coherent. The gate does not pass because founder voting control is permanent, compensation lacks ROIC/FCF anchors, Wiz and Intersect are unproven, regulatory costs are substantial, and the AI build has compressed FCF while shifting the balance sheet and buyback policy. This is investable only as a provisional management thesis, not a decade-long blank cheque.

Upgrade to **PASS** requires: (1) TTM FCF to recover above FY2025's $73.266 billion while capex growth decelerates or management quantifies a credible return bridge; (2) Cloud sustaining at least a high-20s operating margin after separating material acquisition effects, with Wiz/Intersect contribution disclosed; and (3) compensation adding explicit multi-year per-share FCF or ROIC measures plus stronger minority protections or a credible founder-control sunset.

Downgrade to **FAIL** if: (1) 2027 capex rises without a matching increase in normalized operating cash flow and FCF remains below $50 billion for two consecutive reported TTMs; (2) common dilution persists because annual repurchases remain below SBC while management continues mega-awards; or (3) a major remedy, acquisition impairment, related-party action or regulatory failure demonstrates that founder control and board oversight are not protecting minority owners.

Primary sources

- [Alphabet 2026 proxy statement](https://www.sec.gov/Archives/edgar/data/1652044/000130817926000342/goog-20260424.htm)
- [Alphabet FY2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/1652044/000165204426000018/goog-20251231.htm)
- [Alphabet Q2 FY2026 Form 10-Q](https://www.sec.gov/Archives/edgar/data/1652044/000165204426000071/goog-20260630.htm)
- [Alphabet board and governance](https://abc.xyz/investor/board-and-governance/)
- Live FMP transcript endpoint for fiscal Q3 FY2024 through Q2 FY2026, with immutable SEC earnings exhibits controlling dates and financial figures.

Appendix W - Moat and 2046 Durability

Alphabet Inc. - Moat and 2046 Durability

PATH_RECEIVED: C:\Users\Admin\OneDrive\GPT\ER 2.0\Alphabet Inc\appendix_moat.md

Run ID: `pulse-cio-20260807T120231+0800` Assessment date: 2026-08-07 Evidence anchor: TTM ended 2026-06-30; USD unless stated otherwise Authority: research only; no trade, ranking, sizing, portfolio, message, or publication authority

Scope and evidence discipline

This assessment uses the DR-cleared `data_package.md`, the current primer, current-run live SEC filings and earnings exhibits, and a live FMP ten-year income-statement pull archived under `raw\pulse-cio-20260807T120231+0800\w_20260807T130957`. The FY2025 SEC values override FMP's known defects. All three segment files were stubs at the initial check; their final peer-reviewed Sections 4, 5, 8, 9, 11 and summary tables are now integrated below. Their external competitive markers supplement, but do not override, the governed financial package.

Reviewed segment bindings

- `C:\Users\Admin\OneDrive\GPT\ER 2.0\Alphabet Inc\appendix_B_google_services.md` - SHA-256 `1936e0b190712c84cefbf7466d48e796422246e27ed2ccbb9d2fcefcf092c5ff`.
- `C:\Users\Admin\OneDrive\GPT\ER 2.0\Alphabet Inc\appendix_B_google_cloud.md` - SHA-256 `4cc2ba9f3aa3e2c39e79d1b64fb550c7ea014a7ed7f171d01a82aa1f8e68c300`.
- `C:\Users\Admin\OneDrive\GPT\ER 2.0\Alphabet Inc\appendix_B_other_bets.md` - SHA-256 `5b67574752d8191d1a15950d83dbc28ddbcea7305ed1c4c69794735ff4785016`.

1. Moat taxonomy applied

Network effects - strong in advertising and YouTube, moderate elsewhere. Search has a reinforcing loop rather than a pure social network: more user intent attracts more advertisers; denser advertiser auctions improve relevance and monetization; the cash generated funds product quality, distribution, index coverage, Maps/local data, and serving infrastructure. YouTube has a clearer multi-sided network among viewers, creators, advertisers, and rights holders. Creator supply attracts viewing; viewing attracts advertising and subscription investment; monetization attracts more creators. These effects are strongest on Google-owned properties. Google Network is weaker because inventory sits on third-party sites and applications, and its FY2025 revenue of $29.792 billion was below FY2022's $32.780 billion. Cloud benefits from ecosystem effects around partners, developers, Kubernetes, data tools, security, and Gemini, but enterprise cloud is not winner-take-all and customers deliberately use several vendors.

Switching costs - strong in Cloud and enterprise workflows, limited for consumer discovery. A user can change a search engine or AI assistant in seconds; habit and default placement are distribution advantages, not contractual lock-in. An advertiser can move marginal budget quickly when measured returns change. By contrast, Cloud workloads become embedded in data schemas, identity, security policy, observability, developer tooling, model pipelines, employee workflows, and committed capacity. Migration requires testing, governance approval, downtime risk, and retraining. Workspace adds organizational switching costs, though Microsoft has an equally formidable bundle. These costs protect an installed workload, not the price of undifferentiated compute, and multi-cloud architecture limits captivity.

Scale economies - very strong but increasingly capital intensive. Alphabet spreads indexing, safety, AI research, custom silicon, global networking, data centers, advertising tools, and compliance over hundreds of billions of dollars of revenue. The same technical base serves Search, YouTube, Gemini, Workspace, security, and Cloud. This is difficult to replicate. The caveat is that the cost of defending the advantage has risen sharply: capex increased from $32.251 billion in FY2023 to $91.447 billion in FY2025 and $132.402 billion in the current TTM, while TTM free cash flow was only $53.273 billion. Scale is a moat only if utilization, model efficiency, and monetization earn more than the full depreciation and replacement cost of that infrastructure.

Brand and trust - strong in Search/YouTube, relevant but not decisive in Cloud. Google is a habitual gateway to information and YouTube is a destination for creators, learning, entertainment, live events, and television viewing. Brand

lowers consumer acquisition cost and gives new products immediate distribution. Yet trust can reverse: low-quality AI answers, excessive commercial load, privacy failures, unsafe content, or a superior agent can change behavior. Enterprise Cloud procurement values Google's technical credibility, security, and AI capability, but Microsoft and Amazon are at least as trusted in many buying centers.

Regulatory position - not a moat; it is an asymmetric liability. Alphabet can absorb global privacy, content, and AI-compliance costs better than small rivals, but its scale makes it a remedy target. The Q2 FY2026 10-Q says the December 2025 Search judgment restricts distribution and requires sharing certain search data and offering syndication services to competitors; both sides appealed. It also says ad-tech structural remedies remained possible and Google Play remedies were implemented while a settlement sought modifications. The EU Digital Markets Act adds search-data sharing and Android interoperability obligations. Compliance scale may raise entry costs, but default restrictions, data sharing, interoperability, or structural separation can transfer part of Alphabet's advantage to competitors.

Intellectual property and proprietary data - meaningful, but not independently sufficient. Alphabet's models, custom TPUs, ranking systems, maps/local data, ad-optimization systems, and accumulated engineering know-how matter. Patents alone do not protect the profit pool; frontier model techniques diffuse, talent moves, and open models improve. The defensible bundle is proprietary systems plus fresh user/merchant/creator signals, global infrastructure, evaluation and safety processes, and distribution. Data access is also legally constrained and can be mandated for sharing, so the moat cannot be described simply as “more data.”

High-trust procurement - strong in Cloud and security. Large enterprises and governments require security review, resilience, compliance, support, data residency, contractual commitments, and integration partners. The completed Wiz acquisition broadens the security control plane, and Google reports nearly 90% of the Fortune 100 using Gemini Enterprise in the Q2 FY2026 exhibit. Procurement creates durable account access, but Microsoft owns a broader incumbent software relationship and AWS retains deep infrastructure credibility. This is a real moat component, not evidence that Google Cloud can price commodity capacity without restraint.

2. Per-segment moat

Google Services - strongest present moat; 10-year durability is credible, 20-year form is unresolved. Search's protectable asset is distribution, habit, broad information/local-intent coverage, advertiser liquidity, automated bidding/measurement, and global serving scale. The reviewed appendix cites 91.31% worldwide conventional-search share in July 2026; that validates browser-query scale but excludes assistants, marketplaces, and social/vertical apps. YouTube adds creator supply, recommendation quality, connected-TV reach, and advertiser liquidity; its 13.4% share of U.S. TV time in April 2026 validates living-room scale. Network is weakest because third-party inventory can lose traffic. The reviewed five-year model retains a 36.5% Services margin even in bear, versus 42.0% base and 45.0% bull, but assigns bear 25% versus bull 20% because AI substitution and binding remedies are asymmetric. Break signals are commercial-query share loss, paid clicks trailing query growth, falling CPC, worsening traffic-acquisition economics, creator/viewer migration, or margin below the mid-30s.

Google Cloud - strong 5-to-10-year moat; 20-year economics depend on mix and capital returns. Data gravity, security policy, workload architecture, Workspace identity, contracts, and partner implementations make replacement costly. Custom silicon, data/analytics, AI, security, and global capacity differentiate the stack. The reviewed appendix cites an estimated 14% Q1 2026 infrastructure share, behind AWS at 28% and Microsoft at 21%: durable hyperscaler, not uncontested standard. Margin moved from -11.9% in FY2021 to 31.3% TTM. Its reviewed 2031 bear/base/bull margins are 27%/35%/40%; even bear retains scale economics, but base assumes 20.9% revenue CAGR and orderly utilization. Wiz's $29.5 billion price, undisclosed organic bridge, large-contract concentration, and multicloud bargaining raise the capital-return burden. Signals are margin decline despite utilization, backlog lagging revenue, workload repatriation, rising discounts/incentives, or capex above 25% of revenue after supply constraints ease.

Other Bets - optionality, not a demonstrated moat. Waymo may possess autonomy, safety, mapping, regulatory, fleet-density, and local-operations advantages. More than 500,000 weekly rides and a $16 billion funding round validate progress, but peer scale is real: Apollo Go exceeded 350,000 weekly rides in March 2026. No standalone revenue, contribution margin, fleet capital, insurance economics, or city return is disclosed. The reviewed 2031 bear/base/bull margins remain -850%/-250%/-60%; even bull loses $3.357 billion, while probability-weighted loss is about $7.3 billion. This confirms that rides and technical learning are not yet a protected shareholder profit pool. Upgrade requires positive city contribution margin, improving loss per ride, repeatable entry, and disciplined outside funding; downgrade follows rising losses, safety setbacks, adverse liability rules, or city-specific diseconomies.

Blended moat. Services supplied 82.3% of TTM consolidated revenue and nearly all current operating profit after Cloud and corporate costs; the equity therefore remains exposed to Search's transition rather than diversified away from it. Cloud is now a credible second profit engine at 17.4% of revenue, but Other Bets and Alphabet-level costs dilute the strongest segment economics. The blend is still moated today, yet weaker than a simple recital of Search, YouTube, Cloud, Android, and Waymo would suggest because only Services and Cloud have governed positive profit pools.

3. Margin persistence evidence

The ten-year consolidated record supports a real moat, but also shows that margin is not invulnerable. The live FMP series gives FY2016-FY2020; the verified SEC/FMP package controls FY2021-FY2025 and replaces FY2025 vendor values with official revenue of $402.836 billion and operating income of $129.039 billion.

Fiscal year	Consolidated operating margin
FY2016	26.27%
FY2017	23.61%
FY2018	20.12%
FY2019	21.15%
FY2020	22.59%
FY2021	30.55%
FY2022	26.46%
FY2023	27.42%
FY2024	32.11%
FY2025	32.03%

The trough-to-current expansion from roughly 20%-23% in FY2018-FY2020 to roughly 32% in FY2024-FY2025 occurred despite social/retail-media competition, privacy changes, Cloud investment, and regulation. That is evidence of scale and monetization strength. The FY2022 compression also proves that the margin can fall when costs outrun revenue. TTM statutory margin was 33.1%, but central costs reached $21.541 billion and AI infrastructure spending appears mainly through cash flow before full depreciation.

Segment operating margin	FY2021	FY2022	FY2023	FY2024	FY2025	TTM Q2 FY2026
Google Services	37.10%	32.62%	35.17%	39.77%	40.68%	41.89%
Google Cloud	-11.88%	-7.31%	5.19%	14.14%	23.69%	31.33%
Other Bets	-537.98%	-434.08%	-268.17%	-269.66%	-488.94%	-593.36%

Services' recovery and Cloud's sustained operating leverage are moat evidence. Other Bets is the counterexample. The central warning is cash conversion: FY2025 capex was 22.7% of revenue and the TTM figure was 29.7%, so current accounting margins cannot by themselves prove that the AI-era moat earns high incremental returns.

4. AI disruption stress test

Search is the most exposed workflow. “Prompt or query to answer or completed task” is directly replicable by a capable model with access to web, commerce, local, and transactional data. Alphabet's moat must therefore live in distribution, fresh indexed and local data, trusted response quality, advertiser/merchant liquidity, measurement, and the ability to complete commercial tasks. AI Overviews and AI Mode can expand queries, and Q2 management said response cost fell to its lowest level since launch, but engagement without durable monetization is insufficient. A third-party agent that owns the user relationship can auction or route commercial intent elsewhere even if Google supplies some underlying index or ads.

YouTube is more protected. The valuable object is not just a workflow output; it is creator identity, copyrighted and live content, social proof, recommendation history, television viewing, and a monetization relationship. Generative video raises content supply and moderation costs but does not cheaply recreate trusted creators, sports rights, communities, or a global ad/subscription marketplace. YouTube is platform-adjacent to AI because better creation, translation, recommendation, sponsorship matching, and search can increase usable inventory.

Cloud is the most protected major segment, but not from price competition. It combines chokepoint economics - scarce power, accelerators, networking, secure facilities, and procurement - with switching costs and platform adjacency. AI increases compute, data, security, and model-serving demand. Foundation models can reproduce a software feature; they cannot instantly reproduce global capacity, regulated deployment, data governance, or an embedded production estate. The protected profit pool is higher-level data, security, orchestration, and workflow services on utilized infrastructure, not raw accelerator rental.

Other Bets mixes physical and regulatory chokepoints with unproven returns. An AI model alone cannot operate a safe autonomous fleet across cities; vehicles, mapping, permits, insurance, fleet operations, and density matter. That makes Waymo less digitally disintermediable than Search, but much more capital and regulation dependent.

5. The 2046 test

Date test: from 2026-08-07 to 2046-08-07.

Specific 2046 business description: Alphabet sells trusted discovery and task-completion access; auction and commerce tools for measurable customer acquisition; creator-led video and consumer subscriptions; and enterprise compute, data, cybersecurity, productivity, model, and agent infrastructure. Advertisers and merchants pay for incremental sales or qualified attention. Enterprises and governments pay for secure capacity, data governance, cyber defense, model operation, and embedded workflows. Consumers pay for storage, premium media, advanced AI, and selected services. Ranked-list Search is smaller, Network has withered, YouTube remains a destination, and Cloud is a much larger revenue share. Other Bets contributes only if mobility earns positive city-level returns. The reviewed 2031 ranges show Services and Cloud can remain profitable through severe transitions, but do not prove 2046 returns. The surviving moat is commercial-intent liquidity and distribution in Services, plus data/workload/security switching costs and infrastructure scale in Cloud. Consolidated margin is plausibly high-20s to low-30s, below today's 33%, after AI serving, content, compliance, and depreciation.

2046 bear description: independent agents control the customer interface and retain commercial-intent economics; Search becomes an upstream index or ad utility with less pricing power. Default restrictions, search-data sharing, interoperability mandates, and ad-tech remedies reduce distribution and bundling advantages. Open and rival models make inference portable, while enterprise buyers arbitrage Cloud capacity across vendors. Alphabet keeps large revenue but must spend heavily to defend share; Services margins fall toward the 20s, Cloud resembles capital-intensive infrastructure, Other Bets remains a cash consumer, and consolidated margin approaches the mid-teens. This is not the modal outcome, but it is a material, plausibly one-third type of durability risk - high enough that a full PASS would require evidence not yet disclosed.

6. Competitive threat inventory

Threat	Mechanism	Segment(s) affected	Earliest observable signal	Plausibility
AI agents own commercial intent	Assistant answers and completes tasks without a Google session, then routes transactions/ads elsewhere	Services, especially Search and Network	Commercial-query share loss; paid clicks trail query growth; CPC declines; agent referral mix rises	High
Remedy-driven distribution and data unbundling	Default restrictions, search-data sharing, syndication, Android/Play interoperability, or ad-tech structural action lowers exclusivity	Services, Android/Play, ad tech	Default traffic declines; TAC rises; remedy implementation expands; publisher/advertiser churn	High
Cloud/AI capacity commoditization	Rival scale, portable models, overbuild, and customer bargaining compress price and utilization while depreciation rises	Cloud and central AI infrastructure	Margin declines despite growth; backlog slows; discounts/incentives rise; capex stays above 25% of revenue	Medium-high

7. Pricing power verification

Search provides the clearest observable pricing evidence. In Q2 FY2026, paid clicks rose 13% year over year while cost-per-click rose 3%; for the first half, the figures were 13% and 4%. Volume and realized yield rose together, consistent with advertiser auction liquidity and measurable return rather than simple price taking. Services margin was 41.8% in Q2 versus 40.1% a year earlier despite AI serving and distribution costs. That is strong current evidence, though mix, geography, formats, and currency also move CPC.

Network is weaker: cost-per-impression rose 13% in Q2 while impressions fell 12%, yet Network revenue declined 0.7%. Yield on shrinking inventory is not durable pricing power. Consumer subscriptions grew - paid subscriptions rose from more than 325 million at Q4 FY2025 to 350 million at Q1 FY2026 - but Alphabet does not disclose churn, ARPU, or a clean price/adoption bridge. Cloud contracts can run longer than one year and backlog reached $514 billion by Q2 FY2026, supporting demand visibility and switching costs. However, Alphabet does not disclose renewal rates, cohort retention, discounting, minimum-commitment realization, or segment gross margin. Cloud pricing power should therefore be rated **moderate and indirect**, while Search auction pricing power is **strong and observable**.

8. Moat verdict

Moat gate: YELLOW. No change after peer-reviewed segment integration. Services and Cloud retain positive 2031 bear margins of 36.5% and 27.0%, confirming strong current economics, while Other Bets remains loss-making in every scenario. The unresolved question remains whether core advantages earn high returns after AI agents alter discovery, remedies weaken default/data advantages, and Alphabet absorbs the full cost of a $132.402 billion TTM capex program.

2046 test: YELLOW. No change after peer-reviewed segment integration. Advertisers buying measurable commercial outcomes and enterprises buying secure data/AI/workflow infrastructure are specific payers, but the reviewed five-year ranges cannot settle 20-year interface ownership or capital returns. Upgrade requires stable commercial-query share, CPC and Services margin through AI migration; Cloud margin/backlog strength after supply normalizes; and capex/FCF normalization. Downgrade if non-Google agents capture commercial intent, remedies cause sustained distribution loss, or Cloud/AI growth drives owner returns structurally below history.

Source register

- Alphabet FY2025 Form 10-K: `https://www.sec.gov/Archives/edgar/data/1652044/000165204426000018/goog-20251231.htm`.
- Alphabet Q2 FY2026 Form 10-Q: `https://www.sec.gov/Archives/edgar/data/1652044/000165204426000071/goog-20260630.htm`.
- Alphabet Q2 FY2026 earnings exhibit: `https://www.sec.gov/Archives/edgar/data/1652044/000165204426000066/googexhibit991q22026.htm`.
- Current-run live FMP annual income statement: `https://financialmodelingprep.com/stable/income-statement?symbol=GOOGL&period=annual&limit=10`.
- Verified current-run `data_package.md`, `appendix_A_primer.md`, and final-check Sections 4/5 of all three current segment appendices; no prior-date cache was used as evidence.

Appendix B1 - Google Services

Alphabet Inc. — Google Services Segment Deep Dive

Run ID: `pulse-cio-20260807T120231+0800` Historical anchor: TTM ended 2026-06-30 Forecast horizon: 2031-06-30, exactly five calendar years Reporting currency: USD; financial tables use billions unless stated otherwise Scenario weights: Bear 25%; Base 55%; Bull 20% Exact segment profit basis: issuer-disclosed `Operating income (loss)` Trade execution authorized: `false`

0. Segment boundary and taxonomy note

Google Services is one of Alphabet's three stable reportable segments. Its boundary has been comparable from FY2021 through FY2025 and through the June 2026 TTM period. It includes Google advertising products, Android, Chrome, devices, Maps, Google Play, Search, YouTube, consumer subscriptions, apps, and in-app purchases. The FY2025 adoption of expanded significant-segment-expense disclosure did not change the segment identity. The product label `subscriptions, platforms, and devices` has experienced vendor naming drift, but the official SEC taxonomy controls. No pre-restatement and post-restatement dollars are mixed here. Alphabet-level activities are a separately disclosed corporate/unallocated line and are not allocated to Google Services in any historical or forecast table. The sealed statutory bridge is verified with zero residuals and fixes this appendix's profit metric as issuer-disclosed `Operating income (loss)`.

1. What Google Services actually is

Google Services is Alphabet's consumer-facing attention, discovery, media, software-distribution, and device ecosystem. Economically, it contains four dollar-disclosed revenue families. `Google Search & other` monetizes commercial intent across Google Search and related properties, primarily through auction-priced advertisements. Advertisers bid for queries and audiences; Google earns revenue when users interact with ads or when contracted impression criteria are met. Search combines a global web index, query understanding, ranking, consumer interfaces, advertiser demand, measurement, and automated campaign tools. AI Overviews and AI Mode change the answer format but sit inside the same broad discovery-and-commercial-intent system.

`YouTube ads` sells brand and performance advertising against creator and professional video inventory. The product spans mobile, desktop, and connected-TV viewing, including skippable and non-skippable video, Shorts, direct-response formats, sponsorships, and other inventory. Creators supply much of the content and receive a contracted share of monetization, so content payments are economically variable costs. YouTube also benefits from Google's ad stack, measurement, and advertiser relationships. Subscription revenue from YouTube Premium and YouTube TV does not sit in the disclosed YouTube-ads line; it is included in subscriptions, platforms, and devices.

`Google Network` consists mainly of advertising placed on third-party partner properties using Google's platforms. It is structurally different from owned-and-operated Search and YouTube: partners control the user relationship and receive traffic-acquisition or revenue-share payments. That makes Network more exposed to publisher disintermediation, privacy restrictions, browser-policy changes, and lower incremental margins. Its revenue has already declined for three consecutive fiscal years, so this appendix treats it as a shrinking legacy distribution channel rather than as a disguised growth asset.

`Subscriptions, platforms, and devices` combines several unlike economics in one disclosed line. Consumer subscriptions include YouTube Premium, YouTube TV, Google One, and other paid services. Platform revenue includes Google Play apps and in-app purchases. Devices include Pixel phones, Nest products, and related hardware. The segment also contains Android, Chrome, Maps, and Gemini consumer experiences, many of which are free at the point of use and support engagement, distribution, data, and ecosystem retention rather than being separately disclosed revenue lines. The blended category therefore mixes recurring, potentially attractive subscription revenue with commission revenue and lower-gross-margin hardware.

Customers are both sides of a multi-sided network. Consumers generally receive Search, Maps, Android, Chrome, Gmail, YouTube, and Gemini services at no direct monetary price, contributing attention, queries, content, reviews, and product feedback. Advertisers pay for access to intent and audiences. Developers and publishers pay commissions or share revenue through Play and ad-network relationships. Subscribers pay monthly or annual fees, while device buyers pay transaction prices. Go-to-market is mostly product-led at the consumer layer and direct, agency-assisted, or self-service at the advertiser layer. Distribution is reinforced by Android, Chrome, OEM and browser agreements, app-store presence, and habit, but antitrust remedies now limit the exclusivity and duration of some arrangements.

The segment is not a standalone cash-flow reporting unit. Alphabet discloses segment revenue and `Operating income (loss)`, plus selected expense categories, but not segment assets, capex, cash, debt, depreciation, invested capital, or ROIC. Accordingly, this appendix underwrites revenue and the sealed profit metric. It does not fabricate a segment free-cash-flow conversion rate or allocate consolidated infrastructure capex to Services.

2. Current economics at the TTM anchor

TTM Google Services revenue was $367.091 billion and issuer-disclosed `Operating income (loss)` was $153.792 billion, implying a 41.90% margin. The four quarters were Q3 FY2025 $87.052 billion at 38.51%, Q4 FY2025 $95.862 billion at 41.86%, Q1 FY2026 $89.637 billion at 45.28%, and Q2 FY2026 $94.540 billion at 41.83% [SEC earnings exhibits dated 2025-10-29, 2026-02-04, 2026-04-29, and 2026-07-22; `data_package.md` section 5, Google Services row]. Reconstructing the prior-year comparable quarters from the package's disclosed quarterly year-over-year rates yields approximately 14.57% TTM growth. This is an arithmetic diagnostic from the verified quarterly row, not a separately reported company KPI.

The product mix is concentrated. Search contributed $243.310 billion, or 66.28% of TTM Services revenue. YouTube ads contributed $42.582 billion, or 11.60%. Google Network contributed $29.456 billion, or 8.02%. Subscriptions, platforms, and devices contributed $51.743 billion, or 14.10%. These four sums equal the segment's $367.091 billion exactly [SEC earnings exhibits dated 2025-10-29, 2026-02-04, 2026-04-29, and 2026-07-22; `data_package.md` section 5, product rows]. No separate dollar estimate is made for YouTube subscriptions, Gemini consumer plans, Google One, Play, or devices because the package identifies those as true non-disclosures.

The revenue-growth mix is healthier than the aggregate alone suggests. Across the latest four quarters, Search grew 14.54%, 16.73%, 19.13%, and 16.76% year over year. YouTube ads grew 15.02%, 8.69%, 10.71%, and 12.85%. Subscriptions, platforms, and devices grew 20.78%, 16.72%, 19.32%, and 15.25%. Network declined 2.57%, 1.58%, 3.93%, and 0.69% [SEC earnings exhibits dated 2025-10-29, 2026-02-04, 2026-04-29, and 2026-07-22; `data_package.md` section 5]. Thus the segment has three expanding owned-and-operated revenue pools offset by a shrinking partner-distribution pool. Search remains sufficiently large that its mid-teens growth dominates the total.

Historical profitability also matters. Services margin fell from 37.10% in FY2021 to 32.62% in FY2022, then recovered to 35.17% in FY2023, 39.77% in FY2024, 40.68% in FY2025, and 41.90% in the June 2026 TTM. FY2025 disclosed employee compensation expense was $45.124 billion and other costs and expenses were $158.193 billion, against $342.721 billion of revenue. Employee compensation grew only modestly from $46.224 billion in FY2023 even as revenue expanded materially; other costs rose with traffic acquisition, content, infrastructure, devices, and activity [Alphabet FY2023 and FY2025 Forms 10-K, segment and supplemental segment-expense tables; `data_package.md` sections 3 and 3a]. The resulting operating leverage is real, but the TTM margin should not be assumed to rise mechanically because AI inference, depreciation, content costs, regulatory compliance, and distribution payments can absorb scale benefits.

Capital intensity is a disclosed gap at segment level. Alphabet's TTM capex was $132.402 billion [live FMP annual cash-flow statement plus FY2025/H1 FY2025/H1 FY2026 reconciliation; `data_package.md` section 7], and management's full-year 2026 consolidated capex range was $175-$185 billion [Q4 FY2025 earnings call, 2026-02-04; `data_package.md` section 6], but neither amount is allocated among Services, Cloud, Other Bets, or Alphabet-level activities. Search and YouTube increasingly consume shared accelerators, servers, data centers, networks, and power. The segment's accounting margin will absorb depreciation and operating costs associated with those assets, yet this analysis cannot credibly infer Services capex or invested capital from consolidated totals. That limitation matters most to cash-return analysis, not to the segment revenue and operating-income forecast.

3. Unit economics

Search begins with query volume and commercial-query mix. Revenue equals monetizable queries multiplied by ad load, click or impression engagement, and price or yield. Query growth is supported by device penetration, distribution, product utility, and new AI-driven use cases. Monetization depends on how well the system recognizes commercial intent, matches advertisers, predicts conversion, and reports outcomes. Auction density provides pricing resilience when advertiser return on spend is demonstrable. However, AI answers can reduce traditional link clicks, increase compute per query, and concentrate screen real estate. An AI response may therefore expand engagement while initially lowering ad density or raising serving cost. Management's statement that engineering and hardware optimization reduced AI Mode response cost is directionally favorable, but neither absolute cost nor margin contribution is disclosed.

YouTube advertising converts watch time and audience composition into available impressions, fill, and price. Brand demand values reach and cultural relevance; direct response values measurable conversion. Shorts, connected TV, creator

partnerships, and custom sponsorships create incremental formats, but economics vary. Revenue-sharing with creators and content partners scales with monetization, while content moderation, recommendation, storage, bandwidth, and sales costs support the platform. Connected-TV growth can improve premium inventory and living-room reach, but competition for sports and professional content can raise minimum guarantees. The $1 billion annual run-rate disclosed for interactive direct-response ads in the living room demonstrates a real format, yet it remains small relative to total YouTube revenue.

Subscriptions generate revenue from subscriber count multiplied by blended ARPU, net of trials, discounts, partner commissions, taxes, and content or service delivery. The package shows paid consumer subscriptions rising from 300 million in Q3 FY2025 to 325 million in Q4 and 350 million in Q1 FY2026, with YouTube and Google One identified as key drivers. It does not disclose churn, gross adds, ARPU, geographic mix, or YouTube-only subscribers. Subscription contribution margins also differ: cloud-storage services, music/video subscriptions, and virtual pay-TV carry very different content and infrastructure costs. The correct forecast therefore applies growth to the disclosed aggregate subscriptions/platforms/devices revenue line, not to an invented paid-user-times-ARPU model.

Play and platform economics depend on developer spending, installed devices, commission structures, and regulation. A digital commission can be high-margin before ecosystem and compliance expense, but alternative billing, sideloading requirements, and app-store remedies can compress take rates. Devices add ecosystem control and showcase AI features but bring bill-of-materials, logistics, inventory, warranty, and channel costs. Growth in the combined line does not necessarily translate one-for-one into margin expansion if hardware mix rises. Android, Chrome, Maps, Gmail, and free Gemini experiences contribute distribution and retention; because no transfer price is disclosed, attributing their costs or economic value to Search, Play, or subscriptions would be artificial.

Google Network has the weakest unit economics trajectory. Revenue depends on partner inventory and Google's ability to intermediate advertiser demand. Traffic-acquisition and publisher payments consume a large portion of economics, while privacy changes and direct relationships between advertisers and large publishers can reduce the platform's role. Generative answers can also reduce outbound web traffic, weakening the publisher ecosystem that supplies Network inventory. The forecast assumes continued decline in every case except a nearly flat bull path; this prevents an attractive Search thesis from hiding deterioration in the partner channel.

At the segment level, profit is revenue less employee compensation and all other segment costs. FY2025 employee compensation was 13.17% of revenue, down materially from 16.96% in FY2023, while other costs and expenses were 46.16%, down from 47.87%. That explains the margin rise from 35.17% to 40.68% [Alphabet FY2025 Form 10-K, supplemental segment-expense table; `data_package.md` section 3]. The first lever was compensation discipline relative to revenue; the second was modest leverage in other costs. From here, the largest upside mechanism is continued revenue growth without proportional headcount, paired with lower unit inference cost. The largest downside mechanism is simultaneous pressure from lower ad yield, higher distribution or content payments, and rising depreciation or AI-serving expense. Because product-level margins are not disclosed, the scenario margins below are modeled directly at segment level and are not presented as a weighted average of fabricated product margins.

4. Competitive dynamics

Search still has extraordinary conventional-search share. Statcounter measured Google's worldwide all-platform search-engine share at 91.31% in July 2026, versus Bing at 4.47%, Yahoo at 1.24%, Yandex at 1.00%, DuckDuckGo at 0.65%, and Baidu at 0.50% ([Statcounter, July 2026](https://gs.statcounter.com/search-engine-market-share/monthly/worldwide)). This metric is browser-search activity and does not capture every discovery interaction inside AI assistants, marketplaces, social apps, or vertical sites, so it should not be mistaken for 91% of all information seeking. It nevertheless shows that Bing's integration of generative AI has not displaced Google's conventional query scale.

The competitive perimeter is widening. Microsoft competes through Bing, Edge, Windows, Copilot, and its advertising stack. OpenAI, Anthropic, Perplexity, and other assistants compete for answer-oriented, research, coding, shopping, and task-completion queries. Amazon competes for product discovery and retail advertising; Meta and TikTok compete for attention, video discovery, creator content, and performance-ad budgets. Apple controls high-value distribution on its devices and can alter defaults, integrate its own models, or route requests among providers. Vertical platforms such as Booking, Expedia, DoorDash, Reddit, and specialized commerce or travel apps retain first-party data and transactional intent.

OpenAI's June 2026 usage study reported that users sent 50% more messages per day six months after signup and doubled the number of distinct tasks tried, while non-English users represented more than half of active users ([OpenAI Signals, June 30, 2026](https://openai.com/index/how-chatgpt-adoption-has-expanded/)). That evidence does not quantify Search revenue

substitution, but it demonstrates deepening assistant habit and global reach. The risk is not merely loss of browser share. It is that high-value informational and commercial workflows start in an assistant that owns the user context and chooses when, whether, and how to call Google's index or advertising services.

YouTube competes against a different set: TikTok and Instagram/Reels for short-form mobile attention; Netflix, Disney, Amazon, and other streaming services for living-room time; traditional television for reach; Spotify and podcasts for audio attention; and creator platforms for supply. Yet YouTube's position is unusually broad. Nielsen reported YouTube led its U.S. Media Distributor Gauge with 13.4% of total television watch time in April 2026, while Amazon Prime Video had 4.2% and streaming overall had 47.6% ([Nielsen, June 25, 2026](https://www.nielsen.com/news-center/2026/sports-and-dramas-drive-april-viewing-patterns-in-nielsens-latest-gauge-reports/)). The measure excludes much mobile and desktop viewing and is not an advertising-currency rating, but it validates YouTube's living-room scale and its competition with entire media groups rather than only user-generated-video apps.

Competition in Network and Play is more structurally adverse. Publishers can work directly with demand-side platforms or alternative ad exchanges. Browser privacy controls, consent rules, and device identifiers reduce cross-site measurement. Apple and regulators can require alternative app distribution or payment options, putting pressure on Play commissions. Device hardware competes with Apple, Samsung, and Chinese manufacturers at scales where differentiation and supply-chain execution matter. Subscription services face low switching costs, household-budget constraints, and content costs.

Pricing power is strongest where Google proves advertiser conversion or provides unique reach. Search auctions aggregate demand against granular intent; YouTube combines creator inventory with Google measurement and targeting; paid storage benefits from workflow integration. Pricing power is weaker in Network, commodity hardware, and subscription categories where content or storage is easily compared. The base case therefore does not apply one premium growth rate across the segment.

Regulation is now part of competitive structure, not a remote legal tail. The U.S. Department of Justice states that the September 2025 judgment barred exclusive distribution contracts involving Search, Chrome, Assistant, and Gemini, limited certain placement and revenue-share conditions, required access to specified search-index and user-interaction data, and required search and text-ad syndication for eligible rivals ([DOJ remedies summary, updated April 15, 2026](https://www.justice.gov/opa/pr/department-justice-wins-significant-remedies-against-google)). Alphabet is appealing. The remedies can lower rival entry barriers and weaken default-distribution advantages even if Google's product quality sustains high share.

5. Moat at the segment level

Google Services has a powerful but evolving moat. The first layer is demand density. Search matches enormous user query volume with a large advertiser base and a conversion-optimization system trained across diverse commercial categories. More advertisers improve auction density; more queries improve model feedback and coverage; better measurement attracts more budget. A rival needs not only an answer engine, but also fresh indexing, local and commercial data, brand trust, low latency, global language coverage, fraud control, billing, advertiser tools, and credible measurement. That bundle is difficult and costly to reproduce.

The second layer is distribution and habit. Chrome, Android, Search, Maps, Gmail, YouTube, and device relationships create frequent entry points. Defaults have mattered economically, as the antitrust case documents, and remedies reduce the durability of exclusivity. Still, habitual direct use, product quality, saved histories, account identity, and cross-product integration may persist even when users can choose alternatives. Distribution is therefore a moat component, but it cannot be treated as immutable or wholly organic.

The third layer is data and infrastructure. Query and ad-interaction feedback help ranking and conversion models; YouTube's catalog, creator relationships, recommendation history, and rights systems are hard to clone. Alphabet's custom accelerators, model development, global serving network, and software stack can lower unit cost at scale. Management's disclosure that AI Mode response cost reached its lowest level since launch points toward this advantage, although absolute economics remain unavailable. Large capital requirements are also a barrier, but they reduce free-cash-flow conversion and can become a liability if workloads commoditize.

YouTube's moat is a two-sided creator-audience network. Creators value distribution, monetization, analytics, and a vast audience; viewers value breadth, searchability, personalization, and free access. Its catalog ranges from short clips to long-form video, music, live streams, education, podcasts, and television-like programming. A new platform can win a format

or demographic, but replicating the complete catalog and monetization engine is harder. The 13.4% U.S. TV-watch-time share reinforces that YouTube has crossed from a web-video site into a mass-media distributor.

The fourth layer is advertiser workflow. Search, YouTube, app campaigns, measurement, bidding, and creative automation can be purchased through common systems. Cross-format campaigns reduce friction and allow Google's models to shift budget toward predicted return. Switching is possible and large advertisers multi-home, but the learning curves, historical conversion data, and global support create operational stickiness. This moat is strongest when measurement remains credible; privacy restrictions, attribution uncertainty, or self-preferencing concerns can weaken it.

Durability is not uniform. Search and YouTube have strong network and scale effects. Subscriptions have ecosystem advantages but also low consumer switching costs. Play's take rate is vulnerable to regulation. Devices have no demonstrated structural margin moat comparable with Apple's hardware franchise. Network appears to have a narrowing moat, reflected in sustained revenue contraction. The five-year model accordingly assumes aggregate durability without asserting that every product is protected.

The central 5-10 year question is whether AI reinforces Google's system or unbundles it. Reinforcement occurs if Google uses Gemini to expand queries, answer new categories, improve ad conversion, and lower serving cost while retaining consumer choice. Unbundling occurs if assistants become the primary interface, publishers restrict data, advertisers move to closed commerce ecosystems, and regulation forces data or ad access to competitors. The observed conventional-search share and recent Services growth support continued strength; rapid assistant adoption and binding remedies prevent a complacent terminal assumption. The moat is therefore strong enough to support growth and high profitability in base, but not strong enough to justify unchanged mid-teens growth or automatic margin expansion for five years.

6. Historical growth rates

The following table reproduces official dollars from the data package. The three-year CAGR is FY2022 to FY2025, exactly three compounding intervals. Latest YoY is Q2 FY2026 versus Q2 FY2025. Bracketed references identify the specific controlling data-package row for every numeric cell. No historical value is back-solved.

Product / sub-segment	FY2021 rev	FY2022 rev	FY2023 rev	FY2024 rev	FY2025 rev	3-year CAGR	Most recent YoY	Controlling source via data package
Google Search & other	$148.951 [DP section 4, five-year Search row]	$162.450 [DP section 4, five-year Search row]	$175.033 [DP section 4, Search row 1]	$198.084 [DP section 4, Search row 1]	$224.532 [DP section 4, Search row 1]	11.39% [calculated from same row]	16.76% [DP section 5, Search row]	Alphabet FY2023/FY2025 Forms 10-K; Q2 FY2026 SEC exhibit dated 2026-07-22
YouTube ads	$28.845 [DP section 4, five-year YouTube row]	$29.243 [DP section 4, five-year YouTube row]	$31.510 [DP section 4, YouTube row 2]	$36.147 [DP section 4, YouTube row 2]	$40.367 [DP section 4, YouTube row 2]	11.34% [calculated from same row]	12.85% [DP section 5, YouTube row]	Alphabet FY2023/FY2025 Forms 10-K; Q2 FY2026 SEC exhibit dated 2026-07-22
Google Network	$31.701 [DP section 4, five-year Network row]	$32.780 [DP section 4, five-year Network row]	$31.312 [DP section 4, Network row 3]	$30.359 [DP section 4, Network row 3]	$29.792 [DP section 4, Network row 3]	-3.14% [calculated from same row]	-0.69% [DP section 5, Network row]	Alphabet FY2023/FY2025 Forms 10-K; Q2 FY2026 SEC exhibit dated 2026-07-22
Subscriptions, platforms, and devices	$28.032 [DP section 4, five-year SPD row]	$29.055 [DP section 4, five-year SPD row]	$34.688 [DP section 4, SPD row 4]	$40.340 [DP section 4, SPD row 4]	$48.030 [DP section 4, SPD row 4]	18.24% [calculated from same row]	15.25% [DP section 5, SPD row]	Alphabet FY2023/FY2025 Forms 10-K; Q2 FY2026 SEC exhibit dated 2026-07-22
Google Services total	$237.529 [DP section 3, Services row]	$253.528 [DP section 3, Services row]	$272.543 [DP section 3, Services row]	$304.930 [DP section 3, Services row]	$342.721 [DP section 3, Services row]	10.57% [calculated from same row]	14.53% [DP section 5, Services row]	Alphabet FY2023/FY2025 Forms 10-K; Q2 FY2026 SEC exhibit dated 2026-07-22

Arithmetic verification is within 2% for every row. Search: $198.084B x 1.1335 = $224.531B versus $224.532B reported. YouTube ads: $36.147B x 1.1167 = $40.366B versus $40.367B. Network: $30.359B x 0.9813 = $29.791B versus $29.792B. Subscriptions/platforms/devices: $40.340B x 1.1906 = $48.029B versus $48.030B. Services: $304.930B x 1.1239 = $342.709B versus $342.721B. Differences are rounding, not unexplained gaps. The product rows also tie: $224.532B + $40.367B + $29.792B + $48.030B = $342.721B exactly.

The history exposes three distinct regimes. Search accelerated after FY2023 and exited Q2 FY2026 at 16.76% growth, above its 11.39% three-year CAGR. YouTube ads recovered from near-flat FY2022 and has grown at low double digits. Subscriptions/platforms/devices is the fastest durable line, although its blended nature prevents attributing growth to any single product. Network has contracted from $32.780 billion in FY2022 to $29.792 billion in FY2025. The segment model therefore cannot be reduced to one headline growth rate without losing economically meaningful mix.

7. Management guidance and operating anchors

Alphabet did not provide numerical FY+1 revenue or Google Services margin guidance in the data package. The relevant management statements are qualitative operating anchors, reproduced verbatim below from `data_package.md` section 6. They support scenario direction but do not override the need for explicit deceleration and cost assumptions.

- **Search monetization, Q3 FY2025, Philipp Schindler:** "Our investments in new AI experiences, such as AI Overviews and AI Mode, continued to drive growth in overall queries, including commercial queries, creating more opportunities for monetization." Interpretation: AI is currently expanding usage rather than visibly cannibalizing aggregate Search. The forecast still separates query growth, ad yield, and inference cost.
- **Advertiser adoption, Q3 FY2025, Philipp Schindler:** "Rolled out globally in September, AI Max and Search is already used by hundreds of thousands of advertisers, currently making it the fastest-growing AI-powered search ads product." Interpretation: advertiser tooling is being adopted, but no dollars, retention, or incremental return on ad spend were disclosed.
- **Search usage, Q4 FY2025, Sundar Pichai:** "Search saw more usage in Q4 than ever before, as AI continues to drive an expansionary moment." Interpretation: the current demand signal is positive; a record level is not itself a five-year growth rate.
- **AI Mode frequency, Q4 FY2025, Sundar Pichai:** "In The US, we saw daily AI mode queries per user double since launch and AI overviews continue to perform very well." Interpretation: early frequency growth is strong, but the base period is short and neither monetization density nor cost is quantified.
- **Product-led Search growth, Q1 FY2026, Sundar Pichai:** "We continue to invest in improvements to AI overviews, which are driving overall search growth and we're also seeing strong growth in both users and usage of AI mode globally." Interpretation: supports above-historical near-term Search growth and continued reinvestment.
- **Gemini in ads, Q1 FY2026, Philipp Schindler:** "We are accelerating the deployment of Gemini across our entire ads infrastructure to help businesses reach more customers in more places than ever before." Interpretation: automation can increase campaign conversion and reach; forecast benefit is kept inside Search and YouTube growth rather than assigned fictitious Gemini revenue.
- **Measured value, Q2 FY2026, Philipp Schindler:** "Strong performance in Search and YouTube underscores how our investments in AI translate into measurable value for our users and advertisers." Interpretation: the official Q2 growth rates corroborate strong demand, but management did not quantify causal attribution.
- **Inference economics, Q2 FY2026, Sundar Pichai:** "Thanks to our engineering and hardware optimizations this quarter, we reduced the cost of AI mode responses to its lowest level since launch even as we have brought more advanced AI capabilities." Interpretation: this is the main margin-support anchor. Total expense can still rise if AI Mode usage grows faster than unit-cost reductions.
- **YouTube direct response, Q3 FY2025, Philipp Schindler:** "On direct response, we're excited about the growth in revenue we're seeing, especially from small and medium advertisers adopting demand gen." Interpretation: performance advertising broadens YouTube beyond brand budgets, but no product dollars or margin were given.
- **Living-room format, Q3 FY2025, Philipp Schindler:** "Looking at the living room, our long-term bet, more advertisers are adopting interactive direct response ads, leading to an annual revenue run rate exceeding $1 billion globally for this format." Interpretation: this is a concrete but still small monetization vector relative to $42.582 billion of TTM YouTube ad revenue.
- **Total YouTube scale, Q4 FY2025, Sundar Pichai:** "This quarter, Search continued to accelerate with revenues growing 17%, YouTube's annual revenues surpassed $60 billion across ads and subscriptions." Interpretation: the amount includes subscriptions; it must not be inserted into the YouTube-ads row. It does validate a large recurring-revenue component inside the combined segment.

- **Paid subscriptions, Q4 FY2025, Sundar Pichai:** "We have over 325 million paid subscriptions across consumer services, strong adoption for Google One and YouTube Premium." Interpretation: this is a company-wide consumer count and not a YouTube-only subscriber figure.
- **Paid-subscription momentum, Q1 FY2026, Sundar Pichai:** "Overall, the number of paid subscriptions has now reached 350 million with YouTube and Google One being the key drivers." Interpretation: a 25 million sequential increase supports continued aggregate growth, but absent churn and ARPU disclosure it cannot anchor a bottom-up subscriber model.
- **Creator monetization, Q1 FY2026, Philipp Schindler:** "And Gemini now powers YouTube creator partnerships, a centralized platform integrated directly into YouTube Studio for creators and Google ads for advertisers." Interpretation: better creator-advertiser matching may improve monetization and inventory utilization.
- **Ask YouTube engagement, Q2 FY2026, Sundar Pichai:** "More than 140 million users engaged with Ask YouTube on the watch page in June 2026." Interpretation: adoption is material, but no incremental revenue or retention effect is disclosed.
- **Brand formats, Q2 FY2026, Philipp Schindler:** "We launched custom sponsorships to put brands at the heart of the world's biggest moments as they unfold on YouTube using AI to dynamically surface videos tailored to a brand's desired moment." Interpretation: format innovation supports pricing and relevance, but remains inside the aggregate YouTube forecast.

The consolidated capex guidance of $175-$185 billion for FY2026 and management's warning that depreciation and data-center operating costs will rise are also relevant [Q4 FY2025 earnings call, 2026-02-04; `data_package.md` section 6]. They are not allocated to Services, so the model uses them only as a reason not to assume effortless margin expansion. There is a genuine disclosure gap: `[DATA GAP: no numerical Google Services revenue, product revenue, or segment-margin guidance; no product-level operating-income margins]`.

8. Forward growth assumptions by product

All forecasts compound from the exact June 2026 TTM product dollars to June 2031. The TTM anchors are the four official SEC earnings exhibits dated 2025-10-29, 2026-02-04, 2026-04-29, and 2026-07-22, reproduced in `data_package.md` section 5. The historical CAGR column is FY2022-FY2025. "Mgmt FY+1 guide" distinguishes qualitative direction from a numerical guide; Alphabet gave no numerical product guide.

Base case growth assumptions

Product	3-year historical CAGR	Latest YoY	Mgmt FY+1 guide	Base CAGR TTM to TTM+5y	Justification
Google Search & other	11.39%	16.76%	Positive qualitative; no number	10.17%	AI expands queries and improves ad tools, but growth decelerates as scale rises and assistant competition broadens discovery.
YouTube ads	11.34%	12.85%	Positive qualitative; no number	10.99%	Connected-TV and direct response support growth; competition for attention and content costs prevent sustained mid-teens.
Google Network	-3.14%	-0.69%	No numerical guide	-2.00%	Partner inventory, privacy, and publisher disintermediation keep the line declining despite cyclical stabilization.
Subscriptions, platforms, and devices	18.24%	15.25%	Subscription adoption positive; no number	11.99%	Paid accounts and ecosystem cross-sell grow, while a larger base, Play regulation, and hardware mix drive deceleration.

Search's base path is 14%, 12%, 10%, 8%, and 7%. The starting rate is below the latest 16.76% but consistent with management's expansionary AI commentary; the terminal rate reflects a much larger revenue base, assistant substitution, and remedy-driven distribution pressure. This gradual path avoids assuming an abrupt collapse unsupported by the current official results. YouTube ads follows 13%, 12%, 11%, 10%, and 9%, reflecting connected-TV reach, direct response, and new AI formats, offset by media competition. Subscriptions/platforms/devices follows 14%, 13%, 12%, 11%, and 10%; Network

declines 2% annually.

Bull case growth assumptions

Product	3-year historical CAGR	Latest YoY	Mgmt FY+1 guide	Bull CAGR TTM to TTM+5y	Justification
Google Search & other	11.39%	16.76%	Positive qualitative; no number	14.18%	AI Mode creates new commercial queries, monetization approaches classic Search, and share remains near current levels.
YouTube ads	11.34%	12.85%	Positive qualitative; no number	14.99%	Living-room leadership, direct response, Shorts, and sponsorships expand inventory value faster than history.
Google Network	-3.14%	-0.69%	No numerical guide	0.60%	Better automation and ad syndication stabilize partner revenue, but the mature channel does not become a growth engine.
Subscriptions, platforms, and devices	18.24%	15.25%	Subscription adoption positive; no number	16.99%	Paid subscriptions compound with low churn, Google One and YouTube retain pricing, and hardware does not dilute growth.

The bull path is not a straight extrapolation of one quarter. Search grows 17%, 16%, 14%, 13%, and 11%; YouTube ads grows 17%, 16%, 15%, 14%, and 13%; subscriptions/platforms/devices grows 19%, 18%, 17%, 16%, and 15%. Network grows 1%, 1%, 1%, 0%, and 0%. This case requires Google to convert AI engagement into incremental commercial activity while preserving advertising yield and user choice under remedies. It also requires YouTube to retain its living-room leadership and subscriptions to avoid material regulatory take-rate erosion.

Bear case growth assumptions

Product	3-year historical CAGR	Latest YoY	Mgmt FY+1 guide	Bear CAGR TTM to TTM+5y	Justification
Google Search & other	11.39%	16.76%	Positive qualitative; no number	4.58%	Assistant substitution, lower ad density in answer interfaces, and distribution remedies overpower query expansion.
YouTube ads	11.34%	12.85%	Positive qualitative; no number	5.79%	Attention remains durable but ad budgets fragment, content costs rise, and Shorts monetization lags long form.
Google Network	-3.14%	-0.69%	No numerical guide	-4.81%	Publisher traffic erosion, privacy constraints, and alternative monetization accelerate structural decline.
Subscriptions, platforms, and devices	18.24%	15.25%	Subscription adoption positive; no number	5.99%	Subscriber growth slows, Play take rates fall, and hardware or lower-ARPU geographies dilute mix.

The bear path still recognizes the positive starting evidence. Search slows through 8%, 6%, 4%, 3%, and 2%, rather than assuming an immediate revenue decline while official quarterly growth is mid-teens. YouTube ads grows 7%, 7%, 6%, 5%, and 4%. Subscriptions/platforms/devices grows 8%, 7%, 6%, 5%, and 4%. Network declines 6%, 6%, 5%, 4%, and 3%. The scenario is severe because the segment's consolidated growth falls to low single digits, but it is source-bound: it converts specific risks into an orderly five-year transition rather than inventing a shock quarter.

Year-by-year product forecast: Bear

Product	TTM 2026	Jun-2027	Jun-2028	Jun-2029	Jun-2030	Jun-2031
Google Search & other	243.310	262.775	278.541	289.683	298.373	304.341
YouTube ads	42.582	45.563	48.752	51.677	54.261	56.432
Google Network	29.456	27.689	26.027	24.726	23.737	23.025
Subscriptions, platforms, and devices	51.743	55.882	59.794	63.382	66.551	69.213
Google Services total	367.091	391.909	413.115	429.468	442.922	453.010

Year-by-year product forecast: Base

Product	TTM 2026	Jun-2027	Jun-2028	Jun-2029	Jun-2030	Jun-2031
Google Search & other	243.310	277.373	310.658	341.724	369.062	394.896
YouTube ads	42.582	48.118	53.892	59.820	65.802	71.724
Google Network	29.456	28.867	28.290	27.724	27.169	26.626
Subscriptions, platforms, and devices	51.743	58.987	66.655	74.654	82.866	91.153
Google Services total	367.091	413.345	459.495	503.922	544.899	584.399

Year-by-year product forecast: Bull

Product	TTM 2026	Jun-2027	Jun-2028	Jun-2029	Jun-2030	Jun-2031
Google Search & other	243.310	284.673	330.220	376.451	425.390	472.183
YouTube ads	42.582	49.821	57.792	66.461	75.766	85.615
Google Network	29.456	29.751	30.048	30.349	30.349	30.349
Subscriptions, platforms, and devices	51.743	61.574	72.658	85.009	98.611	113.402
Google Services total	367.091	425.818	490.718	558.270	630.115	701.549

Every annual total is the sum of the four displayed product lines, subject only to $0.001 billion rounding. The model makes no separate revenue line for Gemini consumer plans or YouTube subscriptions; their economics remain inside the issuer's disclosed product families.

9. Forward margin assumptions — issuer-disclosed Operating income (loss)

Product-level margins are a true non-disclosure. Search, YouTube ads, Network, and subscriptions/platforms/devices likely have materially different economics, but assigning analyst margins to them would fabricate precision and could falsely allocate shared engineering, infrastructure, sales, distribution, and content costs. This appendix therefore forecasts the exact sealed segment metric, issuer-disclosed `Operating income (loss)`, directly at the Google Services level. The only explicit cost bridge is revenue minus the modeled segment profit. No Alphabet-level activity is inserted.

Case	TTM revenue	TTM Operating income (loss) margin	Jun-2031 revenue	Jun-2031 Operating income (loss) margin	Jun-2031 Operating income (loss)	Specific margin mechanism
Bear	367.091	41.90%	453.010	36.50%	165.349	Lower Search ad density and yield; higher AI serving, content, distribution, depreciation, and compliance burden.
Base	367.091	41.90%	584.399	42.00%	245.447	Headcount and unit-inference leverage offset higher depreciation, content, and regulatory costs; mix is broadly neutral.
Bull	367.091	41.90%	701.549	45.00%	315.697	Search and YouTube scale, lower response cost, ad automation, and subscription mix outweigh infrastructure and content growth.

The bear margin contracts by 540 basis points. The mechanism is not a generic "investment phase." The scenario assumes that answer interfaces monetize at lower density than classic results, rivals and remedies weaken distribution economics, creator and premium-content payments rise, and shared infrastructure depreciation flows into Services faster than revenue. The decline is staged rather than immediate because current Q2 margin remained 41.83% and management reported falling unit response cost. By 2031, segment cost is $287.661 billion, or 63.50% of revenue, versus TTM cost of $213.299 billion, or 58.10%.

The base margin is effectively flat, rising ten basis points to 42.00%. This embeds meaningful operating leverage in employee compensation and ad automation, because the revenue base grows 9.75% annually. That leverage is consumed by AI inference volume, depreciation from the consolidated infrastructure build, YouTube content and creator economics, and

compliance costs. Flat margin is deliberately more conservative than extending the FY2023-FY2025 recovery. It also avoids treating Network's declining mix as automatically accretive when the company does not disclose product profitability or shared-cost allocation.

The bull margin rises 310 basis points to 45.00%. To earn that outcome, management must sustain low incremental headcount, lower cost per AI response faster than query complexity and volume rise, improve ad conversion enough to protect auction yield, and scale YouTube and subscriptions without an offsetting surge in content or device cost. The improvement is capped well below a frictionless software margin because traffic acquisition, creator sharing, content, infrastructure, and hardware remain economic costs. Jun-2031 segment cost is $385.852 billion, which still grows substantially in absolute dollars.

The year-by-year profit paths make the margin mechanism auditable.

Case	Jun-2027 margin / profit	Jun-2028 margin / profit	Jun-2029 margin / profit	Jun-2030 margin / profit	Jun-2031 margin / profit
Bear	39.50% / 154.804	38.00% / 156.984	37.00% / 158.903	36.50% / 161.667	36.50% / 165.349
Base	41.80% / 172.778	41.70% / 191.609	41.80% / 210.639	41.90% / 228.313	42.00% / 245.448
Bull	42.40% / 180.547	43.00% / 211.009	43.70% / 243.964	44.40% / 279.771	45.00% / 315.697

The displayed base Jun-2031 profit rounds to $245.448 billion in the year-by-year table because it uses the displayed $584.399 billion revenue; the unrounded product model produces $245.447 billion. The scenario summary and rollup use $245.447 billion as the governed terminal output. The $0.001 billion display difference is rounding only.

10. Segment rollup and arithmetic reconciliation

The terminal rollup is entirely bottom-up on revenue. Each product starts from its disclosed TTM value and compounds through the five explicit annual rates in section 8. Segment `Operating income (loss)` is then segment revenue multiplied by the scenario margin in section 9. No product margin, corporate cost, hedging amount, below-line gain, or tax item is embedded.

Bear terminal rollup	Jun-2031 revenue	Share of segment	Revenue less segment profit contribution status
Google Search & other	304.341	67.18%	Revenue modeled; product profit not disclosed
YouTube ads	56.432	12.46%	Revenue modeled; product profit not disclosed
Google Network	23.025	5.08%	Revenue modeled; product profit not disclosed
Subscriptions, platforms, and devices	69.213	15.28%	Revenue modeled; product profit not disclosed
Google Services total	453.010	100.00%	36.50% segment margin; 165.349 segment profit

Bear tie-out: $304.341B + $56.432B + $23.025B + $69.213B = $453.011B using displayed product values, versus $453.010B from unrounded calculations. The $0.001B difference is rounding and equals 0.0002%, well inside the 1% tolerance. $453.010B x 36.50% = $165.349B.

Base terminal rollup	Jun-2031 revenue	Share of segment	Revenue less segment profit contribution status
Google Search & other	394.896	67.57%	Revenue modeled; product profit not disclosed
YouTube ads	71.724	12.27%	Revenue modeled; product profit not disclosed
Google Network	26.626	4.56%	Revenue modeled; product profit not disclosed
Subscriptions, platforms, and devices	91.153	15.60%	Revenue modeled; product profit not disclosed
Google Services total	584.399	100.00%	42.00% segment margin; 245.447 segment profit

Base tie-out: $394.896B + $71.724B + $26.626B + $91.153B = $584.399B exactly at displayed precision. $584.399B x 42.00% = $245.448B at displayed precision and $245.447B from the unrounded model.

Bull terminal rollup	Jun-2031 revenue	Share of segment	Revenue less segment profit contribution status
Google Search & other	472.183	67.31%	Revenue modeled; product profit not disclosed
YouTube ads	85.615	12.20%	Revenue modeled; product profit not disclosed
Google Network	30.349	4.33%	Revenue modeled; product profit not disclosed
Subscriptions, platforms, and devices	113.402	16.16%	Revenue modeled; product profit not disclosed
Google Services total	701.549	100.00%	45.00% segment margin; 315.697 segment profit

Bull tie-out: $472.183B + $85.615B + $30.349B + $113.402B = $701.549B exactly. $701.549B x 45.00% = $315.697B. Across all cases, Search remains roughly two-thirds of segment revenue, so Search economics remain the load-bearing underwriting variable. Subscriptions/platforms/devices gains mix, while Network loses mix even in the bull case.

11. Key risks and wildcards

- **AI-interface substitution — Bear.** Consumers may shift high-value queries to assistants that provide direct answers, remember context, and execute tasks. Even if Google supplies some infrastructure or search results, it may lose the primary interface, ad inventory, or customer data. The early evidence is mixed: Google's current Search growth is strong, while external assistant usage is deepening.
- **AI monetization density and cost — Bear/Base.** AI Overviews and AI Mode can create more queries but may display fewer conventional ads and consume more compute. Unit response cost is falling according to management, yet total serving cost can rise faster. The base case assumes offset, not a windfall.
- **Distribution and antitrust remedies — Bear.** Limits on exclusive agreements, data-access obligations, and ad syndication can reduce default advantages and help rivals reach minimum scale. Further Search, ad-tech, Android, or Play remedies could change take rates or product bundling. Appeal outcomes are not predicted here.
- **Search quality and publisher ecosystem — Bear.** Generative answers may reduce publisher traffic, leading content owners to block crawling, demand compensation, or invest less in open-web content. Lower-quality source supply could weaken result freshness and increase licensing cost.
- **YouTube attention and content cost — Bear/Base.** TikTok, Instagram, streaming platforms, and sports-rights buyers compete for viewing and creators. YouTube can retain audience while earning lower incremental margins if revenue shares, minimum guarantees, moderation, bandwidth, or connected-TV content costs rise.
- **YouTube monetization upside — Bull.** Connected-TV leadership, direct response, Shorts, shopping, creator partnerships, and sponsorships could increase revenue per hour faster than assumed. The bull case requires both attention retention and advertiser conversion, not watch time alone.
- **Subscriptions and platform regulation — Bear.** The 350 million paid-subscription count lacks ARPU and churn. Growth could be concentrated in lower-price markets. Alternative app billing and distribution can reduce Play economics; YouTube TV and media subscriptions can face rising content costs.
- **Device and category-mix risk — Bear/Base.** The combined subscriptions/platforms/devices line can grow while margin deteriorates if hardware becomes a larger portion. The absence of subline dollars and margins is a genuine model limitation.
- **Advertising cyclicality — Bear.** Search and YouTube remain exposed to macroeconomic demand, vertical mix, small-business health, and foreign exchange. Auction pricing can adjust rapidly downward even while queries remain stable.
- **Measurement and privacy — Bear/Base.** Consent requirements, identifier loss, browser rules, and platform restrictions can reduce attribution. Google's first-party surfaces help, but weaker measurement can lower advertiser willingness to pay or intensify regulatory scrutiny.

- **Execution and capital intensity — All cases.** Alphabet's consolidated 2026 capex plan is exceptionally large. If infrastructure arrives ahead of monetizable demand, depreciation and operating costs can pressure Services. If supply is constrained, product quality and latency can suffer. Segment capex is not disclosed, so this risk cannot be precisely allocated.
- **Network stabilization — Bull wildcard.** Search/ad syndication remedies and better automation could support partner monetization, allowing Network to stabilize. The bull model gives only 0.60% CAGR, recognizing the possibility without assuming a return to historical scale.

Scenario summary

Case	Segment TTM+5y Revenue	Exact profit metric	Segment TTM+5y Profit Margin	Segment TTM+5y Profit	Probability
Bear	$453.010B	Issuer-disclosed Operating income (loss)	36.50%	$165.349B	25%
Base	$584.399B	Issuer-disclosed Operating income (loss)	42.00%	$245.447B	55%
Bull	$701.549B	Issuer-disclosed Operating income (loss)	45.00%	$315.697B	20%

The 55% base weight reflects the strongest current evidence: mid-teens Services growth, positive management tone on Search/YouTube AI monetization, and falling AI Mode unit response cost, tempered by the absence of numerical segment guidance. The 25% bear weight is deliberately higher than the 20% bull weight because assistant substitution, binding distribution remedies, Network decline, and an unusually heavy consolidated infrastructure build can impair both growth and margin, whereas the bull requires several independent favorable outcomes at once. These weights are non-uniform, sum to 100%, and do not imply trade, ranking, or sizing authority.

These are segment-underwriting outputs only. They provide no trade, order, portfolio, ranking, sizing, messaging, or publication authority. Alphabet-level activities, hedging, below-line income, tax, balance-sheet adjustments, diluted shares, and security-level returns must be handled once by the synthesis and return stages, not allocated into Google Services.

Appendix B2 - Google Cloud

Google Cloud — Segment Deep Dive

Company: Alphabet Inc. **Ticker:** GOOGL **Forecast anchor:** TTM ended 2026-06-30, comprising Q3 FY2025, Q4 FY2025, Q1 FY2026, and Q2 FY2026 **Exact horizon:** 2031-06-30, exactly five calendar years after the TTM end **Reporting currency:** USD billions unless otherwise stated **Exact segment profit basis:** issuer-disclosed **Operating income (loss) Scenario probabilities:** Bear 25%; Base 55%; Bull 20%

This appendix is security-return underwriting input, not a trade, ranking, sizing, portfolio, or messaging instruction. Alphabet-level activities are excluded from every Google Cloud profit forecast below and remain a separate corporate/unallocated line in the sealed statutory bridge.

0. Segment boundary and taxonomy note

Google Cloud is one of Alphabet's three reportable segments. Its boundary is stable across FY2021-FY2025: it contains Google Cloud Platform, enterprise applications including Google Workspace, security, and related enterprise services. The newer segment standard expanded expense and Alphabet-level activity disclosure but did not restate the three-segment identity [data_package §1, lines 50-65]. The acquisition of Wiz closed on 2026-03-11 and its results are consolidated in Google Cloud, which creates an acquisition-comparability break inside an otherwise stable reporting boundary [data_package §9, first row]. This appendix therefore treats reported Cloud as the governed financial line, explicitly flags the Wiz step-up, and does not invent an organic/acquired split that Alphabet has not disclosed.

1. What this segment actually is

Google Cloud sells computing, storage, networking, databases, analytics, artificial-intelligence infrastructure and models, cybersecurity, developer tooling, collaboration applications, and implementation or support services to enterprises, governments, software developers, and digital-native customers. The segment has two broad commercial engines. Google Cloud Platform, or GCP, is the consumption-heavy infrastructure and platform layer. Google Workspace and other enterprise applications are predominantly seat- or subscription-oriented. Security, including Wiz after closing, spans Google Cloud and multicloud estates. Alphabet does not disclose the revenue of any of these engines separately, so they are driver sleeves rather than additive forecast lines.

Infrastructure revenue is generally earned when customers consume compute, accelerators, storage, data processing, database, network, and managed-AI capacity. Contracts may involve committed spend, discounts, and multi-year arrangements, but actual recognized revenue depends on service delivery and usage. This makes backlog informative about demand but not equivalent to near-term revenue. A large contract can enter backlog years before recognition, may be conditional on capacity deployment, and can carry materially different gross economics depending on hardware, software, network, and support mix.

Workspace monetizes Gmail, Docs, Meet, Drive, Gemini-enabled productivity features, administration, and collaboration through per-user or enterprise plans. Its economics should be more recurring and less directly capital-intensive than raw accelerator consumption, but Alphabet does not publish Workspace dollars, gross margin, churn, or seat counts. Security adds cloud-native protection, threat intelligence, security operations, and now Wiz's code-to-cloud platform. The official acquisition announcement says Wiz will retain its brand and work across AWS, Azure, GCP, and Oracle rather than becoming a GCP-only tool. That openness can enlarge the addressable market, but it also means Wiz revenue is not a simple function of GCP workload share ([Alphabet's Wiz completion announcement](https://abc.xyz/investor/news/news-details/2026/Google-Completes-Acquisition-of-Wiz-2026-ta7OaU2uA0/default.aspx)).

The go-to-market combines direct enterprise sales, systems integrators, independent software vendors, resellers, and Google Cloud Marketplace. Customers can buy individual services or commit to broad platform usage. The marketplace creates an ecosystem and procurement channel, but gross marketplace transaction value is not the same as Alphabet revenue. Management's statement that transactions grew more than sevenfold year over year is therefore treated as adoption evidence, not a revenue-growth input [data_package §6, Google Cloud row 8].

Google Cloud's distinctive product proposition is an integrated stack: custom TPUs and global infrastructure; Vertex AI and Gemini models; BigQuery and data analytics; Kubernetes heritage; Workspace distribution; and security tooling. That stack can reduce friction for a customer building data-intensive AI applications. It does not eliminate multicloud behavior.

Enterprises commonly spread workloads across several providers for resiliency, bargaining leverage, regulation, legacy fit, and access to differentiated models. Google Cloud can win share without becoming the customer's exclusive provider; conversely, a strong AI stack does not guarantee that the associated compute remains exclusively on Google infrastructure.

2. Current economics

Google Cloud generated **$77.617 billion** of revenue and **$24.319 billion** of issuer-disclosed **Operating income (loss)** in the TTM ended 2026-06-30, implying a **31.33% margin** [Q3 FY2025 through Q2 FY2026 SEC earnings exhibits for revenue; `OFFICIAL_TTM_RECONCILIATION` in data_package §3a for profit]. The TTM revenue figure is the exact model anchor, not FY2025 revenue. FY2025 revenue was $58.705 billion, up 35.80%, while FY2025 Operating income (loss) was $13.910 billion and the corresponding margin was 23.69% [Alphabet FY2025 10-K segment table, `SEC_2025_10K`; data_package §3].

The recent quarterly pattern is unusually strong. Revenue rose from $15.157 billion in Q3 FY2025 to $17.664 billion in Q4, $20.028 billion in Q1 FY2026, and $24.768 billion in Q2 FY2026. Reported year-over-year growth accelerated from 33.51% to 47.75%, 63.36%, and 81.80%. Operating income (loss) margin rose from 23.71% to 30.08%, 32.94%, and 35.59% [Alphabet SEC earnings exhibits dated 2025-10-29, 2026-02-04, 2026-04-29, and 2026-07-22; data_package §5]. These figures are official, but the last two quarters include Wiz only after its March 2026 closing. The 81.80% Q2 growth rate therefore cannot be treated as a clean organic run rate, and the TTM contains only part of a full year's acquired contribution.

Cloud backlog was $242.8 billion at FY2025 year-end. The data package also records point-in-time values of $155 billion at Q3 FY2025, $460 billion at Q1 FY2026, and $514 billion at Q2 FY2026 [Alphabet FY2025 10-K; earnings-call transcripts dated 2025-10-29, 2026-04-29, and 2026-07-22; data_package §0a]. The series is not a standardized five-year RPO history, and Alphabet does not disclose a duration curve, cancellation profile, workload mix, or gross-margin content. It supports the conclusion that contracted demand is abundant, but it cannot support a mechanical backlog-to-revenue conversion. The forecast uses it to keep first- and second-year growth above mature-cloud rates in the base and bull cases, while allowing meaningful deceleration thereafter.

Product economics are non-disclosed. GCP grew faster than Cloud overall in the recent commentary, Workspace grew double digits, and products built on Google's GenAI models grew nearly 800% in Q1 FY2026, but no standalone dollars are provided [data_package §4, undisclosed-product rows; §6, Google Cloud rows 5-6]. Over 70% of existing Cloud customers used AI products in Q3 FY2025, indicating broad penetration but not the revenue or consumption intensity of those products [data_package §6, Google Cloud row 2]. This appendix therefore does not assign a percentage share of Cloud revenue to GCP, Workspace, AI, security, or Wiz.

Capital intensity is high and increasing, but segment capex is not disclosed. Consolidated TTM capex was $132.402 billion against $445.866 billion of revenue, and full-year 2026 capex guidance was $175-$185 billion. Management has warned that infrastructure investment will pressure depreciation and data-center operating costs [Alphabet Q2 FY2026 10-Q for TTM revenue/capex; Q4 FY2025 earnings-call transcript dated 2026-02-04 for guidance; data_package §§6-7]. Those consolidated figures serve only as a capacity and cost warning. They are not allocated into Google Cloud and do not create a fabricated segment ROIC. **[DATA GAP: Alphabet does not disclose Google Cloud capex, invested capital, cash, debt, or ROIC.]**

The quality of the current margin is promising but not yet fully seasoned. Employee compensation expense rose from $19.054 billion in FY2023 to $20.519 billion in FY2024 and $22.078 billion in FY2025, far slower than revenue. Other costs and expenses rose from $12.318 billion to $16.598 billion and $22.717 billion, reflecting the much heavier variable and infrastructure burden [Alphabet FY2025 10-K supplemental segment-expense table; data_package §3]. Compensation leverage explains an important part of the margin expansion. The rising other-cost line cautions against projecting every incremental revenue dollar at software-like margins.

3. Unit economics

Google Cloud revenue converts into Operating income (loss) through a blend of high fixed-cost infrastructure, usage-sensitive technical costs, and comparatively scalable product-development and go-to-market expense. The first economic layer is the physical fleet: land, data centers, servers, TPUs, GPUs, network equipment, power, cooling, and operations. The cash cost precedes revenue, then appears in the income statement through depreciation, energy, maintenance, bandwidth, and technical infrastructure usage. Capacity deployed too early lowers utilization and margin; capacity deployed too late constrains customer onboarding and pushes demand into backlog or to competitors.

The second layer is workload mix. General compute, storage, and network services can be competitive and price transparent. Managed databases, analytics, AI platforms, security, and collaboration software can command more value because they

embed software, data gravity, workflows, and switching friction. Generative-AI training is accelerator- and energy-intensive; inference can become attractive if utilization is high and model, compiler, and chip efficiency improve, but it can also carry severe cost when customers demand frontier performance and pricing declines quickly. Workspace and security would ordinarily be expected to carry less direct infrastructure cost than raw training, yet the company gives no product margins. The model uses only segment-level margins and discusses mix directionally.

The third layer is employee and ecosystem cost. Google must fund engineers, sales teams, customer support, model development, cybersecurity research, and partner incentives. The historical expense disclosure shows clear compensation leverage: from FY2023 to FY2025, employee compensation grew about 15.9% while Cloud revenue grew 77.4%. In contrast, other costs and expenses grew 84.4%, roughly in line with revenue, which is consistent with infrastructure and delivery cost scaling [Alphabet FY2025 10-K supplemental segment-expense table; data_package §3]. This combination produced a swing from a $2.282 billion operating loss in FY2021 to $13.910 billion of Operating income (loss) in FY2025 [Alphabet FY2023 and FY2025 10-K segment tables; data_package §3].

Several mechanisms can expand margin. Better fleet utilization spreads depreciation and site operating cost across more consumption. Custom TPUs can reduce cost per training or inference unit when utilization and software support are strong. Larger customers may broaden from compute into higher-value data, security, and AI services. Workspace seat and ARPU growth can add recurring revenue without proportionate physical infrastructure. Sales efficiency improves as a larger installed base expands rather than requiring a new logo for every dollar. Wiz can add a security control plane that works across clouds, potentially increasing higher-value software content and marketplace pull-through.

Several mechanisms can compress margin. Alphabet's $175-$185 billion consolidated capex plan [Q4 FY2025 earnings-call transcript dated 2026-02-04; data_package §6] creates a depreciation wave even if physical capacity initially sits underutilized. AI accelerator and power costs can rise faster than realized price. Competition may force contract credits, reserved-capacity discounts, free migrations, or low-priced model inference. The Wiz purchase can bring amortization, integration expense, retention compensation, and channel conflict. Hardware or accelerator sales can boost reported revenue while diluting margin. Customer concentration in a few enormous AI labs or model providers can increase bargaining power and volatility. None of these effects justifies an arbitrary product-margin allocation; they justify a scenario range around the disclosed segment margin.

The economically important distinction is between revenue growth and return on capital. Google Cloud could sustain rapid reported growth while consuming large upstream capex and producing a lower incremental return than its Operating income (loss) suggests. Because no segment invested-capital balance exists, this appendix cannot calculate a credible Cloud ROIC. It instead requires the security-level synthesis to reconcile consolidated capex, depreciation, cash flow, and terminal capital intensity separately. A high Cloud segment margin is not permission to ignore that reconciliation.

4. Competitive dynamics

The direct infrastructure competitors are Amazon Web Services and Microsoft Azure, with Oracle Cloud, Alibaba Cloud, CoreWeave, and other neoclouds competing in particular geographies or accelerated-compute workloads. In productivity applications, Workspace competes most directly with Microsoft 365. In security, Google and Wiz compete with Microsoft, Palo Alto Networks, CrowdStrike, Zscaler, and specialist cloud-security vendors. In data platforms and AI tooling, Google faces Databricks, Snowflake, OpenAI-linked services, Anthropic-linked services, and a proliferating open-source stack.

The market is large enough for multiple winners. Synergy Research Group estimated Q1 2026 cloud-infrastructure service revenue of $128.6 billion, up 35% year over year. It estimated worldwide shares of 28% for AWS, 21% for Microsoft, and 14% for Google, while noting that Microsoft and Google grew substantially faster than Amazon ([Synergy Research Group, 29 April 2026](https://www.srgresearch.com/articles/cloud-market-annual-revenue-run-rate-topped-half-a-trillion-dollars-in-q1-as-growth-surge-continues)). These figures are infrastructure-market estimates and do not map exactly onto Alphabet's Google Cloud segment, which includes Workspace and security. They nevertheless show both Google's credible third position and the distance from the two larger installed bases.

Peer growth prevents an overly sharp deceleration assumption. AWS grew Q1 2026 revenue 28% to $37.6 billion and generated $14.2 billion of segment operating income, a roughly 37.8% margin ([Amazon Q1 2026 results](https://ir.aboutamazon.com/news-release/news-release-details/2026/Amazon-com-Announces-First-Quarter-Results/)). Microsoft reported Azure and other cloud services growth of 40% in fiscal Q3 2026, with cost of revenue up 47% because of AI infrastructure investment ([Microsoft FY2026 Q3 Cloud performance](https://www.microsoft.com/en-us/Investor/earnings/FY-2026-Q3/intelligent-cloud-performance)). Microsoft expected the following quarter's Azure growth to remain 39%-40% in constant currency ([Microsoft FY2026 Q3

call](https://www.microsoft.com/en-us/investor/events/fy-2026/earnings-fy-2026-q3)). Mature scale has therefore not forced immediate teens growth during the AI capacity cycle. The base case lets Google Cloud remain above 20% through year three, then fades as the acquisition comparison and exceptional backlog cycle normalize.

Pricing power is uneven. Customers value reliability, global availability, security certifications, proprietary AI acceleration, data integration, and developer productivity. These capabilities can protect price where switching is risky or where the service produces differentiated outcomes. But standard compute and storage are comparable across providers, large customers negotiate aggressively, and open-source models weaken exclusivity. Long commitments improve visibility while exchanging some pricing. The strongest pricing power likely sits in integrated data, AI, security, and workflow solutions; the weakest sits in undifferentiated capacity.

Entry barriers are formidable at hyperscale. A credible competitor needs global data-center capacity, semiconductor supply, high-speed networks, fault-tolerant control software, a broad service catalog, enterprise support, compliance, partner distribution, and years of operational trust. AI adds model research, accelerator design, and enormous power requirements. Neoclouds can enter a narrow accelerator niche, but replicating the full stack is harder. Conversely, the same capital barrier can destroy value if supply is built ahead of profitable demand, so it is a barrier to entry rather than an automatic guarantee of attractive returns.

Substitution risk comes from three directions. First, customers can migrate or architect across clouds, reducing exclusive workload ownership. Second, AI model and application vendors may capture the economics while treating infrastructure as a commodity. Third, efficient on-premise or sovereign-cloud solutions may retain regulated workloads. Google's defense is the integration of data, models, TPUs, security, and productivity, plus willingness to support multicloud through Wiz. The risk is that openness helps customer adoption while limiting infrastructure lock-in.

5. Segment-level moat

Google Cloud has a real but not impregnable moat. Its strongest asset is the integration of proprietary infrastructure and software. Google has designed TPUs over multiple generations, operates a global private network, trains frontier Gemini models, and owns data and developer technologies such as BigQuery and Kubernetes heritage. A customer can combine model access, data analytics, application development, and infrastructure within one environment. Replicating that breadth, reliability, and capacity requires extraordinary capital and accumulated engineering knowledge.

Data gravity and operational integration create switching costs. Once an enterprise stores large datasets, builds identity and governance controls, trains teams, integrates billing, and deploys production services, migration is costly and risky. Workspace adds user-level distribution and daily workflow exposure. Security can become a cross-estate control layer. These connections support retention and expansion even when a customer remains multicloud.

The installed partner and marketplace ecosystem reinforces distribution. Systems integrators train staff around provider platforms; independent software vendors list products; enterprises centralize procurement. Management's reported marketplace transaction acceleration is evidence that this loop is strengthening, though it does not quantify recognized revenue [data_package §6, Google Cloud row 8]. The more valuable the ecosystem becomes, the easier it is to add workloads and the harder it is for a small entrant to match breadth.

The moat's limitations matter. AWS has a larger infrastructure share and deep operational credibility. Microsoft couples Azure with Microsoft 365, Windows, identity, GitHub, and a powerful enterprise sales channel. Open models and model portability can reduce differentiation in the AI layer. Procurement teams deliberately maintain multiple providers to preserve leverage. Standard services face price competition, and physical infrastructure does not become less capital intensive simply because the software layer is differentiated.

Wiz can strengthen the moat if Google uses it as the trusted multicloud security layer without compromising neutrality. The official strategy retains Wiz's availability across major clouds, which can expand distribution and customer trust. It can weaken the moat if customers or partners perceive Google ownership as a reason to prefer independent security vendors, or if integration distracts from product velocity. The $29.5 billion purchase price increases the burden of proof: strategic quality does not itself establish an attractive acquisition return [Alphabet Q1 and Q2 FY2026 10-Qs, Note 8 and MD&A; data_package §9].

Over five to ten years, the moat should preserve Google's position among the three global hyperscalers and support attractive segment profitability. It does not establish that Google Cloud will overtake AWS or Azure, retain an 80% growth rate, or earn a structurally superior return on new AI capacity. The forecast accordingly gives the base case a 20.93% five-year revenue CAGR and 35.0% terminal Operating income (loss) margin—strong outcomes, but well below extrapolation of the latest

quarter.

6. Historical growth rates

Alphabet separately discloses only the Google Cloud segment total. GCP, Workspace, enterprise AI, security, and Wiz revenue are not separately disclosed, so no back-solved or analyst-allocated product dollars appear here. The four-observation table uses the finest dollar-disclosed line and calculates a true three-year CAGR from FY2022 to FY2025.

Product / sub-segment	FY2022 revenue	FY2023 revenue	FY2024 revenue	FY2025 revenue	3-year CAGR, FY2022-FY2025	Most recent FY YoY	Specific source
Google Cloud total	$26.280B	$33.088B	$43.229B	$58.705B	30.72%	35.80%	Alphabet FY2023 and FY2025 10-K segment tables; data_package §§3-4

Arithmetic checks: $26.280B × 1.2591 = $33.088B, $33.088B × 1.3065 = $43.229B, and $43.229B × 1.3580 = $58.705B, all within rounding and well inside the required 2% tolerance. The true three-year CAGR is ($58.705B / $26.280B)^(1/3) - 1 = 30.72%. No row was back-solved. For wider context, the clean five-year series is $19.206B, $26.280B, $33.088B, $43.229B, and $58.705B for FY2021-FY2025 [Alphabet FY2023 and FY2025 10-K segment tables; data_package §4], a 32.22% FY2021-FY2025 CAGR.

Non-additive product driver	Dollar history	Growth disclosure	Forecast use
GCP core and AI	Not separately disclosed [§4 undisclosed row 1]	Faster than Cloud overall qualitatively; GenAI-built products nearly +800% in Q1 FY2026	Supports above-market near-term Cloud growth; no standalone dollars
Google Workspace	Not separately disclosed [§4 undisclosed row 2]	Double-digit growth; seats and ARPU cited as drivers	Supports recurring growth and potential mix benefit; no standalone dollars
Security including Wiz	Not separately disclosed [§9 Wiz row]	No comparable organic series	Acquisition and cross-sell driver; explicitly prevents organic-growth inference
Google Cloud Marketplace	Recognized revenue not separately disclosed [§6 Cloud row 8]	Transactions over 7x YoY in Q2 FY2026	Ecosystem evidence only; marketplace transactions are not segment revenue

[DATA GAP: GCP, Workspace, enterprise AI, security, and Wiz standalone revenue, growth on a comparable organic basis, and product margins are not disclosed.] That gap is a constraint on product attribution, not a reason to leave the reportable-segment forecast null.

7. Management guidance and operating anchors

The data package contains eight Google Cloud comments. All are reproduced below from §6 rather than re-fetched.

- **Q3 FY2025, Sundar Pichai [data_package §6, Google Cloud row 1]:** “Our complete enterprise AI product portfolio is accelerating growth in revenue, operating margins and backlog.” Reported results validate the direction, but the forecast avoids assuming that simultaneous acceleration persists for five years.

- **Q3 FY2025, Sundar Pichai [data_package §6, Google Cloud row 2]:** “Over 70% of existing Google Cloud customers use our AI products, including Banco BV, Best Buy and FairPrice Group.” This demonstrates broad adoption within the installed base. It does not disclose spend penetration, customer concentration, or incremental margin.

- **Q4 FY2025, Anat Ashkenazi [data_package §6, Google Cloud row 3]:** “The Google Cloud segment delivered outstanding results in the fourth quarter as the business continued to benefit from strong demand for enterprise AI products.” Demand is corroborated by revenue and backlog, but supply and depreciation remain counterweights.

- **Q4 FY2025, Anat Ashkenazi [data_package §6, Google Cloud row 4]:** “And operating margin increased from 17.5% in the fourth quarter of last year to 30.1%.” The 30.1% quarterly anchor is consistent with scale leverage. Subsequent Q2 FY2026 margin reached 35.59%, but acquisition mix and infrastructure cost can make quarterly levels volatile.

- **Q1 FY2026, Sundar Pichai [data_package §6, Google Cloud row 5]:** “Our enterprise AI solutions have become our primary growth driver for cloud for the first time.” The model treats enterprise AI as the main growth sleeve, not as a separately quantified business.

- **Q1 FY2026, Sundar Pichai [data_package §6, Google Cloud row 6]:** “In Q1, revenue from products built on our GenAI models grew nearly 800% year-over-year.” This is an off-base product-set growth rate. Applying it to total Cloud would fabricate scale and is expressly rejected.

- **Q2 FY2026, Sundar Pichai [data_package §6, Google Cloud row 7]:** “Gemini continues to be a key driver of growth and is deeply integrated across all of our cloud products, including Gemini Enterprise, data analytics, cybersecurity and Google Workspace.” Breadth strengthens cross-sell but makes double counting particularly dangerous. Gemini is embedded across lines rather than modeled as an additive revenue bucket.

- **Q2 FY2026, Sundar Pichai [data_package §6, Google Cloud row 8]:** “We are driving growth with partners with transactions on Google Cloud Marketplace growing over 7x year-over-year.” Marketplace momentum supports ecosystem depth, but gross transaction growth is not recognized segment revenue growth.

The relevant capital guidance is consolidated: management's FY2026 capex range was $175-$185 billion, with infrastructure investment expected to pressure depreciation and data-center operating cost [Q4 FY2025 earnings-call transcript dated 2026-02-04; data_package §6]. This is the principal cost-side anchor used in the margin scenarios. There is no issuer-provided full-year Cloud revenue or segment-margin guide. **[DATA GAP: Alphabet did not provide a quantified Google Cloud FY2026 revenue or Operating income (loss) margin guide.]**

8. Forward growth assumptions

Only Google Cloud total is an additive financial line. Product drivers beneath it are non-additive because separate product dollars are undisclosed. The scenario CAGRs are compounded from $77.617 billion at 2026-06-30 to 2031-06-30, exactly five calendar years.

Base case

Product	3-year historical CAGR	Latest YoY	Mgmt FY+1 guide	Base CAGR TTM to TTM+5y	Justification
Google Cloud total	30.72%	81.80% Q2 FY2026	No quantified guide	20.93%	Backlog and AI adoption sustain growth, but Wiz comparability, capacity, and scale drive an explicit fade from 34% to 11%.

Base-year growth is 34%, 26%, 20%, 15%, and 11%. This is not an immediate collapse from the latest 81.80% reported quarter. The first year retains a high rate because the TTM includes only partial Wiz consolidation, Cloud backlog is large, and AI demand remains strong. Growth then decelerates as the acquisition comparison is fully lapped, the revenue base doubles, and customers gain more supply choices. The path is defensible against current peers: AWS grew 28% in Q1 2026 and Azure 40%, so a 34%-26%-20% first-three-year sequence for the smaller and currently faster Google business does not assume unusually abrupt maturation.

Bull case

Product	3-year historical CAGR	Latest YoY	Mgmt FY+1 guide	Bull CAGR TTM to TTM+5y	Justification
Google Cloud total	30.72%	81.80% Q2 FY2026	No quantified guide	27.03%	AI capacity, TPU economics, Workspace/Gemini cross-sell, Wiz security distribution, and share gains sustain a 44% to 16% fade.

Bull-year growth is 44%, 32%, 25%, 20%, and 16%. The case assumes Google converts contracted demand faster, custom infrastructure delivers attractive price-performance, and the combined security platform becomes a broad multicloud control layer. It still cuts growth materially from the latest quarter and never uses the nearly 800% GenAI product rate as a segment input. The path requires continued share gains in a market that remains structurally above normal IT growth.

Bear case

Product	3-year historical CAGR	Latest YoY	Mgmt FY+1 guide	Bear CAGR TTM to TTM+5y	Justification
Google Cloud total	30.72%	81.80% Q2 FY2026	No quantified guide	11.49%	Acquisition growth laps, capacity arrives into weaker demand, multicloud bargaining intensifies, and AI infrastructure commoditizes; growth fades from 20% to 6%.

Bear-year growth is 20%, 14%, 10%, 8%, and 6%. Even the bear case keeps positive growth because the business has contracted backlog, a large installed base, and durable cloud migration. The downside is not disappearance; it is a return toward mature enterprise-technology growth after acquisition normalization, pricing pressure, and lower AI workload intensity. Starting at 20% also avoids an implausibly instantaneous deceleration from the current reported rate.

Year-by-year revenue bridge

Case	TTM anchor	Year 1 growth / revenue	Year 2 growth / revenue	Year 3 growth / revenue	Year 4 growth / revenue	TTM+5y growth / revenue
Bear	$77.617B	20% / $93.140B	14% / $106.180B	10% / $116.798B	8% / $126.142B	6% / $133.710B
Base	$77.617B	34% / $104.007B	26% / $131.049B	20% / $157.258B	15% / $180.847B	11% / $200.740B
Bull	$77.617B	44% / $111.768B	32% / $147.534B	25% / $184.418B	20% / $221.302B	16% / $256.710B

Non-additive product-driver discipline

Driver sleeve	Bear	Base	Bull	Additive dollars or margin?
GCP core infrastructure	Capacity catches demand as pricing weakens	Strong AI and data demand with orderly deceleration	Sustained share gain and high utilization	No; embedded in Cloud total
Enterprise AI and Gemini	Model value shifts to applications; inference price falls	Broad adoption converts into consumption and cross-sell	Gemini quality and TPU economics become differentiated	No; embedded across products
Workspace	Seat growth slows and AI price realization disappoints	Seats and ARPU remain double-digit drivers	Gemini increases ARPU and retention	No; standalone dollars undisclosed
Security and Wiz	Integration friction and neutral vendors win	Multicloud security broadens customer access	Unified code-to-cloud platform becomes a control layer	No; organic and acquired dollars undisclosed
Marketplace and partners	Transactions grow but take rate or recognition is limited	Ecosystem expands procurement and workload pull-through	Partner flywheel materially increases consumption	No; transactions are not revenue

The product-driver table is explicit about what changes in each scenario while preserving the disclosure boundary. It does not pretend that GCP, Workspace, AI, security, or Wiz can be summed to the reported Cloud total.

9. Forward Operating income (loss) margin assumptions

The current TTM issuer-disclosed Operating income (loss) margin is 31.33%. The forecast uses one reportable-segment margin because product-level margins are undisclosed. Alphabet-level activities are excluded.

Case	TTM margin	Year 1 margin	Year 2 margin	Year 3 margin	Year 4 margin	TTM+5y margin	TTM+5y Operating income (loss)
Bear	31.33%	30.0%	28.5%	27.5%	27.0%	27.0%	$36.102B
Base	31.33%	32.5%	33.0%	33.5%	34.0%	35.0%	$70.259B
Bull	31.33%	34.5%	36.0%	37.0%	38.0%	40.0%	$102.684B

Bear mechanism. The 433-basis-point decline from TTM to 27.0% assumes depreciation and data-center operating cost rise faster than realized revenue, AI infrastructure becomes more price competitive, and Wiz integration adds amortization and retention cost. Workspace or security mix cannot offset weaker utilization. The margin remains positive and well above early history because Google has already achieved scale and compensation leverage.

Base mechanism. The 367-basis-point expansion to 35.0% assumes revenue growth absorbs fixed platform and go-to-market expense, fleet utilization remains healthy, custom chips and software improve cost per AI unit, and recurring Workspace/security contribution partially offsets higher depreciation. The result is close to the 35.59% Q2 FY2026 margin but

does not extrapolate that single quarter immediately across the TTM. Margin rises gradually because the $175-$185 billion consolidated capex program creates a real depreciation burden [Q4 FY2025 earnings-call transcript dated 2026-02-04; data_package §6].

Bull mechanism. The 867-basis-point expansion to 40.0% requires high utilization, sustained price-performance advantage from TPUs, a richer software/security mix, material sales leverage, and successful Wiz integration. This is demanding but finite. AWS's Q1 2026 margin of roughly 37.8% shows that high-30s hyperscale margins are attainable, while 40% requires Google to combine faster scale with superior mix. It is not the default case.

Product driver	Margin direction	Reason	Quantified separately?
GCP infrastructure and AI compute	Ambiguous	Utilization and custom chips help; depreciation, power, accelerators, and price competition hurt	No
Workspace	Positive mix tendency	Subscription and seat economics can scale with lower direct infrastructure burden	No
Security and Wiz	Positive after integration; negative near term	Software value and cross-sell versus amortization, retention, and integration cost	No
Marketplace	Modestly positive if ecosystem-led	Partner distribution can lower customer-acquisition friction	No

The segment margin is not presented as a revenue-weighted product average because the underlying product revenues and margins are not disclosed. Any such average would be fabricated. The governed segment-level approach is the only reconstructable one.

10. Segment rollup

The rollup has one additive revenue line: Google Cloud total. It therefore reconciles exactly by construction, while the non-additive driver sleeves in Section 8 explain rather than sum the outcome.

Case	TTM+5y Google Cloud revenue	Additive product lines	Operating income (loss) margin	TTM+5y Operating income (loss)	Revenue tie-out
Bear	$133.710B	Google Cloud total only	27.0%	$36.102B	100.0%
Base	$200.740B	Google Cloud total only	35.0%	$70.259B	100.0%
Bull	$256.710B	Google Cloud total only	40.0%	$102.684B	100.0%

Case	Revenue CAGR	Revenue multiplier	Profit margin change	Profit calculation
Bear	11.49%	1.723x	-433 bps	$133.710B × 27.0% = $36.102B
Base	20.93%	2.586x	+367 bps	$200.740B × 35.0% = $70.259B
Bull	27.03%	3.307x	+867 bps	$256.710B × 40.0% = $102.684B

Using the required 25%/55%/20% weights, probability-weighted terminal Google Cloud revenue is $195.18 billion and probability-weighted terminal Operating income (loss) is $68.20 billion. Those expected values are scenario diagnostics, not a separate forecast case and not a security IRR. The security-level model must combine this segment with Google Services, Other Bets, Alphabet-level activities, below-line items, tax, shares, net cash/debt, distributions, and exit valuation exactly once.

No corporate cost has been pushed into Cloud. The sealed bridge identifies Alphabet-level activities as the only corporate/unallocated operating line and records no operating bridge adjustments [data_package §3a, lines 165-173]. The synthesis stage must therefore add this appendix's segment Operating income (loss) to the other segment outputs, then forecast Alphabet-level activities independently.

11. Key risks and wildcards

[Bear] Acquisition-quality and comparability risk. Wiz closed for $29.5 billion and entered Google Cloud during the TTM [Alphabet Q1 and Q2 FY2026 10-Qs, Note 8 and MD&A; data_package §9]. Reported growth may be materially flattered by

consolidation, while the purchase price creates amortization, retention, integration, and return-on-capital burdens. Alphabet has not disclosed a clean organic Cloud bridge or Wiz revenue. The model lowers growth sharply after the first year rather than capitalizing the latest 81.80% rate.

[Bear] AI infrastructure commoditization. If model portability rises and customers can move inference easily among hyperscalers or neoclouds, price becomes the primary differentiator. Rapid declines in unit price can overwhelm efficiency gains unless workload volume grows faster. The bear case captures this through lower growth and a 27% terminal margin.

[Bear] Depreciation and power shock. Consolidated capex is escalating to a guided $175-$185 billion in FY2026, and management explicitly expects depreciation and data-center costs to rise [Q4 FY2025 earnings-call transcript dated 2026-02-04; data_package §6]. Delays in power, networking, or accelerator deployment can create the worst of both worlds: capital committed but revenue delayed. Segment capex is undisclosed, so the consolidated cash-flow model must test this independently.

[Bear/Base] Customer and workload concentration. A small number of very large AI contracts can drive backlog and reported growth. Those customers may have strong bargaining power, volatile training cycles, and incentives to design their own infrastructure. Alphabet does not disclose Cloud customer concentration or backlog duration. Large backlog therefore provides demand evidence but not smooth revenue or margin assurance.

[Bear/Base] Competitive bundling. Microsoft can bundle identity, productivity, developer, security, and Azure services into enterprise agreements. AWS offers the largest infrastructure footprint and service ecosystem. Google may respond with discounts or migration incentives, limiting margin even when share rises. Workspace is a useful counter-bundle but its revenue and economics are undisclosed.

[Bear/Base] Multicloud neutrality. Wiz's cross-cloud stance is strategically sensible, yet Google ownership can create concern among AWS- or Azure-centric customers. Preserving neutrality may broaden Wiz adoption while limiting exclusive GCP pull-through. Forcing tighter GCP integration could generate more infrastructure demand but weaken trust. The base case assumes balance rather than perfect cross-sell.

[Base/Bull] Backlog conversion and supply execution. $242.8 billion of FY2025 year-end backlog and later larger point-in-time disclosures indicate abundant contracted demand [Alphabet FY2025 10-K; data_package §0a]. Faster server and data-center deployment could unlock revenue while improving fleet utilization. The bull case assumes successful capacity execution; the base case assumes an orderly but decelerating conversion; no case equates backlog with revenue.

[Bull] TPU and Gemini differentiation. If custom chips, model quality, compiler efficiency, and integrated data services deliver superior price-performance, Google can win AI workloads and retain more economics. This would support the bull growth and margin path. The risk is technological: a lead can reverse quickly, and customers can use competing or open models on multiple clouds.

[Bull] Workspace and security monetization. Higher paid-seat growth, AI-enabled ARPU, and effective Wiz cross-sell could shift mix toward recurring software. Because Alphabet does not disclose product dollars or margins, this remains a mechanism rather than an additive forecast. The 40% bull margin should be accepted only if later disclosures show both strong growth and disciplined infrastructure cost.

[All cases] Regulation, sovereignty, and data localization. Governments increasingly demand local control, security certification, and data residency. Compliance can deepen entry barriers for scaled providers but also raises capital and operating cost and may favor local or sovereign offerings. Google must balance a global platform with regional controls.

[All cases] Evidence gaps. Alphabet does not disclose standardized five-year Cloud backlog/RPO, ARR, net retention, churn, billings, customer count, product revenue, product margin, or segment invested capital [data_package §10]. These are not excuses to leave mandatory segment returns blank; they require conservative ranges, transparent limitations, and continued monitoring of reported segment revenue, Operating income (loss), backlog, and consolidated capex.

Scenario summary

Case	Segment TTM+5y Revenue	Exact profit metric	Segment TTM+5y Profit Margin	Segment TTM+5y Profit	Probability
Bear	$133.710B	Operating income (loss)	27.0%	$36.102B	25%
Base	$200.740B	Operating income (loss)	35.0%	$70.259B	55%
Bull	$256.710B	Operating income (loss)	40.0%	$102.684B	20%

The central conclusion is constrained but constructive: Google Cloud has reached genuine hyperscale economics, with a 31.33% TTM Operating income (loss) margin and a credible integrated AI, data, productivity, and security moat. The current 81.80% quarterly growth rate is not a durable organic forecast because it sits amid Wiz consolidation and an exceptional capacity/backlog cycle. A 20.93% five-year base CAGR and 35.0% terminal margin preserve substantial value creation while explicitly recognizing acquisition comparability, depreciation, power, competition, and non-disclosed product economics.

Appendix B3 - Other Bets

Other Bets — Segment Deep Dive

Company: Alphabet Inc. **Ticker:** GOOGL **Run ID:** `pulse-cio-20260807T120231+0800` **Forecast anchor:** TTM ended 2026-06-30, comprising Q3 FY2025 + Q4 FY2025 + Q1 FY2026 + Q2 FY2026 **Exact horizon:** 2031-06-30, exactly five calendar years after the TTM end **Scenario probabilities:** Bear 25%; Base 55%; Bull 20% **Exact segment profit basis:** issuer-disclosed `Operating income (loss)` **Currency:** USD; figures are billions unless stated otherwise **Authority boundary:** research only; no trade, order, message, ranking, sizing, portfolio-mutation, or publication-gate authority.

This appendix uses `data_package.md` and the sealed `statutory_bridge.json` as the sole sources for Alphabet historical dollars, growth, accounting classifications, and management quotations. The sealed bridge SHA-256 is `0853f189c7f6c61089dcd516972b3e95faf49696d91029200e37242bc3989742`, matching `gate_manifest.json`; the durable DR gate says `STATUTORY BRIDGE VERIFIED — CLEARED FOR FORECASTING`. The raw JSON retains a stale workflow-status string, but its exact bytes are the hash-sealed packet and the data package reproduces the cleared bridge with zero residuals. No Alphabet historical was re-fetched or overwritten here. External live sources are used only for competitive context.

0. Segment boundary and taxonomy note

Alphabet's three reportable segments—Google Services, Google Cloud, and Other Bets—are stable across FY2021-FY2025. Other Bets remains an aggregation of several operating segments that are individually immaterial. There was no reportable-segment restatement during that period, so the five annual aggregate revenue and `Operating income (loss)` observations are comparable on Alphabet's published taxonomy [Alphabet FY2023 and FY2025 Forms 10-K; data_package §0a, taxonomy conclusion; §1, reporting structure]. The portfolio inside the stable reportable boundary is not static: Verily completed an external capital raise and was deconsolidated in Q1 FY2026, and Alphabet agreed in March 2026 to contribute GFiber into a new entity, with closing then expected late in 2026 [Q1 FY2026 earnings call, 2026-04-29, Anat Ashkenazi; Q1 and Q2 FY2026 Forms 10-Q; data_package §6, Other Bets quote row 6; §9, corporate-actions rows 4-5]. These are real perimeter changes. The forecast therefore treats the current $1.507B TTM aggregate as the only defensible quantitative anchor [Q2 FY2026 Form 10-Q and `OFFICIAL_TTM_RECONCILIATION`; data_package §0a], does not assume that every FY2025 revenue source remains consolidated through 2031, and does not manufacture a pro-forma product split that Alphabet has not disclosed.

The boundary between segment economics and corporate economics is equally important. Alphabet-level activities were a separate $21.541B TTM operating loss line and are not allocated into Other Bets [`OFFICIAL_TTM_RECONCILIATION`, sealed in `statutory_bridge.json`; data_package §3a, TTM bridge, Alphabet-level activities row]. This appendix forecasts only Other Bets' issuer-disclosed `Operating income (loss)`. It does not push shared AI R&D, corporate initiatives, shared costs, fines, settlements, consolidated financing, tax, or other income into the segment. That discipline prevents a seemingly conservative Other Bets loss assumption from double-counting corporate costs elsewhere in the combined model.

1. What this segment actually is

Other Bets is not a conventional business division with one customer set, one price book, or one sales channel. It is Alphabet's container for multiple frontier businesses that remain too small or too heterogeneous to report separately. The data package identifies Waymo, Wing, and life-sciences ventures such as Isomorphic Labs as representative activities [data_package §1, reporting structure]. Their common economic feature is not the product sold; it is the use of Alphabet's technical talent, AI capability, capital, and patience to pursue markets that could become large but currently require sustained investment.

Waymo offers autonomous mobility. The customer proposition is point-to-point transport without a human driver. Potential revenue models include per-ride fares, fleet or platform economics, and partnerships with existing mobility networks, but Alphabet does not disclose the mix. Go-to-market is city-by-city and operational rather than purely digital: the service must obtain permissions, map and validate a domain, build or access fleet and depot capacity, provide rider support, and maintain safe operations. At Q4 FY2025 management said Waymo exceeded 20 million fully autonomous trips and was providing more than 400,000 rides per week; Q1 FY2026 management said weekly rides exceeded 500,000 [data_package §6, Other Bets quote rows 3 and 5]. These are adoption indicators, not revenue or margin disclosures.

Wing provides autonomous drone delivery, increasingly through retailer and delivery-platform partnerships. The product is a small-package logistics service: a merchant or platform tenders an order, Wing handles air delivery within an approved operating area, and the consumer receives the item near the home. Potential charging bases include delivery fees, merchant contracts, network services, or capacity arrangements, but none is disclosed. Management said Wing had safely completed more than one million home deliveries and cited Walmart, DoorDash, and Papa Johns partnerships [data_package §6, Other Bets quote row 7]. Again, the disclosure establishes operating scale, not segment revenue, price per delivery, contribution margin, or capital return.

Isomorphic Labs and other life-sciences ventures apply AI to biological discovery and drug design. The commercial model can include research payments, milestone payments, collaboration economics, royalties, and eventually proprietary therapeutic value. Timing is inherently lumpy: scientific progress, partner acceptance, preclinical work, clinical development, regulatory review, and commercialization occur on different clocks. Isomorphic's own live site describes collaborations with Novartis, Lilly, and Johnson & Johnson, while its 2024 Lilly and Novartis collaborations were described as having potential value of nearly $3B excluding possible royalties. That is contract potential, not recognized Alphabet revenue, and the source does not establish what portion, timing, or probability belongs in Other Bets financials ([Isomorphic Labs partnerships](https://www.isomorphiclabs.com/partnerships); [2024 collaboration announcement](https://www.isomorphiclabs.com/articles/isomorphic-labs-kicks-off-2024-with-two-pharmaceutical-collaborations)).

The segment may include other ventures and residual activities that Alphabet does not enumerate financially. It should therefore be understood as a portfolio of operating experiments, not as “Waymo revenue plus a few immaterial projects.” The aggregate line is the reporting unit. The model below keeps that unit intact.

True non-disclosures that govern this appendix

Waymo, Wing, and Isomorphic Labs revenue are not separately disclosed. Their product gross margins, contribution margins, `Operating income (loss)`, capital expenditure, invested capital, cash needs, customer concentration, pricing, utilization, and product-level unit economics are also not disclosed. For Waymo specifically, Alphabet does not provide a consistent five-year series for paid rides, revenue per ride, contribution margin, fleet size, or autonomous miles. For Wing, management provides a cumulative delivery milestone but no price or cost per delivery. For Isomorphic, public collaboration headline values do not equal revenue and cannot be converted into a recognized-revenue schedule without contract milestones and probability data. These are **true non-disclosures**, not missing analyst work [data_package §4, non-dollar product rows 5-6; §10, true non-disclosure rows 1, 2, and 5].

No product-level dollar or profitability estimate is introduced to fill those holes. Any product-level economics that follow are qualitative driver analysis only. The only dollar forecast line is the disclosed Other Bets aggregate.

2. Current economics: FY2025 and TTM

Other Bets generated $1.537B of FY2025 revenue, down 6.74% year over year, and an issuer-disclosed `Operating income (loss)` of negative $7.515B. The corresponding margin was negative 488.94% [Alphabet FY2025 Form 10-K segment table; data_package §3, Other Bets rows]. For the TTM ended 2026-06-30, revenue was $1.507B and `Operating income (loss)` was negative $8.942B [Alphabet Q2 FY2026 Form 10-Q and `OFFICIAL_TTM_RECONCILIATION`; data_package §0a, KPI table, Other Bets latest-interim cell; §3a, TTM bridge, Other Bets row]. Dividing the two sealed TTM values gives a diagnostic margin of negative 593.36%. That calculation does not replace an issuer-reported margin; it simply makes the loss intensity visible.

The quarterly path was volatile but consistently deeply loss-making. Q3 FY2025 revenue was $0.344B, down 11.34%, with a negative 414.53% margin. Q4 revenue was $0.370B, down 7.50%, with a negative 977.57% margin. Q1 FY2026 revenue was $0.411B, down 8.67%, with a negative 510.95% margin. Q2 revenue was $0.382B, up 2.41%, with a negative 470.94% margin [Alphabet SEC earnings exhibits dated 2025-10-29, 2026-02-04, 2026-04-29, and 2026-07-22; data_package §5, Other Bets row]. The four revenues sum to the $1.507B TTM anchor. The margins should not be read as a normal seasonal pattern: small revenue denominators and financing, compensation, portfolio, or development spending can move the ratio dramatically.

The economic asymmetry is stark. Revenue was only 0.38% of official FY2025 consolidated revenue, while the segment's $7.515B loss consumed meaningful operating income generated elsewhere [Alphabet FY2025 Form 10-K segment table; data_package §1, Other Bets row]. A segment with a negative 593% TTM margin is not near conventional operating break-even. Even a several-fold revenue increase does not guarantee profit if autonomous fleets, safety operations, geographic launches, clinical programs, and other R&D expand simultaneously.

Capital intensity cannot be quantified at the segment level. Alphabet does not disclose Other Bets capex, assets, debt, or invested capital [Alphabet FY2025 Form 10-K segment note and Q2 FY2026 Form 10-Q; data_package §10, true non-disclosure row 2]. Qualitatively, the portfolio is capital- and research-intensive: Waymo requires vehicles, sensor suites, depots, maintenance, remote assistance, mapping, safety engineering, and local operating teams; Wing requires aircraft, launch and delivery infrastructure, certification, maintenance, and network operations; life sciences require computation, specialized scientists, wet-lab validation, and potentially clinical-development funding. The clearest source-bound capital signal is that Waymo received a $16.0B funding round in February 2026, with the significant majority funded by Alphabet [Alphabet Q1 FY2026 Form 10-Q and Q4 FY2025 earnings call, 2026-02-04, Anat Ashkenazi; data_package §9, corporate-actions row 3]. The figure is financing, not an expense forecast, and it does not reveal annual cash burn or Alphabet's fully diluted ownership.

3. Unit economics

Waymo

Waymo's theoretical economic advantage is removal of the paid human driver from ride-hailing. In a mature network, revenue per trip would be driven by fare, trip length, market, time, and platform mix. Variable costs would include electricity, cleaning, tires, maintenance, insurance and claims, connectivity, customer support, roadside events, fleet repositioning, and partner fees. Fixed and semi-fixed costs would include vehicle and sensor depreciation, depots, local launch teams, mapping, simulation, safety validation, software R&D, and regulatory compliance. Network density matters because more rides per vehicle and fewer empty repositioning miles can spread vehicle and depot costs over more paid trips.

That mature template is not evidence of Waymo's current margin. Alphabet discloses none of fare per ride, paid miles, empty miles, fleet size, vehicle utilization, hardware cost, depreciation per vehicle, insurance cost, city-level fixed cost, or contribution profit. The weekly-ride milestone shows throughput, but throughput can rise while loss per ride remains high if expansion requires overlapping fleets and teams. The $16B funding round reinforces that scaling is capital consuming. Therefore this appendix does not state that Waymo is “approaching break-even,” does not assign a margin to a ride, and does not convert 500,000 weekly rides into revenue.

The principal margin-up mechanisms are higher rides per vehicle, lower autonomous hardware cost, lower remote-assistance intensity, fewer service incidents, better routing and repositioning, denser service areas, and procurement scale. The principal margin-down mechanisms are low utilization in newly launched cities, expensive redundancy, insurance or incident costs, vehicle recalls, adverse regulation, partner fees, and competition that caps fares. A credible bull case needs both rapid demand growth and cost learning; demand alone is insufficient.

Wing

Wing earns economically attractive delivery margins only if each additional delivery uses little labor, aircraft utilization is high, route density is adequate, failed deliveries are rare, and regulatory permissions let one operator supervise a scaled fleet. Costs include aircraft depreciation and replacement, batteries and charging, maintenance, operations staff, merchant integration, hubs, local permits, insurance, customer support, and any visual-observer or airspace-management burden. Package weight, range, weather, noise, landing or tether constraints, and community acceptance limit the addressable order pool.

The U.S. regulatory structure makes scale economics path-dependent. The FAA states that Part 135 certification is the only route for small drones to carry another party's property for compensation beyond visual line of sight; it also describes certification, operating approvals, airworthiness, and environmental-review obligations ([FAA package delivery](https://www.faa.gov/uas/advanced_operations/package_delivery_drone)). The proposed normalization of beyond-visual-line-of-sight operations could lower a structural labor bottleneck, but proposal timing and final requirements remain uncertain. Wing's one-million-delivery milestone is operationally meaningful, yet Zipline said in March 2026 that it had completed more than two million commercial deliveries ([Zipline delivery milestone](https://www.zipline.com/newsroom/zipline-s-never-ending-quest-to-make-quiet-deliveries-even-quieter)). Wing therefore has credible capability but not an uncontested scale lead.

Isomorphic Labs and life sciences

AI drug design has a software-like research layer but biotechnology-like outcome risk. Early revenue can come from upfront research fees and milestones, while economic value may depend on reaching difficult technical, preclinical, clinical, regulatory, and commercial milestones. Compute and model-development costs can scale efficiently, but biological validation,

medicinal chemistry, trials, manufacturing, and commercialization remain expensive and failure-prone. A platform that proposes better molecules faster can still produce no approved drug.

Isomorphic's live sources show strategic validation: the Novartis collaboration expanded, Lilly remains a partner, and a Johnson & Johnson collaboration was announced in January 2026 ([Isomorphic partnerships](https://www.isomorphiclabs.com/partnerships); [Isomorphic announcements](https://www.isomorphiclabs.com/announcements)). It also announced a $2.1B Series B in May 2026 to scale its drug-design and development work ([Isomorphic funding](https://www.isomorphiclabs.com/press/isomorphic-labs-funding)). Those facts support technical and capital access; they do not disclose Alphabet-recognized revenue, operating margin, ownership dilution, or probability-adjusted program value. Competitor Recursion describes an integrated AI-enabled platform spanning biology, molecule design, and clinical development and guided to less than $390M of 2026 cash operating expense excluding partnership inflows and transaction costs, illustrating that even advanced platforms remain investment-heavy ([Recursion FY2025 results](https://ir.recursion.com/news-releases/news-release-details/recursion-reports-fourth-quarter-and-full-year-2025-financial)).

Segment-level conclusion on unit economics

Other Bets' aggregate margin is driven by a mismatch between small current reported revenue and large portfolio investment. The segment can improve through three routes: scale revenue faster than operating infrastructure; prune or externally fund capital-intensive ventures; or realize milestones and commercialization economics without matching expense growth. It can worsen if Alphabet simultaneously expands Waymo, Wing, and life-sciences programs, or if portfolio exits remove revenue before they remove costs. Because product costs and revenue are not disclosed, a product-weighted margin calculation would be invented precision. Section 9 instead forecasts the disclosed aggregate `Operating income (loss)` margin with explicit mechanisms and a conservative negative margin in all scenarios.

4. Competitive dynamics

Autonomous ride-hailing

Waymo competes with several models of autonomy. Tesla's live Robotaxi site says autonomous rides are offered in multiple U.S. cities using Model Y vehicles, with its purpose-built Cybercab intended for the future ([Tesla Robotaxi](https://www.tesla.com/robotaxi)). Tesla's strategic advantage is manufacturing scale, a large deployed vehicle base, and a potentially lower-sensor-cost approach; its key underwriting uncertainty is whether safety, regulation, and service quality converge across broad operating domains. Amazon's Zoox pursues a purpose-built bidirectional vehicle and said in 2026 that Las Vegas service was open to the public and San Francisco service to select riders ([Zoox community](https://zoox.com/community)). Zoox emphasizes rider experience and purpose-built hardware, but purpose-built fleets also demand manufacturing capital and local launches.

Baidu's Q1 2026 results said Apollo Go delivered 3.2M fully driverless operational rides in the quarter, peaked above 350,000 weekly rides in March, exceeded 22M cumulative rides as of April, and reached 27 cities as of May ([Baidu Q1 2026 results](https://ir.baidu.com/static-files/3801bfaf-9eb4-47a9-8b8c-b9f46c524875)). The comparison is not apples-to-apples across geography, fare, ride definition, subsidy, or regulation, but it establishes that Waymo is not the only scaled operator. Traditional ride-hailing networks also remain substitutes: human-driven Uber, Lyft, taxis, public transit, private cars, and micro-mobility can respond on price, availability, and coverage.

Waymo's potential pricing power comes from safety trust, reliable service, scarce local authorization, differentiated rider experience, and possibly lower mature cost than a human-driven ride. Pricing power is not yet demonstrated in disclosed financials. If multiple autonomous networks serve the same dense corridors, fares may converge toward competitive ride-hailing economics while fleet owners bear substantial depreciation. Market entry barriers are high—autonomy software, safety validation, operational data, fleet integration, capital, regulation, and local operations—but high barriers do not guarantee high returns when several well-capitalized firms clear them.

Drone delivery

Wing competes with Zipline, Flytrex and other drone operators, as well as ground couriers, merchant-owned delivery, and consumer pickup. Zipline's more than two million commercial deliveries indicate a credible scaled rival. Ground delivery remains flexible across heavy packages, bad weather, apartments, and complex drop-offs. Drone delivery can win on speed and labor efficiency for lightweight, urgent, or high-frequency orders, but noise, airspace, weather, payload, and community constraints narrow its domain.

Regulatory certification and accumulated safe operations are barriers. Merchant integrations and local network density can create switching costs. Yet the service may have limited direct pricing power if it is embedded behind Walmart or DoorDash, whose order volume and customer relationship strengthen their bargaining position. Wing's partnerships are therefore both a distribution advantage and a potential margin constraint.

AI drug design

Isomorphic competes with technology-first drug-discovery firms such as Recursion and with increasingly capable internal AI groups at global pharmaceutical companies. It also competes indirectly with conventional structural biology, medicinal chemistry, contract research, and academic innovation. Its strongest assets are access to Alphabet and DeepMind talent, leading models, compute, and the scientific reputation associated with AlphaFold. Isomorphic said its Drug Design Engine improved performance on difficult protein-ligand tasks, but benchmark performance is not clinical efficacy or commercial success ([Isomorphic Drug Design Engine](https://www.isomorphiclabs.com/articles/the-isomorphic-labs-drug-design-engine-unlocks-a-new-frontier)).

Partners can choose multiple AI platforms, build internally, or wait for clinical proof. Partnering validates interest but can cap upside through shared economics. The durable barrier would be a proprietary feedback loop joining models, experimental data, medicinal chemistry, and human outcomes. Until molecules produce reproducible clinical success, the moat is promising rather than proven.

5. Moat at the segment level

Other Bets has **shared resource advantages**, but it does not yet have one proven segment-wide moat. Alphabet can supply patient capital, AI research, compute, engineering talent, brand visibility, legal resources, and global partnerships. Those advantages increase the probability that individual ventures survive long enough to learn. They do not make aggregate losses self-correcting, and they do not establish pricing power.

Waymo's most plausible moat is the integrated safety-and-operations learning loop: autonomous miles and difficult edge cases improve the driver; better performance supports regulatory approval and user trust; approval enables more rides; more rides generate more operational data. City launch experience, fleet systems, and safety processes are difficult to copy quickly. The moat could be durable for five to ten years if Waymo maintains a clear safety advantage and converts it into dense commercial networks. It weakens if competitors reach comparable safety with cheaper hardware or a faster city-expansion model.

Wing's moat is narrower. Aircraft design, quiet operation, regulatory approvals, delivery reliability, merchant integrations, and operating history matter. But the customer-facing relationship often belongs to retailers or delivery platforms, alternative drone systems exist, and ground delivery caps willingness to pay. Wing may build a valuable network without achieving exceptional margins.

Isomorphic's moat could be substantial if proprietary models and experimental feedback consistently produce better drug candidates and partners contribute unique learning. Access to DeepMind heritage and capital is a real advantage. However, scientific publications spread knowledge, pharma partners retain strong domain expertise, competitors invest heavily, and clinical validation remains the ultimate test. The current evidence supports a technical edge and partner validation, not a proven 10-year economic moat.

The aggregate segment therefore fails a strict “durable current margin moat” test: current margin is deeply negative, product margins are undisclosed, and portfolio composition changes. Its value is option-like. The correct underwriting response is not to assign a separate venture-capital asset value, but to use broad scenarios and require visible operating progress before moving expected losses toward zero.

6. Historical growth rates

Alphabet discloses no Waymo, Wing, or Isomorphic Labs revenue dollars. The finest defensible financial line is Other Bets aggregate. The requested three-year table uses FY2023-FY2025; the “3-year historical CAGR” is the two-interval CAGR from the first to the third observation. No figure is estimated or back-solved.

Product / sub-segment	FY2023 revenue	FY2024 revenue	FY2025 revenue	3-year historical CAGR	Most recent YoY	Data package cite
Other Bets aggregate	$1.527B	$1.648B	$1.537B	0.33% [calculated from FY2023 and FY2025]	-6.74%	Alphabet FY2025 Form 10-K segment table; data_package §3, Other Bets rows; §4, aggregate row

Arithmetic checks: $1.527B × 1.0792 = $1.648B, matching FY2024 within rounding. $1.648B × 0.9326 = $1.537B, matching FY2025 within rounding. Both checks are inside the required 2% tolerance. The five-year context is $0.753B, $1.068B, $1.527B, $1.648B, and $1.537B for FY2021-FY2025 [Alphabet FY2023 and FY2025 Forms 10-K segment tables; data_package §4, five-year Other Bets series]. That longer series looks faster because the FY2021 base was small; the recent three-point CAGR is nearly flat and is more relevant to the forecast.

Product / operating KPI	Dollar revenue disclosed?	Recent operating evidence	Forecast use
Waymo	No; true non-disclosure [data_package §4, non-dollar product row 5]	More than 400,000 weekly rides at Q4 FY2025 and more than 500,000 at Q1 FY2026 [data_package §6, Other Bets quote rows 3 and 5]	Directional support for aggregate growth; no ride-to-revenue conversion
Wing	No; true non-disclosure [data_package §4, non-dollar product row 6]	More than 1M cumulative home deliveries [data_package §6, Other Bets quote row 7]	Directional support only; no delivery revenue or margin
Isomorphic Labs	No; true non-disclosure [data_package §4, non-dollar product row 6]	Partnerships and financing are externally visible, but recognized revenue is not	Lumpy optionality only; no milestone schedule

7. Management guidance and commentary

Alphabet did not give a numerical Other Bets revenue or margin guide. Every relevant data-package quotation is reproduced below; none is converted into undisclosed product economics.

- **Q3 FY2025, Sundar Pichai — Waymo scaling [data_package §6, Other Bets quote row 1].** “Waymo's growth and momentum are strong, and 2026 is shaping up to be an exciting year.” This supports continued operating expansion, but it does not specify revenue, cities, fleet, margin, or loss.

- **Q3 FY2025, Anat Ashkenazi — resource allocation [data_package §6, Other Bets quote row 2].** “Within Other Bets, we continue to allocate more resources to businesses like Waymo, where we see opportunities to create substantial value.” This is the most important margin anchor: Alphabet explicitly intends to fund growth, so the model should not force losses to vanish merely because ride volume rises.

- **Q4 FY2025, Sundar Pichai — ride scale [data_package §6, Other Bets quote row 3].** “In December, we surpassed 20 million fully autonomous trips and are now providing more than 400,000 rides every week.” This demonstrates service scale. Revenue per ride, paid share of rides, fleet utilization, and cost per ride remain undisclosed.

- **Q4 FY2025, Anat Ashkenazi — Waymo financing [data_package §6, Other Bets quote row 4].** “Alphabet funded a significant portion of the $16 billion investment round that Waymo announced on Monday, which will allow the business to accelerate its global expansion.” The financing provides runway and supports the bull growth case, while also demonstrating that expansion is capital intensive. It is not recognized revenue and not a segment expense schedule.

- **Q1 FY2026, Sundar Pichai — ride momentum [data_package §6, Other Bets quote row 5].** “Waymo also surpassed 500,000 fully autonomous rights per week, doubling in less than a year.” The transcript says “rights,” evidently a transcription error for rides, and that wording is preserved. The KPI supports network adoption; it cannot be translated into dollars.

- **Q1 FY2026, Anat Ashkenazi — portfolio boundary [data_package §6, Other Bets quote row 6].** “In Q1 of this year, Verily completed an external capital raise that resulted in its deconsolidation from Alphabet.” This can reduce comparability and potentially remove both revenue and expense. No segment pro-forma was disclosed, so no adjustment is invented.

- **Q2 FY2026, Sundar Pichai — Wing scale [data_package §6, Other Bets quote row 7].** “Wing has safely completed more than 1 million home deliveries, and we continue to grow our presence through partnerships with Walmart, DoorDash and Papa Jones.” The transcript's “Papa Jones” wording is preserved. This supports operating progress and distribution, but it supplies neither revenue per delivery nor margin.

- **Q2 FY2026, Sundar Pichai — Waymo structure [data_package §6, Other Bets quote row 8].** “We're really focused on scaling the business right now and executing to that extraordinary potential, and that's what we are focused on.” Management prioritizes execution over a disclosed separation timetable. The model therefore keeps Waymo inside aggregate Other Bets through the horizon and does not add a separate Waymo asset value.

8. Forward growth assumptions

The forecast begins at $1.507B of TTM revenue [Alphabet Q2 FY2026 Form 10-Q; data_package §0a] and compounds for exactly five years to 2031-06-30. Because product dollars are true non-disclosures, the only valid financial product line is the aggregate. Waymo, Wing, and Isomorphic evidence informs the aggregate scenario selection but never becomes a fabricated revenue allocation.

Base case growth

Product	3-year historical CAGR	Latest YoY	Management FY+1 guide	Base CAGR TTM to TTM+5y	Justification
Other Bets aggregate	0.33%	-6.74%	No numerical guide	15.00%	Waymo rides scaled rapidly and Wing passed 1M deliveries, but Verily deconsolidation and possible GFiber perimeter change depress the near-term base. A 15% CAGR assumes operating growth eventually outweighs exits without converting KPIs into product dollars.

The base case is above the recent 0.33% three-point CAGR because the historical aggregate masks a rapidly scaling Waymo alongside changing portfolio composition. It is well below the growth implied by doubling Waymo rides because rides are not revenue and other activities may shrink or leave the consolidation perimeter. The path is a constant 15% aggregate growth rate for transparency; no false precision is added through a product mix.

Bull case growth

Product	3-year historical CAGR	Latest YoY	Management FY+1 guide	Bull CAGR TTM to TTM+5y	Justification
Other Bets aggregate	0.33%	-6.74%	No numerical guide	30.00%	Waymo uses its funding to expand cities and density, Wing converts partnerships into repeat volume, and life-science milestones contribute. The case still avoids any assumed fare, delivery fee, or drug milestone.

The bull rate is intentionally demanding. Competitors demonstrate that robotaxi and drone-delivery scale can move quickly: Apollo Go reported millions of quarterly rides and Zipline reported more than two million deliveries. Those comparisons validate market formation, not Waymo or Wing economics. Thirty percent annual growth produces $5.595B at the horizon—large relative to current Other Bets but still small beside Alphabet's core businesses.

Bear case growth

Product	3-year historical CAGR	Latest YoY	Management FY+1 guide	Bear CAGR TTM to TTM+5y	Justification
Other Bets aggregate	0.33%	-6.74%	No numerical guide	-5.00%	Portfolio exits remove revenue, autonomous deployment is slowed by safety or regulatory constraints, merchant bargaining limits Wing, and life-science milestones slip. Continuing investment prevents the revenue decline from implying an orderly wind-down.

The bear case is not a liquidation case. A true closure would require assumptions about project-level assets and liabilities that are not disclosed. Instead, revenue erodes modestly while Alphabet continues to fund the remaining ventures, an adverse but

plausible operating combination.

Revenue path from the TTM anchor

Case	TTM 2026-06-30	2027-06-30	2028-06-30	2029-06-30	2030-06-30	2031-06-30	Exact 5-year CAGR
Bear	$1.507B	$1.432B	$1.360B	$1.292B	$1.227B	$1.166B	-5.00%
Base	$1.507B	$1.733B	$1.993B	$2.292B	$2.636B	$3.031B	15.00%
Bull	$1.507B	$1.959B	$2.547B	$3.311B	$4.304B	$5.595B	30.00%

Each horizon value equals $1.507B × `(1 + CAGR)^5`. The path makes the thesis testable. Base requires aggregate revenue to exceed $1.99B by 2028-06-30 and $2.64B by 2030-06-30. Bull requires more than $3.31B by 2029-06-30. If reported aggregate revenue remains near $1.5B after portfolio changes settle, the base case is failing even if ride counts continue rising.

9. Forward `Operating income (loss)` margin assumptions

The exact metric is issuer-disclosed `Operating income (loss)`. Current TTM margin is negative 593.36%, calculated from negative $8.942B of TTM `Operating income (loss)` and $1.507B of revenue [Alphabet Q2 FY2026 Form 10-Q and `OFFICIAL_TTM_RECONCILIATION`; data_package §3a, TTM bridge, Other Bets row; §0a, KPI table, Other Bets TTM revenue cell]. Alphabet provides no product margins, so a product-level revenue-weighted margin is impossible without fabrication. The segment margin is forecast directly and all cases remain loss-making.

Case	TTM margin	TTM+5y `Operating income (loss)` margin	Change	Specific mechanism
Bear	-593.36%	-850.00%	-25,664 bps	Revenue exits faster than shared venture costs; Waymo expansion and safety operations continue; setbacks extend the funding period; low denominator magnifies the loss ratio.
Base	-593.36%	-250.00%	+34,336 bps	Higher Waymo network density, learning and portfolio discipline spread costs over twice the revenue, but geographic expansion and life-science R&D keep the segment deeply negative.
Bull	-593.36%	-60.00%	+53,336 bps	Rapid aggregate scale, better autonomous utilization, lower hardware and operating cost per ride, regulatory scale for Wing, and milestone revenue create leverage; continuing reinvestment prevents an unsupported positive margin.

The large basis-point changes are mathematically unavoidable when the starting margin is below negative 500%. They should not be mistaken for normal incremental-margin precision. In base, the margin improves along a staged path from negative 500% to negative 250%, leaving a $7.578B horizon loss—still close to FY2025's loss despite nearly doubling revenue. In bull, the segment does not reach break-even; the model requires evidence of product profitability before granting that outcome. In bear, losses rise toward $10B because Alphabet continues funding businesses even as reported revenue contracts.

Case	2027-06-30 margin / profit	2028-06-30 margin / profit	2029-06-30 margin / profit	2030-06-30 margin / profit	2031-06-30 margin / profit
Bear	-650% / -$9.306B	-700% / -$9.520B	-750% / -$9.690B	-800% / -$9.820B	-850% / -$9.912B
Base	-500% / -$8.665B	-430% / -$8.570B	-360% / -$8.251B	-300% / -$7.908B	-250% / -$7.578B
Bull	-430% / -$8.424B	-300% / -$7.640B	-190% / -$6.291B	-110% / -$4.735B	-60% / -$3.357B

Every profit cell equals the corresponding section 8 revenue multiplied by the displayed `Operating income (loss)` margin, subject only to rounding. No Alphabet-level activity is included. The year-by-year table also prevents an unjustified “hockey stick” to break-even: even bull retains a material loss at the exact horizon.

10. Segment rollup and probability-weighted optionality

Because no product dollars are disclosed, “bottoms-up” means building from the finest issuer-disclosed unit—the aggregate Other Bets revenue line—then explicitly layering the observable product drivers without assigning them fabricated dollars. The rollup has one financial row and therefore reconciles exactly.

Case	Financial forecast line	TTM revenue	5-year CAGR	TTM+5y revenue	TTM+5y `Operating income (loss)` margin	TTM+5y `Operating income (loss)`	Reconciliation
Bear	Other Bets aggregate	$1.507B	-5.00%	$1.166B	-850.00%	-$9.912B	One disclosed line; ties 100%
Base	Other Bets aggregate	$1.507B	15.00%	$3.031B	-250.00%	-$7.578B	One disclosed line; ties 100%
Bull	Other Bets aggregate	$1.507B	30.00%	$5.595B	-60.00%	-$3.357B	One disclosed line; ties 100%

At the mandated 25% bear, 55% base, and 20% bull weights, probability-weighted horizon revenue is $3.078B and probability-weighted horizon `Operating income (loss)` is negative $7.317B. The ratio of those two weighted amounts is negative 237.75%, but it is not a fourth scenario margin and should not replace scenario-by-scenario consolidation.

Optionality is included exactly once. The bull scenario captures faster adoption and operating leverage; the base captures partial progress; the bear captures adverse execution and perimeter effects. Synthesis should use the segment revenue and `Operating income (loss)` outputs in the consolidated model and **must not add a separate Waymo, Wing, Isomorphic, or “venture portfolio” asset value** unless it first removes the same economics and proves a non-overlapping ownership and valuation bridge. External fundraising headlines do not establish Alphabet's diluted ownership, liquidation preferences, or distributable equity value. Treating them as a separate asset on top of the scenario operating forecast would risk double counting.

The expected outcome remains a major operating loss, which is the central underwriting conclusion. Other Bets optionality may be economically meaningful, but current evidence does not support a positive probability-weighted operating contribution by 2031. The aggregate model is conservative in profit while allowing wide revenue outcomes.

11. Key risks and wildcards

- **Safety incident or regulatory pause — Bear.** A serious autonomous-driving event could slow permits, reduce usage, increase insurance and compliance costs, and force costly technical remediation. The revenue and margin effects would reinforce each other.
- **Autonomy commoditization — Bear.** If Tesla, Zoox, Apollo Go, or another platform reaches comparable safety with cheaper hardware or faster deployment, Waymo may lack fare pricing power. High ride volume could then coexist with weak returns on fleet capital.
- **City-level operating diseconomies — Bear/Base.** Each market may require bespoke mapping, regulation, depots, remote support, and local operations. If learning transfers poorly, expansion can increase fixed cost faster than network density.
- **Fleet utilization and empty miles — Bear/Base.** Paid rides alone do not reveal utilization. Excess vehicles, long repositioning trips, cleaning downtime, or peak-demand imbalance can keep contribution margins negative even as weekly rides rise.
- **Portfolio-perimeter volatility — All cases.** Verily's deconsolidation and the planned GFiber transaction show that reported Other Bets revenue and loss can change through financing or structure rather than underlying demand. The aggregate historical series may therefore diverge from economic progress.
- **Alphabet funding appetite — Bear/Bull wildcard.** Parent capital is an advantage when it finances learning, but it can prolong uneconomic projects. Conversely, external funding may validate a venture and reduce Alphabet's cash burden while diluting ownership. Neither effect can be quantified from disclosed segment data.

- **Wing regulation and community acceptance — Bear/Base.** Part 135, BVLOS, airworthiness, noise, weather, and local approval determine addressable density. Regulatory normalization is upside, but final rules and permissions can impose costs that delay attractive unit economics.

- **Merchant bargaining power — Bear/Base.** Walmart, DoorDash, and other partners bring volume and demand aggregation but may retain the customer relationship and negotiate away delivery economics. Partnership count is not pricing power.

- **Life-science milestone illusion — Bear.** Large headline collaboration values are contingent and can be misread as contracted revenue. Programs can fail before milestones, and model performance does not remove clinical or regulatory risk.

- **Clinical breakthrough — Bull.** Reproducible success from Isomorphic-designed candidates could create milestone, royalty, or proprietary-pipeline economics far beyond the current aggregate revenue base. No such value is separately booked in this forecast because timing and probability are undisclosed.

- **Faster hardware and compute cost decline — Bull.** Cheaper sensors, vehicles, simulation, training, and inference could improve both Waymo and Wing economics. The bull margin path requires this progress together with utilization gains, not as a stand-alone assumption.

- **Separation or monetization — Bull wildcard.** An external capital raise, partnership, or separation could reveal market value and reduce consolidated losses. Until ownership, preferences, proceeds, and ongoing consolidation are disclosed, it is not a forecastable shareholder asset bridge.

Summary

Case	Segment TTM+5y Revenue	Exact profit metric	Segment TTM+5y Profit Margin	Segment TTM+5y Profit	Probability
Bear	$1.166B	Issuer-disclosed `Operating income (loss)`	-850.00%	-$9.912B	25%
Base	$3.031B	Issuer-disclosed `Operating income (loss)`	-250.00%	-$7.578B	55%
Bull	$5.595B	Issuer-disclosed `Operating income (loss)`	-60.00%	-$3.357B	20%

The segment's investment case is optionality, not current profitability. Revenue can compound materially if Waymo, Wing, and Isomorphic Labs convert operating progress into commercial dollars, but Alphabet does not disclose enough product economics to underwrite a positive segment margin. The base case therefore allows 15% revenue growth while retaining roughly $7.6B of annual horizon losses; the probability-weighted loss is $7.3B. Any future upgrade should require product or aggregate evidence that revenue growth is accompanied by lower cash and `Operating income (loss)` intensity. There are no data-gap flags in this appendix: the missing product dollars and unit economics are documented true non-disclosures after the source search, not figures that may be responsibly estimated.

Appendix S - Synthesis (Combined Earnings Model)

Alphabet Inc. — Synthesis (Combined Earnings Model)

PATH_RECEIVED: `C:\Users\Admin\OneDrive\GPT\ER 2.0\Alphabet Inc\synthesis.md`

Run ID: `pulse-cio-20260807T120231+0800` Assessment date: 2026-08-07 Authority: research only; no trade, ranking, sizing, portfolio, message, or publication authority

This appendix mechanically consolidates the three final peer-reviewed segment forecasts into one statutory operating-income, normalized net-income, and listed-unit EPS model. It does not reclassify history, invent a fourth operating segment, capitalize an undisclosed Waymo value, or extrapolate the TTM equity-security fair-value gain. Issuer-disclosed facts, exact sealed data, and analyst-derived forecast rules are labelled separately. All amounts are USD billions unless explicitly stated otherwise.

1. Anchors

- **Today:** 2026-08-07.
- **Fiscal year-end:** December 31.
- **TTM anchor:** 2026-06-30.
- **TTM quarters:** Q3 FY2025, Q4 FY2025, Q1 FY2026, and Q2 FY2026. The governed arithmetic is the exactly equivalent cumulative bridge `FY2025 - H1 FY2025 + H1 FY2026`.
- **Latest completed fiscal year:** FY2025, ended 2025-12-31. It is used only as a historical tie-out, not as the forecast base.
- **Horizon:** 2031-06-30, exactly 5.0 calendar years after the TTM end. No six-fiscal-year compounding occurs.
- **Valuation security:** `XNAS:GOOGL`, Alphabet Class A common stock, one listed common share.
- **Valuation price:** USD 357.75 per GOOGL Class A common share, last completed raw exchange close for the 2026-08-06 market session. Raw quote evidence SHA-256 is `c24aae618a3455fe72b2723965176e616d75df631274ad8c2df4c4c219c1de23`; QFR-sealed quote-packet SHA-256 is `432377beb3eef185e63f83864000b9a2b1f1dcf87dae8e3a7ed79f1aa97a71e5`. Actionability expires at 2026-08-08T12:11:55+08:00 under the packet's conservative fallback.
- **Reporting and quote currency:** USD and USD. The sealed FX factor is therefore 1.0000 USD quote currency per USD reporting currency, dated 2026-08-06, with source `IDENTITY_SAME_CURRENCY`.
- **Security-unit bridge:** the financial statement denominator is Alphabet Class A, B, and C common shares combined. The packet establishes a depositary ratio of 1, share-class factor of 1, and therefore 1 financial share per listed GOOGL unit. This unit factor bridges consolidated diluted EPS to the quoted Class A unit without claiming that all classes have identical voting rights.
- **Split bridge:** 12,309.000 million financial-statement diluted shares at 2026-06-30 multiplied by the sealed split factor of 1.000 equals 12,309.000 million quote-basis diluted financial shares at the quote date. There was no intervening split. Dividing by the depositary/class factor of 1.000 gives 12,309.000 million listed-unit equivalents.
- **Historical bridge:** statutory-bridge SHA-256 `0853f189c7f6c61089dcd516972b3e95faf49696d91029200e37242bc3989742`. The strict validator returned `STATUTORY_BRIDGE_VALID`, and the durable gate manifest records `STATUTORY BRIDGE VERIFIED — CLEARED FOR FORECASTING` and `DATA PACKAGE VERIFIED — CLEARED FOR WAVE 2`.

The quote packet was validated at 2026-08-07T13:25:35+08:00 with exact-byte hash, schema, format, semantic, evidence, unit, split, currency, and freshness checks. The statutory bridge was separately validated at the exact expected hash. These are the sole price and historical-profit anchors used here.

2. Segment-level forward assumptions

The following is a reproduction of the governed reviewed outputs, not a re-derivation. The exact profit metric for all three segments is issuer-disclosed `Operating income (loss)`. Google Services source is `appendix_B_google_services.md` Sections 8-10, SHA-256 `1936e0b190712c84cefbf7466d48e796422246e27ed2ccbb9d2fcefcf092c5ff`. Google Cloud source is `appendix_B_google_cloud.md` Sections 8-10, SHA-256 `4cc2ba9f3aa3e2c39e79d1b64fb550c7ea014a7ed7f171d01a82aa1f8e68c300`. Other Bets source is `appendix_B_other_bets.md` Sections 8-10, SHA-256 `5b67574752d8191d1a15950d83dbc28ddbcea7305ed1c4c69794735ff4785016`.

Segment	Exact profit metric	TTM revenue	Bear TTM+5y rev	Base TTM+5y rev	Bull TTM+5y rev	Bear margin	Base margin	Bull margin
Google Services	Operating income (loss)	367.091	453.010	584.399	701.549	36.50%	42.00%	45.00%
Google Cloud	Operating income (loss)	77.617	133.710	200.740	256.710	27.00%	35.00%	40.00%
Other Bets	Operating income (loss)	1.507	1.166	3.031	5.595	-850.00%	-250.00%	-60.00%

The corresponding terminal segment operating-income outputs are USD 165.349B, USD 245.447B, and USD 315.697B for Services; USD 36.102B, USD 70.259B, and USD 102.684B for Cloud; and negative USD 9.912B, negative USD 7.578B, and negative USD 3.357B for Other Bets in bear, base, and bull respectively.

Services is built from four issuer-disclosed revenue products but uses a direct segment margin because product margins are not disclosed. Cloud and Other Bets each have one additive issuer-disclosed financial revenue line; product and KPI sleeves are qualitative and non-additive. This structure prevents fabricated product margins and double counting.

3. Combined revenue build

The issuer's TTM segment revenues sum to USD 446.215B, while statutory consolidated revenue is USD 445.866B because hedging losses are negative USD 0.349B. The forecast preserves this disclosed relationship mechanically as a negative 0.07822% revenue adjustment in every scenario. It is a transparent derived rule anchored to `data_package.md` Section 3a and the QF TTM bridge, not an issuer forecast.

Line	Bear	Base	Bull
Google Services TTM+5y revenue	453.010	584.399	701.549
Google Cloud TTM+5y revenue	133.710	200.740	256.710
Other Bets TTM+5y revenue	1.166	3.031	5.595
Sum of segment TTM+5y revenue	587.886	788.170	963.854
Corporate eliminations / hedging at -0.07822%	-0.460	-0.616	-0.754
Combined TTM+5y revenue	**587.426**	**787.554**	**963.100**
Implied TTM to TTM+5y CAGR over 5.0 years	5.67%	12.05%	16.65%

Arithmetic is exact before display rounding. Bear is USD 587.886B minus USD 0.459806B, base is USD 788.170B minus USD 0.616455B, and bull is USD 963.854B minus USD 0.753863B. Each combined result is compared with the same USD 445.866B TTM statutory anchor over exactly five calendar years.

The base model's 12.05% consolidated CAGR is driven by Services at 9.75%, Cloud at 20.93%, and Other Bets at 15.00%, with no invented Gemini, Wiz, Waymo, or YouTube-subscription line layered on top. The faster Cloud path is not allowed to obscure the fact that Services still supplies most revenue and terminal operating profit.

4. Combined operating-income build

The sealed common segment metric is identical across the three appendices. The only corporate/unallocated operating line in the statutory bridge is `Alphabet-level activities`; there are no operating bridge adjustments. The TTM line is negative USD 21.541B, or 4.83% of segment revenue. Forecast treatment follows the driver ledger in `data_package.md` Section 3a: shared AI research and corporate costs scale independently and are not pushed into segments.

The analyst-derived scenario rule is 6.0% of segment revenue in bear, 5.0% in base, and 4.0% in bull. Bear reflects higher central AI, legal, compliance, and corporate cost intensity. Base rounds the current 4.83% burden to 5.0%, allowing only modest scaling. Bull grants operating leverage but never forces the cost to zero. The FY2026 USD 175B-185B capex plan and rising depreciation warning in the data package support restraint; management has not issued a numeric central-cost guide.

Line	Bear	Base	Bull
Google Services operating income (loss)	165.349	245.447	315.697
Google Cloud operating income (loss)	36.102	70.259	102.684
Other Bets operating income (loss)	-9.912	-7.578	-3.357
Sum on sealed segment metric	191.539	308.128	415.024
Alphabet-level activities	-35.273	-39.409	-38.554
Consolidated TTM+5y segment-profit metric	156.266	268.720	376.470
Operating bridge adjustments	0.000	0.000	0.000
Combined statutory TTM+5y operating income	**156.266**	**268.720**	**376.470**
Implied operating margin	26.60%	34.12%	39.09%

The base margin expands from TTM statutory 33.11% to 34.12%, much less than a simple weighted sum of Services and Cloud leverage would imply because Other Bets and central activities remain material costs. Bear demonstrates that revenue can grow while consolidated margin compresses materially. Bull requires both strong segment outcomes and central-cost leverage; it is not a frictionless software case.

5. Net income and EPS build

TTM other income of USD 151.641B contains exceptionally large equity-security fair-value gains. That amount is explicitly nonrecurring in the governed package and is not extrapolated. Because the sealed statutory packet does not disaggregate a forecastable interest schedule, the model labels below-line values as analyst-derived normalized assumptions. Net interest income is USD 4B, USD 6B, and USD 8B in bear, base, and bull, bounded against the current USD 242.474B cash/investment pool and USD 98.165B debt. Other income excluding net interest is zero in bear and base; bull allows a bounded USD 10B positive investment result, far below the TTM spike. No scenario assumes a repeat of the fair-value gain.

Normalized tax rates are 20%, 18%, and 16%. They bracket FY2025's disclosed 16.78% effective rate while recognizing jurisdictional, regulatory, and tax-mix uncertainty. These rates are forecast assumptions, not management guidance and not tax plugs.

Line	Bear	Base	Bull
Combined TTM+5y operating income	156.266	268.720	376.470
Net interest income	4.000	6.000	8.000
Other income, normalized	0.000	0.000	10.000
Pre-tax income	160.266	274.720	394.470
Tax rate assumed	20.00%	18.00%	16.00%
Income-tax provision	-32.053	-49.449	-63.115
Net income	**128.213**	**225.270**	**331.355**
Quote-basis diluted financial shares at TTM+5y (M)	12,562.627	12,352.983	12,143.340
EPS USD per quote-basis financial share	10.206	18.236	27.287
Financial shares per listed unit	1.000	1.000	1.000
EPS USD reporting currency per listed unit	10.206	18.236	27.287
FX: quote USD per reporting USD	1.000	1.000	1.000
EPS USD quote currency per listed unit	**10.206**	**18.236**	**27.287**

For each scenario, `EPS_REPORTING_PER_QUOTE_BASIS_FINANCIAL_SHARE = NI_REPORTING ÷ QUOTE_BASIS_DILUTED_FINANCIAL_SHARES`. The security-unit bridge then applies `EPS_QUOTE_PER_LISTED_UNIT = EPS_REPORTING_PER_QUOTE_BASIS_FINANCIAL_SHARE × 1.000 × 1.000`. Bear is USD 128.212672B divided by 12.562627B shares, base is USD 225.269990B divided by 12.352983B shares, and bull is USD 331.354666B divided by 12.143340B shares.

5a. Return-method input bridge

CS, not S, selects the controlling shareholder-return method. S provides the complete earnings inputs and identifies whether an EV/NOPAT terminal bridge is governed. Current balance-sheet facts are source-bound, but no reviewed input supplies a scenario-specific 2031 cash, debt, lease, preferred, minority-interest, or other-senior-claim path. A residual net-debt plug would be prohibited. Therefore the fully reconciled EPS/P-E method is the recommended primary method; EV/NOPAT cannot control unless CS independently constructs a source-bound terminal capital-structure path without double counting.

Return-method input at 2031-06-30	Bear	Base	Bull	Status / source boundary
Statutory operating income	156.266	268.720	376.470	Derived above from reviewed segments and sealed bridge
Normalized cash tax rate	20.00%	18.00%	16.00%	Explicit analyst scenario assumption
Normalized NOPAT	125.013	220.350	316.235	Operating income multiplied by one minus tax rate
Terminal cash and short-term investments	Unavailable	Unavailable	Unavailable	Current 2026-06-30 amount is 242.474; no governed terminal path
Terminal gross debt	Unavailable	Unavailable	Unavailable	Current long-term debt is 98.165; no governed terminal path
Terminal lease liabilities	Unavailable	Unavailable	Unavailable	Current operating leases are 14.591; no governed terminal path
Terminal preferred equity	Unavailable	Unavailable	Unavailable	Current mandatory-convertible preferred is 18.023; terms do not authorize a common-share plug
Terminal minority interest	Unavailable	Unavailable	Unavailable	No governed terminal scenario schedule
Terminal other senior claims	Unavailable	Unavailable	Unavailable	No governed terminal scenario schedule
Separately valued non-operating assets	Unavailable	Unavailable	Unavailable	No separate Waymo/Wing/Wiz value permitted on top of operating scenarios
Diluted listed-equivalent shares (M)	12,562.627	12,352.983	12,143.340	Explicit Section 6 share path and unit factor 1.000

The current net-cash-after-debt-and-leases amount of USD 129.718B is a diagnostic, not a 2031 forecast and not an addition to P/E-derived terminal equity value. Preferred stock is also not converted into common shares because the governed inputs do not contain the required conversion terms. This prevents both omission and double counting.

6. Share-count path

The packet's 12,309.000M quote-basis diluted shares controls the starting point. TTM SBC is USD 28.147B and TTM common repurchases are USD 17.403B. Using the packet price of USD 357.75 as a deliberately fixed diagnostic average price, SBC issuance approximates 78.678M shares per year. This conversion is an analyst approximation because accounting SBC expense is not a grant-date share count. It is reconciled directionally against history: annual repurchases of roughly USD 46B-62B accompanied the decline from 13.553B diluted shares in FY2021 to 12.230B in FY2025, while TTM repurchases fell below SBC and H1 FY2026 repurchases were nil. A flat share count is therefore not assumed.

Scenario annual buybacks are USD 10B bear, USD 25B base, and USD 40B bull. They are below the FY2021-FY2025 peak range and reflect the competing capex/acquisition demands documented in the management appendix. The fixed-price

convention isolates cash-allocation differences from an otherwise circular future-market-price assumption.

Bear year	Starting shares (M)	Buyback	Avg price USD	Shares retired (M)	SBC issuance (M)	Ending shares (M)
2027-06-30	12,309.000	10.000	357.75	27.952	78.678	12,359.725
2028-06-30	12,359.725	10.000	357.75	27.952	78.678	12,410.451
2029-06-30	12,410.451	10.000	357.75	27.952	78.678	12,461.176
2030-06-30	12,461.176	10.000	357.75	27.952	78.678	12,511.901
2031-06-30	12,511.901	10.000	357.75	27.952	78.678	12,562.627

Base year	Starting shares (M)	Buyback	Avg price USD	Shares retired (M)	SBC issuance (M)	Ending shares (M)
2027-06-30	12,309.000	25.000	357.75	69.881	78.678	12,317.797
2028-06-30	12,317.797	25.000	357.75	69.881	78.678	12,326.593
2029-06-30	12,326.593	25.000	357.75	69.881	78.678	12,335.390
2030-06-30	12,335.390	25.000	357.75	69.881	78.678	12,344.187
2031-06-30	12,344.187	25.000	357.75	69.881	78.678	12,352.983

Bull year	Starting shares (M)	Buyback	Avg price USD	Shares retired (M)	SBC issuance (M)	Ending shares (M)
2027-06-30	12,309.000	40.000	357.75	111.810	78.678	12,275.868
2028-06-30	12,275.868	40.000	357.75	111.810	78.678	12,242.736
2029-06-30	12,242.736	40.000	357.75	111.810	78.678	12,209.604
2030-06-30	12,209.604	40.000	357.75	111.810	78.678	12,176.472
2031-06-30	12,176.472	40.000	357.75	111.810	78.678	12,143.340

Each path satisfies `starting shares + five × (SBC issuance - repurchase retirement) = ending shares`. Bear ends with 253.627M net new shares, base with 43.983M net new shares, and bull with 165.660M fewer shares. These are dilution mechanics, not claims about future authorization or execution.

7. P/E 15 test

Required EPS at the sealed price is exactly USD 357.75 divided by 15, or USD 23.850 per listed unit.

Case	EPS USD per listed unit	EPS times 15	Packet price	Cushion	Pass?
Bear	10.206	153.088	357.750	-57.21%	FAIL
Base	18.236	273.541	357.750	-23.54%	FAIL
Bull	27.287	409.304	357.750	14.41%	PASS

The confident base case controls the gate, not the bull case. Because base EPS times 15 is below the same-currency, same-listed-unit quote-packet price, **P/E 15 gate: FAIL — cushion -23.54%**. The bull pass cannot cure the base failure. This result is especially important because TTM reported EPS of USD 19.94 includes nonrecurring fair-value gains; normalized base horizon EPS remains below the governing USD 23.85 requirement despite large operating growth.

8. Reflexivity and historical bridge reconciliation

The TTM segment revenue sum is USD 367.091B plus USD 77.617B plus USD 1.507B, or USD 446.215B. Adding negative USD 0.349B of hedging produces USD 445.866B consolidated revenue exactly, a 0.00% residual. The TTM common segment-profit sum is USD 153.792B plus USD 24.319B minus USD 8.942B, or USD 169.169B. Adding Alphabet-level activities of negative USD 21.541B produces statutory operating income of USD 147.628B exactly.

The FY2025 sanity check also ties. Segment revenue is USD 342.721B plus USD 58.705B plus USD 1.537B, or USD 402.963B; negative USD 0.127B of hedging yields statutory revenue of USD 402.836B. Segment operating profit is USD 139.404B plus USD 13.910B minus USD 7.515B, or USD 145.799B; negative USD 16.760B of Alphabet-level activities yields USD 129.039B statutory operating income. No plug, scaling residual, reclassification, or mixed profit metric is used.

The forward model retains the same exact segment metric and independently forecasts the two non-segment bridge lines that exist: revenue hedging/eliminations and Alphabet-level activities. It keeps below-line income below operating income. This is why the forecast remains reflexive to the statutory statements rather than merely summing attractive segment margins.

9. Latest interim bridge reconciliation

The cumulative interim method is triggered. The exact formula is `latest completed FY - comparable prior-year YTD + current-year YTD`. Both YTD periods cover January 1 through June 30, so dates match and no quarter overlaps.

Consolidated line	FY2025	Less H1 FY2025	Plus H1 FY2026	TTM 2026-06-30
Revenue	402.836	-186.662	229.692	445.866
Operating income	129.039	-61.877	80.466	147.628
Other income, net	29.787	-13.845	135.699	151.641
Pre-tax income	158.826	-75.722	216.165	299.269
Income-tax provision	26.656	-12.986	41.394	55.064
Net income	132.170	-62.736	174.771	244.205

The same bridge is exactly Q3 FY2025 plus Q4 FY2025 plus Q1 FY2026 plus Q2 FY2026. The quarter labels describe the economic coverage; the cumulative arithmetic is the reproducible statutory method. Diluted EPS is not summed across quarters. The governed common numerator is USD 244.119B after USD 0.086B of preferred dividends, divided by 12,244.359M day-weighted diluted shares, giving TTM EPS of USD 19.9373.

10. Sensitivity — which variable matters most

Sensitivity holds all non-tested variables at base. Services growth variation recompounds the USD 367.091B TTM anchor for five years and applies the base 42% segment margin while holding central costs fixed. Cloud margin variation applies to base terminal Cloud revenue. Share variation changes only the denominator. Tax variation changes only the modeled rate on base pre-tax income.

Variable tested	Downside input / EPS	Base input / EPS	Upside input / EPS	EPS range versus base
Google Services revenue CAGR	7.75% / 16.808	9.75% / 18.236	11.75% / 19.779	-7.83% to +8.46%
Google Cloud margin	33.0% / 17.970	35.0% / 18.236	37.0% / 18.503	-1.46% to +1.46%
TTM+5y share count	+5% / 17.368	Base / 18.236	-5% / 19.196	-4.76% to +5.26%
Tax rate	21% / 17.569	18% / 18.236	15% / 18.903	-3.66% to +3.66%

Services growth is the dominant tested earnings variable because of its scale, followed by share count. Even the favorable end of each one-variable sensitivity remains below USD 23.85 required EPS, so no single modest adjustment repairs the P/E 15 failure. A pass requires a combination of stronger Services monetization, materially higher margins or lower dilution, or a less demanding exit multiple. That makes commercial-query growth, Search yield, AI serving cost, and repurchase discipline the most decision-relevant triggers.

11. Combined earnings summary

Scenario probabilities are bear 25%, base 55%, and bull 20%. The asymmetry reflects a current business with strong Services and rapidly improving Cloud, offset by binding regulatory remedies, interface-disruption risk, capital intensity, and a moat/management YELLOW rather than a uniform distribution.

Case	Revenue	OI	OI margin	NI	EPS USD per listed unit	Probability	EPS times 15	Vs USD 357.75
Bear	587.426	156.266	26.60%	128.213	10.206	25%	153.088	-57.21%
Base	787.554	268.720	34.12%	225.270	18.236	55%	273.541	-23.54%
Bull	963.100	376.470	39.09%	331.355	27.287	20%	409.304	14.41%
Probability-weighted	772.631	262.156	33.93% diagnostic	222.223	18.039	100%	270.581	-24.36%

Probability-weighted EPS is the arithmetic sum of scenario EPS times its weight: USD 10.205881 times 25% plus USD 18.236080 times 55% plus USD 27.286947 times 20%, or USD 18.038704. The weighted financial lines are diagnostics rather than a fourth scenario and do not authorize an arithmetic average of later security IRRs.

12. Tie-out checks

- **PASS — reported-financial and statutory-bridge tie-out.** TTM revenue: 367.091 + 77.617 + 1.507 - 0.349 = 445.866. TTM OI: 153.792 + 24.319 - 8.942 - 21.541 = 147.628. FY2025 revenue: 342.721 + 58.705 + 1.537 - 0.127 = 402.836. FY2025 OI: 139.404 + 13.910 - 7.515 - 16.760 = 129.039. Residuals are zero and within both statutory packet tolerance and 2%. Sources: `statutory_bridge.json`, `data_package.md` Sections 2-3a, and QF P2-P4.

- **PASS — NI / shares / listed-unit / FX equals EPS.** Bear: 128.212672B / 12.562627B × 1 × 1 = USD 10.205881. Base: 225.269990 / 12.352983 × 1 × 1 = USD 18.236080. Bull: 331.354666 / 12.143340 × 1 × 1 = USD 27.286947. Source: Sections 5-6 and `quote_packet.json`.

- **PASS — segment sum tie-out at horizon.** Before the separately named hedging adjustment, each combined segment-revenue subtotal equals 100% of the three governed segment outputs: 587.886, 788.170, and 963.854. The only gap to statutory revenue is negative 0.07822% corporate elimination/hedging, explicitly shown in Section 3. Source: all three reviewed segment Section 10 tables.

- **PASS — product-to-segment rollup.** Services displayed-product sums tie to terminal segment revenue within 0.0002% bear and exactly at displayed precision in base and bull. Cloud and Other Bets each use one issuer-disclosed additive line and tie 100%. Source: reviewed segment Section 10 tables.

- **NOT TRIGGERED — weighted product-margin check.** Alphabet does not disclose product margins within Services, Cloud, or Other Bets. Each reviewed appendix therefore applies the exact issuer-disclosed segment `Operating income (loss)` margin directly. A product-weighted margin would fabricate unavailable economics. There is no mixed segment-profit basis. Source: reviewed segment Sections 9-10 and the statutory bridge.

- **PASS — share-count and security-unit path.** 12,309.000M financial-statement shares × split factor 1 = 12,309.000M quote-basis shares; dividing by depositary factor 1 × class factor 1 = 12,309.000M listed equivalents. Over five years, bear 12,309.000 + 5 × (78.678 - 27.952) = 12,562.627; base 12,309.000 + 5 × (78.678 - 69.881) = 12,352.983; bull 12,309.000 + 5 × (78.678 - 111.810) = 12,143.340. Source: `quote_packet.json`, `data_package.md` Section 7, and Section 6.

- **PASS — growth plausibility.** Services product base CAGRs range from negative 2.00% to 11.99% versus disclosed three-year histories of negative 3.14% to 18.24%. Cloud base 20.93% is below 1.2 times its 30.72% three-year CAGR. Other Bets base 15% exceeds its distorted 0.33% aggregate history but is explicitly justified by rapidly scaling Waymo rides, portfolio deconsolidation, and a much faster comparable trajectory; it remains a USD 3.031B terminal line and negative USD 7.578B profit. Source: reviewed segment Sections 6 and 8.

- **PASS — historical and forecast arithmetic.** Services terminal products equal each TTM product multiplied through exactly five displayed annual rates. Cloud: 77.617 × 1.34 × 1.26 × 1.20 × 1.15 × 1.11 = approximately 200.740 base. Other Bets: 1.507 × 1.15^5 = approximately 3.031 base. Equivalent CAGR checks for every segment row are within 1%, and no line uses six periods. Source: reviewed segment Sections 8 and 10.

- **PASS with quantified step-change evidence — recency anchor.** Base first-forward-year segment revenue is 413.345 + 104.007 + 1.733 = 519.085, 16.33% above the 446.215 segment TTM base. This exceeds 10%, but the appendices provide quantified primary-source evidence: Q2 FY2026 Services grew 14.53%, Cloud grew 81.80%, and Other Bets grew 2.41%. TTM revenue-weighting those disclosed rates produces an approximate 26.2% current segment run-rate, above the modeled 16.33%; the model therefore decelerates rather than steps above current evidence. Source: `data_package.md` Section 5 and segment annual paths.

- **PASS — period and horizon integrity.** FY2025 minus January-June 2025 plus January-June 2026 creates the TTM ended 2026-06-30 with identical date coverage and no overlap. Q3 FY2025 through Q2 FY2026 are the same four non-overlapping economic quarters. Every forecast compounds from 2026-06-30 to 2031-06-30, exactly 5.0 calendar years. Source: QF P4, Stage 0 anchors, and Sections 3, 6, and 9.

- **PASS — valuation, unit bridge, packet hashes, and probability arithmetic.** Exact quote-packet hash is `432377beb3eef185e63f83864000b9a2b1f1dcf87dae8e3a7ed79f1aa97a71e5`; exact statutory-bridge hash is `0853f189c7f6c61089dcd516972b3e95faf49696d91029200e37242bc3989742`. Listing, price, split, class/depositary factor, and FX all reproduce the sealed packet. EPS × 15 equals USD 153.088, USD 273.541, and USD 409.304 within rounding. Probabilities 25% + 55% + 20% = 100%; weighted EPS is USD 18.038704. Cushions use only USD 357.75. The base case controls and fails at negative 23.54%.

All eleven checks are cleared: ten required checks PASS and the product-margin condition is genuinely not triggered because the issuer does not disclose product margins and the governed model uses one exact segment metric. No required check fails.

SYNTHESIS CLEARED — 11/11 TIE-OUTS PASSED

Appendix CS - Compounder Score

Alphabet Inc. - Compounder Score

PATH_RECEIVED: `C:\Users\Admin\OneDrive\GPT\ER 2.0\Alphabet Inc\appendix_compounder_score.md`

Run ID: `pulse-cio-20260807T120231+0800` Analysis date: 2026-08-07 Security: Alphabet Class A common stock, `XNAS:GOOGL` Reporting / quote currency: USD / USD Authority: research only; no trade, ranking, sizing, portfolio mutation, message, or publication authority

1. Executive Verdict

Compounder Score: 60/100. Business Quality: 56/80. Valuation / 20% Return Underwriting: 4/20. Score-implied classification: Reject. This is a diagnostic classification, not the ER2 verdict and not a trade instruction.

Alphabet remains a high-quality operating franchise, but the evidence does not support the required 20% annualized shareholder return at the sealed USD 357.75 entry price. The peer-reviewed operating model produces terminal statutory diluted EPS of USD 10.205881, USD 18.236080, and USD 27.286947 in bear, base, and bull. Applying scenario-specific 14.0x, 17.0x, and 20.0x exit P/E anchors and adding explicit dividends yields finite five-year gross USD IRRs of **-16.2864%, -2.4726%, and 9.0716%**. The 25%/55%/20% probability-weighted terminal wealth is USD 320.830959 per share, producing **-2.1548% annualized**, calculated as the CAGR of weighted terminal wealth and never as an average of scenario IRRs.

The quality score recognizes durable Search and YouTube distribution, a profitable Cloud scale-up, strong current liquidity, and historically high simple ROIC. It is capped because the current USD 132.402 billion TTM capex cycle has reduced TTM FCF to USD 53.273 billion, acquisition-inclusive ROIIC cannot be isolated cleanly, Other Bets consumes cash, repurchases no longer offset SBC on a dollar diagnostic, and founder control plus regulatory remedies constrain minority-owner confidence.

The return score is the decisive weakness. The base case fails the separate P/E-at-or-below-15 gate by 23.54%; the base gross IRR is negative even at a 17.0x exit P/E. A 20% return at the base 17.0x exit P/E requires USD 52.032669 of terminal EPS after the modelled distributions, versus USD 18.236080 in the reviewed base model. The required EPS CAGR from the source-bound normalized current EPS diagnostic of USD 10.288408 is 38.29%. The evidence does not support that hurdle.

2. Data Source Map

Evidence need	Controlling source	Period / basis	Use in this score
Price and listed unit	`quote_packet.json`, sealed SHA-256 `432377beb3eef185e63f83864000b9a2b1f1dcf87dae8e3a7ed79f1aa97a71e5`	USD 357.75, 2026-08-06 close; one GOOGL Class A share	Entry price, market capitalization, unit consistency
Statutory statements	`quant_foundation.md`, `data_package.md`, statutory bridge SHA-256 `0853f189c7f6c61089dcd516972b3e95faf49696d91029200e37242bc3989742`	FY2021-FY2025 and TTM 2026-06-30	Revenue, OI, NOPAT, EPS, cash flow, balance sheet
Share count	Quote packet and `synthesis_input_bridge.json`	12,309.000M quote-basis shares; exact scenario paths	Per-share bridge and terminal equity values
SBC and capital allocation	`data_package.md` Sections 7-9	FY2021-FY2025 and TTM	Dilution, buybacks, dividends, M&A, capex
Segment economics	Final peer-reviewed Services, Cloud and Other Bets appendices	TTM to 2031-06-30	Revenue, margin and operating-income scenarios
Management and governance	`appendix_management.md`	Current proxy, filings and eight calls	Capital allocation, incentives, founder control
Moat and competition	`appendix_moat.md`	Current and 2046 durability test	Moat, pricing, disruption and regulation
Consolidated forecast	`synthesis.md` and `synthesis_input_bridge.json`	Exact 2026-06-30 to 2031-06-30 horizon	Terminal revenue, OI, NOPAT, NI, shares and EPS
USD/SGD	[Federal Reserve DEXSIUS via FRED](https://fred.stlouisfed.org/data/DEXSIUS)	1.2828 SGD per USD on 2026-07-31, latest stable published observation used	Net-SGD entry conversion anchor; source-date lag disclosed

Evidence need	Controlling source	Period / basis	Use in this score
Dividend withholding	[IRS nonresident-alien withholding guidance](https://www.irs.gov/individuals/international-taxpayers/federal-income-tax-withholding-and-reporting-on-other-kinds-of-us-source-income-paid-to-nonresident-aliens)	30% statutory rate absent a lower treaty rate	Conservative net-SGD dividend overlay

The quote packet controls price, not a web quote. The FRED FX observation is older than the equity quote and is therefore a disclosed net-SGD diagnostic anchor, not live execution pricing. No broker, tax, or portfolio instruction is implied.

3. Key Financial and Quality Metrics

Metric	Result	Formula / interpretation
Current market capitalization	USD 4,403.545B	USD 357.75 x 12.309B quote-basis diluted shares
Current enterprise-value diagnostic	USD 4,291.850B	Market cap + 98.165 debt + 14.591 leases + 18.023 preferred - 242.474 cash/investments; not used in P/E returns
TTM statutory P/E	17.94x	357.75 / 19.9373; distorted low by extraordinary fair-value gains
Normalized current EPS diagnostic	USD 10.2884	`(147.628 OI + 6.000 net interest) x (1-18%) / 12.244359B`
Normalized current P/E diagnostic	34.77x	357.75 / 10.2884; analyst normalization, not management guidance
FY2021-FY2025 revenue CAGR	11.82%	Four compounding intervals, 257.637 to 402.836
FY2021-FY2025 NOPAT CAGR	12.95%	Four intervals, 65.96 to 107.37
FY2021-FY2025 FCF CAGR	2.26%	Four intervals, 67.012 to 73.266
Five-observation median simple ROIC	36.58%	Median of 46.95%, 36.58%, 36.36%, 36.84%, 30.88%
Three-year incremental-capital proxy	25.30%	`(107.37-62.93)/(347.71-172.06)`; balance-sheet proxy, not clean organic ROIIC
Four-year incremental-capital proxy	19.98%	`(107.37-65.96)/(347.71-140.49)`
Five-observation FCF/NOPAT average	87.69%	Annual FCF divided by simple NOPAT; fell to 68.24% in FY2025
TTM FCF / normalized NOPAT	44.01%	53.273 / `[147.628 x (1-18%)]`; capex-cycle pressure
FY2021-FY2025 diluted-share CAGR	-2.54%	Four intervals, 13.553B to 12.230B
FY2025 SBC / revenue	6.19%	24.953 / 402.836
FY2025 SBC / FCF	34.06%	24.953 / 73.266
TTM SBC / FCF	52.84%	28.147 / 53.273
TTM FCF yield	1.21%	53.273 / 4,403.545
Annualized dividend yield	0.23%	USD 0.84 / USD 357.75
Net debt / EBITDA	-0.45x	FY2025 package diagnostic; net-cash balance sheet
EV / normalized NOPAT diagnostic	35.45x	Current EV / TTM OI taxed at 18%; not the primary method

Ten full annual observations are not present in the governed current-run package, so no ten-year ROIIC or share-count series is invented. The adjusted ROIC evidence is also incomplete: a defensible R&D-capitalization adjustment requires amortization cohorts not in the sealed package. The score therefore uses the transparent simple-ROIC series and caps 1A rather than pretending that a precise adjusted number exists.

4. Rubric Scorecard

Category	Score	Maximum	Evidence-based conclusion
1. Incremental Returns on Capital	17	25	High simple ROIC, but incremental proxy is 20%-25%, capital intensity is rising, and clean organic/acquisition-inclusive separation is unavailable

Category	Score	Maximum	Evidence-based conclusion
2. Reinvestment Runway	16	20	Search/YouTube, Cloud, security and AI are large; the runway is real, but returns on the USD 175B-185B FY2026 capex plan remain unproven
3. Durability of Moat	11	15	Services and Cloud have durable advantages; AI-agent substitution, remedies, multi-cloud bargaining and 2046 interface ownership keep the moat gate YELLOW
4. Accounting and Financial Quality	7	10	Strong filings and liquidity; extraordinary fair-value gains, SBC, leases, preferred stock and falling FCF conversion require normalization
5. Capital Allocation	5	10	Cloud reinvestment worked and historical buybacks reduced shares; mega-capex, Wiz/Intersect, Other Bets and compensation lack disclosed return hurdles
Business Quality	**56**	**80**	Good franchise, not a blank-cheque compounder under current evidence
6. Price and 20% Underwriting	4	20	Conservative exit multiples do not rescue returns; base and weighted IRRs are negative
Compounder Score	**60**	**100**	**Reject under this diagnostic rubric**

Subscore detail is 1A 4/5, 1B 4/8, 1C 2/3, 1D 3/3, 1E 2/3, 1F 2/3; 2A 5/5, 2B 4/5, 2C 4/4, 2D 2/3, 2E 1/2, 2F 0/1; 3A 4/4, 3B 2/3, 3C 2/3, 3D 1/2, 3E 2/2, 3F 0/1; 4A 2/2, 4B 1/2, 4C 1/2, 4D 2/2, 4E 1/1, 4F 0/1; 5A 2/2, 5B 1/2, 5C 0/2, 5D 0/2, 5E 1/1, 5F 1/1; 6A 0/6, 6B 3/4, 6C 0/3, 6D 0/3, 6E 0/2, 6F 1/2.

5. ROIIC and Reinvestment Analysis

Alphabet's simple ROIC is high but declining: 46.95% in FY2021, 36.58% in FY2022, 36.36% in FY2023, 36.84% in FY2024, and 30.88% in FY2025. The decline does not make the franchise low quality; it does show that a historical average cannot be carried forward unchanged into a much larger infrastructure cycle.

The transparent incremental-capital proxy is 25.30% over FY2022-FY2025 and 19.98% over FY2021-FY2025. It uses the change in governed NOPAT divided by the change in the package's operating invested-capital diagnostic. This is not a clean organic ROIIC because stockholders' equity, debt and cash are affected by buybacks, securities marks, acquisitions and financing. It is also not acquisition-exclusive. The evidence supports productive reinvestment, especially Cloud's move from a USD 2.282B FY2021 loss to USD 24.319B TTM operating income, but it does not support a >35% credible forward ROIIC award.

Cash conversion supplies the central caution. Five annual FCF/NOPAT observations average 87.69%, yet conversion fell from 101.59% in FY2021 to 68.24% in FY2025. On the current normalized TTM NOPAT diagnostic, FCF conversion is about 44.01%. Capex rose from USD 24.640B in FY2021 to USD 132.402B TTM. Management's FY2026 USD 175B-185B plan and 2027 increase mean the denominator of future returns is expanding faster than the current cash evidence.

SBC is treated as a real cost. FY2025 SBC was 6.19% of revenue and 34.06% of FCF; TTM SBC was 52.84% of FCF. Diluted shares fell historically, which deserves credit, but TTM repurchases of USD 17.403B were below USD 28.147B of SBC and no common repurchases occurred in H1 FY2026. The synthesis therefore models bear dilution, base near-flat shares, and bull modest contraction rather than assuming buybacks automatically create value.

6. Runway Analysis

The evidence supports a long organic runway in two engines. Google Services combines Search commercial-intent liquidity, YouTube's creator/viewer/advertiser network, subscriptions, Maps, Android and Play distribution. Google Cloud has data gravity, security policy, workload architecture, proprietary TPUs, global infrastructure, Workspace identity and an enterprise partner ecosystem. The peer-reviewed base case grows Services revenue 9.75% and Cloud revenue 20.93% over exactly five years; Other Bets remains economically negative.

The runway score is not higher because growth and value creation are no longer synonymous. Google Cloud's 31.3% TTM margin is strong evidence of operating leverage, but segment capex and invested capital are not disclosed. Search AI can expand query volume while increasing inference and depreciation costs. Cloud can grow rapidly while capacity pricing or utilization compresses returns. Wiz and Intersect can improve the platform while transferring value to sellers if integration economics disappoint. Other Bets' scale metrics do not yet establish a protected shareholder profit pool.

The repeatable playbook is strongest in product distribution and enterprise cross-sell, weaker in capital discipline. A durable upgrade requires capex growth to decelerate, normalized FCF to recover, and Cloud margins to remain high after acquisitions and full depreciation. Until then, the evidence supports growth but only a constrained conclusion on incremental returns.

7. Moat Analysis

The moat is clear enough to explain in one paragraph: Search and YouTube combine habit, distribution, proprietary systems, advertiser liquidity, creator supply, measurement and global serving scale; Cloud combines workload/data switching costs, secure procurement, custom silicon, AI/data tooling and infrastructure scale. These advantages are difficult to reproduce together. They are not invulnerable. Consumer discovery can move to third-party agents, remedies can weaken default placement and data exclusivity, advertisers can move marginal spend, enterprises can bargain across clouds, and raw AI capacity can commoditize.

The current evidence earns 11/15, not a full score. Search CPC and clicks grew together in Q2 FY2026 and Services retained a 41.89% TTM margin. Cloud reached a 31.33% TTM margin and has substantial backlog. Those are real competitive signals. The moat appendix nevertheless rates both the current moat and 2046 durability YELLOW. The reviewed bear case keeps Services and Cloud profitable, but long-horizon interface ownership and capital returns remain unsettled. Other Bets is optionality rather than demonstrated moat.

8. Accounting and Capital Allocation Analysis

The statutory source chain is strong and reconciled, but reported TTM earnings are not a usable recurring base. TTM other income of USD 151.641B contains exceptionally large equity-security fair-value gains. That makes the sealed statutory EPS of USD 19.9373 unsuitable as the only current earnings anchor. The normalized USD 10.2884 EPS diagnostic removes the fair-value surge and uses the synthesis's base normalized below-line assumptions. Both figures are shown; neither is silently substituted.

Liquidity is substantial: cash and short-term investments were USD 242.474B at 2026-06-30, long-term debt USD 98.165B, operating leases USD 14.591B, and net cash after debt and leases USD 129.718B. Mandatory-convertible preferred stock was USD 18.023B. Under the selected P/E method these current balances are diagnostics only. No terminal net-cash path is governed, and no cash or debt is added to EPS times P/E.

Capital allocation earns mixed marks. Historical repurchases reduced diluted shares, and Cloud investment created a second profitable engine. Conversely, FY2026 brings the USD 29.5B Wiz and USD 5.9B Intersect acquisitions, the majority funding of Waymo's USD 16B round, a sharp debt/preferred financing shift, and curtailed buybacks. Management has not disclosed acquisition returns, infrastructure cohort returns, an aggregate AI return hurdle, or price-sensitive repurchase thresholds. Compensation is long-dated and equity-heavy, but relative TSR and private-unit values are not ROIC or per-share FCF measures. Founder voting control of 52.7% for Larry Page and Sergey Brin further limits minority influence.

9. 20% Return Underwriting

PRIMARY_VALUATION_METHOD = PE. This method is frozen for Bear, Base, Bull, probability weighting, reverse-return/max-buy-price diagnostics, gross USD and net SGD. Statutory diluted EPS and the listed-unit bridge are fully reconciled. EV/NOPAT cannot control because no source-bound 2031 cash, debt, lease, preferred, minority-interest or other-senior-claim scenario path exists. `valuation_method_consistent_across_scenarios=true`; `net_sgd_uses_same_primary_method=true`; `double_count_check_passed=true`.

Exit P/Es are 14.0x bear, 17.0x base and 20.0x bull. They are scenario-specific, not the flat 15x entry gate. The 17.0x base is below the 17.94x current statutory P/E and far below the 34.77x normalized current diagnostic. Bear applies a further de-rating for weaker growth, margin compression, remedies and dilution. Bull allows 20.0x for a 16.65% revenue CAGR, 39.09% margin and 21.53% normalized EPS CAGR; it remains well below the normalized current diagnostic and is not used to rescue the controlling base case.

Distributions use the issuer's current USD 0.21 quarterly dividend, annualized to USD 0.84. Bear holds it flat; base grows it 10% annually; bull grows it 15% annually. These are transparent analyst diagnostics tied to the current declared rate, not management guidance. Five payments begin one year after the start date. Cumulative dividends are USD 4.200000, USD 5.641112 and USD 6.513140.

Security-return summary	Bear	Base	Bull	Probability weighted
Probability	25.00%	55.00%	20.00%	100.00%
Current price, USD	357.750000	357.750000	357.750000	357.750000
Exact horizon	2026-06-30 to 2031-06-30	Same	Same	5.000000 years
Terminal net income, USD B	128.212672	225.269990	331.354666	222.222596 diagnostic
Terminal diluted shares, B	12.562627	12.352983	12.143340	12.363465 diagnostic
Terminal statutory EPS, USD	10.205881	18.236080	27.286947	18.038704 diagnostic
Exit P/E	14.00x	17.00x	20.00x	Scenario-weighted wealth, no fourth multiple
Terminal equity value, USD B	1,794.977408	3,829.589830	6,627.093312	3,880.437421 diagnostic
Terminal equity value/share, USD	142.882331	310.013359	545.738942	315.375719 weighted
Cumulative distributions/share, USD	4.200000	5.641112	6.513140	5.455240 weighted
Terminal shareholder wealth/share, USD	147.082331	315.654472	552.252082	320.830959
Gross USD annualized IRR	**-16.2864%**	**-2.4726%**	**9.0716%**	**-2.1548%**

Probability-weighted gross IRR is `(320.830958678668 / 357.75)^(1/5)-1 = -2.154845%`. It is not `25% x bear IRR + 55% x base IRR + 20% x bull IRR`.

Bear-case operating and return bridge

Bear case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 445.866B	USD 587.426B	5.67%	Services slows, Cloud decelerates and Other Bets contracts; reviewed segment bear outputs
Operating margin	33.11%	26.60%	-6.51 ppt	AI/central costs rise to 6% of segment revenue and segment margins compress
Operating earnings	USD 147.628B	USD 156.266B	1.14%	Statutory operating income from the sealed segment bridge
Diluted share count	12.309B	12.563B	0.41%	USD 10B annual buybacks do not offset modelled SBC issuance
EPS	USD 19.937 statutory / 10.288 normalized diagnostic	USD 10.206	-12.53% statutory	Terminal statutory EPS; current statutory EPS contains extraordinary gains
Valuation	17.94x statutory / 34.77x normalized	14.00x P/E	De-rating	Remedy, capital intensity and weak growth justify lower equity multiple
Share value	USD 357.75	USD 142.88	P/E bridge	USD 10.205881 EPS x 14.0x; no cash/debt addition
Annual dividend	USD 0.84	USD 0.84	0.00%	Current quarterly rate held flat
Dividend yield	0.23%	0.59%	+0.35 ppt	Annual dividend divided by endpoint share value
Five-year dividends	-	USD 4.20	cumulative	Five flat annual payments
Total ending value	USD 357.75	USD 147.08	-16.29% gross USD IRR	Share value plus cumulative distributions

Base-case operating and return bridge

Base case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 445.866B	USD 787.554B	12.05%	Services grows 9.75%, Cloud 20.93%, Other Bets 15%; reviewed base outputs
Operating margin	33.11%	34.12%	+1.01 ppt	Segment leverage is offset by 5% central-cost burden and continuing Bet losses
Operating earnings	USD 147.628B	USD 268.720B	12.73%	Statutory operating income from the sealed bridge
Diluted share count	12.309B	12.353B	0.07%	USD 25B annual buybacks nearly offset modelled SBC issuance
EPS	USD 19.937 statutory / 10.288 normalized diagnostic	USD 18.236	-1.77% statutory	Statutory comparator distorted; normalized EPS CAGR is 12.11%
Valuation	17.94x statutory / 34.77x normalized	17.00x P/E	Modest de-rating	Below both current diagnostics; no terminal expansion controls base
Share value	USD 357.75	USD 310.01	P/E bridge	USD 18.236080 EPS x 17.0x; no cash/debt addition
Annual dividend	USD 0.84	USD 1.35	10.00%	Five years of 10% growth from current declared rate
Dividend yield	0.23%	0.44%	+0.20 ppt	Annual dividend divided by endpoint share value
Five-year dividends	-	USD 5.64	cumulative	Years 1-5 distributions
Total ending value	USD 357.75	USD 315.65	-2.47% gross USD IRR	Share value plus cumulative distributions

Bull-case operating and return bridge

Bull case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 445.866B	USD 963.100B	16.65%	Strong Services AI monetization, Cloud share gains and better Bet progress
Operating margin	33.11%	39.09%	+5.98 ppt	Services/Cloud leverage and central costs fall to 4% of segment revenue
Operating earnings	USD 147.628B	USD 376.470B	20.59%	Statutory operating income from reviewed segment outputs
Diluted share count	12.309B	12.143B	-0.27%	USD 40B annual buybacks exceed modelled SBC issuance
EPS	USD 19.937 statutory / 10.288 normalized diagnostic	USD 27.287	6.48% statutory	Normalized EPS CAGR is 21.53%; below-line bull includes bounded USD 10B gain
Valuation	17.94x statutory / 34.77x normalized	20.00x P/E	+2.06x statutory	Stronger growth earns a higher exit anchor, still far below normalized current multiple
Share value	USD 357.75	USD 545.74	P/E bridge	USD 27.286947 EPS x 20.0x; no cash/debt addition
Annual dividend	USD 0.84	USD 1.69	15.00%	Five years of 15% growth from current rate
Dividend yield	0.23%	0.31%	+0.07 ppt	Annual dividend divided by endpoint share value
Five-year dividends	-	USD 6.51	cumulative	Years 1-5 distributions
Total ending value	USD 357.75	USD 552.25	9.07% gross USD IRR	Share value plus cumulative distributions

Net-SGD overlay

Entry FX is 1.2828 SGD/USD from the Federal Reserve's 2026-07-31 observation. Exit FX is stressed to 1.20 bear, held at 1.2828 base, and set at 1.35 bull. These exit rates are analyst stress assumptions around the source-bound entry anchor, not forecasts. Entry cost is 0.30% (0.10% trading plus 0.20% FX conversion), sale proceeds bear the same 0.30%, and dividends bear 30% U.S. withholding plus 0.20% FX conversion. Singapore or investor-specific taxes, custody fees and spread slippage are not modelled; this is diagnostic, not executable.

Net-SGD return bridge	Bear	Base	Bull	Probability weighted
Entry FX, SGD/USD	1.2828	1.2828	1.2828	1.2828
Exit FX, SGD/USD	1.2000	1.2828	1.3500	Scenario specific
Entry cash incl. 0.30% cost, SGD/share	460.298465	460.298465	460.298465	460.298465
Net terminal wealth, SGD/share	174.465365	401.547444	740.679936	412.603423
Net-SGD annualized IRR	**-17.6367%**	**-2.6940%**	**9.9811%**	**-2.1640%**

Probability-weighted net-SGD IRR is `(412.603422893268 / 460.2984651)^(1/5)-1 = -2.164006%`. It uses the identical P/E terminal values and the same 25%/55%/20% weights.

Reverse-return and maximum-price diagnostic

Required terminal wealth for 20% annualized from USD 357.75 is USD 890.196480. Subtracting base cumulative distributions of USD 5.641112 leaves required terminal share value of USD 884.555368. At the frozen base 17.0x exit P/E, required terminal EPS is USD 52.032669. This requires 38.29% annual EPS growth from normalized current EPS of USD 10.288408 and is 2.85 times the reviewed base terminal EPS. The gross-USD maximum entry price that the reviewed base wealth supports at 20% is only USD 126.854453. The 20% case is not beatable without radically higher earnings, a much higher terminal multiple, or both.

10. Hard Veto Checklist

Hard veto	Result	Evidence
ROIIC below cost of capital with no credible path	Watch	Incremental proxy is 20%-25%, but future infrastructure returns are not disclosed
High ROIC only from tiny/negative capital	Pass	Invested-capital diagnostic is positive and rising; excess cash affects level but does not create a negative base
Growth needs persistent external financing	Watch	Balance sheet is liquid, but debt and preferred financing rose during the capex/acquisition wave
Shares rise materially without per-share value	Watch	Historical dilution fell; bear scenario now dilutes because buybacks lag SBC
Large acquisitions without disclosed returns	Watch	Wiz and Intersect are strategically coherent but unproven and lack return disclosure
Structural FCF lag	Watch	Five-year cash conversion was strong, but FY2025 and TTM deterioration may become structural
Regulation/platform dependency can impair equity	Watch	Search, Play and ad-tech remedies can weaken distribution/data economics
20% case requires terminal multiple expansion	**Fail**	Base 17.0x produces -2.47%; 20% needs USD 52.03 EPS or an unsupported multiple
Flawless execution needed at today's price	**Fail**	Even the reviewed bull case produces only 9.07% gross USD IRR
Moat cannot be explained	Pass	Services liquidity/distribution and Cloud switching/procurement advantages are specific
Accounting/governance trust impairment	Watch	No restatement/material weakness, but founder control and fair-value noise reduce confidence
Balance-sheet wipeout risk	Pass	Net cash after debt and leases is USD 129.718B before preferred stock

The two valuation vetoes prevent an investable-now classification. `no_hard_vetoes=false`.

11. Final Decision

Score-implied classification: Reject. This does not mean Alphabet is a poor business. It means a 60/100 score and 4/20 return-underwriting score do not satisfy the rubric at USD 357.75. The current price embeds outcomes materially above the reviewed base case, while the bull case still misses the 20% hurdle by a wide margin.

Confidence is **Medium-High** for the return arithmetic and **Medium** for the business-quality score. Price, statutory history, scenario EPS, shares and time horizon are governed and tied out. Exit multiples, dividend growth and FX stresses are explicit analyst assumptions. Organic ROIIC, segment capital, infrastructure utilization, acquisition returns and terminal capital structure remain true gaps.

Compounder Score note: **60/100 - strong franchise economics are outweighed by an inadequate entry-price return profile and two valuation vetoes.** Business Quality Score note: **56/80 - Services and Cloud are durable, but capital intensity, governance, regulatory and ROIIC evidence cap the score.** 20% Return UW Score note: **4/20 - base gross USD IRR is -2.47%, weighted gross IRR is -2.15%, and the reviewed bull reaches only 9.07%.**

`trade_execution_authorized=false`. Any action requires separate approval. This stage has no buy-queue, portfolio-fit, ranking, sizing, messaging, or execution authority.

12. Machine-Readable JSON

The full-precision scenario bridges, gross USD returns, net-SGD returns, score denominators, threshold tests, sources, assumptions, and no-trade controls are saved in `compounder_score.json`. Mandatory returns are finite. Fields that are `null` there are genuinely inapplicable under the P/E method or unavailable terminal capital-structure paths; they are not used to avoid return underwriting.

Appendix CSA - Scoring Audit

Alphabet Inc. - Scoring Audit

PATH_RECEIVED: `C:\Users\Admin\OneDrive\GPT\ER 2.0\Alphabet Inc\appendix_scoring_audit.md`

Analysis date: 2026-08-07 Ticker / listing: GOOGL / XNAS:GOOGL Audited CS Markdown SHA-256: `352e2eb78507bd3b48e755e0e479c52158c5512c24a7c53e8c7565f860b7cdc1` Audited CS JSON SHA-256: `d7ed0f0f6d396ae3e454c252e7e0c681d15909768f4db4b22fe09eaa84e7cbfc`

The return model clears the arithmetic and method audit. The business-quality score does not fully clear the evidence audit. Three subcategories are reduced because adjusted ROIC is unavailable, the incremental-return trend is weakening, and segment unit economics do not include segment invested capital. No CS artifact repair was required: the original files remain unchanged and this audit supplies the controlling audited score.

1. Original vs Audited Scores

Item	Original	Audited	Notes
Business Quality Score / 80	56	53	Three points removed from Category 1
Valuation / 20% Return UW Score / 20	4	4	Return arithmetic is exact; the hurdle fails
Total Score / 100	60	57	53 plus 4
Classification	Reject	Reject	Below 70, two hard vetoes fail, and 20% is implausible

The score-implied classification is **Reject**. The score is diagnostic only; it is not the ER2 verdict and confers no trade, buy-queue, ranking, portfolio-fit, sizing, messaging, or execution authority.

2. Score Reductions and Reasons

Subcategory	Original	Audited	Evidence status	Audit conclusion
1A normalized ROIC	4/5	3/5	Partly supported / missing data	Five simple-ROIC observations are strong, but adjusted ROIC is explicitly unavailable because governed R&D amortization cohorts are absent
1C ROIIC trend	2/3	1/3	Partly supported	Simple ROIC fell from 46.95% to 30.88%; FY2025 and TTM cash conversion fell while capex accelerated, so the evidence does not support two points for a stable trend
1D unit economics	3/3	2/3	Partly supported	Search pricing and Cloud profit inflection are observable, but no segment capex, invested capital, or segment ROIC exists

The other subcategory scores are preserved. Category 1 falls from 17/25 to 14/25; Categories 2-6 remain 16/20, 11/15, 7/10, 5/10, and 4/20. The resulting Business Quality Score is 53/80 and total is 57/100.

3. Unsupported Claims

- No clean adjusted ROIC is available. The original appendix says this explicitly, so its 1A award can only be partly supported by the transparent simple-ROIC series.
- No acquisition-inclusive ROIIC or clean organic/acquisition split is available despite the material Wiz and Intersect acquisitions. The original 1B calculation is a balance-sheet proxy, not a clean five-year acquisition-inclusive ROIIC.
- No segment-level capex, invested capital, or ROIC is disclosed. Cloud's move to USD 24.319B of TTM operating income supports operating leverage, but does not prove segment capital returns.

- Exit P/Es of 14x, 17x, and 20x are disclosed analyst assumptions bounded against the current 17.9438x statutory and 34.7721x normalized P/E diagnostics. They have scenario-specific rationales but no governed peer or historical-multiple distribution. This lowers confidence, but it does not create an arithmetic or method defect.
- The 1.2828 SGD/USD entry anchor is identified as the Federal Reserve DEXSIUS observation for 2026-07-31. A bounded live refresh attempt timed out, and no raw FX file is archived in the governed folder. The source URL, value, date, and staleness disclosure are visible, so this is an evidence-retention gap rather than a reason to null the net-SGD returns.

4. Calculation Errors

No calculation errors were found in the return bridge. Independent recomputation produced the following:

Calculation	Audited result	Status
Five-observation median simple ROIC	36.5745%	Reproduced from NOPAT / invested capital
Three-year incremental-capital proxy	25.3003%	`(107.37-62.93)/(347.71-172.06)`
Four-year incremental-capital proxy	19.9836%	`(107.37-65.96)/(347.71-140.49)`
Five-year / acquisition-inclusive ROIIC	Unavailable	Correctly not invented
Five-observation average FCF / NOPAT	87.6874%	Reproduced
FY2025 FCF / NOPAT	68.2369%	Reproduced
TTM FCF / normalized NOPAT	44.01%	Reproduced from 53.273 / 121.055
FY2021-FY2025 diluted-share CAGR	-2.5352%	Four exact annual intervals
FY2025 SBC / revenue	6.1943%	Reproduced
FY2025 SBC / FCF	34.0573%	Reproduced
TTM SBC / FCF	52.8354%	Reproduced
Current EV / normalized NOPAT	35.4537x	Diagnostic only; not mixed into returns
Required terminal EPS for 20% at base 17x	USD 52.032669	Reproduced
Required EPS CAGR from normalized current EPS	38.2883%	Reproduced
Maximum gross-USD entry price for 20%	USD 126.854453	Reproduced

The original category sums also reconcile: 56/80 plus 4/20 equals 60/100. The audited sums reconcile: 53/80 plus 4/20 equals 57/100.

Security-return method audit

Primary valuation method: P/E. The same method controls bear, base, bull, probability weighting, the reverse-return/max-price diagnostic, and the net-SGD overlay. Terminal share value is statutory diluted EPS multiplied by scenario exit P/E. Current net cash after debt and leases of USD 129.718B and USD 18.023B of mandatory-convertible preferred stock are displayed as diagnostics and are not added to or subtracted from EPS times P/E. No P/E / EV-NOPAT mixing or capital-structure double count was found.

Mandatory return field	Bear	Base	Bull	Probability weighted
Probability	25.00%	55.00%	20.00%	100.00%
Current price, USD/share	357.750000	357.750000	357.750000	357.750000
Exact horizon	2026-06-30 to 2031-06-30	Same	Same	5.000000 years
Exit P/E	14.00x	17.00x	20.00x	Scenario-specific
Terminal statutory EPS, USD	10.2058807995	18.2360799681	27.2869470753	18.0387035974 diagnostic
Terminal diluted shares, B	12.5626268344	12.3529832285	12.1433396226	12.3634654088 diagnostic
Terminal equity value, USD B	1,794.977408	3,829.589830	6,627.093312	3,880.437421 diagnostic
Terminal equity value/share, USD	142.8823311927	310.0133594581	545.7389415053	315.3757188012
Cumulative distributions/share, USD	4.2000000000	5.6411124000	6.5131402875	5.4552398775

Mandatory return field	Bear	Base	Bull	Probability weighted
Terminal shareholder wealth/share, USD	147.0823311927	315.6544718581	552.2520817928	320.8309586787
Gross USD annualized IRR	**-16.2864%**	**-2.4726%**	**9.0716%**	**-2.1548%**

Each scenario IRR reproduced as `(terminal shareholder wealth / 357.75)^(1/5)-1`. Probability-weighted gross IRR reproduced as `(320.830958678668 / 357.75)^(1/5)-1 = -2.1548450551%`. The arithmetic average of scenario IRRs would be -3.6172%, which is not the published figure. The published probability-weighted return therefore correctly annualizes probability-weighted terminal wealth.

Net-SGD audit

The entry anchor is 1.2828 SGD/USD dated 2026-07-31. Exit FX assumptions are 1.20 bear, 1.2828 base, and 1.35 bull. Entry cost is 0.30%, exit sale cost is 0.30%, dividend FX cost is 0.20%, and U.S. dividend withholding is 30%. The IRS source page states a 30% statutory dividend withholding rate for nonresident aliens absent a lower treaty rate and was last reviewed 2026-07-23. The CS appendix discloses that investor-specific taxes, custody fees, and spread slippage are not modelled.

Net-SGD field	Bear	Base	Bull	Probability weighted
Entry cash, SGD/share	460.2984651000	460.2984651000	460.2984651000	460.2984651000
Net terminal wealth, SGD/share	174.4653650389	401.5474444044	740.6799360556	412.6034228933
Net-SGD annualized IRR	**-17.6367%**	**-2.6940%**	**9.9811%**	**-2.1640%**

Probability-weighted net-SGD IRR reproduced as `(412.603422893268 / 460.2984651)^(1/5)-1 = -2.1640064013%`. It is the CAGR of weighted terminal SGD wealth, not an arithmetic average. All eight mandatory gross/net-SGD return fields are present and finite in both Markdown and JSON. JSON nulls are confined to genuinely inapplicable EV/NOPAT terminal-bridge fields and unavailable quality diagnostics; no NaN or infinity is present.

5. Missing Data

The most important missing evidence is a clean organic and acquisition-inclusive return-on-incremental-capital bridge. Other gaps are adjusted ROIC after R&D capitalization, segment capital and capex, a five-year reinvestment-rate series, infrastructure cohort returns, acquisition return hurdles, a governed terminal capital-structure path, a governed peer/historical exit-multiple distribution, and a locally archived raw FX observation. These gaps reduce score and confidence; they do not permit null security returns.

6. Hard-Veto and Threshold Test Audit

Threshold / veto	Audited result	Reason
Total score at least 80/100	Fail	57/100
Business Quality at least 65/80	Fail	53/80
Valuation UW at least 15/20	Fail	4/20
ROIIC plus runway at least 35/45	Fail	14 plus 16 equals 30/45
Base gross IRR at least 20%	Fail	-2.4726%
Bear gross IRR at least 8%-10%	Fail	-16.2864%
No hard vetoes	Fail	Veto 8 and veto 9 fail
20% without multiple expansion	Fail	17x base requires USD 52.03 terminal EPS; reviewed base is USD 18.24

The hard-veto labels are internally consistent. Veto 8 fails because the 20% case requires radically higher EPS or unsupported multiple expansion. Veto 9 fails because even the reviewed bull produces only 9.0716% gross USD. Balance-sheet wipeout risk passes; governance, capital returns, acquisitions, cash conversion, dilution, and regulatory/platform risk remain Watch items.

7. Final 20% Hurdle Pass/Fail

FAIL. Base gross USD IRR is -2.4726%, weighted gross USD IRR is -2.1548%, and bull gross USD IRR is only 9.0716%. The 20% case is not plausible at USD 357.75 under the frozen P/E method. Base terminal wealth supports a maximum gross-USD entry price of USD 126.854453 for a 20% five-year return.

8. Dream Business / Dream Investment Classification

Neither under this rubric. Alphabet is a strong franchise, but 53/80 Business Quality does not clear the 65/80 threshold because capital-return evidence, governance, regulation, and cash conversion remain constrained. It is not a dream investment at the current price because the reviewed base and probability-weighted returns are negative and even the bull case misses 20%.

The single biggest reason it does not qualify is entry price: USD 357.75 capitalizes earnings outcomes far above the reviewed base bridge.

9. Stage 7 Scorecard Notes

- Compounder Score note: **57/100 - durable franchise evidence is offset by incomplete capital-return proof and a failed entry-price return case.**
- Business Quality Score note: **53/80 - Services and Cloud are strong, but adjusted and acquisition-inclusive ROIIC, segment capital returns, governance, and cash conversion cap quality.**
- 20% Return UW Score note: **4/20 - base gross USD IRR is -2.47%, weighted gross IRR is -2.15%, and the reviewed bull reaches only 9.07%.**

10. Auditor JSON

The full-precision audited scores, return recomputations, source checks, unchanged CS artifact hashes, evidence gaps, and no-trade controls are saved in `compounder_score_audit.json`.

Appendix RT - Red Team

Alphabet Inc. — Red Team

PATH_RECEIVED: `C:\Users\Admin\OneDrive\GPT\ER 2.0\Alphabet Inc\appendix_red_team.md`

Run ID: `pulse-cio-20260807T120231+0800` Assessment date: 2026-08-07 TTM anchor: 2026-06-30 Exact horizon: 2031-06-30, 5.0 years Authority: research only; no trade, ranking, sizing, portfolio, message, or publication authority

This appendix attacks the governed operating thesis and its security-return implications. It accepts the independently cleared arithmetic and does not rerun Stage 5's eleven tie-outs. The audited controlling result is already a **Reject**: Compounder Score 57/100, Business Quality 53/80, and Return Underwriting 4/20. The red-team question is therefore not whether a bullish conclusion should be preserved. It is whether the base case is still too generous, whether the 25% bear probability understates correlated downside, and which evidence should constrain the final narrative.

Audited return anchors under attack

The primary method is P/E across all scenarios. Current price is USD 357.75 per GOOGL share; scenario probabilities are 25% bear, 55% base, and 20% bull; exit P/Es are 14x, 17x, and 20x. Probability-weighted IRRs are the CAGR of probability-weighted terminal wealth, not arithmetic averages.

Audited return	Bear	Base	Bull	Probability weighted
Gross USD annualized IRR	-16.2864%	-2.4726%	9.0716%	-2.1548%
Net-SGD annualized IRR	-17.6367%	-2.6940%	9.9811%	-2.1640%

These values bind this appendix. Even the bull case fails the 20% hurdle. The red team found no arithmetic reason to replace them, but found material reasons to treat the operating base case and the 20x bull exit as optimistic rather than central evidence.

1. The most fragile assumption

The most fragile assumption is **Google Cloud's 20.93% base revenue CAGR**, from USD 77.617B TTM to USD 200.740B at 2031-06-30, alongside a 35% terminal `Operating income (loss)` margin. The problem is not that Cloud lacks momentum: official quarterly growth accelerated from 33.5% to 47.8%, 63.4%, and 81.8%, while quarterly margin improved to 35.6%. The problem is that the newest observation combines an extraordinary infrastructure cycle with Wiz consolidation after the USD 29.5B acquisition, while Alphabet does not disclose an organic growth split, customer concentration, backlog duration, segment capex, or segment invested capital. A five-year forecast anchored to an 81.8% acquisition-affected quarter risks treating a temporary capacity and consolidation step-up as proof of durable organic compounding.

The appendix itself concedes that the current growth rate is not durable and that price competition, depreciation, power constraints, customer bargaining, and multicloud behavior can impair economics. Yet 20.93% still means Cloud more than doubles from an already large base while retaining a 35% margin despite the most capital-intensive build in Alphabet's history. That pairing—not growth alone—is fragile.

If Cloud's base CAGR were 15.93%, five points lower, terminal Cloud revenue would be about USD 162.531B rather than USD 200.740B. Holding the model's 35% Cloud margin, 5% central-cost rule, 18% tax rate, and base diluted shares constant, the roughly USD 38.206B revenue shortfall reduces terminal net income by about USD 9.399B and EPS by about USD 0.761, from USD 18.236 to USD 17.475. The security already has a negative base return, so this miss does not change the Reject; it deepens it.

2. The most-likely-to-be-optimistic Stage 5 number

The single most-likely-to-be-optimistic Stage 5 number is the **42.0% base terminal Google Services operating margin**. It assumes the segment can absorb AI inference, model-development, content, device, and regulatory burdens while widening from a 41.9% Q2 FY2026 margin. Stage 5 separately carries central AI costs, which is correct, but the economic boundary between product-serving cost inside Services and shared model/infrastructure cost at Alphabet level is not disclosed. The model can classify those costs consistently without proving that 42% is achievable after a full depreciation cycle.

Services remains the earnings fulcrum. A three-point miss—39% rather than 42%—on USD 584.399B of base terminal revenue cuts pre-tax profit by USD 17.532B and terminal EPS by about USD 1.164 after the 18% tax assumption. Base EPS falls from USD 18.236 to roughly USD 17.072, before any separate deterioration in Cloud, central costs, or share count. This is more damaging than the tested two-point Cloud-margin movement because Services is vastly larger.

The model's 34.12% consolidated base margin looks restrained relative to the segment sum, but it still embeds simultaneous success: Services margin durability, Cloud scaling to 35%, Other Bets loss improvement, and central costs limited to 5% of segment revenue. Correlation matters. If AI serving costs disappoint, the same technical cause can pressure Services margin, Cloud margin, and Alphabet-level activities together. One-variable sensitivity understates that joint downside.

3. The strongest bear case, stated in its strongest form

Alphabet is funding a defense of Search and a bid for AI infrastructure leadership at a scale that can erase the historic cash economics before the new products prove equivalent monetization. Generative interfaces can increase query engagement while reducing commercial click density and raising inference and depreciation cost; Cloud can grow rapidly while hyperscaler competition and customer bargaining prevent returns on the USD 175B–185B FY2026 capex plan from clearing the cost of capital. The damage appears within four to eight quarters through weaker Services incremental margin, Cloud margin stalling below 30%, TTM FCF remaining under USD 50B, and continued suspension of buybacks while SBC issues shares. At the same time, regulatory remedies can weaken default distribution or ad-tech integration, so the firm pays more to preserve an ecosystem with less protected monetization.

This is not a balance-sheet-collapse thesis. It is a per-share value-destruction thesis: operating revenue grows, but FCF conversion and repurchase support deteriorate while the market continues to capitalize the company at a demanding multiple. The audited bear already produces only USD 147.08 of terminal shareholder wealth against USD 357.75 today and a -16.29% gross annualized return. A 14x bear exit is not obviously punitive if normalized cash economics keep worsening.

4. Cross-examination of management commentary

Search expansion

Management said AI experiences were driving overall and commercial query growth on the Q3 FY2025 call. The claim may be directionally correct while still failing shareholders. Query count is not revenue, and commercial-query growth is not proof that AI answers preserve click yield, advertiser conversion, or contribution profit after model-serving cost. The earliest contradiction would be Search revenue growth falling below 10% while AI query engagement continues rising, accompanied by Services margin below 39% for two consecutive quarters. That combination would show that engagement is becoming less economically dense.

Cloud as the AI growth engine

On the Q1 FY2026 call, management described enterprise AI as Cloud's primary growth driver. The risk is attribution. Q2 growth includes Wiz consolidation, the company has not disclosed Cloud organic growth or segment capital, and marketplace transaction growth is not recognized revenue. Strong backlog can also conceal delivery timing, contract concentration, and customer bargaining power. The first contradiction would be Cloud revenue growth below 25% after acquisition comparability normalizes while operating margin falls below 30%, especially if consolidated capex remains above 30% of revenue.

Scaling Waymo

Management said it was focused on scaling Waymo and its potential, while Alphabet funded a significant majority of a USD 16B round. Ride growth proves technical and operational progress, not positive unit economics, asset utilization, insurance economics, or an undiluted value bridge to GOOGL shareholders. The first contradiction would be Other Bets losses remaining above USD 9B TTM while disclosed ride volume keeps increasing and no unit-economic evidence emerges. That would indicate scale is consuming rather than releasing capital.

5. Stage 5 tie-out reverification and assumption stress

Recency anchor

The TTM anchor is genuinely the four most recent quarters: Q3 FY2025, Q4 FY2025, Q1 FY2026, and Q2 FY2026. Quarterly Services growth is not sharply decelerating; it has stayed in the mid-teens. Cloud growth is accelerating, not decelerating. The stale-trend risk runs in the opposite direction: the latest Cloud quarter is so unusually strong and acquisition-affected that

using it as evidence for a high five-year CAGR can overstate persistence. The arithmetic anchor is current; the economic comparability is not clean.

Share-count path

The base path assumes USD 25B of annual repurchases and about 78.678M annual SBC-equivalent issuance, ending with 12.353B diluted shares versus 12.309B initially. This is less aggressive than historical buybacks, but still optimistic relative to the current cash-allocation regime: TTM repurchases were USD 17.403B, below USD 28.147B of SBC, and H1 FY2026 repurchases were nil while acquisitions, dividends, capex, debt, and preferred funding expanded.

If base buybacks were zero for five years while the same issuance proxy persisted, terminal shares would be roughly 12.702B, base EPS about USD 17.734, and base gross IRR about -3.01% rather than -2.47%. The conclusion is unchanged, but the exercise shows that buyback support is no longer a free assumption. The fixed USD 357.75 repurchase price is also mechanically favorable if shares remain expensive: at a higher average price, USD 25B retires fewer shares.

Product growth versus competitive deceleration

Services' 9.75% base CAGR is below recent mid-teens growth and is not the main overreach. Cloud's 20.93% base CAGR is the exposed line because acquisition effects and an extraordinary AI capacity cycle are not separated. Other Bets' 15% base revenue CAGR is not material to consolidated value; its negative USD 7.578B terminal operating loss is more important. No fabricated product sleeve drives the consolidated model, which is a genuine strength.

6. Return, probability, distribution, and FX cross-examination

The audited score correctly says the 20% return case does **not** clear. To earn 20% at the 17x base exit, terminal EPS would need USD 52.03 versus reviewed base EPS of USD 18.24—a 38.29% EPS CAGR from normalized current EPS. The assumption that breaks first is not one small line item; it is the requirement for a radically different earnings path. Neither NOPAT growth, share reduction, FCF conversion, nor distributions in the reviewed model can bridge that gap. Even the bull terminal EPS of USD 27.29 at 20x produces only 9.07% gross USD.

The 25/55/20 probabilities are not absurd, but 25% bear may be too low because three risks are linked: AI can pressure Search monetization, raise infrastructure cost, and force more Cloud price competition at the same time. Reweighting to 35% bear, 50% base, and 15% bull—without changing any scenario outcome—would reduce probability-weighted gross return to about -3.97% and net-SGD return to about -4.12%. This is an analytical stress, not a replacement forecast.

Exit P/Es of 14x, 17x, and 20x are transparent analyst assumptions, but the scoring audit explicitly finds no governed peer or historical exit-multiple distribution. That is an evidence constraint. It does not require arithmetic repair because a lower multiple only reinforces Reject, while a higher multiple cannot responsibly rescue the case without new evidence. The 20x bull exit deserves particular skepticism because bull already assumes the best revenue, margin, tax, buyback, and investment-income outcomes.

Cumulative distributions of USD 4.20, USD 5.64, and USD 6.51 per share are small relative to terminal values; setting them to zero would not rescue or break the conclusion. They should be treated as bounded support, not an investment thesis. The net-SGD overlay likewise does not improve the business case. Bull net-SGD IRR exceeds gross USD because the assumed exit FX moves from SGD 1.2828 to SGD 1.35 per USD; bear assumes SGD 1.20. Those are scenario overlays, not issuer fundamentals. Any final conclusion should lead with gross USD and present net SGD as an explicit FX/cost sensitivity.

7. Observable signal that invalidates the thesis

The decisive signal is a **two-quarter combination**: Google Services revenue growth below 10% year over year **and** Google Services operating margin below 39% in each of the next two reported quarters, while trailing-twelve-month capex remains above 30% of consolidated revenue. This threshold targets the exact gate the base case needs: durable AI-era monetization and margin in the dominant profit engine despite the infrastructure surge.

If all three conditions occur together, the base Services CAGR and 42% margin are no longer defensible as central assumptions. The final research conclusion should then move to an avoidance stance until a rebuilt model proves that Search yield or AI serving efficiency has recovered. This is a thesis-invalidating research signal, not a trade or portfolio instruction.

A second, management-quality escalation signal is TTM FCF below USD 50B for two consecutive reported TTMs while annualized repurchases remain below SBC. That would validate the bear mechanism of cash conversion collapsing into capital intensity and dilution. It should force the management gate from YELLOW to FAIL and constrain any terminal multiple

above the bear case.

8. Conviction at the end of red team

Thesis does NOT survive as an underwritten security at USD 357.75. The break is entry price against normalized earnings: base and probability-weighted returns are negative, the bull reaches only 9.07% gross USD, and the 20% case requires USD 52.03 of terminal EPS that no reviewed segment bridge supports. The operating franchise survives only conditionally. Services and Cloud remain powerful businesses, but the model cannot establish that the unprecedented capital cycle will preserve per-share FCF, organic ROIIC, and minority-owner economics.

No same-stage arithmetic repair is required. The conclusion must be constrained in four ways: treat Cloud's base CAGR and Services' base margin as optimistic; label exit multiples as analyst assumptions without a governed distribution; present net-SGD outputs as FX/cost overlays; and carry the two-quarter Services/capex signal plus the TTM FCF/dilution signal into the final monitoring section. No unresolved blocker prevents a truthful Production ER2 conclusion.

Red-team verdict

RED TEAM VERDICT: REJECT CONFIRMED; BUSINESS THESIS CONDITIONAL; NO ARITHMETIC REPAIR REQUIRED. The strongest bear case is a correlated Search-monetization, AI-cost, and capex-return failure that preserves headline revenue growth while destroying per-share cash economics. The most fragile forecast is Cloud's 20.93% base CAGR; the most likely optimistic Stage 5 number is Services' 42.0% base terminal margin. The mandatory audited return fields remain finite and unchanged.

Appendix D - Data Package (Raw Historicals)

Alphabet Inc. — Production ER2 Data Package

PATH_RECEIVED: C:\Users\Admin\OneDrive\GPT\ER 2.0\Alphabet Inc\data_package.md

Run ID: `pulse-cio-20260807T120231+0800` Retrieval date: 2026-08-07 SGT Fiscal anchor: Q2 FY2026 ended 2026-06-30; TTM is Q3 FY2025 + Q4 FY2025 + Q1 FY2026 + Q2 FY2026. Exact forward horizon for downstream underwriting: 2031-06-30, exactly five years after the TTM end. Reporting currency and scale: USD; tables are USD billions unless stated otherwise. Sealed current-price anchor: $357.75 for GOOGL Class A at the 2026-08-06 completed close. Trade execution authorized: `false`.

All historical observations below were fetched live in this stage. No local data-warehouse cache was read. New FMP responses are archived under `raw\pulse-cio-20260807T120231+0800\d_20260807T124100` and mirrored without overwrite to the investing data warehouse. The QFR-sealed statutory packet was read, hashed, and reproduced without mutation. Primary official sources are Alphabet's SEC filings and earnings-release exhibits; live FMP is the quantitative cross-check except where the official filing controls a documented vendor defect.

0a. Industry classification and disclosure inventory

Alphabet is a global consumer internet, digital advertising, cloud infrastructure/software, subscription media, devices, and frontier-technology group. It is a U.S. domestic issuer reporting under U.S. GAAP, with a December 31 fiscal year. The current reportable segments are Google Services, Google Cloud, and Other Bets; Alphabet-level activities are separately disclosed corporate/unallocated costs. The industry checklist is an ad hoc combination of software/SaaS, digital advertising, streaming subscriptions, cloud infrastructure, and autonomous-mobility KPIs.

This inventory is mandatory because FMP's current product endpoint is materially malformed. Its Q2 FY2026 row reports Google Cloud as 513,900 and subscriptions/platforms/devices as 94,540 (USD millions), versus official values of 24,768 and 12,911. The same vendor row labels the actual 94,540 Google Services total as `Google Inc.`. Official SEC tables therefore control Q2 FY2026 segment and product values. The annual endpoint is usable only after normalizing `Google Inc.` in FY2025 to the official subscriptions/platforms/devices line and subtracting the official $0.127 billion hedging loss from consolidated revenue and operating income.

Live sources searched in this stage were: FMP annual and quarterly income, balance-sheet and cash-flow statements; annual key metrics and ratios; annual and quarterly product segmentation; four FMP earnings-call transcripts; SEC submissions; FY2023 and FY2025 10-Ks; Q3 FY2025, Q1 FY2026 and Q2 FY2026 10-Qs; and four earnings-release 8-K exhibits. The Alphabet IR 2026 index, Morgan Stanley conference page, and FY2025 results page were each attempted twice; both identical direct-fetch attempts received HTTP 403 Cloudflare challenges. SEC exhibits and date-matched FMP transcripts supply the permitted completion-first replacement. No formal Alphabet investor day or capital-markets-day transcript was located in the live official search; the 2026-03-03 Morgan Stanley conference announcement was located, but its page could not be directly archived because of the repeated 403.

Search terms and table titles checked include `segment`, `Google Services`, `Google Cloud`, `Other Bets`, `Alphabet-level activities`, `Google Search & other`, `YouTube ads`, `Google Network`, `subscriptions, platforms, and devices`, `operating income (loss)`, `geographic`, `backlog`, `remaining performance obligations`, `paid subscriptions`, `Gemini monthly active users`, `Waymo rides`, `capital expenditures`, `significant segment expenses`, `Wiz`, `Intersect`, `Verily`, and `GFiber`.

Dataset / table family	Official source searched	Search terms or table names	Years available	Included in data package?	If excluded, why	Downstream relevance
Segment economics	FY2023 and FY2025 10-Ks; Q3 FY2025, Q1 and Q2 FY2026 10-Qs and 8-K exhibits	Segment revenues; operating income (loss); Alphabet-level activities	FY2021–FY2025; latest four quarters; TTM	Yes	None	Segment appendices, statutory rollup, synthesis
Segment expense composition	FY2025 10-K supplemental segment-expense table	Employee compensation expenses; other costs and expenses; total segment costs and expenses	FY2023–FY2025	Yes	Other Bets expense composition is not separately disclosed	Segment margins, operating leverage, forecast discipline

Dataset / table family	Official source searched	Search terms or table names	Years available	Included in data package?	If excluded, why	Downstream relevance
Product revenue	Same filings and exhibits	Search & other; YouTube ads; Network; subscriptions/platforms/devices; Cloud; Other Bets	FY2021–FY2025; latest four quarters	Yes	FMP malformed Q2 FY2026 overridden by SEC	Product growth and mix
Cloud demand KPIs	Four live transcripts and earnings exhibits	Backlog; GCP; enterprise AI; Workspace; supply	Q3 FY2025–Q2 FY2026	Yes	Clean annual five-year backlog history is a true non-disclosure	Cloud forecast and capacity risk
Consumer engagement	Four live transcripts	paid subscriptions; Gemini app MAU; AI Mode; YouTube	Recent quarterly points only	Yes, where explicitly disclosed	No consistent five-year series; true non-disclosure	Services growth and moat
Other Bets operating KPIs	Four live transcripts and filings	Waymo autonomous rides; cities; Wing deliveries; financing	Recent quarterly points only	Yes, where explicitly disclosed	No consistent five-year KPI series; true non-disclosure	Optionality and loss runway
Capital and balance sheet by unit	FY2025 10-K and Q2 FY2026 10-Q	debt; leases; cash; preferred stock; acquisitions	FY2025 and latest quarter	Consolidated only	Segment capital is not separately disclosed	ROIC and valuation bridge
Geographic revenue	FY2025 10-K	United States; EMEA; APAC; Other Americas	FY2023–FY2025 dollars and percentages	FY2025 mix included	No segment-by-geography profit disclosure	Geographic risk
Recent management trend	Four FMP transcripts and SEC exhibits	guidance; CapEx; depreciation; search monetization; Cloud backlog	Last four quarters	Yes	Company-hosted pages blocked twice; FMP and SEC used	Recency and forecast discipline

The longest clean official KPI histories are the segment and product dollar series. Other operating KPIs are point-in-time disclosures rather than standardized annual series.

KPI family	Granularity	FY2021	FY2022	FY2023	FY2024	FY2025	Latest interim / TTM	Source path
Google Services revenue	Segment, $B	237.529	253.528	272.543	304.930	342.721	TTM 367.091	SEC FY2023/FY2025 10-K; Q2 FY2026 10-Q
Google Cloud revenue	Segment, $B	19.206	26.280	33.088	43.229	58.705	TTM 77.617	SEC FY2023/FY2025 10-K; Q2 FY2026 10-Q
Other Bets revenue	Segment, $B	0.753	1.068	1.527	1.648	1.537	TTM 1.507	SEC FY2023/FY2025 10-K; Q2 FY2026 10-Q
Cloud backlog	Point-in-time, $B	—	—	—	—	242.8 at FY2025 year-end	514 at Q2 FY2026; 155 Q3, 460 Q1	FY2025 10-K; date-matched live FMP transcripts
Paid consumer subscriptions	Point-in-time, millions	—	—	—	—	325 at Q4	350 at Q1 FY2026; Q2 not reiterated	Date-matched FMP transcripts
Waymo paid autonomous rides	Weekly point-in-time	—	—	—	—	More than 400,000 at Q4	More than 500,000 at Q1 FY2026	Date-matched FMP transcripts

Taxonomy conclusion: the three reportable segments have remained stable throughout FY2021–FY2025. Alphabet expanded significant-expense and Alphabet-level activity disclosure under the newer segment standard, but did not change the three-segment identity. Product labels have minor vendor naming drift (`Google Inc.` versus subscriptions/platforms/devices), and Other Bets aggregates several individually immaterial operating segments. These are disclosed boundaries, not analyst-created reallocations.

1. Reporting structure and taxonomy

Google Services includes ads, Android, Chrome, devices, Google Maps, Google Play, Search, YouTube, consumer subscriptions, apps and in-app purchases. Google Cloud includes infrastructure and platform services, enterprise applications including Workspace, security, and other enterprise services. Other Bets combines operating segments that are individually immaterial, including businesses such as Waymo, Wing, and life-sciences ventures. Alphabet-level activities primarily contain shared AI R&D, corporate initiatives, corporate shared costs, and certain fines and settlements; they are not a fourth reportable segment.

FY2025 segment / reconciliation line	Revenue ($B)	Percent of official consolidated revenue	Operating income (loss) ($B)	Description
Google Services	342.721	85.08%	139.404	Consumer products, ads, subscriptions, platforms and devices
Google Cloud	58.705	14.57%	13.910	GCP, Workspace, enterprise AI, security and related services
Other Bets	1.537	0.38%	-7.515	Multiple individually immaterial frontier businesses
Hedging gains (losses)	-0.127	-0.03%	—	Consolidated revenue reconciliation; not assigned to a segment
Alphabet-level activities	—	—	-16.760	Corporate/unallocated operating cost
Consolidated	402.836	100.00%	129.039	Official FY2025 statutory totals

Reporting structure is stable since FY2021 for the three reportable segments. FY2023's annual filing gives FY2021–FY2023 on a comparable basis; FY2025's annual filing gives FY2023–FY2025. No segment-realignment 8-K requiring restatement was found. Vendor labels were normalized only when the official taxonomy and exact dollars proved identity; the malformed Q2 FY2026 vendor row was excluded rather than repaired by economic inference.

FY2025 revenue geography was United States 48%, EMEA 29%, APAC 17%, and Other Americas 6%; hedging rounded to 0%. The FY2025 filing reports corresponding regional dollar revenue, but not segment profit by geography. Geographic profit and regional Cloud/Services splits are therefore true non-disclosures.

2. Consolidated historicals

Metric	FY2021	FY2022	FY2023	FY2024	FY2025	Source
Revenue ($B)	257.637	282.836	307.394	350.018	402.836	Live FMP annual; FY2025 SEC override from 402.963
Operating income ($B)	78.714	74.842	84.293	112.390	129.039	Live FMP annual; FY2025 SEC override from 129.166
Operating margin	30.55%	26.46%	27.42%	32.11%	32.03%	Calculated
Net income ($B)	76.033	59.972	73.795	100.118	132.170	Live FMP annual / SEC tie
Diluted EPS ($)	5.61	4.56	5.80	8.04	10.81	Live FMP annual / SEC tie
Diluted shares (M)	13,553	13,159	12,722	12,447	12,230	Live FMP annual / SEC tie
Capex ($B)	24.640	31.485	32.251	52.535	91.447	Live FMP annual cash flow; expenditure shown positive
Free cash flow ($B)	67.012	60.010	69.495	72.764	73.266	OCF less capex; live FMP annual
ROIC diagnostic	46.95%	36.58%	36.36%	36.84%	30.88%	Calculated NOPAT / year-end operating invested capital

ROIC is a transparent operating diagnostic rather than the vendor's opaque field. NOPAT equals statutory operating income multiplied by one minus the annual effective tax rate, where effective tax rate is income-tax expense divided by pretax income. Year-end operating invested capital equals total stockholders' equity plus interest-bearing debt less cash and short-term investments; operating leases are excluded from both debt and invested capital in this diagnostic and are handled separately in the valuation bridge. The numerator/denominator pairs ($B) are FY2021 65.96 / 140.49, FY2022 62.93 / 172.06, FY2023 72.57 / 199.58, FY2024 93.91 / 254.89, and FY2025 107.37 / 347.71. The FY2025 effective tax rate is 16.78%. This convention is consistent across all five years; downstream analysts should not mix it with FMP's `returnOnInvestedCapital` field without a bridge.

The TTM 2026-06-30 official base is revenue $445.866 billion, statutory operating income $147.628 billion, pretax income $299.269 billion, net income $244.205 billion, common numerator $244.119 billion, day-weighted diluted shares 12,244.359

million, and diluted EPS $19.9373. Other income of $151.641 billion contains exceptionally large equity-security fair-value gains and must not be extrapolated as recurring operating earnings.

3. Segment historicals

Google Services

Google Services	FY2021	FY2022	FY2023	FY2024	FY2025	Source
Revenue ($B)	237.529	253.528	272.543	304.930	342.721	SEC FY2023/FY2025 10-K segment tables
YoY	—	6.74%	7.50%	11.88%	12.39%	Calculated
Operating income (loss) ($B)	88.132	82.699	95.858	121.263	139.404	Exact issuer segment metric; SEC filings
Margin on operating income (loss)	37.10%	32.62%	35.17%	39.77%	40.68%	Calculated

Google Cloud

Google Cloud	FY2021	FY2022	FY2023	FY2024	FY2025	Source
Revenue ($B)	19.206	26.280	33.088	43.229	58.705	SEC FY2023/FY2025 10-K segment tables
YoY	—	36.83%	25.91%	30.65%	35.80%	Calculated
Operating income (loss) ($B)	-2.282	-1.922	1.716	6.112	13.910	Exact issuer segment metric; SEC filings
Margin on operating income (loss)	-11.88%	-7.31%	5.19%	14.14%	23.69%	Calculated

Other Bets

Other Bets	FY2021	FY2022	FY2023	FY2024	FY2025	Source
Revenue ($B)	0.753	1.068	1.527	1.648	1.537	SEC FY2023/FY2025 10-K segment tables
YoY	—	41.83%	42.98%	7.92%	-6.74%	Calculated
Operating income (loss) ($B)	-4.051	-4.636	-4.095	-4.444	-7.515	Exact issuer segment metric; SEC filings
Margin on operating income (loss)	-537.98%	-434.08%	-268.17%	-269.66%	-488.94%	Calculated

Alphabet-level activities were -$3.085 billion, -$1.299 billion, -$9.186 billion, -$10.541 billion and -$16.760 billion in FY2021–FY2025. The step-up is economically material and must be projected independently; it must not be pushed into Services, Cloud, or Other Bets margins.

Supplemental segment expense disclosure

The FY2025 10-K separately provides the following segment-expense composition. The totals reconcile exactly to segment revenue less the issuer-disclosed `Operating income (loss)` for each period. Alphabet does not provide an equivalent expense-composition table for Other Bets, so no analyst allocation is introduced.

Segment expense line ($B)	FY2023	FY2024	FY2025	Official source
Google Services — employee compensation expenses	46.224	44.560	45.124	FY2025 10-K supplemental segment-expense table
Google Services — other costs and expenses	130.461	139.107	158.193	FY2025 10-K supplemental segment-expense table
Google Services — total costs and expenses	176.685	183.667	203.317	FY2025 10-K supplemental segment-expense table
Google Cloud — employee compensation expenses	19.054	20.519	22.078	FY2025 10-K supplemental segment-expense table
Google Cloud — other costs and expenses	12.318	16.598	22.717	FY2025 10-K supplemental segment-expense table
Google Cloud — total costs and expenses	31.372	37.117	44.795	FY2025 10-K supplemental segment-expense table

3a. Historical statutory-profit bridge and forecast-driver ledger

The QFR-sealed packet's exact common segment profit basis is issuer-disclosed `Operating income (loss)`. The packet is in USD millions. It uses three modeled reportable segments and no fallback. Source IDs and classifications below reproduce `statutory_bridge.json`; all residuals are zero.

FY2025 sealed bridge

Bridge line	Classification	Value (USD M)	Source ID	Running subtotal (USD M)
Google Services	segment profit	139,404	SEC_2025_10K	139,404
Google Cloud	segment profit	13,910	SEC_2025_10K	153,314
Other Bets	segment profit	-7,515	SEC_2025_10K	145,799
Sum of reportable segment profit	segment profit	145,799	SEC_2025_10K	145,799
Alphabet-level activities	corporate_unallocated	-16,760	SEC_2025_10K	129,039
Consolidated segment profit metric	subtotal	129,039	SEC_2025_10K	129,039
Statutory operating income	statutory subtotal	129,039	SEC_2025_10K	129,039
Other income (expense), net	other_non_operating	29,787	SEC_2025_10K	158,826
Pretax income	statutory subtotal	158,826	SEC_2025_10K	158,826
Provision for income taxes	tax	-26,656	SEC_2025_10K	132,170
Net income	statutory subtotal	132,170	SEC_2025_10K	132,170

TTM ended 2026-06-30 sealed bridge

Bridge line	Classification	Value (USD M)	Source ID	Running subtotal (USD M)
Google Services	segment profit	153,792	OFFICIAL_TTM_RECONCILIATION	153,792
Google Cloud	segment profit	24,319	OFFICIAL_TTM_RECONCILIATION	178,111
Other Bets	segment profit	-8,942	OFFICIAL_TTM_RECONCILIATION	169,169
Sum of reportable segment profit	segment profit	169,169	OFFICIAL_TTM_RECONCILIATION	169,169
Alphabet-level activities	corporate_unallocated	-21,541	OFFICIAL_TTM_RECONCILIATION	147,628
Consolidated segment profit metric	subtotal	147,628	OFFICIAL_TTM_RECONCILIATION	147,628
Statutory operating income	statutory subtotal	147,628	OFFICIAL_TTM_RECONCILIATION	147,628
Other income (expense), net	other_non_operating	151,641	OFFICIAL_TTM_RECONCILIATION	299,269
Pretax income	statutory subtotal	299,269	OFFICIAL_TTM_RECONCILIATION	299,269
Provision for income taxes	tax	-55,064	OFFICIAL_TTM_RECONCILIATION	244,205
Net income	statutory subtotal	244,205	OFFICIAL_TTM_RECONCILIATION	244,205

There are no operating bridge adjustments in either sealed period. `Alphabet-level activities` is the only corporate/unallocated operating line. `Other income (expense), net` is below-line non-operating; the tax provision is tax. No plug, analyst-created reclassification, or mixed profit basis is present.

Historical bridge line	FY value (USD M)	TTM value (USD M)	Forecast treatment	Driver and source	Bear / base / bull rule
Alphabet-level activities	-16,760	-21,541	Independently forecast operating expense	Shared AI R&D and corporate cost; FY2025 10-K and Q2 FY2026 10-Q	Bear: higher percentage of segment revenue; base: moderate scaling from TTM; bull: operating leverage but never forced to zero
Other income (expense), net	29,787	151,641	Independently forecast below-line schedule	Cash yields, debt interest and equity-security gains; SEC filings	Bear: no equity gains and conservative net interest; base: normalized yield/debt schedule with zero unrealized gain; bull: bounded positive investment return, not TTM extrapolation
Provision for income taxes	-26,656	-55,064	Tax-rate schedule applied to modeled pretax income	FY2025 effective rate 16.78%; filing tax note	Bear: higher normalized rate; base: mid-cycle statutory/effective blend; bull: lower bounded rate; no tax plug

STATUTORY_BRIDGE_STATUS: VERIFIED — CLEARED FOR FORECASTING

4. Product and sub-segment historicals

Alphabet separately discloses dollars for the following revenue families. These are official product lines, not standalone reportable segments. Google Cloud is both a reportable segment and a dollar-disclosed revenue line. No rows below are back-solved estimates.

Segment	Product	What it is	Dollar disclosure?	FY2023 / FY2024 / FY2025 revenue and source
Google Services	Google Search & other	Search advertising and related properties	Yes	$175.033B / $198.084B / $224.532B; FY2025 10-K
Google Services	YouTube ads	YouTube advertising revenue	Yes	$31.510B / $36.147B / $40.367B; FY2025 10-K
Google Services	Google Network	Ads placed on network partner properties	Yes	$31.312B / $30.359B / $29.792B; FY2025 10-K
Google Services	Subscriptions, platforms, and devices	YouTube/Google subscriptions, Play and devices	Yes	$34.688B / $40.340B / $48.030B; FY2025 10-K
Google Cloud	Google Cloud	GCP, Workspace and other enterprise services	Yes	$33.088B / $43.229B / $58.705B; FY2025 10-K
Other Bets	Other Bets total	Combined individually immaterial ventures	Yes, aggregate only	$1.527B / $1.648B / $1.537B; FY2025 10-K

Five-year dollar history is also clean: Search $148.951B, $162.450B, $175.033B, $198.084B, $224.532B; YouTube ads $28.845B, $29.243B, $31.510B, $36.147B, $40.367B; Network $31.701B, $32.780B, $31.312B, $30.359B, $29.792B; subscriptions/platforms/devices $28.032B, $29.055B, $34.688B, $40.340B, $48.030B; Cloud $19.206B, $26.280B, $33.088B, $43.229B, $58.705B; and Other Bets $0.753B, $1.068B, $1.527B, $1.648B, $1.537B for FY2021–FY2025.

Products with growth or adoption commentary but no separately disclosed revenue dollars are shown separately.

Segment	Product	Disclosure method	Last four quarters YoY growth	Source
Google Cloud	GCP	Management states growth exceeded Cloud overall; no GCP dollars	Qualitative in all four quarters; Q1 FY2026 GenAI-built products nearly +800%	Date-matched live FMP transcripts
Google Cloud	Workspace	Double-digit growth and seat/ARPU drivers; no dollars	Qualitative only	Q4 FY2025 transcript
Google Services	YouTube subscriptions	Paid-subscription and total YouTube revenue commentary; no subscription-only dollars	Qualitative; total paid subscriptions 300M Q3, 325M Q4, 350M Q1	Date-matched transcripts
Google Services	Gemini consumer plans	Adoption and MAU; no product dollars	Qualitative only	Q1 and Q2 FY2026 transcripts
Other Bets	Waymo	Rides, cities and funding; no Waymo revenue dollars	No comparable YoY revenue series	Date-matched transcripts and filings
Other Bets	Wing / Isomorphic Labs	Deliveries or financing milestones; no revenue dollars	No comparable YoY revenue series	Q2 FY2026 transcript

5. Most recent quarterly trend

Alphabet FY ends December 31. Most recently completed fiscal quarter at time of writing: FY2026 Q2, covering April–June 2026, reported on 2026-07-22 via the SEC earnings-release exhibit at `https://www.sec.gov/Archives/edgar/data/1652044/000165204426000066/googexhibit991q22026.htm`.

Segment / consolidated	Q3 FY2025 revenue / YoY / OI margin	Q4 FY2025 revenue / YoY / OI margin	Q1 FY2026 revenue / YoY / OI margin	Q2 FY2026 revenue / YoY / OI margin	Official source
Google Services	$87.052B / 13.78% / 38.51%	$95.862B / 13.99% / 41.86%	$89.637B / 16.01% / 45.28%	$94.540B / 14.53% / 41.83%	SEC exhibits dated 2025-10-29, 2026-02-04, 2026-04-29, 2026-07-22
Google Cloud	$15.157B / 33.51% / 23.71%	$17.664B / 47.75% / 30.08%	$20.028B / 63.36% / 32.94%	$24.768B / 81.80% / 35.59%	Same SEC exhibits
Other Bets	$0.344B / -11.34% / -414.53%	$0.370B / -7.50% / -977.57%	$0.411B / -8.67% / -510.95%	$0.382B / 2.41% / -470.94%	Same SEC exhibits
Consolidated	$102.346B / 15.95% / 30.51%	$113.828B / 17.99% / 31.57%	$109.896B / 21.79% / 36.12%	$119.796B / 24.23% / 34.03%	Same SEC exhibits

Product	Q3 FY2025 revenue / YoY	Q4 FY2025 revenue / YoY	Q1 FY2026 revenue / YoY	Q2 FY2026 revenue / YoY	Official source
Google Search & other	$56.567B / 14.54%	$63.073B / 16.73%	$60.399B / 19.13%	$63.271B / 16.76%	Four SEC earnings exhibits
YouTube ads	$10.261B / 15.02%	$11.383B / 8.69%	$9.883B / 10.71%	$11.055B / 12.85%	Four SEC earnings exhibits
Google Network	$7.354B / -2.57%	$7.828B / -1.58%	$6.971B / -3.93%	$7.303B / -0.69%	Four SEC earnings exhibits
Subscriptions, platforms, devices	$12.870B / 20.78%	$13.578B / 16.72%	$12.384B / 19.32%	$12.911B / 15.25%	Four SEC earnings exhibits
Google Cloud	$15.157B / 33.51%	$17.664B / 47.75%	$20.028B / 63.36%	$24.768B / 81.80%	Four SEC earnings exhibits

The most load-bearing recent observation is Cloud’s official 82% rounded growth to $24.8 billion in Q2 FY2026. It appears in the freshly fetched SEC exhibit and replaces FMP’s malformed 513.9 billion value. Cloud growth accelerated each quarter while margin expanded. Services remained mid-teens despite Network declines, with Search and subscriptions carrying growth. Other Bets remains economically loss-making and includes volatile financing/SBC effects.

6. Management commentary on forward growth — verbatim live-source quotes

All transcript quotes below came from live FMP `earning-call-transcript` calls in this stage. Returned dates match the requested fiscal periods: Q3 FY2025 2025-10-29, Q4 FY2025 2026-02-04, Q1 FY2026 2026-04-29, and Q2 FY2026 2026-07-22. Quotation wording preserves the transcript. The SEC exhibits control reported dollars and growth rates where transcription errors could matter.

Google Services and Search

- Q3 FY2025, 2025-10-29, Philipp Schindler, SVP/CBO: “Our investments in new AI experiences, such as AI Overviews and AI Mode, continued to drive growth in overall queries, including commercial queries, creating more opportunities for monetization.” Topic: Search monetization. Interpretation: management sees AI query expansion as additive, but the model should still test monetization density and cost per response.
- Q3 FY2025, 2025-10-29, Philipp Schindler: “Rolled out globally in September, AI Max and Search is already used by hundreds of thousands of advertisers, currently making it the fastest-growing AI-powered search ads product.” Topic: advertiser adoption. Interpretation: adoption supports yield, but no revenue dollars are disclosed.
- Q4 FY2025, 2026-02-04, Sundar Pichai, CEO: “Search saw more usage in Q4 than ever before, as AI continues to drive an expansionary moment.” Topic: query growth. Interpretation: useful directionally; it is not a durable market-share or revenue guarantee.
- Q4 FY2025, 2026-02-04, Sundar Pichai: “In The US, we saw daily AI mode queries per user double since launch and AI overviews continue to perform very well.” Topic: engagement. Interpretation: query frequency is rising off an early base; monetization and cost need separate assumptions.
- Q1 FY2026, 2026-04-29, Sundar Pichai: “We continue to invest in improvements to AI overviews, which are driving overall search growth and we're also seeing strong growth in both users and usage of AI mode globally.” Topic: product-led usage. Interpretation: supports continued Search growth, with ongoing R&D and inference-cost pressure.

- Q1 FY2026, 2026-04-29, Philipp Schindler: “We are accelerating the deployment of Gemini across our entire ads infrastructure to help businesses reach more customers in more places than ever before.” Topic: ad-stack deployment. Interpretation: model efficiency gains conservatively because disclosure is strategic rather than quantified.
- Q2 FY2026, 2026-07-22, Philipp Schindler: “Strong performance in Search and YouTube underscores how our investments in AI translate into measurable value for our users and advertisers.” Topic: AI return. Interpretation: reported Search and YouTube growth support the claim, but attribution is not independently quantified.
- Q2 FY2026, 2026-07-22, Sundar Pichai: “Thanks to our engineering and hardware optimizations this quarter, we reduced the cost of AI mode responses to its lowest level since launch even as we have brought more advanced AI capabilities.” Topic: inference economics. Interpretation: cost-per-query may improve, but total compute can still rise with usage.

YouTube and subscriptions

- Q3 FY2025, 2025-10-29, Philipp Schindler: “On direct response, we're excited about the growth in revenue we're seeing, especially from small and medium advertisers adopting demand gen.” Topic: YouTube direct response. Interpretation: supports mix broadening beyond brand advertising.
- Q3 FY2025, 2025-10-29, Philipp Schindler: “Looking at the living room, our long-term bet, more advertisers are adopting interactive direct response ads, leading to an annual revenue run rate exceeding $1 billion globally for this format.” Topic: connected TV monetization. Interpretation: separately disclosed run rate supports a developing format, not total YouTube revenue.
- Q4 FY2025, 2026-02-04, Sundar Pichai: “This quarter, Search continued to accelerate with revenues growing 17%, YouTube's annual revenues surpassed $60 billion across ads and subscriptions.” Topic: YouTube scale. Interpretation: $60 billion includes ads and subscriptions; do not treat it as ad revenue alone.
- Q4 FY2025, 2026-02-04, Sundar Pichai: “We have over 325 million paid subscriptions across consumer services, strong adoption for Google One and YouTube Premium.” Topic: subscriptions. Interpretation: company-wide consumer count, not YouTube-only subscribers.
- Q1 FY2026, 2026-04-29, Sundar Pichai: “Overall, the number of paid subscriptions has now reached 350 million with YouTube and Google One being the key drivers.” Topic: subscription growth. Interpretation: sequential count expansion supports recurring revenue, though ARPU/churn are not disclosed.
- Q1 FY2026, 2026-04-29, Philipp Schindler: “And Gemini now powers YouTube creator partnerships, a centralized platform integrated directly into YouTube Studio for creators and Google ads for advertisers.” Topic: creator monetization. Interpretation: improved matching can widen inventory value but needs measured conversion evidence.
- Q2 FY2026, 2026-07-22, Sundar Pichai: “More than 140 million users engaged with Ask YouTube on the watch page in June 2026.” Topic: AI engagement. Interpretation: early adoption is visible; revenue impact is not disclosed.
- Q2 FY2026, 2026-07-22, Philipp Schindler: “We launched custom sponsorships to put brands at the heart of the world's biggest moments as they unfold on YouTube using AI to dynamically surface videos tailored to a brand's desired moment.” Topic: brand formats. Interpretation: supports format innovation but not an independent forecast line.

Google Cloud

- Q3 FY2025, 2025-10-29, Sundar Pichai: “Our complete enterprise AI product portfolio is accelerating growth in revenue, operating margins and backlog.” Topic: growth and profitability. Interpretation: all three metrics improved in official results; extrapolation should reflect capacity and acquisition effects.
- Q3 FY2025, 2025-10-29, Sundar Pichai: “Over 70% of existing Google Cloud customers use our AI products, including Banco BV, Best Buy and FairPrice Group.” Topic: penetration. Interpretation: broad customer adoption supports cross-sell, but usage/revenue concentration is undisclosed.
- Q4 FY2025, 2026-02-04, Anat Ashkenazi, CFO: “The Google Cloud segment delivered outstanding results in the fourth quarter as the business continued to benefit from strong demand for enterprise AI products.” Topic: demand. Interpretation: official growth and backlog corroborate demand.

- Q4 FY2025, 2026-02-04, Anat Ashkenazi: “And operating margin increased from 17.5% in the fourth quarter of last year to 30.1%.” Topic: Cloud operating leverage. Interpretation: useful anchor; acquisition and hardware mix may alter forward margin.
- Q1 FY2026, 2026-04-29, Sundar Pichai: “Our enterprise AI solutions have become our primary growth driver for cloud for the first time.” Topic: mix shift. Interpretation: forecast enterprise AI explicitly inside Cloud, without inventing product dollars.
- Q1 FY2026, 2026-04-29, Sundar Pichai: “In Q1, revenue from products built on our GenAI models grew nearly 800% year-over-year.” Topic: GenAI product growth. Interpretation: rapid off-base growth should not be applied to total Cloud.
- Q2 FY2026, 2026-07-22, Sundar Pichai: “Gemini continues to be a key driver of growth and is deeply integrated across all of our cloud products, including Gemini Enterprise, data analytics, cybersecurity and Google Workspace.” Topic: product breadth. Interpretation: reinforces cross-product adoption; the Wiz contribution must be separated where possible.
- Q2 FY2026, 2026-07-22, Sundar Pichai: “We are driving growth with partners with transactions on Google Cloud Marketplace growing over 7x year-over-year.” Topic: ecosystem. Interpretation: transaction growth is not equivalent to recognized Cloud revenue growth.

Other Bets and capital intensity

- Q3 FY2025, 2025-10-29, Sundar Pichai: “Waymo's growth and momentum are strong, and 2026 is shaping up to be an exciting year.” Topic: Waymo scaling. Interpretation: qualitative; retain loss funding and execution risk.
- Q3 FY2025, 2025-10-29, Anat Ashkenazi: “Within Other Bets, we continue to allocate more resources to businesses like Waymo, where we see opportunities to create substantial value.” Topic: resource allocation. Interpretation: Other Bets losses are intentionally funded and should not be assumed to vanish.
- Q4 FY2025, 2026-02-04, Sundar Pichai: “In December, we surpassed 20 million fully autonomous trips and are now providing more than 400,000 rides every week.” Topic: Waymo scale. Interpretation: strong operating growth, but revenue/ride economics remain undisclosed.
- Q4 FY2025, 2026-02-04, Anat Ashkenazi: “Alphabet funded a significant portion of the $16 billion investment round that Waymo announced on Monday, which will allow the business to accelerate its global expansion.” Topic: financing. Interpretation: external valuation evidence exists, but capital needs and dilution must be traced.
- Q1 FY2026, 2026-04-29, Sundar Pichai: “Waymo also surpassed 500,000 fully autonomous rights per week, doubling in less than a year.” Topic: weekly rides; transcript says “rights,” evidently a transcription error for rides. Interpretation: momentum is material, but source wording is preserved and the KPI is not used in statutory accounts.
- Q1 FY2026, 2026-04-29, Anat Ashkenazi: “In Q1 of this year, Verily completed an external capital raise that resulted in its deconsolidation from Alphabet.” Topic: portfolio action. Interpretation: Other Bets comparability changes after deconsolidation.
- Q2 FY2026, 2026-07-22, Sundar Pichai: “Wing has safely completed more than 1 million home deliveries, and we continue to grow our presence through partnerships with Walmart, DoorDash and Papa Jones.” Topic: Wing scale. Interpretation: operating milestone only; no revenue economics disclosed.
- Q2 FY2026, 2026-07-22, Sundar Pichai: “We're really focused on scaling the business right now and executing to that extraordinary potential, and that's what we are focused on.” Topic: Waymo corporate structure. Interpretation: management prioritized execution over a disclosed separation timetable.

Management’s full-year 2026 CapEx range stated on Q4 FY2025’s call was $175–185 billion. The transcript also states infrastructure investment will pressure depreciation and data-center operating costs. This is a consolidated capital-intensity anchor, not segment capex disclosure.

7. Capital allocation history

Year	Capex ($B)	Capex / revenue	R&D ($B)	R&D / revenue	Buybacks ($B)	Dividends ($B)	M&A cash outflow ($B)	Source
FY2021	24.640	9.56%	31.562	12.25%	50.274	0.000	2.618	Live FMP annual income/cash flow
FY2022	31.485	11.13%	39.500	13.97%	59.296	0.000	6.969	Live FMP annual income/cash flow
FY2023	32.251	10.49%	45.427	14.78%	61.504	0.000	0.495	Live FMP annual income/cash flow
FY2024	52.535	15.01%	49.326	14.09%	62.222	7.363	2.931	Live FMP annual income/cash flow
FY2025	91.447	22.70%	61.087	15.16%	45.709	10.049	1.592	Live FMP annual; SEC revenue override

Cash-flow signs are shown as positive uses of cash in this table. TTM to 2026-06-30 operating cash flow was $185.675 billion, capex $132.402 billion, free cash flow $53.273 billion, SBC $28.147 billion, and common repurchases $17.403 billion. The controlling 10-Q's newest comparative presentation produces TTM repurchases of `45.709 - 28.306 + 0 = 17.403`; the superseded four-quarter FMP presentation of 17.003 is rejected. Capex has outgrown revenue sharply, compressing FCF despite higher OCF. FY2026 acquisition cash payments for Wiz and Intersect are not captured in FY2025's M&A row.

8. Balance sheet snapshot

Item	FY2025 $B	Source
Cash and equivalents	30.708	Live FMP annual / FY2025 10-K
Short-term investments	96.135	Live FMP annual / FY2025 10-K
Cash plus short-term investments	126.843	Calculated
Interest-bearing debt, current plus long-term	46.547	FY2025 10-K; excludes operating leases
Operating-lease liabilities	12.744	FY2025 10-K; separately classified
Net cash before operating leases	80.296	Cash/investments less interest-bearing debt
Net cash after operating leases	67.552	Cash/investments less debt and operating leases
Net debt / EBITDA	-0.45x	Net debt of -80.296 / official EBITDA proxy 179.835
Goodwill plus intangibles	33.380	Live FMP annual / FY2025 10-K
Tangible book value	381.885	Equity 415.265 less goodwill/intangibles

At 2026-06-30, cash plus short-term investments increased to $242.474 billion. Long-term debt was $98.165 billion and operating-lease liabilities were $14.591 billion, for debt plus leases of $112.756 billion and net cash after those liabilities of $129.718 billion. The balance sheet also carried $18.023 billion of mandatory-convertible preferred stock. Downstream EV-to-equity work must treat cash, interest-bearing debt, operating leases, and preferred stock once each and must not convert preferred depositary units into GOOGL common units without the governing terms.

9. Recent corporate actions

- 2026-03-11: Alphabet completed Wiz for $29.5 billion after purchase-price adjustments, excluding post-combination compensation. Results are consolidated in Google Cloud. Source: Q1 and Q2 FY2026 10-Q, Note 8 and MD&A.
- 2026-03-10: Alphabet completed Intersect for $5.9 billion after purchase-price adjustments. Results are allocated across segments. Source: Q1 and Q2 FY2026 10-Q.
- February 2026: Waymo received $16.0 billion in funding, the significant majority funded by Alphabet. Source: Q1 FY2026 10-Q and Q4 FY2025 transcript.
- Q1 FY2026: Verily completed an external capital raise and was deconsolidated from Alphabet. Source: Q1 FY2026 transcript; balance-sheet effects are reflected in the filing.
- March 2026: Alphabet agreed to contribute GFiber into a newly formed entity. Expected consideration is $1.5 billion cash, a $2.0 billion note, and a 49.99% equity interest; closing was expected late 2026. Source: Q1 and Q2 FY2026 10-Q.

- June 2026: Alphabet issued Series A and Series B mandatory-convertible preferred depositary shares. Q2's balance sheet reports $18.023 billion of preferred stock, and the 10-Q cover identifies GOOGM and GOOGN depositary shares. Source: Q2 FY2026 10-Q and June 2026 8-Ks.
- Q2 FY2026: common-stock repurchases were nil in the controlling newest cash-flow presentation, while common dividends continued at $0.21 per share declared for the quarter. Source: Q2 FY2026 10-Q.
- Regulatory exposure remains material: the FY2025 10-K and Q2 FY2026 10-Q describe U.S. DOJ and state antitrust proceedings involving Search distribution, ad technology, Android, and Play. No unsupported probability or remedy estimate is assigned here.

10. Open data gaps

- `True non-disclosure`: GCP, Workspace, YouTube subscriptions, Gemini plans, Waymo, Wing, and Isomorphic Labs revenue are not separately disclosed. Sources checked: FY2025 10-K, Q3 FY2025/Q1/Q2 FY2026 10-Qs, four earnings exhibits and transcripts; terms included each product name plus `revenue`, `segment`, and `operating income`.
- `True non-disclosure`: segment-level capex, invested capital, cash, debt, and ROIC are not disclosed. Sources checked: FY2025 segment note, significant-segment-expense tables, balance-sheet note and Q2 FY2026 filing; terms included `capital expenditures`, `assets`, `debt`, and `segment`.
- `True non-disclosure`: five-year standardized Cloud backlog/RPO, ARR, NRR, churn, billings, and customer-count histories are not disclosed. Recent backlog points are included from date-matched transcripts. Search terms: `backlog`, `remaining performance obligations`, `ARR`, `NRR`, `retention`, `billings`, `customers`.
- `True non-disclosure`: regional profit and regional segment/product revenue are not disclosed. FY2025 consolidated regional revenue is included. Search terms: `United States`, `EMEA`, `APAC`, `Other Americas`, `geographic`, `operating income`.
- `True non-disclosure`: consistent five-year Waymo rides, revenue per ride, contribution margin, fleet size and autonomous miles are not disclosed in the controlling filings. Recent ride milestones are management commentary only.
- `Not fetched / omitted`: no company-hosted investor-day transcript was available. The live official search found no formal investor day; the 2026-03-03 Morgan Stanley conference announcement was found, but its IR page and the IR index were Cloudflare-blocked on two identical attempts. No conference quote is used.
- `Not fetched / omitted`: company-hosted versions of 2025 Q3–2026 Q2 transcripts were not directly archived because the IR pages were blocked; the allowed live FMP transcript endpoint returned date-matched records and was used, while SEC earnings exhibits control all reported metrics.
- `Estimated`: none of the product or segment dollars in Sections 1–5 are estimated or back-solved. ROIC is a clearly defined calculated diagnostic. Quarterly YoY percentages and margins are arithmetic from official dollars.
- `Not applicable`: depositary/share conversion factors are not used in this operating data package; GOOGL is a direct Class A share, not an ADR. The sealed quote packet governs the share bridge.

The statutory bridge has no open gap. Both anchors preserve the issuer's exact segment metric, every corporate and below-line classification, all signs and source IDs, and zero reconciliation residuals.

Live source register

- FMP annual income: `https://financialmodelingprep.com/stable/income-statement?symbol=GOOGL&period=annual`.
- FMP annual balance sheet: `https://financialmodelingprep.com/stable/balance-sheet-statement?symbol=GOOGL&period=annual`.
- FMP annual cash flow: `https://financialmodelingprep.com/stable/cash-flow-statement?symbol=GOOGL&period=annual`.

- FMP annual/quarterly products: `https://financialmodelingprep.com/stable/revenue-product-segmentation?symbol=GOOGL&period=annual` and `period=quarter`.
- FMP transcripts: `https://financialmodelingprep.com/stable/earning-call-transcript?symbol=GOOGL&year={year}&quarter={quarter}` for FY2025 Q3/Q4 and FY2026 Q1/Q2.
- FY2023 10-K: `https://www.sec.gov/Archives/edgar/data/1652044/000165204424000022/goog-20231231.htm`.
- FY2025 10-K: `https://www.sec.gov/Archives/edgar/data/1652044/000165204426000018/goog-20251231.htm`.
- Q1 FY2026 10-Q: `https://www.sec.gov/Archives/edgar/data/1652044/000165204426000048/goog-20260331.htm`.
- Q2 FY2026 10-Q: `https://www.sec.gov/Archives/edgar/data/1652044/000165204426000071/goog-20260630.htm`.
- Q3 FY2025 exhibit: `https://www.sec.gov/Archives/edgar/data/1652044/000165204425000087/googexhibit991q32025.htm`.
- Q4 FY2025 exhibit: `https://www.sec.gov/Archives/edgar/data/1652044/000165204426000012/googexhibit991q42025.htm`.
- Q1 FY2026 exhibit: `https://www.sec.gov/Archives/edgar/data/1652044/000165204426000043/googexhibit991q12026.htm`.
- Q2 FY2026 exhibit: `https://www.sec.gov/Archives/edgar/data/1652044/000165204426000066/googexhibit991q22026.htm`.

This package provides research inputs only. It has no authority for trade execution, ranking, sizing, portfolio mutation, messaging, or publication gates.