

OFF EARTH DATA RESEARCH · LAUNCH MARKET BRIEF NO. 1

The Rideshare Cliff

SpaceX has stopped taking new Transporter and Bandwagon bookings beyond late 2028. Nothing that exists today replaces the product. This report measures the hole, ranks who could fill it and when, and traces the consequences for satellite operators, integrators and insurers through 2030.

PUBLISHED

25 August 2026

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DATA CUT

OED graph run 25 Aug
2026; public sources to 25
Aug 2026

OVERALL CONFIDENCE

Moderate to high on facts;
moderate on the 2029
model

Late 2028

Dates from which SpaceX is no longer taking new commercial rideshare reservations: "late 2028 or early 2029" per the nine customers cited by SpaceNews, "beyond late 2028" per SatNews and Bloomberg

436

Payloads carried on SpaceX's six dedicated rideshare missions in 2025, roughly half the count of non-megaconstellation smallsats launched worldwide

0

Orbital flights to date by Neutron, Eclipse, Nova, Terran R, RFA One, Miura 5 and Maia combined

61%

Share of base-case 2029 replacement tonnage that sits on vehicles which have never flown

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01

Summary

SpaceX has closed its rideshare programme to new customers beyond late 2028. The capacity it carried, about half of the world's non-megaconstellation smallsats, has no replacement of comparable price, cadence or reliability on any current timeline.

Since late June 2026, at least nine SpaceX customers and integrators have confirmed that SpaceX is no longer accepting new Transporter (sun-synchronous) or Bandwagon (mid-inclination) reservations for dates beyond late 2028. Bloomberg reported on 23 July that the same applies to new dedicated Falcon 9 bookings. On 22 August Elon Musk wrote that SpaceX will be "winding down Falcon" once Starship flies reliably several times a week, and Ars Technica has reported that SpaceX told NASA it plans to end commercial Falcon 9 launches in 2028. SpaceX itself has announced nothing: there is no press statement, no filing language and no earnings-call remark. Existing bookings are being honoured, Transporter-18 and Bandwagon-5 are scheduled for no earlier than October 2026, and integrators have bought five whole Falcon 9s for 2027 and 2028. What remains open is whether the freeze hardens into a retirement date and whether Starship can ever serve sun-synchronous orbit from Texas or Florida.

The replacement side is the larger problem. Every medium-lift vehicle nominated as a substitute has, as of 25 August 2026, either never flown or had a 2026 that went backwards. The exceptions are small: Electron, Vega-C, Ariane 6 and H3 have flown well this year, and none of them carries Transporter-class volume. No Neutron stage has reached the pad, and Rocket Lab's language on 10 August shifted from a fourth-quarter launch target to "delivery of Neutron to the launch pad in Q4 2026." New Glenn has one failure in three flights and lost its pad to a static-fire explosion in May. Vulcan has been grounded since February. Firefly's Alpha has succeeded on three of seven flights and its Block 2 debut slipped to the fourth quarter. Isar's Spectrum is 0 for 1 with a second attempt now targeted for September; RFA One slipped again on 10 August; PSLV is grounded after two consecutive failures with an undisclosed cause; Japan's Kairos is 0 for 3. Terran R, Nova, Eclipse, Miura 5 and Maia are unflown. Starship has not yet reached orbit (Flight 14, the first attempt, was targeted for 28 August), has no rideshare product or price, and has no documented route to sun-synchronous orbit from any site: no west-coast pad or environmental process, and no polar-corridor approval from Florida.

Six findings

- 1. The gap opens in 2029, and it is already shaping decisions.** The remaining Transporter and Bandwagon manifest plus five aggregator-bought Falcon 9s give 2027 and 2028 roughly 21 and 38 tonnes of SpaceX-sourced third-party capacity. Much of it is already sold: SEOPS reported its 2028 sun-synchronous Waymaker mission about 90% contracted by mid-August (a July report had said the manifest filled within three weeks, with about 30 customers waitlisted). Anyone planning a 2029 launch today has no SpaceX rideshare option, no dedicated Falcon 9 option if Bloomberg's reading is right, and no proven alternative at anything near \$7,000 per kilogram.
- 2. Demand is larger than the anecdotes suggest.** SpaceX's dedicated rideshares carried 436 payloads in 2025, about 46% of the count of non-megaconstellation smallsats launched worldwide and, by our estimate, 55 to 65% of Western ones. We put the rideshare-class market at about 22 tonnes a year today, growing to roughly 30 tonnes by 2029 as average smallsat mass rises; the mass figure is the least certain number in this report. 259 organisations launched a smallsat in 2025 and 106 were doing so for the first time; the long tail of first-timers has no comparable alternative.
- 3. Nameplate replacement capacity looks adequate on paper by 2029 and is not.** Our base case sums to about 53 tonnes of non-SpaceX third-party rideshare-class capacity in 2029 against 29 tonnes of demand. About 61% of that supply is on vehicles that have never flown, and weighting each vehicle by the probability that it is operating at the assumed cadence, and by its flight record, cuts credible supply to about 32 tonnes (23 to 39 depending on how fast the new vehicles arrive): parity with base demand, short of the high case. In the bear case, credible 2029 supply is 11 tonnes. Vehicles flying today with an established record (Electron, Vega-C, Ariane 6, H3) supply about 7 tonnes, a quarter of base demand; adding PSLV once it returns and the early-record vehicles takes it to about half, and none of that capacity carries a 140-satellite manifest.
- 4. Neutron is the right shape and the wrong date.** A fully loaded Neutron to polar orbit would undercut Transporter's list price per kilogram. But Rocket Lab is selling dedicated missions at \$50 to 55 million with no discounting, has no scheduled rideshare product (one rideshare contract was pending in its backlog as of late 2025), says the Kepler deal "pushes Neutron's manifest toward full capacity through the end of the decade," and its stated cadence is one flight, then three, then five. In our base case, in which Neutron flies but is sold as dedicated missions, it contributes nothing to rideshare in 2027 and about 3 tonnes in 2028.
- 5. The price of access rises roughly 1.2 to 6 times, and the price of reliability rises more.** Every alternative costs more per kilogram than Transporter, from Neutron-aggregated rides at an estimated \$8,000 to 12,000 to Electron at \$28,000 to 42,000. Moving a \$10 million, 150 kg satellite from a 99% reliable vehicle at \$7,000 per kilogram to an 85% vehicle at \$10,000 multiplies the expected mission loss per kilogram roughly sixteen-fold and takes the reliability-adjusted cost from about \$7,700 to \$21,500 per kilogram. Insurance can transfer that risk only where capacity exists, and for new vehicles it is thin and priced by spot.
- 6. The winners are whoever holds inventory.** Integrators that bought Falcon 9s (Exolaunch, now being acquired by EQT; SEOPS; Maverick with Portal), operators with dedicated-launch anchors (BlackSky and iQPS on Electron, Kepler on Neutron), and Rocket Lab itself. The most exposed are high-cadence rideshare users without an announced alternative, led by ICEYE (38 satellites on SpaceX rideshares in 24 months, ramping to 100 a year), Spire, Muon, HawkEye 360 and Planet's replenishment line, plus every university and NASA CubeSat Launch Initiative payload.

THE SHORT VERSION

As of late August 2026 SpaceX has not announced the end of Transporter. What nine customers and Bloomberg report is that SpaceX stopped taking new Transporter and Bandwagon reservations, and per Bloomberg new dedicated Falcon 9 bookings, for dates beyond late 2028, while honouring existing contracts, with Transporter-18 and Bandwagon-5 scheduled for no earlier than October. Musk has said Falcon will be wound down only once Starship flies reliably several times a week, and Starship has not yet reached orbit. The practical effect is a 2029 cliff in low-cost sun-synchronous rideshare that no current provider covers: third-party Falcon 9 buys extend supply through 2028, and Electron, Alpha, Neutron, New Glenn and the European and Indian vehicles are smaller, pricier, unproven, or all three.

Confidence: **high** on the freeze and its scope as reported; **high** on vehicle status and flight records; **moderate** on demand mass (SpaceX does not publish per-mission mass); **moderate** on the 2029 supply model; **low** on any Starship sun-synchronous timeline.

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What SpaceX did, and did not do

The story surfaced on 25 June 2026 when SpaceNews reported, citing at least nine SpaceX partners and customers, that SpaceX was no longer accepting Transporter or Bandwagon bookings for late 2028 or early 2029 and beyond, and that available slots in the intervening years could fall to roughly half of recent levels (the SpaceNews text is not accessible to us; its wording is relayed by TechTimes and an industry summary). SpaceX did not respond to requests for comment. SatNews repeated the finding on 20 July with the same sourcing, small satellite operators and mission integrators rather than SpaceX; AIAA carried a similar headline on 21 July that we could not retrieve. Bloomberg's 23 July report, sourced to people familiar with the matter and quoted here second-hand because the original is paywalled, widened the scope: SpaceX has begun turning away satellite operators seeking dedicated Falcon 9 launches beyond 2028, has stopped new rideshare reservations, and "has also halted production of some non-reusable Falcon hardware." Falcon 9 would continue to serve NASA and Defense Department missions, and Crew Dragon still needs a Falcon.

Two later statements bound the intent. On 22 August Musk posted: "Once Starship is flying reliably several times per week, it makes sense to shift super scarce SpaceX engineering and production resources to Starship to get launch rate to several times per day, which means winding down Falcon." No date was attached. Ars Technica, as relayed by Space.com on 24 August, reported that SpaceX has told NASA it plans to end commercial Falcon 9 launches in 2028, and described NASA's concern about the retirement; Space.com adds that ISS crew and cargo flights are expected to continue until at least 2030. The Ars report itself is not accessible to us.

DATE	EVENT	SOURCE AND STANDING
20 May 2025	Exolaunch procures multi-year Transporter, Bandwagon, near-polar and dawn-dusk capacity through 2028.	Exolaunch release quoting Bednarek. On the record.
24 Mar 2026	SpaceX VP Commercial Sales Stephanie Bednarek: manifest "packed" through 2026 to 2028 and "very busy" in 2029; "rockets don't seem to be the limiting factor. It's more about payload processing space." 165 missions flown in 2025.	Via Satellite, SATShow panel. On the record.
26 May 2026	Exolaunch buys two dedicated Falcon 9 missions (Exo-1 late 2027, Exo-2 2028); SEOPS announces Waymaker, a sun-synchronous dedicated Falcon 9 rideshare for late 2028 (then numbered Waymaker-1).	Company releases; Via Satellite. On the record.

DATE	EVENT	SOURCE AND STANDING
25 Jun 2026	SpaceNews: nine partners and customers say SpaceX is not accepting Transporter and Bandwagon bookings for late 2028 or early 2029 and beyond.	SpaceNews (original behind robots block; cited via TechTimes and a Japanese industry summary). Sourced to customers.
7 Jul 2026	Transporter-17 launches 81 payloads from Vandenberg; SpaceNews and TechTimes coverage carries the booking freeze.	Via Satellite and Spaceflight Now for the launch; SpaceNews (not retrievable) and TechTimes for the freeze.
20 to 21 Jul 2026	SatNews reports SpaceX "has stopped accepting new commercial launch bookings" for Transporter and Bandwagon "beyond late 2028," citing Starlink and orbital AI data-centre priority and "minimal excess mass margin." AIAA carries a similar headline the next day.	SatNews; no SpaceX quote. AIAA headline only, not retrieved.
23 Jul 2026	Bloomberg: SpaceX turning away dedicated Falcon 9 customers beyond 2028; expendable hardware production partly halted; first Florida Starship launch "late this year."	Bloomberg, people familiar; no SpaceX comment; text quoted second-hand.
4 Aug 2026	SpaceX Q2 2026 results and first post-IPO call: no mention of rideshare, Transporter, Bandwagon or a Falcon retirement date. Shotwell: "highest Falcon cadence" and "on the precipice of operationalizing Starship." 10-Q silent in the portions read.	SEC filing; call transcript.
17 Aug 2026	SEOPS reports its 2028 sun-synchronous Waymaker mission about 90% contracted and adds a second, mid-inclination vehicle for early 2028; says Waymaker pricing will exceed SpaceX's past rideshare pricing.	Payload; SEOPS. On the record.
20 Aug 2026	Portal Space Systems buys a whole Falcon 9 for 2028 citing "all of the angst over launch [availability]"; Maverick resells the other half.	Payload. On the record.
20 to 21 Aug 2026	White House memorandum (released 20 August) sets a target of 1,000 or more US launches a year by 2030 against a 2025 baseline of 193; Via Satellite's report on it places the rideshare freeze and the integrators' Falcon 9 purchases in the same picture. The memorandum itself, as reported, does not mention SpaceX rideshare.	Via Satellite, 21 Aug 2026.
22 Aug 2026	Musk: Falcon to be wound down once Starship flies reliably several times per week.	X post, quoted by Teslarati and Space.com. On the record.
24 Aug 2026	Ars Technica (via Space.com): SpaceX told NASA it plans to end commercial Falcon 9 launches in 2028.	Space.com relaying Ars Technica; not a SpaceX statement.

Why SpaceX is doing it

No source has SpaceX's reasoning in its own words, so what follows is inference from its disclosures. Three facts line up. First, Falcon 9 is at capacity and most of it is internal: SpaceX reached its 100th launch of 2026 in the third week of August (18 August by one count, 22 August by another) and about 78% of its flights to mid-August carried Starlink; Musk told investors on 4 August that Falcon delivers "roughly 2,500 tons a year to orbit." Second, external launch is a shrinking part of the company. Launch Services revenue was \$648 million in the second quarter and \$978 million for the first half, down from \$1,056 million in the first half of 2025 even as cadence rose; the Space segment as a whole was 12% of second-quarter revenue. Third, Transporter was never lucrative. Novaspace's Gabriel Deville estimated in 2024 that 2023's Transporter missions earned SpaceX \$12.5 to 20 million each against an operating cost of up to about \$15 million, leaving "anywhere between \$5 million and nothing per Transporter mission in profits." A product that consumes a Falcon core and a Vandenberg slot to earn a thin margin from 80 customers is the obvious one to close when the company's own Starlink V3, Starshield, Starfall re-entry and orbital data-centre programmes need every core through 2028 and the engineering organisation is being pointed at Starship.

The scope question matters for the model in Section 6. If only rideshare is closed (SatNews, AIAA, SEOPS), then aggregator-bought dedicated Falcon 9s could in principle continue past 2028 and the cliff would be a price step rather than a wall. If Bloomberg is right that dedicated bookings are closed too, the five Falcon 9s already

bought for 2027 and 2028 are the last of their kind. The Ars Technica report that SpaceX has told NASA it will end commercial Falcon 9 launches in 2028 points to the second reading. The buyers' rush for 2028 vehicles is consistent with either, since a rideshare-only freeze would also send them to the product still on sale. We model the second reading as the base case, quantify the first in Sections 6 and 10, and on the evidence put the odds at roughly 60:40 in favour of the harder reading. A Starship that reaches operational cadence would also free Falcon 9 cores from Starlink duty before any Starship rideshare product exists, which is a second route to a softer landing.

Confidence: **high** that the freeze exists and covers rideshare; **moderate** that it covers dedicated Falcon 9; **moderate** on the motive reconstruction.

03

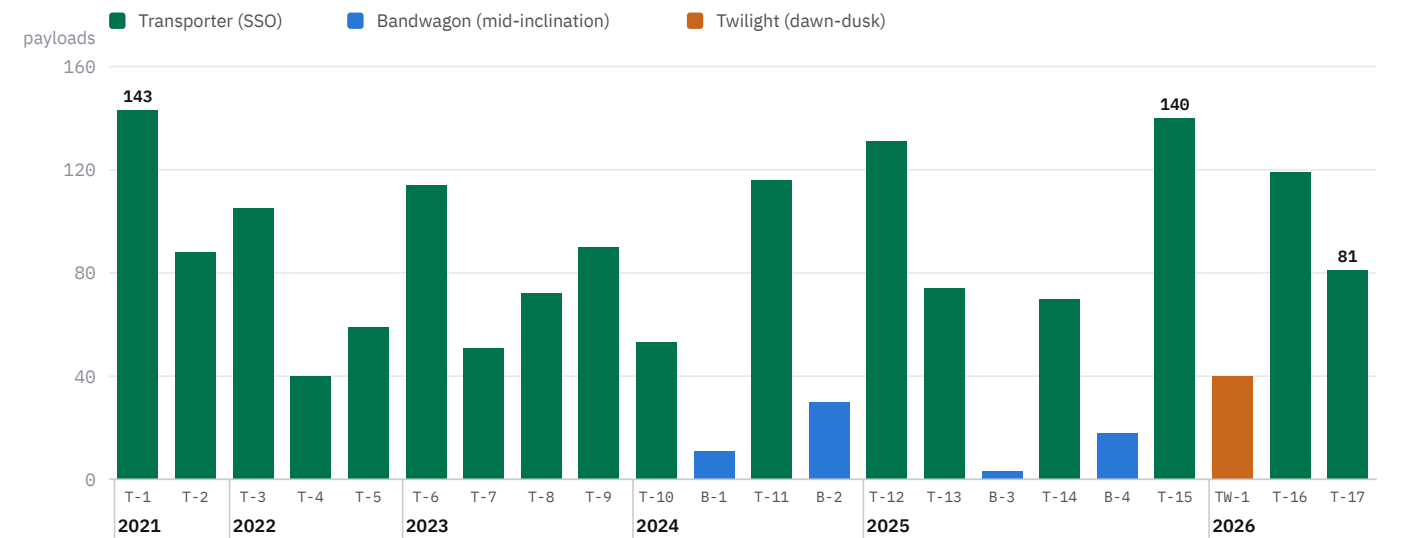
The product being withdrawn

Transporter is not a rocket. It is a scheduled, priced, reliable bus service to a specific orbit, and that combination is what the market has to rebuild.

SpaceX announced the Smallsat Rideshare Program in August 2019 and flew Transporter-1 on 24 January 2021 with a record 143 spacecraft. Seventeen Transporter missions to sun-synchronous orbit, four Bandwagon missions to mid-inclination orbits (from April 2024) and one Twilight dawn-dusk mission (January 2026) had flown by 25 August 2026. Adding up the published per-mission counts gives roughly 1,650 spacecraft on 22 dedicated rideshare missions; press reports after Transporter-17 put SpaceX's cumulative rideshare count past 1,800; the basis is not published and presumably includes rideshares flown on other missions. Cadence rose from two missions in 2021 to six in 2025 (Figure 1). Every Transporter since April 2023 has flown from Vandenberg SLC-4E; the early missions used Florida's southerly polar corridor.

FIGURE 1

Spacecraft per SpaceX dedicated rideshare mission, January 2021 to July 2026



Per-mission counts from launch coverage (Spaceflight Now, NASASpaceflight, Via Satellite, Payload, Space.com). T-9 is shown as 90 deployed from Falcon 9; a further 23 were released later from orbital transfer vehicles. In the web version, hover a column for the mission date.

What the service offered

Three things made Transporter the default choice for Western smallsat operators. It was scheduled: two to four sun-synchronous missions a year at predictable times, so a constellation could plan replenishment. It was priced by the kilogram on a public rate card, which let a first-time operator budget a 50 kg satellite at \$350,000 without a negotiation. And it flew on Falcon 9, whose in-flight record stands at roughly 690 successes in 693 attempts, so a customer could self-insure a \$5 million satellite and be right to. The rate card history below shows SpaceX exercising pricing power as demand outran supply: the per-kilogram rate has risen 40% since late 2019 and the minimum ticket has risen 27% since October 2022, while the queue lengthened to two years or more.

EFFECTIVE	MINIMUM TICKET	RATE ABOVE MINIMUM	NOTES
Aug 2019	\$2.25M for 150 kg	\$15,000/kg	Launch announcement; revised within weeks
Late 2019	\$1.0M for 200 kg	\$5,000/kg	Three SSO missions a year promised
Mar 2022	\$1.1M for 200 kg	\$5,500/kg	"To keep pace with rising inflation"
Oct 2022	\$275,000 for 50 kg	\$5,500/kg	Plate-based ports (8, 15, 24 inch); mid-inclination, GTO and TLI added
2023 to early 2025	\$300,000 for 50 kg	\$6,000/kg	Payload reported \$6,500/kg in March 2023; the listed rate was \$6,000
Mid to late 2025	\$325,000 for 50 kg	\$6,500/kg	
Feb 2026 onward	\$350,000 for 50 kg	\$7,000/kg	Current list; mid-inclination and beyond by inquiry. Dedicated Falcon 9 list about \$70M (one 2026 report says \$74M)

How much demand it carried

SpaceX does not publish per-mission mass. Novaspace's Deville counted 29 tonnes across the first nine Transporters, about 3.2 tonnes a mission. Recent manifests are heavier: K2 Space's Gravitas bus (2 tonnes) flew on Transporter-16, MBZ-SAT (750 kg) on Transporter-12, CAS500-4 (about 500 kg) on Transporter-17, and Exolaunch alone integrated more than 1.5 tonnes on Transporter-13. Our estimate is that the six dedicated rideshares carried 17 to 25 tonnes of customer mass in 2025, and we use 20 tonnes; the research streams behind this report put the figure anywhere between 10 and 35 tonnes, so it is the least certain number in the model. Adding about 2 tonnes a year that already flies as co-passengers on Vega-C, PSLV, H3 and Electron gives a 22-tonne 2025 base for the rideshare-class market. The implied average of about 45 kg per payload is far below Bryce's 177 to 213 kg average for non-broadband smallsats because the Transporter population is CubeSat-heavy: Planet's SuperDoves and Spire's Lemurs are 5 kg-class, and universities fly 1U to 6U.

The count is better documented. BryceTech's Smallsats by the Numbers 2026 records 4,466 smallsats launched in 2025, of which 79% were LEO broadband constellations (Starlink, OneWeb, Amazon Leo, Qianfan, Guowang), leaving about 938 non-megaconstellation smallsats. SpaceX's dedicated rideshares carried 436 payloads, or 46% of that count, though the two figures are not on the same basis: the 436 includes hosted payloads, transfer-vehicle sub-payloads and a few spacecraft above Bryce's 600 kg limit. Restricting the denominator to Western operators, who cannot use Chinese or Russian vehicles, the share is plausibly 55 to 65%, consistent with Deville's estimate that Transporter captured 57% of Western smallsat launch demand between 2019 and 2023. Bryce also records that 259 organisations launched a smallsat in 2025 and 106 of them were first-time

operators, up from 59 in 2024. In our judgement most Western first-timers reach orbit through a Transporter port; Electron, PSLV and Vega-C have carried some.

Demand is growing and getting heavier. Novaspace forecasts 16,900 smallsats under 500 kg over 2026 to 2035, about 1,690 a year, with growth "driven by growing sovereign constellation demand." Bryce's ex-broadband average mass sits around 200 kg (its 2026 edition gives 213 kg for 2024 and 177 kg for 2025 and describes smallsat mass as increasing). The bus market is moving up: NanoAvionics added a 500 kg-class platform on 24 August because customers "want that greater degree of capability in a larger platform," Kepler's Aether relays are 300 kg class, and Exolaunch's new EXOtube stacks are sized for 20 to 1,400 kg satellites. We hold the market at 22 tonnes in 2026, a supply-constrained year with one fewer dedicated mission, then grow mass 10% a year: 24 tonnes in 2027 to 32 tonnes in 2030 in the base case, with a low case 25% below (18 to 24 tonnes) and a high case 35% above (32 to 43 tonnes). Because 2025 throughput was flown under a two-year queue, the base is a floor under demand rather than a measurement of it.

Who rides it

The manifests of Transporter-10 through 17, Bandwagon 1 to 4 and Twilight-1 identify the dependent population. The table ranks the largest commercial users by verified 2024 to 2026 appearances and records what each has said or done since the freeze became public.

OPERATOR	VERIFIED USE OF SPACE X RIDESHARE, 2024 TO JUL 2026	STATED PLANS	HEDGE SINCE JUNE 2026	EXPOSURE
ICEYE (FI)	38 satellites on nine SpaceX rideshares in 24 months, all via Exolaunch; 76 launched since 2018	Production doubling from 50 to 100 a year by 2027 "supported by a matching launch cadence"; \$520M Series F; EUR 1.7B Bundeswehr contract via Rheinmetall JV	None announced in twelve press releases June to August	Highest
Spire Global (US)	29 satellites January to July 2026, every one on SpaceX rideshare via Exolaunch; 6 to 10 per mission through 2025	Continuous replenishment; FY26 revenue guidance \$75 to 85M	None in releases; Q2 call not accessible	High
Muon Space (US)	FireSat and Vindlér satellites on T-13, T-14, T-16, T-17	13 satellites manifested to launch in the next year, vehicles unspecified; 500 satellites a year capacity by 2027; \$250M Series C on 20 August	None announced	High

OPERATOR	VERIFIED USE OF SPACE RIDESHARE, 2024 TO JUL 2026	STATED PLANS	HEDGE SINCE JUNE 2026	EXPOSURE
Planet Labs (US)	37 to 38 spacecraft on each of T-11, T-12 and T-15; Pelicans on most missions; nine Pelicans on orbit by June 2026 of 30 planned	30-Pelican constellation; JSAT takes 10; SuperDove replenishment	2 July contract with Isar Aerospace for Pelicans from Andøya "as early as late 2026" (Spectrum has not reached orbit)	Medium-high
HawkEye 360 (US)	Clusters on Bandwagon-1, T-11, Twilight-1, T-16	Continued cluster deployment; IPO May 2026 (\$436M net)	None in 8-K of 22 June	Medium-high
Loft Orbital (US)	T-11, T-13, T-17	30 operational satellites by end-2027; bought 10 Airbus and 1 Apex bus	None found	Medium-high
Varda (US)	One capsule on each Transporter from T-12 to T-16 (W-2 to W-6)	"Multiple times per week" ambition; DoD launch-services award for October 2026	SpaceX's own Starfall capsule (demo 23 June) now competes for the same Falcon capacity	Medium-high
Satellogic (AR/US)	T-11, T-12, T-16	Merlin constellation first launch Q4 2026, full capability H1 2027	10-Q names "dependence on third parties, including SpaceX" as a risk factor; no alternative named	Medium
Kepler Communications (CA)	33 satellites via rideshare including 10 Aether relays on Twilight-1	Optical relay service declared operational 24 August	First dedicated buy: Neutron from Wallops, NET 2028 (announced 10 August); Kepler cites orbital control, not SpaceX availability	Hedged
Apex, K2 Space, Portal, Starcloud (US)	Apex Nova on T-17; K2 Gravitas on T-16; Starcloud-1 on Bandwagon-4; Portal on Bandwagon-5	Bus builders building ahead of orders; K2 and Starcloud sized for Starship-class economics	Portal bought a whole Falcon 9 for 2028; Starcloud raised \$250M, which Payload framed against "a looming launch shortage"	Medium

OPERATOR	VERIFIED USE OF SPACE RIDESHARE, 2024 TO JUL 2026	STATED PLANS	HEDGE SINCE JUNE 2026	EXPOSURE
Unseenlabs, Tomorrow.io, GHGSat, Pixxel, Fleet, EnduroSat, Sateliot, Albedo, Sidus, Umbra, Capella, OroraTech	One to four spacecraft on one or more 2024 to 2026 missions	Incremental constellation growth	Unseenlabs flew BRO-22 on Japan's H3 in June 2026; others none found	Medium
Government and academic	USSF Space Test Program (via SEOPS), NASA CubeSat Launch Initiative payloads on T-11, T-15, T-17, Twilight-1; Korea's 425 Project anchored Bandwagon 1 to 4; ESA, Saudi, Hellenic, Taiwanese, Canadian, Emirati, Norwegian, Hungarian and Czech payloads; universities on every mission	Steady	No NASA, USSF, ESA or CSA statement on the freeze found	High (no budget for dedicated launch)

The channel through which most of this demand flows is even more concentrated than the operators. Exolaunch says it has flown on every Transporter and Bandwagon since 2021, has deployed 839 satellites on 48 missions and integrated 49 of Transporter-17's 81 payloads; it has 68 more manifested on Transporter-18 and Bandwagon-5. SEOPS integrated 10 on T-17, 19 on T-16 and 23 on T-13. Maverick, ISISpace, D-Orbit, Impulse and Momentus carry the rest. Section 9 returns to what the freeze does to that channel.

Confidence: **high** on mission counts and pricing; **moderate** on mass and on the Western share; **high** on the exposure table's manifest facts, **moderate** on the exposure grades.

04

Starship: the eventual answer and the interim problem

Starship is the reason SpaceX can afford to close Transporter. It is not yet a reason for anyone else to relax.

The vehicle's 2026 record is real progress and still short of orbit. Flight 12 on 22 May debuted the V3 ship from Starbase's second pad; the booster suffered engine failures and a hard water landing, the ship lost a vacuum Raptor but completed a suborbital flight and re-entry. Flight 13 on 24 July deployed 20 Starlink V3 satellites on a suborbital arc, survived re-entry with what Musk called a solved heat shield, and splashed down upright; the booster's landing burn failed. All thirteen Starship flights to date have been suborbital. Flight 14, targeted for no earlier than 28 August, is the first orbital-insertion attempt and the first operational Starlink V3 deployment; the ship tower catch floated on the 4 August earnings call as possible on the next flight was deferred on 20 August

to "a few months." No ship-to-ship propellant transfer has been demonstrated. Musk's stated ambition is "at least 1 flight a day, possibly more" a year from now; the Falcon wind-down condition he set on 22 August (Section 2) is several reliable flights a week.

Pads are further along than flights. The FAA published a Final Environmental Impact Statement and Record of Decision for Starship at LC-39A on 3 February 2026 (up to 44 launches a year) but had not issued a licence as of 25 August. The Department of the Air Force signed its Record of Decision for SLC-37 on 20 November 2025 (up to 76 launches a year), conditional on further FAA airspace analysis. SpaceX's CFO told investors on 4 August the company is activating pads at Starbase, LC-39A and SLC-37. Bloomberg's sources expect the first Florida Starship launch late this year or early 2027.

The sun-synchronous problem

Transporter's orbit is the issue. Sun-synchronous orbit needs a near-polar, retrograde inclination of about 97.5 degrees. From Vandenberg that is a straight southward ascent. From Florida, Falcon 9 reaches it through the polar corridor reopened in 2020: a south-southeast ascent, a dogleg down the coast, and an overflight of Cuba that the Air Force permitted only for vehicles with autonomous flight termination and, in practice, booster flyback. Transporter-1 through 6 used it. From Starbase, a southbound polar trajectory overflies Mexico and lies outside any existing authorisation.

Nothing in the public record addresses Starship and polar orbits. Neither the LC-39A nor the SLC-37 environmental documents specify azimuths. There is no Starship pad, licence application or environmental process at Vandenberg: the Department of the Air Force's October 2025 Record of Decision raised SpaceX's Vandenberg ceiling to 100 launches a year and authorised SLC-6, but for Falcon 9 and Falcon Heavy only. The single super-heavy signal on the West Coast is a Department of the Air Force request for information of 30 December 2025 for "heavy/super-heavy launch capability" at SLC-14, which named no company or vehicle and drew a 12 January 2026 letter of concern from Representative Salud Carbajal. For scale, the SLC-37 environmental process took 21 months from notice of intent to Record of Decision, with FAA work still pending. A Vandenberg Starship pad before 2029 is not supported by any document we found, and a Florida polar corridor for a roughly 5,000-tonne vehicle over Cuba is an approval that does not yet exist. The counterargument deserves stating: the Falcon 9 corridor went from proposal to first flight in about a year once the Air Force agreed, Starship's performance margin makes a dogleg penalty irrelevant, and silence in the environmental documents is not a prohibition. The binding constraints are SpaceX's priorities and the absence of any product, not physics. We weight the counterargument low because SpaceX has said nothing about polar Starship flights from any site and its own polar demand is small next to Starlink's.

Two further gaps matter to the customers in Section 3. SpaceX has said nothing about a Starship rideshare product, price or first mission; the only booking with a rideshare character is ispace's 500 kg lunar slot no earlier than 2030, and SpaceX's prospectus commits only to "payload delivery to orbit in the second half of 2026" for Starlink V3. And SpaceX's own Transporter-class demand, Starlink V3, Starshield, Starfall and the orbital data-centre programme, is queued ahead of any third party. The realistic reading is that Starship will eventually offer sun-synchronous capacity at a price that resets the market, that "eventually" means no earlier than 2029 to 2030 with low confidence, and that the 2029 gap it leaves behind is the subject of this report.

Confidence: **high** on flight and pad status; **high** that no Starship SSO route or rideshare product exists in the record; **low** on any date for one.

The replacement field

More than thirty vehicles could in principle carry a Western smallsat to sun-synchronous orbit between 2027 and 2030. Apart from Falcon 9, four are flying today with an established record, and none of the four sells a scheduled sun-synchronous rideshare at scale.

Neutron: timeline, economics and the rideshare question

Rocket Lab's Neutron is the vehicle the market most wants to be ready, and the one whose timeline has moved most. Announced in March 2021 for a 2024 debut, it slipped to mid-2025 (May 2024, engine-driven), then to the second half of 2025, then to 2026 after a November 2025 call that moved pad arrival to the first quarter. A first-stage tank ruptured in hydrostatic qualification on 21 January 2026, which Peter Beck attributed to a hand-laid section built by a contractor before Rocket Lab's automated fibre placement machine was running. The February 2026 call reset first launch to the fourth quarter of 2026; the May call held it. The 10 August results release and call changed the metric: production is "aligned with the target delivery of Neutron to the launch pad in Q4 2026," exact launch timing depends on the outcome of first-stage qualification and other tests later in 2026, and, in Beck's words on the call, "the window for an end-of-year launch is narrowing." Third-party trackers moved the debut to 2027 the same day; a prediction market put a 2026 launch at about 14%.

The hardware is close. Archimedes has passed 400 hot fires across both stage variants, Stage 2 was qualified in April 2025 and is having flight avionics installed, the fairing and thrust structure are qualified, interstage load tests are complete, and Launch Complex 3 at Wallops has been open since September 2025. What remains is the sequence that has undone other new vehicles this year: first-stage qualification, integration, static fire, licence, wet dress, launch. Beck said as much on the call, noting "for another space company that when that doesn't go well, it really doesn't go well," evidently a reference to New Glenn's 28 May static-fire explosion. No FAA Part 450 licence for Neutron is in the public record, and the "Return On Investment" landing barge, needed from Flight 2, was still under construction as of the last tracker update in May.

On paper Neutron is exactly what Transporter's customers need. The payload user's guide gives 13,000 kg to a 500 km orbit at 40 degrees with a barge landing and 10,100 kg to polar orbit; 8,500 and 6,200 kg with return to launch site; 15,000 and 11,800 kg expendable. At the \$50 to 55 million price the CFO reaffirmed on 10 August, a full barge-landing polar mission works out at \$4,950 to 5,450 per kilogram, below Transporter's \$7,000 list, and a return-to-site polar mission at \$8,070 to 8,870. The guide describes multi-manifest and rideshare missions using the restartable second stage and ESPA-class dispensers, and a 24-month standard integration schedule.

Three things stand between that arithmetic and a Transporter substitute. First, Rocket Lab is not selling per-kilogram slots; it is selling dedicated missions at full price and says it has "absolutely zero issues in selling full price Neutrons pre-test flight." Its backlog included one rideshare contract pending manifest confirmation as of November 2025, but a scheduled rideshare product would have to be built by an aggregator buying whole vehicles, which is what Exolaunch and SEOPS now do with Falcon 9. Second, the manifest is filling with dedicated customers. They include two launches for a confidential constellation operator (November 2024), the May 2026 five-launch deal, Kepler's 2028 mission, the \$397 million Space Force SB-AMTI award to build and launch Flatellites, and the Air Force Research Laboratory point-to-point cargo experiment. They also include the NSSL Phase 3 Lane 1 on-ramp, which requires one successful flight before Neutron can compete for task orders, and "future Iridium capacity" once the \$8 billion Iridium acquisition closes in mid-2027. The Kepler release says the deal "pushes Neutron's manifest toward full capacity through the end of the decade"; Kepler itself attributes the purchase to orbital control and schedule rather than to SpaceX's availability. Third, cadence. Beck's stated

ramp is "1-3-5": one flight, then three in the following year, then five. If the first flight is in the first half of 2027, the five-flight year is 2029 at the earliest, and Rocket Lab said in November 2025 that the first flight would carry no customer payload.

Beck's reading of the market on 10 August is the clearest executive statement on launch scarcity in the record, though he did not refer to the SpaceX freeze. In one answer: "I have personally never seen launch so constrained pretty much ever. Other launch providers are backing off and focusing on their own needs as well." In another: "Even as new capacity comes on market from some competitors, a lot of that capacity is already spoken for their own internal programs. Whether it be internets or AI data centers or whatever... I see this constrained launch market persisting for quite some time." Rocket Lab has the balance sheet to finish the job: \$2.13 billion of cash at 30 June, a \$2.36 billion backlog, record quarterly revenue of \$234 million, and a \$1.94 billion at-the-market programme partly earmarked for the Iridium cash component. It also has 93 Electron missions of experience with a 1-3-6 ramp of its own.

OED BASE CASE FOR NEUTRON

First flight in the first half of 2027 (probability-weighted: 15% December 2026, 45% first half 2027, 30% second half 2027, 10% later); 60 to 70% chance the first flight succeeds, with a failure adding nine to twelve months. One to two flights in 2027, three to four in 2028, five to six in 2029 and seven to nine in 2030, sold as dedicated missions. Rideshare-equivalent mass in that base case: nil in 2027, about 3 tonnes in 2028, 5 in 2029 and 8 in 2030, reflecting the pending rideshare contract and an occasional aggregator buy. If Rocket Lab or an aggregator productises Neutron rideshare from 2028, the Scenario A condition in Section 10, the figures become 15, 30 and 45 tonnes for 2028 to 2030. A static-fire or first-flight failure, the bear case, pushes the first customer flight into 2028 and rideshare-equivalent mass to 2 tonnes in 2029.

Electron: the wrong size at the right cadence

Rocket Lab's small launcher is the only vehicle in this report whose 2026 record is unambiguously good: 21 launches in 2025, 14 by 21 August 2026, 100% mission success in both years, 52 consecutive successes since the September 2023 failure and 89 successes in 93 attempts overall. It is also structurally unable to absorb Transporter volume. Electron lifts about 300 kg to low Earth orbit and 200 kg to sun-synchronous orbit at an implied price near \$8.5 million, which is \$28,000 to 42,000 per kilogram, four to six times Transporter. Twenty-five launches a year at 200 kg is 5 tonnes of theoretical capacity, of which dedicated constellation customers (iQPS, Synspec, BlackSky) and a rising share of HASTE suborbital missions (at least 35 of the 90-plus launch backlog) leave perhaps 2 to 3 tonnes open, roughly one Transporter's worth. Electron is the answer for a 100 to 300 kg satellite that needs a specific orbit on a specific date, not for a 5 kg CubeSat or a 40-satellite batch.

The rest of the field

The table summarises every other candidate, ordered by realistic relevance to the sun-synchronous rideshare gap. "Record" is orbital attempts and successes as of 25 August 2026 with partial failures counted against; "SSO reach" notes whether the launch site can reach sun-synchronous orbit without a large performance penalty; "Rideshare product" records whether a scheduled, priced multi-customer service exists. OED SEPI scores are from the 25 August pipeline run on the one-year window, shown with the number of observed factor families so the reader can see how much evidence sits behind each score (see Appendix C).

VEHICLE (OPERATOR)	STATUS, 25 AUG 2026	RECORD	SSO - CLASS PAYLOAD AND PRICE	SSO REACH	RIDESHARE PRODUCT	EARLIEST MATERIAL SSO CONTRIBUTION	OED SEPI (FACTORS)
Falcon 9, aggregator-bought (Exolaunch Exo-1/2, SEOPS Waymaker-1/2, Portal)	Five dedicated vehicles booked for late 2027 and 2028; SEOPS's sun-synchronous Waymaker mission ~90% contracted; SEOPS says pricing above SpaceX's	690/693	Up to ~15 t; 4.5 to 6 t realistic fill; ~\$12,000 to 16,000/kg derived (whole-vehicle cost plus integrator margin)	Yes (Vandenberg)	Yes, sold by the integrator	2027 to 2028 only; nothing beyond	86.95 (7)
Firefly Alpha Block 2	Block 2 debut pushed to Q4 2026; 2026 guidance cut to three launches; most 2027 slots sold to Lockheed Martin, NASA and USSF	3/7 (2 failures, 2 partials); ground stage loss Sep 2025	630 to 745 kg SSO; ~\$15M (widely reported, not on a primary source); \$20,000 to 24,000/kg	Yes (Vandenberg SLC-2W)	No; Spaceflight Inc. brokerage discontinued after 2023 acquisition	2027, ~1 to 2 t/yr	42.67 (4)
Firefly Eclipse (with Northrop Grumman)	Miranda engine qualification "imminent"; first flight NET 2027 from Wallops	Unflown	16.3 t LEO; price not published	Partial (Wallops, dogleg)	No	2028 to 2029	42.67 (4)
Relativity Terran R	Aeon R engines being installed since 7 Aug; Stage 2 not yet hot-fired; company target late 2026, realistic 2027; ~\$3B backlog, GEO and constellation heavy; NSSL Lane 1 on-ramp 8 Jul 2026	Unflown (Terran 1 failed 2023)	23.5 t LEO reusable; ~\$55M (2023 figure); ~\$2,300/kg LEO	Partial (Cape, dogleg)	No	2028 at the earliest, via an aggregator	47.46 (5)
Stoke Nova	Second-stage fit checks at LC-14 complete 19 Aug; flight engines in acceptance; company says 2026, funding coverage says 2027; ~\$1B Series E at ~\$9B closing August	Unflown	3 t reusable, 7 t expendable; price not published	Partial (Cape, dogleg)	No	2027 to 2028, small	42.52 (2)

VEHICLE (OPERATOR)	STATUS, 25 AUG 2026	RECORD	SSO - CLASS PAYLOAD AND PRICE	SSO REACH	RIDESHARE PRODUCT	EARLIEST MATERIAL SSO CONTRIBUTION	OED SEPI (FACTORS)
Blue Origin New Glenn	Grounded: BlueBird 7 lost to upper-stage anomaly 19 Apr; vehicle and pad lost in 28 May static-fire explosion; return to flight "this year"; Amazon Leo and NSSL first in queue; dual- manifest offered after fifth flight	2/3	45 t LEO; price not published	Partial (Cape, dogleg); West Coast pad announced, designation unverified	No	2027 to 2028, secondary slots	79.26 (3)
ULA Vulcan	Grounded since second solid- motor nozzle anomaly 12 Feb 2026; Space Force paused NSSL missions and moved a GPS III to Falcon 9; next flight Amazon Leo NET Sep 2026; 2026 plan of 16 to 18 flights collapsed to one flown	4/4 with two anomalies	Up to 27 t LEO; ESPA and aft- bulkhead secondaries only	Yes (Vandenberg SLC-3, new)	Secondary slots on primaries	Sub-1 t/yr	85.64 (5)
Ariane 6 (Arianespace)	Eight flights, seven successes; three flown in 2026 by 25 Aug, MTG-I2 next; 6 to 8 in 2026, 9 to 10 from 2027; backlog >30 including 18 Amazon Leo; MLS rideshare announced July 2026 for GEO from 2029	7/8 (VA262 partial)	A62 10.35 t LEO; >EUR 100M; ~\$11,500/kg whole vehicle	Yes (Kourou)	MLS co- passenger on institutional SSO flights; no dedicated SSO rideshare	2027, 0.5 to 1 t/yr	62.17 (3)

VEHICLE (OPERATOR)	STATUS, 25 AUG 2026	RECORD	SSO - CLASS PAYLOAD AND PRICE	SSO REACH	RIDESHARE PRODUCT	EARLIEST MATERIAL SSO CONTRIBUTION	OED SEPI (FACTORS)
Vega-C (Avio)	Five consecutive successes since return to flight Dec 2024; three flights a year, target six; Avio now launch operator; selling whole vehicles to EO operators for 2027 to 2031	6/7	2.3 t SSO; EUR 46 to 52M; \$23,000 to 26,000/kg whole vehicle at \$1.17 per euro; SSMS slot price unpublished	Yes (Kourou)	SSMS dispenser; no dedicated SSMS mission on the 2026 to 2030 manifest	2027, 1.5 to 2 t/yr	n/a (Avio unscored)
Isar Spectrum	Flight 2 stood down four times (Jan, Mar, Apr, Jun); NET September 2026; >EUR 800M raised; Planet contract 2 Jul; ~60% of demand now defence	0/1	700 kg SSO from Andøya; ~EUR 10,000/kg target	Yes (Andøya)	Dedicated and ESA-brokered slots	2027 if Flight 2 succeeds, ~1.5 t	37.91 (3)
RFA One	Maiden window opened 10 Aug; vehicle de-stacked after "an issue with the vehicle that requires further investigation"; no new date	Unflown (stage lost Aug 2024)	1.3 t SSO; price unverified	Yes (SaxaVord)	Dedicated	2027 to 2028	25.54 (2)
PLD Miura 5	First flight from Kourou "2026 or early 2027"; first vehicle expendable and ~0.5 t class; EUR 350M+ raised	Unflown	~450 kg SSO reference; price not published	Yes (Kourou)	Dedicated	2028	28.61 (1)
MaiaSpace Maia (ArianeGroup)	First orbital flight 2027; ex-Soyuz pad agreement Feb 2026	Unflown	500 kg SSO reusable, 1.5 t expendable	Yes (Kourou)	Dedicated	2028 to 2029	24.50 (0)

VEHICLE (OPERATOR)	STATUS, 25 AUG 2026	RECORD	SSO - CLASS PAYLOAD AND PRICE	SSO REACH	RIDESHARE PRODUCT	EARLIEST MATERIAL SSO CONTRIBUTION	OED SEPI (FACTORS)
PSLV and SSLV (ISRO / NSIL)	Grounded after consecutive third-stage-phase failures (18 May 2025, 12 Jan 2026, the latter losing about 18 co-passengers, ISRO's first loss of foreign payloads); failure analysis reported June 2026 but cause undisclosed; no flight since; production moving to HAL-L&T (23 Aug 2026)	58/63	1.75 t SSO; ~EUR 10,000/kg (~\$12,000) at ISRO cost; NSIL price unpublished	Yes (Sriharikota)	Yes, historically 20 to 100 co-passengers per flight	2027 if it returns to flight and the root cause is disclosed; ~1 t/yr rising to ~2 t	38.16 (3, placeholder rows)
H3 (MHI / JAXA)	Return to flight 11 Jun 2026 with H3-30 and the first foreign commercial secondary (Unseenlabs); QZS-7 10 Aug; MHI targets eight a year by 2028 and has stated rideshare intent	7/9	~4 t SSO (H3-30); ~\$34M target; ~\$8,500/kg whole vehicle	Yes (Tanegashima)	Secondaries; no product	2027, a few hundred kg; dedicated mission 2030	17.42 (1)
Skyroot Vikram-1	Maiden flight 18 Jul 2026 reached a 450 km, 60 degree orbit (Skyroot statement reported by Via Satellite); Exolaunch partnership to sell capacity; Vikram-2 (900 kg to 1 t) 2027	1/1	260 kg SSO	Yes (Sriharikota)	Dedicated and rideshare via Exolaunch	2027, ~0.5 t/yr	32.20 (2)
Space One Kairos	Third consecutive failure 4 to 5 Mar 2026	0/3	150 kg SSO	Yes (Kii)	Dedicated	Not before 2028	29.25 (1)
Innospace Hanbit-Nano	First orbital attempt failed 23 Dec 2025; suborbital test terminated 19 Aug 2026; next attempt NET Q4 2026	0/1	90 kg SSO; ~\$32,000/kg	Yes (Alcântara)	Dedicated	Negligible	16.44 (1)

VEHICLE (OPERATOR)	STATUS, 25 AUG 2026	RECORD	SSO - CLASS PAYLOAD AND PRICE	SSO REACH	RIDESHARE PRODUCT	EARLIEST MATERIAL SSO CONTRIBUTION	OED SEPI (FACTORS)
Gilmour Eris	First flight failed 30 Jul 2025; second NET 2027	0/1	300 kg LEO	No (Bowen licensed 20 to 65 degrees)	Dedicated	Bandwagon-class only, 2028	36.97 (0)
Astra Rocket 4, Phantom Daytona II, Vaya Dauntless, Starfighters, iRocket, Aevum, Skyrora XL, HyImpulse SL1, Latitude Zephyr, Interstellar Zero, Perigee Blue Whale, Epsilon S	All pre-first-orbital-flight; Astra targeting fall 2026 for defence targets; Phantom quoting \$4M for 306 kg SSO and booking 2027; Epsilon S reverting to the Enhanced Epsilon stage for a possible late-2026 flight	Unflown (Astra Rocket 3: 2/7)	90 to 600 kg class	Various	Dedicated	2028 to 2030, under 1 t/yr each	0 to 35 (0 to 2)
Chinese vehicles (Kinetica-1 and 2, Ceres-1, Zhuque-2E and 3, Gravity-1, Long March 8 and 12)	China flew 93 missions in 2025 and 53 by early August 2026; Kinetica-1 has 14 successes in 15 flights; Zhuque-3 landed and then toppled on 18 Aug; Kinetica-2 debuted successfully 30 Mar	Various; Kinetica-1 14/15	1.5 to 8 t SSO; Gravity-1 quoted ~\$9,300/kg	Yes	Yes, domestic	None for Western payloads: any spacecraft with US-origin content is barred from Chinese launch under ITAR and the EAR, and we found no Western operator using Chinese rideshare in 2025 or 2026. Non-Western Transporter customers (UAE, Thailand, Brazil) can and do use Chinese vehicles, which frees perhaps 1 to 2 t a year of Western-accessible capacity	40 to 51 (1 to 3)
Soyuz (Roscosmos)	Closed to Western customers since March 2022; residual demand is Iranian and Russian government	Proven	n/a	Yes	Historically	None	n/a

Two observations follow from the table. The vehicles that could carry Transporter-class mass in 2027 and 2028 at a Transporter-class price are Falcon 9s that integrators have already bought and, at full fill, Neutron once it flies. Everything else is either too small to matter (under 1.5 tonnes a flight, often under 0.5), too expensive per kilogram (Electron, Alpha, Vega-C whole-vehicle), too committed to anchor tenants (Vulcan, New Glenn, Ariane

64 to Amazon Leo; Alpha to Lockheed Martin), unflown, or legally closed. The second observation is that the European Launcher Challenge, with EUR 902 million subscribed at the November 2025 ministerial for Isar, MaiaSpace, RFA and PLD (Orbex withdrew in February after entering administration), buys ESA missions from 2026 to 2030 and requires an orbital flight by 2027; it does not create commercial sun-synchronous rideshare slots. Combined nameplate of all four challengers is about 3 tonnes to sun-synchronous orbit per round of flights.

Orbital transfer vehicles and integrators

The companies that sit between operators and rockets are the ones adapting fastest, and the way they are adapting tells us what the post-Transporter market looks like. Impulse Space has flown three Mira missions on Transporters. It now markets its Helios kick stage as compatible with Falcon 9, Starship, Terran R, New Glenn, Vulcan, Neutron, Eclipse, Ariane 6 and H3, sells plate-based rideshare on it, raised a \$500 million Series D on 2 June, and on 8 July became the first upper-stage prime on-ramped to NSSL Lane 1. Momentus (Vigoride-7 on Transporter-16 with ten payloads, Vigoride-8 sold out for 2027) remains Transporter-dependent. D-Orbit, Exotrail, Starfish and Turion likewise reached orbit on Transporters in 2025 and 2026. Orbital transfer vehicles solve altitude, phasing and plane spacing; they do not solve inclination, because a 45 to 70 degree plane change from a Cape launch is beyond any chemical or electric tug in service. Sun-synchronous rideshare therefore still has to originate from Vandenberg, Kourou, Andøya, Sriharikota or Tanegashima, or accept a dogleg penalty from Wallops or the Cape.

The integrators are becoming inventory holders. Exolaunch, which EQT agreed to buy on 18 June (about \$339 million per Dealroom, with revenue expected to rise 250% in 2026), holds Transporter capacity through 2028 plus its two dedicated Falcon 9s, and has flown on Electron and integrated five satellites for Isar's second flight. SEOPS launched Waymaker, a 2028 sun-synchronous Falcon 9 rideshare that was about 90% contracted by mid-August, then added a mid-inclination vehicle for early 2028; SEOPS now numbers the mid-inclination mission Waymaker-1 and the sun-synchronous one Waymaker-2. Its president, Evan Hoyt, has been quoted urging customers to plan 36 months ahead instead of 12. RIDE! bought 1,000 kg on the sun-synchronous Waymaker mission. Maverick is retailing half of Portal's 2028 Falcon 9. No US integrator has publicly booked Alpha, Eclipse, Nova, Terran R, New Glenn or Vulcan rideshare capacity, and no aggregator has announced a dedicated non-US sun-synchronous mission on Vega-C, Ariane 6 or PSLV since the freeze. The first such booking will be the real signal that replacement supply is being productised.

Confidence: **high** on vehicle status and records; **moderate** on prices where marked as estimates; **moderate** on the Neutron base case.

06

The capacity model, 2027 to 2030

Adding up published payload figures gives one answer. Weighting them by whether the rocket will exist gives a different one.

Method

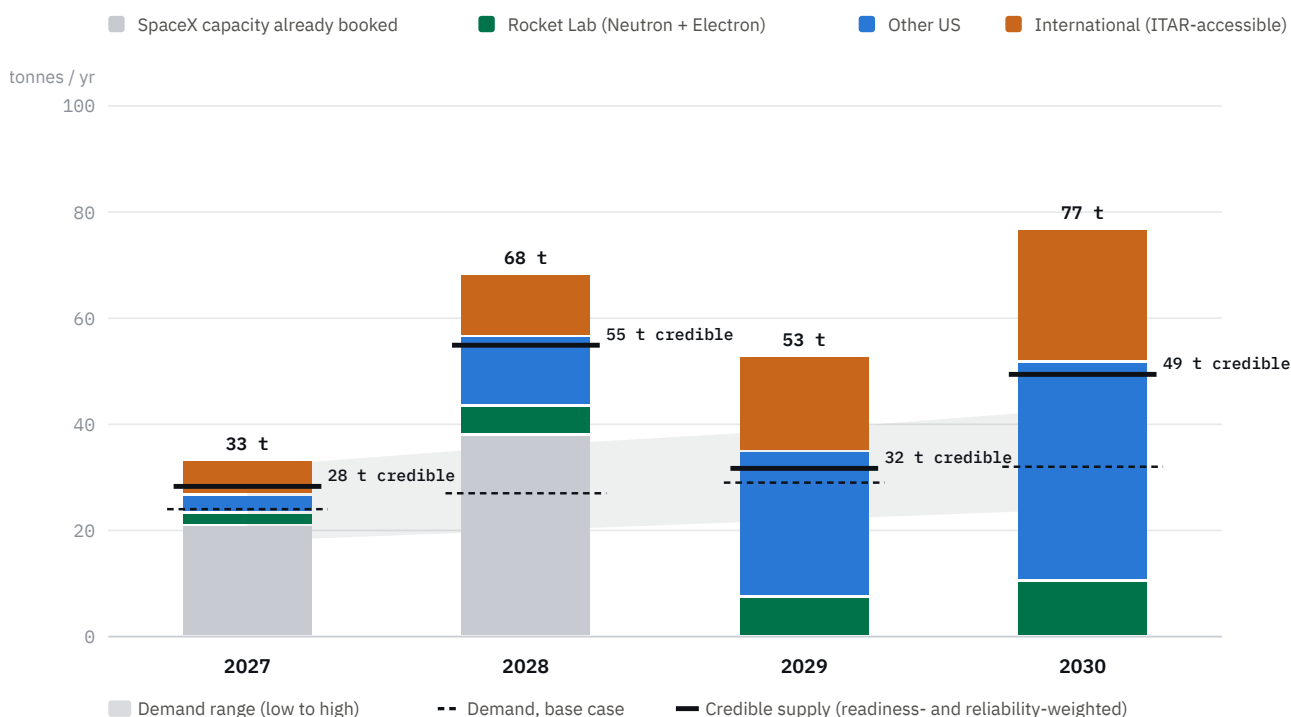
We model the mass of rideshare-class capacity, sun-synchronous and mid-inclination, that could plausibly be sold to Western third-party smallsat customers each year, by provider, in bear, base and bull cases. "Third-party" excludes anchor-tenant mass (Amazon Leo, NSSL, Lockheed Martin's Alpha block buy, Iridium replenishment, Starlink) and counts only what an unaffiliated operator could buy. For vehicles launching from

the Cape or Wallops we apply a 25% penalty as a blended allowance for the dogleg to sun-synchronous orbit, since most of the demand is sun-synchronous. Rideshare shares per vehicle are assumptions, not disclosures, and are listed in Section 11 with their sensitivity. SpaceX-sourced capacity for 2027 and 2028 has two parts. The first is the remaining Transporter and Bandwagon manifest, assumed at 14 to 15 tonnes a year, about three-quarters of the 2025 level: bookings are honoured, and the "roughly half" that SpaceNews's sources described refers to the unsold slots now closed to new customers. The second is the five aggregator-bought Falcon 9s at about 6 tonnes each (4.5 in the bear case, 8 in the bull), above the 3 to 3.5 tonne historical fill of Transporter and dedicated Falcon 9 LEO missions because the integrators now sell stacks for satellites up to 1,400 kg. It is shown because it meets demand, though much of it is already sold.

Nameplate capacity is then converted to credible capacity by multiplying by two probabilities: that the vehicle is operating at the assumed cadence in that year, and that a given flight succeeds. For vehicles flying today with an established record the first is one and the second is the Laplace success estimate at the current record, $(\text{successes} + 1) / (\text{attempts} + 2)$, with partial failures counted as failures. For vehicles with an early record the first is 0.7 to 0.9; for grounded vehicles it is below one. For vehicles that have not yet reached orbit the first is a readiness probability set from each programme's status (35% for Neutron in 2027 rising to 85% in 2030, 15% for Eclipse and Terran R in 2027 rising to 70%, and so on) and the second is 85%, the typical early-life reliability of a new vehicle once it is operating. This is a judgement-based measure; Section 11 shows how it moves when readiness is scaled down or up by 40%, and how it compares with a flat prior. It answers the question a customer signing a 2029 contract has to answer, which is how much of the promised capacity is likely to exist. Demand is the Section 3 estimate. The full provider-level table is in Section 11.

FIGURE 2

Third-party rideshare-class launch supply (sun-synchronous and mid-inclination) by source against demand, base case, 2027 to 2030



Stacked columns are nameplate capacity plausibly sold to Western third parties (tonnes a year). Grey is SpaceX capacity already booked (remaining Transporter and Bandwagon manifest plus aggregator-bought Falcon 9s), which ends in 2028. The heavy tick is credible capacity: the same total weighted by the probability that each vehicle is operating at the assumed cadence and by its per-flight reliability. The dashed line is base-case demand; the band spans the low and high cases. In the web version, hover a segment for its value.

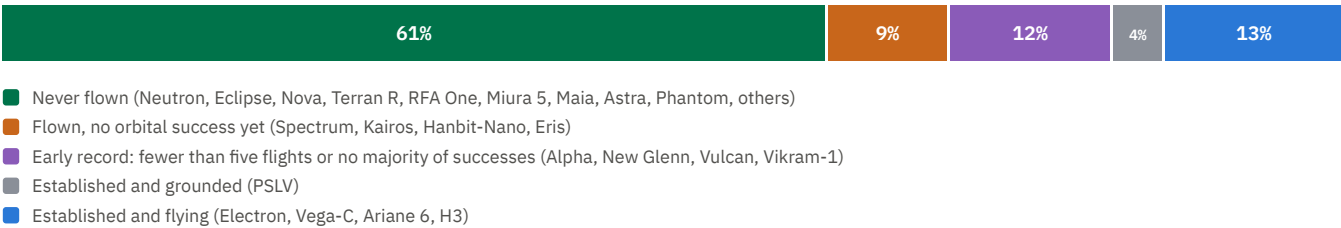
What the base case says

In 2027 the market is adequate on paper and tight in practice (Figure 2): 33 tonnes of capacity against 24 of demand, but 21 of the 33 are SpaceX vehicles already sold. The 12 tonnes of non-SpaceX supply are spread across Electron (2.5), Vega-C, Ariane 6 co-passenger slots, Alpha, a first Isar year, a first Nova year, and PSLV and RFA One flights that depend on a return to flight and a first flight respectively. In 2028 the aggregator Falcon 9s arrive and total capacity reaches 68 tonnes nameplate and 55 credible against 27 tonnes of trend demand. That apparent cushion is being consumed as we write: operators whose satellites will be ready in 2028 or early 2029 are booking the 2028 vehicles now, which is why SEOPS's sun-synchronous mission is 90% contracted and why 2028 demand will run above trend. After 2028 the SpaceX-sourced capacity ends.

In 2029 the base case shows 53 tonnes of non-SpaceX nameplate capacity against 29 tonnes of demand, an apparent surplus of nearly two to one. Credible capacity is 32 tonnes, between 23 and 39 depending on how quickly the new vehicles arrive: parity with base demand and short of the 39-tonne high case. The composition is the problem (Figure 3). About 61% of the 53 tonnes is on vehicles that have never flown: Eclipse (9), Nova (7), Terran R (5), Neutron (5), RFA One (2.7) and the smaller European and American vehicles. A further 9% is on vehicles that have flown but not reached orbit (Spectrum, Kairos, Hanbit-Nano, Eris), 12% on vehicles with fewer than five flights or without a majority of successes (Alpha, New Glenn, Vulcan, Vikram-1), and 4% on PSLV, which is established but grounded. Vehicles flying today with an established record (Electron, Vega-C, Ariane 6, H3) supply 7 tonnes, a quarter of base demand; with PSLV back and the early-record vehicles counted, about half. None of that established capacity carries a Transporter-sized manifest: Electron takes one to ten satellites at a time, Vulcan and New Glenn offer ESPA-class secondaries, and Vega-C's figure assumes a dedicated SSMS mission that is not yet manifested. By 2030 the base case reaches 77 tonnes nameplate and 49 credible, above demand if the new vehicles fly.

FIGURE 3

Where base-case 2029 replacement capacity comes from, by the vehicle's flight status today



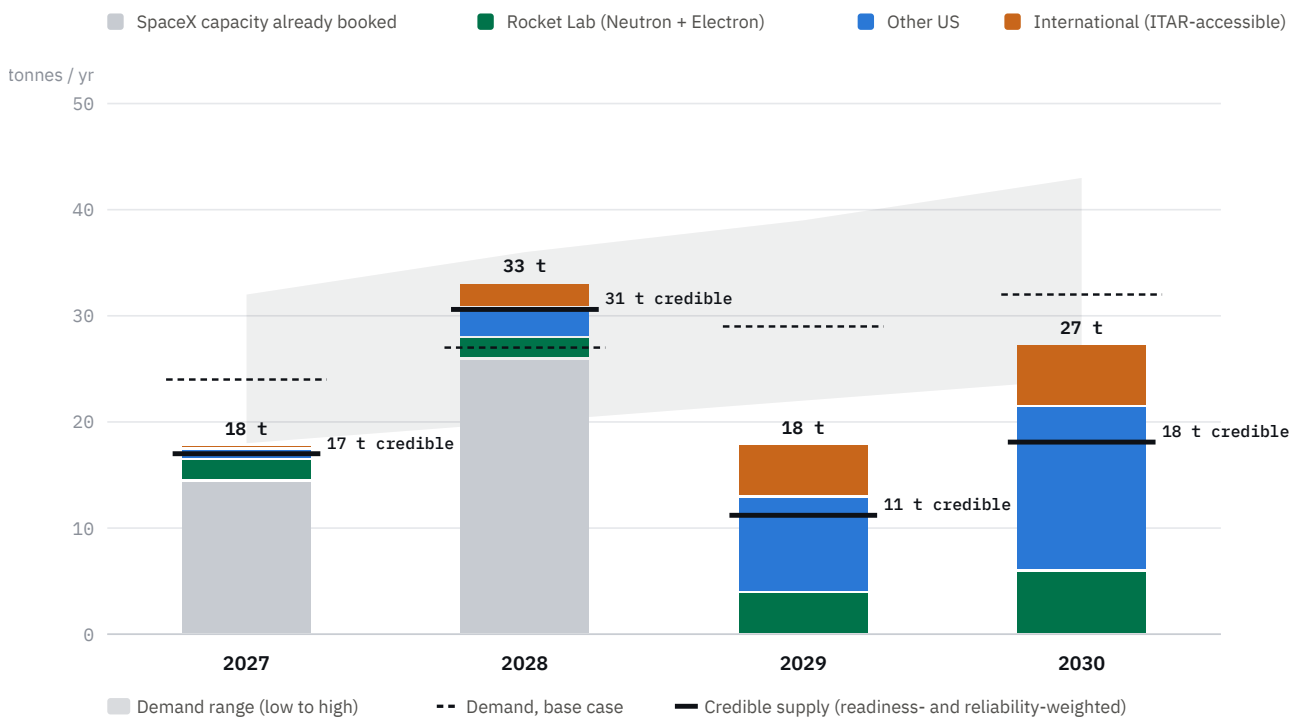
Share of the 53 tonnes of non-SpaceX third-party rideshare-class capacity in the 2029 base case, grouped by the vehicle's orbital record as of 25 August 2026. "Established" means at least five orbital flights with a majority of successes.

What the bear case says

The bear case is not exotic; it is the pattern of the last twelve months continued for two more years. Neutron's first customer flight slips into 2028 after a ground-test or first-flight failure; Eclipse, Nova and Terran R each lose a year; Isar and RFA reach orbit but fly two or three times a year rather than five; PSLV returns but flies little foreign mass until the root cause is disclosed; New Glenn and Vulcan serve their anchor tenants only. Non-SpaceX supply in 2029 is then 18 tonnes nameplate and 11 tonnes credible against 22 to 29 tonnes of demand (Figure 4): a shortfall of about 50 to 60% on the credible measure, and of nearly three-quarters against the high-demand case, in a year when the Transporter option no longer exists at any price.

FIGURE 4

The same model in the bear case



Bear case: one further failure or twelve-month slip per new vehicle, PSLV flying little foreign mass, anchor tenants consuming New Glenn and Vulcan. The 2029 shortfall against base demand is about 11 tonnes on nameplate and 18 tonnes on credible capacity.

What the model does not capture

Tonnage understates the problem in three ways and overstates it in three. It understates because parcel size matters: a 2029 market made of 700 kg Spectrum flights, 260 kg Vikram flights and 2.3 tonne Vega-C flights cannot carry a 140-satellite manifest the way Transporter-15 did, and each small flight carries its own integration schedule, licence and range slot. It understates because price matters: Section 7 shows every alternative above \$7,000 per kilogram. And it understates because product matters: no vehicle in the table offers a scheduled, priced multi-customer sun-synchronous service today; Vega-C's SSMS, Ariane 6's MLS and PSLV's co-passenger slots are sold flight by flight around institutional primaries. The model overstates the problem by ignoring demand destruction and migration: the CubeSat tail that a price doubling pushes below break-even is large in count and small in mass, perhaps 10 to 15% of the tonnage, and operators that hedge by going dedicated (Kepler, Planet through Isar, BlackSky and iQPS on Electron) take their mass out of the rideshare pool; both effects sit inside the low-demand case. It overstates by ignoring re-timing: some 2029 payloads will fly in 2028 on the aggregator Falcon 9s, and Bandwagon-class payloads can move to mid-inclination slots that New Glenn, Vulcan and Eris serve without a dogleg. And it overstates by ignoring the roughly 150 payloads by which press tallies exceed our per-mission sum, which we take to be rideshares on non-dedicated missions, a channel that persists as long as Falcon 9 flies Starlink from Vandenberg.

Three developments would change the answer. A Rocket Lab or aggregator decision to run Neutron as a scheduled sun-synchronous rideshare from 2028 would lift Neutron's contribution from the 5 tonnes assumed in the 2029 base case to 15 to 30 tonnes, enough on its own to cover the high-demand case; nothing Rocket Lab has said suggests it, and its manifest suggests the opposite. A SpaceX decision to keep selling dedicated Falcon 9s to integrators past 2028, which the SatNews and SEOPS reading of the freeze allows and the Bloomberg reading does not, would add 18 to 30 tonnes a year (three to five vehicles at 6 tonnes) at roughly twice Transporter's price and convert the cliff into a price step; we put the odds of that reading at roughly 40%. And a

Starship that reaches operational cadence would free Falcon 9 cores from Starlink duty before any Starship rideshare product exists. None can be assumed by a customer contracting today.

Confidence: **moderate** on the base case; **moderate** on demand; **moderate** on the composition finding, which moves between about 58% and 70% depending on how Neutron's rideshare share and the derivative vehicles (Vega-E, Alpha Block 2, Vikram-2) are classed. The finding that established, flying vehicles cover a quarter to a third of demand holds across those choices.

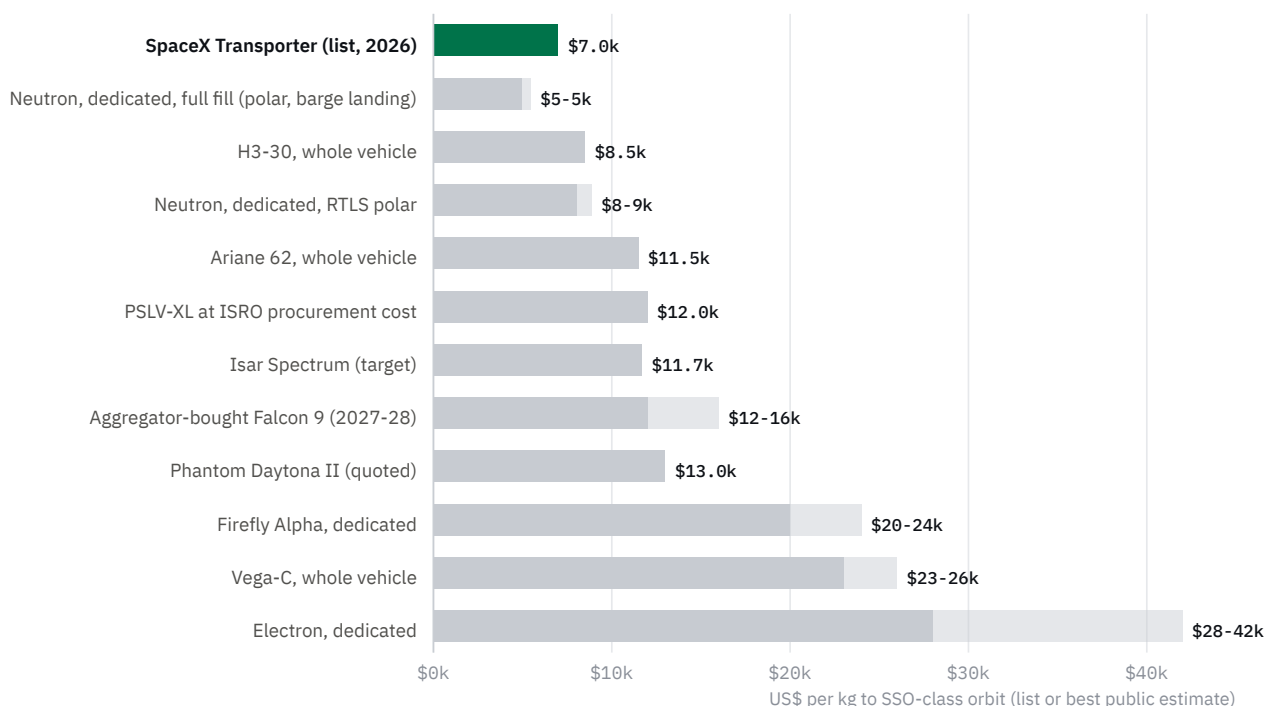
07

Price and unit economics

The per-kilogram rate card is what made Transporter a market rather than a procurement. Its replacement will be dearer, and the increase lands hardest on the smallest satellites.

FIGURE 5

Price per kilogram to sun-synchronous-class orbit, list or best public estimate



Solid bars show the low end of each range and lighter extensions the high end. Whole-vehicle figures assume the buyer fills the rocket; a rideshare customer pays an aggregator's margin on top. Neutron and Terran R prices are company or dated statements; Vega-C uses ESA-paid contract values, Ariane 6 the reported per-mission launch cost above EUR 100 million; PSLV uses ISRO's procurement cost. Euro figures converted at \$1.17.

Three price bands emerge (Figure 5). At or below Transporter's \$7,000 per kilogram sit only vehicles that a customer cannot buy by the kilogram today: a full Neutron to polar orbit with a barge landing, and a full Terran R. Between \$7,000 and \$16,000 sit a full H3-30, Ariane 62 and PSLV at whole-vehicle cost, Isar's target, Phantom's quote and, at the top of the band, the aggregator-bought Falcon 9s: a \$70 million vehicle filled to 4.5 to 6 tonnes costs \$12,000 to 16,000 per kilogram before the integrator's margin, which is why the SEOPS president has said Waymaker will cost more than SpaceX's rideshares did. This is also the band a Neutron rideshare would land in once an aggregator's margin, a partial fill and a return-to-site penalty are applied, and it

is where we expect the 2029 market to clear if Neutron flies. Above \$20,000 sit the vehicles that exist and fly today: Alpha, Vega-C as a whole vehicle, and Electron. The market's centre of gravity therefore moves from \$7,000 to roughly \$10,000 to 15,000 per kilogram in the base case, and to \$20,000 or more if the new medium-lift vehicles are late.

What that does to a satellite business case

For a 100 kg Earth-observation satellite with an all-in mission cost of \$5 to 10 million, a Transporter slot at \$700,000 is 7 to 14% of the budget. At \$12,000 to 15,000 per kilogram the launch is \$1.2 to 1.5 million, or 12 to 30%. On a dedicated Electron at \$8.5 million the launch is half to two-thirds of the mission and only works with a paying anchor, which is the BlackSky and iQPS model. For a 500 kg ESPA-Grande class satellite at \$20 to 40 million all-in, Transporter's \$3.5 million is 9 to 18% of the budget; the base-case band takes that to \$6 to 7.5 million, or 15 to 37%. A doubling of launch cost is absorbable for government and defence programmes buying ESPA-class spacecraft; it pushes the marginal CubeSat, the university payload and the thin-margin IoT constellation below break-even. A tripling forces dedicated-launch economics that only anchored constellations can carry.

The quotes from the buyers are consistent with that arithmetic. RIDE!'s chief executive: "There is a clear asymmetry between the timeline for which satellites need to be launched and what the market can provide." Exolaunch's Jeanne Allarie: "We need a big European rideshare program and we need it now." Portal's chief executive, on buying a whole Falcon 9: "I needed to secure Portal's launch future for the next couple of years." None of them is waiting for Starship. The behaviour we observe is the opposite of an Osborne effect: operators are paying up for 2027 and 2028 certainty, and the only place a wait-for-Starship posture shows up is in bus design, where K2's Giga-class and Starcloud's 88,000-satellite filing presume Starship economics that do not yet exist.

One more consequence deserves a line because it is regulatory rather than commercial. FCC milestone schedules were set against Transporter-class pricing and availability. Amazon Leo, with 90-plus launches under contract at a reported cost approaching \$10 billion, had 396 satellites in orbit against a 1,616 milestone on 30 July 2026 and received a waiver. Dozens of second-round NGSO licensees with far fewer resources were authorised on the assumption that cheap rideshare would be there through the decade. As SatNews put it in July, launch manifests are becoming spectrum policy.

Confidence: **high** on list prices; **moderate** on whole-vehicle and derived figures; the unit-economics ranges are illustrative.

08

Reliability and insurance

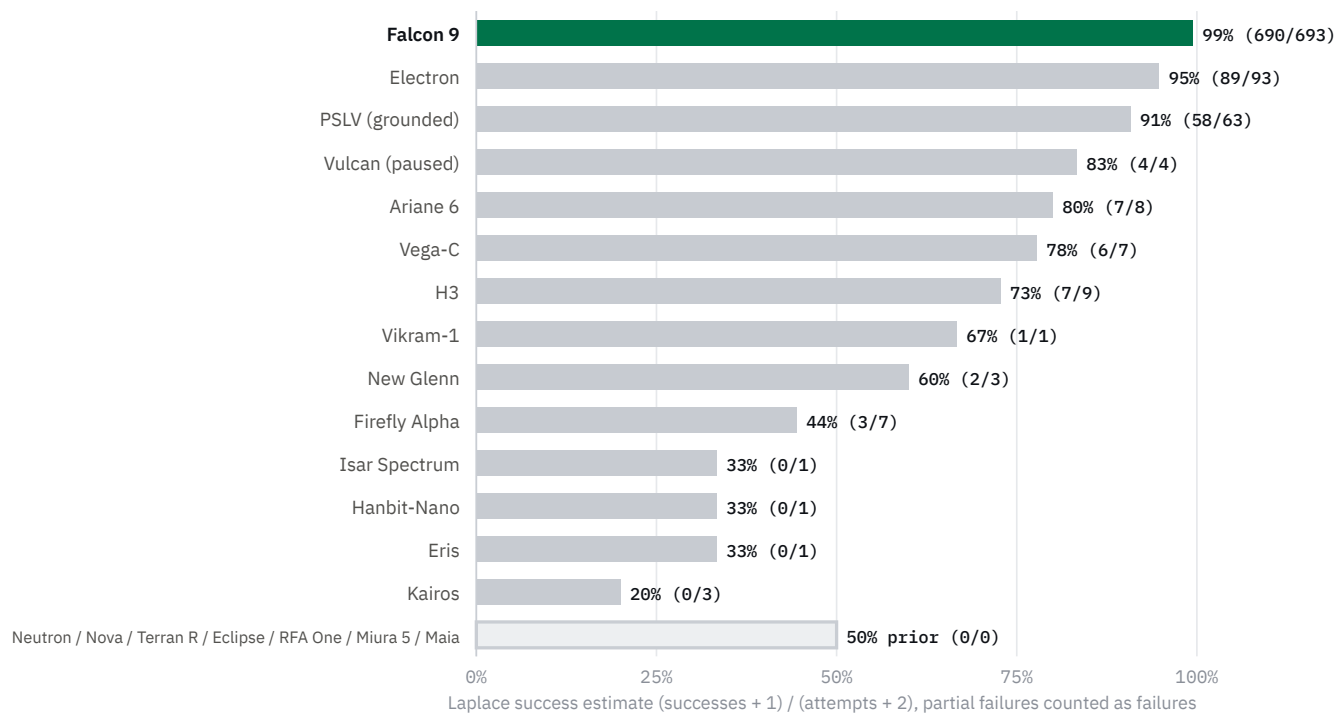
Transporter's customers rarely bought launch insurance: on Falcon 9 the expected loss was too small to justify the premium and the administrative cost. The vehicles replacing it raise the expected loss sharply, and the capacity to insure it is, for now, thin.

The flight records

Figure 6 sets out the records as an underwriter reads them.

FIGURE 6

Launch vehicle flight records as an underwriter would read them, 25 August 2026



Laplace estimate (successes + 1) / (attempts + 2), which pulls thin records toward 50%. Partial failures (wrong orbit, payload lost after a nominally successful ascent) are counted as failures. Falcon 9's count includes the July 2024 upper-stage loss and excludes ground losses; Electron includes HASTE suborbital flights. Full table in Appendix B.

Falcon 9's record is the benchmark against which every replacement is priced: about 690 successes in 693 in-flight attempts, a current streak in the low 300s since the July 2024 Starlink upper-stage failure, and it is the reference point against which every other vehicle's rate is set. Four upper-stage anomalies in nineteen months (July 2024, September 2024, February 2025, February 2026) cost one payload and produced short groundings, which matter to schedule buyers but not to launch policies. Electron is the proven small-lift benchmark at 89 of 93. Vega-C and Ariane 6 are re-earning trust with five and seven consecutive successes respectively. Vulcan is certified but paused. PSLV, which had the third-longest record in the table, lost its proven status with two consecutive failures and an undisclosed cause. Everything else is new-vehicle risk: Alpha at three of seven, New Glenn at two of three, Spectrum, Kairos, Hanbit and Eris without an orbit between them, and seven vehicles with no attempts at all.

How the market prices reliability

Launch insurance is a spot market. Rates are finalised at binding, quoted per placement, and repriced across every open placement on a vehicle the moment it fails. The observable bands for launch-plus-one-year cover are 3 to 6% of insured value on Falcon 9 and Ariane in a soft market, 8% typical, and 12% or more for a hardened market or a new vehicle; Falcon 9 GEO rates rose from under 6% to about 10% during the 2023 loss year and have been falling since. As the SpaceNexus commentary put it in March, "a vehicle with 80 consecutive successes is rated very differently from one on its third flight," and Gallagher noted in the first quarter of 2025 that insurers were "doubling down on their technical assessments" of new vehicles "due to a perceived increase in risk for early adopters." We could not find a published maiden-flight rate or exclusion in any broker document. The empirical evidence is that Ariane 6's and New Glenn's first flights carried no insured commercial payload, and that an insured \$30 million commercial satellite, AST SpaceMobile's BlueBird 7, flew on New Glenn's third flight. It became 2026's first insured launch-caused total loss when the upper stage under-performed. No

broker states a rule; our reading of the proxies is that three to five consecutive successes is where capacity becomes broadly available, and ten or more where rates approach the proven band.

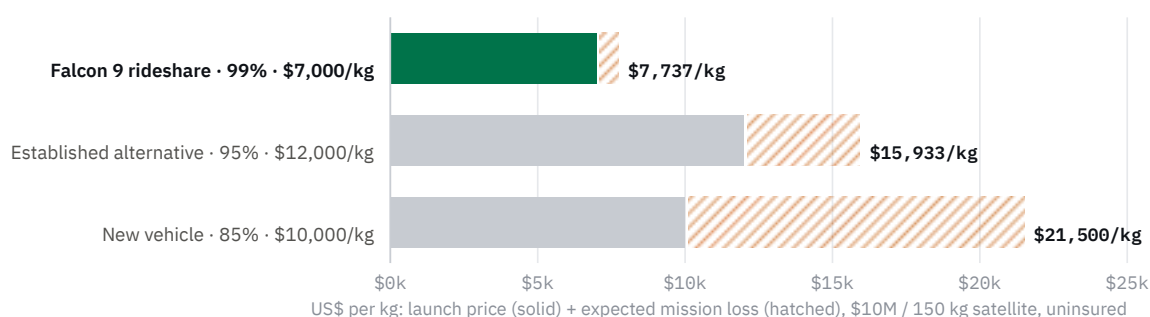
Gallagher's second-quarter 2025 update contains the sentence that explains the market's exposure to what is coming: "As with all lines of insurance, there is a compression of pricing such that the best (e.g. mature) risks pay more than their calculated technical failure rate would suggest, while newer, untested risks pay less than experience would indicate." Underwriters have been recovering on Falcon 9 and Ariane what they could not charge on new vehicles. A market in which Falcon 9 commercial business shrinks and new-vehicle business grows removes the subsidy and exposes the underpricing at the same time.

Why smallsat operators do not insure, and what changes

About 3% of LEO satellites carry insurance, up from 1% in 2021 (Gallagher, end 2023), and roughly 300 spacecraft in total carry comprehensive in-orbit cover. The economics explain it. A launch-only premium at 5 to 10% on a \$2 to 5 million CubeSat is \$100,000 to \$500,000, comparable to or above the \$350,000 Transporter ticket, and the administrative cost of underwriting a sub-\$1 million unit exceeds the premium. Operators buy redundancy instead: spares, extra capacity on orbit and, until now, a launch vehicle whose 1% failure rate made the expected loss trivial. Where Transporter-class payloads have been insured they were ESPA-class: MethaneSAT (about \$40 million claim in 2025; launched on Transporter-10), AstroForge's Odin (\$3 million), Utilitysat (\$30 million, 2024).

FIGURE 7

Reliability-adjusted cost of launch for a \$10 million, 150 kg satellite



Expected mission loss = probability of failure × (satellite value + launch price), per kilogram. A 12-month delay cost of \$2 million would add roughly \$130, \$670 and \$2,000 per kilogram to the three cases. Insurance at plausible rates (3 to 5% on the proven vehicle, 8 to 12% on the established alternative) costs 3 to 5 times the expected loss on Falcon 9, which is why its customers self-insure, and 1.6 to 2.4 times on the established alternative. On the new vehicle a 12% rate would cost only 0.8 times the expected loss, which is the underpricing Gallagher describes; no published rate exists for a vehicle with fewer than three flights.

The arithmetic in Figure 7 is the core of the insurance argument. Moving from a 99% vehicle at \$7,000 per kilogram to an 85% vehicle at \$10,000 raises the sticker price 43% and the expected loss per kilogram sixteen-fold, from about \$740 to \$11,500. The reliability-adjusted cost of launch, price plus expected loss, goes from \$7,700 to \$21,500 per kilogram. No launch price recovers that gap at 85% reliability; a 95% vehicle would have to charge about \$4,200 per kilogram (about \$3,700 if a \$2 million delay cost is included) to match Falcon 9's reliability-adjusted cost. The 85% case is kinder than the current record of every unflown vehicle in Appendix B, which is the point: it describes a new vehicle that is working. The arithmetic assumes the launch price is lost on failure; a reflight guarantee, which Rocket Lab, Firefly and Isar have offered, reduces the second term but not the first. Operators have three responses. Constellations will keep self-insuring, spread their manifests across two or three vehicles and hold spares, as AST SpaceMobile did when it flew BlueBird Block 2 satellites on Falcon 9 in June and August, within weeks of the New Glenn loss, while collecting its \$30 million claim. Single-

spacecraft ESPA-class operators, the EO, IoT and MicroGEO companies flying \$20 to 80 million assets, are the most exposed and will seek launch-only cover on Neutron, Vega-C and Electron at 8 to 15% or more, and negotiate refund and reflight clauses. Lenders will re-underwrite: "if the insurance isn't available, then the finance isn't available," as Atrium's David Wade has put it, and a facility whose condition precedent is launch insurance at commercially reasonable rates can be breached by a change of vehicle.

The state of the market that has to absorb this

The space insurance market entered 2026 profitable and small. 2024 produced about \$211 million of claims on roughly \$580 million of premium. 2025 was tracking a net profit near \$500 million and the lowest claims volume in almost a decade. Then SpainSat NG-2, insured for more than \$400 million, was struck by a micrometeoroid in late December 2025; its operator disclosed the impact on 2 January 2026 and confirmed the satellite unrecoverable on 16 January. The notice of potential loss, received on 26 December, moved the 2025 loss ratio from about 15% to about 75%. Theoretical capacity per risk is \$500 to 600 million; competitive capacity is nearer \$300 million. Brit, Canopus, the Hiscox and Munich Re syndicates and Volante have left since 2023; Tata AIG, Phemis, Aesir, Whitecap, Hive and Relm have entered, mostly as small-line MGAs, and Howden opened a dedicated space practice in December 2025. Gallagher expects 2026 premium to "significantly contract" because few large GEO satellites are launching and constellation operators still do not buy, and it reports rate reductions available on prime business. In other words, the market has the balance sheet for a handful of \$300 million towers and the appetite for softening, not for hundreds of \$5 to 50 million placements on vehicles with two flights. The 2026 tower is 43% sourced from MGAs, and the number of senior space underwriters worldwide is well under a hundred according to Gallagher as cited by spacepolicies.org; bandwidth, not capital, limits a shift to many small policies.

Implications for underwriters and brokers

We found no underwriter or broker comment on the freeze as of 25 August; the absence is itself a finding. Four consequences follow from the analysis above. Demand for launch-only cover on ESPA-class spacecraft riding new vehicles will rise, and capacity will be offered selectively at spot rates (Gallagher's own statement is that small-satellite capacity "is heavily influenced by the risk profile and Sum Insured"), which favours brokers with vehicle-level technical assessments. The cross-subsidy problem becomes acute as Falcon 9 commercial volume falls, so rates on new vehicles must move toward actuarially fair levels or losses will follow. Product gaps open: multi-launch aggregate policies for constellation operators flying across three vehicles, launch-delay and manifest-slip cover for a market planning 36 months out, and slot-cancellation cover should SpaceX cancel any post-2028 commitment. And the single most useful data point for pricing an n-of-three vehicle, the rate paid on BlueBird 7's New Glenn placement, is not public; a broker with it holds an advantage. Vehicle-level reliability tracking, the reliability-adjusted cost of launch per kilogram, and manifest-level exposure by operator are inputs this market does not currently get from any single source; Off Earth Data intends to maintain all three alongside this report.

Confidence: **high** on market figures from broker reports; **moderate** on rate bands (no primary maiden-flight rate found); **high** on the expected-loss arithmetic given its stated inputs.

Downstream effects on the satellite market

The freeze reprices launch, but its second-order effects run through manufacturers, integrators, investors and regulators, and they are already visible.

Operators: who loses and who is hedged

The exposure table in Section 3 ranks the operators. The pattern is that the companies with the fastest replenishment cycles and the least dedicated-launch history are the most exposed, and that the hedges announced so far are partial. ICEYE is the largest unhedged block: 38 satellites on SpaceX rideshares in two years, a production line doubling to 100 a year by 2027, a \$520 million Series F and a EUR 1.7 billion German defence contract, and no announced launch contract with anyone but SpaceX. Spire's replenishment is entirely on Exolaunch-integrated SpaceX missions. Muon has thirteen satellites manifested to launch in the next twelve months and is building toward 500 satellites a year. Planet's Isar contract is a real hedge for Pelican but rests on a vehicle that has not reached orbit. Kepler's Neutron buy is the cleanest hedge in the group, though Kepler frames it as a choice for orbital control rather than a response to the freeze, and the mission is not before 2028. The government and academic tail, NASA's CubeSat Launch Initiative, the Space Test Program's SEOPS-integrated payloads, ESA's technology demonstrators and the university programmes on every Transporter, has no budget line for dedicated launch and no agency has said what it will do.

The operators that are structurally insulated are those that already fly dedicated: BlackSky and iQPS on Electron (iQPS has contracted eighteen Electron missions in total), Synspective on Electron, the SDA and NRO constellations on NSSL vehicles, and Amazon Leo on everything. Their advantage in 2029 is not price; it is schedule certainty and orbit choice, which Beck has long argued brings rideshare customers back to dedicated launch once they can afford it. Consolidation follows: Novaspace's 2026 outlook notes that "consolidation dynamics are also accelerating," Seraphim's index shows M&A running at four times the prior year, and the launch-plus-constellation integrators (SpaceX, Amazon, Blue Origin and now Rocket Lab with Iridium) are the ones that hold what Beck calls "the keys to space."

Manufacturers: inventory risk

The bus and satellite manufacturers sized their 2026 to 2028 production ramps against Transporter-class launch availability. Apex builds Nova buses ahead of orders and has raised three rounds in fourteen months; Muon is scaling from 50 to 500 spacecraft a year; NanoAvionics to hundreds of platforms by 2028; ICEYE to 100 a year; Loft has bought eleven buses for thirty satellites by end-2027; K2 plans constellation deployment in 2028. A 2029 launch gap converts finished spacecraft into working-capital inventory and pushes revenue recognition to the right. Novaspace's April forecast notes that "as vertical integration accelerates, independent suppliers face a narrowing addressable market," so the smaller-constellation channel is what remains, and that is the Transporter channel. None of the manufacturers surveyed had made a public statement on the freeze.

Integrators: from brokers to inventory holders

The most consequential structural change is happening in the channel. Until 2026 Exolaunch, SEOPS, Maverick and ISISpace were integrators and brokers: they bought Transporter ports, added dispensers and sold slots. Since May they have become owners of scarce inventory. Exolaunch's two Falcon 9s and its multi-year Transporter block are, on our reading, the asset EQT is paying for; SEOPS's sun-synchronous Waymaker mission was about 90% contracted within three months and the programme now has a second vehicle; Maverick is selling half of a customer's rocket. The integrator's margin rises with scarcity, the customer's planning horizon stretches from 12 to 36 months, and a secondary market for booked capacity is forming in the gap. Whether

SpaceX rideshare contracts are transferable, whether deposits are refundable if SpaceX cancels a post-2028 mission, and whether integrators are marking up Transporter inventory are all questions we could not answer from public sources; they are the questions a buyer should be asking.

Orbital transfer vehicles: a lost ride and a new role

Every OTV operator reached orbit on a Transporter in 2025 and 2026, so the freeze removes their primary. It also creates their reason to exist. Impulse's Helios is explicitly designed to sit under New Glenn, Vulcan, Neutron, Terran R and Eclipse and to sell plate-based rideshare on primaries that fly to other orbits; Impulse has been building a GEO rideshare product with Exolaunch since 2024, when its president Eric Romo framed the question as "can we aggregate enough demand to make this work?" Bryce's forward view is that OTVs and dispensers "may further increase selection of medium to heavy launch vehicles." The catch, again, is inclination: an OTV can distribute forty satellites across altitudes and planes from a Neutron polar flight, but it cannot take a satellite launched from the Cape at 28 degrees into sun-synchronous orbit.

Investors

Capital was moving before the freeze became public. Seraphim's second-quarter 2026 index recorded \$7.5 billion across 141 deals, the second-largest quarter on record, with the launch category up 162% year on year on Impulse's \$500 million round (closed 2 June) and Isar's \$311 million (9 June); Apex's \$200 million (5 June) also fell inside the quarter, and the index, which ends 30 June, does not mention the freeze. Since then Muon (\$250 million, 20 August) has closed and Stoke is raising about \$1 billion at a \$9 billion valuation. We found no company that cited the freeze in its own announcement; Payload framed Starcloud's \$250 million extension on 24 August against "a looming launch shortage" as SpaceX "prepares to sunset the Falcon 9 rocket and pauses new bookings for rideshare missions." The venture view at the SpaceX IPO in June was that competing with SpaceX on launch was foolhardy; the freeze gives launch startups a demand narrative they did not have. The risk for investors is the composition finding in Section 6: the money is flowing to vehicles that have not flown, and the 2029 market they are being valued against depends on all of them flying.

Governments

The policy response has been fastest in Washington. The August presidential memorandum sets a target of 1,000 or more US launches a year by 2030 against a 2025 baseline of 193 launches, 85% of them SpaceX; as reported it does not mention rideshare, but the trade coverage of it placed the freeze and the integrators' Falcon 9 purchases in the same frame. NSSL Phase 3 Lane 1 now has seven providers after Impulse and Relativity were on-ramped on 8 July (the new entrants must each fly once before competing for task orders), and its ceiling has been raised to a reported \$17 billion. The Space Force's \$397 million SB-AMTI contract is a demand anchor for Neutron; its \$266 million Kodiak award is for Electron-derived HASTE suborbital flights. NASA's launch-services and CubeSat programmes have said nothing. In Europe the Launcher Challenge predates the freeze and buys institutional missions rather than commercial slots; Arianespace's July rideshare announcement targets GEO from 2029. India transferred PSLV, LVM3 and SSLV production to an HAL-L&T consortium on 23 August with NSIL retaining commercial procurement, which is the right structure for a cheap sun-synchronous rideshare provider if PSLV's reliability returns. Japan's H3 has taken its first foreign commercial secondary. None of these is a Transporter replacement before 2029.

Confidence: **high** on the documented facts; **moderate** on the exposure ranking and consolidation reading.

Scenarios and signposts

Four futures are consistent with the evidence, and they are not mutually exclusive. The next twelve months will tell us which ones we are in.

SCENARIO	CONDITIONS	2029 NON-SPACEX SUPPLY (MODEL)	WINNERS	LOSERS	OED VIEW
A. Neutron productised for rideshare	Neutron flies by early 2027 and succeeds; three to five flights in 2028; Rocket Lab or an aggregator sells scheduled sun-synchronous rideshare on it from 2028; Eclipse or Nova reaches orbit in 2027	Bull case: 129 t nameplate, 79 t credible, of which Neutron rideshare 30 t. Prices settle at \$8,000 to 12,000 per kilogram and parcel sizes return to multi-tonne	Rocket Lab; Exolaunch/EQT and SEOPS as Neutron aggregators; Impulse; Kepler; Planet; iQPS and BlackSky on Electron	European challengers that miss the 2027 flight milestone; sub-50 kg CubeSat operators, whose unit price still rises	Plausible but not the base: it requires a commercial decision Rocket Lab has not made and a Neutron schedule at the optimistic end of its own distribution
B. Neutron flies, sold dedicated; other new vehicles slip	Neutron's first flight in 2027 with a 1-3-5 ramp sold as dedicated missions; Eclipse, Nova and Terran R each lose about a year; no scheduled rideshare product before 2029; dedicated Falcon 9 sales end after 2028	Base case: 53 t nameplate, 32 t credible (23 to 39). Bear case if a new vehicle fails: 18 t nameplate, 11 t credible. Clearing price rises 1.5 to 2 times; demand pulls forward into 2028 and some is destroyed	Electron; integrators holding 2028 Falcon 9 inventory; Vega-C and Isar if reliable; H3; underwriters with new-vehicle expertise	ICEYE's 100-a-year ramp; Spire; Muon; university and CSLI payloads; first-time operators; IoT constellations; second-round NGSO licensees with FCC milestones; bus manufacturers carrying inventory	Most likely; this is the report's base case
C. SpaceX keeps selling dedicated Falcon 9s past 2028	The rideshare-only reading of the freeze (SatNews, SEOPS) holds and integrators keep buying three to five Falcon 9s a year	Base case plus 18 to 30 t at roughly twice Transporter's price; the cliff becomes a price step	Exolaunch, SEOPS, Maverick and RIDE! as the channel; every rideshare-dependent operator	New small and medium launchers, whose 2029 demand narrative weakens	The reading Section 2 rates at roughly 40%; the single most important thing to watch
D. Starship sun-synchronous rideshare by 2029	Starship reaches orbit in 2026, flies weekly by 2027, and SpaceX secures a polar corridor or a Vandenberg pad and sells a rideshare product by 2029	Supply expands sharply; price per kilogram falls below Transporter's; Giga-class buses, orbital compute and manufacturing scale	K2, Starcloud, Varda-class users of mass; SpaceX; anyone who waited	Electron and Alpha retreat to responsive and defence niches; Neutron competes on schedule not price; European sovereign launch survives on institutional preference. The 2028 to 2029 losers are the same as in B, because nothing closes the interim gap	Unlikely on any 2029 timeline: no polar route or product exists in the record

The scenarios are not exclusive: C can combine with A or B, and D with any of them. We do not assign numerical weights to A, B and D, because their joint probabilities cannot be derived from the evidence; C carries the weight given to the rideshare-only reading in Section 2. The "OED view" column states the reasoning. What is not a matter of judgement is that Scenario D does not rescue 2028 or 2029 for anyone whose satellite is ready then, and that Scenario A depends on a commercial decision Rocket Lab has not made.

Signposts

WHEN	WHAT TO WATCH	WHAT IT WOULD TELL US
28 Aug 2026 (NET)	Starship Flight 14: first orbital-insertion attempt, first operational Starlink V3 deployment	Whether "reliably several times per week" is a 2027 or a 2028 conversation, and so when Falcon's wind-down clock starts
Sep 2026	Isar Spectrum Flight 2 from Andøya; Planet's second-quarter FY2027 call; Amazon Leo LV-01 on Vulcan (return to flight)	Europe's only capitalised small launcher reaching orbit or not; Planet's first public comment on launch access; whether ULA's solid-motor problem is solved
Oct 2026	Transporter-18 and Bandwagon-5; Ariane 6 LE-04 and MetOp-SG-B1; first Neutron rideshare or aggregator announcement, if any	Whether SpaceX signals anything about 2027 to 2028 cadence; whether anyone productises Neutron
Q4 2026	Neutron delivery to Launch Complex 3, first-stage qualification, static fire; Alpha Block 2 first flight; RFA One maiden flight; Miura 5 maiden flight; New Glenn return to flight; SpaceX Q3 results and call (November)	The 2027 supply picture in one quarter. Any SpaceX comment on rideshare or Falcon retirement would be the first on the record
Dec 2026 to Q1 2027	Neutron first flight window; ESA European Launcher Challenge frame contracts; PSLV return to flight and root-cause disclosure; FAA licence for Starship at LC-39A; any Vandenberg Starship notice of intent	Scenario A versus B; whether cheap Indian capacity returns; whether a Starship sun-synchronous route exists on any timeline
H1 2027	Rocket Lab and Iridium closing (expected mid-2027); Terran R and Nova first flights; Eclipse first flight; any SpaceX signal on 2029 dedicated Falcon 9 bookings	Whether the 2028 medium-lift cohort exists; whether Scenario C is live
H2 2027	Exolaunch Exo-1 flies; Waymaker integration begins; secondary sales of 2028 capacity	How much of the 2028 aggregator capacity is resold and at what markup
Through 2027	Any underwriter statement on new-vehicle launch capacity; the first insured ESPA-class placement on Neutron, Vega-C or Alpha and its rate; the first US aggregator booking on Alpha, Eclipse, Nova, Terran R, New Glenn or Vulcan; any operator public statement citing the freeze in a delay or write-down	Whether the insurance market prices the transition or retreats from it; whether replacement supply is being productised; where the losses land

Confidence: **moderate** that B is the most likely path; **low** on the probability assigned to C; **high** that the signposts listed will resolve most of the uncertainty within twelve months.

11

Method, confidence and data notes

Sources and method

This report was built from primary and trade sources retrieved between 20 and 25 August 2026. They comprise company releases and investor materials (Rocket Lab, Firefly, SpaceX's prospectus and 10-Q, Exolaunch, SEOPS, Isar, Avio, Arianespace, Stoke, Blue Origin, ULA, Impulse, ICEYE, Spire, Planet, Kepler, Muon, Satellogic, HawkEye 360); regulatory documents (FAA and Department of the Air Force environmental decisions, 14 CFR Part 440, the ESA Launcher Challenge); broker market reports (Gallagher's quarterly space updates 2023 to 2026, Seradata via SatNews, Insurance Insider); industry datasets (BryceTech Smallsats by the Numbers 2025 and 2026, Novaspace's 2026 smallsat forecast and outlook, Seraphim Space Index Q2 2026); and launch coverage (Spaceflight Now, NASASpaceflight, European Spaceflight, Via Satellite, Payload, SatNews, Space.com, TechTimes). SpaceNews, Bloomberg, AIAA and Ars Technica could not be read directly and are cited as relayed

by other outlets, marked as such. Every sourced numerical claim was traced to its source by a research analyst and re-checked by an independent verification pass; estimates and assumptions are identified as such in this section and in the tables. Where two sources disagree we say so in the text or below.

The OED graph (pipeline run 25 August 2026; 3,254 tracked entities, 3,185 scored) supplied SEPI scores, activity records and the spaceport registry. SEPI is a seven-factor composite (government contracts 22.5%, regulatory 18%, technical milestones 18%, funding 13.5%, talent 10%, partnerships 9%, sentiment 9%) blended with a Bayesian prior; scores shown here are on the one-year window and are accompanied by the count of observed factor families so that prior-dominated scores can be recognised. Methodology at www.offearthdata.com.

Model assumptions

Demand: the Western third-party rideshare-class market (sun-synchronous and mid-inclination) is put at 22 tonnes in 2025 and 2026: about 20 tonnes on SpaceX's dedicated rideshares (436 payloads on six 2025 missions; Novaspace measured 3.2 tonnes a mission for 2021 to 2023 and recent manifests are heavier; our range is 17 to 25 tonnes) plus about 2 tonnes already flying as co-passengers on Vega-C, PSLV, H3 and Electron. From 2027 mass grows 10% a year: 24, 27, 29 and 32 tonnes. The low case is 25% below (18, 20, 22, 24) and absorbs demand destruction and migration to dedicated launch; the high case is 35% above (32, 36, 39, 43) and reflects the two-year queue under which the 2025 throughput was flown. Supply: per-vehicle flights per year in bear, base and bull cases from company guidance less a typical twelve-month slip, times payload to sun-synchronous orbit, times an assumed third-party share (Alpha 35%, Eclipse 25%, Terran R 10% of 17.6 tonnes, or 1.8 tonnes a flight, Nova 40%, New Glenn and Vulcan secondary slots of 0.5 to 2 tonnes per host flight, Ariane 6 co-passenger slots of 0.5 to 1 tonne, Vega-C co-passengers on two institutional flights a year plus one dedicated SSMS every two years, PSLV and SSLV about 1 tonne in 2027 rising to 2 tonnes by 2029 as co-passengers of 400 to 500 kg return on three to four flights plus SSLV, Neutron sold as dedicated missions with rideshare-class sales of a fraction of a flight's mass a year from 2028, rising to about one flight in 2030). The share assumptions have no disclosure behind them; halving or doubling the Eclipse, Nova and Terran R shares moves 2029 base nameplate by about minus 11 or plus 21 tonnes. Cape and Wallops launches take a 25% sun-synchronous penalty. Credible capacity multiplies nameplate by a readiness probability (one for established vehicles flying today; 0.7 to 0.9 for vehicles with an early record; 0.6 to 0.9 for grounded PSLV; 0.1 to 0.85 for vehicles without an orbital success, set from programme status) and by per-flight reliability (the Laplace estimate for vehicles with at least one success; 85% for the rest; Astra and Epsilon S at 75% for partial heritage). Scaling the readiness probabilities of vehicles without an orbital success by 0.6 and 1.4 gives the 23 to 39 tonne range around the 32-tonne 2029 base; the older flat-prior method gives 22, 30 and 37 tonnes at priors of 30%, 50% and 70%. China and Russia are excluded as legally inaccessible.

PROVIDER	STATUS	READINESS 2027 TO 2030	RELIABILITY	2027	2028	2029	2030	2029 BASE, CREDIBLE
				BEAR / BASE / BULL	BEAR / BASE / BULL	BEAR / BASE / BULL	BEAR / BASE / BULL	
SpaceX Transporter and Bandwagon, remaining manifest	established	100%	99%	10 / 15 / 18	8 / 14 / 18	0 / 0 / 0	0 / 0 / 0	0.0
Aggregator-bought Falcon 9s (Exo-1/2, Waymaker-1/2, Portal) at ~6 t each	established	100%	99%	4.5 / 6 / 8	18 / 24 / 32	0 / 0 / 0	0 / 0 / 0	0.0

PROVIDER	STATUS	READINESS 2027 TO 2030	RELIABILITY	2027 BEAR / BASE / BULL	2028 BEAR / BASE / BULL	2029 BEAR / BASE / BULL	2030 BEAR / BASE / BULL	2029 BASE, CREDIBLE
Neutron, rideshare-equivalent (dedicated-only market in base; aggregator product in bull)	never flown	35 / 65 / 80 / 85%	85%	0 / 0 / 3	0 / 3 / 15	2 / 5 / 30	4 / 8 / 45	3.4
Electron, open orbital capacity	established	100%	95%	2 / 2.5 / 3	2 / 2.5 / 3	2 / 2.5 / 3	2 / 2.5 / 3	2.4
Firefly Alpha Block 2	early record	85 / 90 / 90 / 90%	44%	0.7 / 1.2 / 2.1	1 / 1.7 / 2.6	1.2 / 2 / 3.1	1.2 / 2 / 3.1	0.8
Firefly Eclipse	never flown	15 / 45 / 60 / 70%	85%	0 / 0 / 3	0 / 3 / 9	3 / 9 / 18	6 / 15 / 24	4.6
Relativity Terran R	never flown	15 / 45 / 60 / 70%	85%	0 / 0 / 0	0 / 1.8 / 3.5	1 / 5.3 / 9	2 / 8.8 / 14	2.7
Stoke Nova	never flown	30 / 55 / 65 / 75%	85%	0 / 1 / 2	1 / 3.5 / 7	2.5 / 7 / 12	5 / 9.5 / 17	3.9
New Glenn, secondary slots	early record	70 / 85 / 90 / 90%	60%	0 / 0.5 / 1.5	0.5 / 1.5 / 3	1 / 2 / 4	1 / 3 / 5	1.1
Vulcan, secondary slots	early record	85 / 90 / 90 / 90%	83%	0.3 / 0.6 / 1	0.3 / 1 / 1.5	0.3 / 1 / 1.5	0.3 / 1 / 1.5	0.8
Astra Rocket 4	never flown	15 / 30 / 40 / 45%	75%	0 / 0 / 0.3	0 / 0.3 / 0.9	0 / 0.6 / 1.2	0 / 0.6 / 1.2	0.2
Phantom Daytona II	never flown	10 / 25 / 35 / 45%	85%	0 / 0 / 0.3	0 / 0.3 / 0.9	0 / 0.6 / 1.2	0 / 0.9 / 1.8	0.2
Other US small launchers (Vaya, Starfighters, iRocket, Aevum)	never flown	10 / 15 / 25 / 35%	85%	0 / 0 / 0	0 / 0 / 0	0 / 0 / 0.5	0 / 0.5 / 1	0.0
Ariane 6, MLS co-passenger	established	100%	80%	0 / 0.5 / 1	0 / 1 / 3	0 / 1.5 / 8	0 / 2 / 8	1.2
Vega-C and Vega-E, SSMS	established	100%	78%	0.2 / 1.5 / 2.4	0.3 / 2 / 3	0.3 / 2.5 / 4	0.3 / 3 / 5	1.9
Isar Spectrum	no orbital success yet	55 / 70 / 80 / 85%	85%	0 / 1.5 / 2.5	1 / 2.45 / 5	1.5 / 3.9 / 7.5	2 / 4.9 / 10	2.6
RFA One	never flown	40 / 60 / 70 / 75%	85%	0 / 0.9 / 1.8	0 / 1.8 / 4.5	0.9 / 2.7 / 7.3	0.9 / 3.6 / 9	1.6
PLD Miura 5	never flown	30 / 55 / 65 / 75%	85%	0 / 0.2 / 0.5	0 / 0.6 / 1.6	0.3 / 0.9 / 3	0.3 / 1.5 / 4.5	0.5
MaiaSpace Maia	never flown	10 / 40 / 60 / 70%	85%	0 / 0 / 0.25	0 / 0.25 / 1	0.25 / 0.75 / 2.5	0.5 / 1.25 / 4	0.4
PSLV and SSLV (NSIL)	grounded	60 / 80 / 85 / 90%	91%	0 / 0.95 / 2.4	0.4 / 1.5 / 3	0.8 / 2.05 / 4	0.8 / 2.2 / 5	1.6
H3, secondaries (dedicated rideshare in 2030)	established	100%	73%	0 / 0.3 / 0.6	0.3 / 0.45 / 1	0.3 / 0.6 / 2.5	0.3 / 2.6 / 4.5	0.4

PROVIDER	STATUS	READINESS 2027 TO 2030	RELIABILITY	2027 BEAR / BASE / BULL	2028 BEAR / BASE / BULL	2029 BEAR / BASE / BULL	2030 BEAR / BASE / BULL	2029 BASE, CREDIBLE
Epsilon S	never flown	30 / 50 / 60 / 65%	75%	0 / 0 / 0.3	0 / 0.1 / 0.3	0 / 0.2 / 0.3	0 / 0.2 / 0.6	0.1
Kairos	no orbital success yet	20 / 35 / 45 / 50%	85%	0 / 0.1 / 0.2	0 / 0.2 / 0.3	0 / 0.3 / 0.4	0 / 0.4 / 0.6	0.1
Skyroot Vikram-1 and 2	early record	85 / 90 / 90 / 90%	67%	0.18 / 0.55 / 0.9	0.36 / 0.9 / 1.8	0.54 / 1.44 / 3	0.72 / 1.8 / 4.5	0.9
Innospace Hanbit- Nano	no orbital success yet	30 / 50 / 60 / 65%	85%	0 / 0.07 / 0.21	0 / 0.14 / 0.28	0.07 / 0.21 / 0.42	0.07 / 0.28 / 0.56	0.1
Gilmour Eris (mid- inclination only)	no orbital success yet	30 / 50 / 60 / 65%	85%	0 / 0 / 0.2	0 / 0.2 / 0.5	0 / 0.4 / 0.8	0 / 0.5 / 1	0.2
Other international (Skylora, HyImpulse, Latitude, Interstellar, Perigee)	never flown	10 / 20 / 30 / 40%	85%	0 / 0 / 0.4	0 / 0.2 / 0.9	0 / 0.5 / 1.5	0 / 0.8 / 2	0.1
Non-SpaceX total, nameplate				3.4 / 12.4 / 29.9	7.2 / 30.4 / 72.6	18 / 53 / 128.7	27.4 / 76.8 / 175.9	31.7
Non-SpaceX total, credible				2.6 / 7.4 / 13.9	4.8 / 17.2 / 39	11.2 / 31.7 / 78.9	18.1 / 49.4 / 115.9	
All sources including SpaceX booked, nameplate				17.9 / 33.4 / 55.9	33.2 / 68.4 / 122.6	18 / 53 / 128.7	27.4 / 76.8 / 175.9	
All sources including SpaceX booked, credible				17 / 28.3 / 39.8	30.6 / 54.9 / 88.7	11.2 / 31.7 / 78.9	18.1 / 49.4 / 115.9	

DEMAND (TONNES A YEAR)	2027	2028	2029	2030
Low case	18	20	22	24
Base case	24	27	29	32
High case	32	36	39	43

Supply figures are tonnes of rideshare-class mass plausibly sold to Western third parties. Readiness is the assumed probability that the vehicle is operating at the modelled cadence in each year; reliability is the per-flight success probability applied to it. Pair bear supply with high demand for the stress case and bull supply with low demand for the benign case. The Section 5 table pools the smallest launchers into one row; the model carries Astra, Phantom, Epsilon S and Kairos separately and pools the rest.

Known disagreements between sources

- Cut-off wording: "beyond late 2028" (SatNews, Bloomberg) versus late 2028 or early 2029 and beyond (SpaceNews's sources, as relayed). SpaceX has confirmed neither.
- Scope of the freeze: rideshare only (SatNews, SEOPS) versus all new commercial Falcon 9 bookings beyond 2028 (Bloomberg). Modelled as Scenario C in Section 10.
- Cumulative rideshare count: about 1,650 by per-mission sum versus press reports of "over 1,800" after Transporter-17, whose basis is not published.

- 2023 rideshare rate: Payload reported \$6,500/kg; the listed rate for 2023 to early 2025 was \$6,000/kg. SatNews's "sub-\$300,000" ticket in July 2026 is stale against the \$350,000 reported by four other sources. The August 2019 launch price is given as \$2.25 million (Teslarati) and \$2.5 million (illdefinedspace).
- Bloomberg's "halted production of some non-reusable Falcon hardware" cannot mean all expendable upper stages while Falcon 9 flies three times a week; we read it as some hardware lines.
- Waymaker numbering: the May 2026 release called the sun-synchronous 2028 mission Waymaker-1; SEOPS's site and Payload's August coverage now number the mid-inclination mission Waymaker-1 and the sun-synchronous mission Waymaker-2. This report refers to the missions by orbit. Fill: Payload reports about 90% of the sun-synchronous mission's mass contracted by mid-August; TechTimes reported in July that the manifest filled within three weeks with about 30 customers waitlisted. The two reports are not fully consistent and we use Payload's.
- Portal's Starburst-1 is manifested on Bandwagon-5 (Payload, August 2026) after earlier reporting placed it on Transporter-18.
- SpaceX's 100th launch of 2026: 18 August (SpaceDaily) versus 22 August UTC for the 100th orbital mission (Spaceflight Now); the counts may treat Starship flights differently.
- Starship Flight 12 and 13 dates: 22 May and 24 July (Space.com live coverage, TechTimes, the OED launch feed) versus 26 May and 26 July in one summary; we use the former.
- Ariane 6 flight count: eight flights to 17 June 2026 (Arianespace and European Spaceflight, including Galileo L14 on 17 December 2025); one insurance-stream tally omitted that flight and gave seven. Appendix B uses eight.
- H3 return to flight: 11 June 2026 UTC (NASASpaceflight) versus 12 June in the OED feed. Innospace's suborbital test termination: 19 August versus 20 August; one tally counts Hanbit-Nano's December 2025 attempt, another does not. Starship Flight 14: NET 28 August per a 20 August report, September per the launch trackers.
- Firefly Alpha capacity: 1,030 kg LEO / 630 kg SSO (company site) versus 1,170 / 745 kg (likely Block 2). Alpha's ~\$15 million price is widely reported but not on a primary source. Firefly's IPO proceeds: \$868 million versus \$998.6 million including the overallotment.
- PSLV-C62's lost co-passengers: about 18 (NASASpaceflight) versus 16 satellites or 12 commercial payloads in other tallies. Skyroot's Vikram-2 is given as 900 kg (company) and 1,000 kg (press).
- New Glenn's explosion is dated 28 May by Blue Origin, Spaceflight Now and NASASpaceflight; one Space.com article says 8 May. Blue Origin's reported \$10 billion round at a \$130 billion valuation (July 2026) rests on a single mention.
- Space insurance 2024 result: Seradata's profitable year (\$211 million claims) versus a consultancy's "155% loss ratio"; we use Seradata. 2025 premium: \$550 to 600 million (Seradata) versus \$675 million (Space Intel Report). SpainSat NG-2: the notice of loss (26 December 2025) predates the operator's disclosure of the strike (2 January 2026); the strike itself occurred in late December.
- Falcon 9's consecutive-success streak is in the low 300s since July 2024 (our estimate); the "400 consecutive" figure sometimes quoted conflates total flights with the streak.
- HawkEye 360's May 2026 IPO: \$435.9 million net (company) versus \$416 million in one funding tracker.

OED data notes

The OED activity graph carried the Transporter-15, 16 and 17 launches, the Transporter-18 and Bandwagon-5 placeholders, and the Kepler, Portal and Rocket Lab news items used here, and its spaceport pipeline feed supplied the Starship environmental record. Its 2025 launch coverage and its FAA licence feed are incomplete

for the vehicles in this report, no 2027 manifest is yet loaded, and the July 2026 freeze itself has no event row; those gaps are logged for the ingestion queue and did not affect the figures above, which were taken from primary sources. SEPI scores in Appendix C should be read with their observed-factor counts: several European and Asian launch startups are scored on the prior alone.

Appendix A

SpaceX dedicated rideshare mission log

MISSION	DATE (UTC)	SITE	PAYLOADS	NOTABLE CUSTOMERS AND INTEGRATORS
Transporter-1	24 Jan 2021	CCSFS SLC-40	143	Planet 48 SuperDoves; Swarm 36; Spaceflight Sherpa-FX; Exolaunch 30; D-Orbit ION; 10 Starlink
Transporter-2	30 Jun 2021	CCSFS SLC-40	88	Satelloptic, Umbra, HawkEye 360, Lynk; Spaceflight, Exolaunch, D-Orbit, Maverick
Transporter-3	13 Jan 2022	CCSFS SLC-40	105	Planet 44; ICEYE; Capella; Sich 2-1
Transporter-4	1 Apr 2022	CCSFS SLC-40	40	EnMAP (980 kg) primary
Transporter-5	25 May 2022	CCSFS SLC-40	59	Momentus; Spaceflight Sherpa-AC; Exolaunch 21; Spire; ICEYE; HawkEye 360
Transporter-6	3 Jan 2023	CCSFS SLC-40	114	Planet Flock; Kleos; Lynk; Umbra; Epic Aerospace Chimera
Transporter-7	15 Apr 2023	VSFB SLC-4E (first from Vandenberg)	51	Exolaunch 21; D-Orbit; Momentus; SEOPS; Orbital Sidekick; Satelloptic; HawkEye 360
Transporter-8	12 Jun 2023	VSFB SLC-4E	72	Starfish Otter Pup; reentry capsule; OTVs
Transporter-9	11 Nov 2023	VSFB SLC-4E	90 (+23 from OTVs)	Planet 36 SuperDoves and Pelican-1; Exolaunch 11; GHGSat 3; Impulse Mira
Transporter-10	4 Mar 2024	VSFB SLC-4E	53	MethaneSAT; commercial and government
Bandwagon-1	7 Apr 2024	KSC LC-39A	11	Korea 425 SAR; HawkEye 360 Clusters 8 and 9; Capella-14; iQPS-7; TSAT-1A
Transporter-11	16 Aug 2024	VSFB SLC-4E	116	Planet 36 SuperDoves and Tanager-1; ICEYE 4; Spire 7; Umbra 2; Xona Pulsar-0; Exolaunch, ISISpace, SEOPS, Maverick
Bandwagon-2	21 Dec 2024	VSFB SLC-4E	30	Korea ADD; HawkEye 360; Sidus; True Anomaly; Tomorrow.io; Exolaunch; Maverick
Transporter-12	14 Jan 2025	VSFB SLC-4E	131	Exolaunch 35; Planet Pelican-2 and 36 SuperDoves; Spire; MBZ-SAT (750 kg); Pixxel 3; Impulse LEO Express-2; Varda W-2
Transporter-13	15 Mar 2025	VSFB SLC-4E	74	NASA EZIE; NRO; Varda W-3; Albedo Clarity-1; Exolaunch 27 (1,500+ kg); SEOPS 23; USSF STP
Bandwagon-3	22 Apr 2025	CCSFS SLC-40	3	Korea 425 SAR; Tomorrow-S7; Atmos Phoenix 1 reentry capsule
Transporter-14	23 Jun 2025	VSFB SLC-4E	70	Exolaunch 45; Varda; Capella; D-Orbit; Starfish Otter Pup 2; York Dragoon; The Exploration Company
Bandwagon-4	2 Nov 2025	CCSFS SLC-40	18	Vast Haven Demo; Space42/ICEYE 3 SAR; Korea 425; Tomorrow.io 2; Starcloud-1; Exolaunch 13
Transporter-15	28 Nov 2025	VSFB SLC-4E	140	Exolaunch 59; SEOPS 11; Formosat-8; ESA HydroGNSS; Planet 36 SuperDoves and 2 Pelicans; Spire; Varda W-5; Impulse LEO Express-3

MISSION	DATE (UTC)	SITE	PAYLOADS	NOTABLE CUSTOMERS AND INTEGRATORS
Twilight-1	11 Jan 2026	VSFB SLC-4E	40	Kepler 10 Aether; Spire; ICEYE 2; HawkEye 360 Cluster 13; NASA Pandora, BlackCAT, SPARCS
Transporter-16	30 Mar 2026	VSFB SLC-4E	119	Exolaunch 57; SEOPS 19; OHB Italia 8 IRIDE; ICEYE 6; Spire 8; Momentus Vigoride-7 (10 hosted); K2 Gravitas (2 t); Varda W-6; Exotrail; HawkEye 360 Cluster 14; AAC Clyde 2
Transporter-17	7 Jul 2026	VSFB SLC-4E	81	Exolaunch 49; Maverick 12 incl. CAS500-4 (~500 kg); SEOPS 10; Spire 10; ICEYE 4; Apex Nova; Planet Pelican-11; Muon 3 FireSat; Unseenlabs BRO-31; City Labs BOHR; Loft
Transporter-18	NET Oct 2026	VSFB SLC-4E	tbd	Exolaunch 45 manifested; NordSpace Terra Nova; CSA QEYSSat on a later-2026 Transporter
Bandwagon-5	NET Oct 2026	CCSFS	tbd	Exolaunch 23 manifested; Portal Starburst-1 (earlier reported for Transporter-18)

Per-mission counts from launch-day coverage. Sum of flown missions: 1,546 on Transporter (using 90 for T-9), 62 on Bandwagon, 40 on Twilight. Cadence by year: 2021, two; 2022, three; 2023, four; 2024, four; 2025, six; 2026 to date, three.

Appendix B

Flight records

VEHICLE	ATTEMPTS	SUCCESSES	FAILURES AND PARTIALS (DATE)	CURRENT STREAK	EMPIRICAL RATE	LAPLACE	UNDERWRITER VIEW
Falcon 9	~693	~690	CRS-7 (28 Jun 2015); Starlink 9-3 (11 Jul 2024); partial CRS-1 (2012); Amos-6 pad loss (1 Sep 2016, not counted)	~320 since Jul 2024	99.6%	99.4%	Benchmark
Electron incl. HASTE	93	89	25 May 2017; 4 Jul 2020; 15 May 2021; 19 Sep 2023	52	95.7%	94.7%	Proven small-lift
PSLV	63	58	20 Sep 1993; 31 Aug 2017; 18 May 2025 (C61); 12 Jan 2026 (C62); partial 29 Sep 1997	0; grounded	92.1%	90.8%	Was proven; suspended pending root cause
Vulcan Centaur	4	4	Solid-motor nozzle anomalies 4 Oct 2024 and 12 Feb 2026, missions succeeded	4; paused	100%	83.3%	NSSL-certified, paused
Ariane 6	8 (9 by 27 Aug if MTG-I2 flies)	7	Partial VA262 (9 Jul 2024), auxiliary power unit; main payloads deployed	7	87.5%	80.0%	Accepted with heritage credit
Vega-C	7	6	VV22 (21 Dec 2022), Zefiro-40 nozzle	5	85.7%	77.8%	Re-earning trust
H3	9	7	TF1 (7 Mar 2023); F8 QZS-5 (22 Dec 2025), payload adapter delamination	2	77.8%	72.7%	Institutional; new-vehicle pricing

VEHICLE	ATTEMPTS	SUCCESSSES	FAILURES AND PARTIALS (DATE)	CURRENT STREAK	EMPIRICAL RATE	LAPLACE	UNDERWRITER VIEW
Skyroot Vikram-1	1	1	none (18 Jul 2026 flight reached orbit per Skyroot)	1	100%	66.7%	New vehicle
New Glenn	3	2	NG-3 (19 Apr 2026), upper-stage under-thrust, BlueBird 7 lost; 28 May 2026 static-fire explosion (ground)	0	66.7%	60.0%	New vehicle; first insured loss of 2026
Firefly Alpha	7	3	FLTA001 (3 Sep 2021); FLTA006 (29 Apr 2025); partials FLTA002 (1 Oct 2022) and FLTA004 (22 Dec 2023); 29 Sep 2025 ground stage loss	1	42.9%	44.4%	New vehicle
Isar Spectrum	1	0	30 Mar 2025, vent valve	0	0%	33.3%	Unplaceable
Innospace Hanbit-Nano	1	0	23 Dec 2025, first stage	0	0%	33.3%	Unplaceable
Gilmour Eris	1	0	30 Jul 2025, 14 seconds	0	0%	33.3%	Unplaceable
Space One Kairos	3	0	13 Mar 2024; 18 Dec 2024; 4 Mar 2026	0	0%	20.0%	Unplaceable
Kinetica-1 (CAS Space)	15	14	Y6 (27 Dec 2024)	n/a	93.3%	88.2%	Not accessible to Western payloads
Zhuque-2 and 2E	7	6	14 Dec 2022	6	85.7%	77.8%	Not accessible
Neutron, Nova, Terran R, Eclipse, RFA One, Miura 5, Maia	0	0	Neutron tank rupture in test (21 Jan 2026); RFA stage lost in static fire (19 Aug 2024); Terran 1 failed (Mar 2023)	0	n/a	50.0%	No placement possible before first flight

Appendix C

OED SEPI snapshot, launch providers and rideshare-dependent operators

One-year window, pipeline run 25 August 2026. "Factors" is the number of the seven factor families with observed evidence in the window; a score with zero or one observed factor is prior-dominated and should not be compared with a fully evidenced score. Tier 1 is Established, 2 Growth, 3 Early.

COMPANY	SEPI	PERCENTILE	TIER AND BAND	FACTORS	COMPOSITE	READING
SpaceX	86.95	100	1, strong	7	88.34	Fully evidenced; ranks first
United Launch Alliance	85.64	99.8	1, strong	5	67.88	Score does not yet reflect the 2026 grounding
Blue Origin	79.26	99.2	1, solid	3	43.40	Contract-driven; composite well below SEPI

COMPANY	SEPI	PERCENTILE	TIER AND BAND	FACTORS	COMPOSITE	READING
Rocket Lab	69.87	98.2	1, solid	7	74.01	Fully evidenced; contracts factor probably understated because subsidiary-level awards are not resolved to the parent
Planet Labs	64.13	97.3	1, solid	7	65.55	Fully evidenced
Arianespace	62.17	96.8	1, solid	3	20.96	Milestone-driven
BlackSky	56.32	95.1	1, mixed	4	39.65	Dedicated-launch customer
LandSpace	50.93	92.8	1, mixed	2	16.13	Not accessible to Western payloads
Momentum	47.53	91.6	1, mixed	3	21.05	Regulatory-driven; Transporter-dependent
Relativity Space	47.46	91.3	1, mixed	5	31.73	Pre-flight
ICEYE	47.01	91.0	1, mixed	3	18.22	Funding-driven; most exposed operator
Spire Global	46.50	90.4	1, mixed	6	39.33	Exposed operator
Galactic Energy	45.93	89.9	1, mixed	3	24.82	Not accessible
HawkEye 360	43.45	87.9	1, mixed	4	23.71	Exposed operator
Firefly Aerospace	42.67	86.9	1, mixed	4	19.39	Milestones factor at zero despite March success; feed gap
Stoke Space	42.52	86.4	1, mixed	2	11.85	Funding-driven; pre-flight
Impulse Space	38.59	81.4	2, early	6	33.33	Well evidenced for its stage
ISRO	38.16	80.8	2, early	3	0	Placeholder-driven; treat as unscored
Isar Aerospace	37.91	80.0	2, early	3	12.97	Funding-driven
Exolaunch	37.03	78.6	2, early	1	3.33	Prior-dominated; EQT deal not yet reflected
Muon Space	36.18	76.6	2, early	4	20.11	Exposed operator
Kepler Communications	32.48	66.6	2, early	3	4.75	Hedged via Neutron
Skyroot Aerospace	32.20	66.4	2, early	2	5.79	Funding and milestone
Astra Space	31.70	65.6	2, early	2	3.50	Thin
PLD Space	28.61	61.4	2, early	1	0	Prior-dominated
Rocket Factory Augsburg	25.54	58.6	2, early	2	0	Prior-dominated
MaiaSpace	24.50	51.0	2, early	0	0	Prior only
Mitsubishi Heavy Industries	17.42	39.2	3, early	1	13.50	Milestone only; H3 under-covered

Appendix D

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