Commercial Space Transportation

The Federal Aviation Administration's Office of Commercial Space Transportation (FAA AST) and the Commercial Space Transportation Advisory Committee (COMSTAC) have prepared forecasts of global demand for commercial space launches in 2015 through 2024.

The 2015 Commercial Space Transportation Forecasts report (the Report) is in two sections:

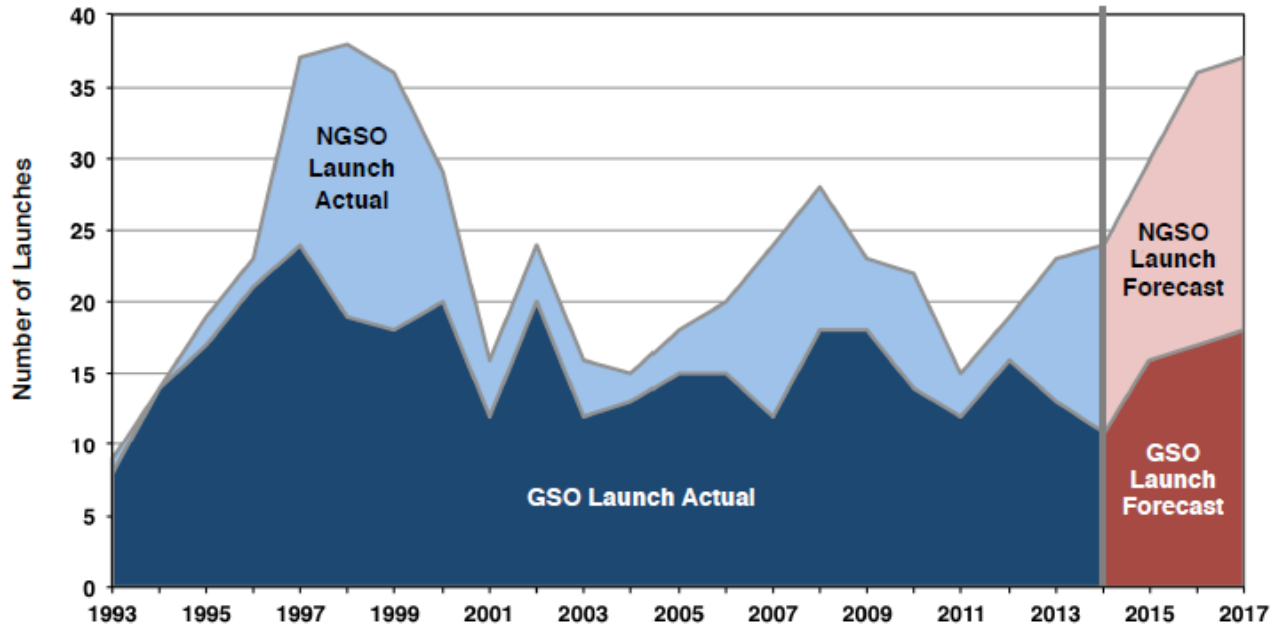
1) The *COMSTAC 2015 Commercial Geosynchronous Orbit (GSO) Launch Demand Forecast*, which projects demand for commercial satellites that operate in GSO and the resulting commercial launch demand to GSO. As a result of the realignment of issuances dates of the Report, this year's GSO Launch Demand Forecast only considers the three-year outlook; and

2) The FAA's *2015 Commercial Space Transportation Forecast for Non-Geosynchronous Orbits (NGSO),*which projects commercial launch demand for satellites to NGSO, such as low Earth orbit (LEO), medium Earth orbit (MEO), elliptical (ELI) orbits, and external (EXT) trajectories beyond orbits around the Earth.

Report projects an average of 17 commercial GSO launches for 2015 through 2017 and 13.1 NGSO launches for 2014 through 2013. The chart below shows the combined GSO and NGSO Historical Launches and Launch Forecast. It reflects the three year GSO forecast outlook. The table below shows the number of GSO and NGSO payloads and launches projected from 2015 and 2024.

It is important to distinguish between forecast demand and the number of satellites actually launched. Launch vehicle and satellite programs are complex, and susceptible to delays, which generally makes the forecast demand for launches the upper limit of actual launches in the near-term forecast.

Combined 2015 GSO and NGSO Historical Launches and Launch Forecasts

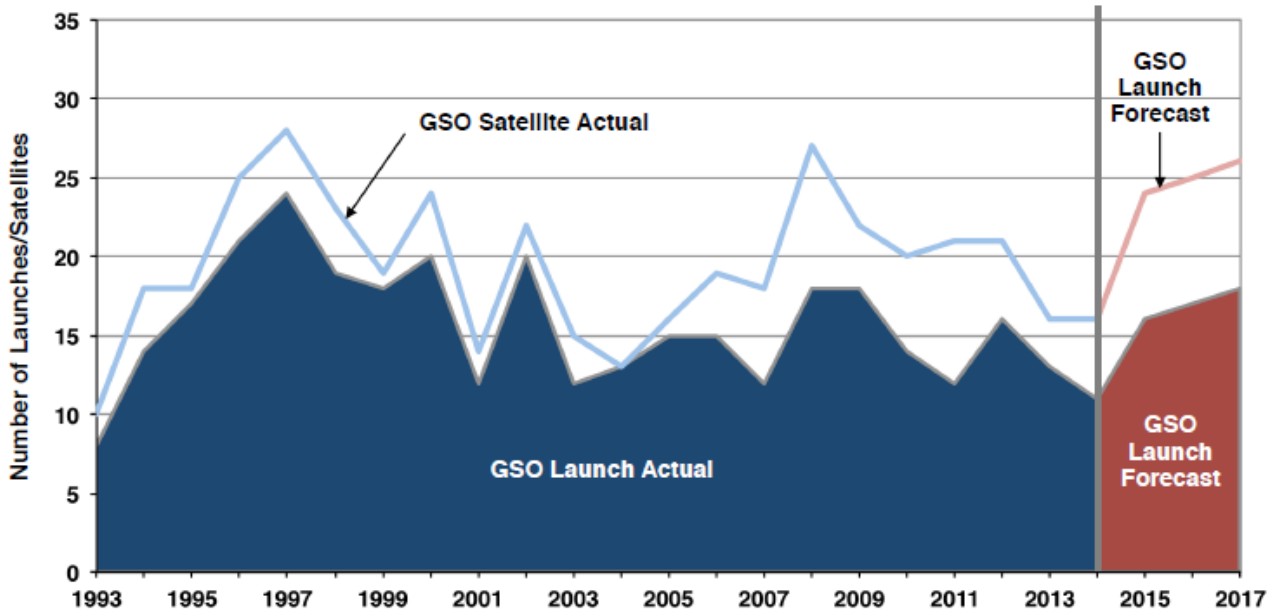


Commercial Space Transportation Payload and Launch Forecasts

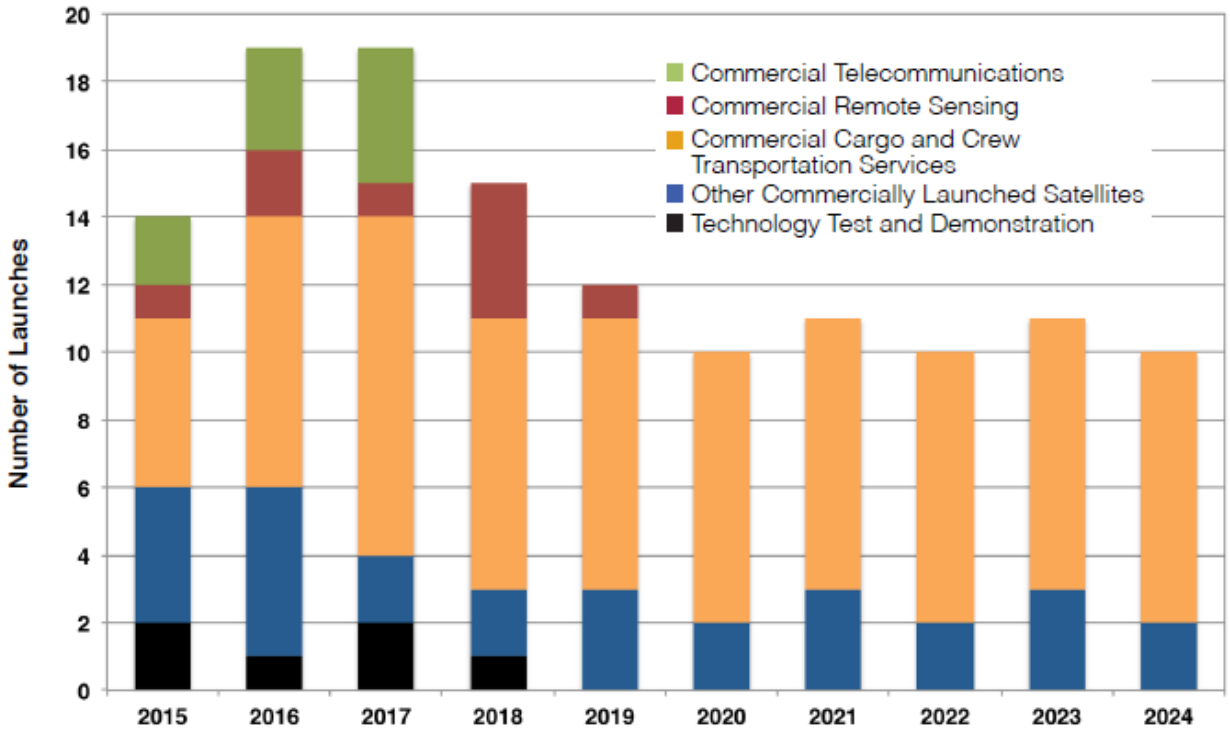
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Avg.
Payloads												
GSO Forecast (COMSTAC)	24	25	26	--	--	--	--	--	--	--	--	25.0*
NGSO Forecast (FAA)	65	136	151	104	92	92	87	86	87	86	986	98.6
Total Payloads	**89**	**161**	**177**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Launches												
GSO Med-to-Heavy	16	17	18	--	--	--	--	--	--	--	--	--
NGSO Med-to-Heavy	13	17	15	13	11	10	10	10	10	10	119	11.9
NGSO Small	1	2	4	2	1	0	1	0	1	0	12	1.2
Total Launches	30	36	37	--	--	--	--	--	--	--	--	--

The GSO market remains stable with a projected demand of 25 satellites per year for the period 2015-2017, up from last year's average for 22.3 for the period 2014-2016. The chart below shows the 2015 GSO Historical Launches and Launch Forecast. Thirty-nine percent of GSO satellites projected to launch from 2015-2017 are in the heaviest mass class (above 5,400 kg). At the same time, seven percent of the satellites in the same period are in the lowest mass class (below 2,500 kg). In 2015, unaddressable launches remained at the comparably high level – launch contracts that were not open to international (including U.S.) competition – as Chinese and Russian government-owned aerospace companies routinely package satellites, launches, and financing together. The satellite services market is generally robust, and new launch vehicle options will affect the dynamics of the launch industry. Operators are cautious about the impact of the economy on their plans but are generally satisfied with satellite and launch vehicle offerings.

2015 GSO Historical Launches and Launch Forecast



Projected NGSO Launches from 2015-2024



The demand for commercial NGSO launches is expected to be at a comparably high level as major NGSO telecommunication constellations are replenished and National Aeronautics and Space Administration (NASA) International Space Station (ISS) commercial crew and cargo resupply missions become more regular. The annual average of NGSO commercial launches is expected to grow from an annual average of seven launches a year over the last ten years to about 11.9 launches annually. From 2015-2024, 986 payloads are projected to launch commercially, driving only 131 launches with multi-manifesting, reflecting an industry planning to launch more micro- and small-class payloads in clusters, instead of increasing the demand for individual launches. The chart above shows the projected NGSO launches for the next ten years. The launches in the next ten years are predominantly commercial launches to the International Space Station, which require medium-to-heavy vehicles. Ninety-one percent of all commercial NGSO launches during the forecast period will launch on medium-to-heavy vehicles. The relatively higher number of small launches is due to Skybox Imaging's plans to use Minotaur C to deploy its constellation and the first test flights of four newly developed commercial small launch vehicles in 2015-2017, to be introduced for commercial launch services in the following years. From 2015-2018 the Report forecasts a number of small commercial satellites to be launched as Iridium, ORBCOMM, Planet Labs, and Skybox all deploy their constellations. The number of these multi-manifested satellites drops off towards the end of the forecast, but the number of launches remains relatively steady as NASA begins its commercial crew program.

For the full study, please visit:

https://www.faa.gov/about/office_org/headquarters_offices/ast/media/Commercial_Space_Transportation_Forecasts_2015.pdf