

LEVERAGING COMMERCIAL SPACE FOR NATIONAL SECURITY

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INTRODUCTION

India's space economy is set to grow from \$8.4 billion (valued in 2022) to \$44 billion by 2033, as expressed by Honourable Union Minister of State for Science and Technology Jitendra Singh during the India Mobile Congress 2025.¹ Ever since India opened the space sector for private and institutional investments, there has been a spurt of entrepreneurial activity and growth of startups. Today, there are more than 300 startup companies in the space sector that are taking advantage of the government's liberal policies to further their entrepreneurial aspirations, and contributing to the Indian space economy. The Department of Space, Indian Space Research Organisation (ISRO), Indian National Space Programme and Authorisation Centre (IN-SPACE) and NewSpace India Limited (NSIL) are providing the necessary support in terms of policy formulation, government funding, and supervision of activities of the commercial space companies. The startups

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1. "India's Space Economy Set To Touch \$44 Billion By 2033: Jitendra Singh At India Mobile Congress 2025", <https://ddnews.gov.in/en/indias-space-economy-set-to-touch-44-billion-by-2033-jitendra-singh-at-india-mobile-congress-2025/>, 8 October 2025. Accessed on November 15, 2025.

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on their part are enthusiastic about their products and are searching for their place in the sun. In the meanwhile, in the Indian context, the national security space has been the responsibility of ISRO that provides the necessary services that the Service Headquarters (HQ) and other agencies of the government need or demand. All the requirements of space

services and products, from the strategic to the tactical level, are provided by ISRO or sourced from friendly foreign countries or from reliable foreign private companies. Sourcing our critical information and intelligence requirements from foreign service providers or foreign countries is a major lacuna in that during periods of hostilities there could be a supply chain disruption. The Ukraine-Russia War is an example. The Starlink satellite service to the Ukraine-Russia front, on which the Ukrainians depended heavily for intelligence on Russian troop dispositions, was curtailed in September 2022.² Although the reason for this was never revealed, it could be because Russia objected and threatened that Starlink's satellites would be legitimate targets if it continued the effort. SpaceX also said in 2023 that it had taken unspecified steps to prevent Ukraine from using Starlink for certain activities, including drone attacks. "Our intent was never to have them use it for offensive purposes," Gwynne Shotwell, the company's president, said at a conference in Washington in February of that year. "There are things that we can do, and have done" to prevent it, she added, without providing further details.³ Such interruptions could result in non-availability of critical information and intelligence for strategising, planning, targeting and damage assessments if India depends on foreign countries or service providers, however friendly they may be. Indian leaders are well

2. "Musk Ordered Shutdown of Starlink Satellite Service As Ukraine Retook Territory From Russia", <https://ddnews.gov.in/en/musk-ordered-shutdown-of-starlink-satellite-service-as-ukraine-retook-territory-from-russia/> July 26, 2025. Accessed on November 15, 2025.

3. Ibid.

aware that geopolitical wheeling-dealing will always be an issue that India would need to factor in at times of hostilities, as evident from our experience during the 1971 Indo-Pak War.⁴ However, with the new space policy in place, with norms, guidelines and principles outlined; and the government having opened the space sector for up to 100 per cent Foreign Direct Investment (FDI) under the automatic route in some specific areas, and 74 per cent/49 per cent in the rest of the areas of the space industry⁵, and set aside financial allocations for stimulating startups with up to 60 per cent funding⁶,

India is at the cusp of revolutionising the commercial space sector. This has the potential to free India from dependence on foreign service providers and friendly foreign countries while providing an opportunity for the national security space to tap into the technological advancements and innovative commercial products available in the commercial sector. How do we leverage this potential for enhancing our national security space?

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SPACE SECTOR IN INDIA

The origin and development of the space sector in India, albeit very early when weighed against the economic conditions just 15 years after gaining independence, has a unique characteristic of being more socio-economically

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4. "Role of the United States in the 1971 War: Implications for India-US Relations", *Journal of Defence Studies*, vol. 15, issue 4 (Manohar Parrikar Institute for Defence Studies and Analyses), <https://www.idsa.in/publisher/journal-of-defence-studies/role-of-the-united-states-in-the-1971-war-implications-for-india-us-relations>. Accessed on November 15, 2025.
 5. "Cabinet Approves Amendment in the Foreign Direct Investment (FDI) Policy on Space Sector", Ministry of Commerce and Industry, February 21, 2024, PIB, Delhi, <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2007876>. Accessed on November 15, 2025.
 6. Gyan Vardhan, "Indian Govt Announces Rs 1,000 Cr Fund to Pump Space Sector Startups", March 26, 2025, <https://entrackr.com/snippets/indian-govt-announces-1000-cr-fund-to-pump-space-sector-startups-8891800>. Accessed on November 15, 2025.

oriented as opposed to national security or military oriented right from the beginning, thanks to the vision of the political leaders and scientists like Dr Vikram Sarabhai and Dr Homi Bhabha who took the lead to establish India's space programme. Space exploration and exploitation were deemed to provide solutions to India's socio-economic problems, which provided great advantage during the initial period of development of space research in India in terms of continued funding from the government, non-partisan cooperation with other space agencies, and the recognition amongst the policymakers and the academic environment that the Indian space sector needed to be nurtured, supported and developed as a core scientific sector to help India progress socio-economically. The civilian space programme resonated well with the United Nations' (UN's) initiative that proposed that space related activities be for peaceful purposes for the benefit of all humankind to avoid the new domain of the human endeavour falling prey to the Cold War rivalry between the US and the Soviets. It also facilitated technical cooperation on space exploration with like-minded nations which helped the Indian space sector to mature rapidly into the league of a very few spacefaring nations that had the capability to launch their own satellites. The civilian outlook, with socio-economic orientation, had two significant impacts on India's space programme. First, it facilitated cooperation and collaboration with other leading spacefaring nations of that period in a bi-partisan way which helped the initial establishment and progress of the Indian space programme; and, second, more significantly from the point of view of the Indian military establishments, the Indian space programme consciously avoided any involvement with the defence forces, or a national security oriented programme, to continue to be seen as a UN advocated space programme for peaceful purposes. Until very recently, the space sector was a government funded sector with the output being utilised by the government and civilian organisations to provide services for the benefit of the people through public sector undertakings and government agencies. "India's space agency has significantly impacted the daily lives of ordinary citizens, far beyond its space missions. Through the development

and deployment of various satellite technologies and their spin-offs, ISRO has seamlessly integrated space-based solutions into numerous aspects of modern life, contributing to everything from communication to disaster management.”⁷ The national security agencies, intelligence agencies and defence forces have also availed of the goods, products and services of the Indian space programme for their utilisation.

COMMERCIALISATION OF SPACE IN INDIA

Commercial exploitation of space products, goods and services evolved as a natural process once the advantages of utilising space for providing certain services like communications, Earth observation, remote sensing, weather monitoring and direct-to-home entertainment were realised. To enhance the commercial aspect of India’s space programme, a commercial arm, the ANTRIX Corporation Ltd was established in 1992 as a space Public Sector Undertaking (PSU), a wholly owned Government of India company, under the Department of Space (DoS), “for promotion and commercial exploitation of space products, technical consultancy services and transfer of technologies developed by ISRO, and to facilitate development of space related industrial capabilities in India”.⁸ In 1997, the DoS put out a framework for satellite communication in India.⁹ This framework is the first policy document that was permitted to “authorise INSAT (Indian National Satellite System) capacity to be leased to non-government (Indian

7. The Hindu Visual Story Team, “India’s Space Journey”, <https://www.thehindu.com/infographics/2025-07-25/indias-space-journey/index.html>. Accessed on November 13, 2025.

8. ANTRIX Corporation Limited, <https://www.antrix.co.in/Aboutus>. Accessed on November 15, 2025.

9. “The fundamental aim of the Policy Framework for Satellite Communications in India approved by the Cabinet is to develop a healthy and thriving communications satellite and ground equipment industry as well as satellite communications service industry in India. Also, use and further development of the capabilities built in India in the area of satellites, launch vehicles and ground equipment design, and sustaining these capabilities is an equally important aim. Making available the infrastructure built through INSAT to a larger segment of the economy and population is another cornerstone of the policy. Encouraging the private sector investment in the space industry in India and attracting foreign investments in this area are other specific goals. The norms, guidelines and procedures have been evolved so as to help reach these aims and goals.” “A Policy Framework for Satellite Communication in India”, <https://ispa.space/assets/pdf/policies/indian/policies/policy-framework-fo-satellite-communication-in-india-1997.pdf>

and foreign) parties following certain well defined norms; and allowing Indian private parties to operate within India using both Indian satellites and foreign satellites, albeit with due preference for Indian satellites.”¹⁰ The basic aim of the framework was to commercialise space services and products by opening the space sector, which hitherto had been a government funded enterprise, to private investments, cautiously, without letting foreign investors outdo the Indian counterparts, and, thus, losing control over the very sensitive space sector as well as the lucrative satellite communications industry. TV uplinking and direct-to-home TV broadcasting through Indian satellites became possible, opening up the entire entertainment industry for private investments. As part of commercialisation of space products, ISRO commenced providing satellite launch services for customers from 1999. “After the first Remote Sensing Data Policy of 2001 which was basically domestically oriented”¹¹, as a further step towards commercialising the data acquisition capability, “in 2011, the government enacted the Remote Sensing Data Policy, 2011 (RSDP, 2011) containing modalities for managing and/or permitting the acquisition/dissemination of remote sensing data in support of developmental activities.”¹² Also, “This policy facilitated operating remote sensing satellites from India, and acquisition and distribution of data within India after necessary permission, with control over the data being exercised by the Government of India for some specific instances. The policy also facilitated acquisition and distribution of remote sensing data in foreign countries through a nodal agency, with the requisite approvals.”¹³ Further, the Indian government put out a draft policy on space-based remote sensing. The “Space-Based Remote Sensing Policy of India (SpaceRS Policy, 2020)” and the associated “Norms, Guidelines and Procedures for Implementation of SpaceRS Policy, 2020 (SpaceRS NGP, 2020) aim at encouraging various

10. Ibid.

11. Malay Adhikari, Ph.D. Research Scholar, Centre for International Legal Studies, Jawaharlal Nehru University, New Delhi, “Remote Sensing: An Analysis of Policy and Law with Reference to India”.

12. “Remote Sensing Data Policy (RSDP, 2011)”, <https://sarinlaw.com/wp-content/uploads/2020/10/Remote-Sensing-Data-Policy.pdf>. Accessed on November 16, 2025.

13. Ibid.

stakeholders in the country to actively participate in space-based remote sensing activities to enhance commercialisation of space technology.”¹⁴ This was another major policy created to commercialise space in line with global trends to enable the Indian space industry to cash in on the global space market. In 2019, the Indian government authorised the creation of “NewSpace India Limited (NSIL), a Central Public Sector Enterprise under the DoS, a wholly owned Government of India company, as the commercial arm of ISRO”¹⁵ with the “primary responsibility of enabling Indian industries to take up high technology space related activities and promotion and commercial exploitation of the products and services emanating from the Indian space programme”¹⁶ and to “act as an aggregator of user requirements and commitments”¹⁷. In June 2020, the Indian government introduced space sector reforms “to encourage the participation of private companies in space activities”¹⁸. The aim was to allow private investments and entrepreneurial activities in the space sector to foster commercialisation of space products, goods and services. “As part of the reforms, the government established the Indian National Space Promotion and Authorisation Centre (IN-SPACe) “to permit Non-Governmental Private Entities (NGPEs) to carry out space activities through it.”¹⁹

NSIL, IN-SPACE AND INDIAN SPACE POLICY, 2023

NSIL, as the commercial arm of DoS, is mandated to commercialise the space products of ISRO [Polar Satellite Launch Vehicle (PSLV) and Small Satellite Launch Vehicle (SSLV) through the Indian industry], provide launch services and satellite-based services for Indian and global

14. Draft Space-Based Remote Sensing Policy of India, 2020 (SpaceRS Policy, 2020) <https://ispa.space/assets/pdf/policies/indian/policies/draft-space-based-remote-sensing-policy-of-india-2020.pdf>. Accessed on November 15, 2025.

15. NewSpace India Limited, <https://www.nsilindia.co.in>. Accessed on November 16, 2025.

16. NewSpace India Limited (NSIL), <https://www.isro.gov.in/NSIL.html>. Accessed on November 16, 2025.

17. “Opening Up Indian Space Sector For Private Sector-Reforms”, <https://www.isro.gov.in/Reforms.html>. Accessed on November 16, 2025.

18. Ibid.

19. Ibid.

To complete the regulatory framework to facilitate a thriving commercial space ecosystem, in 2023, the government enacted the Indian Space Policy, 2023, as the penultimate step in the space sector reforms.

markets; and manufacture satellites, associated systems and subsystems, and build ground infrastructure with the technical support of ISRO.²⁰ IN-Space, on the other hand, is the promoter of the Indian space ecosystem to contribute to the Indian space economy; an enabler to nurture the NGPEs to accomplish their ventures in the space sector; an authoriser of all space operations originating from the country; and the supervisor on behalf of the government to oversee all space activities in the country.²¹ To complete the regulatory framework to facilitate a thriving commercial space ecosystem, in 2023, the government enacted the Indian Space Policy, 2023, as the penultimate step in the space sector reforms. The policy vision was to “augment space capabilities; enable, encourage and develop a flourishing commercial presence in space; use space as a driver of technology development and derive benefits in allied areas; pursue international relations; and create an ecosystem for effective implementation of space applications among all stakeholders for the nation’s socio-economic development and security, protection of the environment and lives, pursuing peaceful exploration of outer space, stimulation of public awareness and scientific quest”²². What had till then been restricted to the public sector undertakings and government agencies as a policy and practice, due to the large funding required for space activities, was now available to private sector enterprises, “opening the doors for enhanced participation of NGEs (Non-Government Enterprises) in carrying out end-to-end activities in the space domain and with an aim to provide them a level playing field”²³. The policy, however, retains the socio-economic

20. Ibid., <https://www.nsilindia.co.in>

21. Indian National Space Promotion and Authorisation Centre, https://www.inspace.gov.in/inspace?id=inspace_index. Accessed on November 16, 2025.

22. Indian Space Policy, 2023, https://www.isro.gov.in/media_isro/pdf/IndianSpacePolicy2023.pdf

23. Ibid.

characteristics, and expects the private sector to reap the benefits of a whole new commercialised space programme to help the people by providing them avenues for innovative applications of space products and services, increased employment opportunities, specialised education, and entrepreneurial activities. The policy expects the Indian space startup ecosystem supported by the vast talent pool of STEM (Science, Technology, Engineering, and Mathematics) educated young minds, to thrive with the right kind of incentives and rewards. The monopoly of ISRO, and ANTRIX, the only space sector public sector undertaking, which was considered an impediment to the growth of the space economy was effectively removed. The policy mandates “the government to focus on R&D (Research and Development) to sustain the space programme; deliver public goods and services as per national priorities; a regulatory framework for a level playing field for NGEs; promote education and innovation, and support for startups; and overall technology development, nurture scientific temperament and awareness”²⁴. The policy also has provision to “provide end-to-end services for safe operations and maintenance in space, and to engage in the commercial recovery of an asteroid resource or a space resource.”²⁵ The policy establishes “IN-SPACE as an autonomous government organization, mandated to promote, hand-hold, guide and authorize space activities in the country”²⁶. NewSpace India Limited, the commercial arm of the Department of Space has been given the responsibility of “commercializing space technologies created out of public expenditure, procure assets from the private or public sector; and service the space-based

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24. Ibid.

25. Ibid.

26. Ibid.

needs of the government or NGEs on sound commercial principles”²⁷. The Department of Space has also been given the responsibility “to oversee space activities; provide policy directives to stakeholders; international cooperation in space awareness data and humanitarian assistance; representing in relevant international organizations; pursue international commitments towards debris mitigation and sustainable development goals; and coordination in the area of space governance and programmes. In addition, creating dispute resolution mechanisms to resolve disputes arising out of space activity is their mandate, too.”²⁸

LEVERAGING COMMERCIAL SPACE FOR NATIONAL SECURITY REQUIREMENTS

In 2024, the US Department of Defence (DoD) released a ‘Commercial Space Integration Strategy’. In the same year, during the North Atlantic Treaty Organisation (NATO) Summit in Washington, DC, the NATO members also evinced interest in tapping into these commercial space capabilities and integrating these into their alliance’s space capabilities. On February 13, 2025, the allied defence ministers endorsed the NATO Commercial Space Strategy. The basic reason for these two actions was the same: to leverage the technological advancements and developments in the commercial space for defence and security. This has two benefits. One, it provides access to the high-end technology and developments in the commercial sector that continuously strive to explore new avenues of business, innovate and improve to be commercially competitive and relevant; and, second, it reduces the burden of acquiring, owning and operating bespoke capabilities, thus, duplicating what is available commercially, by the inherently dual use capability of space assets, thus, reducing the strain on the budget and the operators. An additional benefit is that by integrating the commercial space into the national security requirements, capabilities can be distributed across many systems between the commercial assets and the government’s, which

27. Ibid.

28. Ibid.

would provide built-in redundancy, presenting multiple targets to address, as defence against any threats during hostilities. According to the US DoD “The commercial space sector’s innovative capabilities, scalable production, and rapid technology refresh rates provide pathways to enhance the resilience of national security space architectures and strengthen deterrence. Such integration will help deny adversaries the benefits of attacks against national security space systems and contribute to a safe, secure, stable, and sustainable space domain.”²⁹ According to NATO, “The Commercial Space Strategy aims to strengthen the Alliance’s relationship with commercial space partners and improve its ability to leverage the growing array of commercial space services to meet and inform NATO operational and defence planning requirements in times of peace, crisis and conflict. The strategy will support the implementation of NATO’s Overarching Space Policy by setting out clear priorities to enable improvements in cooperation with the commercial space sector in order to create increased complementary capabilities, capacities, and resilience for the Alliance.”³⁰ The US DoD feels that “this integration will help maintain the technological edge.”³¹ There are, however, risks and challenges involved in integrating the commercial space into the national security space: the commercial asset itself becoming vulnerable to enemy action of cyber attacks or interference; reliance on a commercial asset or capability as a sole provider of capability or overreliance on a single commercial service provider; financial risk to the commercial operator; requirement of the commercial operator to meet higher standards of safety and security, driving up the cost of the venture; integration that might affect the commercial operator’s business model and restrict viability in the international market, are some of the risks. These risks are not insurmountable, and where required, certain risks can be mitigated or accepted if found worth the effort.

29. “Commercial Space Integration Strategy, 2024”, US Department of Defence, <https://media.defense.gov/2024/Apr/02/2003427610/-1/-1/1/2024-DOD-COMMERCIAL-SPACE-INTEGRATION-STRATEGY.PDF>

30. “NATO Commercial Space Strategy”, North Atlantic Treaty Organisations, February 13, 2025, https://www.nato.int/cps/en/natohq/official_texts_236520.htm

31. n. 29.

PROPOSED WAY FORWARD

The Indian government has provided all that is required to facilitate a vibrant space economy. There are adequate enthusiastic and qualified people who want to contribute and avail of the benefits of the ecosystem that has been created. “Over 300 space startups have emerged in just five years, making India the world’s fifth-largest space startup ecosystem.”³² The only thing that the government cannot assure is a market for their products other than assured or preferential contracts in government departments and agencies. The defence forces, para-military forces, armed forces, police forces, national security apparatus and intelligence agencies constitute a large market for space-based products, goods and services, especially those produced within the country. Of these, the defence forces, national security apparatus and intelligence agencies are the most significant, that require niche, secure, assured and reliable services and products at any time and all the time. According to ISRO, “In order to enhance utilisation and maximise benefits from the space assets, it is proposed to change the approach from ‘Supply-Based Model’ to ‘Demand-Based Model’. NewSpace India Limited (NSIL) will act as the aggregator of the user requirements and obtain commitments.”³³ The government has already mandated that the space sector must be ‘demand driven’ and not ‘supply driven’ like in the earlier days when ISRO was the only source and had the monopoly to supply only what it produced or obtained. As far as the sensitive customers like the defence forces are concerned, for the industry to be demand driven, it needs to be made aware of what capability it is looking for, what the supplier quality requirements are, what the standard protocols for communication with systems or equipment already in place are, the need for ruggedness of products, resilience of services, quality assurance and control, the requirement of enhanced cyber and information security protocols and standards, any conditions for sale to other customers within and outside the country, the need for prioritisation of Services customers over commercial

32. n. 1.

33. n. 17.

clients, system specific environmental condition requirements, the scale of purchases, the contracting procedures, the supply chain mechanisms, the after-sale product support, the need for upgrades, maintenance support and training, etc. Like NATO, an agency needs to be put in place to coordinate these aspects with the industry.³⁴ It ought to be an inter-ministerial agency between the DoS and Ministry of Defence (MoD), with representatives from industry that can support this effort by fast-tracking procedures, clearances and contracting. The agency should act a single window for business processes and should facilitate faster transactions, and not introduce another layer of bureaucracy. It would also help in standardisation of protocols across all the stakeholders within the MoD and the participating industries. Contract execution on time, complete fulfilment of the terms of contract, and performance as per contract are the weak areas in the Indian context. Added to these are the lengthy legal procedures involved in the case of litigation. Flexible contracting and financing terms to assure faster contracting, and, if required, termination of contract, for non-performance and non-delivery of services, need to be factored in. Freedom to choose the best in the market even during the period of contracting by introducing regular comparative performance evaluation must be a feature of the contracts. Arbitration procedures, penalty clauses, and liability clauses need to be a part of all negotiations. Non-availability or non-performance during a crisis or conflict is not negotiable and, therefore, it needs to be addressed on those terms. Most importantly, national security and the secrecy associated with it must not become an impediment to the successful implementation of commercial space integration and/or the success of the commercial entity in its business. The companies need to have confidence in the mechanism, as much as

34. "In February 2024, NATO launched a strategic dialogue with the commercial space sector featuring a series of events, conferences and workshops and created 'NIAG-SPACENET' - a commercial space group under the NATO Industrial Advisory Group (NIAG). Over the course of several months, NIAG-SPACENET collected commercial perspectives from across 300 space companies and outlined a number of challenges in its relationship with NATO. Industry has highlighted the great potential of increased commercial integration and stressed the importance of establishing a space industry interface at NATO, developing flexible and streamlined contracting approaches and enabling frequent commercial participation in training and exercises." n. 30.

Interoperability between the forces, and the ability to plug and play by the commercial entities at short notice for emergent requirements should also be a part of the open-ended architecture of the integration.

the mechanism having confidence in the commercial players. The parochial way of treating all those not in uniform to be outsiders requiring a different treatment would have to change. Other than those that are critical and for time-sensitive actions as far as national security is concerned, the practice of owning or controlling bespoke systems or equipment would have to be removed

from the mindset of the defence forces. And the norm of availing goods, products and services from the commercial sector and adapting these to the needs of the defence forces would have to be inculcated. Integration would have to be put in place after evaluating, testing, exercising and wargaming during peace-time under war-like conditions. Interoperability between the forces, and the ability to plug and play by the commercial entities at short notice for emergent requirements should also be a part of the open-ended architecture of the integration. Every country has its own defence strategies, equipment and manpower profile, and associated tactics, techniques and procedures. The commercial space ecosystems are also unique to each country, and at different stages of maturity. Therefore, although there are two templates available in the world for commercial space integration—the US DoD, and NATO—it is felt that it is better that India works out its own methodology and refines it as time goes by.

CONCLUSION

Commercialisation of space has accelerated technology induction and innovativeness in the use of space for newer and better avenues of business. Many nations have enacted national legislations to facilitate commercial exploitation of space and resources on the celestial bodies and the Moon, by governmental and non-governmental entities. The space economy is expected to be a trillion-dollar economy by early next decade, according

to the Space Foundation.³⁵ India also wants to partake in this frenzy³⁶ and has enacted legislations in the form of a space policy and has legislative bodies to promote, authorise and supervise commercial space activities in consonance with the UN mandate. Technological advancements and enhanced commercial activities provide an opportunity for the national security and defence agencies to exploit space for their utilisation where it suits them. Integration of

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commercial space for national security space requirements provides many benefits. It facilitates the latest technology being made available to agencies to utilise it, it reduces the budgetary burden of duplicating the dual use space capability, and it provides space security and redundancy in terms of distributed capability that the enemy might find difficult to deal with. The space sector in India is at the cusp of a revolutionary transformation with the government providing the necessary policy initiatives, organisational structures, and avenues for funding to kickstart the startup ecosystem in the commercial space. The national security agencies and defence forces need to take advantage of this to integrate the commercial space into the national security space. To facilitate this integration, industry needs to be guided to familiarise it with the requirements of the national security

35. "Space Foundation projects the global space economy could cross the \$1 trillion mark as soon as 2032, driven by factors, including the booming commercial market, that is rapidly monetizing advancements in communications and earth observation satellites." *The Space Report 2025 Q2 Highlights Record \$613 Billion Global Space Economy for 2024, Driven by Strong Commercial Sector Growth*, Space Foundation Editorial Team, <https://www.spacefoundation.org/2025/07/22/the-space-report-2025-q2/>. Accessed on November 18, 2025.

36. "At present, the Indian space economy is valued at approximately USD 8.4 billion, constituting a 2% share of the global space market. The government envisions scaling the space economy to USD 44 billion by 2033, including US \$11 billion in exports amounting to 7-8% of the global share." *Empowering India's Space Economy: Rs. 1,000 Crore Venture Capital Fund Initiative for Innovation and Growth*, PIB, Delhi Department of Space, October 25, 2024, <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2068155>. Accessed on November 18, 2025.

space, and towards meeting the necessary standards in quality, security and communication protocols. While there are opportunities, there are also risks and challenges in integrating the commercial space for sensitive national security requirements. There are risks and challenges for the commercial entity too that need to be mitigated or compensated. The space industry requires huge funding for R&D into niche products, as the market for such products is very small and the gestation period for return on investment is generally longer. Therefore, the procurement process needs to be specially curated to provide the industry with the necessary funding during the developmental stage, for risk mitigation against failures, assured or preferential contracts for induction of niche capabilities, and financial and operational risk mitigation. The US DoD and NATO have provided two templates for integration; however, we need to work on our own template to suit our conditions of service. Integration of the commercial space for national security requirements would help the industry to find its niche market while the national security agencies would be free of dependence on foreign countries and agencies for their space-based services and products.