



# Unleashing America's Spaceport Ascendancy

## Rethinking DOD space launch ranges

Brian Miske and Edward Marshall



The landscape of space exploration and utilization is undergoing a transformative shift, driven by unprecedented demand for launches from government, military, and commercial sectors. This surge necessitates a comprehensive reevaluation of the Department of Defense's (DOD) space launch ranges. This article delves into the challenges posed by current infrastructure, the imperative of diversifying launch sites, and the potential for international collaborations, all within the context of modernizing US space capabilities.

## Challenges of current infrastructure

The existing infrastructure at Cape Canaveral and Vandenberg is increasingly strained under the weight of growing launch demands. Cape Canaveral, in particular, is a hub for US launches, with projections indicating a sharp increase in activity. In 2023 alone, two-thirds of all US launches originated from this site, highlighting its critical role in national and commercial space endeavors. A new study recommends investing more than \$2 billion in a major expansion of a port adjacent to Cape Canaveral to meet the growing needs of launch companies there.

However, this concentration of activity brings inherent challenges. The aging equipment and infrastructure at these sites are struggling to keep pace with demand. A sizable portion of range items lacks the necessary spare parts, with 28 percent of components identified as obsolete. This shortage poses a risk to launch readiness and could lead to delays or mission failures if not addressed.

Moreover, the Eastern and Western ranges are vulnerable to natural disasters such as fires, flooding, or mud slides and potential adversarial threats, which could disrupt operations. The Space Force's initiative of Spaceport of the Future making launch ranges more resilient is a step in the right direction, but it requires substantial investment and strategic planning to ensure uninterrupted operations under adverse conditions.



## Necessity of diversifying launch sites

A strategic imperative expanding the United States' launch site portfolio offers several strategic benefits that can enhance its space superiority and counter the competitive threat posed by adversaries' expanding space ambitions. Firstly, by diversifying beyond traditional launch sites like Cape Canaveral Space Force Station and Vandenberg Space Force Base, the US can alleviate congestion and increase launch frequency, thereby improving operational flexibility. This diversification allows for a broader range of mission profiles and reduces the risk of disruptions caused by natural disasters or adversarial actions. Additionally, alternative sites such as Wallops Island and the Pacific Spaceport Complex can provide strategic geographic advantages, enabling launches that are better aligned with specific orbital requirements and defense needs.

Expanding the number of launch sites can contribute to innovation and resilience in the American space sector. By creating a diverse network of spaceports, the US promotes competition and cooperation among private sector launch companies, which accelerates technological progress and drives down costs. Additionally, this approach could pave the way for more public-private partnerships, combining resources and knowledge from both sectors to improve infrastructure and capabilities. Moreover, a dispersed portfolio of launch sites ensures the swift restoration of space capabilities if disruptions such as attacks or failures occur, preserving ongoing operations and deterring adversaries. Having a range of launch facilities bolsters the United States' command of space, strategic advantage, and comprehensive support for its defense-related and commercial space projects.

By diversifying launch sites, it may assist the DOD and United States Transportation Command innovative use of space transportation capabilities to enhance global logistics by developing and testing space-based cargo delivery systems. These efforts aim to enable rapid, point-to-point delivery of cargo and personnel across the globe, potentially reducing transit times to mere minutes, and transform how the DOD and US government respond to emergencies, humanitarian aid missions, and other critical operations.



## Potential for international collaborations

The rising demand for space launches has highlighted the need for a more robust and diversified launch infrastructure, both domestically and globally. In this context, international collaborations emerge as a strategic imperative, offering a multitude of benefits that extend beyond mere capacity augmentation. By fostering partnerships with global allies, the United States can gain access to additional launch sites, shared



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Brian Miske, National Ignition Leader, KPMG

resources, and a wealth of expertise, alleviating the strain on domestic facilities. Moreover, these collaborations provide a platform for knowledge exchange, driving innovation in launch technology, operational efficiency, and safety protocols, positioning the US at the forefront of the rapidly evolving space industry.

Crucially, international collaborations present an opportunity to develop and implement new global standards that can streamline launch protocols and simplify regulatory frameworks. By leveraging the collective expertise and resources of partner nations, the US can spearhead the development of harmonized standards and best practices, facilitating smoother launch operations and reducing bureaucratic hurdles. This standardization not only expedites launch timelines but also fosters a more conducive environment for broader economic models, enabling commercial entities to thrive and contribute to the growth of the space economy. Furthermore, these collaborative efforts strengthen geopolitical alliances, enhancing the United States' strategic positioning in the global space arena and reinforcing its leadership in shaping the future of space exploration and utilization.

## Modernization and future prospects

The US Space Force's "Range of the Future 2028" initiative represents a pivotal step in the modernization of the nation's space launch infrastructure. This comprehensive program aims to overhaul existing facilities, integrate innovative technologies, and transition towards a more agile and resilient launch

model. The DOD's Eastern and Western Ranges will receive approximately \$1 billion for infrastructure projects across future years' defense plan. By upgrading infrastructure and embracing innovations like the Autonomous Flight Safety System (AFSS), the Space Force is poised to revolutionize launch operations, enhancing efficiency, flexibility, and cost-effectiveness.

The adoption of AFSS is particularly transformative, as it reduces reliance on traditional range safety equipment and enables greater launch flexibility. This advanced system allows for real-time monitoring and autonomous termination of a launch vehicle if necessary, streamlining operations and minimizing the need for extensive ground-based infrastructure. By leveraging AFSS, the Space Force has already reduced range system use by approximately 66 percent and by leveraging other emerging technologies, the Space Force can continue to optimize launch cadences, reduce operational costs, and ensure a more responsive and resilient space launch capability.

However, the successful implementation of these modernization efforts hinges on robust policy and funding support. The DOD must prioritize investments in infrastructure upgrades, the development of new launch sites, and the integration of cutting-edge technologies. This commitment to modernization is crucial for the United States to maintain its competitive edge in the global space arena. Additionally, revising statutory and regulatory frameworks to facilitate agile and innovative acquisition processes is imperative, enabling the Space Force to rapidly adapt to evolving technological landscapes and operational requirements.

# Key considerations

Looking at economic development in parallax lens; increased strategic competition and US national security infrastructure. Through active engagement and partnering with different participants, including businesses, municipal authorities, and state administrations, there's potential to support the development of non-DOD spaceports. This effort can lead to economic expansion, advancements in technology, and improve the United States' standing in the space industry as well as the worldwide space market:

## Commercial entities

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- Explore opportunities to establish and operate non-DOD spaceports, leveraging the benefits of reduced congestion and the ability to support diverse mission profiles.
- Invest in the development of cutting-edge launch technologies, such as autonomous flight safety systems, to streamline operations and reduce costs.
- Engage in public-private partnerships with government agencies and academic institutions to drive innovation and share resources for spaceport development.
- Collaborate on regulatory reforms and streamlined licensing processes to facilitate the establishment and operation of commercial spaceports.
- Participate in international collaborations and knowledge-sharing initiatives to contribute to the development of global standards and best practices for launch operations.

## Local governments

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- Assess the feasibility of hosting non-DOD spaceports within their jurisdictions, considering factors such as available land, infrastructure, and community support.
- Develop incentive programs and tax incentives to attract commercial space companies and encourage spaceport development.
- Collaborate with state governments and federal agencies to ensure compliance with safety and environmental regulations during the planning and construction phases of spaceport projects.
- Engage with local communities to address concerns and ensure transparent communication about the potential impacts and benefits of spaceport operations.
- Invest in workforce development programs to cultivate the necessary skills and expertise for spaceport-related jobs.

## State governments

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- Establish state-level policies and regulatory frameworks that support the development of non-DOD spaceports and foster a business-friendly environment for the commercial space industry.
- Allocate funding and resources for infrastructure improvements, such as transportation networks and utility upgrades, to support spaceport operations.
- Partner with academic institutions and research centers to promote space-related education and research, fostering a skilled workforce for the space industry.
- Collaborate with neighboring states and federal agencies to develop regional strategies for spaceport development and ensure seamless integration with national airspace and launch range systems.
- Promote the state's unique advantages, such as favorable weather conditions, low population density, or strategic geographic locations, to attract commercial space companies and spaceport investments.

## Geopolitical perspectives— strategic positioning in space

To outpace growing space threats, US defense and policy decision-makers need to prioritize bolstering resilience and fostering innovation within space operations. The importance placed by the US Space Force on achieving and sustaining space superiority aids in deterring potential foes and preserving order off-planet. Investments in advanced technologies, like dispersed satellite networks, can help cultivate a more robust space structure less susceptible to disruptions. Such measures serve as a deterrent by making enemy targeting efforts more complex, while also aiming to ensure American space assets' functionality during challenging scenarios. Further steps should include upgrading the space infrastructure, highlighted by building new launch facilities, and implementing modern technologies such as AFSS, improving operational adaptability and diminishing dependence on conventional safety equipment. Beyond technological upgrades, solidifying international partnerships is key to enhancing the United States' strategic stance in outer space. Forming alliances and sharing capabilities with trusted partners can improve collective defensive responses against newly materializing threats, presenting a united stance against adversaries. These partnerships could also spark improvements and mutual learning, leading to better launch methods and improved operation management. Additionally, aligning commercial space guidelines with national security needs is vital, ensuring that the expansion of this sector supports the country's broader interests. This encompasses regulation of remote sensing tools and tackling cybersecurity vulnerabilities within space assets. An integrated approach incorporating tech innovation, infrastructural renewal, and global collaboration will enable the US to continue its dominance in space and effectively challenge the evolving space efforts of its adversaries.



**By fostering partnerships with global allies, the United States can gain access to additional launch sites, shared resources, and a wealth of expertise, alleviating the strain on domestic facilities.**

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**Edward Marshall**  
Director, KPMG



## Conclusion

To redefine the US space launch capabilities, we need visionary thinking, commitment, and a willingness to embrace transformative change. As the demand for space access continues to increase due to national security needs and the growing commercial space industry, it is important to envision a future with a strong network of diverse spaceports located strategically across the country. This future can be achieved by collaborating with international partners to develop global standards for launch protocols and fostering a thriving space economy that transcends borders. This requires a concerted and coordinated effort. This future hinges on investing in infrastructure upgrades, integrating cutting-edge technologies like autonomous flight safety systems, and cultivating robust public-private partnerships to propel the United States to the forefront of space innovation and security.

With the intensifying global space race and rapidly advancing adversaries, the US must act decisively to maintain its competitive edge or risk far-reaching consequences for its strategic positioning and its space immanence. The challenges are immense, but the rewards of unlocking a new era of space exploration, economic growth, and solidifying global leadership in this frontier by reimagining the DOD's space launch ranges are immeasurable, limited only by the collective determination to shape the future through human ingenuity.

## Authors



**Brian Miske**  
National Ignition Leader,  
KPMG LLP  
bmiske@kpmg.com



**Edward Marshall**  
Director, Advisory  
KPMG LLP  
edwardmarshall@kpmg.com

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