Hong Kong's Role in Space Commercialisation

Opportunities and Strategic Positioning

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Seminar on the New Space Economy - Breakthroughs and Opportunities

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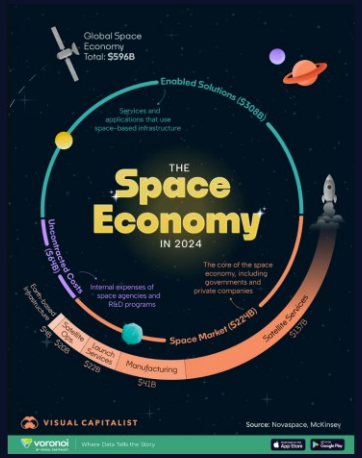
The Global Space Economy



Key Market Segments

Satellite services, ground equipment, satellite manufacturing, and launch services form the core of the commercial space economy, with government space budgets providing additional support.

Market Overview

The global space economy has experienced significant growth, driven by increased commercial activities, technological advancements, and new applications across various industries.

- Global space economy reached **$613 billion** in 2024 (Space Foundation)
- Annual growth rate of **7.8%** since 2020
- Commercial sector constitutes **78%** of total space economy
- Projected to reach **$944 billion** by 2033 (Novaspace)

Satellite Types and Applications

Communication Satellites

Enable global telecommunications, internet connectivity, broadcasting, and mobile services.

- Television and radio broadcasting
- Internet services and mobile networks
- Maritime and aviation communications

Navigation Satellites

Provide positioning, navigation, and timing services worldwide.

- GPS, BeiDou, Galileo, GLONASS systems
- Transportation and precision agriculture

Earth Observation Satellites

Monitor Earth's surface, atmosphere, and oceans for various applications.

- Weather forecasting and climate monitoring
- Disaster management and response
- Urban planning and environmental protection

Internet of Things (IoT) Satellites

Connect remote sensors and devices globally, enabling data collection from anywhere.

- Asset tracking and fleet management
- Remote infrastructure monitoring
- Agricultural and environmental sensing

Scientific Research Satellites

Conduct space-based research and astronomical observations.

- Space telescopes and observatories
- Earth science and space weather monitoring

Orbit Types and Characteristics

Key Orbital Characteristics

Orbit selection impacts satellite performance, coverage, latency, lifespan, and operational costs. Each orbit type offers distinct advantages for specific applications.

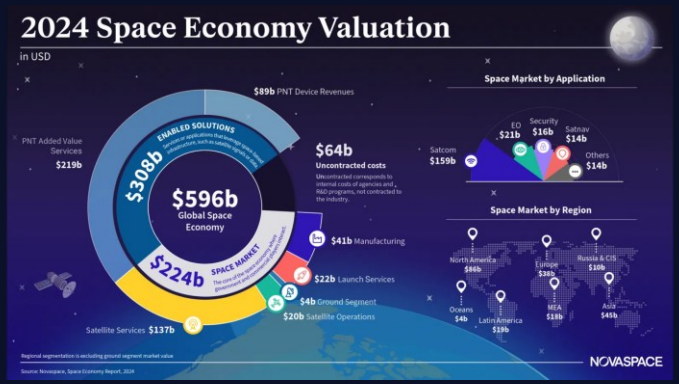
Characteristic	Impact on Operations
Altitude	Determines coverage area, signal strength, and latency
Inclination	Affects geographic coverage and revisit frequency
Period	Time to complete one orbit; impacts operational planning

Parameter	LEO	MEO	GEO
Altitude	350-1,200 km	5,000-20,000 km	**36,000 km**
Latency	**Low** (<60ms)	Medium (80-150ms)	High (~500ms)
Coverage	Small per satellite	Medium	**Large** (semi-global)
Satellites for global coverage	>300	6-12	**3**
Lifespan	3-7 years	10-15 years	**15+ years**
Key applications	Earth observation, IoT, broadband	Navigation, timing	Broadcasting, fixed communications

Emerging Trends

LEO constellations are gaining prominence for low-latency applications, while GEO remains essential for broadcasting and wide-area coverage. Hybrid networks combining multiple orbit types are becoming increasingly common.

Orbit Economics and Operations



Parameter	LEO	MEO	GEO
Launch Cost Range	$5-67M	$20-50M	$70-300M
Cost per kg	$1,200-10,000	$5,000-15,000	$9,000-20,000
Satellite Cost	$0.1-5M (small) $0.4M (Starlink)	$10-50M	$50-400M
Replacement Cycle	5-7 years	10-12 years	15+ years
Ground Infrastructure	Multiple gateways	10-30 stations	Ground Control Infrastructure

Economic Considerations

Orbit selection significantly impacts satellite economics through launch costs, operational lifespan, replacement frequency, and ground infrastructure requirements.

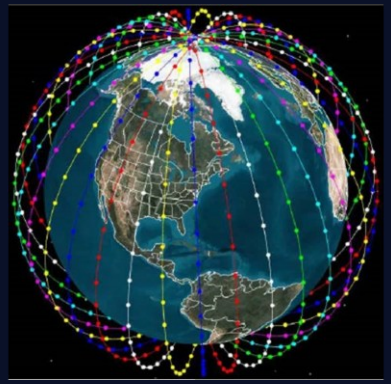
Operational Challenges

Each orbit type presents unique operational challenges, including space debris management, collision avoidance, and end-of-life disposal requirements.

Market Trends

LEO constellations are seeing rapidly decreasing satellite and launch costs, while GEO satellites maintain advantages in longevity and coverage efficiency. Hybrid networks combining multiple orbit types are becoming increasingly common for optimized service delivery.

Key Global Satellite Operators



GEO Satellite Operators

Operator	Founded	Headquarters	Key Services
Intelsat/SES	1964/1985	Luxembourg	Global communications, media
Eutelsat	1977	France	Broadcasting, broadband
AsiaSat	1988	Hong Kong	Asian regional services
APT Satellite	1992	Hong Kong	APAC communications
ChinaSatcom	2009	China	Domestic Chinese services

GEO operators typically focus on broadcasting, fixed communications, and high-throughput data services across large coverage areas with fewer satellites.

LEO Satellite Operators

Operator	Founded	Satellites	Key Services
Starlink (SpaceX)	2019	~9,000	Global broadband
OneWeb	2012	~650	Global broadband
Kuiper (Amazon)	2019	~80	Global broadband
Xing Wang	2022	~40	Chinese broadband
Spacesail	2023	~90	Chinese commercial
Iridium	1997	66	Global voice, IoT

Market Dynamics

LEO operators are rapidly expanding with large constellations focused on low-latency broadband and IoT services, while established GEO operators are adapting with high-throughput satellites and hybrid network strategies.

Strategic competition is intensifying between US, European, and Chinese operators, with increasing government support for domestic space capabilities.

Hong Kong's Established Space Industry

AsiaSat

AS

Founded: 1988

Satellites: 6 in-orbit satellites (AsiaSat 5, 7/8, 6, 9, 4)

Coverage: Asia-Pacific region

Services: Video distribution, DTH, cellular backhaul, enterprise networks, maritime and aeronautical mobility

- First foreign satellite (AsiaSat 1) launched by Chinese Long March 3 Launch Vehicle
- Broadcast support for 8 Olympic Games and 4 Winter Olympic Games
- Carries over 500 international channels reaching 800+ million households

APT Satellite (APStar)

APT

Founded: 1992

Satellites: 6 in-orbit satellites (Apstar 7, 6C/6D/6E, 5C, 9)

Listed: Hong Kong Stock Exchange (Stock Code 1045)

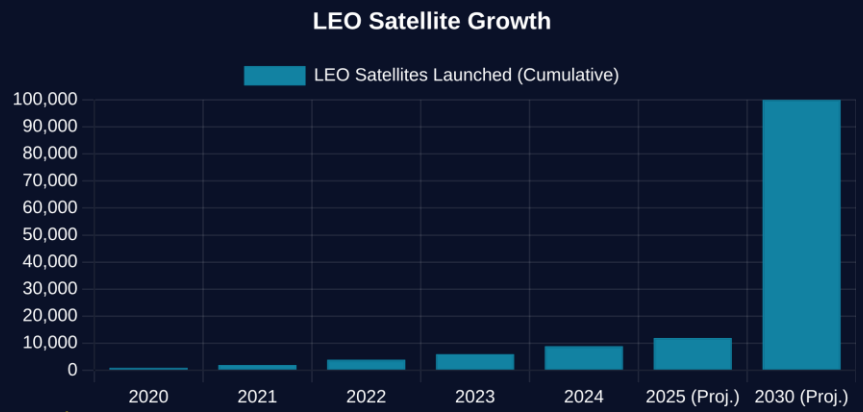
Parent: Subsidiary of China Satellite Communications Co. Ltd.

Hong Kong has been a significant hub for GEO satellite communications for over 30 years, with AsiaSat and APStar playing major roles in providing regional services.

Hong Kong's satellite operators have maintained strong relationships with both Chinese and international partners, serving as a bridge between mainland China and global markets.

Recent developments include new satellite operators like Hong Kong Aerospace Technology Group, which opened a new satellite manufacturing facility in 2023, expanding Hong Kong's space industry capabilities.

LEO Satellite Market Trends



Market Drivers

LEO constellations are experiencing rapid growth driven by decreasing launch costs, miniaturization of satellite technology, and increasing demand for global broadband connectivity and IoT services.

Key LEO Constellation Trends

- **Rapid Deployment:** Starlink has launched ~9,000 satellites since 2019, with plans for 34,400 by 2030
- **Chinese Expansion:** Xing Wang (13,000+ planned) and Spacesail (15,000+ planned) are rapidly developing national LEO constellations. Also, many startups on narrow market segments (sensing, IOT with small constellations).
- **Technology Evolution:** Inter-satellite laser links, phased array antennas, and AI-powered collision avoidance systems are becoming standard
- **Direct-to-Cell:** New satellites enabling direct connectivity to standard smartphones without specialized equipment
- **Challenges:** Space debris concerns, spectrum allocation conflicts, and regulatory hurdles are increasing with constellation density

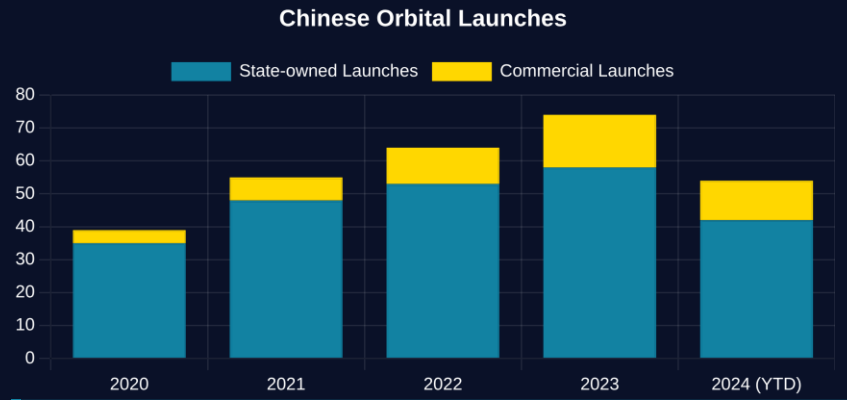
By 2030, LEO constellations are projected to account for over 100,000 satellites, creating new opportunities and challenges for space traffic management and commercial services.

China's Space Industry Capabilities

Satellite Manufacturing Capacity

China has rapidly expanded its satellite manufacturing capabilities with over 58 facilities across the country:

- **37 operational facilities** with combined annual capacity exceeding 2,000 satellites
- **21 facilities under construction or planned** , adding capacity for 2,000+ additional satellites annually
- **Key manufacturing hubs** in Shanghai, Wuhan, Beijing, Tianjin, and emerging facilities in Hainan
- **Notable facilities:** Shanghai Micro-satellite factory (300/year), Geely satellite factory (500/year), Hainan Wenchang super factory (1,000/year)



Launch Vehicle Capabilities

China has developed a comprehensive range of launch vehicles for various mission profiles:

- **State-owned providers:** Long March family (CZ-2/3/4/5/6/7/8/11/12) covering payloads from 500kg to 25 tons
- **Commercial providers:** Galactic Energy, Space Pioneer, Landspace, iSpace, Deep Blue Aerospace with growing capabilities
- **Reusable technology:** Multiple companies developing reusable first stages, with first tests completed in 2023-2024

China's space industry has seen significant commercialisation since 2014, with over 50 commercial space companies established and increasing integration with the global space economy.

Hong Kong's Competitive Advantages

Legal and Regulatory Framework

- Well-established common law system with strong intellectual property protection
- Internationally recognized legal arbitration capabilities for commercial disputes
- Potential to develop specialized space law expertise and arbitration services

International Connectivity

- Strategic position as a bridge between China and international markets
- Strong international business networks and multicultural workforce
- Gateway for Chinese space companies seeking international expansion

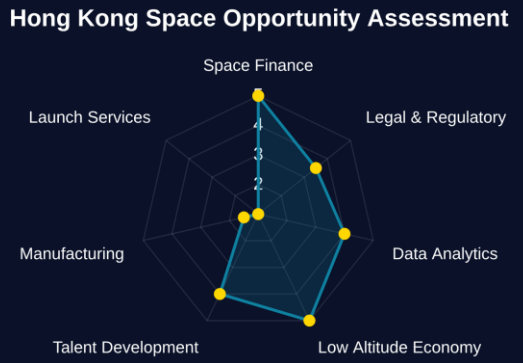
Financial Services

- Global financial center with deep capital markets and investment expertise
- Sophisticated insurance and risk management capabilities
- Experience in Series B+ funding for technology companies
- Potential to develop specialized space insurance and financing products

Current Limitations

- Limited access to space technologies due to export control restrictions
- Insufficient specialized technical talent in space engineering
- Lack of comprehensive government policy framework for space industry
- Limited manufacturing supply chain for space hardware
- High cost of living and business operations compared to mainland cities

Strategic Opportunities for Hong Kong



$ Financial Services

- **Space Insurance:** Develop specialized insurance products for satellites and launches
  Potential: ★★★★★

Legal and Regulatory Services

- **Space Law:** Develop expertise in international space law and arbitration services
  Potential: ★★★☆☆

Data Services

- **Earth Observation Analytics:** Develop value-added services using satellite data
  Potential: ★★★★☆

Low Altitude Economy

- **Urban Air Mobility:** Develop services for drones and air taxis
  Potential: ★★★★★

Strategic Action Plan Overview

A Phased Approach to Space Commercialisation

This strategic roadmap presents a comprehensive 10-year plan for Hong Kong to establish itself as a key player in the global space commercialisation ecosystem, leveraging its unique strengths while developing new capabilities in targeted areas.

Phase 1: Foundation Building (2025-2027)

Establishing policy frameworks, developing financial services and insurance capabilities, creating legal frameworks, and initiating talent development programs.

Phase 2: Capability Building (2027-2030)

Developing data analytics and earth observation services, low altitude economy applications, and expanding international collaboration and market access.

Phase 3: Market Leadership (2030-2035)

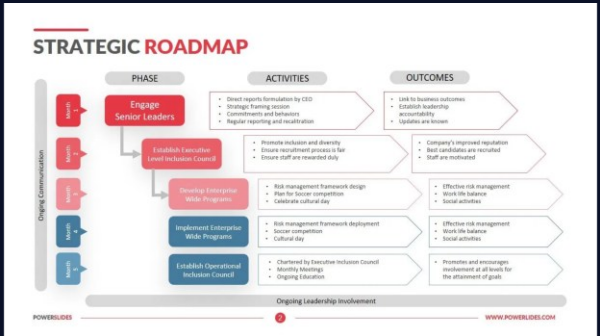
Advancing into high-value global applications establishing global leadership in space finance and investment.

Strategic Focus Areas

The action plan focuses on Hong Kong's competitive advantages:

- Financial services and space insurance
- Legal expertise and regulatory frameworks
- International connectivity and market access
- Data analytics and value-added services
- Low altitude economy applications

Phase 1: Foundation Building (2025-2027)



Establishing the Foundation

Phase 1 focuses on creating the essential policy, financial, legal, and talent frameworks needed to support Hong Kong's space industry development.

Hong Kong Space Industry Office

Dedicated government office to coordinate space industry development, develop policy framework, and create liaison mechanisms with mainland China space agencies.

Timeline: 6 months | Budget: HK$50 million annually

Hong Kong Space Industry Development Strategy

Comprehensive 10-year strategy defining Hong Kong's role in global and regional space value chains with specific targets for industry growth.

Timeline: 12 months | Budget: HK$20 million

Hong Kong Space Finance Hub

Establish Hong Kong as the premier space finance center in Asia by developing specialized financing products, investment funds, and risk assessment frameworks.

Timeline: 18 months | Budget: HK$100 million

Space Insurance Center of Excellence

Develop Hong Kong as a global hub for space insurance through partnerships with major insurers, specialized products, and risk assessment capabilities.

Timeline: 24 months | Budget: HK$80 million

Hong Kong Space Law Center

Establish Hong Kong as a leading center for space law and arbitration with specialized services, legal frameworks, and training programs.

Timeline: 18 months | Budget: HK$30 million

Hong Kong Space Talent Initiative

Build a skilled workforce through space engineering programs, exchange programs, professional certifications, and international talent attraction.

Timeline: 36 months | Budget: HK$200 million

Phase 2: Capability Building (2027-2030)

Building Advanced Capabilities

Phase 2 focuses on developing specialized capabilities in data analytics, earth observation, and the low altitude economy.

Hong Kong Earth Observation Data Center

Establish Hong Kong as a regional hub for satellite data analytics with AI and machine learning capabilities.

Timeline: 36 months | Budget: HK$300 million

Smart City Space Applications

Integrate space technologies into Hong Kong's smart city initiatives through IoT sensors and satellite data.

Timeline: 48 months | Budget: HK$400 million

Hong Kong Low Altitude Economy Zone

Establish Hong Kong as a leader in urban air mobility and drone services with regulatory frameworks and testing facilities.

- Drone delivery services and air taxi transportation

Timeline: 60 months | Budget: HK$500 million

Belt and Road Space Initiative

Position Hong Kong as the gateway for China's space Belt and Road projects by facilitating international expansion.

- Space cooperation agreements with Belt and Road countries

Timeline: Ongoing | Budget: HK$200 million

Phase 3: Market Leadership (2030-2035)

Global Leadership and Advanced Capabilities

Phase 3 focuses on establishing Hong Kong as a global leader in high-value space industry segments, leveraging the foundations built in earlier phases.

Hong Kong Space Component Manufacturing

Develop high-value space component manufacturing capabilities through partnerships with mainland manufacturers, focusing on specialized components and quality assurance.

Timeline: 72 months | Budget: HK$800 million

Hong Kong Space Port Development

Establish Hong Kong as a regional hub for space tourism and commercial launches with infrastructure for suborbital flights and satellite deployment services. Timeline: 120 months | Budget: HK$2 billion

Space Investment and IPO Hub

Position Hong Kong as the premier destination for space company listings and investment with specialized investment banking capabilities and investor education.

Target: 10 space company IPOs by 2030

International Space Commerce Association

Establish a Hong Kong-led initiative to develop industry standards and share best practices among space companies, financial institutions, and legal firms.

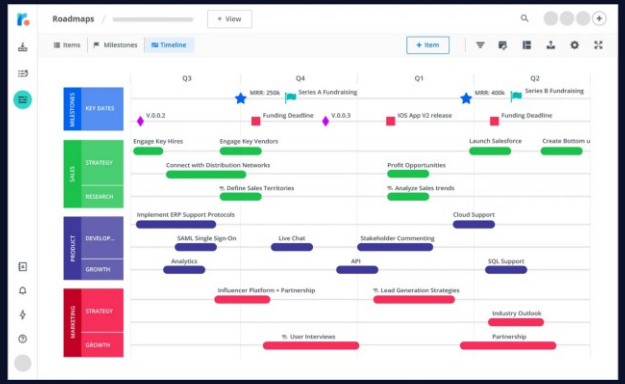
Target: 100+ member organizations globally

Expected Outcomes by 2035

Economic Impact

- GDP Contribution: HK$50 billion (2% of GDP)
- Employment: 50,000 direct jobs, 100,000 indirect jobs
- Export Revenue: HK$20 billion annually

Implementation Framework



Governance Structure

- **Hong Kong Space Development Council** - Chaired by Chief Executive with representatives from government, industry, academia, and international partners
- **Space Industry Advisory Board** - International space industry experts providing strategic advice and industry insights

Funding Mechanisms

- **Government Investment** - HK$5 billion over 10 years for infrastructure, talent development, and regulatory framework
- **Private Sector Co-investment** - Target HK$10 billion through tax incentives, co-investment funds, and loan guarantees

Risk Management

- **Technology Risks** - Diversified technology portfolio and international partnerships
- **Market Risks** - Multiple market segments and flexible business models
- **Regulatory Risks** - Proactive engagement with international regulatory bodies
- **Geopolitical Risks** - Balanced international relationships and neutral positioning

Success Metrics and KPIs

- **Economic Impact** - GDP contribution of HK$50 billion by 2035, 50,000 direct jobs, HK$20 billion export revenue
- **Industry Development** - 500 space-related companies headquartered in Hong Kong, 200 space technology startups
- **International Recognition** - Top 5 global space finance center, 20% of Asia-Pacific space insurance market

Priority Action Items (Next 12 Months)


Action plan implementation steps

Immediate Government Actions

Critical initiatives to be launched by the Hong Kong government within the next 12 months to establish the foundation for space industry development.

Establish Space Industry Task Force

Form an inter-bureau task force led by the Innovation and Technology Bureau with representatives from Financial Services, Commerce, and Education bureaus to coordinate initial policy development.

Space Industry Stakeholder Consultation

Launch comprehensive consultation with local and international space companies, financial institutions, and academic institutions to assess industry needs and partnership opportunities.

Legislative Framework Development

Begin drafting space activities licensing regulations, satellite data privacy and security frameworks, and space insurance regulations in compliance with international space law.

Industry Engagement Initiatives

Key industry-led initiatives to be launched within the next 12 months to catalyze private sector participation in the space economy.

Month 3

Space Finance Working Group

Establish working group with HKMA, SFC, major banks, and insurance companies to develop space-specific financial products, risk assessment frameworks, and regulatory guidelines.

Month 6

Space Technology Innovation Hub

Launch incubation program at Hong Kong Science Park or Cyberport with testing facilities, technical expertise, mentorship, and funding facilitation for space startups.

Month 9

International Partnership Development

Initiate discussions with key international space agencies and commercial companies for technology transfer, joint ventures, and market access opportunities.

Month 12

Hong Kong Space Industry Association

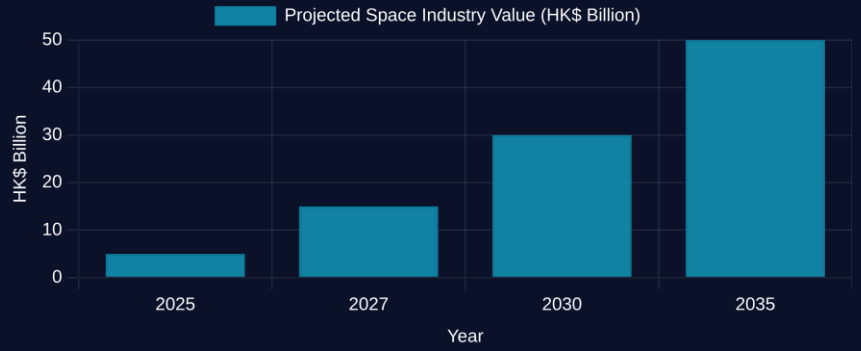
Establish industry association to coordinate private sector efforts, advocate for policy support, and facilitate networking and knowledge sharing.

Economic Impact and Benefits

Action	Priority	Target Date	Cost	Funding Sources
Remove invasive species and stabilize shoreline at Village Park	High	Ongoing	Varies	Village funds, volunteers, partners
Develop new public plaza in main street revitalization area	Medium	2012-2020	$423,735	TIF funds, Park impact fees, Land and water conservation fund, Stewardship grant
Install educational signs at Tamarack Preserve	Medium	2014	$500/sign	Recreational trails program, Village funds, Non-profit groups
Develop Menomonee River Parkway Trail north of Arthur Avenue	Low	None	$18-$25/lineal foot	Recreational trails program, Village funds

Graphic adapted from Village of Menomonee Falls 2011 - 2015 Comprehensive Outdoor Recreation Plan. www.menomonee-falls.org/index.aspx?nid=100

Hong Kong Space Industry Growth Projection



Economic Growth

- GDP Contribution: **HK$50 billion by 2035 (2% of GDP)**
- Export Revenue: **HK$20 billion annually**

Employment Creation

- Direct Jobs: **50,000 high-skilled positions**
- Indirect Jobs: **100,000 across supporting industries**
- Average Salary: **50% higher than city average**

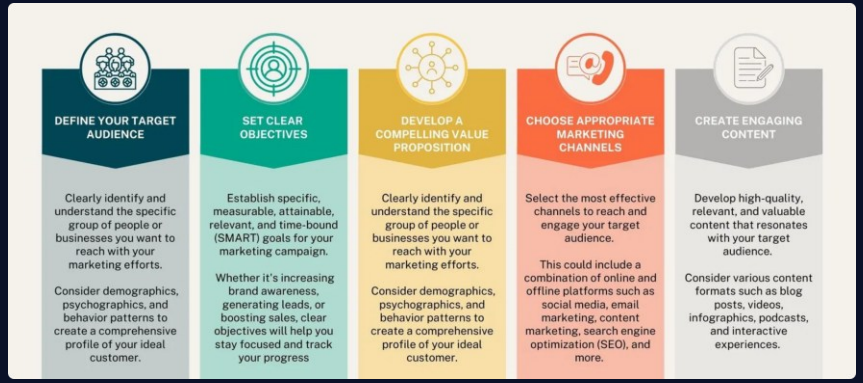
Industry Development

- Companies: **500 space-related companies headquartered in Hong Kong**
- Startups: **200 space technology startups**
- Unicorns: **5 space industry unicorns valued over US$1 billion**

International Recognition

- Global Rankings: **Top 5 global space finance center**
- Market Share: **20% of Asia-Pacific space insurance market**

The Future of Hong Kong's Space Industry Starts Now



Our Vision

"To establish Hong Kong as the 'Space Finance Capital of Asia' by 2035, serving as a bridge between China's space ambitions and the international space community."

The Window of Opportunity

- The global space economy is projected to reach US$1.8 trillion by 2035
- China's space sector is growing at 30% annually with increasing commercialisation
- Other regions are rapidly developing space industry strategies and capabilities
- Hong Kong must act now to secure its position in this high-growth sector

Government Actions

- **Immediate:** Establish Space Industry Task Force within 2025
- **Short-term:** Develop comprehensive space industry policy framework
- **Medium-term:** Commit HK$5 billion in government investment over 10 years

Industry Actions

- **Immediate:** Form Space Industry Association to coordinate private sector efforts
- **Short-term:** Develop space finance and insurance products and services
- **Medium-term:** Mobilize HK$10 billion in private investment for space ventures

Academia Actions

- **Immediate:** Develop space-related academic programs for 2025 launch
- **Short-term:** Establish research partnerships with international space institutions
- **Medium-term:** Create Hong Kong Space Research Institute as a center of excellence