

CLICK TO KNOW MORE









Definition: LEO PNT, or Low Earth Orbit Positioning, Navigation, and Timing, refers to the use of satellites in low earth orbit to provide accurate positioning, navigation, and timing information.





Challenges Addressed: LEO PNT addresses the vulnerabilities of existing Global Navigation Satellite Systems (GNSS) in medium earth orbit, such as signal impairments and interferences.



NSSTC Role: The National Space Science & Technology Center (NSSTC) is at the forefront of developing LEO PNT solutions to enhance the robustness and accuracy of satellite navigation.



Introduction

Global Players





GNSS & Transportation Global Market

GNSS Market:

- The global GNSS market was estimated to be around \$22-24 billion in 2023.
- Projected growth rates remained consistent, with a forecasted CAGR of approximately 7-9% through 2026.
- Key factors driving the growth of the GNSS market include increasing demand for precise positioning and navigation in various industries such as transportation, agriculture, and construction.

Transportation Market:

- The global transportation market was estimated to be approximately \$8.8-9.2 trillion in 2023.
- Growth rates varied by sector, with road transportation being the largest segment, followed by air and maritime transportation.
- Key factors driving the growth of the transportation market include urbanization, population growth, increasing trade activities, and technological advancements in transportation infrastructure and vehicles.

Autonomous Vehicles Market:

- The global autonomous vehicles market likely reached around \$60-65 billion in 2023.
- The growth rate remained robust, with a projected CAGR of about 35-40% through 2026.
- Factors driving the growth of the autonomous vehicles market include advancements in sensor technologies, supportive government regulations, and increasing investments by automotive manufacturers and technology companies.



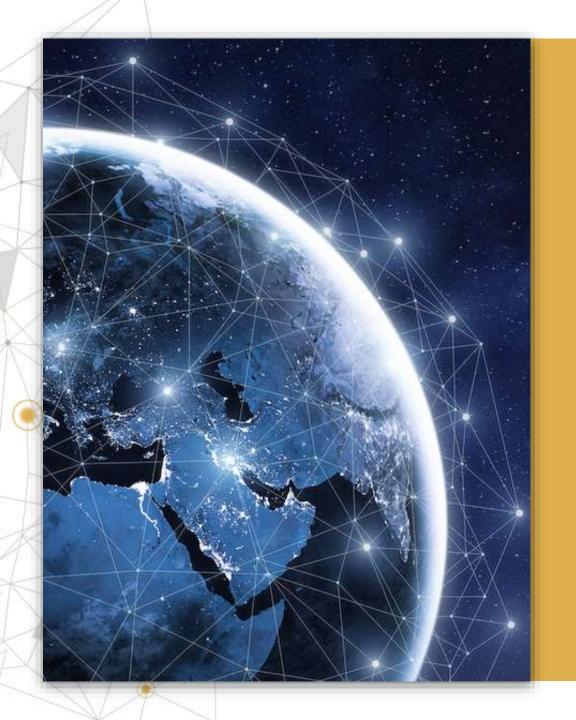
Importance of LEO PNT

Resilience: LEO PNT offers resilience against natural phenomena impairments and interferences, ensuring continuous and reliable positioning and timing information.

Applications: The applications of LEO PNT extend to various sectors including transportation, telecoms, and emergency services, contributing to the overall safety and efficiency of operations.

Future Prospects: Anticipating the future of satellite navigation, LEO PNT is poised to revolutionize the way we navigate and interact with the world around us





NSSTC LEO PNT Mission

Tech-Demo CubeSat

Mini-Constellation (6-10 Sats)

Prototype
Satellite
(MicroSat)

Deployment of the Full Solution



GNSS From LEO

What is the added value?

Resilient Signals

LEO PNT assures robust signals, mitigating the vulnerabilities of existing GNSS and enhancing safety measures for air, land, and maritime transportation.

Real-time Accuracy

The real-time accuracy of LEO PNT facilitates precise navigation and timing, contributing to safer and more efficient transportation operations.

Impact on Society

The societal impact of resilient transportation networks underscores the critical role of LEO PNT in ensuring the safety and well-being of communities.

Dynamic Environments

LEO PNT is designed to operate effectively in dynamic environments, providing uninterrupted navigation support for transportation systems across diverse terrains.

Adaptive Solutions

The adaptive nature of LEO PNT enables transportation networks to overcome challenges posed by natural phenomena and interferences, ensuring continuous connectivity.

Future-proofing

Transportation By futureproofing transportation navigation systems, LEO PNT lays the foundation for sustainable and resilient mobility solutions.



Future Perspectives and Innovations

Industry Collaboration

Engaging in collaborative initiatives with industry partners fosters innovation and accelerates the development of LEO PNTenabled transportation solutions.

International Cooperation

International cooperation and partnerships in LEO PNT for transportation promote knowledge exchange, interoperability, and global harmonization of navigation standards.

Public Awareness

Educating the public about the benefits and implications of LEO PNT in transportation fosters acceptance and understanding, paving the way for widespread adoption.

Policy and Regulation

Addressing policy and regulatory frameworks for LEO PNT in transportation is crucial to ensure standardization, safety, and ethical use of advanced navigation technologies.













