Bharat6G Alliance

6G INITIATIVES & STANDARDS

RAJESH KUMAR PATHAK

KEY RECOMMENDATIONS

Innovative Funding Mechanisms

- Support R&D for industry, startups, academia, and national laboratories.

Solutions Through Startups and CoEs

- Leverage 6G technologies for key sectors: transport, water, power grid, renewables, healthcare, education, digital twins, and smart cities.

Shared Spectrum Use including Reassessment

- Utilize higher frequency bands with light-like propagation characteristics.
- Rationalize congested bands.
- Adopt captive networks for Industry 4.0 and enterprise use cases.

Global Standards Participation

- Contribute to global standards forums for interoperability and global reach.

Tactile Internet and Remote Operations

- Enable realistic 3D rendering of virtual participants and remote machine/robot operations.

Space-Terrestrial Integration

- Ensure ubiquitous coverage through space-terrestrial network integration.

Combined Communication and Sensing

- Develop technologies in Sub-Terahertz bands.

System on Chips (SoCs)

- Create advanced SoCs for modems, radios, and AI processors.

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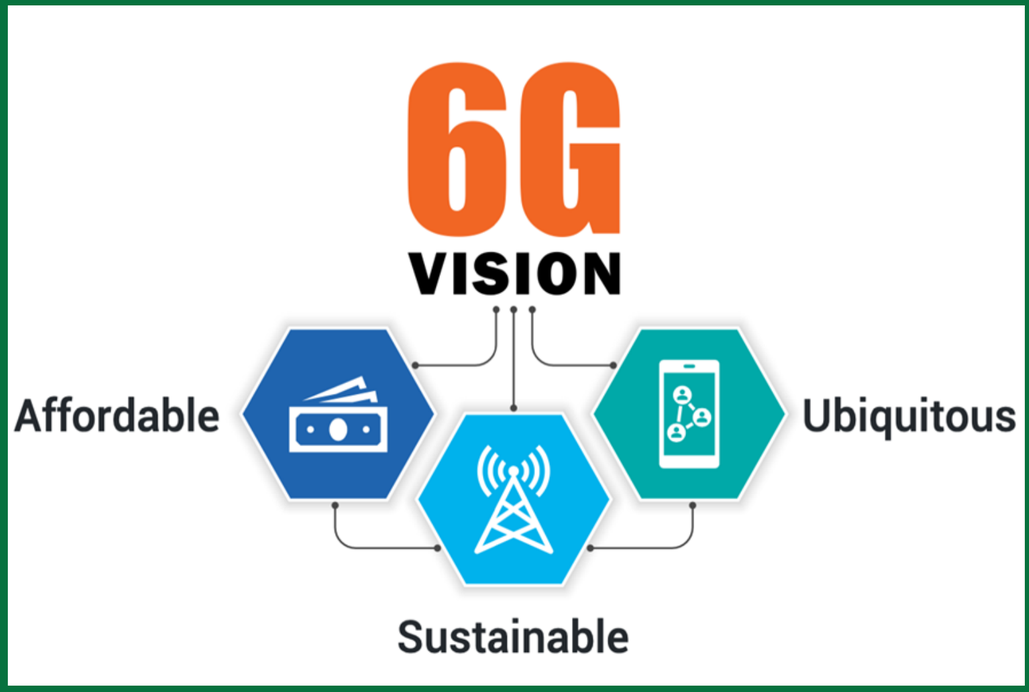

Indian Innovations for the World

TECHNOLOGY LANDSCAPE

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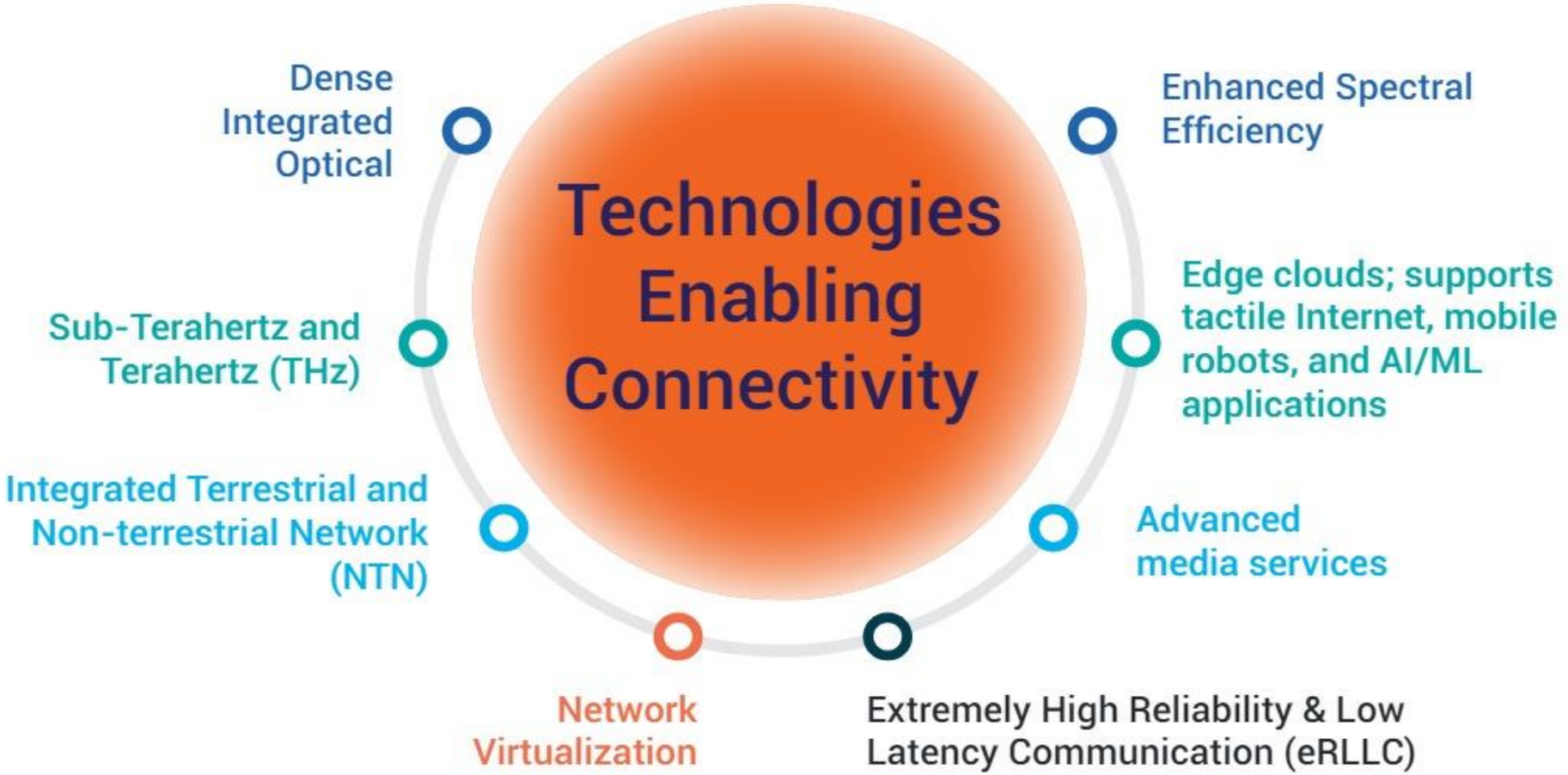
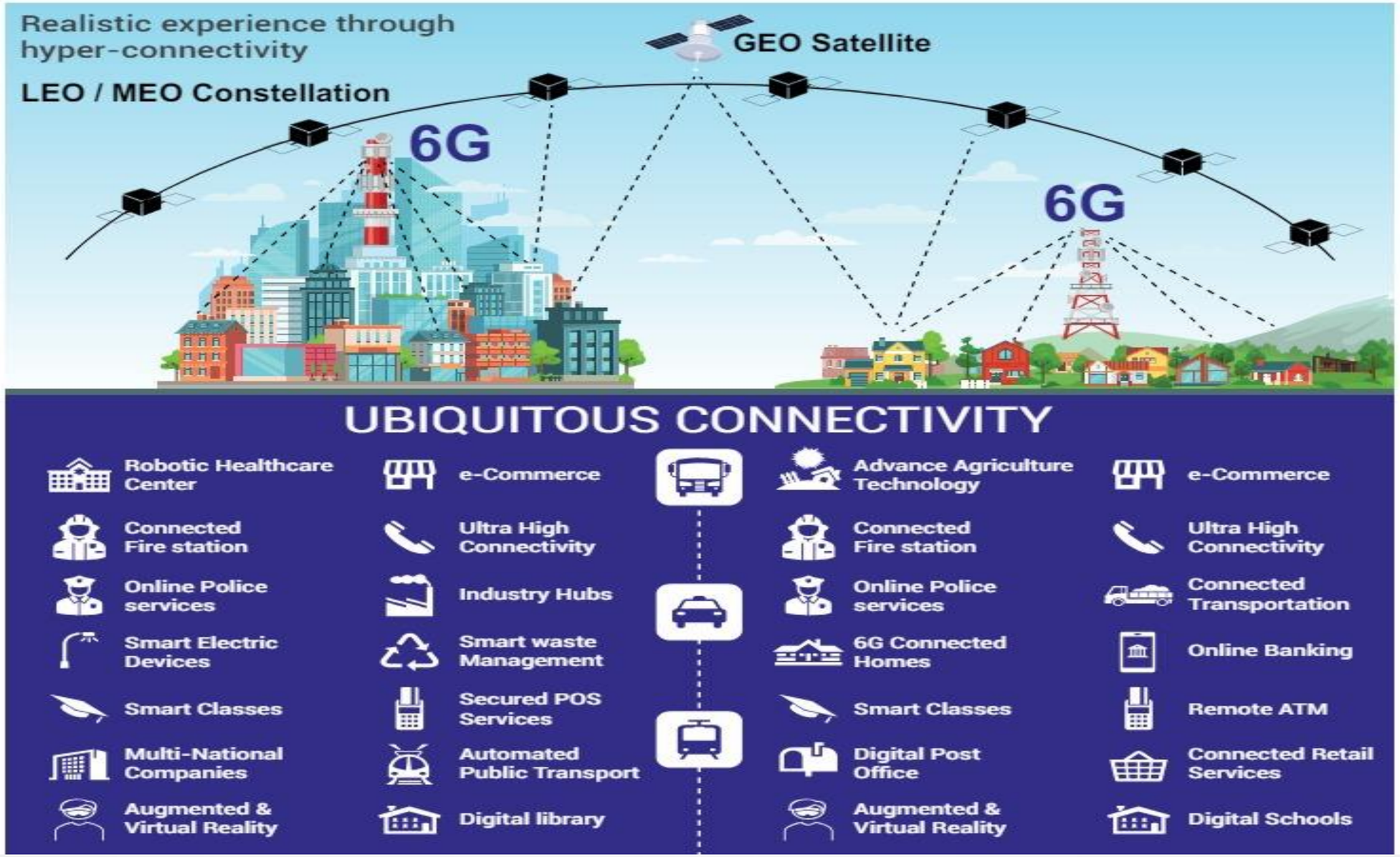


BHARAT 6G ALLIANCE (B6GA)

Bharat6G Alliance



BHARAT 6G ALLIANCE (B6GA)

B6GA is an industry led body consisting of public/private companies, academia, research institutions and Standard Development organizations

- Understand business and societal needs 5G advanced and 6G technology
- Contribution to 6G and other future technology-related global standards, deployments, products, operations and services
- Support and energize Indian participation in standard development organizations
- Promote high impact Open R&D and pursue pre-standardization efforts
- Identify priority areas for research
- Proof-of concept prototypes and demonstrations, and early market interventions led by start-ups.
- Build coalition and synergies with like-minded 6G Global Technology Alliances
- Facilitate availability of 6G test beds and access to 6Gchipsets

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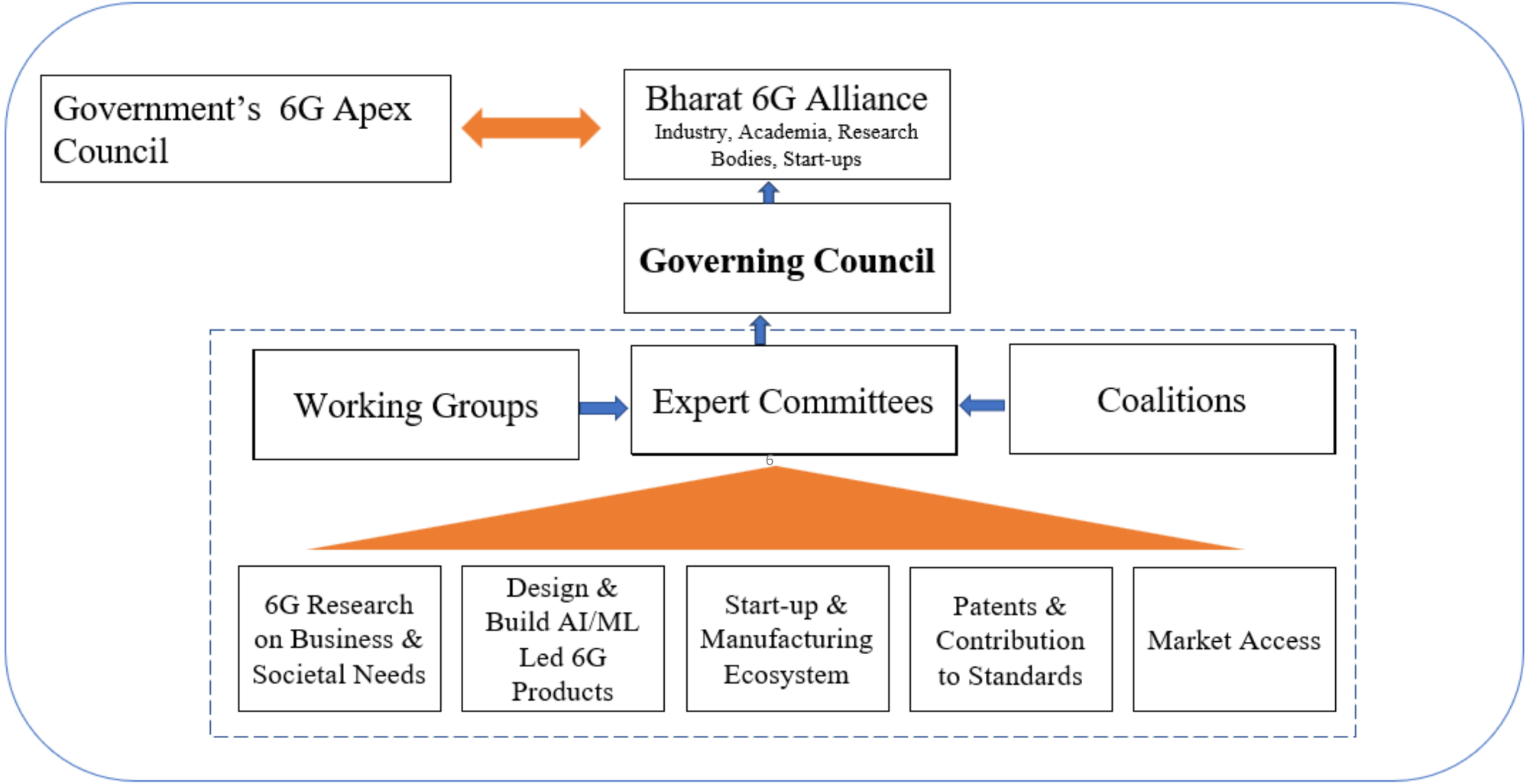
Facilitate the realization of ‘Bharat 6G Vision’

BHARAT 6G ALLIANCE

Organizational Structure



WORKING GROUPS

- **Spectrum**
- **Device technology, sensors and manufacturing ecosystem**
- **Technology**
- **Applications**
- **Green and sustainability**
- **Outreach**
- **6G use-cases and revenue stream**

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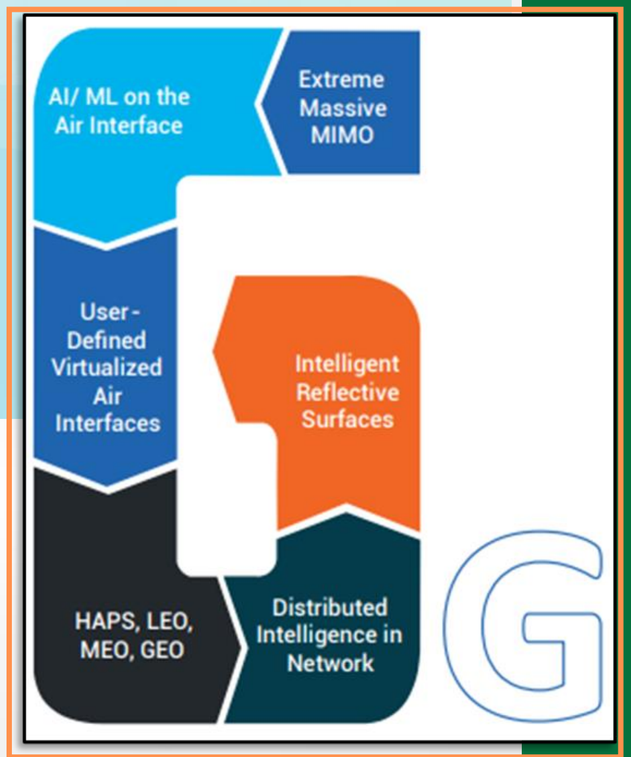

FOCUS ON STANDARDS CONTRIBUTION

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Priority Areas for Standards Contribution

e-Health

- Robotics Surgery
- Online clinical treatment
- Automated labs & pathology

e-Education

- Smart Classes
- Digital Schools
- Real-time distance education

Technology

- High altitude Platforms (HAPS)
- AI, ML and IoT led 4.0 platforms
- Analytics
- Green

Entertainment

- Metaverse Exp.
- Realtime Gaming Experience
- Teleoperated Driving Experience
- Intelligent BOT's

Beyond Connectivity, Coverage and Experience, drive R&D and Innovation around (India Context)

- Enabling rural education and Distance learning
- Emergencies & Natural calamities – Weather, Pandemic, Public safety
- Hospitals connectivity & shared resources and expertise
- Yield & productivity in everything that we do - Agriculture, storage, distribution, supply chain, inventory management & warehousing
- Democratized information and entertainment

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NATIONAL R&D INITIATIVES

- Accelerated research on 6G eco-system
- 6G end-to-end communication system
- Extreme MIMO testbed
- Advanced optical communication test bed
- 6G: THz test bed with orbital angular momentum and multiplexing
- Sub-THz wireless communication with Intelligent Reflecting Surfaces (IRS)
- Digital twin for national infra optimization
- AI4bharat- to position as a global leader in AI- AI Mission
- National Mission- Interdisciplinary Cyber-Physical System
- Quantum Mission

Leverage academia, startups and R&D labs with support from industry and telecom service providers in 6G technology and use-case development

GLOBAL COLLABORATIONS

NextG Alliance of ATIS, USA

6G Smart Networks and Services Industry Association (6G-IA) of Europe

6G Flagship- University of Oulu, Finland

BHARAT 6G ALLIANCE MEMBERS

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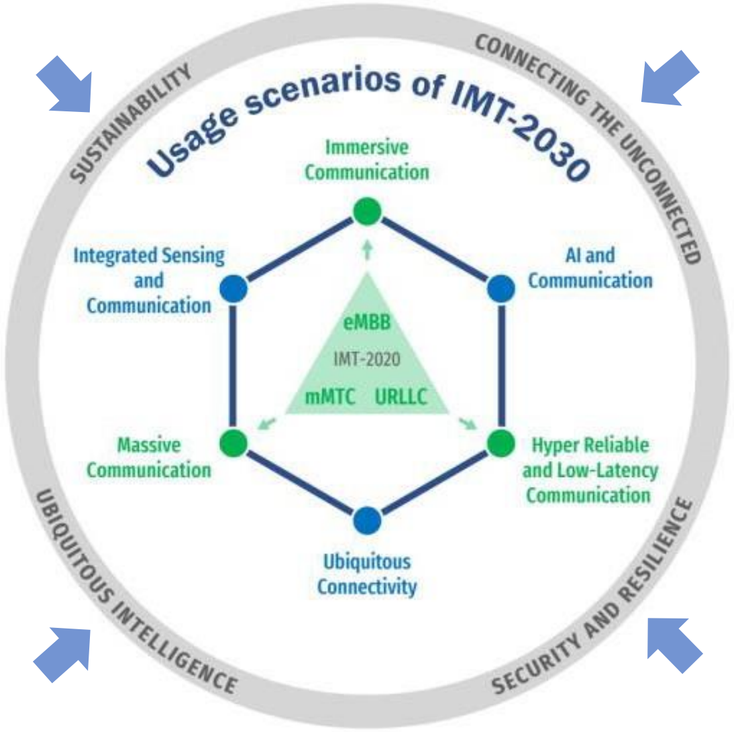
Specific NTN Features Meeting IMT-2030 Goals



Source: Recommendation ITU-R M.2160-0 (11/2023), “Framework and overall objectives of the future development of IMT for 2030 and beyond”

Connecting the Unconnected; Security and Resiliency; Ubiquitous Intelligence; Sustainability

- ✓ Global Coverage: Satellites provide broad coverage, reaching remote and underserved areas without land-based infrastructure, connecting people in rural regions, on ships, and in aircraft
- ✓ Global Ubiquitous Connectivity for Airborne/Maritime: Satellites offer continuous connection for planes, ships, and other moving platforms -- enhancing safety, navigation, and passenger services.
- ✓ Resilience and Redundancy: Satellite networks provide strong backup during emergencies like natural disasters, cyberattacks, or infrastructure problems. This boosts overall network reliability.
- ✓ IoT Connectivity: Satellites connects IoT devices across vast areas, gathering data for analysis providing valuable insights, also benefiting agriculture, environmental monitoring, asset management and more.
- ✓ Low Latency Communication: Advancements in satellite/NTN holds the promise of reducing latency -- vital for real-time applications such as telemedicine and autonomous vehicles.

Potential NTN Use Cases in 6G

Immersive Communication

- Direct connectivity to smartphones/wearable devices in light indoor/in car scenarios
- High speed broadband connectivity to transportation platforms (Trains, aircraft, vessels)
- Fast set-up of connectivity to an area/theater of operation (for utilities and public safety)

Artificial Intelligence and Communication

- Content distribution for media applications

Hyper Reliable and Low-Latency Communication

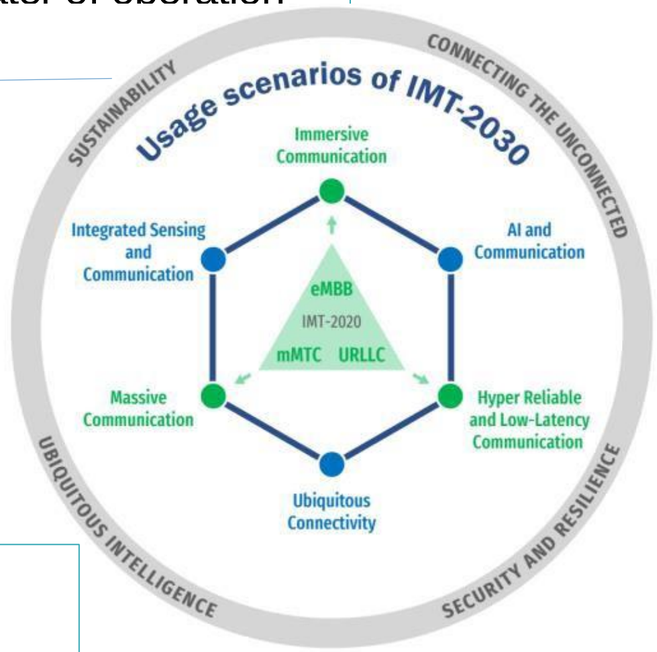
- PNT augmentation to enhance accuracy, reliability, and resilience of location-based services, where GNSS is an issue
- Low latency service over long distance

Integrated Sensing and Communication

- Safety critical applications
- JSAC (Joint Sensing & Communications)

Massive Communication

- Data collect from a wide area (e.g. utilities, agriculture, public safety)



Usage scenarios and overarching aspects of IMT-2030

Ubiquitous Connectivity

Broadband connectivity to:

- land vehicles
- drones (or UxV)
- homes and small offices
- aircrafts

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COLLABORATE TO INNOVATE: SHAPING A BETTER WORLD TOGETHER

VISIT US

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