



Overview

May 2023

Applications that affect all aspects of life, society, and industries

Everyday Living



Service robots for home assistance

Indoor/outdoor delivery services

Intelligent travel assistance

Experience



Real-time interactive gaming

MR entertainment

MR-powered classrooms

XR-enriched transportation

Critical Roles



Digital twins

Robotics for hazardous conditions

Remote surgery, therapy & monitoring

Manufacturing & agriculture

Societal Goals



Digital equity

Cultural and civic participation

Public safety

Sustainable society

6G Overview



- > ATIS formed Next G Alliance in late 2020
- > "Roadmap to 6G" published February 2022 provides foundation for North American 6G vision and leadership
- > Broad ecosystem of contributors



Operators
Vendors
Hyperscalers
Academia
Government
Research Labs

- > More than 800 experts across 100+ members

Foundational Goals



Next G Alliance Agenda

Private sector, academia and government collaborate to position North America as the global leader for Next G technologies.

North American Model for Success

A comprehensive model built on North American 6G technology developments, R&D needs, standards goals and market readiness.

6G Market Leadership

Strategies that will lead to rapid commercialization and adoption of Next G technologies across domestic and global markets.



Foundations for Next G Alliance 6G Vision



North American 6G Roadmap defines the path for connecting every stage of the lifecycle and progressing to an end-of-decade 6G vision

6G Leadership Priorities incorporate innovative applications, societal needs, economic goals, government actions, and technology developments



Audacious Goals create the framework for advancing North American leadership and positioning a robust 6G marketplace

Next G Alliance Approach



Federal Government Stakeholders



Next G Alliance
Industry, Government, Academia

Strategy, Objectives, Priorities, Research Funding Recommendations

Public/Private collaboration and alignment on 6G research priorities, targeted funding, policies and incentivized actions to meet common goal of North American leadership

6G Research Initiatives

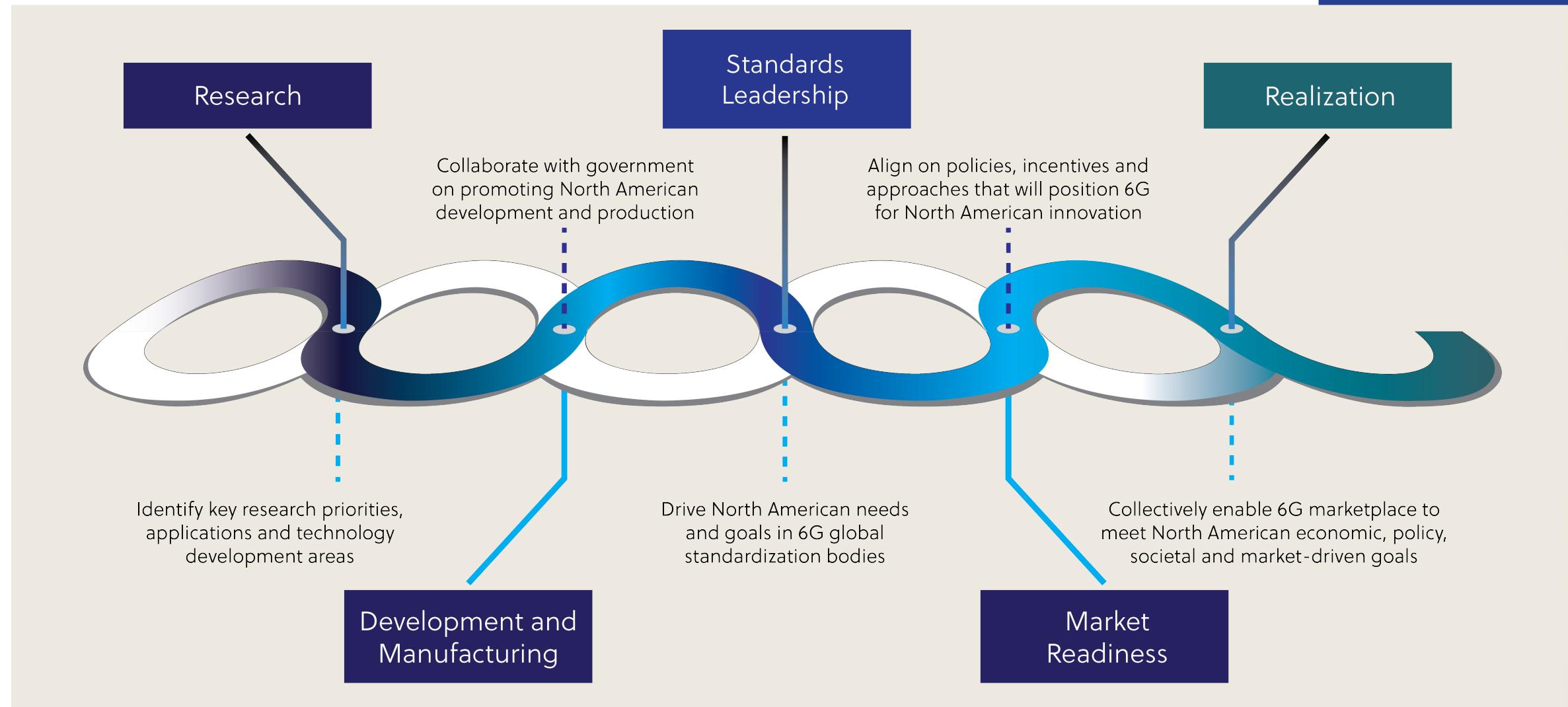
Development and Manufacturing Readiness

Standards Leadership

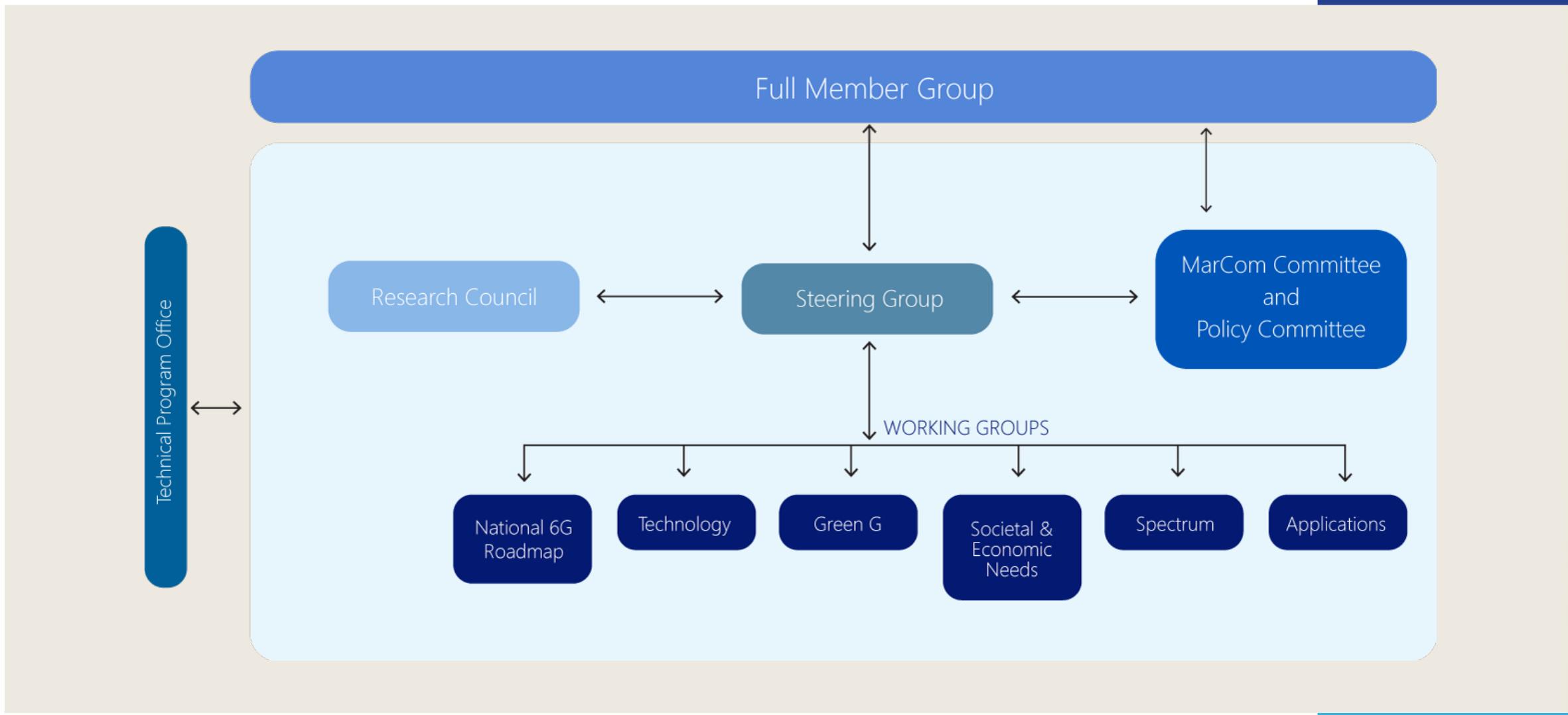
Market Readiness

6G Realization

Next G Alliance Lifecycle to 6G



Next G Alliance Structure



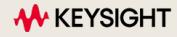
Founding and Full Members



AMD
together we advance



Booz | Allen | Hamilton



Qualcomm



Contributing Members



Institute for the Wireless
Internet of Things
at Northeastern University



MOTOROLA SOLUTIONS



Northwestern
University



ROHDE & SCHWARZ
Make ideas real



TERADYNE



RELLIS
THE TEXAS A&M UNIVERSITY SYSTEM



Government Members



CISA
CYBER+INFRASTRUCTURE



NIST



U.S. Department *of* Defense

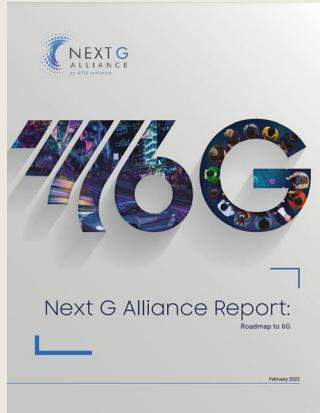


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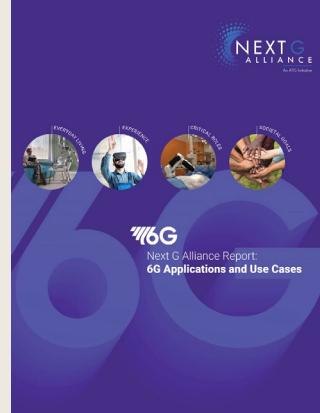
Next G Alliance Reports



The Path
Toward
Sustainable
6G



Roadmap
to 6G



6G Applications
and
Use Cases



6G
Technologies



6G Distributed
Cloud and
Communications
System



6G Trust,
Security, and
Resilience

North America's Six Audacious Goals



- > Top priorities for North America's contribution and Next G leadership
- > Selected by Next G Alliance membership
- > Address multiple stakeholder interests



#1: Trust, Security, and Resilience



The 6G system will be trusted by people, businesses, and governments to be resilient, secure, privacy preserving, safe, reliable, and available under all circumstances.



National Imperatives

- > Dependable and trustworthy networks that underpin and accelerate digital transformation
- > Secure sourcing for 6G technology and supply chains
- > Greater competition from more diverse solution providers

Research Challenges

- > Mission-critical service availability
- > Resilience through automation and resource optimization
- > Security and privacy for hardware and data
- > Uses of trustworthy artificial intelligence

#2: Digital World Experiences



6G will support multi-sensory experiences to enable transformative forms of human-human, human-machine, and machine-machine interactions that bring life-improving use cases and create new economic value.



National Imperatives

- > Closer integration of North American strengths in cloud computing and communications
- > New and enhanced approaches to education, healthcare, and workforce development
- > Policies and programs to scale-up experimentation with 6G digital world applications

Research Challenges

- > Innovation in cyber-physical technologies, going beyond sight and sound
- > Knowledge systems and extreme automation
- > Open and interoperable standards across application and technology domains

#3: Cost-Efficient Solutions



Cost efficiency in all aspects of the network architecture must be improved for delivering services in a variety of environments, including urban, rural, and suburban, while also supporting increased data speed and services.



National Imperatives

- > Affordable access to services essential to American lives
- > Policies addressing rural availability, infrastructure efficiencies and spectrum use
- > Catalyst for digital equity

Research Challenges

- > Improving technology costs for capacity, indoor coverage and wide-area distribution
- > Business model innovation for subscriber-density economics
- > Resource-partitioning solutions for shared space deployments

#4: Distributed Cloud and Communication Systems



6G will provide Distributed Cloud and Communication Systems where communications and unified computing services work together and scale across devices, network computing resources, and data centers.



National Imperatives

- > Apply North America's expertise in cloud and software to shape the transformation to cloud-native mobile networks
- > Consistent quality of service for low-latency mission critical applications and services

Research Challenges

- > Technologies to facilitate deployment of large-scale network compute fabrics
- > Innovation, integration and interoperability of edge devices
- > Autonomic decision-making involving distributed and federated learning

#5: AI-Native Wireless Networks



An AI-Native future network is needed to increase the robustness, performance, and efficiencies against more diverse traffic types, ultra-dense deployment topologies, and more challenging spectrum situations



National Imperatives

- > Shape global evolution of AI in line with North American values as well as economic and security goals
- > Promote critical applications of AI to maintain North American leadership in wireless communications
- > Help North American consumers and workforce to capitalize on economic gains of AI/ML

Research Challenges

- > Open architectures and interoperability
- > Availability of datasets and AI/ML validation
- > Handling of computational complexity, overhead management and minimum performance guarantees

#6: Sustainability



6G systems will reduce environment impact, be more energy-efficient, and will implement circular economy principles



National Imperatives

- > Reduce ICT sector's energy consumption and decarbonize the energy supply
- > Leverage North American expertise in: component design & manufacturing, advanced data modeling & optimization, power-efficient radio technologies, and carbon-neutral data center facilities

Research Challenges

- > Energy reduction across Radio, Core Network, Cloud and Edge compute, IoT & connected devices
- > Environmental impact reduction related to raw materials, land and water use
- > Use of Green Credentials and metrics to promote resource efficiency

Desired Outcomes

North American Leadership

- > Powerful work collaboration across industry, government, and academia
- > Robust marketplace using innovative applications and technologies that connect society in a new digital world
- > Increased ownership of technology advancements that enable the 6G vision

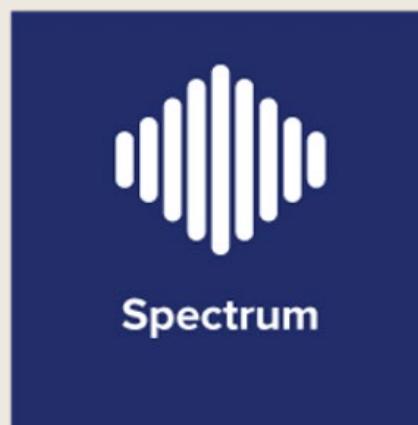
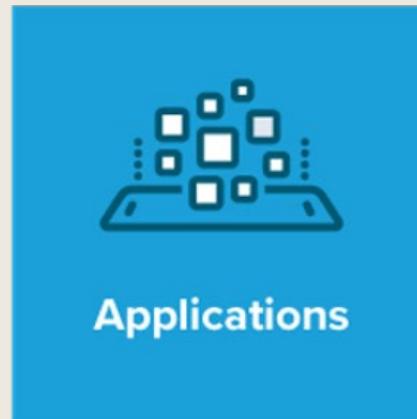
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Distinctive Advancements

- > Multi-dimensional, multi-party, and multi-sensory experiences
- > AI-native, trusted and ethical AI
- > Higher frequency (THz/Sub-THz) and multi-use spectrum
- > Design for sustainability, reduced energy, zero-energy devices
- > Transform quality of life and work across healthcare, public safety, and education

Next Steps

- > Published reports advance Next G Alliance 6G goals
- > Research priorities serve as foundation for industry and academic collaboration
- > Government advocacy to create opportunities to drive North American agenda
- > Collaborate with external groups to advance North American agenda
- > Facilitate innovation and collaboration



Collaboration is the Key to Success

NGA is progressing an action-oriented agenda:

- > Foundational documents lead to recommended priorities and actions
- > Prioritization of 6G research aligned to NGA vision and North American needs
- > Increasing the velocity of 6G research and collaboration across the ecosystem
- > Holistic approach that leverages research outcomes to promote new opportunities (e.g., jobs of the future, education, innovation, and future societal needs).



■ North American 6G leadership requires collaboration across government, industry, and academia



Building the foundation
for North American
leadership in 6G and beyond