



Agenda

1. Challenges, Risks & Vulnerabilities
2. High Priority Actions for Near-Term Resilience
3. Strategy, Modules, Partnerships
4. Emergent & Critical Opportunities



Challenges, Risks & Vulnerabilities

Interdependencies Across Ecosystems

- Cascading Failures
- Critical Dependencies

Natural Disasters – Force Majeure

- Infrastructure Vulnerabilities
- Geographic Impacts

Operational Silos

- Fragmented Systems
- Inefficient Collaboration

Man-Made Challenges

- Escalating Cyber Challenges
- Long-Term Vulnerabilities

Ecosystem Concept:

Communication systems must function as part of an **integrated ecosystem**, linking clinical teams, first responders, public health authorities, and supply chain partners to ensure seamless coordination during disasters.

The failure of any single component—whether power, water, IT, or human workforce—highlights the need for ecosystem resilience rather than isolated fixes.



Practical, Impactful, High-Priority Actions for Near-Term Resilience

Redundancy Across Ecosystems

Primary, Secondary Tertiary layered modes of communications

Scale in Underserved Areas

Look for alternative partners
Look to the sky when needed

Shared Networks & Response

Hybrid command centers
Integrated clinical response

Cross-Sector (Inclusive) Drills

Joint Response
Integrated planning

Ecosystem Concept:

Resilient ecosystems are **redundant, interconnected, and adaptable**, enabling them to respond dynamically to shifting conditions, such as rising cyber threats or unpredictable weather patterns.

Ecosystem thinking ensures that investments in communication systems also enhance other critical infrastructure, such as power and IT, creating cascading benefits.



Strategies, Models, Regulatory Mechanisms, Policies, Systems, Partnerships, and Incentives

Integrated Ecosystem Governance

Governance up and down as well as across and diagonally

Public-Private Partnerships (3P)

Look for traditional and non-traditional partners to close the loop

Policy Alignment

Rural Healthcare Program (FCC)
Cross Sector Focus

Incentivizing Innovation

Grants & tax credits
Integrated planning

Ecosystem Concept:

Partnerships are the foundation of resilient ecosystems. **No single entity can address the complexity of interdependent threats alone.** Support ecosystem-oriented regulatory alignment by helping clients incorporate resilient design standards, such as FGI Guidelines for emergency communication infrastructure, into healthcare facilities.

By viewing healthcare and public health infrastructure as an ecosystem, stakeholders can align incentives and ensure sustained investment in resilience-building measures.



State of Emergent and Critical Opportunities

Communications

(Terrestrial and Space Technologies)

- Integrated Layered Redundancy
- Scalable Shared Coverage Models

Simulations and Predictive Modeling

(Digital Twins and AI Analytics)

- Scenario Testing across the Ecosystem
- Predictive Insights

Innovative Alternatives for Area Coverage and Connectivity

- Aerial Networks (Drones/Gliders/AGV)
- Ground Swarms

Smart Cities and Self-Healing Systems

(IoT and Smart Infrastructure)

- Emergency Prioritization
- Self-Correcting Protocols

Ecosystem Concept:

Emergent technologies thrive within **ecosystem frameworks**, where their integration enhances overall resilience rather than functioning in isolation.

For example, pairing digital twins with AI analytics allows healthcare systems to understand how communication failures affect other critical nodes, like supply chains or energy systems.

Thank you

