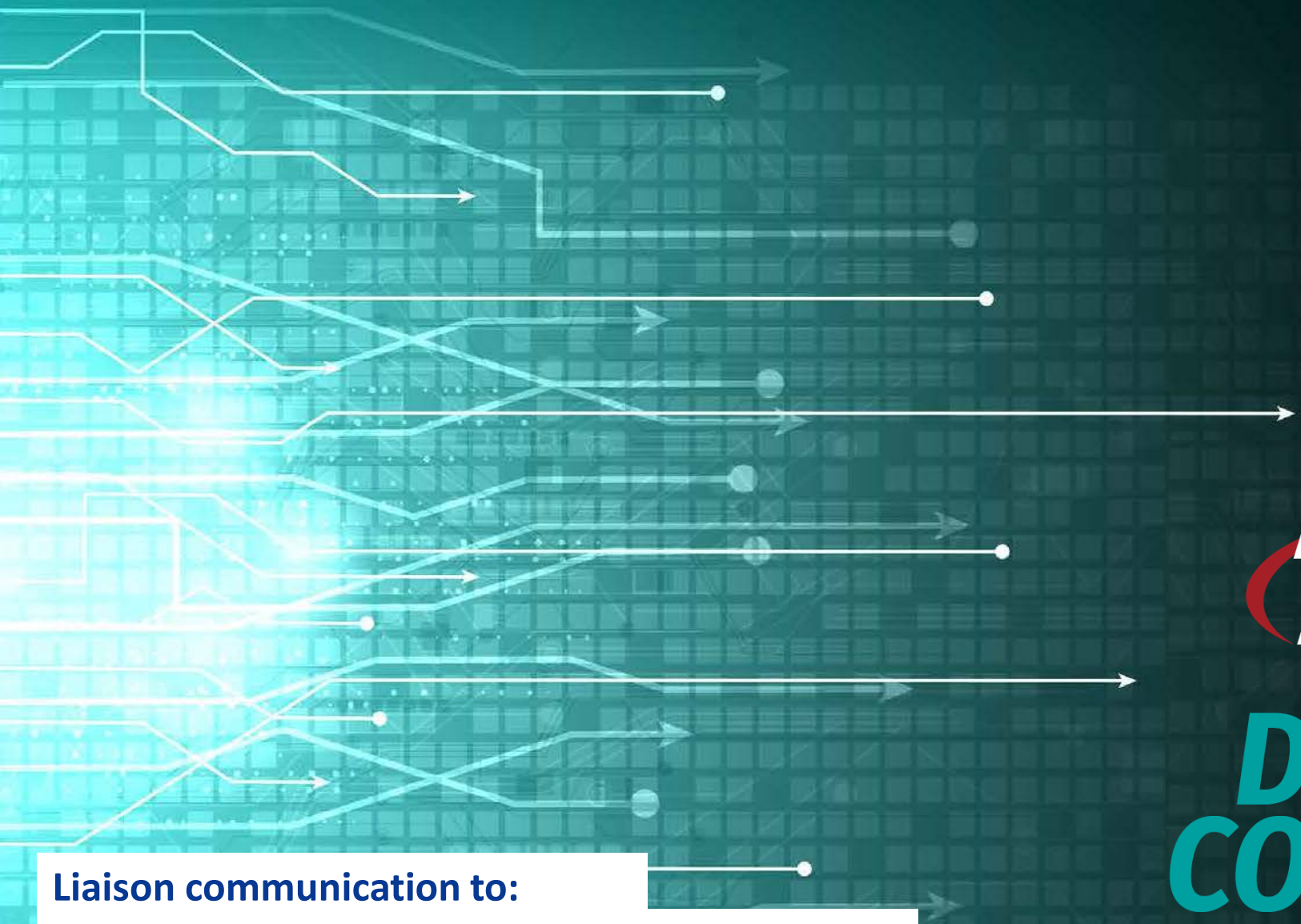


TIA Telecommunications Industry Association

DELIVERING CONNECTIVITY
EMPOWERING INNOVATION

Liaison communication to:

IEEE

802 Nendica

802 Plenary Session

July 10, 2018

Agenda

- Introduction to TIA
- The Vision for Smart Buildings
- TIA's Smart Building Program
- IEEE 802.x in Smart Buildings: Brainstorming Q&A
- Closing Remarks

TIA by the Numbers

526
Members

3,609
Standards Developed

9
Standards Technical Committees

~2M
Workers Employed Worldwide

107
Working Groups

2,500
Individuals Engaged Across Communities

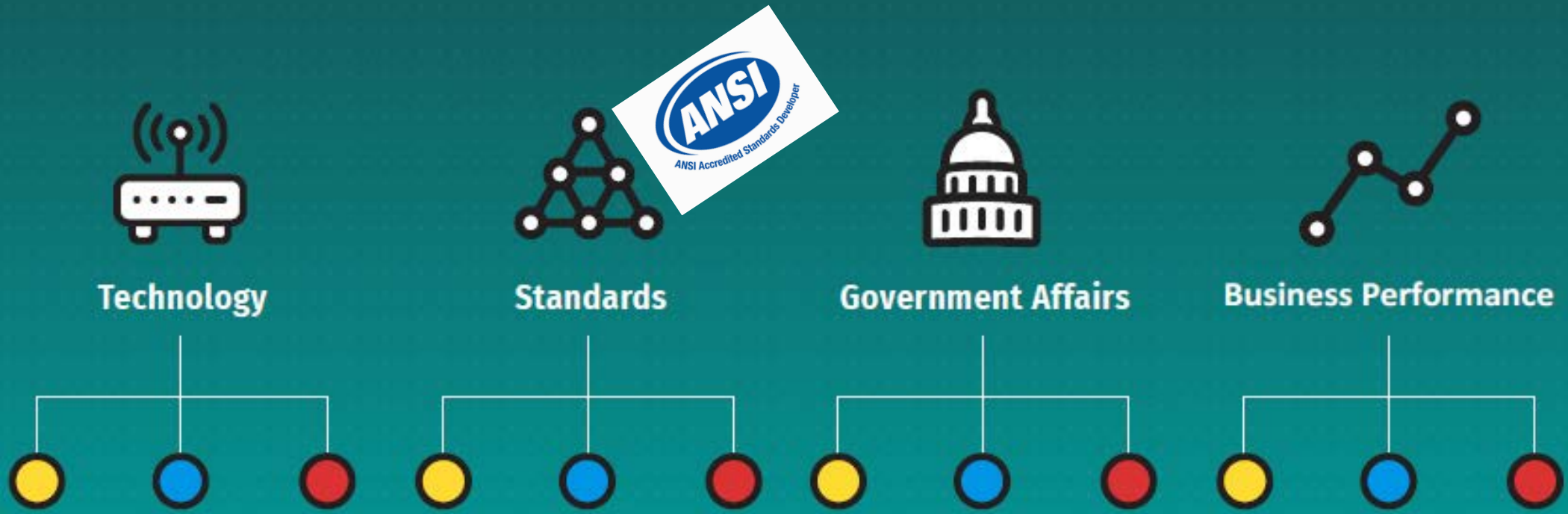
$3T
Contributed to the World Economy by TIA Members

70%
of TIA Member Companies are Small-to-Medium Size Businesses with <$20 Million in Revenue

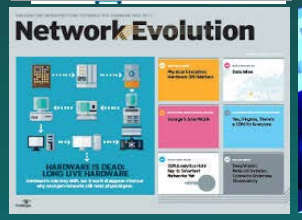
Convening and Enabling Communities of Interest

At TIA we bring together and facilitate numerous communities of interest within **four key verticals**: Technology, Standards, Government Affairs and Business Performance.

Within these many communities, TIA advances strategic **programs**, **products** and **services** to tackle unique challenges the ICT industry faces. The solutions these communities drive provide tangible value to our members that enhance their bottom line.



TIA's Program's Roadmap



Smart Buildings

Edge
Data Center

CO To DC
Conversion

Network
Assurance

Device
Assurance/
Registration

Core Competency: **Network Infrastructure, Connectivity, Quality**

- TR-8 I Mobile and Personal Private Radio Standards
- TR-14 I Structural Standards for Communication
- TR-34 I Satellite Equipment & Systems
- TR-41 I Performance and Accessibility Communications
- TR-42 I Telecommunications Cabling Systems
- TR-45 I Mobile and Point-to-Point Communications Stds
- TR-48 I Vehicular Telematics
- TR-50 I M2M - Smart Device Communications
- TR-51 I Smart Utility Networks

Definition
Benchmark
TL9000 QM
QF / TIA Tools
Assurance
Certification
Registration
Sustainability

Communities Of Interest

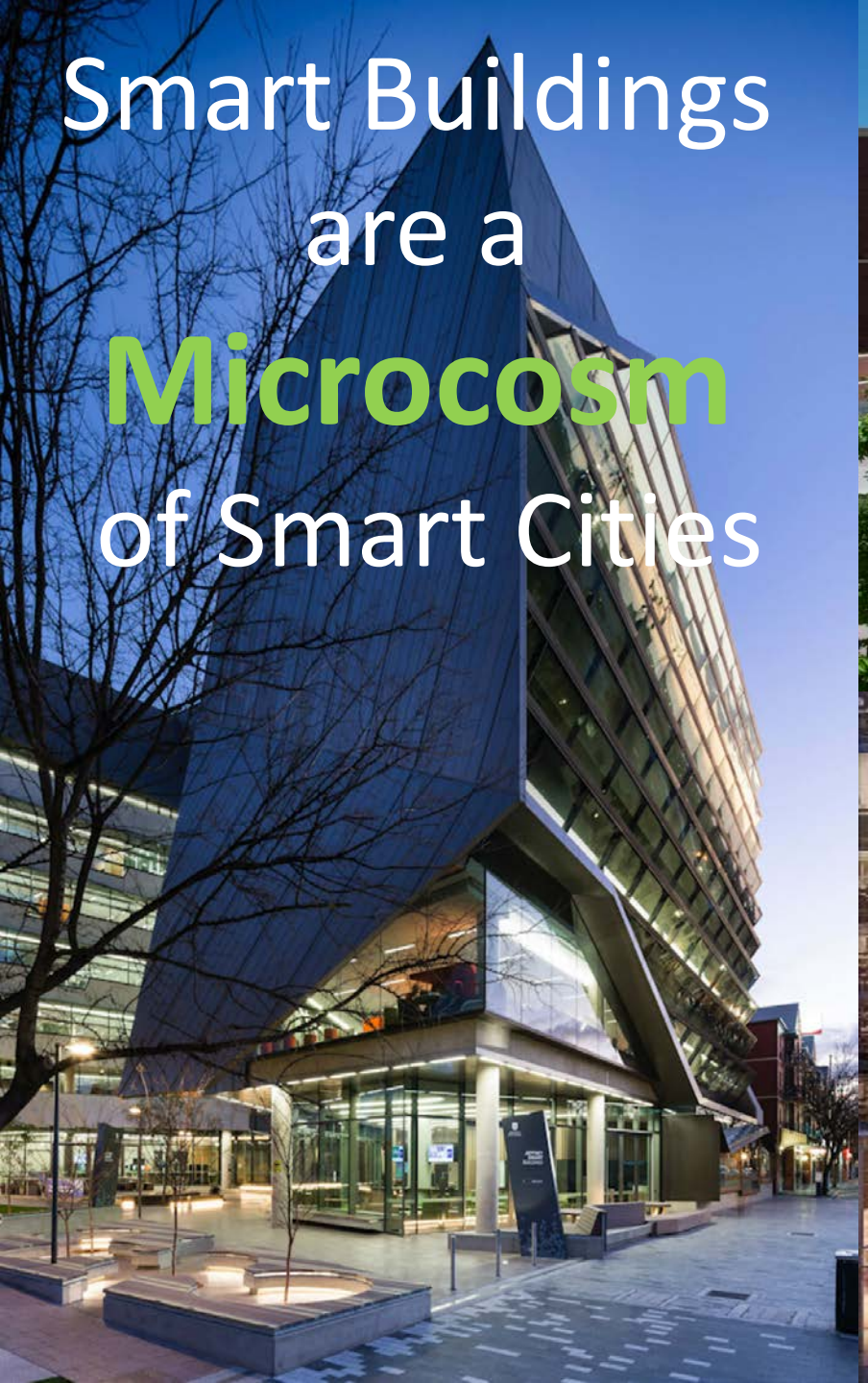
Certification Program

802 Plenary Session
July 10, 2018

Smart Buildings Program

Limor Schafman, Director

Smart Buildings
are a
Microcosm
of Smart Cities



Smart Campus

Smart City

Moving Beyond Efficient Building Management

- HVAC
- Building Management
- Water
- Energy
- Elevators
- Security
- Cameras
- Fire & Safety
- Building Access
- Lighting

Redefining Smart Buildings as Next Gen IoT Ready

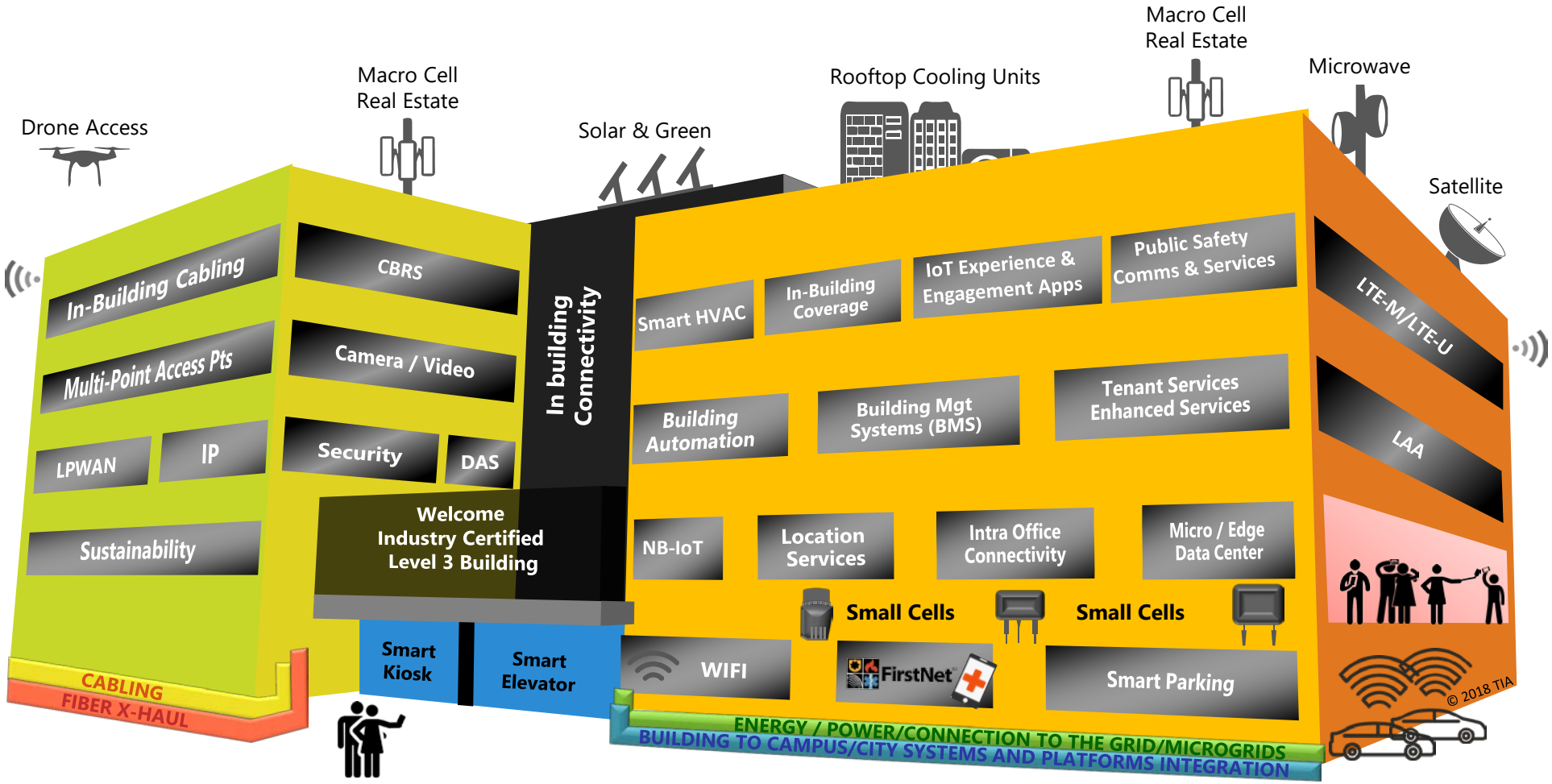
Ensuring that buildings offer valued services while being Secure, Safe, Sustainable, Reliable, Resilient

- **Building Network**
  - IP, Wireless, Networking, Connectivity, Voice, Video, Data, Safety, Security
- **Connected Assets & Components**
  - Sensors, Beacons, Meters, Devices, Smart Devices, BMS, RFID, M2M, Asset Management
- **Operational, Private, Secure Data Lakes and Intelligence**
- **Serving Building Operators**
  - Integrated, data rich systems and applications that Optimize Operations
- **Serving Tenants and Use Cases**
  - Personal, identifiable. Serving their space, performance, and activity needs.
- **Revenue Opportunities**
  - All stakeholders in this ecosystem receive value and see a positive bottom line

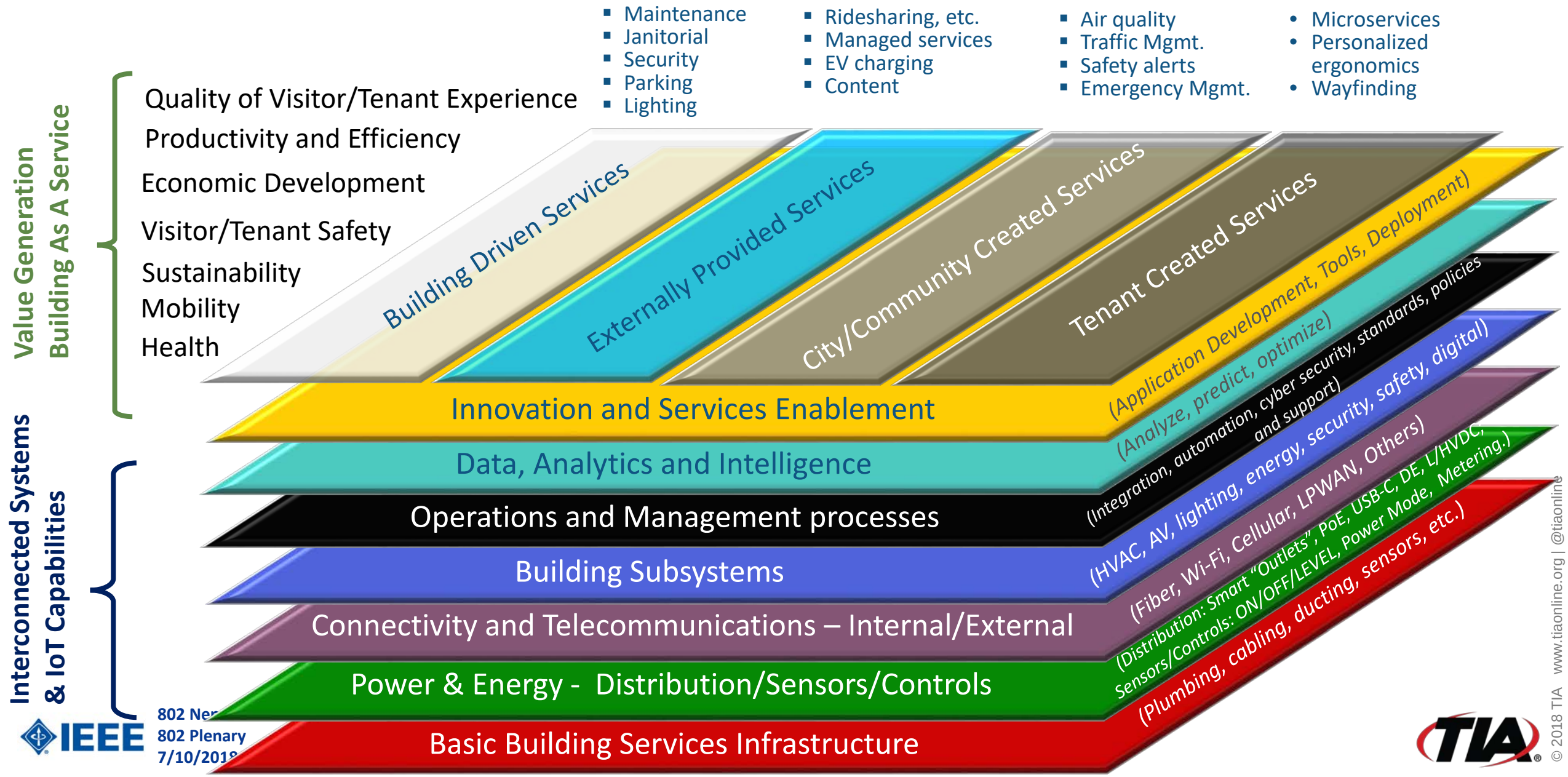
Building Types

- Campuses of all kinds
- Airports
- Office Buildings
- Commercial Buildings
- Government Buildings
- Data centers
- Education/Universities
- Medical/Hospitals
- Hotels and Hospitality
- Industrial and Manufacturing
- Religious
- Warehouses
- Parking / Storage
- Stadiums/Entertainment
- Cruise Ships
- Oil Rigs (off/on shore)
- Residential/MDU Properties

Smart Building As Connected Asset



Smart Building Layered Ecosystem



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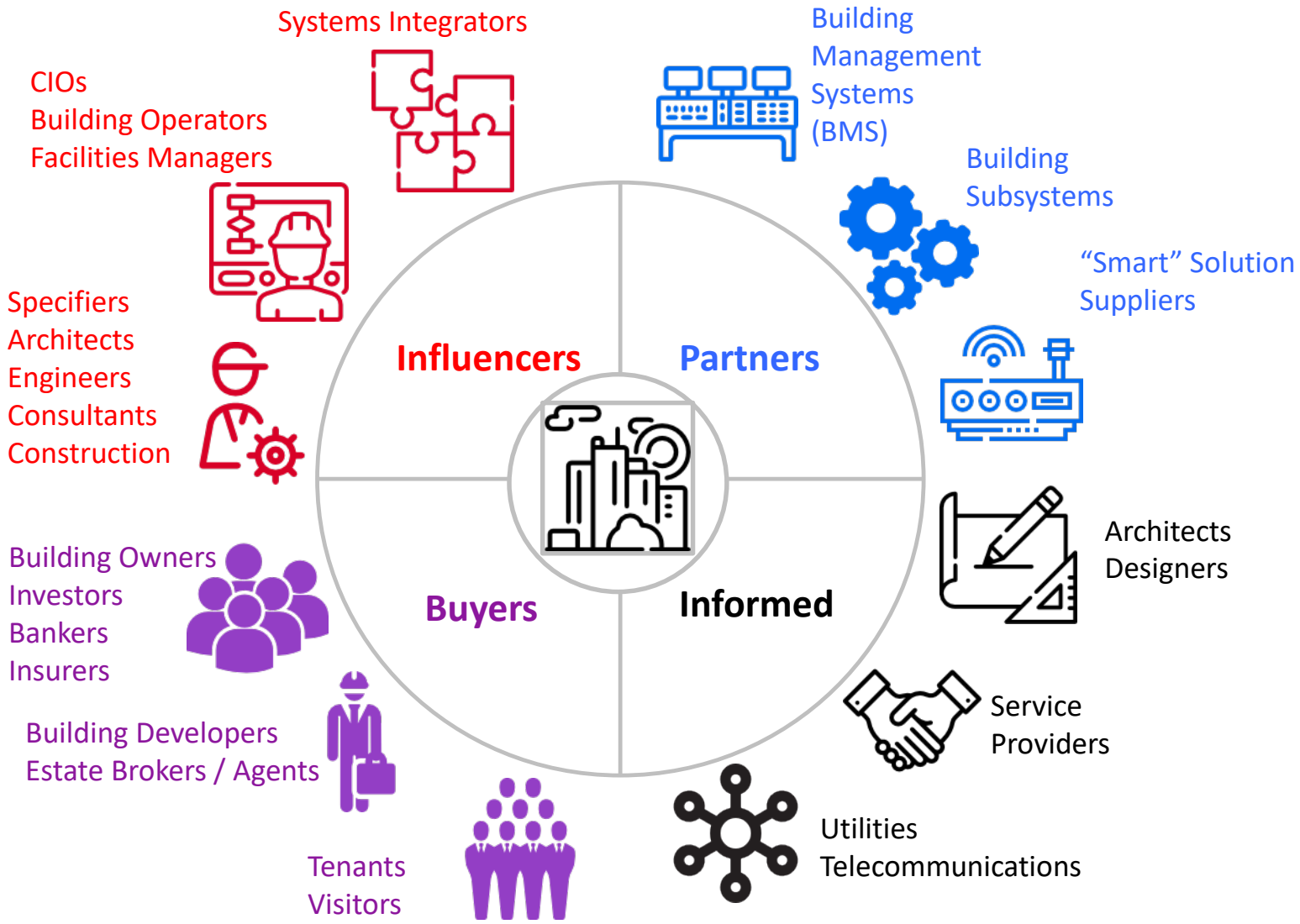
TIA

Smart Buildings Ecosystem



Smart Building Stakeholders

- Real Property
  - Property Owners
    - Land & Building
  - Developers
  - Architects
  - Banks / Financial Investors
  - Construction
  - Suppliers (for construction)
  - BMS contractors
  - CIOs
  - Property Managers / Operators
  - Facility Operators
  - Real Estate Brokers/Agents
  - Buyers
  - Tenants
- Wireless / Wireline
  - Suppliers / consultants, carriers, DAS, Small Cell, Wi-Fi, Cable, Sat, etc.
- Environment in which buildings are located
  - Towns, Cities, City Official, Citizens
- People
  - People working, living, visiting, and providing services in, to and around a building
- Urban/Campus, Energy Micro and Nano Grids / Green Buildings
  - Utilities, local & state gov't; Micro - community level generators; Nano – within a building/home; transactive energy
- Public Safety
  - Systems & Connectivity
- Security
- Insurance

Smart Buildings Collaboration

Key 2018 Activities:

- **GCTC Action Cluster Group**
  Us Ignite, NIST, GSA on Smart Buildings to Smart Cities
- Small Cell Forum joint **Guide Document on Making Buildings Small Cell Ready**
- Movement towards **training, auditing, and certification partnerships**
- MOUs with other Alliances on **shared technology**
- CABA, NAA, & Safer Buildings Coalition for **cross-industry collaboration**
- oneM2M – potential **IoT & cybersecurity**

Smart Buildings Reference Architecture

The Smart Building Program is creating a resource that develops and aggregates:

architectures

frameworks

best practices

standards

and resources

that will assist and guide the design, build and retrofit of Smart Buildings. Reference Architecture will be designed with different stakeholders in mind.

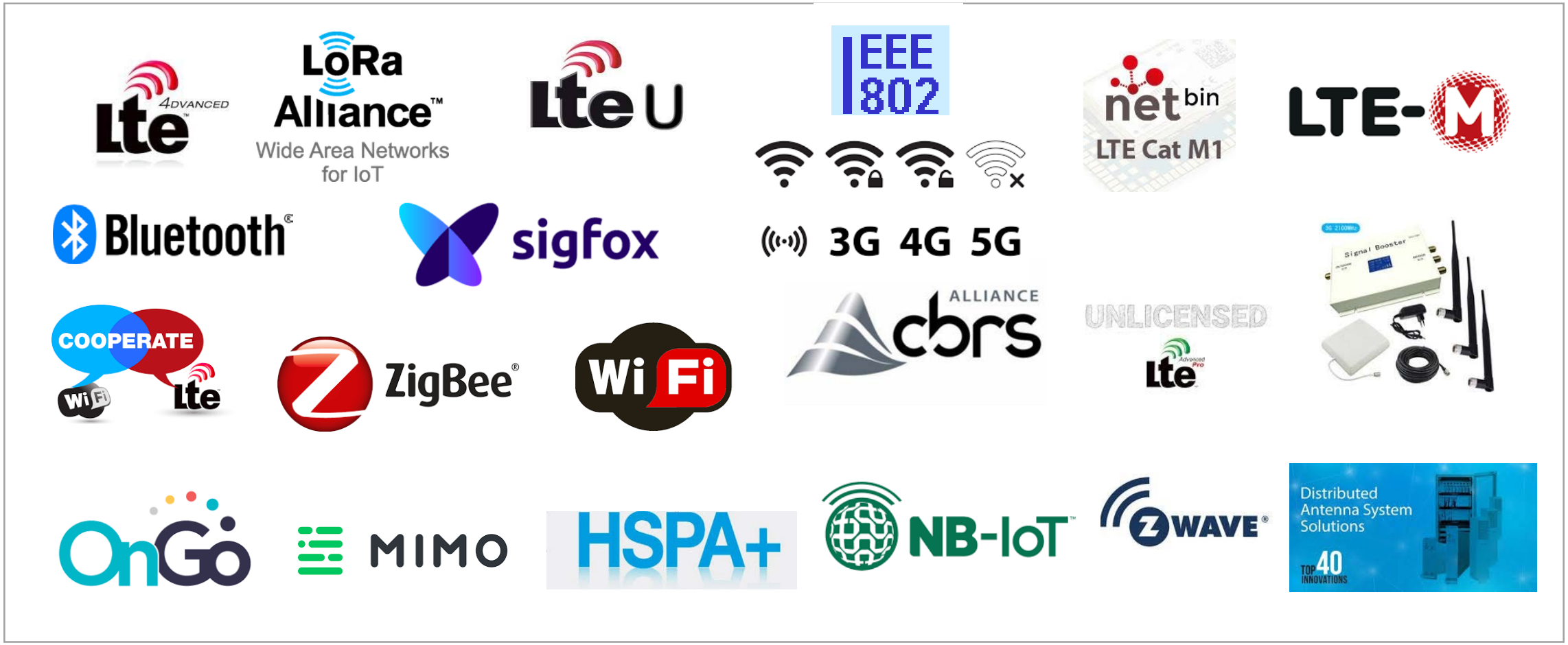
It Takes A Collaborative Community to Execute on the Vision

Smart Buildings Community

IEEE 802.x in Smart Buildings:

Q&A &
Opportunities for Development Brainstorm

In-Building Networking, Interoperability, Communications



The need for Standards.

Thank you!

For more information, contact:

Limor Schafman, Director, Smart Buildings Program, TIA – LSchafman@TIAonline.org