Intelligent Buildings Council (IBC)

Chair: Trevor Nightingale (National Research Council)

Vice-Chair: Harsha Chandrashekar (Honeywell International Inc)

Vice-Chair: Robert Lane (Robert H. Lane and Associates Inc.)

Vice-Chair: Bob Allan (The Siemon Company)

Connect to what's next™

www.caba.org

1. Agenda
2. Call to Order, Welcome, Introductions, about IBC
3. Administrative
4. "Powering Digital Transformation in Smart Buildings" (30 minutes)

    Limor Schafman (TIA)

    Jiri Skopek (2030 Districts Network)

    Ronna Davis (CommScope Inc.)
5. CABA Smart Building Summit (SBS)
6. Research Update
7. White Paper Sub-Committee Update
8. New Business
9. Announcements
10. Adjournment

CABA
Intelligent Buildings Council

 CABA Intelligent Buildings Council (IBC)

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IBC Chair
Trevor Nightingale
Director
National Research
Council

IBC Vice-Chair
Harsha Chandrashekar
Product Approvals &
Regulatory Leader
Honeywell International Inc

IBC Vice-Chair
Robert Lane
President & Managing
Partner
Robert H. Lane and
Associates Inc.

IBC Vice-Chair
Bob Allan
Global Business
Development Manager,
Intelligent Buildings
The Siemon Company

The CABA Intelligent Buildings Council works to strengthen the large building automation industry through innovative technology-driven research projects. The Council was established in 2001 by CABA to specifically review opportunities, take strategic action and monitor initiatives that relate to integrated systems and automation in the large building sector. The Council's projects promote the next generation of intelligent building technologies and incorporates a holistic approach that optimizes building performance and savings.

www.caba.org/ibc

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3.1 Motion to approve past IBC Minutes (Sept 3): www.caba.org/ibc

CABA Intelligent Buildings Council (IBC)

CABA 30 YEARS

3.2 Motion to approve Terrence DeFranco as a new IBC Vice Chair

Terrence DeFranco is President and Chief Financial Officer of Iota Communications, Inc. Prior to Solbright's merger with Iota, he served as the CEO of Solbright Group, Inc. from 2013 to 2018. In the past he served as CEO of Edentify, Inc. His background is primarily in the area of corporate finance, management and capital raising, previously serving as head of investment banking for Baird, Patrick & Co., Inc. and head of investment banking and founding partner of Burlington Securities Corp. He began his career on Wall Street in 1991 with UBS. He has been an active principal investor, senior manager and advisor to many early-stage companies and has extensive experience in dealing with issues related to the management, finance, operations and corporate development of startup and middle market public and private companies. Terrence is a graduate of the University of North Carolina at Chapel Hill with a BA in Economics and currently serves on other corporate and non-profit boards and committees.

iota
PLATINUM BOARD MEMBER

CABA Intelligent Buildings Council (IBC)

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"Powering Digital Transformation in Smart Buildings" (30 min)

Limor Schafman
Senior Director, Smart Buildings Program
TIA (Telecommunications Industry Association)

Jiri Skopek
Vice-chair
2030 Districts Network

Ronna Davis
Strategy and Technology Team
- Building and Campus
CommScope, Inc.

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GLOBAL CITY TEAMS CHALLENGE

Smart Building Super Cluster

Smart Buildings Defined

Limor Schafman
Co-chair, Smart Buildings Super Cluster, GCTC

GCTC TechJam SBSC 2019

Global Cities Team Challenge

- GCTC brings together
  - industry
  - universities
  - nonprofits
  - local and state government

  to work on projects to share knowledge and best practices on smart community technologies

- National Institute of Standards and Technology leads GCTC, in partnership with

- NTIA, Dept. of Homeland Security, National Science Foundation, International Trade Administration and others

GCTC – Work Being Done and Participants a

Participant Cities/Countries Worldwide:

US

- Portland, OR; Denton, TX; Ammon, ID; Washington, DC; Columbus, OH; New York, NY

Europe

- Amsterdam, NL; Genoa, Italy; Valencia, Spain; Others

Asia

- Shirahama, JP; Busan, KR; Daegu, KR

Africa, South America, Australia

Blueprint & Framework topics:

- Data
- Energy/Water
- Healthcare
- Multi-sector integration and building automation
- Public Safety
- Rural and Agriculture
- Smart Buildings
- Transportation
- Wireless Connectivity

To learn more visit: https://pages.nist.gov/GCTC/super-clusters/

Smart Building
Super Cluster

SMART Cities drive innovation
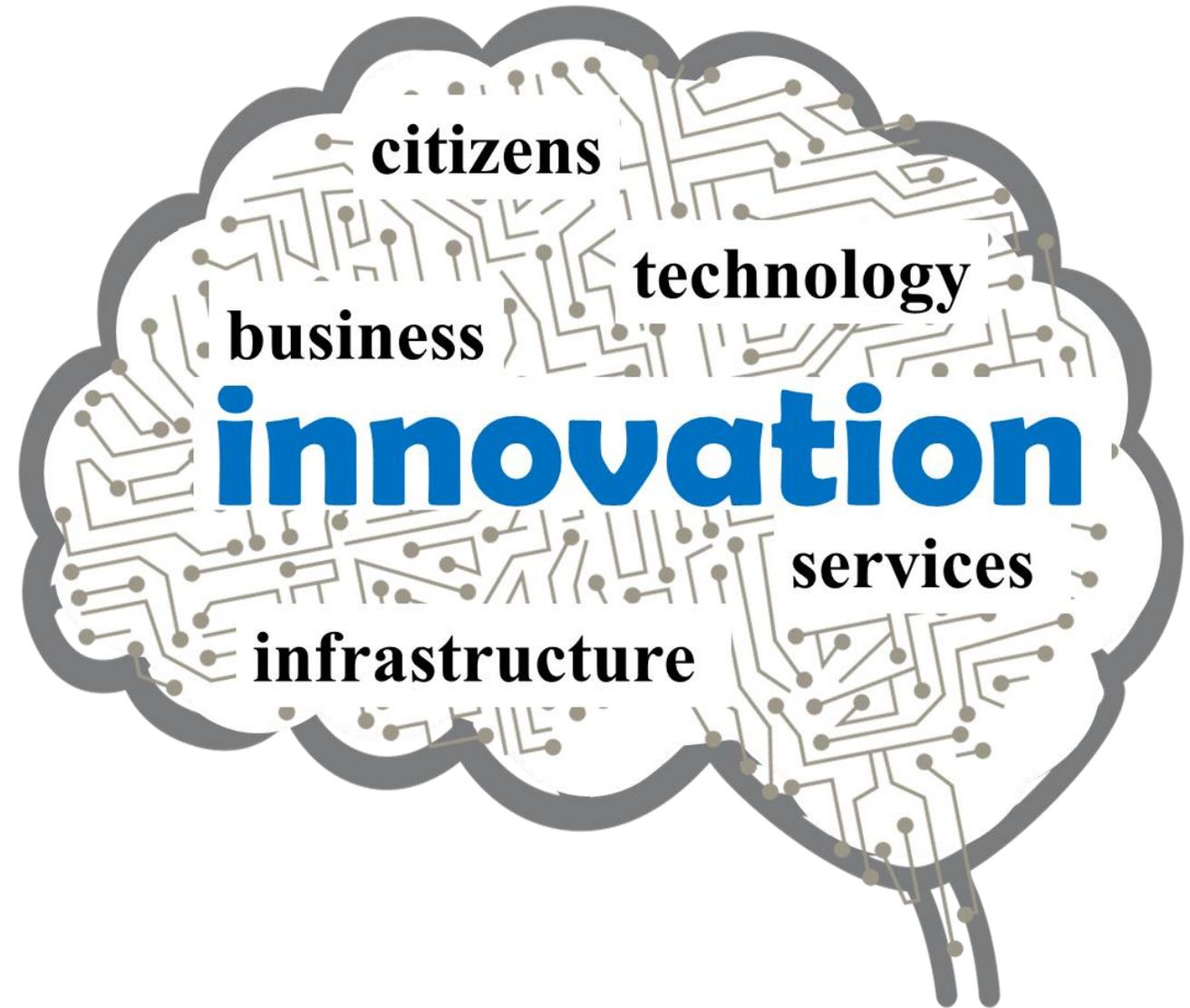
Buildings are building blocks of cities

citizens
technology
business
innovation
services
infrastructure

Traditional city and infrastructure

Today's SMART city is primarily about **applications** that link:

people to people …..

Today's SMART city is primarily about **applications** that link:

people to people …..

and to services – including (especially) transportation

There's a missing piece

What about buildings?

Human Experience & Innovation
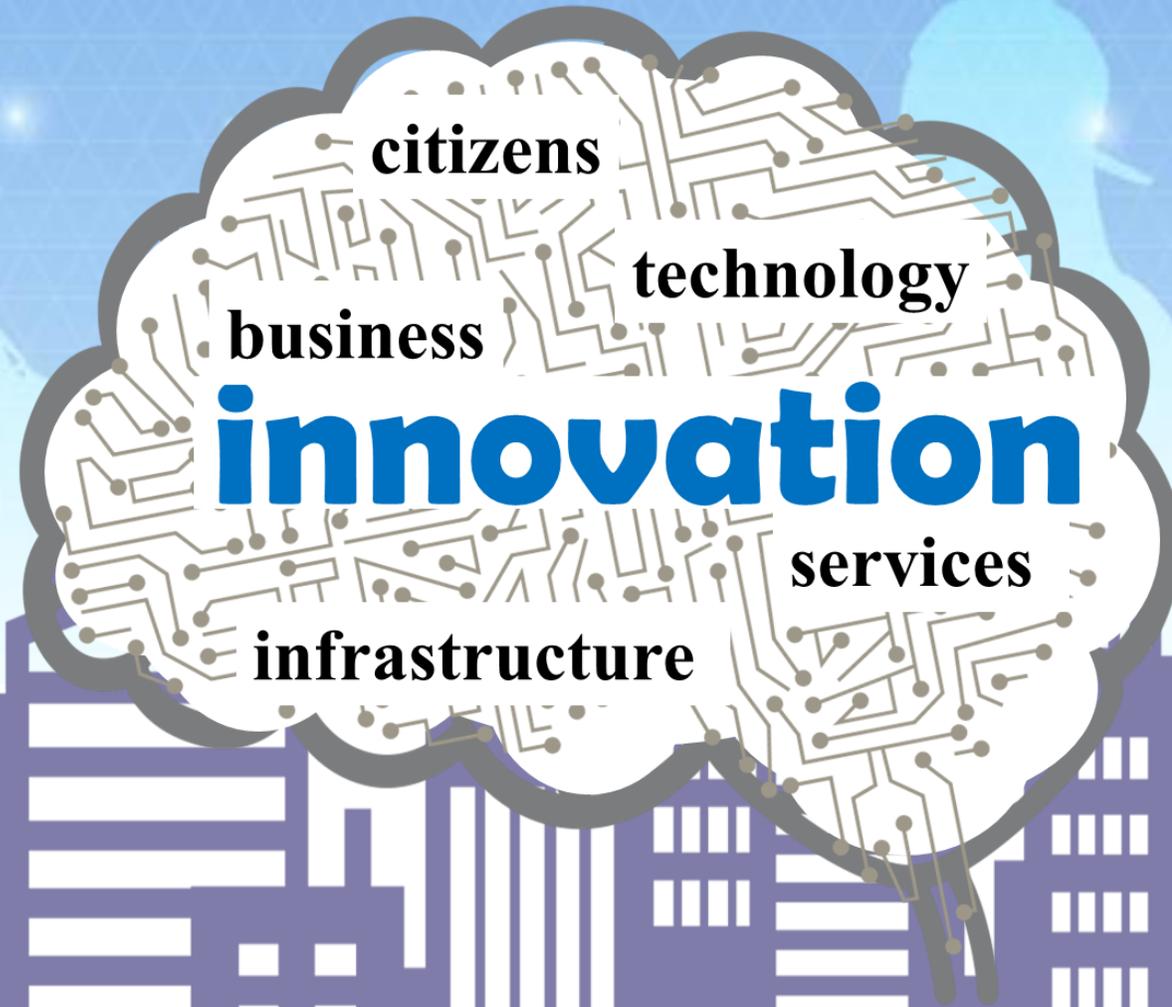
TIA's Definition of a Smart Building

A Smart Building uses an integrated set of

technology, systems and infrastructure

to optimize building performance and occupant experience.

A System of Systems Supporting BAAS

SMART BUILDING INTEGRATED ECOSYSTEM

VALUE GENERATION
BUILDING AS A SERVICE

Quality of Visitor/Tenant Experience
Productivity and Efficiency
Economic Development
Visitor/Tenant Safety
Health & Wellness
Security
Resilience
Sustainability
Mobility

| 7 | OWNER/MANAGER PACKAGED SERVICES | BUILDING DRIVEN SERVICES | EXTERNALLY PROVIDED SERVICES | CITY/COMMUNITY INTEGRATED SERVICES | WORKPLACE AND OCCUPANT DRIVEN SERVICES |

Application development, tools, integration, deployment

INNOVATION AND SERVICES ENABLEMENT

INTERCONNECTED SYSTEMS & IOT CAPABILITIES

6	AUTONOMY & AUTOMATION
5	INTEROPERABLE PROCESSES, SYSTEMS, OPERATIONS AND MANAGEMENT
4	INFORMATION MANAGEMENT
3	POWER & ENERGY
2	CONNECTIVITY AND COMMUNICATIONS
1	BASIC BUILDING SERVICES INFRASTRUCTURE

▲ SELECT A LEVEL TO LEARN MORE

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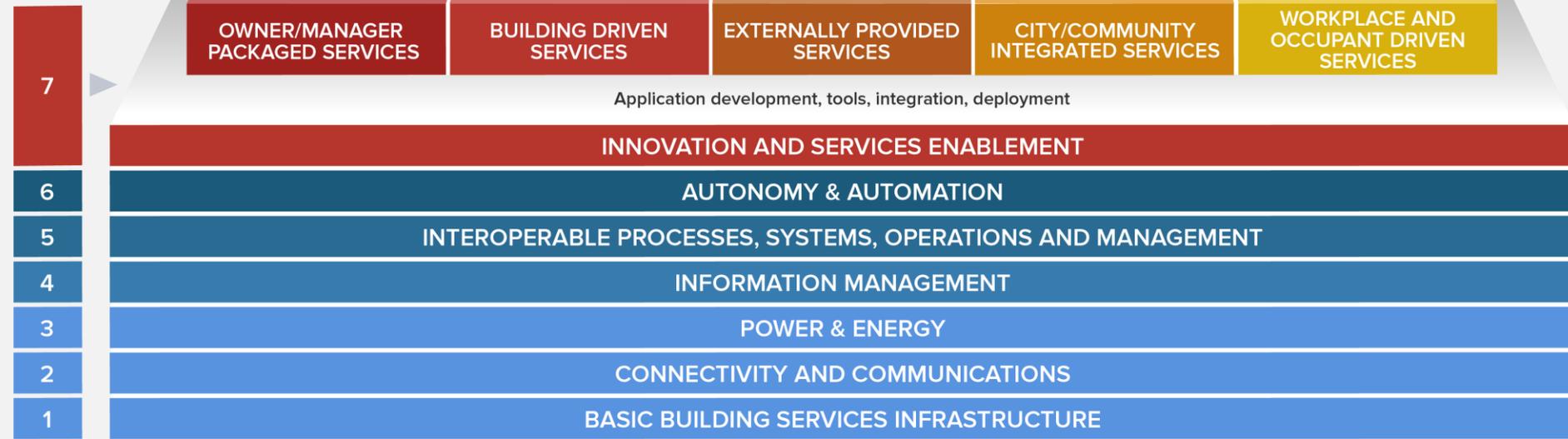
Foundation 1: Basic Infrastructure

SMART BUILDING INTEGRATED ECOSYSTEM

VALUE GENERATION
BUILDING AS A SERVICE

7

6
5
4
3
2
1

INTERCONNECTED SYSTEMS
& IOT CAPABILITIES

Plumbing, cabling, ducting, HVAC, AV, lighting, security, safety, sensors, building automation and management systems

BASIC BUILDING SERVICES INFRASTRUCTURE

▲ SELECT A LEVEL TO LEARN MORE

© 2019 TIA

Foundation 2: Connectivity

SMART BUILDING INTEGRATED ECOSYSTEM

VALUE GENERATION
BUILDING AS A SERVICE

7

6
5
4
3

INTERCONNECTED SYSTEMS
& IOT CAPABILITIES
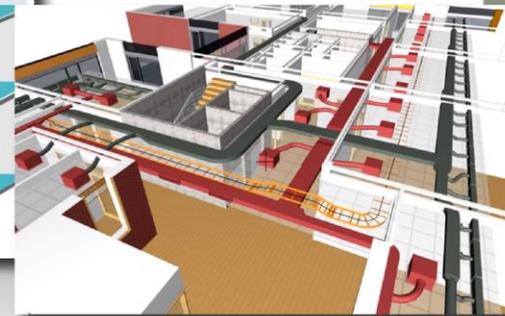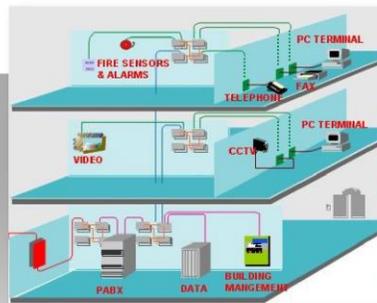
Wired, Wireless (Cellular & Other), WiFi, Public Safety, Internal/External

2   CONNECTIVITY AND COMMUNICATIONS

1   BASIC BUILDING SERVICES INFRASTRUCTURE

▲ SELECT A LEVEL TO LEARN MORE

© 2019 TIA

Foundation 3: Power & Energy

SMART BUILDING INTEGRATED ECOSYSTEM

VALUE GENERATION
BUILDING AS A SERVICE

7

6

5

4

INTERCONNECTED SYSTEMS
& IOT CAPABILITIES

3

2

1
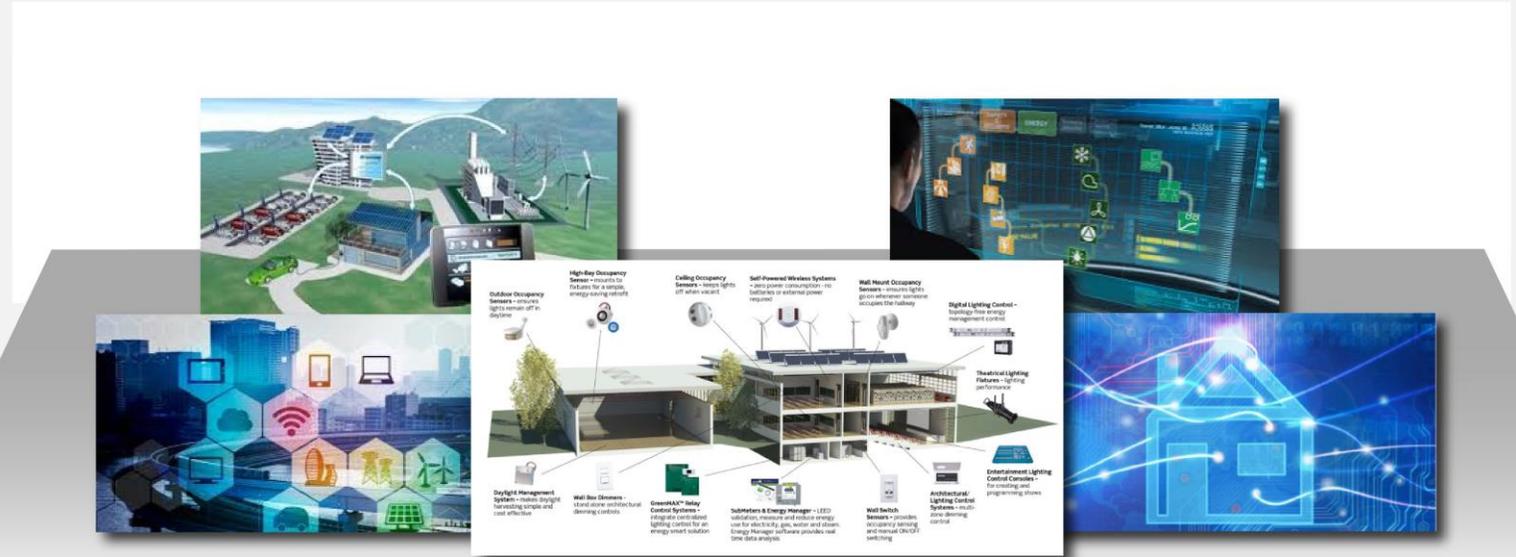
Energy monitoring and management (metering, submetering, prioritized demand-response), USB, PoE, integration with grid and AC/DC microgrids

POWER & ENERGY

CONNECTIVITY AND COMMUNICATIONS

BASIC BUILDING SERVICES INFRASTRUCTURE

▲ SELECT A LEVEL TO LEARN MORE

Smart Building
Super Cluster

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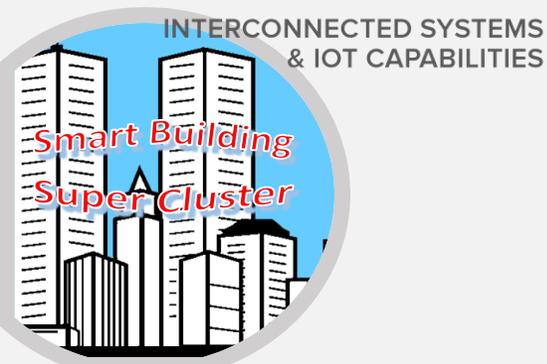
Foundation 4: Data

SMART BUILDING INTEGRATED ECOSYSTEM

VALUE GENERATION
BUILDING AS A SERVICE

7

6

5
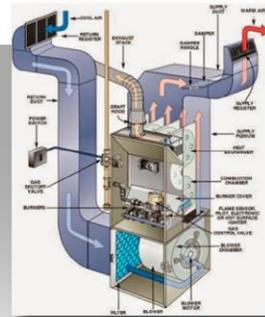
Data capture, analytics, utilization, cross-system sharing, management (including privacy and security), edge computing

4 | INFORMATION MANAGEMENT

INTERCONNECTED SYSTEMS
& IOT CAPABILITIES

3 | POWER & ENERGY

2 | CONNECTIVITY AND COMMUNICATIONS

1 | BASIC BUILDING SERVICES INFRASTRUCTURE

▲ SELECT A LEVEL TO LEARN MORE

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Smart Building
Super Cluster

Foundation 5: Interoperable Systems

SMART BUILDING INTEGRATED ECOSYSTEM

VALUE GENERATION
BUILDING AS A SERVICE

7

Systems and protocols speak a common language, open APIs

6	
5	INTEROPERABLE PROCESSES, SYSTEMS, OPERATIONS AND MANAGEMENT
4	INFORMATION MANAGEMENT
3	POWER & ENERGY
2	CONNECTIVITY AND COMMUNICATIONS
1	BASIC BUILDING SERVICES INFRASTRUCTURE

INTERCONNECTED SYSTEMS
& IOT CAPABILITIES

▲ SELECT A LEVEL TO LEARN MORE

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Foundation 6: Intelligence & Cognition

SMART BUILDING INTEGRATED ECOSYSTEM

VALUE GENERATION
BUILDING AS A SERVICE

7

Machine learning, predictive analytics, automated response, cross-system actuation

6	AUTONOMY & AUTOMATION
5	INTEROPERABLE PROCESSES, SYSTEMS, OPERATIONS AND MANAGEMENT
4	INFORMATION MANAGEMENT
3	POWER & ENERGY
2	CONNECTIVITY AND COMMUNICATIONS
1	BASIC BUILDING SERVICES INFRASTRUCTURE

INTERCONNECTED SYSTEMS
& IOT CAPABILITIES

▲ SELECT A LEVEL TO LEARN MORE

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Smart Building
Super Cluster

A System of Systems Supporting BAAS

GLOBAL CITY TEAMS CHALLENGE

SMART BUILDING INTEGRATED ECOSYSTEM

VALUE GENERATION
BUILDING AS A SERVICE

Quality of Visitor/Tenant Experience
Productivity and Efficiency
Economic Development
Visitor/Tenant Safety
Health & Wellness
Security
Resilience
Sustainability
Mobility

| 7 | OWNER/MANAGER PACKAGED SERVICES | BUILDING DRIVEN SERVICES | EXTERNALLY PROVIDED SERVICES | CITY/COMMUNITY INTEGRATED SERVICES | WORKPLACE AND OCCUPANT DRIVEN SERVICES |

Application development, tools, integration, deployment

INNOVATION AND SERVICES ENABLEMENT

INTERCONNECTED SYSTEMS & IOT CAPABILITIES

6	AUTONOMY & AUTOMATION
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4	INFORMATION MANAGEMENT
3	POWER & ENERGY
2	CONNECTIVITY AND COMMUNICATIONS
1	BASIC BUILDING SERVICES INFRASTRUCTURE

▲ SELECT A LEVEL TO LEARN MORE

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Smart Building Super Cluster

Smart Building Super Cluster

GLOBAL CITY TEAMS CHALLENGE

Thank you!

Limor Schafman
Co-chair Smart Buildings Super Cluster, GCTC
Senior Director, Smart Buildings, TIA
Lschafman@TIAOnline.org

1/22/2019

Smart Building Super Cluster

GLOBAL CITY
TEAMS CHALLENGE

NexGen Smart Buildings: Improving Organizational Productivity and Quality of Life

Jiri Skopek

Digital Ecosystem - It's all about the user's experience
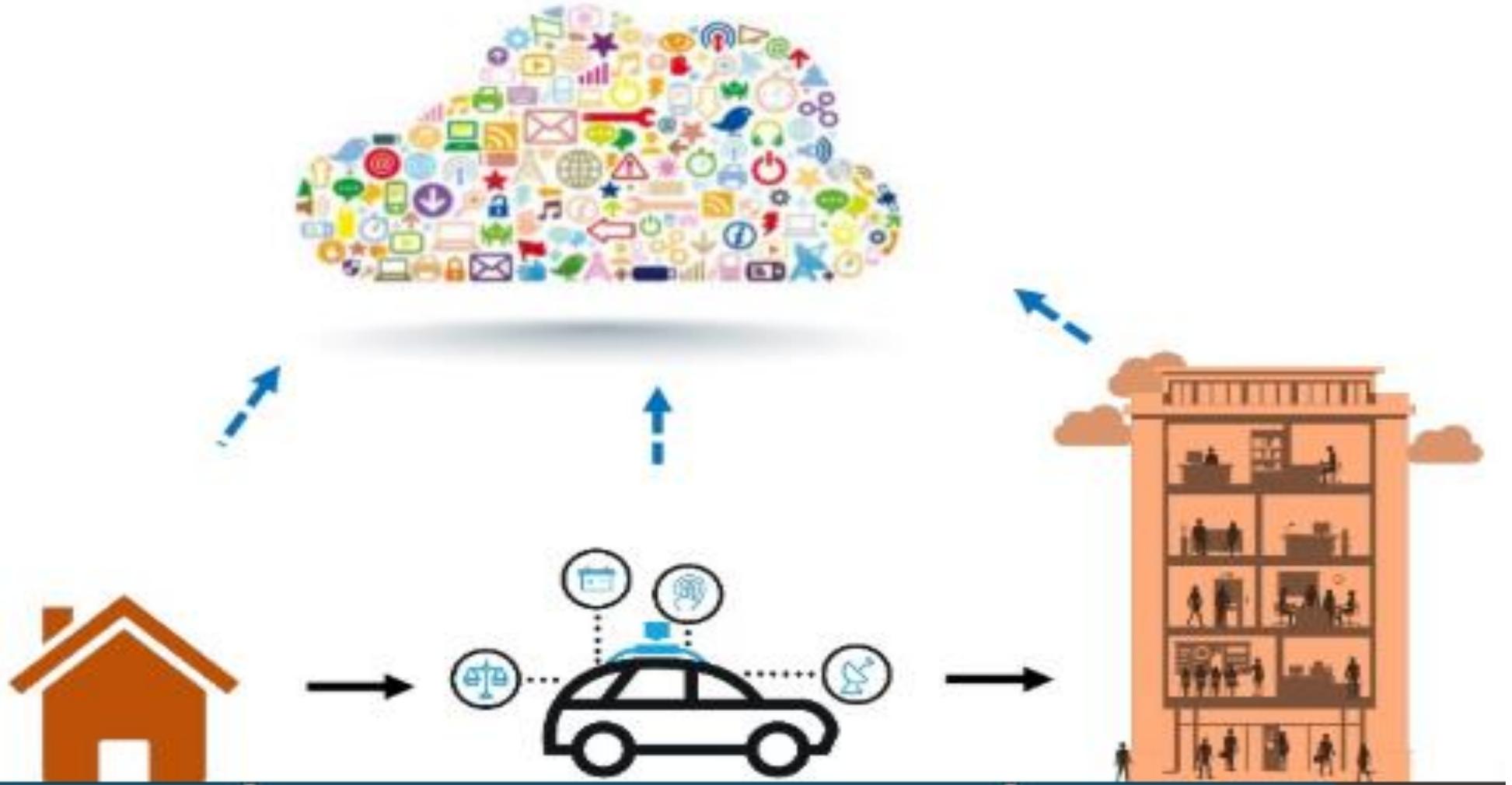
Smart building means different things to different people

Each stakeholder has different objectives and ways of measuring organizational productivity (different KPIs)

Occupants/Employees
- **Workplace Satisfaction**
  - **Health & Comfort**
  - **Work-life balance**
  - **Human connection**
- **Professional amenities**

Building /Facility Management
- **Meeting occupants' expectations**
  - **Tenants' retention**
    - **Cost savings**

Corporate Tenants
- **Effective use of space**
- **Cost space/employee**
- **Workplace Productivity**

Owner/ Investor/Asset Manager (including Municipalities)
- **Rental revenue**
- **Tenant retention**
- **Operations & energy costs**
  - **Vacancy rates**
  - **Resale value**

Human experience

Seamless Operation

Space as a service

Building ROI

Owner/ Investor/Asset Manager

The "Marker" Buildings: the Smartest, Net-Zero, Edge in Amsterdam and Energy Academy Europe (EAE) in Groningen

Bulk of the Existing Large Commercial Buildings

Bulk of the Existing Light Commercial Buildings

"show me the value without associated risks"…

Corporate Tenants- building data becoming part of enterprise data management strategy

Enterprise Data (Curated)	API Request	API Response	Aggregate Data Store	Consumers

Data Host

ODBC

JDBC

SQL

Preferred formats in green - more efficient for transporting data, reducing file sizes, avoiding interpretation errors, and speed of parsing.

Internet of Things (IoT)

Building sensors & data

Real Time

Comma Separated Values (CSV)
Fixed Length
Plain Text
Rich Text (RTF)
Hyper Text Markup Language (HTML)
Extensible Markup Language (XML)
JavaScript Object Notation (JSON)
Proprietary

Aggregate Data Store

Consumer API

Tabular Reports
Spreadsheet extracts

BI and Analytics

Downstream Data Store

Application Gateway

SOAP

REST

Proprietary

Virtualized Data

Retrieved by the consumer API from the source system - eliminates the need to move data to the aggregated data store - gives less control over QC and availability.

Downstream Applications

Copyright OSCRE International, 2018

TECHNICAL attributes to achieve desired smart capabilities that drive organizational productivity

Human experience

Space as a service

Building ROI

Connectivity
Cellular networks, privately managed & WIFI networks, Future readiness

Energy & Power
Analytics; Demand response; Distributed energy

Environmental Controls
Temperature, IAQ, Acoustics

Intelligence
Access to information, Controls, Decision-making, Feedback

Data
Governance, Functionality

Space Planning
Occupancy, Real-time Demand

Resilience
Redundancy, Restoration

Security
Security; Privacy; Future proofing

Safety

PropTech

Example:

The **LANE** platform makes user interaction with the building and the community intuitive.

lane — Employees   Managers   Careers   Journal   About   Get Started
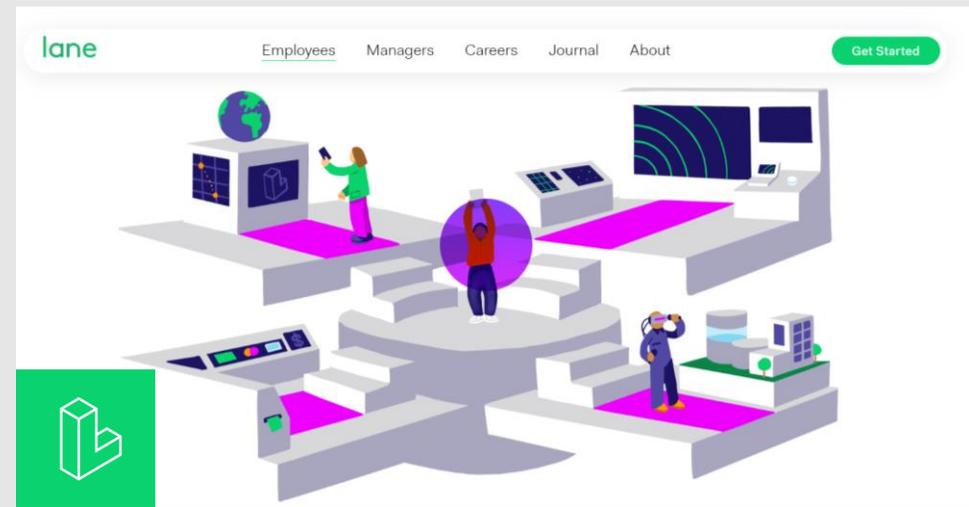
Building /Facility Management and Operations

Energy savings

- Energy Monitoring , Measurement and Verification (M&V),
- Demand Management
- HVAC Optimization

Operational savings

- Fault Detection
- Equipment Predictive Analysis
- Asset Monitoring using Digital Twin -50-70% efficiency gains
- Predictive cleaning

Savings from individual and integrated building systems

HVAC
Variable-speed drive 15–50%

Window shading
Automated shades 21–38%
Switchable film 32–43%

Lighting controls
Advanced lighting control 45%
Web-based management adds 20–30%

Plug load
Advanced power strips 25–50%
Smart plugs 50–60%

Building with integrated systems
8–18%
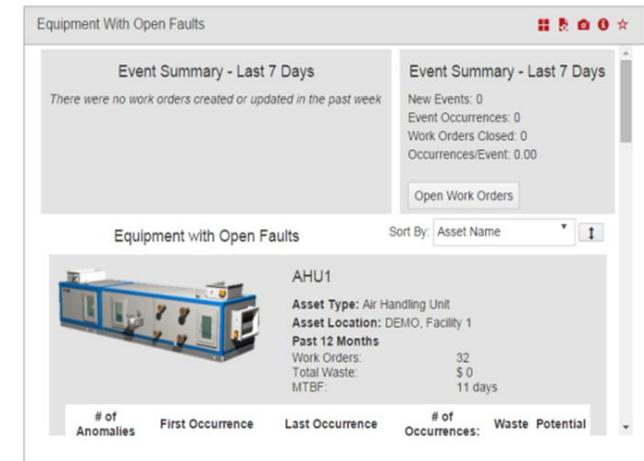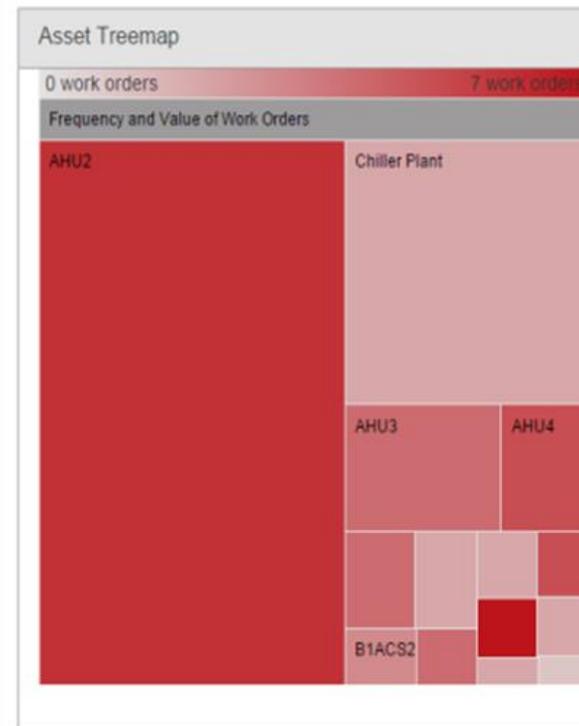
Smart Restroom Monitoring

DC/AC microgrids-part of smart buildings and smart city

The LED's of motors

760 VDC

LED lighting

AC
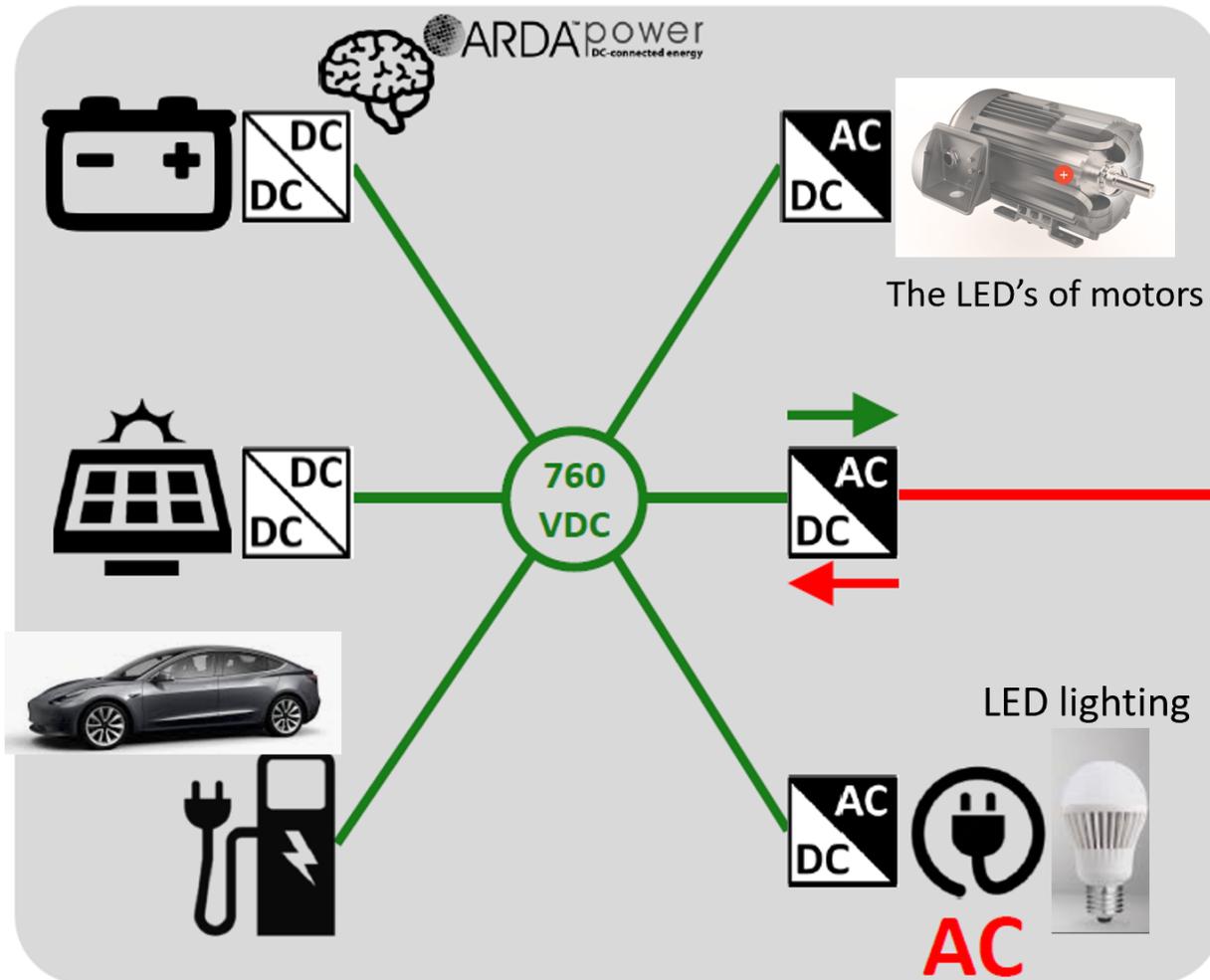
PoE Marriot Hotel, Texas

GLOBAL CITY
TEAMS CHALLENGE

Smart Building Super Cluster

CONNECTIVITY
Empower your Smart Building

Ronna Davis

Trends Driving Connectivity Demands
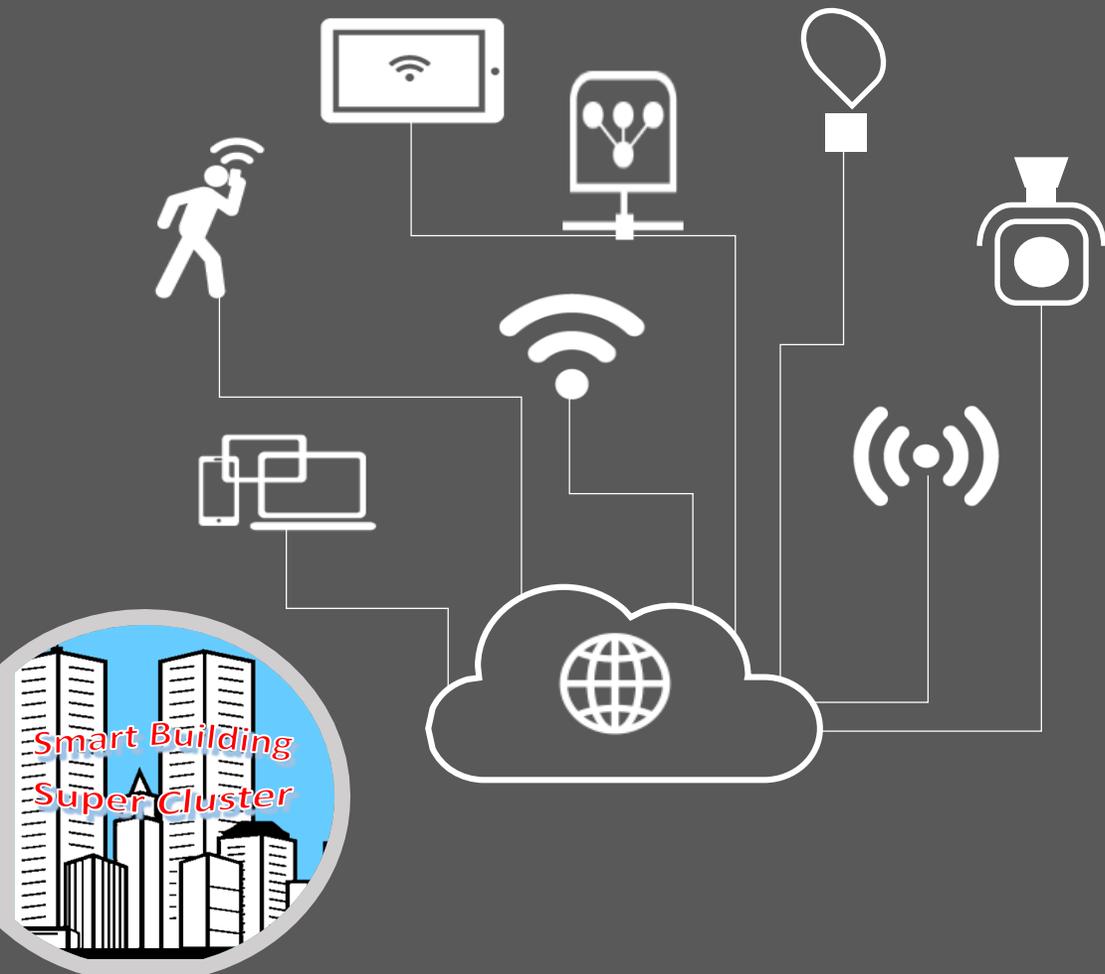
- **IoT**

- **DEVICE LEVEL COMMUNICATION / M2M**

- **SEAMLESS COMMUNICATION OUTDOOR TO INDOOR**

GLOBAL CITY
TEAMS CHALLENGE

Smart Building
Super Cluster

BUILDING CONNECTIVITY

- WIRELESS
  - Cellular Wireless
  - CBRS Private Cellular Network
  - Wi-Fi
  - Short Range Wireless
  - LPWAN

- WIRED
  - Service Provider
    - Multiple Carrier solutions/ Wired and Wireless
  - Building Fiber
    - Backbone and to the Edge
  - Endpoint Device Connectivity
    - 4 Pair Ethernet – Supports High Data Apps and PoE
    - *Single Pair Ethernet – Supports Low Power Low Data Devices*

Smart Building
Super Cluster
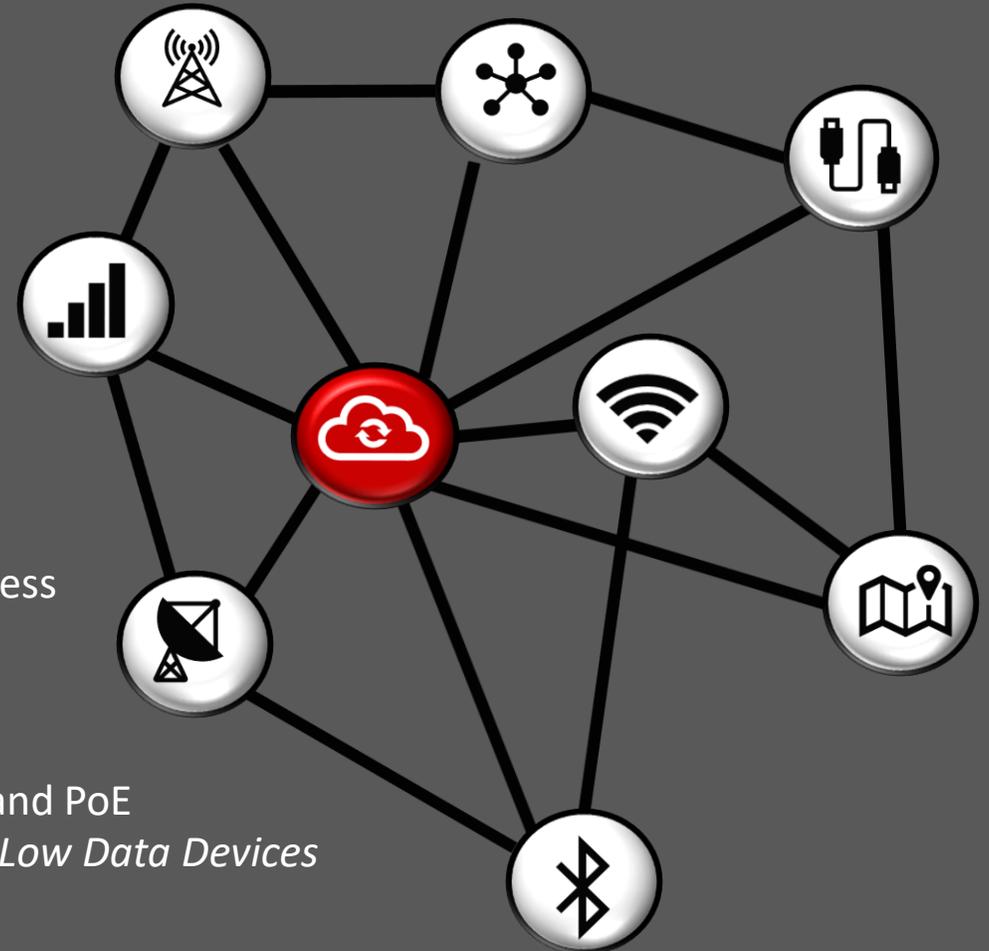
Sustainable Design

- Connectivity enables sustainable design.

- Your network architecture can impact sustainability.

- Energy for your network is a key consideration.

Limor Schafman
Senior Director, Smart Buildings Program
TIA (Telecommunications Industry
Association)

Jiri Skopek
Vice-chair
2030 Districts Network

Ronna Davis
Strategy and Technology Team
- Building and Campus
CommScope, Inc.

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2020 CABA Smart Buildings Summit (SBS), produced by **AGORA**

CABA
SMART
BUILDINGS
SUMMIT

PRODUCED
BY:

AGORA

SBS
SMART BUILDINGS SUMMIT

May 3 - 5, 2020

Sawgrass Marriott Resort & Spa | Ponte Vedra Beach, FL

CABA Intelligent Buildings Council (IBC)

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6.1 2019 IBC Landmark Research "Evidence for Building Retrofits that Improve Organizational Productivity (Phase 2)"

Free Download of Phase 1: www.caba.org/productivity   www.caba.org/research

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6.2 2020 IBC Landmark Research Topic?

CABA Intelligent Buildings Council (IBC)

7.1 Recently Completed: None

www.caba.org/WhitePapers

CABA Intelligent Buildings Council (IBC)

CABA 30 YEARS

7.2 In Progress:

"Energy Metering and Power Quality Metering in North America"

ArcoLogix LLC

Asian Institute of Intelligent Buildings

Brainwave Research Corp.

CMG

Convergint Technologies

CopperTree Analytics Inc.

Current, powered by GE

Cyber Power Systems, Inc.

Domotz

Enercare Connections Inc.

EZ Meter Technologies

Honeywell International Inc.

Ken Wacks Associates

Public Works and Government Services Canada

Renesas Electronics America Inc.

Robert H Lane and Associates Inc.

Schneider Electric

Sustainable Resources Management

Triacta Power Solutions

Zinwave

www.caba.org/WhitePapers

7.2 In Progress:

"Multi-MHz Wireless Power Transfer and Its Commercial Applications"

Airfuel Alliance
University of Michigan - Shanghai Jiao Tong University Joint Institute
Princeton University

www.caba.org/WhitePapers

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7.2 In Progress:

"The Evolution of Integrating LiFi Technology into Smart Lighting and Control Systems for the Intelligent Building"

Wharton County Junior College
Acuity Brands, Inc.
ArcoLogix LLC
Control4
National Electrical Manufacturers Association
Telecommunications Industry Association (TIA)

www.caba.org/WhitePapers

CABA Intelligent Buildings Council (IBC)

CABA 30 YEARS

7.2 In Progress:

"Human Centric Lighting: Non-Energy Benefits of Lighting and its Smart Controls"

Human Centric Lighting Society (Chair)

ArcoLogix LLC

Control4

National Electrical Manufacturers Association

Syska Hennessy

UL LLC

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All proposals and previously completed IBC White Papers can be downloaded at: www.caba.org/whitepapers

CABA Intelligent Buildings Council (IBC)

8.1 Other new IBC business?

CABA Intelligent Buildings Council (IBC)

9. Announcements
Ron Zimmer (CABA)

9.1 Past Event Overview:

Shanghai Intelligent Building Technology, Sept 3-5, Shanghai, China

SCTE-ISBE Cable Tec Expo, Oct 13-16, New Orleans, LA

IFMA's World Workplace Conference & Expo, Oct 16-18, Phoenix, AZ

Smart Utility Summit, Oct 27-29, Phoenix, AZ

CoRETECH 2109, Nov 13-15, San Jose, CA

Greenbuild International Conference and Expo 2019, Nov 19-22, Atlanta, GA

CABA Intelligent Buildings Council (IBC)

CABA 30 YEARS

9. Announcements
Ron Zimmer (CABA)

9.2 Upcoming events:

CABA AGM, Dec 5, 11am ET via Webinar

AHR Expo, Feb 3-5, Orlando, FL

2020 CABA Smart Building Summit (SBS), produced by AGORA, May 3-5 2020, Ponte Vedra, FL

CABA Intelligent Buildings Council (IBC)

CABA 30 YEARS

Next IBC Meeting, Late Jan/Early Feb, 2020

Continental Automated Buildings Association (CABA)

caba@caba.org

www.CABA.org

www.caba.org/ibc

CABA
Intelligent Buildings Council

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