# 056

# LONG RANGE WIDE AREA NETWORK (LoRaWAN)

## OPPORTUNITY

*What percentage of GSA's building portfolio is historic?*

# 35%
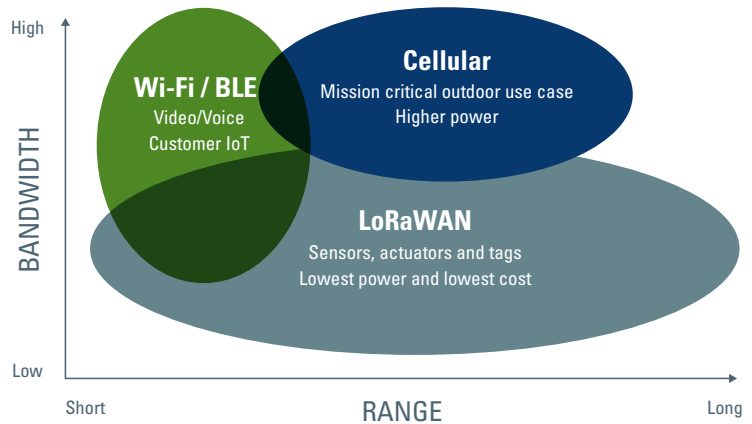### OF GSA BUILDINGS ARE HISTORIC AND USE DENSE CONSTRUCTION MATERIALS

## TECHNOLOGY

*What is a LoRaWAN communication protocol?*

## SCALABLE NETWORKING SPEC FOR INTERNET OF THINGS (IoT) APPLICATIONS
### MILLIONS OF DEVICES, 10+ YEAR BATTERY LIFE, UP TO 10 KM RANGE

LoRaWAN is less prone to obstruction than other wireless protocols[1]



**Wi-Fi / BLE**
Video/Voice
Customer IoT

**Cellular**
Mission critical outdoor use case
Higher power

**LoRaWAN**
Sensors, actuators and tags
Lowest power and lowest cost

BANDWIDTH — High / Low
RANGE — Short / Long

## M&V

*Where did Measurement & Verification (M&V) occur?*

**PACIFIC NORTHWEST NATIONAL LABORATORY** (PNNL) assessed the feasibility of LoRaWAN, provided by MachineQ (a Comcast company), at a federal office building in Newark, NJ.

## RESULTS

*How did LoRaWAN perform in M&V?*

# 200+
## IAQ & ENERGY ALERTS

Consistent data transmission from the basement up two floors of concrete with no signal interference [2]

# 1-DAY
## INSTALLATION

Simple, cost-effective installation [3]

### Connect multiple IoT devices to a single network
Secure: 128-bit cryptography, mutual authentication, end-to-end encryption



Lighting

HVAC

Geolocation

**Building Use Cases**

Security

Asset Tracking

Energy Meters

Indoor Air Quality

## DEPLOYMENT

*How does M&V recommend deploying LoRaWAN?*

*GSA cybersecurity review will be required for full GSA deployment. FedRAMP authorization is not required.

## FACILITATE IoT APPLICATIONS*

Enhance low-data wireless connection in older buildings with dense construction materials

Deploy for single building or campus-wide IoT networks

An API simplifes app integration and supports long-term data strategy

[1] www.lora-alliance.org  [2] Operator-in-the-Loop Grid-Interactive Efficient Building Evaluation, Michael Myer, (PNNL), September 2024, p. 7  [3] Ibid, p. 7