The sources identify five key use cases for Bluetooth Low Energy (BLE) beacons across various industries, emphasizing their role in providing indoor visibility, efficiency, and scale. Beacons are noted as the most balanced choice for these applications compared to technologies like GPS, Wi-Fi, UWB, LoRa, and RFID.

Here are the key use cases and the measurable value delivered by beacon deployments:

1. Indoor Navigation

Core Problem Addressed: Navigation Confusion. In large facilities, poor wayfinding leads to lost visitors and wasted staff time.

Value Delivered (Measurable Results):

- **$200,000 saved** per year in lost time.
- **15% happier patients**.

Industry Example (Case Study: AIIMS Jammu):

- In hospitals, the cost of poor wayfinding can reach $200K per year.
- The deployment of over 1000 beacons at AIIMS Jammu provided **seamless indoor navigation** through a mobile application, enabling **on-time arrivals** and a **calmer patient experience**. This solution redefined navigation and resulted in increased staff efficiency.
- The sources highlight that the problem faced by the hospital was navigational, not medical.

Relevant Beacon Models: The N1 and N14 models are specifically suited for Indoor Navigation due to their compact design and long battery life.

2. Retail Marketing and Proximity Marketing

Core Problem Addressed: Engagement Gaps. Retail environments often struggle with low engagement without proximity tools.

Value Delivered (Measurable Results):

- A **175% Return on Investment (ROI)**.
- **73% buyer engagement** achieved.
- Engagement can be 65% lower without beacons.

Key Functionality: Beacons boost sales and engage customers with **targeted promotions and location-based offers**. They provide attendees and guests with location-based information and timely updates in events and hospitality settings.

Relevant Beacon Models: All primary models (N1, N2, N3, N4, N14) are ideal for **Proximity Marketing** and **Retail Promotions**.

3. Asset Tracking

Core Problem Addressed: Invisible Assets. This results in lost tools and poor visibility within factories or large campuses.

Value Delivered (Measurable Results):

- **68% more accurate inventory**.
- This addresses the general 68% inventory inaccuracy experienced without tracking systems.

Key Functionality: Beacons ensure **real-time visibility of assets** to prevent loss or misplacement with minimal setup. They track movement and location for efficient asset management.

Relevant Beacon Models: All primary models (N1, N2, N3, N4, N14) are designed for versatile **Asset Tracking** applications across various industries.

4. Environmental Monitoring

Core Problem Addressed: Environmental Gaps. This involves risks to temperature-sensitive goods, particularly within the cold chain.

Value Delivered (Measurable Results):

- **$15,000 saved per year**.
- **25% ROI**.
- This directly tackles the high cost of spoilage, such as the **$35 billion per year in pharma spoilage** reported in the cold chain.

Key Functionality: Beacons track temperature, humidity, and other environmental factors in real-time. This capability is critical for monitoring critical goods and assets in temperature and humidity-controlled environments.

Relevant Beacon Models: The **N2** model is specifically built as a **powerhouse for tracking and monitoring critical goods** and is equipped with **Temperature &**

Humidity sensors. The advanced **N4** also includes temperature, humidity, and ambient light sensors.

5. Security and Access Control

Core Problem Addressed: Manual Access Control. Manual processes lead to inefficiency and security risks.

Value Delivered (Measurable Results):

- **300% ROI**.
- **20% faster operations**.
- Beacons can facilitate a **30% theft risk reduction**.

Key Functionality: Beacons automate access control with seamless, location-based security solutions. Advanced models like the N4 offer features such as a **PCB-mounted SOS button** and **3-axis accelerometer (IMU)** for enhanced safety measures, motion detection, and fall detection.

Relevant Beacon Models: All models (N1, N2, N3, N4, N14) are listed for **Security & Access Control**. The N4 is particularly relevant due to its integrated safety and motion features.

A simple beacon network serves as a foundational Internet of Things (IIoT) solution that delivers **real-time visibility, ROI, and control**, effectively solving disconnected processes that drain efficiency and revenue.