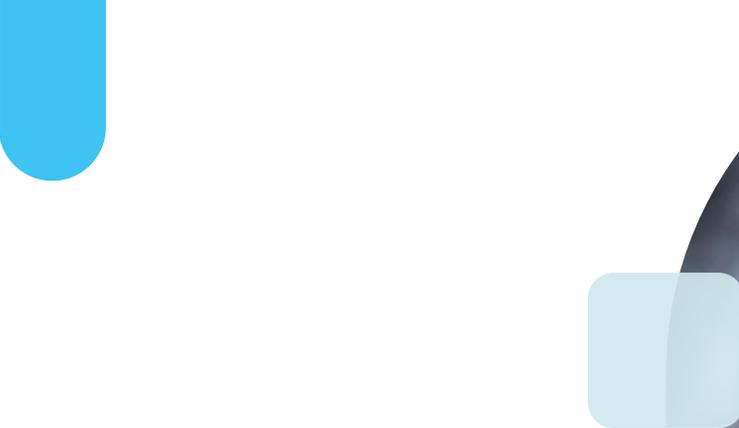




# HARMAN SMART CONNECTED SOLUTIONS

DTS

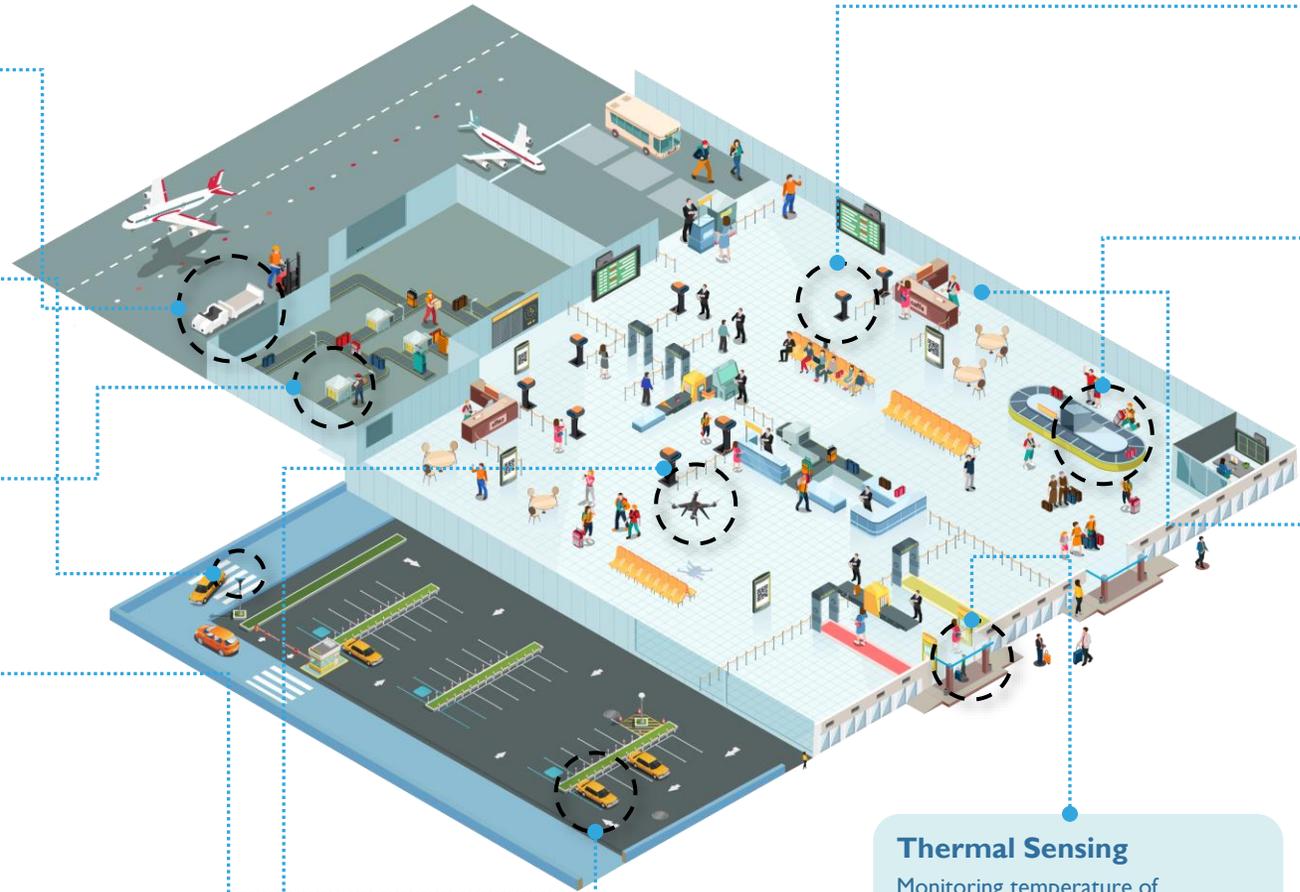


# LIFE-WARE



... TO ENABLE SAFER, SMARTER &  
SUSTAINABLE COMMUNITIES

# SMART ENTERPRISE SOLUTIONS



### Fleet Tracking

Tracking of city vehicles in real time, for position, speed, time to reach, improving operational effectiveness

### Smart Lighting

Smart IoT enabled lighting control system for energy efficiency and operational cost reductions

### Cargo Tracking

Real time tracking and reconciliation of cargo movement from A->B

### Smart Parking

A complete parking solution, for both Operators and citizens, improving overall

### Video Analytics & Surveillance

Edge Processing of Video feeds for real time video surveillance with facial recognition, crowd monitoring, vehicle detection among others

### Virtual Queues

QR Code and scanners for users to entry/exit to Virtual and physical Queues

### Infra Monitoring

Real time status of assets like carousels, lifts, escalators, etc.

### Smart Bin Management

Effective garbage management with state-of-the-art fill level tracking of bins for optimized routes and real time monitoring

### Thermal Sensing

Monitoring temperature of employees & visitors

### Airport Assets Monitoring

Tracking of valuable city assets spread across, in real time

# USE CASES SUITE

## Customer Experience

## Security

## Environment

## Utilities

## Business

- Improved Driving experience with Ease of Parking
- Vehicles Queue Management
- Real Time Containers Tracking
- Vehicle Density Tracking

- Crowding Management
- Zone Management and Boundary Detection
- Warehouse Safety Collision avoidance
- Warehouse Stacking Safety

- Temperature, Pressure, Humidity Monitoring
- Sustainable Carbon footprint reduction with Intelligent Lighting solutions

- Smart Restrooms & Janitorial Services
- Intelligent and Seasons adaptive lighting
- Waste Bins fill level tracking for efficient cleaning

- Container Tracking
- Real time tracking of assets and warehouse Cargo
- Assets Condition Monitoring
- Utilization Monitoring

### HARMAN CENTER OF COMPETENCIES



**EXPERIENCE LED DESIGN**



**INTERNET OF THINGS**



**ADVANCED ANALYTICS**



**VIDEO ANALYTICS**

### HARMAN IPs & ENABLERS



IOT Platform



Cameras



Sensors

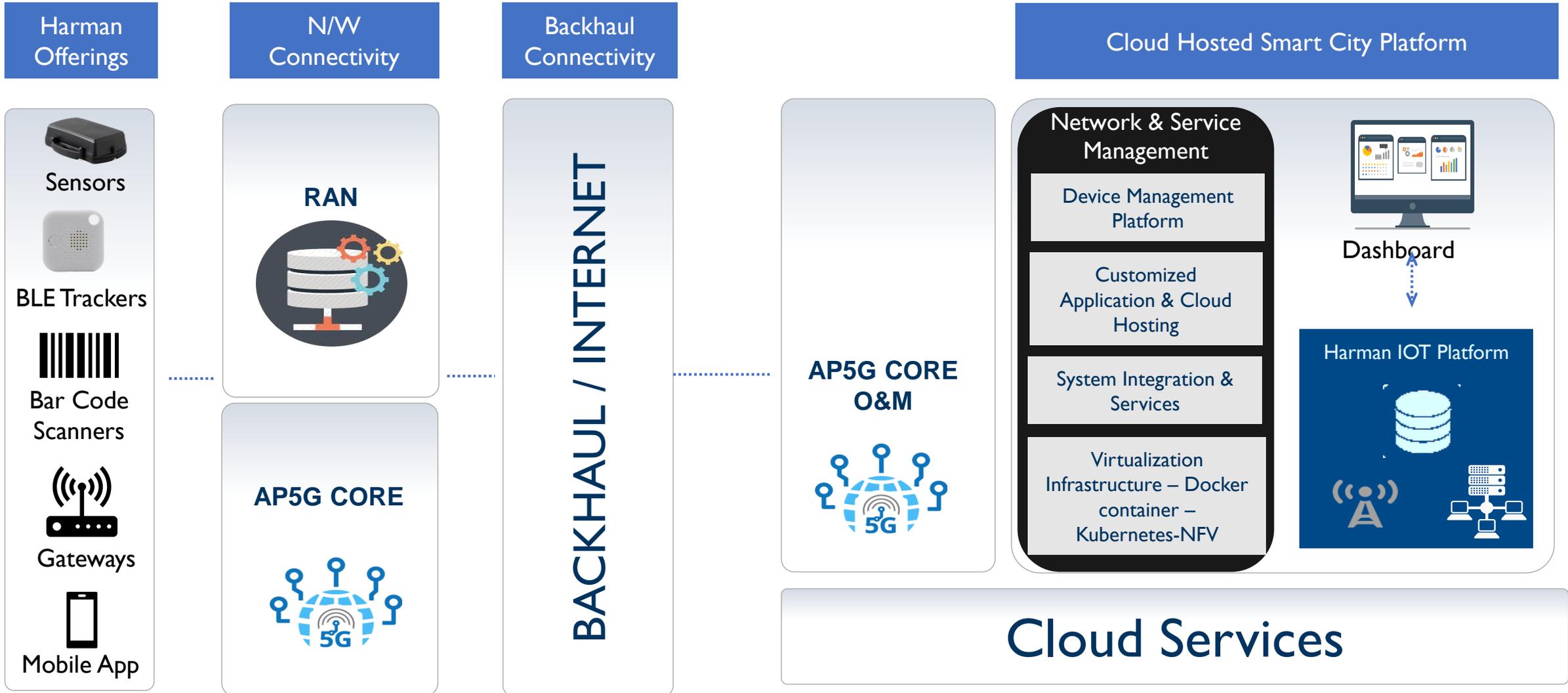


Drone Platform



AI / ML Platform

# SMART SOLUTIONS DEPLOYMENT ARCHITECTURE



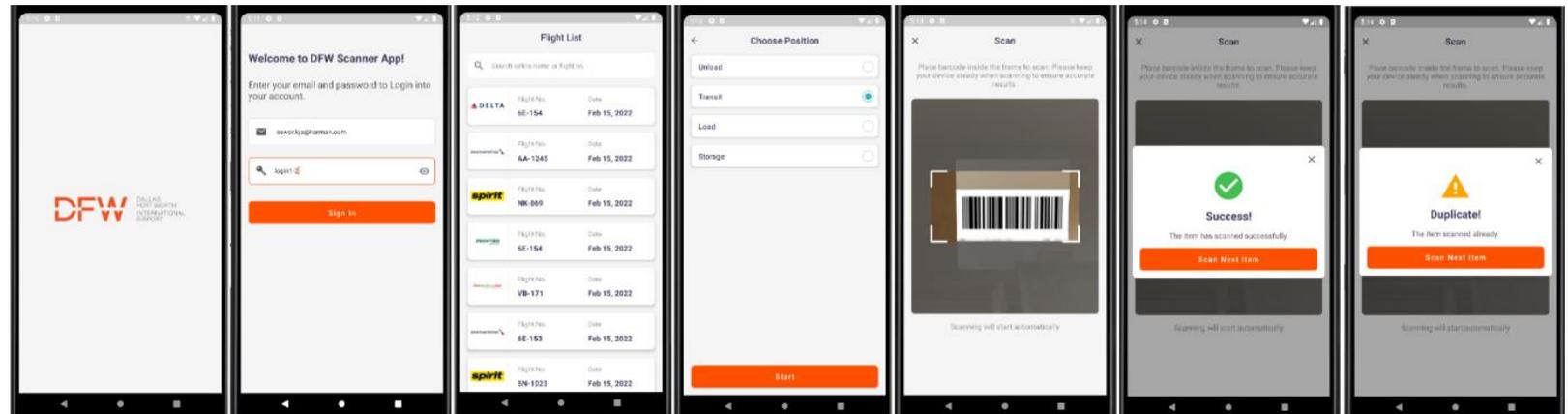
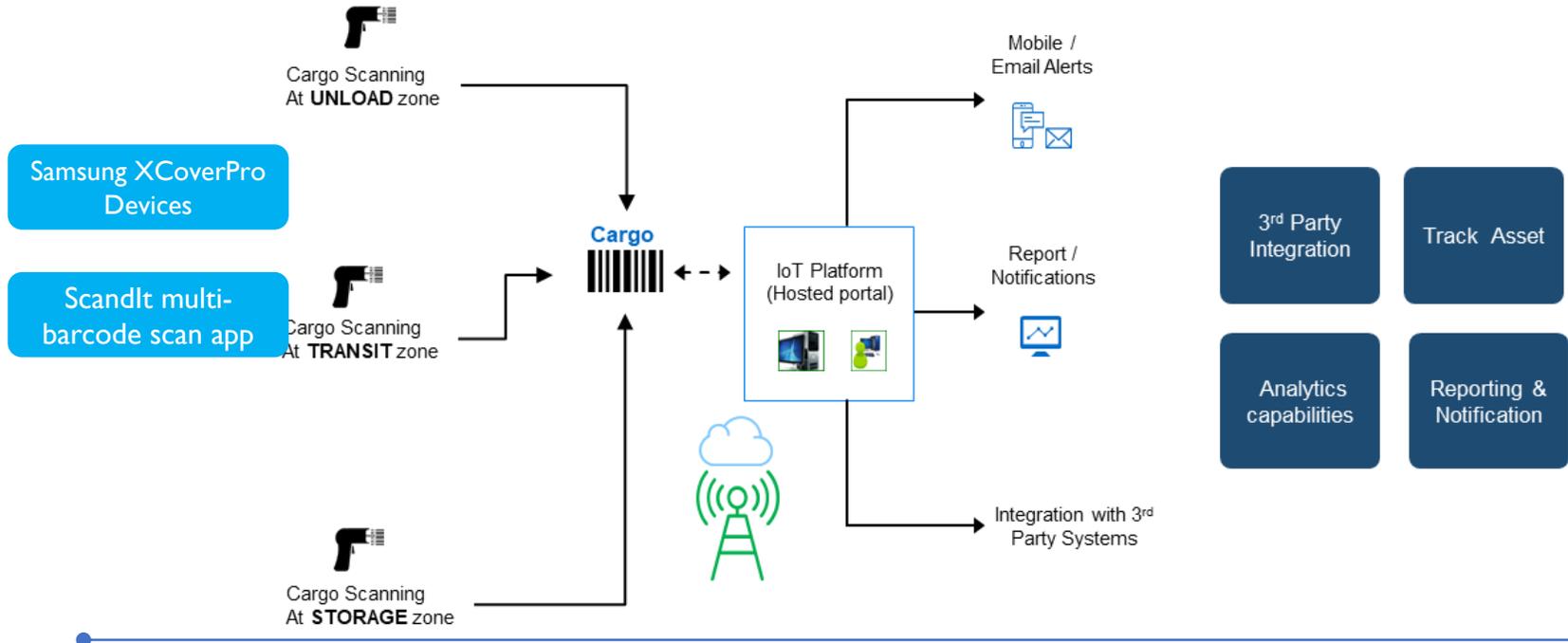


# USE CASES SUITE



## CARGO TRACKING

- Scan the cargoes in each zone say unload, transit, storage
- Tracking of cargo elements across different zone
- Count of assets across zones
- Identify Missing or extra cargoes from the previous zone
- Time tracking of cargoes across zone
- Show average handling duration for each zone



# REAL TIME TRACKING FIELD DASHBOARD

### Cargo Tracking

Cargo Tracking | Cargo Tracking | Filters | Realtime - last minute

**Cargo Processed**  
14

**Processing Time**  
170 min

**Avg. Processing Time**  
4.3 min

**Yet to Receive**  
25

**Extra Cargo**  
6

**Unloading Zone** 3 Devices

**Transit** 2 Devices

**Storage Area** 2 Devices

**Scanned Cargo Items**

35

**Scanned Cargo Items**

10 Scanned, 25 Items to be scanned, 4 Extra Items scanned

**Scanned Cargo Items**

10 Scanned, 25 Items to be scanned, 6 Extra Items scanned

**Avg. Time for Scanning (Min)**  
2.3

First Item Scanned at 05 Jul, 21 | 4:11 AM  
Last Item Scanned at 05 Jul, 21 | 5:30 AM

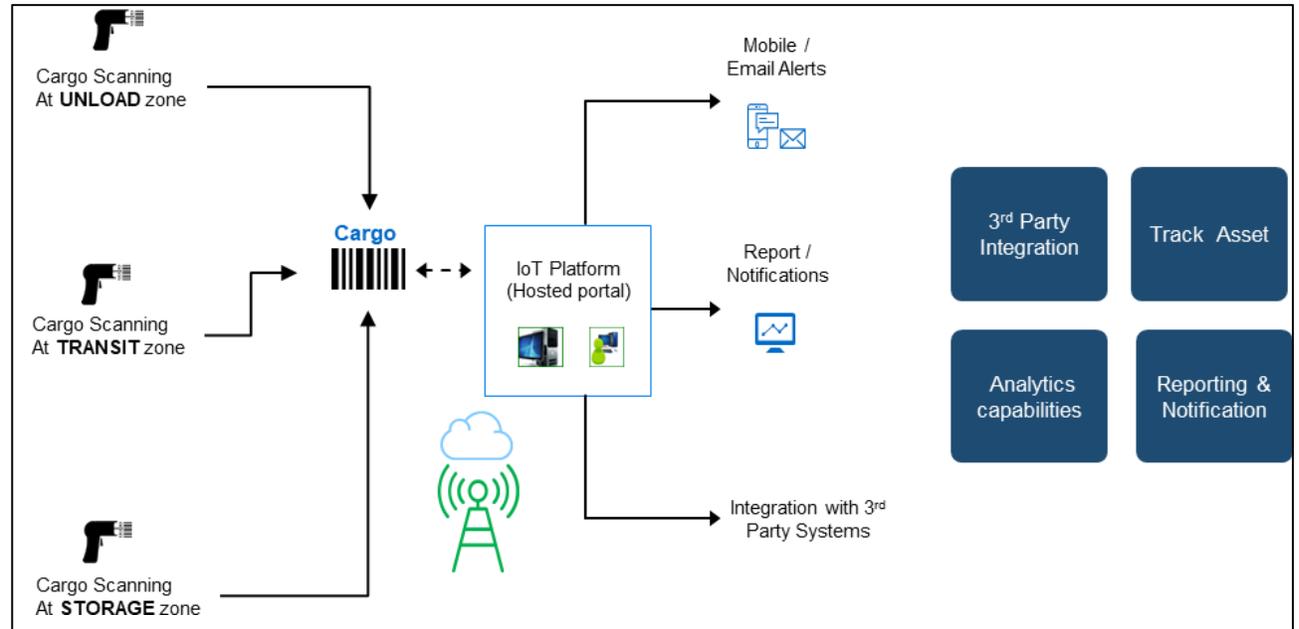
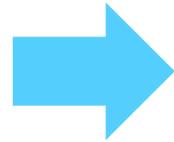
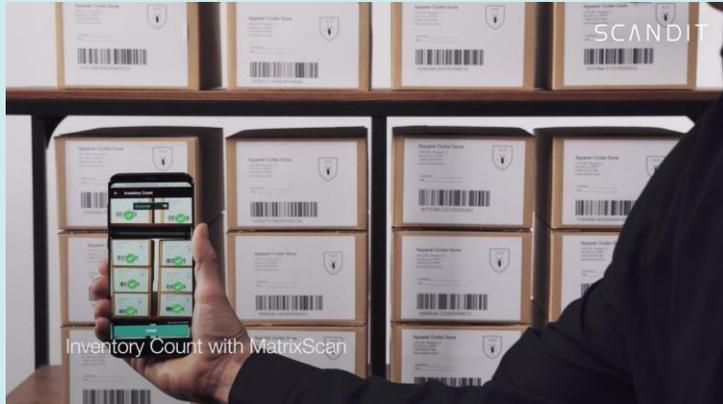
**Avg. Time for Scanning (Min)**  
8.6

First Item Scanned at 05 Jul, 21 | 4:30 AM  
Last Item Scanned at 05 Jul, 21 | 6:30 AM

**Avg. Time for Scanning (Min)**  
2.1

First Item Scanned at 05 Jul, 21 | 6:31 AM  
Last Item Scanned at 05 Jul, 21 | 7:01 AM

# SCANDIT – MULTI-SCANNING MADE EASY!



Multiple Barcode scanning made easy with duplicate detection!

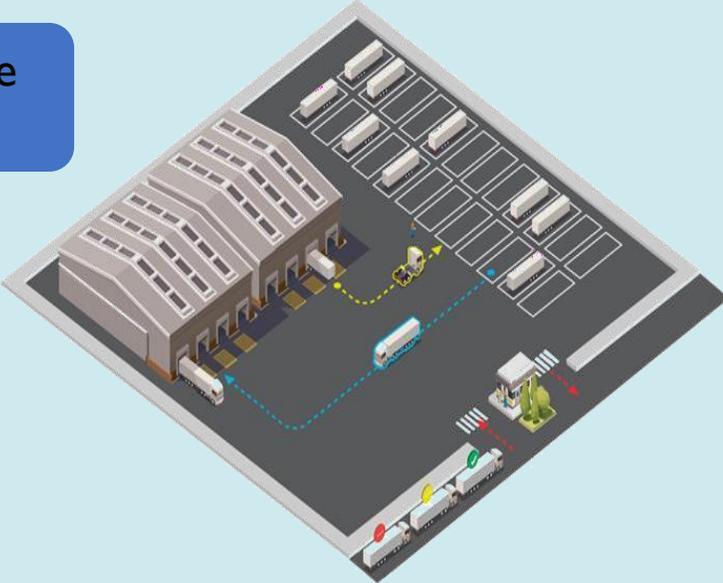


Multi-scans feed into Baggage Tracking Solution



# WAREHOUSE ASSET TRACKING

Asset tracking provides companies of all sizes, across all industries information on the assets like Location, Condition, and Value (both financially and in time)



## PROBLEM AREAS

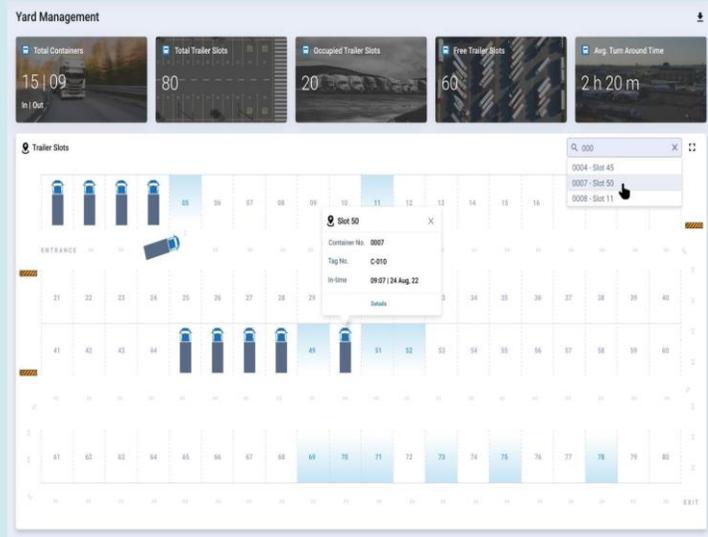
- Are my Yard Jockeys spending a lot of time in finding the trailers?
- Do I have the visibility of where a given trailer is at any point?
- Do I have the visibility of all the open trailer spaces that I have?
- Do my Yard teams have advanced insight into when trucks will enter the yard for loading or unloading?
- Do my stakeholders have insights into what is happening in real time?

## HARMAN SOLUTION HIGHLIGHTS

- Assets Safety
- Real-time Data Visibility
- Cost Savings
- Process Improvements
- Trailer Location Tagging
- Trailer Search
- Asset Movement & Location
- Trailer Slot Occupancy Visibility
- Operational Performance Visibility

## HARMAN SOLUTION ADVANTAGE

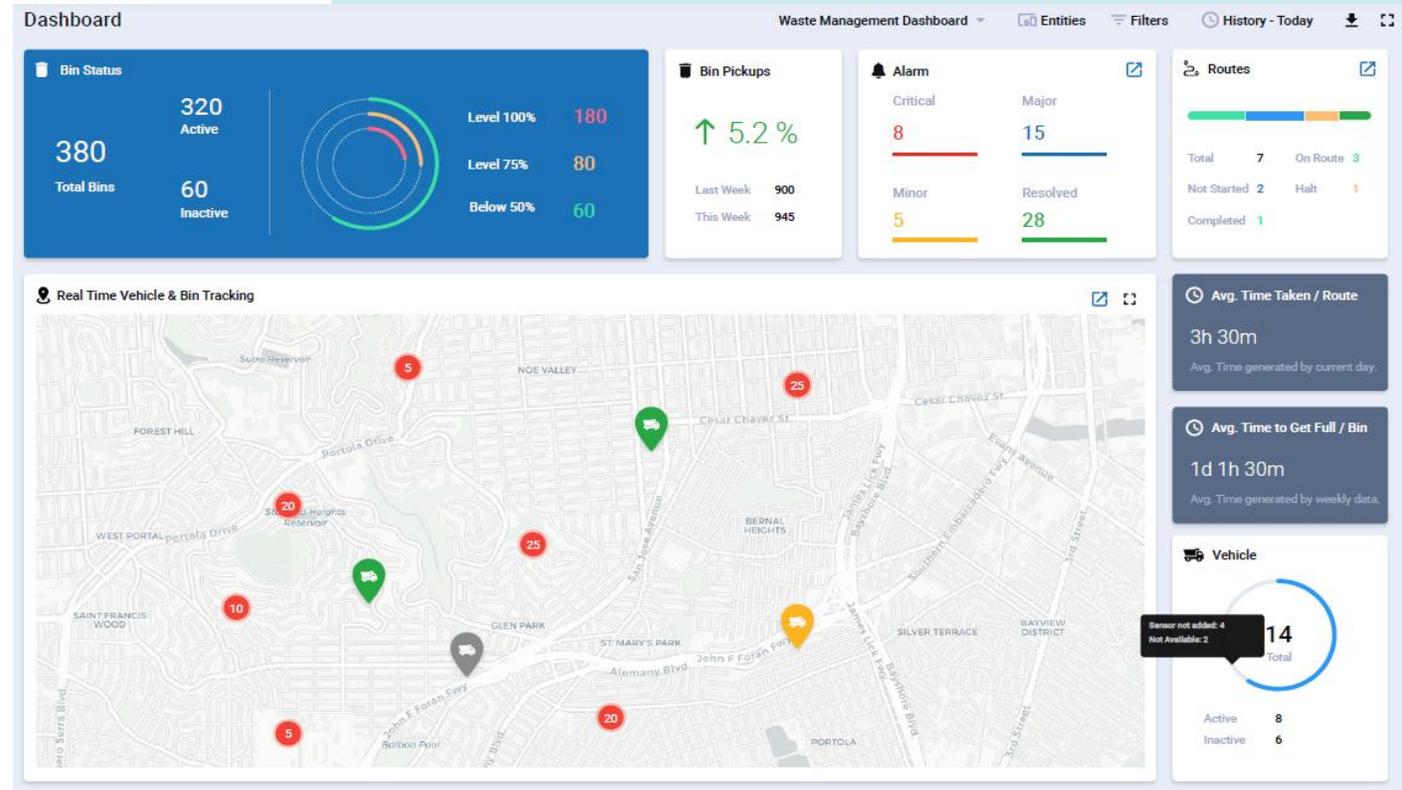
- Real-time Yard Space Visibility
- Real-time Yard Trailer Visibility
- Spotter/Yard Jockey Efficiency
- Yard Dwell Times
- Process Conformity
- Yard Appointment Scheduling
- Real-time operational insights



# SMART WASTE MANAGEMENT

## TANGIBLE AND INTANGIBLE BENEFITS

- Know containers fill status remotely
- Handle collection requests on demand
- Real time data 24 x 7
- Understand waste production patterns
- Provide citizens with more Efficient Waste Management
- Optimize work force
- Optimize waste collection frequencies
- Optimize waste bin capacity, location and type
- Evaluate bin infrastructure density, efficiency cost
- Identifying cost effective routes for collection



## KEY FUNCTIONS

Real-time bin status and monitoring, pick-up trucks tracking

Real time information on current location waste bins, making route definition easier, integrated with LoraWAN sensors

Tracking of fill levels, servicing needs and any critical alarms like geofence crossed, enable quick just-in-time servicing and incident response

An updated mobile app for supervisor and residents for alerts and notifications

# VIDEO AI OFFERING

Real time identification on face profile match,

**FACIAL RECOGNITION**

Real time Alerts and Notification of violations

**REAL-TIME SURVEILLANCE**

Mask compliance

**MASK DETECTION**

Information on how long Person spent time in the zone

**DWELL TIME ANALYSIS**

Identification of different vehicles, traffic density

**TRAFFIC ANALYSIS**

**PEDESTRIAN ANALYSIS**

Pedestrian movement, directions

**TREND ANALYSIS**

Traffic, pedestrian trends based on direction, type, etc

**INTEGRATION WITH EXTERNAL SYSTEMS**

Integrations with different data sources

**OBJECT DETECTION**

Ability to identify any required object and track

**FOOT FALL ANALYTICS**

People Counting

**ZONE ANALYSIS**

heatmap of Zone foot fall and usage

# VIDEO ANALYTICS – OBJECT DENSITY & COUNTING



Footfall Analytics

People Density  
(warehouse, shopfloor, etc.)

Cartons Counting

Collision Avoidance Safety

Crowding Management

Worker Safety

# HARMAN SMART LIGHTING

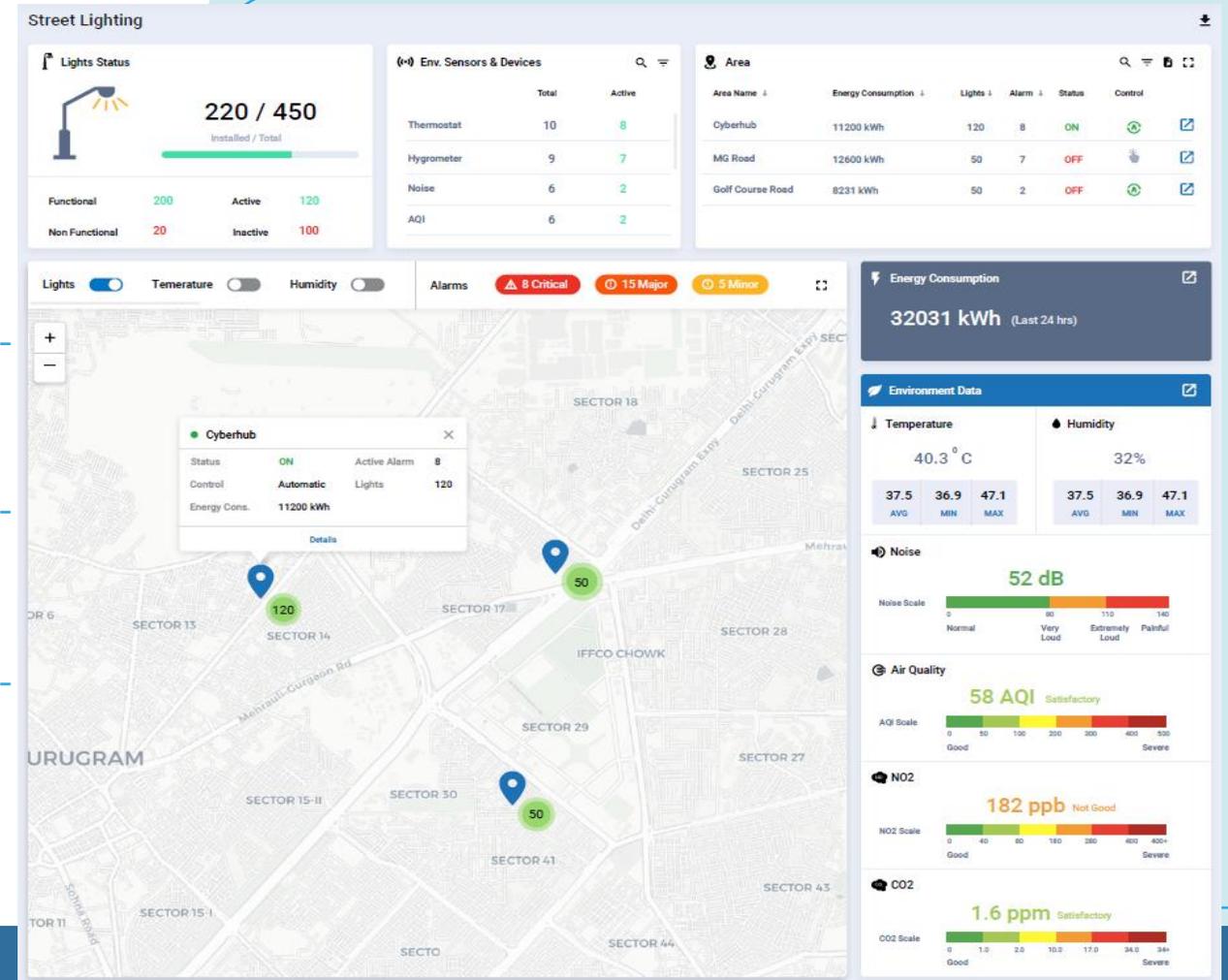
A city administrator can check the functional / non-functional lights status in real time. Additional ability to monitor area wise decentralizes monitoring, thereby improving the maintenance response time. Alarms can be seen at global level

Real time monitoring of electricity consumption, along with historical view, helping to find patterns or abnormal spikes. Area and street light level consumption provides deep insights. Alarms can be seen area wise

Optionally provides an ability to control a group of lights from the dashboard with the master switch. Ability to setup different switching and dimming timing for different seasons can easily be done.

### Extended capabilities on the pole

Various sensors for temperature, humidity, noise, gun shot detection, pollution monitoring can be added on the electricity pole, extending the functional set of same physical set up



### KEY FUNCTIONS

Real time lighting status and Area wise monitoring, Electricity Consumption tracking

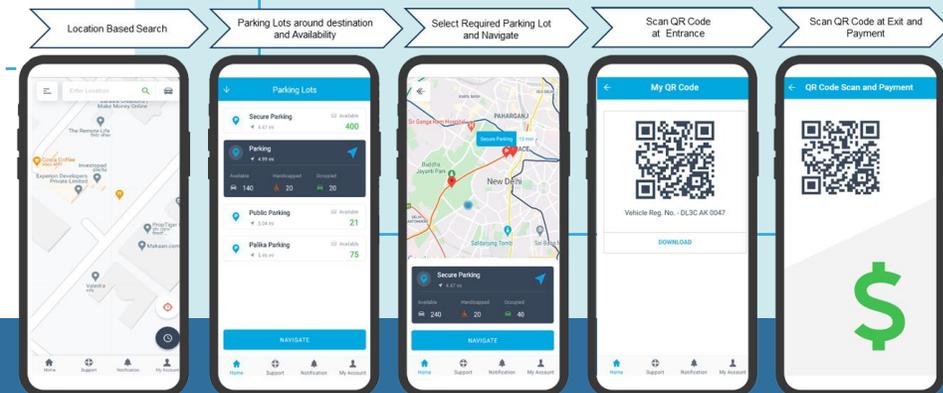
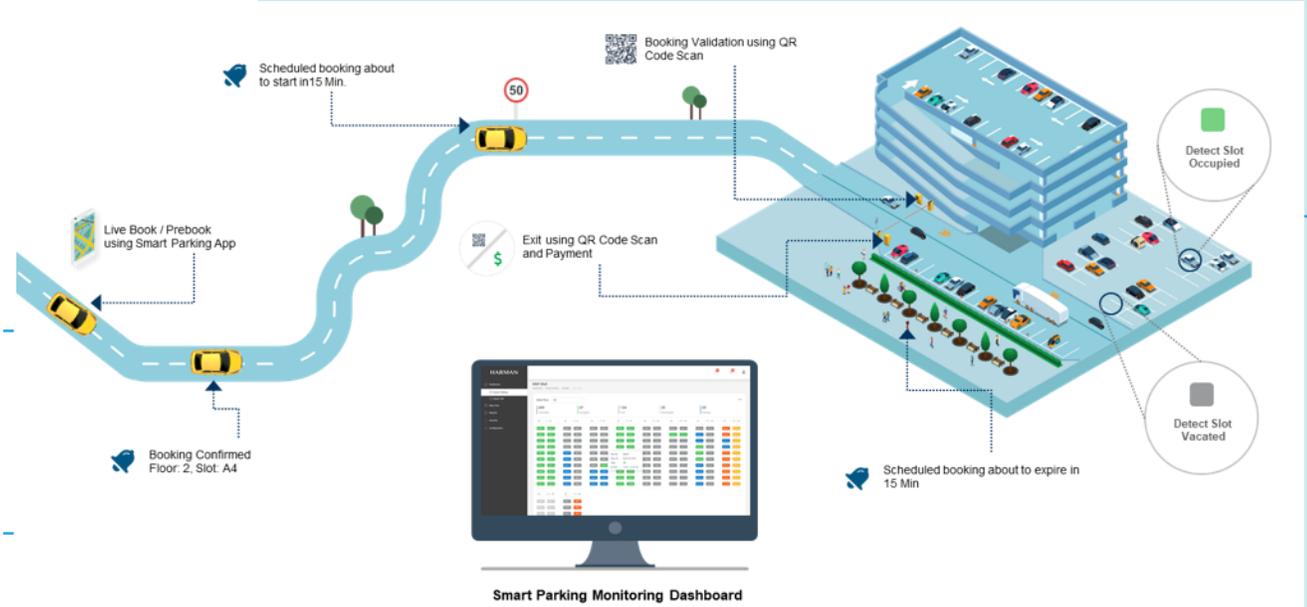
# SMART PARKING

Gives the Operator an ability to manage multiple parking lots spread across cities. Optimizes operational costs.

Real time information on vacant slots, as an example using LoraWAN sensors from Unizen. Other sensors and technologies can be easily integrated as required

Ability to search parking lots, find vacant slots, book slots, automatic payment processing

Full functional Android User Mobile App  
Power in the hands of the user directly



## KEY FUNCTIONS

Real time lighting status and monitoring, Electricity Consumption tracking

# TEMPERATURE & HUMIDITY MONITORING

Receive and visualize in real time the temperature, humidity, pressure, AQI levels and various other information from different sensors on a single window

- Keep track of every sensor location and usage
- Define thresholds for various sensors independently
- Define custom actions for alerts and alarms for each threshold independently
- Notify field staff in realtime to take corrective actions

Provide web and mobile interfaces to search (live location) and report the sensors detail and history \* Implement one integrated solution for different parameters tracking

The screenshot displays the Harman Pnaas Monitoring dashboard. The top navigation bar shows 'Dashboard groups > Pnaas Monitoring > Pnaas Monitoring' and the user 'PNaas Plano, Tenant administrator'. The main content area is divided into several sections:

- Sensors:** A row of four widgets showing real-time data:
  - Temperature Value: 68.7 °F
  - Humidity Value: 60.1 %
  - Times Door Opened: 93
  - Lidar Sensor: 6554 cm
- Temperature History:** A line graph showing temperature trends from Dec 13 to Dec 19, with values ranging from 0°F to 80°F.
- Humidity History:** A line graph showing humidity trends from Dec 13 to Dec 19, with values ranging from 0% to 70%.
- Map:** A map view showing the physical locations of sensors on a street grid.
- Alarms:** A table for managing alerts with columns for Created time, Originator, Type, Severity, and Status.

A dark sidebar on the left contains navigation options: Rule chains, Data converters, Integrations, Customer groups, Asset groups, Device groups, Device profiles, Widgets Library, Dashboard groups (with sub-items: All, Cargo, StreetLight City level, Pnaas Monitoring), White Labeling, and System Settings.



## KEY FUNCTIONS

Real time temperature and asset location status, optimal conditions for asset performance and usage for operational efficiency



**THANK YOU**