
ADB SAFEGATE

Airside 4.0 – Integrating and connecting Airside Assets

Regardt Willer

SWIFT Conference 2023



2023


**ADB
SAFEGATE**

ADB SAFEGATE : In Good Company



VISION

A future of seamless, sustainable and safe airside operations.



MISSION

We lead through innovation with smart, cost-effective and distinctive products, solutions and services to help our customers achieve more with less.

Quick Recap IoT



Collaboration & Process

Embedded Applications and processes



Application

Reporting, Analytics, Monitoring, Control



Data Abstraction

Data Aggregation, Harmonization & Abstraction



Data Accumulation

Cloud Data ingress and cloud storage



Edge Computing

Communication technologies wired & wireless



Connectivity

Communication technologies wired & wireless

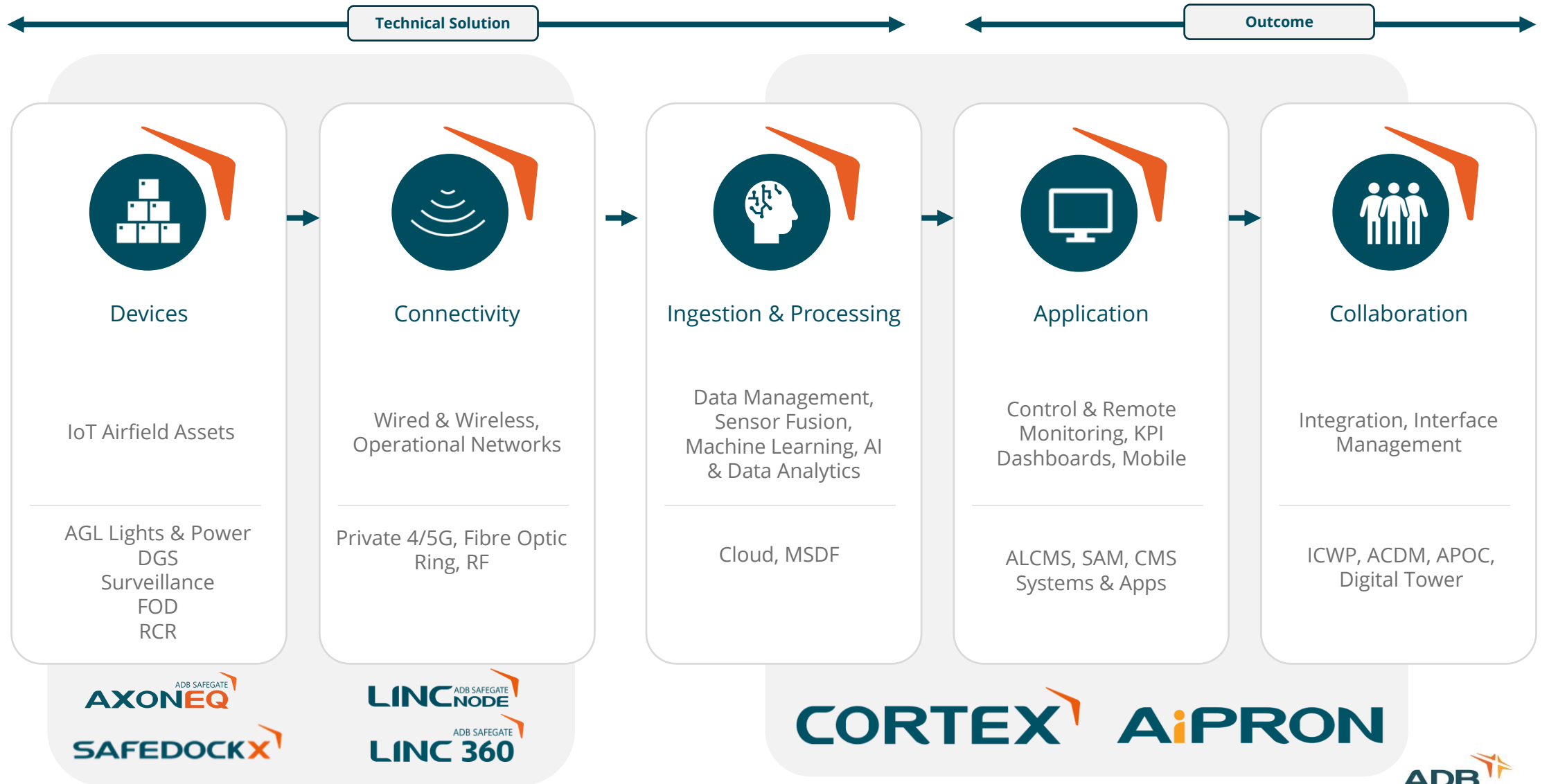


Devices

Local Physical Devices

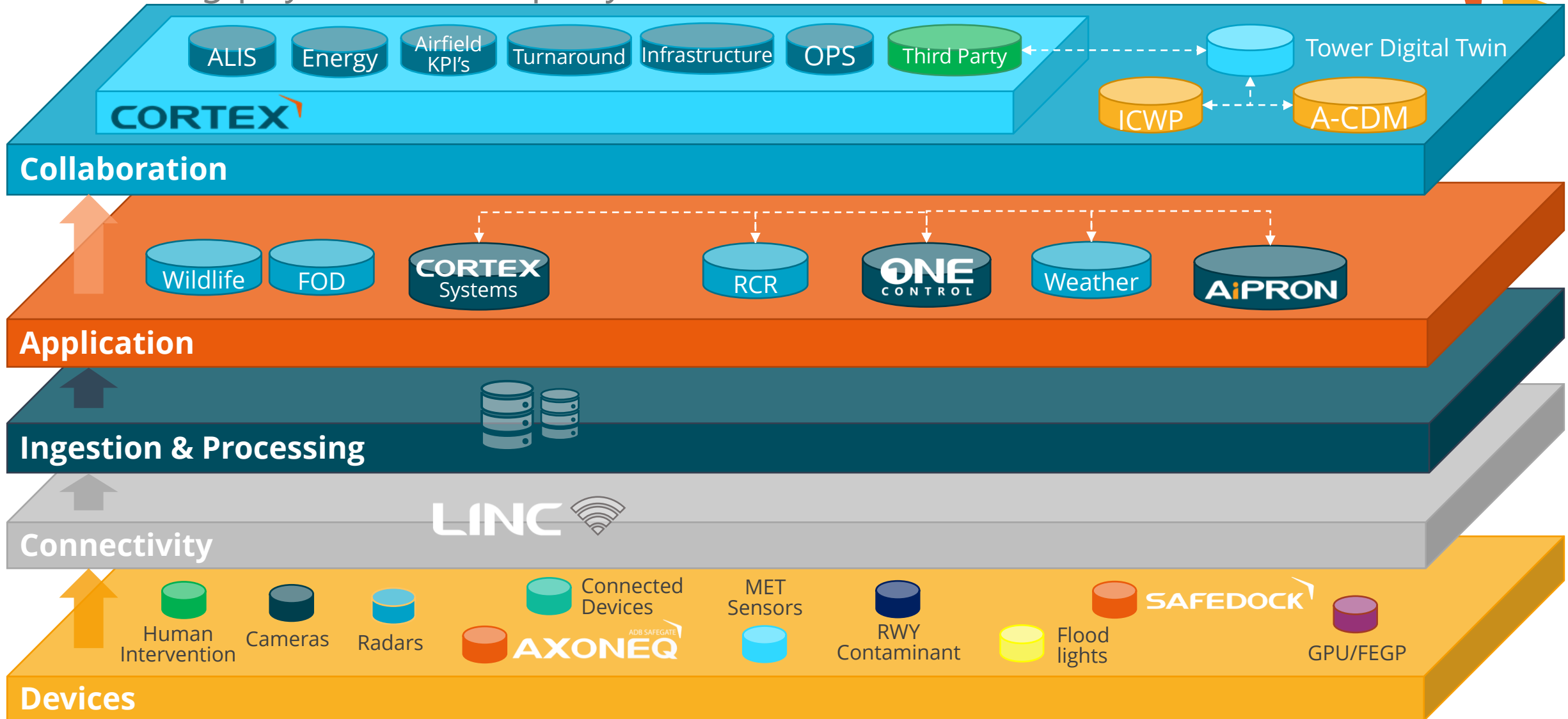


AIRSIDE 4.0 IoT Stack

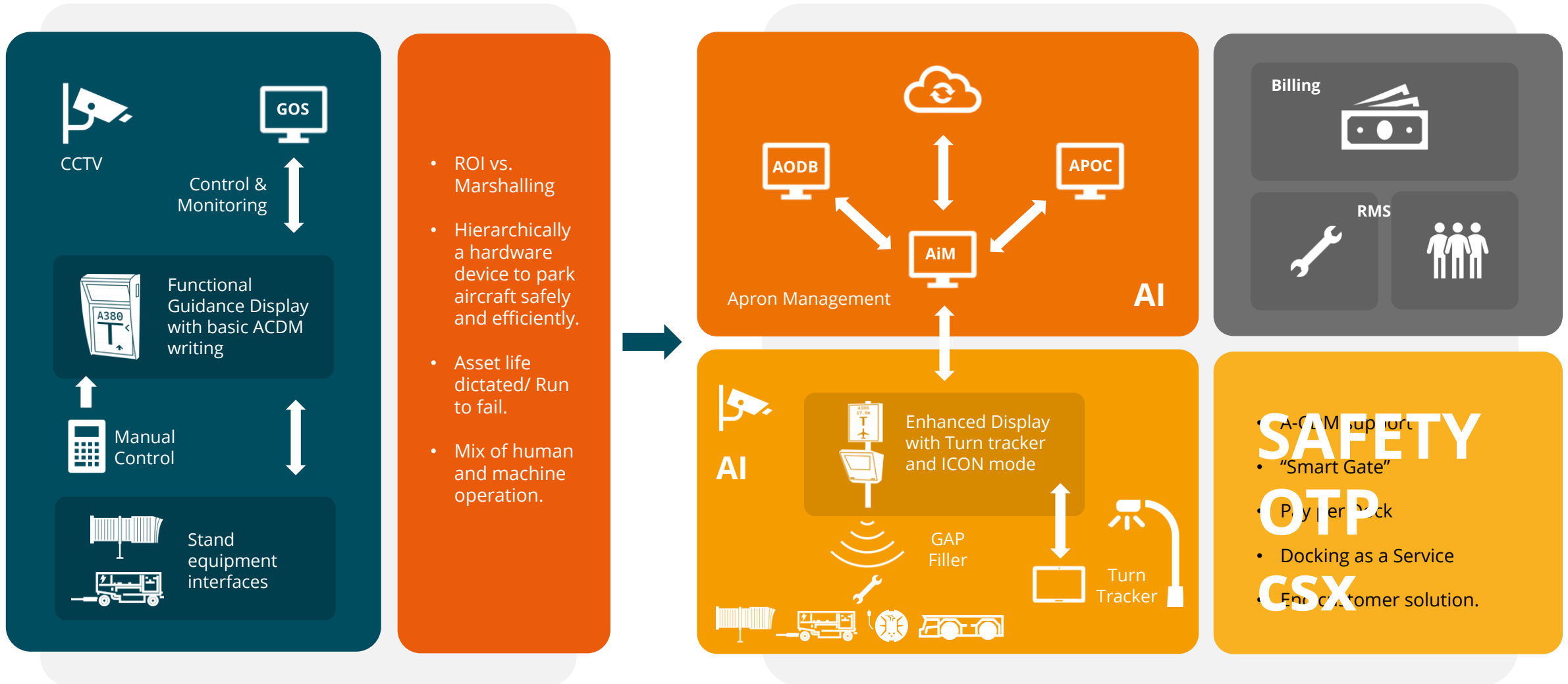


Creating the Digital Airside

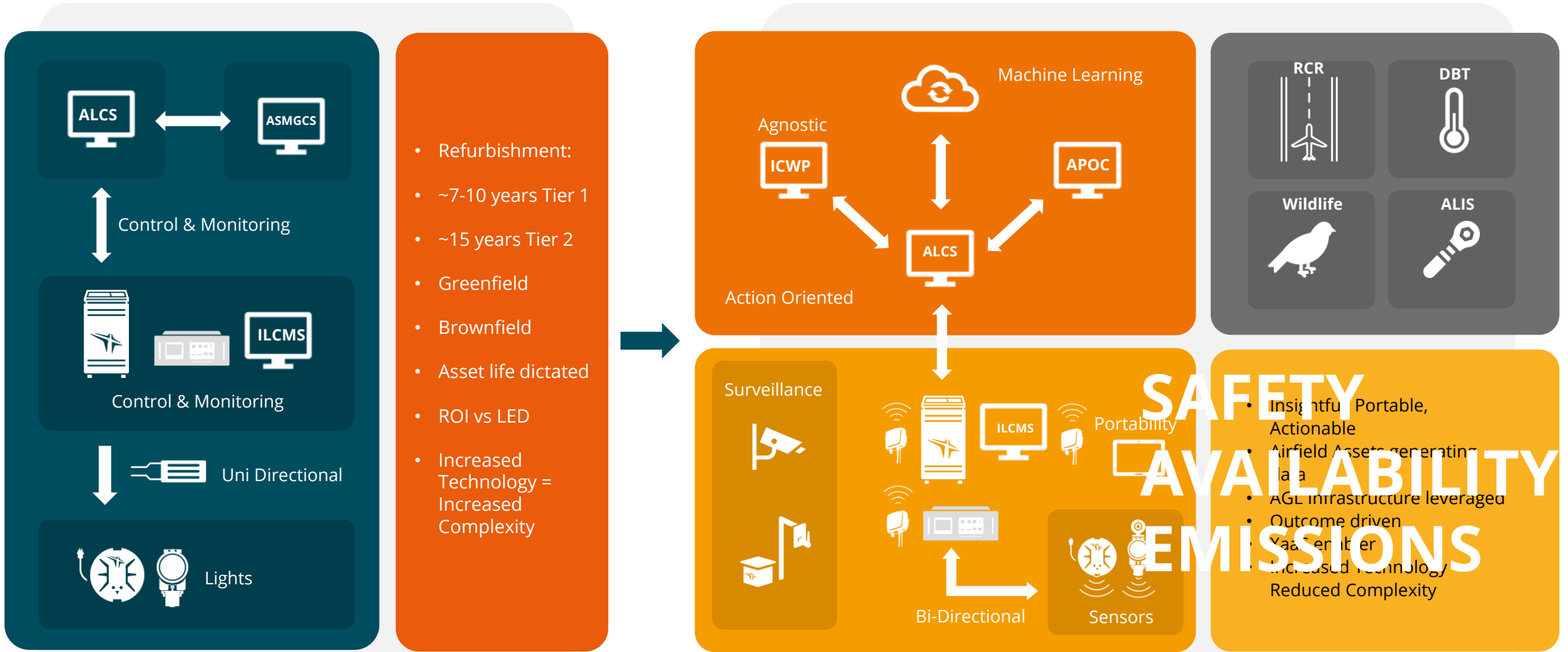
Combining physical and 3rd party devices



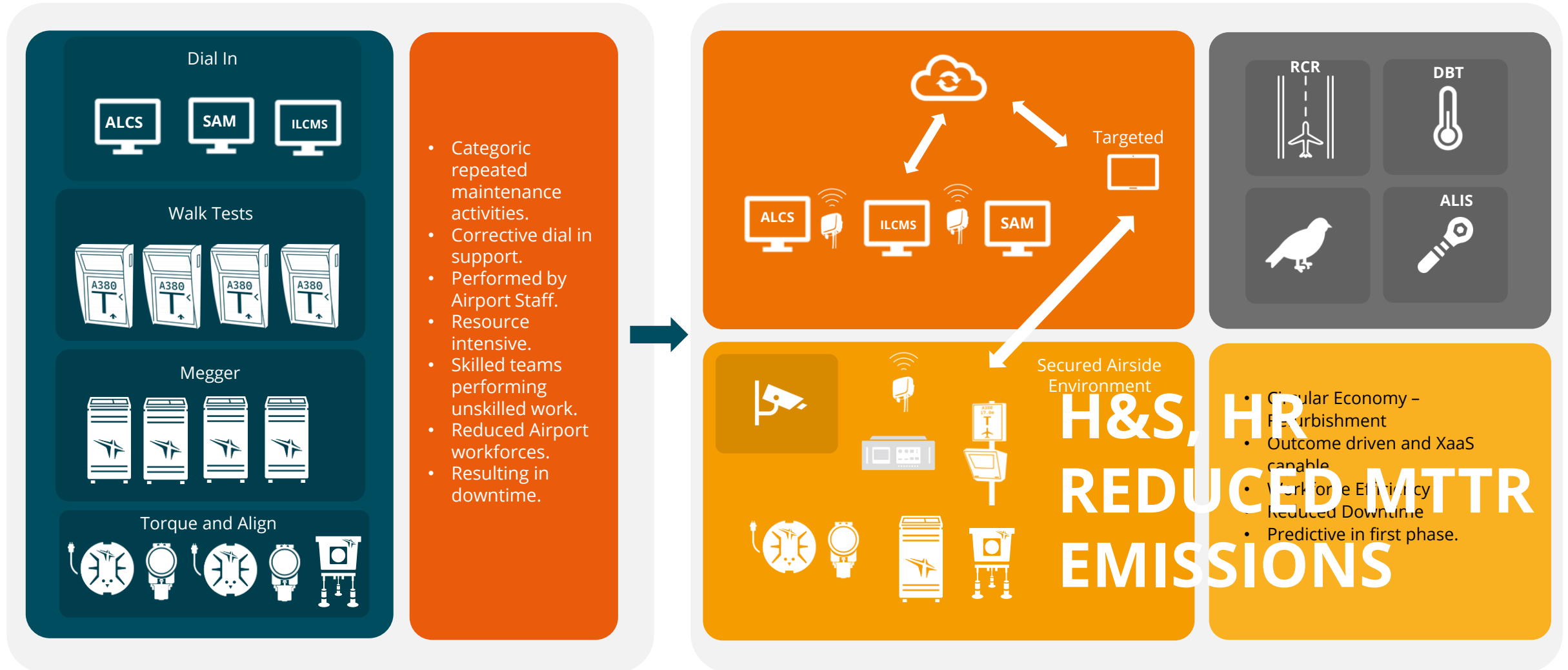
From Docking to Intelligent Apron



From AGL to Intelligent Airfield



From blanket to advanced maintenance



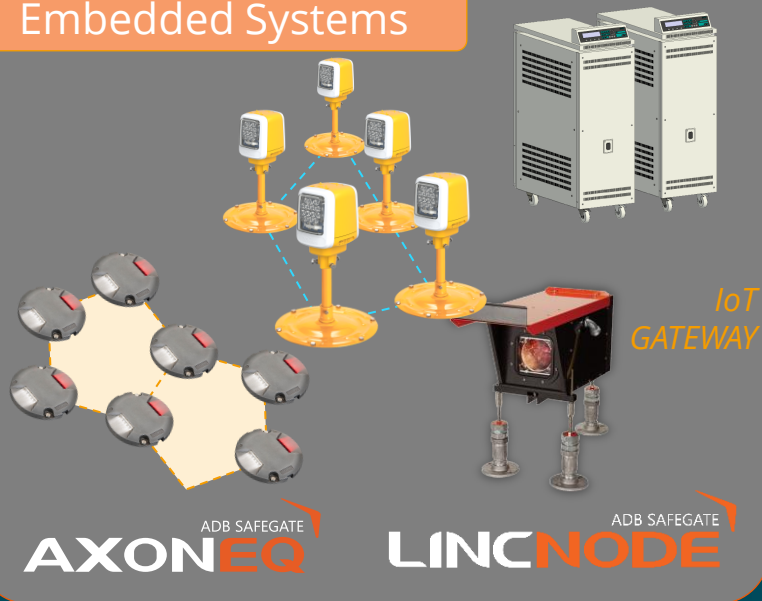
INTELLIGENT
AIRFIELD Ingestion & Processing

**PHYSICAL
HARDWARE**

IoT Devices

Sensors

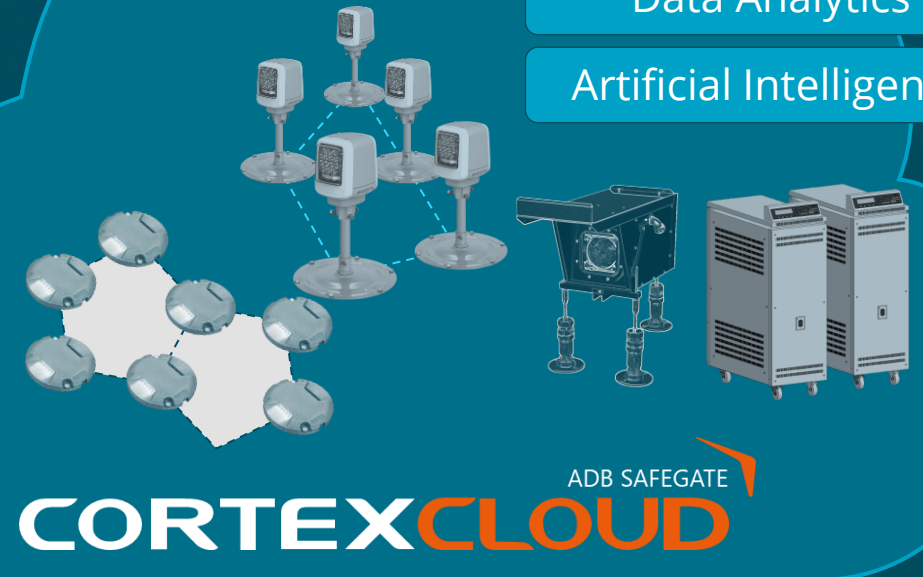
Embedded Systems



DIGITALIZATION

IT NETWORK

Digital Twins



**CYBER
DIGITAL TWINS**

IoT Data Management

Sensor Fusion

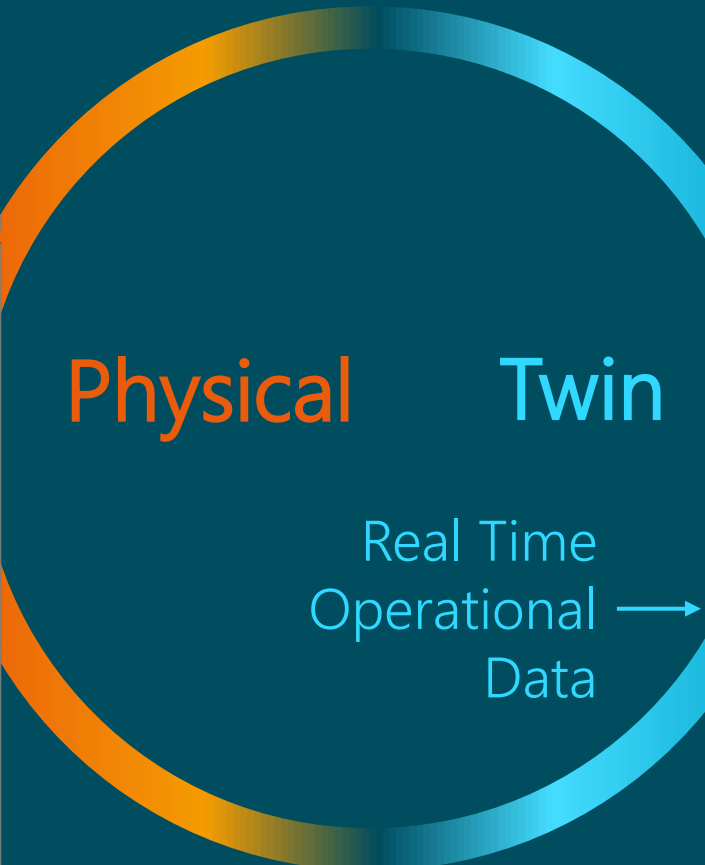
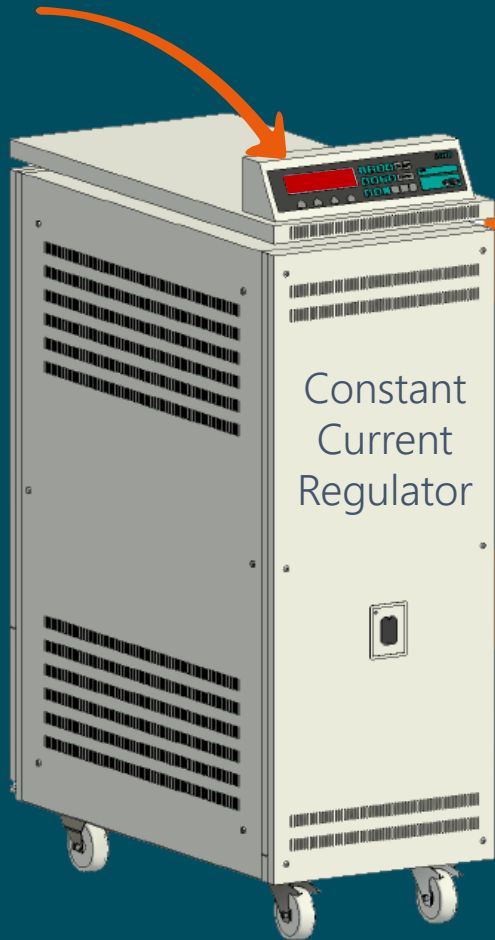
Data Analytics

Artificial Intelligence

CCR | Digital Twin

Constant Current Regulator (CCR)

- Loss of Power
- Incorrect Current
- Insulation Resistance
- Lights Out



15L-33R RWY EDGE CCR



Constant Current Regulator
 Type: VIS-CRE
 Size: 20kW
 Input: 240VAC
 Output: 6.6A
 14L-32R Rwy Edge Circuit: 112

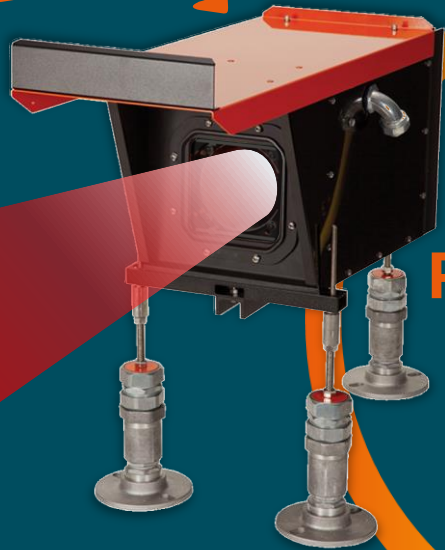
PERFORMANCE

● Input Voltage	235 VAC
● Brightness Step	3 of 5
● Output	4.15 Amps
● Load	17,457 VA
● Insulation Resistance	5 Ohm
● Lights Out	3 Out
● Protective Shutdown	OK

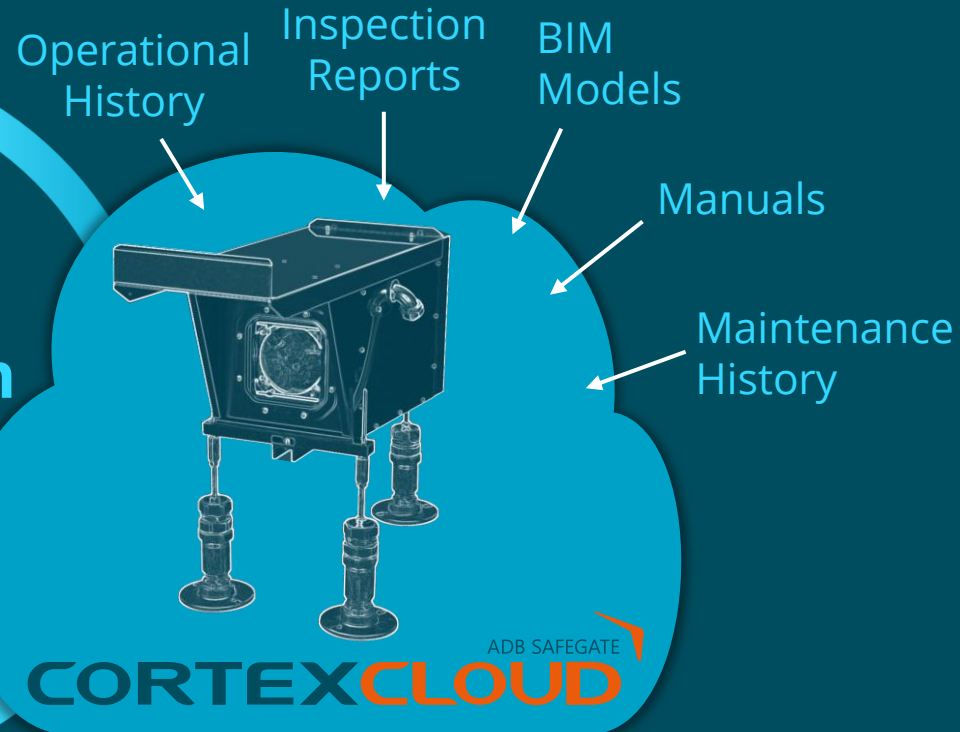
ALARM SETTINGS

Input Voltage	5%
Incorrect Current	5%
Load	10%
Insulation Resistance	Warning: 50M Alarm: 10M
Lights Out	Warning: 5% Alarm: 10%

- LPWA 4G (Low-Power Wide-Area)
- Fully integrated device-to-cloud



Physical Twin



PAPI Digital Twin

Virtual model of a physical airfield lighting device

Real Time
Operational Data



Remote Monitoring

Physical PAPI
IoT enabled with sensors and wireless gateway

Digital Twin

Approach Lights Monitoring



Physical Twin

Real Time
Operational Data →

Approach Lights Monitoring

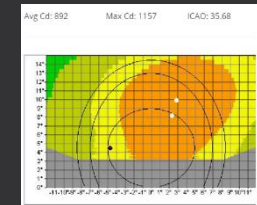
- Detect head rotating or light out of alignment

26L APPROACH LIGHTING SYSTEM



Circuit: 14L-32R Rwy Edge
Fixture ID: 123
Type: High Intensity LED
Color: White-Yellow
Option: without Artic Kit

Photometrics



Candela
95%

PERFORMANCE

● Alignment	+15 °
● Toeing	-25 °
● Temperature	95 °F
● LED Status	OK
● LED Usage	6780 hours
● Vibration	OK

ALARM SETTINGS

Alignment	2 degrees
Toeing	10 degree
Temperature	10%
LED Usage	Warning: 30000 hours

Digital Twin

Inset Light

Runway Inset Light

- Excessive vibration (loose fixture)
- Detect loss of pressure (damaged light)
- Detect light out



Physical Twin

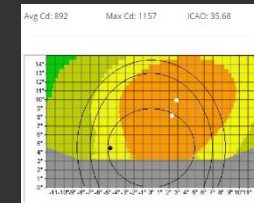
Real Time
Operational
Data

08R-26L RWY CENTERLINE



Circuit: 08R-26L Rwy CL
Fixture ID: 79
Type: High Intensity LED
Color: White-Red
Option: without Artic Kit

Photometrics



Candela
95%

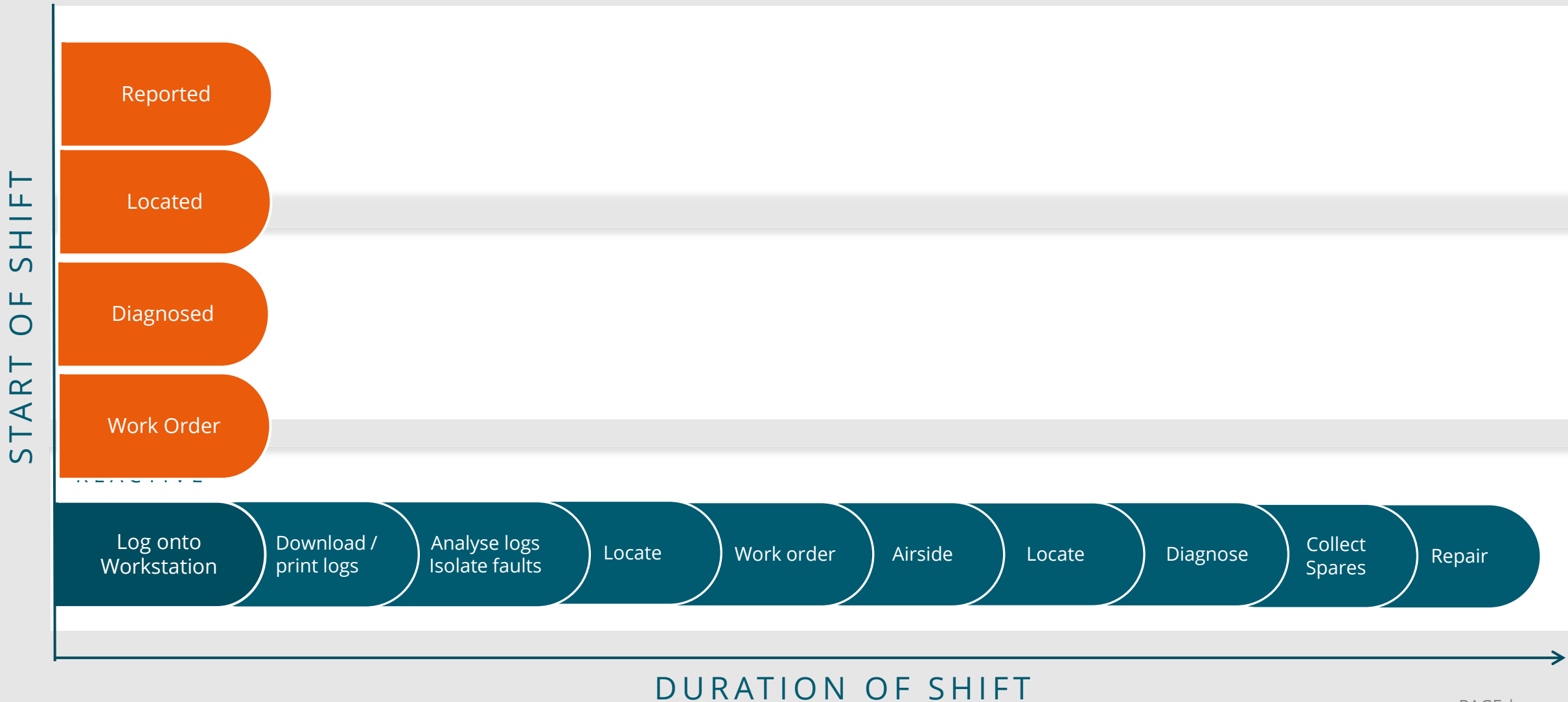
PERFORMANCE

- Pressure **Low**
- Vibration **High**
- Temperature **40** °C
- LED Status **Out**
- LED Usage **16,780** hours

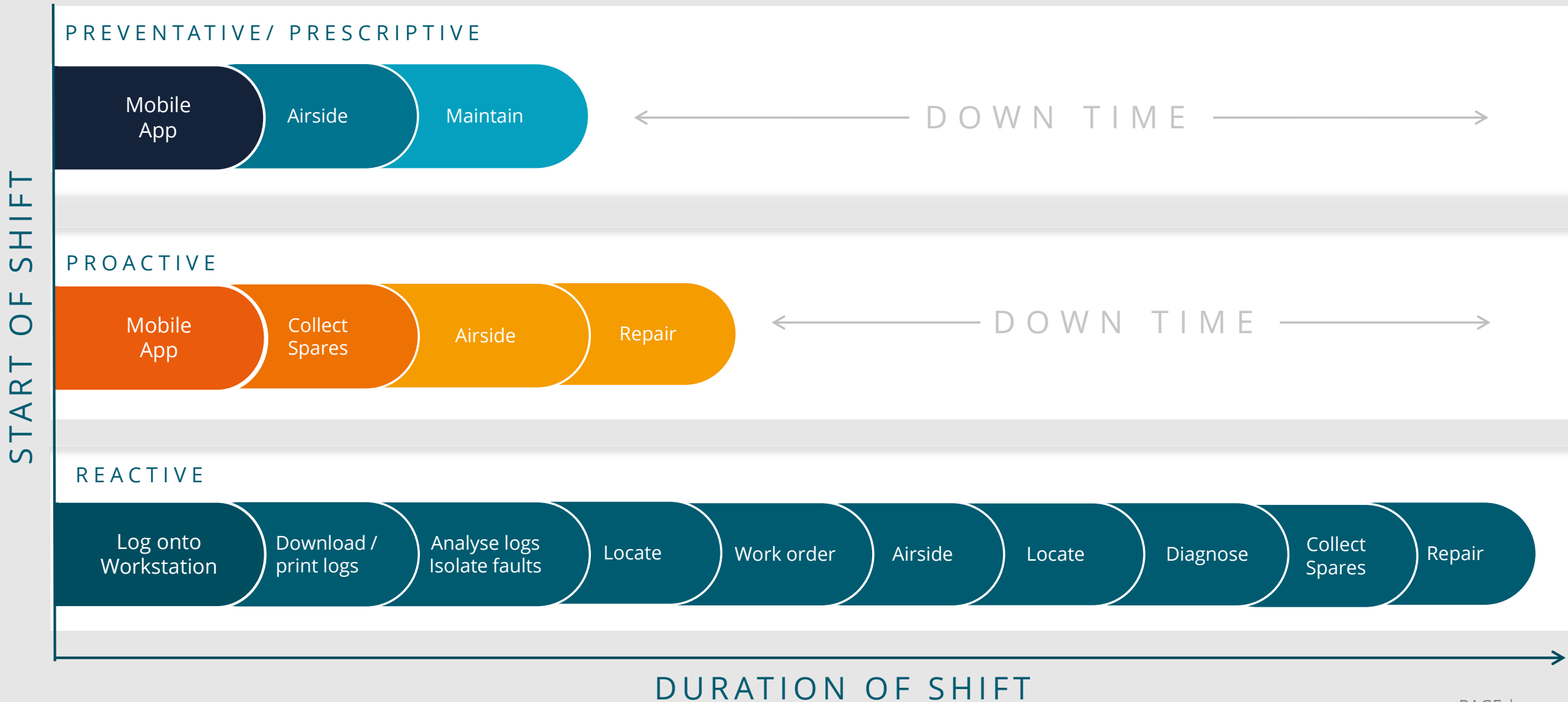
ALARM SETTINGS

- LED Usage 50,000 hours
- Temperature 10%
- Vibration 3

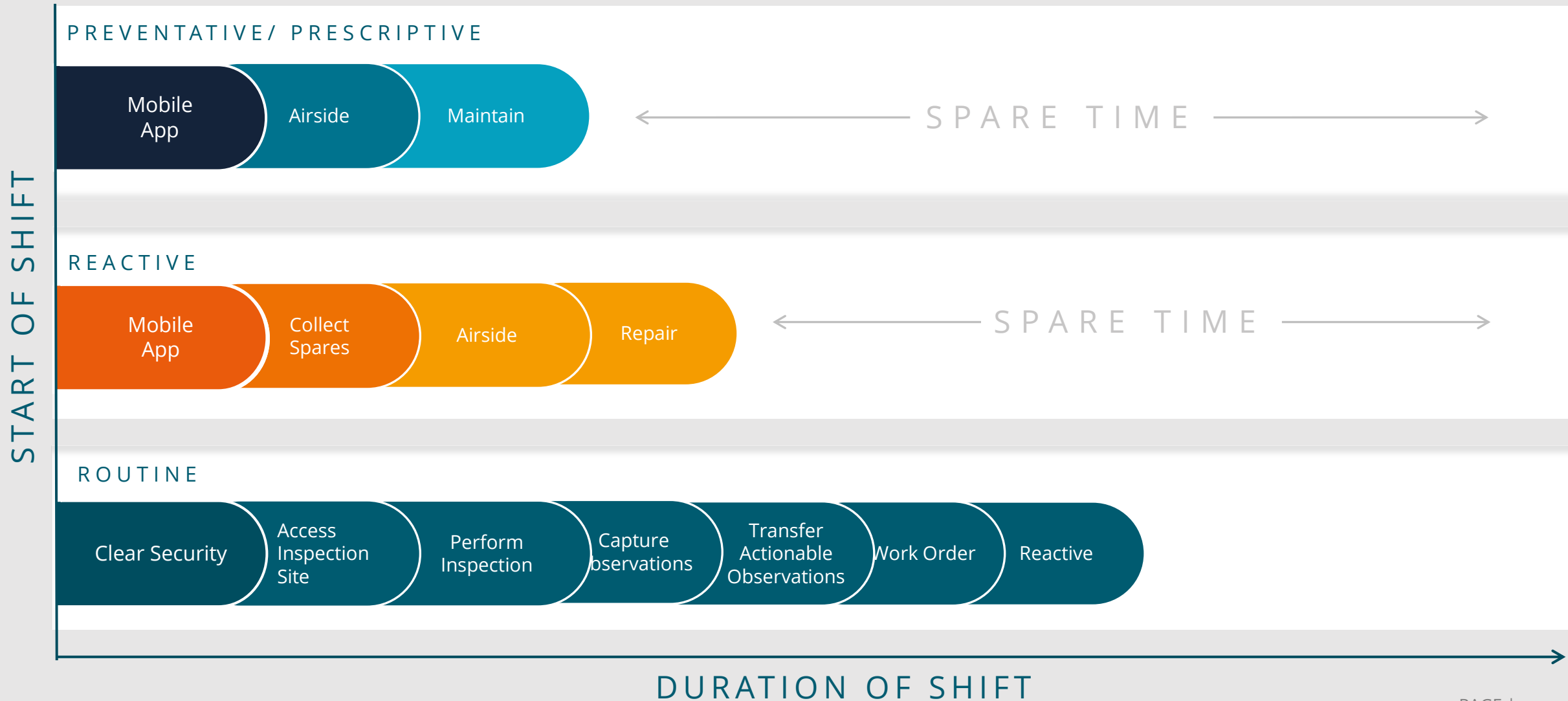
Traditional Maintenance vs Advanced Intelligent



Traditional Maintenance vs Advanced Intelligent



Routine Inspection vs Intelligent





Thank You