

# Wireless LAN is the Foundation of IOT

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**CWNP** 

# MOBILITY EVOLUTION



## ENTERPRISE MOBILITY

## CONSUMER MOBILITY

## INTERNET OF THINGS

### DEVICE EVOLUTION

LAPTOPS, HANDHELDS, SCANNERS



SMARTPHONES, TABLETS



### USAGE EVOLUTION

- **BUSINESS APPLICATIONS** - SUPPLY CHAIN MANAGEMENT. INVENTORY & PRICE CHECK
- **COMMUNICATIONS** - DATA CONNECTIVITY & VOIP (OVER WLAN)

- **BYOD** - DEVICE ONBOARDING & FINGER-PRINTING. APPLICATION VISIBILITY
- **GUEST ACCESS** - INCREASE CUSTOMER DWELL TIME

- CONTEXT BASED CUSTOMER/GUEST ENGAGEMENT
- **ASSET VISIBILITY**
- MANAGEMENT & CONNECTIVITY FOR THINGS

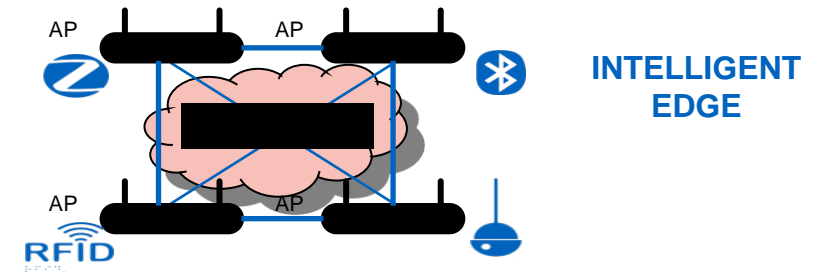
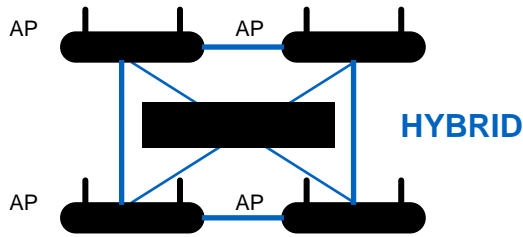
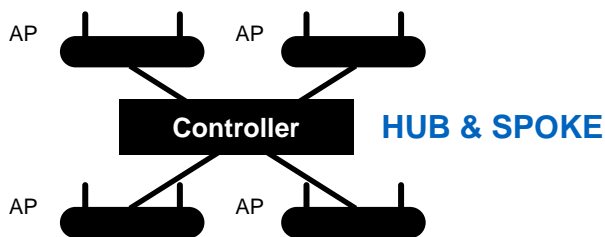
### REQUIREMENTS EVOLUTION

- DESIGN WiFi FOR MOBILE COMPUTERS
- HOTSPOT DEPLOYMENTS

- DESIGN WiFi FOR SMARTPHONES
- ROLE BASED ACCESS CONTROL

- DESIGN WiFi FOR LOCATION
- MANAGE MULTI-RF - WiFi, ZIGBEE, BLE

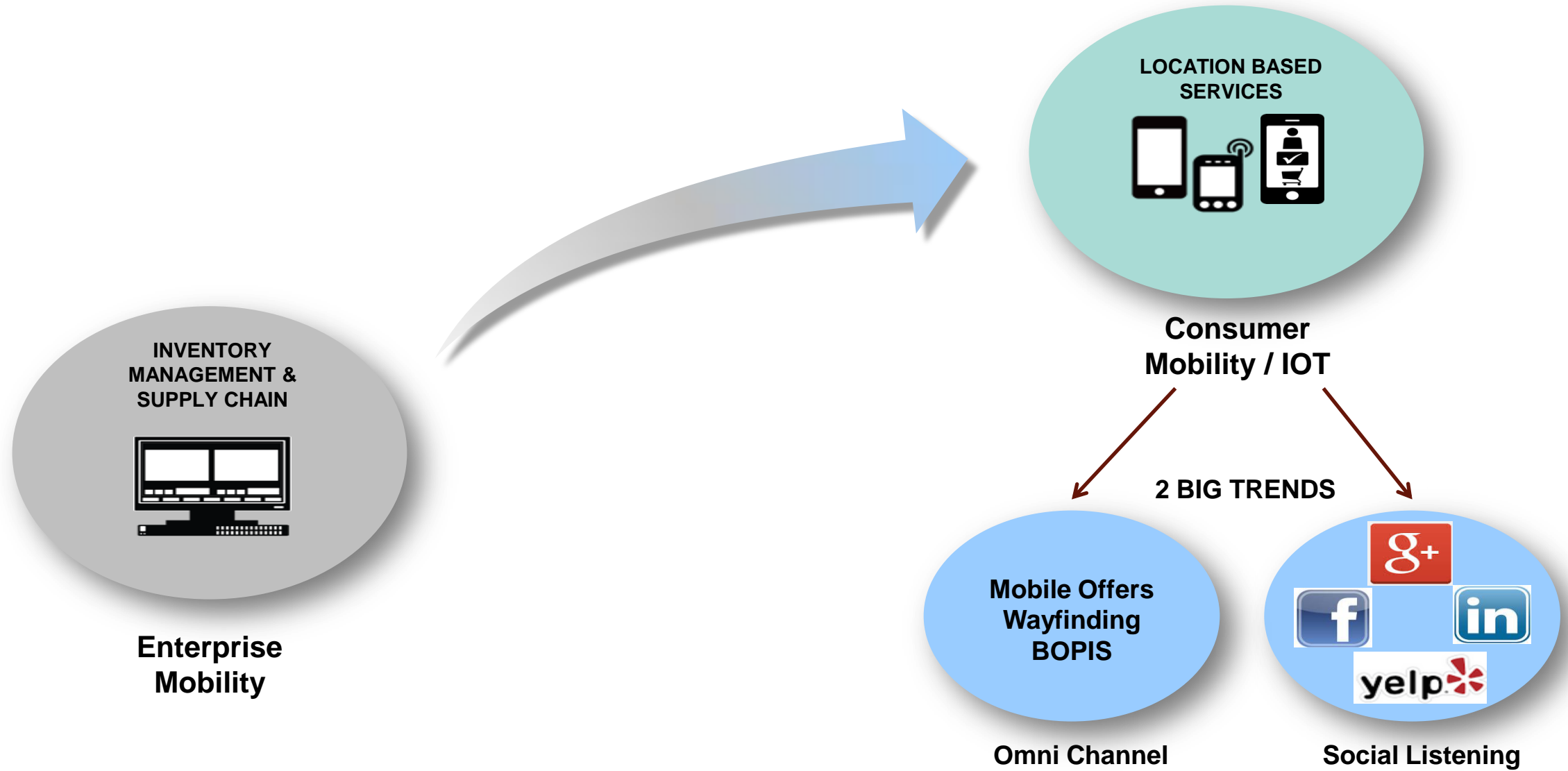
### ARCHITECTURE EVOLUTION



Certified Wireless Network Professional



# TECTONIC SHIFT UNDERWAY

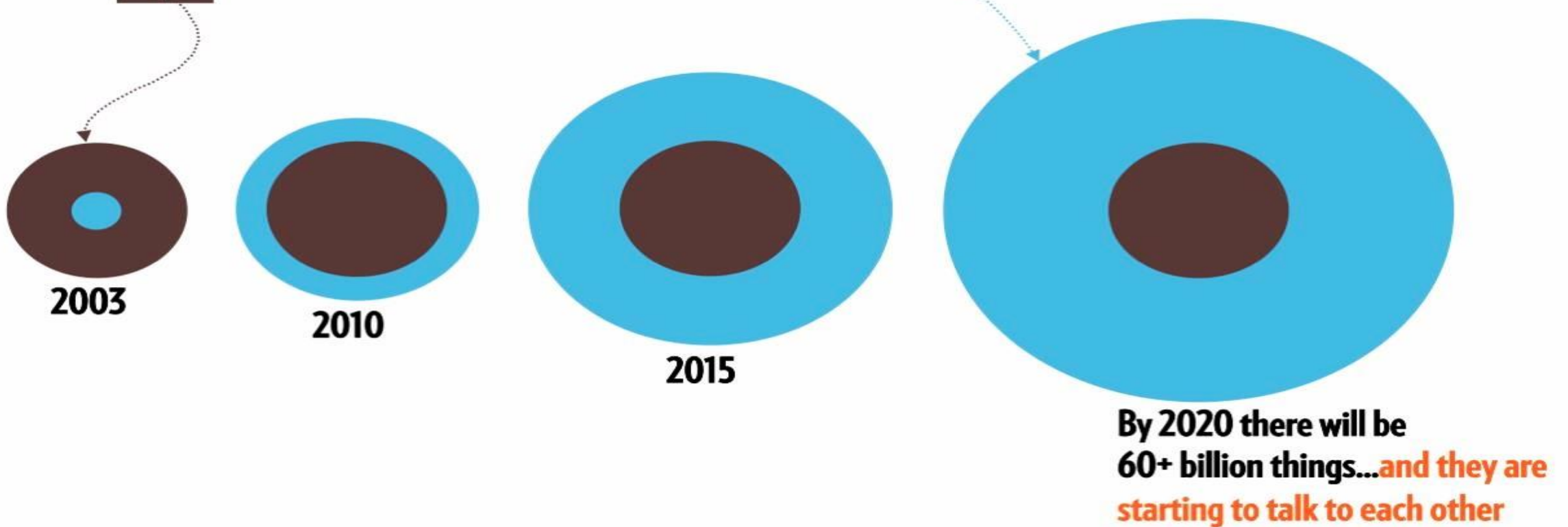


**IOT  
WHY  
NOW**



# EVERYONE & EVERYTHING CONNECTED...

During 2010, the number of **things** connected to the Internet exceeded the number of **people** on earth.



# Understand the IoT Phenomenon... (\$20T EVA)

## Increasing Digital Control of the Physical World

- Sensors & Software that enable things to connect with monitoring, analytics and location systems over IP networks
- To Improve business outcomes: Asset Utilization, Products with network connectivity, Contextual customer engagement.

## Consumer IOT Adoption Skyrocketing (over next 5yrs)

- Connected Cars: 23 million to 250 million, Smart Meters: 300 million to 1.1 billion, 2.4million light bulbs to 100 million light bulbs, 3 billion Activity trackers to 20 billion
- Discrete IoT enabled products

## IoT Acceleration in the Enterprise

- Price of sensors, microcontroller/ sensor performance, size, BT 4.0, IPv6, WiFi
- Retrofitting existing assets with IoT devices - across a process





# IoT ENABLED WAREHOUSE

Robots from Swisslog, Pickup Heavy Items, Guided by Wi-Fi

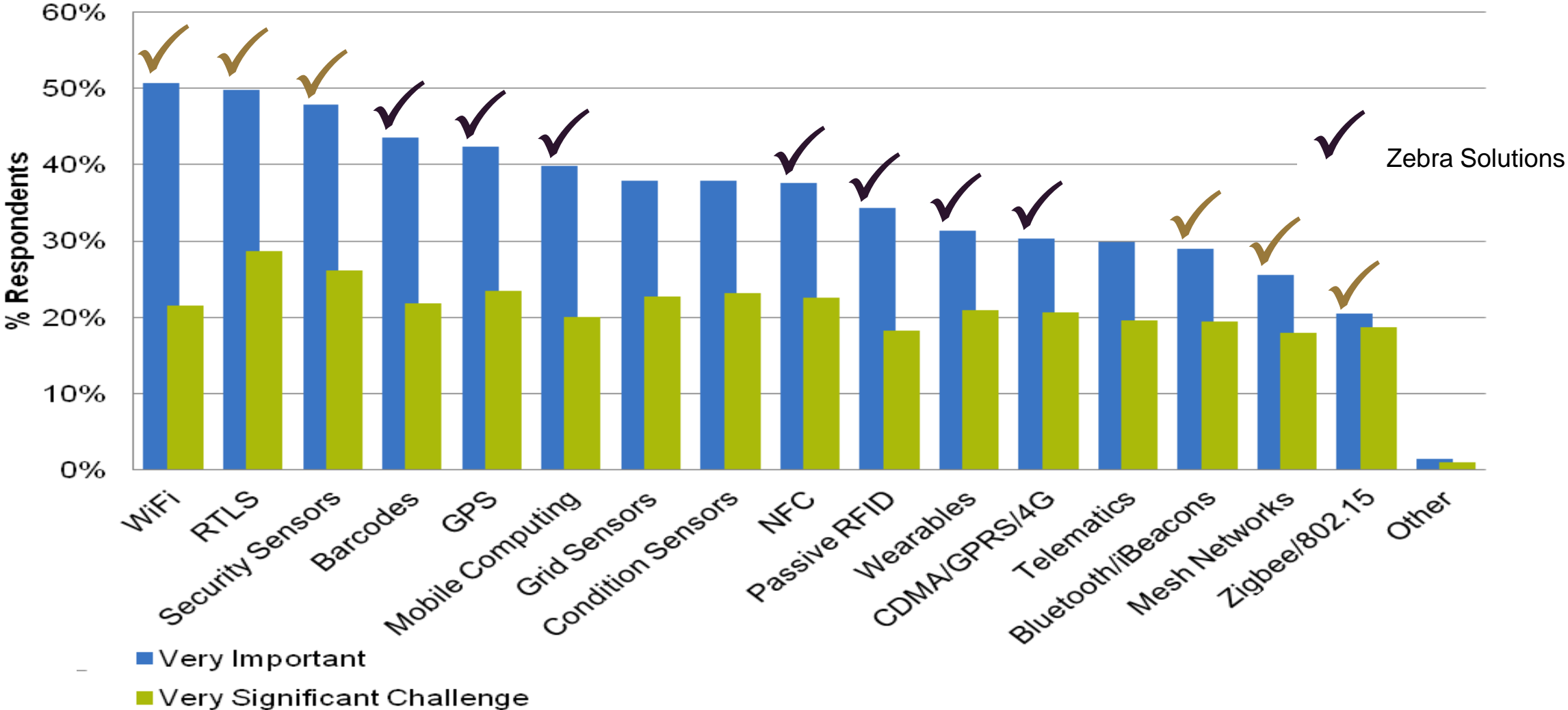


Approx. 500 Access Points



# CUSTOMERS VIEW Wi-Fi as TOP IOT ENABLER

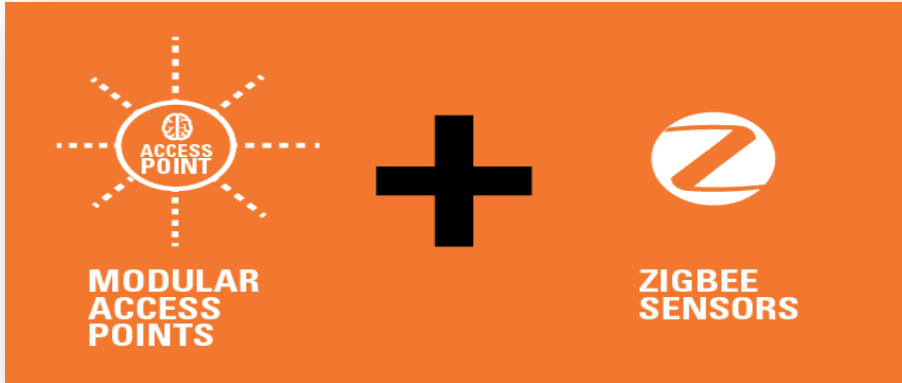
IMPORTANT AND CHALLENGING IOT TECHNOLOGIES





# RETAIL INTERNET OF THINGS

## BEYOND WIFI: ZIGBEE AND BLE



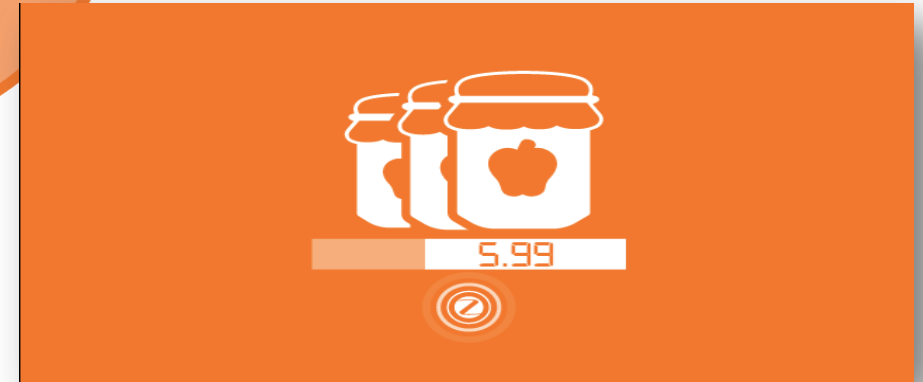
Environmental Control and Monitoring



Video surveillance



Shopper engagement



Blue Tooth Price and location

# TRANSFORMING THE RESTAURANT EXPERIENCE

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# BUSINESS CHALLENGES

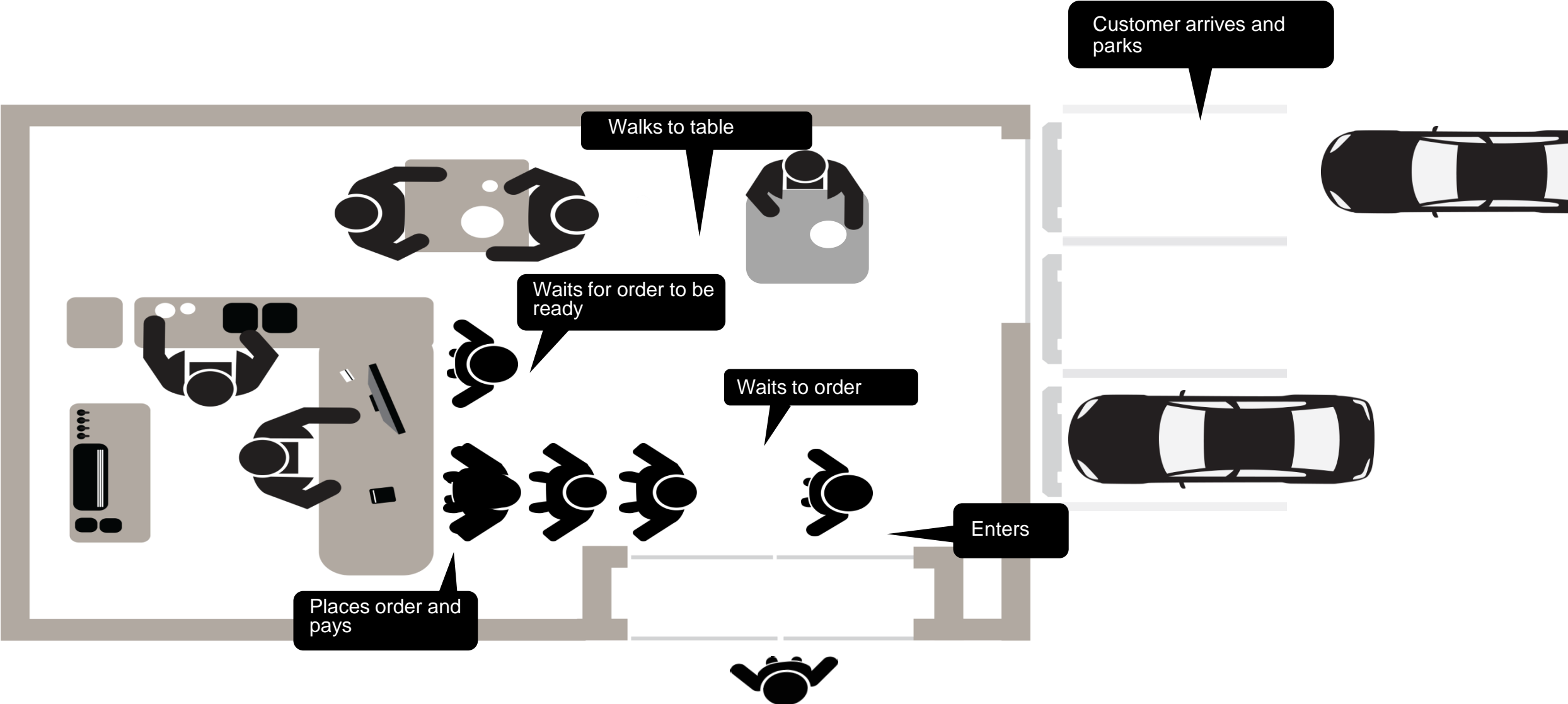
Customer drive aways impacting revenue

Customer wait times impacting return visits

Lack of customer feedback to improve operations

Kitchen prep time for peak periods

# THE CUSTOMER EXPERIENCE TODAY IN THE CAFÉ





# ENGAGING CUSTOMER IN THE CAFÉ

## WHAT IF...

Your customers could skip the line by placing a mobile order and paying with their smartphone?

## WHAT IF...

Your staff knew which table to take the order to?

## WHAT IF...

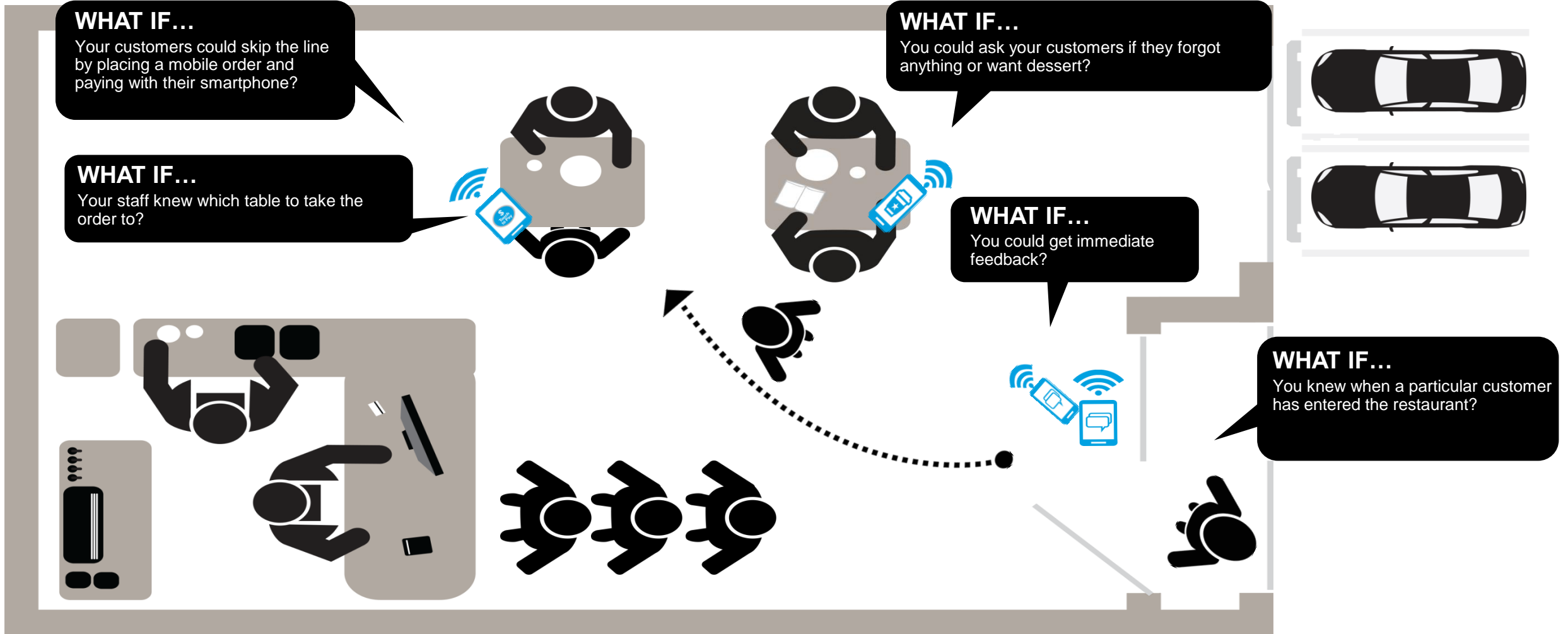
You could ask your customers if they forgot anything or want dessert?

## WHAT IF...

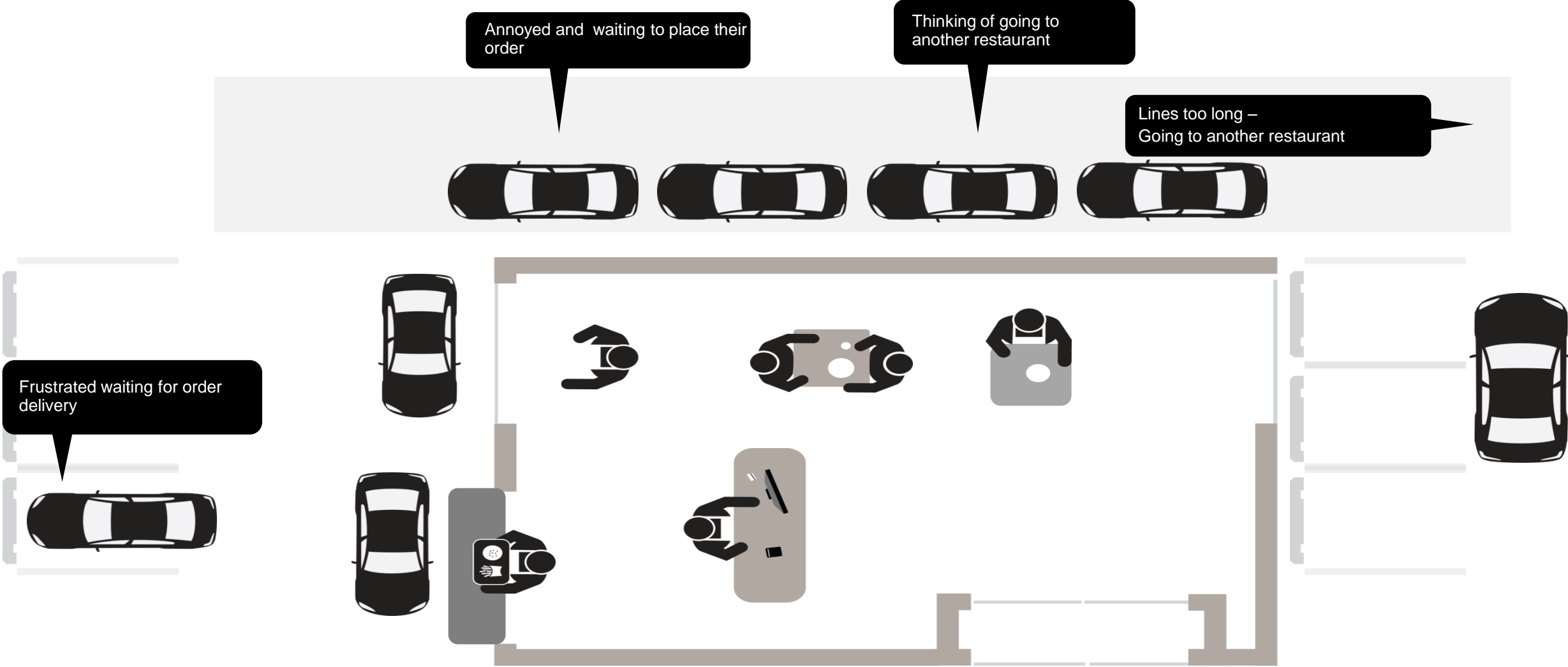
You could get immediate feedback?

## WHAT IF...

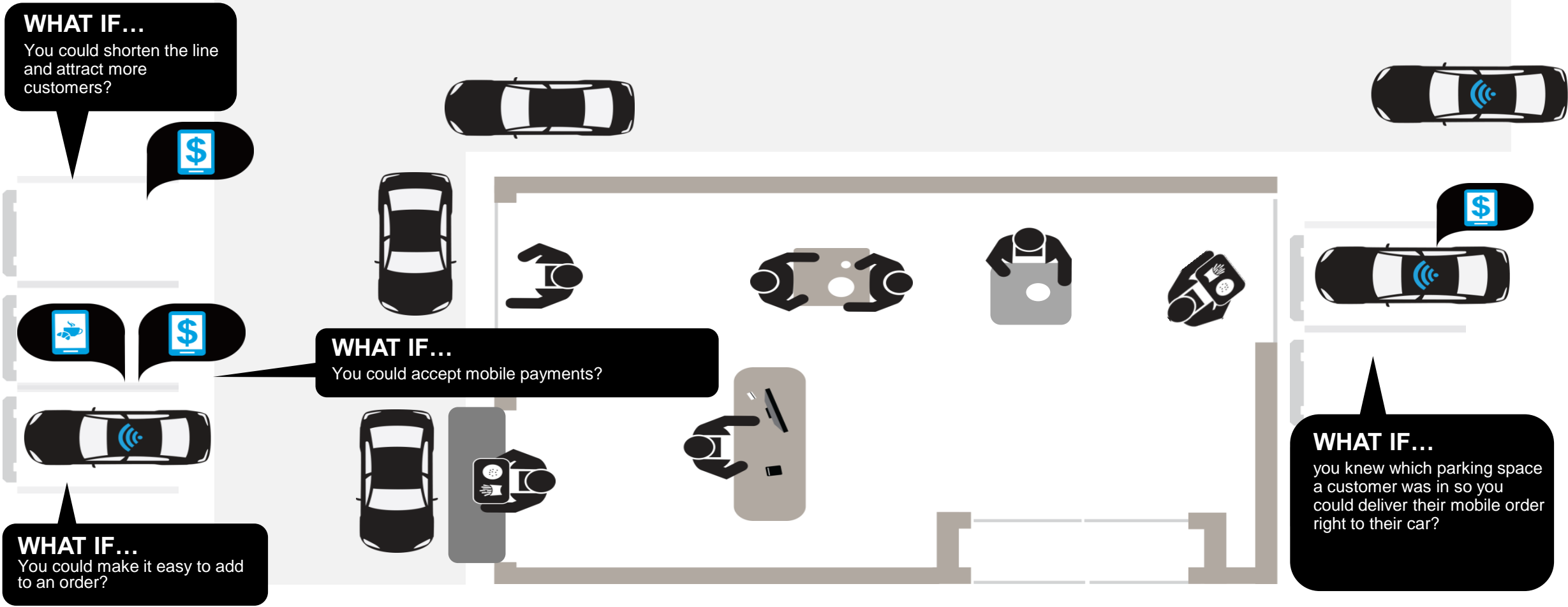
You knew when a particular customer has entered the restaurant?



# THE CUSTOMER EXPERIENCE TODAY AT DRIVE-THRU



# ENGAGING CUSTOMERS DRIVE-THRU AND IN-CAR



# BENEFITS OF MOBILE ENGAGEMENT

## At the store

Anticipate the needs of the customer

Provide a unique customer experience

Increase revenue

Increase customer satisfaction





# TRANSFORMING THE SPORTS EXPERIENCE VIDEO

[HTTPS://WWW.ZEBRA.COM/US/EN/SOLUTIONS/LOCATION-SOLUTIONS/SPORTS-TRACKING.HTML](https://www.zebra.com/us/en/solutions/location-solutions/sports-tracking.html)

# WLAN CHALLENGES IN IOT DEPLOYMENTS

Challenge			
<b>Managing Unlicensed bands</b>	Wi-Fi, ZigBee, BlueTooth, RFID	e.g. Bluetooth and Wi-Fi operating in 2.4G	Ensuring RF coverage and connectivity for each device /sensor
<b>Managing a wide variety of devices</b>	High powered, high performance laptops, tablets, handhelds	Low powered, low bandwidth sensors	Could be large disparity in RF power and behavior between devices and sensors
<b>Authentication of 100's or 1000's of sensors</b>	Wi-Fi handhelds authentication 802.1x	What about Wi-Fi sensors? Full stack? How to on-board and secure?	Must be easy to deploy, but secure to prevent security holes.
<b>Device and sensor/battery life management</b>	Sensor and BLE tags (may need) battery life need to be monitored	Wi-Fi based sensors will limit Wi-Fi beacons to save battery life. Behavior may be different than today's mobile devices	Device management systems will need to incorporate sensors, segment, control and monitor.
<b>Security</b>	Multi-RF environments,	Additional network intrusion points?	Protecting sensors, firmware upgrades?
<b>Analytics</b>	Analytics collected from all connected devices	Additional VLANs, traffic, BW consumption	Monitoring analytics BW vs application, ensuring WAN link capacity

# MODULAR ACCESS POINTS

Platform for the Internet of Things



SENSORS



RFID



MICRO-LOCATIONING



GPS



3G BACKHAUL



VIDEO

# ZEBRA DELIVERS PURPOSE BUILT MOBILITY PORTFOILO

## INFRASTRUCTURE



## DEVICES & SENSORS



## APPLICATIONS & ZATAR



## PERFORMANCE

### PORTFOLIO EVOLUTION

- COMPREHENSIVE .11AC PORTFOLIO
- MID-MARKET SERVICES PLATFORMS

## MOBILITY

### MANAGEABILITY & VISIBILITY

- NETWORK INTELLIGENCE
- APPLICATION VISIBILITY
- FLEXIBLE CAPTIVE PORTAL
- PAN ENTERPRISE INITIATIVES

## ENGAGEMENT

### IOT SOLUTIONS

- MPACT LOCATIONING
- CONCIERGE KIOSKS
- SMART SENSING
- ZATAR



