Introduction

- Mahesh Patel
- Polaris Wireless: Silicon Valley based Mobile Device Location Technology Company
- Chief Innovation Officer @ Polaris Wireless
- 15 years experience in mobile device location technology and intelligence domain
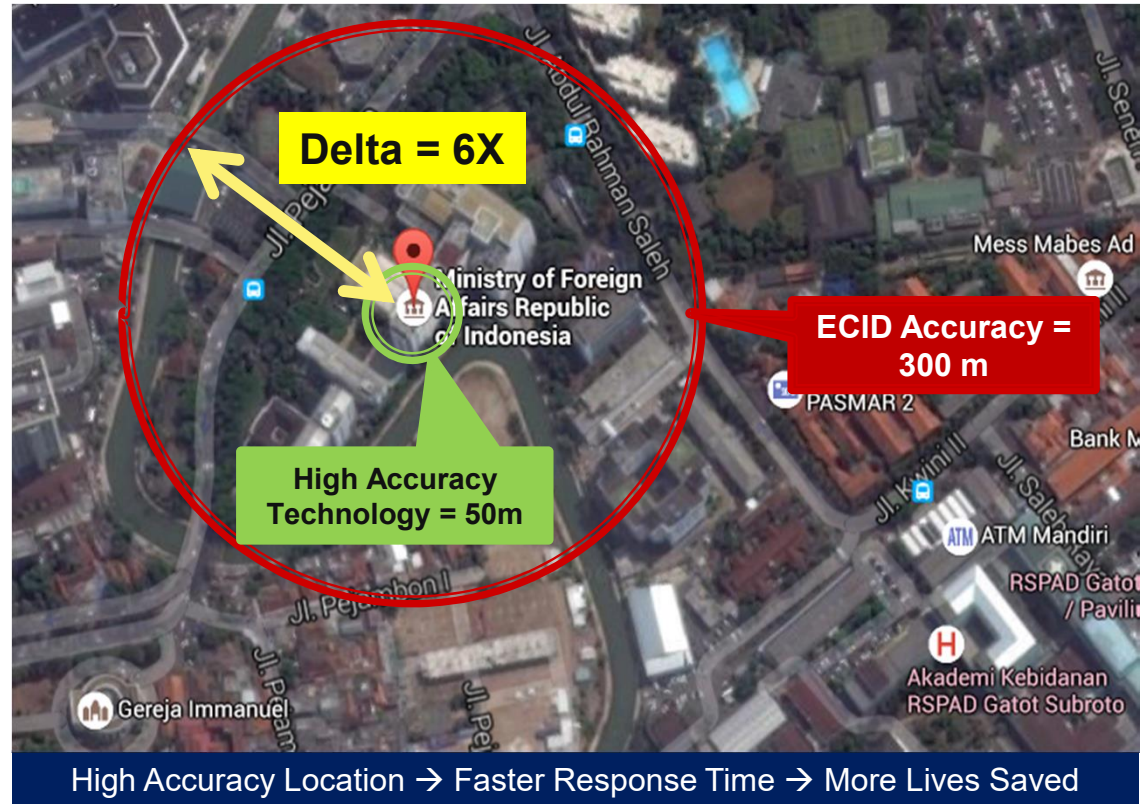
Agenda

1. Introduction

2. Importance of Accurate Location Intelligence

3. Emergency Call Location Intelligence

4. Mass Emergency Location Intelligence

5. About Polaris Wireless

6. Q&A

Public Safety and Emergency Management

High Accuracy is Critical

1. High accuracy location technologies **deliver >>6X performance** as compared to Enhanced Cell-ID (ECID)

2. ECID costs less but Government Agencies need to deploy at least 36X more resources

Delta = 6X

ECID Accuracy = 300 m

High Accuracy Technology = 50m

High Accuracy Location → Faster Response Time → More Lives Saved

Public Safety and Emergency Management

- High Accuracy at <u>scale</u> is also Critical

A large population can be impacted in emergency situations

Accurately knowing the impacted population is critical

Polaris WLS is the Only Technology Capable of

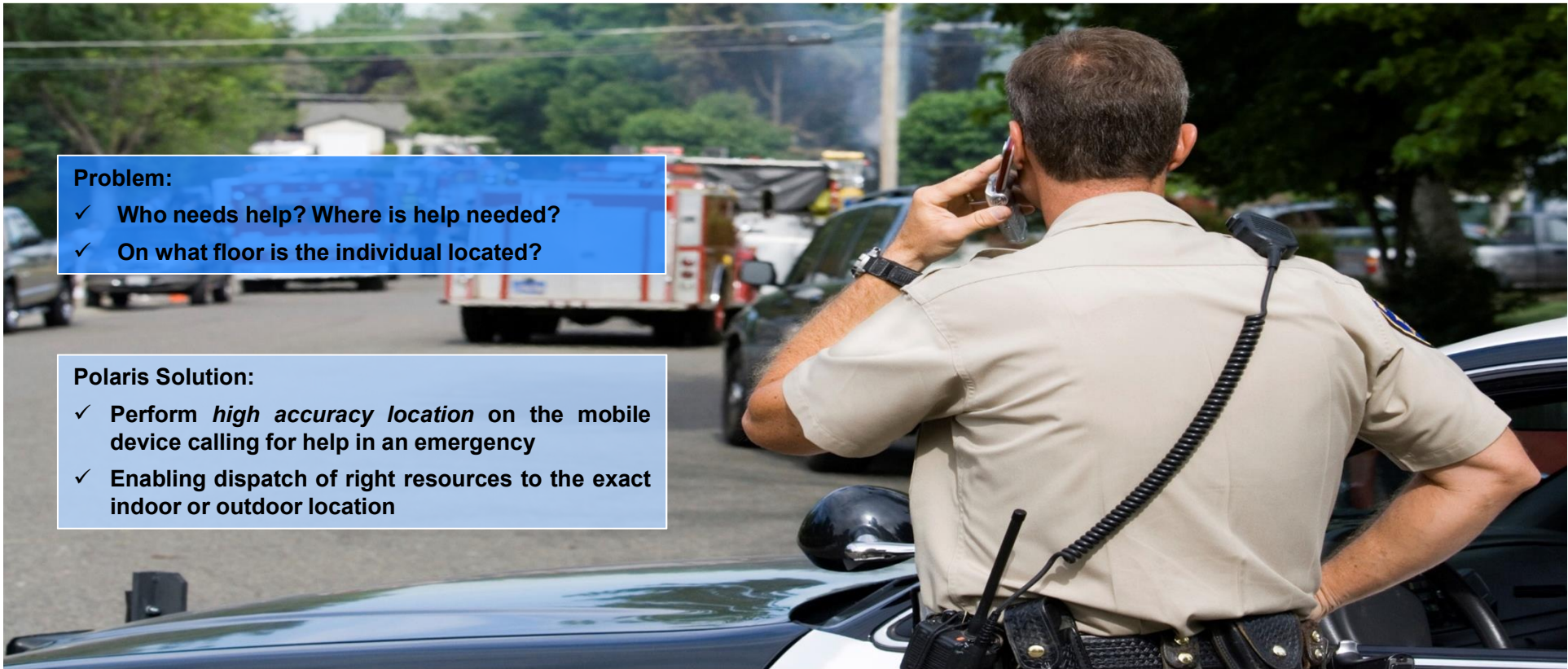High Accuracy Mass Location for <u>all</u> types of Mobile Phones (GPS is not required)

Location Intelligence for **Emergency Caller**

Emergency Caller

Dispatch help efficiently to the exact location of the emergency caller

Problem:

- ✓ Who needs help? Where is help needed?
- ✓ On what floor is the individual located?

Polaris Solution:

- ✓ Perform *high accuracy location* on the mobile device calling for help in an emergency
- ✓ Enabling dispatch of right resources to the exact indoor or outdoor location

Emergency Caller
Automatically Locating Emergency Callers in Real-Time

Operator to Driver:
"999 – what's your emergency?"

Operator to First Responders:
"Car accident on Persiaran Perdana, please dispatch medic, fire and police teams to the scene immediately."

The Polaris platform enables *automatic real-time accurate caller location* of emergency callers,

Polaris platform is US FCC E911 Phase 2 compliant (the most stringent accuracy requirements in the world)

Polaris platform is field proven in saving human lives by precisely locating callers, both indoors and outdoors, within seconds.

Driver to Operator:
"Help! I've had a car accident! And I am disoriented"

Accurate Emergency Caller Location
Benefits

1. **Save lives**

   – Reduces response time for first responder

   – Send proper personal/equipment (access to location may be only by foot or small vehicles)

   – Accurate tracking in kidnapping/abduction or other hostile scenarios

2. **Automatically and accurately locates the emergency caller**

   – Many emergency callers may not know their exact location

   – Easy to use by children and elderly
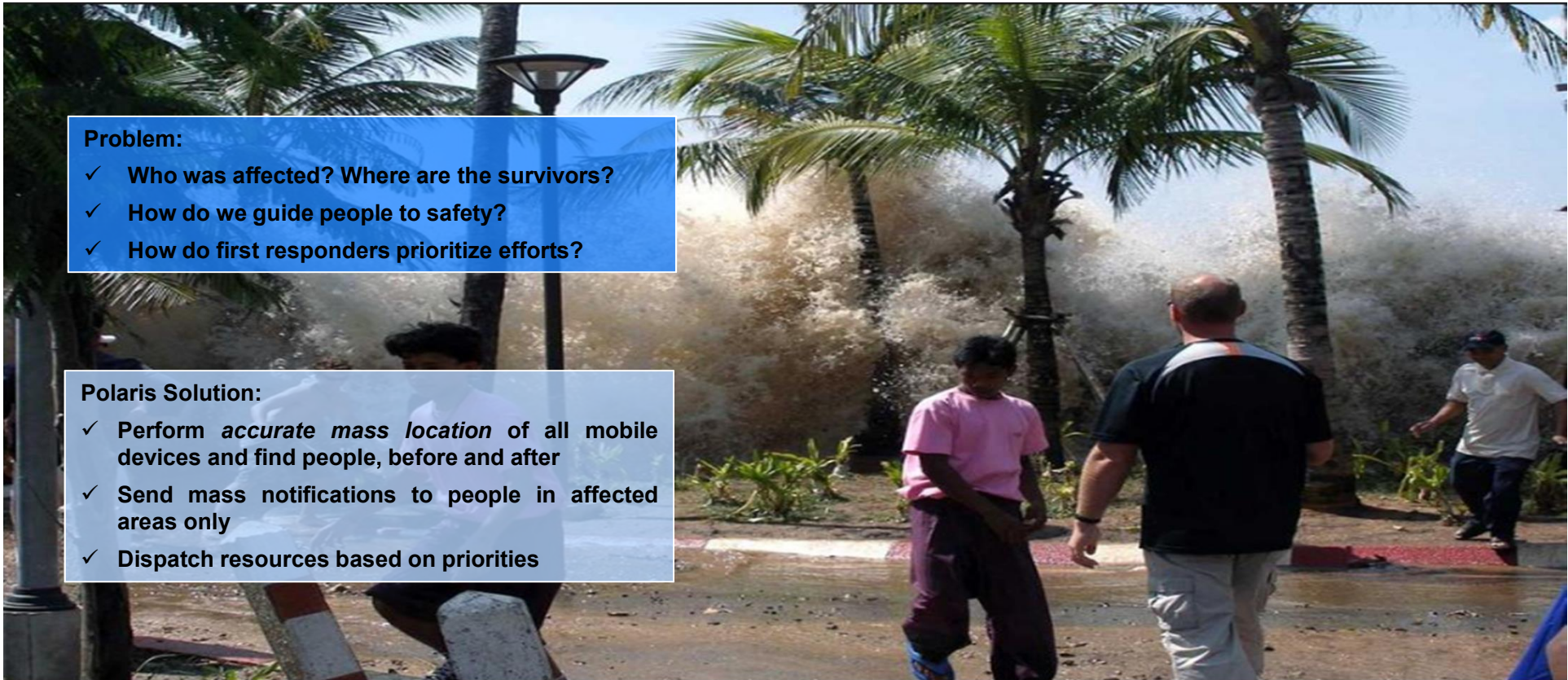
3. **Easy to deploy**

   – No new software on handset; works for all types of handsets

Location Intelligence for **Mass Emergency Management**

Mass Emergency Management

Proactively manage emergencies using locations of impacted people and Blue Forces

Problem:

- ✓ **Who was affected? Where are the survivors?**
- ✓ **How do we guide people to safety?**
- ✓ **How do first responders prioritize efforts?**

Polaris Solution:

- ✓ **Perform *accurate mass location* of all mobile devices and find people, before and after**
- ✓ **Send mass notifications to people in affected areas only**
- ✓ **Dispatch resources based on priorities**

Mass Emergency Management
Notifying People In Area of Interest During Emergency

Accurately determine impacted citizens and dispatch Emergency Alert

The platform enables real-time accurate mass location within an area of interest. First responders can send an SMS to only those people impacted in area, asking them to evacuate or take necessary precautions given the type of event.

Emergency Alert: Evacuate area due to Gas Leak

"Gas Leak Reported in Area"

Mass Emergency Management

Tracking and Collaboration between Blue Forces to ensure Unified Response

Reserve Teams

Medical Post

Relief Shelter

Helipad

Tsunami Evacuation Zone

Easily manage response to national emergencies at **tactical and command level**

Real time updates on **location of emergencies, blue forces (multiple agencies) and resources** (medics, SWAT, Fire)
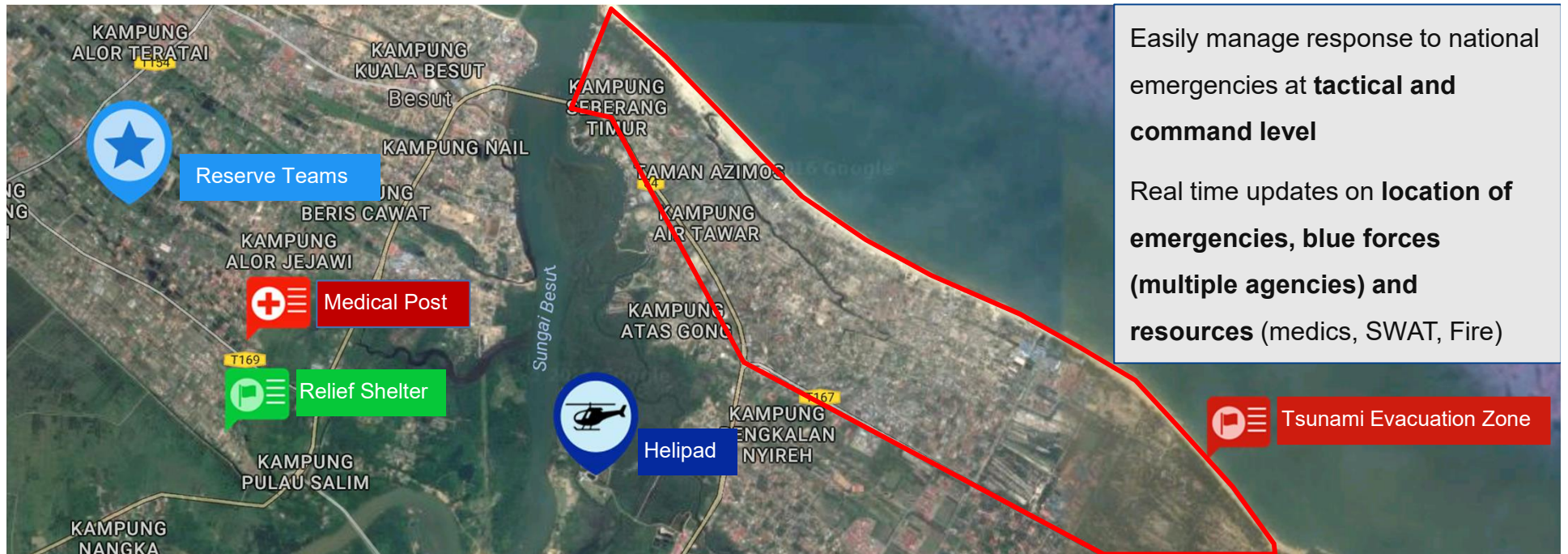
Mass Emergency Management
Post-Event Recovery Advantage

Monitor survivor presence and direct help

Use post-event mass location analytics, with which authorities can trace mobile subscribers and see who may have been in the impacted area

Resources can be assigned accordingly to ensure the safety of impacted people and to find missing persons.

Accurate Location based Mass Emergency Management
Benefits

1. **Identify and alert impacted public and reduce mass panic**

   a. Send early warning notifications regarding potential emergencies

   b. Allow them to make evacuation plans and reduce mass panic among the people

2. **Quickly locate survivors, public safety personnel and resources** (doctors, ambulance etc.) to offer a holistic picture to command authorities for better planning & decision making

3. **Utilize historical information** for **analysis** leading to optimal deployment of resources for future preparedness
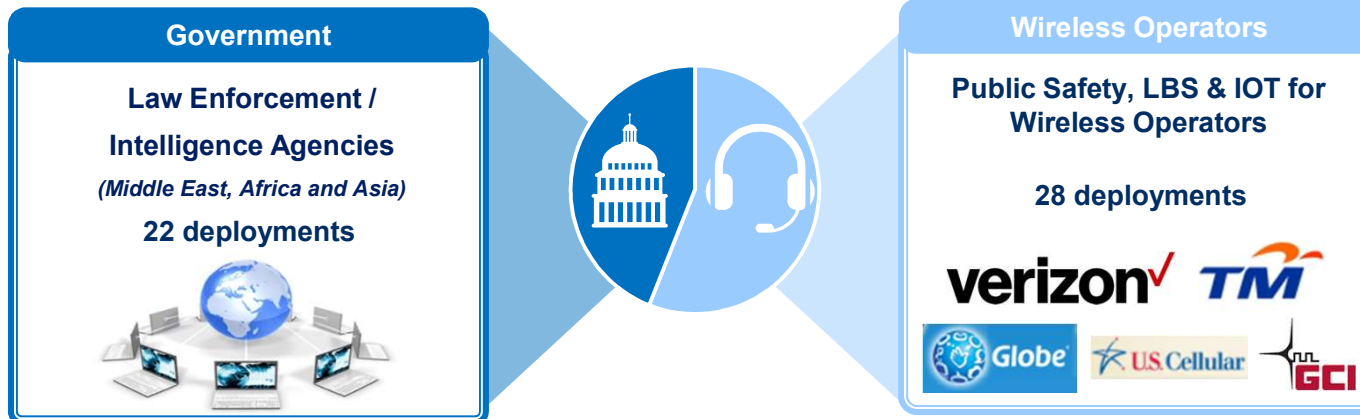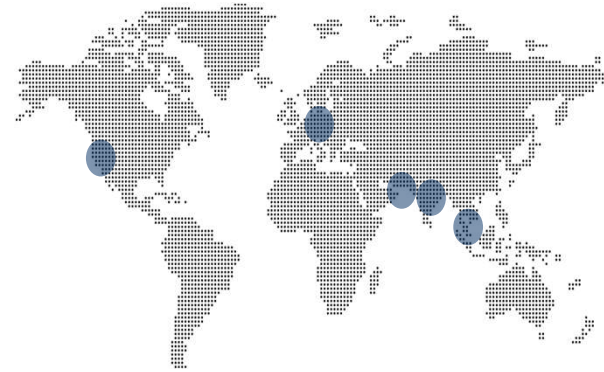
About Polaris Wireless

Global Leader with a Global Presence

- Leader in software-based location solutions for wireless operators and government agencies for over 15 years
- Headquartered in the heart of Silicon Valley in Mountain View, CA
- Deep patent portfolio
- Backed by leading investors including Palisades Ventures and Industry Ventures

Government

Law Enforcement /

Intelligence Agencies

(Middle East, Africa and Asia)

22 deployments

Wireless Operators

Public Safety, LBS & IOT for Wireless Operators

28 deployments

verizon✓ TM

Globe U.S. Cellular GCI

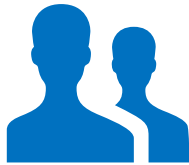# Facts & Figures – Polaris Wireless by the Numbers

Polaris Wireless deployments cover **~475M mobile devices** across 6.7M sq. km. of landmass
We accomplish this through:

Our People

~200 Employees

6 Partnerships with Resellers

Our Presence

8 Countries Served

5 Global Office Locations

Our Product

70+ Patents Awarded or Pending

50 Deployments Worldwide

Polaris Wireless Ecosystem

Business Partners

THALES

IBM

NOKIA

ThalesAlenia Space
A Thales / Finmeccanica Company

GLOBECOMM

amazon web services

Research Partners

STANFORD UNIVERSITY

VirginiaTech
Invent the Future

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

Georgia Tech

Carnegie Mellon University

McMaster University

Vendor Partners

hp

redhat.

Microsoft Windows Server System

Microsoft SQL Server
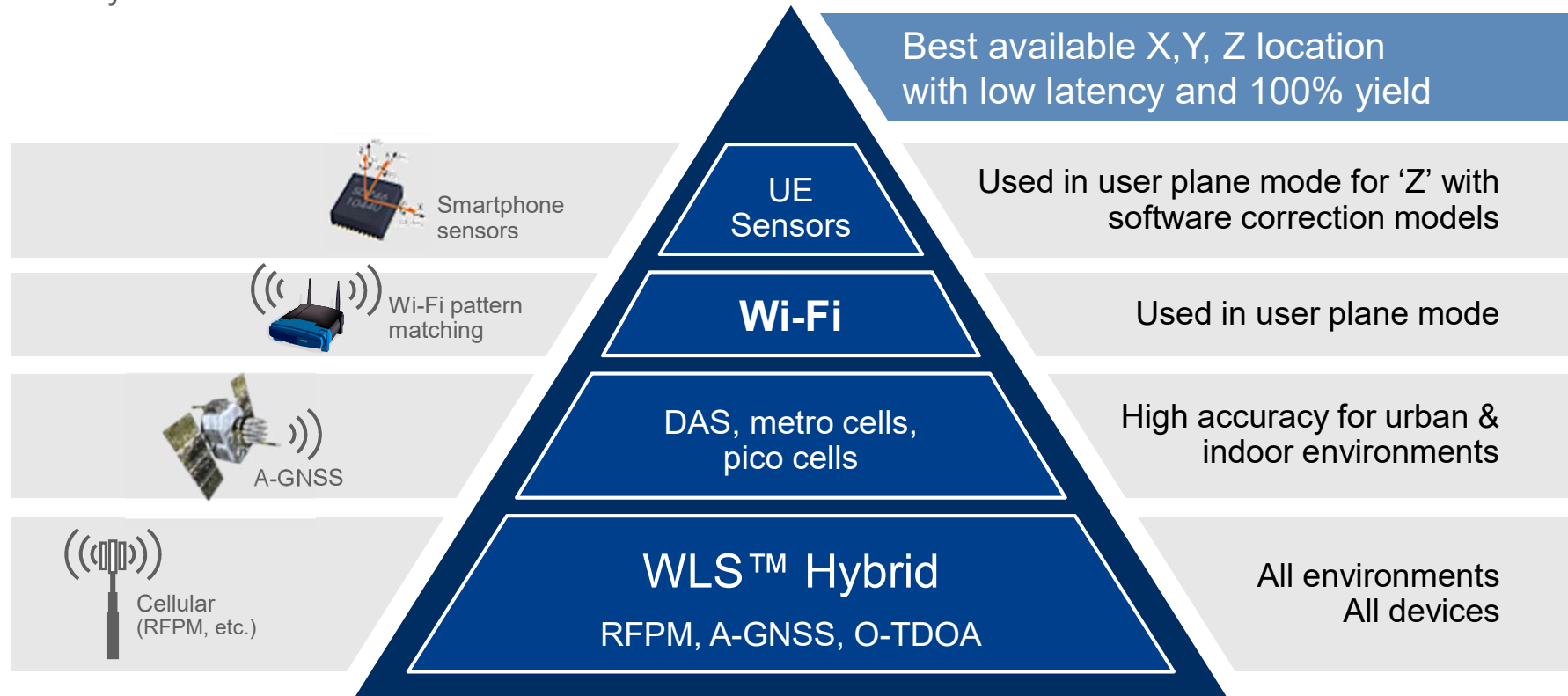
EMC²
where information lives

KEYSIGHT TECHNOLOGIES

esri

map mechanics

DigitalGlobe

Products and Location Technologies

The Hybrid Stack

Best available X,Y, Z location with low latency and 100% yield

Smartphone sensors

Wi-Fi pattern matching

A-GNSS

Cellular (RFPM, etc.)

UE Sensors — Used in user plane mode for 'Z' with software correction models

Wi-Fi — Used in user plane mode

DAS, metro cells, pico cells — High accuracy for urban & indoor environments

WLS™ Hybrid
RFPM, A-GNSS, O-TDOA — All environments All devices

Products and Location Technologies

Hybrid Location – Matching Technology to Environment

| INDOORS/ DENSE URBAN URBAN | WLS |
| RURAL/REMOTE AREAS | A-GPS/ ECID Hybrid |

INDOORS/
DENSE URBAN
URBAN   WLS

SUBURBAN   WLS
                         HYBRID

RURAL/REMOTE
AREAS   A-GPS/
   ECID Hybrid

Products and Location Technologies
Introduction to Polaris Wireless Products

OmniLocate
Universal Location Platform

Platform that scales to meet any network requirements

OmniLocate offers a flexible, virtualized carrier-grade solution that is able to power the high-accuracy, high-volume demands of today's location-based services. OmniLocate easily adapts to any sized network, enabling customers to easily and cost-effectively increase or decrease capacity.
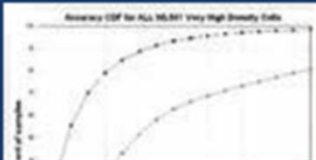
Accuracy chart depicting accuracy of WLS versus ECID

RF signal strength distribution map, which serves as an input for the WLS pattern matching algorithm

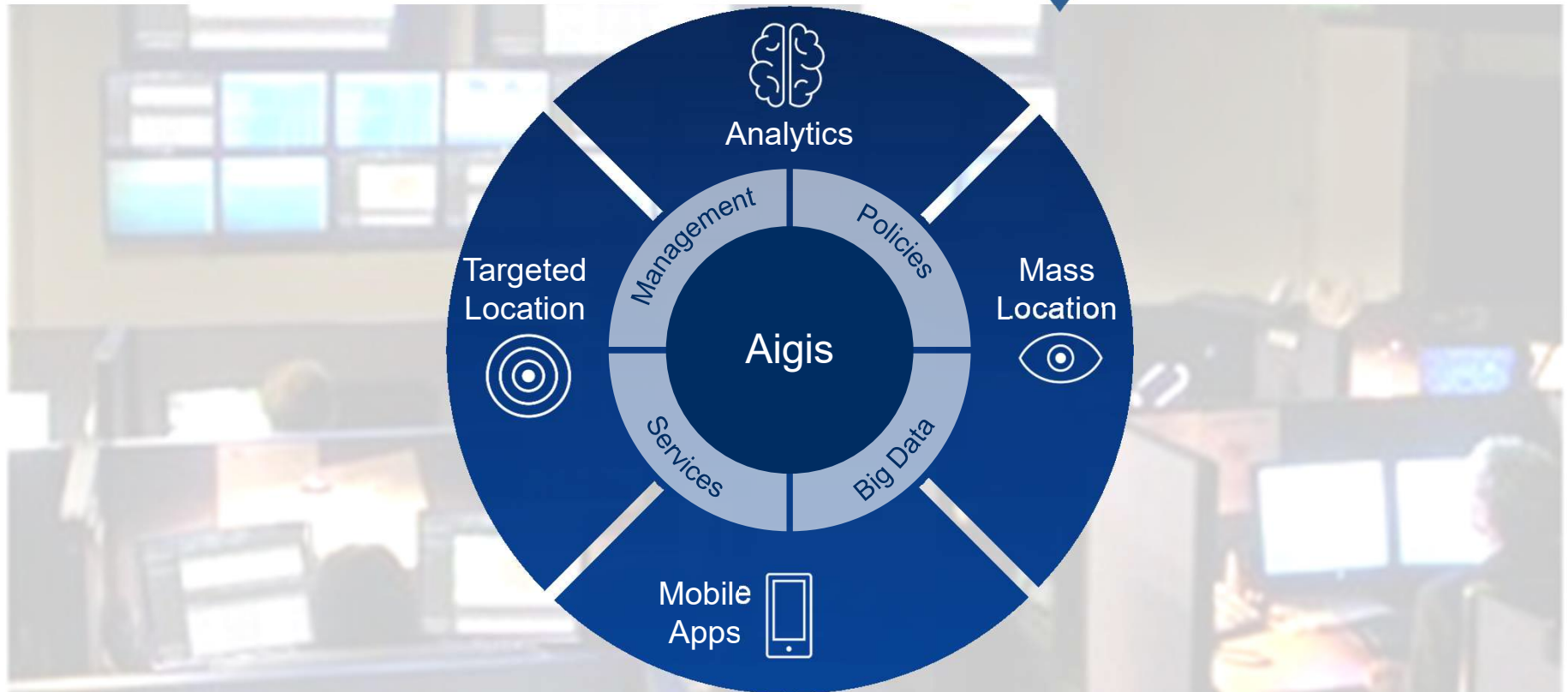Mass snapshot: visualize all mobile activity in a given area

Locate and Track: the most used feature provided by OmniLocate

Products and Location Technologies
Introduction to Polaris Wireless Products

Aigis
Location Intelligence
Application Platform

Summary
High accuracy location & accurate mass location for emergency management

Highest accuracy and reliable location solution optimized for mission critical emergency management

Patented WLS technology delivers the best performance in challenging urban and indoor settings

Supports all mobile devices and air interfaces (2G, 3G, 4G) based on 3GPP standards

Highly scalable, software based solutions running on standard computer hardware

Commercially proven and deployed worldwide

Seasoned management and technology team with deep domain expertise

Enhanced Situational Awareness for Blue Forces

We can help **remove challenges** and enable a **Unified Response** by Blue Forces

Easily manage response to national emergencies at **tactical and command level**

- Real time updates on **location of emergencies, blue forces (multiple agencies) and resources** (medics, SWAT, Fire) on ground for **enhanced** situational awareness

- Share **real-time "inside" data within blue forces** – not rumor or media to asses the situation on ground for **timely action**

- Use map annotations to **easily and clearly communicate plans/ information** to your teams/ other participating agencies

- Make operational intelligence available to blue forces by sharing **photos of suspects and suspicious vehicles** with all officers/ teams/ agencies