



## Measuring Localised Emissions using Walking Sensors

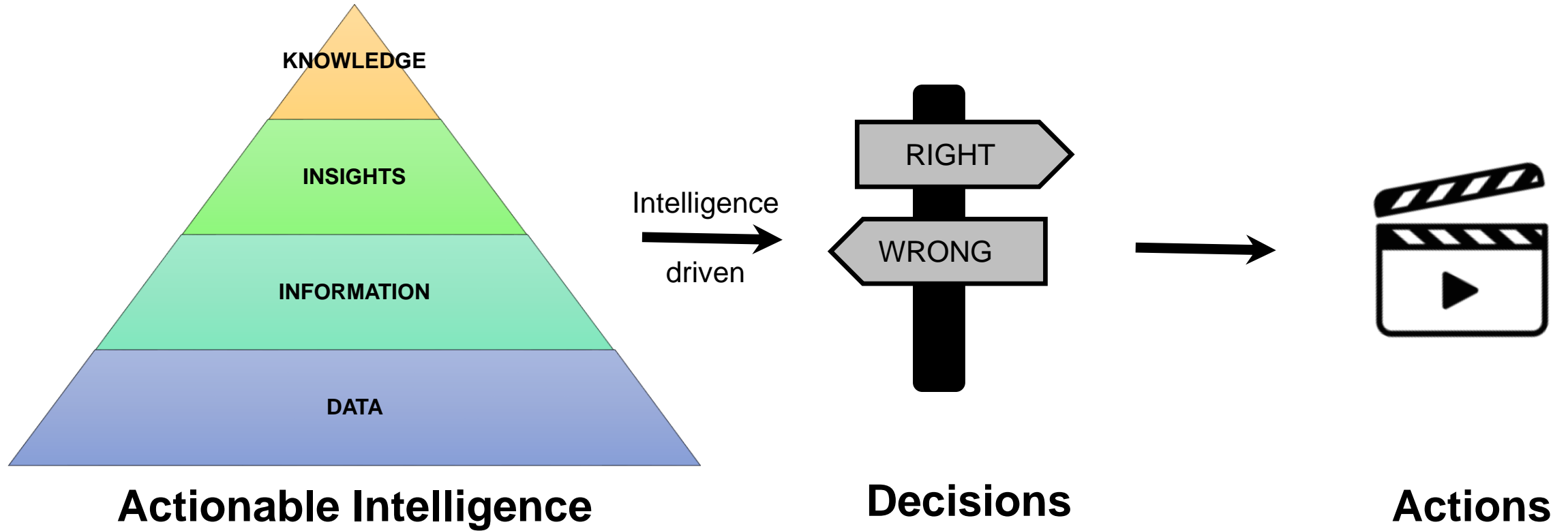
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With thanks to Wearable Technologies  
[www.eleksen.com](http://www.eleksen.com)

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# Why measure emissions data?



# Sense of Urgency?

## Walking the Talk on Emissions?

- Taken an in-depth look at this 'season's' Reporting by 6 European Majors and 7 E&Ps with respect to GHG Emissions
- A short Summary:
  - two of the Majors and one of the E&Ps are 'trying hard';
  - others are quite vague, 'trust us';
  - a minority appear to be pursuing Business as Usual
- Above all.....

*There is too much reliance on laboratory-based 'engineering estimates', only two of the companies have measurement plans....*

Image: Courtesy of David Bamford

# Emissions Measurement Methods

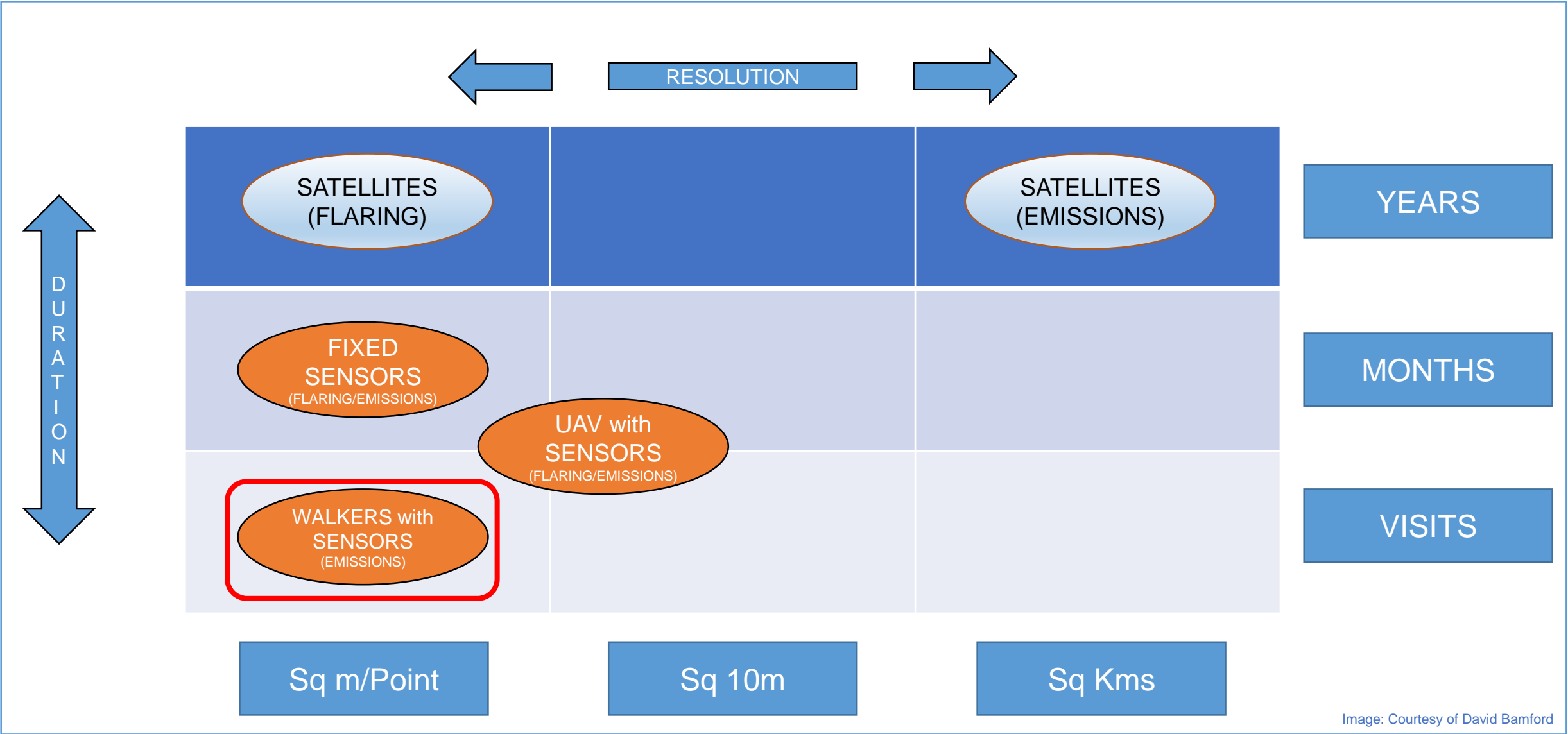
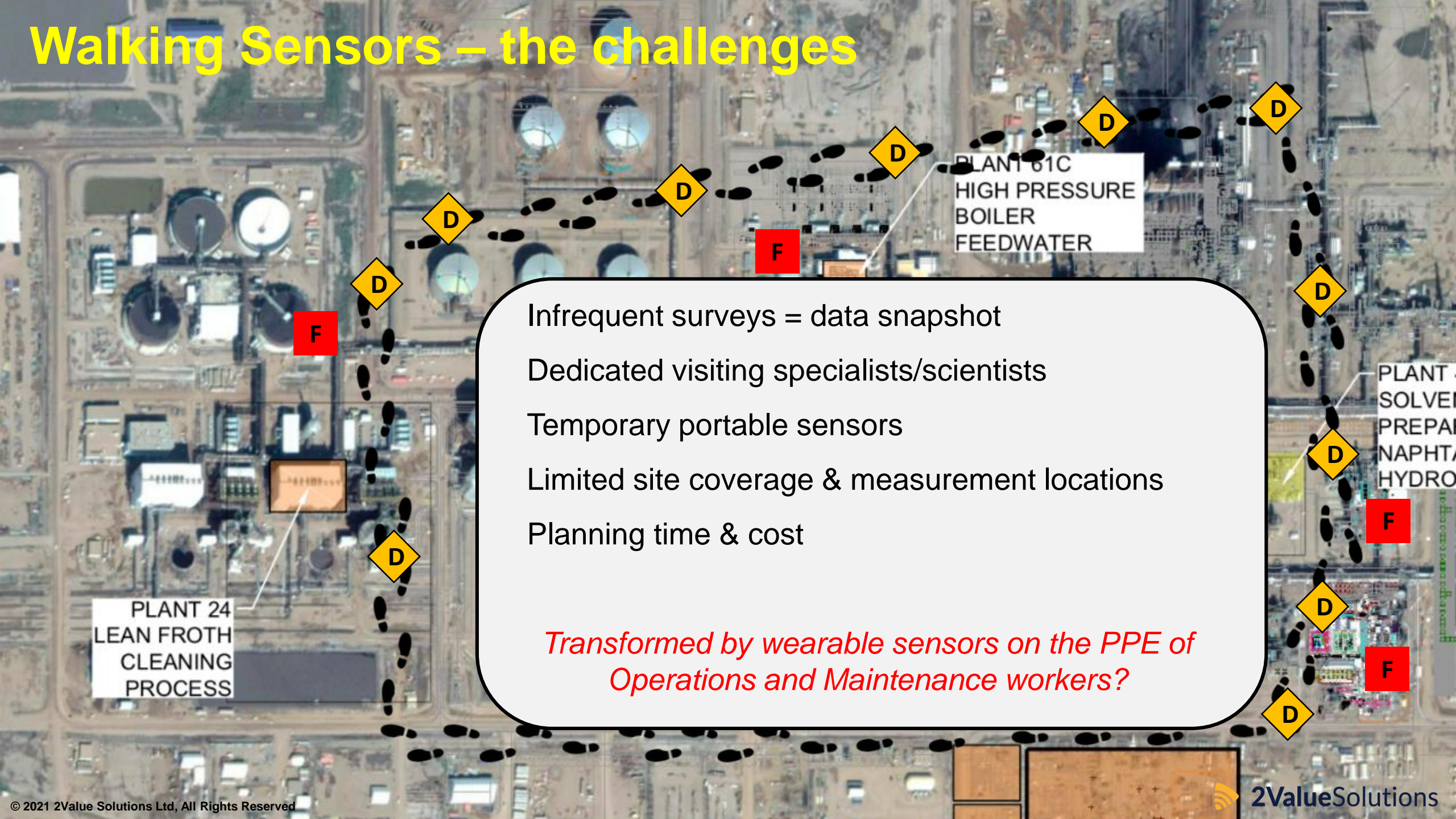


Image: Courtesy of David Bamford



# Walking Sensors – the challenges



Infrequent surveys = data snapshot

Dedicated visiting specialists/scientists

Temporary portable sensors

Limited site coverage & measurement locations

Planning time & cost

*Transformed by wearable sensors on the PPE of  
Operations and Maintenance workers?*





# Walking Sensors – a different approach



**Environment**

**Walking  
Sensors**

**+ Location**

Gas

Air Quality / Dust

Noise

Temperature

Others

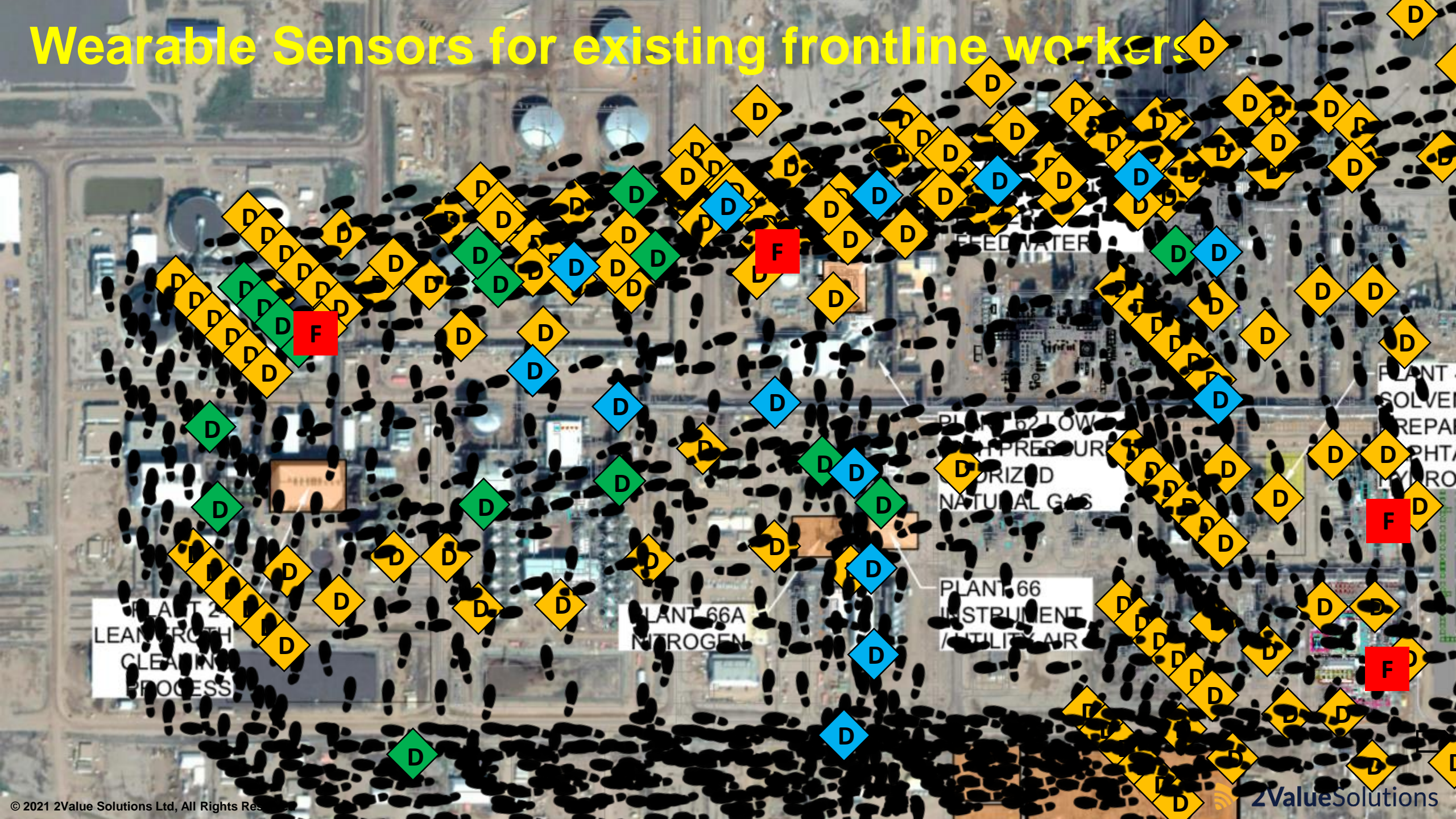


# Wearable Sensors for existing frontline workers





# Wearable Sensors for existing frontline workers





# Re-Purpose Existing Wearable Gas Detectors?

Flammable (LEL)  
Methane  
Pentane  
H<sub>2</sub>S  
Carbon Monoxide  
Oxygen  
VOCs  
Other



Single or Multi Gas ✓

Measure & Record ✓

Alert ✓

Short-range Communications (BLE) ✓





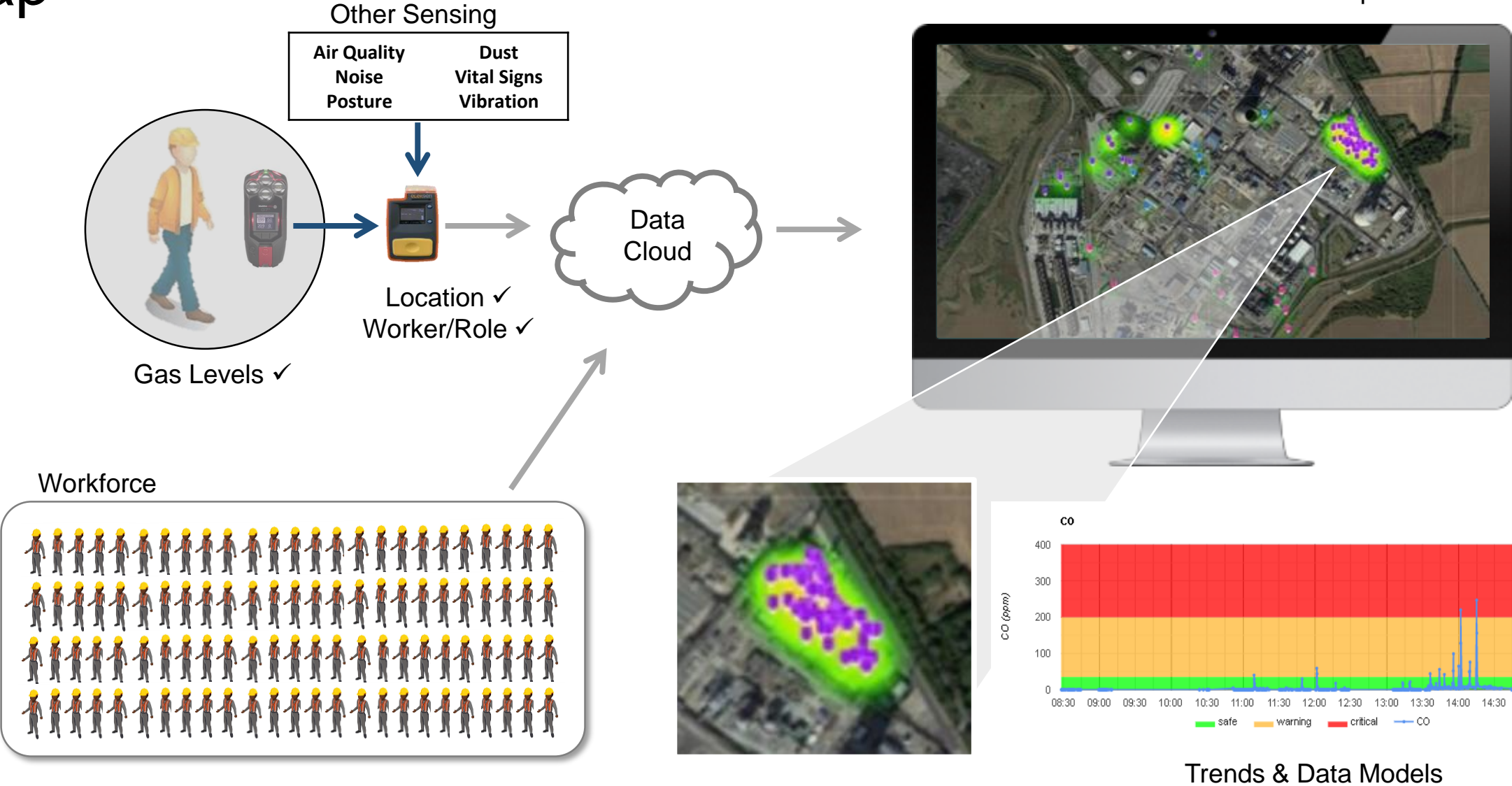
What If ...?

Connected  
Awareness





# Recap



# Detecting spread & adjacents?





# New Approach - Advantages

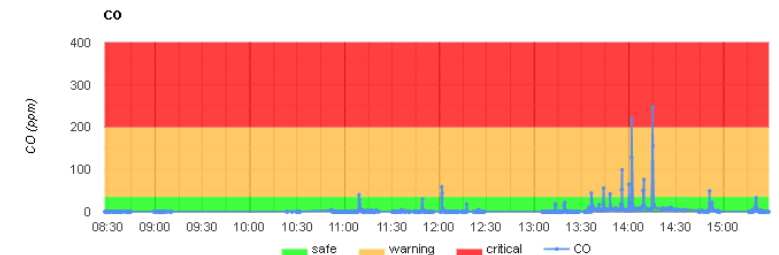
- ❑ Constantly updated localised emission measurements & trends with minimal effort
- ❑ Wide site coverage
- ❑ Localised early indicator of developing emissions
- ❑ Pinpoint emission locations for further investigation
- ❑ No extra manpower required
- ❑ Re-purpose existing equipment



# Field Trial Findings



- ☐ 4-Gas (LEL/Methane, CO, H<sub>2</sub>S, O<sub>2</sub>), Noise, ...
- ☐ Worn by Operations & Maintenance roles
- ☐ Real-time levels, alerts, trends & heat maps
- ☐ Easy to Use: “Fit & Forget”
- ☐ New insights: transients, building emissions
- ☐ Emission extremities





# Challenges Adopting Digital Technology

- ☐ Easy to Use
- ☐ Negligible impact on productivity
- ☐ Data Protection / Privacy
- ☐ Cost
- ☐ Location Granularity
- ☐ Flexibility: Sensor Agnostic
- ☐ Measurement Resolution

# Closing Thoughts



Finger on the pulse & stay in control

Better use existing resources

Solid data foundation for reliable leading indicators

Sense of Urgency

Next Steps: Collaboration Opportunity?





# 2ValueSolutions

# Thank You

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