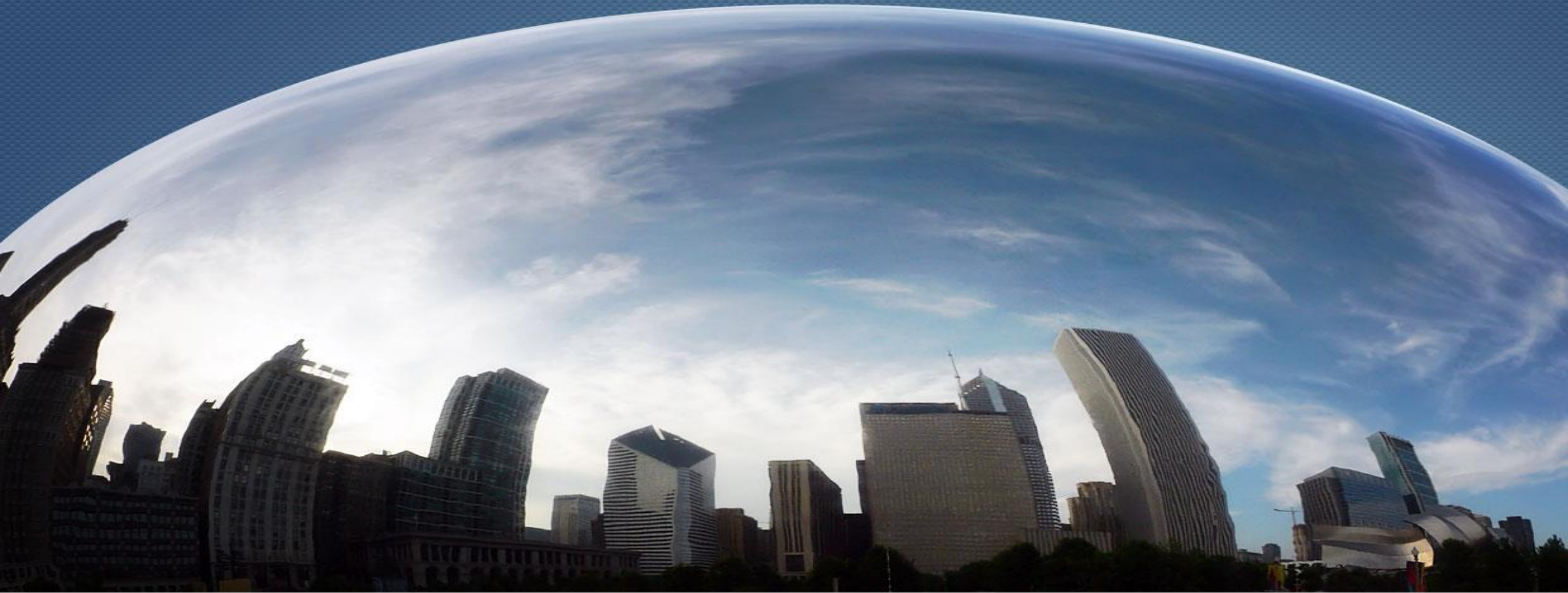


# Creator Tech



## **Smart City Knowledge Sharing Seminar**

**Bangkok, 30th March 2017**



# Agenda

- ▶ Australian Smart City Examples
  - Adelaide
  - Newcastle
  - Ipswich
- ▶ Australian Smart City Companies
  - Smart Parking
  - Cohda Wireless
  - C-Sense/The Weather Co
  - Solar Bins Australia
  - ArcSense
- ▶ ASCA
- ▶ Standards
- ▶ Funding & finance models



## Smart Buildings market in 2017



25% of global facility  
services revenue -  
ABI Research, 2016

China alone will be responsible for 46%  
of the Asian Smart Building market,  
with 36 smart cities & 300+ smart city  
projects underway

ASIA

43% of the global  
construction market  
- BSRIA, 2012

# ADELAIDE, SOUTH AUSTRALIA



# ADELAIDE, SOUTH AUSTRALIA

- ▶ Network of sensors in CBD - support **Smart City Pilot Projects**
- ▶ Manage
  - **Energy consumption**
  - Carbon emissions

**Informative & entertaining city experiences for residents and visitors**

- ▶ **Environmental Monitoring, Smart Lighting and Smart Parking**

Ambition to be one of the world's first smart cities.



# ADELAIDE, SOUTH AUSTRALIA

- ▶ A\$800,000 annual council savings by energy efficiency projects
  - LED lighting
  - Smart lighting controls
- ▶ Target: Adelaide to be **World's First Carbon-neutral City**
- ▶ Schemes support residents/business/property owners to cut consumption
- ▶ Example: Solar Savers Adelaide
  - gives low-income earners and rental property tenants access to solar PV

# IPSWICH, QUEENSLAND





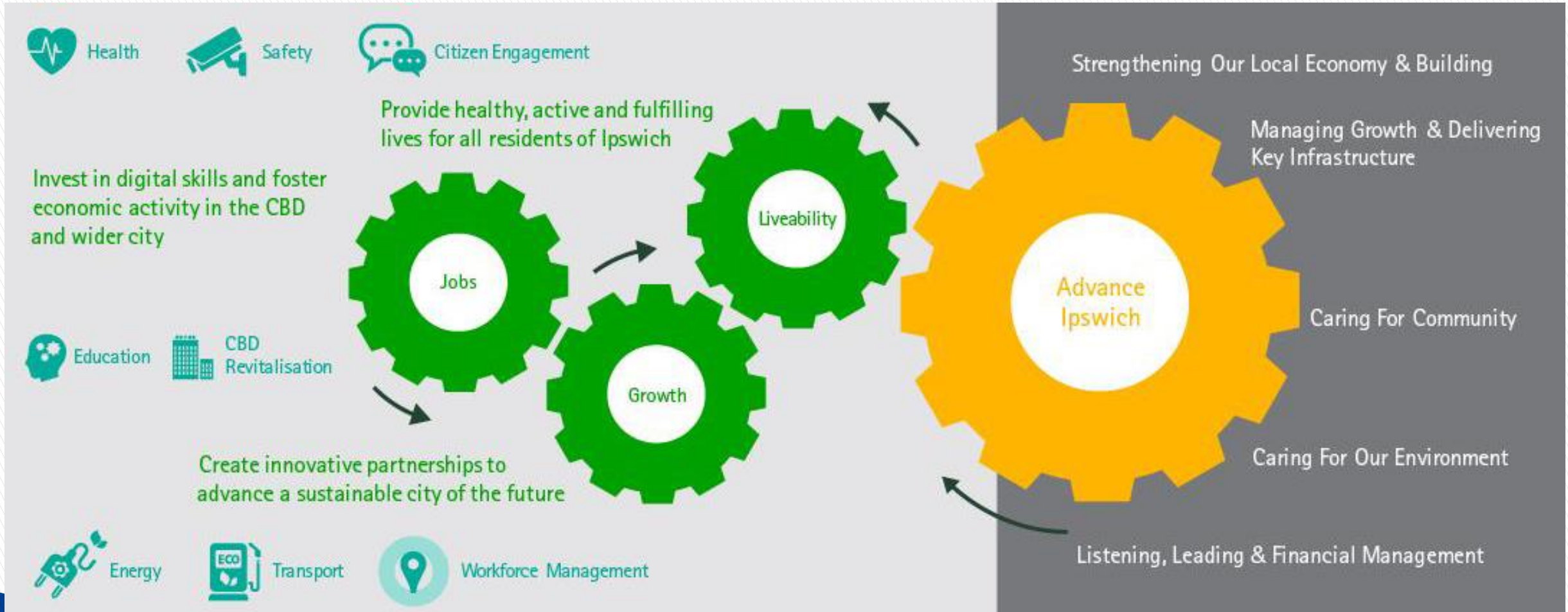
# IPSWICH, QUEENSLAND

## Intelligent Community Forum

- ▶ Named Ipswich one of the World's 21 Smart Intelligent Communities 2011, 2012, 2015
- ▶ One of World 7 Smart Intelligent Communities 2015



# IPSWICH, QUEENSLAND



# IPSWICH, QUEENSLAND

## Ipswich - Vision Statement for Smart City:

- ▶ IPSWICH WILL BE AUSTRALIA's
  - MOST LIVEABLE and
  - PROSPEROUS

## SMART CITY

With thanks to the Smart Cities team from

**NEC Australia Pty Ltd**

**NEC**

[au.nec.com](http://au.nec.com)





# Newcastle Smart City Initiative

**Dr Nathaniel Bavinton**  
**Smart City Coordinator**  
**Strategic Planning**



# NEWCASTLE, NEW SOUTH WALES

## 2030 NEWCASTLE WILL BE A SMART, LIVEABLE & SUSTAINABLE CITY

Connected City – Connecting every person and thing

fixed and mobile communications across the city

Enhance the Environment –enabled with monitoring and sensing

control through data analytics application

Vibrant Public Spaces –better, safer and more sustainable

data analytics and innovative services; even augmented reality



# Drivers of City Revitalisation

## **Commercial Buildings**

New A-Grade Commercial Space



## **Visitor Economy**

New Cruise Ship Terminal

Home-porting capability



## **Cultural Facilities and Night-time Economy**

Victoria Theatre Revamp

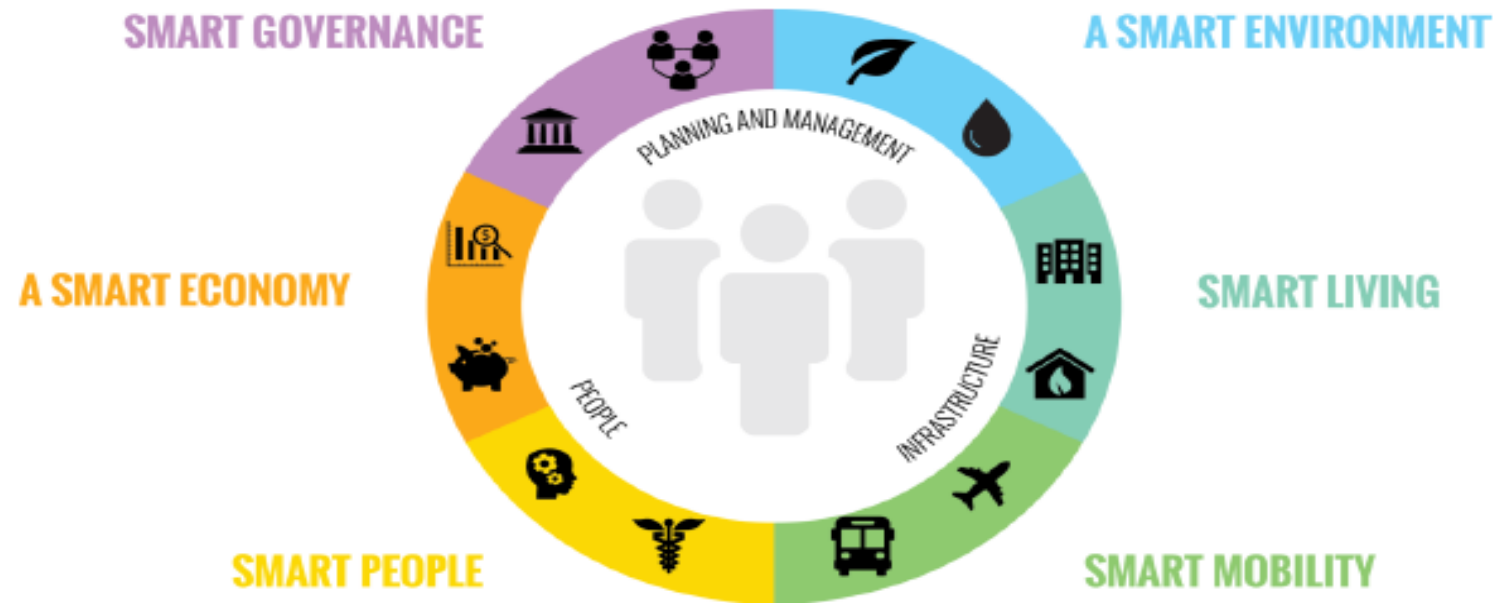
Maturation of licensed venues





# NEWCASTLE, NSW

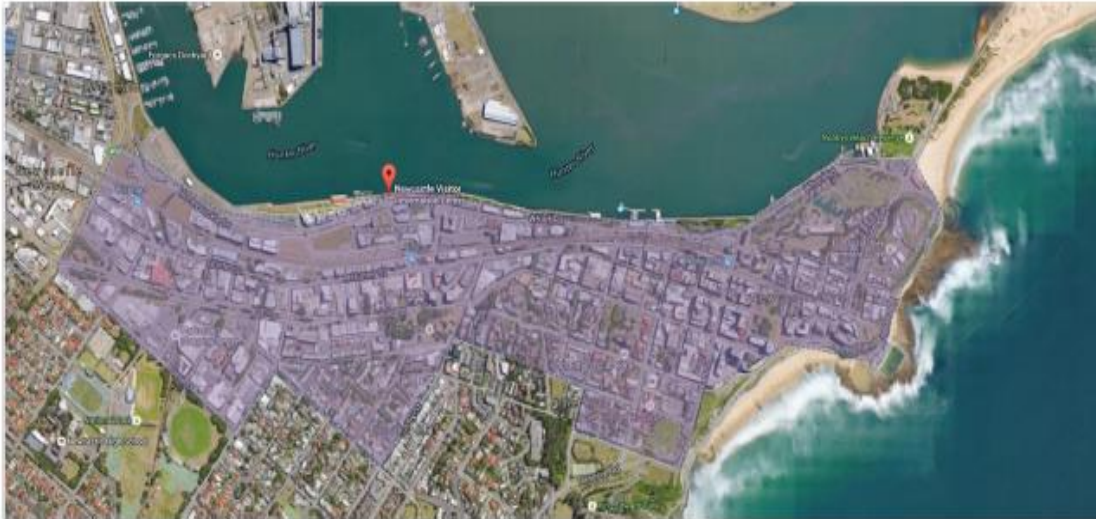
## Newcastle Smart City Strategy



A collaborative strategic planning document guiding both Council and a broader range of city stakeholders and partners towards a smart and innovative city future.

# NEWCASTLE, NSW

## Smart Cities Infrastructure



- Wi-Fi / LPWAN connected Internet of Things network
- Smart city applications and data-rich environment
- A test-bed for new technology and applications
- Foundation of a city open data platform

## A Digital Precinct



- FttP Broadband connected
- Cutting Edge Technology-integrated public domain
- Home to a network of innovation and creative spaces
- Incentivises business relocation and clustering
- Innovation through proximity and cross-sector interaction



# NEWCASTLE, NEW SOUTH WALES

**CREATOR TECH IS PROUD TO BE ASSISTING NEWCASTLE  
IN BOTH FORMING & REALISING ITS SMART CITY AMBITIONS**



# SUMMARY: AUSTRALIAN SMART CITIES

## ► The Issues are Complex:

- Beneficiaries: Citizens?  
Industry? Visitors?
- Finance and funding models?
- Type of technology?



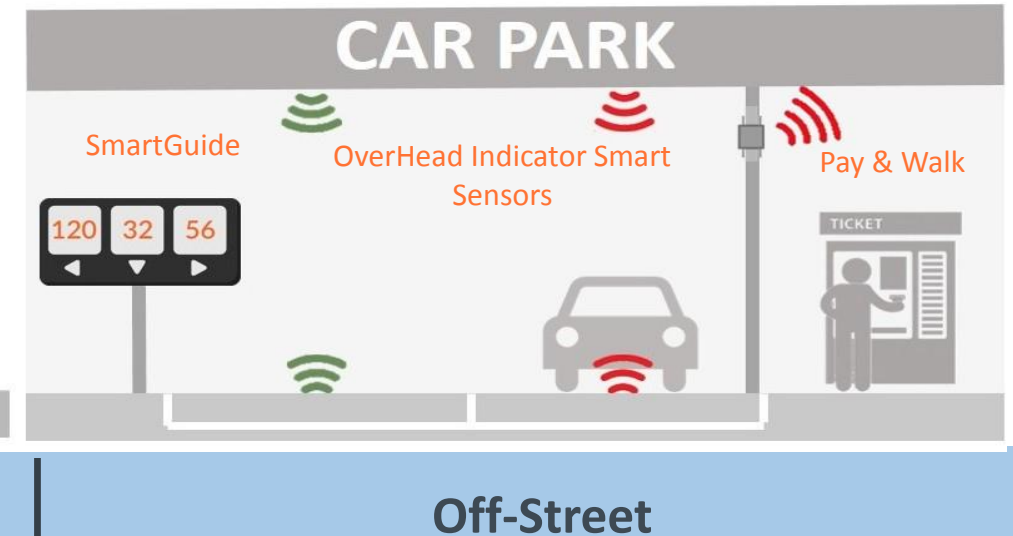
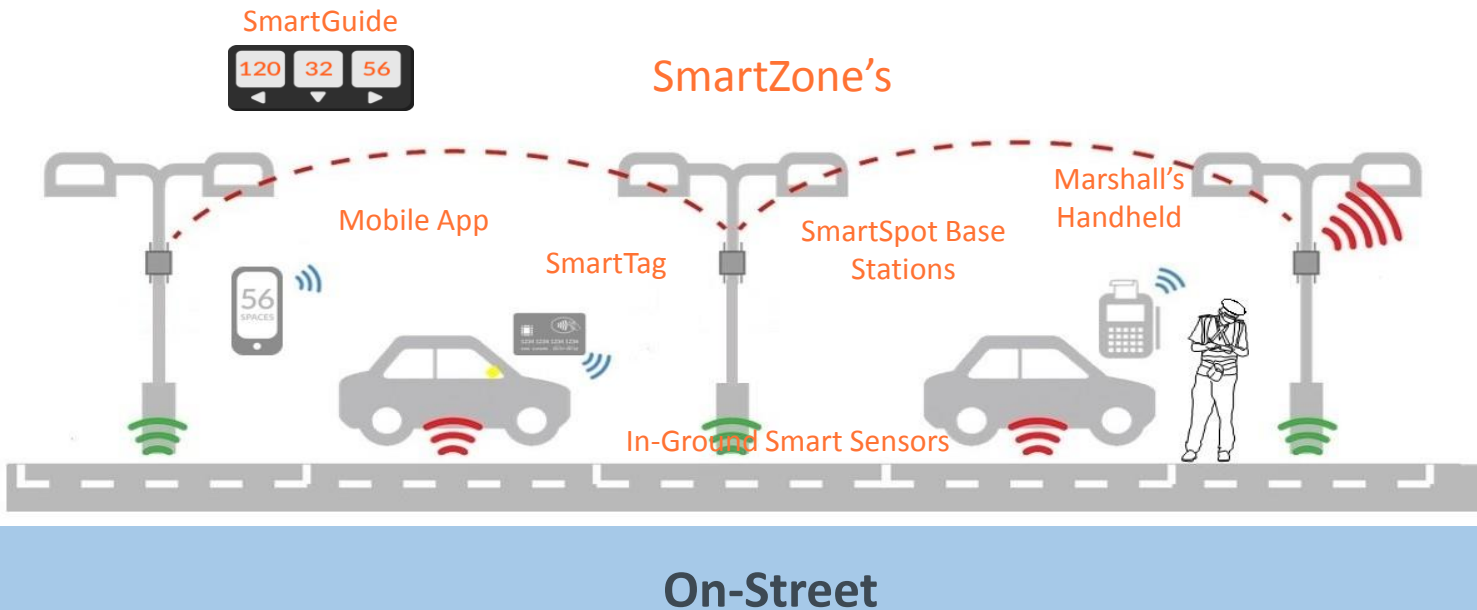
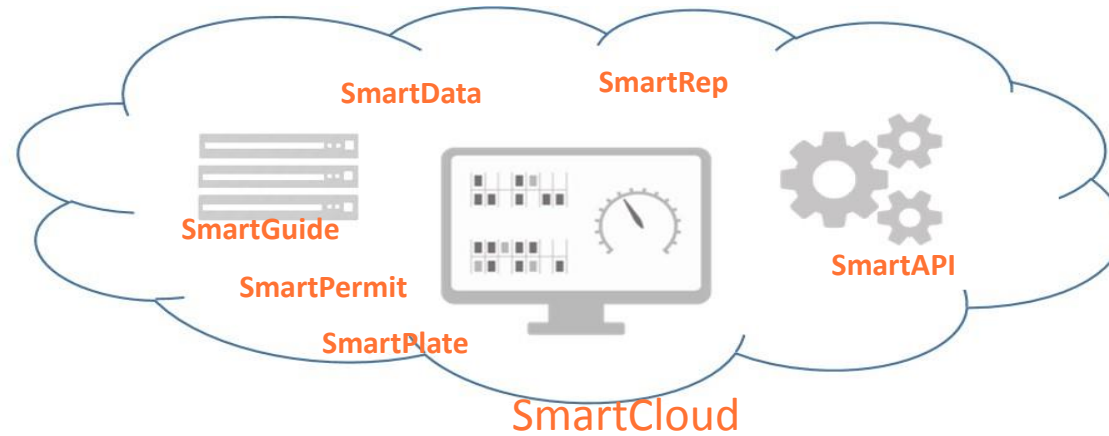
- Issues are also inter-related



# INTRODUCING

# Smart Parking

# The SmartPark System







SMARTCLOUD  
SERVICES  
PLATFORM

INTERNET

SMARTZONE  
SMARTSPOTS



SMARTZONE  
SMARTSPOTS



SMARTZONE  
SMARTSPOTS



AIR QUALITY



BROADBAND



SURVEILLANCE



DIGITAL  
DISPLAYS



SMART  
PARKING



CONTROLLERS



RFID



LIGHTING



# Smart Parking | Business Overview



## GLOBAL

Designs & develops on-street and off-street parking technology and software, enabling clients to manage parking cost effectively.

## TECHNOLOGY

Technology division based in Melbourne.  
Installations in NZ, Australia, UK, Singapore, Malaysia, UAE and South Africa





# Strategic Partnerships

## Strategic Partnerships



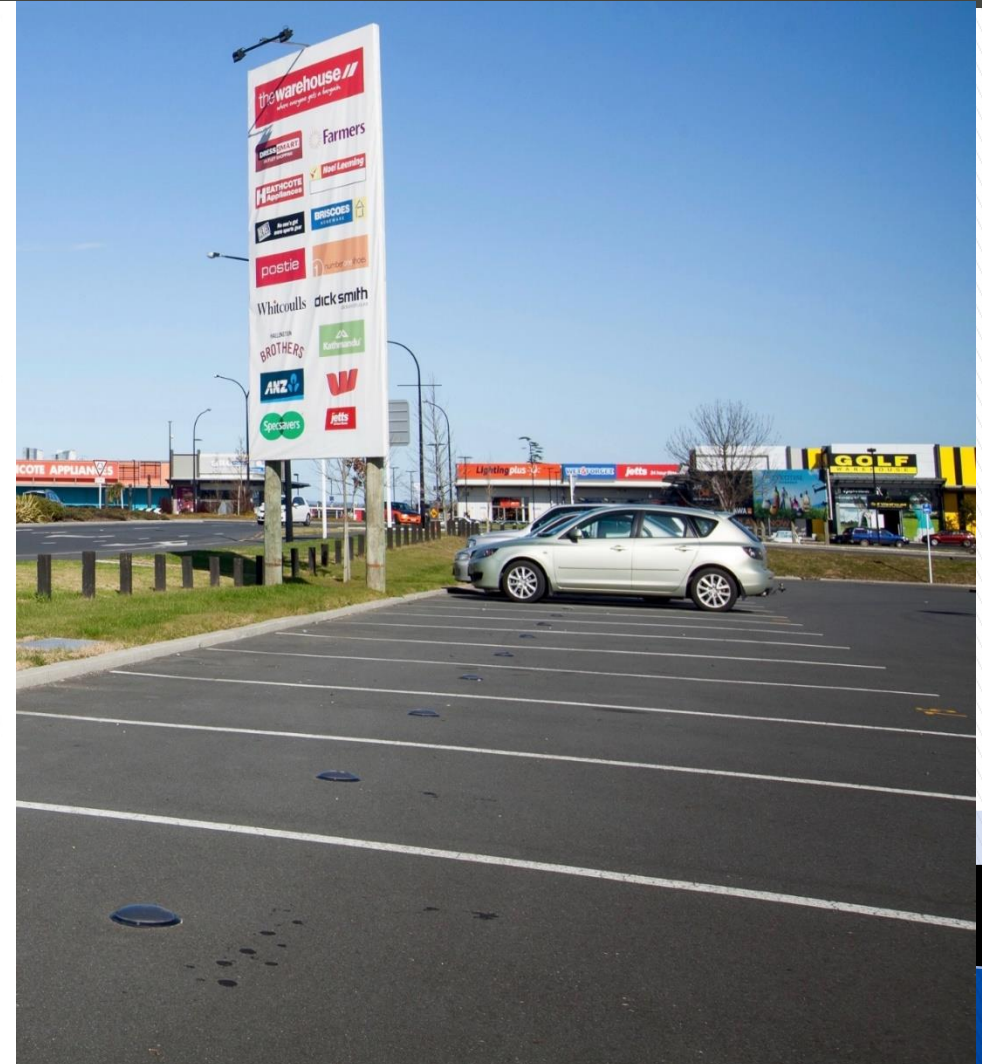
Smart Parking is building relationships with market leading technology companies and telcos.



Smart Parking is growing its relationship CISCO, with partnership opportunities across the UK and Australia.



Smart Parking are working with Intel and exploring an ongoing partnership for projects across Australia.





# Cohda & Smart Cities

Paul Gray  
February 2017



# Cohda Connects Autonomous Vehicles

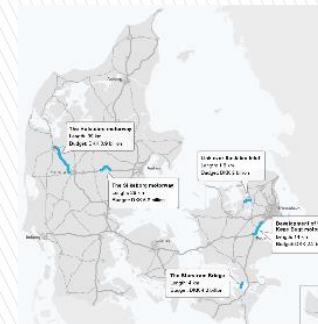
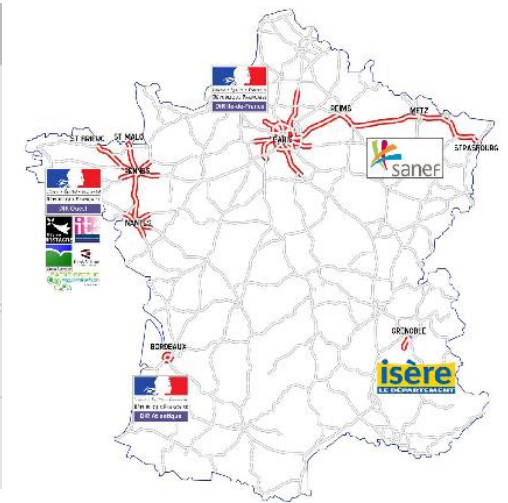
- ▶ Cohda is an Australian-based V2X company
- ▶ Cohda dominates the V2X Connected Vehicle market
  - #1 V2X equipment vendor - 65% market share
- ▶ Now we are offering Smart City infrastructure deployments

**Vehicle-to-everything (V2X)** = passing information from a vehicle to any entity, and back

- ▶ incorporates
  - V2I (Vehicle-to-Infrastructure),
  - V2V (Vehicle-to-vehicle)
  - V2P (Vehicle-to-Pedestrian)
  - V2D (Vehicle-to-device) and
  - V2G (Vehicle-to-grid)

# EU Smart City Connected Vehicle Test Beds

- ▶ Led by the Amsterdam Group
  - <https://amsterdamgroup.mett.nl/Corridor+initiatives/default.aspx>
- ▶ Corridor Project
  - Corridor of infrastructure across Netherlands, Germany & Austria
- ▶ SCOOP
  - Multiple sites across France
- ▶ NordicWay
  - Finland, Norway, Sweden & Denmark





# Cohda Smart City Engagements



Cohda MK5 OBU



Cohda MK5 RSU

- ▶ Sole radio supplier to German sim<sup>TD</sup> trial
- ▶ Contract 1200 vehicles - French SCOOP project
- ▶ 100% of Dutch Corridor Project
- ▶ Partner w Hyundai Austrian Corridor Project
- ▶ Supplied 1500 of the 2800 vehicles in the US Safety Pilot Model Deployment
- ▶ Australian Smart City projects :
  - CITI project in Wollongong
  - Freight Signal Priority in Sydney
  - C-ITS Trial in Queensland

## TRUCKS WILL 'TALK' TO TRAFFIC LIGHTS

April 2016

Minister for Roads Duncan Gay: trial to tackle congestion  
Use **connected technology** - reduce the number of times  
trucks stop at traffic lights.

Truck graphic  
Cohda logo

improve travel time at >100 intersections across Sydney,

- Smoother traffic flow for **all** road users.



# C-Sense: Accurate Weather Solutions

**WEATHER EVENTS** affect:

- Lives - Business - Health - Tourism

**Using input from The Weather Co, sensors & other sources**

**C-Sense can provide highly accurate, localised, predictive weather event information**





# We know weather impacts business

## Media Weather Solutions

Broadcast  
Digital & Mobile  
Audience Alerts



In morning ratings

2x mobile page views  
from customized push alerts

## Insurance Weather Solutions

Customer Engagement  
Claims Management  
Risk Avoidance



of potential claims costs

## Energy Weather Solutions

Trading  
Load Forecasting

Savings of  
**\$9 Million**

generated from integrated  
load forecasting approach

Can generate

**\$800,000**

more per year on a average-  
sized trade floor

© 2017 The Weather Company. An IBM Business

## Retail Weather Solutions

Demand Insight  
Staffing  
Advertising Solutions



In sales year-over-year

## Aviation Weather Solutions

Turbulence Avoidance  
Predictive Analytics  
Forecast Services  
Enroute Hazards



of crew injuries &  
maintenance inspections

11% decline  
of airline cancellations

# Weather Information Sources

**>200,000**

public & personal  
weather stations



**162 forecast  
models**

serve as inputs  
to our forecast



Atmospheric data  
from **50,000**  
flights per day



**15 Million**

Pressures reading  
from mobile devices



**PRECISION**

100x greater coverage



**ACCURACY**

Rated No. 1



**SPEED**

Forecast updates  
every 15 minutes





# Weather is pervasive throughout the health industry



## Asthma



**5%** Increase in child asthma exacerbation ED visits due to unpredicted temperature increase

2-year study by the ACAAI

## Allergies



**67%** Increase in pollen count correlated to winds dispersing pollen

Kansas City study by the University of Missouri

## Heat Illness



**24%** Increase in heat-related ED visits between **24°C** and **30°C**

2014 study for Rhode Island published by Environmental Health Perspectives



## The **AgroMET™** Agricultural Weather Station *Comprehensive Monitoring with Add-On Sensors*



**Leaf Wetness Sensor**

- Pest & Disease Risk Monitoring



**Solar Radiation Sensor**

- Evapotranspiration
- Pest & Disease Risk Monitoring



**Soil Moisture Sensor**

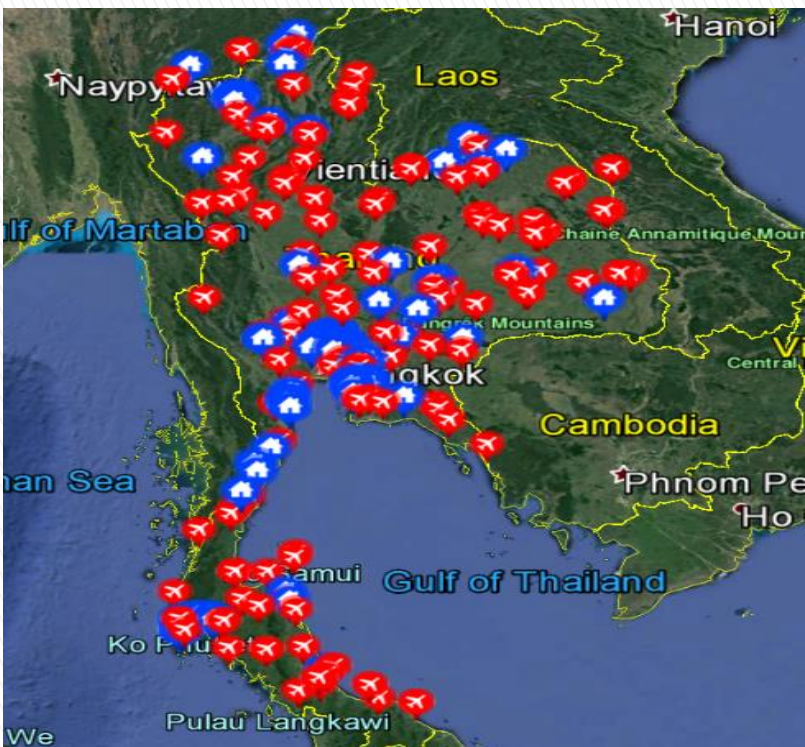
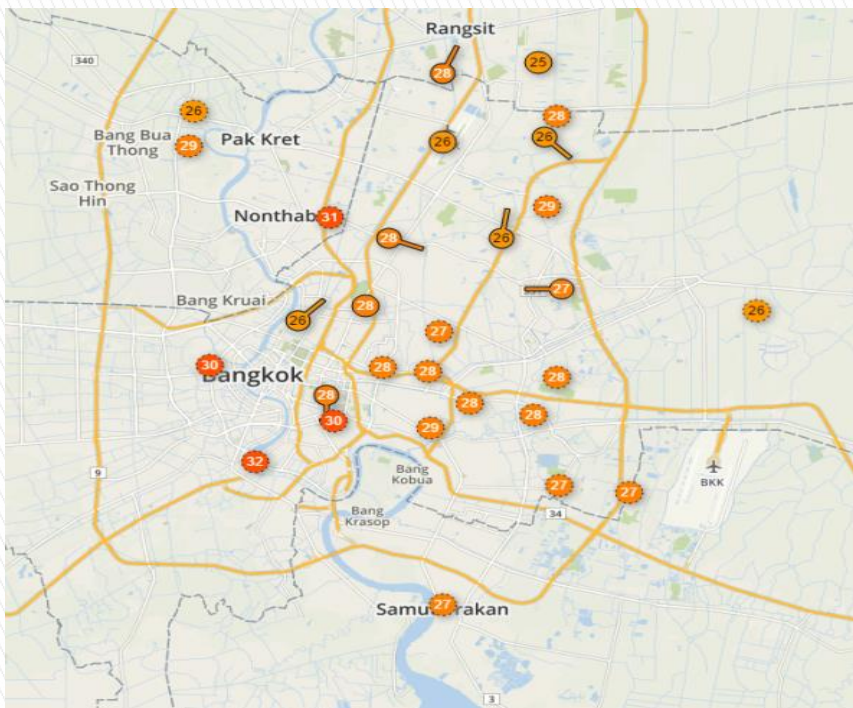
- Informs Irrigation Scheduling



**Auxiliary Temperature Sensor**

- Soil, Canopy or Water Temperature

# The Weather Company offers industry-leading weather data coverage in Thailand



## On-Demand Location (based on Lat/Log coordinates) Weather Data

- 30 km Resolution for historic data
- 0.5km for current & forecast conditions

## Personal Weather Sensors - additional data inputs

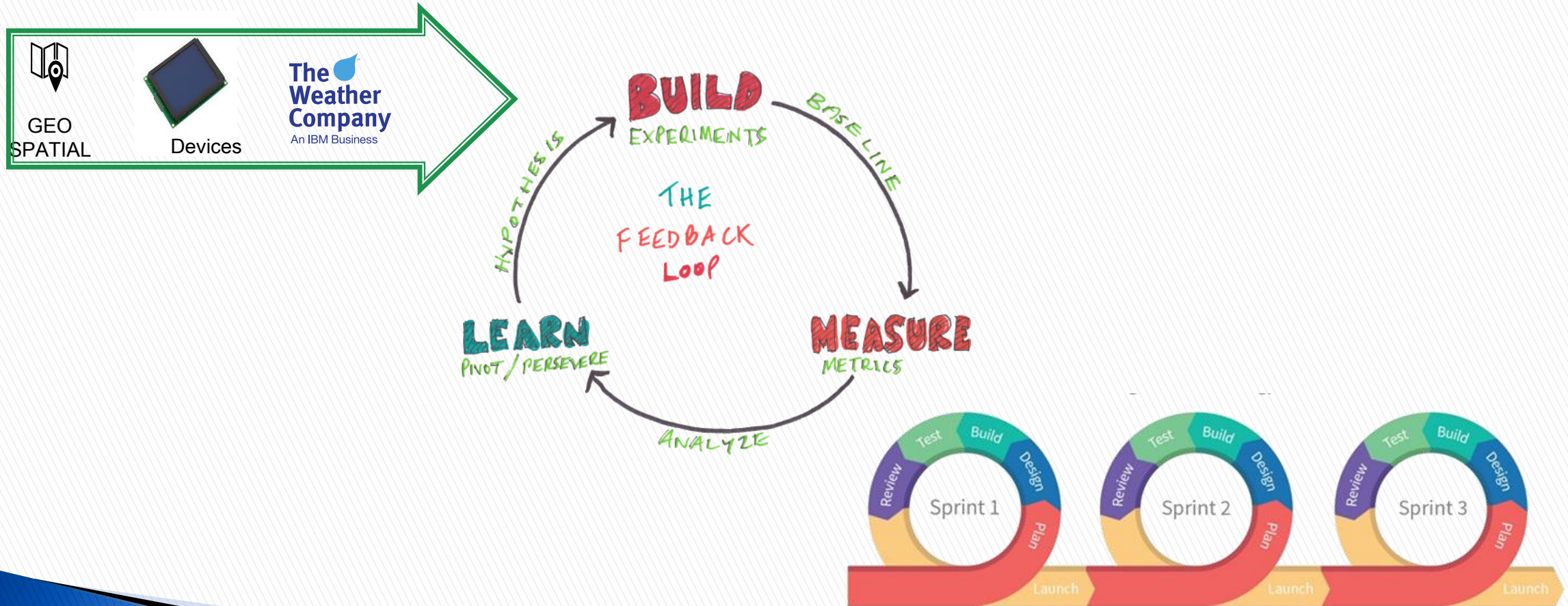
These with our data science models enable us to offer granular forecast data

Core	Current
	Site based Observations (airports), Time- series observations (airports, Current Conditions Imagery Layer)
	<b>Forecast</b> 2 Day Hourly Forecast (48 hours), Daily Forecast (10 day), Intraday Forecast (10 day), Forecast Imagery Layer
Enhanced Current Conditions	Current
	CoD, Current Conditions - Gridded and Polygonal, PWS (Bounding Box & Time Series)
Enhanced Forecast Conditions	Forecast
	Precipitation Event Forecast, 15 Minute Forecast, 15 Day Forecast (Hourly), 15 Day Forecast - Gridded and Polygonal Nowcast, When Will It Rain
Severe Weather	Forecast
	Power Disruption Index, 15 day probabilistic tropical forecast (West Pacific Basic, Indian Basin, Atlantic Basin)
Lifestyle Indices	Forecast
	Pollen Index, Aches & Pains, Breathing, Dry Skin, Driving Difficulty, Frizz, Frost Potential, Golf, Leisure Travel, Mosquito Activity, Running Weather, Ski, Static Electricity, UV, Watering Needs, Heating and Cooling, Degree Days
	Current
	Driving Difficulty, UV
Lightning	Current
	Realtime Lightning (1-4km resolution)
Seasonal Forecast	Forecast
	Seasonal & Sub-Seasonal (precipitation and temperature anomalies, months 1,2,3,1-3 and 2-4)
Historical	Historical
	Government, Cleaned Historical, PWS Historical
ALL PACKAGES	Misc.
	Location Services (global)



# C-Sense can build Accurate Weather Solutions

## IoT SOURCES





# Solar Bins Australia

“Our vision is of a World without Waste. Our mission is to deliver that by overlaying technology into one of the world most resource intensive industries, Waste Management.”

# Solar Bins Australia

- Founded in 2011
- Australian Owned & Operated
- Software Engineering Team – Brisbane
- Industrial Design – Brisbane
- Electronics Engineering – Sydney
- 2 Patents Pending



# Imagine if...

- ... you knew which waste management stations do not need to be collected today
- ... your number of waste bin collections decreased by 70-80%
- ... rubbish stayed in its place and off the streets, parks, sidewalks, and parking lots
- ... pests and overflows were a thing of the past
- ... collection trucks could get off the road,  
= less congestion and less fuel consumption



# Enter, Bigbelly...

A complete *smart* waste & recycling system designed for public space



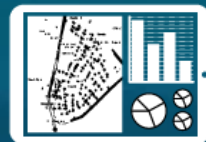
Total  
Containment



Smart &  
Connected



No Visible Waste  
& No Pests



Increased  
Capacity



Cleaner, Safer  
Public Spaces



Reduced



# Improving Quality of Aged Care in Smart Cities

- Increasing number of people living in cities are elderly
- Families/children, as they grow up, move away to work
- Cost of care is increasing.

Installing sensors in the Nursing Home or home: low-cost

- Way of detecting falls, slippages;
- Critical changes in condition

## **ARCSENSE is a Cloud-based analytics service**

- Sends alerts
- Notifies carers/family

When a critical change in condition is detected.



Incident detection & response



Individual Changes



Improved Care



# ArcSense

Sensors



Data



Patterns



Clinical Analytics



Incident detection & response



Individual Changes



Improved Care

• Independent Living • Nursing Homes • Retirement Village

Creator Tech



## Creating a network of smart communities

- Facilitates, promotes and advises on how communities can build liveable, sustainable, workable smart cities.
- Members represent 1 in 3 Australians.



[australiansmartcommunities.org.au](http://australiansmartcommunities.org.au)

[ascaconference.org.au](http://ascaconference.org.au)

[twitter.com/AusSmartComms](https://twitter.com/AusSmartComms)

# ASCA's activities



- Policy and advocacy
- 6 national seminars per year
- Annual conference
- Co-hosted Dutch-Australian Smart City Summit – Nov 2016
- A guide to creating smart communities in Australia

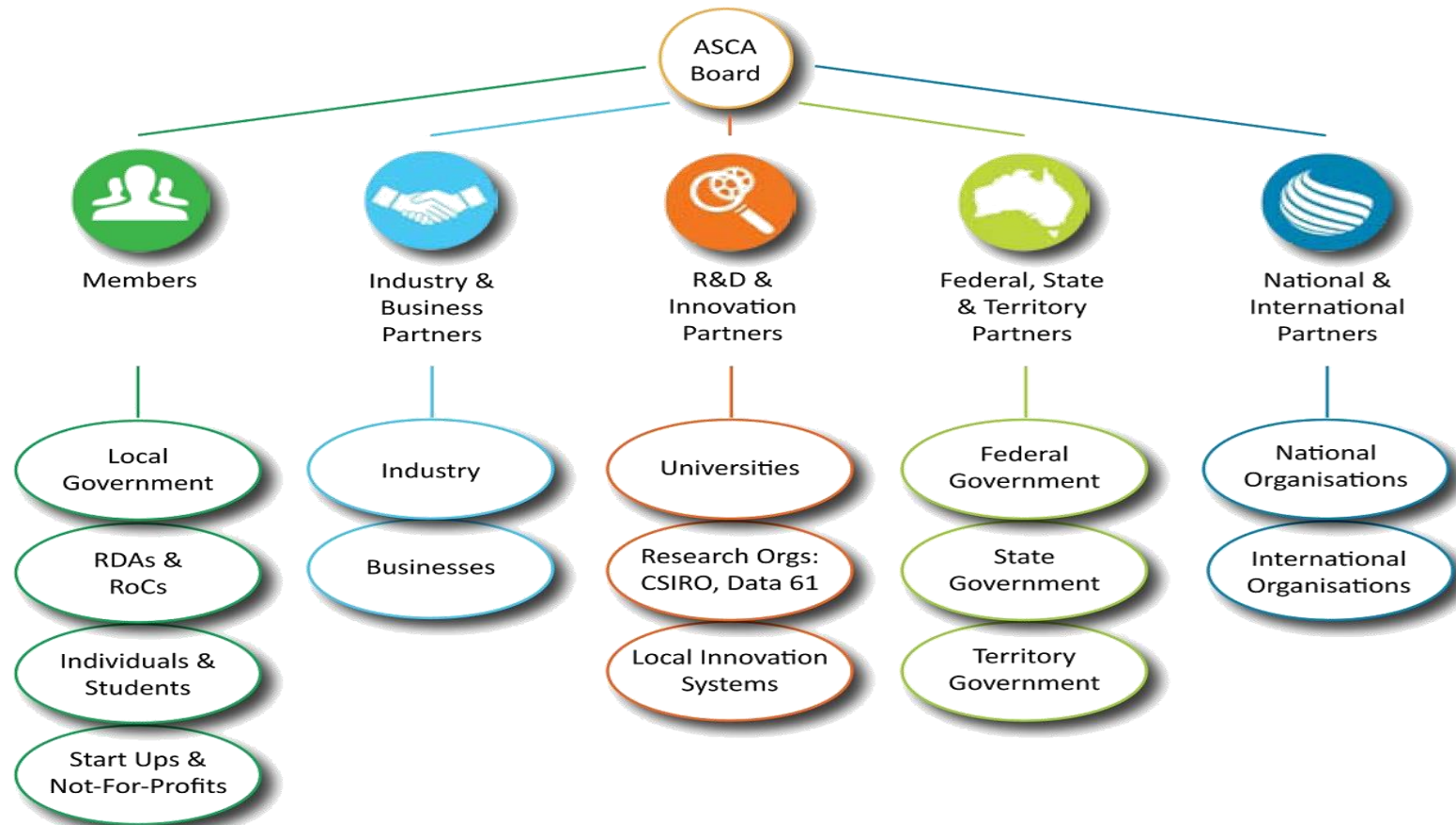


[australiansmartcommunities.org.au](http://australiansmartcommunities.org.au)

[ascaconference.org.au](http://ascaconference.org.au)

[twitter.com/AusSmartComms](https://twitter.com/AusSmartComms)

# Membership structure



[australiansmartcommunities.org.au](http://australiansmartcommunities.org.au)

[ascaconference.org.au](http://ascaconference.org.au)

[twitter.com/AusSmartComms](https://twitter.com/AusSmartComms)



# What our members are doing

- Smart CCTV cameras
- IoT sensors – parking, irrigation
- Smart waste
- Smart lighting and poles
- Smart bins
- Free public WiFi
- Business intelligence
- Virtual reality future
- Smart apps



[australiansmartcommunities.org.au](http://australiansmartcommunities.org.au)

[ascaconference.org.au](http://ascaconference.org.au)

[twitter.com/AusSmartComms](https://twitter.com/AusSmartComms)

# Financing Options – which one to use?

The relevant Finance option or Value Capture mechanism depends on

- Type of infrastructure being built
- Its purpose or objective

Examples:

- |                           |  |
|---------------------------|--|
| • Type of infrastructure: | Smart traffic lights/road signage      |
| • Objective:              | Increased private transport efficiency |
| • Relevant finance model: | Smart zone congestion charging         |
|                           | Fuel tax                               |



# Other Financing Options

- Transit-Oriented Developments
  - property developments around public transport stations are utilised to generate long-term revenue to support public transport operations.
  - Used in Hong Kong and the San Francisco Bay
  - Relevant to public transport (train, bus) finance
- Congestion Charging:
  - road users are charged to access roads/CBD areas
  - Funds reinvested in transport
    - Also incentive for road users to switch to public transport.
  - Used in Singapore and London
- Fuel Tax



# Future-proof Smart City Investment



Lemon-Squash.

WILLIAM HARCOURT (the Barman). "Wonder if I can squeeze any more out of HIM?"

No matter how Smart the funding model, investment will be wasted if:

- Technology is obsoleted
- Infrastructure is non-standard

# Smart City Networks

Which 'low power' network is Fit for Purpose?

- Difficult but critical decision

**Factors:**

- Future-proof
- Vendor lock-in
- Best present and future pricing



# Smart City Networks

## CRITICAL INFRASTRUCTURE HOW TO MANAGE

- Has it been costed in?

### Key Points:

- Future-proof
- No Vendor lock-in
- Best present and future pricing





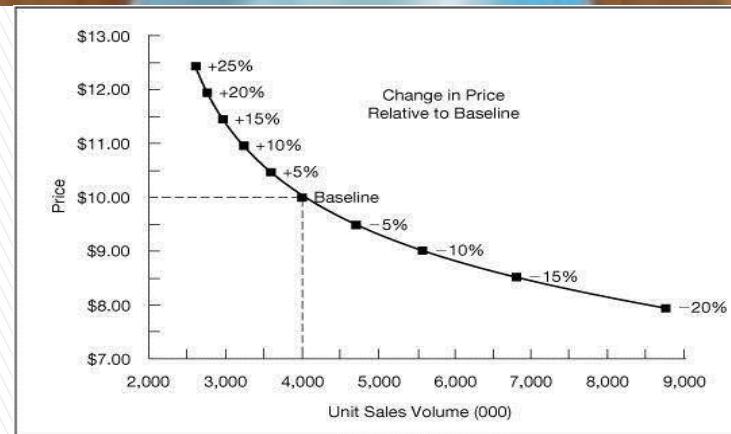
# Smart City Networks

## SOME OF THE EMERGING NETWORK STANDARDS WILL BECOME 'WINNERS'

- Users will enjoy 'decreasing price curve'

## Others will risk:

- Being 'tied' to one supplier
- Price escalation
- Supplier going out of business



# Other Standards



## Hypercat:

- Candidate for “Smart City” standard
- BSI; recognised in Australia
- US National Institute of Standards and Technology working group – develop common IoT-enabled smart city framework



# CREATOR TECH CAPABILITIES

- ▶ Understanding the need for a Digital Smart City Platform
  - Critical infrastructure management.
  - Open standards for capturing and sharing data.
- ▶ Selection of IoT Network:
  - Fit for purpose - **Future-proof** - Cost effective
- ▶ Standards
  - Which standards bodies are relevant?
  - Future-proof
  - Best Return on Investment
- ▶ **How Technology Can Help All Stakeholders**
  - Short-term (now - 5 years)
  - Longer (5 – 15 years)



# Our clients – Industry leaders to start-ups



Securing Your Journey  
to the Cloud



# SUMMARY: SMART CITY PRINCIPLES

- ▶ Need strong leadership
- ▶ Complex Issues
- ▶ **Issues are inter-related**
  - Funding and Finance depend on the objectives, beneficiaries
  - What is achievable depends on technology capabilities
    - Both long- & short-term
- ▶ Decisions on Networks and Standards are critical



# Creator Tech



Thank You