Technology & Transport –
From Horse & Cart to Smart Places

(bonus - Learnings from the IPWEA International Study Tour)
OVERVIEW

• A Brief History of Roads
• Digital Disruption & Smart Cities
• Bulcock Street – A True Smart Street
• Emerging Technologies & Innovation
• Future Shocks
• Final Thoughts
A Brief History of Roads
Currie Street, Nambour – 1930’s
Currie Street, Nambour - now
LED Lighting with Smart Controls

Landscaping & WSUD

Dedicated cycle lanes

DDA; Pedestrian Priority; Shared Path
... and it’s a Road too!
Digital Disruption & Smart Cities
Smart Cities = Cities 4.0

“Smart City” is the name used to brand the current industrial revolution - Digital
Digital influence is transforming our urban communities

Smart City Drivers - 2

Sensors to digitise analogue systems

Driverless vehicles

Increasing uncertainty

Disruption Increasing
What is the Sunshine Coast response?

• Catalyst was Council creation of the new Maroochydore City Centre
• Developed the Smart City Framework which recognised that:
  • Communications and electrical supply critical
  • Smart Region Management Platform for integrated rules based system
  • Smart Centre and Living Lab fundamental to testing, trialling and demonstrating our system
  • Need for solution systems – 15 in total
Ad hoc, department-based planning and discrete projects

Opportunistic
Opportunistic project deployments; proactive collaboration within and between departments; key stakeholders aligned around beginning strategy; barriers to adoption identified

Repetitive
Recurring projects, events, and processes identified for integration; formal committees document strategy, processes and technology with stakeholder buy-in

Managed
Formal systems for work/data flows; technology in place; standards emerge; performance management based on outcomes shift culture, budgets, IT investment, and governance structure

Optimised
Sustainable, region-wide platform in place; agile, continuously improving strategy, IT and governance that allows for autonomy within integrated system of systems; superior outcomes that deliver differentiation

The Smart City Journey

Choosing proactive change
- Parking space availability sensors

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<td>42.9%</td>
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Happy Valley car park
http://system.cleverciti.com/australia1/
• Public Waste Bin Sensors

  Currently 25 bins optimised
  Saving $20k PA
  Total bins approx. 3000
• Automated water meter readings
• Next LiFi - Light as a high-speed internet source
• Luminous paths - Construction technology
• Smart WiFi and Business Intelligence
Key Smart City Infrastructure

- Power
- Pits
- Conduits
- Poles
- Lights (LED)
- Switchboards
- Software control platform
- Optic fibre
- Wi-fi points
- Monitoring devices
Typical duct configuration
Wireless Connectivity
James, 36, accountant: If I have a meeting in Caloundra I can use my smartphone to look for a parking spot within 400m of the venue because I want to work on my walking steps for the day.

Economic benefits: $36M-$40M. Due to optimised parking infrastructure, improved revenue from collections, higher enforcement, and less time by drivers spent looking for parking spots.

Parking data is experimental in nature and is constantly being improved. Satellite imagery is not live.

VIEW NUTLEY ST PARKING...

VIEW HAPPY VALLEY PARKING...
Bulcock Street – A True Smart Street
Bulcock Street, Caloundra - 1935
Bulcock Street, Caloundra - 1945
Bulcock Street, Caloundra - today
Smart Street – Bulcock Street
LED Lighting with Smart Controls

Optical sensors

Waste bin sensors

DDA; Pedestrian Priority; Shared Path

Landscaping & WSUD
Emerging Technologies & Innovation
SMART CITIES ARE A GLOBAL TREND
- More than just hype
- Active investment going on
- An emerging field of public works engineering
- Changing the way regions manage assets, provide services to their people

Chicago puts up sensors to track city’s vitals
Fitbit-like tech to provide block-by-block environmental data and more

Nick Soulady installs a modular sensor box that is part of Chicago’s Array of Things project.

CHICAGO The Windy City has begun installing what sounds a whole lot like a Fitbit that can measure the vitals of a bustling metropolis.

Chicago, which partnered on the project with researchers at the University of Chicago and Argonne National Laboratory and several corporations, last week installed the first two of 500 modular sensor boxes. The devices will eventually allow the city and public to instantly get block-by-block data on air quality, noise levels, as well as vehicular and pedestrian traffic.

The project — dubbed the Array of Things and described by Chicago officials as a “fitness tracker for the city” — is a first-of-its kind effort in the nation. Plans are in the works to replicate the project in the coming years in more than a dozen other cities, including Atlanta, Chattanooga, and Seattle. The Chicago project was funded with the help of a $3.1 million National Science Foundation grant.

"Five years out, if we’re successful, this data and the application could have a big impact on making sure the city is safe and green for everyone,” said Dan 2A

NEWSPAPER
IN NEWS
Turkey strikes against Kurds

EARTHQUAKE IN ITALY

WHEN POLITICS AND JUSTICE COLLIDE: CLINTON
Amsterdam Schiphol Airport – Electric taxis (25% ... going to all by 2020)
Amsterdam electric

Amsterdam stimulates electric mobility. Electric transport is, after all, cleaner, quieter and it contributes to the liveability of the city. It is our ambition to have all car kilometres being driven electric in Amsterdam in 2040. To make this possible, a network of public charging points is installed throughout the city, charging all the cars with electricity from renewable sources.
CONNECTED & AUTONOMOUS TRANSPORT IS HAPPENING.....NOW!

• USA invested $600m in communications
• By 2022 all 20 million cars will have a set software system
• Standards being set for utilities to comply
• Vehicles talking to each other = autonomy follows
CONNECTED & AUTONOMOUS TRANSPORT IS HAPPENING..... NOW!

- BENEFITS:
  - Safety
  - Road capacity
  - Congestion management
  - Real time traffic management
  - Parking reductions (?)
  - Mobile LIDAR collectors
  - Taxation!
CONNECTED & AUTONOMOUS TRANSPORT IS HAPPENING..... NOW!

• RISKS:
  • Loss of lower skilled jobs – taxi drivers; truck drivers
  • Social disruption
  • Different technologies
  • Slow take up
  • Cyber warfare
Connected vehicles

Self driving
Future shocks
I Believe I Can See the Future

More Than the Typical Analytics Routine

Joshua Dodson
@JoshuaDDodson
Helsinki – Autonomous Electric Mini Bus
Final Thoughts
Future Roads

Roads will continue to evolve
Transport Corridors
Urban Places
Multi Modal Assets
Smart & digitally enabled
Flexible spaces through technology systems
Learning & moving people
Maroochydore New CBD

Smart LED Street Lights

Smart Digital Signage

Smart WiFi – Free, Public & Region wide

Wireless – Foundation Layer

Smart Centre – Experience, learning Feedback and Network Operations

Smart Parking

Smart Street Pole

Foundation Layer – Optic Fibre

Foundation Layer – Pits & Pipes

Foundation Layer – Electrical Supply

Smart Transport – Bus & Light Rail

Smart Sensors – Soil Moisture

Smart Waste – Vacuum and Sensors

SCC Carrier Licence
Automatic Waste Collection System

How the waste system works:

1. Chutes
   - Rubbish is thrown into household chutes.
   - No modification to the chutes is needed during the transition to the new system.

2. Recharge valves
   - The rubbish ends up in bins at the bottom of blocks.
   - When the bins are full, sensors will instruct valves to open and drop the rubbish into underground pipes.

3. Pneumatic pipes
   - Waste is then transported by air suction to a centralised bin centre in the precinct, at a speed of 50km per hour.
   - It takes less than a minute for the waste to travel from the blocks to the centralised bin centre.

4. Recyling
   - Outdoor disposal units where the public can throw recyclable waste will also be linked to the system.

5. Air inlets
   - 38 air inlets in the neighbourhood allow air into the underground pipe network, ensuring smooth airflow along the pipes.

6. Cyclone separators
   - Waste at the centralised bin centre is sucked through a cyclone, where it is separated from the transport air.
   - The waste then falls into a compactor below, while the air flows into another pipe.

7. Exhausters
   - These are centrifugal fans that move the airflow in the pipe network.

8. Air filters
   - The air is passed through a filter to remove dust particles and ensure it is released back into the environment.

9. Waste storage
   - When the compactor detects that the waste has reached a certain level, it compresses and pushes the waste into waste containers.
   - Normal waste and recyclables are stored separately.
   - Each container can accommodate 30 tonnes of waste.
   - These containers are transported by trucks to the incinerator plants.
PAPERLESS OFFICE

MY ASS
Currie Street, Nambour - 1915

- Landscaping
- Heavy transport lane
- Dedicated public transport
- Dedicated cycle lanes
- Pedestrian Priority; Shared Path
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Currie Street, Nambour - 1915

Smart communications!
THANKS ..... questions?