

Building a data driven smart city

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A smart city – technology and data as a point of difference

A smart city uses **technology and data** to drive economic activity, accelerate innovation and better manage energy, resources and services – Adelaide, SA

Using **technology, data and innovation** to turn Casey into Australia's most liveable city – Casey, Vic

Newcastle is an open, collaborative, and connected smart city that **uses technology** to make things easier, more liveable and sustainable for everyone – Newcastle, NSW

What is a smart city?

1. Building next generation and sustainable infrastructure
2. Stimulating growth in the new economy
3. Applying technology and data enabled improvements to services



Compelling case for a data enabled city

Efficiency

- Less money spent on unnecessary asset maintenance
- More targeted use of people and budget
- Greater ability to self serve
- Higher levels of automation
- Tighter spend controls

Effectiveness

- Data informed decision making
- More certainty in planning
- Improved transparency
- More engagement with the community
- Stimulating economic growth
- Higher quality of services
- Less mistakes and manual handling

Big data

Volume, veracity, velocity, variety (IBM)

The dream

EPA air quality hourly update: October 16, 2018 6.00 pm - 7.00 pm

Please note that current data may not be shown for some air quality monitoring stations. Measurements are made continuously at air monitoring stations; but there may be temporary technical issues with the collection and display of data.

Hour: [current](#) | [next](#) | [previous](#) | [choose...](#)

Show: [data readings](#) | [index values](#)

Data readings										Air quality index	
Region	Station	Carbon Monoxide	Ozone	Nitrogen Dioxide	Sulfur Dioxide	Particles as PM2.5	Particles as PM10	Visibility Reduction	AQI	Summary	
	Units	ppm	ppb	ppb	ppb	ug/m3	ug/m3	none			
EAST	Macleod					3.6			14	VERY GOOD	
	Brighton					3.4			14	VERY GOOD	
	Box Hill					1.7			7	VERY GOOD	
	Alphington	0.2	17	10	0	3.5	10.7	0.38	17	VERY GOOD	
	Mooroolbark		21			5.0	9.0	0.38	21	VERY GOOD	
	Melbourne CBD					4.0			16	VERY GOOD	
	Dandenong		4	24		3.3	13.9	0.46	20	VERY GOOD	
WEST	Melton		14			2.3			14	VERY GOOD	
	Brooklyn					5.5	13.0	0.42	22	VERY GOOD	
	Footscray	0.2	9	16		4.3	10.5		17	VERY GOOD	
	Pt. Cook		10			5.2		0.39	21	VERY GOOD	
	Altona North			19	0	6.7			27	VERY GOOD	
GEELONG	Geelong Sth.		15	9	0	4.2	14.9	0.44	19	VERY GOOD	
LATROBE VALLEY	Morwell Sth.		16	7	0	5.3		0.43	21	VERY GOOD	
	Morwell East					1.5		0.41	17	VERY GOOD	
	Traralgon	0.3	12	13	1	4.9	10.2	0.40	20	VERY GOOD	
	Moe					1.1			4	VERY GOOD	
	Churchill					1.3			5	VERY GOOD	
REGIONAL VICTORIA	Wangaratta					1.7			7	VERY GOOD	



[View the hourly air quality interactive map.](#)

[Print this record](#)

Air quality index

Very good 0-33 | Good 34-66 | Fair 67-99 | Poor 100-149 | Very poor 150+

The dream

CITY OF MELBOURNE Urban Forest Visual

Intro Map Issues Precincts

Map Explore the tree data

Individual tree data for City of Melbourne trees is presented below. **Pan** and **Zoom** into different areas of Melbourne, **click** on tree symbols to reveal details, and **select** between different locations and filters.


Drag map, click icons for details

- All Trees
- Less than 10 Year Life
- Trees planted in last decade
- Street Trees
- Park Trees

All Precincts All Trees

[Open bigger map in new window](#)

The dream

 Love Me Tender [Home](#) [Gallery](#) [About](#) [Contact](#)

A match-making service for government agencies and suppliers. Explore contracts data from AusTender.

Contracts: Value:

All fields

Agency

Supplier





Broad category

Specific category

Procurement method

Min value **Max value**

Min publish date **Max publish date**

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Assets that fix themselves...



1. LED fails
2. Fault monitoring system detects the failure
3. Asset management system issues a RFQ to all available vendors
4. Vendor systems respond immediately with price and likely timeframe to fix the issue
5. Tradesperson replaces the faulty part
6. Self executing contract in the blockchain releases funds to the vendor when the light turns back on

A liveable city



1. Infrastructure
2. Transport
3. Housing and neighbourhoods
4. Open space
5. Environment
6. Local economy and activity centres
7. Community health and participation
8. Governance

These are data problems

1. Infrastructure
2. Transport
3. Housing and neighbourhoods
4. Open space
5. Environment
6. Local economy and activity centres
7. Community health and participation
8. Governance



What is the quality of our water?

What would happen in a drought?

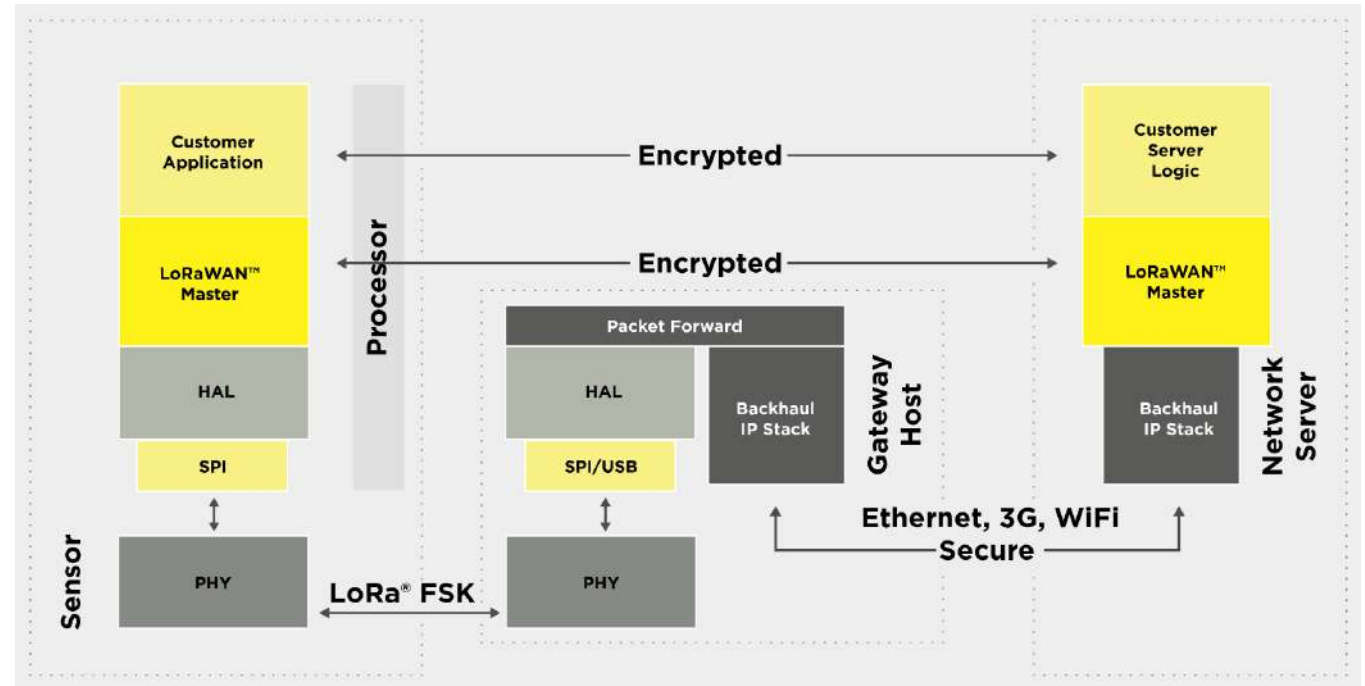
What pollutants are in the air?

With smart solutions

How are our facilities and assets being utilised?

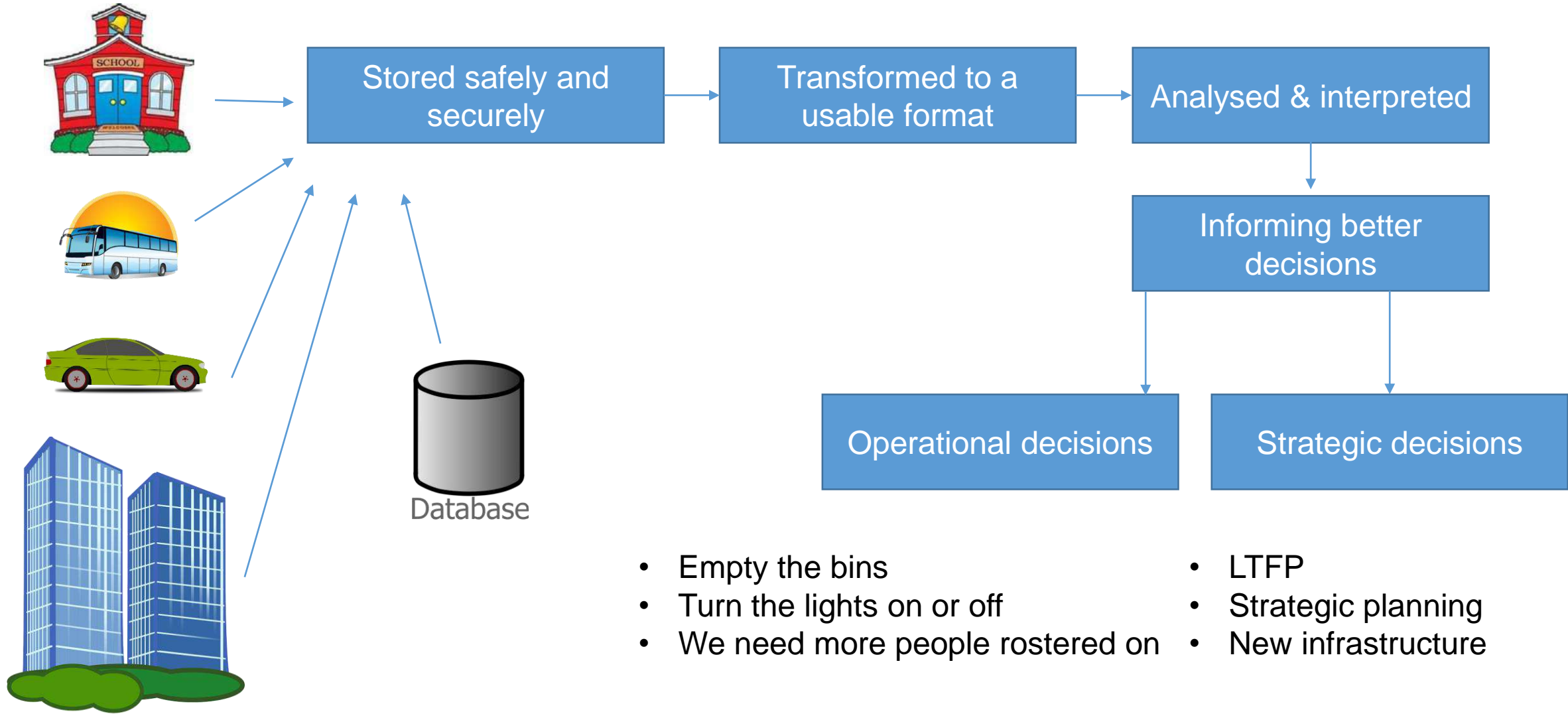
Where are the gaps in our infrastructure provision?

How are our assets performing?

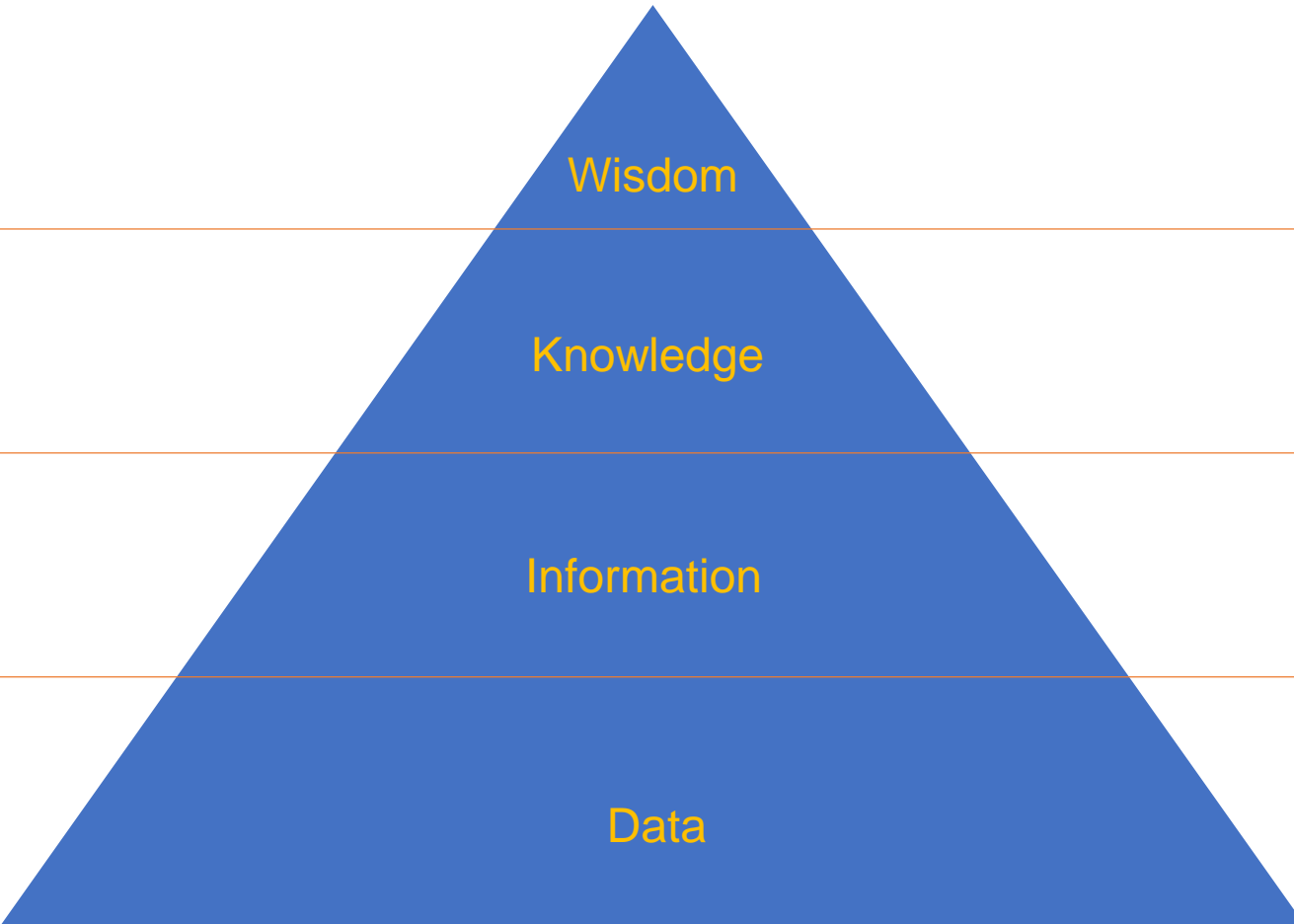


<https://lora-alliance.org/about-lorawan>

The data city value chain



Turning data into value



We need to arrange for the bins to be emptied

+ *insight*

This is an unusually high number for a Sunday morning

+ *meaning*

At 11:03am on 24 May, 6734 people were at Black Rock foreshore

+ *context*

6734, 11:03:00, 24052018, -38.112461, 145.309221

Our reality



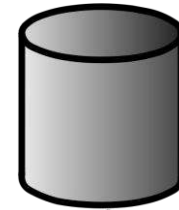
Utilisation dashboard



Transport data viz



Smart parking solution



Database



ERP systems



Building management system

Our reality

First name	Last name	Address	Date of birth	Email address	Phone number
Chris	O'Connor	172 Haybridge St, Clyde	8 February 1982	coconnor@bayside.vic.gov.au	(03) 97993827
Christopher	O'Connor	172 Heybridge St, Clyde	08/02/1982	coconnor@casey.vic.gov.au	03 9799 3887
Chris O'Connor		9 Montbrae Circuit, Narre Warren	02/08/1982	coconnor@wyndham.vic.gov.au	9799 3827
CA	OConnor	9 Montbrae Circuit, Narre Warren	25/08/1957	oconnor@gmail.com.au	97993827
Christopher Andrew	O'Connor	12 Heybridge St, Clyde	n/a	chrisisthegr8est@altavista.com	+61390003827

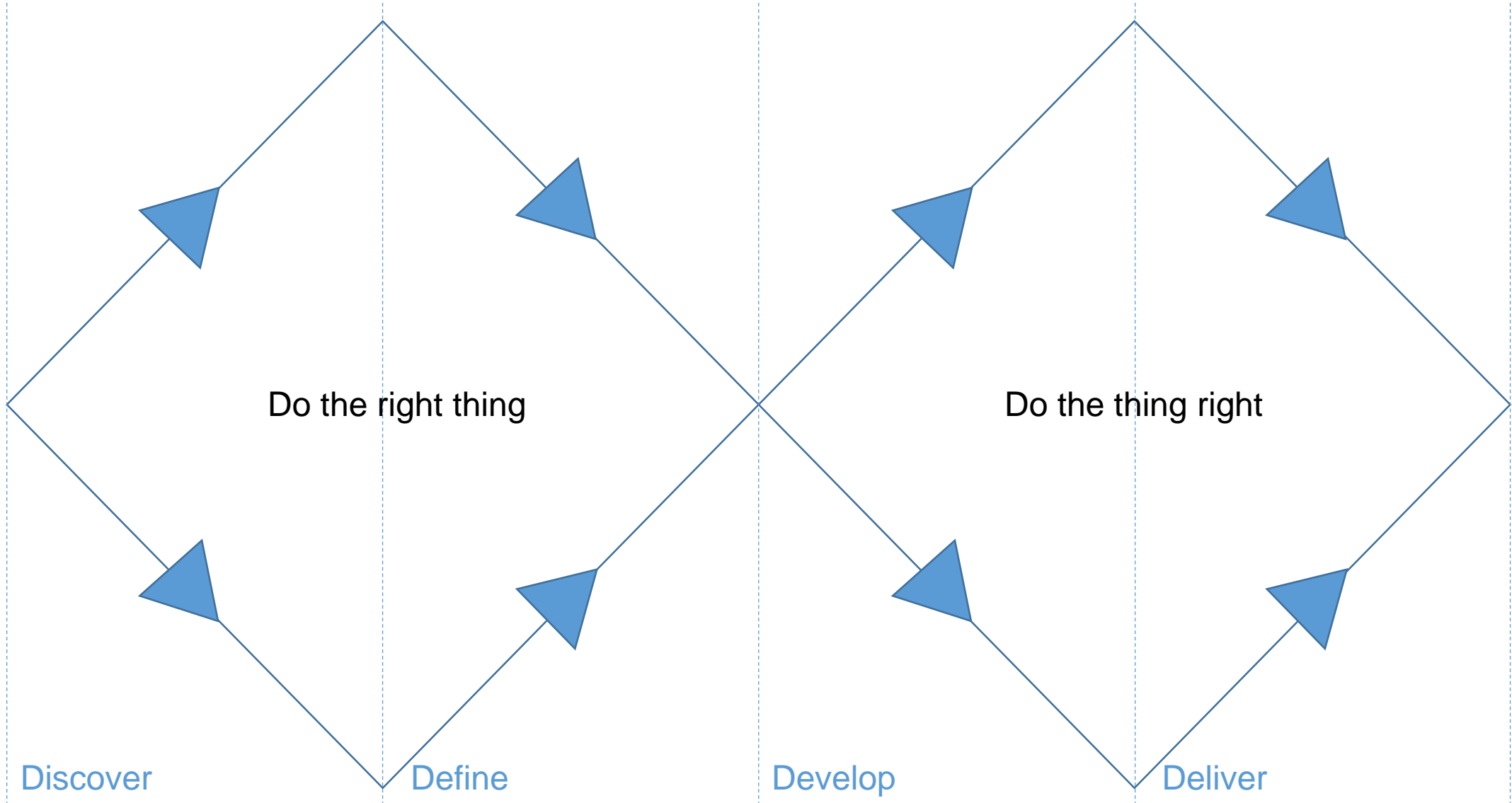
Small data

Gathered through human interactions and observations

Service Design

A more human approach to solving complex, unusual or novel problems





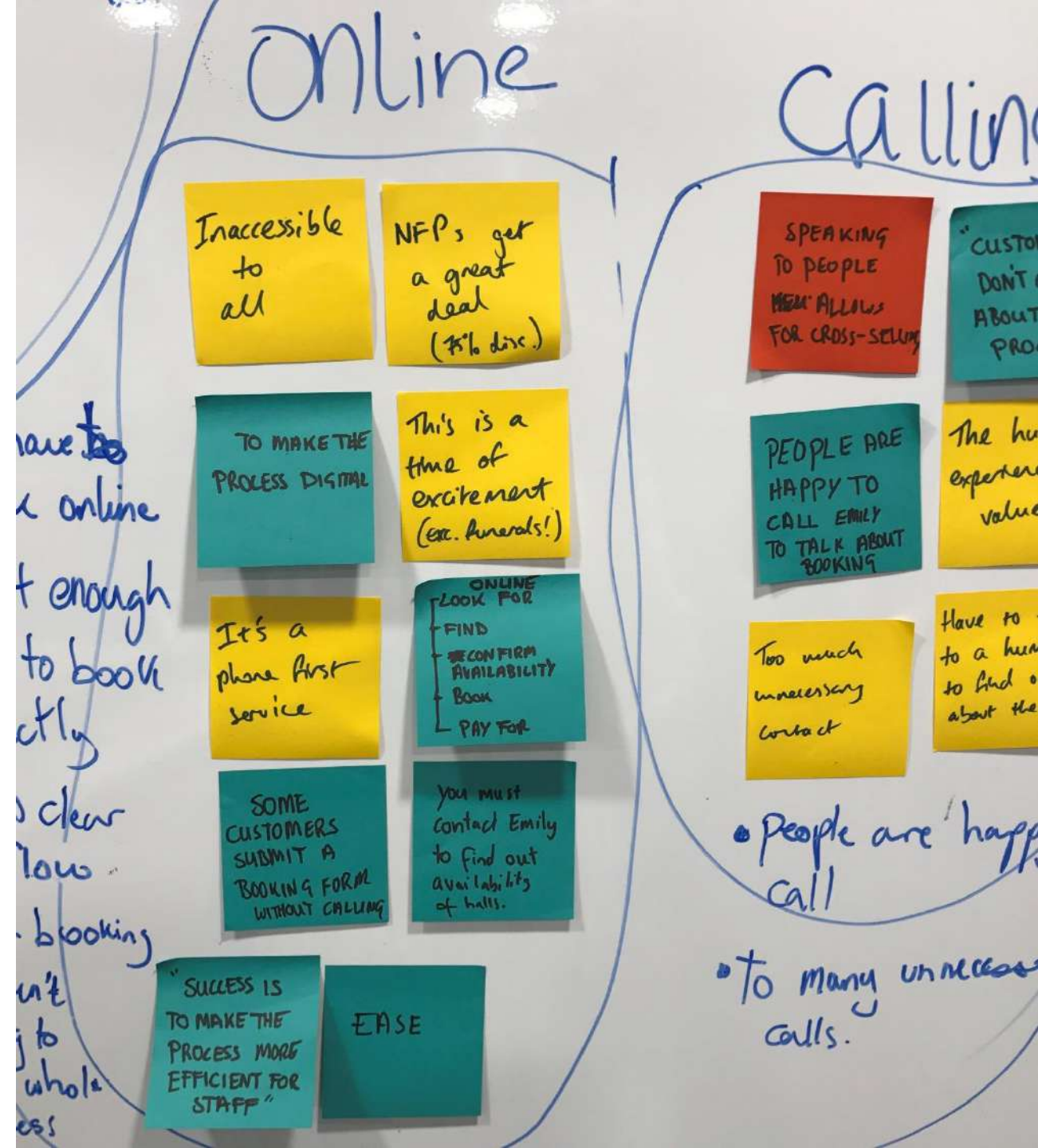
Research methodology

- User interviews
- Previous research
- Observing the customer experience
- Heuristic analysis
- Data analysis
- Technical review
- Capturing business rules
- Competitor analysis
- Generating insights

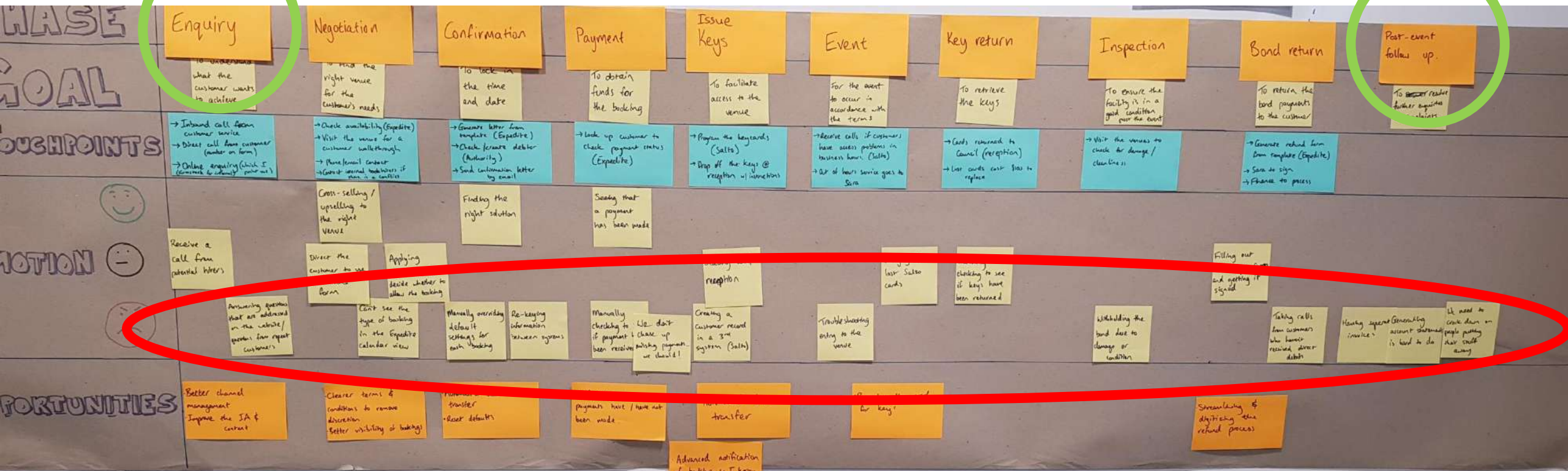


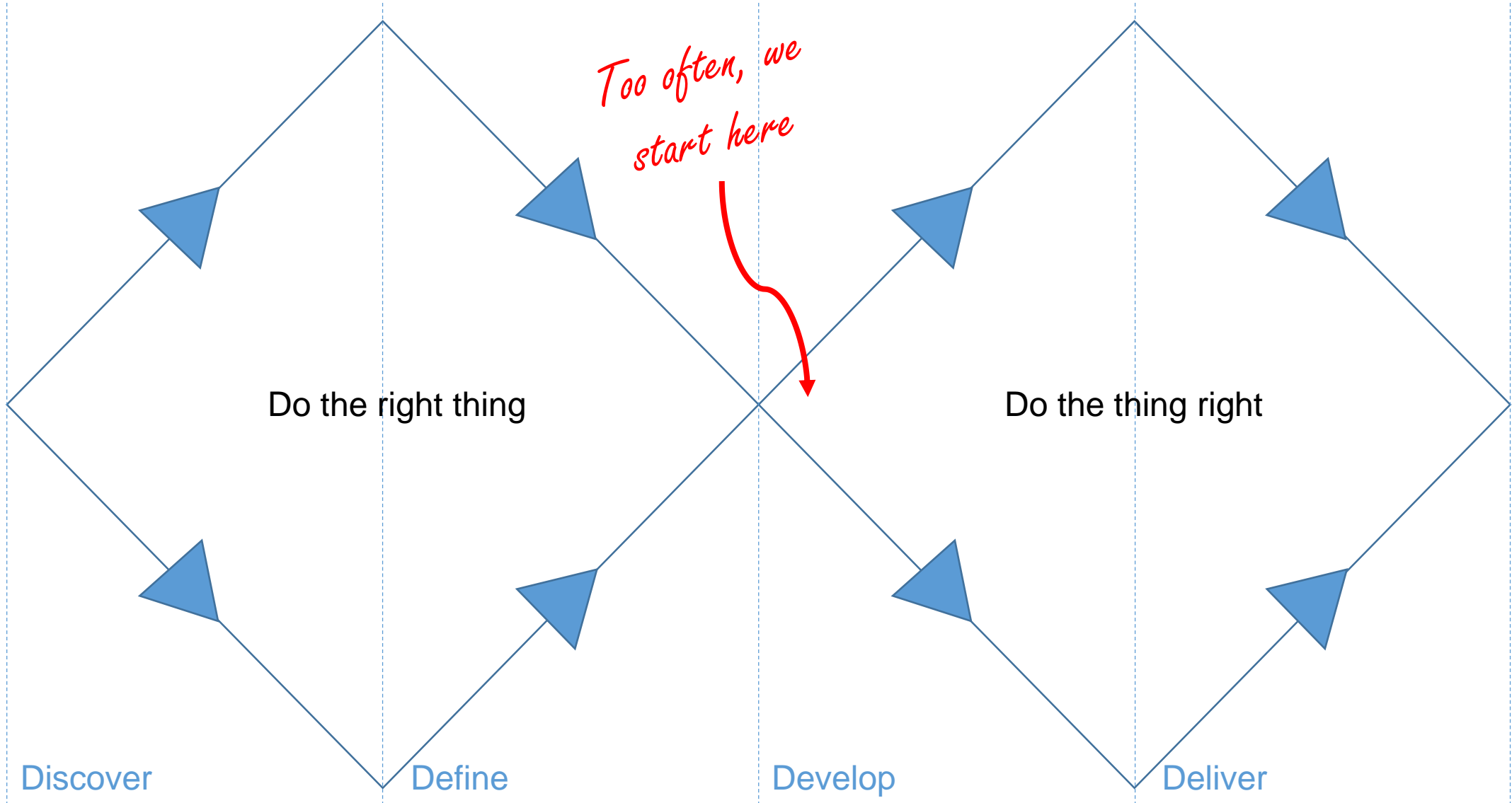
Outputs

- Personas
- Journey maps
- Interview findings
- Process maps
- Business rules
- Data reports
- Insights
- Problem statements



Journey maps





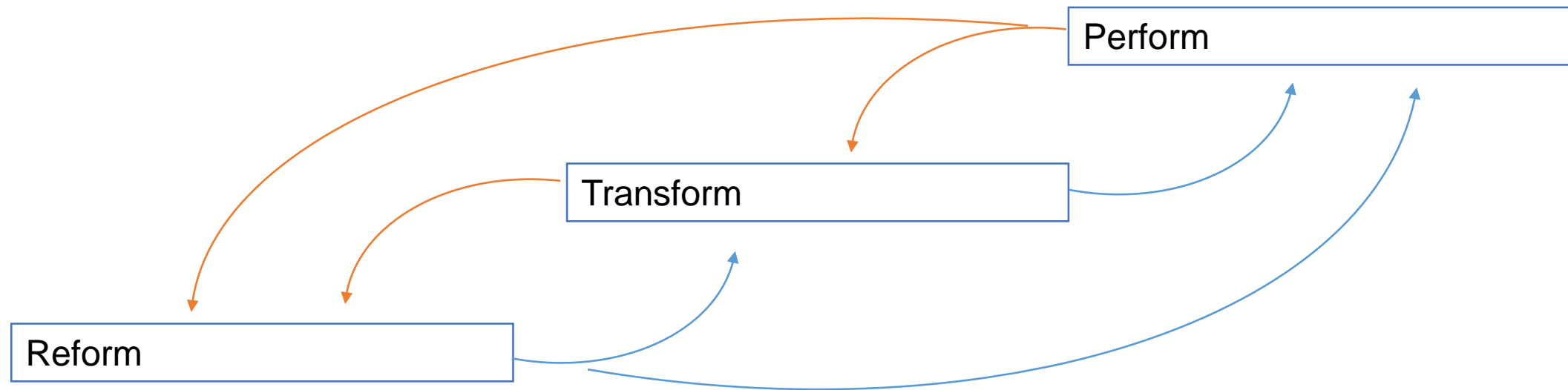
My tips...

- You must aim to become a smart city – it makes good business sense
- Important data can be big and small and everything in between
- Consider the value chain
- Start with your problems and work backwards
- Don't fall for the sales pitches – the dream can quickly become a nightmare
- Make sure you're doing the right thing before you do the thing right

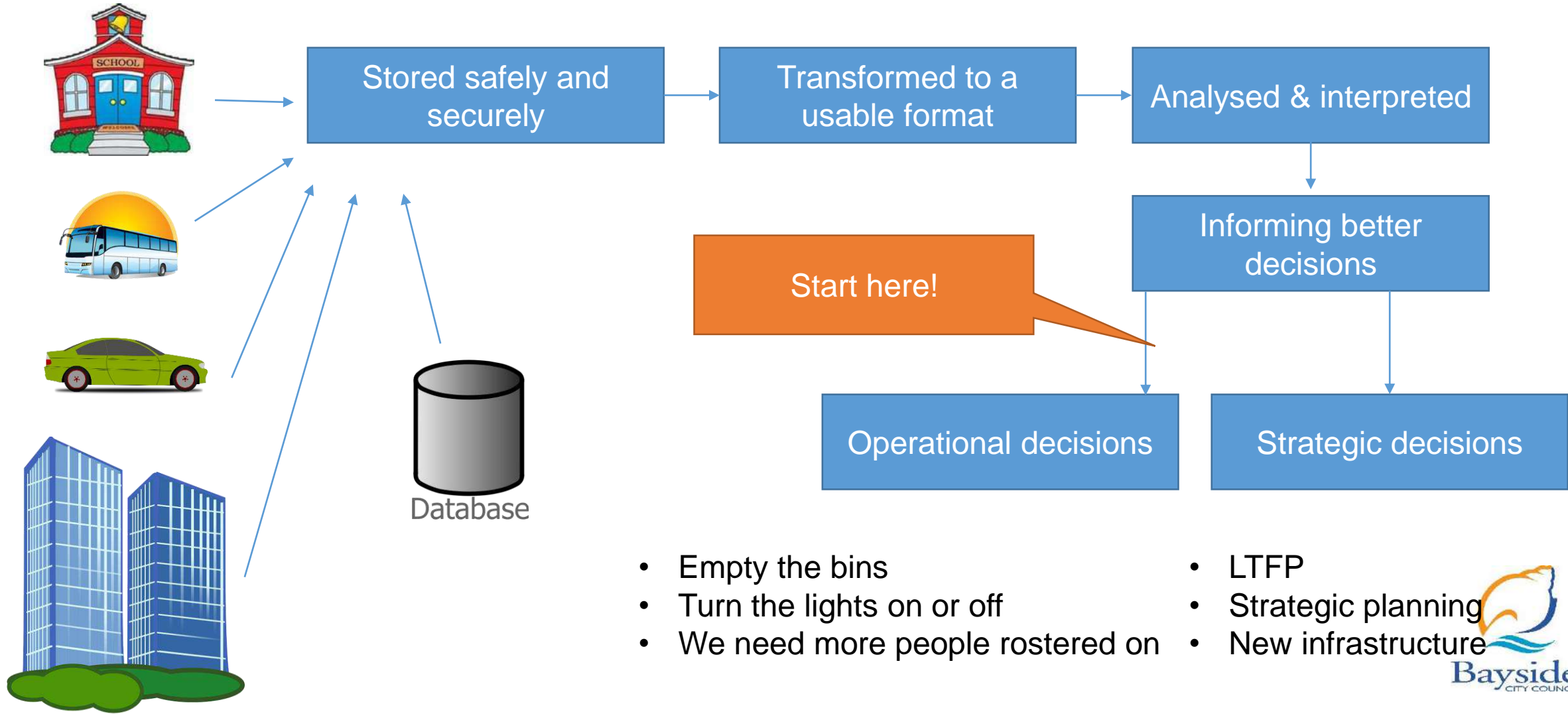
The smart city roadmap

*According to Chris


It's not a linear process



The data city value chain



Two pace implementation

	Year 1	Year 2	Year 3
Projects	<ul style="list-style-type: none">• Public wifi• GovHack• Data lake pilot• Digitise services	<ul style="list-style-type: none">• LoRa gateway• Facility dashboard• Sensor pilot• Open data	<ul style="list-style-type: none">• Energy reduction• City dashboard• Smart contracts• Smart parking
Foundation	<ul style="list-style-type: none">• Data governance• Data architecture• Standards• Capability uplift• Governance• Partnerships 		

Skills along the value chain

Network technologies

Internet of Things devices

Contract management

Knowledge of data standards

Security and safety

Collection

Data governance

Data munging

Coding

Database administration

Data architecture

Curation

Data analysis

Data science

Communicating a story

Data engineering

Algorithms

Analysis

Asking for the right data

Interpreting data

Interrogating the data

Evaluating the decision

Following through and creating accountability

Decisions

Your role?

As local government finance professionals...

- Ask for data to support decisions
- Get more projects into operating budgets, less in capital
- Get comfortable with funding problems, not solutions
- Support investments in new skills (including your own)
- Maintain your own data to a high standard... not just because the auditors said so 😊
- Set your data free

Thank you

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