Sustainable Waste Management – Changing the Way We Keep Our Cities Clean

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City of Adelaide

31st May 2019

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Asset management is the coordinated activity of an Organisation to realise value from its Assets

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$1.7billion worth of assets

Urban Elements

Lighting and Electrical

Transportation

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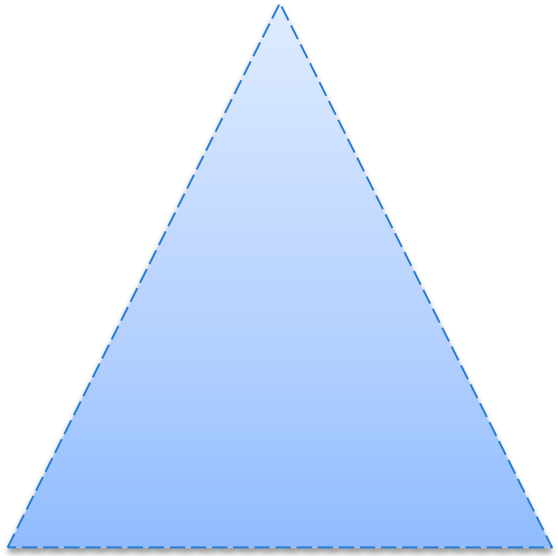
Asset Management

Risk



Cost

Level of Service

Aligned to Strategic Objectives

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Asset Management at City of Adelaide

BY 2020, OUR CITY'S ECONOMY WILL BE GROWING FASTER THAN THE AUSTRALIAN ECONOMY

CITY CARBON EMISSIONS WILL BE REDUCED BY 35% FROM THE 2006-07 BASELINE BY 2020

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Asset Management at City of Adelaide

THE NUMBER OF PEOPLE LIVING IN THE CITY WILL HAVE GROWN FROM 23,000 TO 28,000 BY 2020

THE NUMBER OF PEOPLE THAT ARE VISITING THE CITY EACH DAY FOR SHOPPING, LEISURE OR ENTERTAINMENT WILL HAVE GROWN FROM 111,000 TO 117,000 BY 2020

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The Waste Management Challenge

Global

The link between waste and climate is becoming more and more evident

Reduce, Reuse, Recycle **- effective if the whole cycle is connected**

"The 3Rs represent a major economic opportunity to society. Making less that goes to waste saves business money: On raw material, energy and labour costs".

Waste Management and Research Journal 2015, Vol. 33(12) 1049–1051

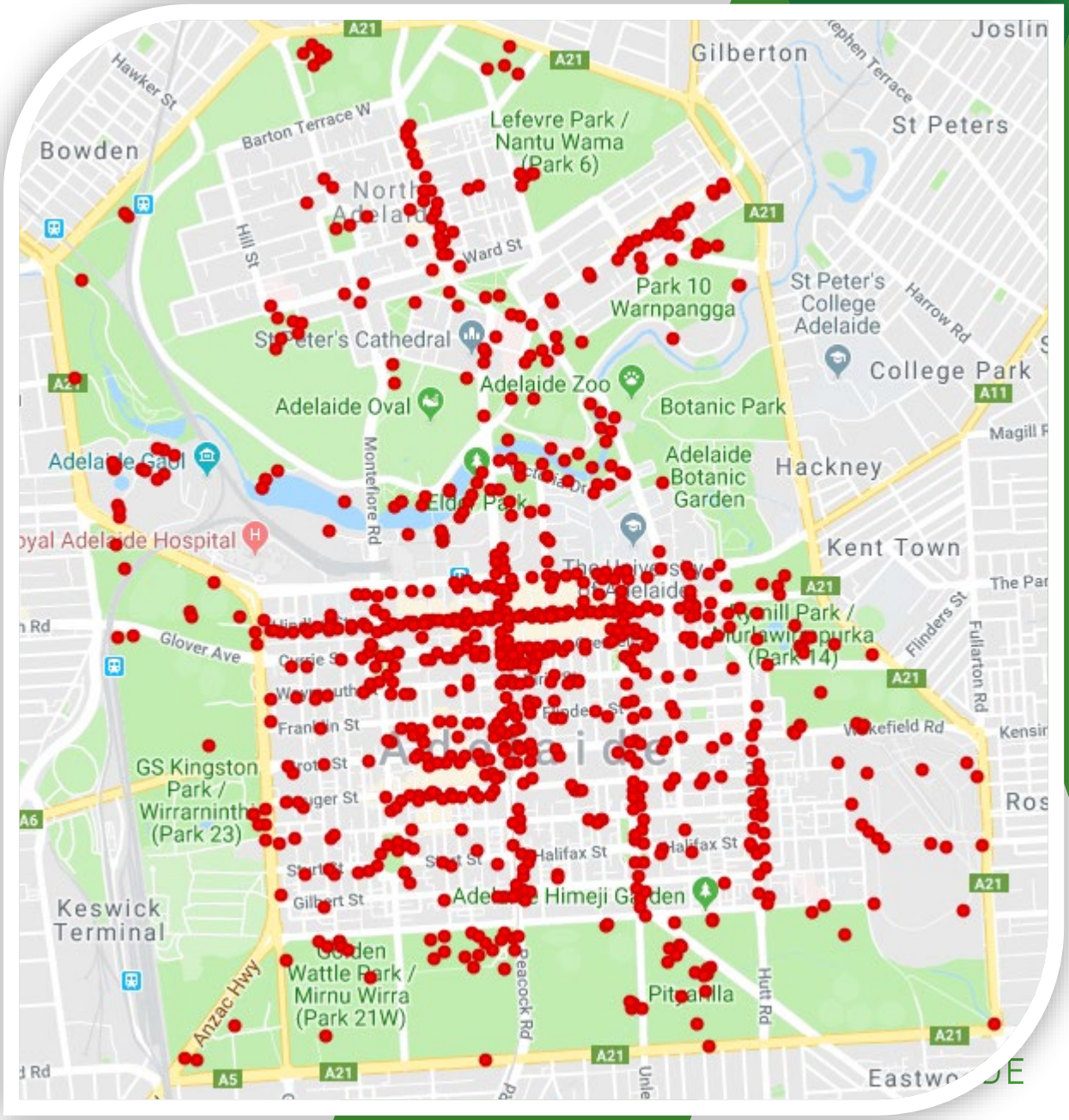
Current Network

862 Bins

Parklands and CBD areas

Collections once per day

- Exception of Hindley St, Rundle Mall and Rundle St – twice per day.



Current Practice

CBD and Parks collection schedules

862 Bins

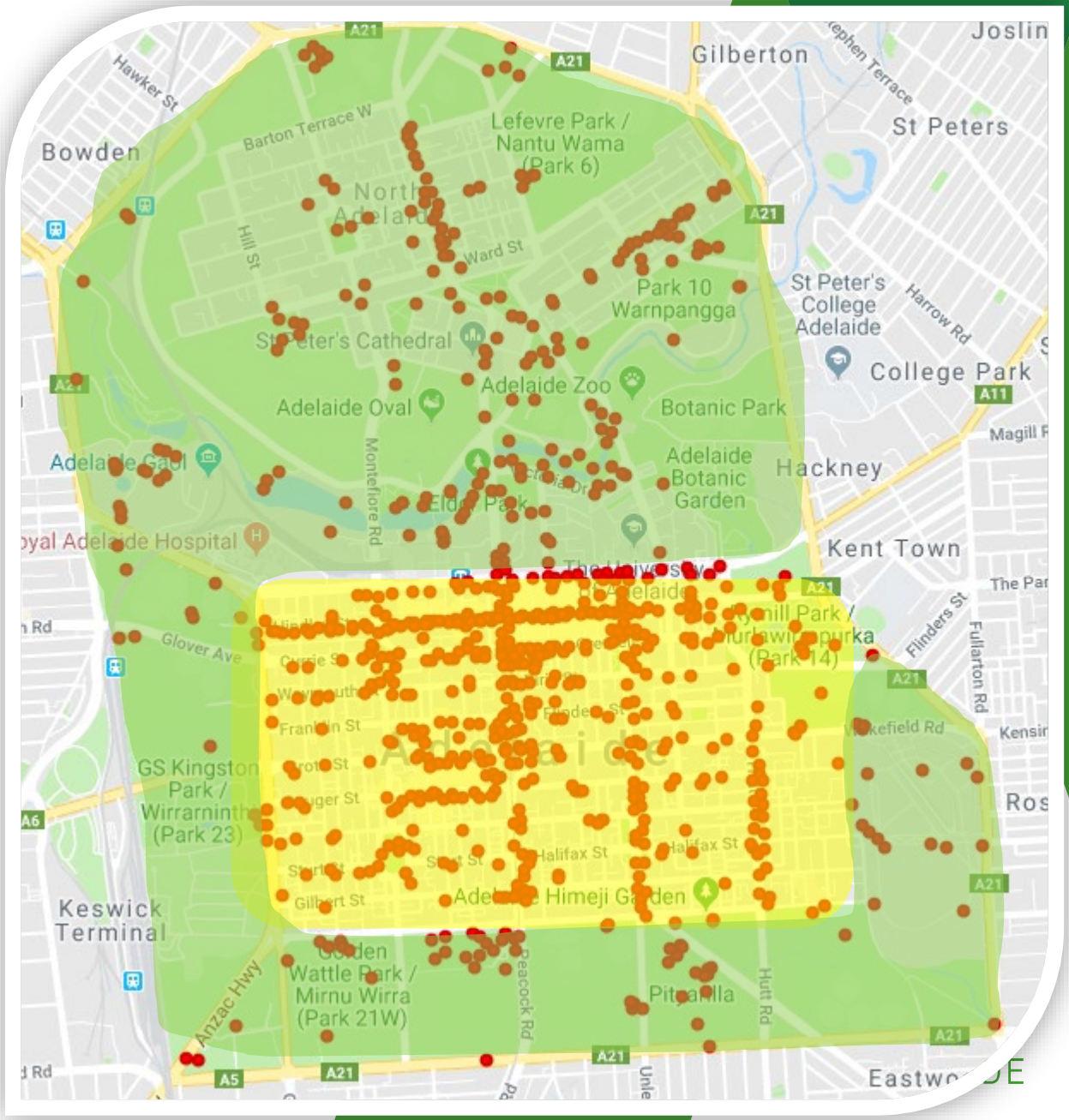
Bin size: 140 or 240 Litre

Network Calculation:

Angas Street has 11 Bins

4 are collected Daily
7 are collected twice weekly

Total waste collection potential: 5880 Litres



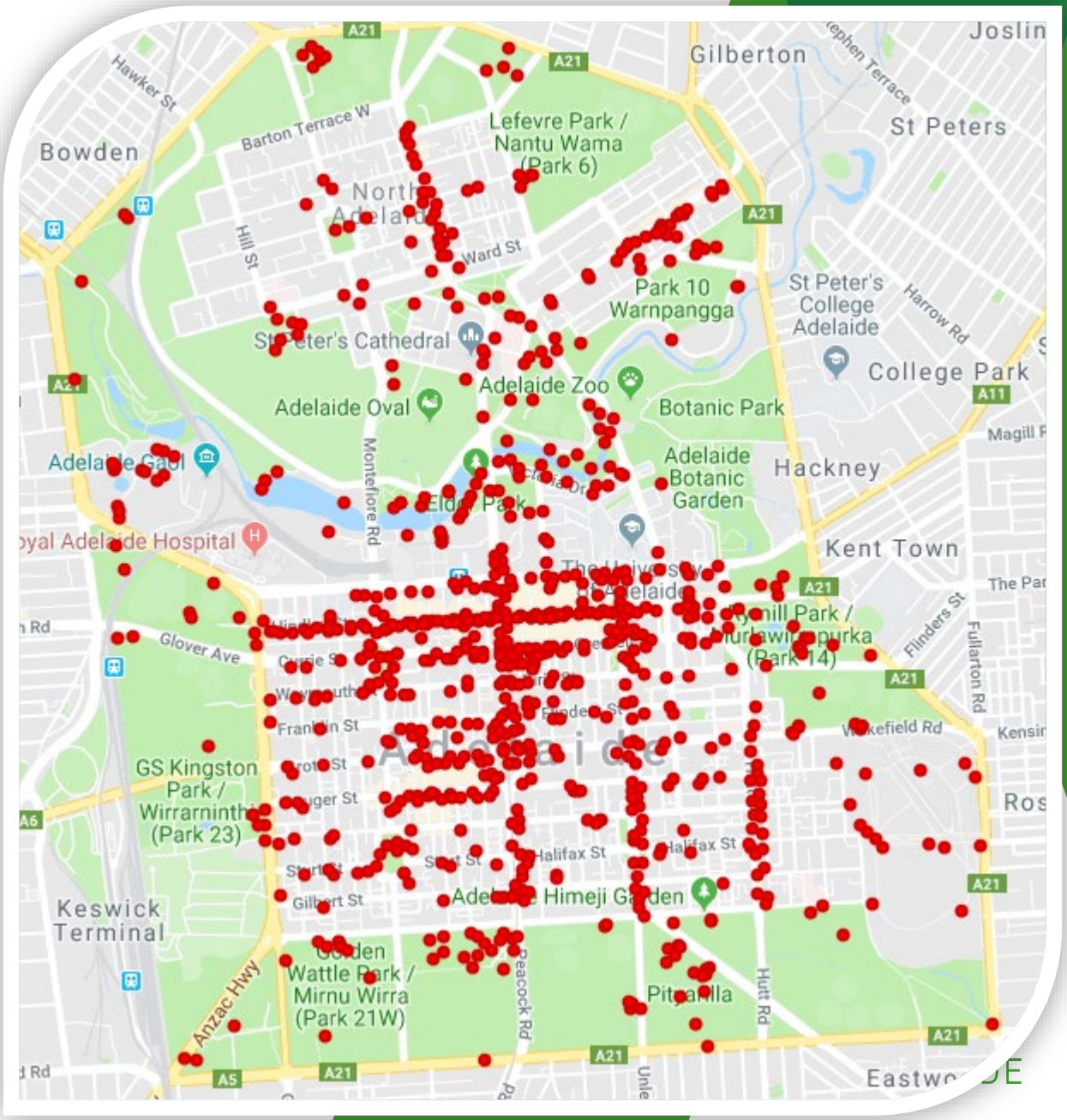
Current Practice (2)

Extrapolated across the network:

Capacity for collection: 912,000 Litres

An Olympic Size Swimming Pool is 2.5ML (2,500,000 Litres)

Is the bin always full?

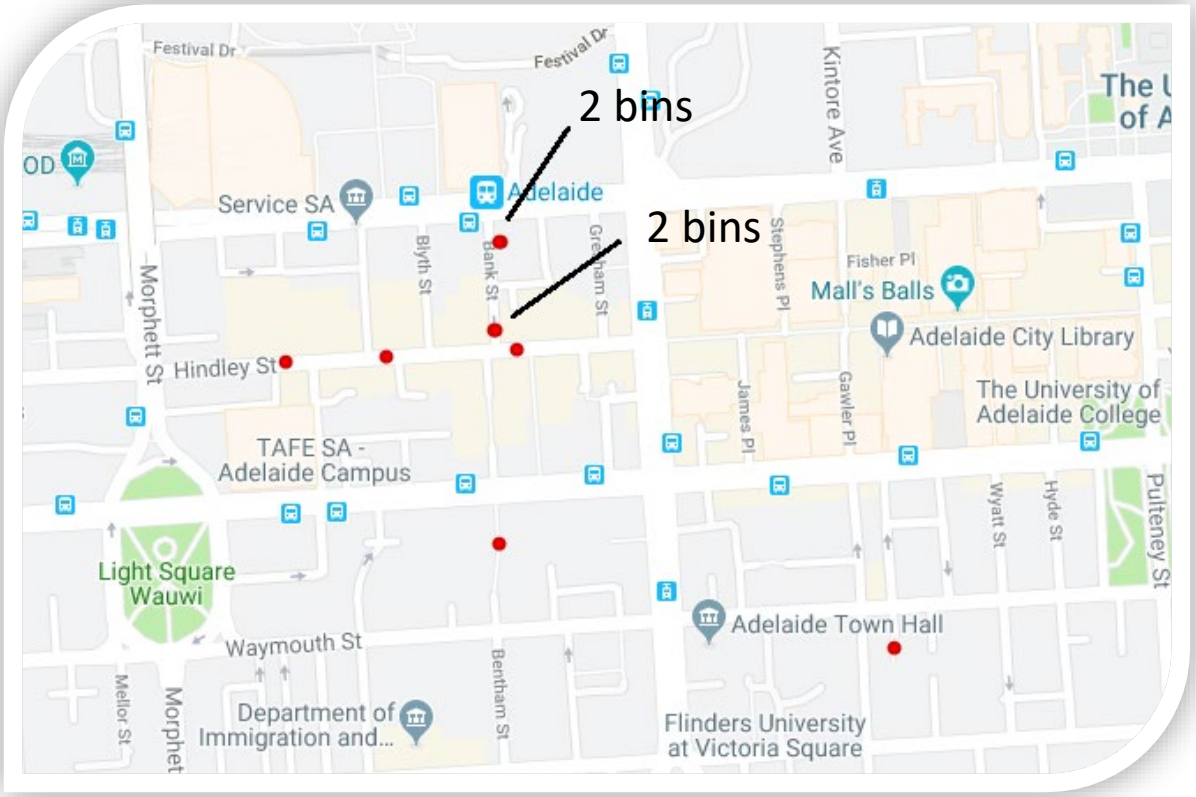


Opportunities for efficiencies

Efficiency Opportunities

Smart City Program, in 2017 introduced:

9 x Clean Cubes
24 x Clean Flex sensors



Major consideration: Overflows

High Traffic Areas in Hindley Street

Past complaints

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Efficiency Opportunities (2)

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Efficiency Opportunities (3)

The Clean Cube use solar power to drive a compaction plate

One full charge can last 4 weeks

Up to 720 kgf

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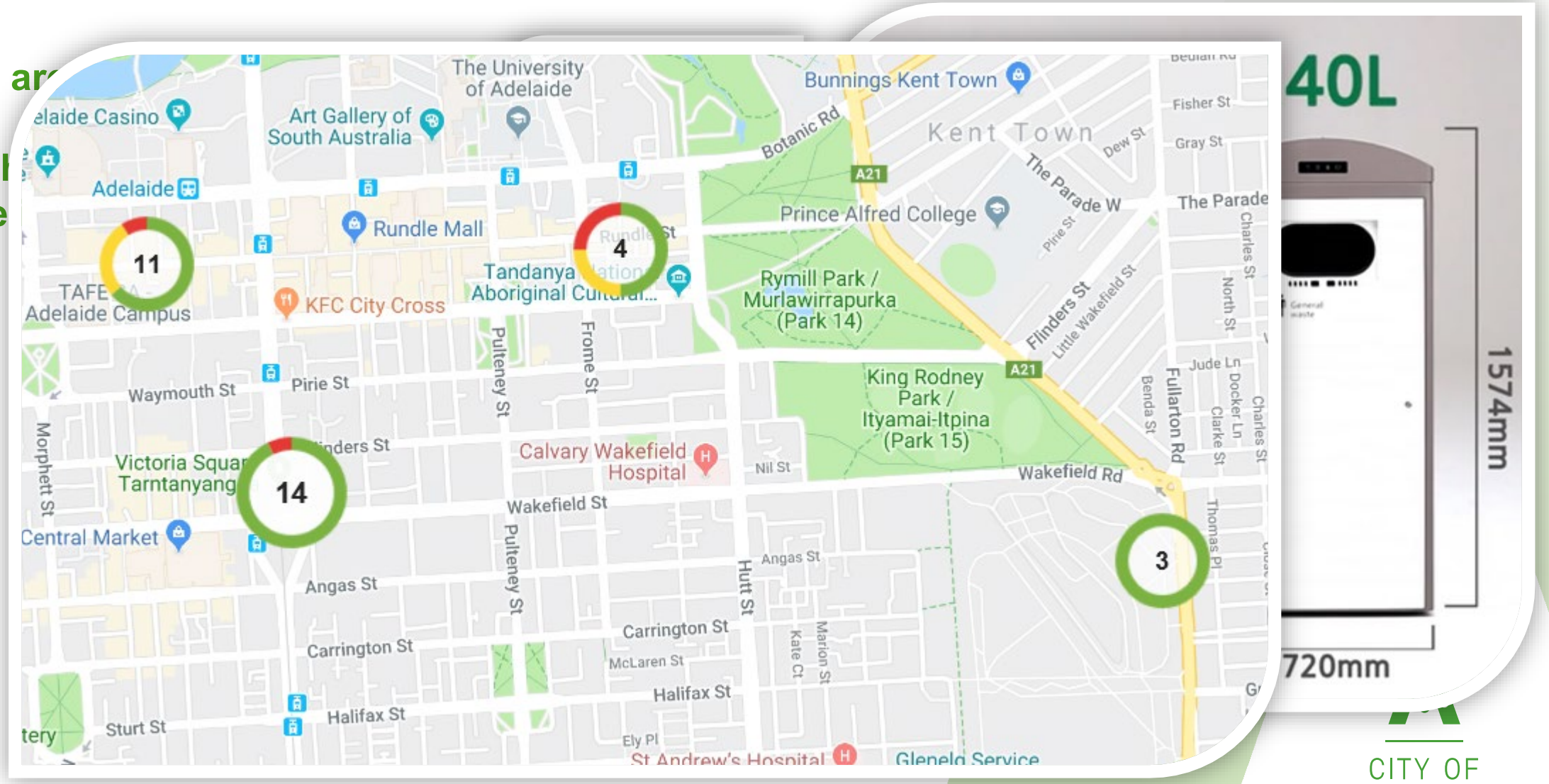
Efficiency Opportunities (4)

These bins ar

They take th
that we use



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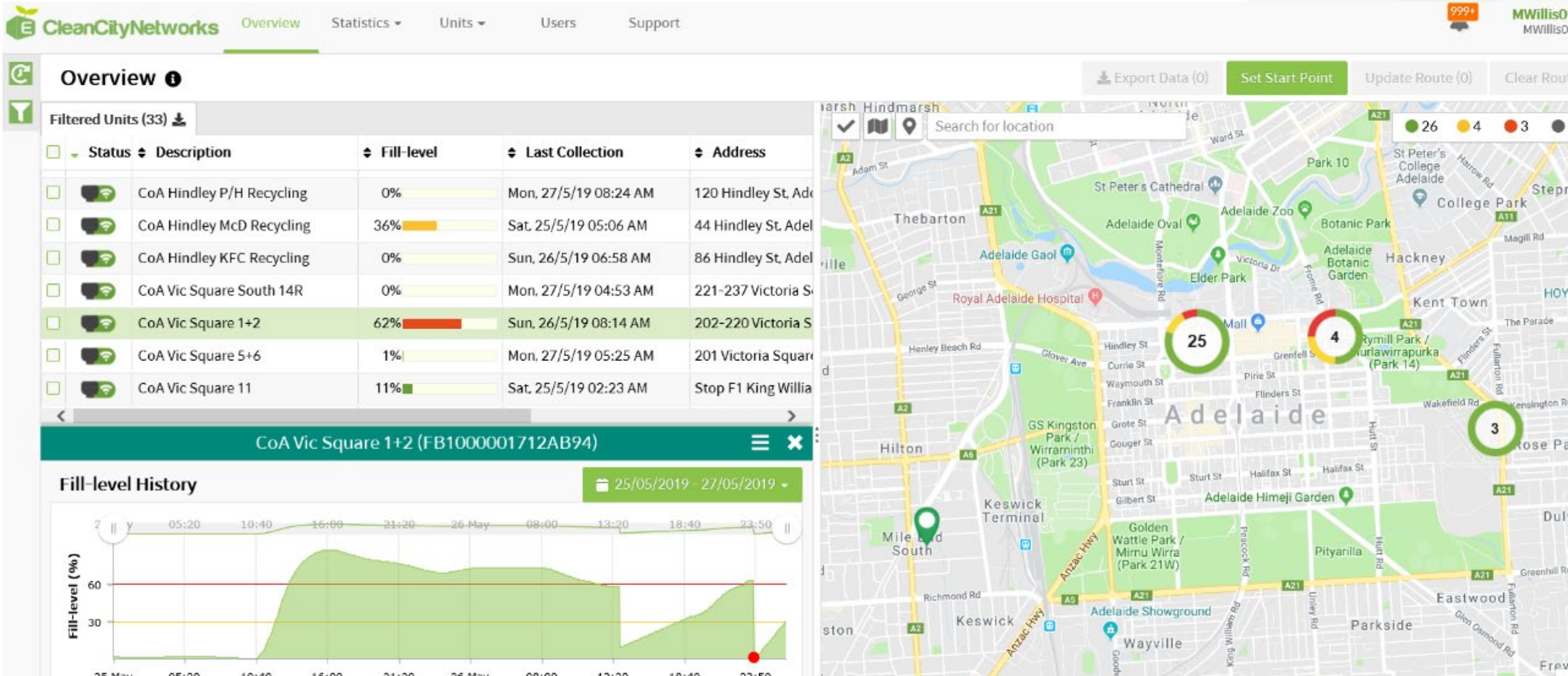
Data Monitoring



Trial at City of Adelaide

Key objectives:

1. Understand technology

2. Quantify benefits

3. Gauge operational feedback

2 trial time periods:

September 10th to October 21st 2018 (6 weeks)

January 1st to April 1st 2019 (13 weeks)

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Trial Period 1

Bin Location	Pre-compaction Collections	Trial Collections	% saving
CoA 25 Pirie St	42	6	86%
CoA Bank St North (North)	42	11	74%
CoA Bank St North (South)	42	16	62%
CoA Bank St South	42	10	76%
CoA Hindley P/H (Twice daily)	84	12	86%
CoA Hindley McD's (Twice daily)	84	15	82%
CoA 240L Hindley KFC	84	9	89%
		Av.	79%

420 weekly collections for these bins normally

The Smart City Portal revealed that there was a decrease in collections on an average of 79% during the trial

A potential for reducing collections by 79%

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Trial Period 1 (part 2)

Collection efficiency: the rate of collection when required, i.e. when the bin is full (over 50%)

Bin Location	Total Waste Generation (L)	Collection Efficiency* (%)
CoA 25 Pirie St	475	50
CoA Bank St North (North)	392	35
CoA Bank St North (South)	1155	53
CoA Bank St South	688	43
CoA Hindley P/H (Twice daily)	565	38
CoA Hindley McD's (Twice daily)	1104	55
CoA 240L Hindley KFC	945	41

The units in some cases were collected below their optimal collection fill-level of 50%

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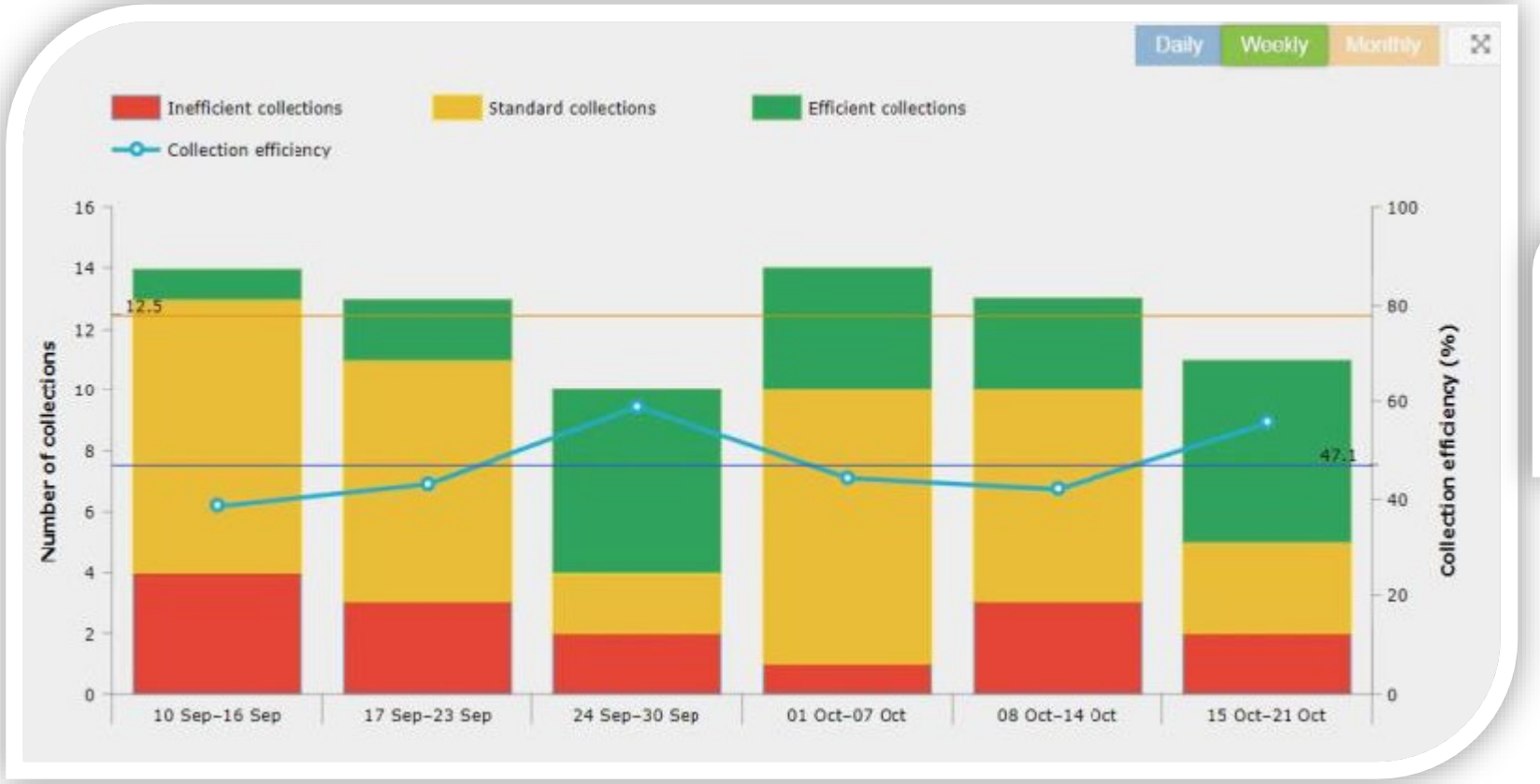
Trial Period 1 (part 2)



Inefficient collection frequency

15 times

60% more inefficient collections on **10 Sep–16 Sep** than the average

60% less inefficient collections on **01 Oct–07 Oct** than the average

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Trial Period 2

1st January 2019 to 1st April 2019

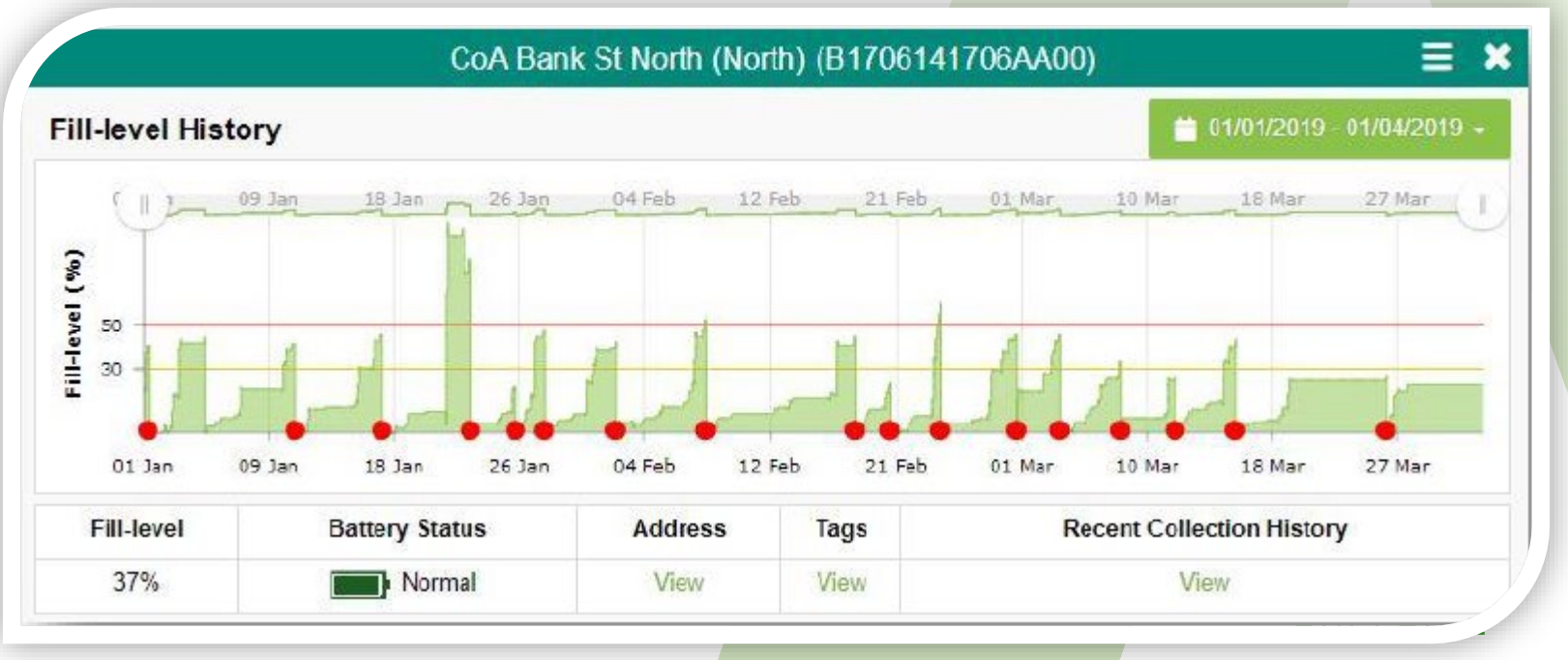
Same potential for collection improvement over both trial periods

Bank Street North

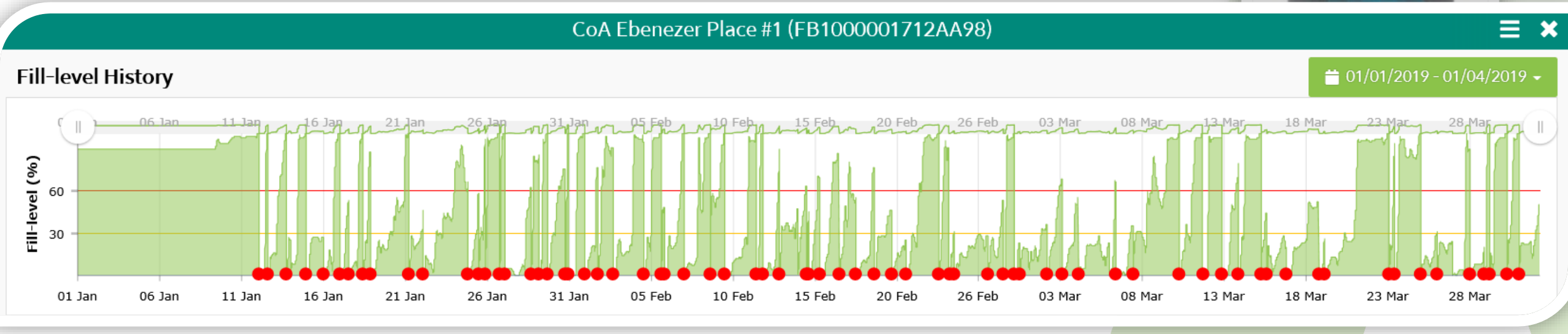
Normal Daily Collection = 91 over the period

Down to 17 times (1.3 per week)

Reduction in collection of 81%



Clean Flex Smart Sensor Trial



- The sensor along Ebenezer overflows constantly and requires collection daily
- Location receives high level ‘dumping’ from unknown sources
- Location has now been swapped with CleanCube from Pirie St

Collection efficiency around 70%

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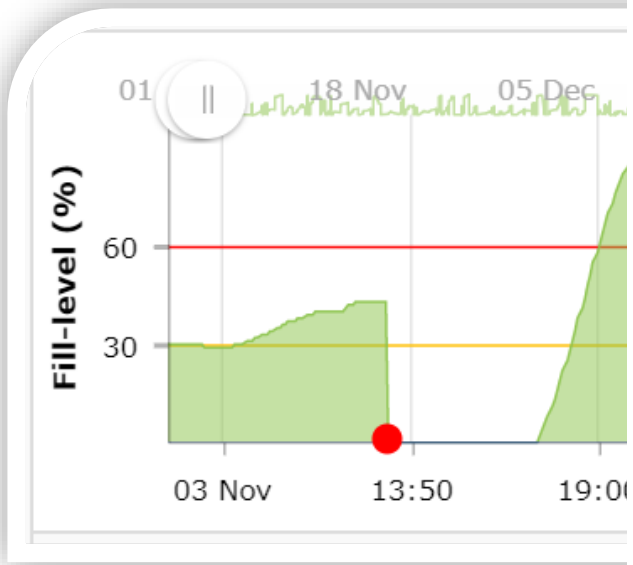
Clean Flex Smart Sensor Trial (2)



Bin	L/day
CoA Ebenezer Place #2	96.4
CoA Ebenezer Place #1	86.6
CoA Vardon Ave #2	57.3
CoA Vic Park 1 Grandstand	45.8
CoA Vardon Ave #1	40.2
CoA Vic Park 2 Sweat Track	35.5
CoA Vic Park 5 Park 3 FullRd	35.1
CoA Vic Park 3 Path 1 Hallifax	31.8
CoA Vic Square 11	28.7
CoA Hindley KFC Recycling	28.5
CoA Vic Square 5+6	25.2
CoA Vic Square 9+10	24.9
CoA Vic Square 1+2	22.8
CoA Vic Park 4 Path 2 Middle BBQ	22.2
CoA Vic Square South 14R	21.6
CoA Vic Square 11+12	20.8
CoA Vic Square 5	19.8
CoA Vic Square 7+8	19.3
CoA Vic Square 7	18.0
CoA Bank St North (South)	17.9
CoA Vic Square 1	17.1
CoA Hindley McD's (Twice daily)	16.7
CoA 240L Hindley KFC	16.6
CoA Vic Square 3	15.8
CoA Hindley McD Recycling	15.7
CoA Bank St South	13.8
CoA Bank St North (North)	10.1
CoA Hindley P/H (Twice daily)	8.9
CoA Hindley P/H Recycling	7.5
CoA 25 Pirie St	7.5
CoA Vic Square 9	5.7

- A secondary benefit that ha tial to identify illegal dumping

3rd Nov: 5pm-8pm – 90% increase

- **The CleanFlex sensors have allowed us to focus on areas with suspicious activity**
- **If we are to maintain high levels of service, then we must allocate costs (cleaning/collections) fairly.**

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Operational Feedback

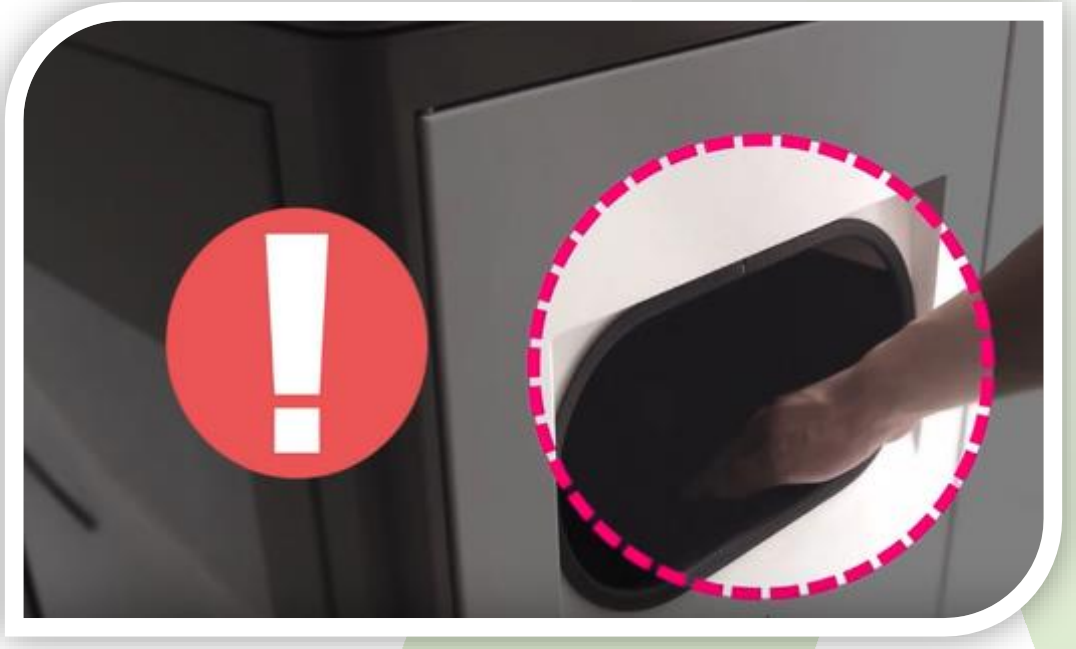
A sensor detect a blockage in the aperture

However, a blocked aperture can indicate a full bin- go to pick it up, and its not

Compacting can split the bin

Odour / cleaning

Preferences



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The Future: Recycling

A decision was made in Adelaide to unlock chassis of nrmal bins to allow for can collection

Unable to do this with compactor bins

A wider waste management strategy is being developed at Adelaide

Recycling compactor bins are available

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The Future: Advertising

Potential to utilise/maximise the advertising opportunities on the Bins

Political decision

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Lifecycle Costing

	Clean Cube	Normal Suite Bin
Design Life	7	10
Capital Cost	$5100	$3000
Operational cost (cleaning/electricity)	$2000 p.a.	$500 p.a.
Maintenance	$500 p.a.	$200 p.a.
Salvage Cost	$500	$250
	$23,100	$10,250

A potentially longer lifecycle cost

But….

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18/19 FY

- 9 Solar Bins installed
- Smart Sensors installed across City

  - Data analysis
  - Identification of locations for additional Solar Bins and sensors

19/20 FY

- Identification of locations for more Smart Bin Rollout
- Rollout commencing

20/21 FY

- Ongoing use of Smart Sensor data

Trial → Expansion → Rollout

Condition Assessment

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Thank you and Questions

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