

NUS Recycling: Behavioural and Systemic lessons



A journey from Oct 2008 to Aug 2009

Contents

- **What is recycling contamination**
- **Fighting Contamination in NUS**
- **Infrastructural System Changes in NUS.**
- **Conclusion**

Let's Imagine

A story...

IMAGINE:

You are done with a fruit juice plastic cup:



And you see the following recycling bins:



Recycling bins
at Spring
Singapore

Did you recycle correctly?

National Environment Agency (NEA) spokesman : throwing waste such as leftover food and drinks into the bins contaminates the recyclable materials and renders them non-recyclable.

RECYCLING CONTAMINATION

How serious is contamination of recycling bins?



[news homepage](#) | [full list of labels](#) | [about the news blog](#)
[wild happenings in singapore](#) | [our wild places](#) | [make a difference!](#) | [wildsingapore](#)

I will be on [early morning field trips](#) from 4 to 12 Jul. Updates to wild news will be late. Apologies. Ria.

Non-recyclable waste in recycling bins

What rubbish

A Straits Times check of 80 recycling bins finds non-recyclable waste in all of them

Yeo Sam Jo, [Straits Times](#) 15 Jun 09;

FROM Orchard Road to HDB estates, recycling bins seem to be everywhere, underlining the country's push for a greener city. But what some people throw into them is a different matter.

The Straits Times peeked into 80 recycling bins in public areas and found that all of them contained some rubbish that could not be recycled.

- [NEA](#): About one-fifth of all waste deposited in recycling bins could not be recycled.

How to tackle contamination?

**EDUCATION! EDUCATION!!
EDUCATION!!!**

BUT HOW TO EDUCATE?

NUS Recycling Journey.

Before Aug 09:

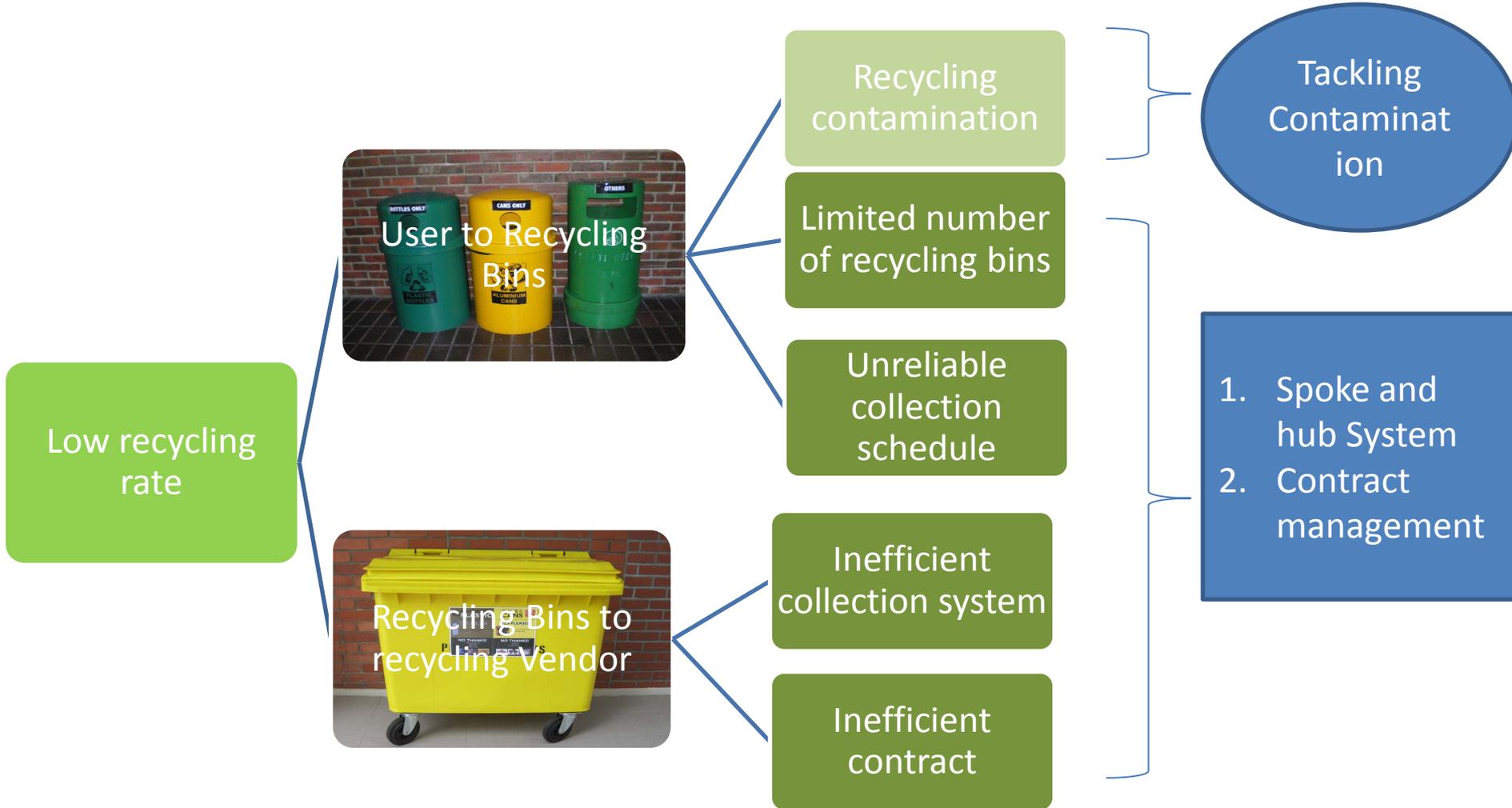
Tackling contamination, resolving systemic inefficiencies in logistics and contract

Low Recycling Rates

Our Recycling Statistics

Year	NUS total waste ('000 tonnes)	Paper (kg)	Plastic (kg)	Cans (kg)	Total Recyclables (kg)	Total Recyclables excluding food waste (kg)	Recycling rate excluding food waste recycling
2006	2.621	76,910	3469	923	81,302	81,302	3.01%
2007	3.079	94,510	2729	392	97,631	97,631	3.07%
2008	2.833	69,580	3600	203	394,783	73,383	2.27%

Status of NUS Recycling (before Aug 09)



Tackling Contamination

Before Oct 2008



Results in Jan/Feb 09



Level of contamination dropped drastically

Vital Behaviours in tackling recycling contamination

- 1. At the point of throwing, help people to decide if it can be recycled**
- 2. Give people an option to not throw into the recycling bin if it cannot be recycled.**

VB1: **Recyclable** at the point of throwing ?



Common recycling bins in Singapore only label
“Paper, plastic, cans”

Recyclable at the point of throwing ?

Need to move beyond just labeling paper, plastic into labeling types of paper and plastic that are accepted.



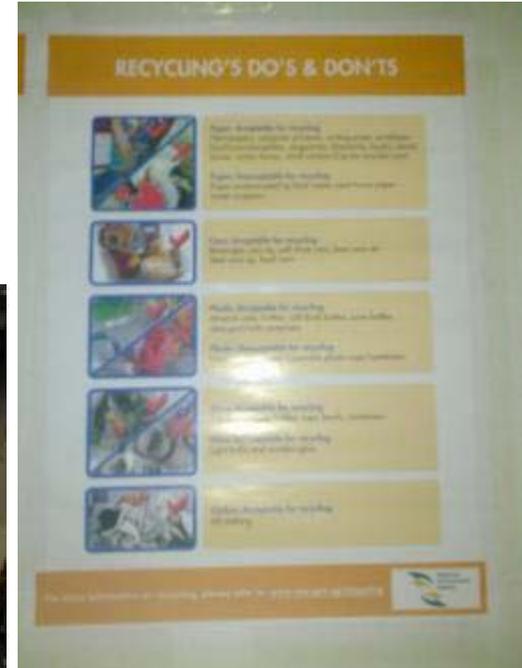
Recyclable at the **point of** **throwing ?**



Email circular



Presentations
during lectures



Poster on
Noticeboards

Recyclable at the **point of** **throwing ?**



Instructions right at the **point of throwing**

Recyclable at the point of throwing ?

- **Expect Error from User = Specific about what to throw**
 - Reference: “Nudge – Improving Decisions about Health, wealth and Happiness”
- **For prompts to be effective, they need to be presented as close in time and space as possible to the targeted behaviour...**
 - Reference: McKenzie-Mohr, D., & Smith, W. (1999). *Fostering sustainable behavior: An introduction to community-based social marketing* (2nd ed.).

VB2: Option not throw into the recycling bin if it cannot be recycled.

- **Expect less from good human behavior**
 - Partner trash bins with recycling bins



Other efforts

Which is the key measure?

Black Label on Bins

Round Stickers at disposal hole

Recycling Bins all face front and neatly arranged

Engaging the Housekeepers

Recycling Video Lecture Talk by SAVE

Mass Mails

Engage the Housekeepers



Education Campaigns

1. Email circular
2. Message of the Day (MOTD)
3. Presentations during lectures

PAPER		
	 Document Paper Paper Boxes Newspaper Magazines	 Tissue Paper Paper Cups Food Wrappers Stickers
CANS		
	 Clean, Empty Metal Drink Cans only	 Plastic Drink Cans Spray Cans Paint Cans
BOTTLES		
	 Clean, Empty Plastic Bottles only	 Food Containers Plastic Cutlery Styrofoam Plastic Bags



Infrastructural issues of NUS recycling

Logistics/contract problems and
solutions: Before Aug 09

Logistical and Contractual issues – Before Aug 09

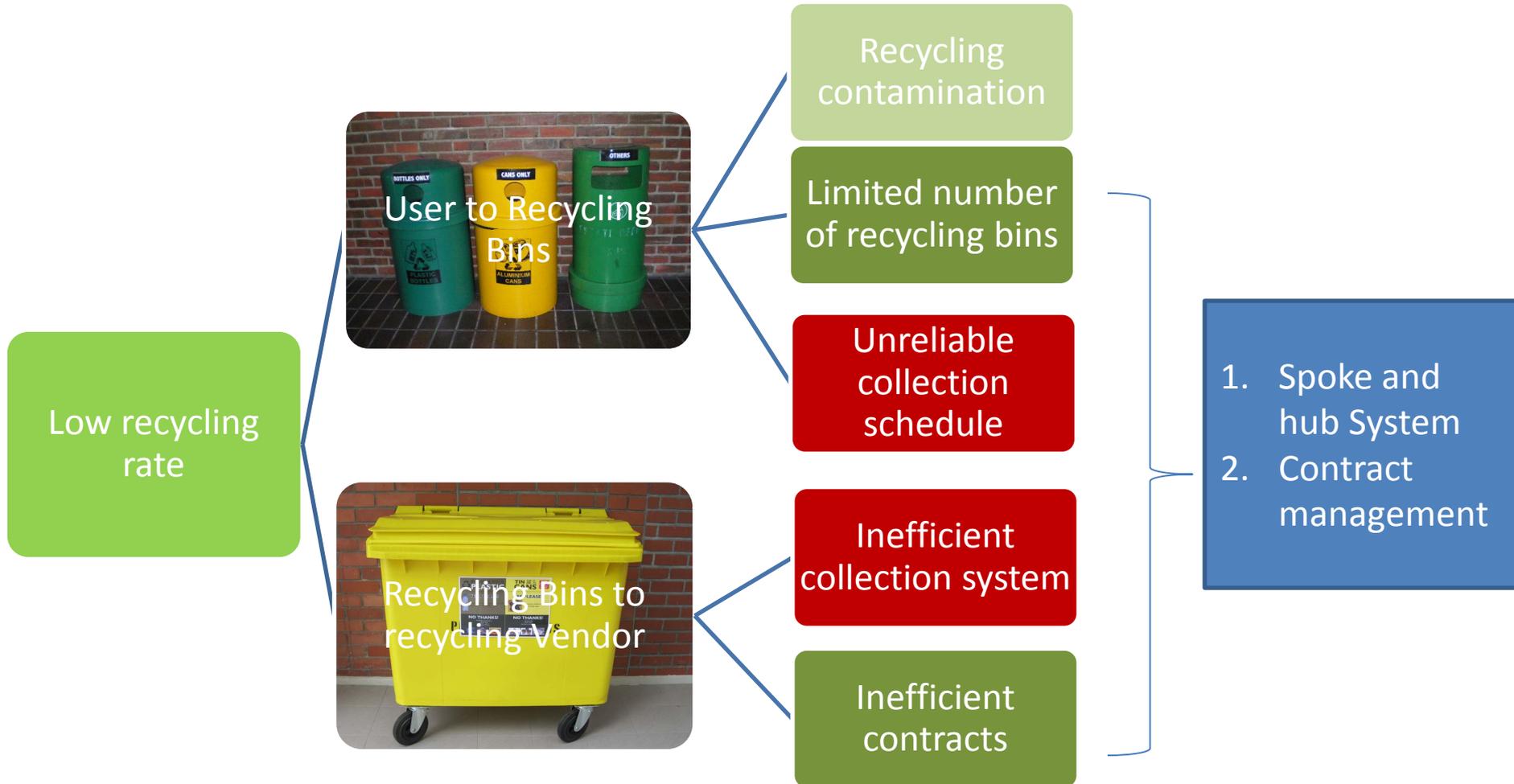
1. Inefficient recyclable collection system

- Unreliable collection system
- Term contractor additional cost

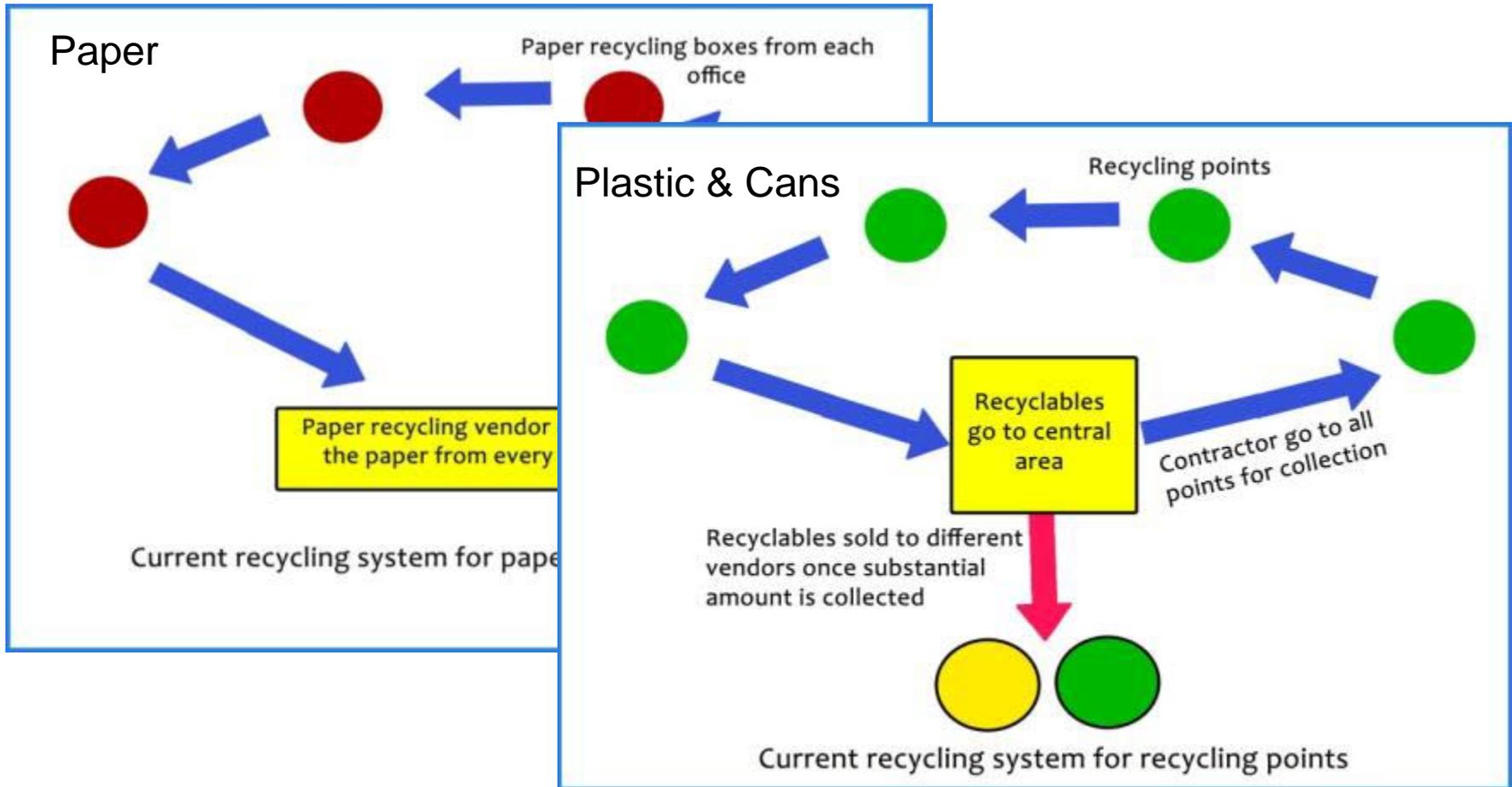
2. Contract inefficiencies

- Contract limited number of collection points
- 4 different contracts – administratively troublesome
- Economically unviable (?)

Status of NUS Recycling (before Aug 09)



1. Inefficient paper, plastic and cans collection system – original system



1. Inefficient paper, plastic and cans collection system – unreliable service

Recyclers/ contractors collect from point to point

a. 100+ points in various offices for paper

b. 39 points for plastic and cans all over campus

Too many locations result in recycling contractor missing locations – **unreliable to users**

1. Inefficient paper, plastic and cans collection system – Term contractor for plastic/cans

- **Additional cost in engaging additional term contractor to collect recyclables from recycling points to a central location to wash and store**

Status of NUS Recycling (before Aug 09)

Low recycling rate



Recycling contamination

Limited number of recycling bins

Unreliable collection schedule

Inefficient collection system

Inefficient contracts

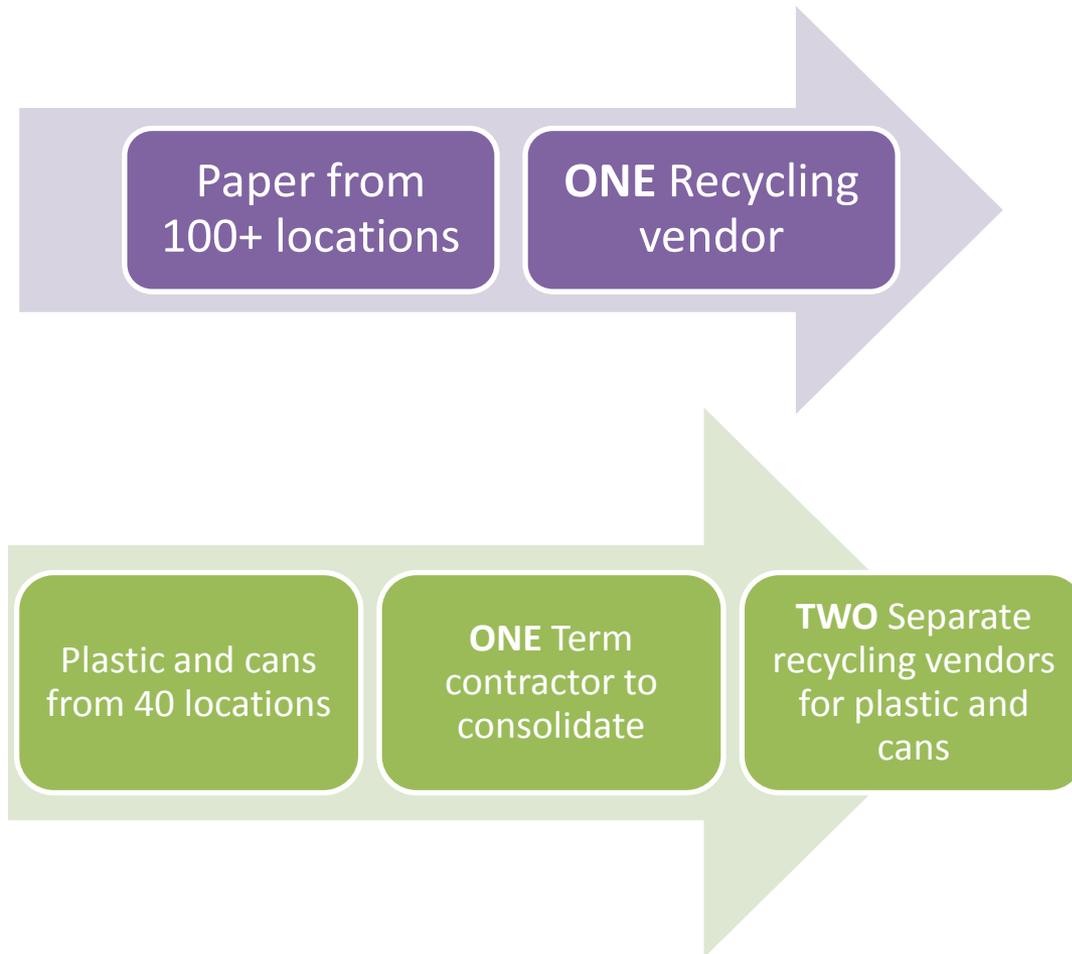
1. Spoke and hub System
2. Contract management

2. Contract inefficiencies – limited number of locations

Contract limit total number of locations due to logistics

- *NUS Admin cannot provide more recycling bins when users request!*

2. Contract inefficiencies – many parties to coordinate



- 1 paper recycling vendor
 - 1 term contractor to collect plastic/cans
 - 1 plastic recycling vendor
 - 1 cans recycling vendor
- = 4 coordinating parties**

2. Contract inefficiencies – economically unviable?

3 separate contracts for paper, plastic and cans

- *Plastic bottles worthless compared to paper and cans, which makes it very less economically unviable(?) to engage recycling vendor*

Solutions to logistic and contract issues

Spoke and Hub system
Contract Management

1. Spoke and Hub system

- Housekeeping staff to clear recycling points

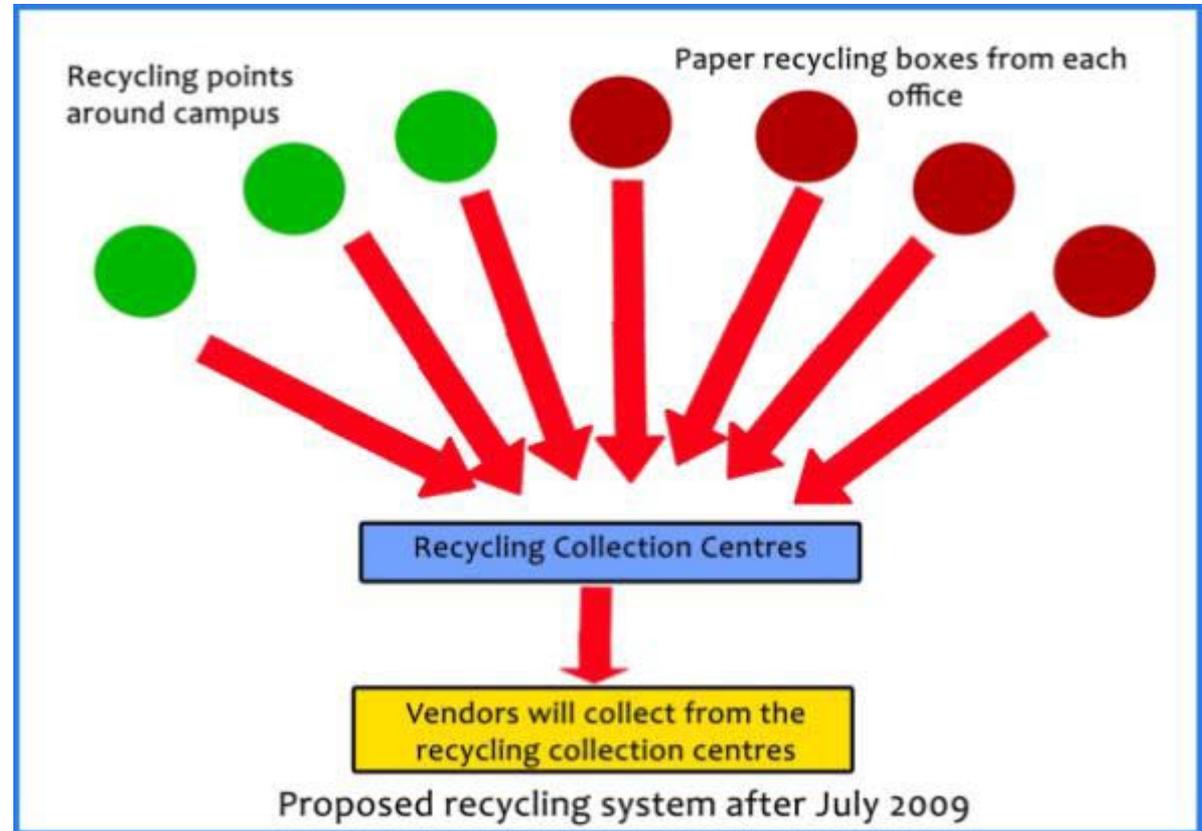
2. Combined contract

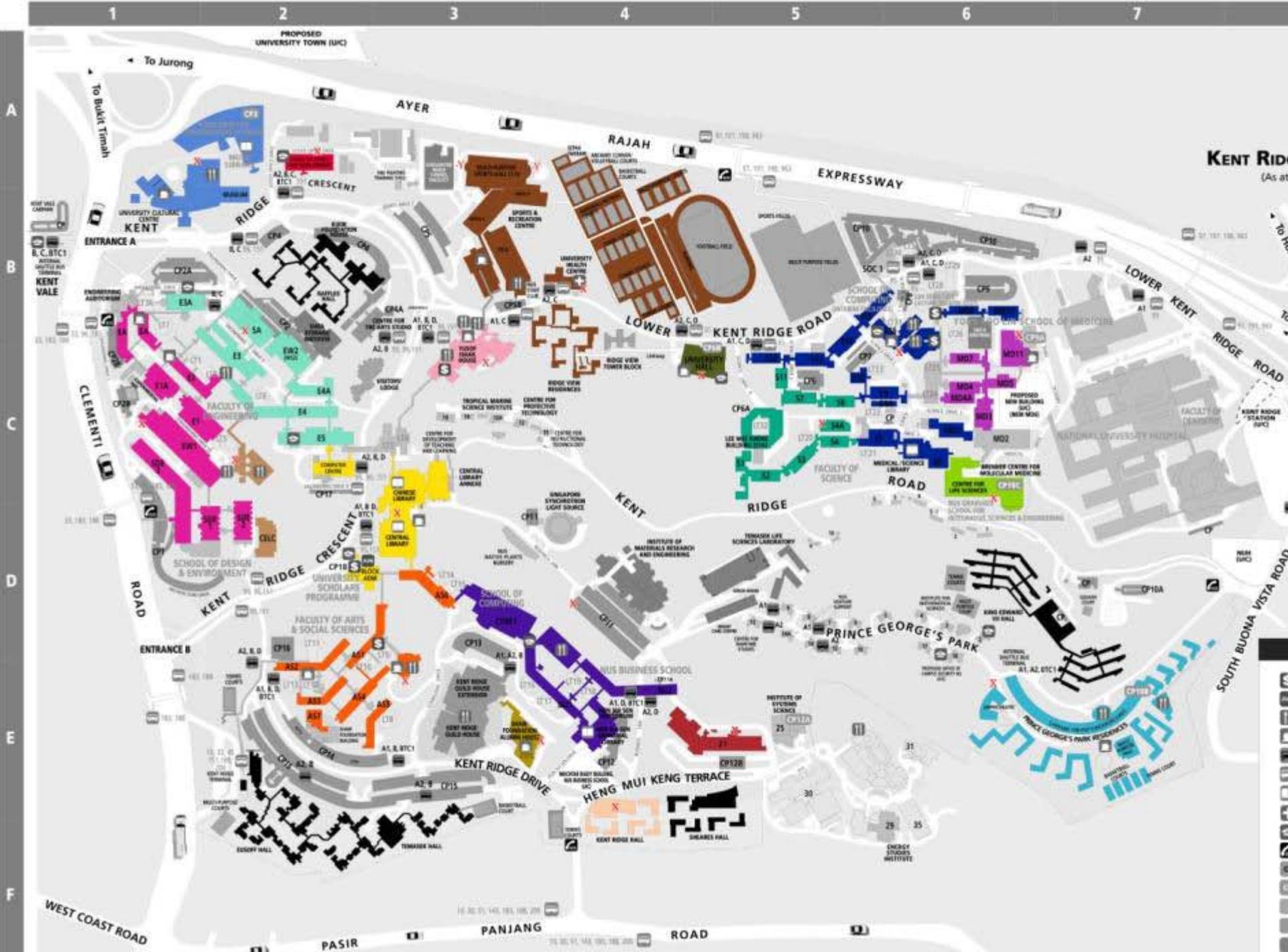
- Combine paper, plastic and cans recycling into a single contract

Current Collection System - Spoke and Hub

Process

1. Housekeepers remove recyclables while clearing trash bins to recycling collection centres (usually bins centres)
2. Recycling vendors collect from recycling collection centres





A
B
C
D
E
F

1 2 3 4 5 6 7

To Jurong

To Bukit Timah

PROPOSED UNIVERSITY TOWN (PUC)

AYER RAJAH EXPRESSWAY

RAJAH

EXPRESSWAY

KENT RIDGE

(As at 23)

To Holland

To Ch...

UNIVERSITY CENTRAL KENT

ENTRANCE A

KENT VALE

ENGINEERING AUDITORIUM

CLEMENTI ROAD

KENT RIDGE

CRESCENT

ROAD

UNIVERSITY CENTRAL KENT

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CLEMENT

Review of Problems

Inefficient Collection System/Contract Inefficiencies

Irregular
Collection

Term
contractor to
consolidate
plastic/cans

Limited
number of
recycling
points

4 different
vendors

Economically
unviable (?)
plastic
recycling

Solutions to the respective problems

Spoke and hub

Regular collection by housekeepers

As many recycling points as trash bins

Removed Term contractor to consolidate plastic/cans

In Essence, Spoke and Hub was crucial, 3 in 1 contract is optional.

3 in 1 contract management

Only 1 vendor to coordinate

More profitable paper and cans offset collection of less valuable plastic

Conclusion: Everyone's efforts

Multi-disciplinary cross-cutting Recycling Task Force working together

- Office of Estate and Development - Contract administration, management of Housekeepers
- Students against Violation of the Earth – Contamination Surveys, Lecture Talks, Labelling stickers.
- OSHE and OES - Leadership, co-ordination