

# Smart Bins

How do you decide if you need them?

NEA Tech Connect Session 19<sup>th</sup> February 2019



What is a  
“Smart Bin” ?



<b>Function</b>	<b>BrainyBins Bin Sensor</b>	<b>RFID Bin with Load Cell</b>	<b>Procomat Procopress</b>	<b>Flexi Compacting Bin</b>
<b>Fullness sensing</b>	Yes. Comprehensive sensing from empty to full	Only when full	When almost full and full	No
<b>Weight tracking by user</b>	No	Yes	No	No
<b>Weight tracking by categorisation</b>	No	Depends	No	No
<b>Compaction</b>	No	No	Yes	Yes
<b>RFID controlled user access</b>	No	Yes	No	No
<b>Password controlled user access</b>	No	No	No	No

**A bin with extra  
software and/or  
hardware capabilities**



Do you need a  
Smart Bin?

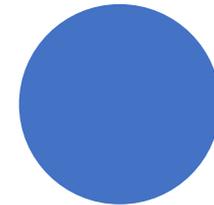
If so, which type?

Even the most experienced companies will only have vague awareness of how fast the bins fill up, and how fast their cleaners empty the bins.

This knowledge is usually concentrated in the hands of a select group of experienced staff

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Understand your own projects first





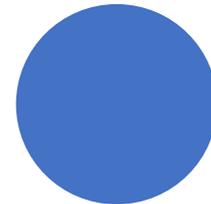
**Bin Fill-level Sensors – why deploy?**

Use fill-level sensors to get a trend  
of your bin fill pattern

Monitor your own trends or  
outsource the process to a 3<sup>rd</sup> party

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Fill-level sensors help you  
know your bin requirements

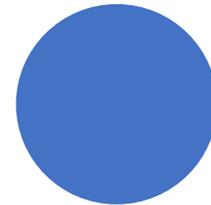


## **If your bins are rarely full:**

1. Review manpower deployment
2. Maintain status quo

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Fill-level sensors help you  
know your bin requirements

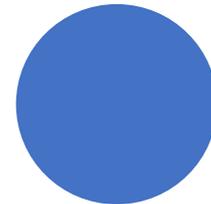


## **If your bins do get full:**

1. You need bigger bins (if possible)
2. Use a compacting bin

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Fill-level sensors help you  
know your bin requirements





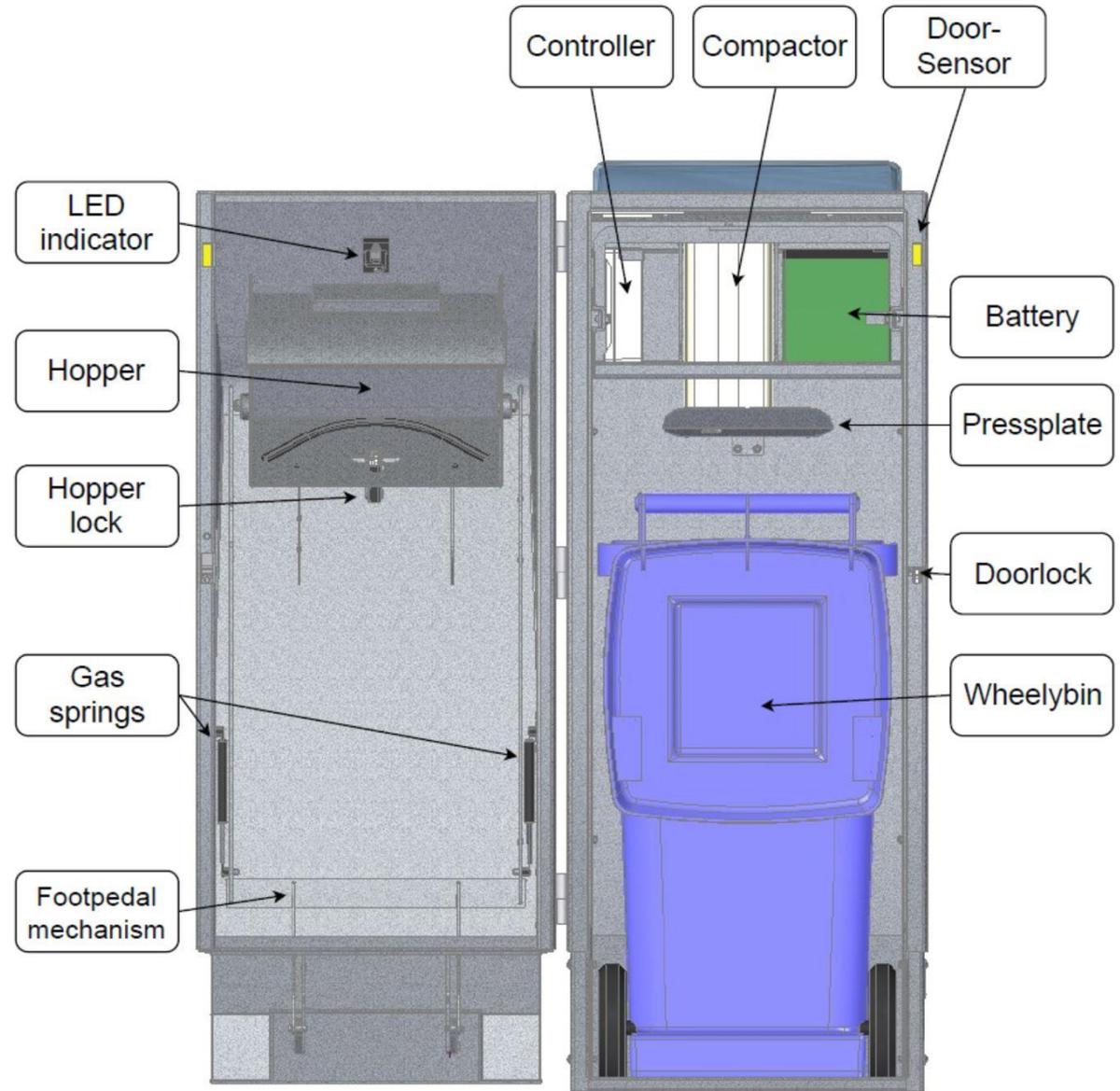
**Compactor Bins to  
reduce collection  
frequency**

**Full compaction bin**  
with all additional  
functions such as  
fullness sensing and  
notifications.

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**Safety consideration:**

waste load is  
compacted so it is  
better for wheelie bins  
to be used





**Compactor Frame only.**  
Compaction is the only function.

No fullness sensor, no notifications.

Can be built into bin housings (eg  
such as bins deployed in fast food  
outlets)

How do you decide between bin fill-level sensors, full compactor bins, or just a basic compactor frame?

# Example Scenario

**High footfall, normal waste volume, and high percentage of organic waste.**

Cleaner, most of the time, clears bins once a day. Sometimes 2 times a day

Is a compactor bin useful? Or would a bin fill-level sensor be sufficient?

**VS**

**High footfall, high waste volume.**

Cleaner clears bin multiple times per day

Would a bin fill-level sensor be useful? Or would a compactor bin be better?

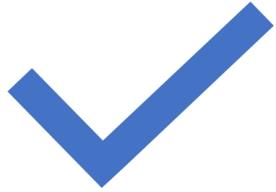
# My conclusion

If bins rarely fill up – a fill-level sensor as ‘insurance’ would be sufficient

If bins consistently fill up 3 to 5 times a day, a compactor frame is sufficient

If bin fill rate is inconsistent, a full fledged compactor bin may be better





**Step 1:** Understand your operations and how fast your bins fill up



**Step 2:** Are bin sensors sufficient or will compaction help?



**Step 3:** If compaction, what type of compactor bin do you need?

# Summary

# Industrial partner for group of SUTD students final year project

## Problems identified:

1. Lack of proper segregation for recyclables thrown into these bins
2. Low usage in general



# Industrial partner for group of SUTD students final year project

Aim to build a smart bin prototype for indoor deployment that possibly utilizes **Artificial Intelligence** and **Machine Vision** to ensure cleaner segregation of recyclables at source.

Points and rewards system to incentivize usage



# Industrial partner for group of SUTD students final year project

They need to interview/survey people as part of preliminary research. Please help them 😊



# Thank you for your attention

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