

Organisation	Changi Airport Group
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A. Problem Statement/Title:

Changi Airport seeks solutions to help F&B operators improve food waste segregation and transfer to an on-site treatment facility.

B. Background of the Problem:

In 2019, the four terminals of Changi Airport generated over 14,000 tonnes of general waste of which 30% is estimated to be food waste from F&B and lounge operators. Having introduced several food waste digesters and worked with few key operators, the airport only managed to divert and process 300 tonnes per year through the digesters. The amount of food waste remains high.

There are a few reasons:

- 1) Users are generally not conversant in waste differentiation and segregation. Cleaners and F&B staff performing waste disposal cannot differentiate organics from inorganics or whether the waste is digestible. Thus, food waste sent to digesters are often contaminated with non-food waste resulting in hastened wear and tear and reduced system efficiency. The use of single-use disposables by some operators aggravated this problem and there appears no impetus for them to switch to reusable cutlery.
- 2) Reluctance of F&B operators and cleaners to segregate food waste. F&B operators generally suffer from manpower crunch and resist the call to perform waste segregation. While good design of food preparation and dish collection areas may provide a conducive environment for waste segregation, staff are still fixated on existing work procedures and neglect waste segregation. CAG has tried to provide monetary incentives in the past to encourage waste segregation but does not view such incentive programmes viable in the long term.
- 3) A menial and laborious task in food waste segregation and handling. Even if operators agree to food waste segregation, the task is usually tedious and lacks synergy with the overall F&B/back of house operations. The staff performing waste segregation will need to use different waste receptacles for different waste types. They are required to sieve off excess liquid from the food waste and may have to transfer it to an offload site that is different from general waste. Furthermore, the receptacle used for food waste is usually not lined with plastic, necessitating additional to wash the food waste receptacles to maintain good hygiene. All these add to the hassle and are obstacles to effective waste segregation.

C. Technical Requirements / Performance Criteria:

The proposed solutions whether through behavioural design, mechanical installation, automation or digital nature should possess these features or drive towards these outcomes:

- Improve the efficacy of segregation such that contamination to food waste is minimised, free from inorganics and non-biodegradables
- Appeal or entice to staff/cleaners to perform food waste segregation. Staff should be able to perform waste segregation productively and not cumber on their other duties.
- Improve the hygiene or efficiency of food waste segregation. This could be through automation, mechanical processing or conveyance technologies where the required intervention by users is minimal.

D. Cost target of the product/solution:

The solution adopter should be able to reduce or maintain the staff strength needed for this task i.e. no additional manpower needed by F&B operators to undertake food waste segregation. The solution cost should be minimal, on leasing, recurring or instalment basis.

E. Timeframe for development of the product/solution:

Within 12-15 months, from award.

F. Potential market / business opportunity for the product/solution:

Changi Airport will work with the solution provider to pilot it at one of its terminal buildings. If intended outcomes are achieved, Changi Airport will extend the solution to other terminals. There are also opportunities for other large hotels, malls and F&B operators to adopt such solutions.

G. Resources to be provided:

CAG can provide trial sites, co-work on trial details, and evaluate potential solutions leading to the development of a working prototype.

H. Other considerations:

Attached pictures of the different channels in which food waste can be generated and consolidated at a commercial premises. The proposed solution may aim to target one or all these channels. The solution may also be conceptual, one that requires alteration to infrastructure or customisation to fit the different channels. The solution need not necessarily target staff/cleaners performing waste segregation, it may also be tailored for food suppliers, kitchen staff or diners/consumers.



Plate waste collected from Restaurants



Sorting of plate waste at a tray return station.



Food waste from central kitchen.



Expired food from supermarket



Plate waste sorted on a dish collection trolley