Problem Statement [C]: To reduce the physical strain of the work crew in waste collection operations

Desired Outcomes:

Together with the Public Waste Collectors, NEA is looking for the possibility of using an assistive technology to aid in the waste collection crew's daily operation to collect heavy bins from a variety of road conditions. Such system should:

1. Improve productivity and safety of operations
2. Improve ease of operations
3. Portability of assistive device
4. Cost effective solution

Background of Problem:

Currently, each public waste collection team requires the use of 2 crew members to perform collection from a mix of bin types on different road conditions. Collection process may require the crew to push and pull the bins against uneven terrains, up/down slopes, against drains, gutters and kerbs. Certain routes require waste collection crew to collect from trade premises with 660L bins which are filled to the brim. Such filled bins may weigh as heavy as 300-400kg. Additionally, the crew may need to lift the heavy bins from grass verge/kerbs and bring down to ground level.

In such cases, the 2 crew members will have coordinate in the manoeuvring and lifting of the heavy bins. In certain road conditions, the driver will also have to alight from his cabin to help directing traffic, resulting in delayed collection, prolonged road obstruction and unproductive operations. Additionally, repeat of such actions daily may result in workplace injuries to the crew overtime.

A proposed solution is required to help in the collection operation without compromising on the operational productivity and safety. Such solution will be used by the waste collection crew and should also be portable, easy to use and safe to operate.

Technical Requirements:

1. Device should help improve the work life of the collection crew.

2. Device should be easy to operate.

3. Device should be easily transportable and stored in the truck when travelling from location to location.

4. Device may be motorised and/or mechanically driven but must not compromise current collection operations. Considerations will be given for device which can improve current operational productivity and safety.

5. The device should be cost effective.

What solutions you are not interested in (if any)?

Not interested in devices which negatively affects the current collection operations

Timeframe for development of proposed solution/product

a. Completion of site evaluation, equipment concept design & detailed drawings 3 months after the start of project
b. Completion of working prototype ready for evaluation 6 months after the start of project.
c. Trial of working prototype with solution adopter for 3 months
d. Provide reports and findings on data collated during trial phase
e. Completion of full functional end product ready for pilot deployment 12 months after the start of project.
f. Provide milestone updates on progress of prototype and end product

Requirements of prototype

Prototype should minimally comply with the points listed under Technical Requirements.

Costing and Procurement

Interested proposals are to propose a cost effective solution which minimally meets the needs as stated in the problem statement. Considerations will be on the costing of the proposed solution. Proposals are also to detail the overall cost of the device as well as its costing breakdown into the following:

a. Material cost
b. Development cost (i.e manpower cost, equipment cost, software cost)
c. Consultancy cost
d. IP, licensing and any other cost

Market Potential for proposed solution/product

Proposed solution could be adopted by waste collectors which are faced with similar problems. Spin-off effects may result from the customisation of the final product to suit other types of operations as required.