**Environment and Transportation Department,**
**Block 2, Floor 6,**
**Civic Offices,**
**Dublin 8.**

**24th November 2022**

**To Each Member of the**
**Climate Action, Environment and Energy Strategic Policy Committee**

# Bin sensor pilot project report

## 1. Project plan

This project is a pilot project for fill level bin sensors, which aims to test whether the use of bin sensor and route optimization system can improve DCC WM collection efficiency. Based on available information, the average side loader requires about 60 bins per shift (excluding the Big Belly bin). Two routes have been selected one from the North and one from South side of Dublin. Therefore, 130 sensors will be leased and installed in the litter bins that two side loaders usually need to empty. The duration of the project is six months, which will cover winter and summer in Ireland, and provide data support to expand the project in the future.

In first three months (Phase 1), the project will be operated similar to our existing Bigbelly network on email notifications. Second three months (Phase 2) will be operated using route optimization system.

- Phase 1 Email notification only

When the waste in the bin reach certain fill level, the system will automatically mark the bin as "Ready to be collected". Local management will receive the names of these bins by email. Before the shift and during the shift break, the driver will be given a "Ready to be collected bin list" from local management. Drivers can decide their own routes based on their local experience.

- Phase 2 With route optimization system

The route optimization system is a navigation system developed by Nord sense for use with Bin sensor information. All bins considered "Ready to be collected" by the bin sensor will be displayed in the system, and the system will set the best collection routes to collect these "full bins" automatically.

The driver can check the bin location and routes through the mobile device, and at the same time reduce the visits to some "unfull bins", thereby reducing driving distances and fuel consumption.

## 2. Purpose of the project

1）Detect the real-time fill level information in the litter bin

2）Test whether notification of fill level bin can help waste collection

3）Explore whether the route optimization system can be used to navigate the vehicle, rationally plan the path, reduce extra travel distance, reduce unnecessary energy consumption, thereby reducing the production of carbon dioxide

## 3. Measurable indicators

After the completion of the entire project, the data (daily driving distance, daily driving length, fuel consumption, and carbon footprint) collected from Phase 1, Phase 2 and the historical data will be compared against each other and conclusions drawn.

## 4. Incorporating fill level sensors with existing smart infrastructure

The knowledge to incorporate the data with existing smart infrastructure data will be gathered throughout the duration of the trial with input from the smart city team and our IS department.

## 5. Project time line

| Task | Mar22 – Oct22 | Nov-22 | Dec-22 | Jan-23 | Feb-23 | Mar-23 | Apr-23 | May-23 | Jun-23 | Jul-23 | Aug-23 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Preparation stage** | | | | | | | | | | | |
| Contact Bin sensor company to discuss the initial plan for the trail project | ██ | | | | | | | | | | |
| Chose the suitable plan and confirm the cost for the whole project | | Week2–Week3 ██ | | | | | | | | | |
| Get the delivery for bin sensor and brackets | | Week2–Week4 ██ | | | | | | | | | |
| Staff training on sensor installation | | Week4 ██ | | | | | | | | | |
| Bin sensor installation for route1 | | | W1 ██ | | | | | | | | |
| Bin sensor installation for route2 | | | W2 ██ | | | | | | | | |
| **Implementation stage** | | | | | | | | | | | |
| Train driver to use notification during collection period | | | W3 ██ | | | | | | | | |
| Trail project phase 1 start( email notification only) | | | W3 ██ | ██ | ██ | W1 ██ | | | | | |
| **Project phase 1 finish date & Project phase 2 start date** | | | | | | | | | | | |
| Train driver to use route optimization system during collection | | | | | | W2 ██ | | | | | |
| Trail project start( with route optimizion system) | | | | | | W3 ██ | ██ | ██ | W1 ██ | | |
| **Project finish date** | | | | | | | | | | | |
| Data analysis & report prepare stage | | | | | | | | | W3 ██ | ██ W3 | |
| Project ready to be reviewed | | | | | | | | | | | W1 ██ |