The Manchester Orbit

DIBA MOHEBZADEH | WASTE MANAGEMENT | CIRCULAR ECONOMY | EVDP 616 - INFRASTRUCTURE AND LAND USE | WINTER 2020

Existing

Calgary

1,284,536

Annual Waste per Capita

485 kg

Annual Landfill Transfer per capita

345 kg

Recycled and Reuse per capita

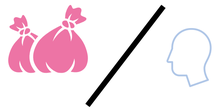
140 kg

Proposed data

Manchester

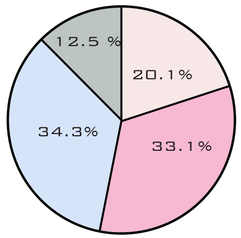
100,000

Annual Waste per year



485,000,000 kg

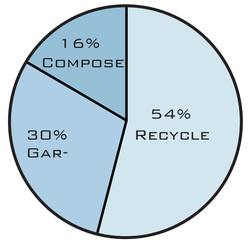
Existing data based - 2019



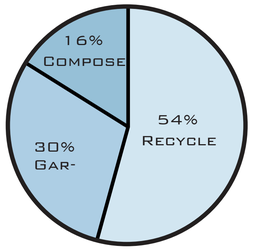
Catego-	Total kgs
Industrial and Commercial	214,000,000
Single Family	206,000,000
Construction and Demolition	125,000,000
Multi-Family	78,000,000
Total	623,000,000

waste distribution chart

Material diversion potential



family waste

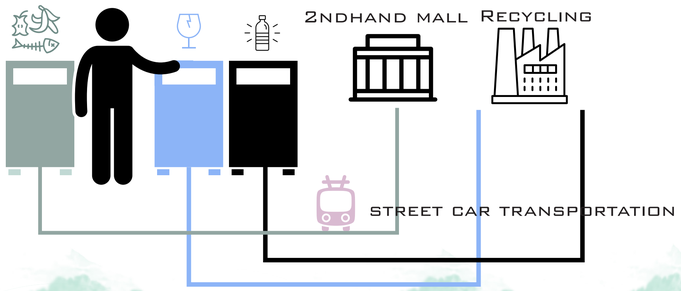


Industrial, commercial

Precedents

Waste distribution proposal

pneumatic waste collection system



RETUNA SECOND HAND MALL

RENOVA RECYCLING PLANT

Proposed Render / Collage

proposed jobs

second hand mall
50 jobs per / 15,000 m2

recycling plant
750 jobs per / 43,000 m2

TOTAL
800

- Proposed recycling plant
- Proposed second hand mall
- greenery
- Proposed and existing
- Existing recycling nodes
- Proposed pneumatic system
- Proposed street car nodes
- 600m radius
- Proposed and existing
- Existing recycling nodes
- Proposed street car nodes

The Manchester Orbit

Background Information

It is estimated that by 2060, Manchester could hold the capacity of 100,000 residents while providing 35,000 jobs. While maintaining suitable points of design parameter. Today, Calgary has a population of 1,284,536 with the annual waste per capita of 485 kgs out of which, 345 kgs are transferred into landfills and 140 kgs are recycled and reused. Based on the 2019 data provided by the City of Calgary, Industrial and commercial sectors produce 214,000,000 kgs (34.1%), single families 206,000,000 kgs (33.1%), construction and demolition 125,000,000 kgs (20.1%) and multi-family produce 78,000,000 kgs (12.5%) of waste per year, with paper and food being the most popular trash of them all. It is interesting to look at how family waste and industrial waste share the same material diversion potential. 54% of recyclables, 30% of garbage and 16% compost-able, which means Manchester has a very high chance of having their recyclable power plant within their district since they focus both on industrial and residential uses. But how are we going to maintain this balance?

Concept Plan

The Orbit is a conceptual circular economy layout which values the existing aspects of Manchester with the help of technology. Manchester as a mixed-use industrial dominated area offers many recycling depots, landfills, and centers that are scattered from one another. By collaborating with the transportation system, while respecting the zero waste to landfill idea of solid waste, the existing recycling depots have been identified and connected with another by nodes. These nodes are calculated within the 600m radius of the nearest depot and street-cars to offer an easily accessible garbage disposal for every resident regardless of age. As a result, three pneumatic waste collection systems are introduced within the 39th avenue, 50th avenue SE and 5th avenue SE range to allow an easier distribution and transfer of trash regardless of location within the site. These are automated vacuum collection systems also known as “AVAC”, which transports waste at a high speed through underground pneumatic tubes to the existing collection systems based on material distribution. This method is not only cleaner and safer for the environment but will also help with the separation and recycling of the waste. This system is currently used in 30 different countries and was first installed in the Solleftea Hospital (Sweden) in 1961, with the first vacuum system for households installed in 1965.

The waste is later on burned for heat which is transferred within the Manchester house. Based on the precedents, Sweden uses 60,000,000 kgs of waste an hour to generate heat for 180,000 homes and 37% receive heat. In which, if the district provides 485,000,000 kgs of waste per year, they will be able to benefit from 8hours of “free” heat for half of Manchester within the year, which is beneficial during pandemic times. The hope is to not have any other material/ waste transferred to the landfills, therefore, once again following Sweden’s concept, a second-hand plaza/ mall will be introduced which will not only repair and reuse but educate the Manchesterians to be able to repair their damaged items.

Based on the precedents, Retuna as a second-hand mall with the area of 15,000 m2 will provide 50 jobs, while Renova as a recycling plant with an area of 43,000 m2 will provide 750 jobs, and this is just the beginning to bringing back the Canadian economy after a dramatic pandemic. The first step is to accept and think of a zero-waste, fair share, car-free system, perhaps an Orbit.

References

Calgary, The City of. “Waste Composition 2019 - Garbage: Open Calgary.” Data.calgary.ca, 19 Feb. 2020, data.calgary.ca/Help-and-Information/Waste-Composition-2019-Garbage/p2fv-5peq.

“Retuna Recycling Plant .” Retuna, www.retuna.se/english/.

“From Dust to Waste.” Envac - Vacuum System History, web.archive.org/web/20110710194217/www.envacgroup.com/web/Vacuum-system_history.aspx.