Household Waste Measuring in Central Finland

Smart waste management solutions in Jyväskylä Kangas urban area

Part of CIRCWASTE - LIFE IP project coordinated by Syke

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Some background information

- 143 000 residents, the seventh biggest city in Finland

- Some 42 000 students

- Kangas is a developing urban area

- Used to be a paper mill

- Has now more than 1 000 workplaces and residents

- In 2040 there will be more than 2 100 workplaces and more than 5 000 residents

- Kind of an city center extention with living, working, services and green surroundings

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District level waste management in Kangas
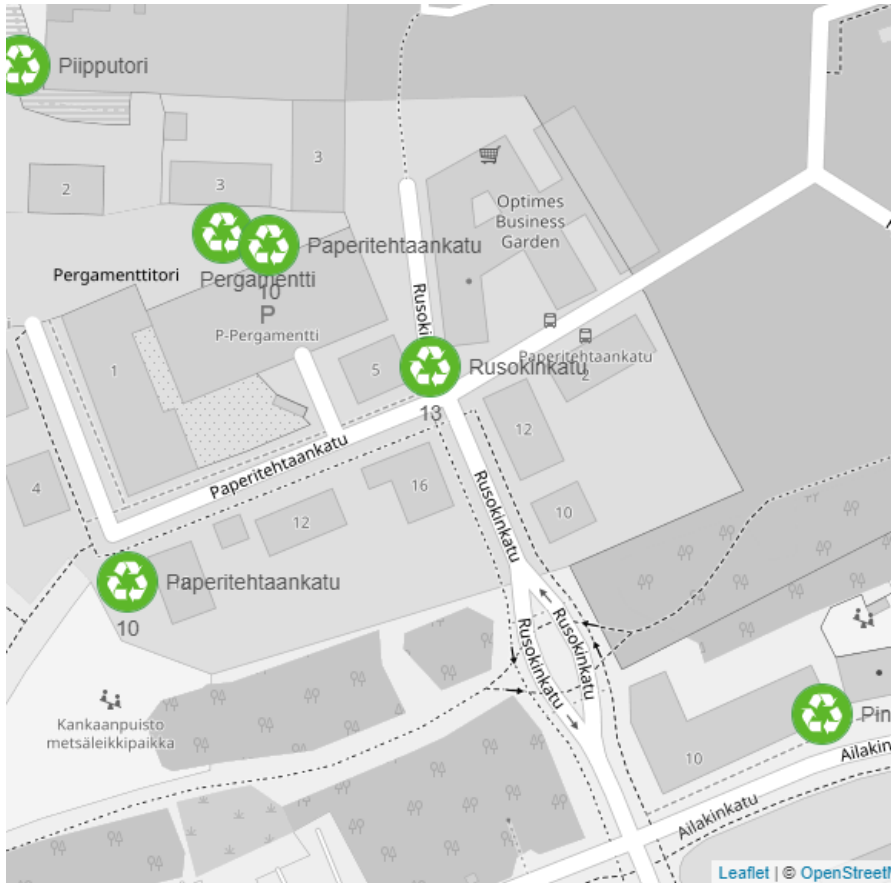
- There are four permanent and two temporary waste collection points
- These are for household type of waste
- Permanent waste collection points are based on semi-underground containers
- Thus capasity is relatively good
- Collection point are situated into the city structure early in the city planning process
- This model
- Reduces the need for space
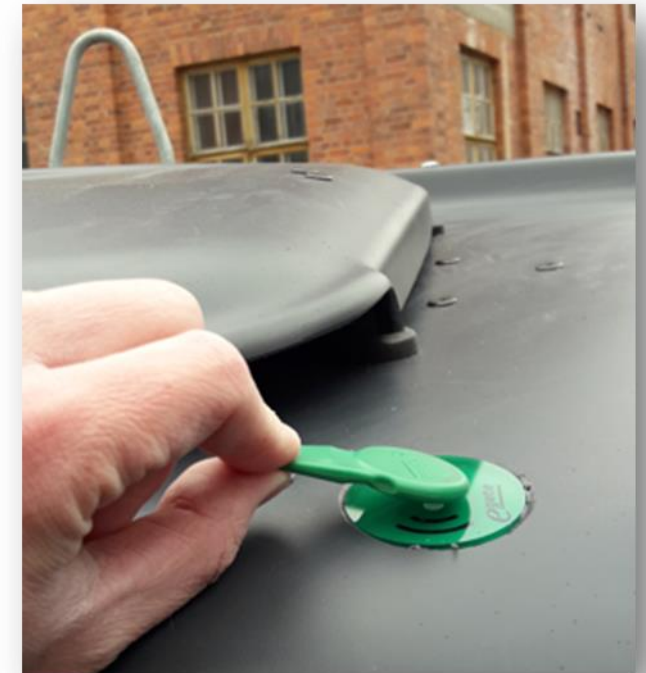- Reduces waste trafic
- Ingreases safety

Collection points

- Semi-underground containers
- Volume up to 5 m³
- Collected waste fractions: mixed, bio/organic, carton/cardboard, paper, glass, metal and plastics
- Capasity on area level
- Container size and emptying intervals

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Smart development, measuring

Electronical locking & data

- Electronical locking system
  - Provider of containers (Molok) have a German partner EMZ
  - System has been in use since May 2019
  - Every waste container's lid has a lock
- Key tags
  - All the apartments have two key tags
  - Key tag management has to be in good hands
- In everyday use
  - All containers are locked
  - All key tags function in all waste containers
- Data
  - Opening data accumulates into eGate portal
  - Vizualiazation of data is integrated into Kangasverkko.fi – areal portal

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Waste container usage data vizualization

Map: https://www.kangasverkko.fi/fi/palvelut/jatehuolto.html
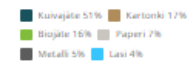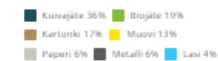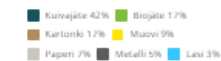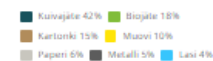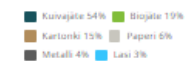
Statistics:
https://www.kangasverkko.fi/fi/palvelut/jatehuolto/tilastot-jatehuolto.html
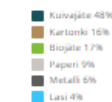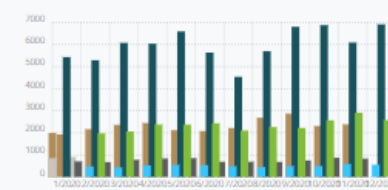
Smart development

Trials and thesis works

- TOF-camera survey. Aim was to find solutions to measure waste bag volumes.
  - No success so far
  - [ovaska-mikael-opinnäytetyö-jamk.pdf (theseus.fi)](#)
- Gamification trial
  - Trial where gamificational approach was used to waste management
  - Kind of substitute for PAYT-approach (Pay as you throw)
  - [Jätteiden lajittelun älykäs pelillistäminen - Osuva (uwasa.fi)](#)

Future

Pr and communication
New technological solutions
Guide

- Pr and communication
  - Residents recycling willigness
  - Project result dissemination
- Every day work
  - Lock and key tag management, data usage
- New kind of lock development and IAM solution integration
  - Approriate and simple processes
- Enhanced data usage
  - Comparisons ect.
- Guide to innovative waste management system for smart city residential areas

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Some thoughts

- Waste management is everything but easy

- Many roles

- Interfaces are diverse

- Legislation varies for different waste producers

- Areal model makes it even more complex

- But district level waste management in Kangas is absolutely a good solution

- GDPR has had it's effects

Thanks for Listening!

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