Transportation of Waste
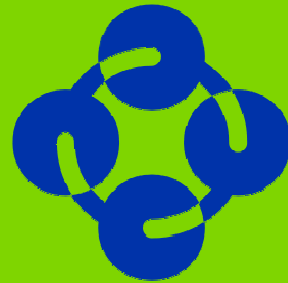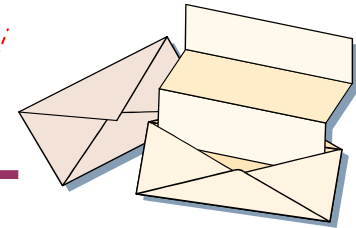
Maria Törn

Property Customers Waste Management Service

6,5 million services / year
(emptied bins &
containers

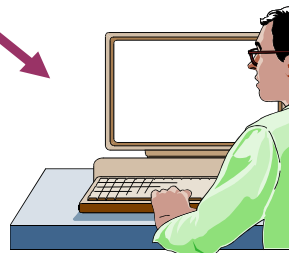1 million people

60 000 customers

290 000 invoices
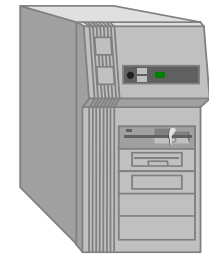€ 17 million

100 collection trucks
(5 private companies)

4 field service persons

7 customer service pers.

190 000 tons of
waste collected

4 planners

customer register

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Waste Collection and Subcontracting

- 60 contract areas (planned by YTV)

- Contract period 5 years

- Tenders are invited by using an open procedure

  (based on unit prices)

- Computerised GPS-based Waste Collection System

- Strict environmental demands

- Working quality effects on payment (+12 … - 20%)

- 5 separate contractors working for YTV

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Collection Services Bought from Private Companies

- 49 mixed waste and 14 biowaste collection areas
- 5-year contracts with private hauling companies
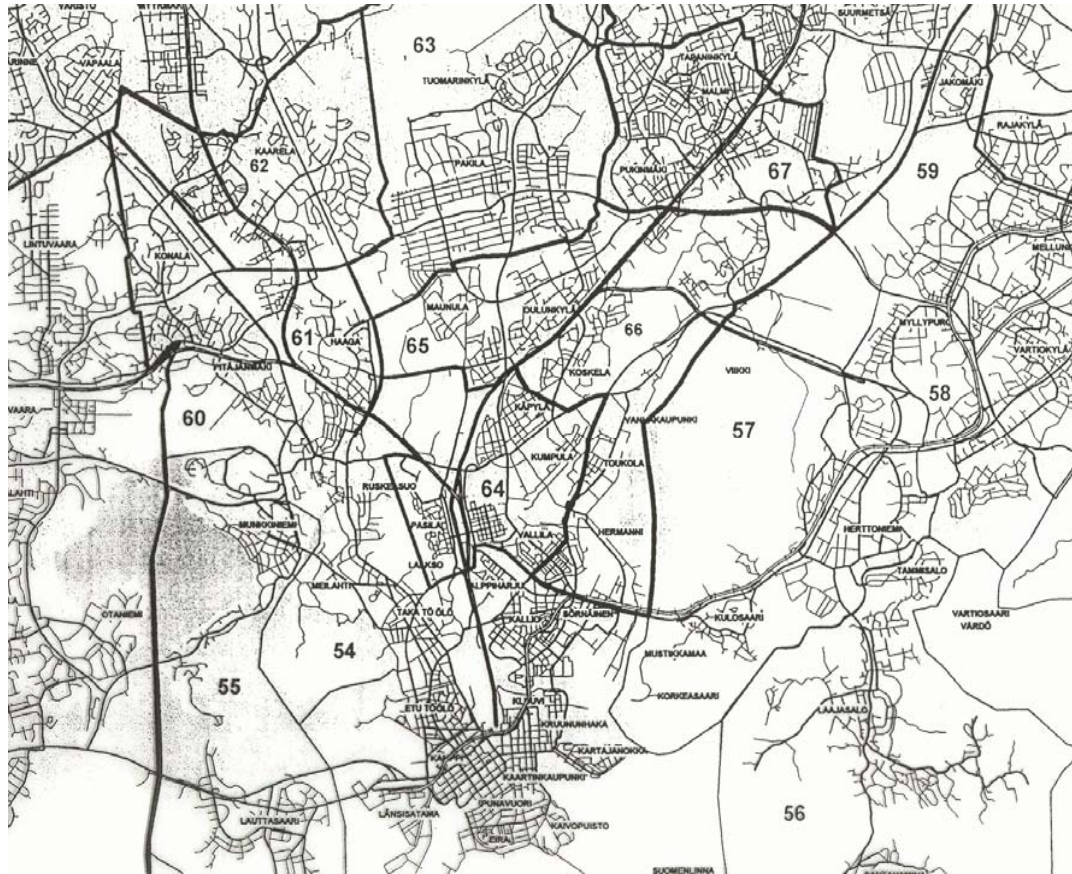
Waste Collection and Transport

Significant Environmental Aspects of Collecting and Transporting Waste (acc.YTV's Quality & Env.System)

Significant environmental aspects	environmental impact	emission
technical condition of the vehicles	quality of air, drainages to terrain, littering	exhaust gases, oil, waste, waste drainages
choosing of the driving route	quality of air, wearing of road network, living comfort	exhaust gases, noise, dust
regularity of emptying the waste containers	littering	waste to neighborhood

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Environmental Requirements in Contracts Concerning Waste Collection

- garbage trucks must have Euro 3 engines

- fuels sulphur content can be at most 0,005 %

- trucks must use biodegradable hydraulic oil

- there can not be any harmful oil spills in the trucks

- garbage trucks must be provided with certain equipment in a case of an oil spill

- no waste can be let out out of the truck to the neighbourhood

- garbage trucks must be provided with cleaning equipment

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Quality Control of Waste Collection
Bonus System for Contractors

- Agreed contract price + 12 % … - 20 %
- Determined monthly for each collection area separately
- Is based on customer complaints which YTV receive
- Is calculated as:

$$\text{Bonus (\%)} = 5{,}0 \times (2 - CI)$$

Complaint Index (CI) = Complaint points/ 1000 pick-ups

- If complaint index is 0 (no complaints) contractor gets additional 2% extra bonus
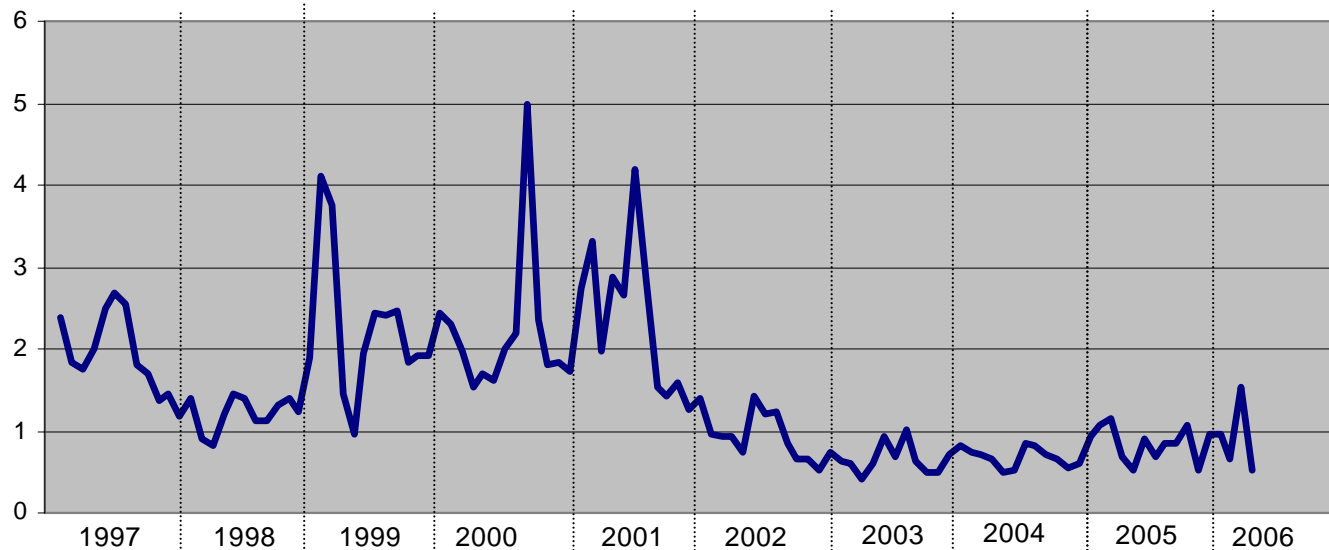
Quality Control of Waste Collection
Bonus System for Contractors

Example of complaints that are registered in the
bonus system:

- all waste or part of the waste has not been collected

- waste bag is missing

- error in waste container delivery

- emptying in a wrong day or a wrong time

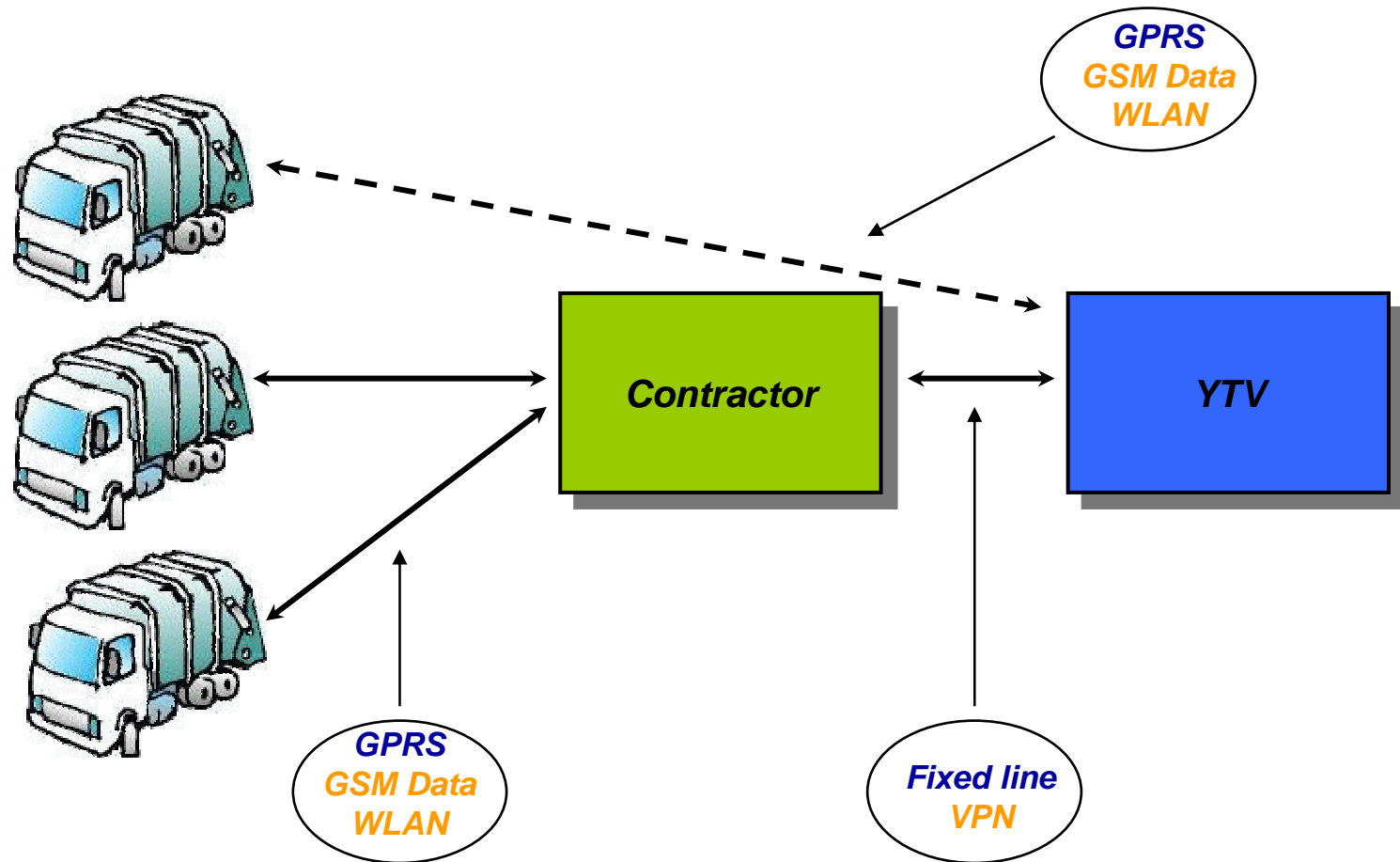- waste container has not been washed

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Complaint per mille

Computerised GPS-based Waste Collection

GPS Collection System - Means of Data Transfer

GPS Collection System Vehicle Software

Activation the distribution area and collection stops using the driver's identification code

Graphical map view with collection stops

Map based guidance for the driver (especially new drivers)

The vehicle is always in the middle of the map
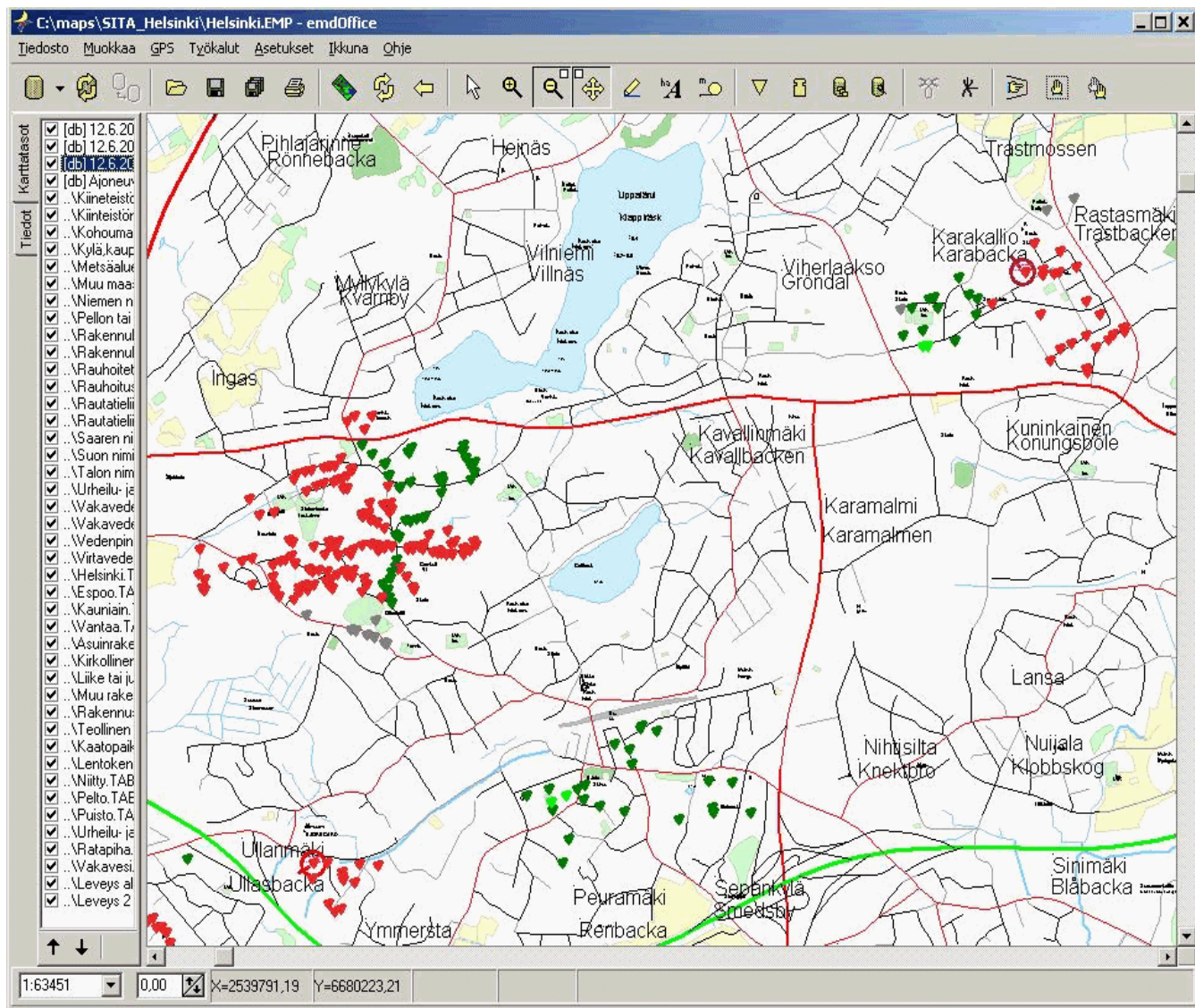   **The view is directed according to the vehicle's movement**

The driver has the freedom to choose the order of collection stops

Details of the customer in a separate window

Collection guidance information

GPS navigation and GPRS data transfer

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Typical Office Map View Showing Progress of Collection

GPS Collection System Office Software

Basic information
> **Users, vehicles, customers**
> **Tasks, additional tasks**
> **(Route planning) order allocation**
> **Statistics, reports**

Real time data to customer service
> **Status of collection areas and collection stops**
> **Immediate information on deviations + historic data**

Graphical map view
> **Collection stops of each area**
> **Location of each vehicle**

Modifications to routes and collection stops
> **Can be done immediately**
> **The system notifies drivers immediately**

Messages from office to vehicles

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Conclusions of the GPS collection system

- **Increases customer satisfaction**
    - **better customer service- up to date information**
    - **immediate troubleshooting - even before complaints**
    - **less mistakes and errors in collection work**
    - **correct invoicing + collection statistics to customer**

- **Drivers very satisfied with the system**
    - **drivers have more possibilities to plan their own work**
    - **less mistakes and errors in collection work**
    - **reliable and easy to use equipment and software**
    - **notations and comments automatically to background system**

- **Environmental friendly**
    - **saves natural resources by reducing the amount of paper and fuel**

- **Increases efficiency in office work**
    - **Decreases the time used to planning routes and making driving arrangements**
    - **Enables the monitoring of collection work in real time in the collection areas**
    - **Makes possible to measure the overall efficiency of collection**

- **Economically feasible investment (payback time 2-3 years)**

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