

Free pre-analysis report

A metropolitan district municipality · solid waste collection · day shift

This is the template of the document you receive after the free pre-analysis. The figures come from a model analysis on the real data of a metropolitan district and from the product's run on the same data; your report will carry your own values. District, neighbourhood and coordinate information has been removed.

1. Operation

Shift	Day, 7.5 hours
Vehicles	40 vehicles; compactor and crane trucks
Waste collected	393,660 kg per shift
Unloading	1 disposal site; a full vehicle unloads and returns to its route
Data sources	Container list (KML), vehicle list (Excel), road network (open map data)
Current routes	Field supervisor's daily plan and vehicle tracking records

2. Result

Shift time spent outside collection

~~30.9%~~ **6.2%**

Fuel consumption and CO₂

-34.5%

Container coverage

100%

Model analysis; not savings measured in the field. The value realised in a pilot is measured and replaces this report.

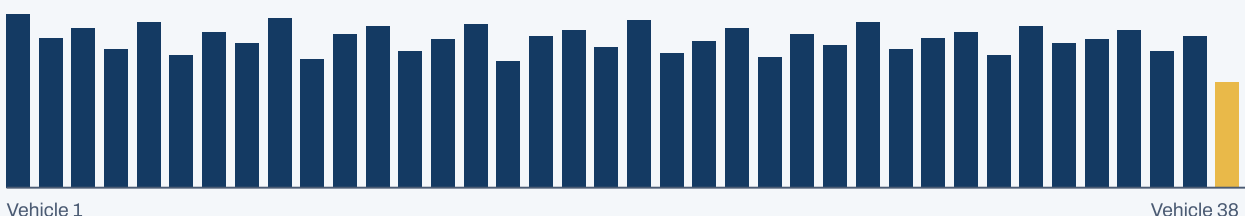
3. Current state and plan

Metric	Current state	Akilkent plan	Difference
Time outside collection (share of shift)	30.9%	6.2%	-24.7 points
Fuel and CO ₂	100 (index)	65.5	-34.5%
Active vehicles / trips	40	38	-2 vehicles
Planned total distance	<i>from tracking data</i>	2,025 km	<i>with your data</i>
Planned CO ₂	<i>from fuel invoices</i>	1,553 kg	<i>with your data</i>
Container coverage	<i>as reported</i>	100%, unassigned containers 0	full

Percentages from the model analysis; vehicle, distance and CO₂ values from the product run of 26 June 2026 (probabilistic fill model, full search budget). In your report the "current" column holds your tracking and fuel records.

4. Plan per vehicle

Planned distance (km) and load per vehicle; the last vehicle half full



Illustrative. In the real report each bar is labelled with vehicle name, planned kilometres, load ratio and number of trips; the same data is given row by row in the Excel attachment.

5. Additional vehicle requirement

The plan assigns every container to a vehicle within the defined fleet and shift. When capacity or shift length is insufficient the plan is not forced: unassigned containers are listed separately and the number and type of additional vehicles needed is stated. In this analysis:

Case	Unassigned containers	Additional vehicles	Note
Current fleet, 7.5-hour shift	0	Not needed	38 vehicles suffice; 2 remain in reserve
<i>If the shift drops to 6.5 hours</i>	<i>reported</i>	<i>N vehicles, type</i>	<i>scenario; computed in your report</i>
<i>If the number of containers grows</i>	<i>reported</i>	<i>N vehicles, type</i>	<i>scenario; computed in your report</i>

The recommendation is based on the total volume of unassigned containers and the vehicle type matching the container type (e.g. a crane truck for underground containers); for fleet sizing before a tender the "High quality" strategy is used.

6. Assumptions

Road network	Real road network; one-way streets, turn restrictions, heavy vehicle bans included
Average speed	<i>by road type; calibrated from your tracking data</i>
Container service time	<i>by container type; from your field measurement</i>
Unloading time	<i>from your disposal site records</i>
Fuel consumption	By vehicle type; literature range 77–100 L/100 km, your records prevail
Emission factor	2.6–2.7 kg CO ₂ per litre of diesel (EPA 2022; DESNZ 2026)
Fill uncertainty	Probabilistic model (extra trip allowance for containers found full)

7. Method and validation

- Points are grouped into zones by proximity, vehicle compatibility and capacity; a first route is built for each zone.
- The visit order is improved for fuel and time; changes that worsen the solution are rejected.
- Constraints: heterogeneous fleet, container-vehicle compatibility, disposal site returns, shift length, multiple trips, coverage.
- Compared with exact solutions on small instances; a separate verifier recomputes distances and checks the rules.
- District-wide solution time: under 20 minutes on 27-vehicle shift data; depends on the number of points and vehicles.

8. Limits and next step

This report is a computer model analysis; it is not a realised field saving and not a guarantee for your organisation. The next step is a pilot in one zone: planned routes are driven in the field and planned versus actual kilometres and fuel are compared. The pilot package is designed to stay within direct procurement limits.

For your own report: your vehicle list and container locations are enough. Request form at akilkent.com/en/iletisim; the report is prepared within 2–3 weeks, with no fee and no commitment.