

Reversed Waste Collection



Geert Boonzaaijer

Senior project manager

Arnhem



ARNHEM

150,828 inhabitants

77,075 households

58% low-rise, 42 % high-rise



Household waste is collected by SITA.

Waste tax per household: 244 Euro.



Amount of waste collected in 2014:
74,687 ton/year

(= 495 kg/inhabitant/year)

Recycling: 37,716 t/y (50.50%)

Incineration: 36,934 t/y (49.45%)

Landfill: 36 t/y (0.05%)

Household waste objectives

Waste Management Plan city of Arnhem
2012-2020:

52% recycling in 2016
60% recycling in 2020

Current objectives at national level:

65% recycling in 2015
75% recycling in 2020
100 kg residual waste in 2020

Our conclusion:

We need a different household waste collection system (better facilities for source separation)

and motivated people, knowing what to do, how to do it, when to do it and why it should be done.

(know-how, attitude, behaviour)



ISWM - TINOS

Gentlemen,
Please sit
down when
you pee !



Reversed Waste Collection

- “Reversed” indicates a change in direction:
- residual waste is no longer collected from homes;
 - residents have to bring residual waste to underground containers located within a walking distance of 100 to 150 metres;
 - better facilities for source separation.



Presenting
recyclables
for collection ?
Easy!

Presenting
residual waste
for collection ?
Less easy!



Reversed
Waste
Collection



ISWM - TINOS



Life+ project

Total cost: 2,173,617 Euro

Contribution EU: 775,383 Euro (max).

Trial areas	Number of households	Percentage high-rise
De Laar-West (mainly low-rise)	2,708	13%
Over het Lange Water (mainly high-rise)	2,655	51%
Malburgen Oost-Noord (focus area)	2,190	32%
TOTAL	7,553	

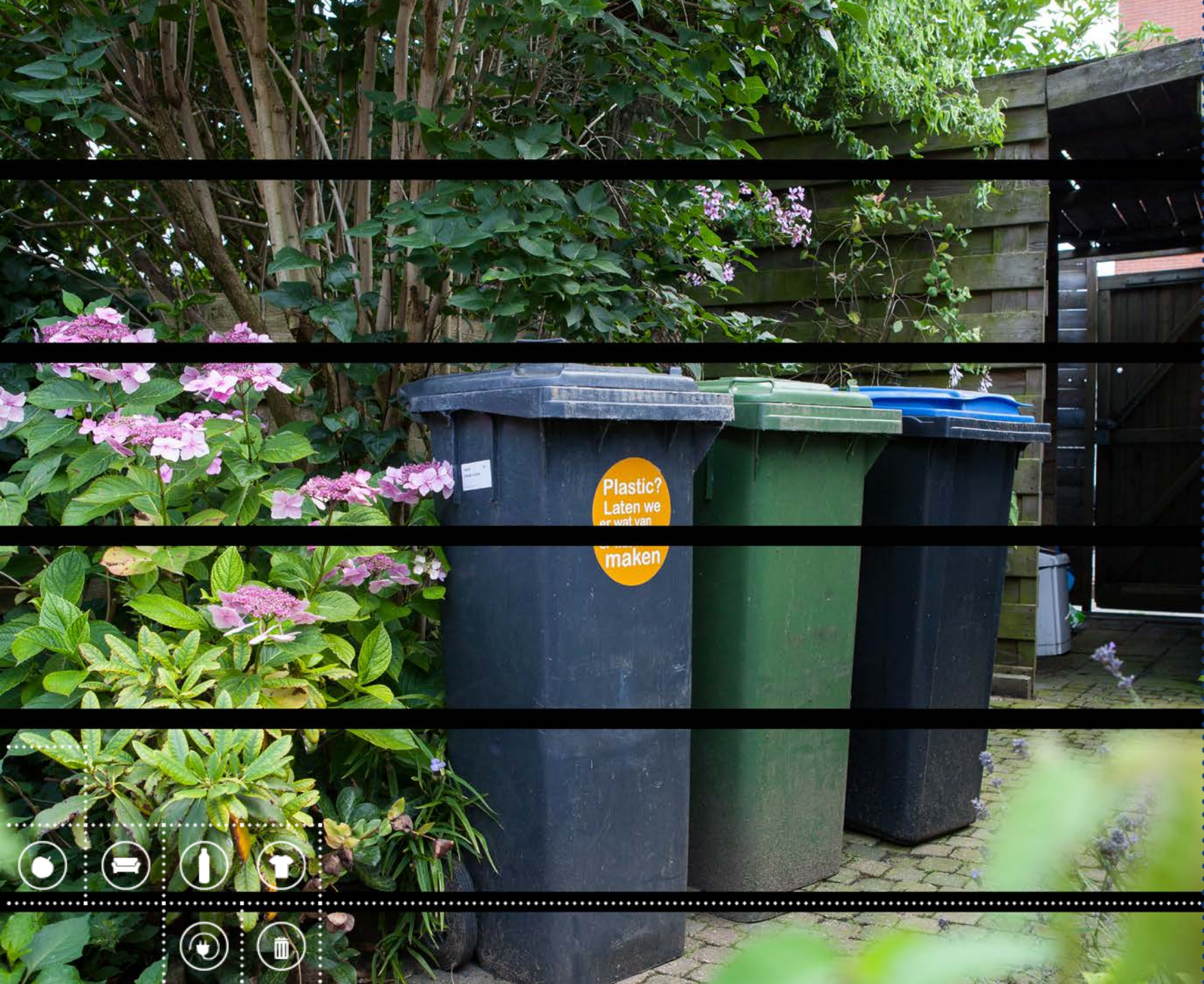
Low-rise area



Old
system



New
system



High-rise area

Old
system



New
system







80 new underground containers



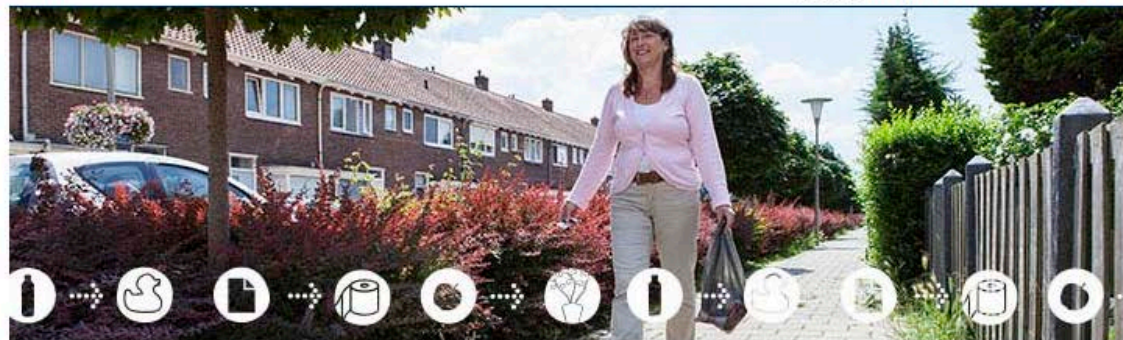
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Communication

- Letter + flyer
- Walk-in evening meetings in each pilot area
- System + draft locations UC's
- 300 comments, 10 objections, 1 appeal
- omgekeerdinzamelen@arnhem.nl
- Meetings with affinity groups (elderly, disabled)
- Residents' feedback groups

Reversed Waste Collection

- + Home ReWaCo
- + The Method
- + Communication and Enforcement
- + The Organisation
- + The Results
- + News items



The Method



The Organisation



Directly to:

[The latest results](#)

Communication and Enforcement



The Results



afval?
aten we
wat van
naken

Omgekeerd inzamelen

Dit is een nieuwsbrief van de gemeente Arnhem 1. aargang nummer 1 | november 2013

Afvalambassadeur Raoul aan het woord

Sinds dit jaar is Raoul Alblas één van de gezichten van de campagne 'Afval is grondstof'. Als afvalambassadeur is hij betrokken bij diverse projecten. Zo gaat hij samen met wethouder Margreet van Gastel naar scholen. Doel is om de jeugd te betrekken bij duurzaamheid en gescheiden afvalinzameling.

Raoul. "Ik vind het leuk om aan allerlei projecten mee te doen. Laatst zat ik in de jury van de kind- en jeugdconcursus. Groepen 7 en 8 van de basisschool hadden

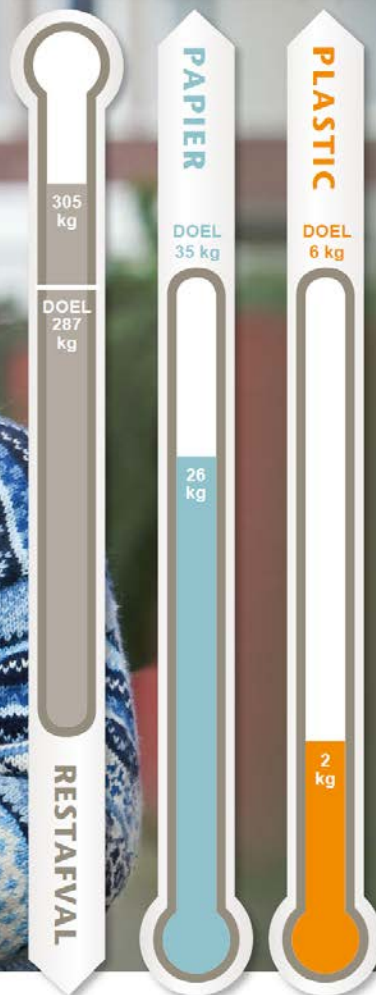


Nieuwsbrief

Welkom in Malburgen-Oost Noord

WIJ DOEN AAN
OMGEKEERD
INZAMELEN!

hoeveelheid in kg per inwoner per jaar



Afval?
Laten we
er wat van
maken

www.arnhem.nl/omgekeerdinzamelen

Notice-boards

2 per trial area



Personal approach contributes to behavioural change !

Waste coaches

- 12 coaches, 4 per trial area, 2 teams
- 36 hours per week
- Also in the evening and on Saturdays and Sundays.
- People with limited chances on the labour market.
- After sufficient training and introduction.

60% should find a job !



Waste coaches

- Walking oracle
- Mailman (handing news letters)
- Checking contents of mini-bins
- Extra ears/eyes law enforcement officers
- Clean-up campaigns with schools
- Meet social workers

Availability of waste coaches = precondition for implementation !



Start Reversed Waste Collection

At 3
primary
schools

“Waste
separa-
tion
game”



Extensive Monitoring Programme (executed by external agencies)

- Amounts of waste collected in each trial area
 - Composition of residual waste
 - Pollution of public area
 - Residents satisfaction

Results after 12 months in kg/person/year

	Baseline	Goal	After 12 months
Over het Lange Water			
Paper/cardboard	26	35	43
Plastic packaging	4	12	18
Residual waste	206	186	205
De Laar-West			
Paper/cardboard	31	43	61
Plastic packaging	5	17	22
Residual waste	270	238	212
Malburgen Oost-Noord			
Paper/cardboard	26	35	36
Plastic packaging	2	6	18
Residual waste	305	287	225

Only waste in mini-bins and UC's !



Results in kg/person/year

	Arnhem 2011	Trial areas average 2014	Increase
Plastic packaging	5,0	19,4	288%
Paper and cardboard	42,0	49,5	17,9%
Residual waste	247,0	213,6	-13,5%

Results in kg/person/year

	Arnhem 2011	Low-rise trial area 2014	Increase
Plastic packaging	5,0	21,6	332%
Paper and cardboard	42,0	63,5	51,2%
Residual waste	247,0	211,8	-14,3%

Pollution of public area (monitoring every container 2 x per week)



Quality levels

A+	No waste next to UC.
A	Little waste next to UC (1 item).
B	Relatively large amount of waste next to UC (3 items maximum).
C	Large amount of waste next to UC (5 items maximum).
D	Very large amount of waste next to UC (more than 5 items).



Results 2014	Quality level				
	A+	A	B	C	D
Over het Lange Water	93.8%	3.2%	1.7%	0.5%	0.8%
De Laar-West	93.0%	3.3%	2.1%	0.6%	1.0%
Malburgen Oost-Noord	86.3%	5.8%	3.9%	1.4%	2.5%
Average of 3 trial areas	91.4%	4.0%	2.5%	0.8%	1.3%



Residents satisfaction survey

Prior to start, after 6 and after 12 months

Representative sample
(3,000 households)

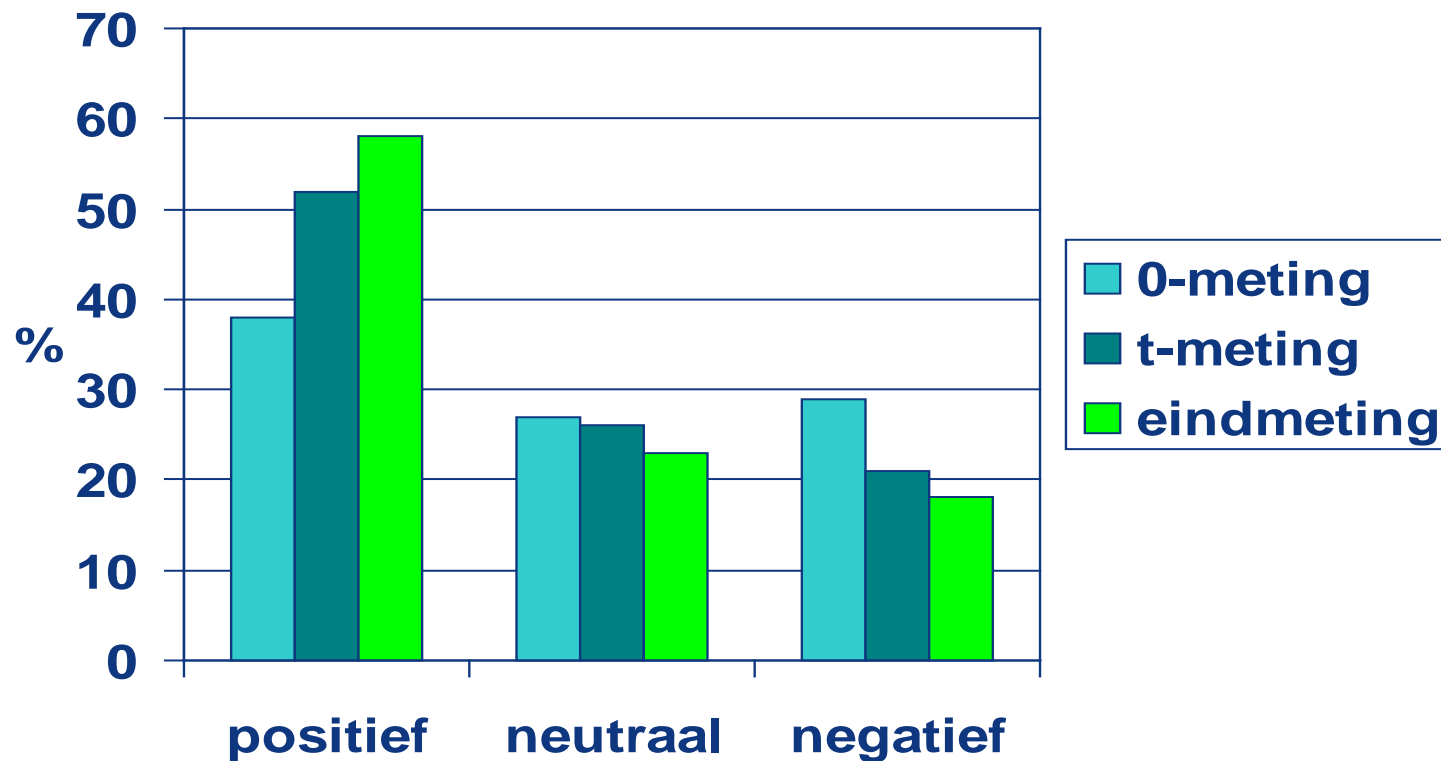
After 12 months: every household.

People with reduced mobility !
Group discussions !

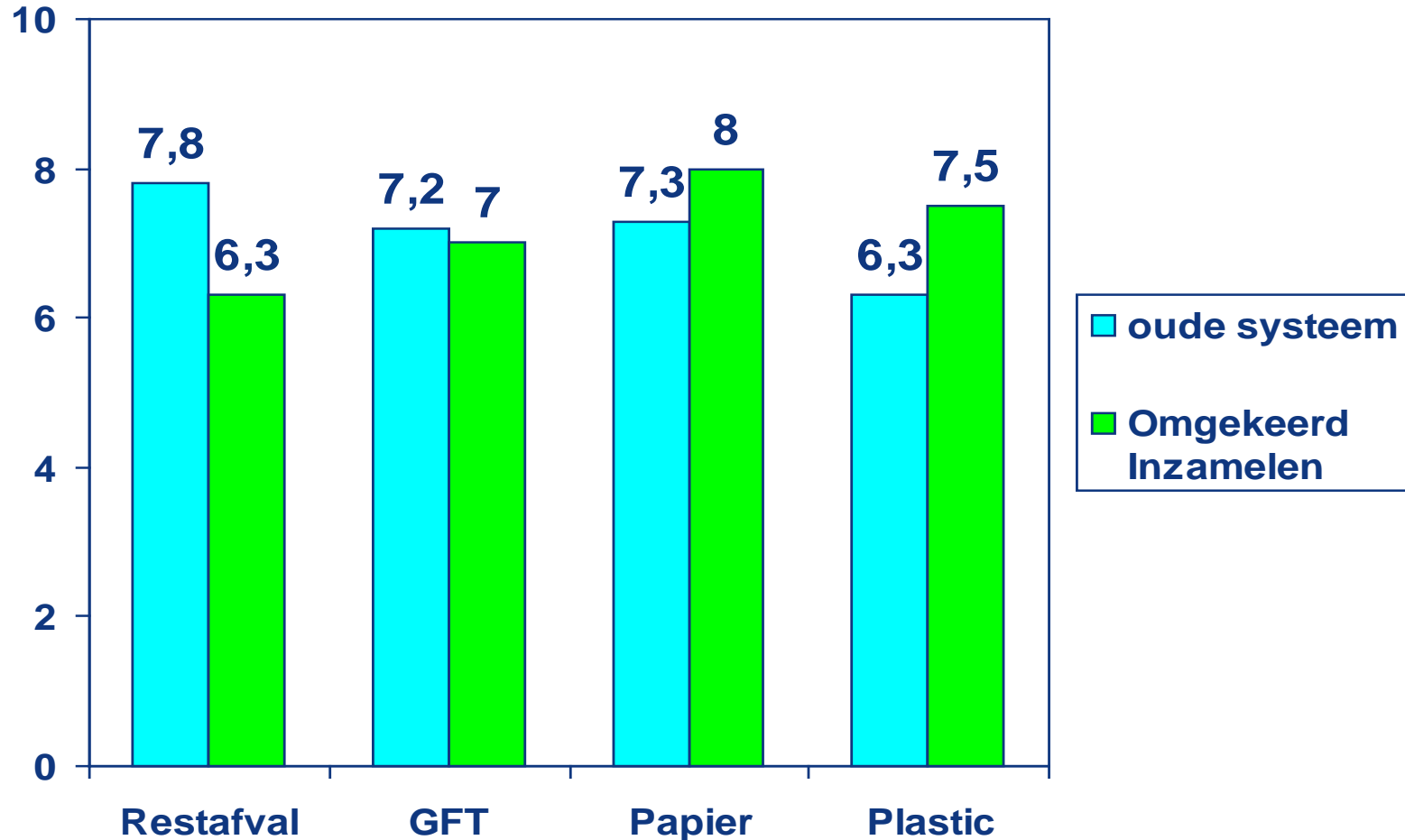


ISWM - TINOS

Opinion about Reversed Waste Collection



Marks for old system and for Reversed Waste Collection



Financial evaluation:

- WMP estimate : investment costs are about 7 million Euro for underground containers, access control systems, waste cards and mini-containers.
- Current estimate: 6.4 million Euro.
- Lower annual net costs for waste collection and processing after about 5 years !

Conclusions

- More source separation !
- Increasing residents satisfaction !
- Costs lower than expected !
- Little pollution of public areas !

Should we roll out ReWaCo across the entire city ?

More information on:
www.arnhem.nl/rewaco

Thank you for your attention!