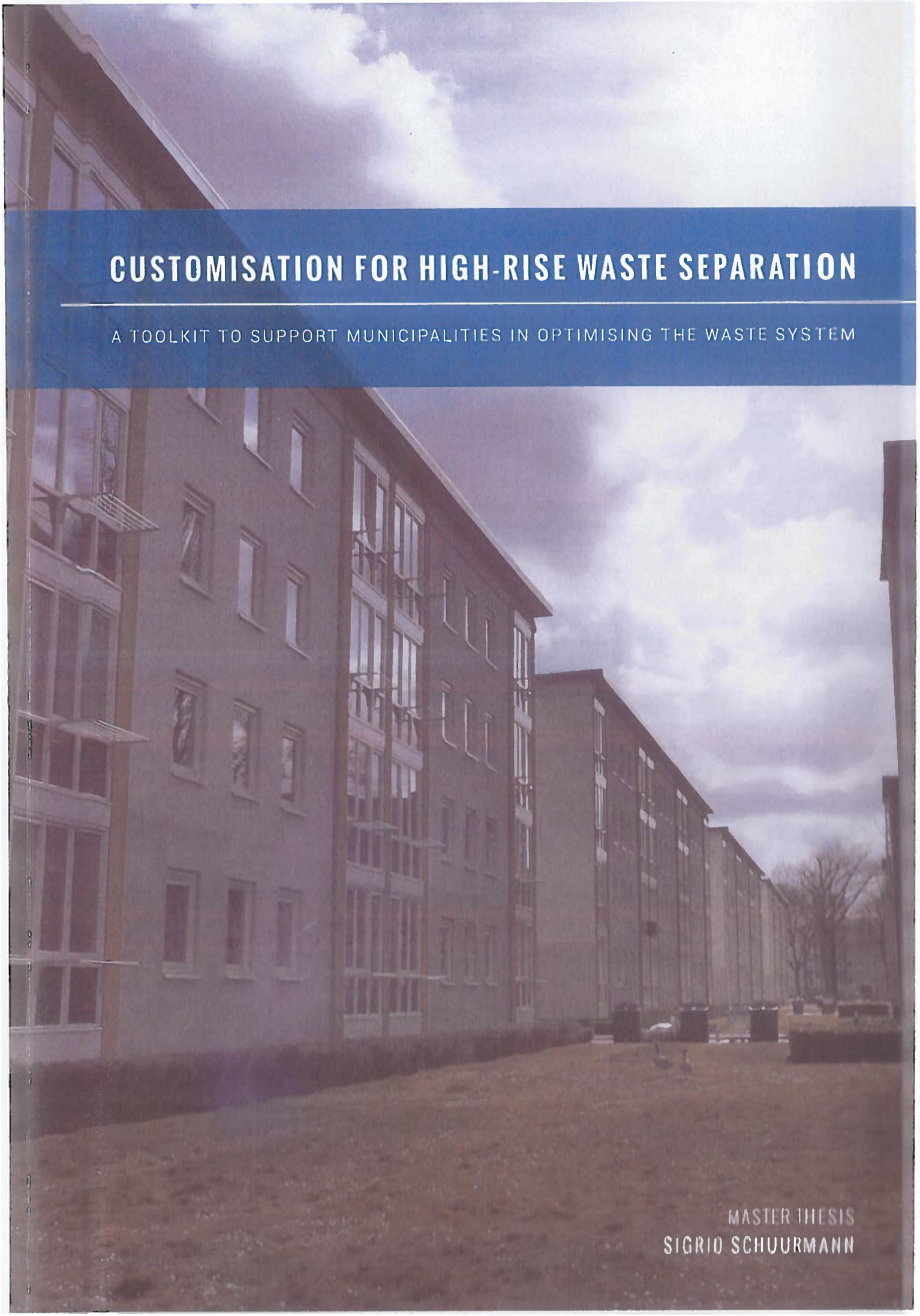

CUSTOMISATION FOR HIGH-RISE WASTE SEPARATION

A TOOLKIT TO SUPPORT MUNICIPALITIES IN OPTIMISING THE WASTE SYSTEM

MASTER THESIS
SIGRID SCHUURMANN

Figure 1. The 'Maatwerk voor Afvalscheiding' toolkit

EXECUTIVE SUMMARY

With the Netherlands moving more and more towards a circular economy, stricter waste management policies and regulations demand developments in the household waste separation sector. The more household waste that is collected in separate fractions, the more waste that can be reused or recycled into valuable material again, rather than ending up at the landfill. Dutch waste system developments like Reversed Waste Collection and 'polluter pays' systems are implemented more and more by municipalities and have ensured that low-rise waste separation has reached a reasonable level. However, high-rise still lags behind significantly due to the influence of various contextual factors on separation behaviour.

The initial aim for this graduation project was to design an incentive system in order to stimulate household waste separation in high-rise areas. A deprived high-rise neighbourhood in Arnhem was chosen as a case study for this project, under the important condition that the designed solution would be applicable in other high-rise areas as well, in order to be cost effective. After extensive analysis of waste systems, separation behaviour and high-rise contexts and exploration of different ideas and concepts, the conclusion led to a change in the design direction.

On the one hand, it seemed impossible to develop an innovative 'one size fits all' solution for every high-rise area, because of the great discrepancies between high-rise contexts, its residents and the corresponding waste systems. On the other hand, municipalities often implement a waste system citywide, while the aforementioned context differences indicate that one type of system will not affect every high-rise context. In other words: in order to stimulate high-rise residents to separate their waste, context-specific – customised – solutions are needed.

In addition to basic waste systems and facilities, many so-called intervention strategies exist that could somehow stimulate someone's separation behaviour. These interventions exist in various shapes and sizes and nowadays, municipalities experience difficulties with finding a clear overview of all possibilities as well as searching for the right (combination of) interventions for a particular neighbourhood.

The 'Maatwerk voor Afvalscheiding' (MvA) toolkit is therefore developed to support municipalities in finding a context-specific addition to the existing waste system, in order to eventually stimulate high-rise waste separation behaviour (Figure 1). A toolkit session should be held by a project group, not only participated by the municipality and its cooperating waste management company, but also with social stakeholders like a social housing company, a welfare organisation, a neighbourhood platform and perhaps even high-rise residents. These parties are more involved in the particular high-rise area, allowing the project group to make a more substantiated decision.

Individual usability tests have indicated that potential users are very enthusiastic about the MvA toolkit and find it a relevant and welcome development in the field of high-rise waste separation. Further development is needed in order to complete the toolkit and pilot sessions with project groups have to find out whether a realistic discussion and outcome can lead to a context-specific addition to the waste system. For now, the MvA toolkit seems to be a promising design and chances are that this project will be continued.

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1 INTRODUCTION

This graduation project has been executed in cooperation with social enterprise Lentekracht. The assignment involved an independent project running parallel to one of the ongoing projects of Lentekracht.

1.1 PROJECT BACKGROUND

Lentekracht is a young social enterprise, founded in January 2015 by Koen Vrielink and Daan van den Berg and located in Nijmegen. In collaboration with young talents and a large network of experts, Lentekracht develops solutions for spatial and socially relevant challenges. The majority of their projects focuses on creating impact on neighbourhood level. An example is 'Stadslab Nijmegen': an online and offsite platform to form a bridge between citizen ideas and initiatives and the municipality Nijmegen.

MIJNwijk

In 2015, Lentekracht participated in a project initiated by social housing company 'Volkshuisvesting Arnhem', called MIJNwijk. This project has started in the neighbourhood Malburgen-West in Arnhem and is primarily centered around the so-called 'problem area' of Malburgen-West: 372 households in high-rise apartment blocks, called 'Wonderflats' (Figure 2). The aim of MIJNwijk was on the one hand to keep valuable waste streams in the district for a better local economy and on the other hand to improve the neighbourhood's liveability, social cohesion and resident participation.

Malburgen-West is part of the neighbourhood Malburgen and in 2007, Malburgen was defined by Minister Vogelaar of Housing, Communities and Integration as a focus neighbourhood ('aandachtswijk') which means it was eligible for restructuring. Even though in the course of time improvements were made like the advent of newly built apartments and a physical makeover of existing high-rise flat blocks, the district – in particular the abovementioned Wonderflats – is still facing a high unemployment rate and weak social ties. Almost half of the population has a foreign background and over 10% lives from social benefits.

An additional problem and one of MIJNwijk's starting points is the poor household waste separation behaviour. Very low recycling rates and a huge amount of constantly recurring street litter and filth are not unfamiliar for this district. MIJNwijk has tried to bring this problem under attention by organising 'cleaning days' together with the residents and by renovating the public space in between the flat blocks (Figure 3). However, no satisfactory solution has been found yet in order to radically change the residents' waste behaviour.

Figure 2. The Wonderflats, focus context of MIJNwijk

Figure 3 Impression of MIJNwijk activities

1.2 STARTING POINTS

This graduation project addresses the waste separation behaviour in high-rise contexts. The following starting points substantiate the need for a new solution in the field of waste separation.

Waste targets

Household waste is composed of a large number of valuable waste fractions. The main waste streams which can be collected separately are plastic or PMB (plastic including metal cans and beverage carton), organic waste, paper and cardboard waste, glass, textile, small chemical waste and bulky waste. Waste that does not belong to one of these fractions is called residual waste. Examples are Styrofoam packaging, diapers, chewing gum and cat litter.

Although in theory the major part of household waste can be separated, in practice only half of the Dutch household waste is collected separately. In 2013, the annual amount of household residual waste was on average 240-250 kilos per person (Ministerie van Infrastructuur en Milieu, 2014). Together with the Dutch municipalities, the Ministry of Infrastructure and Environment has set a target for 2020: from 250 to 100 kilos residual waste per inhabitant per year. That means rigorous plans are needed to change the waste separation behaviour of the Dutch population.

High-rise vs. low-rise

Significant differences in waste separation behaviour are noticeable not only on community level, but also on a smaller scale. High-rise lags behind low-rise on household waste separation behaviour due to various circumstances. The lack of decent facilities, a small apartment and odour nuisance are several examples of essential waste separation barriers. In practice it is noticeable that newly implemented waste systems are often centered around the facilitation for low-rise houses, while there is still so much to achieve on waste separation in high-rise apartments.

1.3 ASSIGNMENT

The assignment of this graduation project was initially formulated as follows:

"Design an incentive system to motivate high-rise residents to separate their household waste"

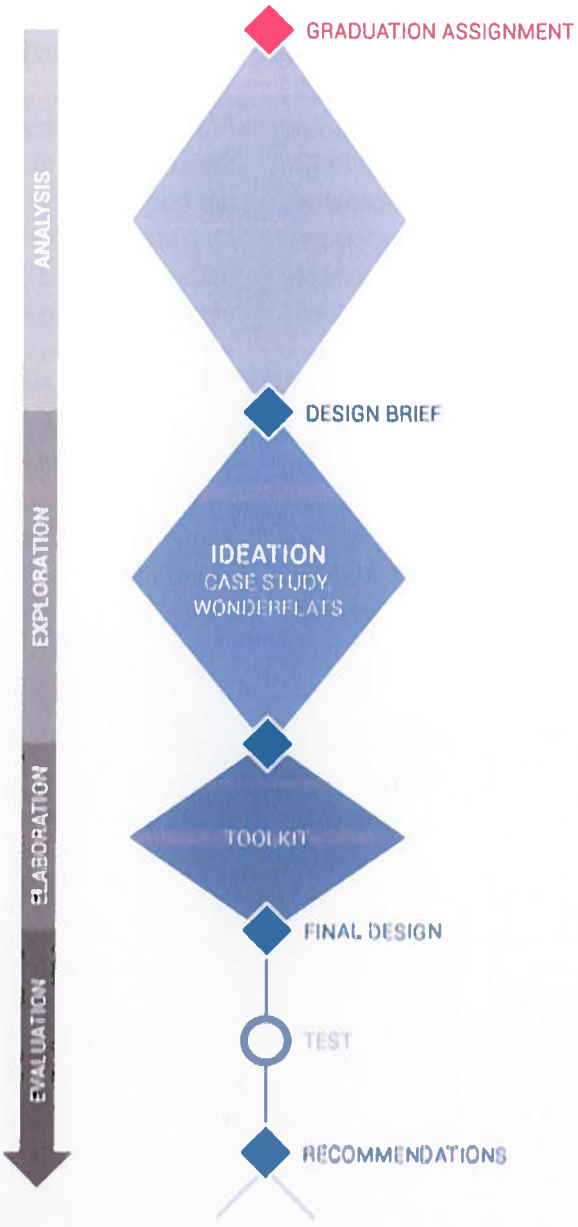
Project structure

At the start of the project, the main purpose was to come up with a target group specific stimulating system in order to improve residents' waste separation behaviour in high-rise areas. The Wonderflats in Malburgen-West served as the project's context, under the important condition that the design should also be applicable in other high-rise areas in order to be effective on a larger scale.

During the project's process, the analysis conclusion led to a change in the design direction. It became apparent that a 'one size fits all' solution for high-rise areas was not feasible. The project's outcome changed into *a toolkit that supports municipalities to compose a context-specific set of interventions* in order to optimise the current waste management system and to eventually stimulate high-rise residents to separate their household waste. In the course of the report this will be explained in detail.

The analysed context – the Wonderflats – hereby served as a case study throughout the project and was used during the 'Exploration' phase in order to generate context-specific ideas and concepts, and during the 'Embodiment' phase to serve as an example of the toolkit's use.

The design process of this graduation project is divided into four phases and visualised in Figure 4.



9 RECOMMENDATIONS

Based on own evaluation and usability test results, fine-tuning of the MvA toolkit is required in order to make the toolkit implementable. This Chapter finalises the project with recommendations for further development.

Property

This graduation project is executed for social organisation Lentekracht. In case the MvA toolkit is going to be further developed, it is interesting to search for other parties who could get involved in the project, for organisational purposes as well as the toolkit' s accessibility for municipalities and project groups. A cut-out of the system map in Figure 71 (the original map is shown in Figure 31 on pages 34-35) shows the stakeholders which are closely involved in municipality decisions regarding waste management.

Organisation

During the usability test, Erik Posthumus from municipality Arnhem suggested to get into contact with the NVRD (the Dutch Royal Association for Waste and Cleaning Management) who might be interested in the MvA toolkit. The municipality is member of this branch organisation, and they have an important advisory role when it comes to waste management sytems and interventions. Erik Posthumus indicated that the NVRD could be an interesting stakeholder as overarching organisation concerning the MvA toolkit, for example for keeping the interventions complete and up to date.

Geert Steeghs mentioned that in addition to the NVRD, the national Department of Public Works could also be an interesting partner, since they are highly involved in waste problems and developments as well. Geert Steeghs also indicated that the VNG and VA perhaps are less interesting stakeholders to approach, since the VNG is not much engaged in waste problems and the VA has no direct advisory role to the municipality. A recommendation for this project would be to get into contact with the aforementioned stakeholders to see whether they might be interested to support further development of the MvA toolkit.

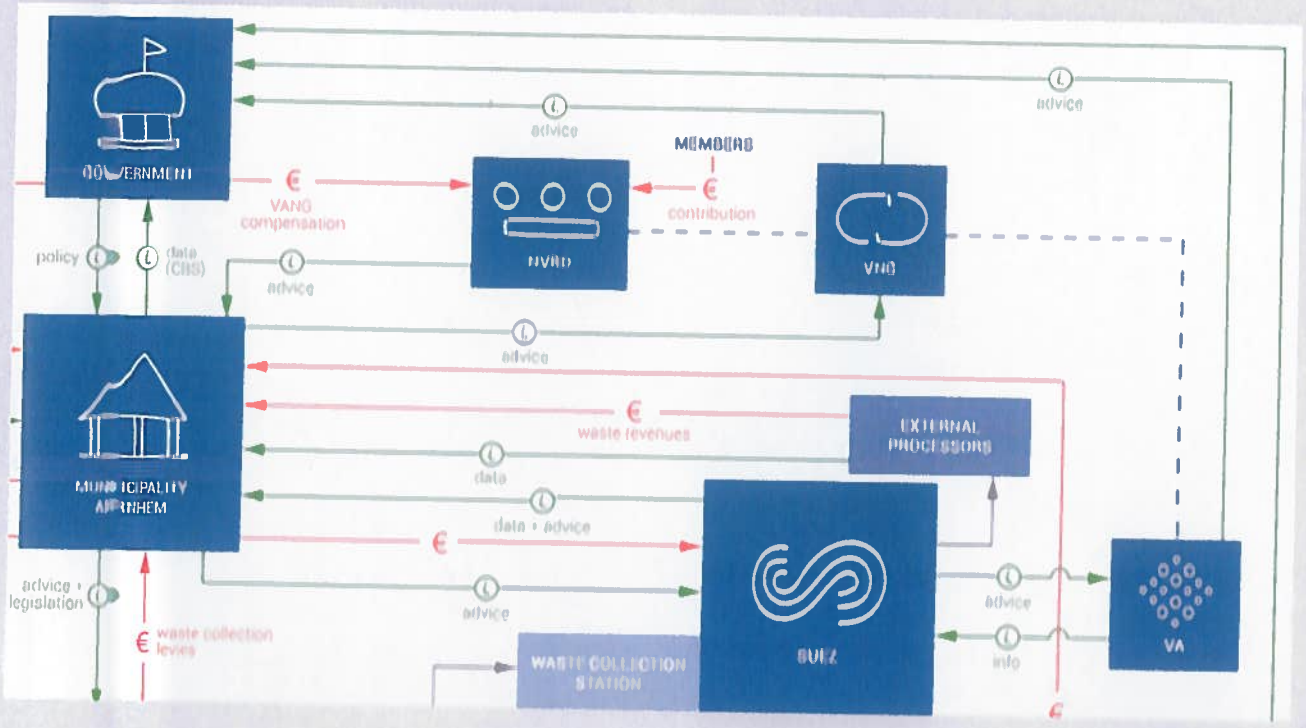


Figure 71. A cut-out of the system map

Accessability

If the MvA toolkit would be owned by an organisation, it must also be considered in what way the toolkit is accessible to municipalities and project groups. During the toolkit's development it is taken into account that because the range of interventions will be updated and therefore change regularly, the different components have common paper formats (from A5 to A2). This way the components can be printed out on A4, optionally be pasted on cardboard and folded (see Figure 72). Even when the toolkit is only available online, it can be easily assemblied by project group into a physical toolkit.

Development

Two aspects that were observed during development and the usability test that requires some fine-tuning before the MvA toolkit could actually be used in (pilot) sessions, are influences for separation behaviour and the concreteness of the toolkit's outcome.

Further research

The contextual factors and indicators for separation behaviour used in the toolkit's decision tree were derived from literature analysis and own observations in two different high-rise contexts. Although the test participants did indicate that they had the impression it was a logical choice of indicators, further toolkit development requires some extra field research in order to confirm the choice and completeness. It would be recommended to investigate in more and various high-rise areas, to figure out whether contextual factors might have been overlooked during this project.

Output

Geert Steeghs from SUEZ rightly pointed out the uncertainty of the toolkit's outcome and the concern that it might interfere with policymakers within the municipality. The initial aim of the toolkit was to end a session with a concrete intervention or combination of interventions, that can be elaborated in a further project phase, eventually leading to pilots in a particular high-rise area. A realistic project group discussion and toolkit's outcome could not yet be tested during this project because of incompleteness (of interventions) and time limitation, therefore it is recommended to include this in further development.

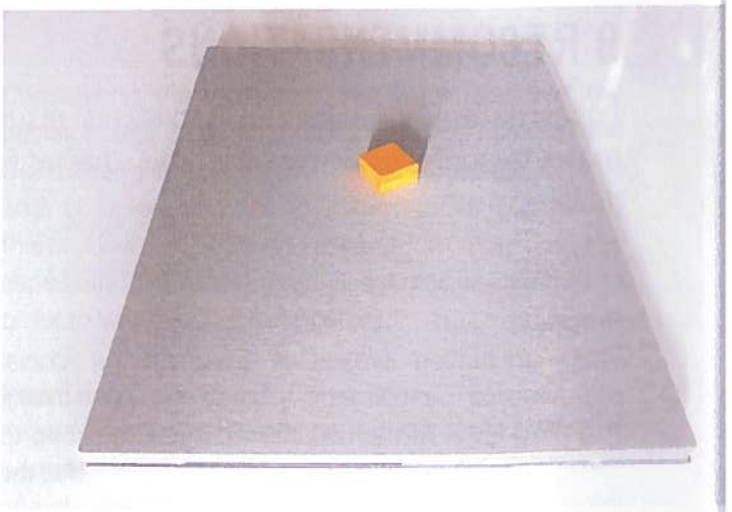


Figure X. Printed and folded MvA toolkit (A4)

Pilot sessions

In line with the previous recommendation to develop and test the toolkit's outcome and group discussion, pilot sessions with the MvA toolkit should also find out whether the suggested target group and facilitation is the best possible way to carry out a toolkit session.

Target group

During the usability test, everyone clearly agreed with the suggestion that a toolkit session should also involve social and neighbourhood stakeholders, instead of just the municipality. Geert Steeghs did mention it is questionable whether high-rise residents should also participate. For instance, when residents are member of a neighbourhood council, it could be interesting to engage them in a session since they are closest to the residents and their needs and demands.

Facilitation

Although the MvA toolkit has a manual that guides the project group through the session, a facilitator would be desirable in order to lead the group discussion and keep track of time. The test participants agreed an external facilitator would be better than one of the stakeholders, to ensure the session (and in particular the discussions) can be leaded impartially. It is difficult to predict the amount of time that is needed in order to reach a satisfactory result. Therefore, pilot sessions are needed to determine the optimal facilitation and time management for discussion and decisions.

Expansion

Once the toolkit in so far has been developed that (pilot) sessions can be carried out, it is also interesting to look for further opportunities to expand the MvA toolkit and maybe use it for other purposes as well.

Interventions

Until now, the interventions used for the toolkit are applied and/or developed in the Netherlands. It would be interesting to look beyond the borders for international solutions too and to discover how these intervention strategies could be implemented in the toolkit and broaden the variety.

In addition to the foregoing, perhaps an (inter) national platform could be a promising tool in order to keep overview of the interventions and to simply add new strategies and keep the collection up to date. The test participants did indicate the added value of a physical board 'game', however, a platform could be a digital addition, especially when the toolkit is accessible online as a printable version.

Multiple versions

The MvA toolkit is developed with the aim to stimulate household waste separation in high-rise areas. With this focus on waste separation, other waste problems like street litter have not been included in this project. This is done on purpose, since the prevention of street litter requires a completely different approach and analysis of influencing factors. However, perhaps for a more distant future, a second version of the MvA toolkit could be considered with the focus on street litter. Geert Steeghs from SUEZ did mention during the test this would be interesting, since the prevention of street litter can also be addressed with intervention strategies.