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Materials and modes of translation: Re-imagining inclusive “zero”-waste futures

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In this paper, we present and reflect upon a creative and participatory approach for engaging citizens in imagining desirable “zero”-waste futures that include different values and perspectives. The approach emerged through a 4-month collaboration involving academic researchers and creative professionals and was prototyped in a formerly industrial neighborhood of Utrecht (*het Werkspoorkwartier*), currently being developed as a creative circular manufacturing area. With our approach, we inquire into and provide an alternative to predominant technology-centered policy visions, which portray the issues of waste as objective challenges that can be addressed through data-driven technological solutions. Such visions neglect many other perspectives and values, particularly those of citizens that face the issue of waste in everyday life, thus providing only a narrow vision of how the future might look like. To gather and articulate different perspectives on alternative “zero”-waste futures, we focus on citizen-science-inspired and speculative design methods to engage people and stimulate imagining futures that bring to light diverse values and perspectives. In the development of the methods, we work in close collaboration with creative practitioners, both in terms of anchoring the research in a real-world context and in terms of combining our different types of expertise. Reflecting on the project, we discuss the potential of our transdisciplinary approach and the co-produced methods to intervene in how we see and imagine alternative futures. We do so by taking “translation” as an analytical lens to understand how different meanings and visions are created through experiential, material, and affective modes of expression. Specifically, we will analyze the translations that occur in the processes of moving from abstract data to matters of concern, and from desirable futures to actionable presents. Looking at these multiple processes through the lens of translation will serve to investigate how different future imaginaries are generated through different materials and modalities of translation, offering different forms of engagement in shaping inclusive urban futures. Translation here will be conceptualized less as a perfect transference of information and more as an open-ended process of paying attention to different values, and identifying those matters for which to care for in our urban futures.

KEYWORDS

zero-waste alternatives, transdisciplinary, translation, matters of care and concern, creative methods, social design

Introduction

It is now widely acknowledged that climate change is real and that there is a great urgency to act. The European Environment Agency tells us, the “core systems of our societies will have to change dramatically” for sustainable transitions to succeed (European Environment Agency, 2022). Faced with environmental degradation, traffic congestion, and a lack of basic services, such as waste management, cities are at the forefront as both causes and potential enablers of sustainability transitions. Yet, solutions to the lacking sustainability of cities are often sought in terms of technological innovation, leading to techno-centered “smart” city imaginaries that fail to address the socio-technical systems that lock in our modernist cities and the complex dynamics of urban life (Hajer and Versteeg, 2018).

Waste provides a useful example of how sustainability issues are perceived and addressed through technological solutions, involving for instance image recognition technologies or smart sensors placed on public trash bins. While such technologies may improve waste management, they miss addressing wider systemic and cultural issues, the importance of local contexts, different worldviews, everyday practices, and lived experiences. In techno-centric visions of optimized cities, waste-management facilities (e.g., bins) are a dot on pristine data visualizations, addressed behind desks and away from the actual material presence of waste. On the ground, waste has an aesthetic and sensorial presence. It can be ugly, smelly, visually, and olfactory repulsive. However, waste also reveals wider societal issues, exposing social inequalities, spatial, environmental, or economic injustices. By disconnecting themselves from what happens on the ground, and the wider societal context, technologically driven solutions fail to achieve far-reaching change, either by not addressing the “value-action gap” (Evans, 2010) or indeed missing out on rich sustainability knowledge and practices of local inhabitants.

In this context, some scholars have pointed out that the climate crisis is not only a crisis that is relevant to the natural sciences, but that it is also a social crisis and indeed, a “crisis of the imagination” (Haiven, 2014; Ghosh, 2016). Amitav Ghosh notes the absence of climate change in novels, the literary format of Western modernity that up until this day is considered “serious fiction” (different from, e.g., science fiction). In this literary tradition of the last three centuries, to Ghosh, there is a “crisis of the imagination” because business as usual continues as if the environment will remain the same calculable and predictable entity as we know it, even while global warming is causing more and more unpredictable freakish and extreme weather events (Ghosh, 2016, p. 7–24). To Max Haiven, there is a “crisis of the imagination” as long as global crises, such as the climate crisis, are not recognized as “crisis of capitalism.” To him, capitalism is the “pathological” system that only serves the “value of the market” instead of giving room to the “plural values of humanity” oriented toward human

flourishing and justice (Haiven, 2014, p. 4–5). This “crisis of the imagination” highlights therefore a pressing need for articulating new “social imaginaries” (Bendor, 2018, p. 132) that reflect perspectives other than the dominant business-as-usual ones, and that collectively can inform alternative worldviews. Taking an approach that is sensitive to the social aspect of climate change and sustainable transitions means a radical shift in mindsets and an acknowledgment that there are no universal solutions. Thus, it becomes critical to bring into focus different perspectives and imaginaries on what sustainable futures might look like to identify actions that reflect the diverse ways in which sustainability issues materialize locally. This reflects a key concern of sustainability transition scholars regarding how to address sustainability in a more nuanced manner by working with inherent complexity and contestation (Köhler et al., 2019).

Against this background, in this article we will reflect on our experience of using creative methods to stimulate engaged meaning-making and imagination of alternative sustainable futures that allow for the inclusion of different values and perspectives. Specifically, we will reflect on our insights gained from a project titled “Co-creating ‘zero’-waste urban futures,” which was developed with a small seed fund from the *Transforming Cities Research Hub* at Utrecht University. During a 4-month collaboration involving academic researchers and creative professionals, we prototyped a transdisciplinary approach and a set of methods to support the co-creation of alternative imaginaries. The activities took place in a former industrial neighborhood of Utrecht, *het Werkspoorkwartier*, that is currently developed into a creative circular manufacturing area. The co-creation of imaginaries focused on the issue of “zero”-waste, an issue which we complicated by engaging in critical conversations of what waste means to whom, and the various politics that come into play by obscuring, eliminating, or ignoring issues of waste, hence the use of “zero” in inverted commas.

In our project, the collaboration with creative practitioners played a crucial role as it helped us expose and address an important gap when it comes to imagining futures that bring to light different values, meanings, experiences, and aspirations—a critical aspect of redressing the “crisis of the imagination” discussed above. Specifically, our collaboration highlighted the significant difficulties encountered during transdisciplinary exchanges and co-creation on the ground. This stemmed from the different worldviews and concerns that came to the fore, such as the broad theoretical concerns around academic conceptions of sustainability and the pragmatic and grounded concerns with local sustainability issues as first-hand experienced in daily life by the inhabitants of the area. Working in close collaboration with creative practitioners based in *het Werkspoorkwartier* allowed us to tackle this challenge by going back and forth between various domains, such as academic research and situated

artistic practice, publicly available data and citizen science ways of experiencing the area, quantitative and qualitative methods, municipal development visions, and collaborative speculation. In this article, we propose these movements between different domains as the processes of translation. Translation here will be conceptualized less as a perfect transference of information or reliable rendering of reality and more as a process of articulating different values and generating different perspectives.

As we are theorizing a socially-committed approach to translation, we also make an attempt to integrate a process of translation into our own article by including illustrations from the social designer Maartje de Goede, one of our collaborators in the project. With these illustrations, we hope to translate part of our ideas in non-academic language, which is an important aspect of Maartje de Goede's social design principle, namely, that design does not happen for people but with them.

In what follows, we will first critically discuss dominant ways in which the future is conceptualized around issues of waste. In particular, we will point to the limitations of a narrow set of meanings and visions that result from the convergence of smart and sustainable city discourses. It is relevant to understand future imaginaries not only in terms of meanings and visions that they provide, but also in terms of how this meaning- and vision-making process is taking place. This requires paying attention to the form and process of imagination and how this can be a collaborative practice that embraces a plurality of perspectives, values, worries, and aspirations. For this purpose, we will first raise the importance of articulating what Latour terms "matters of concern" (Latour, 2004), by developing creative methods to invite engagement with those issues that are considered meaningful by inhabitants. Second, borrowing from Puig de la Bellacasa we will discuss possibilities of collaborative speculation toward what might be "matters of care" (Puig de la Bellacasa, 2017) for desirable futures. For this purpose, we will discuss the methodological approach we took in the "Co-creating 'zero'-waste urban futures" project and outline textually and visually different methodological steps. This will be followed by a closer analysis of some of the key insights we gained through this experience. We do this by analyzing our methods in terms of two processes of translation (articulating matters of concern in the present and speculating on matters of care for the future) that generate new kinds of meaning, supported with visual representations inspired by social design practices. Finally, we conclude with reflections on the potential of the lens of translation to understand the value of transdisciplinary exchanges when aiming to address pressing sustainability challenges in our cities. Such exchanges cannot be reduced to the products of creative encounters between different types of knowledge and expertise. It is an ongoing effort that needs to be sustained also beyond the project timeframe, "on the ground" and when publishing about the collaboration.

Conceptualizing future imaginaries

In this section, we will discuss dominant imaginaries of the city and ways of conceptualizing different kinds of futures. In doing so, we will outline some important elements of our transdisciplinary approach, which is geared toward bringing academic and non-academic perspectives together and collaboratively design a process in which a diversity of desirable futures can be imagined by different participants. For this purpose, we will discuss the relevance of critical academic approaches to current entrepreneurial and technological discourses about smart and sustainable cities, to give insight into dominant imaginaries and wider the context of our research. Moreover, we will also discuss how some of these critical perspectives stand in tension with the ways the concept of zero-waste is employed on the ground to formulate common concerns and organize engagement around articulating desirable futures. As we will show, holding this tension and using it as an opportunity for dialog is the one key aspect in the design of our transdisciplinary approach. Another crucial element of this approach was to shift away the attention on future imaginaries in terms of the ideas they contain toward the process through which these imaginaries have been constructed. In other words, focus is placed on the process rather than on the outputs and their quantity. This also serves as an important foundation for the collaborative, experimental, and creative methods that we coproduced as a part of our transdisciplinary approach.

Imaginaries of the future city: Smart, sustainable, and "zero"-waste

In political and entrepreneurial discourses, visions of the "sustainable city" tend to converge nowadays with visions of the "smart city" toward a hybrid smart-sustainable city imaginary (e.g., Ahvenniemi et al., 2017). In this section, we present a critical academic perspective on the limitations to some appealing future visions that result from the smart city paradigm. Yet, for our transdisciplinary approach, it is relevant to acknowledge that the vocabulary of academic critique does not always match the equally critical engagement in articulating desirable futures by the inhabitants of *het Werkspoorkwartier*. As we will show, the notion of "zero"-waste is particularly useful for bringing these two perspectives into dialog which serves as the basis for developing our transdisciplinary approach.

The smart city paradigm, as a concept and set of technologies, is increasingly adopted by municipalities in their attempts to make cities more sustainable by addressing what are seen to be inefficiencies in the *current* urban system, in sectors such as transport, energy, or waste. As Miller points out, the "smart" of the smart city stands in for technological innovation, often linked to "greater control, extraction of data,

and the spread of ‘surveillance capitalism’” (Miller, 2020, p. 370). At the same time, sustainability, particularly as articulated in the context of improving efficiency in cities, “acts as an imaginary that shapes science, technology, and social order to attain desirable futures” (p. 365). This brings to the fore an important point of convergence between sustainable future imaginations and science and technology innovations in the realm of smart cities. Moreover, despite a strong emphasis on the importance of public input and engagement, particularly in transitions management literature (Seyfang and Smith, 2007), sustainability policy and planning is increasingly a domain driven by bureaucratic, scientific, and technological expertise (Miller, 2015). As such, urban sustainability is often defined by technological developments, standards, and indicators focused on delivering efficiencies or lowering carbon emissions (Miller, 2020, p. 367–8).

Among the so-called smart innovations introduced to waste management and recycling in the Netherlands are smart trash containers and the switch from separating plastic, metal cans, and drink cartons by private households to separating after disposal (“nascheiden”) by means of high-tech shredding. These waste and recycling systems are presented by Dutch municipalities (e.g., Utrecht, Leiden, Rotterdam, and Amsterdam) and the corporations that provide and maintain them (e.g., AVR) as integral elements of a future “smart and sustainable” city.¹ Yet, it is important to ask: Who is benefitting from these solutions? Do these solutions help to fundamentally address problems of production and consumption, or do they implicitly maintain the status quo?

Smart city critics such as Hollands (2008), Kitchin (2015), Luque-Ayala and Marvin (2015), and March and Ribera-Fumaz (2016) have pointed out that an underlying driver for building smart infrastructures is a high-tech entrepreneurialism that operates according to the interests of commercial companies without guarantees that investment will advance the welfare of the city. Moreover, the emphasis on scientific and technological developments and expertise leads to depoliticizing sustainability, despite the fact that sustainability projects and policies are “deeply contested and political” (Miller and Lubitow, 2014). In using big data, algorithms and other smart technological developments to address sustainability, issues are portrayed as

1 See for example: “Mr. Fill DÉ Slimme Afvaloplossing: Mr. Fill. (n.d.)” *Mr*, 23 Aug. 2021, <https://www.mr-fill.com/nl/>. “Home - AVR - Too Good to Waste.” (n.d.) *AVR*, 29 July 2021, <https://www.avr.nl/nl/>. “Nascheiding PMD Uit Restafval Bij Avr. (n.d.)” *Recycling Nederland*, 28 Oct. 2021, <https://recyclingnederland.nl/sorteren/nascheiding-pmd-uit-restafval-bij-avr/>. Gemeente Utrecht. “Scheiden Plastic, Blik En Pak Afval Hoeft Niet Meer Thuis.” (2021) *Wapen Van De Gemeente Utrecht*, 7 Sept. 2021, <https://www.utrecht.nl/nieuws/nieuwsbericht-gemeente-utrecht/scheiden-plastic-blik-en-pak-afval-hoeft-niet-meer-thuis/>.

apolitical. Yet in doing so, municipalities and governments are advancing techno-political goals, such as technological progress, economic development, efficient resource use, and social control (Mattern, 2017; Sadowski and Bendor, 2019). As such, it becomes clear that under the guise of seemingly incontestable societal benefits, certain interests are privileged over others. Besides being presented as uncontroversial in the places where they are developed, smart city solutions are often also thought of as being transferable and possible to replicate in different city contexts with less attention paid to local specificities (Cugurullo, 2018; Sadowski and Bendor, 2019), which nevertheless remain critical if a more nuanced approach to sustainability transitions is to be taken (Köhler et al., 2019).

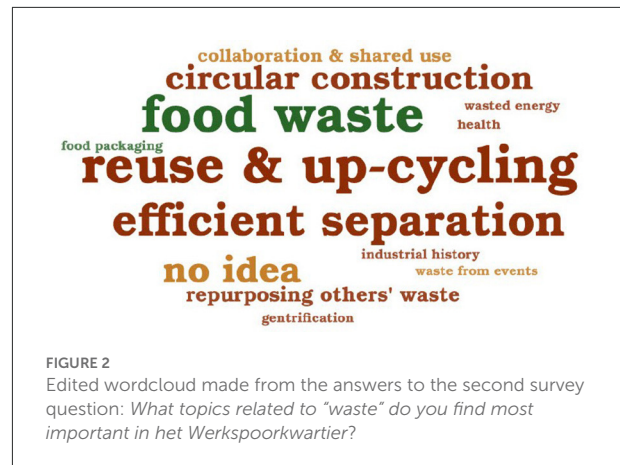
Critiques of the smart city also resonate with feminist science and technology studies perspectives that use a vocabulary connoting different aspects of waste to draw attention to the irregularities that cannot be generalized, complexities that cannot be simplified, knowledge that cannot be disciplined, and the inconveniences that cannot be fixed by simple technological solutions. Instead of eliminating waste to “zero,” we find here the plea of “staying with the trouble” (Haraway, 2016), a turn to “dirt” (Mattern, 2015, 2017; van der Tuin and Verhoeff, 2022, p. 78–80), an appreciation of “contamination” (Tsing 2015 [2017], p. 27–34), and “mess” (Chiles et al., 2020). These critical approaches suggest an affirmative understanding of waste that also allows us to escape dominant technologies of optimization and efficiency. Waste, in such an understanding, may testify to systemic “inefficiencies,” yet this is not necessarily a problem that needs to be eliminated, as these inefficiencies may be rendered “meaningful” in the sense of Gordon and Walter’s concept of “meaningful inefficiencies.” Closely following ongoing trends of smart city IT systems to organize municipal services for its residents, Eric Gordon and Stephen Walter observe that these systems are increasingly made efficient in terms of “cost-effectiveness, speed, and market distribution” (Gordon and Walter, 2019, p. 321). Yet, there is also a risk that these systems are geared toward directing people’s behaviors and tailored toward the “good user” (p. 313–4). To counter such a tendency and provide opportunities for civic engagement, Gordon and Walter argue that it is important that these systems provide “room for play,” which would allow for the “possibility of messiness,” “disorder,” and “waste” similarly to the way that Roger Caillois has referred to play as an “occasion of pure waste” (Gordon and Walter, 2019, p. 310–29; Caillois, 1961, p. 5). These inefficiencies are important, as they allow for “novel actions to emerge” and by extension civic engagement (p. 328). As such, an ideal vision of a zero-waste city as a seamless and efficient system needs to be treated with suspicion. This is because it can easily brush over important social issues and hide from sight the kinds of frictions and struggles that may be necessary to more radically transform our cities and wasteful practices.



As discussed above, an academic and theoretical embrace of waste and the messy may be convincingly conceptualized as a useful critical lens. However, there is a shift in the perspective when it comes to the everyday meanings, practices, and experiences around waste and wasting. As academics involved in setting up the project, we all came together through a shared concern with waste from a critical theoretical perspective. Yet in our conversations with our collaborators and some of the area's inhabitants before and during our workshops, it became clear that they were motivated by the very materiality of waste, and to find ways in which less wasteful practices could be created in the area. In a survey we conducted to ask about people's perceptions about waste in general and as related to *het Werkspoorkwartier* specifically, most respondents explained waste as "something no longer useful." Therefore, on a practical, grounded level, waste is not primarily thought of in relation to the critical potential observed in academic literature. Instead, it is understood as an absence of usefulness (refer to Figure 1).

This is further exemplified by answers to the second survey question of "What topics related to 'waste' do you find most important in *het Werkspoorkwartier*?". Again, there was not so much an embrace of waste as a critical theoretical perspective, but rather the ambition to significantly reduce waste already in the design process and also for the rest of the product's life cycle (refer to Figure 2).

These brief observations made based on our initial research results already showed the tension between critical theoretical perspectives that are concerned with social or environmental justice, and a strategic everyday vocabulary that allows people to come together and get involved in fighting environmental degradation and improving social issues on the ground. This tension, as we will elaborate further on, is a tension that lies at the heart of our transdisciplinary research approach that aims to bring together academic perspectives with locally grounded perspectives of inhabitants. To mark this tension between these different perspectives, we chose to write about "zero"-waste. With the inverted commas around "zero," we want to pay tribute to the critical academic perspectives that address narrow and



reductionist technocratic approaches focused on the "zeroing" of waste, which ignore the complexity of the societal issues revolving around waste and wastefulness. Despite this critical awareness, we continue using the term "zero"-waste, as it served as an entry point into conversations about desirable futures for the area, and it provided a way of bringing different people together through the shared concern of finding better ways of dealing with waste.

As such, the concept of "zero"-waste serves as a critique of dominant smart-sustainable city visions and simultaneously provides an appealing concern for people to come together and imagine alternative futures.

Imagining as form and process

The way *how* these futures are imagined is just as important as the content of these imaginaries. This has been observed by various thinkers that are pleading for new ways of thinking about our relations to everyday environments. To Morton, "the ecological thought" is not just a matter of content but of *form* (Morton, 2012, p. 4). Similarly, Haraway tells us that "It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with" (Haraway, 2016, p. 12). Thus, imagining the future is not only about the specific content of an imaginary but also the *process* of imagination: if "it matters what stories we tell to tell other stories with" it also matters whose stories are being told by whom, with whom, with how many, and how.

For instance, in their paper on techniques of futuring, Oomen et al. (2022) investigate the form and process of futuring in the context of contemporary sustainability politics. With techniques of futuring, they refer to the "practices bringing together actors around one or more imagined futures and through which actors come to share particular orientations for action" (p. 3). As such, they draw attention to the fact that futuring is not a neutral endeavor as it can shape policy

directions and support for certain developments in the present. As such, how futuring is done, or the techniques of futuring employed to envision the future, take a central role. Moreover, techniques of futuring are not a “preconceived script” but something emerging in a process, which further helps to understand imagination as a process, an activity rather than a thing (p. 12). At the same time, expert-led quantitative methods have become the default technique of futuring that plays into a widely shared “trust in numbers” and a sense of “scientific rigor” (Porter, 1996 in Oomen et al., 2022, p. 11). As Oomen et al. put it: “Currently, the ubiquity of forecasts, projections and scenario-modeling in public policy, politics and business planning in modern society creates a particular range of imagined futures, delimited in the ways they can imagine futures” (p. 15). Yet, with quantitative techniques of futuring, only a very narrow image of the future can be depicted. Thus, there is a need for a more encompassing toolbox that provides alternative forms and processes to think about the future that are appropriate to the complexity of problems we are facing with the issues such as climate change (Mangnus et al., 2021; Oomen et al., 2022, p. 15).

The idea that one mode of imagining the future is insufficient for the issues we are facing when it comes to “wicked problems” such as sustainability also underlies the argument of Mangnus et al. (2021, p. 4). In their paper, they further disentangle different approaches to the future and their respective strengths and limitations. They categorize different conceptual approaches to the future into predictive, plausible, experimental, and critical approaches (p. 3–4). These different approaches are able in varying degrees to make predictions, cope with uncertainty, creatively open up alternatives, allow for collective engagement, or foster a critical awareness of the differences and the particularities of all of the above approaches. This latter aspect of self-reflexivity, to Mangnus et al., is of relevance when it comes to imagining the future. As different approaches serve different purposes and open-up and close-off different futures possibilities, which futuring approach is chosen is a political issue that is entangled with power structures (p. 2, 4, 5, 6). Mangnus et al. show that the approach toward the future has far-reaching implications for how the futuring is being done, what future is made, and what is seen as worthy to further investigate.

The political significance of how futuring is done also lies at the heart of Ann Light’s writing, through which we may further understand the relevance of considering who is involved in the imaginative form and process. Light analyzes the potentialities and limitations of speculative design, which, with Oomen, Hoffmann, and Hajer we might call a specific technique of futuring, or with Mangnus et al. would fall into the category of an experimental approach to the future. Speculative design, Light notes, is “not [...] making workable products, but of critiquing them to reveal different possible futures” (Mangnus et al., 2021, p. 3). Yet, as she further analyzes, while speculative

design importantly provides an alternative and critical vision on the future, it oftentimes does not make the imagining itself a more collaborative process and the main imaginative work is done by the designer. To Light therefore, “speculative design is often clever, but this very cleverness can be detrimental to accessibility” (p. 5). This does not only stifle a more democratic engagement with the “future,” but also has been described as “elitist, Western, patriarchal” and as such tends to further privilege historically privileged groups (to develop her argument, Light builds on Prado de Martins, 2014; Prado de Martins and Oliveira, 2014; Wong and Khovanskaya, 2018). As such, speculative design that is the result of a design process with one authoritative author, risks foreclosing a multiplicity that might be more prevalent with a more participatory approach to design. This further shows that, when it comes to techniques of futuring, not only the conceptual approach to the future matters (whether it is predictive, plausible, experimental, or critical) but also who is involved in doing the imagining with whom.

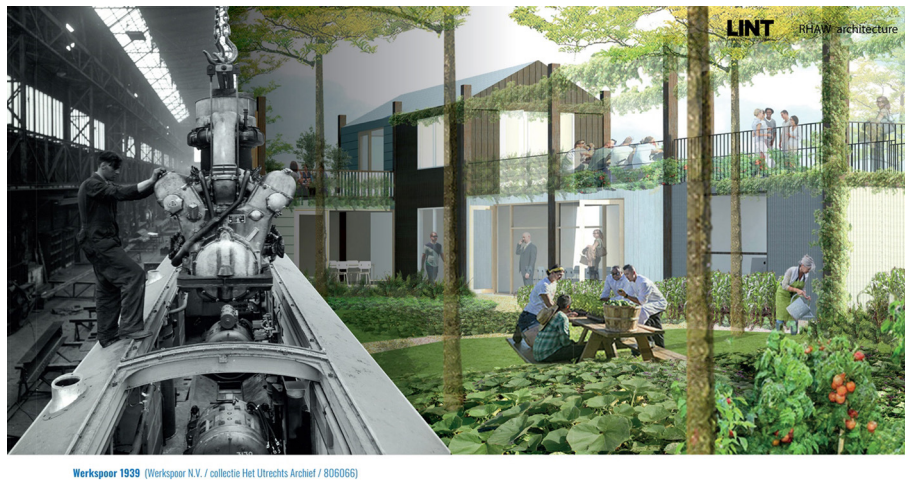
This discussion helps us to underscore that an analysis of alternative “zero”-waste imaginaries is not only about a close analysis of what visions and values are expressed in these imaginaries. Importantly, it is also about how these imaginaries are produced—in other words, what is the form and process of imagination. Consequently, the methods employed are a crucial component of the imaginaries. This will be the focus of the following section.

Methodology

With our interest in how imaginaries are generated in terms of form and process, the methodology we chose for co-creating “zero”-waste imaginaries is of importance. Our analysis focuses on the two workshops in the methodological steps of 4 and 5 for which we had between 7 and 12 participants. As the methodology in our transdisciplinary approach is intimately entangled with the place where our activities took place, we will first introduce the site of our residency and then outline our methodological steps.

Site of residency

For 4 months, our research activities were concentrated in the area of *het Werkspoorkwartier*, a former industrial area of Utrecht. Its name refers to the former factories of *het Werkspoor* and railcars were produced in this area from the last century until the 1970s. The area is currently being developed as a “creative circular manufacturing area” hosting various creative organizations that engage in different ways with the notion of



Werkspoor 1939 (Werkspoor N.V. / collectie Het Utrechts Archief / 806066)

FIGURE 3

Illustration taken from the website of the European Regional Development Fund showing the past, present, and future of *het Werkspoorkwartier*. Source: Werkspoorkwartier: Creatief Circulair Maakgebied | Het project (efro-wsk.nl).

circularity.² This vision was developed by the municipality of Utrecht together with local companies and initiatives (Figure 3). This commitment to circularity makes the area particularly interesting from a “zero”-waste perspective. According to the *Ellen MacArthur Foundation* (n.d.), a UK-based charity dedicated to promoting the circular economy, to “eliminate waste and pollution,” is the first principle of the circular economy. During our residency in *het Werkspoorkwartier*, we were curious to explore how the vision of circularity materializes in practice and how this engages people from the area in imagining their own circular and “zero”-waste imaginaries.

As part of our residency in *het Werkspoorkwartier*, we conducted our research through close collaboration with Creative Coding Utrecht (CCU), a creative organization located in this area. Some of us had previously collaborated in other projects and were aware of our shared interests and concerns regarding urban development and sustainability. Creative Coding Utrecht provided an “anchor” point in the area and a link between us as academics and diverse inhabitants of the area, introducing us to their local networks. As *het Werkspoorkwartier* is an industrial area that comprises repair garages, a slaughterhouse, an electricity company, community centers, artist ateliers, offices, and various other creative practices, the “inhabitants” of the area represented people that work rather than live here. As such, we do not use the notion of “inhabitant” to refer to inhabitants of a residential neighborhood but to people who spend an extended part of their daily life here for work, cultural or other social reasons. In the broader context of urban democracy struggles (e.g., Purcell, 2002), it

seemed important to us to include various such “inhabitants” (oftentimes, tenants or temporary occupiers) and gather their perspectives on what a “zero”-waste future for the area might look like.

Transdisciplinary scholars have highlighted that addressing sustainability challenges requires new ways of knowledge production and decision-making that bring together different kinds of knowledge, experience, and expertise, including those of communities beyond academia (Lang et al., 2012). In practice, this meant that our methods were coproduced and often adjusted during the research process to reflect temporal and spatial characteristics of the research and its site, and the different participants. Aiming for transdisciplinary coproduction, it was key for us to be embedded in the area where we decided to conduct the research as “researchers in residence,” a concept inspired by artist residencies. This allowed us to be present and make ourselves and our research visible in its context; to experience the area, get a better grasp of its features and inhabitants and work closely with our local collaborators from CCU. The coproduction benefits of conducting research in residence were previously identified by one of us, when working with communities engaging in urban commons initiatives (e.g., Baibarac and Petrescu, 2019). Many of our conversations took place in the office of our collaborators, CCU, which was located in one of the former industrial buildings located in the area, refurbished with second-hand building materials. While this provided an example of how circularity is practiced in the area (i.e., circular construction), it also physically exposed us to the lack of thermal comfort experienced by the inhabitants of these buildings, particularly during cold winter mornings and indeed during one of our workshops. As such, our research became embodied and felt through the immediacy of our

² Het Project. *Werkspoorkwartier: Creatief Circulair Maakgebied*, 30 Dec. 2021, <https://efro-wsk.nl/over-het-project/>.

senses, allowing us to better empathize with those we involved in it.

Outline of methodological steps

To provide an overview of our research process, below, we include snapshots of our methodological steps. The CCU-affiliated social designer, Maartje de Goede, also “translated” these steps into a visual report for an accessible and engaging overview (refer to [Figure 4](#)).

Step 1: Making acquaintances

As our project aimed at transdisciplinary co-production, our first question was as follows: How to talk to others and how to invite interest in participation, in a way that leads to mutually useful knowledge? With the help of the creative director of CCU, we established contact with key local inhabitants. Through initial conversations with them, we got to know the area, its history, and current developments regarding its creative circularity aims, including what they found important topics related to “zero”-waste. In addition, we attended public events in the area.³ These initial acquaintances allowed us to introduce ourselves and our research and connect with future participants in our sessions.

Step 2: Surveying present views and ideas on “waste”

To access a wider range of local inhabitants and gain a broader outlook on the topic of “waste” and aspirations regarding a potential “zero”-waste future for the area, we created a short online survey. We disseminated it through our local collaborators and initial acquaintances we made in the area. While not extensive (we only received 26 answers), the survey allowed us to make our research more visible and reach people that were not necessarily in leading positions but nonetheless wanted to share what they considered to be the important issues when dealing with waste. The answers were visualized and shared with the people that attended subsequent workshops (refer to [Figures 1, 2](#)).

Step 3: Visualizing waste-related open data

Besides the research on the ground, we were interested to find out what kinds of publicly available data exist and what those could tell us about waste-related issues. Through our CCU collaborators, we involved a data scientist who researched existing open datasets from the municipality of Utrecht, among

³ Symposium Werkspoorkwartier Creatief En Circulair Maakgebied Werkspoorkwartier (2021), <https://www.werkspoorkwartier.nl/over-werkspoor/actueel/symposium-werkspoorkwartier-creatief-en-circulair-maakgebied/>.

which the distribution of trash bins in Utrecht, satisfaction about waste collection, number of bats, and reports of environmental pollution, etc.⁴ Through a number of meetings, involving us, the data scientists, and our local collaborators, we explored possibilities for visualizing these datasets in ways that would ultimately allow for the addition of new “data layers,” as collected through our own citizen science workshops with local inhabitants. To this aim, CCU’s data scientist decided on using Microsoft’s PowerBI as a tool to visualize various datasets in an easily legible visual form (refer to [Figure 5](#)).

Step 4: Deepening the “map” with citizen-science methods

We used the visualized open datasets on PowerBI, together with the survey answers, to generate an initial discussion among the participants of our first workshop. Instead of the researchers and collaborators defining a topic to collect data on, we wanted to engage the participants in defining and exploring their own topics of interest around waste in the area. The discussion of the maps produced using open datasets, and the survey answers were used to inspire participants to think about such topics. The topics that the groups decided to focus on included litter, wastelands, and paint waste. To collect and map data, we developed the workshop as a “walk-shop,” a method combining the experiential qualities of walking with a workshop setting (e.g., [Powell, 2018](#); [Baibarac-Duignan and de Lange, 2021](#)). The participants collected data on the amount and kind of litter they found in the area, the amount of wasteland that would allow for biodiversity, and the willingness and resources of people working in the area to share and sell their paint on a second-hand market. Mirroring the multilayered aspects of digital visualizations, we asked participants to draw their maps on plexiglass, which we later visualized one on the top of the other to evoke further reflections. As such, we materially fused different layers of information—providing a tangible experience of a “deep map”—later digitized and added to the PowerBI (refer to [Figures 6, 7](#)).

Step 5: Re-imagining “zero”-waste urban futures

Our last workshop, entitled “Sowing Visions of Zero-Waste Futures,” was aimed at engaging participants in creating speculative stories about the future of the area by means of making objects from their imagined futures. Besides local inhabitants, we were joined at the workshop by a municipality worker and a consultant previously involved in developing the circular development vision of the area. In this workshop, we

⁴ The data visualizations made by Ruth Schmidt can be found on [PowerBI Report \(2021\)](#): <https://bit.ly/36xn2ux>.



FIGURE 4 Visual report by Maartje de Goede translating our methodological approach into the medium of illustration.

built on the “deep” (multilayered and hybrid) maps created in the previous steps and expanded on some of the key frictions identified when combining diverse layers. The participants gathered in small groups to craft their desirable future of waste material, which we had gathered or that was donated to us by different people from *het Werkspoorkwartier*. Consequently, participants were invited to position their future vision on a timeline and then think about all the actions that would be necessary to achieve that future vision (refer to [Figures 9, 10](#)).

Translation as a lens for processes of meaning-making and vision-making

Our experimental and collaborative research process often involved creatively rethinking our methodological steps in response to local conditions of the site, the participants, and the moment in time when we carried out our project, which partly overlapped with social gathering restrictions during the COVID-19 pandemic. Therefore, our reflections on what we did are not about the meanings and visions that were produced during the workshops. Rather, we want to analyze the process of meaning-making and vision-making by evaluating what has been done on a methodological level and what can be gained from such a creative transdisciplinary approach.

How to evaluate highly context-specific research findings raises certain challenges Anna Tsing has termed “problems with scale” (Tsing, 2015, [2017], p. 37–8). The problem is that highly context-specific research can hardly be summarized and generalized into one story as is common practice in modern knowledge production (Tsing, 2015, [2017], p. 37–8). This recognition of the refusal of scalability is in tension with the “translational” endeavor that lies at the heart of modern Western knowledge production geared toward rendering insights from different domains of knowledge into one “unified system of knowledge and practice” (Tsing, 2015, [2017], p. 217). Tsing’s critique is that in Western science, this occurs all too often without acknowledging this translation as a “messy process” that involves “jarring juxtaposition and miscommunication” (Tsing, 2015, [2017], p. 217). It is clear that any reflection on what we did during our workshops is limited to the very specific circumstances in which we operated and is at best a “messy translation” of how creative methods may assist collaborative processes of meaning-making and vision-making.

Writing a few decades before Tsing (the volumes of which have been first published in the years 1969, 1972, 1974, 1977, and 1980), Michel Serres can be viewed to some extent as an exception to this general tendency of omitting the messiness in translation. Serres in his *Hermes Series* shares a similar critique with Tsing, as he also opposes the idea that in (scientific) knowledge production one account has more authority over others. Instead, he argues that it is more relevant to understand

the translational process of communication between different domains of knowledge (Brown, 2002, p. 5). With Serres, these different domains of knowledge primarily refer to different disciplines (ranging from the natural and social sciences to the arts and humanities) and different historical periods (ranging from antiquity to enlightenment, to contemporary theories) (p. 2–3). Crossing these disciplinary and temporal boundaries is something that characterizes Serres’ own interdisciplinary writing, but it is something he traces in other works too, such as the paintings of Turner (Brown, 2002, p. 5–6). For Serres this is a process that does not come without “adventure” or “risk” as it may lead to the “distortion” of what is being communicated (p. 2, 7, 8). Yet, Serres thinks of this “noise or interference” as a necessary part of any (successful) communication (p. 9). Moreover, it simultaneously provides a “source of invention” (Brown, 2002, p. 2). As such, we may find in Serres’ theory of translation a concept to make sense of the processes of meaning-making and vision-making that involves precisely going back and forth between different modes and materials, while maintaining the spirit of “staying with the trouble” by bringing into focus the “noisy,” and the “messy.”

In this paper, when evaluating our methods and reflecting on what lessons can be learned, we will use the concept of translation to make sense of how knowledge is generated. For this purpose, we want to distinguish between two processes of knowledge generation, namely, the processes of meaning-making and vision-making. We see these as two different translational processes (even as they are highly interrelated). Before we continue with our analysis, we will briefly further distinguish the processes of meaning-making and vision-making, which we develop through the two equally interrelated and yet significantly different concepts of “matters of concern” by Latour and “matters of care” by Puig de la Bellacasa. Staying with the trouble—the mess and the noise in transdisciplinary processes—we will show how articulating shared matters of concern in the present and collaboratively speculating on matters of care for desirable futures present two different modes of translation. One emphasizes processes of meaning-making and another centers around vision-making.

Indebted to Serres’ philosophy of science, Bruno Latour helps to further understand translation as the social process of meaning-making. For this purpose, Latour’s writing in the 1980s, the early years of actor-network theory, together with Michel Callon, gives further insight into translation as a social process of issue formation. Being interested in the question of how certain actors become able “to speak or act on behalf of another,” they use the concept of translation to understand “all the negotiations, intrigues, calculations, acts of persuasion and violence” by which this becomes possible (Callon and Latour, 1981, p. 279). Thus, translation here is the process during which diverse interests and values translate into a strategic orientation which ultimately may have implications on a policy level.

Even more important for understanding translation as the process of meaning-making is Latour's concept of "matters of concern." In his academic work, Latour has been a significant figure pointing toward the "lack of scientific certainty" (Latour, 2004, p. 227). In his article "Why Has Critique Run Out of Steam?" (2004) he critically reflects on his own contributions to this matter and the general tendencies in the field of social critique of science. In the face of conspiracy theories on the topic of global warming and 9/11, he sees the need to re-evaluate the role of the critic (p. 226–7). To Latour, the critic should no longer be "the one who debunks, but the one who assembles" (p. 246). In other words, the condition of scientific knowledge being socially constructed should not be a reason for "moving away" from matters of fact (p. 231). Rather, we should treat them with "care and caution," which helps to describe reality and perhaps even will "save our lives" (p. 227, 232). It is knowledge with this kind of attentiveness that Latour calls "matters of concern." Tying this back to the concept of translation as a way to make sense of how different perspectives are generated, it becomes clear that what matters most is not whether the translation is all-encompassing without traces of social construction, but rather how formulating matters of concern allows to adequately understand and live in the worlds we inhabit.

As Latour also briefly hints at, this is a line of thought that was developed by Haraway before, when developing her theory of "situated knowledge." Continuing the discussion based on the work of Tsing and Serres, translation in the context of "situated knowledge" refers to the process where insights into one thing may be used to make sense of other things. Here, Haraway argues that from a feminist perspective, "[t]ranslation is always interpretive, critical, and partial" (Haraway, 1988, p. 589). What her writing helps to further underline is that this translation is not only a social process, but also a process where power differences come into play. It is for this reason, that people have the responsibility that the knowledge they create helps to construct "worlds less organized by axes of domination" (p. 585). Yet, placing the responsibility for better worlds at the center of translation takes us beyond Latour's initial notion of matters of concern. It goes beyond describing the world in the best possible ways, but in fact also involves an element of speculation of what could be. It is toward this direction that Maria Puig de la Bellacasa expands Latour's "matters of concern" into "matters of care."

Resonating with Latour and Haraway, Puig de la Bellacasa is similarly wary of the idea that science and technology are neutral and apolitical matters of fact. Yet, as an alternative, she proposes "matters of care," which helps to develop an interrelated but slightly different translational process than meaning-making, namely, the process of vision-making. Through the notion of "care," Puig de la Bellacasa is able to bring in feminist theory that helps to further understand the affective engagement of care while also opening up the issue of responsibility. Puig de la Bellacasa's rich understanding of care includes "the affective

and ethical dispositions involved in concern, worry, and taking responsibility for other's wellbeing" (p. 4). Yet, as Puig de la Bellacasa willingly admits, there is no given answer to how this would look like, as this changes with context. As she puts it:

Thinking matters of fact as matters of care does not require translation into a fixed explanatory vision or a normative stance (moral or epistemological). I suggest rather that it can be about a speculative commitment to think about how things could be different if they generated care. A *commitment because it is indeed attached to situated and positioned visions of what a livable and caring world could be*; but one that remains speculative by not letting a situation or a position [...] define in advance what is or could be. (60, emphasis added)

Thus, matters of care may help to understand translation also beyond an explanatory process of meaning-making, as a speculative process of vision-making of how a desirable future might look. In this sense, it is "provoking political and ethical imagination" (p. 7). In what follows, we will analyze how our methodological approach allowed on the one hand for translational processes of meaning-making by facilitating a process of articulating matters of concern in the present. On the other hand, it also allowed for a translational process of vision-making by speculating on matters of care for the future. Yet, in the end, as we will show, these two processes do not happen separately, but in fact spill over into each other, leading to some important reflections.

Translation as meaning-making: Articulating matters of concern in the present

As it can be seen from the outline of the methodological steps in the Section Methodology, we started our research process with a careful look into what the inhabitants of the area thought were important waste-related issues and what data were already publicly available. In this section, we will discuss the importance of seeing these activities not only as collecting information, but also as a translational process of meaning-making. In this process, information is not merely "transferred" from one medium to another (e.g., open data to digital visualizations), but translation emerges as a social and multiactor process where different interests are at play that may conflict or be formulated into shared matters of concern. This also shows the relevance of taking a transdisciplinary approach through which imaginaries are collectively generated, bridging the divides in perspectives among academia, policymaking, and citizen-science perspectives.

Before we started with our workshop activities that were aimed at co-creating alternative "zero"-waste imaginaries for desirable sustainable futures, we explored together with our local

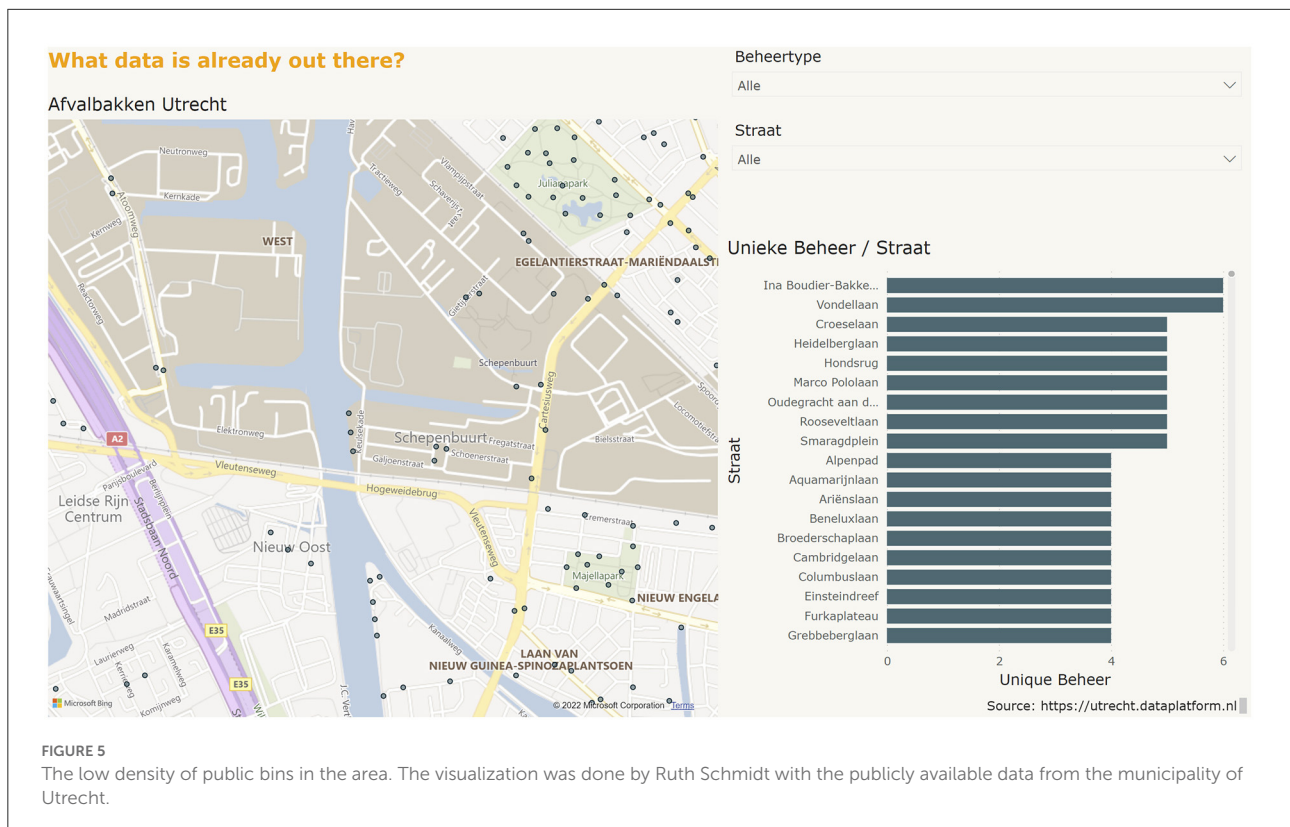
collaborators from CCU, most significantly here co-founder and director Fabian van Sluijs and data analyst Ruth Schmidt, what could be known about the area already. What data would be already publicly available about the area and what could it tell us? For this, we mostly drew from the open data that are provided by the municipality of Utrecht. One dataset we encountered in this context was a dataset that showed the location of public bins all over the city of Utrecht. This dataset revealed that the density of bins in *het Werkspoorkwartier* was significantly lower than in all the surrounding areas. By visualizing this information, Ruth Schmidt turned it into a more accessible format. This is also a social-political gesture, as making the data easily legible provided us in the subsequent workshops with new opportunities to make these data available to participants. As such, it constituted a first step in the translational process of meaning-making as we created a space where knowledge was debated and could be contested.

Turning the data into an easily navigable visualization, consequently, opened up new lines of inquiry. During our workshop, we looked at the visualization as a way of communicating about the services the municipality provides to its residents. Emptying public bins is the responsibility of the municipality. Thus, showing all the public bins the municipality is in charge of is a way of demonstrating its *raison d'être* to its residents. Yet, what we also observed as part of our workshops is that the density of bins is not equally spread throughout the

city. This tells us that political (or managerial) decisions are made about why certain areas are more in need of public bins than others. *Het Werkspoorkwartier* was such an area with a low density of bins (refer to Figure 5). At first glance, the scarcity of bins in *het Werkspoorkwartier* can be explained in quite practical terms: *het Werkspoorkwartier* is not a residential area and private enterprises are in charge of their own waste removal. Yet this view neglects that all kinds of people spend their days in the area and pass through it. As such, the scarcity of bins in the area is not because there is no need for bins, but a political decision concerning (and arguably displacing) responsibility for waste management.

For the purpose of transparency, accountability, and informed democratic decision-making, it is necessary that the municipality publicly provides data to its residents about how the city is organized. Simultaneously, it is important to recognize that these data tell only one part of the story about the area. It is equally important that other ways of making sense of the area, and in our case, specifically other ways of making sense of the issue of waste, are developed. The strength of a transdisciplinary research approach is that it tries to work across the divides among academics, policymakers, and citizens. Therefore, in a subsequent workshop, we examined how citizen science could provide a useful set of methodologies to enrich existing datasets.

For our data walk-shop (step 4), we explored the potential for citizen science techniques to engage participants with the



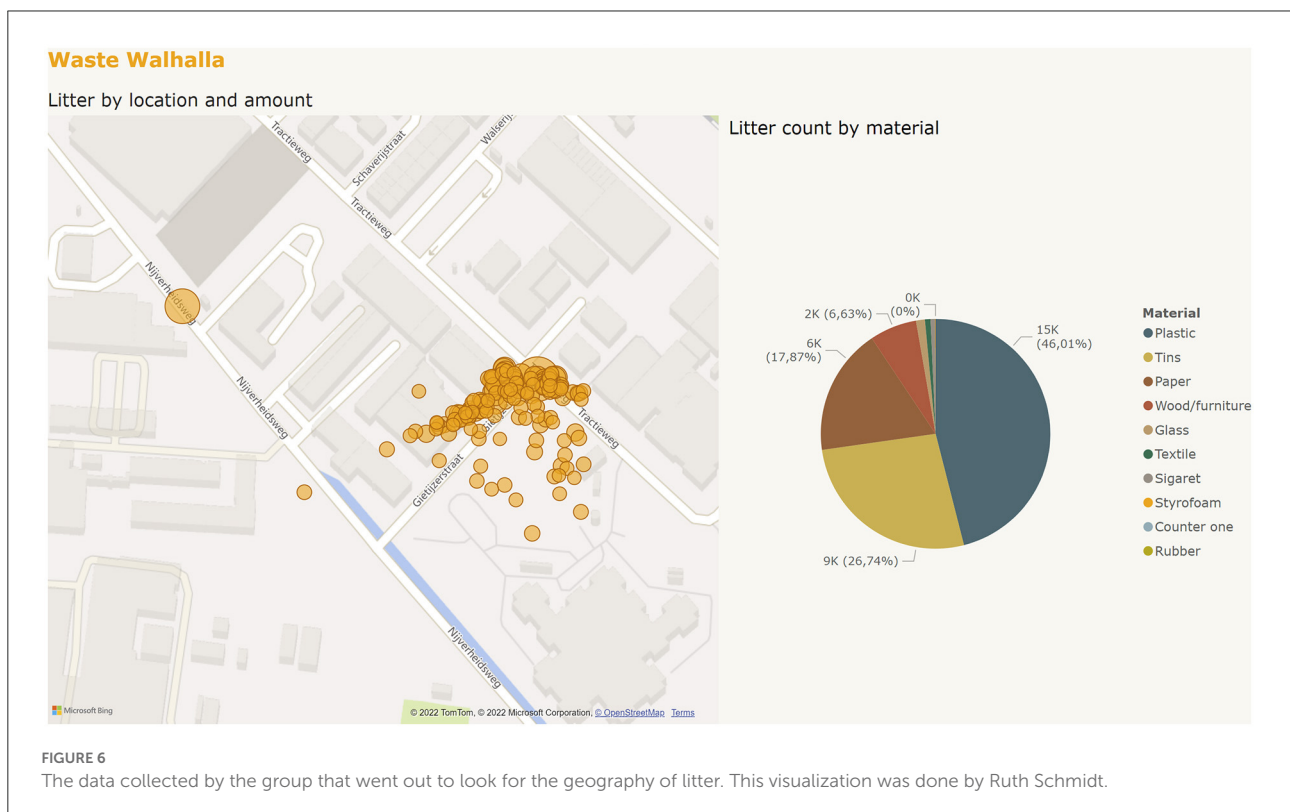
area, specifically around issues of waste and circularity. We started the walk-shop by showing what we had already come to know about the area in advance. This included the different datasets visualized in PowerBI and an overview of some survey responses of their fellow inhabitants we conducted beforehand (step 2). We then opened the floor to the participants and discussed what things they would like to further explore about the area. One group was interested in the geography of litter, which is thematically close to the above example of public bin availability: Where would there be the greatest accumulation of litter? Could this be connected to specific landscape features, such as a wind corridor? The distribution of litter, arguably, is a type of data that more closely relates to how inhabitants experience and perceive the area. It provides a very different perspective than a map on the infrastructures of waste management can provide (Figure 6).

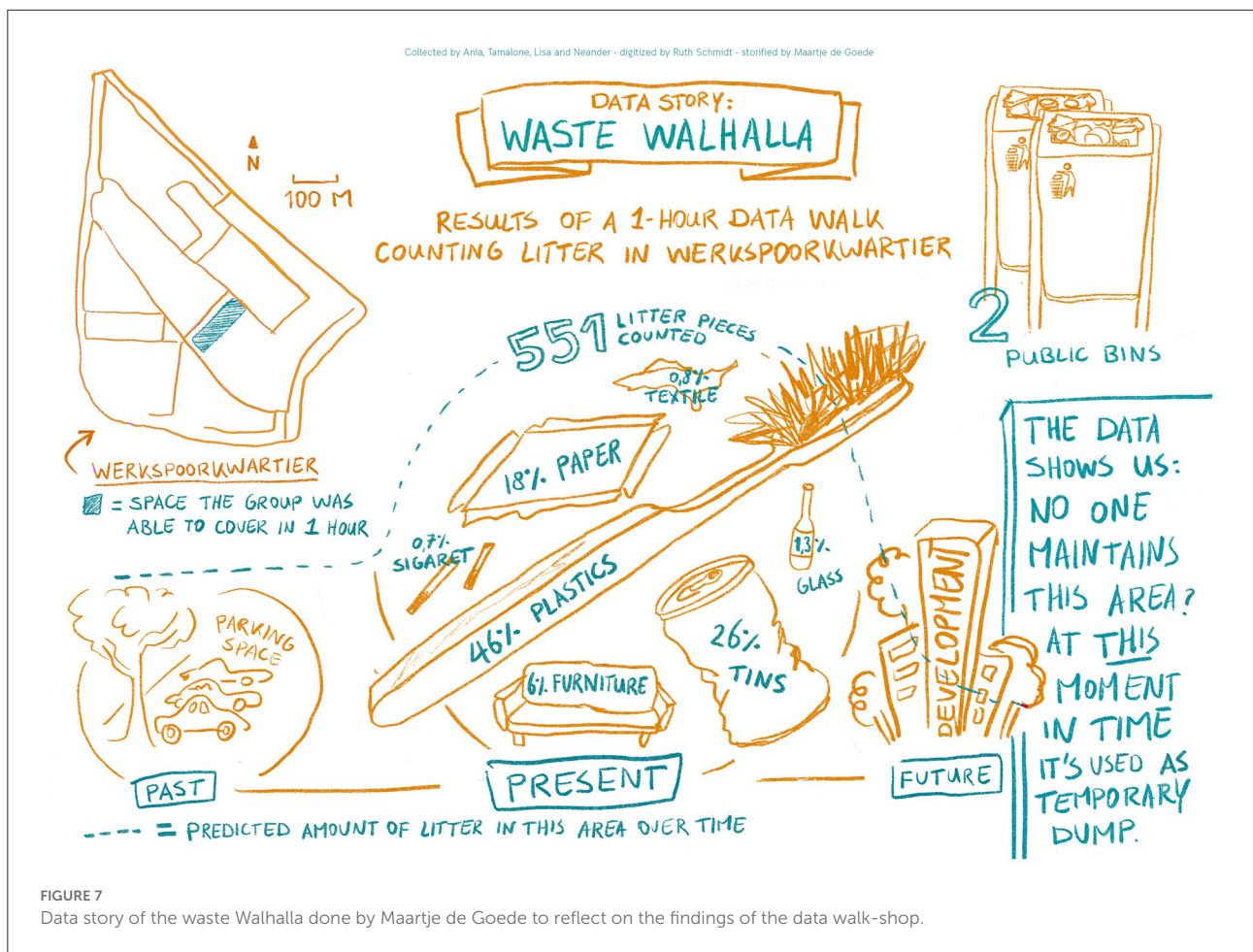
During our walk-shop, a group set out to digitally categorize litter in terms of type (e.g., plastic, textile, and glass), amount, and geolocation. The group ended up spending most of their time in an abandoned parking lot where they found waste of any kind, ranging from glass bottles to old furniture. Overwhelmed by the sheer quantity, the group gave this place the title “waste Walhalla.” This was a “messy” and “noisy” process. Within the allotted time slot of an hour, they did not nearly finish plotting all the litter they found in the parking lot—let alone the entire area of *het Werkspoorkwartier*. The knowledge that

was created in this short period could be easily “debunked” as insufficient and an inconclusive matter of fact. However, if we look at the walk-shop activity of mapping as a translational process of meaning-making, we could say that the process of collaboratively “assembling” data was more important than the data itself, which could be seen as “just good enough data” for the purpose of engagement with the issue (Gabrys and Pritchard, 2018). This “just good-enough data” of the waste Walhalla was already sufficient to clearly show a very different picture of the area than what could be gained from looking at the municipal data (Figure 7).

Based on the data and stories of the group, Maartje de Goede made a “data story” that worked as a summary of the experience of the group. This story is surely distorted. The proportions, examples, and representational value can be questioned in multiple ways. Yet, it compellingly showed an issue we were concerned about and we thought worthy of addressing. Thus, even if the “data story” would not hold as a matter of fact, it was meaningful by pointing to a matter of concern. This translational process is also summarized by Maartje de Goede in Figure 8. It shows the process in which meaning is created by going beyond abstract data (as e.g., provided by the municipality) toward matters of concern through experiential engagement.

In the longer-term, whereas the “data” generated through such workshops would be impossible and arguably unnecessary to scale, the process of making sense together despite the





differences may be an important step toward generating an actual circular, “zero”-waste vision for the area, in more inclusive ways.

Translation as vision-making: Speculating on matters of care for the future

After analyzing the process of meaning-making as the collective formulation of matters of concern, in this section, we will analyze the speculative process that occurs when imagining what a desirable future could be. A desirable future, here, would be a future that the participants would like for themselves and for others. As others are implied in this futuring exercise, it becomes clear that it is also an exercise of thinking about other agents and their envisioned futures, which is a matter of care and responsibility.

Our last workshop, entitled “Sowing Visions of Zero-Waste Futures,” was aimed at imagining how desirable futures might look like for *het Werkspoorkwartier*. The seeds that

would be sown during this workshop were the visions created by the participants. The notion of the “seed” emerged in the context of speculative design out of a concern with the unidirectional content of anticipatory scenarios, particularly when these are aimed at understanding technological futures (e.g., Light, 2021). “Seeds” from this perspective refer to “smaller units of content” aimed at sparking collaborative speculation instead of “scenarios,” which present more developed narratives that reinforce the authority of the designer. Reflecting this view, our last workshop also provided less guidelines on what kinds of futures to design and the participants were free to explore different ideas and temporalities.

The most significant “guiding material” we prepared for the participants was a big table with various donated materials from CCU and other artist ateliers in the building of the Haveloods and leftovers from circular construction sites around the area. In addition, we prepared a small exhibition of all the previously produced artifacts, such as the collaborative maps and visual outcomes of the initial survey. The participants were divided into small groups of three people and could use these materials for inspiration in their design of prototypes or artifacts evoking an imagined future for the area.



FIGURE 8 Translation as meaning-making: from abstract data to matters of concern.

The workshop was a speculative exercise, not only because the participants were invited to speculate on what the future might look like, but also speculative in the feminist sense of taking responsibility for the wellbeing of others by prototyping visions for the future that explored values and perspectives other than the dominant ones (e.g., beyond the municipal vision of circularity for the area and the main actors involved in its development). To stimulate this aspect of speculation, the only other guideline we provided next to the materials was that the future should be desirable. Yet, in line with Puig de la Bellacasa’s refusal to give a universal meaning of care, what desirability means was left up for the groups to discuss. As such, the task of thinking about a desirable future was also an exercise in political and ethical questioning and imagination: “desirable for who?” “in terms of what?” and “who is responsible for guaranteeing these visions?” These are questions that are not possible to answer in a factual way, as they are not about matters of fact. Yet, through embodied engagement with the materials provided and by making things together with others,

these questions could be explored in a tangible way, bringing to light participants’ feelings, worries, and aspirations about the future.

It comes as no surprise that the “seeds” that were sown for desirable futures were very different in kind. One group designed a forest garden titled “Werkspoorwoods” (refer to Figure 9). Another group imagined a distribution system that would minimize food waste from lunches purchased in local office canteens. The different design artifacts created by the groups provided different answers to the question of what would be desirable and whose wellbeing should be cared for. For instance, the vision of the “Werkspoorwoods” took a perspective that included human and more than human entities, as surely a forest garden is a more agreeable environment for many species than, for example, a paved parking lot or even a well-manicured linear park, as was included in the municipal vision for the area. The food distribution vision was oriented toward human food cycles, collaboration, and local networks, raising the need for joint responsibility and



FIGURE 9
Werkspoorwoods as a speculative object for forest gardening.

for companies to take the lead role in addressing the food waste issue.

After the visions for desirable futures were generated, the groups were asked to “plant” their “seed” ideas on an open timeline that started in the present and went into the future far up until the 2100s (see Figure 10). Groups were free to choose their own temporalities as future moments of where to position their prototypes or artifacts. Consequently, the groups were invited to brainstorm about what they thought would be necessary in order to support their desirable futures using post-it notes. We thought of these actions as “roots” through which the visions could grow. Examples of rooting actions include the following: the rise to power of left and green parties, or setting up a tree asylum for the future trees of the Werkspoorwoods. By rooting their visions in the timeline, the intention was not that participants would make a statement about the probability of these futures to happen. This speculative exercise was not about prediction or forecasting likely futures. It was an exercise in debating and reflecting

on the present by engaging with the imagined futures as materialized through the co-created prototypes. Roots could also be drawn to connect with actions identified by other groups, which reinforced those actions that could turn out particularly impactful, while also highlighting potential frictions between certain actions.

This last activity of the workshop showed that the translational process of vision-making is never disconnected from the process of meaning-making. Placing the objects along the timeline and speculating on what would be needed to make them real indicated that the rooting of the visions into actions served more than the purpose of provoking ethical and political discussions. Here, Puig de la Bellacasa once more may provide some insights: To her, a speculative approach simultaneously “presupposes a critical approach to the present. Why would one want other possible worlds if nothing was wrong with this one?” (p. 7). This critical perspective that is implied in vision-making, then, is also a process of meaning-making. Our experience of this last workshop was that it

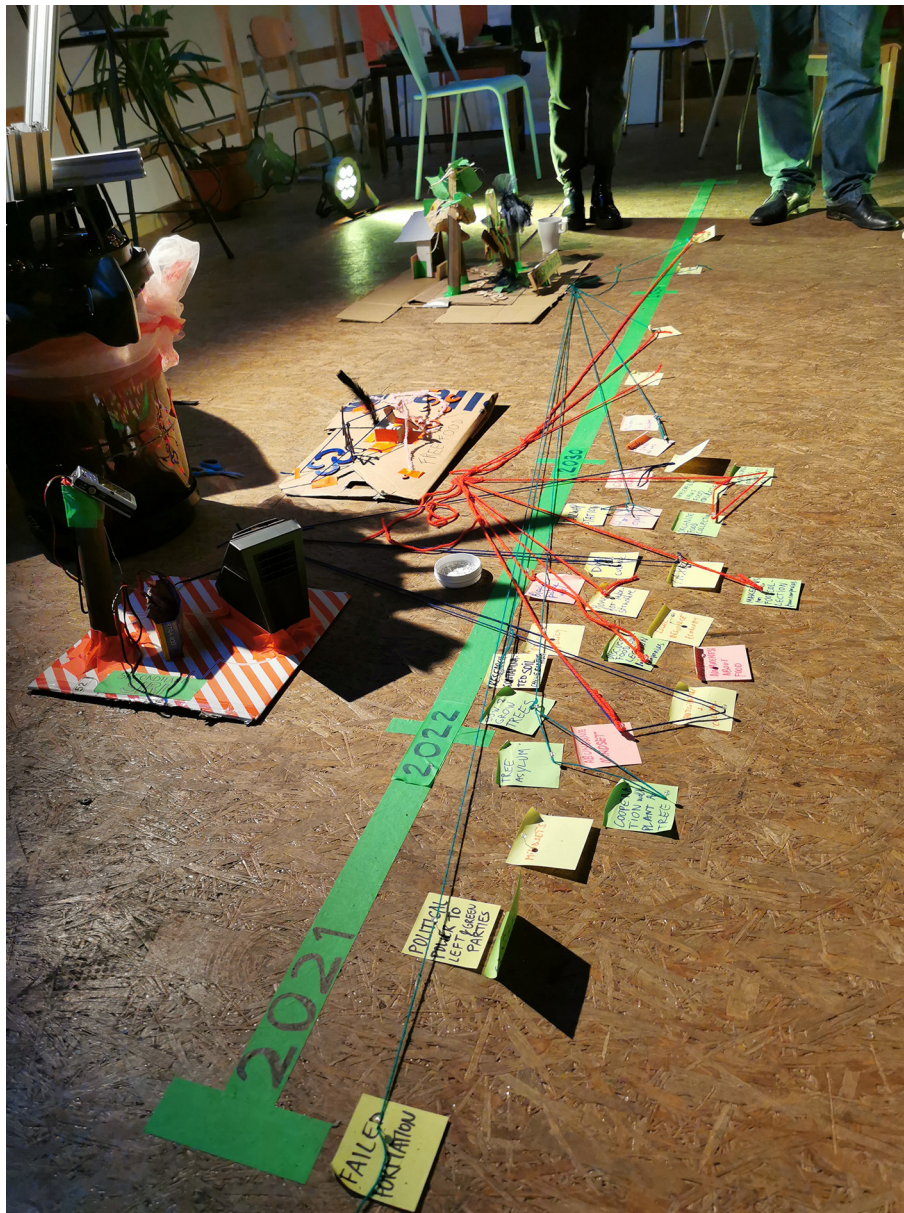
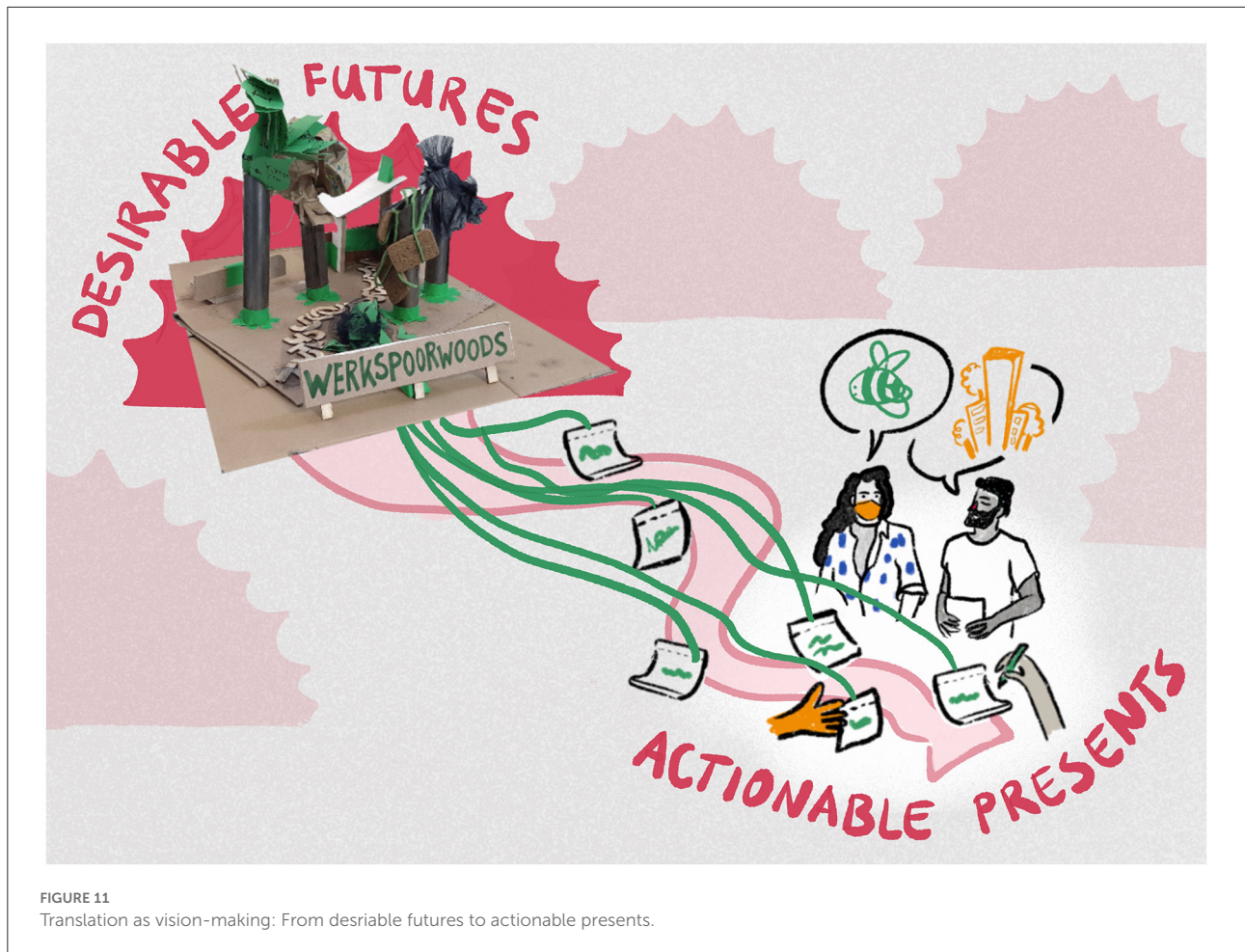


FIGURE 10
Speculative objects planted on the timeline with rooting actions.

was an engaging process that transformed these distant future visions into something that can inspire our actions already today. In spelling out the various necessary steps to take to achieve a certain goal, the relation between the present and the future became more tangible, closer within reach of those who articulated them. As we reflected together with the participants, this tangibility of the future increased a sense of ownership in the present, or indeed in the various presents as experienced in the everyday lives of those involved. The desirable future was less something out of control, or something predicted and

shaped by others, but something to actively strive for and feel empowered to take action toward. Despite the differences in values and perspectives, as illustrated by the diverse artifacts, making futures together enabled reflection on some key aspects that would make a collective future desirable—in other words, identifying matters of care for the future. Simultaneously, the present seemed to provide more ground for actions than initially felt. Thus, through the lens of translation we can see how ideating together desirable futures and thinking about their relations to the present through material and affective



engagement makes the present itself seem more actionable (Figure 11).

Conclusion

We started this paper with a discussion on how contemporary urban challenges such as climate change are often imagined within the discourse of smart technologies and big data, addressing the inefficiencies in urban systems. This shapes a certain kind of urban imaginary: a polished and techno-optimistic vision of urban futures that rests on a dominant and limited understanding of our present as rife with inefficiencies and problems that can only be solved by technology. To be clear, technology and data can have an important role in achieving sustainable futures. However, for these futures to be just and inclusive, it is at least as important to open space for alternative imaginaries of inhabitants other than the dominant smart corporate actors. On a small scale, this is what we have experimented with in our project around “zero”-waste futures

where we engaged in transdisciplinary dialog around the issues of waste in the area of *het Werkspoorkwartier*.

We examined the various translational processes of meaning-making and vision-making and looked at these processes as messy and noisy, which reflects our view that “zero”-waste ambitions need to be approached in the spirit of “staying with the trouble.” What this means is that we see meaning-making and vision-making on the issue of “zero”-waste as thick social processes, full of irreducible complexities. This is particularly important for our project, as we were interested in involving different people in thinking about alternative meanings to dominant modes of understanding our urban environment and its “problems,” and alternative visions on how urban “zero”-waste futures might look. We showed this tension between different perspectives most clearly when fleshing out the differences between academic- and practice-based perspectives on waste. We consider it valuable and relevant to bring to the fore these differences in perspectives, even if it demands a lot of time and attention and might be experienced as inefficient.

Reflecting on transdisciplinary coproduction, this inefficiency becomes crucial for enabling productive dialogs, knowledge exchanges, and cross-pollination of ideas and practices. Ultimately, it is about fostering relations, beyond the immediate aims and short timelines of a project, something reminiscent of the notion of “infrastructuring” from participatory design (Hillgren et al., 2011; Björgvinsson et al., 2012). Contrary to project-based design, which tends to be limited by short timeframes and set goals, infrastructuring is an approach for social innovation aimed at building networks and longer-term relationships. It sees design as an open-ended process where diverse stakeholders can innovate together. Design contexts from this perspective are seen as socio-material frameworks where matters of concern can be articulated. Moreover, as we have shown in this paper, extending the present context through prototyping visions of desirable futures allows articulating matters of care for a shared future and opens up new ways of thinking about the present. This brings about challenges that relate to the inherent complexity of transdisciplinary processes, for instance, in terms of the local specificities of the research context, which requires adequate methods that match the scope and that cannot be simply transposed from other projects. As such, scaling the methods or the data generated becomes a further challenge, or in the language of efficient public participation, a process difficult to “scale.”

Nevertheless, what we have learned through our transdisciplinary process is that making room for inefficiency—for mess and noise—allows for a recognition of other values beyond those normally inscribed in our everyday environments, to support a more nuanced understanding of “public” values and a re-evaluation of those matters for which to care in our futures. This can help to free the collective imagination about other possible futures and open debates about what we can do together, in the here and now, to move toward them.

In this context, other ways of thinking about scaling transdisciplinary research and civic engagement processes may be more appropriate. In particular, it may be useful to explore alternative paradigms and philosophies that extend current spatially-oriented paradigms, such as the interdisciplinary field of mobilities (e.g., Sheller and Urry, 2006) and the philosophy of Michel Serres (specifically his thinking on folded time, percolation, and multiple temporalities), which challenges Cartesian understandings of space and time. Moreover, scaling civic engagement processes may be more productively imagined as unfolding through ecologies of initiatives that shape socio-material assemblies of spaces, objects, human and more than human actors, through which innovation can emerge (e.g., Manzini and Rizzo, 2011). This would require shifting paradigms in public participation from singular moments of engagement in externally formulated issues to ongoing encounters between diverse types of knowledge and expertise

that foster debates about urban sustainability issues where they are most directly experienced, that is, in everyday city spaces.

In our case, the notion of messy and noisy translation has helped to do a messy and noisy “scaling” of our experimental seed project by allowing us to analyze and reflect on what we did and thus share our learnings. Translation through the Latourian notion of matters of concern was particularly useful to understand how meaning can be created about the area that goes beyond available datasets and instead feeds from experiential modes of knowing and collective processes of discussing and exploring what would be relevant to know. Experiential modes of knowing as fostered by the walk-shop allow for re-engaging with everyday spaces and paying attention to what we could take for granted, which can increase the awareness of our own values and also of values embedded in our urban environments. These become important ingredients in articulating collective matters of concern. At the same time, through understanding translation as a matter of care, building on Puig de la Bellacasa, we showed that creating space for collective speculation on how desirable futures might look and how to get there, represents an ethical and political matter that is also able to evoke renewed affective and material engagement in the present.

As the translational processes of meaning-making and vision-making are noisy and messy, it also remains an open-ended endeavor, beyond a temporally limited project. This means that we have to acknowledge the various limitations that are the part of our translational processes. Most significantly, the fact that we co-created our meanings and visions with inhabitants of our research area does not mean that we did that with *all* inhabitants. For example, we struggled to recruit people to participate in our workshops who were neither themselves directly involved in the development of the area nor creative practitioners. As such, we missed many perspectives from other positions in terms of social and cultural backgrounds in an area that in fact stands out for its diversity of business and cultural institutions, ranging from Turkish cultural centers, to high-end media and architecture studios, to repair garages and a slaughterhouse. As such, our experimental series of workshops was not a project of finding what waste *really* means in the area, or what people *really* want, but rather it was part of what ought to be a continuous process of engaging citizens in shaping desirable and sustainable futures. From this perspective, then, writing this article is yet another translating endeavor, through which we re-arrange information in another way, providing another perspective on the various activities we carried out, in a tone and format that realistically is mostly geared toward academic readers. Yet, besides this, we also included “translations” in our own writing through the illustrations of Maartje de Goede that summarize and complement our ideas in another medium and are aimed at transmitting them further and hopefully speaking to, and inspiring, different communities.

Data availability statement

The datasets presented in this article are not readily available because the creative and highly context-specific data are of a nature that resist simple digitization and recording. Requests to access the datasets should be directed to tamalone@gmx.de. Data from the municipality of Utrecht and part of the results can be found here: <https://bit.ly/36xn2ux>.

Ethics statement

Ethical approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Ethical considerations regarding participation and data were followed by the project team in the development of the workshops. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements. Consent was obtained verbally from the workshop participants prior to joining.

Author contributions

TE wrote large part of the article. CB-D of the co-creating alternative zero-waste urban imaginaries - wrote large part of the paper as well while also advising TE on literature and structure. MG, CB-D, and TE were responsible for the workshop design and further contributed by making the illustrations for the article. ML was mostly involved through revision and giving feedback. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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