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SMART CITIES: FUTURE FRICTIONS AND OPPORTUNITIES

From the Project

“Designing for Controversies in
Responsible Smart Cities”



This magazine is one of the outcomes of the NWO project “Designing for Controversies in Responsible Smart Cities”, with project number CISC. CC.012, which is (partly) financed by the Dutch Research Council (NWO).

UNIVERSITY OF TWENTE.



Universiteit Utrecht



M A R X M A N
advocaten

FUTURE CITY
Official FIWARE iHub The Netherlands
foundation

**DESIGN
INNOVATION
GROUP**



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www.responsiblecities.nl

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WELCOME

to our Responsible Smart Cities Magazine!

Technology is everywhere: glued to other hands, integrated into our cars, or hidden behind garbage bins in your street. These technologies change the way we are in the world and experience it. For example, an urban walk is very different if you are efficiently using Google Maps to get from A to B than if you are quietly strolling in the sunset.

When was the last time you got lost in the city or engaged into a conversation with a stranger while asking for directions? The introduction of technology in our cities disrupts how our society operates, calling for reflection and debate about the values that we hold important.

In the “Designing for Controversies in Responsible Smart Cities” project, we reflect on the intricate nature of human-technology relations in the city, exploring how design and philosophy of technology can come together to stimulate ethical reflection and foster civic engagement in smart cities.

What do we need to not only reflect on and analyse past or current practices, but to foster our imagination and collective sense-making in order to act towards responsible smart city futures? What role can design and futuring play in this? How can we make constructive use of smart city controversies to develop responsible smart cities?

Futuring: engaging with design methods for engaging different groups in imagining and reflecting on futures.

In this magazine, you can learn about our team and what motivates us to work towards achieving responsible smart cities. As an illustration of our approach, we showcase our web experience 'Future Frictions'.

Future Frictions is one of the outcomes of our project with input from the University of Twente, Utrecht University, and a consortium of public and private partners. Future Frictions emerged from a collaboration between our project and a collective of creative coders, being Creative Coding Utrecht (CCU) and Katpatat. CCU is a community of makers who share knowledge and together explore the artistic potential of self-made software and hardware for creative expressions. Future Frictions is our

contribution to exploring creative and innovative forms of civic engagement around the topic of smart city development.

The magazine complements our toolkit of methods, which can be accessed as a downloadable pdf file scanning the QR code below



ABOUT

the Project

Technology is changing our cities: there are sensors and cameras everywhere, all the services we can potentially imagine are just a click away, 5G antennas are emerging everywhere. And this is just the beginning. Often, smart city initiatives assume that technology is universally beneficial, providing visions and projects that represent an ideal solution-oriented future.

In practice, smart technology can empower or disempower, include or exclude parties involved. As a result, the implementation of smart technology can lead to friction. Tensions may occur because ways in which technology has impact on the city are not univocal: different people perceive them differently. For example, a surveillance camera can safeguard safety, but it also constitutes an invasion of citizens' privacy. When these perspectives conflict, controversies arise where people disagree, with issues at stake that are sufficiently important not to be ignored.

In this research project, we consider that acknowledging controversies and debating them and responding to them allows various desires of interest groups in society to be represented.

We take controversies as a point of departure to envision responsible smart city futures, encourage ethical reflection and stimulate civic engagement. These principles contribute to the development of responsible and inclusive smart city visions and projects.





What does
RESPONSIBILITY
in smart cities mean?



MASCHA VAN DER VOORT

*Professor of Human Centred Design
(University of Twente)*

“FOR THE DEVELOPMENT of responsible smart cities, the main opportunity is to develop a smart city that accommodates all of its citizens by placing the needs and wishes of all parties at the centre of the development process, instead of introducing readily available technology. However, in doing so we face the challenge to accommodate all parties to participate in the development process actively and to explore and envision the consequences of potential development decisions.

In this context, I see a main role for designers and design research to provide the tools that **empower all parties to explore and communicate their needs and wishes as well as what they could contribute to their smart city.** Triggering our imagination is a good way for all kinds of users of the smart city to explore and identify the potential future of their smart city.”



> “DESIGN AND ETHICS
FUEL IMAGINATION”



PETER-PAUL VERBEEK

*Professor Philosophy of Technology
(University of Twente)*

“NO ETHICS WITHOUT IMAGINATION. Taking responsibility for the cities that we are designing requires anticipation of the ways in which smart city technologies affect human beings, social practices, and societal structures.

Getting in touch with the potential implications of this new, technological public space is a first crucial step in taking responsibility for it, and designing it in ethically responsible ways. And this is where ethics and imagination meet. **We need to develop methods to guide our imagination in such ways that it enables us to see things that we could not see otherwise.** Theories about human-technology relations and the interactions between technology and society can provide such guidance. In such theories, sense-making often plays a central role: technologies help people to understand and make sense of the world around them. Smart lighting systems help to shape how people experience public space, and therefore if and how they come together. Traffic control systems disclose cities in

dynamic ways for drivers, bicycle users and pedestrians, and therefore shape the character of the city. ‘Citizen sensing’ technologies enable citizens to measure and understand the quality of their living environment and to put issues on the political agenda. Smart city technologies, therefore, are much more than just functional instruments. Only by using our imagination we can take responsibility for their impact on our lives and on the society that we live in.”



ANOUK GEENEN

*PhD Candidate Human Centred Design
(University of Twente)*

“RESPONSIBLE SMART CITIES TO ME are cities that are value-driven and vision-driven, that offer room for multiple perspectives of urban life and that use urban technology as a means rather than an end. Technology offers us many benefits and ways to gain more comfortable ways of navigating city life, to optimise traffic and reduce waste. Albeit highly admirable goals, the technologies implemented in a smart city are more often than not purely driven on economic arguments of increasing efficiency. To me, **a responsible city caters towards its citizens and their needs, fulfils a sense of community, and allows room for exploration, surprise and serendipity.**

But how can we envision the smart city beyond economically-driven values such as efficiency, as well as give more room to public values such as solidarity and autonomy? Design and other forms of creative engagement can help us narrate the city in a meaningful

way, helping us experience and imagine it through tangible objects and future scenarios. Design offers opportunities to engage with the future, to encounter different perspectives and possibilities and reflect on the sense and sensibility of smart city technology.”

> “BRING FUTURES TO
THE PRESENT TO MAKE
INFORMED DECISIONS”



JULIETA MATOS-CASTAÑO

*Postdoctoral Researcher Human Centred Design
(University of Twente)*

“IMPLEMENTING SMART CITY technology can be controversial. For example, let us think about how many of us use technology to

navigate in the city. It allows us to plan our journey and reach our destination very easily. Although this is very convenient, how will our cities turn out if we always have a clear destination in mind? Will there be any room for exploration and surprises? Or will our cities turn into sequences of predictable events?

Imagining potential smart city futures is essential to reflect on the impact of technology on society and to make informed decisions in the present. This is not something that we can do alone: it requires the involvement of public and private organisations, citizens, and knowledge institutes to surface multiple perspectives and act responsibly.

In this context, design can help us to make futures tangible in the present collaboratively. Design fiction, speculative design or an

experiential futures are great approaches to bring to life the effects of technologies in our cities and lives. What better way to have a constructive debate about the futures than by experiencing them in the here and now?

In our project, **we experiment with creative forms of engagement to bring together ethical reflection and creative collaboration as a way of shaping responsible smart city futures.**”





CORELIA BAIBARAC-DUIGNAN

*Postdoctoral researcher,
Department of Media and Culture Studies
(Utrecht University)*

“ACHIEVING A RESPONSIBLE smart city future requires the inclusion of multiple perspectives and voices in their development. This needs an understanding of what ‘smart’ means for different actors, in different urban contexts: what do we value as being a ‘smart’? Moreover, **it needs creative forms of engagement in imagining what a smarter futures may look like and in shaping pathways that address different values.**

The concept of *controversing*, developed in this project to reflect a deliberate strategy for making datafication controversial, offers the potential for developing such forms of engagement. Our walk-shop method illustrates this concept, by situating datafication in the urban environment, enhancing awareness of its presence, and stimulating debate on the values it reflects. However, *controversing* is not just about the city as is, but also about the city as it could be.

This is well illustrated by our scenario-based digital tool, *Future Frictions*. While the tendency in smart city development is to improve what is already there, achieving a responsible smart city futures is a matter not only of technology and data: it is one of diverse stories and collective imagination around the kinds of worlds we wish to inhabit and how we might get there.”

› “CONTROVERSIES
HELP TO
FOSTER CIVIC
ENGAGEMENT”





MICHEL DE LANGE

*Assistant Professor,
Department of Media and Culture Studies
(Utrecht University)*

“IN THE CONTEXT OF SMART CITIES, I consider responsibility firstly as a normative framework resulting from ongoing public contestations about the desirability of future smart tech in relation to public values. It is a dynamic outcome of continual discursive struggles, e.g. what people consider a just balance between private and collective benefits. Secondly, responsibility involves an attitude: being open to criticism and speculative alternatives for the urban futures. This what-if spirit (“it could be different”) underpins any attempt at achieving greater social justice. Thirdly, responsibility is a condition for civic participation, a required infrastructure for democratic engagement by a wide variety of people.

A key challenge is how to involve people in discussions about the future of datafied smart cities. ‘Datafication’ most likely is an ephemeral phenomenon for most people. Hence, I think of civic engagement in the datafied smart city as an interfacing issue: how are data made and interpreted in meaningful ways, what know-

ledge is produced (and what is not), how can non-experts laymen ‘do things with data’ as part of their own lives and collective concerns?

Frictions and controversies about how technologies and society shape one another, and can be a productive way of gathering people around issues of responsible smart city developments. **Creating ‘responsible smart cities’ then departs from acknowledging its own controversial nature and the value of controversies.”**



Feeling lonely?
Not an

NO



FUTURE FRICTIONS

Imagine you are walking in a neighbourhood. A woman is sitting peacefully on a bench, and a teenager is looking at her mobile phone while waiting for a friend. You stop and talk to a father who is watching his child playing in a square. Suddenly, you encounter an Artificial Intelligence cat that can use data to help people that feel lonely. What if you could decide how to use the data collected by this cat? How would your choices impact people that live in the neighbourhood? What if you could also see the kind of future that these choices are leading to?

Future Frictions is a web experience that makes you walk around a neighbourhood and interact with different people living in it. While encountering a specific smart city technology (a surveillance drone, an AI cat, sensing pigeons), you are confronted with making controversial decisions regarding its application that will have consequences for the neighbourhood and its residents' daily lives. Based on your choices, the city will change as well as the interactions with and between the people living there.



Future Frictions was featured in the “Up Close and Personal” talkshow organized by Design United for the Dutch Design Week 2021. To watch the interview, scan this QR code



Future Frictions encourages reflection and debate on the interconnectedness between individual and collective values in smart cities, and on the impact of technology shaping our urban experience. The project also focuses on the role that critical and speculative design can play to stimulate ethical reflection and civic engagement in complex socio-technical contexts. From a design perspective, the project focuses on the role that critical and speculative design can play in stimulating ethical reflection and civic engagement in complex socio-technical contexts, such as smart and sustainable cities, through an immersive web experience.



Future Frictions brings futures to the present



Take a moment to think about everything that has happened. Go and sit on a bench.

Experience

Future Frictions!

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Future Frictions emerged through a collaboration between our project and a collective of creative coders; Creative Coding Utrecht (CCU) and Katpatat. CCU is a community of makers with the aim to share knowledge and together explore the artistic potential of self-made software and hardware for creating expressions .



Scan the QR codes below to experience it.

We have two versions.

Future Frictions 3D

Individual/group experience
(20 minutes approximately)



Future Frictions app

Individual/group experience
(10 minutes approximately)



The different forms of engagement of Future Frictions



online
/individual



in workshops



in exhibitions



in the
public space

JOS VAN WINKEL

*Lead of Policy, Strategy and Safety
(Amersfoort Municipality)*



“FOR THE MUNICIPALITY OF AMERSFOORT, the main focus is on our citizens. Our aim is to address social problems such as the need for new houses and measures for climate change, thereby using new technologies and data to support our plans. In our opinion, technology and data are part of the means to reach our goal.

As a responsible smart city, we consider it important to balance the opportunities and threats of new technology and data carefully. Guarding public interests implies thorough research on the technological, commercial, legal and ethical aspects of new technologies and data before we start using them.

We are aware that the municipality cannot do this research on its own. We need additional perspectives to take balanced decisions. For that reason, **we involve citizens, knowledge institutions, companies and other governmental institutions.”**

› “RESPONSIBILITY CALLS FOR INVOLVEMENT OF ALL PARTIES AND FOR REINFORCING DEMOCRATIC VALUES”



JAN-WILLEM WESSELINK

*Programme Manager at Future City Foundation and
Project Manager for City Deal 'A Smart City, that's how you do it'*



“RESPONSIBLE SMART CITIES entail taking advantage of the opportunities offered by digitisation and technology. The Netherlands are facing a major renovation. We lack housing for young people, we have to make our entire energy system CO2-neutral, and our construction circular.

The emissions of nitrogen are too large to handle. In the social domain and in healthcare, we are facing an almost unsolvable staff shortage. Yet spatial planning and social plans hardly involve the application of new technological solutions. While society experiences radical transformations, in spatial planning and in the social domain we pretend it is still 1990.

Of course, **this must be done in a way that reinforces the democratic values that we hold dear.** When discussing major transformations in the Netherlands, we are also talking about ethics.

In fact, ethics and other instruments help us to change processes in spatial planning and in the social domain in a constructive way. As a beautiful Dutch proverb has it, they prevent us from “throwing the baby out with the bathwater”.

Especially in stormy times, it is good to have a compass. That is why it is so important to let ethics govern design right now. But we must have the courage to take steps, to do research and to use new technology in order to start an enormous renovation that is needed. Not using these aids is irresponsible.”



LEON HENDRIKS

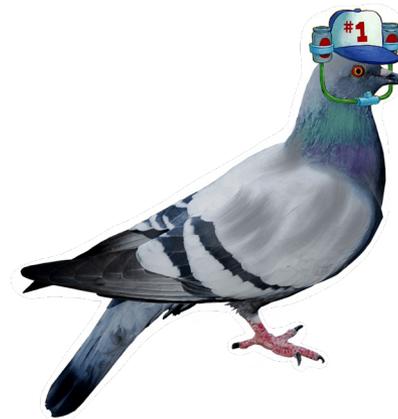
*Managing Partner
(Aerovision)*

“IN SMART CITIES, an important aspect are the ethics of data collection and data sharing. Taking responsibility implies that regulations must be obeyed, e.g. GDPR. In addition, a responsible project makes sure that all parties are consulted and that their concerns are taken into account. Furthermore, data sharing is important. Responsible smart cities should be transparent and share data with all parties. This also requires a good regulatory framework to prevent the unwanted and unsolicited use or misuse of data.

As a result, transparency is by far the most important thing to pursue. This does not always come by nature, so a good set of regulations to enforce this is necessary. Reflection, design, and experiments play an important role to discover desired directions, risks, and opportunities and it will also create awareness and involvement of all parties. This could serve as an ex-ante impact analysis of a smart

city initiative.

In our practice, we encounter many technology push projects, where often the proposed project goals are not well connected to the underlying problem. **Good practice is to give actors the opportunity to experiment and address societal challenges.** And there is much to learn from each other. Therefore, a collaboration platform will enlarge the understanding, improve the design and accelerate acceptance of new, and for some parties, strange interventions in public space.”





JORIS VOORHUIS

*Attorney at Private Law
(Marxman)*

“IN SMART CITIES, involving citizens must be at the core of all action.

Governments, municipalities and cities are becoming more and more

‘datafied’. You can think of simple sensors in waste containers to monitor when it is full, but also of sensors and cameras used for crowd control or public order. In fact, every day more data are being collected from citizens by governmental and non-governmental organisations. A significant part of this data are the personal data of individuals. From a legal perspective, processing these kind of data requires a high level of responsibility. Apart from the most common obligations, such as appropriate security measures and a legal basis for processing, transparency is the most important value. If organisations communicate in an easy and transparent way about the type of personal data that they process to what purpose, citizens will be more understanding and willing to participate.

However, experience shows that this is one of the biggest challenges for governmental organisations. In addition to this, non-personal

data collected from citizens and (smart) cities should not be monopolised by (public) organisations. The opportunity for smart cities lies in making such data accessible for any organisation, if it has objectives that benefit citizens”.

> **“THE OPPORTUNITY FOR SMART CITIES LIES IN MAKING DATA ACCESSIBLE FOR ANY ORGANISATION, IF IT HAS OBJECTIVES THAT BENEFIT CITIZENS”**



LIANNE POLINDER

Designer

(Design Innovation Group)

“IN SMART CITIES, being responsible should always involve being accountable. And **accountability only makes sense when other people can call someone to account, which requires both the opportunity and the capability to engage.**

The conversation around smart cities can be riddled with technobabble, academia talk, undefined container concepts and assumptions. Citizens can easily feel intimidated and unqualified to discuss the design and implementation of smart/adaptive/responsive technology in the public space. Which is a real shame, not only because the people it affects should be involved, but also because every person — regardless of what they do or do not know about technology or smart cities — is an absolute expert at living their own life in their own environment.

Creating opportunity: invite citizens to a table within reach. Creating capability: facilitate meaningful and accessible interaction around that table. Accessibility is not a default setting: you deliberately need to design it that way. Create a safe environment and level playing field by bringing everyone up to speed on the basics. Strip away the noise. Do not use words that mean different things to different people (such as ‘privacy’). Use images. Talk about daily life. Involve emotions. We have had people talk about health, support, feeling safe, distrust, convenience, the importance of being able to stay true to yourself, and about what they would want for their children playing in the streets. And these are the conversations that need to be had on the road to responsible (smart) cities.

› “BEING RESPONSIBLE SHOULD ALWAYS INVOLVE BEING ACCOUNTABLE”



NEANDER GILJAM

*Creative Developer
(Katpatat)*

“FOR US, a Future without Frictions means less bureaucracy and more participation. Technology can be scary sometimes. However, if we are willing to move forward as a society, we also need to embrace it in our daily lives (where applicable). To find where technology can help, there are many opportunities to find and involve citizens in a reflection group’, so that the government can consult this group for feedback on the ideas and initiatives that they undertake.

At a governmental level, we should establish collaborations between (preferably young) tech-savvy people to work with researchers that can reflect on the impacts of technology on society. By establishing these collaborations, we can make educated decisions at different levels more quickly. If we play it well, we can increase our knowledge about technology and how we can use it to our advantage in our daily lives.

That way, we will not get swallowed by potential ‘bad’ technological decisions. All in all, we, as people that love technology, **see a bright and better future together with new technologies, as long as we do not forget that we are humans, with all our flaws but also with the means to overcome those flaws.”**



FOR MORE INFORMATION, VISIT
WWW.RESPONSIBLECITIES.NL



COLOPHON

Responsibility and smart cities go hand in hand. Since 2018, we have worked together to develop methods that help us to articulate what matters to communities in cities, and that encourage ethical reflection on the impacts of technology in society. By developing and testing our methods, we have learned that smart city controversies are a fruitful foundation for collaboration to make us think critically and creatively about smart city futures. Controversies help us to bring the values we hold dear forward, and contribute to establishing constructive dialogues with citizens, companies, governmental organizations and knowledge institutions.

Experimenting with different forms of stakeholder involvement is at the core of our work. Future Frictions, as

well as our “Towards Responsible Smart Cities: Cook-it Book”, are examples of the importance of creating opportunities for experimentation and reflection for participation in smart cities. We have experienced that these creative forms of engagement foster imagination on alternative smart city futures and lead to renewed perspectives in which stakeholders can learn from one another.

Our project is coming to an end, but not the mindsets and learnings that we have been fostering in the last years. In the years to come, we hope that the insights from our project inspire others to continue exploring and realizing the potential opportunities that controversies offer to shape responsible smart city futures.

