Reclaiming the human dimension in automated urban enforcement services

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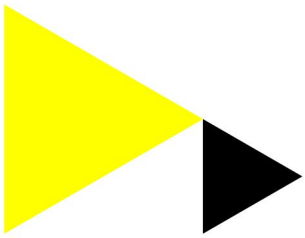

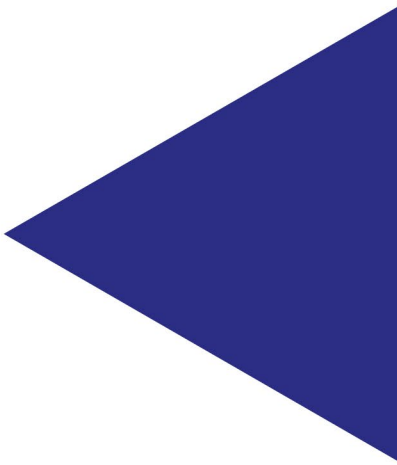

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Smarter cities but less human?

Cities are becoming smarter—but are they becoming more human?

Since the beginning of this century, the arrival of governmental urban technology in public spaces – aka smart city tech – promises to keep the city clean, safe and well maintained. The liveability and even the quality of life in cities is claimed to improve according to this narrative. Although the efficiency and short term effectiveness of city municipalities seem to improve, there are serious unintended consequences of the growing number of technologies that push human presence, communication and interaction mostly 'out of the loop'. And with that the subtle, but crucial, situational judgments that arise when humans interact (Zacka, 2017).

It is a problem that author Ben Green refers to as the 'tech goggles cycle' (Green, 2019). It starts with adopting a solutionist approach, believing that technology could and should make our society function more efficiently and smart. After implementing a technology, all that remains visible are those things that can be measured and therefore can be improved on. Spontaneously emerging goals and visions, and bottom-up workarounds, are not grounded in the technology and therefore become harder to recognize and act upon.

In 10 years of ThingsCon, many of us have argued this spontaneity and sometimes messiness of cities are in fact essential elements of a thriving city. For example Usman Haque, keynote speaker of ThingsCon in 2014, writes in praise of messy cities (Haque, 2013). In the Human Values for Smarter Cities project[1] , we – still – explore a balance between efficiency and messiness in Dutch cities. Through a series of workshops[2] we experimented with alternatives for merely efficient urban technologies. Instead: could they be redesigned to become generative systems that revitalize human interactions in a the urban context?

The need for answering this design and research question was confirmed during an initial field visit at one of the involved municipalities. Civil servants mentioned the possible tensions that accompany the use of smart city technologies in urban spaces to help to keep the city safe, clean and well-maintained. One concern they

1 https://humanvaluesforsmartercities.nl/.

2 Society 5.0 2023, ThingsCon 2023 & ThingsCon 2024.

expressed was that human scale in decisions might decrease, because incorporating high fidelity contextual information in a decision is difficult in an automated approach. They noted that this contrasts with their municipality's simultaneous investments in human-scale services and interventions. Adding to this, there was a concern of human contact in neighbourhoods possibly decreasing, because automated processes require less human involvement and contact. In this case they identified a contrast with the municipality's simultaneous projects that aim to facilitate more ownership and self-solving capacity in neighbourhoods which require a human face and human interaction.

At stake is more than just smoother operations. What we risk losing is the ability to tolerate ambiguity, to listen to each other and let empathy grow and to make collective decisions through dialogue. As cities become more technologically mediated, we must ask: are we designing systems that support human flourishing, or are we designing flourishing systems supported by human input?

The smart city's narrow mind

Interestingly enough, the aforementioned concerns did not have much to do with the problem and solution space of the technology in question – like parking cars in the city. Instead, they expressed concerns touching upon much more fundamental societal issues – like the loss of "the human scale" (Canoy et al., 2021). Smart city systems promise frictionless efficiency: automate enforcement, eliminate ambiguity, ensure compliance. But what happens when that promise overrides the texture of everyday life?

In our workshops, we gathered a community to discuss real-life examples and to extrapolate undesirable consequences if these were not incidents but practice as usual. For example, a woman who parks her electric rental car to unload holiday bags to the apartment on the fourth floor. She does not have the number plate of the rental car in her parking app, so she does not pay for parking the car. More importantly, she knows that loading and unloading is allowed without paying, even if it takes some time to run up and down to the fourth floor. She gets a fine, and after an appeal she is informed that she has to pay the fine because: "You are only loading and unloading if you immediately let people get in or out or if you immediately remove or load large or heavy items from the car. The inspection revealed that you were not loading and unloading. So you had to pay parking fees."

In the discussion about this case, participants stated that the complete process with the camera car leaves almost no room for a human-to-human debate and no 'grey zone' for decisions made about imposing a fine or not in specific situations. At the same time there is much room for interpretation about what 'immediately' means from the perspective of the various stakeholders. In the perspective of the municipality this seems to mean that you have to be in sight of the car, while in the perspective of city dweller this

means unloading as quickly as possible to your apartment. Before introducing the technology, parking control was moving by less quickly, and the city dweller would probably have had the right interpretation.

The findings of the workshops including other real life examples substantiated three clusters of undesirable consequences. Firstly, participants noted that the discretion available to civil servants is diminishing with the advance of urban technologies, resulting in decisions that are increasingly black-and-white. Every exception to the rule has to be coded in. A second field of worry was the growing responsibility the municipality takes for arriving at solving problems, at the cost of self-solving capabilities in the community. Thirdly, participants identified that the cultural ability to negotiate or debate is under pressure, both among citizens and between citizens and civil servants, possibility leading to a loss of trust in the community and municipality in the longer term.

This looks like a city that no longer negotiates but enforces. A public realm that no longer facilitates and listens but flags violations. A system that values efficiency over empathy. Smart city solutions often claim to be neutral tools. But neutrality becomes blindness when systems are designed without room for context, care, or conversation.

Redesigns for the human dimension

The question, then, is how we might reintroduce human inefficiency into systems that seem designed to erase it? Rather than rejecting automation outright, the workshop participants explored how to redesign automated systems that reflect human values. What if, instead of removing discretion, we designed spaces where discretion could be meaningfully exercised? What if systems flag edge cases not only to issue fines, but to ask whether a situation deserves a second look?

In our participatory workshops, interesting, speculative redesigns were developed that generated opportunities for more human interaction and with that, disclosure of details about a certain situation. For example, a proposal offered the chance of debating the decisions about resident's parking actions in real time. In this case when someone parks a car for loading or unloading and a scan car drives by, the owner receives a notification straight away. This enables the owner to speak up for him or herself and debate the upcoming decision in real time. In turn, this might prevent the signal becoming a fine that goes through the whole the process, including a potential appeal.

In another more speculative proposal, the basic idea was that a resident can put a note underneath the car's windscreen wiper and that the parking scan car can read that. So notes with something like "I'll be right back" or "I am unloading" leads to the car and its

driver knowing that they need to return after maybe 10 minutes to check the same parking spot. If the car is gone, the owner was loading or unloading. If it is still there, the car has been there too long, and the owner should receive a fine. This prevents a lot of occurrences where the civil servant has to judge photos of the situation to decide about a fine for not loading or unloading or a decline of the objection to a fine.

In the workshops, most of the speculative redesigns introduced a faster distribution of information amongst the various actors, providing them with the opportunity to take action in real-time. This materialized in ideas about human contact, interaction and negotiation, sometimes between residents and other times between a resident and a civil servant. In all cases the idea was to delay the triggering of a fully automated process, which has a high chance of ultimately being unnecessary or unfair. This seemed to reclaim professional discretion and enable more human-scale interventions and decisions. In almost all speculative scenario's more collective ownership and creativity in the neighbourhood was fostered, while making room for better division of the available municipal resources.

The human city: between trust and control

Why is it so hard to build smart city technologies that genuinely serve or empower people—not just as users of a city, but as citizens with needs, stories, and judgment? From speculating in our workshops we learned that the answers go deeper than flawed systems or limited resources. It lies in the foundational worldview that guides how these systems are imagined, funded, and designed. At the heart of that worldview is a particular idea of human nature. Today's smart city infrastructure is often built on a logic of control. Systems are designed to optimize traffic flow, enforce rules, and detect violations with minimal human discretion. This makes sense if you assume people are mostly self-interested and likely to abuse the system when given too much discretion. From this perspective, human judgment is a problem to be minimized—too slow, too subjective, too contextual.

The parking enforcement system in Amsterdam, offers no space for drivers to explain the context of their actions. A missed payment, a hurried unloading, intentionally not paying — all are treated the same. The system is blind to intent, nuance, or circumstance. The unintended consequences are subtle but significant: shame, frustration, and a growing sense that the city is not on your side. In some cases, people comply out of fear, not trust. In others, they disengage entirely. Worse, those with the least access to digital infrastructure or legal know-how are often the most vulnerable to rigid automation. This exactly why Bernardo Zacka argues that the presence of street-level frontline workers in urban enforcement services is especially important for navigating the ambiguous situations that policy measures create in real-life situations involving citizens (2017).

And yet, the idea of building in more human discretion often meets resistance within municipalities. What if people exploit it? What if they lie, manipulate, or game the system? These concerns reflect a deeper anxiety: that trust will be abused, and openness will backfire. In a world increasingly driven by metrics, risk reduction, and political accountability, it's safer to design systems that treat everyone the same—even if that sameness erases critical differences. This risk-aversion may be precisely what's holding us back. A city that assumes the worst in people ends up designing the worst for them. It creates systems that are overdetermined, defensive, and indifferent to the moral reasoning that shapes everyday life.

This isn't a call for naive optimism. It's a call for thicker, more accurate view of human behaviour—ones that see people not just as users or violators, but as interpretive, caring, context-sensitive participants. In this view, friction isn't always a failure. It can be a way of enabling ethical reflection. Ambiguity isn't chaos. It's the texture of lived experience, negotiation and ultimately democracy. Designing for this complexity requires a fundamental shift. It means building systems that allow for interpretation, discretion, and dialogue. That might involve interfaces where users can annotate their actions, or systems where frontline workers can apply judgment without fear of being overruled by algorithms. It could mean incorporating time delays for certain decisions—not to slow things down, but to create space for collective reflection.

The question then is not "How do we prevent every misuse?" but it becomes: "How do we balance trust and control in a way that honours the public we serve?" The irony is that truly smart cities may need to become a little less certain of their intelligence. They may need to be more like the people who live in them: adaptive, relational, capable of pausing to consider before acting. This is not about abandoning technology. It's about reimagining its purpose—not just to predict and correct behaviour, but to support the ethical capacities of urban life.

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Tessa Steenkamp is a designer shaping the interactions between people, places and technology. As a design researcher at the lectorate ‘Civic Interaction Design’ at UAUS, she takes part in the project Human Values for Smarter Cities. Her research is formed through designing and organizing participatory experiments in public space and mainly addresses the use of image recognition in public space. How could these algorithms be designed and communicated, in such a way that a wider public is aware of, and engaged in, their deployments? Tessa also runs her strategic design studio Bits of Space . The studio researches socio-spatial challenges through the lens of personal experience, and translates insights into spatial concepts and future scenarios.

Mike de Kreek has a background in participatory action research and arts-based research in contexts of collaborative learning, co-creation and collaborative governance. He gets enthusiastic when academic processes are collaborative in themselves, nurturing improvements of work or empowerment of people. He is part of the Human Values for Smart Cities project, which runs from 2022 to 2026 and is led by the Civic Interaction Design Research Group at the AUAS. The focus lays on civic participation and engagement in articulating, making and evaluating of smart city technologies in urban spaces.