

A Charter for the Smart City

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A Charter for the Smart City

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Author: Richard Wouters (Wetenschappelijk Bureau GroenLinks)

Contributors: Martin Ander (Institut Aktivního Občanství), Miriam Kennet (Green Economics Institute), Petra van der Kooij, Luuc Ritmeester, and members of the working group on smart cities (Wetenschappelijk Bureau GroenLinks), Carlotta Weber (Green European Foundation)

GEF project coordination: Carlotta Weber

Proofreading and editing: Aoife Daly

Graphics, design, and layout: Nuno Pinto da Cruz

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Green European Foundation

Rue du Fossé 3, 1536 Luxembourg
Brussels office: Mundo Madou, Avenue des Arts 7-8,
1210 Brussels, Belgium

info@gef.eu

www.gef.eu



Wetenschappelijk Bureau GroenLinks

Oudegracht 312, Utrecht, Netherlands
PO Box 8008, 3503 RA Utrecht, Netherlands

info@wetenschappelijkbureaugroenlinks.nl

www.wetenschappelijkbureaugroenlinks.nl



Institut Aktivního Občanství

Křížkovského 300/33, Brno 603 00, Czech Republic

martin.ander@aktivniobcanstvi.cz

www.aktivniobcanstvi.cz

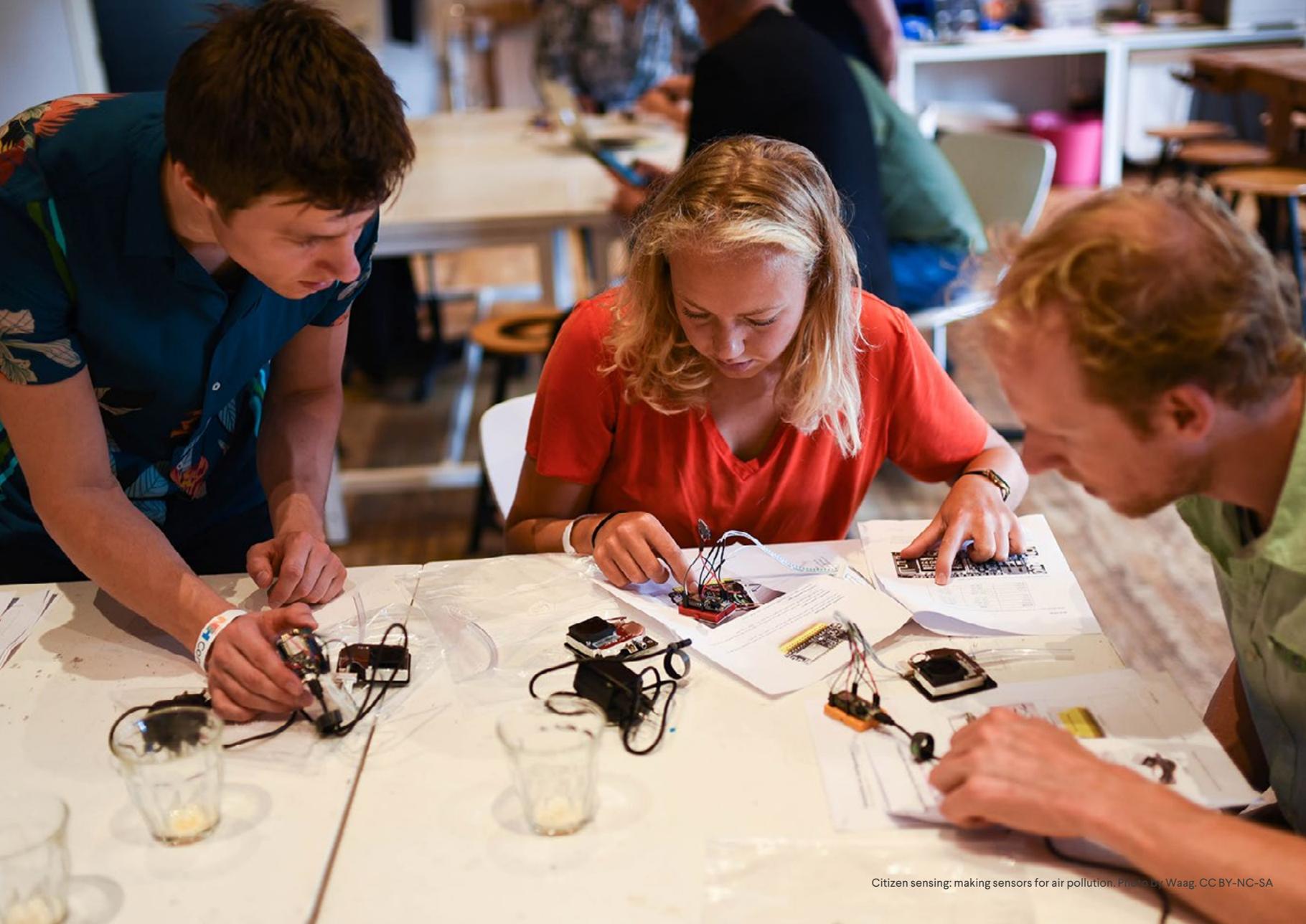


Green Economics Institute

6 Strachey Close, Tidmarsh, Reading, RG8 8EP, United Kingdom

info@greeneconomicsinstitute.org.uk

www.greeneconomicsinstitute.org.uk



Citizen sensing: making sensors for air pollution. Photo by Waag. CC BY-NC-SA



Introduction

People make technology. Technology, in turn, influences our lives, our societies, and even our ethics. Which decisions may be taken by algorithms instead of by humans? The data collected by sensors in our streets, to whom does it belong? Do we entrust the care of our elderly to robots? These questions concern all of us. The development of new technologies therefore cannot be left to engineers and managers. New technology requires public debate and democratic control.

All over Europe, municipalities want to become ‘smart cities’, front-runners in the use of big data and smart information technologies. These technologies observe, decide, and act with a certain degree of autonomy: from sensors, to algorithms, to robots. Local politicians might find it hard to keep up to speed with the technologies deployed in and by their city, let alone to weigh the pros and cons before the technological innovations are actually developed and implemented.

Smart technologies offer opportunities for improving the quality of life in cities, for reducing their ecological footprint, and for creating new urban commons. But they may also present threats to civil liberties and to social justice, especially where smart city solutions are pushed by big tech companies. Technological innovation should not be an end in itself. A smart city is only really smart if data collection and artificial intelligence are steered by values.

This Charter for the Smart City puts the values of democracy, connectedness, human dignity, privacy, sustainability, and equality at the heart of smart cities. Local politicians and active citizens who share these values may use the principles in this Charter as starting points for democratic debate and informed moral judgment on technological innovations in their communities.

The Charter was developed through a series of roundtables in various European cities, from Brno to Oslo¹, as well as an online consultation. The drafters of the Charter would like to express their gratitude to the hundred-plus experts, (local) politicians and activists who shared their ideas. If this Charter brings some wisdom to the smart city, it is thanks to their contributions.

¹ See <https://gef.eu/project/a-charter-for-the-smart-city>



► Ten smart actions for a smart city

How can local politicians put the principles of the Charter for the Smart City into practice? Here are a few examples. Additional inspiring examples can be found in the text boxes throughout this booklet.

- 1.** Set clear design requirements for new technology, from open source and privacy to energy efficiency and circularity. *(see principle 1)*
- 2.** Make agreements about co-creation – the development of new technology together with employees and other stakeholders – both within the municipal organisation and with the companies and organisations to which the city outsources tasks. *(see principle 2)*
- 3.** Set up an impact assessment committee to provide the municipality with solicited and unsolicited advice on new technology that affects the city. *(see principle 4)*
- 4.** Give citizens more control over their personal data, for example by facilitating the use of the privacy app IRMA. *(see principle 8)*
- 5.** Make data that is collected by the city – insofar as it is not personal data – available as open data. Demand the same from companies. *(see principle 9)*
- 6.** Set up a municipal hotline for chained errors in order to rectify incorrect data about citizens which has seeped through from one computer system to another. *(see principle 10)*
- 7.** Have the algorithms used by and in the city assessed for detrimental effects such as discrimination. *(see principle 11)*
- 8.** Use inclusive calculation models, with a high shadow price for CO₂ emissions and other adverse environmental effects, to accelerate the breakthrough of green technology. *(see principle 13)*
- 9.** Ban cameras with automated facial recognition from the public space. *(see principle 15)*
- 10.** Recognise the right to meaningful human contact for people who need services or care from the municipality. *(see principle 16)*



A Charter for the Smart City: Principles

For an explanation of the principles and examples of good practices, see the pages mentioned.



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15. Create lively public spaces that invite movement and encounters, and where people are not constantly monitored. *page 36*
16. Recognise the right to meaningful human contact. We cannot outsource the care for others to robots. Contact with citizens at the government office, both online and offline, must hold the potential to lead to changes in government decisions. *page 38*
17. Combat the social and digital divide. Provide a basic digital service for people with few digital skills. Stand up for the rights of workers and for a fair distribution of income, wealth, and housing. *page 40*
18. Promote a fair platform economy. Implement tailor-made policies to safeguard public values. Prioritise non-commercial platforms or create public platforms. *page 41*



FÉ IN DE WAAG



Meeting of experts on citizen sensing. Photo by Ars Electronica/Making Sense Team. CC BY-NC-ND 2.0

A Charter for the Smart City: **Explanations and good practices**





A. Democratising the development of technology

1. Ensure public debate and democratic governance, as technology influences who we are and how we live together. Enshrine public values in the design requirements of technology.

Technology is political. Technology influences who we are and how we live together. Urban technological innovations thus require that we ask what kind of citizens – as well as consumers, neighbours, and parents – we want to be, and what kind of city we want to live in. What values do we uphold, and to this end what problems need to be addressed, with or without the use of new technology?

Technology can serve our values or undermine them. When values clash, so do people's opinions. This is why public debate about technological innovation is needed. Smart city projects require transparent, inclusive, and gender-sensitive dialogue with and between citizens as a step towards informed political decision-making, whereby the trade-off between values is made explicit. The chip on the keycard to a waste container, for example, can tell a municipality which households do not separate their waste. Is it acceptable for a municipality to ring their doorbell and address their behaviour? Or is that

too serious an invasion of their private lives? What weighs heavier, sustainability or privacy?

In the design stage of technology, certain values are already built in. Is an algorithm capable of explaining its decisions, for instance, thus enabling a government to fulfil its duty to state reasons? A municipality that opts for a new technology should communicate its design requirements to developers and suppliers at an early stage. Open source, interoperability, security, privacy, user-friendliness, accountability, energy efficiency, and circularity are important design requirements.

A question not to be overlooked is: do we really need new technology? The high-tech solution to a problem is not always the best one. Some low-tech inventions are almost unbeatable; think of the bicycle as a means of urban transport. Sometimes nature offers solutions; trees, for example, are the city's air conditioners. Social innovations can be more effective than technological innovations. For instance, communal housing arrangements where people of different generations and abilities live together may better meet the needs of elderly and disabled people than social and care robots.² Often, technological and social innovations go hand in hand.

² See for example the Sargfabrik in Vienna www.sargfabrik.at/CustomResources/PDFs/Presse/ea6241ee-1811-4bfe-8607-17553c346a16.pdf



Euskirchen – Closing organic loops

Vegetable, fruit, and garden waste can only be recycled into compost for new crops if households separate it from other waste. This requires a change in behaviour from citizens, especially in cities. A technofix, as yet, does not exist: organic waste sorted from residual waste by machines is too contaminated to re-enter the food chain. However, technology can help control the quality of organic waste separated by households. In the German town of Euskirchen, waste collection trucks are equipped with a sensor that checks the contents of organic waste bins. Bins that contain too much metal are not emptied. This helps reduce the contamination of the organic matter with plastics as well, because citizens take greater care in separating their waste materials.³ In short, closing organic loops demands both social and technological innovations.

ers – from employees, to clients, to local residents – must be involved in the design process. Their knowledge and experience is indispensable if we want technology to take their values into account and to meet their needs.

The Hague – Living lab for senior citizens

The Dutch city of The Hague has set up a living lab for the development of technology that helps aging citizens live on their own longer and more comfortably. A group of 150 elderly people is involved in selecting and improving technological solutions. The needs of the elderly determine which technology developers may take part in the lab. Together, using a 'try-out home', the elderly and the developers find out which solutions meet the needs of elderly people with disabilities or constraints. If necessary, the technology is improved.⁴

2. Promote the involvement of all stakeholders in the development and implementation of technology. Innovations must take the values and needs of users into account.

Development and implementation of technology cannot be left to engineers and managers. Technological innovation induces changes in the workplace, or in the relationship between healthcare workers and care recipients. People's roles change. This is why all stakehold-

Technological innovation should be aimed at supporting employees, not at replacing them. What do employees need to do their jobs better? How can their work be made more satisfying? Innovation requires that employees have a say.⁵ Arrangements for co-creation – the development of technology together with employees and other stakeholders – can be made within the municipal organisation, as well as in contracts with organisations and companies to which the municipality outsources tasks.

³ Kreis Euskirchen, *Störstoff-Detektor für Bioabfall* (in German) www.kreis-euskirchen.de/umwelt/abfall/detektor_bioabfall.php

⁴ iZi Gezond Lang Thuis (in Dutch) <https://wijenizi.nl>

⁵ EU High-Level Expert Group on Artificial Intelligence, *Policy and Investment Recommendations for Trustworthy AI*, 2019, p. 13 <https://ec.europa.eu/digital-single-market/en/news/policy-and-investment-recommendations-trustworthy-artificial-intelligence>



3. Invest in technological citizenship. Work together with citizens and create space for experiments.

A city must not only be smart *for* citizens, but also *thanks to* citizens. It starts with education. Children need to learn about the way technology influences our lives and our societies, and about its opportunities and risks. Digital skills are indispensable, but not all kids need to become whiz kids. For humans and technology to work well together, we must foster those talents in children that artificial intelligence does not excel in: imagination, self-initiative, empathy, and moral judgement. Reflection upon technology also deserves a place in local arts and culture policies, for both adults and youth. For example, artists can visualise all the data being collected in a city's public space.⁶

Technological citizenship not only requires awareness of technology's sway, but also empowerment. A smart city helps citizens to use technology to tackle the issues they care about. It supports living labs and maker spaces. It encourages citizens to take their own measurements around their living environments.⁷ Citizen sensing connects people and can stir them into political action, for example if the air they breathe turns out to be unhealthy.

Antwerp – Citizen sensing

In the Belgian city of Antwerp, two thousand citizens participated in the citizen science project 'Curious Noses', an inquiry into air pollution which was supported by the municipality and by scientists. By fixing two sensors to their windows for a month, the participants measured the concentration of nitrogen dioxide in their streets. It turned out that the European Union's and the World Health Organisation's limit value for this pollutant was being exceeded at some 45 per cent of the measuring points, mainly due to car traffic. The inquiry moved the issue of bad air quality higher up the political agenda and helped the regional authorities to tweak their own measuring method. Two years later, in 2018, the Curious Noses project was repeated in the whole region of Flanders. Twenty thousand people took part.⁸

A smart city works together with citizens. Public spaces are better maintained if people are able to report full trash containers or broken street lamps via an app.⁹ If the app also informs people about action taken – or not – following their report, they can more easily hold their government to account. Such an app can also be used to invite citizens to make suggestions for neighbourhood improvements.¹⁰ These suggestions then deserve a substantive response from the local government, whether they are deemed feasible or not.

6 See the Embassy of Data <https://vimeo.com/237758758>

7 See The Bristol Approach to citizen sensing www.bristolapproach.org

8 <https://curieuzeneuzen.be/in-english>

9 See for example Fixmystreet.com www.mysociety.org/community/fixmystreet-in-the-uk and Sag's Wien (in German) www.wien.gv.at/sagswien/index.html However, see also principle 4 on the risk of discrimination.

10 See for example Verbeter de buurt (in Dutch) www.verbeterdebuurt.nl



A smart city makes room for experiments, especially when the initiative comes from citizens: from neighbourhood composting to smart charging stations that use electric car batteries to balance supply and demand on the grid. These bottom-up innovations sometimes require an adaptation of municipal rules, which should not stand in the way of a promising experiment. When necessary, initiators should also receive official support so that they do not get lost in a maze of rules.

Brussels – Neighbourhood composting

Brussels is a front-runner in neighbourhood composting. In nearly 200 places, groups of households are working together to compost their organic waste with the aid of microorganisms and worms. The financial support of the Brussels Capital Region to the citizens' initiative WORMS has contributed to the proliferation of compost bins and worm hotels.¹¹ Some designers of worm hotels want to make them smart by adding sensors and software that monitor the worms and provide information on how to improve the composting process.¹²

Experiments do not always succeed. In a smart city, a failed experiment is not a political sin.

4. Anticipate the unforeseen consequences of technology. Call upon the imagination of scientists, philosophers, and artists. Take responsibility.

New technology always has unexpected and unintended consequences. If a municipality is too much led by reports from citizens via an app when it comes to the maintenance of public spaces, there is a risk of discrimination: in poorer neighbourhoods, where people are less proficient at complaining digitally, street furniture is not repaired as quickly as elsewhere.¹³ Sensors that monitor the well-being of elderly people living alone do not always deliver the promised time savings for care workers and informal carers; for example, some people deliberately leave the refrigerator door open for too long, just to receive a phone call from a carer.¹⁴

We can try to anticipate by drawing lessons from the past and sketching scenarios for the future. Governments can benefit from the knowledge and imagination of historians, philosophers, ethicists, and artists to map the possible consequences of technological innovations for people and society.

¹¹ <https://wormsasbl.org> (in French and Dutch)

¹² Jan-Matthijs Blom, 'Rowin maakt met zijn wormenhôtels compost van verse wormenpoep', *De Gezonde Stad*, 2019 (in Dutch) www.degezondestad.org/blog/37/rowin-maakt-met-zijn-wormenhôtels-compost-van-verse-wormenpoep

¹³ Burak Pak et al., 'FixMyStreet Brussels: Sociodemographic Inequality in Crowdsourced Civic Participation', *Journal of Urban Technology*, 2017 www.researchgate.net/publication/316030107_FixMyStreet_Brussels_Socio-Demographic_Inequality_in_Crowdsourced_Civic_Participation

¹⁴ Wetenschappelijke Raad voor het Regeringsbeleid, *De robot de baas. De toekomst van werk in het tweede machinetijdperk*, 2015, p. 118 (in Dutch) www.wrr.nl/publicaties/verkenningen/2015/12/08/de-robot-de-baas



Building compost bins. Photo by Climate Justice League. CC BY-NC-SA 2.0

Techno-moral vignettes

One way to reflect on the unforeseen consequences of technology is the development of techno-moral vignettes: fictional scenarios, written or visual, about the (ethical) changes that technology may bring about.¹⁵ How freely do we move through the city, for example, when cameras with facial recognition hang everywhere? Or when passers-by, using smart glasses such as the Google Glass, are capable of uncovering our identity and consulting our social media profiles?

Any government can bring together thinkers, experts, and citizens in an impact assessment committee that provides solicited and unsolicited advice on new technologies that affect the city. For instance, such a committee can sound the alarm if it thinks the precautionary principle needs to be applied. This principle dictates that when human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm.¹⁶

Flanders – Electromagnetic radiation limits

Scientists disagree on the risks that electromagnetic fields pose to public health. The Belgian region of Flanders applies a strict limit for the electromagnetic radiation of antenna stations for telecommunication in the vicinity of homes, schools, and nurseries. In some other EU countries, there are no legal limits.¹⁷ Now that the deployment of the fast 5G network will lead to a considerable increase in the number of small antennas, it is up to municipalities in those countries to decide whether or not they curb radiation, as a precaution.

Regular evaluation is required with the introduction of technological innovations. Technology needs a constant critical look, including by audit authorities and ombuds(wo)men. For example, research into neighbourhood watch apps shows that these apps, instead of improving security, can fuel fear, mutual distrust, discrimination, and vigilantism.¹⁸

Unforeseen damage should not be passed on to society or affected individuals. Designers and providers of technology, as well as the companies and authorities that make use of it, must take responsibility.¹⁹

¹⁵ For an example of a techno-moral vignette using video images, see www.rathenau.nl/en/making-perfect-lives/synbio-politics, under 'Future Scenarios'.

¹⁶ UNESCO, *The Precautionary Principle*, 2005, p. 14 <https://unesdoc.unesco.org/ark:/48223/pf0000139578> The precautionary principle is one of the leading principles in the environmental policies of the European Union, according to article 191 of the Treaty on the Functioning of the European Union.

¹⁷ RIVM, *Comparison of international policies on electromagnetic fields*, 2018 www.rivm.nl/comparison-of-international-policies-on-electromagnetic-fields-2018

¹⁸ Rani Molla, 'The rise of fear-based social media like Nextdoor, Citizen and now Amazon's Neighbors', *Vox*, 7 May 2019 www.vox.com/recode/2019/5/7/18528014/fear-social-media-nextdoor-citizen-amazon-ring-neighbors and Clara van de Wiel, 'Amper beleid bij forse groei buurtpreventie door burgers', *NRC Handelsblad*, 18 April 2019 (in Dutch) www.nrc.nl/nieuws/2019/04/18/amper-beleid-bij-foerse-groei-buurtpreventie-door-burgers-a3957374

¹⁹ See for instance Municipality of Eindhoven, *Smart Society IoT Charter*, 2017 <https://data.eindhoven.nl/explore/dataset/eindhoven-smart-society-iot-charter/information> Amsterdam's hotline for chained errors is a good example of taking responsibility. See principle 10.

5. Let knowledge be free. Do not lock technology up in patents. Use open standards and free open source software.

The sharing of knowledge leads to more knowledge. The smart city expects the companies with which it cooperates not to erect walls around technology and data, in the form of patents, commercial secrets, and data licences. They must contribute the knowledge acquired to the public commons – unless there are clear risks of abuse. If a community shares in the risks of innovations, it is only fair for it to share in the returns as well.

Smart governments use open standards for ICT and free open source software: computer programmes of which the source code is public and which allow their users to modify and share them. Open ICT increases the transparency of the functioning of ICT systems and allows programmes from different providers to ‘talk’ to each other. This protects governments from being shackled to a supplier (vendor lock-in). Open ICT also facilitates the exchange of information with citizens and helps to ensure that data remains accessible in the long term.

Barcelona – Open source software

The city of Barcelona spends 80 per cent of its ICT budget on open source projects²⁰ because it wants to have control over its own computing.²¹ The municipality makes the open source software it develops available to others by publishing it on portals such as GitHub²² and Joinup²³. This includes the (source) code of its advanced citizen participation platform Decidim, which has been adopted by dozens of other cities, from Helsinki to Mexico.²⁴

From digital signatures to WiFi connections, the reliability of technology can be enhanced by implementing voluntary standards. Those standards are usually developed by stakeholders under the auspices of standardisation organisations such as ISO and CEN. Governments also make use of these standards or request companies and organisations to comply with them. However, government transparency is compromised if these standards can only be consulted against payment, as is often the case. Governments should either refrain from using or referring to standards that are locked behind a paywall, or strive to make them freely available.

The algorithms that a government uses for decision-making must be verifiable and allow the government to justify its decisions.²⁵ The intellectual protection of an algorithm – for example, when it is purchased from a company – must not stand in the way of its verifiability or of the government’s duty to state reasons.

20 Gijs Hillenius, ‘80% of Barcelona’s IT investment linked to open source’, *Joinup*, 2018 <https://joinup.ec.europa.eu/collection/open-source-observatory-osor/news/growing-100-2020>

21 Municipality of Barcelona, *Ethical Digital Standards: a Policy Toolkit* www.barcelona.cat/digitalstandards/en/init/0.1/index.html

22 https://ajuntamentdebarcelona.github.io/en/index_en.html

23 <https://joinup.ec.europa.eu/collection/ajuntament-de-barcelona-barcelona-city-council>

24 <https://decidim.org>

25 See principle 11.





B. Technology in service of democracy and fundamental rights

6. Prioritise technology that connects people. Nurture dialogue.

Technology can set people apart, but it can also strengthen community values. A city wanting to promote encounters and connectedness tries to prevent technology from isolating us from our fellow citizens. It does not allow a street to be taken over by Airbnb tourists. In the future, it will provide the self-driving shared car with as much space as needed to replace the private car, but it will prevent public transport, cycling, and walking from being pushed out.²⁶ Such a city uses technology to bring citizens together, for instance through a website where they can request or offer neighbourly assistance.

Dialogue between citizens can be fostered by platforms and apps that allow them to submit neighbourhood improvement plans, on the condition that their idea has sufficient supporters. Only through consultation with neighbours can the plan become a real citizens' initiative that requires a response from the municipality.²⁷

Haarlem – Neighbourly help

BUUV²⁸ is a digital platform that allows people to ask for assistance from other people in their neighbourhood: a ride to the doctor, an odd job in the house, walking the dog or just providing companionship. There is no quid pro quo. Some participants exclusively offer assistance. For people with few digital skills, BUUV has installed notice boards at meeting points in the city. BUUV started out in the city of Haarlem and is now active in ten Dutch municipalities. The cost is shared by these municipalities. The return of BUUV is an increase in social capital: participants gain trust in other people.²⁹

Discussing, convincing and being convinced, giving and taking, fighting and making peace belong to life. Technology that makes these crucial social skills superfluous does not exist, and we should not wish for it.

²⁶ See principle 15.

²⁷ See for instance Locali (in Dutch) <https://locali.nu>

²⁸ <https://buuv.nu/english>

²⁹ Emy Sloom, *BUUV: A Community to Understand Social Capital*, master thesis University of Amsterdam, 2017 www.scriptiesonline.uba.uva.nl/document/650972



7. Let technology contribute to a vital democratic culture. Protect citizens against manipulation.

Digital tools can strengthen democracy in numerous ways, from facilitating access to public sector information to broadening citizens' participation in decision-making.³⁰ Digital platforms and social media provide a forum for public debate and for contact between elector and elected. There are good examples, especially at the local level, of politicians who do not exclusively send, but also receive. They reply to questions online, answer for their decisions and pick up ideas.

Even in the digital era, democracy cannot function according to the 'you ask, we provide' model. Internet surveys and polls of individual preferences are no substitute for political debate between citizens. The fulfilment of individual wishes must sometimes give way to a higher, collective interest. Exchanges of viewpoints, negotiations, and compromises are indispensable in defining the common interest. Instruments that want to give people more control over their living environments, such as participatory budgets and apps for citizens' initiatives,³¹ must do justice to the deliberative aspect of democracy.

Brno – Participatory budget

The Czech city of Brno goes to length to integrate deliberations into its participatory budget. The yearly vote on the projects that are proposed by citizens to improve their city, from playgrounds to classes for seniors, is preceded by a series of public meetings. During these discussions, the proponents of a project can refine their proposals, strike compromises, forge alliances, and garner support. The last meeting decides which projects will be presented at the top of the voting list. Also, Brno makes sure that the city district councils are involved in the selection of feasible projects. The final vote – open to all citizens, who can cast their ballot either online or offline – determines which projects will be implemented by the city. But this vote is just the final stage of ten months of deliberations.³²

Unfortunately, social media such as Facebook and Twitter offer possibilities to manipulate voters for political purposes. Disinformation is abundant. Profiling of social media users enables political marketers to exploit the weaknesses and fears of specific groups and individuals. Voters are misled about a party's political priorities, if it can present itself to every voter as a one-issue party for his or her interests.³³ The public sphere gets fragmented, if the political messages that citizens receive are tailored to their political, social, or psychological profile, or are filtered by the bubble of like-minded people that social media creates around them.

30 See Dirk Holemans & Kati Van de Velde, *(W)E-democracy: Will Parliament survive the Digital Era? Hopeful approaches to democracy in digital times*, 2017 https://gef.eu/wp-content/uploads/2018/01/GEF_WE-Democracy_final.pdf

31 See principle 6.

32 Dáme na vás (in Czech) <https://damenavas.brno.cz> See also 'Brno – Smart governance leader', *city:one*, nr. 2, 2018 https://issuu.com/cityone/docs/city-one_en_09-18_s

33 F. J. Zuiderveen Borgesius et al., 'Online Political Microtargeting: Promises and Threats for Democracy', *Utrecht Law Review*, vol. 14/1, 2018 www.ivir.nl/publicaties/download/UtrechtLawReview.pdf



Governments can counter disinformation without harming freedom of expression. For instance, they can support independent (local) media, independent funds for investigative reporting, and independent fact-checkers. They can incorporate media literacy in school subjects. Political parties, even at the local level, would do well to agree between themselves to refrain from microtargeting in online election campaigns.

European Parliament - No profiling

In 2018, the European Parliament drew lessons from the Cambridge Analytica scandal. This British data company had captured the data of 87 million Facebook users without their permission, after which it was used for political purposes, including Donald Trump's election campaign in the United States.³⁴ The European Parliament's resolution "calls on political parties and other actors involved in elections to refrain from using profiling for political and electoral purposes; calls on political parties to be transparent as to their use of online platforms and data".³⁵

8. Protect privacy and personal information. Give citizens control over their data and prevent class injustice.

Privacy and the protection of personal data are essential for our freedom and security. If governments or companies infringe too deeply upon our privacy, we are prevented from thinking freely, speaking freely, and exchanging ideas freely. This leads to conformism. An all-seeing government stifles diversity and creativity in society. If companies know too much about us, we are exposed to the risk of having our opinions and preferences manipulated. Privacy is not only an individual right, but also a common good.

Smart cities are only really smart when they handle personal data carefully. They need to have a good reason to collect and process personal data and they must be able to explain this. This follows from the European Union's General Data Protection Regulation (GDPR) and its underlying principles: lawfulness, fairness, transparency, purpose limitation, data minimisation,³⁶ accuracy, storage limitation, integrity, confidentiality, and accountability. Cities must demand the same from the companies they work with. Contracts with companies partnering with the smart city must be public, especially in connection with tasks in which personal information is collected and processed. The transparency principle of the GDPR is at stake here.

³⁴ 'The Cambridge Analytica Files', *The Guardian* www.theguardian.com/news/series/cambridge-analytica-files

³⁵ European Parliament resolution of 25 October 2018 on the use of Facebook users' data by Cambridge Analytica and the impact on data protection www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P8-TA-2018-0433+0+DOC+XML+V0//EN

³⁶ Including 'privacy by design' and 'privacy by default'.



The supervisory role of municipalities does not have to be limited to their own organisations and the companies they contract. They can make agreements about privacy and data protection with all companies and institutions operating within the municipal boundaries.³⁷ Rules that apply to everyone can be laid down in local regulations, for example concerning the use of sensors in the public space.

Some companies treat personal data as merchandise. However, rewarding people for their data puts them to an improper choice between economic gain and preserving their privacy. Trade in personal data undermines privacy as a common good and leads to a society in which the rich have more privacy than the poor. Municipalities should not provide support to companies that purchase or resell personal data, whether they are start-ups or tech giants.

Even when governments legally collect and process personal information in the performance of official tasks, they should seek opportunities to give citizens as much control as possible over their personal data. For example, by offering a privacy-friendly alternative in situations where showing a passport, identity card, or driving licence is currently required.

Privacy app

The open source app IRMA (*I Reveal My Attributes*) enables citizens to reveal properties (attributes) of themselves without disclosing personal information that is not relevant in the situation at hand. Thus, citizens can fill out municipal web forms without having to enter their official digital identity code; IRMA allows them to prove that they are residents of the municipality. At the door of a nightclub, 'over 18' and a digital passport photo are the only personal attributes that are needed to get in. These are the only data the bouncer gets to see upon reading out the QR code on the mobile phone of youngsters who have the IRMA app. The more companies and governments facilitate the use of IRMA, the less often people need to cede their name, address, passport number, or national identification number. That enhances their privacy and reduces the risk of identity fraud.³⁸

Initiatives such as IRMA show that governments can use technology to give citizens more control over their data. However, governments also use technology to gain more control over citizens. When it comes to combating benefit fraud, the principle of purpose limitation – personal data may be used only for the purpose for which it was ceded or for a compatible purpose – has become virtually meaningless. Governments feed algorithms with a wide range of personal data, from dog ownership to holiday destinations, in order to establish risk profiles.³⁹ The benefit recipients who fit the profile are *prima facie* suspects, to be subjected to investigation.

³⁷ See for example the *Tada Manifesto* <https://tada.city/en/home-en>

³⁸ IRMA is being developed by the Privacy by Design Foundation <https://privacybydesign.foundation/en>

³⁹ Peter Olsthoorn, 'Verdacht door Data', *iBestuur Magazine* 12, 2014 (in Dutch) <https://ibestuur.nl/magazine/verdacht-door-data>

A society in which your socio-economic status determines the extent to which you are entitled to privacy and data protection is guilty of class injustice. Moreover, support for useful technological innovations crumbles if citizens find out that their data is being used improperly: “Your waste card tells us that you produce a lot of waste. We are here to check whether you are in fact entitled to a single person’s allowance.” That is why national and local politicians must prevent the data dragnet for profiling from being cast too widely. Select before you collect: governments need to demonstrate the necessity and proportionality of the use of each category of personal data, especially when it concerns special personal data, regarding health for example.

9. Share data that is not traceable to a person. Such data is a public commons. Keep in mind that not all knowledge can be captured in hard data.

Collecting, combining, and analysing data allows governments to become smarter at designing and evaluating policies. But they should not keep the data to themselves. Sharing information with citizens is at the heart of democratic accountability. Data collected by or on behalf of governments – insofar as it is not personal data – must be considered a public commons. This data, whether it concerns the health of trees⁴⁰ or 3D models of cities,⁴¹ should therefore be available to everyone to access, use, and share.

40 Map of Amsterdam’s trees: <https://maps.amsterdam.nl/bomen/?LANG=en>

41 Helsinki’s 3D city models: www.hel.fi/helsinki/en/administration/information/general/3d

42 www.findtoilet.dk For other examples of reuse of open data, see the European Data Portal: www.europeandataportal.eu/en/using-data/use-cases

43 If there is a risk of de-anonymisation, it can be legitimate for governments to limit access to and reuse of anonymised datasets. See F.J. Zuiderveen Borgesius et al., *Open Data, Privacy, and Fair Information Principles: Towards a Balancing Framework*, 2015 https://pure.uva.nl/ws/files/17279722/SSRN_id2695005.pdf

44 See for example Y. de Montjoye et al., ‘Unique in the Crowd: The privacy bounds of human mobility’, *Nature Scientific Reports*, 2013 www.nature.com/articles/srep01376

Denmark – Toilet app

The popular app FindToilet allows its users to find the nearest public toilet in Copenhagen and other Danish municipalities. It has been developed by a woman who suffers from urinary incontinence and provides highly relevant, up-to-date information for other people with and without incontinence. FindToilet collects open data from local governments and visualises it on an online map and in the app. All the collected toilet data is available for reuse by others.⁴²

Personal information can also be open data, provided that it is irreversibly anonymised and therefore no longer personal. Governments need to be open about the anonymisation techniques they use, and they should check these regularly in order to prevent the data from being able to be traced back to identifiable persons through new datalinks.⁴³ Anonymised location data in particular is vulnerable to de-anonymisation.⁴⁴

Open data requirements must apply to all companies operating on behalf of or with the support of a government, and to those with a permit granted by a government. Everyone should be able to use this data, whether it be citizens who want to analyse their living environments or companies that want to develop new applications.



Barcelona – Data as a commons

According to the city of Barcelona, “data can generate new monopolies and accumulations of wealth which accentuate inequality. However, they can help generate evenly-distributed wealth and give us a better understanding of people’s needs and how to elaborate appropriate responses.”⁴⁵ Barcelona opts for the egalitarian scenario and chooses to treat data collected in the city as a ‘common asset’. That includes data that is collected by companies. This data, with the exception of personal information, is published in reusable formats on Barcelona’s open data portal.⁴⁶

Some citizens are willing to voluntarily provide personal data for the public good. In doing so, they should be able to determine the purposes for which their data may be used: for health statistics and medical research, for example, but not for the development of medicines that will be subject to expensive patents. Municipalities can promote such data commons.⁴⁷

It is important to remember that not all knowledge can be captured in hard data or figures. In order to be able to evaluate loneliness in the city, or the quality of a school, ‘softer’ information such as experiential knowledge is also required.

10. Take care that government ICT systems respect the principles of good administration. Introduce the right to the central rectification of data.

Legal rules for dealing with citizens – including the principle of legality, the right to explanation, and the principles of proportionality and legal certainty – must also apply to a government that goes digital. In practice, it may happen that government ICT systems are set up in a way that violates good administration. For example, when the software cannot handle the complexity of the rules or cannot be corrected. In this way, incorrectly entered information about citizens can persist in government databases for years; even helpful government professionals are powerless against the systems. Municipalities and other governments must not allow ICT systems to undermine the principles of good administration.

Decisions that have far-reaching consequences for citizens or residents, such as involuntary deregistration from the population register, should not be taken on autopilot. Good administration requires that, in each individual case, the various interests at stake are weighed up against each other, on the basis of fairness and proportionality, whereby a municipality needs to make an effort to contact the person concerned.

45 Municipality of Barcelona, ‘Ethical and Responsible Data Management: Barcelona Data Commons’, *Barcelona Digital City blog*, 2018

<https://ajuntament.barcelona.cat/digital/en/blog/ethical-and-responsible-data-management-barcelona-data-commons>

46 Open Data BCN <https://opendata-ajuntament.barcelona.cat/en>

47 See for example the DECODE project: <https://decodeproject.eu/what-decode>





Participatory budgeting in Brno. Proposals are discussed on the Dáme na Vás platform as well as in meetings. Photo by City of Brno. ©

Amsterdam – Hotline for chained errors

Citizens who frequently travel abroad or sublet their home may be deregistered by their municipality. In the population register, they are labelled 'departed, destination unknown', sometimes without their knowledge and against their will. The consequences can be dramatic: these individuals might lose their health insurance, state pension accrual and parking licence, can no longer apply for a passport or driving licence, do not receive a voting pass for elections; if they own a company, it may also be deregistered. If an affected individual manages to re-register, all these rights and entitlements are not automatically restored. That requires him or her to undertake an arduous journey through various authorities.⁴⁸ The city of Amsterdam has set up a municipal hotline for chained errors in order to rectify incorrect data about citizens that have seeped through from one system to another. The reports come from officials who are confronted with distraught citizens and from the municipal ombudsman. Citizens themselves, as yet, cannot turn directly to the hotline.⁴⁹

If an unjustified deregistration or another erroneous decision has set off a chain of other (automated) decisions, to the citizen's detriment, a municipality must assume responsibility for correcting the mistake. Citizens may not be sent from pillar to post. Municipalities, as well

as other authorities, should introduce the right to central rectification: all rights that a citizen or resident loses because of an administrative act must be restorable by a single administrative act as well.⁵⁰

11. Set limits to decision-making by algorithms and ensure human control. Have algorithms checked for discriminatory bias, and comply with the duty to state reasons.

"Because the computer says so" can never be an acceptable explanation for a government decision that affects citizens. The application of automated decision-making calls for checks and balances in order to protect human dignity and ensure good governance. The GDPR sets legal limits for the use of algorithms in decision-making. The general rule⁵¹ is that governments or companies cannot assign decisions to computers if such decisions could bring about significant disadvantages for citizens or consumers. In exceptional cases in which automated decision-making is allowed, the citizen or consumer has the right to obtain an explanation, to object, and to request that a new decision is taken by a person instead of a computer.

ICT systems must therefore make it possible for government professionals to overrule the algorithms based on their own considerations

48 See Arjan Widlak & Rik Peeters, *De digitale kooi – (on)behoorlijk bestuur door informatiearchitectuur*, 2018 (in Dutch)

49 Gemeentelijk Meldpunt Ketenfouten: www.amsterdam.nl/stelselpedia/artikelen-stelsel-gemeentelijke (in Dutch)

50 See footnote 48. This also follows from article 19 of the GDPR: "The controller shall communicate any rectification or erasure of personal data or restriction of processing (...) to each recipient to whom the personal data have been disclosed, unless this proves impossible or involves disproportionate effort."

<https://gdpr.eu/article-19-notification-obligation> A government that takes refuge behind the exception clause, puts a disproportionate onus on the citizen.

51 Article 29 Data Protection Working Party, *Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679*, WP251, 2017 http://ec.europa.eu/newsroom/just/document.cfm?doc_id=47963

of data and interests. An official must be able to say ‘no’ even if the algorithm says ‘yes’.

Governments need to demonstrate that their algorithms are fair. Automated decisions need to be well-reasoned so that they can be verified by the citizen(s) concerned, the more so because the rules for automated decision are not always a seamless translation of the underlying laws and regulations. Governments should make the algorithms they use public, explain their decision-making rules, assumptions, legal and data sources, and have the algorithms tested by independent experts, including ethicists. These tests must be repeated regularly, in particular for self-learning algorithms.⁵² This involves, among other things, ensuring that the algorithm does not develop a discriminatory bias with regard to certain social groups.⁵³

Governments can better comply with their duty to state reasons if they include the right to explanation as a design requirement in the writing of the algorithm code. Truly smart algorithms must be able to explain in understandable language how they have arrived at an outcome. This facilitates human intervention in the decision-making process.⁵⁴

Amsterdam – Review of algorithms

Amsterdam is developing a method to assess the algorithms that are used in the city – both by the municipality and by companies – for detrimental effects such as discrimination. One of the reasons for the assessment was an experiment with a self-learning algorithm that automatically handled complaints about a neighbourhood. If the algorithm had been put into service, it would have led to a situation where neighbourhoods with well-educated citizens who know how to complain would have been better cleaned by the city’s sanitation department than other neighbourhoods.⁵⁵

12. Work on a public digital infrastructure. Offer a platform to service providers, citizens’ initiatives, and urban commons.

A smart city does not succumb to the lure of tech companies offering free services in order to appropriate data. All governments have the responsibility to prevent the concentration of data power, market power, and political power in the hands of tech giants such as Google

52 See Amie Stepanovic, ‘Hardwiring the future: the threat of discrimination by design’, *Green European Journal*, 2018

www.greeneuropeanjournal.eu/hardwiring-the-future-the-threat-of-discrimination-by-design

53 See Kristian Lum, *Predictive Policing Reinforces Police Bias*, 2016 <https://hrdag.org/2016/10/10/predictive-policing-reinforces-police-bias>

See also Amnesty International and Access Now, *The Toronto Declaration: Protecting the right to equality and non-discrimination in machine learning systems*, 2018

www.amnesty.org/en/documents/pol30/8447/2018/en and *Declaration of Cities Coalition for Digital Rights*, 2018 <https://citiesfordigitalrights.org>

54 That human intervention must be more than a formality: “To qualify as human intervention, the controller must ensure that any oversight of the decision is meaningful, rather than just a token gesture. It should be carried out by someone who has the authority and competence to change the decision. As part of the analysis, they should consider all the available input and output data.” Article 29 Data Protection Working Party, *Guidelines on Automated individual decision-making and Profiling for the purposes of Regulation 2016/679*, WP251, 2017, p. 10 http://ec.europa.eu/newsroom/just/document.cfm?doc_id=47963

55 See Municipality of Amsterdam, *Agenda Digital City*, 2019, p. 24 www.amsterdam.nl/publish/pages/901896/agenda_digital_city-eng.pdf and Jan Fred van Wijnen, ‘Amsterdam wil ‘eerlijke’ computers in de stad’, *Het Financieele Dagblad*, 1 March 2019 (in Dutch) <https://fd.nl/ondernemen/1291305/amsterdam-wil-eerlijke-computers-in-de-stad>



and Facebook. They should not sustain a business model that is based on collecting ever more of our personal data in order to put together ever more detailed profiles of us that allow commercial and political actors to manipulate us ever more cunningly: they seduce us into buying things we didn't know we needed, for example, or exploit our personal fears for political gain.⁵⁶

Issy-les-Moulineaux – Alternative search engine

The default search engine on municipal computers in the French town of Issy-les-Moulineaux is not Google, but Qwant.⁵⁷ This European search engine does not waltz off with its users' personal data when they enter a query. Advertisements are based on queries, not on user profiles. Search results on Qwant are not personalised either, in order to prevent a situation where users are more likely to receive information that confirms their ideas than information that contradicts them.⁵⁸

Technology companies can go bankrupt, which could result in a disruption of public services. From the point of view of continuity, vital

technological facilities – such as the sensor network that controls traffic lights in the city – are preferably public rather than private property.

A public digital infrastructure – from fibreglass cables, to sensors, to platforms – gives a government the control it needs to ensure that service providers can compete on fair and equal terms, that personal data is protected, and that other data is shared. This is important, for example, for the responsible introduction of Mobility-as-a-Service platforms, which offer travellers a personalised door-to-door journey using different modes of transport and a single app.⁵⁹

A public digital infrastructure can also be used to support citizens' initiatives. This would mean for example that residents wanting to set up a digital neighbourhood platform would not be dependent upon WhatsApp or Facebook.⁶⁰ Public-civil cooperation can create new urban commons: resources that belong neither to the state nor to the market, but are democratically governed by a community of users.⁶¹ From cooperatives producing clean energy and sharing electric cars to food collectives for the purchase and promotion of regional, artisanal products. These initiatives, which foster connectedness in the city, often need a municipality to partner with them, for instance for

⁵⁶ See principle 7.

⁵⁷ Municipality of Issy-les-Moulineaux, *Protéger les données personnelles*, 2019 (in French) www.issy.com/decouvrir-issy/ville-numerique/qu-est-ce-que-la-smart-city/protéger-les-donnees-personnelles

⁵⁸ Team Quant, *Overview*, 2016 <https://help.qwant.com/help/overview> See also Sven Taylor, 'The complete list of alternatives to all Google products', *Techspot*, 2019 www.techspot.com/news/80729-complete-list-alternatives-all-google-products.html

⁵⁹ See principle 18.

⁶⁰ The DECODE project is running a pilot to develop a privacy-preserving local social network in Amsterdam: www.decodeproject.eu/pilots

⁶¹ See Vedran Horvat, *Real democracy in your town. Public-civil partnerships in action*, 2019 <https://gef.eu/publication/real-democracy-in-your-town-public-civic-partnerships-in-action> See also the *Bologna Regulation for the Care and Regeneration of Urban Commons*. This regulation on public-civil cooperation was adopted by the city council of Bologna in 2014. www.comune.bologna.it/media/files/bolognaregulation.pdf In 2017, Michel Bauwens and Yurek Onzia wrote a *Commons Transition Plan* for the city of Ghent. <https://stad.gent/ghent-international/city-policy-and-structure/ghent-commons-city/commons-transition-plan-ghent>

the development of open source platforms and apps that support the pooling and sharing of energy, vehicles, or food. In return, a municipality may demand that the cooperatives and collectives share the benefits of *commoning* with fellow citizens who cannot contribute money or skills.

Catalonia – Cooperative for electric car-sharing

Som Mobilitat is a cooperative for electric car-sharing in Catalonia. It has a membership of 1500, organised in local groups, and a fleet of 34 e-cars. Som Mobilitat has received subsidies from the regional government and from municipalities for setting up new groups of car-sharers in villages and neighbourhoods. Five municipalities are members of the cooperative. Other municipalities provide parking places or electricity for the shared cars; in return, they may use the cars for a certain number of hours or they may offer test drives to their citizens.⁶² Som Mobilitat works together with other cooperatives in Belgium, the Netherlands, and Germany on technologies indispensable for car-sharing, such as a digital platform and a smartphone app. New cooperatives can join the alliance and adopt the technology, so that they don't have to reinvent the wheel.⁶³

Before turning to businesses, governments must first ask themselves whether they are able to develop and manage their own technology for the city and its citizens.⁶⁴ They might need to hire more people with expertise, specialists with a heart for the public good. Cooperation with other (democratic) governments, at home and abroad, as well as with knowledge institutions, can make the investments manageable.

Tirana – In-house development

In Tirana, the capital of Albania, the city's ICT department is constantly building new platforms and services, drawing upon open source software.⁶⁵ These innovations serve both the city's staff and its citizens; an open data portal⁶⁶ and a forum for e-participation⁶⁷ are amongst the platforms that were built in-house. The municipal ICT team gets help and advice from the local as well as the international open source community.

62 www.sommobilitat.coop/en See also Bart Grugeon Plana, 'Burgercoöperaties en commons in Catalonië effenen het pad voor een samenwerkingseconomie', *Oikos*, nr. 89, 2019, pp. 63-68 (in Dutch)

63 The Mobility Factory www.themobilityfactory.eu

64 "[P]rivate companies may not always understand how cities work (...) Departments within the municipality may deal with tasks more efficiently and effectively than private companies. Investments into training internal staff, instead of outsourcing projects to costly ICT companies, is something that should be considered." M. Ryan, 'Ethics of Public Use of AI and Big Data', *ORBIT Journal* 2/2, 2019 www.project-sherpa.eu/885-2

65 Italo Vignoli, 'The Municipality of Tirana moves to open source software and open standards by migrating to LibreOffice', *The Document Foundation blog*, 2018 <https://blog.documentfoundation.org/blog/2018/11/22/municipality-of-tirana>

66 Open Data Tirana <https://opendata.tirana.al>

67 Virtual Forum Tirana <https://merrpjese.tirana.al/?locale=en>





C. Technology in support of green and social values

13. Technology must contribute to sustainability. Use all policy tools to accelerate the deployment of green technology. Make sure our smart city is not someone else's environmental disaster.

In order to live within the boundaries of the earth's carrying capacity and to meet everyone's needs at the same time, technology – in addition to changes in behaviour and consumption, especially of the world's richest inhabitants – is indispensable.

Pricing the degradation of natural resources is an excellent tool for boosting the development and use of green technology. The polluter should pay. Due to the slow pace of fiscal greening, the European Union and national governments are hindering the breakthrough of clean tech. Municipalities, however, also have possibilities for greening levies; for example, they can waive fees for people retrofitting their homes for energy efficiency.

Standards, long-term goals, subsidies, and government purchases are also important governmental instruments for accelerating the roll-out of green technology. In regards to purchasing, tenders, and in-house projects, it is important that municipalities and other authorities make their choices on the basis of inclusive calculation models, which show the costs (and returns⁶⁸) of buildings, roads, vehicles, and appliances over their entire life cycle, including energy consumption, maintenance, and decommissioning.⁶⁹ The assessment is more likely to favour green technology if the calculation models anticipate a high price for greenhouse gas emissions (CO₂ shadow accounting), for fossil fuels, and for scarce raw materials such as phosphate.

68 In a climate-neutral economy, buildings, infrastructure etc. will increasingly be net suppliers of energy. In a circular economy, the costs of decommissioning – for example the demolition of buildings – will increasingly be surpassed by the revenues. Minimising the consumption of primary raw materials leads to a high demand for secondary raw materials.

69 The 'total cost of ownership and usership'.



Governments must exploit the opportunities for synergy between systems: the heat from waste water can feed heat networks, and (shared) electric cars can deliver storage for green electricity. As we move towards a fully renewable energy system, artificial intelligence will acquire a major role. Smart grids keep the supply of and the demand for heating, cooling, or power in balance, using data on the forecasted weather, the available storage capacity, and the willingness of companies and households to make their energy consumption dependent on supply and price.

Local generation of renewable energy offers a unique opportunity to create new commons. Collective solar roofs, neighbourhood heat pumps, collective batteries, and distributed smart grids, managed by energy cooperatives, can speed up the energy transition, democratise the energy system, forge new bonds between neighbours, and prevent sensitive data on the energy use of households from coming into the hands of large energy corporations. Renewable energy cooperatives deserve municipal support.

For closing the materials loop, (information) technology is essential as well. A circular economy, without waste, requires a meticulous documentation of products and materials in order to enable their safe reuse and recycling. Materials without 'identity' are likely to end up as waste.⁷⁰

A smart city should pay careful attention to the energy and materials it uses to become smart. The hardware needed for new technologies, from datacentres to sensors, must be energy efficient, emissions-free, long-lasting, repairable, and recyclable. It must also be free of raw materials that come at the cost of human rights violations or severe damage to the environment. Our smart city should not be someone else's civil war or ecological disaster.⁷¹

Smart tech for circularity

Online registers of materials passports of buildings⁷² and products, RFID tags that give information about the origin and composition of products, sensors that report when a structure needs maintenance, smart appliances that give instructions about how to be disassembled, robots that assist workers in dismantling buildings and products for recycling, trading platforms for 'harvested' materials and secondary raw materials – a circular city is a smart city.⁷³

70 See Thomas Rau & Sabine Oberhuber, *Material Matters, Een alternatief voor onze roofofbouwmaatschappij*, 2016 (in Dutch)

71 See Maria Kaika, 'Our sustainability is someone else's disaster: Cities and the environment', *Green European Journal*, 2018
www.greeneuropeanjournal.eu/our-sustainability-is-someone-elses-disaster-cities-and-the-environment

72 See for instance Madaster: www.madaster.com/en

73 See for instance Circular Economy Collective, *4'33" Time for a Circular Economy*, Fontys, 2017



Malmö – Sustainable ICT

As a signatory of the Green Digital Charter⁷⁴, the Swedish city of Malmö has committed to decrease the carbon footprint of the ICT used within its own organisation by 30 per cent in 2020. The city is on course to reach this goal. It has reduced energy waste in its datacentre and endeavours to procure the most energy efficient equipment on the market. By requiring sustainability certification for ICT products and holding regular meetings with suppliers, Malmö aims to set the highest possible demands on fair trade and circularity as well. These demands reflect the city's commitment to the implementation of the United Nations' Sustainable Development Goals.

14. Organise resilience: avoid excessive dependence on digital systems, retain non-digital options, and invest in cybersecurity.

The stronger our dependence on digital systems, the greater the disruption if these systems fail or are hacked. In order to protect resilience, we should think twice before completely digitising the systems that keep our societies running, such as the payment system.

European Central Bank – Retain cash

If we maintain cash currency for smaller transactions – also at public administration service points – we can save ourselves for a while if the payment system is down due to a cyberattack, a power outage, or a banking crisis.⁷⁵ Maintaining cash not only protects societal resilience, but also the self-reliance of individuals: children, elderly people, and persons with disabilities, for instance. Some of them do not have a payment card, find it difficult to use such a card, or lose the overview of their finances when they make digital payments. A cashless society would also make life (even) harder for undocumented migrants who do not have access to a bank account, a payment card, or a payment app. “Cash payments facilitate the inclusion of the entire population in the economy,” according to the European Central Bank. It has warned municipalities that they are in breach of European rules if they adopt a ‘no-cash’ policy.⁷⁶

Resilience includes both the ability to withstand disruptions and the ability to adapt to changing circumstances, such as climate change. Resilience benefits from diversity: analogue components that enable key facilities to function when digital control fails, renewable energy sources and energy carriers that can (partly) fill in for each other. If we power vehicles not only with green electricity but also with green hydrogen, we can prevent an overall transport shutdown in the event of a lengthy power outage. Resilience also benefits from modularity: it is desirable for subsystems to have a certain degree of autonomy, so

⁷⁴ EURO CITIES, *Green Digital Charter (revised)*, 2016 www.greendigitalcharter.eu/greendigitalcharter-2/text

⁷⁵ See David Crouch, ‘Being cash-free puts us at risk of attack: Swedes turn against cashlessness’, *The Guardian*, 3 April 2018

<https://amp.theguardian.com/world/2018/apr/03/being-cash-free-puts-us-at-risk-of-attack-swedes-turn-against-cashlessness>

⁷⁶ European Central Bank, letter to De Nederlandsche Bank on no-cash policy of Dutch municipalities, 20 September 2018 <https://zoek.officielebekendmakingen.nl/blg-877812>



that they can continue to function if there is a disruption elsewhere in the system. A local smart grid that can continue to supply power from local energy sources and batteries if the main grid has gone down is resilient.⁷⁷

Strengthening resilience necessitates investments in cybersecurity. A smart city sets high security requirements for suppliers of digital applications, from 'security by design' to fast and adequate security updates. It avoids becoming dependent on a single supplier and shuns the use of hardware and software from countries such as China and Russia for critical infrastructure⁷⁸, in view of the risks of digital espionage and sabotage. It exclusively uses domestic or European cloud services. It not only trains its employees to be alert to digital threats such as phishing emails, but also solicits them to signal security risks. It invites security researchers, including ethical hackers, to discover and report vulnerabilities in its ICT systems. It simulates crises in which multiple digital systems fail or are held ransom, and shares the results with others.

Cybersecurity also includes data minimisation: you can't leak personal data if you do not have it. For example, it is not always necessary to register national identification numbers for communications between municipalities and citizens.

15. Create lively public spaces that invite movement and encounters, and where people are not constantly monitored.

The city's streets, squares, and parks should invite physical movement, play, exercise, and encounters. Digital platforms do not eliminate the need for physical meeting places; urban design, architecture, and traffic policies should contribute to lively public spaces where people feel both free and safe.

The introduction of new vehicles, from electric scooters to self-driving cars, should not be at the expense of space for pedestrians, cyclists, and playing children. In the city, the quality of outdoor life must be prioritised over the speed of travel.

People must be able to move around in the public space without being constantly followed by cameras and sensors. Municipalities should be cautious with camera surveillance. Local politicians should realise that the personal data collected by cameras and sensors, such as for traffic management, can be requisitioned by law enforcement and intelligence agencies. Under no circumstances should they transfer such data automatically to the police. That would make a mockery of the principle of purpose limitation.⁷⁹

⁷⁷ See Dirk Holemans, 'Freedom and Security in the Twenty-first Century', in: Erica Meijers (ed.), *Populism in Europe*, 2011, pp. 171-186

⁷⁸ Including the essential services listed in Annex II of EU-directive 2016/1148 on the security of network and information systems <https://ec.europa.eu/digital-single-market/en/network-and-information-security-nis-directive>

⁷⁹ See principle 8.



San Francisco – Ban on facial recognition cameras

The American city of San Francisco has banned its agencies, including the police, from using cameras with facial recognition software. “The propensity for facial recognition technology to endanger civil rights and civil liberties substantially outweighs its purported benefits, and the technology will exacerbate racial injustice and threaten our ability to live free of continuous government monitoring,” according to the city’s Board of Supervisors.⁸⁰ Henceforth, the agencies need the Board’s permission before they can acquire other types of surveillance technology. The Board also demands a yearly audit report on the use, the costs and the effectiveness of such technology.⁸¹

Automated biometric identification in the public sphere is too serious a breach of privacy. This includes cameras with facial recognition software. The use of such cameras, which can capture biometric data of many people simultaneously, is likely to have a chilling effect, for instance by deterring people from taking part in demonstrations.⁸² Moreover, the current facial recognition software has a discriminatory bias: women and non-white people are more likely to be flagged up in error.

Tracking people using the signals from their mobile devices also clashes with their reasonable expectation not to be followed in the public space. WiFi or Bluetooth tracking should not be used without informed consent from those involved.⁸³

Nijmegen – Counting passers-by

The Dutch city of Nijmegen is running a pilot on a privacy-friendly method of measuring the flow of visitors in the city centre. The images of twenty cameras are immediately converted to anonymous data. This can never be traced back to specific persons. Passers-by cannot be followed along their route, and the municipality and shopkeepers get live information on the volume of traffic in the streets.⁸⁴ If this pilot on ‘privacy by design’ is successful, municipalities that use WiFi tracking to count passers-by might no longer be able to demonstrate that they comply with the GDPR. This regulation requires that administrative bodies, in carrying out a public task, use methods that do as little harm as possible to people’s privacy.

80 San Francisco Board of Supervisors, *Ordinance amending the Administrative Code - Acquisition of Surveillance Technology*, 2019

<https://sfgov.legistar.com/View.ashx?M=F&ID=7206781&GUID=38D37061-4D87-4A94-9AB3-CB113656159A>

81 Shirin Ghaffari, ‘San Francisco’s facial recognition technology ban, explained’, Vox, 2019 www.vox.com/recode/2019/5/14/18623897/san-francisco-facial-recognition-ban-explained

82 The EU’s High-Level Expert Group on Artificial Intelligence lists the automated identification and tracking of individuals through biometric data as one of the “critical concerns” that might undermine the trustworthiness of artificial intelligence. *Ethics Guidelines for Trustworthy AI*, 2019, p. 33 <https://ec.europa.eu/futurium/en/ai-alliance-consultation/guidelines>

83 See Jill Baehring, ‘What does the GDPR say about WiFi tracking?’, *Privacy Company blog*, 2019 www.privacycompany.eu/en/what-does-the-gdpr-say-about-wifi-tracking

84 Municipality of Nijmegen, *Aantal voorbijgangers in het centrum* (in Dutch) www.nijmegen.nl/tellingen



Citizens are entitled to information about data collected in the public space. To that end, municipalities can create a public register of sensors, as well as a map⁸⁵ that shows where the sensors of both the municipality and other organisations and companies are located. It should be made clear which data is being collected by the sensors, for which purpose, and whether or not personal data is involved. Such transparency makes it easier for citizens to contest surveillance, to reuse the open data from the sensors for new applications, or to submit a request to do their own measurements with the sensors.⁸⁶

16. Recognise the right to meaningful human contact. We cannot outsource the care for others to robots. Contact with citizens at the government office, both online and offline, must hold the potential to lead to changes in government decisions.

Within domains such as health care and education, governments need to introduce the right to meaningful human contact.⁸⁷ People are entitled to the help, attention, and compassion of others when they need care. Conversely, caring for others is an essential element of what it means to be human. We cannot outsource that part of our humanness to robots and other forms of artificial intelligence unless the care recipients themselves prefer it for reasons of privacy or au-

tonomy. With technological innovations in healthcare, it is important to make a sharp distinction between innovations that aim to replace human care and innovations that aim to improve, facilitate, and supplement human care.

Robots vs chattersocks

Helping elderly people put on and take off their compression stockings is a care assignment that robots can take over from humans in the future, according to the advocates of care robotics. A robot for compression stockings could increase the self-reliance of elderly people living at home. However, for many older people, the daily visit by a home care worker who helps out with the stockings is also an opportunity for a chat. In the Dutch city of Zwolle, these home care workers are aptly named 'chattersocks'.⁸⁸ If municipalities or home care organisations impose a robot on elderly people, loneliness might increase.

The right to meaningful human contact must also apply at the government office. Every citizen has the right to access and make meaningful contact with the government in a way that is appropriate for him or her, both online and offline. This contact only qualifies as meaningful if it can lead to a change of (intended) government decisions regarding the citizen.⁸⁹

85 See for example Amsterdam's map of sensors: <https://slimmeapparaten.amsterdam.nl>

86 See principle 12.

87 See the Rathenau Institute's plea for new human rights for the robot age: www.rathenau.nl/en/digitale-samenleving/human-rights-robot-age

88 In Dutch: *klets-kousen*

89 "It is not a formal requirement (contact via paper or via human interaction), but a material requirement that the citizen is spoken to substantively and that contact is not limited to explanations but can lead to adjustment of intentions or actions – in other words, that the contact is meaningful – and that the citizen feels taken seriously and that the government actually helps him," according to the Dutch Council of State. Raad van State, *Ongevraagd advies over de effecten van de digitalisering voor de rechtsstatelijke verhoudingen*, 2018 (translated from the Dutch)





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17. Combat the social and digital divide. Provide a basic digital service for people with few digital skills. Stand up for the rights of workers and for a fair distribution of income, wealth, and housing.

Rotterdam – Online and offline service

In some cities, the only way to apply for social housing and respond to housing offers is through a website. That puts house seekers with few or no digital skills at a disadvantage. In the Dutch city of Rotterdam, the ombudswoman has stood up for the digitally illiterate: “The government should be there for everyone: the poor, the rich, the young, the old, the digitally skilled and the non-digitally skilled. These people deserve to be helped.”⁹⁰ Municipalities should take care that there are offline avenues to renting an affordable home.

Excessive techno-optimism can exacerbate social and economic inequalities in the city. For instance, the gap between citizens with many digital skills and those with few or none at all might grow. Cities should involve a multitude of social groups in the development of

new technology and make it as accessible as possible.⁹¹ They must ensure that citizens can always go to a municipal office instead of being referred to a website and that they can communicate with the public administration by mail instead of digitally. ‘E-government’ makes life easier for many citizens, but not for all.

In addition, cities should consider introducing a basic digital service, starting with the elderly and people with mental disabilities: they receive reliable home help if their computer freezes or if they get stuck filling in a digital form.⁹²

Paris – Digital helpers

One-fifth of the adult population of Paris needs help to access online services.⁹³ To promote digital inclusion, the city of Paris provides subsidies for the deployment of ‘digital helpers’, both professionals and trained volunteers.⁹⁴ They help people who want to improve their digital skills, but also people who are unable to master these skills. When performing online acts on behalf of the latter group of people, the helpers inevitably become acquainted with personal data. In order to protect the confidentiality of this data, Paris has drawn up a ‘Charter for the digital helper’.⁹⁵

www.raadvanstate.nl/adviezen/zoeken-in-adviezen/tekst-advies.html?id=13065

90 Nieuwsuur, ‘Hulp aan digibeten schiet tekort, identiteitsfraude ligt op de loer’, nos.nl, 22 February 2019 (in Dutch)

<https://nos.nl/nieuwsuur/artikel/2273004-hulp-aan-digibeten-schiet-tekort-identiteitsfraude-ligt-op-de-loer.html>

91 See principle 2.

92 Compare with the Kuiken/Özutok motion on digital neighbourhood assistance adopted by the Dutch parliament (in Dutch): <https://www.parlementairemonitor.nl/9353000/1/j9vvij5epmj1ey0/vkspohb3anyo>

93 WeTechCare, *La Ville de Paris et WeTechCare s’associent pour faire reculer l’exclusion numérique à Paris*, 2017 (in French) <https://wetechcare.org/la-ville-de-paris-et-wetechcare-sassocient-pour-faire-reculer-l'exclusion-numerique-a-paris>

94 Municipality of Paris, *Règlement de l’appel à projets: inclusion numérique*, 2019 (in French) <https://api-site-cdn.paris.fr/images/104352>

95 Municipality of Paris, *Charte de l’aidant numérique*, 2017 (in French) <https://api-site-cdn.paris.fr/images/96393>

Digitisation may also lead to a divide in the labour market, between people with many technological or creative skills and people with fewer of these skills. The latter risk being condemned to badly-paid disposable jobs in the services sector, with few social protections and little control over their work. Municipalities should stand up for the rights of these working people; from the livelihoods of workers in the platform economy⁹⁶ to the autonomy and dignity of employees whose work is increasingly controlled and assessed by computer systems.⁹⁷ Even people in low-paid jobs are entitled to a certain degree of professional autonomy and to human intervention in the assessment of their work performance. Data never tells the whole truth.

A city that attracts many tech companies, or aims for them, has to be aware of the threats this may pose to social cohesion: from growing inequalities in income and wealth to soaring rents and house prices that drive the less well-off out of the city. Such a city needs to mobilise all instruments at its disposal, from housing and labour market policies to local taxes, in order to ensure that the city remains a place for all people, no matter their background.

18. Promote a fair platform economy. Implement tailor-made policies to safeguard public values. Prioritise non-commercial platforms or create public platforms.

More and more goods and services are sold, rented, or shared via digital platforms. These platforms can serve values such as sustainability, social cohesion, employment, and entrepreneurship, but may undermine other values including equality, decent work, consumer protection, non-discrimination, privacy, autonomy, road safety, and quality of life. A municipality would do well to list the values it wants to promote and protect in an assessment framework, which allows it to judge whether a platform adds value to the community. The result may be measures ranging from prohibition to stimulation.

Ghent – Platform regulation

The Belgian city of Ghent has restricted the renting out of houses to tourists through platforms such as Airbnb. It doesn't want the shortage of affordable housing to worsen. By contrast, the city fosters platforms for car-sharing, including by providing them with free and reserved parking spaces.⁹⁸

⁹⁶ See principle 18.

⁹⁷ UNI Global Union, *10 Principles for Workers' Data Rights* www.thefutureworldofwork.org/opinions/10-principles-for-workers-data-rights

⁹⁸ Gent Autodeelstad (in Dutch) <https://autodelen.gent>



The disadvantages of the platform economy are primarily manifested on commercial platforms. These platforms can contribute to the commercialisation of human relationships: if people rent rather than lend out their homes, profit replaces hospitality. Such platforms also threaten to increase inequality: some homeowners earn substantially thanks to Airbnb, whereas renters do not have that option. Workers in the platform economy often face poor working conditions – especially in the case of bogus self-employment – and are the slaves of algorithms. Platform services that seem convenient to consumers may be a disaster for workers.

Commercial platforms compete *for* the market rather than *in* the market. Surfing on the network effect,⁹⁹ they strive for a monopoly, at which point shareholders can appropriate an even greater part of the created value because users no longer have a choice. Governments would therefore do well to promote non-commercial and cooperative¹⁰⁰ platforms¹⁰¹ by engaging goods and services themselves,¹⁰² or by making a digital infrastructure available. In order to make sure that public values are protected, governments can even take the lead in creating new platforms, for instance for door-to-door mobility services.¹⁰³

Cascais – Mobility platform

The Portuguese city of Cascais has set up its own mobility platform, MobiCascais. A smart card, an app, and a website allow travellers to reserve, use, and pay for a wide range of mobility-connected services, from buses and trains to shared bicycles, shared cars, taxis, patient transport, parking, and electric car charging. By integrating different modes of public and private transport, Cascais aims to offer its citizens smooth mobility that is less dependent on private cars.¹⁰⁴

99 The value of a product or service increases according to the number of others using it. See Wikipedia: https://en.wikipedia.org/wiki/Network_effect

100 Users are also the owners of cooperative platforms. See Rathenau Institute, *Eerlijk Delen*, 2017 (in Dutch) www.rathenau.nl/nl/digitale-samenleving/eerlijk-delen

101 Examples: CouchSurfing www.couchsurfing.com and Fairbnb <https://fairbnb.coop>

102 “Such support does not necessarily have to be seen as unfair competition for purely commercial initiatives. It can also be seen as part of innovation policy, when the government wants to prevent a premature and irreversible lock-in given the current uncertainty about the long-term effects of platform architectures.” Rathenau Institute, *Eerlijk Delen*, 2017, p. 104 (translated from Dutch) www.rathenau.nl/nl/digitale-samenleving/eerlijk-delen

103 See principle 12.

104 www.mobicascais.pt







Contact us:



GREEN EUROPEAN FOUNDATION

Rue du Fossé 3, L-1536 Luxembourg
Brussels Office: Mundo Madou,
Avenue des Arts 7-8, 1210 Brussels

t: +32 2 329 00 50

e: info@gef.eu

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