



AALBORG UNIVERSITY
DENMARK

Aalborg Universitet

Toward a Smart Urban Planning. The Co-production of Contemporary Citizenship in the Era of Digitalization

Lissandrello, Enza

Published in:
Smart and Sustainable Planning for Cities and Regions

DOI (link to publication from Publisher):
[10.1007/978-3-030-57332-4_26](https://doi.org/10.1007/978-3-030-57332-4_26)

Creative Commons License
Unspecified

Publication date:
2021

Document Version
Other version

[Link to publication from Aalborg University](#)

Citation for published version (APA):
Lissandrello, E. (2021). Toward a Smart Urban Planning. The Co-production of Contemporary Citizenship in the Era of Digitalization. In A. Bisello, D. Vettorato, H. Haarstad, & J. Borsboom-van Beurden (Eds.), *Smart and Sustainable Planning for Cities and Regions: Results of SSPCR 2019* (pp. 373-386). Springer Publishing Company. https://doi.org/10.1007/978-3-030-57332-4_26

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

Take down policy

If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.

1 Towards a Smart Urban Planning. The Co-Production 2 of Contemporary Citizenship in the Era of Digitalization

3 Enza Lissandrello¹

4 Abstract

5 This paper investigates mediated negotiations in 'smart city' experimentalism. As often claimed, data can open
6 pathways for innovative planning processes. However, the idea of planning underpinned by the interplay between
7 citizens and data too often remains unquestioned. How might we move the idea of planning from data to
8 providing (technical solutions) to data to transform (urban societal realities)? How can data empower citizens as
9 true drivers of transformative urban change? This paper argues for a planning perspective to enhance a new
10 sense of citizenship in a future technology-driven urban democracy. The framework combines planning theory
11 with theories of societal change under a critical pragmatism. The empirical research derives from Mobility Urban
12 Values (MUV2020), a Horizon 2020 innovation and research project (2017–2020), with the ambition to change
13 mobility endeavors towards a more participatory and sustainable urban policy. The paper synthesizes analysis of
14 the 'practice stories' of professionals dealing with and facilitating the interplay between data and citizens in six
15 European cities. It then discusses MUV's deliberative planning process in which citizens generate data (co-
16 creation of values), interpret data (co-design of facts) and perform utterances to call for new urban policy (co-
17 production of actions). The conclusions draw a possible pathway to enhance smart urban planning as a
18 perspective to empower citizens *with* data for a progressive democracy in the era of digitalization. Change-
19 oriented practitioners can potentially facilitate smart urban planning through: 1) technological devices that engage
20 individual citizens (choices) with data practices in everyday life; 2) frames for the interpretation of data *with*
21 citizens' and communities (practice); and 3) public conversations between citizens with other publics (system) for
22 new street-level practices of urban democracy.

23

24 **Keywords:** planning theory; data; theories of change; deliberative democracy; critical pragmatism

25 1 Introduction

26 This paper aims to illuminate a new perspective to mediate the interplay between citizens and data by
27 rethinking the nature of planning in an era of digitalization. Both data and citizen sciences have too
28 often left unquestioned the very idea of planning as the very fundamental mindset for working data *with*
29 citizens. The 'idea of planning' has been discussed in theory as a way of thinking '*prior to a particular
30 set of practices or institutions, and provides a vantage point from which to judge the vagaries of
31 regulatory or professional requirements, and hence the possibility for challenge and subversion*'
32 (Campbell 2012: 393). The planning perspective allows new insights into the contemporary interplay
33 between citizens and data. Data can open up new pathways for innovative processes when they do not
34 just remain anchored to evidence-based planning. Under an evidence-based paradigm, data often
35 serve to provide 'solutions' among a close cycle of experts and professionals (rather than citizens): a)

¹ Aalborg University, Rendsburggade 14, enza@plan.aau.dk

36 proving scientific facts, b) testing technology services and c) creating evidence to present to policy
37 actors for negotiating future strategies. However, the evidence provided by data remains too often
38 distant from the real politics of planning. In other words, within an evidence-based paradigm, data
39 generally fail to address the very question: What data matter politically and which kinds of meanings
40 and transformative potential do data represent for citizens and urban democracy? Thinking of citizens
41 as data points reproduce and maintain (rather than transforms) a technocratic idea of planning. A 'smart
42 mentality' focused on techno-scientific solutions risks to separate the city from its very politicization.
43 Neglecting issues of citizens' accountability for participation and deliberative governance, the 'co-
44 creation' with data and citizens—often claimed by smart cities experiments—risk remaining a pure
45 'exercise' in public engagement. A progressive idea of planning is at the base of rethinking future urban
46 citizenship for contemporary change-oriented practitioners.

47 How might we move the idea of planning from data to providing (technical solutions) to data to transform
48 (urban societal realities)? How can we open the idea of planning to empower citizens through data for
49 a smarter and more sustainable urban future? This paper advances the idea of smart urban planning.
50 It draws on theories of change and a critical-pragmatism approach, and it elaborates on the practical
51 experience of Mobility Urban Values (MUV), an EU Horizon 2020 research and innovation project
52 (2017–2020) aimed at changing urban mobility and policy. MUV's change-oriented practitioners engage
53 citizens through a gamified interaction (Di Dio et al. 2018), shape local communities, and arrange new
54 partnerships with local businesses, policymakers, and Open Data enthusiasts in six EU cities
55 neighborhoods (in Amsterdam, Helsinki, Barcelona, Palermo, Fundao and Ghent). Societal values
56 related to mobility guide new visions for more sustainable, safer, inclusive, and healthier future
57 scenarios and urban innovation (Lissandrello et al. 2018) with an impact (Caroleo et al., 2019). This
58 paper does not aim to assess the success of the MUV project in achieving more sustainable urban
59 mobility in urban planning; instead, it focuses on the learning experience to elaborate further on the
60 idea of planning for a future technology-driven urban democracy.

61 The paper is structured as follows. The first part frames the current discussions on smart city
62 experimentalism, questioning the planning idea underpinning such processes. A critical pragmatic
63 perspective highlights the theories of change and advances a deliberative planning approach based on
64 data values, facts, and actions. The second part adopts this framework to examine the “practice stories”
65 of MUV's professionals dealing with the co-creation of values through data, the co-design of those data
66 into a meaningful interpretation of facts, and new citizens' utterances for conversations and calls of
67 policy actions. It follows a pathway towards the idea of smart urban planning to orient and inspire
68 change-oriented professionals to facilitate a future coproduction of citizenship through data. From the
69 planning perspective, citizens—not just as data points—become drivers of transformative urban change
70 through new models of interaction and community building through data. The vision of smart urban
71 planning in an era of digitalization is all about underpinning the future sense of citizenship within the
72 digital and physical ecosystem of knowledge and action.

73 **2 Rethinking the Idea of Planning**

74 Planning as the guide to future action is radically changing. The practical reason is that planning is
75 deeply dependent on societal development. Therefore, every kind of change in society—as desired
76 values of sustainability—creates pressure on the institutionalization of planning. Planning also
77 changes in its very idea, therefore its purpose as the way of thinking about the future, beyond

78 particular regulatory and governance frameworks. For example, the ecological discourse on climate
79 change and the transition to a low-carbon society has placed pressure on the production–
80 consumption linearity within the growth paradigm. The technical and economic rationality in planning
81 has, therefore, embroiled the process in uncertainty. The recent COVID-19 crisis has also accelerated
82 awareness of the limit of planning in ‘the risk society’ (Beck 1992). Professionals need new methods,
83 skills, and attitudes for planning under conditions of risk and change, a change occurring suddenly
84 without long-term warning and with significant consequences such as a recession and biodiversity
85 collapse. Zygmunt Bauman (2007) argues that we are facing ‘the passage from the ‘solid’ to the
86 ‘liquid’ phase of modernity.

87 We are merely living in a time when social forms (structures that limit individual choices, institutions
88 that guard repetitions of routines, patterns of acceptable behavior) can no longer (and are not
89 expected) to keep their shape for long. These social forms ‘decompose and melt faster than the time
90 it takes to cast them, and once they are cast for them to set’ (Bauman 2007: 1). Likewise, planning
91 institutions and the way to think and govern the future are becoming unlikely to be given enough time
92 to solidify. Liquid societal dynamics of transformation also entail smart city imagination as a flow of
93 technological innovation (Cardullo and Kitchin 2019). While we still have not adopted routines to plan
94 with and through data, the liquid smart-mentality and digitalization place individual citizens at the
95 center of future distributed urban transformations. The planning idea underpinning smart urban
96 practice, however, often reproduces the citizenship of passive users. Finally disciplined by guidance
97 on ‘the correct’ use of technology, the ‘smart citizen’ can assume ‘the correct’ behavior encapsulated
98 through a multiplicity of digital devices and services, digital platforms, apps, and wearables as
99 pervasive technology-mediations. The smart citizen adopts a function as a data provider.

100 A new technological urban imaginary (Vanolo 2016) develops the smart city’s idea and big data
101 production within an evidence-based idea of planning. Therefore, the latest phase of citizen-focused
102 claims and language often just mirrors a one-way direction (Cowley, Joss and Dayot 2018; Saunders
103 and Baeck 2015). Citizens providing data are a passive voice to inform, narrow, limit, and control
104 through the interplay between technology and participation. Interaction is often facilitated by a
105 particular entrepreneurial or pre-given design (Wilson, Tewdwr-Jones and Comber 2019; Baker,
106 Coaffee and Sherriff 2007; Kitchin 2015). The question is, therefore, how technology and participation
107 through data can co-produce a new type of *citizenship*, *i.e.*, *citizens as active and responsible voices*.
108 This paper argues for a focus on the idea of planning to think and to govern the future: an idea that
109 can place at the center of methods to produce new capacities for knowledge, communities of practice,
110 and commonhoods in the era of digitalization. Planning requires enabling skills and attitudes to
111 navigate the risk society for an effective change of the role of citizens from data providers to data
112 drivers of urban democracy (Lissandrello and Vesco 2020).

113 Planning as a process of change concerns casual, emergent, and co-evolving behaviors, social
114 practices, and systems that define and enhance diverse policy perspectives and drivers. In the urban
115 context, these processes of change take form and reflect diverse temporalities. The city is a system of
116 slow and fast dynamics of change. Sedimented historical layers of urban form and urban identity are
117 resilient to change, while fast contemporary urban lifestyles, nowadays supported by technologies,
118 transform urban dynamics and the sense of citizenship. Therefore, theories of change are important
119 for planning because they offer a perspective to identify the process of transformation, the tension

120 points (Flyvbjerg et al. 2016), and the policy angle that is already part of the system. For example,
121 behavioral change-based policy on individual choice often offers a perspective that implies an
122 external influencer that includes 'the different combinations of policy instruments – classically
123 characterized as carrots, sticks, and sermons – to... facilitate choices such that individuals can make
124 as a 'better' choices for themselves' (Shove, Pantzar and Watson 2012). Data are often gathered
125 from individual citizens, using, for example, techniques for rewarding behavior. In the field of urban
126 mobility studies, low-carbon policy based on behavior change can consist of rewarding individual
127 choices of biking or walking rather than using a car. This 'rewarding' can happen in form of specific
128 prizes, taxes, and salaries. For an urban change, the fact that individual citizens' choices produce
129 behaviors, habits, and routines is important. Indeed, when individual citizens consolidate their
130 patterns of behavior, they also shape social practice. The perspective of social practice allows us to
131 illuminate change through 'practice carrying'. In other words, choosing to bike rather than drive a car
132 is not about an individual's choices alone but a pattern of practice and communities, for example,
133 biking communities. In a perspective of change, policy-based social practice can consist of connecting
134 individuals into communities. In the example of low-carbon policy based on urban mobility practice, a
135 'practice carrying' can be the car-sharing policy that connects individuals within a (digital) social
136 context of communities of sharing. But changes in policy and planning occur within a complexity that
137 includes behaviors (individual choices) and social practice (communities). This complexity can be
138 understood as a system. A system is an ensemble or assemblage of multiple social practices as
139 normalized behaviors and mechanisms of societal regulation that stabilize and maintain the system
140 itself. In a policy perspective, a 'system change' consists of turning the existence of the system itself
141 (Urry 2004), therefore the complexity of behavior, social practice and the holistic policy perspective
142 represented by the system. Studies on socio-technical system change (Geels, 2005) show that that
143 implies a long-term and complex transformation governed and maintained by both individual choices
144 and social practices. A systemic change thus implies the alignment of innovations with 'turning points'
145 or 'cracks' that might exist within the institutionalized and normalized behavior and practice under the
146 flows or exogenous dynamics. These exogenous dynamics can be, for example, the climate change
147 (landscape) that places pressure for a change of automobility (regime). Simultaneously, car-free
148 neighborhoods (niches) can constitute an example of turning points or cracks in the current
149 automobility practice and behaviors. From a system perspective, a change thus takes place through
150 the alignment of multiple dynamics. Change-oriented practitioners and professionals cannot fully
151 influence these alignments. However, the system approach is extremely relevant to change-oriented
152 practitioners to identify 'turning points' or 'cracks' which might activate opportunities to co-construct,
153 co-generate or co-produce systemic change. 'Things may look bleak and hopeless, but for those who
154 are nimble on their feet, the inevitable creaks and crevasses in the institutional structure always
155 provide ever so many opportunities for positive action' (Krumholz and Forester 1990). Thinking the
156 future requires the awareness that a system change will entail complex multi-level dynamics,
157 unexpected consequences, risks and flows that require professionals to "reflect in action" (Schon
158 1983). In other words, in the context of 'smart' digitalization and urban data, change-oriented
159 practitioners need to rethink the fundamental idea of planning. The potential coproduction of systemic
160 change depends on the idea of thinking and governing the future as a way to enhance opportunities
161 and political engagement and learning. The choices of individual citizens, communities and possible
162 futures of urban citizenship need to be at the center of the system change. A critical-pragmatism
163 framework to planning and public policy offers a pathway to pose questions about the interplay of

164 citizens and data. Such an interplay can consist of dealing with creaks, crevasses and cracks in the
165 current system. It might open possibilities for micro-politics ‘in the trenches’ (Forester 1999, 2013;
166 Wagenaar 2011) in the deliberation about value, facts and actions (Forester, 2017). In the remainder
167 of this paper, this framework of theories of change and critical pragmatism contributes to exploring the
168 ‘practice stories’ of MUV professionals engaged in the process of dealing with the interplay of data
169 and citizens across the spheres of technology and participation. Smart urban planning includes the
170 generation of data with citizens and the co-creation of values through individual choices, as well as
171 the interpretation of data into a co-design of meanings with communities of practice, and the
172 coproduction of a collective redesign of policy actions. These stages aim to illuminate a planning
173 perspective of coproduction of citizenship for systemic urban change.

174 **3 Shaping Citizenship *with* Citizens: MUV Mediated Negotiations**

175
176 MUV (Mobility Urban Values) is a three-year Horizon 2020 project (2017–2020) in which an
177 interdisciplinary team of EU academics and practitioners has envisioned the possibility of activating
178 systemic urban change. The focus point of the change-oriented practitioners was bringing ethical urban
179 mobility practices through technology-driven data devices. The theories of change, just mentioned,
180 constitute the background for a vision that intertwines issues of individual choices, common social
181 practice, and urban ecosystem change. Citizens impact their environment through their choices and
182 behavior, shape communities, and transform their urban living system. MUV departs from a gamification
183 strategy through an app that aims to influence the choices of individual citizens towards more
184 sustainable mobility lifestyles. By uploading the app, citizens are transformed into MUVers, so they
185 become active players in the digital world. By selecting their everyday active mobility choices (walking,
186 cycling, public transport, or car-sharing), citizens gain points connecting to local businesses that reward
187 them with prizes when they become sustainable-mobility champions. The MUV idea is that, through a
188 motivational device (app) based on gamification and reward, citizens can produce data on their mobility
189 choices. This approach to behavior change based on a policy of control exploits techniques of rewarding
190 or nudging through technology. However, MUVers co-create sustainable mobility values as ‘carriers’ of
191 practice in their everyday active-mobility practice. These values are co-created when citizens engage
192 in gaming communities and MUVerhoods. Sharing their sustainable mobility experience, citizens
193 connect their journeys (points) to other MUVers, competing for the mobility challenge of winning points.
194 MUVers connect to local businesses, as well as provide active mobility data to local planners and
195 participating mobility managers. The next section synthesizes analysis and extracts some of the MUV
196 practice stories of change-oriented practitioners (pilot coordinators in various cities), performing the
197 participatory process of engagement of data and citizens for urban-policy innovation.

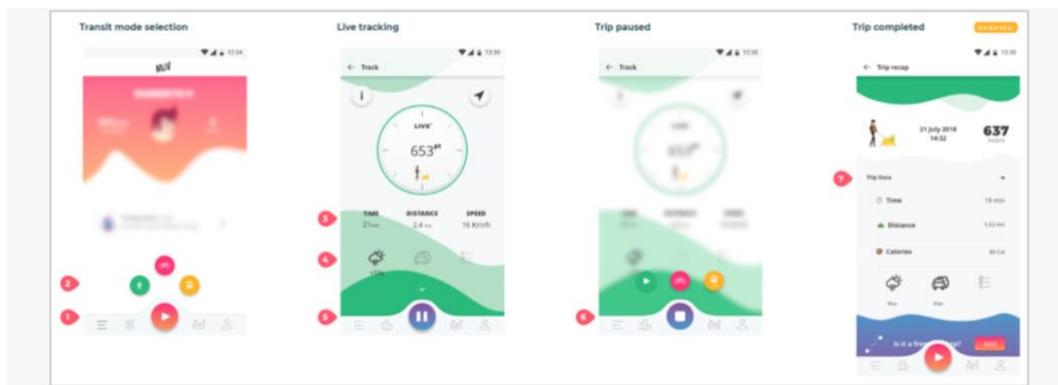
198

199 **3.1 Generating Mobility Data with Citizens—The Co-Creation of Values**

200

201 People think about mobility in terms of problems. When you approach citizens from this angle, they
202 start to talk about frustrations: finding parking places, safety on roads, congestion. The turning point of
203 the system is to transform the idea of mobility into something completely different from what citizens
204 experience in everyday life: let’s talk about mobility as fun (MUV pilot coordinator 2017). When
205 downloading entering the digital device, citizens transform into MUVers. MUVers are digital individuals

206 who, through a metaphor of sports narrative, play athletes to get rewards for their sustainable-mobility
207 choices, i.e., walking, biking, car-sharing, carpooling and travelling on public transportation. MUVERS
208 connect to public authorities that gather MUV mobility data and provide training sessions to coach-
209 athletes to improve their sustainable mobility skills. MUVERS also connect to local business communities
210 that, as sponsors, have the opportunity to promote their brand and their products through the athletes'
211 best achievements and provide prizes to them. The MUV app (Fig. 1), through gamification, collects
212 and tracks spatio-temporal data on citizens' active mobility.



213
214 **Fig. 1** The MUV mobile app—on-screen visualisation to generate data and co-create values

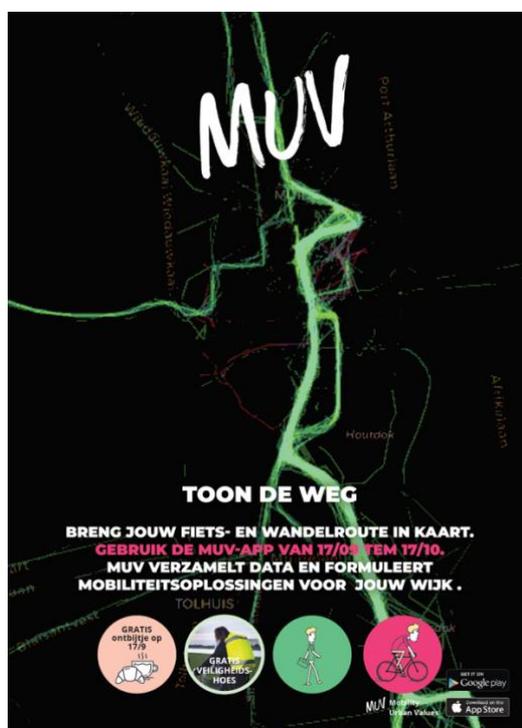
215 MUV gamification is therefore based on a 'nudging' policy, as depicted in Fig. 1, within the theories of
216 behavioral change. However, MUV gamification is a means of mediation from the individual behavior
217 of citizens to a common social practice of game communities. MUVERS compete with each other,
218 connect to local businesses and gain knowledge of their own impact on the urban environment.
219 MUVERS generate data and co-create values simultaneously when engaging in a more sustainable
220 urban lifestyle. In everyday active-mobility practice, connecting with other MUVERS and shopping at
221 local businesses, MUVERS mobilize MUVerhoods. MUVerhoods are physical and digital environments
222 that shape an urban context and provide the actors of urban transformations (citizens, local
223 businesses, public authorities, active local communities) a sense of community with a playful vision of
224 reality. The engagement and mobilization of MUVerhoods occur on-street level through playful events
225 with citizens as the MUV open-days. The design of these events aims to inform and diffuse the MUV
226 game and shape game customizations (MUV pilot coordinator 2017).

227 MUVERS champions are ambassadors who maintain strong individual ties within the MUVerhoods
228 (community) and expand that community. MUVERS target groups vary among cities. In Palermo, these
229 groups include university students and tourists. In Fundao, the target is composed of workers in new
230 enterprises (such as start-ups), in Helsinki residents already sensitive to traffic. In Ghent, families with
231 children and schools' teachers are involved in the MUV project. In Barcelona, the target group is
232 individual citizens already engaged with alternative modes of transportation and sports lovers; in
233 Amsterdam, rather, participants are elderly communities and data hackers. Gamification on urban
234 streets and the organization of events takes place when giving prizes to the MUV winners,
235 establishing gamified competitions among cities and involving citizens in participation activities such
236 as workshops during EU mobility weeks and other local festivals. MUVERS have an active role in
237 shaping their gaming communities. The effect of MUVerhoods' motivations creates new urban values
238 such as a healthy and cultural lifestyle, inclusive and safe shopping and 'smart' identity. MUV aims to

239 inspire enjoyment of mobility to empower citizens' with their data measurement ('meten is weten'—'to
240 measure is to know'—to quotes a famous Dutch sentence). This quote is a model of urban citizenship
241 for the digital future (be the change he/she wants to see)' (MUV pilot coordinator 2018).

242 3.2 Interpreting Facts—The Co-Design of Meanings

243 The MUVers data on active mobility gathered from the app have been visualized in MUVmaps in each
244 city. How do you ensure that people feel not only like data-points? The pilot coordinator in Amsterdam
245 proposed this leading question when preparing workshops with citizens. The stake is the kind of
246 difference that MUV will make for people when interpreting data into facts. MUV is not the only
247 platform that creates mobility data. Nowadays, we have several route-planning and ridesharing
248 platforms and other digital products related to mobility. Large flows of data also sometimes do not
249 involve the users of these platforms. In MUV, the interpretation of data into facts—mobility tracks and
250 journeys—has been the center of the co-design strategy. Data call for the design of meanings along
251 with the citizens (MUV pilot coordinator 2019).



252

253

Fig. 2 The MUVmap (Ghent)

254 Besides mobility journeys, MUVMaps serve to visualize and interpret data collected from MUVers
255 through the app. Citizens and policymakers need greater transparency of data. Data collected are
256 often perceived as evaporating from the hands of those who generate them. How do the data
257 collected by a cyclist help the cyclist? Specific questions have been a leading role of pilot coordinators
258 (MUV pilot coordinator 2018). Interpreting the maps with participants, such as start-up companies,
259 municipality workers and media agents, afforded the opportunity to visualize for the first time the data
260 gathered by the MUV app. All the participants demonstrated real satisfaction in being directly involved
261 in this process of mapping and visualization. Their contribution was active and productive (MUV pilot

262 coordinator 2019). The interpretation of facts through maps has enabled translating data meanings
263 into values. For example, maps of mobility practice in Fundao have deepened values for a more
264 healthy lifestyle; in Ghent safety-related data have pinpointed specific areas in MUVerhoods. Data
265 interpretations have also emphasized the intertwined importance of quantitative data on the diverse
266 tracks with the qualitative perspectives and approaches of citizens (MUV pilot coordinator 2019). The
267 'MUV ambassadors' in Ghent, for example, have provided qualitative insights on the safety of bikers
268 in their everyday mobility. The issue was to pinpoint specific critical areas in the neighborhood to
269 engage the local knowledge. The 'citizen expert panel' in Helsinki, responding to surveys and tracking
270 routes, has contributed direct interpretations of data on living MUVers experience. The collective
271 understanding of the data on walking, for instance, reproduced and visualized on the maps, has led to
272 insights on pedestrians' diverse safety issues in various cities and neighborhoods. In Palermo,
273 walking issues highlighted by citizens identified specific safety needs for tourists or young citizens
274 during the night across the historical center that would be improved with better lighting. In Barcelona,
275 citizens interpreted maps to define issues with the timing of green lights for pedestrians on the
276 crosswalks in peak-hours. The voice of the new green wave of an active citizens' movement in
277 Barcelona proclaims alternatives to car-mobility that are emerging but still require strategies of
278 connectivity among, for example, existing bicycle lanes. The absence of data on the map raised
279 citizens' safety issues or specific lacks of service such as an efficient public-transport ticket service in
280 Barcelona that impedes easier hop-on and hop-off.

281 **3.3 Calling for Policy Actions—The Co-Production of Conversations**

282 The interpretations of the maps produced by the citizens' journeys and their analysis with the
283 visualization of tracks on maps have enabled highlighting particular problems. These problems have
284 been utilized to shift from 'complaints' to 'policy action' with citizens. Every MUV pilot city in these
285 three years of experience with MUVers and MUVerhoods also open channels of co-policymaking
286 between citizens and urban mobility planners, policy makers and other publics. The MUVers' active,
287 playful activity has sparked positive energy to talk freely about new ideas for future policy actions
288 (MUV pilot coordinator 2020). The calls for policy actions have proven to be more effective when
289 designed in combination with festivals and other events in cities. The 'EU mobility week' has been the
290 anchoring event to produce new conversations among citizens and various types of publics, for
291 example, through temporary communication campaigns. In Palermo, a guerilla marketing campaign
292 has raised the attention for citizens-policy interaction on mobility issues, mediated by MUV
293 professionals. Posters produced after the interpretation of the maps with citizens have been placed on
294 the street level to trigger several conversations (MUV pilot coordinator 2019). In Ghent, a campaign
295 facilitated the information about the safer routes on the neighborhood and the crossroads that kids
296 can use. MUVers' are equipped with fluorescent covers that show 'safety across the neighborhood'. A
297 'neighborhood house' has been established to provide more information on safety and the MUV app.
298 Other campaigns have been the to chalk-spray Emoji's conversations that visualize the bikers'
299 experiences on 'hot spots' (Fig.3). New ideas on how to improve urban mobility policy in MUVerhoods
300 concerning citizens' everyday-mobility practice have produced conversations adapted to the diverse
301 pilot contexts and urban identities. In Palermo, the safety of pedestrians during evening hours has
302 created the idea of streetlights designed by artists that would activate as people pass by to reduce
303 fear on the streets and criminality and encourage walking instead of taking the car (MUV pilot
304 coordinator 2019).



305

306

Fig. 3 Living MUV Emoticons (Ghent)

307

Safety for tourists to enjoy the city and discover urban experiences have been advanced by the conversations between cyclists and the public administration by adopting some temporary obstacle-free bike lanes. Values of sustainability have forged ideas of carpooling among citizens by multiple people. In Ghent conversations on the upcoming Sustainable Urban Mobility Plans (SUMP) have been enhanced targets for MUVers data (MUV pilot coordinator 2019). In Barcelona, the conversations have activated citizens' ideas on the safety needs of pedestrians on crosswalks and traffic adjustments such as the green light timing; also emerging ideas have been facilitating hop-on-hop-off on public transport with the use of contactless cards or smartphones (MUV pilot coordinator 2019). In Fundao, the idea of converting rural ways into bike lanes will facilitate a healthy lifestyle; promoting a bike lane to school will reduce car dependency; and education can enhance sustainable mobility orientations. Peripheral car parking in the city and pedestrian routes crossing the whole town will facilitate walking instead of other modes of transport (MUV pilot coordinator 2019). In Helsinki, the conversations between citizens and other policy actors have also underlined the relationship and the role of citizens and data providers. Citizens providing data have pursued the idea to become immediately informed about the role and nature of the data provided (e.g., automated graphs generated in the response), increasing the motivation for data production (MUV pilot coordinator 2019).

323

324

4 Towards a Smart Urban Planning: Co-Producing Citizenship in the Era of Digitalization

325

326

The MUV project and the practice stories of the change-oriented practitioners in various cities have provided exciting lessons on the interplay between data and citizens to inspire the idea of planning: data shape not just pieces of evidence to point to specific solutions but can co-produce a diverse view of the role of the citizens and future citizenship. The MUV participatory process has developed towards deliberately meet inclusive, safe, resilient and sustainable urban-mobility values with citizens. Six EU neighborhood communities have been transformed in MUVerhoods, living urban experiences based on mobility data and game communities. The idea of planning that emerges here is the shift from a mindset of thinking the future *for* citizens as data-points to imagining the future *with* citizens as

333

334 active agents of transformative urban governance. Lessons from MUVs consist of the redesign of the
 335 deliberative stages through which the role of citizens change concerning the data for a transformative
 336 urban democracy. MUV contributes to illuminate a pragmatic pathway to re-imagine the idea of
 337 planning with data and citizens—for the generation of data (the co-creation of values), the
 338 interpretation of facts (the co-design of meanings) and the call for policy actions (the coproduction of
 339 conversations) (Table 1). MUV inspires the idea of planning in which data open new pathways to
 340 transform urban societal realities and co-produce a new sense of future citizenship. Smart urban
 341 planning, under a critical-pragmatism perspective, emerges as a participatory process in which values
 342 are co-created with data citizens, meanings are co-designed by their interpretation and actions are
 343 co-produced by conversations at street-level urban democracy. The role of the professionals as
 344 change agents consists of mediating citizens' everyday practice to generate data and values in their
 345 daily life, facilitating citizens' interpretation of data through representation and negotiate citizens' ideas
 346 with policy actors. A key lesson from MUV is the continuous data-driven mediation to cultivate
 347 conversations among data, citizens and policy actors.

Co-Creation of Values	Co-Design of Meanings	Co-Production of Conversations
Generate Data	Interpretation of Data	Transformation of Data into Action
Professionals mediate citizens' everyday practice to generate data of value for individual and collective choices.	Professionals facilitate citizens' representation and interpretation of data into facts.	Professionals elicit citizens to negotiate policy actions
Lessons from MUV: the app and gamification strategy collect data and shape urban mobility values as an active and healthy lifestyle	Lessons from MUV: data aggregated are visualized and communicated through maps that citizens can interpret	Lessons from MUV: communication campaigns and temporary urbanism engage citizens' ideas at street-level practice
Citizens create data communities	Citizens design data meanings	Citizens produce urban citizenship
Lessons from MUV: game communities shape MUVerhoods where citizens connect to play active mobility together	Lessons from MUV: visualization of aggregated data on maps elicits local knowledge of MUVerhoods	Lessons from MUV: campaigns at street-level produce a new sense of citizens' ownership of MUVerhoods

348 **Table 1** Staging a critical pragmatic pathway for smart urban planning

349 Acting as a smart urban-planning process, MUV has opened a new mindset regarding the interplay of
 350 data and citizens in policymaking. Smart urban planning is not just about the final destination of data
 351 —if data will serve traffic planning, or urban development, or new sustainable mobility plans or the
 352 provision of new services—but the very way change-oriented professionals think in action future
 353 citizenships. A shift from an idea of planning *for* citizens to planning *with* citizens requires reflexive
 354 professionals to re-imagine the very coproduction of urban ecological and digital ecosystems of
 355 knowledge through citizens and data. In MUV, this system of knowledge has created new positive
 356 energy for policy change towards a new culture of participation and deliberative democracy. In the era
 357 of digitalization, professionals urge rethinking the idea of planning through data for future urban
 358 democracy. Change-oriented practitioners can enhance a transformative potential by rethinking the

359 role of citizens through data with: 1) technological dispositive that do not just 'gather' data but engage
360 individual citizens' to make sense of those data in the practice of the everyday life (choices); 2) frame
361 the means for the interpretation of data with citizens' to shape new communities of knowledge
362 (practice); and 3) create public conversations between citizens and other publics for transformative
363 utterances of urban societal realities (system), to be enhanced possibly by street-level practices. The
364 citizens' practice in their everyday life is the essential setting for re-imagining and redesigning new
365 digital and physical urban futures for planning the next city.

366 **Acknowledgements**

367 This research has received funding from the European Union's Horizon 2020 research and innovation program,
368 under grant agreement No 723521. Thanks to the research team and especially to Nicola Morelli (AAU), Jesse
369 Marsh (atelier. it), the coordinators of MUV 2020 Salvatore Di Dio (PUSH), Domenico Schillaci (PUSH), and all the
370 rest of the smart urban planners Andrea Vesco (LINKS), Max Kortlander (Waag), Judith Veenkamp (Waag), Alessia
371 Torre (PUSH), Rafel Nualart (i2cat), Emilia Pardi (BAG), Inge Ferwerda (LUCA), Heli Ponto (FVH). The paper
372 derives and synthesizes several deliverables produced in the course of the MUV project, but the author has sole
373 responsibility for the content of this publication. Thanks to the two anonymous reviewers for contributing to the
374 improvement of the quality of the manuscript in its final form.

375

376

377 **References**

- 378 Baker, M., Coaffee, J., and Sherriff, G. (2007). Achieving successful participation in the new UK spatial
379 planning system. *Planning Practice and Research*, 22(1), 79–93. DOI:10.1080/02697450601173371
- 380 Bauman, Z. (2007). *Liquid Times: Living in an Age of Uncertainty*. Polity.
- 381 Beck, U. (1992b) 'From Industrial to Risk Society', *Theory, Culture and Society* 9: 97–123
- 382 Campbell, H. (2012). 'Planning ethics' and rediscovering the idea of planning. *Planning Theory*, 11(4),
383 379–399.
- 384 Cardullo, P., and Kitchin, R. (2019). Smart urbanism and smart citizenship: The neoliberal logic of
385 'citizen-focused' smart cities in Europe. *Environment and Planning C. Politics and Space*, 37(5),
386 813–830. DOI:10.1177/0263774X18806508
- 387 Caroleo, B., Morelli, N., Lissandrello, E., Vesco, A., Di Dio, S., and Mauro, S. (2019). Measuring the
388 change towards more sustainable mobility: MUV impact evaluation approach. *Systems*, 7(2), 30.
- 389 Cowley, R., Joss, S., and Dayot, Y. (2018). The smart city and its publics: Insights from across six UK
390 cities. *Urban Research and Practice*, 11(1), 53–77. DOI:10.1080/17535069.2017.1293150
- 391 Di Dio, S., Lissandrello, E., Schillaci, D., Caroleo, B., Vesco, A., and D'Hespeel, I. (2018, December).
392 MUV: A game to encourage sustainable mobility habits. In *International Conference on Games and*
393 *Learning Alliance* (pp. 60–70). Springer, Cham.
- 394 Flyvbjerg, B., Landman, T., and Schram, S. (2016) *Tension Points: Learning to Make Social Science*
395 *Matter*.
- 396 Forester, J. (1999). *The deliberative practitioner: Encouraging participatory planning processes*. MIT
397 Press.

398 Forester, J. (2013). On the theory and practice of critical pragmatism: Deliberative practice and creative
399 negotiations. *Planning Theory*, 12(1), 5–22.

400 Forester, J. (2017). On the evolution of a critical pragmatism. *Encounters with planning thought*, 280-
401 296.

402 Geels, F. W. (2005). Processes and patterns in transitions and system innovations: Refining the co-
403 evolutionary multi-level perspective. *Technological forecasting and social change*, 72(6), 681–696.

404 Geels, F. W. (2005). The dynamics of transitions in socio-technical systems: a multi-level analysis of
405 the transition pathway from horse-drawn carriages to automobiles (1860–1930). *Technology
406 analysis and strategic management*, 17(4), 445–476.

407 Kitchin, R. (2015). Making Sense of Smart Cities: Addressing Present Shortcomings. Cambridge
408 Journal of Regions, Economy, and Society, 8(1), 131–136. DOI:10.1093/cjres/rsu027

409 Lissandrello, E., Morelli, N., Schillaci, D., and Di Dio, S. (2018, May). Urban innovation through co-
410 design scenarios. In *Conference on Smart Learning Ecosystems and Regional Development* (pp.
411 110-122). Springer, Cham.

412 Lissandrello, E., Vesco, A. (2020) Editorial Preface. International Journal of Urban Planning and Smart
413 Cities n.1 [https://www.igi-
414 global.com/pdf.aspx?tid%3D244196%26ptid%3D228593%26ctid%3D15%26t%3DEditorial%20Prefaceandisxn=null](https://www.igi-global.com/pdf.aspx?tid%3D244196%26ptid%3D228593%26ctid%3D15%26t%3DEditorial%20Prefaceandisxn=null)

415 Saunders, T., and Baeck, P. (2015). Rethinking Smart Cities from the Ground Up. Retrieved from
416 https://media.nesta.org.uk/documents/rethinking_smart_cities_from_the_ground_up_2015.pdf

417 Schön D (1983) *The Reflective Practitioner: How Professionals Think In Action*. New York: Basic.
418 Books.

419 Shove, E., Pantzar, M., and Watson, M. (2012). *The dynamics of social practice: Everyday life and how
420 it changes*. Sage.

421 Urry, J. (2004). The 'system' of automobility. *Theory, culture and society*, 21(4-5), 25–39.

422 Vanolo, A. (2016). Is There Anybody Out There? The Place and Role of Citizens in Tomorrow's Smart
423 Cities. *Futures*, 82, 26–36. DOI:10.1016/j.futures.2016.05.010

424 Wagenaar, H. (2011). "A beckon to the makings, workings, and doings of human beings": The critical
425 pragmatism of John Forester. *Public Administration Review*, 71(2), 293–298.

426 Wilson, A., Tewdwr-Jones, M., and Comber, R. (2019). Urban planning, public participation, and digital
427 technology: App development as a method of generating citizen involvement in local planning
428 processes. *Environment and Planning B. Urban Analytics and City Science*, 46(2), 286–302.