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Future-oriented codesign workshops as a method of empowering citizens in urban infrastructure development: a capabilitarian analysis

Abstract: Urban mobility infrastructures have a major impact on the everyday life of city residents. Not only their mobility, but also their health, enjoyment of life and development of lifestyle preferences are affected by them. However, inclusive participation in infrastructure planning processes is difficult to achieve. We explore a foresight approach that develops desirable urban visions that involve residents in the preparation of decisions that will impact their lives. We propose future-oriented co-design workshops for the operationalization of a capabilitarian focus on conscientization, conciliation and collaboration to involve citizens in the visioning of infrastructure planning. The study is based on future-oriented codesign workshops held in Montreal in 2022-2023. Residents were invited to evaluate and discuss various future scenarios that re-imagine a highway currently cutting through the city. The results show the capabilitarian co-design workshops to promote critical thinking, vision creation, and to a lesser extent collaboration in the discussions triggered by the future-oriented codesign workshops. The results also reveal the difficulties of making such discussions truly inclusive, as well as their ambivalent relation to urban planning processes.

Keywords: foresight, co-design; urban mobility; conscientization; conciliation; planning

Introduction

In the 2020ies, the Ministry of Transportation of Québec (Canada) will remake the aging *Métropolitaine*, as the Montreal stretch of the highway 40 is known. The *Métropolitaine* is an elevated structure that cuts through several neighborhoods of Montreal, and is for this reason also referred to as a “scar” of the city (CREMTL 2020). In 2019, as their contribution to the Biosphère’s MTL+ exhibition inviting infrastructure utopias for Montreal in 2067, the horticulturalist Albert Mondor gathered a group of ecologists and architects to propose the *Métropoligne*. According to their vision, the elevated structure would be transformed into a gigantic urban farm along with a train and bike paths, whereas the highway would be moved to a tunnel under the city. Examples such as New York’s *High Line* or the *Big Dig* in Boston show the possibility of remaking urban transport infrastructure.

Urban mobility infrastructures have a major impact on the everyday life of city residents. Not only their mobility, but also their health, enjoyment of life and development of lifestyle preferences are affected. (Re)-making such infrastructures poses basic challenges for democratic, urban planning: who to involve, when and how in the imaging and design of cities for human development and sustainability (Dong et al., 2012, Frediani et al. 2019). This study addresses this challenge drawing on a capabilitarian innovation model, Ibrahim’s 3-C model (Ibrahim 2017). More specifically, the study asks if the conceptual ideas of the 3-C model can be translated into future-oriented workshops to involve citizens in the visioning on infrastructure planning of their cities. The resulting novel combination of capabilitarian theory with a strategic foresight method provides an operationalization of the 3-C model, and contributes to the toolbox of participatory urban planning.

The study is based on future-oriented codesign workshops held in Montreal in 2022-2023. During the workshops, Montreal residents and specifically those living near the *Métropolitaine* highway (“the highway” for short in the following) were invited to evaluate and discuss various future scenarios for the highway. The results show the approach to enable critical thinking, vision creation, and to a lesser extent collaboration in the discussions triggered by the future-oriented codesign workshops. The results also show the

difficulties of making such discussions truly inclusive, as well as their ambivalent relation to urban planning processes.

The next section of the paper introduces our conceptual approach followed by a presentation of the method. We then present the workshop results, and discuss them in the light of operationalizing the 3-C method and the empowerment of residents in urban transformation processes for sustainable and inclusive cities.

Conceptual Approach

The ongoing unsustainable tendencies in economies across the world have yielded a call for a transformation of current production and consumption systems (Díaz et al. 2019). As part of this call, there is interest in conceptions of innovation that move beyond the prevailing focus on technical novelty for commercial use in markets to social innovation and the possibilities of changing practices of production and consumption (Howaldt et al. 2017). Social innovation calls for a focus on both the ends and outcomes of innovation processes, and on the process and potential change in relations (Chiappero-Martinetti et al. 2017). Since the capabilities approach is focused on the agency of persons as ends, and their real opportunity to achieve the doings and beings (or “functionings”) they value, capabilitarian scholarship has contributed to the theory and practice of social innovation (Ziegler 2021). Beyond a funder-driven buzzword prone to neoliberal capture (Kaika 2017), a capabilitarian approach integrates agency and valuation process of those “benefited” by innovation process not just as objects but as subjects of these processes. In this spirit, Ibrahim (2017) has developed a conceptual, capabilitarian model of grassroots innovation bringing together the processes of conscientization, conciliation and collaboration:

- (1) Conscientization puts the emphasis on critical reflection about the status quo and seeks to create space for the perception and aspiration for better living conditions. Individuals may limit themselves to what they consider feasible as a coping or adaptive mechanism. Wealthy individuals might not want to critically reflect on necessary

changes to resource-intensive lifestyles; income-poor individuals might lack time and resources to reflect on necessary changes (for example in adaptation to climate change, Vermeire et al. 2021). In short, this process touches on the long-standing capabilities normative and empirical challenge of adaptive preferences (Robeyns 2017), i.e. the difference between de facto preferences and aspirations on the one hand, and on the other hand the aspirations people could or even should have. Coping mechanisms can undermine the possibility of a long-term perspective, at the heart of sustainability and deliberate transitions in direction of sustainability. Therefore, conscientization insists on processes that enable critical reflection and promote the ability to aspire changes in lifestyles.

- (2) Conciliation refers to deliberating on and creating communal visions as an input for joint action and responsibility. Since individuals and their social positions are heterogeneous, aspirations of a better life and visioning result in plural perspectives. There is accordingly a need to bring together potentially conflicting preferences and interests towards joint visions and action formulations. Thus, conciliation refers to the process of reconciling individual interests with community or collective goal formulations. This process in turn promotes a sense of responsibility for the community as well as a sense of belonging. This process touches on an allegedly problematic individualism of the capabilities approach and the question of how a moral respect for individuals can be integrated with collective processes and structural change (Leßmann 2020).
- (3) Collaboration refers to the problem that even a well-defined communal vision is unlikely to have much practical input if it does not engage with powerful actors who constrain and enable action possibilities due to regulatory power, monetary and symbolic resources and so on. For capabilities scholarship, this process further explores the relation between the agency of individuals and groups and structural change, or what in social innovation research is often referred to as an issue of scale and scalability:

“Collaboration between local communities and other actors, such as the state, local NGOs and donor agencies, is crucial for challenging the existing unequal power relations among and between these ‘partners’. Through these partnerships, the

sustainability, scalability and success of social innovations at the grassroots can be promoted” (Ibrahim 2017, 3).

The 3-C are not a phase model of grassroots innovation but rather a conceptual model for the analysis and promotion of concurrent, interrelated processes (Ibrahim 2017). While the conceptual wealth of the model has promoted its uptake for research on local communities, the model requires further addition for use in action-oriented, urban sustainability research. The model offers no method for putting conscientization, conciliation and collaboration processes into place. It offers conceptual lenses for studying such urban processes, and our study accordingly seeks to close a gap here.

Indeed, cities are a focus area of social innovation research. There has been research on social innovation in a smart city context, and the role of citizens in measuring and reporting (Angelidou et al. 2017), as well as for dissenting with depoliticizing processes (Kaika 2017). Beyond this, there are numerous case studies on various grassroots and bottom-up initiatives such as urban agriculture and urban gardening (Krischer et al. 2016; Spijker et al. 2018) as well as on innovations in urban governance, such as participatory budgeting. These highlight the role of citizens and grassroots initiatives within multi-actor governance and the combination of bottom-up and down-processes (Wolfram 2018). Public policy is called on to support local experimentation (Gordon et al. 2017) and meaningful participation possibilities in policy processes (Tosun et al. 2017).

Steen et al. (2020) reviewed capabilitarian methods at the intersection of social innovation, technology and design such as the partnership framework, the choice framework, capability cards and a dedicated social and ethical impact canvas. Across these methods, the capabilitarian approach prioritizes a focus on ends (such as capability cards to help participants identify project outputs and outcomes or canvases starting from the deliberation on the intended, culminating outcomes in terms of values and ends) to then move towards means, actors and partnerships. The review did not identify a dedicated, capabilitarian method for urban social innovation processes; thus highlighting the relevance of operationalizing the 3-C model.

Beyond a focus on social innovation, Dong et al. (2012) developed a framework for the assessment of government policy and practices in the design and planning of the physical environment. Six design capabilities of citizens along six dimensions are to be evaluated according to preconditions (for participation in general, such as cognitive skills) and operational conditions (such as dedicated investment in inclusive participation). While this puts the focus on the role of public actors (such as municipalities), the framework offers insights in relation to the collaboration process, which we will return to in the discussion section.

Also, building on this framework, Alexiou et al. (2022, 34), identified a “gap in exploring the actual design capabilities of non-expert designers/citizens as they unfold within the confines of a design project in action”. They highlighted the role of professional designers as enablers of design processes. This observation converges with capabilitarian innovation research and the role of social innovators in linking and enabling conversion of resources into capabilities (Ziegler 2010). For both designers and innovators this enabling role is tied to a critical question of power (Ibrahim 2017, 13). Rather than viewing local or external innovators as latently non-democratic agents imposing their views and exclusionary processes on others – a wider concern in research on social innovation (Teasdale et al. 2021) - a key concern is the role of such innovators in facilitating a discussion of ideas and innovations, and this, in capabilitarian spirit, starting with a focus on the ends. Accordingly, we turn in the next section to a method that promises to operationalize the 3-C in exactly this direction.

A strategic foresight method: future-oriented codesign workshops

Strategic foresight refers to processes and methods that enable a reflection on the future and future visions along with strategies and trajectories leading towards anticipated futures or enabling desirable futures by backcasting (Popper 2008).

More specifically, we are drawing on a strategic foresight approach - future-oriented codesign workshop - that has been practically explored in a variety of urban as well as sustainability contexts (Scherrer 2023). Foresight, once confined to large corporations and

governments, is increasingly democratized to address collective futures in socio-ecological transitions. The co-design workshops align with the capabilities approach in two key ways:

1) The future can be influenced and improved by human agency. Strategic foresight asserts: “The future is not entirely determined by the present: it is inherently uncertain, and we have the power to influence its trajectory” (Scherrer 2023, own translation).

2) An ethical focus on individuals as ends, and therefore sources of desirable futures. As the strategic foresight approach states, “each of us can envision the future, but in today's short-term-focused world, a little boost is needed to reactivate our imagination. We use stories to break free from present constraints” (Scherrer 2023, own translation). The language of reactivating our imagination aligns with the a key aspect of the conscientization process, and the inclusive “we” reflects the conciliatory and collaborative nature of the exercise.

The future-oriented codesign workshops can be presented in four steps. First, drawing on an analysis of current and future tendencies (based on literature reviews, expert interviews and workshops), a number of possible futures are developed. This is based on a morphological analysis that combines different hypotheses of future tendencies along with economic, social, cultural, and technical variables (Lamblin 2018), all with the goal of stimulating the participants’ imagination and moving beyond “black and white”, good versus business-as-usual scenarios. The hypotheses are combined to produce the framework of different scenarios that explore the “futures cone” (Voros 2003) as widely as possible. Drawing on a speculative design approach (Dunne and Raby 2013), these futures are translated into short narratives about possible futures given the respective time horizon of the project (such as an urban development by 2030 or 2050). The narratives translate the possible future into stories with different characters so as to better illustrate the future (including possible tensions) and to invite and challenge the imagination of participants.

Second, the participants discuss the narratives in co-design workshops. Participants are invited to discuss the stories and their desirable and undesirable elements. At this point, it is also possible to discuss possible conciliations of tensions and competing interests.

In the third step, transition pathways are explored. In this step, milestones are identified. These are elements considered important for moving in the desirable direction. Moreover, links between milestones must be established, along with their possible sequences. This step is inspired by the backcasting method (Dreborg 1996; Bibri 2018): a vision of the desirable future becomes an objective to be achieved. The vision allows to explore various possible pathways towards the desirable future, which then, in a final fourth step, can be shared back with participants and the general public.

Our focus is on the second step of this approach, the use of future narratives to elicit conscientization and conciliation processes, along with their implications for collaboration options and requirements.

Inclusion and diversity

At the philosophical origin of the capabilities approach is a recognition of the diversity of persons: their differences in personal traits, social and environmental contexts, and how these translate into different real and desired freedoms to convert resources into action. Likewise, the co-design approach is committed to the democratization of foresight, i.e., rather than viewing foresight as a domain of experts and “future gurus”, it aims to include citizens and invites them to get engaged in the co-design workshops.

However, research on participation processes shows that inclusion and diversity in such workshops cannot be taken for granted (Allen and Slotterback 2017; Gasperoni 2023). Men tend to speak more than women in workshops - and grassroots innovation organization therefore often draws on safe spaces, for example for women only, to prepare for a more inclusive process later. Likewise, those familiar with the culture or milieu will feel more at ease than those who feel as (and are perceived as) minorities. This situation can lead to distrust detrimental to participation. Language differences, including vernacular differences, can imply that contributions are not understood or not taken seriously

(Listerbon 2007). Beyond simply not allowing somebody to speak, there are therefore more subtle processes of testimonial and hermeneutic injustice, which have led to the proposal that epistemic contribution, as the capacity of informing and understanding as well as of being appreciated in discussion, should be considered a capability of central importance (Fricker 2015). Then on the more pragmatic side, some information provided might be too technical for some participants (or otherwise not accessible), locations and time might not be feasible for some groups, also because more well-off groups might have more opportunity to participate in such workshops for socio-economic reasons (Listerborn 2007).

In sum, research shows that for workshops to be inclusive and diverse, a special effort is required when preparing and conducting them: reaching out to diverse groups, finding appropriate spaces and times, and training moderators to be aware of cognitive biases and the just listed challenges. Inclusion and diversity are ideals that such workshop preparations can aspire to, but not something that can be taken for granted. The insights of this literature were therefore used in the preparation of the workshops presented below.

Methodology

Preparing the workshops

The future-oriented codesign workshops were prepared drawing on two main sources: 1) the already available information from *Chemins de Transition*, a multi-year strategic foresight project on future-making in Quebec (Canada), about major tendencies in Montreal and in Quebec; 2) preparatory research from Fall 2021 until May 2022 specifically on the Highway 40, which was based on document analysis, interviews and case analysis. For the document analysis, the origin-destination report of Quebec's Ministry of Transportation as well as "Montréal en Statistique" were consulted to get a better understanding of the highway users' socio-economic profile and mode of transportation, as well as of the socio-economic profile of neighbouring communities. This

part of the project established that men predominate in the use of this section of the highway (57%), that users are between 30-60 years (64%) and tend to have a full-time job (70,9%); moreover, low-income households with less than 30 000 CAD account for only 6,5% of users; whereas income over 120 000 CAD and more account for 22,5% of users (Lemieux and Boisjoly 2022). In addition, 22 interviews were conducted: 2 with local merchants, 3 with school directors and technicians, 3 with experts in plant technology and agriculture, 2 with experts in inclusive intersectional planning, 2 with experts in transportation and urban planning, 8 with local organizations, and 2 with representatives of the city of Montreal. Moreover, innovative cases of remaking urban highways and mobility infrastructures from around the world were scanned by the research team.

On this basis, three future scenarios were developed in the summer of 2022 and translated into short stories and visuals set in 2050: 1) Removing the elevated structure of the highway in favour of new urban boulevards under the authority of the respective neighbourhoods; 2) transformation of the elevated structure of the highway into a large urban agricultural area; 3) destruction of the highway in favour of a new, transparent tunnel for electric cars (financed via the privatization of the highway). Box 1 outlines the three scenarios. Full scenarios are available from Allium (2023).

Scenario 1: The connected boulevard

This scenario introduces the story of Robert, a grandfather tasked to pick up his grandson Jules due to the work constraints of his daughter Emma. Robert wants to use the shared electric cars service offer when he realizes that a harvest festival is blocking his road. In this scenario, the Metropolitan Highway was dismantled and replaced by a connected urban boulevard. During special events such as the festival, each neighbourhood needs to limit travel to local displacements only. The scenario presents a model of multiple transport usages, challenging the conciliation of cars, pedestrians, bicycles and public transportation. At the social level, it presents social constraints around small social circles of people with similar identities who interact closely and who can be isolated from larger social interactions. At the economic level, it includes a transportation tax to finance different types of transportation. At the technological level, an app utilizing AI optimizes

transportation fares and travel to reduce traffic and pollution by shifting work schedules to a 24/7 model.

Scenario 2: The overpass community garden

This scenario introduces the story of Thi and Van Duong, who arrived in Quebec almost a year and a half ago, following the severe droughts that struck Vietnam in 2049. Once one of the country's most important highways, the Metropolitan Highway was later abandoned because of the slowdown of globalization and the decline of import-export. The former highway deck has become Canada's largest urban agricultural overpass. For a year now, Thi and Van have been leading an aquaponics project in a space they were granted directly under the market garden corridor. In this scenario, Thi and Van are confronted with some challenges because the cooperative they are part of is asking them to reduce their energy consumption. Furthermore, the cooperative is considering moving them to a different location in the overpass to rent their current spot to a bigger corporation that will pay more.

Scenario 3: The two-speed smart city

The protagonist of this scenario, Hakim, a young, disabled man, lives in a building, which was built according to circular economy principles. Everything is optimized, from the temperature to air quality. Only electric self-driving shuttles and solo cars can drive under the transparent photovoltaic tube covering the highway. A large, well-known California high-tech company funded this highway in exchange for the rights to build a lot of circular neighbourhoods like Hakim's. Like all Quebecers, Hakim was endowed with a mobility account at birth, with a defined number of mobility carbon credits for all his life - the government's solution to reconcile individual freedom and the need for an ecological transition to net zero. However, Hakim sold over 20 years' worth of his carbon mobility credits to secure his apartment. Consequently, his mobility credit account is now depleted, leaving him with only the essential social minimum. This minimum can only be utilized for public transport, which is both deteriorated and congested.

Box 1: The three scenarios

Conducting the workshops

The workshops are a contribution to transition arenas that enables residents to envisage desirable change in a context where they and their organizations and institutions (e.g., here the city and the responsible ministry) appear to be locked-in to a reproduction of the status quo, e.g., remaking a highway as is, despite changing needs of citizens, climate pressures and so forth (Gilbert-Lapointe 2021).

In the fall and winter 2022/2023, four workshops were organized in locations near the highway, in the neighborhoods of Villeray-Saint-Michel-Parc-Extension and Ahuntsic-Cartierville. Since the goal was to make the workshops more inclusive, the workshop invitations were varied: one workshop targeted experts; another focused on women only; and the two other workshops were open to the general public. Also, places, times, and days of the week of the workshops were varied to accommodate different schedules and maximize the number of participants. Food and drinks were offered at all workshops, and childcare support was also made available for the women-only workshop (For budget reasons, this offer could not be made available at all workshops, and hence a decision was made to prioritize this workshop).

The workshops, spanning approximately three hours, commenced with a welcoming phase, followed by an introduction for all participants. This introduction included an overview of the concept of inclusive workshops, accompanied by pertinent statistics aimed at sensitizing participants to biases in discussions.

Next, participants were randomly organized into three groups, each assigned to discuss one of the scenarios. During the group sessions, moderators first presented the scenario through out-loud reading. Participants were encouraged to ask questions to establish a common understanding of the context and clarify complex terms. Following this, moderators prompted participants to deliberate on both desirable and undesirable elements of their respective scenarios. Then, moderators invited participants to come up with a shared vision of the future of the highway, as well as identify the collaborators needed to advance this vision and potential detractors who could impede its realization.

Finally, a subsequent plenary session provided a platform for groups to share the outcomes of their discussions and discover briefly the other groups' scenarios.

Data gathering and analyzing workshop results

In order to get a better understanding of the participants' profile, participants were invited upon arrival to fill out a voluntary autodeclaration form with questions about their age, gender identification, cultural group identification, situation of handicaps, language spoken, income, address, and mobility choices.

During the workshops, each group had one moderator and one notetaker. Notetakers wrote down what was happening during the workshops using a schema with four categories: 1) positive elements in the scenario (according to participants); 2) negative elements in the scenario (according to participants); 3) what the participants would like to change in the scenarios; 4) coming up with a group vision and potential collaborations. Each section was again separated into three sub-sections: 1) points of agreement between participants, 2) points of disagreement between participants, and 3) other. Sections 1 to 3 were designed to track conscientization processes during the workshops whereas section 4 was designed to track conciliation and collaboration. All scenario discussions were recorded for further reference, and notetakers produced workshop summaries based upon said recordings and discussion notes.

Immediately after each workshop, moderators and notetakers held a debrief session in order to share spontaneous insights, comment on participation dynamics (speaking time distribution, specific observations, etc.) and provide feedback on the general conduct of the workshop. Upon completion of the four workshops, a further debriefing session with all moderators was directed by taking into account several indicators linked to the three Cs (for example, an indicator of the conscientization process was: "Were there many clarification questions?", and an indicator of the conciliation process was: "Were there moments when personal interests conflicted with collective interests? If so, which ones? And were they the subject of discussions?").

Thematic analysis was then used to examine and code the group discussions (Nowell et.al. 2017). Based on the data (notes, summaries and observations), the authors generated initial codes that were later reviewed and transformed into thematic issues. Because each scenario presented different perspectives on mobility, social interaction, land use, and economics, the authors examined recurring patterns and contradictions in thematic issues within and across scenarios. Additionally, the interpretation of thematic issues was juxtaposed with observations of participants' interactions. Controversy, agreement, dominance, and discussion engagement were observed to enhance the interpretation.

In addition to coding the data, participants' interactions were classified, indicating whether their opinion was consensual or not, and whether the collective engagement was uniform or not, according to their social profile (in particular, gender, age, and expert perception, i.e. people who acted as experts in the field). This analysis allowed the authors to analyse the construction of the collective visions and to identify which scenario had more consensus and engagement of the participants.

Limitations

All authors of the present paper participated in the preparatory phase, three authors participated as moderators and notetakers, and all authors participated in the subsequent analysis and discussion of results. The preparatory phase included a presentation on the difficulties and challenges of inclusive workshop organizations. Thus, authors and further supporters were aware of topics such as bias, which, however, does not mean that bias was eliminated from notetaking. Also, the results depend on participants from the surrounding neighbourhoods, the generalizability of themes emerging from the workshops therefore cannot be taken for granted. Likewise, implications for the 3-C model are limited to these workshop observations.

Results

Participants' profile

In total, 54 persons participated in the workshops and 49 people filled out the auto-declaration form. 63% of participants were women (see Table 1). About half of the participants (56%) were between 25 and 44 years old, 2% below 25 and 42% above 44. 10% reported a disability, 12% identified as a visible minority and 76% as white. Participants tended to have a good formal education (64% above bachelor's degree, 18% bachelor's degree). They also tended to report a household income around or above the total provincial average before tax household income of 67,400 CAD

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: 39% of participants with an income of at least 90,000 CAD, 27% between 60,000 and 89,999 CAD, 16% between 35,000 and 59,999 CAD, and 4% between 20,000 and 34,999 CAD, 14% preferred not to answer this question.

In comparison, people living near the highway have a slightly different socio-economic background than the participants: there are more or less 50% men and women living in these neighbourhoods, 17% women and 20% men are less than 30 years old, 16% women and 16.5% men are between the ages of 30 and 49, and 19% women and 20.5% men are over the age of 50. Only 0 to 10% do not have any degree, except for the Saint-Michel neighbourhood where about 25 to 35% of inhabitants do not have a degree. Lastly, people living in the Villeray, Ahuntsic, Saint-Michel, and Parc-Extension neighbourhoods tend to have an annual income between 30,000 to 89,000 CAD (Boisjoly et al. 2021).

30% of participants reported using the car as a method of transportation (with 20% using it as their sole method of transportation), 38% using public transport (with 18% using it as their sole method of transportation), 38% biking (with 22% biking as their sole method of transportation), and 26% walking (with 12% walking as their sole method of transport).

In sum, while the representation of women at the workshop was good, the workshops also tended to reproduce the current users of the highway as far as a higher representation of higher income participants is concerned, whereas just as with the actual highway use, lower income local populations were less represented. The workshops did not achieve significant participation from vulnerable groups.

	Workshop 1 (general public)	Workshop 2 (experts)	Workshop 3 (women)	Workshop 4 (general public)
Number of participants	9	24	6*	11*
Gender distribution	8 women 1 man	12 women 12 men	all women	6 women 5 men
Number of visible minorities	1	3	1	1
Income distribution	→ 4 at least 90,000 CAD → 2 between 60,000 and 89,999 CAD → 3 did not wish to answer	→ 10 at least 90,000 CAD → 5 between 60,000 and 89,999 CAD → 5 between 35,000 and 59,999 CAD → 1 between 20,000 and 34,999 CAD → 3 did not wish to answer	→ 2 at least 90,000 CAD → 1 between 60,000 and 89,999 CAD → 1 between 35,000 and 59,999 CAD → 1 did not wish to answer → The last datum is counted in the next column	→ 3 at least 90,000 CAD → 5 between 60,000 and 89,999 CAD → 2 between 35,000 and 59,999 CAD → 1 between 20,000 and 34,999 CAD

Table 1: Workshops and their participants (based on the autodeclaration form)²

Conscientization

“The process of conscientization encourages citizens to think critically about their realities and nurtures their ‘capacity to aspire’ for better lives” (Ibrahim 2017). So did the future-oriented codesign workshops promote conscientization?

There is direct and indirect evidence for the future-oriented codesign workshops to foster critical thinking by way of generating discussions about alternative futures. The former is in evidence, when participants critiqued future scenarios. For example, in the women’s workshop, participants expressed that there were few desirable points in Scenarios 1 and 3. Points of critique included the promotion of individualism as well as the privatization of public infrastructure along with the potential exclusion of economically poorer citizens (in Scenario 3).

Participants used personal experiences and aspirations to critique undesirable aspects or to endorse desirable elements. For example, one participant regretted not having more green spaces near the highway, since he would have liked to have a garden near his house. This shows that participants are creating connections between the scenarios and their own lives, which we interpret as important for fostering conscientization.

The literature suggests that men discredit people, especially women, using personal examples (Raibaud 2015). However, we could not find evidence for this form of discreditation during the workshops, and in fact, men also seemed to use personal examples.

The indirect evidence of critical thinking is due to participants’ comments about the future-oriented codesign method (as opposed to the content of the scenarios). We found sceptics of this kind across all workshops. Method criticism included questioning if talking about the highway in the future would prevent concrete action now, as well as questioning how foresight scenarios can translate into concrete consequences in formal planning processes. Some participants viewed the method as a form of utopian dreaming unrelated to “concrete” and “feasible change”. One participant said: “I want to see what is feasible and not a utopia.” Another added: “I understand the principle, but I don’t think it is relevant to start from utopia knowing that the MTQ³ wants to rebuild the highway identically.”

This raises an ambivalent point of critique, as some participants expected to engage in discussions about the organizers' or the MTMDQ's vision for the highway, rather than developing their own visions. On the one hand, this could be interpreted as a realist form of critical thinking that wants to focus directly on the ministry's action. On the other hand, this form of critique also suggests a possible unwillingness to think "out of the box" of the present and prevailing power, and thus a limitation of the method to convince some participants to (re-)think their long-term visions.

We also find evidence for the method to foster a capacity to aspire by way of triggering discussions and statements such as participants endorsing desirable aspects or even scenarios. In particular, participants tended to endorse Scenario 2 as futuristic yet desirable and concrete (the exception being two participants in one workshop who found nothing desirable in this scenario and stayed silent when participants asked what they liked about the scenario).

In sum, these results suggest that the future-oriented codesign method contributes to conscientization-facilitating discussions, specifically for those participants who are convinced by the method. If they are willing to follow it, the capacity to aspire for an improved future is facilitated. This result is limited to the workshop observation, and evidence for more lasting impacts would depend on a follow-up study. In addition, if participants doubted the method, the results are ambivalent: they point on the one hand to the valid point of wanting to understand the relation between desirable futures and their feasibility and practical implication; on the other hand, they can express an unwillingness to critically think about the present, and be resigned to the view that nothing can change. Unwillingness to think about desirable futures in this sense was particularly related to the idea that significantly changing current, individualized transportation as part of a socio-ecological transition is not feasible, nor any deeper change to the economy.

Conciliation

Conciliation refers to deliberating on and creating communal visions as an input for joint action and responsibility. In this section, we first turn to the how of the conciliation process and then to a thematic analysis of its content. Given that each scenario presents distinct

approaches to mobility, the local economy and social interactions, we will analyse how participants reject or appreciate the various themes presented in these scenarios, and whether they converge on a shared vision.

Through this analysis, it becomes evident that a significant majority of participants advocate for alterations to the highway. They highlight the importance of incorporating diverse modes of transportation, decreasing reliance on cars, and fostering greater engagement with nature and the community.

Still, results for the visioning process differed across groups (see Table 2). The majority of groups did generate one or several visions. However, five groups did not arrive at any vision. Those groups all collected results via written bullet points. By contrast, groups who chose to draw their vision seemed to arrive at a vision more easily.

	Workshop 1 (general public)	Workshop 2 (experts)	Workshop 3 (women)	Workshop 4 (general public)
Scenario 1	No vision(s) <i>Bullet Points</i>	Multiple visions <i>Bullet Points</i>	No vision(s) <i>Bullet Points</i>	One common vision <i>Drawing</i>
Scenario 2	One common vision <i>Drawing</i>	One common vision <i>Drawing</i>	Multiple visions <i>Drawing</i>	No vision(s) <i>Bullet Points</i>
Scenario 3	No vision(s) <i>Bullet Points</i>	One common vision <i>Bullet Points</i>	No vision(s) <i>Bullet Points</i>	Multiple visions <i>Bullet Points</i>

Table 2: Visions and modes of vision preparation.

Participants in workshops with multiple visions agreed to disagree. In Workshop 2, in the discussion of Scenario 1, participants argued that a reason for disagreement was due to distance from the highway: people who came from further away would be for public transport but against removing cars, whereas participants living closely to the highway would more likely question the need for a highway and the current mobility system. In

Workshop 3, in the discussion of Scenario 2, there was widespread agreement on a vision except for the remaking of the elevated structure. The participants agreed to produce two different visions. In a related manner in Workshop 4, there was disagreement in Scenario 3, regarding the place of the train versus alternative modes of transportation (car or active transportation). The disagreements show the difficulty of conciliation. They also suggest that in the deliberation process, participants come to recognize differences.

Workshops with neither a common nor multiple visions revealed three types of barriers: 1) limits to the “acceptable” imagination, such as a world without or with much less personal cars; 2) disagreement on means, such as the use of coercive measures (as depicted in Scenario 3); 3) disagreement on the role of such visions in formal policy processes which prevented them from achieving a joint visioning process.

We also tracked differences in speaking times. Moderators had been instructed to facilitate equal speaking times, and this was achieved with the exception of the expert workshop as well as the Workshop 4 (where there was one scenario group that included two experts, an architect and an urban planner). For these workshops, moderators reported needing more effort to manage equal speaking times for men and women, but also difficulty to get one expert to speak at all in one of the workshops (an engineer who disagreed with the method). These difficulties resulted mainly from a tendency of such participants to respond more quickly to the questions of moderators, and to bounce ideas more quickly among each other. Experts from the field of urban planning tended to speak with a greater sense of legitimacy, whereas moderators observed a tendency of possible self-censorship among other participants, potentially due to a fear of making mistakes. This was also a result of some experts telling others what is “feasible” (and thereby limiting perceived options for desirable futures). While the notion of making mistakes was in part due to the difference in status (layperson versus expert), it also sometimes generalized to the experts, when the visioning theme itself was perceived as a matter of expertise.

Joint themes of the process of conciliation

We analysed the scenario discussions and vision phases of the workshops and drew out some common themes. Primary themes are topics that emerged in all workshops and across

all groups; secondary themes are topics that emerged across some but not all workshops. Themes are topics that participants discussed across workshops, i.e., agreeing and disagreeing with one another. Thus, the thematic analysis is a device to draw out the themes that specifically mattered to workshop participants. It identifies elements that infrastructure planners likely ought to take into consideration. Here we report on the primary themes that occurred throughout all workshops (for secondary themes, see Gasperoni 2023):

- *Space and transport management* refers to how the highway should be designed to optimize the space for transports and civilians, as well as how the different modes of transportation should be organized. *Space management* refers to how participants would organize the space on the highway and in its surroundings, including fair access to it (physical and economic costs). Participants frequently mentioned wanting dedicated routes on the highway for public and heavy transport. They also wished for dedicated spaces for pedestrians and bicycles, bypass routes, and devoting less space to cars on the highway. Participants also highlighted the importance of a more aesthetic infrastructure in place of the current highway. *Transportation management* is specifically about modes of transport (cars, public transport, active transport, etc.) and how they fit with the highway. While space management focuses on creating a space to improve the highway infrastructure itself, transportation management is about managing what goes *on* the highway. Participants mentioned wanting to diversify the different modes of transport by having fewer cars on the highway and, more specifically, fewer “solo cars” (cars with only one person inside). Car-sharing services, public long-distance transportation (e.g., trains, tramways, more public transport on the North/South and East/West axis), and encouraging active mobility (e.g., biking or walking) would replace this solo transport mode. However, participants overall still wanted to maintain the highway’s transit function.
- *Ecological transition*: This theme focuses on medium- to long-term instrumental solutions for environmental goals. Participants wanted fewer cars to reduce greenhouse gas (GHG) emissions. They discussed using less concrete in the construction by replacing it with recycled materials. Participants also talked about capturing carbon emissions, managing waste, and recovering water (stormwater, for example). Moreover, participants considered the implementation of net zero transportation

modes, arguing that only relying on electric cars was not enough. Additionally, they examined the spread of plants and animals appropriate for Quebec's climate so as to reduce heat islands and pollution.

- *Nature*: This theme focuses on the personal relation of participants with nature. Participants provided several examples to make nature more accessible to nearby residents such as increasing the number of parks and greening urban spaces by installing green roofs and walls, and converting the upper level of the highway into a green space.
- *The infrastructure as a social, cultural, and educational place*: By this, participants meant fostering public spaces by limiting division between neighbourhoods, and reclaiming the highway area for citizens. They mentioned wanting educational and nature-related cultural activities in the neighbourhoods, as well as leisure activities such as climbing walls, and art pieces like frescoes. Participants also emphasized the need for good cohabitation between pedestrians, bicycles, and shops.

While the focus on transportation management and the ecological transition as cross-cutting themes are not surprising in this context, the thematic analysis points to the importance of relational dimensions in future-making: the relation with ecosystems and urban nature (beyond the reduction of greenhouse gases), and urban infrastructure as a place of encounter. This relational component suggests important considerations for rethinking infrastructure in a way that inspires residents and thereby also is perceived as legitimate.

Comparing the women's group to mixed-gender groups, we observed some additional themes absent from the mixed workshops. Specifically, the women only groups discussed food management in terms of both improving low-income people's nutrition and in terms of local and ecological food production (Gasparoni 2023). This topic was there across all women's groups (Workshop 3) but neither a primary nor a secondary theme in the other workshops.

Collaboration

Collaboration refers to the need of linking desirable futures to established communal, private and public actors, who can help carry the process further and who might also block it due to diverging interests.

Due to time constraints, the exploration of collaboration was limited. Only three subgroups out of twelve had time to discuss collaborations. These groups identified communal, private and public organizations at the levels of the district, municipality and the province, including the need of involving educational institutions. Perceived willingness of some of these actors to engage in change was also discussed.

More subtly, people from the responsible ministry of transportation attended all four workshops (as individuals in their free time). This indicates that the future-oriented codesign workshops serve potentially as a method of preparing collaborations. However, as noted above, it comes at the cost (or moderation challenge) of participants with “more insight” limiting or directing discussion.

Discussion

Addressing the inclusion of citizens and experts in discussions regarding urban mobility infrastructures, while also fostering critical reflection on sustainability issues, presents a significant challenge. To tackle this challenge, we devised and implemented four future-oriented codesign workshops with 12 sub-groups, deploying the 3-C capabilitarian model to stimulate creativity, reflection, discussion, and collaboration. Although we successfully gathered valuable perspectives from citizens and diversified experts, beyond the promotion of gender equality enhancing women’s participation, we encountered difficulties in achieving adequate representation from low-income and racialized communities. Consequently, our findings offer valuable insights into participants’ perspectives on mobility planning, while also shedding light on both the limitations and potentials for future applications of the present approach. In this discussion section, we therefore reflect on the implications of our approach for the 3-C model, for future-oriented codesign workshops, and for urban planning more generally.

3-C Model revisited

Using future-oriented codesign workshops to operationalize the 3-C model seems to work relatively well for conscientization and conciliation processes. In terms of the process of *conscientization*, the majority of participants demonstrated critical thinking and expressed aspirations for a better future. To be sure, an event like a workshop cannot demonstrate long-term impact on preferences and practices. However, the codesign workshops make a critical initial contribution in that they invite participants to think about what could be, and how this is (potentially) different from what they envisaged before the workshop, while all along framing it in terms of possibilities, of something that can be done. The approach thus corresponds to a capabilitarian perspective on the difficult problem of adaptive preferences (Robeyns 2017, 137), and it invites further research on medium- and long-term impact of such workshops and grassroots innovation processes.

We found visions to be expressed across a number of shared themes - space and transportation management, the ecological transition, nature, and infrastructure as social, cultural, and educational spaces -, and we also found evidence for gender-specific conscientization processes. Comparing the women's group to mixed-gender groups, we noticed that issues such as food systems and pedestrian safety were particularly emphasized by women. In terms of the process of *conciliation*, we observed that participants' conciliation appeared to be fostered when visualization was used by participants, e.g., the drawing reported above. Moreover, across all workshops, participants discussed shared themes that indicate a widespread concern for implementing multiple transportation options with greater space for pedestrians, cyclists, and public transportation, while reducing reliance on cars (though still accommodating them to some extent). The thematic analysis also showed a widespread importance of relation to (and therefore access to) urban nature (beyond instrumental benefits only) as well as of viewing the (greener) infrastructure as a place of relations also in social and cultural terms. In addition, the literature suggests that the demand for a green and blue infrastructure (such as green walls and stormwater retention) also has instrumental benefits, e.g., increased active transportation (walking, cycling) and increased satisfaction with them (Lemieux and Boisjoly 2022). In sum, our discussion outcomes reveal that most participants envision changes to the highway that prioritize diverse transportation options, reduced car usage, increased presence of nature, and stronger community ties.

Zooming out of the workshop specifics, we also note that visioning processes in such workshops, with all their diversity and tensions, are de facto processes of fostering internally defined collective views (Leßman 2020, 3). Even with the proviso of the event-character of workshops, this remains a critical point, notable due to the danger of social innovation discourse yielding externally-defined collectives (e.g. the “beneficiaries” in the vision of an innovator). The approach creates a space for discussion and for blending of “external” elements - a typical, initial element of innovation processes, since even grassroots innovations will have initiators – and “internal” elements in the development of complex and changing collectives.

The *collaboration* process was least present in our operationalization of the 3-C model. While this might be in part due to pragmatic reasons (such as time constraints), there is likely also a deeper political and power reason that we will turn to below.

Innovation processes typically and, at least in terms of popular discourse, trivially, imply innovators. For example, in our case, the initial inspiration is due to ecological activist and horticulturalist Albert Mondor, who envisaged the Métropoligne utopia mentioned in the introduction. At the same time, the focus on innovators risks reducing a democratic process of future-making to the implementation of innovators’ ideas. In this light, our strategic foresight method with its plural scenarios offers a way to open possibilities and thereby democratize the innovation process. Innovators also become moderators and designers of workshops, and need to develop capacities to take on this critical role. This enabling role, even though crucial for the implementation, is an addition to Ibrahim’s initial presentation of the model. Put differently, there is an important, socially innovative role in facilitating the 3-C in such a way that they actually deliver on conscientization, conciliation and collaboration. It follows that the training and preparation of workshop designers and moderators is a crucially important aspect (distinct from “collaborating” in the sense discussed above). There is a need for enabling “process moderators” to initiate and facilitate the 3-C, and to reflect on their own power within the process (Wittmayer et al. 2014). This takes us to the future-oriented codesign workshops.

Implications for future-oriented codesign workshops

The 3-C model offers critical lenses to consider diversity and inclusion in strategic foresight processes. Despite our initial effort to create inclusive strategic foresight workshops, our results show only limited success in this respect. For example, only 12% of participants self-identified as belonging to a racialized group (visible minority). This might be because the project lacked the resources to pay participants which would have favored participation from more diverse socio-economic backgrounds. Furthermore, maintaining continuous communication with organizations in contact with more diverse populations proved to be quite challenging, probably because a lot of these organizations already work with limited resources and could thus not dedicate as much time helping with recruiting for the workshops. However, the project did manage to include a substantial number of female participants. Speech distribution was gender neutral, except in the experts' workshop. In the other workshops, participants who were experts (most were men) also tended to dominate the discussion. As noted before, the literature suggests that women tend to illustrate their ideas using personal examples and are often discredited because of this (Raibaud 2015). We could not find evidence of this form of discrimination in the workshops, with men also using personal examples. This might be because there was a good gender distribution in the workshops. Moreover, using scenarios favours the use of narration and anecdotes, which pairs well with the use of personal examples. So, while the future-oriented codesign workshops yielded some results in terms of women's inclusion and equal participation, improvements are needed in terms of inclusion of visible minorities. We therefore discuss in the following paragraphs possibilities of further experimenting with the approach, participant recruitment, facilitation methods and project continuity.

One option would be to further deepen the grassroots orientation and incorporate a popular education approach to value citizens' knowledge of space utilization (Freire 1992; Ithuralde 2020). The conscientization process could commence with a conversation about how citizens interact with mobility infrastructure, identifying the challenges and benefits it presents in their daily lives. Storytelling and visual aids could then be employed as educational tools to explore implicit challenges related to mobility, social inequalities, environment, and local economy. Subsequently, participants could share insights and learn from the different challenges presented in each scenario, learning with the different

controversies presented in all of them. Finally, participants would create their own scenario based on their knowledge and inspired by the discussed scenarios.

Secondly, participant recruitment and engagement need to be reconsidered to ensure a diverse range of participants. While some workshops could remain open to the public and promoted through various channels, specific workshops could be organized in close collaboration with local organizations working with target populations such as immigrants and refugees, LGBTQ+, seniors, persons with mental and/or physical disabilities and other relevant and vulnerable populations (Allen and Slotterback 2017). Such workshops could be part of community activities and thereby better integrate in target populations routine. While international experience shows that such group processes can be empowering, they also have to be part of a more general approach that ultimately brings people together in shared discussion across groups. This would suggest a sequential approach as for example used by social innovators in watershed development and sanitation infrastructure creation (Ziegler et al. 2014, 110f). Pragmatically, both general and targeted participant recruitment processes will benefit from follow-up support, such as short meetings or phone calls, to explain the purpose and workshop dynamics' or from compensation for participants for their time dedicated to the project.

Thirdly, we note the difficulty participants encountered when disentangling critical thinking about future possibilities from everyday constraints and lock-ins. One group showed reluctance in deeply engaging with dreaming, generally participants had difficulties imagining a city without cars, and urban experts intervened with realism, limiting the scope of dreaming to what they perceived as feasible. One option would therefore be to add to the future-oriented codesign workshops dedicated to conscientization and visioning a subsequent workshop focused on feasibility. Providing such a second meeting would respond to participants' demand for understanding what is possible to do and prevent dreaming "evasion" during the future-oriented codesign workshops. Thus, when participants ask what is feasible or not, moderators could say that the workshop is focused on what is desirable and that another meeting will address feasibility so as not to reproduce "lock-in" prematurely.

In relation to that, we note that thematic analysis of future-oriented codesign workshops offers a way to identify topics that residents care about (even if they disagree on the particulars). For example, we noted that the topic of access to nature as well as of infrastructure as a public (social and cultural) place is likely of high importance, even if potentially more “hidden” than the more obvious topics of transportation management or GHG emissions reduction for ecological transition. Thus, the analysis can provide urban planners with insights for urban infrastructure development. This idea is supported by the observations that urban experts already de facto participated in the workshops and thus showed an interest in the future-oriented codesign workshops even though they were not part of the formal infrastructure planning.

Implications for infrastructure development and urban planning

The workshops were deliberately designed as transition arenas outside official and formal urban planning processes. This might also explain why the topic of collaboration was the least present of the 3-C.

On the side of residents’ inclusion, workshops with more time (or an additional feasibility workshop) could prepare participants by offering an introduction of the various municipal, provincial and federal responsibilities in urban infrastructure, formal planning processes and so forth. This would add a dimension of civic education (Baril 2018).

On the side of de facto collaboration, it would also be possible to envisage an approach that is mandated by a formal body (such as an affected city district). Given the frequent lock-in in infrastructure planning, this would depend on windows of opportunities that allow formal bodies and urban planners to insert such strategic foresight workshops into their planning processes. Such insertion might improve resident’s perception of the feasibility and practicality of workshops, while at the same time possibly introducing constraints given powers and interests that sustain the current infrastructure. With such a move to policies and programs of municipalities and ministries, an evaluation of preconditions and operational conditions along the six dimensions developed by Dong et al. (2012) could be considered, precisely to anticipate power dynamics and constraints at odds with inclusive, civic innovation processes.

Conclusion

While Ibrahim offered a rich conceptual approach, she did not provide a methodology to practically apply the 3C-model. This article contributes to the development of Ibrahim's 3C-model by drawing on future-oriented codesign workshops. We used this novel combination to examine participation and inclusion dynamics through strategic foresight workshops held in 2022-2023 with Montreal residents living near the Métropolitaine.

The primary results showed that the strategic foresight method facilitated critical thinking and the capacity to aspire among participants, thus promoting conscientization in the form of conversations (and visuals) of urban infrastructure possibilities. Participants were enabled to develop visions for the highway, specifically when using visual methods. But conciliation was also challenging, notably due to differences in perspectives and opinions on feasible changes. The collaboration process would probably require a further workshop, also to provide time for civic education on various urban planning and governance processes.

Although we tried to involve diverse stakeholders in the planning process and researched barriers to inclusivity, such as differences in gender, socio-economic background, and expertise, the workshops were attended mostly by educated, middle-class individuals, and vulnerable populations were underrepresented. However, women, typically excluded from urban workshops, were strongly represented in the workshops.

This article identified common themes in the discussions, such as space and transport management, ecological transition, nature integration, and the highway's potential as a social and cultural space. Collaboration with relevant organizations, including government bodies and educational institutions, was also explored but limited due to time constraints.

Overall, the results emphasize the significance of engaging citizens and fostering inclusive participation in urban infrastructure planning to create sustainable and desirable future visions for cities. Our study and experience show strategic foresight workshops to be an additional tool to explore citizens and expert's visions for urban planning changes in capabilitarian spirit. Inclusiveness can be further enhanced by integrating popular

education and collaborating with community organizations working with vulnerable populations.

Notes

¹ These numbers are available for 2019 from <https://statistique.quebec.ca/en/fichier/revenu-faible-revenu-quebec-2019-donnees-tendances-depuis-25-ans.pdf>, accessed 10.6.2023.

² Note that the total number of participants comes up to 50 because one participant attended both workshops 3 and 4. Also note that some participants did not wish to answer some questions, which had an impact on the income statistics.

³ The MTQ is the Ministry of Transportation of Quebec, it has since been renamed MTMDQ (Ministry of transportation and sustainable mobility of Quebec).

References

Alexiou, Katerina, Veronica Hale and Theodore Zamenopoulos (2022). “Design Capital: Unearthing the Design Capabilities of Community Groups.” *International Journal of Design*, 16(2) 33–46.

Allen, Ryan, and Carissa S. Slotterback. 2017. “Building Immigrant Engagement Practice in urban planning: The case of Somali refugees in the Twin Cities.” *Journal of Urban Affairs*, 43 (6): 740-755.

Allium (Aliance pour l’innovation dans les infrastructures urbaines de mobilité). 2023. www.allium.com. Site web, last accessed 15.9.2023

Angelidou, Margarita, and Artemis Psaltoglou. 2017. “An empirical investigation of social innovation initiatives for sustainable urban development.” *Sustainable Cities and Society*, 33: 113-125. <https://doi.org/10.1016/j.scs.2017.05.016>

Baril, Jean. 2018. *Guide citoyen du droit québécois de l’environnement*. Les éditions Écosociété.

Bibri, Simon E. 2018. “Backcasting in futures studies: a synthesized scholarly and planning approach to strategic smart sustainable city development.” *European Journal of Futures Research*, 6 (13). <https://doi.org/10.1186/s40309-018-0142-z>

Boisjoly, Geneviève, Marie Huynh, Sara Yahiaoui, Vincent Obry-Legros. 2021. *Étude préliminaire : Portrait du quartier, des résidents et de la mobilité autour de la section de l'autoroute 40 entre les boulevards Provencher et Marcel-Laurin*. Département de génie civil, géologique et des mines Polytechnique Montréal.

Chiappero-Martinetti, E., Christopher H. Budd, and Rafael Ziegler. 2017. “Social Innovation and the Capability Approach—Introduction to the Special Issue.” *Journal of Human Development and Capabilities*, 18 (2): 141-147. <https://doi.org/10.1080/19452829.2017.1316002>

CREMTL (Conseil régional de l'environnement de Montréal). 2020. *Réfection de l'autoroute Métropolitaine : coïncés dans les années 1950 jusqu'en 2050?* Montréal, Canada. <https://cremtl.org/actualites/2020/refection-lautoroute-metropolitaine-coinces-les-annees-1950-jusquen-2050>

Díaz, Sandra, Josef Settele, Eduardo Brondízio et al. 2019. *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Bonn: IPBES.

Dong, Andy, Somwrita Sarkar, Crighton Nichols and Thomas Kvan. 2013. “The capability approach as a framework for the assessment of policies toward civic engagement in design.” *Design Studies*, 34 (3): 326-344.

Dreborg, Karl H. 1996. “Essence of backcasting.” *Futures*, 28 (9): 813-828. [https://doi.org/10.1016/S0016-3287\(96\)00044-4](https://doi.org/10.1016/S0016-3287(96)00044-4)

Dunne, Anthony, and Fiona Raby. 2013. *Speculative everything: design, fiction, and social dreaming*. Cambridge, Massachusetts: The MIT Press.

Frediani, Alexandre A. 2019. *Cities for Human Development. A capability approach to City-Making*. Rugby, UK: Practical Action Publishing.

Freire, Paulo. 1992. *Pedagogia da Esperança: reencontro com a Pedagogia do Oprimido*. Rio de Janeiro, Brazil: Paz e Terra.

Freire, Paulo. 1970. *Pedagogia do Oprimido*. Rio de Janeiro, Brazil: Paz e Terra.

Fricke, Miranda. 2015. “Epistemic Contribution as a Central Human Capability.” In *The Equal Society: Essays on Equality in Theory and Practice*, edited by George Hull, 73-90. Maryland: Lexington Books.

Gasparoni, Chiara. 2023. “Prospective and social innovation workshops: Analysis of conscientization, conciliation and collaboration processes for inclusive urban planning.” *Projet d’intégration*, HEC Montréal.

Gilbert-Lapointe, Camille-Charlotte. 2021. “Quelles stratégies pour des transformations urbaines durables? Recommandations pour l’Alliance pour l’innovation dans les infrastructures urbaines de mobilité (ALLIUM).” *Projet d’intégration*, HEC Montréal.

Gordon, Ariel, Lucas D. Becerra, and Mariano Fressoli. 2017. “Potentialities and constraints in the relation between social innovation and public policies: some lessons from South America.” *Ecology and Society*, 22 (4): 7. <https://doi.org/10.5751/ES-09493-220402>

Howaldt, Jürgen and Michael Schwarz. 2017. “Social Innovation and Human Development—How the Capabilities Approach and Social Innovation Theory Mutually Support Each Other.” *Journal of Human Development and Capabilities*, 18 (2): 163-180. <https://doi.org/10.1080/19452829.2016.1251401>

Ibrahim, Solava. 2017. "How to build collective capabilities: The 3C-model for Grassroots Led development." *Journal of Human Development and Capabilities*, 18 (2): 197-222. <https://doi.org/10.1080/19452829.2016.1270918>

Ithuralde, Raúl E. 2020. "Thinking about a popular education in sciences?" *Cadernos De Pesquisa*, 50 (175): 186-208. <https://doi.org/10.1590/198053146644>

Kaika, Maria. 2017. "'Don't call me resilient again!': the New Urban Agenda as immunology ... or ... what happens when communities refuse to be vaccinated with 'smart cities' and indicators." *Environment and Urbanization*, 29 (1): 89-102. <https://doi.org/10.1177/0956247816684763>

Krikser, Thomas, Annette Piore, Regine Berges, and Ina Opitz. 2016. "Urban Agriculture Oriented towards Self-Supply, Social and Commercial Purpose: A Typology." *Land*, 5 (3): 19. <https://doi.org/10.3390/land5030028>

Lamblin, Véronique. 2018. "L'analyse morphologique, une méthode pour construire des scénarios prospectifs : Prospective and strategic foresight toolbox." *Futuribles International*.

Lemieux, Charlotte and Geneviève Boisjoly. 2022. *Mandat 1 - Études des usagers de l'autoroute Métropolitaine et recherche documentaire sur les impacts des infrastructures vertes sur la mobilité*. Montréal, Canada: Allium.

Leßmann, Ortrud. 2020. "Collectivity and the capability approach: survey and discussion." *Review of Social Economy* 80 (4): 461-490.

Listerborn, Carina. 2007. "Who speaks? and who listens? the relationship between planners and women's participation in local planning in a multi-cultural urban environment." *GeoJournal*, 70 (1): 61-74. <https://doi.org/10.1007/s10708-007-9114-8>

Nowell, Lorelli, Jill Norris, Deborah White, and Nancy Moules. 2017. "Thematic analysis: Striving to meet the trustworthiness criteria". *International Journal of Qualitative Methods*, 16 (1): 1609406917733847.

Popper, Rafael. 2008. "How are foresight methods selected?" *Foresight*, 10 (6): 62-89. <https://doi.org/10.1108/14636680810918586>

Raibaud, Yves. 2015. "La participation des citoyens au projet urbain : une affaire d'hommes !" *Participations*, 2 (12): 57-81. <https://doi.org/10.3917/parti.012.0057>

Robeyns, Ingrid. 2017. *Wellbeing, Freedom and Social Justice: The Capability Approach Re-Examined*. Open Book Publishers.

Scherrer, Frank. "L'approche." *Chemins de transition*. Accessed March 5, 2023. <https://cheminsdetransition.org/approche/>

Spijker, Stephanie N., and Constanza Parra. 2018. "Knitting green spaces with the threads of social innovation in Groningen and London." *Journal of Environmental Planning and Management*, 61 (5-6): 1011-1032. <https://doi.org/10.1080/09640568.2017.1382338>

Steen, Marc and Rafael Ziegler. 2020. "Methods and Tools for the Application of the Capability Approach in the Domain of Technology, Innovation and Design." HDCA conference, London 2020.

Teasdale, Simon, Michael Roy, Rafael Ziegler, Stefanie Mauksch, Pascal Dey, and Emmanuel Raufflet. 2021. "Everyone a Changemaker? Exploring the Moral Underpinnings of Social Innovation Discourse Through Real Utopias." *Journal of Social Entrepreneurship*, 12 (3) 417-437.

Tosun, Jale, and Jonas J. Schoenefeld. 2017. "Collective climate action and networked climate governance." *Wiley Interdisciplinary Reviews-Climate Change*, 8 (1): 17. <https://doi.org/10.1002/wcc.440>

Vermeire, Jacob, Saskia Crucke, Josephine Mutesi, and Annelies Vinck. 2021. "Tackling climate change under time-poverty: Cooperatives as temporal pacers." *Sustainable development*, 31 (1): 253-264. <https://doi.org/10.1002/sd.2387>

Voros, Joseph. 2003. "A generic foresight process framework." *Foresight*, 5 (3): 10-21. <https://doi.org/10.1108/14636680310698379>

Wittmayer, Julia M., and Niko Schöpke. 2014. "Action, research and participation: roles of researchers in sustainability transitions." *Sustainability Science*, 9: 483-496. <https://doi.org/10.1007/s11625-014-0258-4>

Wolfram, Marc. 2018. "Cities shaping grassroots niches for sustainability transitions: Conceptual reflections and an exploratory case study." *Journal of Cleaner Production*, 173: 11-23. <https://doi.org/10.1016/j.jclepro.2016.08.044>

Ziegler, Rafael. 2010. "Innovations in Doing and Being: Capability Innovations at the Intersection of Schumpeterian Political Economy and Human Development," *Journal of Social Entrepreneurship*, 1(2): 255-272.

Ziegler, Rafael. 2021. "Capabilities approach and social innovation". In *A Research Agenda for Social Innovation*, edited by Jürgen Howaldt, Christoph Kaletka and Antonius Schroeder, 117-131. Cheltenham: Edward Elgar Publishing.

Ziegler, Rafael, Lena Partzsch, Jana Gebauer, Marianne Henkel, Justus Lodemann. 2014. *Social Entrepreneurship in the Water Sector: Getting Things Done Sustainably*. Cheltenham: Edward Elgar Publishing.