Impacts of the Sharing Economy on Urban Sustainability: The Perceptions of Municipal Governments and Sharing Organisations

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Abstract: By changing the institutionalised practices associated with resource distribution, the sharing economy could support sustainable urban transformations. However, its impacts on urban sustainability are unknown and contested, and key actors hold different perceptions about them. Understanding how they frame these impacts could help solve conflicts and outline what can be done to influence the development of the sharing economy in a way that fosters urban sustainability. This study explores the diversity of these frames across actors (sharing economy organisations and municipalities), segments (accommodation, bicycle, and car sharing), and cities (Amsterdam and Toronto). A framework of the impacts on urban sustainability was developed following a systematic literature review. This then guided the analysis of secondary data and 51 interviews with key actors. Results show that accommodation sharing is framed most negatively due to its impact on urban liveability. Bicycle sharing is surrounded by less conflict. Still, in Amsterdam, which has a well-functioning bicycle infrastructure, it is viewed less positively than in Toronto. Car sharing is the most positively framed segment in Amsterdam as its potentials to lower emissions align with municipal sustainability agendas. Practical insights for negotiations between sharing economy organisations and municipalities to advance urban sustainability are proposed.

Keywords: sharing economy; framing; sustainability; accommodation sharing; car sharing; bicycle sharing; city

1. Introduction

Cities around the world face rapid urbanisation accompanied with pressing environmental challenges, aggravating socio-economic inequalities, and emerging diseases [1]. In response, the United Nations introduced sustainable development goal 11 with the aim to “make cities and human settlements inclusive, safe, resilient and sustainable” [2]. Researchers, urban actors and transnational municipal networks also advocate for an urgent urban transformation towards sustainability [3–7]. A sustainable urban transformation requires that cities become more resilient and able to mitigate environmental problems, improve liveability (such as through the provision of affordable housing and efficient public transportation), maintain economic growth, promote equity and justice among citizens, and ensure a decent quality of services by supporting emerging technologies and innovations [8–10].

One of the focal areas to advance sustainable urban transformations is improved resource management practices [11]. Cities have accumulated large pools of resources, many of which have high idling capacity [12–14]. Premises, parking lots, cars, bicycles, washing machines, tools, and even clothes stay unused most of their lifetime [15]. Therefore, the idea of “the sharing economy”—a novel way of resource distribution facilitated by online platforms where temporary access is given to goods owned by urban citizens and
organisations—has been highlighted as a potential solution to many urban sustainability challenges [16,17].

The sharing economy is facilitated by information and communication technology (ICT), which has enabled its institutionalisation. As such, it is closely connected to the concept of smart cities, which also aims to improve urban space through ICT [18]. Cities that label themselves as smart were found to indirectly support the sharing economy through their smart agenda programmes [19]. The sharing economy has been praised for being part of a greater sustainability transition that could reduce production volumes, thereby lowering the negative environmental impacts associated with manufacturing and end-of-life product management [20–23]. However, there are many instances when it does not contribute to sustainability [24], and it has been even accused of reinforcing “the current unsustainable economic paradigm” [25]. Previous work explored social [26–28], economic [25,29,30], and environmental [31,32] impacts of the sharing economy, but there is no consensus on how it impacts urban sustainability.

The ambiguity about the sustainability impacts of the sharing economy in academic literature mirrors the related socio-political debate which unfolds among different actors in cities [19]. These actors include sharing economy organisations (SEOs) and their users, governments at different levels, various third-party organisations, the media, and the incumbent sector [14,33]. How they perceive the sustainability impacts of the sharing economy depends on their experiences, interests, capacities, agendas, and responsibilities. These perceptions are therefore not homogenous. They form the actors’ attitudes which define how they frame the sharing economy and its sustainability impacts.

Framing “select[s] some aspects of a perceived reality and make[s] them more salient ( . . . ), in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and / or treatment recommendation” [34]. Its purpose is to scrutinize, simplify, organise, and categorise complex issues, situations, and events and bring clarity to them [35]. Since the framings of the same issue held by various actors differ [34], the framings can either align or be contested [36].

Sustainability has often taken a central stage in the debates on how the sharing economy should develop and become embedded into existing urban systems [37]. For example, SEOs often argue that due to its sustainability potential, the sharing economy should be supported in its current form [33,38], while in many instances, municipal governments (MGs) have been working to reshape it [14,39] in order to maximise its positive impacts on cities and their citizens, and minimise the negative effects. However, the uncertainty about the actual impacts has resulted in the perceived impacts (sometimes based on the actual impacts) influencing the opinions of the public, the media, municipal government officials, and other relevant actors. Consequently, how the impacts are perceived by key actors influences the development of the sharing economy and determines how cities will be shaped by SEOs in the future.

MGs and SEOs can negotiate and co-design local policies [40] or collaborate on providing better access to goods for all citizens [14]. At the same time, there are multiple examples of conflicts [12–14] which sometimes result in restrictions and bans by MGs and legal actions by SEOs in response. Examples include a lawsuit in San Francisco on regulations for short-term home rentals, the legal process in London between Uber and a municipal transport authority that revoked Uber’s license to operate [41], or city authorities penalising Mobike in Shanghai for street-clogging and misuse of public areas by free-floating bicycles [42].

In other words, the sharing economy is a largely contested concept in cities, and the conflicts between MGs and SEOs are influenced by how these actors frame them. Often, the actors use sustainability claims to frame these conflicts. Therefore, understanding sustainability framings of the sharing economy and the underlying arguments held by both parties would inform “how these frames affect the development of a conflict, as well as how they can be used to influence it” [35]. This knowledge may then become an important tool in conflict resolutions [43,44]. As such, mapping the contestations and alignments of
sustainability framings of the sharing economy by MGs and SEOs could help uncover the points of intervention to advance more sustainable forms of the sharing economy in cities. However, at present, there is little research on how the sustainability impacts of the sharing economy are framed by urban actors. Previous attempts focused either on one segment, e.g., accommodation sharing [45] or ride-hailing [46], or on the sharing economy as a whole [47,48]. The former approach has a narrow focus, and the latter assumes a uniformity of all sharing economy segments although they are far from homogeneous in their business models [49] and sustainability impacts [15,37,50]. Furthermore, there is limited knowledge about the differences and commonalities in framings held by various actors, particularly by MGs and SEOs [39] who constitute two key actor groups shaping the development of the sharing economy in cities [12,13]. Lastly, sustainability framings are likely to differ across cities as each city has unique socio-economic and environmental features and sustainability aspirations [51], but cross-city comparisons are lacking.

This paper seeks to address these gaps by exploring how sustainability framings of the sharing economy differ and align across actors (MGs and SEOs), segments (accommodation, bicycle and car sharing), and cities (Amsterdam and Toronto). It explores the diversity in the perceived sustainability impacts and discusses potential reasons for the differences. It also highlights key conflict issues and offers practical suggestions on how a consensus about developing a more sustainable sharing economy could be achieved.

The focus is on the sharing of cars, bicycles, and accommodation, which are the dominant and arguably the most contested sharing practices in cities [14]. Both peer-to-peer (P2P) and business-to-consumer (B2C) business models are included in the analysis. The car sharing business models represented in this paper are B2C free-floating models (where the cars can be picked up and dropped off anywhere in the city), B2C one-way station-based (same pick-up and drop-off spot), B2C two-way station based (with designated pick-up and drop-off spots), and P2P (privately owned, thus station-based). Bicycle sharing business models follow the same patterns as car sharing, however, in the case cities included in this study, only B2C station-based models were available. The accommodation sharing segment is represented in this paper by the sharing organisation Airbnb. Although other business models exist, such as free (Couchsurfing) and reciprocal (HomeAway) [45], they are surrounded by significantly fewer conflicts regarding their sustainability impacts and are therefore omitted from this study.

The framings held by MGs and SEOs are analysed in two case cities: Amsterdam, the Netherlands, and Toronto, Canada. Both cities are home to many SEOs from different segments [52,53] and are members of the Sharing Cities Alliance, which signals municipal engagement with the sharing economy agenda. At the same time, they exhibit different structural conditions; political, economic, and cultural factors; and sustainability aspirations which influence how they govern SEOs [14,51], and thus provide fruitful grounds for comparisons.

Section 2 presents a literature review on sustainability impacts and framings of the sharing economy. Section 3 explains the research approach and methods used to conduct the systematic literature review, develop an analytical framework, and gather and analyse data collected in the two cities. Section 4 presents findings on how car, bicycle, and accommodation sharing is framed by MGs and SEOs in Amsterdam and Toronto. Section 5 discusses the differences in framings between the actors and cities. It also suggests potential reasons for these differences and offers recommendations on what aspects to consider in order to advance more sustainable forms of sharing in cities. Recommendations are also provided on how SEOs and MGs could co-create the sharing economy together to ensure that it is beneficial to the cities and their citizens and alleviates urban problems.

2. Literature Review on Sustainability Impacts and Framings of the Sharing Economy

Studies seeking to understand the sustainability impacts of the sharing economy are growing in numbers. They typically focus on specific environmental or economic factors. Urban liveability is also considered. It encompasses social growth and an equitable
distribution of, for example, housing, jobs, and infrastructure. Academic studies also explore whether and how the sharing economy contributes to the service quality in urban areas [8–10]. At the same time, the complexity of the impacts and their strong context dependency often make them difficult to discuss in absolute terms.

The purpose of the systematic literature review presented in this section was to collect data on what is known about the sustainability impacts of the sharing economy, and how these impacts are framed by scholars. Literature on three sharing economy segments was reviewed: car, bicycle, and accommodation sharing. An overview of the findings is presented in Appendix A (car sharing), Appendix B (bicycle sharing), and Appendix C (accommodation sharing). Sections 2.1–2.4 provide a summary of the literature review.

The methodology for this literature review is explained in Section 3.2. The outcome of this review is a research model (Figure 1, Section 3.2) that was subsequently used to analyse empirical data on how MGs and SEOs frame the sustainability of the sharing economy in Amsterdam and Toronto (Section 4).

![Figure 1](image_url). Research model consisting of framing themes (left) and framing categories (right).

### 2.1. Environmental Impacts and Framings

*Car sharing* is believed to have lower environmental impact than car ownership as it is estimated that greenhouse gas (GHG) emissions are reduced when car owners shed their cars [54]. It may remove up to 13 private vehicles off the road and reduce driving distances by 27–43% [55] because it is combined with public transport, walking, and cycling [56]. In B2C schemes, cars tend to be newer and have lower emission profiles than the private fleets of P2P schemes [31]. Car sharing may also save resources by avoiding the production of new cars, increasing the utilisation rate, allowing users to choose the right car size [31], and reducing the need for parking spaces [57]. However, it could also be used as an addition to private cars [58] and public transportation [59].

*Bicycle sharing* is framed as a sustainable transport option [60] due to reductions in air pollution, GHG emissions [61], parking spaces [62], and road congestion [63]. Studies show that, for example, free-floating bicycle sharing systems have great potential to reduce resource use compared to station-based schemes or private ownership scenarios [64]. However, this form of bicycle sharing has also attracted negative attention [65] because these schemes sometimes offer an oversupply of bicycles to overcome the competition, in addition to having poorly designed management systems. This results in discarded bicycles, clogging of pavements, and an excessive waste of resources [66]. Sometimes, the bicycles are discarded by the providers, and municipalities or other societal partners have to organise their removal [42]. The rebalancing of bicycle sharing schemes also requires additional car driving and contributes to air pollution and congestion [67,68].

The environmental impacts of *accommodation sharing* are underexplored. Available information usually centres around the activities of the sharing economy giant Airbnb,
leaving out other organisations (e.g., HomeExchange, VRBO, Couchsurfing). Reports commissioned by Airbnb claim significant environmental gains compared to staying in hotels—up to 78% in energy savings, 48% in water, 32% in waste, and 89% in GHG emissions [69]. However, several studies have criticised the reports’ lack of transparency regarding data and methods, calling for caution in interpreting their results [31]. In order to understand the environmental impacts of accommodation sharing, user behaviour should be acknowledged [45]. For example, sharing models where the same space is shared by hosts and guests may lead to a reduction of electricity and heating consumption per user, while renting an entire home may have the opposite effect [45]. At the same time, accommodation sharing could reduce the demand for building new hotels [30] and avoid the environmental impacts associated with their construction.

2.2. Economic Impacts and Framings

The literature on sustainable cities defines economic impacts in terms of economic growth and equity [8–10]. The main economic benefits of the sharing economy include economic growth facilitated by the increasing levels of economic activity and capitalising on otherwise idling resources and assets [70]. SEOs and resource owners generate economic value and pay taxes on their revenues which benefits either the cities or the states [61]. The sharing economy is also framed as a response to the malfunctioning of the global financial system by representing an alternative way to generate additional income. Research on the effects of the sharing economy on incumbent businesses is emerging [71–73], although less is known about the rebound effects of additional incomes from sharing activities [31].

Car sharing is shown to directly influence both the disposable income of households, and indirectly impact the economic outputs of other sectors [74]. Studies demonstrate that car sharing is a more economically attractive option than car ownership [75] although it often substitutes the ownership of a second car [76]. The indirect or secondary economic impacts of car sharing stem from re-spending the additional income or money saved on cheaper forms of mobility [31]. The corresponding environmental impacts from these activities depend on the environmental intensities of goods and services in additional consumption responses. The effect of car sharing on car manufacturers is probably very marginal due to the potentially lower demand, since many manufacturers are present on the sharing markets as service providers [77]. Besides, the lifetime of shared cars in B2C schemes is 3–5 years, which means that car sharing indirectly contributes to the provision of relatively new cars but with high mileage to second-hand markets. Thus, the potential of car sharing to reduce car ownership can be questioned and, to our knowledge, has not been explored.

Bicycle sharing is framed as having a positive influence on the economic growth of cities [61]. It may also have a positive marginal impact on household disposable incomes, if they forgo bicycle ownership and restrain from owning a car and instead choose cycling, walking, and public transportation [78].

The participation in accommodation sharing platforms enables people to earn additional income from renting unused premises [45], thereby fostering economic empowerment and micro-entrepreneurship [71]. However, critics warn that the earnings can be re-spent on high-impact consumption categories, which reduces the potential positive impacts [79]. In terms of macro-economic and city-wide effects, accommodation sharing is framed as promoting tourism in cities, which leads to revenue generation for local businesses and municipalities [80]. It also brings extra spending to areas outside of tourist centres [45]. On the other hand, accommodation sharing has been often criticized for increasing rental prices and overall property prices in places popular with tourists. This eventually results in neighbourhood gentrification and increased segregation within cities [81,82]. Moreover, in several cities, the hosts are not renting a spare room, but multiple properties acquired to be rented out on accommodation sharing platforms. Some of the “hosts” are also commercial actors with dedicated investments [83]. Many cities realise the potential distortions of the housing market induced by sharing activities and introduce various regulatory measures,
but monitoring and enforcement is difficult and expensive [84]. Another important negative impact of accommodation sharing is revenue losses by the incumbent hotel industry [82], and the resulting employment effects [85].

2.3. Liveability Impacts and Framings

Studies of the impacts of the sharing economy on liveability often mention empowering people, increasing trust, building social cohesion, improving safety, and providing equitable access to city infrastructures [3]. Indeed, the low-cost, short-term, access-based consumption options offered in the different sharing economy segments provide opportunities to most, if not all, demographic groups [60,86].

For instance, car sharing allows a more efficient use of public spaces (less parking) and nudges people to use public transport while also potentially reducing the need to expand transportation networks [75]. It is also framed as providing greater security than traditional mobility options, such as private cars [87]. The ability of ride sharing or carpooling schemes to build social ties has also been mentioned [88]. Furthermore, car sharing might improve equity by providing access to cars to lower-income citizens [89]. At the same time, some studies claim the opposite and warn that only well-off consumers can afford car sharing [68]. Car (and bicycle) sharing schemes are often framed as complementary options to public transport that can help reduce overcrowding in public transport [60,90], improving spatial connectivity [91] and enhancing the feeling of belonging to a community of car or bicycle sharers [92]. On the other hand, it could also replace public transport [60].

Bicycle sharing has been praised for being a safer mode of transport compared to cars, reducing traffic accidents, and improving health [93] and wellbeing through physical activity [61,68]. On the other hand, the literature also pointed out a number of adverse effects, such as increased bicycle-related accidents [65], vandalism [94], negative health consequences due to exposure to air pollution from traffic [95], and reduction of walking [60]. Bicycle sharing is also framed as having negative impacts on liveability in cities because it may gentrify neighbourhoods when new or too many schemes are introduced [96]. In several cities, free-floating bicycle sharing schemes are cluttering public spaces and increasing congestion for pedestrians [65].

Accommodation sharing is associated with several positive impacts on urban liveability. For example, it could boost cultural activities when it brings in more tourists. During the COVID-19 pandemic, accommodation (and other sharing segments) catered to different emergency services. Such responses could make cities more resilient [97]. However, many negative framings were also found. It has been accused of intensifying gentrification and increasing the number of visitors in cities, which leads to overcrowding in city centres [81,98,99]. The loss of the housing stock (permanent units and long-term rentals) to short-term rentals has also been discussed [100]. This could, in turn, negatively impact social cohesion in neighbourhoods [101]. As a result, the inclusiveness of tourism is also debated [102]. Accommodation sharing is also shown to increase the pressure on everyday community resources such as waste management and transport, sometimes in areas where there is a lack or under-capacity of such infrastructures [103].

2.4. Service Quality Impacts and Framings

Service quality is defined as an important element of a sustainable city. It can be achieved through innovation of the emerging digital and data technologies that aid economic growth and equity, reduce environmental pressures, and improve social cohesion and liveability [8–10].

ICT exploited in car and bicycle sharing can greatly improve the quality of mobility services, including the condition of shared vehicles. For instance, B2C car sharing schemes have much larger shares of electric and hybrid vehicles than the regular private fleet [104]. ICT facilitates better access and seamless booking, and improves in the provision of reviews in both car [105] and bicycle sharing segments [106]. These aspects increase the quality of travel and offer more flexibility, time efficiency, and easier parking [107]. ICT enables
more options for integrating different modes of urban transportation by city planners [108]. However, bicycle sharing was shown to be prone to theft and vandalism [109], which impairs the service experience.

**Accommodation sharing** is framed as a service that allows users to belong anywhere in the world [110]. Engaging with hosts offers travellers a more authentic experience and gives them a chance to “live like a local” [111]. In addition to facilitating low-cost accommodation of higher value, it is also believed to provide better quality, authenticity, and variety of services than hotels [112]. ICT innovations offer easier transactions, such as booking and check-in/out, and reliable and trustworthy systems for reviews and customer support [113]. Transaction security is a critical issue for all types of sharing platforms, as it can be four times more effective in increasing trust than regular social referrals [114]. ICT with new apps and big data analytics speeds up and increases the geographic coverage of sharing economy offerings and changes the social, cultural, and economic nature of relations [115].

The literature review above illustrates the diversity of sustainability impacts and framings in the three sharing economy segments. It found a general lack of studies systematically investigating, comparing, and contrasting how the impacts of the sharing economy are perceived and framed by different actors and across different segments and cities.

## 3. Methodology

### 3.1. Research Approach

Framing analysis can be conducted both inductively and deductively. The deductive approach allows for a more holistic view of issues and an understanding of which frames are included or excluded [116]. This study adopted a hybrid approach by first performing a systematic literature review to collect statements about the sustainability impacts of the sharing economy (Section 3.2). The literature review resulted in an inventory of framing themes and categories which form a conceptual framework (Figure 1). The framework was then used to guide the analysis of 51 in-depth semi-structured interviews with the representatives of MGs, SEOs, and sharing economy experts in Amsterdam and Toronto (Section 3.3). The focus was on the sustainability framings of accommodation, car, and bicycle sharing by the key actors influencing the development of the sharing economy in cities—SEOs and MGs.

### 3.2. Systematic Literature Review and Development of a Research Model

A systematic literature review was conducted [117] to summarise the existing knowledge on the sustainability impacts of car, bicycle, and accommodation sharing. It was guided by the research questions of the study [118]. The literature review was performed from March to June 2020 and complemented in January 2021. It focused on academic multi-disciplinary peer-reviewed publications in Scopus. A three-step procedure inspired by Blaikie [119] was followed.

Step 1 involved the identification of publications through practical screening to ensure peer-review quality among journal articles and conference papers in English, searching by title, abstract, and keywords. Book reviews, reports, commentaries, and working papers were excluded. The main search terms included “accommodation sharing” and its synonyms “short term rental” and “Airbnb”, combined with “sustainability”, “environmental”, “social”, “economic”, and “economic”. For the mobility segment, we used “shared mobility” and “car sharing” combined with the same sustainability related terms; similarly, we used the synonyms “bicycle sharing” and “bike sharing” for the bicycle segment. We ran 28 search strings combining target search field and different keywords, e.g., TITLE-ABS-KEY (“car sharing”) AND TITLE-ABS-KEY (“sustainability”). The filtering yielded 363 articles.

Step 2 identified the most relevant papers by word frequencies. For a full text analysis, the 363 papers were uploaded into a database for a word frequency query with the help of the Qualitative Data Analysis Software NVivo v.12 QSR International. First, the query included words “environmental”, “social” and “economic”. We ranked all publications in
the sample and chose 20 of the most top-ranked articles with the highest number of hits in the respective categories: environmental (minimum 36 hits per paper), social (minimum 72 hits per paper), and economic (minimum 35 hits per paper). After excluding duplicates, the final sample comprised 54 articles. The same procedure was followed to scan the sample by segment-related queries. An additional 45 articles were chosen based on the highest frequency of hits of the terms: car sharing (99–305 hits per paper), bicycle sharing (84–327 hits per paper), and accommodation sharing (13–148 hits per paper).

Step 3 involved an analysis and coding of the resulting sample of the 99 articles. Three articles contained three categories with high word frequency (e.g., bicycle sharing, accommodation, and economic) and 12 articles had two categories (e.g., bicycle sharing and environmental) with high word frequency. The coding started from these articles that were deemed the most relevant. Coding was guided by the sustainable city themes highlighted in the literature, e.g., thematic publications addressing sharing and environmental issues, liveability in a city, infrastructure and social cohesion, economic growth and equity among citizens, and quality of services by supporting emerging technologies and innovations [8–10]. Besides that, an open coding content analysis technique was used where the text is coded with titles and notes based on their relevance to the sustainability impacts of the three sharing segments. The inductively emergent titles are then collected into a coding sheet and sorted and merged into higher-level categories [120] that operationalise the four framing themes, i.e., environmental issues, liveability, economic growth and equity, and service quality. For each of the three segments, the following number of framing statements was collected: 58 for accommodation sharing, 55 for bicycle sharing, and 50 for car sharing. These statements were then grouped into 16 categories under the four framing themes (Figure 1), and both positive and negative framings were identified for each segment. A complete overview of these statements and how they were classified under the 16 framing categories and the four framing themes is presented in Appendix A (accommodation sharing), Appendix B (bicycle sharing), and Appendix C (car sharing).

The framing themes and categories were used to develop an initial research model (Figure 1), which was then used to analyse empirical data on how MGs and SEOs frame the sustainability of accommodation, car, and bicycle-sharing in Amsterdam and Toronto (Section 4).

3.3. Empirical Data Collection and Analysis

To collect actor-related sustainability framings in the three segments, 51 in-depth, semi-structured interviews were conducted with MGs, SEOs, and sharing economy experts in Amsterdam (31) and Toronto (20). The interviewed municipal employees were working with economic development, traffic and public space, and housing affairs in Amsterdam, and economic development, licensing, and standards in Toronto. The SEOs included CEOs, founders, or other representatives of car, bicycle, and accommodation SEOs. To complement and triangulate the data collected from MGs and SEOs, additional interviews were conducted with sharing economy experts, including knowledge institutes; consultancy firms; lobby organisations; think tanks; governmental institutions at city, provincial, and national levels; and Amsterdam- and Toronto-based researchers knowledgeable about the sharing economy scene in the two cities.

Most of the interviews were conducted from January to April 2019 in Amsterdam, and from September to December 2019 in Toronto, with a few follow-up interviews during the summer of 2020. The interviews were executed both online and in-person during a one-week visit to each city by all authors following our approach of a “mobile research lab” (A mobile research lab is a methodological approach with roots in ethnography. It comprises three months of preparation and a one-week visit to a city to study the sharing economy. It engages with a mixed-method approach, including interviews with relevant actors, observations, site visits, focus groups and workshops [14]) [121]. Interview questions were designed with the aim to get a broad overview of sharing economy landscapes in each city and the three segments of interest, and to extract the actors’ framings about the
sustainability impacts of the three segments. Each interview lasted about 60 min. All interviews were recorded, anonymised, and transcribed.

In addition to in-depth interviews, official written material, such as reports, public statements, press releases, websites, and blogs by MGs and SEOs were reviewed. This secondary data ensured that the collection of actors’ sustainability framings was comprehensive, particularly in the situations when access to primary data was limited. Data from both primary and secondary sources was coded using the research model developed from the systematic literature review (Section 3.2, Figure 1). The findings on sustainability framings of the sharing economy in Amsterdam and Toronto are presented in Section 4.

4. Findings and Analysis

This section presents differences and similarities in the sustainability framings of the sharing economy by two (seemingly) polar actor groups (SEOs and the MGs) in two cities (Amsterdam and Toronto), across three sharing segments (car, bicycle, and accommodation sharing). The presentation of the framings is clustered under the four framing themes from the research model (Figure 1): environmental issues, liveability, economic growth and equity, and service quality.

4.1. Car Sharing

There are multiple, diverse car sharing schemes in both cities. They include free-floating and station-based B2C and P2P businesses. In Amsterdam, free-floating B2C organisations include Share Now, Fetch, Buurauto, and Sixt. The station-based are Green Wheels, My Wheels, and ConnectCar. SnappCar, a peer-to-peer organisation, also operates in Amsterdam. In Toronto, there is one free-floating CS company, Communauto, and the rest are station-based. These include Zipcar, Options for Cars, and Enterprise CarShare. Turo is the only P2P scheme in Toronto. The vibrant car sharing scene in both cities is reflected in rather high numbers of collected framing statements: 41 in Amsterdam and 33 in Toronto. A categorised list of the collected statements is available in Appendix D (Amsterdam) and Appendix E (Toronto).

Figures 2 and 3 summarise the empirical findings on how car sharing was framed by the representatives of MGs (“CITY”) and SEOs (“SEO”) in Amsterdam and Toronto. These graphs do not carry any statistical significance; rather, they serve as an overview of the variety of statements recorded under each framing category and indicate whether they were framed positively or negatively by the SEOs and MGs.

![Figure 2. Sustainability framings of car sharing in Amsterdam ("env" = environmental issues; "liv" = liveability and social issues; "econ" = economic growth and equity; "serv" = service quality; "city" = municipal government; "SEO" = sharing economy organisations. The scale at bottom of each graph shows the number of collected statements).](image)

Most of the statements regarding car sharing concerned the framing themes “liveability” and “ecological issues”. The segment was associated mostly with positive statements by both MGs and SEOs, although the MG of Amsterdam was somewhat less positive to car sharing compared to that in Toronto.
4.1.1. Environmental Issues

Car sharing is often framed in terms of its environmental effects as it allegedly decreases car use, fuel use, and GHG emissions. The high number of statements about environmental issues collected in Amsterdam can be attributed to the general interest of the MG in car sharing: “Car sharing in Amsterdam ( . . . ) was relatively little and was a really positive thing ( . . . ) but there wasn’t really a programme behind it. But now we are really trying to make car sharing big in Amsterdam” (Int #A20_CITY). The municipality has signed three national green mobility deals, which, among other things, aim to promote car sharing. The objective of the first “Green Deal Autodelen” was to expand car sharing by having 100,000 shared cars in the Netherlands by 2018. The objective was not met and was followed by the second “Green Deal Autodelen” aiming to reach 700,000 users by 2021. By signing the deal, the City of Amsterdam commits to, among other things, expanding carsharing throughout the city, combating GHG emissions by supporting electric CS fleets, challenging the market to devise innovative CS concepts, and experimenting with parking permits [122]. The third deal is the City Deal on Electric City Mobility that aims to, among other things, introduce car sharing in new housing developments. The municipality hopes that the adoption of car sharing will reduce the number of cars in Amsterdam: “We look into getting rid of the huge amount of cars in the city centre, so if we introduce some car sharing initiatives” (Int #A03_CITY).

The municipal officials in Amsterdam are predominantly positive about the environmental impacts of car sharing (Int #A10_CITY, Int #A11_SEO). They tend to agree with SEOs that car sharing decreases pollution and improves air quality as car owners shed their cars. They also believe that B2C carsharing cars are “greener” than private cars and taxis as they are more likely to be electric. The positive impact on public transport was also highlighted: “For public transport growth, car sharing is ( . . . ) actually positive. ( . . . ) We see that people who start car sharing are using more public transport and bikes” (Int #A10_CITY). The importance of a green mobility mix was also brought up: “We don’t want [people] to use the cars ( . . . ) I want ( . . . ) them on a bike, [using] public transport, and only when ( . . . ) there is no option, then they should use car sharing” (Int #A11_SEO).

The SEOs in Amsterdam claimed that car sharing decreases the demand for larger, fuel-demanding cars because it allows users to select larger cars on demand. They see car sharing as encouraging sustainable lifestyles and contributing to sustainable energy transitions in cities. Nevertheless, municipal actors warned that pollution would increase if car sharing increased access to cars and reduced the use of public transportation.

Amsterdam and Toronto MGs appreciated that car sharing helped introduce electric vehicles to citizens and contributed to phasing out diesel and petrol engines. However, an SEO representative cautioned about the negative impacts of mining for electric car batteries, and urged to find solutions to make car sharing a “cleaner” option for urban mobility.

In Toronto, the statements of environmental benefits of car sharing were fewer and it was difficult to find contextual connections. The MG generally did not see car sharing as a means to alleviate environmental issues despite the city declaring a climate emergency [123]. Their position is that car sharing increases car use and the related air pollution when used in addition to privately owned cars. SEOs argued that car sharing improves air quality by reducing mileage and because (B2C) car sharing fleets are generally “greener” than private fleets. Thus, the two actor groups did not concur on the issue of air pollution in relation to car sharing.

4.1.2. Liveability

Liveability was the most discussed car sharing theme in Toronto and the second most discussed in Amsterdam, after environmental issues. Most of the statements concerned the impact on existing infrastructures. SEOs used exclusively positive statements, while the MGs employed both positive and negative statements.

Interestingly, actors in both Amsterdam and Toronto were unsure whether car sharing has a positive or negative impact on traffic congestion, public transportation, and parking space, as these topics were contested. However, they argued that car sharing brings a more diverse mobility mix and solves the last mile problem.
In Amsterdam, both actor groups highlighted that car sharing may reduce the need for parking: “The environmental impact is important, but more important (...) is the effect on public space, especially in cities that have to grow and have to build a lot. So (...) we have to stimulate car sharing [in] Amsterdam” (Int #A33_CITY).

SEOs in both cities claimed that car sharing provides greater security than private cars because they are newer and better maintained. In Amsterdam, the MG agreed with this, but in Toronto, the MG claimed that car sharing might increase car accidents, showing that there is contestation regarding this issue.

Overall, actors in Amsterdam appeared more positive towards car sharing than actors in Toronto. A possible reason for this might be that Amsterdam actively supports car sharing and includes it in urban planning, whereas in Toronto, it is a niche segment that is much less embedded into the existing transport systems. In addition, private cars dominate transportation pass. The overall sentiment in Amsterdam was that as long a sharing economy business model caters to local citizens, rather than visitors, it is welcomed in the city.

4.2.1. Economic Growth and Equity

Economic growth and equity was the least frequently mentioned theme. This could probably be attributed to the lack of specific studies on the issue. In both Amsterdam and Toronto, car sharing was appreciated for providing disadvantaged groups with access to cars and for reducing household costs when people shed their cars. However, in Amsterdam, the municipal representatives warned that it externalises costs to the wider society when parking space for car sharing schemes is subsidised by the city.

4.2.2. Service Quality

The ability of car sharing to improve service quality was evaluated positively across both actor groups in Amsterdam and Toronto. Most actors agreed that car sharing facilitates easy access to cars, promotes new technologies, eases pressures on parking, improves the quality of travel, and saves time. Mobility services received rather positive attitudes in Toronto, where they are regarded as a service that fills in the last mile gap for carless travellers.

4.2. Bicycle Sharing

Amsterdam and Toronto provide interesting cases for exploring the impacts of bicycle sharing on urban sustainability in two vastly different contexts. The combination of unfavourable climate conditions and a lack of bicycle lanes makes cycling and bicycle sharing in Toronto a niche activity in comparison to Amsterdam with its highly developed cycling infrastructure [124]. Interestingly, each city has only one major bicycle sharing system—Bike Share Toronto and OV-fiets (Amsterdam), which are station-based. Amsterdam has imposed restrictions on free-floating systems because they clogged the narrow streets [125]. In Toronto, the existing marginal demand was already met by Bike Share Toronto (Int #T02).

A total of 21 and 22 statements about bicycle sharing were gathered in Amsterdam and Toronto, respectively. Figures 4 and 5 summarise the empirical findings on bicycle sharing in Amsterdam and Toronto. Generally, the SEOs and MGs in both cities were more positive about the benefits of bicycle sharing. The municipal actors in Amsterdam were more vocal about some of the negative impacts than their counterparts in Toronto.

**Figure 4.** Sustainability framings of bicycle sharing in Amsterdam.
4.2.1. Environmental Issues

In terms of environmental issues, most actors framed bicycle sharing positively. SEOs in both cities argued that it contributes to more sustainable urban mobility and replaces trips made by cars. These statements were also found in the literature, indicating that the beliefs that bicycle sharing alleviates environmental issues are rather widespread. In Toronto, no negative statements about environmental issues were found. However, in Amsterdam, the MG was concerned that bicycle redistribution vehicles, which might run on diesel or gas engines, could increase emissions. On the other hand, they appreciated that bicycle sharing decreases the number of discarded old bicycles as people move from bicycle ownership to bicycle sharing schemes. Removing discarded bicycles, which often litter the canals, is the municipality’s responsibility [126]. Therefore, bicycle sharing could save the municipality a considerable amount of resources.

4.2.2. Liveability

The overall strongest liveability statement was “solves the last mile problem.” Both cities want to integrate bicycle sharing into existing public transport networks in an attempt to improve mobility. The SEOs argued similarly—Int #T21_SEO stated that: “(bicycle sharing) completes the first and last mile of your public transit and (…) fills in those gaps where public transport doesn’t serve”. In Toronto, both actor groups mentioned the last mile problem in conjunction with the poor quality of public transportation to which they saw bicycle sharing as an alternative. (In a global ranking report on sustainable city mobility Toronto ranked 54th and Amsterdam 11th [127]).

SEO’s in both cities suggested that sharing reduces traffic accidents due to fewer miles travelled by cars, but some of the sharing economy experts in Toronto cautioned about the general increase of bicycle-related accidents. The variation in opinions could be attributed to the fact that, over the past 14 years, road fatalities have been increasing in Toronto [128], while in Amsterdam, they have been decreasing since the 1970s [129]. The City of Toronto aims to address its inadequate cycling infrastructure as part of its action plan on reducing traffic accidents [128]. Despite a disagreement on whether BS leads to an increase in fatal injuries, SEOs in both cities and government officials in Toronto agreed that bicycle sharing promotes physical activity.

The station-based system OV-fiets was generally supported by the municipality. It caters to the locals because it requires a membership and can be connected to the public transportation pass. The overall sentiment in Amsterdam was that as long a sharing economy business model caters to local citizens, rather than visitors, it is welcomed in the city.

4.2.3. Economic Growth and Equity

Very few statements were used regarding the impact on economic growth and equity. In Toronto, this theme was dominated by SEOs who claimed that bicycle sharing removes the necessity to buy own bicycles, allows users to save money, and promotes tourism to the city. SEOs in both cities also claimed that by being low-cost, it constitutes to an equitable form of transportation.

At the time of the interviews, free-floating schemes were no longer operating in Amsterdam, but there were discussions about allowing them back under conditions decided by the municipality. The MG claimed that they were mainly used by tourists, not by locals, who already owned their bicycles. Furthermore, they argued that these schemes brought in even more tourists to an already overcrowded city and clogged the pavements.
4.2.4. Service Quality

Service quality was among the least controversial themes in Toronto as there was a consensus between the MG and SEOS that bicycle sharing delivers a good service for the city. SEOS were most likely to point out the benefits of bicycle sharing (increased accessibility, reliability, flexibility, and convenience, coupled with faster commuting times). This could be attributed to the insufficient extent of public transport system in Toronto, which bicycle sharing is supposed to complement. This is in contrast with a well-developed sustainable mobility mix in Amsterdam, where bicycle sharing is not seen as revolutionary, and where the MG did not make any statements regarding service quality.

4.3. Accommodation Sharing

The empirically gathered framings of accommodation sharing are based on 43 statements from actors in Amsterdam (Figure 6 and Appendix H) and 45 in Toronto (Figure 7 and Appendix I). This segment yielded the most data, indicating that its sustainability framings are highly debated with a large diversity in statements. Similar to the literature review, Airbnb dominated the discussion on accommodation sharing in both cities. Therefore, the “SEO” in this particular segment refers to Airbnb. The following sections present findings on how actors framed the impact of AS on ecological issues, liveability, economic growth and equity, and service quality.

4.3.1. Environmental Issues

The impact of accommodation sharing on the environment was framed predominantly positively by the SEOS. In Amsterdam, an SEO highlighted AS’s environmental superiority compared to traditional hotels, and its potential to promote sustainable tourism and transportation. In Toronto, the environmental framings were much less pronounced and almost never illustrated by identifiable environmental effects.

4.3.2. Liveability

Liveability was the most negatively framed accommodation sharing theme in both cities. In Amsterdam, the interviews and the reviewed policy documents indicated that these negative impacts were often linked with the ill effects of tourism. For example, the statements “causes overcrowding in cities” and “gives rise to illegal short-term rentals” were employed by both the MG and the SEOS, indicating a high level of awareness of these issues; at the same time, it was recognised that “overcrowding in cities” impacts mostly
tourist-intensive areas. It must be noted, however, that the negative statements used by the SEO were mentioned only indirectly, for example, when the company stated that it signed an agreement with the City of Amsterdam to “combat illegal hotels.”

The representatives of Amsterdam’s MG highlighted, among other things, that AS causes nuisance to the neighbours and is responsible for an overall loss of the sense of community during a “tourist takeover” of the city: “It’s more intruding if somebody is renting out their house and it is next to you” (Int#A03_CITY).

These negative connotations echo an Amsterdam strategy “City in Balance 2018–2022: Towards a new equilibrium between quality of life and hospitality” [130], which has the ambition to find balance between tourists and residents. Published in 2018, the strategy states that “visitors are welcome, but residents come first,” which was the dominant sentiment towards short-term rentals when interviewing MGOs and reviewing public documents. Short-term rentals are being affected by the measures taken by the municipality to tackle over-tourism, although they only account for around 8% of all visits to Amsterdam [131]. Nevertheless, accommodation sharing is seen as the cause of the overcrowding: “The problem is with Airbnb and other websites that they not only replace tourists from hotels to apartment buildings, but they also attract extra tourists. And for some cities, that may be welcome for their economy, but for the already very touristic cities like Amsterdam [...], we are not really fond of attracting extra people” (Int#A32_CITY).

A discussion about regulating AS has been ongoing among city-level policy makers and SEOs in Amsterdam. Airbnb commissioned a study to argue why they oppose a proposed 30-day cap [131]. The report states that the new cap would only have a limited effect on overcrowding in Amsterdam and claims that a planned cruise ship terminal would incur a more significant increase in the number of tourists. This shows the embeddedness of over-tourism into the negotiations about regulations on short-term rentals.

The negative impacts on affordable housing caused by the rise of illegal short-term rentals were also discussed. The MG argued that “illegal hotels” lead to intensified gentrification, the misuse of subsidies meant for residential development, and the loss of affordable housing.

In Toronto, the MG used negative connotations when discussing the impacts of accommodation sharing on liveability. Compared to Amsterdam, the dominant frame was not over-tourism, but the loss of housing stock to short-term rentals, and an increase in housing prices. The affordability of housing in Toronto has decreased in the past decade as it has become the 5th least affordable city in a comparison of 92 major housing markets in eight English-speaking countries in 2021 compared to the 15th least affordable in 2010 [132]. The housing prices have deteriorated from 3.9 to 8.6 times annual incomes in the past 15 years [132].

However, an SEO argued that shared properties are unlikely to be transferred to long-term rentals: “Those people [...] generally aren’t surrendering their extra property to the long-term housing market [...]. They’re just signing up on Booking.com or somewhere else. So, [data sharing] benefits those other companies, which [the municipalities] do not like [because] they don’t pay taxes and don’t share data” (#T08_SEO).

Another issue brought up frequently in Toronto was the lack of safety measures in shared properties. The municipality alleged that accommodation sharing causes safety concerns and endangers citizens due to non-compliance with fire and safety rules.

4.3.3. Economic Growth and Equity

The theme “economic growth and equity” provided the richest source of statements about accommodation sharing. In both cities, SEOs used only positive statements, while the statements by MGs were more varied. Negative effects on the incumbent hotel industry were among the main concerns of the municipal officials in Toronto, who warned that the industry was stagnating due to accommodation sharing platforms that were able to expand and pose unfair competition to legitimate hotels. The Toronto municipality (in contrast to Amsterdam) generally appreciated that accommodation sharing brings more tourists to
the city, extra revenues to auxiliary businesses, and additional income to renters. However, the MGs in both cities were clear that some regulation is needed to protect the interests of long-term renters and curb the negative impacts on the incumbent businesses.

In 2015, the Ontario Chamber of Commerce published the report “Harnessing the Power of the Sharing Economy: Next Steps For Ontario”, which framed accommodation sharing and the sharing economy in general as “vibrant, emerging sectors” that need to be (cautiously) supported. In 2018, the Ontario’s Ministry of Finance published the report “The Home-Sharing Municipalities Guide For Ontario”, which focused on several issues with AS, including the impact on affordable housing and public safety concerns. At the same time, it highlighted its opportunities such as tourism growth or competitive advantage. The sentiment in this report corresponds with the empirical findings, which show that Toronto officials framed the liveability of AS negatively, but economic growth and equity was framed both positively and negatively by them.

In Amsterdam, the municipal government appreciated the ability of renters to earn extra money, and the creation of new jobs. SEOs, which used exclusively positive statements, highlighted a large variety of positive impacts on equity, household income, the economy at large, and city infrastructure. This shows that they are using a wide variety of arguments in their attempt to gain legitimacy.

4.3.4. Service Quality

Service quality was framed almost exclusively positively in both cities, apart from a governmental official in Toronto who warned that accommodation sharing puts the homeowners at risk of damage of property. Otherwise, the Toronto municipality appreciated that accommodation sharing enables visitors to live like locals, offers authentic experiences, and expands hospitality services that are affordable. Similar statements were found in Amsterdam, but mostly from SEOs. Service quality is the least contested framing within accommodation sharing because actors generally agree on its benefits. It must be noted, however, that compared to bicycle and car sharing, it is often tourists, not local citizens, who benefit from the offered service.

5. Discussion and Conclusions

This paper explored the framings of SEOs and MGs in Amsterdam and Toronto in three sharing economy segments—car, bicycle, and accommodation sharing. The premise was that these actors use different sustainability framings as a way to influence the general discourse and shape the development of the sharing economy. Cities have a power to steer the development of the sharing economy and navigate it in a way that benefits them and their citizens. Thus, how they define what is sustainable and desirable in a particular city context plays an important role in institutionalising the sharing economy.

The paper mapped the sustainability framings along four framing categories—environmental issues, liveability, economic growth and equity, and service quality. By facilitating a better understanding of these framings, it helps to identify alignments and contestations and potential points for intervention to support more sustainable forms of the sharing economy in cities. This study can be used by sharing economy actors to collaborate on the development of the sharing economy in a way that supports sustainable urban development. The main takeaway is that each city faces unique sustainability challenges, and SEOs hoping to make a positive impact might consider becoming acquainted with these. Similarly, cities could collaborate with SEOs on improvements to urban sustainability, but should be cautious of negative effects. The paper further provides a comprehensive list of possible impacts of car (Appendix A), bicycle (Appendix B), and accommodation (Appendix C) sharing that can be used as a checklist for assessing the sustainability impact (both positive and negative) on specific cities. This list can also be used as an initial directory of potential rebound effects. On the other hand, this study does not provide an account of the actual sustainability impacts of the sharing economy. Rather, its aim was to shed light on how the impacts are perceived by two key actors—MGs and SEOs. Furthermore,
the findings are specific to Amsterdam and Toronto, thus, they cannot be generalised to other cities. However, the overviews of the sustainability impacts in Appendices A–C can be used in replication studies.

In Amsterdam, the MG and the SEOs generally agreed about the positive impacts of car sharing on the environment, liveability, and economic growth and equity. This implies that car sharing SEOs are seen as agents of positive change and their contribution to alleviating urban issues is recognised by the MG. On the other hand, their impact on service quality, although framed positively, was not found to be a major reason for the MG to support car sharing. In Toronto, on the contrary, the municipality appreciated the positive impact on service quality, while it did not consider car sharing as positive to the environment, liveability, and economic growth and equity.

A possible reason for this difference might be that the City of Amsterdam actively supports car sharing and includes it in urban planning as an addition to its mobility mix that also includes walking, cycling, and public transportation. In Toronto, however, citizens rely on private cars to a greater extent as private car ownership is a necessity to cover longer travel distances and deal with less developed public transport. Therefore, in Toronto, car sharing is seen as a way to gain access to cars, rather than as a means of solving environmental challenges.

The impacts of car sharing on cities are contingent on the city context. The findings indicate that factors such as quality of existing public transportation, overall mobility mix, available public space for parking, and air pollution play important roles in determining the impacts of car sharing on urban sustainability.

In Amsterdam, it was found that bicycle sharing can bring only marginal benefits due to an already high bicycle ownership and a strong cycling culture. The city has also experienced the adverse effects of an oversupply of several free-floating bicycle sharing schemes in the past, which resulted in restrictions on these business models and in negative framings. Another reason why free-floating bicycle sharing systems are not supported in Amsterdam is because they are seen as catering to tourists, rather than locals. The only system currently supported by the municipality is a nation-wide, station-based system used predominantly by local citizens in combination with train trips. It is supported because it is solving the last-mile problem and is used by local citizens.

The bicycle sharing market in Toronto is also rather niche, but for different reasons than in Amsterdam. Cycling and the related infrastructure are marginal due to unfavourable weather conditions and a prevalence of cars. Nevertheless, both SEOs and the MG in Toronto framed bicycle sharing largely positively, except for the risks of more road accidents (this was less of an issue in Amsterdam, where cycling infrastructure is more adequate). Toronto might benefit from integrating bicycle sharing into their less-developed public transportation system in the suburbs, which would reduce the last-mile problem and contribute to sustainable transportation.

In both cities, the MGs generally agreed that bicycle sharing offers low-cost solutions and provides an equitable form of transportation for broad socio-demographic groups. Thus, bicycle sharing organisations are expected to provide affordable transportation in a safe way, while avoiding cluttering the streets—especially in cities with old town centres where the pavements are narrow. Finding ways to connect bicycle sharing with public transportation and in doing so, solving the last-mile problem, is welcomed by both municipalities.

Liveability in the accommodation sharing segment was the most negatively framed theme by the MGs in both cities because it was believed to be increasing rental prices, causing gentrification and over-tourism. On the other hand, the highest alignment of framings between the MG and SEOs was around the positive impacts on the economic growth and equity, and service quality.

In Amsterdam, the dominant framings were overcrowding, loss of the sense of community and over-tourism. The city with ca. 900,000 inhabitants receives 9 million visitors annually [133], which explains why overcrowding and nuisances caused by excessive
tourism are clearly voiced and reflected in the national strategies to spread tourism to other parts of the Netherlands [134]. As such, accommodation sharing companies could aid these efforts by expanding their services to areas outside of Amsterdam. In addition, they could advocate for good tourist behaviour to avoid conflicts with the city and with the locals.

In Toronto, the issue of overcrowding was not prominent, but accommodation sharing was instead believed to negatively impact the availability of affordable housing. The Toronto municipality (in contrast to Amsterdam) generally appreciated that space sharing brings more tourists to the city, resulting in more revenues to businesses and additional income to renters. Therefore, the SEOs should not target entire home rentals, but instead redirect their focus on the sharing of rooms, which is more likely to benefit local residents and avoid the removal of housing units from the rental market.

In light of MGs struggling to govern the sharing economy in a way that brings sustainability benefits, one-size-fits-all governance mechanisms are not recommended as the impacts of the sharing economy (and the needs of cities) are vastly different. Rather, the governance of sharing should consider the unique characteristics of each city to minimise negative impacts and maximise the potential benefits to urban sustainability.

This study makes a contribution to the existing knowledge of the sharing economy by exploring how MGs and SEOs frame the impacts of the sharing economy on urban sustainability. It draws conclusions about what can be learnt from these framings to advance more sustainable forms of sharing in cities. The paper explored the framings of two key actors—MGs and SEOs. However, there are other actors involved in the debates surrounding the sharing economy. As such, the framings held by incumbent businesses, sharing economy users (both service providers and customers) and non-users, and the wider society, may be the subject of further inquiries. This is important as they define how sharing services are legitimised, accepted, scaled up, and institutionalised.

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Appendix A. Framing of Car Sharing Coded from the Literature

This visualisation shows how the sustainability impacts of car sharing were framed in academic literature. The findings were systematised using a research model that comprised of framing themes (far left) and framing categories (middle-left). The collection of statements on the sustainability impacts of car sharing is presented in middle-right. These statements are classified as positive (36 statements) and negative (14 statements).
This visualisation shows how the sustainability impacts of bicycle sharing were framed in academic literature. The findings were systematised using a research model that comprised of framing themes (far left) and framing categories (middle-left). The collection of statements on the sustainability impacts of bicycle sharing is presented in middle-right. These statements are classified as positive (33 statements) and negative (22 statements).
Appendix C. Framing of Accommodation Sharing Coded from the Literature

This visualisation shows how the sustainability impacts of accommodation sharing were framed in academic literature. The findings were systematised using a research model that comprised of framing themes (far left) and framing categories (middle-left). The collection of statements on the sustainability impacts of accommodation sharing is presented in middle-right. These statements are classified as positive (29 statements) and negative (29 statements).
Appendix D. Framing of Car Sharing by SEOs and the MG in Amsterdam

This visualisation depicts how sharing economy organisations (SEO) and municipal government officials (CITY) framed the sustainability impacts of car sharing in Amsterdam. The collection of statements is presented in middle-right. The statements are systematised into framing categories (middle-left) and framing themes (far left).
Appendix E. Framing of Car Sharing by SEOs and the MG in Toronto

This visualisation depicts how sharing economy organisations (SEO) and municipal government officials (CITY) framed the sustainability impacts of car sharing in Toronto. The collection of statements is presented in middle-right. The statements are systematised into framing categories (middle-left) and framing themes (far left).
Appendix F. Framing of Bicycle Sharing by SEOs and the MG in Amsterdam

This visualisation depicts how sharing economy organisations (SEO) and municipal government officials (CITY) framed the sustainability impacts of bicycle sharing in Amsterdam. The collection of statements is presented in middle-right. The statements are systematised into framing categories (middle-left) and framing themes (far left).
Appendix G. Framing of Bicycle Sharing by SEOs and the MG in Toronto

This visualisation depicts how sharing economy organisations (SEO) and municipal government officials (CITY) framed the sustainability impacts of car sharing in Toronto. The collection of statements is presented in middle-right. The statements are systematised into framing categories (middle-left) and framing themes (far left).
Appendix H. Framing of Accommodation Sharing by SEOs and the MG in Amsterdam

This visualisation depicts how sharing economy organisations (SEO) and municipal government officials (CITY) framed the sustainability impacts of accommodation sharing in Amsterdam. The collection of statements is presented in middle-right. The statements are systematised into framing categories (middle-left) and framing themes (far left).
Appendix I. Framing of Accommodation Sharing by SEOs and the MG in Toronto

This visualisation depicts how sharing economy organisations (SEO) and municipal government officials (CITY) framed the sustainability impacts of accommodation sharing in Toronto. The collection of statements is presented in middle-right. The statements are systematised into framing categories (middle-left) and framing themes (far left).

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