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The Unsustainable Proximity Paradox in Medium-Sized Cities: A Qualitative Study on User Perceptions of Mobility Policies

José Cáceres-Merino [1], Juan Francisco Coloma [1,*], Marta García [1] and Andres Monzon [2]

[1] Department of Construction, School of Technology, University of Extremadura, 10003 Caceres, Spain; jcaceress@alumnos.unex.es (J.C.-M.); martagg@unex.es (M.G.)
[2] Transport Research Centre—TRANSyT, Universidad Politécnica de Madrid, 28040 Madrid, Spain; andres.monzon@upm.es
* Correspondence: jfcoloma@unex.es

Abstract: Medium-sized cities face unique challenges in fostering sustainable mobility due to their socio-spatial characteristics, including recent decentralized services and urban sprawl. This study examines user-centric factors influencing mobility behaviors in Caceres, Spain, through qualitative focus group analysis with 18 participants across two age groups. By employing a co-occurrence methodology, this research identifies key relationships within four thematic areas: public transport, active mobility, innovation, and urban planning. The findings reveal persistent car dependency despite sustainable policies, driven by the following: (1) inadequate public transport coordination between urban and regional areas, poor information availability, and lack of service synchronization; (2) perceived safety concerns, insufficient infrastructure for cycling, and ineffective pedestrianization strategies; (3) limited adoption of technological solutions due to cultural barriers, preference for informal arrangements, and usability issues with transport apps; and (4) mismatches between urban form and service distribution, proximity perception, and consumer preferences reinforcing car dependency. This study underscores the need for integrated transport systems, mixed land-use planning, and improved accessibility measures to achieve equitable and sustainable mobility transitions. The conclusion includes a series of policy recommendations.

Keywords: mobility behavior; modal choice; medium-sized cities; urban area; focus group

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1. Introduction

Medium-sized cities have traditionally been characterized by their balanced density, proximity to services, and walkability. However, recent urban transformations have led to increased car dependency, even in cities with shorter travel distances [1]. While some metropolitan areas have successfully reduced reliance on private vehicles, many medium-sized cities continue to struggle with fostering sustainable mobility, even those that implement public and active transport policies [2]. This paradox highlights a fundamental challenge: existing sustainable mobility strategies often overlook the socio-spatial realities of these cities, where service decentralization and urban sprawl undermine accessibility and non-motorized mobility options.

Previous research on sustainable mobility has predominantly focused on large metropolitan areas, leaving a significant gap in the understanding of mobility behaviors in medium-sized cities. Between 2016 and 2020, urban transport studies increasingly relied on quantitative urban indicators [3], which were instrumental in identifying modal shares and infrastructural limitations. However, such approaches often fail to capture the nuanced

personal and social factors influencing users' behavior. For instance, a comparative qualitative workshop highlighted that while metrics like Gross Domestic Product, demographic indicators, and modal share provide valuable insights into mobility behavior, they often overlook cultural differences in attitudes toward proximity and urban features [4]. The study also found that city size significantly shapes travel behavior by influencing how individuals perceive and interact with their environment.

Using the British city of Exeter—190,000 inhabitants—as a case study, Barr et al. [5] criticized the over-reliance on big data to drive sustainable urban planning. Their qualitative workshops revealed that mobility needs are often shaped by emotional experiences of travel, contrasting with the rationalized behaviorism commonly seen in quantitative analyses. Similarly, in the Spanish city of Vitoria—population 250,000—residents showed lower tolerance for public transport waiting times compared to those in the city of Madrid—population 3.5 million—where greater access to diverse transport options reduced this sensitivity [6]. These findings underscore the need for user-centered approaches to better understand mobility behaviors in medium-sized cities.

The importance of small- and medium-sized cities in addressing the sustainable mobility transition is without doubt, as they house 56% of the Iberian Peninsula's population and account for more than 75% of its cities, a similar proportion to that in the European continent [7]. Despite this, medium-sized cities have remained under-represented in previous studies. For the Iberian Peninsula, previous research considers city cores with populations between 200,000 and 300,000 as the threshold between medium-sized and large cities [8]. However, smaller urban areas ranging from 30,000 to 200,000 inhabitants have primarily been analyzed using quantitative approaches focused on national-scale indicators and demographic trends [9]. Compared to large metropolitan areas, medium-sized cities face unique challenges for sustainable mobility, such as lower density, dispersed land use, and limited institutional capacity, which often result in higher car dependency and fragmented transport networks [10].

This paper aims to identify key user-centric factors that shape unsustainable mobility trends in medium-sized urban areas. Consequently, the paper will outline specific policy actions that can address unsustainability and achieve equitable access to services such as healthcare, education, and employment, focusing on reducing car dependency and its social, economic, and environmental externalities.

Section 2 presents the methodology, including the case study and the qualitative assessment tools. Section 3 analyzes the variables identified in the analysis, discussing them in relation to previous studies. Furthermore, Section 4 includes an overall discussion that allows the reader to comprehensively review the findings. As the conclusion, Section 5 presents a series of policy actions drawn from the qualitative analysis aimed at reducing car dependency in medium-sized cities, with a focus on service accessibility and transport policy integration.

2. Materials and Methods

The methodological workflow followed a structured approach, combining case study selection, focus group implementation, and qualitative data analysis. Caceres, Spain, was chosen based on its mobility dynamics, and focus groups were conducted to capture user perceptions. Data were transcribed and coded using specific software, employing a co-occurrence analysis to identify key relationships between mobility factors. Sections 2.1–2.3 further develop each stage of this methodology in detail.

2.1. Case Study: Medium-Sized Cities and the Selection of Caceres, Spain

The city of Caceres was selected as a case study (Figure 1). Before conducting the study, the researchers explored the city's recent mobility policies—the bus network, pedestrian areas, information available to travelers, and urban developments. This allowed us to gain a general view of the urban typology and transport network. Segregated mobility data of the city and the Functional Urban Area (FUA) were collected from local sources, including the Urban Sustainable Mobility Plans of the city and provincial councils. National sources, namely, the National Institute of Statistics, were also consulted to analyze modal share for commuting purposes.

Figure 1. Location of Caceres in the Iberian Peninsula.

Caceres is a medium-sized city in western Spain, with a population of approximately 96,000 inhabitants. The city of Caceres is the capital of its province and has strong relationships with an FUA that extends beyond the administrative limits and has approximately 115,000 inhabitants. Like many Iberian FUAs, this urban area has shown slight population stagnation in the last few decades [11].

The Caceres historic city center was recognized as a World Heritage City by UNESCO in 1986. It accounts for 9 ha of narrow streets that have been gradually pedestrianized since the 1990s. During the 21st century, pedestrianization has reached streets and areas outside of the historic core, including densely populated urban areas built during the second half of the 20th century. Overall, the city currently presents moderate walkable accessibility, although 35% of the population lives in low-walkability areas [12].

Currently, the bus network comprises 8 permanent lines and 3 temporary lines that operate based on school and university schedules. All bus stops display real-time information through a QR-code reader bus app, while panels are available at main city center stops. These bus stops are gradually being reformed to be fully accessible. To encourage public transport use, public administrations have recently implemented free tickets for people under 16 and those over 65, and a 50% reduction in fares for all passengers.

Despite the efforts of different administrations to adapt the city to more sustainable policies, the plans contrast with the persistent dominance of private vehicle use. While the city surroundings reach 78% of journeys made by car, 15% on foot, and 6% by bus [13]—a typical case in rural and suburban areas—the city itself does not show significant differences in modal share, where private car use accounts for 69% of commuting trips, 18% are made on foot, and only 10% are made by public transportation [14] (Figure 2).

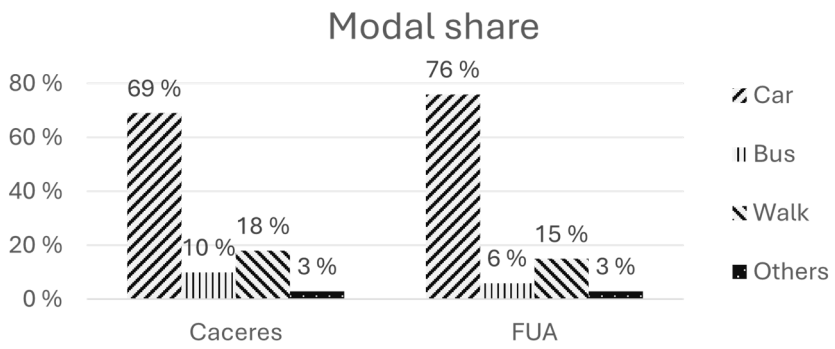

Figure 2. Modal share of Caceres city and FUA.

Therefore, Caceres has been chosen for this research, given the existing paradox between its public policies and the infrequent changes in user behavior. The qualitative analysis of factors shall allow us to evaluate to what extent the implemented policies are or are not increasing users' satisfaction.

2.2. Focus Groups

Focus groups (FGs) were selected as the primary research tool due to their capacity to capture user perceptions and lived experiences. Previous studies have successfully applied FGs to explore multimodal services [15], child-related mobility needs [16], and concerns over road safety [17], showing consistent results. Altogether, they allow for open discussions that reveal underlying social and psychological mobility factors, providing a nuanced perspective complementary to quantitative methods.

The sample selection was informed by previous quantitative mobility data from the city's transport authority, which highlighted distinct travel patterns between residents of the city core and the FUA surroundings. These data revealed differences in modal choices, trip frequencies, and travel times, guiding our participant selection to ensure the representation of these diverse mobility experiences.

The FGs were organized differently according to age groups, a common practice sustained in the previous literature [18], to reflect differences in behaviors and perspectives derived from age, including perceptions of time and distance and modal preferences [19]. The age ranges were chosen to capture distinct life stages that typically correspond to different mobility needs and behaviors. The younger group represents students and early-career professionals, while the older group encompasses established professionals, parents, and older adults, aligning with life-stage categories identified in the previous literature [20].

Recruitment was conducted through targeted outreach in educational institutions, workplaces, and community networks to ensure a balanced representation of transport users. As for the geographical distribution of the sample, participants were selected using a purposive sampling strategy, as described by Mack et al. [21]. We applied stratification to ensure heterogeneity between residents of the city core and surroundings. While the FUA is composed of 89% urban residents, we deliberately oversampled participants from rural municipalities—22% of the sample—to ensure that their experiences were adequately captured in the analysis. This approach follows stablished practices in grounded theory research, where the goal is to capture the density of topics, rather than statistical representativeness [22]. Additionally, we sought diversity in occupation and primary mode of transport to capture a range of perspectives. Participants were also informed of the purpose and confidentiality of the activity, and permission was asked for the audio recording, transcription, and analysis of results through a paper form. The FGs were conducted in November 2023 in the facilities of the University of Extremadura Technology School. Each FG session was conducted by two researchers: one serving as the moderator to facilitate

discussion and another as a note-taker to record non-verbal cues and group dynamics. To ensure quality, three recorders were used simultaneously for each group to capture three participants' voices.

Multiple FGs allow for the identification of common themes while highlighting discrepancies or unique perspectives between different groups [23]. This approach also helps mitigate the risk of idiosyncratic group dynamics influencing the results, as insights can be compared across sessions, ensuring more representative and robust data [24]. Additionally, the literature suggests that two to three FGs are generally sufficient to capture a significant portion of important themes within a relatively homogeneous population [25], supporting our decision to conduct two sessions.

We conducted (1) an FG of nine young workers and students (18–30 years old), primarily formed by students and early-career professionals who frequently navigate urban mobility for education and work. This group represents a demographic that tends to rely heavily on public transport and shared mobility services, often adopting multimodal travel behaviors due to their dynamic lifestyles and lower rates of car ownership, as supported by Bellizzi et al. [26]. The second focus group included nine adults (31–65 years old) comprising working professionals and older residents with well-established travel patterns. This age group is more likely to prioritize private vehicles and exhibit less reliance on shared mobility, reflecting their preference for convenience and stability in travel, according to Alexander et al. [27]. Following Susilo et al. [28], by segmenting participants into these two age-based groups, we aimed to capture the nuanced differences in mobility needs, preferences, and behaviors shaped by life stage and socioeconomic factors.

Before starting the discussion, participants completed a short questionnaire including socio-demographic data, daily modal choices, and commuting time. Table 1 presents the characteristics of the participants according to the questionnaire, illustrating the diversity of origins, modes, and commuting times.

Table 1. Participants' demographics.

		Occupation			Main Commuting Mode				Average Commuting Time (min)		
	n	**Workers**	**Students**	**Both**	**Car**	**Bus**	**Walk**	**Others ***	**<15**	**15–30**	**30–60**
Origin											
City core	14	1	2	1	5	3	1	5	7	5	2
Surrounding	4	10	2	2	3	1	0	0	2	1	1
Gender											
Male	12	8	3	1	3	4	1	4	6	4	2
Female	6	3	1	2	5	0	0	1	3	2	1
Age group											
18–30	9	2	4	3	4	4	1	0	3	5	1
31–65	9	9	0	0	4	0	0	5	6	1	2
Total	18	11	4	3	8	4	1	5	9	6	3

* The questionnaire included this option without specifying further modes.

2.3. Identification of Key Factors for Analysis

Through a thematic analysis, the initial theoretical approach identified four core pillars influencing mobility behaviors in medium-sized cities, namely, public transport, active mobility, innovation, and urban planning. These four themes were selected based on a literature review on sustainable mobility in urban contexts and supported by bibliometric analysis [3,29,30], together with knowledge of the local conditions. Rather than analyzing specific modes or infrastructures, we opted for thematic groups that encompass both the

physical systems and the socio-cultural dynamics enable behavioral analysis. This allowed us to explore how spatial, technological, and governance-related factors shape decisions in the long term.

FG discussions were moderated using a semi-structured format, ensuring open-ended yet structured dialogues around these mobility dimensions. To facilitate discussions, guiding questions were prepared based on existing research in mobility. Moderators introduced key concepts when participants did not mention them organically, following Krueger [22]. Appendix A presents the guiding questions that informed the thematic areas and overall FG development.

In total, 188 min of discussion were recorded. Transcriptions were analyzed using Atlas.ti 25, a licensed qualitative analysis software [31]. The coding frame was manually built employing the software hierarchies for thematic analysis, ensuring robustness through the use of hypernyms, hyponyms, and co-hyponym relationships, adapting the established script to the final textual results [32]. The qualitative analysis of the FGs was initially structured around the four predefined thematic areas. Each thematic area was formed by a group of factors, while the guiding questions structured the categories within each group of factors. Finally, the coding process followed Bingham's [33] recommendations, starting with an explanatory pre-coding phase, where the four thematic areas formed pre-set explanatory factor groups, categories, and factors. Following Moretti et al. [34], the coding framework was maintained under the 15-category threshold considered for the effective study of results. Figure 3 shows the four groups and fourteen categories considered in the coding framework. In the figure, blue, green, purple, and brown symbolize the public transport, active mobility, innovation, and urban planning categories, respectively.

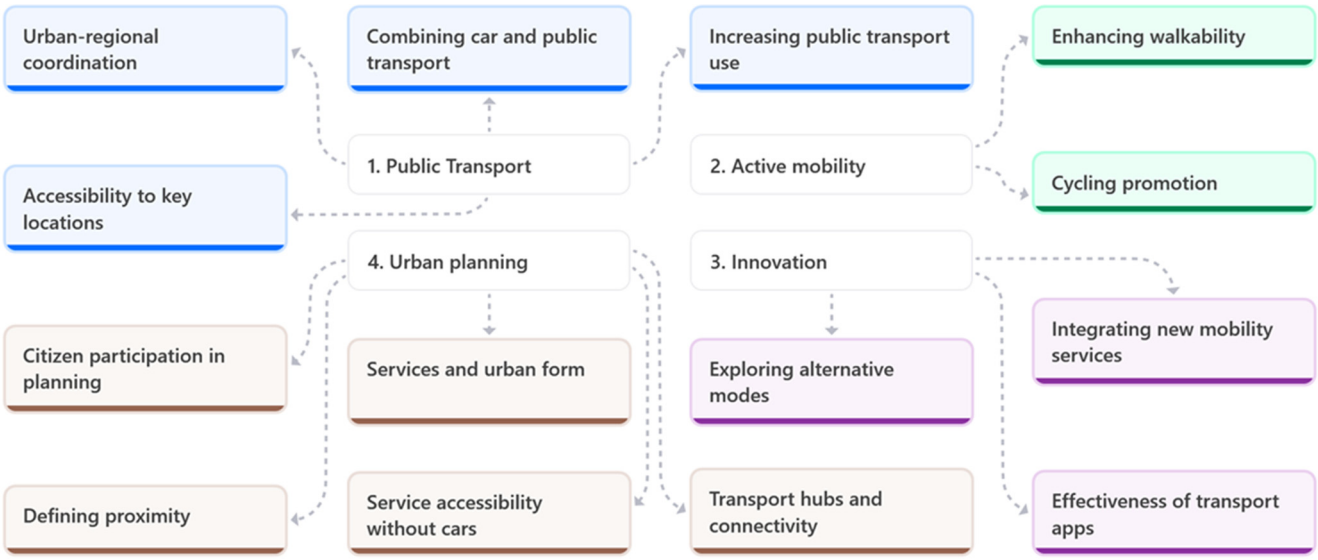

Figure 3. Four groups and fourteen categories considered in the coding framework.

Within each category, factors were coded as either explanatory or citizen-selected. Explanatory factors were derived deductively from the literature review and deliberately searched for in the transcripts, representing pre-established mobility concepts. In contrast, citizen-selected factors emerged inductively from participants' discussions without being prompted by researchers, capturing unexpected or context-specific mobility issues. This dual categorization approach, as illustrated in Figure 4, ensured that our analysis captured both theoretically grounded mobility factors and emerging local concerns. The workflow progressed from general groups of factors based on a literature review to more specific categories—aligned with moderators' questions—and finally to the most specific level of

citizen-selected factors. This structured approach ensured that both pre-established and emerging mobility factors were systematically identified throughout the coding process.

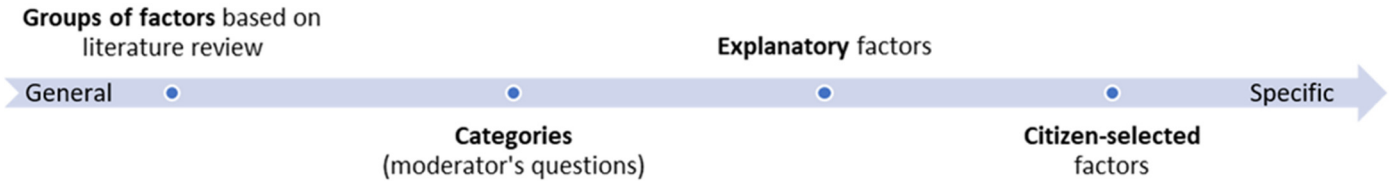

Figure 4. Workflow of the coding framework.

To maintain the qualitative nature of the study, we avoided quantifying variables based solely on their absolute frequency or the number of participants who mentioned them. Instead, the analysis focuses on co-occurrence patterns between factors [35]. This approach enables us to identify semantic relationships between factors within the coding framework, highlighting the most relevant connections within the predefined thematic areas [36].

To apply this analysis, we used Atlas.ti 25's Co-Occurrence Analysis, which detects proximity-based relationships among all factors for those occurring in the same quotations. By analyzing how factors overlap within quotations, this method reveals both complementary and contradictory relationships, offering deeper insight into discourse analysis. The index used for the selection of relevant factors is the co-occurrence coefficient. This allows us to identify a coefficient ranging from 0 (meaning factors do not appear together in any quotations) to 1 (meaning two factors always appear in the same quotations). The coefficient is calculated following Equation (1):

$$c = n12/(n1 + n2 - n12), \quad (1)$$

where c is the co-occurrence coefficient and n12 is the absolute number of co-occurrences between factors n1 and n2.

For the selection of threshold criteria to identify the most relevant factors, it is important to note that co-occurrence analysis is not equivalent to correlation coefficients. When interpreting co-occurrence coefficients, it is critical to consider the potential for high coefficients to indicate synonymy or redundancy between factors, which may not provide additional insights into the data. In line with recommendations for discourse analysis [37], we carefully examined co-occurrence relationships to ensure that they reflected meaningful connections between distinct concepts. Consequently, the relevance criteria depend on a specific coding framework established by researchers [38].

We follow the indications provided by Friese [39], indicating that the significance of any given coefficient should be interpreted within the specific context of the research and coding structure. For our analysis, we propose an iterative hybrid approach consisting of two stages:

1. Intra-group analysis: We identified all factors within each of the four thematic groups and applied co-occurrence analysis within them. This method prevents interference from code frequencies across thematic areas, as variations in frequencies may arise from participants' concerns or knowledge about specific topics.
2. Intra-category analysis: to mitigate similar interferences at the category level, we analyzed co-occurrences within the 14 categories.

Once these two analyses were performed, we analyzed each group of factors using our relevance criteria by selecting the three highest coefficients above a 0.2 coefficient threshold within each group. Since co-occurrences are symmetrical, this method limits the maximum

number of pairs, allows for the analysis of the strongest relationships within all groups of factors, and minimizes the risks of clustering the most relevant factors within any specific category, providing an understanding of all topics considered.

3. Results

The co-occurrence analysis was conducted on a final coding framework comprising 72 factors organized into 14 categories, reflecting the diverse aspects influencing mobility behaviors in medium-sized cities. From this comprehensive framework, the co-occurrence analysis identified 25 factors distributed across 11 categories. Results for all groups can be found as supplementary data at the end of this paper. Table 2 summarizes the factors and categories found to be relevant in our analysis.

Table 2. Factors with co-occurrence coefficients c > 0.2.

Groups	Categories	Factors
Public Transport	Accessibility to key locations	Lack of information
	Combining car and public transport	Park-and-ride
		Lack of willingness
	Urban–regional coordination	Schedule synchronization
		Lack of services
		Informal alternatives
		Information availability
Active mobility	Enhancing walkability	Pedestrian-friendly streets
		Traffic calming measures
	Cycling promotion	Lack of cycling culture
		Fear of road sharing with cars
Innovation	Effectiveness of transport apps	Usability
		Reliance on WhatsApp groups for carpooling
	Exploring alternative modes	Vehicle-sharing services
Urban Planning	Defining proximity	15 min city concept
		Perception of proximity
		Compact urban planning
	Services and urban form	Convenience vs. quality
		Consumer preferences
		Decentralization of services
		Services are close
		Retail distribution
	Citizen participation in planning	Skepticism about impact
		Participatory urban planning
	Service accessibility without cars	Neighborhood-level amenities

The following sections, namely, Sections 3.1–3.4, cover the three highest co-occurrences for each group according to the analysis. The order of the thematic areas follows the pre-set script available in Appendix A. The order of each co-occurrence analyzed represents a higher to lower coefficient.

3.1. Public Transport Co-Occurrence Analysis

The public transport group included 21 factors, resulting in 210 possible co-occurrence pairs. From this group, we identified a total of four pairs with a co-occurrence coefficient (c) above 0.2. Figure 5 shows the co-occurrences analyzed in Sections 3.1.1–3.1.3.

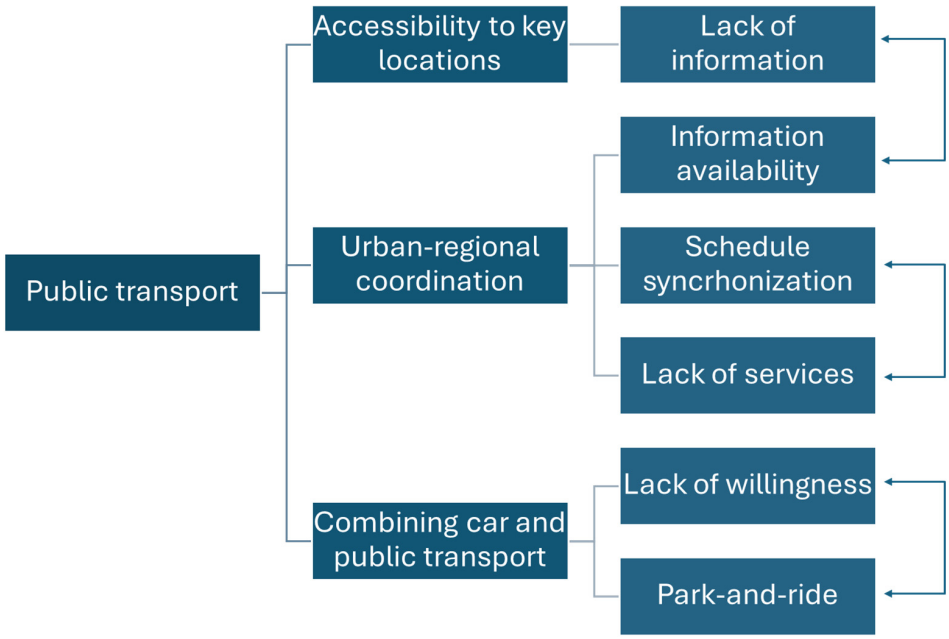

Figure 5. Co-occurrence network of public transport factors.

3.1.1. Information Availability vs. Lack of Information

The highest co-occurrence in the public transport group (c = 0.43) linked "Information availability" with "Lack of information". Participants frequently expressed frustration with the lack of integrated information systems that provide seamless access to public transport schedules, routes, and real-time updates, particularly when traveling between the city and the surrounding rural areas.

> "There was a woman walking by [the village], so she showed me a picture of the timetable her cousin took one day at the town hall and sent to her phone." (young, urban, man)

The reliance on informal networks illustrates the gaps in information channels, leaving users to organize their mobility through social contacts. This underscores the importance of community-based solutions in regions where formal mobility services fall short [40].

3.1.2. Lack of Services and Schedule Synchronization

The second-strongest co-occurrence (c = 0.33) linked "Lack of services" with "Schedule synchronization". This reveals a critical issue in the coordination of transport services between the city of Caceres and its surrounding FUA. Participants frequently expressed concerns regarding the lack of synchronized systems between different transport operators. Furthermore, conflicts between municipal services disrupted intercity mobility, pushing residents toward private vehicles.

> "Some rural taxi drivers worked in Caceres, so there was a conflict which resulted in service cancelation between municipalities for a long time." (Young, rural, man)

The lack of integration discourages potential new users and deters occasional users from using certain routes, as observed in other medium-sized Spanish cities [6]. In contrast to compact cities where walking times outcompete waiting times, the dispersed layout

found in the case study implied longer commutes, reducing the interchanges between active and motorized modes [41]. This lack of transport flexibility exacerbates social exclusion, particularly for older residents who find themselves isolated without a car.

> "Being fair, an elder cannot get [to the Hospital] on their own. Not to mention from a village." (young, rural, woman)

3.1.3. Social Rejection of Combining Cars and Public Transport

Another co-occurrence (c = 0.30) linked "Park-and-ride" with "Lack of willingness". Participants stressed the competitiveness of combining active mobility and driving, rather than driving and using public transport. Participants overwhelmingly dismissed the idea of park-and-ride solutions, preferring walking after parking or using individual modes (e.g., motorcycles) to minimize travel time.

> "It would make more sense to leave the car and just walk rather than leaving the car and taking the bus." (young, rural, man)

Some locations already function as informal park-and-ride hubs, but primarily for carpooling rather than public transport connections.

> "It is not an official park-and-ride, but it works like one. The supermarkets parking lots is a carpooling hub every morning." (young, rural, man)

Participants also noted that low congestion levels reduce the incentive for commuters to switch from cars to public transport. In rural areas, car dependency is deeply rooted, making it unlikely that individuals would plan multi-step public transport journeys.

> "There aren't many traffic jams, that's why people keep driving. They don't have issues with using their car." (adult, man, urban)

3.2. Active Mobility Co-Occurrence Analysis

The active mobility group included 12 factors, resulting in 66 possible co-occurrence pairs. Only two pairs were identified above the threshold established. Figure 6 shows the co-occurrences analyzed in Sections 3.2.1 and 3.2.2.

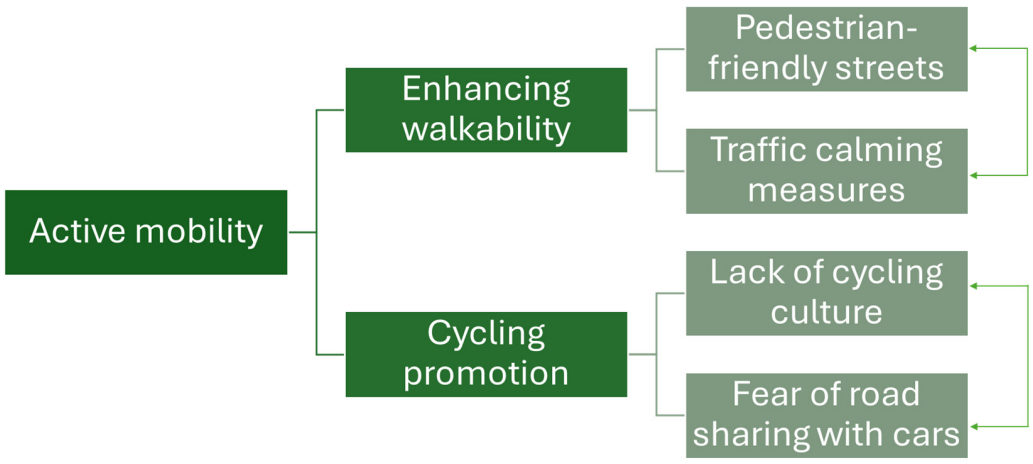

Figure 6. Co-occurrence network of active mobility factors.

3.2.1. Pedestrian-Friendly Streets and Traffic Calming Measures

The co-occurrence analysis revealed a notable relationship (c = 0.25) between "Traffic calming measures" and "Pedestrian-friendly streets". This moderate co-occurrence suggests a recognition of the connection between these concepts but indicates gaps in their implementation.

Walking remains a primary mode of transport in Caceres, yet participants frequently criticized pedestrianization policies. While intended to improve mobility and air quality, many felt that pedestrianization prioritizes tourism over residents' daily needs.

> "They pushed everyone out of the Old Town to turn it into a showcase. How many businesses remain? If you have mobility issues and can't drive or take a bus because it's just pedestrians, how are you supposed to get around?" (Adult, urban, man)

This concern mirrors trends in World Heritage cities, where pedestrianization often reconfigures historic centers for visitors, reducing their functionality for everyday life [42]. Participants noted how essential services have relocated to the outskirts, increasing reliance on cars even for those living in pedestrianized areas. These accounts illustrate how pedestrian spaces remain compromised by car-oriented planning, limiting the effectiveness of pedestrianization strategies. This dynamic is summarized in Figure 7, which represents the pedestrian infrastructure–motorization cycle identified in the FGs.

Figure 7. Negative effects of pedestrianization described by participants.

> "They moved the hospital away, so now the center has more bars and catering. It's changing." (young, urban, man)

3.2.2. Fear of Road Sharing and Cycling Culture

The second-highest co-occurrence (c = 0.24) linked "Lack of cycling culture" with "Fear of road sharing with cars". This relationship illustrates a significant barrier to cycling adoption. Participants felt it was unsafe sharing the road with cars due to a perceived lack of respect from drivers and inadequate cycling infrastructure.

Despite growing interest in cycling, participants highlighted major barriers to its wider adoption. The most frequently mentioned issues were a lack of dedicated infrastructure, fear of sharing the road with cars, and cultural perceptions of cycling.

> "I don't use my bike because I'm scared. In summer, I do, because there's less traffic." (young, urban, man)

The co-occurrence analysis indicated that dedicated cycling lanes and a fear of road sharing with cars were the most frequently cited concerns. While some participants supported expanding cycling lanes, others questioned the feasibility due to street layouts and car-oriented planning.

> "A bike lane that shares space with cars is not a solution." (adult, urban, man)

3.3. Innovation Co-Occurrence Analysis

The innovation group included 15 factors, resulting in 105 possible co-occurrence pairs. Two significant relationships were identified. Figure 8 shows the co-occurrences analyzed in Sections 3.3.1 and 3.3.2.

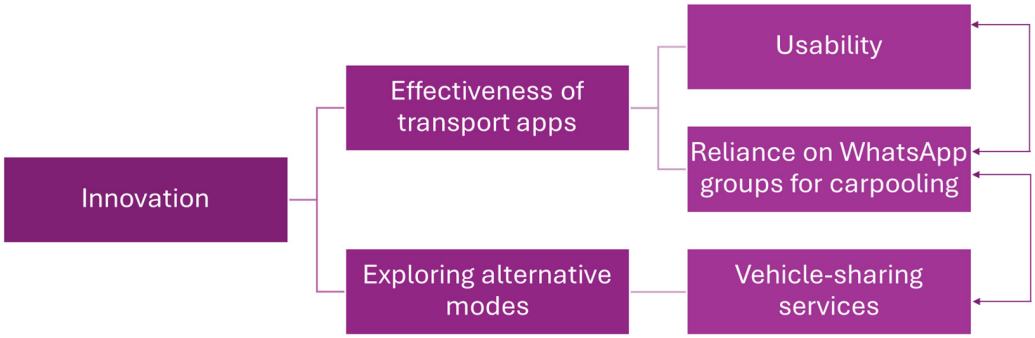

Figure 8. Co-occurrence network of innovation factors.

3.3.1. App Usability and Carpooling

The strongest co-occurrence in the innovation group (c = 0.30) linked "Usability" with "Reliance on WhatsApp groups for carpooling". This indicates that while participants recognized the potential of transport apps, they frequently relied on informal carpooling arrangements facilitated through WhatsApp groups. Discussions on shared options revealed a general skepticism toward carpooling, ridesharing, and app-based transport services. Participants expressed concerns about trust, reliability, and efficiency, emphasizing that shared mobility does not fit well with their daily routines.

> "For commuting, I wouldn't use shared mobility. If you and I leave at 7 AM, but I have to wait or pick someone up, it's just not worth it." (Adult, urban, man)

One of the main barriers to adoption was the perceived inconvenience of coordinating schedules with others. In a city like Caceres, where distances are relatively short, participants felt that waiting for another rider or adjusting their trip for a shared ride often negates any benefits. These findings suggest that the lack of strong demand, coupled with the city's spatial configuration and existing mobility habits, limits the potential of shared mobility services. While participants acknowledged the success of such services in larger cities, they expressed doubt about their usefulness in Caceres' mobility landscape.

> "If I have to detour just to pick up someone, by the time I do that, I could already be at my destination." (Adult, urban, woman)

3.3.2. Vehicle-Sharing and Apps

The second-strongest co-occurrence (c = 0.23) connected "Vehicle-sharing services" with "Reliance on WhatsApp groups for carpooling". Participants acknowledged the potential of emerging mobility options, such as car-sharing services, micromobility (bicycles, e-scooters), and on-demand transport. However, adoption remained low due to practical limitations and perceived inefficiencies. For instance, car-sharing services for urban–rural trips were dismissed by some due to payment complexities and delays in ride acceptance.

> "Sharing through WhatsApp is easier than paying through an app and waiting for someone to accept." (Young, rural, woman)

Similarly, while participants expressed interest in micromobility solutions for exclusively urban contexts, they emphasized that the lack of dedicated infrastructure (e.g., secure bike lanes and parking facilities) hinders their widespread adoption. This aligns with the findings in Section 3.2.2, where cycling infrastructure was identified as inadequate for promoting active mobility.

Lastly, participants frequently compared their personal experiences with those in other cities, revealing a preference for better-integrated transport systems. This comparison highlights how experiences influence modal choices and expectations. While these compar-

isons may be subject to personal bias, they underscore the potential for a modal shift when residents experience well-developed mobility ecosystems elsewhere.

> "I've rented a car in other cities, but never a bike. In Caceres, I couldn't even consider it." (Adult, rural, man)

3.4. Urban Planning Co-Occurrence Analysis

The urban planning group included 21 factors, resulting in 210 possible co-occurrence pairs. The analysis revealed a total of seven pairs above 0.2. The following sections cover the three highest values. Figure 9 shows the co-occurrences analyzed in Sections 3.4.1–3.4.3.

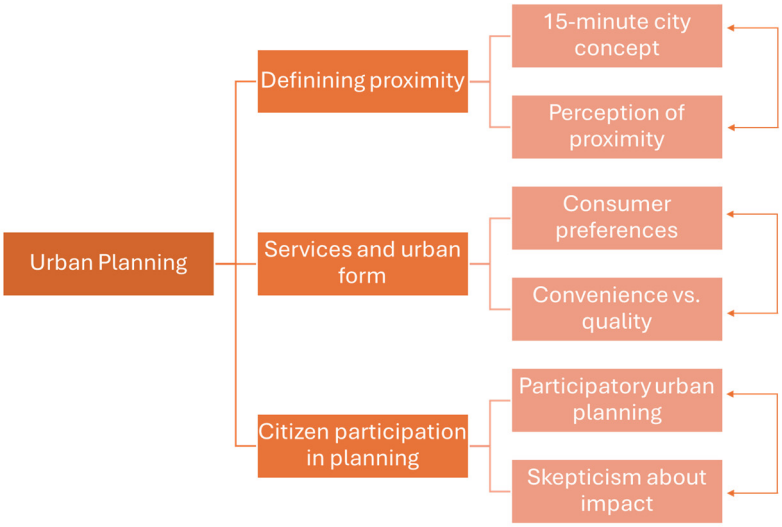

Figure 9. Co-occurrence network of urban planning factors.

3.4.1. Perception of Proximity and 15 min City Concept

The strongest co-occurrence in the urban planning group (c = 0.42) linked "Perception of proximity" with "15 min city concept". Proximity is a key factor influencing mobility choices. However, participants emphasized that it is not solely determined by physical distance, but also by urban design, environmental quality, and the perception of safety and urban vitality. Short trips were perceived as long and unpleasant when they lacked engaging surroundings, pedestrian infrastructure, or human activity in public spaces.

> "Sometimes, even if the distance is the same, it just feels farther." (young, rural, man)

This aligns with the 15 min city concept, which emphasizes accessibility and the quality of urban spaces rather than pure geographical proximity [43]. However, participants pointed out that some areas in Caceres, despite being physically close to services, felt disconnected due to poor urban design and a lack of an active street life.

> "Going from *Múltiples* to *Plaza de Toros* isn't far, but it's awful. Just cars, no views, nothing." (young, rural, woman)

This perception reflects findings from previous research on urban morphology, which highlights that walkability is strongly linked to the presence of mixed-use spaces, active facades, and a sense of security [44]. When pedestrian environments lack visual interest, social interaction, or functional destinations, trips feel longer and more unpleasant, discouraging non-motorized travel.

3.4.2. Consumer Preferences and Convenience vs. Quality

Another co-occurrence (c = 0.38) linked "Convenience vs. quality" with "Consumer preferences". Participants usually expressed that the decentralization of services has significantly shaped mobility behaviors, making walking a secondary mode, primarily used for leisure rather than daily activities. Participants emphasized that while some services are physically close, land-use patterns and urban design often reinforce car dependency by making certain trips inconvenient or inefficient without a vehicle.

> "I usually walk in Caceres when I go out for drinks or shopping. But for work or errands, I drive—distances are just long enough to make you late if you walk." (young, rural, man)

Even in areas where supermarkets and retail stores are within walking distance, participants reported preferring driving due to efficiency and habit. Weight-based shopping behaviors further reinforced weekly car-dependent trips instead of frequent short-distance walking trips.

> "I have supermarkets right next to me, but I always take the car. I shop once a week and fill the trunk. I don't have time for daily trips." (Adult, urban, woman)

Participants emphasized that service distribution has a direct impact on walkability, with the relocation of key amenities reducing accessibility and weakening urban vitality. The peripheral location of essential Points of Interest (POIs), particularly the university, has further entrenched car dependency, as many daily trips now require motorized transport. The university's relocation was particularly criticized for disrupting student life and disconnecting it from the city fabric, making Caceres less vibrant and less attractive for residents and newcomers alike.

> "In Salamanca, student life happens in the city center. Caceres has lost that. It's not just about convenience—it affects the city's appeal." (young, rural, man)

This socio-spatial disconnect contrasts with similar medium-sized cities, where centrally located university campuses maintain strong urban interactions and economic activity [45]. This process is further exacerbated in Spanish World Heritage cities, where touristification has reshaped central areas, often prioritizing short-term visitors over long-term residents [46]. While some areas of Caceres feature pedestrian-friendly infrastructure, participants noted that these spaces often serve recreational rather than functional purposes, failing to provide direct access to essential services.

> "There's a great area for walking and cycling near the new ring road. But you only go there for walking, never because you actually need to." (young, rural, man)

The findings align with research on urban sprawl and land-use planning, which suggests that even when services are nearby, built-environment factors and mobility habits reinforce car dependency [47]. Ultimately, these patterns limit the effectiveness of walkability initiatives, as pedestrian infrastructure alone cannot counteract spatial mismatches between services and residential areas.

3.4.3. Citizen Participation in Planning: Skepticism About Impact and Participatory Urban Planning

The co-occurrence analysis revealed a significant relationship (c = 0.31) between "Skepticism about impact" and "Participatory urban planning".

The political challenges of enacting sustainable mobility policies have become increasingly apparent in recent years, encountering resistance from across the political spectrum [48]. A key issue raised by participants was the lack of alignment between mobility

policies and urban development, reflecting trends observed in other Spanish cities where accessibility and transport planning remain disconnected from broader land-use policies [49]. Participants expressed skepticism about their role in shaping urban planning decisions, arguing that economic and political factors dominate over participatory processes. This perception reflects broader urban governance challenges, where short-term political agendas often dictate spatial development strategies rather than long-term sustainable planning.

> "Urban planning is based on where land is cheapest. If there's an empty lot, that's where development happens, whether it makes sense or not." (young, rural, man)

Others pointed out that urban planning decisions depend on political cycles, making long-term strategic planning difficult. These responses reflect low trust in participatory planning processes, suggesting a need for better communication and community involvement in mobility-related decision-making.

> "It all depends on who's in charge at the time. Some listen more, some less." (young, urban, man)

4. Discussion

This study identified key factors shaping mobility choices and their implications for sustainable mobility planning in medium-sized FUAs through a user-centered approach, focusing on public transport, active mobility, innovation, and urban planning. The findings reveal that mobility choices are primarily shaped by urban form and policy decisions, as shown by participants' references to service distribution, land-use mismatches, and political planning priorities.

Public transport in medium-sized cities has struggled to address spatial inefficiencies, with many key destinations remaining inaccessible by public modes. While national affordability policies have increased urban PT ridership [50], our findings suggest that they have not resolved the mismatch between service supply and demand, leading to overcrowding in some areas and a lack of service in others. Our analysis reveals that users in medium-sized cities are particularly sensitive to factors such as waiting times, a lack of flexibility, and poor urban–regional coordination. This gap reinforces reliance on private vehicles, particularly in less congested areas where public transport does not offer a competitive alternative, thereby reducing urban resilience [51]. The lack of integrated systems between urban and rural areas further exacerbates these issues. According to Miciukiewicz and Vigar [41], the recurrence of these challenges can serve as a reminder of limited rights and opportunities, particularly for vulnerable groups like the elderly. Consequently, users' negative perceptions of public transport services, coupled with the convenience of private vehicles in less congested environments, contribute to the continued motorization of the modal share as the primary means of ensuring accessibility.

While active mobility and micromobility could serve as sustainable alternatives, their adoption in medium-sized cities faces perception and infrastructure barriers. According to previous findings of Cubells et al. [52], which expressed how micromobility systems are socially scrutinized to further extents, their use can deeply affect pedestrian safety perception [53]. Similarly to previous research [54,55], our analysis highlights that low adoption rates further entrench skepticism toward alternative transport modes, creating a self-reinforcing barrier to their expansion. As for walking, despite being physically viable for many short trips, it has been primarily associated with leisure rather than commuting or other trip purposes. This mirrors findings in touristified historic centers like the Spanish Mediterranean city of Malaga, Spain, where public spaces are increasingly occupied by commercial activities, potentially diminishing the appeal for residents' everyday use and impacting their perception of walkability [56]. Additionally, the perception of distance

emerged as a key consideration, aligning with Moreno et al. [43], who argue that perceived proximity is shaped more by urban design and street-level quality than by absolute distance. Addressing these limitations is crucial for fostering a shift toward sustainable urban mobility, as also highlighted by Castillo-Manzano et al. [57], who emphasize that pedestrianization in out-of-center locations can enhance resident satisfaction, boost local economies, and promote sustainable consumption habits, offering a replicable model for medium-sized cities.

The low co-occurrences found for innovation and digitalization prove how smaller municipalities often lack the resources to invest in comprehensive mobility-as-a-service (MaaS) solutions, which aligns with the findings of Mulley et al. [58]. In their research, they analyzed how MaaS solutions tend to depend on short-lived pilots, without finally generating stable systems. This reinforces disparities between urban and rural areas, further marginalizing peripheral populations. This critical gap is reflected in the use of social networks and community-based solutions, as official apps do not fully meet users' needs or expectations. This is consistent with Mounce et al. [40], who highlight that rural mobility solutions often succeed through multi-stakeholder governance, yet such collaborative frameworks remain underdeveloped.

Nevertheless, the high coefficients of the last group highlight that mobility choices are primarily structured by urban planning, land use, and design. While cities often create shared spaces in historic centers, they simultaneously relocate essential facilities and housing to the periphery [49]. Our findings reveal that in the case of Caceres, although pedestrian-friendly interventions are implemented, these spaces often become underutilized or specialized for leisure activities. As noted by Jiménez Martín et al. [59] for Spanish medium-sized historic cities, the lack of diverse, reachable activities and efficient traffic calming measures in these areas indicate they do not qualify as de facto walkable places for day-to-day mobility. According to Bartzokas-Tsiompras et al. [60] and Tzouras et al. [61], extensive pedestrian areas have been shown to be efficient under functional diversity and consequent pedestrian presence and interactions in public space.

In the case of Caceres, participants—particularly, younger respondents—identified hospitals and the university campus as examples of a broader trend of decentralization and service relocation, where FUAs prioritize land specialization over mixed-use development. However, such services are often excluded from urban accessibility analyses, as they are considered territorial nodes rather than mere urban amenities [62]. Yet in medium-sized cities, this perspective—combined with the pedestrianization and specialization of historic neighborhoods—undermines the efficiency of compact city centers, compelling both rural and urban residents to rely on motorized transport for daily mobility. Echoing Mohammed et al. [45], campus universities do not inherently strengthen their relationship with urban areas; rather, their integration depends on physical connectivity between cities and campuses, which significantly influences students' social integration and urban vibrancy.

Although our findings may be influenced by the fact that the FGs were conducted on the university's campus, this perceived lack of place-making and weak urban integration likely extends to other major employment and education hubs that function similarly in medium-sized cities. As observed by Miner et al. [63], this dynamic further marginalizes vulnerable social groups, such as children and the elderly. Our findings show that this gap between urban planning and mobility policies ultimately reinforces car dependency both in and beyond the city core.

Finally, governance fragmentation remains a key barrier to integrated mobility solutions. While metropolitan governance models have improved coordination in large cities, medium-sized urban areas lack mechanisms to address mobility challenges beyond administrative boundaries [64]. In our study, the participants latently mentioned this perceived

otherness in their quotes, showing how smaller urban areas are not perceived as entities but rather as amalgamations of individual parts.

This study also presents methodological limitations that deserve critical reflection. While the focus group approach enabled the identification of nuanced mobility perceptions, its qualitative nature limits the generalizability of findings beyond the context of the case study. The sample was designed to ensure diversity and thematic density. Yet this methodological choice aligns with discourse analysis traditions, where analytical relevance emerges not from the number of respondents, but from the depth and density of the textual content analyzed. Following this logic, the co-occurrence method applied allowed us to capture meaningful patterns. However, future research could build on this study by applying similar frameworks in medium-sized cities, combining discourse analysis with complementary quantitative or longitudinal approaches, to explore how mobility narratives evolve in response to policy interventions.

5. Conclusions and Policy Recommendations

This study identified key relationships among factors affecting mobility in medium-sized FUAs through a user-centered approach, focusing on public transport, active mobility, innovation, and urban planning. The findings highlight several barriers to sustainable mobility, leading us to suggest the policy recommendations outlined below.

First, public transport could benefit from supralocal authorities unifying systems, as participants reported significant barriers related to the lack of coordination between urban and regional services and the fragmentation of information. While resource limitations in medium-sized cities risk overcrowding for captive users, improved shelters, bus lanes, and vehicles and better service synchronization could enhance resilience and accessibility while reducing social marginalization.

Second, active mobility policies should prioritize street-level design over extensive center pedestrianizations, focusing on widespread traffic calming and polycentric shared spaces. Through the incorporation of a broader diversity of modes in current pedestrianized areas—such as public transport and micromobility systems—the sense of emptiness in historic centers can be addressed.

Third, although medium-sized cities struggle to implement innovation strategies, the attitudes expressed by participants indicate an increasing interest in new usability features for mobility apps, including the efficiency of route planning and payment, as well as the provision of real-time information. To address the detected lack of information, it should not only be available through individual resources but also be included in public spaces and vehicles.

Fourth, urban planning needs to avoid its current car-centered approach, which is showing negative impacts on both urban and territorial scales, increasing car dependency for most users. Thus, development plans need to be revised to ensure that developments promote mixed land use, discourage sprawl, and encourage densification to reduce car dependency and maintain urban vitality.

The partnership between different stakeholders is necessary to address the proposed changes. Future research should focus on adapting these recommendations to current governance models, particularly in rural–urban partnerships and metropolitan governance within FUAs.

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Abbreviations

The following abbreviations are used in this manuscript:

FUA	Functional Urban Area
FG	Focus Group

Appendix A. Focus Group Script

The moderators present the research project and the methodology. Then, they hand around the confidentiality form and a short survey on the participants' social profiles, including the following:

- Name and surname;
- Age and gender;
- Occupation;
- Modes of transport;
- Most frequent trip duration.

The moderators ask an open question to facilitate participation: What is the biggest mobility constraint you face during your daily trips?

Following the previous questions, the facilitators ensure the following topics and subtopics are covered:

Public transport:

- What would you need to use public transport more?
- What do you think would help urban and regional public transport coordination?
- Do you think car and public transport could be combined for regional and urban trips respectively?
- How would you improve public transport accessibility toward important POIs, like Hospitals or University?

Active mobility:

- What would make walking in Caceres more appealing? What could encourage walking?
- What do you think Caceres lacks for people to ride bikes more?
- Mobility innovation:
- Beyond traditional modes like cars, bus, walking or bikes, is any other mode appealing to you?
- Would you be willing to use other services? How would you combine new services with your current ones?
- Does the current bus app address your needs? Are you missing any option?

Urban planning and infrastructure:

- Is there any transport hub in Caceres? Where do you think it should be placed?

- What do you consider to be close, thinking in terms of time?
- Explain what services are close to your house, reachable without a car.
- Do you prefer a far, good-quality bakery or a very close, standard one? Do you prefer local shops or shopping centers? Why?
- Do you know any local participation mechanism? Have you used it? How?

After the topics have been covered, participants are encouraged to summarize their biggest concern on the matter.

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