

Shah Alam as Car-free Cities to Improve Urban Mobility among Young Families

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Abstract

More than 10% of the Selangor population resides in Shah Alam. Despite the authority's low-carbon mobility initiatives, there is a shortage of car-free and low-car development guidelines to achieve low-carbon cities and improve urban mobility. The aim of this study is to understand the challenges and opportunities of achieving car-free cities and input from young family lifestyle needs. This is qualitative study and the data were obtained using interviews. Results discovered that all the informants supported the concept of car-free cities but emphasized the importance of a reliable and efficient public transport system, infrastructure, alternative mobility options, policies, and changes in mindset to transition towards car-free cities successfully. The findings also demonstrated that all young families value flexible working hours and prioritize family time. The results would lead to developing a guideline for redeveloping Shah Alam from a car-centric city into a car-free city. This study supports the National Transport Policy 2019-2030 by accelerating the implementation of low-carbon mobility initiatives while improving urban mobility among young families by integrating childcare into the urban mobility infrastructure.

Keywords: Urban Mobility, Young Families, Childcare, Smart Cities, Built Environment Informatics

Introduction

Patel, Gandhi, and Bhatt (2016) describe a car-free city as "a city where a ban on motorized vehicles from all parts of the towns is in practice with only a few possible exceptions such as emergency vehicles." However, as the application of this phenomenon can be seen as a rarity, we will also focus on car-free development, which is defined by Steven Melia (2010) as: "Residential or mixed-use developments which: a) Provide a traffic free or nearly traffic-free

immediate environment, b) Are designed to facilitate movement by non-car means, and c) Offer no parking for residents or limited parking separated from the dwellings.”

The benefits of car-free cities are profound. According to Crawford (2000), car-free cities reduce noise, air pollution, and traffic hazards and enhance the quality of life for individuals and communities. They result in vibrant, attractive streets while saving energy and preserving the environment. Yet, only a handful of cities, such as Venice, have achieved a completely car-free status. Given these substantial benefits, such car-free cities’ need and added value merit exploration. Determining the successful policies and strategies that facilitate the transition to car-free cities and the underlying requirements and challenges is critical.

Internationally, cities like Amsterdam, Groningen, Freiburg, Copenhagen, and Barcelona have made remarkable strides toward implementing car-free or car-light policies. They offer many lessons on the effectiveness of certain strategies and infrastructural changes in fostering car-light living. These cities illustrate the challenges and solutions in policy implementation, shedding light on potential pathways for similar transitions in cities like Shah Alam.

According to the National Transport Policy 2019-2030, Malaysia aims to accelerate the implementation of low-carbon mobility initiatives. Aligned with the 11th Malaysia Plan and its Sustainable Development Goals, numerous initiatives and projects have been undertaken locally, such as the Shah Alam Low Carbon City 2030 Action Plan. This plan seeks to unite the city council, industry players, and civil society to foster a sustainable urban life through comprehensive planning and participatory approaches.

However, despite these efforts, Malaysia is still in the early stages of its journey toward car-free or car-light urban living. Learning from global best practices and applying those lessons to the local context could help shape the future of Malaysia’s urban mobility landscape. Understanding the cultural, geographical, and infrastructural differences that could impact these policies’ implementation is key to developing a successful car-free transition strategy in Malaysia. By considering the examples of international cities and localizing their strategies, it is possible to construct a comprehensive blueprint for a car-free or car-light city in Shah Alam, tailored to meet young families’ emerging lifestyle and mobility needs. With the right approach, Malaysia could significantly reduce its car dependence, transforming urban spaces into more livable, sustainable, and people-centered environments.

Modern family life presents a multitude of challenges for young parents. The fast pace of life, long working hours, and balancing work and family responsibilities can be overwhelming (Haddock et al., 2006). Current urban design and transportation systems can contribute to these pressures, particularly car-centric cities. Extended commuting times, traffic congestion, and the stress and costs associated with car ownership can further compound these issues. Transitioning to car-free or car-light cities with improved urban mobility could offer young families more time, less stress, and a better quality of life. However, this transition must be carefully managed to meet these families’ evolving lifestyle and mobility needs. Space allocation in a city is a zero-sum game. Car-centric cities dedicate ever more space to cars and their storage, making life progressively worse for those living there (ThinkCity, 2019).

More cars on the road (13 million and counting in Malaysia) will result in more time wasted in traffic jams, worsened air and noise pollution, and higher rates of traffic fatalities. Single-occupancy vehicles also produce at least four times more carbon emissions than public transport on a per-passenger kilometer basis (ThinkCity, 2019). On top of the economic and environmental costs, car reliance increases the likelihood of health problems caused by a sedentary lifestyle. Malaysia is already the fattest country in Asia, with almost half of our adult population overweight or obese. In Kuala Lumpur, we spend an average of 53 minutes stuck in traffic and 25 minutes looking for parking. That adds up to nearly 20 full days of idle sitting each year (ThinkCity, 2019). The challenges in prioritizing urban space for people and the adverse perception surrounding micro-mobility vehicles result from decades of policies that have turned Malaysia into a car-centric nation (FMT news, 2022). There is hardly any serious effort to reduce car dependency in Malaysia as this is common sense, especially when government agencies have been preaching about the United Nations Sustainable Development Goals, low-carbon cities, road safety, and public health issues (Kadir, 2022).

The decrease in the quality of the urban environment makes people feel unsafe (for example, occupying sidewalks with parked vehicles makes children use the road for riding bicycles or playing, forcing parents to dedicate more time to child supervision). Thus, people seek a safer environment offered by a private garden, often available only in the city's outskirts (the center being already fully built or with too high land values) (Bertolini, 2013). Once a family has moved out of the city, increasing personal mobility no longer represents a personal choice but a necessity in improving quality of life. More vehicles need to be purchased for other family members, which, along with those purchased to increase quality of life, lead to road congestion (Nobis, 2003). According to a comprehensive definition provided by Crawford (2000), which specifically excludes private cars in favor of emergency vehicles, Venice is the only city we know of where car-free living is almost entirely implemented. However, the book of Crawford is mainly theoretical, as there is a lack of applied examples. Although several papers analyzed the theoretical aspect of these car-free cities (e.g., Crawford, 2000; Crawford, 2009; Minh, 2016; Nieuwenhuijsen, Bastiaanssen, et al., 2018), there are very few cities in which this complete car-free concept has been implemented (Alameri, 2011). Results from the study have to do with the factors related to congestion and reducing the number of cars in areas to counter this congestion (e.g., Bonnel, 1995; C. Nobis, 2003; Tsubohara, 2007). Environmental results are often mentioned, with effects like countering the carbon emissions caused by traffic. Nieuwenhuijsen, Bastiaanssen, et al. (2018) explained, "*Despite emerging initiatives and a growing awareness of the environmental, health and social benefits of car-free cities, the academic literature on how to make this transition (...) remains scarce.*" However, this statement is strongly related to how car-free cities are defined.

Shah Alam and Malaysia's current land use is generally dominated by transport use & road infrastructure. Unfortunately, both affordable urban housing and quality public spaces remained scarce in Shah Alam. Besides, land we could have used for affordable homes or parks is instead used to store empty cars. Despite the authority low carbon mobility initiatives, there is still a lack of framework and guidelines on car-free and low-car developments to achieve low-carbon cities and improve urban mobility. What can be concluded from the existing academic knowledge is that car-free and low-car developments are on the rise. There is an increasing number of initiatives, and literature describing those initiatives is also on the rise. However, this remains an underexposed field of knowledge. There is a lack of

understanding of how urban design in car-free cities can meet young families' emerging lifestyle and mobility needs. There is a need to improve urban mobility among young families by implementing car-free cities in Shah Alam.

Literature Review

Car-Free City

The concept of a "car-free city" varies significantly across studies (Crawford, 2000; Foletta and Henderson, 2016; Melia, 2014; Nieuwenhuijsen and Khreis, 2016). It ranges from cities mostly devoid of motorized vehicles, with exceptions for necessary services, to cities completely free of private cars. Despite these varied definitions, Crawford (2000) suggests the purest realization of the car-free concept is rare and mainly theoretical, except Venice. Full car-free cities are infrequent, and there is a growing trend in many cities to reduce car prevalence, especially in city centers (Topp and Pharoah, 1994). Some cities, like Oslo, plan to pedestrianize their city centers entirely (Rydningen et al. Kolltveit, 2017). There are also various examples of car-free or car-reduced residential developments, such as several areas in Amsterdam, Vauban in Freiburg, and Hammarby Sjöstad in Stockholm (Foletta & Henderson, 2016).

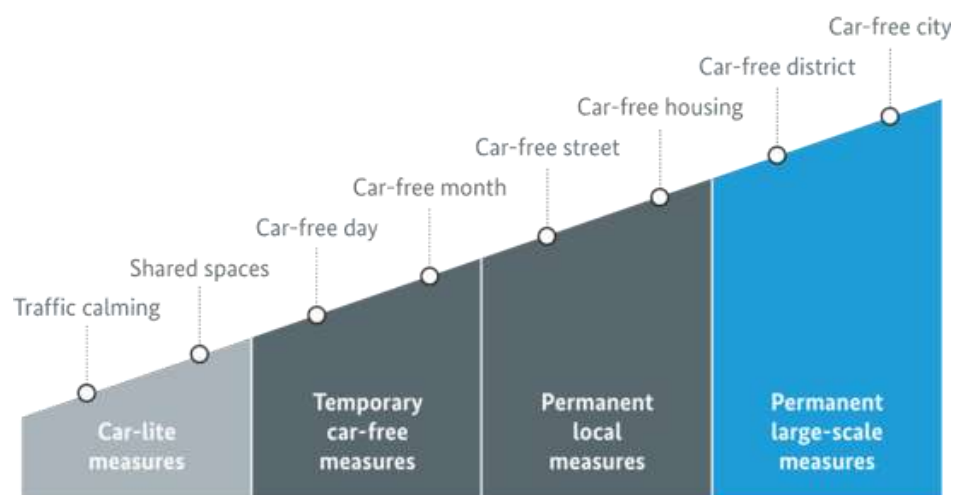


Figure 1: Car-free Spectrum
(Adopted from TUMI, n.d.)

However, the literature lacks a comprehensive road map for car-free cities (Nieuwenhuijsen, Bastiaanssen et al., 2018). Several high-level strategies are commonly proposed, such as restricting car access to city centers, implementing urban tolls, and promoting public transport (Bonnell, 1995). However, these strategies often lack detailed analysis and are not generally applied in existing residential areas (Steven Melia, Barton, and Parkhurst, 2013).

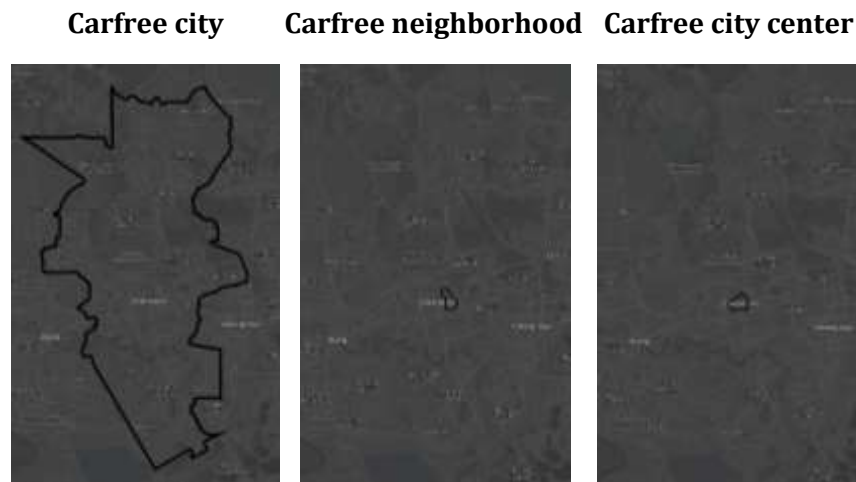


Figure 2: Car-Free Areas Example in Shah Alam

Source: Author

In conclusion, the idea of a car-free city, while not implemented in its most rigorous form, is gaining traction and evolving in practice (Nieuwenhuijsen, Bastiaanssen et al., 2018). More research is needed to develop comprehensive, scalable strategies from existing car-free developments and initiatives, including assessing these strategies' effectiveness in various contexts to inform future urban planning endeavors.

Urban Mobility

Zahraei's (2019) study emphasizes the power of thoughtful urban design to minimize the need for lengthy cross-city travel. By incorporating commonly accessed services, facilities, and amenities within each district, all residents, including the elderly and those with physical challenges, can carry out their daily activities without covering long distances. These district centers can function round-the-clock with the juxtaposition of work centers, schools, and leisure and recreational venues. This also encourages flexible working schedules rather than a rigid 9-to-5 routine and fosters an evolution in mobility modes that cater to 24-hour communities, such as autonomous buses operating continuously (Zahraei, 2019). Yet, it is important to note that Zahraei's study leans towards desirable future scenarios, compelling us to actively work towards bringing these visions to life (Inayatullah, 2003).

Furthermore, Rynning (2018) explores the concept that urban design interventions could potentially sway modal choices, particularly through the influence of the neighborhood-scale built environment on the travel experience. As individuals traverse different neighborhoods during a trip, they interact with the immediate surroundings, and these cumulative interactions, the perceptions and experiences they create, can shape travel satisfaction and, consequently, future modal choices (Rynning, 2018). Hipogrosso (2022) posits recommendations for sustainable mobility while considering Transit-Oriented Development (TOD) concepts. These recommendations include expanding the bicycle network, improving sidewalk and bus shelter conditions, implementing car parking regulations, and lowering maximum driving speeds. The diversity and compactness of land use in the study area and a high degree of functional mix make it a fitting candidate for the TOD urban planning approach (Hipogrosso, 2022).

Lastly, Almeida et al. (2017) argue that car sharing services present a promising alternative to private vehicle ownership, mainly due to their convenience and economic benefits. For urban landscapes, car sharing services offer considerable advantages in terms of both mobility and environmental impact. Reduced vehicular traffic improves city congestion and allows more efficient use of public space. From an environmental perspective, fewer vehicles on city streets lead to lower pollution levels, improved air quality, reduced greenhouse gas emissions, and diminished energy dependence. In conclusion, the literature underscores that innovative urban planning, design, and progressive mobility services can significantly influence our travel behaviors and modal choices. This enhances our daily travel experiences and contributes to sustainable urban development. As we progress, it is paramount that we continue to embrace these insights and adapt our urban landscapes to promote sustainable and inclusive mobility. By doing so, we can ensure that our cities cater to all residents' mobility needs while prioritizing environmental sustainability.

Young Family Lifestyle Needs

Multiple quantitative studies have established that our daily mobility patterns can be influenced, to a certain degree, by our lifestyles, which are an amalgamation of our values and practices (Bagley & Mokhtarian, 2002; Beckmann et al., 2006; Kemper et al., 2012; Van Acker, 2015). However, it is still a matter of debate whether these lifestyle considerations strongly influence our mobility choices than traditional socio-demographic factors (Beckmann et al., 2006). Interestingly, our lifestyle choices, such as car availability, do not just shape our mobility capital. The interaction is reciprocal, as our travel-oriented attitudes can also impact our car ownership decisions (Acker et al., 2014).

This interplay between lifestyle and mobility was notably investigated in Switzerland, where a study focused on the residential choices of families in the urban agglomerations of Bern and Lausanne (Thomas, 2013). With the significant role of mobility in the lives of young families, largely driven by the spatial dispersion of family members' activities, two crucial resources were identified: residential location and car usage. The choice of residence, defined by its accessibility and the services it offers, plays a central role in orchestrating daily life. This is particularly true for dual-income young families, who often prefer city-center residences to conveniently juggle professional obligations, family responsibilities, and cultural pursuits. Even though a car was owned by 90% of the surveyed families, a significant 80% marked public transport accessibility as an essential criterion for housing selection. This was to ensure independent mobility for their children, an autonomy that these young parents highly appreciated. The study thus illuminated how different "residential lifestyles" center around certain transport modes that, in turn, influence residential location choices.

Chatterjee et al. (2018) underscores the importance of understanding young adults' evolving lifestyles and travel habits when predicting future transport use. While forecasting future travel demand, it becomes imperative to consider the extent and pattern of car access across the population. However, there is a notable absence of data regarding the usage of emerging transport alternatives, particularly shared mobility. We need to modify and adapt our survey and monitoring methods to gain insights into how different age groups perceive and use these new options. To conclude, as we forge ahead, it is important to acknowledge that understanding the intricate relationship between lifestyle choices, especially of young families, and mobility patterns is crucial for designing future-oriented transportation policies and urban planning strategies. Our data collection methodologies must be broadened to encapsulate the dynamic transportation landscape and evolving societal norms. By doing so,

we can ensure that our future mobility strategies cater to the diverse lifestyles of our population, with a specific focus on the needs of young families, promoting inclusivity and sustainability.

Method

By asking questions about car-free cities, an attempt was made to gain insight into how people think about them. The second aim was to identify the issues and challenges that people and the local authority face and what factors they think should be present to make car-free cities successful. The interview questions were prepared using the thematic analysis (Tables 1.1 & 1.2), after which the deductive codes were drawn. During the interviews, the informants attempted to determine the factors contributing to car-free cities' success based on past experiences and case studies from successful car-free cities like London, Singapore, Madrid, and Copenhagen. The success factors were not explicitly mentioned, but open questions were asked to see if the informants mentioned the factors from the literature review and deductive codes themselves. In this way, it was possible to see whether the success factors mentioned in theory are also experienced as success factors by the young families and local authorities.

To better understand the lifestyle needs of young families, semi-structured interviews were conducted with informants from young families, with their backgrounds in corporate offices and architecture firms, as well as employees from the local authorities of the cities. The interviews had prepared a list of questions. However, during the interview, the order of the questions in some interviews changed when a respondent had already answered the following question. Probing questions allowed the collection of more relevant information contributing to the research objective. Informants from young families were asked several additional questions, with some questions related to flexibility in working hours and family time.

Note that interviews were conducted with young families because this research aims to improve and meet their lifestyle needs in future car-free cities. Young families are the people who live in car-free cities, so their input was considered valuable for this research. In addition, future car-free cities are mostly planned and realized by local authorities and architecture firms. Therefore, in addition to interviews with young families, it was decided to conduct interviews with the local authorities and architects. Their view on car-free cities provides valuable insights into how local authorities and architects view future car-free cities, which can help improve them.

Table 1
Thematic Analysis (Sub RQ1)

<p>Main RQ: How can urban design in car-free city development accommodate the emerging lifestyle and mobility needs of young families?</p> <p>Aim of research: This research aim to formulate a framework including strategies and guidelines on how to achieve car-free cities to improve urban mobility among young families.</p> <p>Informants:</p> <ul style="list-style-type: none"> • 1 MBSA (Majlis Bandaraya Shah Alam) officer • 1 Architectural firm • 2 Young families 					
Research Questions	Deductive codes	Strategy of inquiry	Interview Questions	Inductive codes	
				Coding	Final theme
<p>Sub RQ1:</p> <p>What are the key issues and challenges faced in achieving and implementing car-free cities to support the needs of young families?</p>	<p>Issues & Challenges in achieving car-free cities for young families</p>	<p>In-depth interview</p> <p>Literature Review</p>	<p><i>IQ1: What is your opinion on car-free cities?</i></p> <p><i>IQ2: What are the issues and challenges that you think is obstructing the city and the people to shift towards car-free life?</i></p> <p><i>IQ3: Woud you like to live and work in a car-free cities?</i></p> <p>a. Are you willing to shift to car-free life if there is availability of alternative to cars?</p>		

Source: Author

Table 2
Thematic Analysis (Sub RQ2)

<p>Main RQ: How can urban design in car-free city development accommodate the emerging lifestyle and mobility needs of young families?</p> <p>Aim of research: This research aim to formulate a framework including strategies and guidelines on how to achieve car-free cities to improve urban mobility among young families.</p> <p>Informants:</p> <ul style="list-style-type: none"> • 1 MBSA (Majlis Bandaraya Shah Alam) officer • 1 Architectural firm • 2 Young families 			
Research Questions	Deductive codes	Strategy of inquiry	Interview Questions
<p>Sub RQ2: What are the essential factors that can enhance the urban mobility of young families within car-free cities?</p>	<p>Young Family Lifestyle Needs</p>	<p>In-depth interview Literature Review</p>	<p>IQ1: How would you describe a successful car-free cities?</p> <p>a. Which factors do you think have to be implemented to make a car-free cities successful? b. What are your expectations of a car-free cities?</p> <p>IQ2: Would you prefer to adapt a flexible working hours compared to fixed working schedule?</p> <p>a. What are the advantages and disadvantages of remote work in your opinion?</p> <p>IQ3: Do you think public transport and shared mobility are important factors based on your residential choice?</p> <p>a. Would you prefer your children to travel independently? b. Why do you think that your children would want to travel with you? c. If there is childcare centre/nursery that integrate with transit centre, will you like to bring along your children to work?</p> <p>IQ4: Would you like to adapt to 9-to-5 working hours?</p> <p>a. Would you allow your employees to leave work on time so that parents could spent more time with their children? b. If there is a positive impact of performance from the employees, would you like to consider and/or continue with the most practicable working hours in the future?</p>
			Inductive codes
			Coding
			Final theme

Source: Author

Informants

Potential informants were first identified through the purposive sampling method (Lopez & Whitehead, 2013). According to Lopez & Whitehead (2013), purposive sampling is where participants are recruited according to pre-selected criteria relevant to a particular research question. Sometimes called “judgment sampling,” purposive sampling is designed to provide information-rich cases for in-depth study. This is because participants are those who have the

required status or experience or are known to possess special knowledge to provide the information researchers seek.

Table 3

Description of Informants

#	Informants	Reason	Date Interview	Transcribed
R1	Local Authority	In-depth knowledge of urban transport in general	20-04-2023	Yes
R2	Architecture Firm	Functioning as architect for several transit stations, hence, know future measures and participation in car-free cities	03-05-2023	Yes
R3	Young Family	Understanding of young family's needs in terms of emerging mobility and lifestyle trends	27-04-2023	Yes
R4	Young Family	Understanding of young family's needs in terms of emerging mobility and lifestyle trends	01-05-2023	Yes

Source: Author

Result and Discussion**Interviews****What are the Key Issues and Challenges Faced in Achieving and Implementing Car-Free Cities to Support the Needs of Young Families?****Opinion on Car-Free Cities**

During the interviews, the young families, the architecture firm employees, and the local authority employees were asked about their opinions on the concept of car-free cities. The informants' answers are displayed in Table 1.4. The informants generally have positive attitudes towards car-free cities, emphasizing benefits such as lower carbon emissions, reduced traffic, improved safety, and enhanced mental health. However, they acknowledge the need for suitable infrastructure, comprehensive public transportation networks, and consideration of local contexts and public acceptance when implementing car-free city concepts.

Table 4

Opinion on Car-Free Cities Per Informants' Group

	Local Authority	Architecture Firm	Young Families
<i>Positive about car-free cities</i>	0/1	1/1	0/2
<i>No one-sided opinion on car-free cities</i>	1/1	0/1	2/2

Source: Author

Issues and Challenges Faced in Achieving and Implementing Car-Free Cities Per Informants' Group

The informants provided valuable insights into the issues and challenges hindering the transition to a car-free lifestyle. The local authority of Shah Alam emphasized the need to change the mindset of individuals and shift away from the prevailing car-centric design. They highlighted the lack of comprehensive data and analysis on public transport in planning guidelines, advocating for greater focus on public transport considerations from the early

stages of development. Additionally, they addressed challenges related to public transport connectivity, scattered development, and the importance of government campaigns and road pricing to gradually limit car usage. The design principal stressed the challenges posed by the climate and discomfort, particularly in hot regions, and the need for government policies and enforcement to provide better pedestrian infrastructure.

These issues and challenges reflect the obstacles cities and individuals face in transitioning to a car-free lifestyle. By addressing these concerns through appropriate policies, infrastructure development, mindset change, and improved public transportation systems, cities can create an environment conducive to sustainable and car-free living. These insights highlight the multifaceted nature of the challenges and the importance of addressing them to facilitate the transition towards sustainable and car-free urban living.

Preference Regarding Living and Working in Car-Free Cities

All informants were asked about their preferences regarding living and working in car-free cities. The informants’ preferences vary somewhat, but there is an overall positive sentiment toward living and working in car-free cities (Table 1.5). Other than that, the informants highlight the need for safe infrastructure, reliability, comfort, reduced carbon emissions, and improved quality of life as key factors influencing their preferences.

Table 5

Preference Regarding Living and Working in Car-Free Cities Per Informants’ Group

	Local Authority	Architecture Firm	Young Families
<i>Leaning toward car-free life</i>	1/1	0/1	2/2
<i>No one-sided opinion on car-free life</i>	0/1	1/1	0/2

Source: Author

What are the Essential Factors to Enhance the Urban Mobility of Young Families within Car-Free Cities?

Successful Factors of Car-Free Cities

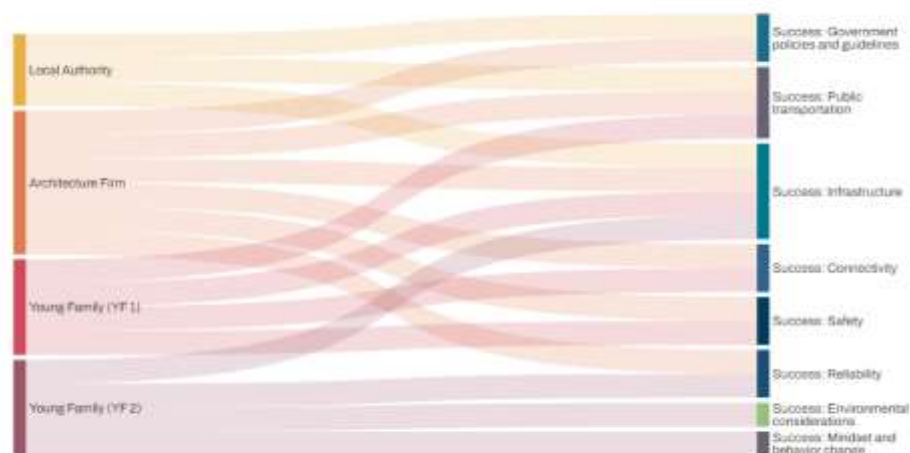


Figure 3: Sankey diagram, success factors per informants’ group

Source: Author

These factors were mentioned in response to the questions: “How would you describe a successful car-free city?”, “Which factors do you think have to be implemented to make car-free cities successful?” and “What are your expectations of car-free cities?”. Therefore, some factors may have been mentioned at other times in the interview. However, this diagram only looks at the factors that informants mentioned when they were explicitly asked about factors for success. The first thing to notice is that “Infrastructure” is mentioned by all the informants. This seems to indicate that infrastructure is associated with successful car-free cities. As per the sources, the establishment of well-designed pedestrian walkways and cycling paths that seamlessly integrate with public transportation networks, while also ensuring the provision of comfortable and safe infrastructure, including covered walkways, sufficient lighting, and safety features, is crucial for the development of thriving car-free cities.

A second observation is that both “environmental considerations” and “mindset and behavior changes” are mentioned by one of the young families. He believes changing citizens’ mindsets is crucial in influencing their transportation choices. He emphasizes the importance of reliability as a determining factor, where the general perception is that cars are more dependable. To shift this perspective, he proposes two approaches. The first is to enhance the reliability of public transport systems, encouraging people to choose them over cars. The second approach focuses on environmental factors, such as creating car-free cities by reducing carbon dioxide emissions. He suggests an example of launching a campaign with a target to reduce emissions by 50% within a decade, ultimately resulting in a 50% decrease in car usage in cities. The informant indicates potential strategies for influencing citizens’ transportation choices by presenting these factors, reliability and the environment.

Flexible Working Hours, Advantages and Disadvantages of Remote works

Overall, the informants generally lean towards preferring flexible working hours. They highlight the advantages of flexibility regarding traffic control, quality of life, reduced stress, and better work-life balance. However, some acknowledge that certain work may still require fixed working hours or face-to-face interaction. The informants highlight advantages such as reduced commuting time, increased flexibility, and the ability to attend to personal and family needs. Nevertheless, they also mention disadvantages such as isolation, difficulties in using remote work tools, and the potential for decreased supervision and productivity. The insights can shed light on how flexible work arrangements impact the feasibility of car-free living among young families.

Public transport and shared mobility as important factors in residential choice, independent travel for children, and childcare centers integrated with transit centers

Table 6

Perspectives Regarding Public Transport and Shared Mobility as Important Factors in Residential Choice, Independent Travel For Children, And Childcare Centers Integrated With Transit Centers Per Informants' Group.

	Local Authority	Architecture Firm	Young Families
<i>Find public transport and shared mobility are important factors in residential choice</i>	1/1	1/1	1/2
<i>Does not find public transport and shared mobility as important factors</i>	0/1	0/1	1/2
<i>Leaning toward independent travel for children</i>	0/1	0/1	1/2
<i>No one-sided opinion on independent travel for children</i>	1/1	1/1	1/2
<i>Positive about the childcare center integrated with the transit center</i>	0/1	0/1	2/2
<i>No one-sided opinion on childcare centers integrated with the transit center</i>	1/1	1/1	0/2

Source: Author

The reasons why children would want to travel with their parents vary across the informants. They include that it is for convenience, saves money, and focuses on environmental consciousness. Informants from local authorities and architecture firms express a positive inclination towards bringing their children to work if a childcare center/nursery is integrated with the transit center. They both consider the convenience factor of having their children on the same transit line as a benefit, making drop-off and pick-up easier. However, the local authority of Shah Alam mentions that the success of this arrangement would require further study to evaluate its effectiveness. At the same time, the design principle emphasizes the importance of the quality of the nursery provided (Table 6). Both informants also acknowledge the potential time-saving aspect of integrating childcare and transit, reducing the need to commute to another industry or location. All the informants show varying levels of interest and support for bringing their children to work if a childcare/nursery is integrated with the transit center. When expressing their opinions on this matter, they consider factors such as convenience, the quality of the facilities, educational benefits, and safety measures. 9-to-5 working hours

The table below (Table 7) shows that all informants acknowledge the value of adapting to 9-to-5 working hours or incorporating flexible work schedules. They recognize the importance of allowing employees to leave work on time to spend quality time with their children and families. They also highlight the potential positive impact on employee well-being and performance.

Table 7

Preference For 9-To-5 Working Hours, Allowing Employees to Leave work on Time, and Consideration of Most Practicable Working Hours Continuation After Employees' Positive Impact as Per Informants' Group

	Local Authority	Architecture Firm	Young Families
<i>Positive about 9-to-5 working hours</i>	0/1	1/1	1/2
<i>No one-sided opinion on 9-to-5 working hours</i>	1/1	0/1	1/2
<i>Positive about allowing employees to leave work on time</i>	1/1	1/1	2/2
<i>Finds 9-to-5 working hours practicable and consider continuing if positive impact of performance from employees</i>	1/1	1/1	1/2
<i>No one-sided opinion on 9-to-5 working hours, but consider continuing if positive impact of performance from employees</i>	0/1	0/1	1/2

Source: Author

Qualitative Data Analysis From the Interviews

Sub RQ1: What are the Key Issues and Challenges Faced in Achieving and Implementing Car-Free Cities to Support the Needs of Young Families?

Achieving and implementing car-free cities to support the needs of young families presents several challenges. These include resistance to alternative modes of transportation, adverse weather conditions that discourage walking, and inadequate pedestrian and cycling infrastructure. Insufficient data on public transport and a preference for car-oriented development further hinder progress. Overcoming these challenges requires prioritizing public transport, integrating it into planning guidelines, and improving connectivity. Behavior change initiatives and awareness campaigns can challenge car-centric mindsets. Moreover, legal considerations such as road pricing should be explored, and creating a clean and safe environment is crucial. Better pedestrian infrastructure, government involvement, and considerations of population density and housing options are important. Financial feasibility and the availability of alternative transportation modes contribute to the success of car-free cities. By addressing these challenges and promoting the benefits of car-free living, sustainable and livable environments that cater to the needs of young families can be achieved.

Sub RQ2: What are the Essential Factors that can Enhance the Urban Mobility of Young Families within Car-Free Cities?

The key factors identified by young families for achieving enhanced urban mobility within car-free cities include prioritizing public transport and reducing the number of cars on the road. A comprehensive infrastructure plan that includes cycling paths, pedestrian walkways, and designated public transport routes is crucial. Changing citizens' mindsets through awareness

campaigns highlighting the benefits of public transport is essential. Safety measures such as covered walkways and confidence-building measures for cycling are important considerations. Furthermore, integration of childcare facilities with transit centers is desired to accommodate the needs of young families. Flexible working hours to reduce commuting time and improve work-life balance are preferred. The vision of a car-free city includes improved public transportation facilities, air quality, and low accident rates. The desire for car-free areas, pedestrian-only roads, and a connected urban landscape where pedestrians, public transport, and shared mobility are prioritized is evident. Mental and policy changes, thorough urban planning, connectivity focus, and prioritization of public transportation and non-motorized modes are emphasized. Consequently, these factors contribute to a sustainable and accessible city where families can benefit from reliable public transport and contribute to a greener future.

Conclusion

In summary, this research highlights the factors that enhance urban mobility for young families in car-free cities and identifies the challenges faced during the transition to such urban environments. The findings emphasize the need for a cultural shift away from car-centric mindsets and the importance of prioritizing public transport, pedestrian infrastructure, and awareness campaigns to encourage behavior change. Safety, flexibility in work hours, and the integration of childcare facilities within transit centers are essential considerations for young families. Effective policies, innovative urban planning, and materials like ETFE for noise reduction are crucial for successful car-free cities. The study underscores that transitioning to car-free cities requires a comprehensive societal transformation and offers valuable insights for future research and planning efforts. Ultimately, the aim is to create sustainable, livable cities that cater to the needs of their residents while reducing reliance on cars and promoting alternative modes of transportation.

Significance of Study

The significance of this study lies in its potential to inform the redevelopment of Shah Alam, transforming it from a car-centric city into a car-free city. By identifying the key issues and challenges faced in achieving and implementing car-free cities to support the needs of young families, this research provides valuable insights that can guide the development of a comprehensive guideline for the transformation process. Furthermore, this study aligns with and contributes to the National Transport Policy 2019-2030. The findings support the policy's objective of accelerating the implementation of low-carbon mobility initiatives by advocating for a shift towards car-free cities. The study offers practical recommendations that align with the policy's goals by prioritizing public transport, integrating childcare facilities into the urban mobility infrastructure, and promoting pedestrian and cyclist-friendly environments. Overall, the significance of this study lies in its potential to guide the redevelopment of Shah Alam into a car-free city while also supporting the objectives of the National Transport Policy. By offering practical recommendations to enhance urban mobility among young families and promoting sustainable, low-carbon mobility initiatives, this research contributes to creating more livable, inclusive, and environmentally friendly cities.

Future Recommendations

Future recommendations for advancing car-free cities and enhancing urban mobility for young families include expanding the sampling size to capture diverse perspectives, incorporating noise reduction measures such as ETFE in urban design, and pursuing ongoing research and innovative strategies. Increasing the sample size will provide a more comprehensive understanding of young families' challenges and preferences. Integrating noise reduction measures like ETFE can address noise pollution concerns near transport hubs. Continuous research and innovative approaches, including integrated transportation systems and public awareness campaigns, are vital for improving urban mobility. Implementing these recommendations will contribute to developing sustainable and family-friendly urban environments.

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