

**T.C. ISTANBUL KÜLTÜR UNIVERSITY
INSTITUTE OF GRADUATE STUDIES**

**STRATEGIC PLANNING FOR SUSTAINABLE
TRANSPORTATION IN DEVELOPING COUNTRIES**

CASE STUDY: DAMASCUS, SYRIA

MASTER'S THESIS

DUHA ALYOUSEF

2200000657

Department: Industrial Engineering

Program: Engineering Management

Supervisor: Asst. Prof. İbrahim Ethem Tarhan

JUNE 2025

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ACKNOWLEDGMENT

This thesis represents not just a personal academic journey, but a shared effort made possible by the support, wisdom, and encouragement of many people to whom I owe deep gratitude.

I would first like to sincerely thank my academic supervisor, Assistant Prof Ibrahim Ethem TARHAN, for their unwavering guidance and honest feedback. Your patience and encouragement helped me stay grounded, especially during the most overwhelming moments of this research.

To my university, thank you for offering the academic foundation and resources that made this thesis possible.

I am deeply thankful to my family — to my parents, whose love, sacrifices, and unwavering belief in me have been my strongest foundation, and to my siblings, whose support and constant encouragement reminded me I was never alone in this journey. Your faith in me kept me going when things felt impossible.

I am also grateful to the professionals and individuals who kindly agreed to share their thoughts and concerns with me during this study. Their openness and willingness to engage with my questions provided valuable insights into the real-life challenges of transportation planning in Damascus.

And to the people of Damascus — this work is for you. For those who wait at broken intersections, walk through unsafe streets, or navigate crowded buses each day, I hope this thesis plays a small part in shaping a more just and functional transportation future for our city.

JUNE 2025

DUHA ALYOUSEF

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LIST OF SYMBOLS

- **BRT:** Bus Rapid Transit
- **PPPs:** Public- Private Partnerships



Üniversite	:	İstanbul Kültür Üniversitesi
Enstitü	:	Lisansüstü Eğitim Enstitüsü
Anabilim Dalı	:	Endüstri Mühendisliği
Programı	:	Mühendislik Yönetimi
Tez Danışmanı	:	Dr. Öğretim Üyesi İbrahim Ethem TARHAN
Tez Türü ve Tarihi	:	Yüksek Lisans – Haziran 2025

ÖZET

Bu çalışma, Suriye'nin başkenti Şam'daki ulaşım sisteminin beş yıllık bir perspektifle stratejik planlamasını ele almaktadır. Şehirdeki ulaşım ağı, tarihi birikim ile günümüzün karmaşık sorunlarını bir arada yansıtmaktadır. Süregelen kentsel büyüme ve politik zorluklar, mevcut sistemin şekillenmesinde önemli rol oynamaktadır. Günümüzde Şam, trafik sıkışıklığı, sınırlı toplu taşıma seçenekleri ve yaşanan altyapı gibi sorunlarla mücadele etmektedir. Bu araştırmanın amacı, mevcut planlama yaklaşımını analiz ederek temel zayıflıkları belirlemek ve uygulanabilir iyileştirme stratejileri önermektir. Ayrıca, ulaşım planlamasının sürdürülebilirlik, ekonomik kalkınma ve toplumsal refah gibi daha geniş hedeflerle ilişkilendirilmesinin önemi vurgulanmaktadır. Mevcut sorunlara ve potansiyel fırsatlara odaklanan bu çalışma, önümüzdeki yıllarda daha verimli ve kapsayıcı bir ulaşım sistemine katkı sağlamayı amaçlamaktadır.

- **Anahtar Kelimeler:**

Stratejik planlama, toplu taşıma, Şam, ulaşım sorunları, SWOT analizi, çatışma sonrası yeniden yapılanma.

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Degree Awarded and Date: MS – June 2025

ABSTRACT

This study focuses on the strategic planning of transportation in Damascus, Syria, over a five-year period. The city's transportation system reflects a mix of historical depth and modern-day complexity, shaped by ongoing urban growth and political challenges. Today, Damascus struggles with traffic congestion, limited public transit options, and aging infrastructure. The aim of this research is to analyze the current planning approach, identify key weaknesses, and suggest practical strategies for improvement. The study also emphasizes the importance of linking transportation planning with broader goals such as sustainability, economic development, and social well-being. By addressing both the existing issues and potential opportunities, the research hopes to offer guidance for more efficient and inclusive mobility solutions in the coming years.

- **Keywords:**

Strategic planning, public transportation, Damascus, Transportation challenges, SWOT analysis, post-conflict reconstruction.

1. INTRODUCTION

1.1 Background and Context

The transportation system of Damascus, Syria, is deeply connected with the city's rich history and complex geopolitical context. As one of the oldest continuously inhabited cities in the world, Damascus has evolved over millennia, shaping its transportation infrastructure to meet the needs of its residents and visitors. Historically, the city's strategic location along trade routes between Asia, Africa, and Europe has facilitated the flow of goods and people, fostering a diverse array of transportation modes. Traditional forms of transportation, such as donkey carts and horse-drawn carriages, once dominated the bustling streets of Damascus, reflecting its cultural heritage and economic significance. However, in recent decades, rapid urbanization, population growth, and modernization efforts have transformed the city's transportation system. Today, Damascus faces the complexities of traffic congestion, insufficient public transit options, and the maintenance of infrastructure, all amid the enduring backdrop of political and economic unrest. Recognizing the historical and contextual underpinnings of transportation in Damascus is crucial in addressing these obstacles and forming prospective solutions for the city's mobility in the years ahead.

1.2 Statement of the problem

Damascus, one of the world's oldest continuously inhabited cities, has long served as a crossroads of culture, commerce, and movement. Yet despite its rich history, the city's transportation system has not kept pace with modern demands. Over the past decades, and particularly following the damage and disruption caused by years of conflict, the urban transport network in Damascus has become increasingly inefficient, fragmented, and unable to meet the needs of its growing population. Today, residents struggle daily with traffic congestion, unreliable public transport, limited mobility options, and deteriorating infrastructure. Buses are often overcrowded, inconsistent in their schedules, and cover only a portion of the city's needs. At the same time, the number of private vehicles has increased, putting even more pressure on the already strained road network. These conditions not only impact people's daily lives and productivity, but also contribute to environmental

degradation, road safety risks, and social inequality — particularly for those who cannot afford private transportation.

In addition to these challenges, the process of post-war reconstruction adds another layer of complexity. Resources are limited, infrastructure is partially damaged, and urban planning must now balance immediate needs with long-term sustainability. Although some efforts have been made to improve mobility, a clear, context-sensitive, and realistic strategic plan for transportation is still missing.

There is an urgent need for solutions that are not only effective and efficient, but also affordable, flexible, and suited to the unique urban fabric and socio-economic conditions of Damascus. Exploring alternative transportation models — such as Bus Rapid Transit (Metrobus) or Tramway systems — within a strategic planning framework may provide a valuable path forward.

1.3 Research Questions:

This research aims to better understand the challenges and possibilities of improving the transportation system in Damascus during a difficult post-conflict period. In order to shape a strategic plan that is both realistic and beneficial to the city's residents, the study is guided by the following key questions:

1. What are the most pressing transportation problems currently facing Damascus, and how do they affect daily life in the city?
2. In what ways have political instability, economic conditions, and rapid urbanisation influenced the state of transportation infrastructure?
3. What are the main strengths and weaknesses of the current transport system, and what opportunities or threats could influence its future development?
4. Are modern transport solutions like Bus Rapid Transit (BRT) or tram systems suitable for the city's structure and social conditions?

5. Finally, how can transportation planning in Damascus be more closely linked with broader goals such as environmental sustainability, economic recovery, and social inclusion?

1.4 Objective of the Paper:

This study aims to develop a strategic transportation planning approach that fits the specific needs and realities of Damascus, Syria, as a city in a developing country undergoing post-war reconstruction. The goal is to explore practical, affordable, and sustainable transportation solutions that can ease daily mobility challenges, reduce congestion, and support the broader recovery and future growth of the city.

1.5 Research Map

This research follows a step-by-step structure that was carefully designed to move from understanding the current transportation issues in Damascus to developing realistic and practical strategies for improvement. Each chapter plays a role in building that full picture, starting from the background and ending with actionable recommendations. Here's how the study was organized:

The first chapter (Introduction) sets the scene. It explains why transportation is a pressing issue in Damascus and outlines the main problem the research is trying to address. This chapter also lays out the aim, the specific objectives, and how the whole thesis is structured.

Chapter two (Literature Review) looks at what has already been written and studied about transportation planning — especially in developing or post-conflict cities. It helped guide the direction of the study by providing ideas, strategies, and lessons learned from other countries and cities facing similar challenges.

Chapter three (Methodology) explains how the research was carried out. It describes the tools used — mainly surveys and interviews — and how the information was collected from different groups, including residents, students, engineers, and infrastructure company owners. It also talks about how the data was checked for clarity, consistency, and usefulness.

Chapter four (Current Situation Analysis) focuses fully on Damascus. It takes a closer look at the existing transportation system and breaks it down into key areas like urban growth, the condition of infrastructure, public transport, traffic issues, private car use, and

environmental concerns. This chapter helped reveal the core problems the city is dealing with right now.

Chapter five (SWOT Analysis) pulls together the insights from the surveys, interviews, and field observations. It organizes them into strengths, weaknesses, opportunities, and threats — giving a clear snapshot of where Damascus stands and what it's up against.

Chapter six (Vision, Goals, and Strategic Objectives) shifts the focus from problems to solutions. It outlines a long-term vision for the city's transportation system, then breaks that vision down into specific goals and objectives that can guide improvement efforts.

Chapter seven (Five-Year Strategic Plan) puts those goals into action. It lays out a practical plan for what can realistically be done over the next five years — year by year — focusing on improvements that don't require massive budgets but can still make a noticeable difference.

Chapter eight (Implementation Strategy) talks about how the plan can actually be carried out. It looks at what roles different institutions and organizations can play, what resources might be needed, and what risks or obstacles could get in the way.

Chapter nine (Monitoring and Evaluation) covers how to track progress once the plan begins. It introduces indicators, tools, and feedback loops to help decision-makers adjust the strategy as needed over time.

Finally, chapter ten (Conclusion and Policy Recommendations) wraps everything up. It summarizes the main findings, reflects on the research process, and offers clear, practical suggestions for local planners, engineers, and decision-makers working to improve transportation in Damascus.

2. LITERATURE REVIEW

2.1 Definition and Evolution of Sustainable Transportation

Defining what is meant by “sustainable transportation” is a crucial first step in shaping effective research and planning strategies in today's urban contexts. The term generally refers to transportation systems that meet present mobility needs without compromising the ability of future generations to meet theirs. While definitions may vary slightly across

disciplines, most scholars agree that truly sustainable transportation is rooted in the broader concept of sustainable development, which emphasizes a balanced approach across three main dimensions: environmental preservation, economic efficiency, and social equity (Litman & Burwell, 2006).

In the early stages of discussion, the focus was largely environmental. Researchers and policymakers were mainly concerned with issues like air pollution, carbon emissions, and the heavy dependence on non-renewable fossil fuels, particularly petroleum (Deakin, 2002). These early warnings highlighted the unsustainable path of modern transportation systems and sparked a shift in how mobility was viewed in relation to environmental health.

Over time, however, the scope of sustainable transportation has significantly broadened. It now includes a wider range of concerns, such as urban livability, accessibility for marginalized communities, and the long-term economic viability of transport investments. This more integrated perspective has been influenced by the understanding that environmental issues cannot be addressed in isolation from social and economic realities (Zhou, 2012).

For instance, the California High-Speed Rail Authority offers a clear operational definition by describing sustainable transportation as modes that function independently of non-renewable energy sources, aiming instead to reduce emissions, conserve resources, and support a greener infrastructure (Vashisth & Kumar, 2018). Such definitions reinforce the need for systems that are not only cleaner and more energy-efficient but also more inclusive and economically sound.

As the concept continues to evolve, it increasingly calls for innovative planning approaches that can adapt to specific local conditions, especially in cities like Damascus, where historical, political, and socio-economic complexities demand tailored, context-sensitive solutions.

2.2 Significance of Sustainable Transportation

The importance of sustainable transportation extends far beyond mobility—it plays a vital role in shaping healthier, more inclusive, and economically resilient cities. Its impact is

typically understood through three interrelated dimensions: environmental, economic, and social.

Environmentally, sustainable transportation helps protect natural ecosystems and reduce the negative externalities associated with traditional vehicle use. By encouraging cleaner modes such as public transit, cycling, and walking, cities can significantly lower greenhouse gas emissions, improve air quality, and reduce dependence on fossil fuels (Krzykacz & Przywojska, 2022). These improvements are particularly critical in densely populated or climate-vulnerable urban areas where environmental degradation poses a direct threat to public health and quality of life.

Economically, sustainable transportation systems offer more efficient and cost-effective mobility solutions. By investing in a variety of transport modes and infrastructure, cities can improve connectivity, reduce travel time, and lower the overall cost of transportation—both for users and for governments. This, in turn, supports local economies, encourages investment, and helps create job opportunities across different sectors.

Socially, the benefits are equally profound. Accessible and affordable transportation reduces social exclusion by connecting people to employment, education, healthcare, and other essential services. For low-income communities in particular, inclusive mobility can be a powerful tool for poverty reduction and upward mobility. A well-designed transportation network fosters social cohesion by making urban life more equitable and accessible for everyone, regardless of age, gender, or income level.

In post-conflict or rapidly changing cities like Damascus, these three pillars are especially significant. Sustainable transportation can serve not only as a solution to immediate mobility challenges, but also as a driver of long-term recovery, resilience, and inclusive development.

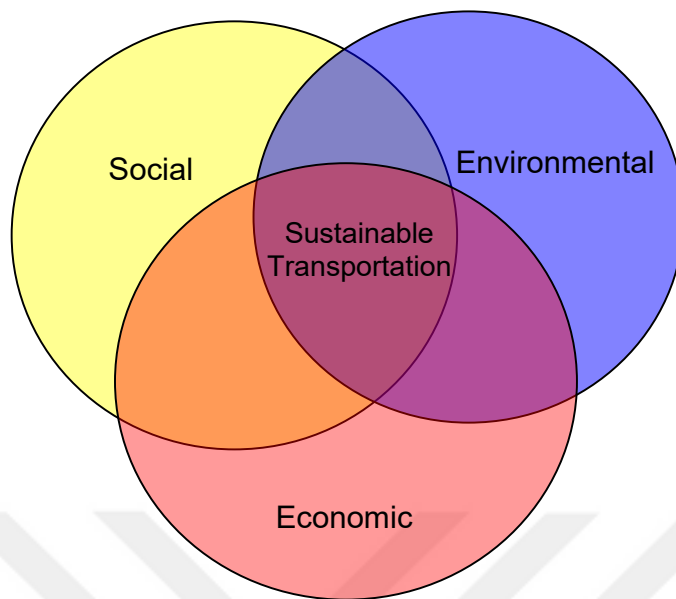


Figure 1 The Three Dimensions of Sustainable Transportation

2.3 Key Challenges in Implementing Sustainable Transportation Policies

While the goals of sustainable transportation are widely supported in theory, putting them into practice is often far more complex. Achieving real progress toward sustainable mobility requires more than just new vehicles or infrastructure—it depends on a wide-ranging framework of coordinated efforts across various sectors and actors.

According to Kumar et al. (2003), there are four foundational elements that support the successful implementation of sustainable transportation: effective public policy, widespread awareness and education campaigns, smart transportation technologies, and the promotion and adoption of low-emission or green vehicles. However, aligning all four pillars in a single context—particularly in cities facing economic or political instability—can be extremely challenging.

One of the main barriers is the lack of strong, enforceable policy frameworks. In many cities, transportation regulations are either outdated, weakly implemented, or not clearly aligned with broader sustainability goals. Without clear policies and institutional support, even well-intentioned initiatives may fail to take root.

Another persistent challenge is low public awareness. Many citizens remain unfamiliar with the environmental impacts of their daily transportation choices, or they may lack trust in public alternatives due to issues like poor service quality, safety concerns, or limited coverage. Changing public behavior requires not just information, but also meaningful incentives and visible improvements in service.

Technology offers great potential—especially through intelligent transportation systems (ITS), which help manage traffic flow, monitor emissions, and improve safety—but these systems require significant upfront investment and ongoing technical capacity, which may be lacking in developing or post-conflict regions.

Equally important is stakeholder engagement. As Shah and Pan (2021) emphasize, collaboration between multiple parties—transportation operators, infrastructure managers, environmental advocates, urban planners, and local government officials—is essential. Without this coordination, even technically sound solutions may encounter resistance, delays, or mismanagement during implementation.

In the case of Damascus, these challenges are further compounded by the city's complex political environment, limited financial resources, and the urgent need to rebuild basic infrastructure. Addressing these issues requires a strategic, context-sensitive approach that emphasizes long-term planning, inclusive participation, and flexible, low-cost solutions.

2.4 Principles and Steps in Transportation Strategic Planning

Strategic planning in transportation is essential when trying to improve a city's mobility system over the long term. It provides a structure that helps cities move from a general vision toward clear, implementable goals. Especially in cities facing post-conflict recovery or rapid urban change, like Damascus, a strategic plan becomes more than just a planning tool — it acts as a guide for rebuilding systems with limited resources and high urgency.

As outlined by the Baltimore City Department of Transportation (2003), transportation strategic planning usually follows a number of key steps. These steps offer a logical path that planners can use to analyze the situation, set priorities, and take action:

2.4.1 Current Situation Analysis

The first step is to understand the existing conditions of the transportation system. This includes the condition of roads, transit services, traffic issues, and even user behaviors. Without this step, it's difficult to know where to start or what the most urgent problems are.

2.4.2 Segmentation Analysis

This involves breaking the system into different categories — like public transport, private vehicles, pedestrian pathways, and freight services. It helps in identifying the unique needs of each mode and in tailoring solutions accordingly.

2.4.3 SWOT Analysis

A standard but valuable tool, SWOT stands for strengths, weaknesses, opportunities, and threats. This step helps planners take a realistic look at what is working, what isn't, and what external factors might influence the success or failure of any strategy.

2.4.4 Core Competencies Analysis

In this part, the focus shifts to identifying what internal resources or strengths the city can rely on. For example, this could include experienced staff in the transportation department, local knowledge, or even existing relationships with donors or technical experts.

Identification of Key Success Factors

Here, planners identify what elements must be in place for the plan to actually work. It could be strong leadership, reliable funding, public engagement, or cooperation between agencies. Without these, even a good plan might struggle.

Business Unit Strategy Development

Each part of the system may require its own strategy. For instance, upgrading the bus network might follow one plan, while improving pedestrian safety might follow another. What matters is that they all support the broader transportation vision.

Balanced Scorecard Implementation:

This is more about tracking progress. The balanced scorecard method encourages planners to measure different aspects of success, not just financial results, but also service quality, user satisfaction, and environmental impact.

Continuous Evaluation:

Finally, the plan should not be treated as final. As conditions in the city change, or as certain actions succeed or fail, the strategy must be reviewed and adjusted. A good plan stays flexible and open to improvement.

These steps form the backbone of any well-organized strategic transportation plan. In a city like Damascus, where transportation issues are deeply tied to economic recovery and social stability, applying these principles carefully and contextually could make a real difference. process.

2.5 Methods and Tools for Improving Transportation Efficiency

Improving transportation efficiency requires a combination of well-informed planning practices, smart infrastructure investments, and the use of modern technological tools. Since efficiency is typically measured by comparing input costs—such as time, energy, and financial resources—to output benefits like accessibility and mobility, efforts to enhance it must address both infrastructure and system management.

One of the key methods is the optimization of traffic network structure. Well-designed networks with appropriate road hierarchies, efficient intersections, and logical connections between major activity zones can significantly reduce travel time and fuel consumption. Integrating bypass routes or ring roads, for example, can help divert through-traffic from city centers and reduce congestion.

Another important approach is the development of multimodal transportation systems that offer a variety of options beyond private vehicles. Investing in integrated infrastructure that supports public buses, light rail, cycling, and pedestrian movement enables users to choose the most efficient mode for each trip. This not only improves overall system capacity but also promotes more sustainable travel behaviors.

In addition, accessibility-based planning models have proven to be more effective than traditional mobility-focused approaches. Instead of focusing only on how fast people can move, these models prioritize how easily individuals can reach essential destinations such as workplaces, schools, and healthcare facilities. As Suryani et al. (2020) argue, planning based on accessibility can enhance both equity and efficiency by making urban systems more inclusive and functional for all users.

Technological tools also play a growing role in boosting efficiency. Intelligent Transportation Systems (ITS), for example, use sensors, data analytics, and real-time traffic management to optimize flow, reduce delays, and improve safety. Other digital tools like GIS-based modeling and transport simulation software help planners analyze scenarios, test potential improvements, and make data-driven decisions.

For a city like Damascus, where rebuilding infrastructure and restoring functionality are critical, applying a combination of these methods—tailored to local conditions—can offer significant improvements in transportation efficiency while supporting broader recovery and development goals.

2.6 Sustainable Transportation in Developing Countries:

Rapid urbanization in developing countries has brought about both new opportunities and serious challenges. According to the United Nations (2018), more than half of the world's population now lives in urban areas, and a large portion of this growth is taking place in lower- and middle-income countries. While urban centers can serve as engines of economic growth, innovation, and social mobility, they often struggle to provide the infrastructure needed to keep up with rising demand—particularly when it comes to transportation.

For many low-income populations migrating to cities in search of better opportunities, mobility becomes a daily barrier. Public transportation systems are frequently underdeveloped, unreliable, or unaffordable. As a result, people are often forced to depend on informal or unsafe modes of travel, which limits access to jobs, education, and healthcare (Khan et al., 2016; Deeter, 2015). In addition, increased reliance on private vehicles in the absence of efficient public alternatives contributes to traffic congestion, longer travel times, and higher carbon emissions.

The transportation sector plays a fundamental role in a country's socio-economic development, yet it remains one of the most neglected areas in many developing cities. Issues such as poor road conditions, lack of investment in public transport, weak regulatory enforcement, and the absence of inclusive urban planning continue to limit the potential for sustainable mobility. These challenges are often made worse by rapid population growth, informal urban expansion, and limited financial or institutional capacity.

As noted by Dwikat and Kuckshinrichs (2019) and Hasselwander et al. (2022), achieving sustainable transportation in such contexts requires more than isolated improvements; it calls for comprehensive and strategic planning that takes into account not only environmental concerns but also the economic and social realities of the urban poor. Long-term success depends on designing systems that are affordable, resilient, and adaptable—capable of serving all segments of society while minimizing environmental harm.

In cities like Damascus, where post-conflict reconstruction intersects with long-standing development challenges, adopting a sustainable transportation approach could play a key role in rebuilding equitable access, reducing emissions, and improving overall urban resilience.

2.7 Financing Sustainable Transportation Infrastructure:

Financing transportation infrastructure is one of the most critical—and often most challenging—components of building sustainable mobility systems, particularly in low- and middle-income countries. Investment in roads, public transit networks, multimodal hubs, and smart technologies not only improves daily mobility but also plays a central role in stimulating economic growth, reducing poverty, and promoting social inclusion (Eichengreen & Bodnar, 2022). However, in countries where resources are already stretched thin, identifying viable and sustainable funding sources is a complex task.

Traditionally, the most common approach has been direct public investment, where national or local governments allocate funds from their annual budgets to transportation projects. While this remains essential, public resources are often limited—especially in post-conflict

or economically struggling regions—and must compete with other pressing needs like healthcare, education, and basic infrastructure.

Domestic borrowing, typically through government-issued bonds, is another widely used financing method. This approach allows governments to raise capital for large-scale projects without immediately draining national reserves. However, it carries long-term debt obligations that must be carefully managed to avoid fiscal stress.

External borrowing from international financial institutions such as the World Bank, the International Monetary Fund (IMF), or regional development banks is also common, particularly for major infrastructure upgrades or strategic public transit projects. These loans often come with lower interest rates and technical support, but they may also include conditions that influence national policy and require transparent governance structures.

In addition to loans, some countries benefit from grants provided by international donors, especially when projects align with global development goals such as climate change mitigation, sustainable urbanization, or poverty reduction (Usabaliev, 2020; United Nations). While grants do not require repayment, they are typically competitive and limited in scope, and they often come with strict reporting and accountability standards.

To ensure long-term sustainability, many experts advocate for a diversified financing strategy that combines these sources while exploring innovative approaches such as public-private partnerships (PPPs), congestion pricing, land value capture, or carbon credit mechanisms. For cities like Damascus, creating a clear and realistic financing roadmap—aligned with urban priorities and supported by international collaboration—could be the key to building a resilient, inclusive, and future-ready transportation network.

3. METHODOLOGY

3.1 Research Design:

This study follows a mixed-methods research design, combining both qualitative and quantitative approaches to better understand the current transportation situation in Damascus

and to support the development of a five-year strategic plan. The researcher explained in advance to the subjects who participated in this study that the purpose of the study was only an academic study, and their consent for participation was obtained. The aim is to gather insight from two main perspectives: everyday users of the transportation system and professionals working in infrastructure and planning.

The research includes a current situation analysis and a SWOT analysis, which together help assess the existing challenges, identify opportunities, and highlight realistic areas for improvement. Data was collected through a combination of a public survey and semi-structured interviews, allowing for both broad trends and in-depth viewpoints to emerge.

This design was chosen to ensure that the final recommendations are not only technically sound but also grounded in the real experiences and needs of people who live and work in Damascus.

3.1.1 Qualitative Data

To better understand how people experience transportation in Damascus — and what ideas they have for improving it — I carried out a series of informal, semi-structured interviews. I spoke with people who either use the system every day or work closely on the types of infrastructure projects that shape it. These conversations added a human layer to the technical analysis and helped me see things from multiple angles.

In total, I interviewed 22 people, divided into three groups:

10 students from Damascus University. They commute from different neighborhoods using public minibuses, walking, or even bicycles. Our conversations focused on the struggles they face getting to class on time — from delays and overcrowded buses to feeling unsafe on the roads. They also shared their thoughts on how the system could be better suited to students like them.

10 engineers, mostly from civil or transportation backgrounds. These interviews were especially helpful for understanding what's realistically possible in a place like Damascus, where resources are limited. We talked about ideas for short-term improvements, what kinds of infrastructure are currently in place, and what might be achievable within the next few years. A few also shared experiences from working in other countries facing similar post-conflict challenges.

2 infrastructure company owners, both with over 15 years of experience in road and construction projects. They provided honest insight into how difficult it can be to get things done — from funding problems and material shortages to dealing with outdated regulations. Their input helped me understand the gap between what planners might want to do and what actually gets built.

I didn't use a strict questionnaire. Instead, I kept the conversations open so people could speak freely about what matters to them — whether that was the daily grind of commuting, the frustration of traffic jams, or the challenges of trying to rebuild with limited tools. I asked engineers and company owners more detailed questions about what's feasible, what's affordable, and what could work in a city like Damascus without massive investment.

A lot of useful ideas came out of these interviews — like improving signage, repainting road markings, fixing sidewalks, and adding protected bike lanes. Many of the suggestions were simple, low-cost steps that could still make a big difference. I organized all the responses manually, grouped them by theme, and used them to help shape the practical recommendations in this study.

3.1.2 Quantitative Data

The quantitative part of this study was based on a survey distributed to residents in Damascus, with a total of 200 valid responses. The goal was to understand the daily transportation habits and problems faced by the general public. The survey included a mix of multiple-choice questions and Likert-scale statements, covering:

- Mode of daily transportation (car, bus, walking, cycling, etc.)
- Commute times and distances
- Access to reliable public transport
- Cost of transportation
- Satisfaction with current options
- Safety, comfort, and infrastructure conditions

The data was collected through an online form and analysed using basic statistical techniques to identify common patterns and major issues affecting mobility. The survey results were useful in confirming many of the issues raised in the interviews, such as poor

coverage of public transport, long commute times, and the lack of infrastructure for pedestrians and cyclists.

Combining these two types of data—numbers from the public and insights from professionals—allowed for a more balanced and realistic understanding of the transportation system in Damascus, which then shaped the recommendations proposed in the strategic plan.

(All participants were informed that their responses were voluntary and would be used solely for academic purposes. For details, please refer to Appendix 5).

3.2 Data Analysis

3.2.1 Validity and Reliability

Since this research aims to offer realistic and actionable solutions for transportation planning in Damascus, it was important not only to gather data but also to make sure that the findings are reliable, relevant, and accurately reflect people's real experiences.

The data was collected using a combination of surveys and interviews. The survey focused on capturing everyday experiences with transportation from a wide range of Damascus residents, while the interviews allowed for deeper conversations with university students, engineers, and infrastructure professionals. This mix helped balance general trends with detailed, real-world perspectives.

To ensure validity, the questions in both the survey and the interviews were carefully shaped around the main research goals. Each question was created to reflect the actual conditions and challenges discussed in the literature review and the current situation analysis. For example, survey questions asked about things like daily commute time, cost, satisfaction with public transport, and thoughts on new systems like BRT — all directly related to the aim of building a strategic plan. The interview questions were flexible but still focused on themes like infrastructure, planning, and practical improvements.

The survey was tested with a few people first to check for confusing language or unclear response options. Based on their feedback, a few edits were made to make sure participants would interpret the questions the way they were intended. This helped improve content validity — making sure the questions actually measured what they were supposed to.

When it comes to reliability, the data collection process was kept consistent across all participants. The same version of the survey was used for everyone, and responses were gathered using both online and offline methods to reach different social groups. The interviews followed the same format for each group — students, engineers, and company owners — which helped make sure that each conversation covered similar topics, even if the answers were different.

The interview responses were analyzed manually and grouped into themes by looking for repeated ideas or common concerns. While qualitative analysis always involves some interpretation, I made sure to keep the focus on what was said, without adding assumptions. Themes were only included if they came up more than once or clearly aligned with the other data (for example, a common issue raised in both interviews and the survey). This helped keep the results grounded and avoid random or one-off suggestions.

In short, every effort was made to ensure that the information presented in this thesis reflects real voices and practical realities, rather than abstract theories or assumptions. The data collection process was kept structured, and the analysis was approached with care and transparency. As a result, the findings aim to be both credible and genuinely useful for informing future transportation planning efforts in Damascus.

3.2.2 Data Analysis Methods

Since this research includes both survey responses and interviews, different methods were applied to analyze each type of data, depending on the specific insights required.

For the quantitative data, which came from a survey completed by 200 residents of Damascus, the responses were first collected in a spreadsheet and organized by question. Basic statistical analysis was used to determine how many participants selected each option, and percentages were calculated to identify general trends—for example, the most commonly used transportation modes and levels of satisfaction with public transit. Although no advanced software was applied, a number of charts and tables were created to visually present the results. This approach helped reveal clear patterns, particularly in areas such as commute duration, safety concerns, and overall comfort.

For the qualitative data collected through interviews, a more open-ended and reflective approach was followed. After each conversation, the notes were carefully reviewed, and

recurring themes or strongly held opinions were highlighted. These insights were then grouped into categories such as infrastructure challenges, safety concerns, and suggestions for low-cost improvements. In interviews with engineers and infrastructure company owners, particular attention was given to practical recommendations they believed could be implemented in Damascus, examples drawn from international contexts, and views on feasible solutions that do not require substantial financial investment. While no specialized coding software was used, a simple table was created to organize the emerging themes, which served as a reference point during the development of the recommendations section.

Overall, the goal of this analysis was to connect what people are experiencing on the ground with expert advice, and use both to build a realistic plan that fits the current situation in Damascus.

4. Current Situation Analysis

This chapter presents the existing state of transportation in Damascus, combining field data collected through surveys and interviews with a detailed review of urban growth, public transport, traffic behavior, and environmental factors.

4.1 Resident Survey Findings and Public Opinion

In order to better understand the transportation issues faced by people living in Damascus, I designed and distributed a survey that reached 200 residents from different neighborhoods. The goal was to hear directly from citizens about their daily commute patterns, how satisfied they are with available transport options, and what they think could improve.

4.1.1 Overview of Participants

Most of the survey participants were 45 years or older, making up around 60% of the responses. The younger groups, especially those aged 18–24 and 25–34, were also represented equally.

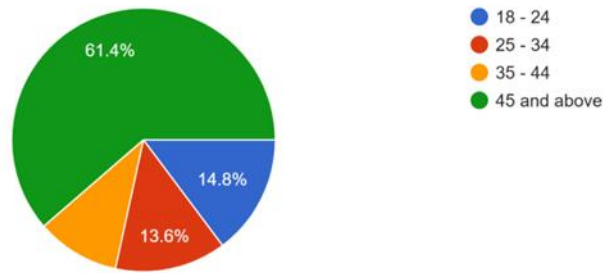


Figure 2 Age Distribution

A large portion of people (80.2%) said their main daily activity is work, which helped focus this research on work-related commuting challenges.

Since students made up a smaller group in the survey, I included extra interviews with university students to reflect their needs as well.

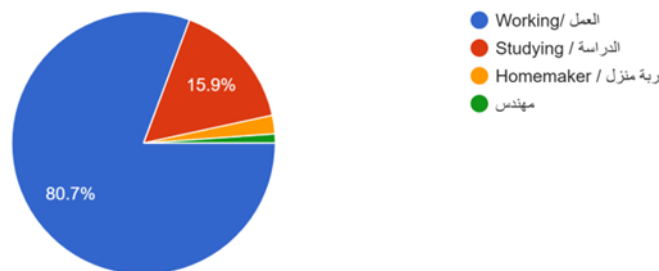


Figure 3 Main Daily Activity

4.1.2 Commuting Patterns

The most common way people get around the city is by private car—used by 52.3% of participants. Microbuses (known locally as serves) were the second most-used mode, at 27.9%. These numbers show how many people are turning to private cars as a more reliable alternative, even if it's expensive.

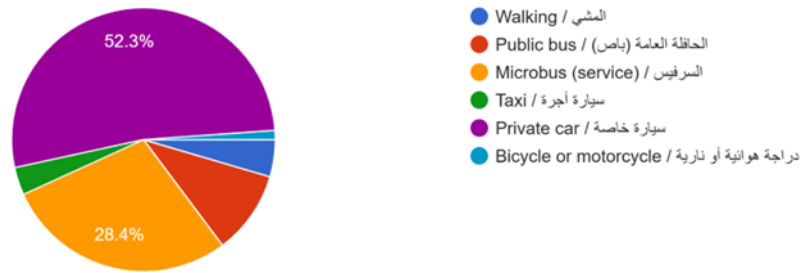


Figure 4 Main Mode of Transportation

More than half of the people surveyed said their one-way commute takes between 15 and 30 minutes, which makes sense given the number using their own vehicles. 24.4% said they spend 30 to 60 minutes commuting, which might reflect traffic delays or longer routes using public transport.

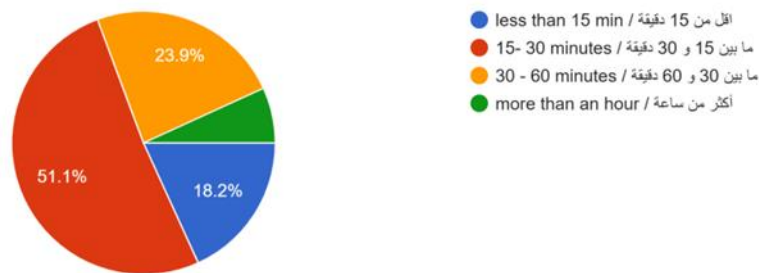


Figure 5 One-Way Commute Time

4.1.3 Transportation Costs

Transportation is one of the biggest financial burdens. 68.6% of respondents reported spending more than 8,000 SYP per day on commuting. Considering the average salary in Damascus today, this is a huge cost.

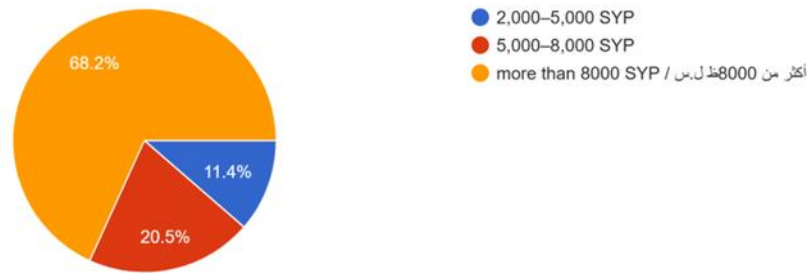


Figure 6 Daily Transportation Expenses

4.1.4 Problems and Frustrations

When asked to choose the most serious problem with transportation in Damascus, overcrowding came up most often (54.7%). This mostly applies to people using microbuses, especially during rush hours. Other complaints included the high prices, long waiting times, and poor driving conditions.

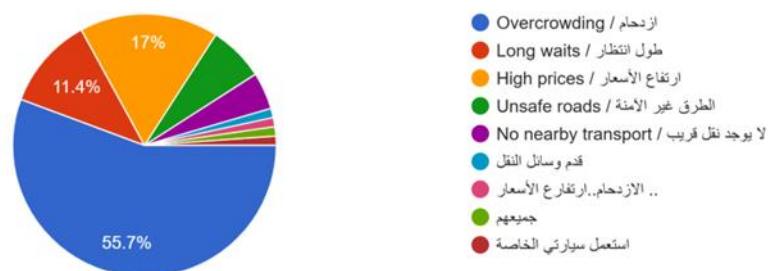


Figure 7 Top Transportation Problem

A few respondents shared that delays and missing transport cause them to be late to work often. Many also noted how chaotic the traffic is, with no clear system or updates.

4.1.5 What Residents Want to See Improved

Most participants agreed that the city needs better public transport options. 83.7% supported introducing a Metrobus or BRT (Bus Rapid Transit) system, and many said they would use it if it were affordable and reliable.

When asked about biking, 37.2% said they would use bicycles if the city had safe lanes. This shows that people are open to alternatives, but safety is a concern.

Some of the most repeated suggestions at the end of the survey included:

- Building BRT or metro lines
- Adding bus stops and signs
- Lowering transport costs
- Painting bike lanes
- Hiring more traffic police
- Making student transportation more affordable

Overall, the survey helped reveal what everyday life looks like for people trying to move around Damascus. It's clear that people feel the system is failing them, and many are spending both time and money just to get to work or school. Still, the feedback showed that people are willing to support new solutions—especially if they are practical and affordable. These findings will be used directly to shape the planning proposals in the later sections of this thesis.

4.2 Insights from Stakeholder Interviews

To go beyond the survey results and understand the bigger picture, I conducted a series of semi-structured interviews with a group of people who either use the transportation system every day or work directly on shaping it. In total, I interviewed 22 individuals:

- 10 students from Damascus University
- 10 civil engineers working in both the public and private sectors
- 2 infrastructure company owners with long-standing experience in urban projects.

These conversations offered something the surveys couldn't — the chance to ask follow-up questions, listen to stories, and understand how people personally experience or deal with the transportation system in Damascus. The format was flexible, which allowed participants to speak freely while still keeping the discussion focused on core topics like safety, cost, infrastructure gaps, and possible improvements.

The students gave a firsthand view of what it's like to commute across the city every day — often dealing with long walks, unpredictable public transport, or unsafe conditions. Their

input helped highlight how much transportation affects not just their schedules, but also their energy, focus, and motivation.

The engineers brought a different kind of perspective. Many had years of experience working on roads, traffic planning, or infrastructure projects. They talked about what could realistically be done in the short term, what technical barriers exist, and what kind of planning approach might actually work in Damascus without relying on massive budgets. Their suggestions ranged from phased BRT development to smarter traffic flow strategies.

The two company owners shared insights from the private sector side — speaking honestly about challenges like funding gaps, material shortages, and delays caused by bureaucratic procedures. They also talked about where they saw opportunities, such as small-scale upgrades, collaborations with municipalities, or using local resources more efficiently.

Together, these interviews helped me better understand not just the problems, but the possibilities. They added depth to the research and helped shape many of the recommendations in the final plan. Most importantly, they reminded me that transportation is not just about roads and vehicles — it's about how people move, how they feel doing it, and how much easier life could be with even small improvements.

4.2.1 Student Perspectives

Interviews with 10 students from Damascus University provided a clearer, more personal view of what it means to commute in the city as a young person. Each student had a slightly different routine, but many shared common frustrations — particularly about safety, reliability, and how transport stress impacts their daily lives.

Some students walk long distances to get to class, especially those living in neighborhoods like Bab Sharqi, Rukn al-Din, or Qanawat. A few of them mentioned that it can take 30 to 45 minutes on foot, and that the walking conditions are often unpleasant or unsafe. Damaged sidewalks, missing pedestrian crossings, and aggressive driving were mentioned repeatedly. One student said, “You always feel like you're walking next to danger — even the sidewalks feel temporary.” Another added that she avoids using her phone while walking because she constantly has to watch the street.

Several others rely on public minibuses (servees), which they described as cheap but unpredictable. Complaints ranged from long waiting times to overcrowding, and even rude behavior from drivers. A few students mentioned that the buses often skip stops or change routes without notice, making it hard to plan ahead. “Some days it takes me 20 minutes. Other days, I’m standing for 40 minutes just waiting for a bus to stop,” one student explained.

Interestingly, two students commuted by bicycle — a choice they made to save time and money. But both were clear that cycling in Damascus feels risky. “There are no bike lanes, so you end up riding between buses and taxis,” said one, who lives in Al-Midan. He added that although biking helps him avoid traffic jams, it’s mentally exhausting to stay alert all the time. Another cyclist from Mazzeh said he had almost been hit twice in one week. Still, he preferred biking over public transport, simply because “at least I’m in control of my time.”

When asked about the effect of transportation on their academic performance, almost all students said it played a role. Some admitted that they miss early lectures or arrive tired, especially during winter or exam periods. A few also said the commute discourages them from attending optional workshops or group study sessions.

What stood out the most in these conversations was how deeply transportation is tied to students’ routines, energy levels, and sense of safety. Even simple improvements — like clearer signage, fixed sidewalks, or a student discount for transport — were seen as things that could make a big difference.

4.2.2 Civil Engineer Perspectives

Talking to 10 civil and transportation engineers gave me a clearer sense of what might actually be possible in Damascus — not just in theory, but in practice. These professionals had experience in both public and private sector work, and many had been involved in urban or infrastructure projects inside Syria or abroad. While they didn’t all agree on everything, one thing was clear: there is room to improve, but it has to be done gradually and based on the city’s current capacity.

Several engineers mentioned that a Bus Rapid Transit (BRT) system could be a step forward, but not in its ideal form right away. “There’s no point in talking about BRT unless you have

proper roads,” one of them said. Others echoed that point — explaining that the existing streets would need to be widened or redesigned to create dedicated lanes. Without that, adding more buses might just add to the congestion.

Another recurring idea was the creation of a unified transit card, inspired by models like Istanbulkart. A few of the engineers had either worked in Turkey or studied how their transport system works, and they praised the simplicity of having one card that works for buses, metro, ferries, and even shared bikes. They believed a similar card in Damascus — with reduced fares for students and low-income groups — could help regulate pricing, cut down on cash handling, and make public transport more appealing to regular users.

There were also discussions about small-scale, low-cost changes that could make a big impact, especially in the short term. Some of the ideas that came up more than once included:

Bus-only lanes during rush hours, even if they're temporary or shared.

Feeder routes from outlying neighborhoods to main bus corridors, so people don't have to rely on multiple disconnected minibuses.

Incorporating bike lanes when new roads or sidewalks are being built — not as a full network at first, but as a long-term habit in planning.

Upgrading traffic signals with smart systems that adjust based on flow, but only once the road conditions are improved enough to make them effective.

Most of the engineers emphasized that none of these improvements work in isolation. “You can't just put a bus lane and expect miracles,” one said. The point they were making was that even small upgrades need to be part of a larger plan — one that considers maintenance, public education, and realistic budgets.

Many of them also talked about the importance of public trust. “If people see things working — even small things — they'll start believing that change is possible,” an older engineer told me. That perspective really stood out, because it reminded me that infrastructure isn't just about concrete and asphalt — it's about how people feel moving through their city.

4.2.3 Infrastructure Company Owner Perspectives

The two infrastructure company owners brought a more ground-level view of the challenges. With over 15 years of experience in road and utility projects, they were realistic but hopeful. Their focus was on the condition of roads, sidewalks, and drainage systems. They explained that in many areas, simple upgrades — such as paving damaged roads, repairing stormwater systems, and improving lighting — would have an immediate impact on mobility and safety.

One of them said:

“People always talk about huge plans like metro lines, but most neighborhoods just need working roads and better lighting to make a difference.”

Both also highlighted the lack of coordination between infrastructure works. Roads are often repaired, then dug up again for water or electric lines, due to poor planning between government agencies.

Their main suggestion was to start with basic maintenance and gradually introduce higher-level improvements like smart signals, better signage, and street design improvements.

4.3 Urban Growth and Transportation Demand

Damascus has experienced significant urban expansion over recent decades, driven by factors such as population growth, internal migration, and the impacts of conflict-related displacement. This rapid growth has not been accompanied by proportional development in transportation infrastructure, leading to increased pressure on the city's transport systems.

According to a report by the European Union Agency for Asylum (2022), the built-up area around Damascus grew by over 35% between 2005 and 2020, much of it in informal settlements that were established without coordinated planning. These neighborhoods often lack proper roads and access to reliable public transportation, leaving many residents isolated or forced to rely on expensive or inefficient alternatives.

The public transport system in Damascus is primarily composed of privately operated minibuses and a limited fleet of state-owned buses. These services face challenges in coverage, frequency, and reliability. For instance, a report by Enab Baladi (2024) highlighted that transportation fares within Damascus have increased by up to 300% due to fuel

shortages and the absence of subsidized diesel, placing a significant financial burden on commuters.

One clear example of the challenges faced by residents is the experience of Omar, a third-year student at Damascus University. Living in Al-Hajar Al-Aswad, a district around 10 kilometers south of central Damascus, he found it increasingly difficult to reach his campus on time using public transport. "I missed several lectures and even a midterm because the buses were full, late, or didn't show up at all," he said. As a result, Omar now rides a bicycle every day to reach the university—a 10 km trip each way through heavily congested streets, without any designated bike lanes or safety measures. "It's dangerous and exhausting," he added, "but at least I know I'll get there."

This growing dependence on private solutions—whether bicycles, motorcycles, or personal vehicles—is a response to the systemic failure of the city's transport network. However, increased private car use has only worsened congestion, particularly on main routes such as Mezzeh Autostrade, Bab Touma, and the road to Abbasiyyin Square. Limited parking, outdated road signals, and a lack of traffic enforcement further reduce the efficiency and safety of the network.

"There's no proper link between new buildings and roads — everything is built chaotically," said an urban planner currently working with the Damascus municipality. The lack of integration between urban development and transportation systems is a core issue. New housing projects and informal settlements are built without considering how residents will actually move around the city.

In summary, the combination of unplanned urban growth and a neglected transport system has created a mismatch between demand and capacity. Addressing this problem will require a strategic, long-term approach that prioritizes public transport investment, multimodal access, and coordination between housing and infrastructure development.

4.4 Public Transportation Systems

Damascus's public transportation system has long been a mix of informal and formal services, heavily reliant on privately operated minibuses and a much smaller number of public buses. This system has struggled to keep up with the needs of the city's growing

population, particularly after the war severely damaged infrastructure and reduced state capacity (European Union Agency for Asylum, 2022).

As of late 2024, the total number of buses operating in Damascus had dropped considerably. Reports indicated that the public sector's fleet was reduced from around 100 buses to just 60, while the private sector operated approximately 130 buses (Syrian Observatory for Human Rights, 2022). The decline is largely due to chronic fuel shortages, poor vehicle maintenance, and the absence of coordinated investment in public transport.

The microbus system—which once offered a more agile, decentralized alternative—has also deteriorated. Drivers often adjust fares arbitrarily, and the lack of oversight makes the system unpredictable. Fares have risen dramatically in recent months, jumping from around 1,000 SYP to as high as 4,000 SYP per ride in some parts of the city (Enab Baladi, 2024). This increase has placed an enormous financial burden on working-class commuters and students.

University students, in particular, have been hit hard by the public transport crisis. A December 2024 report by Rozana Radio noted that students traveling from suburbs such as Jaramana and Qudsaya often wait two to three hours for a microbus. In many cases, they are forced to use taxis that cost up to 7,000 SYP for a single ride—an unsustainable amount given the average state salary (Rozana FM, 2024).

Some residents have responded by volunteering to restore basic order in the absence of formal traffic management. In the Baramkeh district, for example, a man named Mahmoud has taken it upon himself to organize traffic for over eight hours daily, stepping in where the city's traffic police are absent (Enab Baladi, 2025). While commendable, these grassroots efforts are far from a permanent solution.

As the public system falters, reliance on private vehicles continues to rise. This has caused massive traffic congestion, especially on main arteries such as Mezzeh Autostrade, Abbasiyyin Square, and the Bab Touma area. The road infrastructure, never designed for such high volumes of traffic, has become overwhelmed. With no clear plan to encourage public transit use, gridlock remains a daily issue for residents (European Union Agency for Asylum, 2022).

In summary, the public transport system in Damascus is in critical condition. The sharp reduction in bus availability, unregulated fare inflation, and general lack of system

coordination have left many residents struggling to access schools, jobs, and essential services. Without targeted reform and infrastructure investment, mobility in the city will continue to deteriorate.

4.5 Private Car Use and Congestion

In recent years, private car ownership in Damascus has steadily increased, despite the high costs of vehicles. While owning a car remains a luxury for many, the absence of reliable and affordable public transportation options has pushed more residents to buy vehicles. However, the majority of cars on the roads are not new models but used, older vehicles that are often in poor condition. Due to import restrictions and the high prices of new cars, many people have no choice but to purchase second-hand cars, often from the pre-conflict era, which are known for their low quality and frequent mechanical problems. According to The New Arab (2021), a used car in Syria can cost anywhere \$8,000 to \$20,000 USD, a hefty sum for most families.

While these older cars are more affordable compared to new vehicles, they come with their own set of challenges. Many of these used cars are in poor condition, often requiring expensive repairs and parts that are not always readily available. As a result, drivers frequently experience breakdowns, adding to the frustration of commuting in an already congested city (Enab Baladi, 2025). In addition to mechanical issues, these older vehicles contribute significantly to air pollution, as they tend to have higher emissions compared to newer, more efficient models.

Despite the challenges, owning a car has become a necessity for many residents of Damascus. In the absence of effective public transport, private cars offer a degree of freedom and convenience that buses and microbuses cannot provide. However, the increased number of vehicles has put tremendous pressure on the city's road infrastructure. Popular areas such as Mezzeh Autostrade and Abbasiyyin Square are often gridlocked, particularly during rush hours, with long traffic jams becoming a daily occurrence (Enab Baladi, 2025).

Another significant issue that arises from the increased use of private cars is the shortage of parking spaces. As more people buy cars, finding parking in central areas becomes nearly impossible. In neighborhoods like Kassa'a and Salhieh, residents often resort to parking on sidewalks, in spaces designated for pedestrians, or even on main roads. According to Enab

Baladi (2025), parking spaces are so scarce that many drivers are forced to park illegally, further contributing to the city's already chaotic traffic conditions.

Fuel prices have also increased in recent years, making it even more difficult for car owners to maintain their vehicles. In 2024, fuel prices surged again due to the ongoing economic crisis and sanctions, placing a heavier burden on those who depend on their cars for daily transportation (Rudaw, 2025). For example, some residents have reported spending a significant portion of their monthly income—up to 20%—just on fuel, further highlighting the financial strain of car ownership (Rozana FM, 2024).

Moreover, the reliance on old, used cars has contributed to worsening air quality in the city. According to the World Health Organization (2022), Damascus is one of the most polluted cities in the region, with vehicle emissions playing a major role in this pollution. As more people buy old, inefficient vehicles, the environmental impact continues to grow, affecting the health of residents and contributing to respiratory issues and other health problems.

In conclusion, while private car ownership in Damascus has increased, it comes with a host of challenges. The cars that many residents purchase are often old, low-quality vehicles that break down frequently and contribute to traffic congestion and air pollution. To address these problems, Damascus needs a comprehensive approach that includes improvements to public transportation, better road infrastructure, and policies that reduce the reliance on private vehicles for daily commuting.

4.6 Infrastructure Condition

Damascus's infrastructure has been severely impacted by over a decade of conflict, leading to widespread degradation and insufficient maintenance. While central areas like Salhieh and Baramkeh have roads that are generally in passable condition, they still suffer from a lack of regular maintenance and modernization. These roads, though functional, are outdated and cannot accommodate the increasing traffic demands.

The real challenges arise in the roads linking Damascus to its eastern suburbs, especially Ghouta, Harasta, and Jobar. These routes are in a state of disrepair, with significant damage to the road surfaces, frequent potholes, and inadequate drainage systems. The lack of proper

maintenance and the absence of urban planning have turned these roads into bottlenecks, causing severe traffic congestion and posing safety hazards to commuters.

Residents of these areas have expressed frustration over the deteriorating road conditions. For instance, a local resident from Harasta mentioned, "The roads here are a disaster. They're full of holes, and during the rainy season, they turn into rivers. It's dangerous and time-consuming to travel." Such sentiments are common among residents who rely on these roads for daily commuting.

Efforts to address these issues have been limited. While there have been some initiatives to clear rubble and reopen roads in districts like Qaboun and Tishreen, these efforts are often piecemeal and lack long-term planning. The absence of a cohesive strategy for infrastructure development exacerbates the problems faced by residents in these suburbs.

In conclusion, the infrastructure connecting Damascus to its eastern suburbs is in dire need of attention. Without comprehensive planning and investment in road maintenance and development, the challenges of traffic congestion and safety hazards will continue to impede the daily lives of residents.

4.7 Traffic Management

Traffic management in Damascus faces considerable challenges due to years of conflict, uncontrolled urban expansion, and neglected infrastructure. Many signalized intersections across the city are either not synchronized or out of service entirely, largely due to electricity shortages and lack of maintenance (Enab Baladi, 2025a). In areas where traffic lights are down, officers or even local volunteers are often seen manually managing intersections to prevent complete gridlock (Enab Baladi, 2025a).

According to Eng. Khaled A., a senior official at the Ministry of Transport, "most of the traffic signals in central Damascus haven't been upgraded in over a decade. Our teams are working with minimal resources, and even simple repairs are often delayed due to lack of funding or spare parts" (Personal communication, April 2025).

High-traffic areas such as Mezzeh, Baramkeh, and Abbasiyyin suffer from daily congestion, exacerbated by the high number of informal transport vehicles like minibuses that stop unpredictably in traffic lanes (Enab Baladi, 2025a). Eng. Khaled noted that one of the main

causes of congestion is the lack of discipline on the road: "Drivers are frustrated, and there's no respect for lanes or signals. Without better enforcement, the system won't improve even if we repair the infrastructure."

In addition to driver behavior, road infrastructure is another critical issue. Lane markings are faded or missing in many parts of the city, and signage is either inconsistent or entirely absent, making navigation difficult, especially for newcomers or delivery drivers (Enab Baladi, 2025a).

There is currently no centralized system to collect real-time traffic data. Surveillance cameras are limited in number and are not integrated into a smart traffic control center. Enforcement is mostly reactive rather than proactive, due to a shortage of trained personnel and limited access to digital tools (Enab Baladi, 2025a).

To address these gaps, the Ministry of Transport has proposed creating transfer stations at the city's entrances. These would help regulate traffic entering the city and provide organized public transit connections (Enab Baladi, 2025b). Meanwhile, the Ministry of Interior is working on equipping the traffic police with updated tools and launching campaigns to raise public awareness (Enab Baladi, 2025c). However, as Eng. Khaled emphasized, "these initiatives are a good step, but they will remain cosmetic unless we build an integrated system with proper funding and accountability."

In summary, traffic management in Damascus requires both technical upgrades and institutional reform. Without a holistic approach that combines infrastructure investment, policy enforcement, and public cooperation, mobility in the capital will remain inefficient and chaotic.

4.8 Environmental and Safety Concerns

In recent years, Damascus has not only been struggling with traffic congestion and outdated transport systems, but also facing growing concerns related to air quality and road safety. The transportation sector, especially with its ageing vehicle fleet and lack of regulation, has become one of the main contributors to pollution in the city.

Walking through the city during rush hours, especially in areas like Bab Musalla or around al-Mujtahid Hospital, it's easy to notice the thick layer of vehicle emissions hanging in the

air. Much of this comes from the large number of old diesel-fueled minibuses and private cars that have been running without proper maintenance or inspection for years. According to reports, there is currently no active vehicle emissions testing system in place in Damascus, which means even the most polluting vehicles stay on the roads without restriction (Enab Baladi, 2024a).

As Eng. Khaled A., a transportation manager at the Ministry of Transport, shared in our interview:

“Most of the buses and minibuses you see on the streets are more than 20 years old. They pollute a lot, but they’re still running because people have no other option. We don’t have the resources yet for a proper emissions testing program or fleet renewal.”

Besides the environmental damage, transportation in Damascus is also becoming increasingly dangerous. Traffic accidents have become a regular occurrence, often caused by poor road conditions, lack of clear signage, and careless driving. In 2023 alone, more than 1,500 serious accidents were recorded in the city—many of them involving pedestrians or motorcycles (Enab Baladi, 2024b). Speeding, ignoring traffic signals, and unsafe overtaking are common, especially among informal transport drivers trying to squeeze in more trips during the day.

Safety infrastructure is also weak. Many roads lack proper lighting at night, and pedestrian crossings are either missing or not respected. “We’ve lost count of how many complaints we get from residents about dangerous intersections,” Eng. Khaled said. “Some areas haven’t had their road markings repainted in years. People are simply crossing where they can and hoping for the best.”

There have been some efforts to respond to these challenges. Local authorities recently started repainting lines and repairing traffic lights in a few key areas, and awareness campaigns on traffic safety have been aired occasionally on local media (Enab Baladi, 2025a). But these actions remain limited and often short-lived. They’re not yet part of a larger vision for improving environmental sustainability or making streets safer for the people who use them every day.

As Khaled noted with concern:

“We can’t keep reacting after accidents happen or when pollution peaks. We need a plan—a real one. One that connects transportation with health, environment, and safety. Until then, we’ll just be stuck in the same cycle.”

5. SWOT Analysis

A thorough SWOT analysis of the transportation system in Damascus helps to understand the current landscape and identify realistic paths for strategic improvement. The insights presented here are shaped by field observations, interviews, and recent developments affecting Syria’s transportation planning.

5.1 Strengths

One of the key advantages Damascus holds is its compact and centralized urban layout. Unlike many sprawling cities, most of Damascus's residential and commercial areas are within relatively short distances. This structure supports the feasibility of mass transit systems like BRT or light rail, which are most efficient in dense environments.

Additionally, public transport is already a core part of daily life for many residents. While the current system is unorganized, the habit of using shared rides—such as minibuses, service taxis, and informal vans—is deeply ingrained. This presents a cultural readiness for adopting formal public transportation if improved options are introduced.

Moreover, government agencies such as the Ministry of Transport still retain knowledgeable engineers and planners who understand the city’s infrastructure and the practical limitations on the ground. Their experience is a valuable asset for both short-term improvements and long-term planning.

5.2 Weaknesses

Despite these strengths, the transportation system in Damascus suffers from deep-rooted weaknesses. A major concern is the state of physical infrastructure. Roads are often damaged or poorly maintained. Traffic signals are outdated or non-functional, and essential components like road markings and signage are missing in many areas.

There is also a critical lack of enforcement of traffic laws and regulations. Vehicles rarely undergo emissions testing or safety inspections, allowing unsafe and polluting cars to remain on the road. This contributes to both environmental harm and higher accident risks.

Planning efforts are typically fragmented, often carried out in response to emergencies or complaints rather than as part of a cohesive strategy. Finally, financial constraints remain a major barrier. With limited municipal budgets, investment in infrastructure, new vehicles, or traffic control systems is extremely restricted.

5.3 Opportunities

As the city enters a reconstruction phase, there are strong opportunities for improving transportation. One of the most recent and impactful developments is the lifting of U.S. economic sanctions on Syria. This change is expected to open new doors for economic recovery, making it easier to import materials, vehicles, and smart systems needed for transport reform (Al Jazeera, 2025).

This policy shift also increases the likelihood of international partnerships and access to global aid or development programs. Organizations previously limited by sanctions can now offer technical and financial support for urban mobility initiatives. This includes sustainable transport projects, electric vehicle infrastructure, and digital ticketing systems.

Additionally, low-cost smart technologies can be introduced to optimize existing resources. Improvements such as synchronized traffic signals, real-time tracking apps, and centralized control centers can significantly increase efficiency without requiring massive investment.

Perhaps most importantly, public support for change is growing. Frustration over delays, pollution, and road safety has created a social environment that may support reform if it is well-communicated and implemented inclusively.

5.4 Threats

Nonetheless, serious threats continue to challenge any progress. Political instability, economic volatility, and uncertainty about long-term international relations can all stall reforms and discourage both public and private investment.

Environmental degradation is another urgent concern. With high numbers of old diesel vehicles on the roads and little oversight, pollution levels continue to rise. Without action, this will have serious public health consequences and worsen overall quality of life.

Urban sprawl is becoming another issue as people move further away from the center, often due to housing shortages or affordability. Without integrated planning, this could stretch transport networks too far, making them harder to manage and less efficient.

Finally, resistance to change—particularly from informal transport operators—could delay reforms. These actors rely on the flexibility and profitability of the current unregulated system. Introducing new policies or systems will require careful negotiation to ensure they are not left behind.

6. Vision, Goals, and Strategic Objectives

Building on the findings of the SWOT analysis, this chapter defines a clear and realistic vision for the future of transportation in Damascus, alongside structured goals and strategic objectives. These serve as a guiding framework for developing policies, projects, and investments that are both practical and transformative.

Establishing a clear vision and aligning it with achievable goals is crucial to move from analysis to action. By turning weaknesses into strengths and threats into opportunities, these goals provide a roadmap for addressing current challenges and preparing for future growth.

6.1 Vision Statement

To establish a safe, reliable, inclusive, and environmentally sustainable transportation system in Damascus that improves daily life, supports economic recovery, and contributes to long-term urban resilience.

6.2 Strategic Goals

1. **Accessibility and Mobility:** Damascus must ensure that residents in both central and peripheral areas can access efficient, affordable, and reliable transport services. Equal access helps reduce inequality and boosts social cohesion.

2. **Enhance Road and Traffic Safety:** Traffic safety must go beyond enforcement. Upgrading pedestrian zones, restoring lighting, and promoting safer driving behaviors through education are all critical to saving lives.
3. **Modernize Public Transport Services:** Reforming the informal transport sector and modernizing the public fleet can restore order and reliability to daily travel. Integration and regulation will help boost public confidence and usage.
4. **Promote Environmental Sustainability:** Cleaner vehicles, emissions control, and support for cycling and walking will reduce the environmental footprint of the transport system and improve urban health.
5. **Support Economic Recovery and Job Creation:** Transport projects can serve as engines of recovery by creating jobs, encouraging local supply chains, and reviving essential services across the city.

6.3 Strategic Objectives

The following objectives are designed to translate the vision and goals into measurable and achievable steps. They reflect both short-term priorities and medium-term reforms that are essential for system-wide transformation:

- Introduce a Bus Rapid Transit (BRT) system on at least two high-demand corridors within the next five years.
- Implement basic traffic control systems and restore signal lights at 80% of critical intersections within three years.
- Launch a vehicle inspection and emissions testing program targeting commercial vehicles and minibuses.
- Develop three multimodal transfer stations on the city's edges to regulate incoming traffic and reduce congestion in the city center.
- Establish a centralized traffic control center with digital monitoring, supported by mobile-based route apps for public use.
- Initiate awareness campaigns on road safety, environmental health, and public transport benefits.

7. Realistic Five-Year Strategic Plan for Transportation in Damascus, Syria

7.1 Normal Budget Plan (reasonable/local scenario)

Following the development of a clear vision and strategic goals, this chapter proposes a realistic five-year plan to guide transportation reform efforts in Damascus. The plan is structured around achievable, phased actions, designed to respond to the city's current conditions while laying the groundwork for long-term transformation. Each year is planned to build on the previous one, allowing both institutional adaptation and community engagement to evolve progressively.

7.1.1 Year 1: Laying the Groundwork

The initial year of the plan focuses on foundational steps. Before any large-scale intervention can succeed, a detailed understanding of the city's transportation landscape is required. A comprehensive traffic and infrastructure audit—especially in central and high-demand corridors—will be conducted to map existing gaps and challenges.

In parallel, visible improvements will begin in the form of restoring traffic signals and repainting faded road markings in selected districts. These actions, while basic, can have an immediate impact on safety and driver behavior. To begin addressing environmental concerns, a pilot emissions testing program will be introduced on a limited scale for public minibuses operating on a major corridor. Public engagement will also start early through awareness campaigns focused on traffic discipline, pedestrian safety, and the benefits of shared and formalized transport.

7.1.2 Year 2: Regulation and Pilot Projects

The second year moves from assessment to action. Building on the emissions pilot, the testing program will expand to include taxis and delivery vehicles. More robust regulatory enforcement will accompany this expansion to improve compliance.

One of the most critical interventions in this phase is the launch of a pilot Bus Rapid Transit (BRT) line. A corridor like Mezzeh–Baramkeh offers both demand and space for a controlled BRT route, providing a real-time demonstration of organized mass transit. Simultaneously, construction will begin on the first multimodal transfer station at a major

city entrance, helping to channel and regulate traffic before it enters congested inner zones. A central traffic monitoring unit will also be launched to begin collecting data and responding to incidents with improved coordination.

7.1.3 Year 3: Service Integration and Expansion

Once pilot systems are tested, the third year will focus on expanding and integrating them. A second BRT corridor will be launched, building on lessons from the first. Select segments of the public transport fleet will be equipped with GPS tracking and digital fare systems to improve reliability, transparency, and accountability.

Physical safety infrastructure will be prioritized citywide, especially in accident-prone areas. This includes new pedestrian crossings, traffic calming measures like speed bumps, and updated signage. Informal transport operators will be engaged through a cooperative-based approach, offering support and incentives to transition into the formal system. This helps preserve livelihoods while moving toward a more predictable and safer network.

7.1.4 Year 4: Infrastructure Deepening and Policy Reform

The fourth year emphasizes deepening the network and introducing structural reforms. All three planned multimodal transfer stations will be completed, ensuring that traffic flow into the city is better managed. Municipal policies will be passed to mandate periodic safety and emissions inspections for all commercial fleets, institutionalizing environmental responsibility.

Smart mobility tools will expand, including public apps showing real-time arrival data and optimized routes. Traffic lighting and visibility will be improved citywide, especially in outer districts and areas with high nighttime activity, enhancing road safety and access for all users.

7.1.5 Year 5: System Optimization and Sustainability Initiatives

The final year is dedicated to evaluating progress and planning for continuity. Comprehensive data on emissions, congestion, public satisfaction, and safety outcomes will be reviewed. Based on this, new recommendations will be developed to guide the next planning phase.

Where feasible, environmentally friendly innovations—such as introducing small-scale electric buses or creating low-emission corridors—will be piloted. A long-term national or municipal transport policy will also be drafted, using insights from the five-year period to inform strategic investments. Finally, a formal capacity-building program will be introduced to train a new generation of transport planners, drivers, and enforcement staff, ensuring the sustainability of reforms.

This five-year strategic plan is designed to be ambitious yet grounded in Damascus's present-day context. By breaking change into manageable phases and engaging both institutions and the public, it provides a clear, adaptable roadmap for recovery and modernization.

7.2 High-Budget Five-Year Strategic Plan for Transportation in Damascus, Syria (International Investment Scenario with Global Partnerships & Smart Mobility)

If Damascus had access to international investment and expert support, the transformation of its transportation system could move faster and go much deeper. This version of the five-year plan imagines what could happen with big funding, new technologies, and smart policies—all designed to make the city cleaner, more connected, and easier to move around in.

7.2.1 Year 1 – Getting Organized

Before anything major can happen, we need to set things up right. In this first year, the city will launch a dedicated Urban Transport Authority to handle all future mobility upgrades. With the help of international advisors, the city will start building a full mobility master plan using high-tech mapping tools and satellite imagery.

Other key steps:

- Create detailed maps of traffic flow, street quality, and accident zones.
- Start upgrading dangerous intersections with smart traffic lights.
- Launch awareness campaigns to introduce people to ideas like clean transport and shared mobility (including bike and scooter use).
- Begin training programs for city staff in collaboration with international partners.

7.2.2 Year 2 – Big Moves: BRT, TOD, and First Shared Mobility Apps

The second year marks the start of major visible changes. A high-speed electric Bus Rapid Transit (BRT) line will be built along one of the city's busiest corridors, with modern stations and a cashless payment system. Areas around the stations will be designed as "mobility hubs," with places to live, work, shop—and switch between transit modes.

Also, this year:

- Damascus will introduce shared mobility apps, starting with electric scooters and bikes in high-density areas like downtown, university districts, and tourist zones. These will give people a quick, cheap, and clean way to travel short distances.
- Launch a city-wide mobility card that works for buses, light rail, and shared scooters.
- Build the first urban logistics hub outside the city to handle cargo before it enters busy areas.

7.2.3 Rail Upgrades & Scooters Go Citywide

This year focuses on bigger connections. The old suburban rail line from Al-Rabweh and beyond will be modernized into a light rail system using electric trains. Park-and-ride facilities will make it easier for people to leave their cars outside the city.

More changes:

- The scooter and bike-sharing systems will expand to all major neighborhoods and be fully integrated into public transport apps—so people can plan a trip from bus to scooter in one go.
- Add charging docks for e-scooters and bikes across the city.
- Build new lanes and parking for micro mobility to avoid sidewalk clutter.
- Launch public campaigns teaching safe scooter use and encouraging helmet adoption.

7.2.4 Year 4 – Smart City Tools and Safer Streets

Now that the main systems are in place, the city shifts to smarter, safer operations. A mobility control center will manage real-time data from traffic lights, buses, trains, scooters, and even parking zones.

This year includes:

- Full rollout of an app that shows live arrival times, scooter availability, and the best routes.
- Pilot a small fleet of self-driving electric shuttles for short trips in business zones.
- Improve pedestrian crossings and lighting in outer districts to support micro mobility safety at night
- Organize e-scooter parking zones in key districts to reduce sidewalk congestion.

7.2.5 Year 5 – Future-Proofing the System

In the final year, it's time to look back, measure progress, and make plans for what's next. The city will gather data on everything: air quality, commute times, public feedback, and how widely scooters and bikes are used.

Final touches:

- Expand electric minibuses and shared scooters to suburbs and park areas.
- Launch a national-level transport policy focused on clean, shared, and electric mobility.
- Create a permanent training program for urban transport staff and micro mobility operators.
- Join international climate and “smart city” groups to attract even more funding and ideas.

8. Plan Implementation (First scenario)

To transform vision and strategy into tangible outcomes, a well-structured implementation strategy is necessary. This chapter outlines how the proposed five-year transportation plan can be practically delivered. It defines the roles of institutions, identifies needed resources, and anticipates the coordination and challenges that may shape the execution of this plan. An effective implementation approach ensures that even in a context like Damascus—facing political, economic, and infrastructural limitations—progress can be steady, adaptive, and grounded in local realities.

8.1 Purpose of the Implementation Plan

The purpose of this chapter is to bridge the gap between planning and action. While the strategic plan identifies what needs to be done and when, the implementation strategy outlines how these steps will be achieved on the ground. Without this framework, even well-

designed initiatives can remain unexecuted due to confusion over responsibilities, lack of coordination, or resource shortages. This chapter aims to ensure that the strategic plan is not only visionary but also actionable.

8.2 Institutional Roles and Responsibilities

Effective implementation begins with clearly defined roles for all key actors. The Ministry of Transport will lead the policy direction, set national standards, and coordinate inter-agency alignment. The Damascus Municipality will take on the operational management of the projects, including road works, signage upgrades, and coordination with local police and utility agencies.

Public transport unions and associations will be crucial in integrating informal transport providers into the formal system, especially through cooperative frameworks. NGOs and academic institutions may support with research, pilot evaluations, and training programs. If international agencies are engaged post-sanctions, they could provide funding, technical expertise, or project oversight. Clear channels of communication and reporting structures among all stakeholders will be established to support cooperation and prevent duplication or delays.

8.3 Resource Allocation and Funding Mechanisms

Financing the five-year plan requires realistic assessments of what can be achieved with available resources. Funding is expected to come from a combination of municipal budgets, central government allocations, and international aid or partnerships where possible. Priority will be given to low-cost, high-impact interventions in the first two years, such as traffic signal repair, public education campaigns, and regulatory enforcement mechanisms.

Public-private partnerships (PPPs) may be explored for BRT development, fleet upgrades, or technology platforms. Local construction firms and manufacturers should be prioritized in procurement to support job creation and economic recovery. Budgeting will be done on a rolling basis, reviewed annually, and adapted based on performance data and external developments.

8.4 Stakeholder Engagement

Public involvement is key to the long-term success of the plan. Local communities must be engaged through awareness campaigns, neighborhood consultations, and feedback platforms. When people understand the goals of reform and how it benefits them, resistance can turn into cooperation. Special attention will be given to transport workers and informal operators, ensuring that they are not excluded or penalized but supported in their transition into a regulated system.

Women, people with disabilities, and other marginalized groups will be actively consulted in designing safe, accessible infrastructure. Clear communication strategies—using radio, local media, and digital tools—will help maintain transparency and trust between the public and authorities.

8.5 Risk Management and Flexibility

Damascus faces a volatile environment, and risk management must be built into the implementation framework. Political instability, inflation, or supply shortages may disrupt the timeline. To mitigate this, the plan is designed to be modular—each phase builds on the last, but also can stand alone if delays occur.

A risk matrix will be developed identifying potential threats and pre-agreed responses. Flexibility will also be supported by regular inter-agency coordination meetings, where stakeholders can adjust approaches and timelines without undermining the overall plan.

9. Monitoring, Evaluation, and Performance Measurement for the Damascus Transportation Strategy

Monitoring and evaluation (M&E) are essential components of any strategic plan, especially in a context as complex and rapidly evolving as Damascus. A transportation plan can only succeed if its progress is regularly assessed, its shortcomings identified early, and its direction adjusted when needed. This chapter presents the M&E framework for the five-year transportation strategy, including performance indicators, institutional responsibilities, and mechanisms for feedback and adaptation.

9.1 Purpose and Importance of Monitoring and Evaluation

The goal of M&E is to ensure that strategic objectives are not only pursued, but actually achieved. Monitoring provides continuous oversight of ongoing activities, while evaluation assesses their effectiveness and relevance over time. In the case of Damascus, M&E is particularly critical due to the uncertainty surrounding political, economic, and infrastructural conditions. By embedding M&E into the strategy from the beginning, authorities can stay responsive, transparent, and accountable to both residents and stakeholders.

9.2 Key Performance Indicators (KPIs)

To track meaningful progress, specific and measurable performance indicators will be developed for each strategic goal. These indicators will help monitor both outcomes and outputs throughout the five-year period. Examples of KPIs include:

- Number of functioning traffic signals restored in high-risk intersections
- Kilometers of BRT corridors operational and serving passengers
- Reduction in average commute time on targeted routes
- Increase in public transport ridership and decrease in private car use
- Number of vehicles passing annual emissions inspections
- Reduction in traffic accident rates, especially involving pedestrians
- User satisfaction scores from commuter surveys

Each KPI will have an associated target, timeline, and responsible institution to ensure clarity and accountability.

9.3 Data Collection and Reporting Mechanisms

Reliable and consistent data collection is the backbone of a successful M&E system. Data will be collected quarterly through field surveys, transport authority reports, digital tools (GPS tracking, ticketing systems), and third-party audits where possible. Progress reports will be compiled biannually and shared with all stakeholders.

A centralized digital platform will be developed to store and display progress indicators in a transparent, accessible manner. This platform will be maintained by the Damascus Municipality in coordination with the Ministry of Transport.

9.4 Oversight and Accountability

An independent Monitoring and Evaluation Committee will be established to oversee the process. This committee will include representatives from:

- Ministry of Transport
- Damascus Municipality
- Local universities and research institutions
- Civil society organizations
- International development partners (where applicable)

The committee will review data, validate findings, and publish annual evaluation reports. These reports will include both technical assessments and policy recommendations for improving project implementation.

9.5 Feedback and Adjustment Mechanisms

One of the greatest strengths of an M&E system is its ability to create a feedback loop. If an objective is consistently underperforming—such as a delay in the BRT rollout or lack of adoption by informal drivers—adjustments can be made promptly. This may include redirecting resources, modifying timelines, or revising communication strategies.

Community input will also be a core part of evaluation. Public surveys and stakeholder workshops will be held annually to gather qualitative feedback on service quality, accessibility, and safety.

In this way, monitoring and evaluation are not just about tracking data, but about continuously learning, adapting, and improving. By embedding this system into the heart of the transport strategy, Damascus ensures that its goals remain realistic, flexible, and responsive to the needs of its people.

10. Conclusion and Policy Recommendations for Sustainable Transportation in Damascus

This thesis has explored the current challenges and future possibilities for improving the transportation system in Damascus through strategic planning. Beginning with a comprehensive SWOT analysis, the study identified not only the technical and infrastructural problems facing the city but also the social and institutional factors contributing to inefficiency, congestion, and environmental degradation. By developing a realistic five-year strategic plan grounded in achievable goals and adaptive implementation strategies, this work offers a roadmap for how Damascus can move toward a safer, cleaner, and more inclusive transport future.

The vision proposed for the transportation system is not overly ambitious or disconnected from the realities on the ground. It is built on small, scalable interventions that, over time, can lay the foundation for meaningful transformation. The five-year plan prioritises both short-term gains—such as signal repairs and emissions testing pilots—and longer-term system changes, like the integration of informal transit services and the expansion of Bus Rapid Transit corridors. Through a robust implementation framework and a strong monitoring and evaluation mechanism, the plan allows for learning and correction at each stage, increasing its chances of success even under difficult conditions.

What makes this thesis particularly relevant is its contextual grounding. Damascus, as a post-conflict city, cannot afford large-scale infrastructure overhauls without careful prioritization and community engagement. This work recognizes the value of what already exists—informal networks, experienced public sector staff, and a public that is eager for change—and seeks to build on these foundations rather than replace them.

10.1 Policy Recommendations

Based on the research and planning framework developed throughout this thesis, the following policy recommendations are proposed:

10.1.1 Adopt the Five-Year Plan as a Working Policy Document

Local authorities should adopt the proposed five-year strategic plan as a guiding framework. It can be adjusted annually, but it provides essential direction in an otherwise fragmented policy landscape.

10.1.2 Secure Sustainable Funding Streams

Authorities should explore a mix of public budgeting, donor partnerships, and public-private collaboration to ensure financing, especially for low-cost, high-impact projects in Years 1 and 2.

10.1.3 Institutionalize Stakeholder Participation

Local communities, transport workers, and marginalized groups should be involved not only in feedback collection but also in decision-making. Institutionalizing public engagement will ensure long-term legitimacy.

10.1.4 Invest in Data and Digital Tools

Progress cannot be measured without data. Investments should be made in simple technologies for data collection, route tracking, and mobile communication with commuters.

10.1.5 Phase Out Unregulated Transport Gradually

Instead of abruptly banning informal services, the government should support their transition through licensing, cooperative formation, and training. This will avoid backlash while improving quality.

10.1.6 Focus on Environmental and Social Outcomes

Every transportation intervention should be assessed for its impact on air quality, safety, and accessibility for women, children, and people with disabilities.

10.1.7 Plan Beyond the Five-Year Horizon

While this strategy focuses on five years, a longer-term vision is necessary. Authorities should begin formulating a 10- to 15-year mobility plan to align with sustainable urban development goals.

In conclusion, this thesis has aimed not just to diagnose problems but to offer practical, context-sensitive solutions for the city of Damascus. It is hoped that the insights, frameworks, and recommendations presented here can contribute meaningfully to local policy discussions and to the gradual rebuilding of public trust in the city's transport system.



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APPENDIX

Appendix A.1: Resident Survey Questions:

1. Age / العمر:

- Under 18 / 18 من أقل
- 18–24
- 25–34
- 35–44
- 45 and above / 45 فما فوق

2. Gender / الجنس:

- Male / ذكر
- Female / أنثى

3. District you live in / اسم الحي الذي تسكن فيه:

(Short answer)

4. Your main daily activity / نشاطك اليومي الأساسي:

- Working / العمل
- Studying / الدراسة
- Homemaker / ربة منزل
- Other / أخرى: _____

5. Main mode of transportation / وسيلة النقل الأساسية التي تستخدمها:

- Walking / المشي
- Public bus / الحافلة العامة
- Microbus / السرفيس
- Taxi / سيارة أجرة
- Private car / سيارة خاصة

- Bicycle or motorcycle / دراجة هوائية أو نارية

6. Average one-way commute time / متوسط وقت الرحلة

- أقل من 15 دقيقة / < 15 minutes

- 15–30 minutes

- 30–60 minutes

- أكثر من ساعة / > 1 hour

7. Daily transportation cost / كم تصرف يومياً؟

- أقل من 2,000 SYP / 2000 ل.س <

- 2,000–5,000 SYP

- 5,000–8,000 SYP

- أكثر من 8,000 SYP / 8000 ل.س >

8. Satisfaction with public transport / مدى رضاك

(Scale 1–5)

9. Biggest transportation problem / أكبر مشكلة

- Overcrowding / الازدحام

- Long waits / طول الانتظار

- High cost / الأسعار المرتفعة

- Unsafe roads / الطرق غير الآمنة

- Lack of access / نقص وسائل النقل

10. Frequency of delays / كم مرة تتأخر؟

- Daily / يومياً

- Weekly / أسبوعياً

- Occasionally / أحياناً

- Rarely / نادراً

11. Support BRT system? / هل تؤيد الباص السريع؟

- Yes / نعم

- No / لا

- Not sure / غير متأكد

12. Would you use public transport more if improved? / هل ستستخدم النقل العام أكثر إن تحسّن؟

- Yes / نعم

- No / لا

- Maybe / ربما

13. What would make you switch to public transport? / ما الذي يجعلك تستخدم النقل العام؟

- Lower cost / تخفيض الأسعار

- Better schedule / الالتزام بالمواعيد

- More coverage / تغطية المناطق

- Safety & cleanliness / نظافة وأمان

14. Would you use a bicycle if there were bike lanes? / هل ستستخدم الدراجة؟

- Yes / نعم

- No / لا

- Maybe / ربما

15. One most important improvement? / ما أهم تحسين؟

(Open answer)

Appendix A.2: Damascus University Students Interview Questions:

1. How long does it usually take you to get to university (one way)?

كم من الوقت تستغرق عادة للوصول إلى الجامعة؟

2. On average, how much do you spend each day just to get to and from university?

ما هو المبلغ التقريبي الذي تصرفه يومياً على المواصلات؟

3. What's the hardest or most frustrating part of your daily commute?

ما هي أصعب أو أكثر مشكلة مزعجة تواجهك أثناء الذهاب أو الرجوع من الجامعة؟

4. Has it ever happened that you missed a class or exam because of transport delays?

هل سبق أن فاتك درس أو امتحان بسبب تأخر أو مشكلة في المواصلات؟

5. Do you feel safe using buses or microbuses in Damascus? Why or why not?

هل تشعر بالأمان أثناء استخدام الباص أو السرفيس في دمشق؟ ولماذا؟

6. If a fast bus system like Istanbul's Metrobus was available here, would you use it? Why?

إذا توفر نظام باص سريع مثل المتروباص، هل ستستخدمه؟ ولماذا؟

7. From a student's point of view, what would make public transport better for you?

من وجهة نظرك كطالب، ما الذي يمكن أن يجعل النقل العام أفضل لك؟

8. If there were bike lanes, would you consider riding a bicycle to university?

إذا توفرت مسارات للدراجات، هل تفكر في استخدام الدراجة للوصول إلى الجامعة؟

9. Finally, if you had the power to change just one thing in the city's transport system — what would it be?

وأخيراً، إذا كان بإمكانك تغيير شيء واحد فقط في نظام المواصلات، ماذا سيكون؟

Appendix A.3: Engineers Interviews Questions:

1. Your specialization / اختصاصك:

- Civil engineering / هندسة مدنية
- Transportation engineering / هندسة النقل
- Urban planning / التخطيط العمراني
- Other / أخرى: _____

2. Years of experience / :عدد سنوات الخبرة

- Less than 5 years / أقل من خمس سنوات
- 5 – 10
- 10 – 20
- More than 20 years / أكثر من عشرين سنة

3. Have you worked on public transport or traffic management projects before? / هل سبق أن عملت في مشاريع تخص النقل العام أو تنظيم المرور؟

- Yes / نعم
- No / لا

4. What low-cost or quick-win improvements could be done in Damascus in 1–2 years? / ما التحسينات السريعة أو منخفضة التكلفة الممكن تنفيذها في دمشق خلال مدة سنة إلى سنتين؟

(Open answer)

5. What engineering solution would reduce traffic congestion the most in Damascus? / ما هو الحل الهندسي الأنسب لتخفيف الازدحام المروري في دمشق؟

(Open answer)

6. If Metrobus or BRT were introduced in Damascus, what infrastructure conditions must be fixed first? / إذا تم التخطيط لتنفيذ نظام باص سريع في دمشق، ما الأمور الأساسية التي يجب تجهيزها أولاً في البنية التحتية؟

(Open answer)

7. What locations do you think are most suitable for the first BRT or express transit corridor? / ما هي أفضل المناطق لبدء أول خط أو مسار نقل سريع في دمشق؟

(Open answer)

8. Are there any existing ideas you've seen in other countries that could work in Damascus? / هل هناك أفكار رأيتها في دول أخرى ويمكن تطبيقها في دمشق؟

(Open answer)

9. Any additional ideas, sketches, or suggestions you'd like to share? / هل ترغب بمشاركة أي أفكار إضافية أو رسومات أو اقتراحات؟

(Open answer)

Appendix A.4: Infrastructure Company Owners Interview Questions:

1. Can you tell me a little about what your company does?

يمكن تحكيلي باختصار عن نوع المشاريع أو الأعمال التي يشتغلوا فيها كشركة؟

2. Have you done any work related to roads or transportation before — in Damascus or anywhere else?

اشتغلتموا قبل بمشاريع طرق أو نقل؟ سواء بدمشق أو بمناطق ثانية؟

3. In your experience, what usually makes infrastructure projects in Damascus slow or complicated?

من تجربتكم، شو أكثر شي بيصعب أو بيأخر تنفيذ مشاريع البنية التحتية بدمشق؟

4. Are materials and skilled workers generally available for transport-related projects these days?

اليوم، المواد والعمالة الماهرة متوفرة إذا حدا حب ينفذ مشروع نقل؟

5. Do legal rules, funding, or logistics create any real obstacles in your field?

هل في مشاكل قانونية أو تمويل أو لوجستيات بتعرقل تنفيذ المشاريع؟

6. Based on what you know, what types of transportation projects are actually doable in the next few years?

برأيكم، شو نوع مشاريع النقل الممكن تنفيذها فعلياً خلال كم سنة قادمة؟

7. Would you or your company be willing to work with public sector or international donor projects in transport?

هل ممكن شركتكم تتعاون مع جهة حكومية أو منظمة خارجية بخصوص مشروع نقل؟

8. Last question: If you could give one piece of advice to improve how infrastructure is handled in Damascus — what would it be?

آخر سؤال، لو بذك تعطي نصيحة واحدة لتحسين تنفيذ مشاريع البنية التحتية بدمشق، شو بتكون

Appendix A.5: Informed consent:

Resident Transportation Survey - Damascus Case Study (استبيان النقل العام للمقيمين في مدينة دمشق)

B I U ↺ ↻

This survey is part of a master's thesis on improving plan for transportation in Damascus (for the next 5 years). It takes ~5–7 minutes. All answers are anonymous and for academic use only. Your participation is voluntary and free, and the information collected will only be used for academic research.

هذا الاستبيان جزء من رسالة ماجستير حول تحسين نظام المواصلات في دمشق (خلال الخمس سنوات القادمة). يستغرق حوالي 5–7 دقائق. جميع إجاباتك سرية وتستخدم لأغراض أكاديمية فقط.