

Urban Transportation Problems and Issues in Homs-Syria

Analytical Study of the Current Condition and Proposing Future Solutions

I. SHAHEEN SALEEM¹

¹University of Debrecen, Faculty of Engineering, Department of Civil Engineering, saleemshaheen646@gmail.com

Abstract. Cities in the north middle east are known for their past and old valuable heritage, with a complex master plan of each one. Homs in Syria is one of them, it has a history dates back to 2000B.C. with a unique formation of the city. However, the urban area of Homs has a very distinctive characteristics, but unfortunately it suffers from the transportation system operated. The congested and unorganized planning process have led the city to a complete mess and disorders, for all categories of its inhabitants. This study analysis the components of the transportation system, and identifies the greatest issues and problems the inhabitants suffer from, by locating the driving forces and the causes of these issues, and generally asses the quality of the system itself. Therefore, a holistic approach is proposed to improve the transportation system, and suggests some key plans to shift the city to a higher level of development. By locating the strength points, and detect the benefits of these strength points and exploit them. By evaluating the road network and create a new system that mitigates the negative environmental impacts (emissions, noise...) and reduce the crowded gathering of inhabitants, which caused a severe stress in their daily life. Overall, an attempt of implementing a new transportation system to contribute in the development process, and opens the possibility to develop other systems of the city in a sustainable framework..

Keywords: Cycling, Homs, Street network, Syria, Transportation System.

Introduction

Since transportation network is one of the most essential components in master plan for any settlements, moreover, road networks shape the layout of the city, and provides different definitions through maps. The urban area of Homs, is widely known with its history and the consequence civilization who settled there throughout the past centuries; however, these historical values are somehow not well-recognized in the city, because of unorganized transportation system in Homs. The city has many different aspects and strategic location, as a centre of connection between other governorates in Syria. Unfortunately, this strategic location affected the city negatively with more vehicles going through the city which resulted a major noise pollution, nevertheless the congested roads and lack of infrastructure and traffic lights and other transporting essential parts, have led they city to a total chaos in terms of transportation. Transportation systems are overlapped in Syria generally and

in Homs especially, due to different responsible parties who have poor connection with each other when taking decisions and actions. This problem affected the local residents at the first place, they have lost the safety feeling when they leave their homes to work, universities schools, this lack of safety factor, has created major social problems. Unorganized transportation system has turned many cities around the world to more accidents rate, illegal works, and left irresponsible societies. In the next sections, a holistic analysis of the current condition of transporting systems in Homs throughout maps and graphs, in order to find some key solutions for future implementations.

1. Homs Overview:

1.1. Geographical location and general information:

Regarding the governorate area, Homs is considered the largest one in Syria, notably, it has borders with two neighbouring countries, Iraq in the east, and Lebanon in the west (Figure.1). With a geographical location in the middle of the country, it splits Syria to upper and lower halves, occupying an area of 42,223 km², but almost 70% of this area is vacant, only the urban area in the western side, with rural areas surrounding it, and palmyra in the middle of the map in the Syrian Desert, both historical and residential settlements. The urban area of Homs has a strategic location as a transportation node links most of the Syrian highways together, from Aleppo and Hama in the north, and Damascus the capital in the south and the coastal cities in the west. The city occupies an area of 7,758.92 km² space, and a population of 945,299 which forms half of the total inhabitants of the governorate as all (1.8 million). But these numbers are statistics before the crisis, so the actual population is unknown until now due to the large displacement of local residents in the city seeking for shelter and safety inside the city or outside the city, and most generally outside the country. The city has been changed dramatically after the crisis and many of its roads have been closed for two-three years because of the conflict occurred in the city. Nowadays, most of the roads are opened now and used by different transportation vehicles, but only roads and streets are relatively functional today, since 50% of Homs settlements were partially or entirely destroyed.



Figure.1 – Map of Syria Locates Homs City, Source: UNITED NATIONS



Figure.2 – Destruction in Homs, Source: Shaam News Network



Figure.3 – Destruction in Residential Areas in Homs, Source: Hamed Jafarnejad

1.2. Homs after the crisis:

Many fundamental changes and transformations happened within the city due to the war in the last decade (Figure.2+3). Since we are talking about war, damages and destruction reached entire neighbourhoods in the city, displacing people and causing life losses. One of these changes was the fluctuation of the city's population, which was estimated roughly about 806000 inhabitants before the crisis back in 2010, after the crisis in 2013 and due to large amount of displaced people as well as life losses, the population dropped to almost 545000 inhabitants (UNHABITAT, 2014). However, this trend has raised again and reached almost 775000 inhabitants according to the latest statistics back in 2017 (Figure.4).

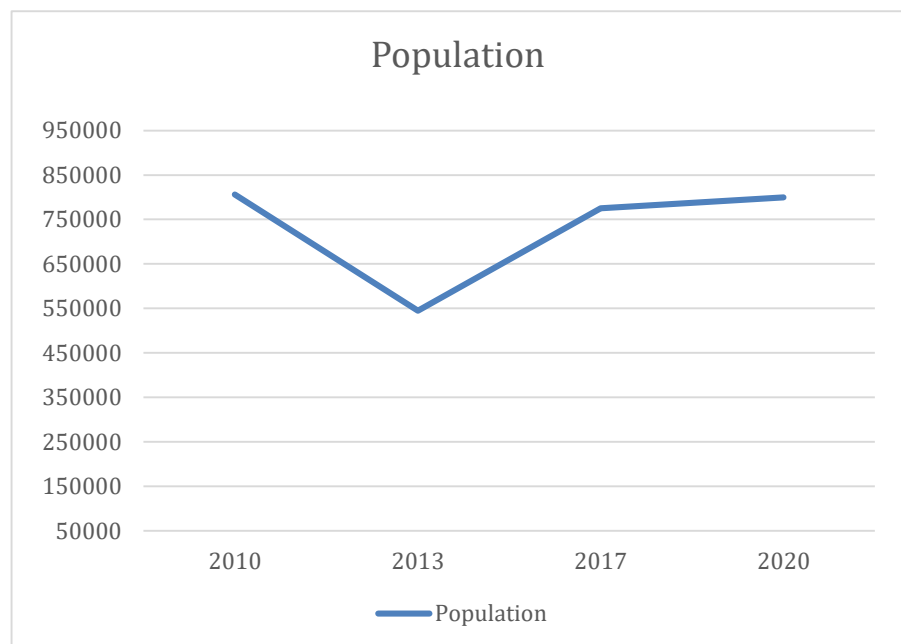


Figure.4 – Homs city population Changes in the past decade, Source: Author

2. Literature Review

This paper is prepared after reviewing previous studies in various fields, regarding the special situation of the city, notably it is in a developing country and has experienced a crisis in the last decade. Firstly, a

study has been reviewed about the development of transportation sector generally in Syria, where a holistic analysis of the transporting situation in the early 1990s, and how this sector was limited in terms of vehicles and customers at first, with a very slight variation in types of vehicles, and the purpose of use, some of them were especially for certain type of people such as, military employees and governmental workers in high positions, or for transferring goods and harvested crops for people who work in the agricultural affairs; however, the study investigated the essential changes in transporting sector, by explaining how services and transporting network were extended and replanned to most of the city parts including suburbs to benefit all of the residents regardless of their profession, and how financing new cars and minibuses increased the number of driven cars on the road and caused a marked increasing in the number of cars in street networks by the year of 1996 with the constant increasing of population (Hopfinger & Khadour, 1999). Secondly, after the constant increasing of vehicles during the first decade of the 20th century, a study was dedicated to analyse the negative effects of transportation in Syria, by explaining the number of vehicles and the use of them, and referring that almost half of the vehicles are private cars which means the increasing number of car ownership between 2000 and 2010; nevertheless, the paper mentioned what type of fuel has been used in that period and how governmental support oriented drivers to use specific type of fuel, but unfortunately, a big amount of it has been smuggled to the neighbouring country due to corrupted bodies; the authors concluded that transportation in Syria is one of the main reasons in air pollution, and suggested many solutions to mitigate this negative influence, by highly recommending using renewable energy sources and green transportation system, in addition to mentioning the electric cars which have been permitted in Syria back in 2010, and referred to the importance of adopting radio taxi system, and imposing penalties and fines on people who act illegally in the transportation sector (Almasri, Muneer, & Cullinane, 2011). Following the timeline, after the Syrian crisis, many significant and unpleasant changes occurred in Syrian cities and especially in Homs, this was clearly investigated through observational study based on series of interviews with different architects and residents of Homs, telling stories to the author who delivered a set of statements, indicating the pre-crisis period by mentioning the connection between Al-Waer area and Homs, even though the street has no establishments or any other functions, it has created a sense of a space for different activities of local residents, in addition, the interviewees mentioned the major destruction in Homs during the crisis, and how this destruction has affected significantly the city's scale and urban fabric as a result of entire neighbourhoods turned down into rubble, in other words, the city has changed physically, spatially, socially, and culturally; although, stating the facts of mixed feelings of passengers who commute to work when moving between functional and non-functional parts of the city (Azzouz, 2019). Moreover, in terms of assessing the current condition, a study assessment conducted by UNHABITAT, illustrated the situation of public transportation in Homs before and during the crisis, that Northern bus terminal is completely damaged, thus regional coaches' trips have become random and based on travellers' direct contact with the private operators. However, the southern bus terminal is still operational, but services are limited to people living in eastern neighbourhoods (UNHABITAT, 2014). Furthermore, another analysis of Homs as part of a conflict was produced, generally, the paper mentioned the large gap when commuting in the urban area created major disconnection between parts of the city, nevertheless, stating the fact that resuming in urban continuity - in mobility, social connections, economic productivity, cultural activity - is slow and ineffectual and the possibilities for interaction across the city are severely reduced, and finally providing the fact that Balancing the

urgent need to rebuild with fair and effective long-term planning must be done in the most inclusive and transparent way as possible (Pullan & Azzouz, 2019). However, by reviewing another paper pertains to reconstructing process in Syrian cities, the author made a clear point when referring to the awful process that aims to erase significant parts of the city and its history by changing the urban fabric and street names, where they are considered as social heritage in Syrian people's memory, nevertheless, indicating the risk when slicing neighbourhood and reshaping the city regardless of the social needs and measurements for local residents (Azzouz, Re-imagining Syria, 2020).

3. Transportation in Homs

This section analysis the current transportation conditions in Homs, with a special overview on the road network, and how transportation systems are operating. In addition to referring all types of transporting nowadays and investigating the commuting routes the citizens take on their daily basis.

3.1. General transportation system status in Homs

Transportation in Syria generally and Homs especially, known as an unorganized system including most types of vehicles, including infrastructure, traffic rules, pedestrian lines, and crossing paths. When considering driving in Homs, drivers cannot obey any basic driving rules due to the irresponsible driving methods most drivers get along with. In Homs, the transporting system is highly affected by the streets network which was a result of the urban formation, since the city has been built in different timelines and planning principles, three types of urban tissue can be recognized in Homs (Table.1), starting from the oldest one, which is the old town in the middle of the urban area, has its own characteristics inside the boundaries of the old town, narrow streets, winding and zigzagged paths, the widest one is almost 7 meters and the smallest with is almost 2.5 meters. The second type is the organized urban areas, built based on master plans done by engineering and planners at the local administration authorities, this type is relatively the best one in Homs since it has a unified streets width and measurements, with pedestrian lines on both sides of the streets, and in some spots, some well-designed and legal car parking can be found. The third type is the relatively in between the previous types, it has been shaped after buildings were established (mostly residential buildings), it has a high number of intersected streets, with straight paths and somehow unified width (between 7 meters and 5 meters), but this type has no pedestrian lines nor car parking spots, which means drivers park illegally by the side of the street.

By observing the city's master plan, these different streets networks are combined with the main roads in the city (the most crowded streets), they are two ways roads, with green island in between, and sometimes pedestrian lines on the sides and very few bus stops, with parking spots in the western side of the city, especially in Brazil-Street. Transportation system in the city includes high number of vehicles with different types and versions, and as an attempt to classify transportation vehicles in the city, we can start by the most used type by inhabitants:

- Public Transportation, this type is widely used by inhabitants and known as a cheap insufficient, and crowded method for passengers to commute between home and work. It includes two versions, the first one is mini-buses (or old white vans) which carries 11 passengers at most. The second version is the larger one (white and green buses), typical buses has been added to

the public transportation system back in 2010, its capacity is for 40 passengers, and they carry people for longer distances.

- Taxi Services: covers most of the urban area, high number of vehicles with a very low demand due to their high prices and expenses.
- Private vehicles: belong to local residents, who can afford the price and use It for different purposes such as commuting, goods transporting.
- Minibuses between municipalities, this is the exact same type of vehicles in public transportation, but it is used to transfer peopled between governorates or to surrounding rural areas.
- Motorcycles and bikes, for local workers, but this type has no lanes dedicated for them at any spot within the city.



Type 1 – Old Town, Source: Author



Type 1 – Bustan Al Diwan, Source: RAMEZ ALSAJ



Type 2 – Organized Settlements, Source: Author



Type 2 – Organized Settlements, Source: Osama Zehlawi



 <p>Type 3 – Illegal Settlements, Source: Author</p>	 <p>Type 3– Illegal Settlements, Source: Author</p>
---	---

Table.1 – Street Networks in Homs.

3.2. Transportation Problems and Issues in Homs

Many causes and reasons interacted and made the transportation a complete chaos in Homs, with zero safety factors, and no organized public transportation in terms of stops and stations, in addition to the absence of rules and regulations from responsible authorities. These issues can be addressed as the following:

- a. The public transportation system is insufficient in terms of transferring passengers, since it doesn't have any mandatory stops, as the vehicles pick up passengers at any spot. Moreover, drivers keep picking up passengers even if it is completely full, which makes commuting trips unhealthy, especially nowadays during the Covid-19 crisis, where social distancing rules are impossible to be followed, nor applied. Nevertheless, public transportation vehicles, especially buses, are decreasing because due to the absence of rules, since bus drivers are changing their routes and working outside the city to carry travellers towards surrounding rural areas, as this behaviour provides drivers with more financial income.
- b. The high ratio of asphalted streets in the city, transforms the city into an area with no walkable or cycling paths, which decreased the safety factor for any resident outside his/her home. In addition, the latter problem, opened a wide habit for drivers to park their cars illegally by the side of the street, in most areas of the city. This problem can be noticed clearly by city's master plans, where asphalted streets dominate maps.
- c. The high number of private vehicles contributes significantly in air pollution, nevertheless the unbearable noises coming from car horns and beeps whenever there are vehicles, which turns the city into a noisy one. Many residents prefer to own a private vehicle, because of the insufficiency of public transportation.
- d. The absence of monitoring and observation by traffic policemen, somehow contributed in orienting drivers to reckless and illegal driving, they drive most of the time without obeying traffic rules, for example, if the street is designed for two lanes, three cars can be found easily there. In addition, as a result of this irresponsible behaviour of local authorities especially traffic policemen, has led residents to act irresponsibly as well, as people cross the street illegally at any spot they choose, without waiting

for traffic lights (which are also absent in more than 40% of the city), and without adhering to crossing lines dedicated for pedestrians.

e. This whole transportation problem is a result of irresponsible and unconscious social habits, which created a major chaos in the city, affected the image of the city for outer visitors, and also contributed in adding negative values to the urban area as well. This congested transportation is distributed in specific areas in the city, but mostly in the city centre where most workers have jobs, and in the southern half of Homs exactly at the gate of the university where thousands of students get in and off the public transportation, in order to get home or dormitory.

Accordingly, transportation problems are relatively large and it seems to be impossible to organized them from scratch, so a list of issues should be addressed in a prioritized way:

- Public transportation: system network and vehicles, capacity and operating system.
- Pedestrian lines and walking pavements, crossings and public spaces.
- Cycling system, paths and regulations.
- Parking spots and spaces.

4. Future proposal and solutions

By analysing and identifying transportation problems in Homs, it seems to be impossible to organize the transportation by its own without problems following this improvement. Therefore, a set of recommendation are suggested, based on the high population and what issues this population is causing such as traffic and congestion, thus, new habits should be added in everyday life of each individual, and to start developing a city, we need to focus on population first not the governmental bod. New systems can be added as engines for future developments, need only small budget and some organizational routines and few rules make sense for people to obey it. Since the city doesn't have any bike lanes nor cycling culture has ever been addressed, and university students are occupying large seats in public transportation, or causing congested assemblies at some areas in the city, a slight but effective solution can be proposed, which is cycling system dedicated only for university students who want to commute from their houses to faculties, which is such an opportunity because all of the faculties are located in one campus, with student's dormitory in the same area. On the other hand, and speaking of future solutions, the city has been through significant changes in the past decade, as mentioned in the literature review, neighbourhoods have been entirely destroyed to the ground, and local residents everyday experience major difference between different parts of the city when commuting (Azzouz, A tale of a Syrian city at war, 2019). This can be integrated with rebuilding strategy for Homs, where new opportunities can be exploited for better solutions in terms of urban formation, housing units, transportation, and open spaces. Since the current condition in many destroyed areas delivers a whole destroyed image, new future planning process can be adopted, bearing in mind preserving the social traditions and habits, keeping the architectural features and environment for local residents when they come back to their own neighbourhoods, this idea contributes in recreating the sense of belonging and community, because it does not apply for local citizens to live in skyscrapers and contemporary neighbourhoods in a city known with its own characteristics and built heritage. Taking into consideration all of the cases mentioned previously, a set of recommendations can be listed as the following:

- Eliminating the current public transportation vehicles (buses and minibuses), and replace them with only one type of buses, and deploying them into the city with specific routes, this can be accomplished by creating a complete network covers all of the urban parts of the city, including Al-Waer (New Homs) (Figure.5). In addition to set a series of bus stops and stations where residents can get on and off the vehicles, and informing citizens with daily routine of public transportation, by opening the possibility of checking the buses through Google Maps, or any other mobile application.
- The longish extension of the city between north and south, and regarding the wide roads linking the southern Homs with its north, a tram line could be planted since the city has a relatively unified typology (Figure.5).
- As mentioned in section 2, the old town has a very unique street network, as it is built on the traditional Arabic city standards, and regarding the area it occupies and social habits and traditions, it can be exploited as a walkable site only, where the old town can be accessible only by walking or cycling, with very few exceptions for services and emergencies, with parking lots can be assigned on the outer lane of the old town (Figure.6).
- Since congestion in public transportation and some spots in the city is result of university students' assemblies, a new culture can be addressed in students' everyday life, by suggesting bike sharing program, so they can cycle and travel by bike from their houses/dormitories to university, by setting bike parking, distributed inside the campus and some spots outside of it, which can be used only by university students who have cards enables them to unlock bikes (Figure.7).
- Syria had a high rate of road traffic accidents, and ranked 58 globally, according to the latest WHO data published in 2018 Road Traffic Accidents Deaths in Syria reached 3,528 or 2.47% of total deaths (WORLD HEALTH ORGANIZATION, 2018). This high rate can be decreased by setting firm rules and regulations by local authorities, especially traffic authorities, by imposing fines and punishments to any individual who breaks the law, by parking, ignoring traffic lights, crossing the street illegally, using car horns irrationally.
- Homs is directed into rebuilding strategies in the near future, this rebuilding strategies all should have essential points in common, the first thing is to find solutions how to mitigate the illegal parking and establishing multi-floor garages distributed inside the city. Besides considering reducing the asphalted streets and thinking of pedestrians as a priority when designing public spaces and paths.

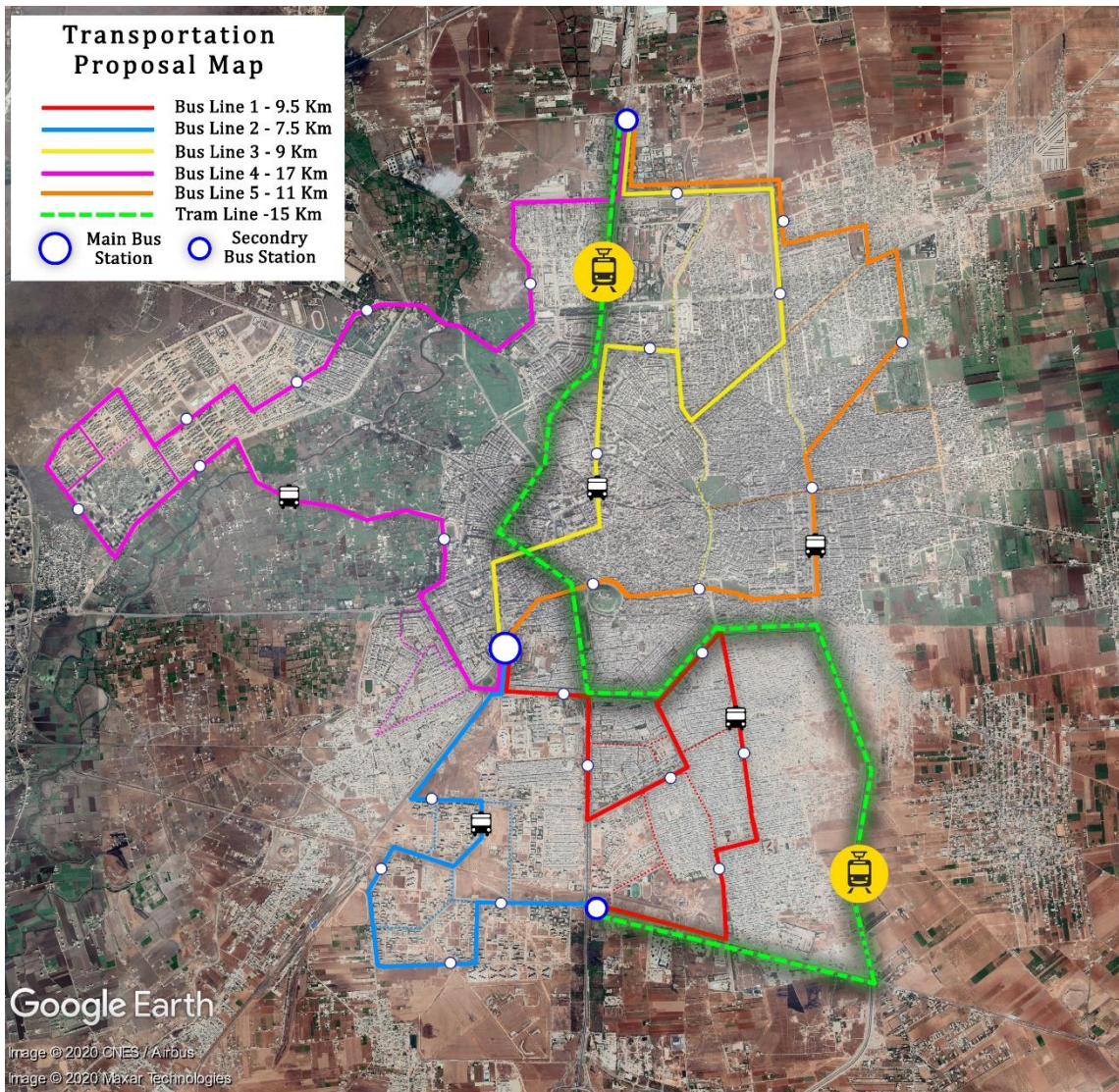


Figure.5 – Public Transportation Network Proposal, Source: Author



Figure.6 – Configurational illustration of future walkable old town of Homs, Source: Author

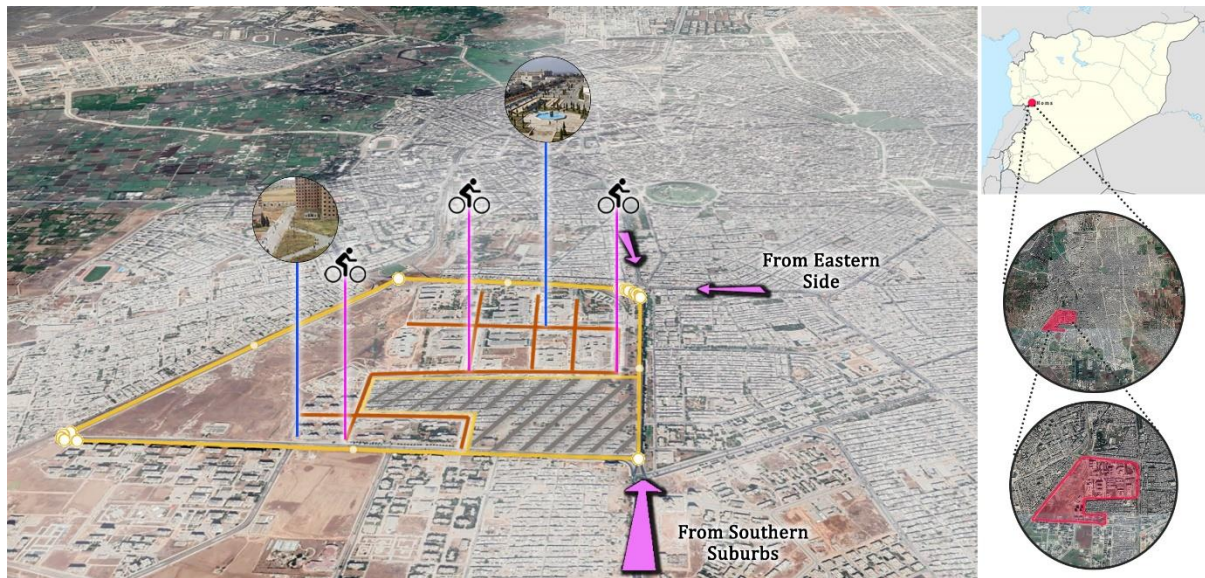


Figure.7 – Configurational illustration of cycling system at the university, by indicating possible paths student can ride their bikes on, Source: Author

5. Challenges and Obstacles

When considering applying the previous recommended solutions and improvements, they cannot be adopted easily without obstacles, that sometimes make the process impossible. These challenges can differ due to many conditions such as, economic status, local communities and their traditional habits, urban infrastructure, and not to forget local authorities and corrupted bodies. Many of these obstacles can intersect and make the process more complicated. In order to classify them clearly, we can highlight them as the following: financial, social, and administrative challenges. Regarding the financial obstacles, when adopting new public transportation system, it can be hard on many levels, such as the financial funding of this project and where should this budget come from when the country is experiencing the heaviest economic collapse in its history. Especially when this new system needs new vehicles and technical implementations. On the other hand, from an administrative point of view, contributors from different sectors and how much they are loyal to their job and to which extent they can operate decently without accepting any bribes, and how fast and efficient their work can be.

Considering the social situation in the city, the population of Homs is consisted of different religions, ethnics and sects, and a significant portion of them are conservative people, and due to some old traditions, girls and ladies are not accepted nor welcomed to ride a bike. Therefore when adopting cycling system, it is rather going to be used way much less than expected, perhaps only 50% of the target group are going to use bikes, this actually leads a large amount of university students to still use the public transportation, hence, congesting the vehicles again. Moreover, when discussing the parking lots and garages, some inhabitants won't feel safe enough when they do not park their cars next to their residences, it somehow means that some people will not accept leaving their cars in another building for hours, this sense of insecurity comes from the latest years where groups of stealers and thieves used to steal cars equipment and elements. Most of these adoptions can face numerous complications and

barriers, most of these barriers are directly or indirectly relate to population's mentality, and what they have used to experience as normal daily routine in their everyday life in the past twenty years, even if these improvements mean more flexibility and less stress and more comfortable, it is still difficult for significant group of them to adapt this new style easily.

To delve deeper into the challenges, we need to drift a little out of the core of this study. Since transportation is a daily need in people's live, we need to address this issue from different perspectives. For instance, all studies related directly or indirectly to transportation and mobility should be conducted theoretically and practically. In order to address all relations between different sectors within the city. Since Homs is a post-war city, the idea of improving the mobility system could be addressed more properly within the rebuilding programs. Since all future projects in Homs need funding resources, either national or international, more concise, intersected studies and projects are more preferably to be produced; rather than individual strategies that cover one sector separately. For example, when thinking about potential funding resources, a possible solution could come from exploiting the urban heritage the city has. This would happen if urban renewal processes are conducted firstly at historical sites (and surrounding areas), as these projects would gain financial profit, which in turn could contribute in proceeding with reconstructing and development projects and initiatives within the city. This idea is only an example of how different sectors could affect each other, and how multi-development projects could have inner solutions for potential issues. Therefore, cohesive and extended studies cover all city's components need to be addressed scientifically. In an attempt to produce significant results, which in turn contribute effectively in leading experts to improve the current condition within the city.

6. Conclusion

This conclusion has two different approaches, the first one explains the possible opportunities and the benefits of adopting the recommended solutions, and the other one suggests how challenges can be avoided in an attempt to move the city to a level of prosperity. On one hand, when establishing new concepts and exploiting existing resources such as preserving the old town and transferring it into a walkable one, this opens the possibility in the future for new tourists who would like to visit and relax inside the old city of Homs, therefore, raising the economic situation and opening new projects that encourage tourists to visit and discover the forgotten heritage of Homs, which in turn, develops the investments inside the city. Moreover, organizing the public transportation especially routes and stops, contributes significantly in rising the awareness and consciousness of local people, which mean more responsible future generations. In addition, this walkability concept contributes drawing people's attention to the importance of physical activities such as walking and running, here we can drive the city gradually into sustainable goals (Good Health and Well-Being).

On the other hand, the potential obstacles who can stand in the way of accomplishing future improvements, as mentioned before most of them relate somehow to social mentality, and financial stability. The first one, can be changed gradually by opening this conservative environment to the positivity of changing, and how this can be beneficial for them and for the society, by setting start-ups and establishing workshops ensures the importance of youth empowerment and how they can be future leaders for their own communities. Concentrating on younger generations and well educating them

academically and professionally, would produce a more mature, responsible society. Since this new generation will behave more responsibly towards their city and its surrounding environment. Regarding the financial status, an economy within any given city, could have many opportunities to be improved gradually, by exploiting what the city has, and how to turn these resources into beneficial ones. However, all of the mentioned above must be addressed in a complete strategy, which has a stages and sub-stages, aiming to improve the city as a one liveable object. Since organization and documented future projects are the key solution for a city like Homs, and it is only a matter of prioritizing what the city needs first.

References

- [1] Almasri, R., Muneer, T. & Cullinane, K., 2011. The effect of transport on air quality in urban areas of Syria. *Energy Policy*.
- [2] Azzouz, A., 2019. A tale of a Syrian city at war. *City*, pp. 107-122.
- [3] Azzouz, A., 2020. Re-imagining Syria. *City*, pp. 721-740.
- [4] Hopfinger, H. & Khadour, R., 1999. The Development of the Transportation Sector in Syria and the Actual Investment Policy. *Middle Eastern Studies*, July, Volume 35, pp. 64-71.
- [5] Pullan, W. & Azzouz, A., 2019. Briefing Paper 11: Destruction and Reconstruction-How urban recovery has become an integral part of conflict and war. *CinC*.
- [6] UN-HABITAT, 2014. CITY PROFILE HOMS, s.l.: UN-HABITAT.
- [7] W. H. O., 2018. SYRIA: ROAD TRAFFIC ACCIDENTS. [Online] Available at: <https://www.worldlifeexpectancy.com/syria-road-traffic-accidents#:~:text=Syria%3A%20Road%20Traffic%20Accidents&text=According%20to%20the%20latest%20WHO,Syria%20%2358%20in%20the%20world.>