



**An-Najah National University
Faculty of Engineering
Urban Planning Department**

Graduation Project1

" Land Use Planning and Urban Transport "

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الإهداء

بسم الله الرحمن الرحيم

(قل اعملوا فسيرى الله عملكم ورسوله والمؤمنون)

صدق الله العظيم

إلهي لا يطيب الليل إلا بشكرك ولا يطيب النهار إلى بطاعتك .. ولا تطيب
اللحظات إلا بذكرك .. ولا تطيب الآخرة إلا بعفوك .. ولا تطيب الجنة إلا برؤيتك

"الله جل جلاله"

إلى من بلغ الرسالة وأدى الأمانة .. ونصح الأمة .. إلى نبي الرحمة ونور العالمين

"سيدنا محمد صلى الله عليه وسلم"

إلى من مثلي الأعلى بالحياة ، قدوتي ، إلى من كلله الله بالهيبة والوقار ، إلى من علمني العطاء دون

انتظار ، إلى من أحمل اسمه بكل افتخار

"والدي العزيز "

إلى روحي بالحياة وسر نجاحي ، صديقتي ، رفيقة دربي ، إلى من الجنة تحت أقدامها ، إلى جنتي على

الأرض .

"أمي الحبيبة"

إلى سندي بالحياة ، قوتي وملاذي بعد الله ، إلى من تحلو الحياة بوجودهم ، إلى رفقائي ومصدر

فرحي

"أخوتي الأعزاء"

إلى فرحتي وشريك حياتي ، إلى من أعطى حياتي معنى آخر ، إلى هدية الله ومن قدم العون والدعم

لي خلال المشروع إلى من قال به تعالى "والله جعل لكم من أنفسكم أزواجاً"

"خطيبي الغالي "

الشكر والتقدير

لأبد لنا ونحن نخطو خطواتنا الأخيرة في الحياة الجامعية من وقفة نعود إلى أعوام قضيناها في رحاب الجامعة مع أساتذتنا الكرام الذين قدموا لنا الكثير باذلين بذلك جهودا كبيرة في بناء جيل الغد لتبعث الأمة من جديد ... وقبل أن أمضي، أقدم أسمى آيات الشكر والامتنان والتقدير والمحبة إلى الذين حملوا أقدس رسالة في الحياة ... إلى الذين مهدوا لنا طريق العلم والمعرفة ... إلى جميع أساتذتنا الأفاضل وأخص بالتقدير والشكر :

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وكذلك أشكر كل من ساعد على إتمام هذا البحث وقدم لنا العون ومد لنا يد المساعدة وزودنا بالمعلومات اللازمة لإتمام هذا واتوجه بشكر خاص : الى الدكتور عادل جعيدي لمساعدته والمعلومات القيمة والنصائح

المفيدة في تخطيط المواصلات التي قدمها بكل كرم

و الى كل من: الدكتور عماد دواس والدكتور ايهاب حجازي والدكتور خالد الساحلي

على كرمهم في تقديم المساعدة

كما اشكر جميع زملائي وزميلاتي على جميع النصائح والمساعدات العلمية والعملية

Table of contents

" Land Use Planning and Urban Transport "

<u>Chapter One: Introduction</u>	5
<u>Overview</u>	5
<u>Problem and importance of the study</u>	5
<u>Research Objectives</u>	6
<u>Study plan and methodology</u>	6
<u>Analytical framewor</u>	6
<u>Sources of information</u>	7
<u>Study contents</u>	7
<u>Chapter two: LITERATURE REVIEW</u>	8
<u>TRANSPORTATION AND URBAN FORM – A HISTORICAL OVERVIEW</u>	8
<u>Land use for transport purposes</u>	9
<u>Interaction between land use patterns, transport and the environment</u>	10
<u>Managing conflicting demands for urban space</u>	12
<u>Mobility and transport in international comparison</u>	12
<u>Urban density and modal choice</u>	13
<u>Impact of land use on urban transport at different scales</u>	13
<u>Property, building and site level; street characteristics</u>	13
<u>Blocks, residential areas, city neighborhoods</u>	15
<u>Integrated planning and steering cultures.</u>	18
<u>The Theory of Land Use and Transport</u>	20
<u>The Administrative and Legal Provisions Influencing Integrated Land Use and Transport Planning</u>	21
<u>Chapter three: Case studies</u>	23
<u>Case Studies</u>	23
<u>BEST PRACTICE AND TRANSFERABILITY</u>	26
<u>Determining best practice based on a five-level-framework</u>	27
<u>Results of best practice analysis</u>	27
<u>CONCLUSION</u>	28

Chapter One: Introduction

1.1 Overview

There is a lot of talk in our Palestinian cities about the traffic congestion and its impact on the city in general and on the individual in particular, and the voices on increasing reliance on public transport rather than the use of private cars, which leads to reduce environmental pollution, visual and sensory, as well as provide spaces used To open the new streets in favor of urban expansion.

The talk is about the appropriateness between land use and transportation in the city, where transportation is one of the most important determinants of the shape of the city, as land uses transport as is common in our cities.

The city is established with several factors, the most important of which are the land and transportation uses, and the larger the land, the easier it is and the more suitable land uses. The closer the sites are to the transportation, the more expensive it is and the more popular it is as a location for services and activities, whether economic, social or cultural. Some of which constitute the structure of the urban system.

The main trend of urbanization is to attract population and economic activity from remote rural areas to urban areas, which can lead to urban expansion and the emergence of uses and services to meet the needs of the population. Thus, the need for a network of streets suitable for the region, The spatial separation between home, work and recreational activities increases the demand for transportation, an increasing challenge for policy makers and transport planners. The relatively low population density in rural and peripheral areas makes it difficult to provide public transport of sufficient quality to attract large numbers of users (EC, 2007, 2009A). Urban urbanization has also led to increased demand for individual transport, such as private cars. This is because distances have increased between public service providers and private companies due to a focus on economic activities and public institutions in major urban areas (EC, 2009A). Low land density leads to increased traffic, overcrowding and environmental pollution with negative impacts on quality of life (EC, 2007).

1.2 Problem and importance of the study

Our Palestinian cities suffer from the deterioration of the economic, political and planning conditions, as a result of the Israeli occupation that has taken control of the Palestinian territories as well as the absence of the legislative authority and the proper planning of land for a long time. This has led to the emergence of random urbanization and land misuse, which has created a poor transportation network, thus creating a non-urban and informal form of cities. The study highlights the current situation of the cities of the transport network, land use and problems, and attempts to develop solutions and proposals that help to link the use of land to the most suitable form and planning for transportation.

1.3 Research Objectives

The main objective of this study is to develop a systematic framework for Palestinian cities to promote high quality of life by building a model of sustainable cities based on transit-oriented development.

The study aims to achieve a number of objectives:

1. Use the general framework and planning of the theme of urban transport.
2. Review a number of study cases.
3. Diagnose the motive of urban transport and land use.
4. Analysis and evaluation of the reality of urban transport and land use.
5. Present a proposal for the planning of urban transport and land use.

1.4 Study plan and methodology

To achieve the desired objectives, the methodology of the study is based on three main axes, which are summarized in each of the following:

1. General and theoretical framework, which deals mainly with:

- a. Review concepts and theories related to the planning and
- b. regulation of land use and transport systems
- c. Study of some cases and similar experiments

2. The Information Framework

- a. Historical , geographical, economic and planning background for the study area.
- b. Study the reality of the division of land in the city in terms of development and distribution of uses and classification.

1.5 Analytical framework :

- a. Identify a region in the city that will be studied in the field and forwarded, and solutions and recommendations for the city can be suggested.
- b. A critical study and evaluation of the reality of the division and use of land and transportation through the development of the study area, both urban and planning.
- c. Identify the problems experienced by the reality of land use and transportation through various means such as questionnaires.
- d. Development of proposals and scenarios for land use in light of urban development.

1.6 Sources of information

The study draws its information from a number of sources, the most important of which are:

- a. **Office resources:** through research in books, references, studies, periodicals and the Internet in the topics of urban planning, land use, urban transport ... and other related topics.
- b. **Official sources:** which includes studies, reports, publications and statistics issued by the relevant ministries and official institutions such as the municipality, ministries and the Central Bureau of Statistics.
- c. **Personal sources:** Includes survey, field study, questionnaire, interviews, observations and analysis of the study area in all its aspects, in addition to the researcher's experience as an architect of urban planning.

1.7 Study contents

The study consists of seven chapters, covering each of the following:

- a. The first chapter is an introduction to the study and addresses its importance, objectives and methodology.
- b. The second chapter includes the general and theoretical framework, including concepts and theories related to the subject of the study such as the cities and their planning, and the concept of land use and urban transport. In addition to some case studies.
- c. Chapter 3 deals with case studies.
Chapter Four discusses the diagnosis of the motives for planning urban transport and land use.
- d. Chapter 5 deals with the analysis of land and transportation uses and the identification of problems for transportation and land use.
- e. Chapter 6 includes proposals for the planning and development of urban transportation network and land use.
- f. Conclusions and Recommendations.

Chapter two: LITERATURE REVIEW

2.1 TRANSPORTATION AND URBAN FORM – A HISTORICAL OVERVIEW

The history of the American metropolis within the framework of four transportation related eras: · Walking – Horsecar Era (1800 – 1890) · Electric Streetcar Era (1890 – 1920) · Recreational Automobile Era (1920 – 1945) · Freeway Era (1945 – present). ([MULLER, PETER O., TRANSPORTATION AND URBAN FORM](#)).

As evident from the names, each of these era's were characterized by breakthroughs in transportation technology, which pushed the outer edge of the metropolis into a new outer zone. During the Walking Horsecar and Electric Streetcar era, the cities were compact centers of development built around railroads and ports. With the arrival of the automobile, the city size exploded as more people started moving to the fringes in search of cheaper land and housing. In the years after World War II, as the auto came within the economic reach of more citizens, jobs followed people to the suburbs creating today's multi-nucleated and dispersed metropolitan areas. ([LUTRAQ](#)) The biggest catalyst to suburban growth was the construction of the freeway system, which reached its peak during the 1960s and 1970s. The history of the Interstate Highway System shows that it was conceived by the federal and state governments without giving adequate thought to its external implications. While the transit system had already started declining, the advent of the freeways accelerated its deterioration.

the connection between transportation and land use disintegrated to such an extent that even a massive investment in the transportation system would initiate only a minor change in urban form. the main reason for this is the highly developed stage of the transportation network in the US. ([THE WEAKENING TRANSPORTATION LAND USE CONNECTION](#)) Moreover, the existing built environment cannot be expected to change over the next twenty years. people no longer consider "commute" a vital ingredient in the location of their houses or firms. They are willing to pay higher commute costs in return for larger, newer homes in the suburbs.

Due to this weakening transportation – land use connection, there is a need for local and state governing agencies to implement policies that abandon short-term mobility measures and plan for long-range accessibility measures.

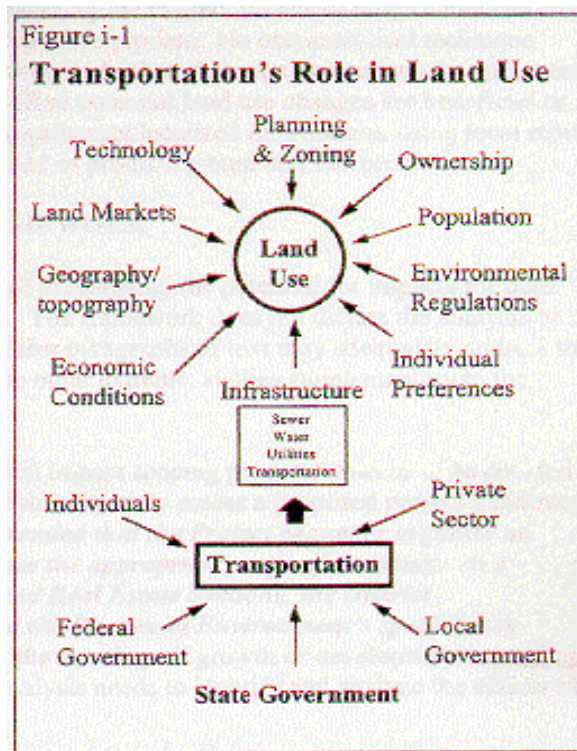


FIGURE 1 : TRANSPORTATION'S ROLE IN LAND USE .

2.1.1 Land use for transport purposes

Mobility, especially in the form of motorized transport requires an increasing share of land, both within cities and in rural areas. Cities in highly motorized countries dedicated much of their urban area for roads(LUTRAQ).

Living and transport conditions vary sharply between cities. Transport solutions have to be adapted to local conditions and needs. (Photo 1) might just as well have been taken in a US city, in which broad arteries provide space for large cars. But this type of road does not reflect the needs of the people living without a car in a non-car environment (Photo 2). What conclusion can be drawn for the priorities in urban transport policy?



Photo 1 : Jakarta, main road



photo 2:Jakarta, small road

the simple comparisons of average road space between cities do not in themselves justify additional road infrastructure investments. Car ownership rates differ significantly, as does trip demand and travel distances. A car-oriented life-style is out of reach of most people in developing countries. It is true that private car ownership increases at high rates, as well as the demand for other motorised transport services. This leads to overload of existing roads, congestion, and environmental degradation of urban space. But international experience clearly shows that comprehensive construction programs will not be able to cope with the automobiles' demand for road space. ([TRANSPORT POLICY ADVICE](#))

Planners all around the world know that car-based urban transport is not a sustainable development path – neither with respect to urban functions nor to the environment. Only public transport can assure mobility in large cities. And only by preserving good conditions for walking and cycling it is possible to maintain a satisfactory level of urban quality. ([TRANSPORT POLICY ADVICE](#))

What kind of urban development and what land use planning supports sustainable transport?

2.1.2 Interaction between land use patterns, transport and the environment

The spatial distribution of housing, working, shopping, leisure, and other activities determines average trip distances in urban transport. High population density, as well as a mixture of land uses for various social and economic activities, maintain low distances between origins and destinations of urban trips. Conversely, low-density development and large road areas increase trip lengths and lead to a higher share of automobile trips. ([TRANSPORT POLICY ADVICE](#)).

By influencing the spatial structure of locations in the urban environment, land use planning can contribute to a minimization of kilometers driven, and support a high transit share. Dense and mixed-use development helps to keep walking and cycling attractive. These are the most environmentally friendly transport modes. International comparative studies have indicated that there are close links between population density, motor vehicle use and per-capita energy consumption in the transport sector. Given the high specific emissions per kilometer of motor vehicles in developing countries, the amount of traffic generated by unfavorable spatial structures directly affects air quality. ([TRANSPORT POLICY ADVICE](#)).

Further, oil consumption and greenhouse gas emissions will inevitably increase rapidly if transport and land use policies in countries follow the kind of spatial transformation which the highly motorized countries have undergone. Figure 1 illustrates the “vicious cycle” of car traffic leading to deteriorated living conditions, heading to suburbanization and transforming the rural areas into settlements, in which households are dependent on the private car for daily

mobility. Increasing car use again follows the traffic spiral, when more roads are built to satisfy car commuters, transforming precious urban land into wasteland as shown in the Seattle photo (Photo 3) [\(LUTRAQ\)](#).

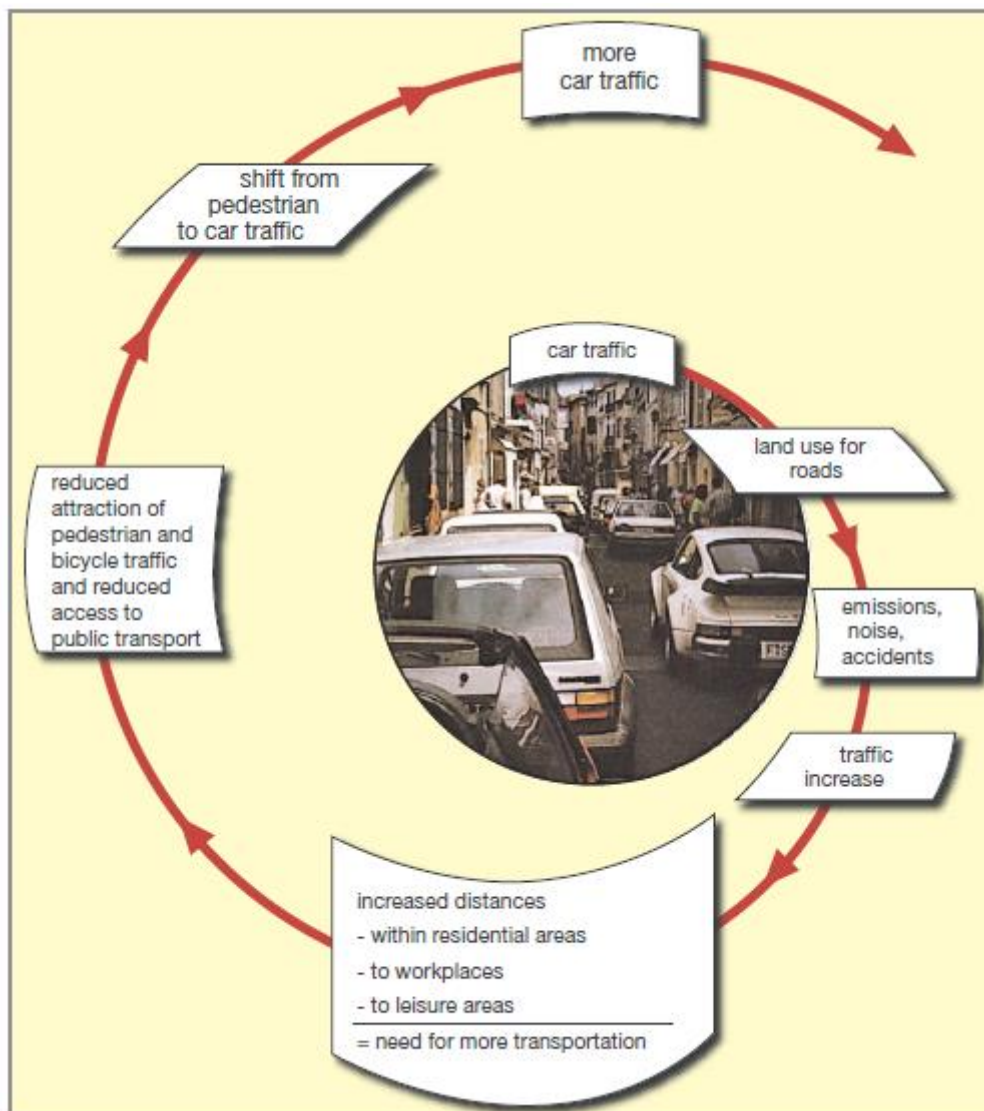


Photo 3 : Traffic and land use interaction (traffic spiral) Wuppertal Institute VE-151e / 95.

These insights are based on local experiences, on the observation that congestion and travel times are ever-increasing, and on the monetary burdens caused for private and public budgets. [\(LUTRAQ\)](#)

Additionally, there are the concerns for the local environment, especially air pollution, noise, groundwater pollution from run-off, loss of soil functions, and loss of biodiversity. And then there are the global concerns with respect to energy resources and greenhouse gas emissions. International climate policy has begun to initiate reduction commitments, which put energy- saving land use policies on the agenda. This has contributed to a critical attitude towards the amount of automobile use – some name it automobile dependency . The Kyoto

Protocol is just the beginning; future negotiations will require the developing countries to also contribute to greenhouse gas emission reductions ([TRANSPORT POLICY ADVICE](#)).

How can urban land use planning contribute to future responsible mobility with less emissions and energy consumption?

2.1.3 Managing conflicting demands for urban space

Mobility of passengers and of goods is a necessary element of social and economic interaction, forming the basis for progress and welfare by bringing talents and skills together. Division of labor increases productivity, at the cost of increasing transport activities. Migration and population growth cause additional requirements for housing and other land uses. Individualization of lifestyles and liberalization of economic activities transform into market forces which compete for scarce urban space. Livable cities need to balance economic, social and environmental requirements against limited space. Besides the competition between housing, shopping, green areas and roads within the traditional urban boundaries, there is the problem of occupying agricultural land by suburbanization of the various urban functions. Historically, cities have been located in fertile areas where agricultural production could feed the urban population ([URBAN TRANSPORT \(GTZ\)](#)).

Even if current agricultural production in developing countries may be sufficient in total quantity, loss of resources for nearby food production increases the volume of goods transported over longer distances. Sustainable regional development, on the contrary, would aim at the preservation of agricultural production within close proximity to the urban population. In general, regional manufacturing would provide opportunities for less transport activities, but under current transport price conditions other cost factors dominate the spatial decisions, resulting in larger production and distribution networks ([URBAN TRANSPORT \(GTZ\)](#)).

Although market pressures in most countries work in favour of low-density, space-consuming settlement decisions, land-use planning should aim at creating transport-avoiding structures ([URBAN TRANSPORT \(GTZ\)](#)).

Involvement of the public may support this concept, and back the decisions of planners against interest groups ([URBAN TRANSPORT \(GTZ\)](#)).

2.2 Mobility and transport in international comparison

The terms “mobility” and “transport” are often equated. Mobility is reduced to movement, standing simply for the change of location and transport itself. The number of kilometers driven becomes the focus of attention and often becomes the indicator of mobility. As a consequence other options for realizing the destinations and purposes that are connected with mobility are not taken into consideration. In fact, a person driving a lower number of kilometers can be

more flexible and mobile if he has to drive or even cycle/walk a lower number of kilometers for fulfilling his activities than somebody who depends on a car in order to reach his destinations. In this sense, mobility should be measured in a wider sense relating to “potential access”, rather than simply to “kilometers of movement”(URBAN TRANSPORT (GTZ)).

2.2.1 Urban density and modal choice

The decisions taken in favour of one of these two major development paths do not only concern the competitive relationship between the urban transport modes, but also shape urban development beyond the transport sector. Where transport is more based on transit, a city grows differently than in a car-oriented development paradigm (LUTRAQ).

The specific character of an urban transport system in the table ranked according to the Transit-oriented urban development aims at supporting structures which encourage public transport and discourage car use. But land use planning can only resist the spread of car use to a limited extent. This has been exemplified by the European experiences, where a degree of car-based sprawl has taken place despite land use planning efforts(LUTRAQ) .

2.3 Impact of land use on urban transport at different scales

The influence of different land use parameters on transport is discussed below.

2.3.1 Property, building and site level; street characteristics

Trip frequency, trip distances and modal choice related to home, site and street characteristics have recently been analyzed in the Netherlands (Meurs/Haaijer, 2001). The type of home (flat, detached/semi-detached, terraced house, with or without garden) influences personal mobility choice, as well as street characteristics (e.g. cycle route at front door, easy or restricted parking, traffic calming). However, stronger effects were attributed to variations in neighborhood characteristics (LAND USE PLANNING AND URBAN TRANSPORT (GIZ)).

The traditional urban housing type of “block wing tip edge building” (perimeter development) forms dense blocks along urban streets; this is still the typical configuration in and around many central districts of European cities. (photo 4 gives an example from Berlin.) In many Asian cities this type of building prevails in quarters built up to the 1930s. Later on, line land development became the ruling paradigm of urban planners worldwide with the consequence of increasing trip lengths (LAND USE PLANNING AND URBAN TRANSPORT (GIZ)).

The traditional road-side blocks of up to 6 floors have a number of advantages for sustainable mobility: Immediate access from house entrance to the pedestrian walkways, and close visual as well as acoustic contact between inhabitants and the pedestrian areas which make stronger effects were attributed to variations in neighborhood characteristics (LAND USE PLANNING AND URBAN TRANSPORT (GIZ)).

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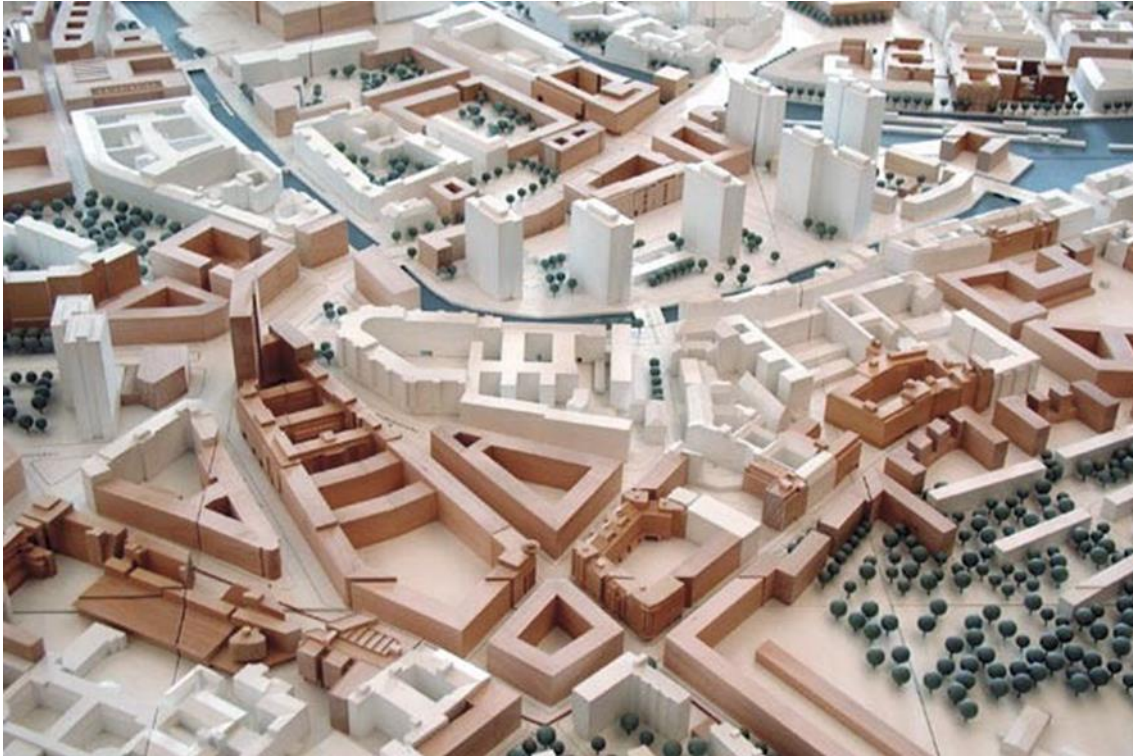


Photo 4 : City of Berlin(Block wing edge buildings (Berlin) (architectural model)

The traditional road-side blocks of up to 6 floors have a number of advantages for sustainable mobility: Immediate access from house entrance to the pedestrian walkways, and close visual as well as acoustic contact between inhabitants and the pedestrian areas which make walking comfortable and safe. Building fronts typically are narrow, often with the combination of shops at ground level with flats on the upper floors. This type of mixed-use housing allows high accessibility to a large variety of urban functions within short walking distances. Access to bus and tram stops is easy, too. It has been found that the longer walking distances to bus and tram stops along rows of houses are accepted where building fronts are varied ([LAND USE PLANNING AND URBAN TRANSPORT \(GIZ\)](#)).

Different styles and ground floor uses are to be preferred from that point of view, rather than large front lengths and monotonous faces of buildings.

With increasing motor vehicle traffic on the roads, however, living conditions are affected by noise and emissions. Reacting to these worsening environmental

conditions, designs of buildings were changed in a way that the living rooms no longer faced the streets but were turned backward. Visual contact and public safety are suffering from this development, which makes walking less comfortable and safe ([LAND USE PLANNING AND URBAN TRANSPORT \(GIZ\)](#)).

In the second half of the 20th century, line land development became popular amongst architects and developers, locating buildings no longer front-by-front to the roads but at some distance from streets, surrounded by greens and bushes. (See high-rise buildings in the upper part of photo 4.) These buildings are not favorable locations for shops and services because of the distance to the street and to passers-by, resulting in increasing separation of functions. Although this site structure may improve environmental conditions, this type of development is less attractive to pedestrians, increasing average trip distances and reducing accessibility. The paradigm shift with respect to buildings has changed mobility preferences ([LAND USE PLANNING AND URBAN TRANSPORT \(GIZ\)](#)).

Where the distances are growing and roads are wider, and parking lots are provided around the isolated buildings, car use becomes more comfortable than walking and public transport ([LAND USE PLANNING AND URBAN TRANSPORT \(GIZ\)](#)).

2.3.2 Blocks, residential areas, city neighborhoods

Land use parameters at the neighborhood level include density (in terms of addresses per hectare) and multiple configuration of functions, with easy access to all daily destinations by foot; locations for shopping, services, leisure locations, parks, etc. Most activities are made within the residential area as very short trips. This should focus attention of transport planners on the local level. Good pedestrian and bicycle facilities, connections through blocks for non-motorized traffic, parking schemes and short distance access transit (below 300 meters) are important variables for encouraging choice of sustainable transport modes. Distance to public transport stops strongly influences mode choice ([WEGENER/FÜRST, 1999](#)).

The traffic load on local streets determines the quality of living in the residential area. Traffic calming increases the share of walking and cycling. High density of homes, achieved either by small dwellings or by multi storey buildings, generates sufficient concentrated transport demand to support good public transit supply. ([WEGENER/FÜRST, 1999](#)).

Space requirements for different transport modes vary significantly, as already illustrated by Photo 4. This is important for considering the kind of mode to be supported by urban transport planning. In order to provide mobility opportunities for a certain amount of persons travelling, buses, pedestrians and cyclists make better use of scarce urban space than automobiles. Approximate maximum passenger flows per lane is given in Table 1 ([LAND USE PLANNING AND URBAN TRANSPORT \(GIZ\)](#)).

Table 1: Space requirements for various transport modes, under various operating conditions.#

Mode	Capacity scenario (users/ hour/lane*)	Speed (km/h)	Space demand (m² per user)
Pedestrian	23,500	4.7	0.7
Pedal cycle +	5,400	12	8
Motorcycle ++	2,400	12	17.5
Car (urban street)	1,050	12	40
Car (expressway)	3,000	40	47
Bus (55 seats)	7,700	10	4.5
Bus or Tram (150 seats)	18,000	10	2
Tram (250 seats)	24,000	10	1.5
Metro rail	40,000	25	2.5

These figures are not maximum values or typical speeds for all situations, but rather present the space required, under various conditions

* The width of a lane is assumed as 3.4 m

+ One user per pedal cycle

++ 1.1 users per motorcycle

All public transport modes are assumed to be 80 % full.

Car ownership inevitably requires urban land consumption even when the car is not moving, thus reducing the opportunities for other land uses. Roadside parking occupies scarce land resources needed for improved public space, bus lanes, bicycle lanes, and improved traffic flow. One passenger car requires about 10 to 15 m² at the roadside. For parking lots one has to calculate twice as much use of land space to account for access and egress (Gorham, 1998). For a rough estimate of the accumulated land cover- age, every car can be estimated to be associated with 1.5 parking places at various locations (home, office, shopping, etc.), and two-thirds of these places can be assumed to be off street. This leads to more than 3 km² parking area requirements for an urban fleet of 100,000 cars ([LAND USE PLANNING AND URBAN TRANSPORT \(GIZ\)](#)).

Private passenger cars should park in commercially operated parking lots or garages, or on private property. Vendors should leave space for pedestrians, and bus stops also require space.

Driving behavior and speed is directly related to road design. The faster a driver is going, the higher the risk of an accident, and the more severe the consequences. In traffic situations with cars, cyclists and pedestrians sharing roads, the highest risk is on the side of the “soft targets”. Figure 5 demonstrates the relation between pedestrian mortality when hit by a car and vehicle speed. Limitation of maximum traffic speeds to 30 km/hr has been identified as a

suitable and cost-effective measure to reduce accident and fatality rates ([LAND USE PLANNING AND URBAN TRANSPORT \(GIZ\)](#)).

Road width in residential areas should not exceed 3.5 m, to prevent drivers from going too fast. Figure 2 shows the risk of fatal injuries to pedestrians in car accidents. Road width reduction may enable provision of additional space for pedestrians and/or bicyclists.

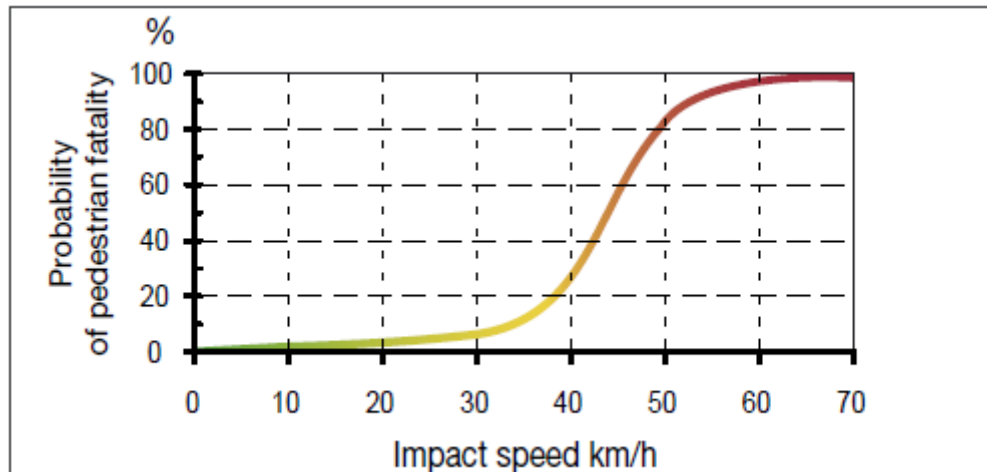


Figure 2: Probability of pedestrian fatality by impact speed. Barter et al., 2000

Average travel speed on urban roads in housing areas is in any case mostly below 30 km/h. On busy roads and in densely built areas, reduction of peak speeds via a speed limit of 30 km/h will not affect average car travel times significantly ([LAND USE PLANNING AND URBAN TRANSPORT \(GIZ\)](#)).

There is a well-known relationship between the width of a road and driving speed. While in most countries the maximum allowed urban speed is 50 km/hr, wide lanes and lack of police enforcement lead to much higher peak speeds, thus increasing accident risk and especially endangering crossing pedestrians. The extremely broad road arteries for instance in Chinese cities (Photo 5) tempt car drivers into higher speeds of 80 km/hr or even more between intersections, increasing not only risk and impact of accidents but also exhaust and noise emissions. Because road capacity restraints typically are caused by throughput at junctions, rather than by road dimension of the sections in between, road width could be reduced without negative impact in terms of congestion and travel time. This could either lead to improvements for pedestrians and cyclists, or provide options for greening along streets (Photo 6) ([LAND USE PLANNING AND URBAN TRANSPORT \(GIZ\)](#)).



Photo 5: A typical urban road in Shanghai. Karl Fjellstrom



Photo 6: Urban road space with green belt (Frankfurt). The green strip is the Zeil, one of Europe's premiere shopping streets. Karl Fjellstrom

Ecological quality of urban greens along roads may not be high with respect to biodiversity of flora and fauna, but there is a positive effect in terms of walking comfort and microclimate, as well as for clearing run-off waters. These advantages have to be balanced with the road area requirements ([LAND USE PLANNING AND URBAN TRANSPORT \(GIZ\)](#)).

2.4 Integrated planning and steering cultures.

Integrating transport and land-use planning? How steering cultures in local authorities affect implementation of integrated public transport and land-use planning .

Integration in general concerns “the management of cross-cutting issues in policy making that transcend the boundaries of established policy fields, and do not correspond to the institutional responsibilities of individual departments”

(STEAD AND MEIJERS 2009). In the research literature on land use and transport planning, integration is viewed as a hierarchy, the first tier of which is confined to co-operation and information between sectors. The second tier involves trying to avoid conflicting objectives. This does not necessarily mean having the same objectives for different sectors, but it does mean a certain co-ordination in the planning of implementation. Co-ordination and efforts to avoid conflicting objectives are also present on the third tier, but now sectoral fields are integrated in a way which creates greater value than individual parts. The same objectives are used here for formulating various long-term plans and strategies. Representatives of different sectors work together and endeavour to create inter-sectoral synergies in the planning of implementation (STEAD AND GEERLINGS 2005).(DIVA 2016).

While policy integration should not be seen as an end in it self.To benefit public transport, the planning of urban development and of public transport itself should be integrated in such a way that new urban development takes place in locations which are good for public transport. A large customer base can be created by building densely and by intermingling housing and workplaces. In this way the traffic load during peak hours can be evened out. Central stopping points, straight runs and measures to ensure brief transit times are also needed to make public transport more competitive in relation to motorism (DIVA2016).

The need for integrated planning has, admittedly, achieved a major rhetorical impact. The new buzzwords in research literature, planning manuals and policy documents, both in Sweden and in other Western European countries, are integration of transport and land use in practical planning. National authorities in Sweden are end eavouring, through inspiration and best practices in planning manuals, to induce municipal politicians and officials to plan on an integrated basis (Tornberg 2009; Swedish Transport Administration 2010, Swedish National Board of Housing, Building and Planning 2013). But translating objectives for integrated planning into practice has proved difficult (see for example studies in Australia, the United Kingdom and the Scandinavian countries: McEldowney et al. 2007; Legacy et al. 2012; Curtis 2012; Hrelja et al. 2013; Næss et al. 2013; Smith 2013, Smith et al. 2014). Previous studies have shown the integration of transport and land use to require careful handling of sectoral interests by politicians and officials (ISAKSSON ET AL. 2009). Research has shown that in practice the feasibility of integration is often eviscerated by conflicts between politicians and officials with rival agendas. The meaning of sustainable transport systems and urban development is differently interpreted from one sector to another and is variously “translated” by the politicians and officials concerned, depending on the context (HULL 2005; HULL 2008). And so actual decision-making and planning practice in the municipality can still be fragmented between different sectoral fields and affected by conflicts of interest. Research has shown that the ability of politicians and officials to create viable forms of cooperation and to achieve a consensus on objectives is often crucial but at the same time hard to achieve in

practice ([CONNELLY AND RICHARDSON 2004](#)). In summary, experience teaches us to expect conflicts between transport modes, and tension among different planning sectors and their representatives in local transport and land use planning ([DIVA 2016](#)).

2.4.1 The Theory of Land Use and Transport

An extensive literature review exercise identified successful land use and 'transport policies based on theories, empirical and modelling studies [Greiving and Kemper, 1999; Wegener and F~rst, 1999]. ([DIVA 2016](#)).

The review concluded that:

a. Land-use and transport policies are only successful with respect to criteria essential for sustainable urban transport (reduction of travel distances and travel time and reduction of share of car travel) if they make car travel less attractive (i.e. more expensive or slower). ([DIVA 2016](#)).

b. Land-use policies to increase urban density or mixed land-use without accompanying measures to make car travel more expensive or slower have only little effect, as people will continue to make long trips to maximise opportunities within their travel cost and travel time budgets. However, these policies are important in the long run as they provide the preconditions for a less car-dependent urban way of life in the future. ([DIVA 2016](#)).

c. Transport policies that make car travel less attractive (more expensive or slower) are very effective in achieving the goals of reduction of travel distance and share of car travel. However, they depend on a distribution of homes, jobs and services which are not too dispersed. In addition, highly diversified labour markets and different job locations of workers in multiple worker households set limits to an optimum co ordination of work places and homes. ([DIVA 2016](#)).

d. Large retail and leisure facilities that are not spatially integrated in the urban area increase the distance travelled by Car and the share of car travel. Land-use policies to prevent the development of such facilities ('push') are more effective than land-use policies aimed at 'promoting high density, mixed-use development ('pull'). ([DIVA 2016](#)).

e . Fears that land-use and transport policies designed to constrain the use of cars in city centers are detrimental to the economic viability of city centers have in no case been confirmed by reality (except in cases where at the same time massive retail developments at peripheral greenfield locations have been approved). ([DIVA 2016](#)).

f. Transport policies to improve the attractiveness of public transport have in general not had a major effect on the reduction of car use. They have attracted only little development at public transport stations, but contributed to further suburbanization of population.

2.4.2 The Administrative and Legal Provisions Influencing Integrated Land Use and Transport Planning

Following a literature review of planning policy in each of the 15 European countries, member states were grouped into one of three categories according to their degree of co-ordination and integration of transport and land use planning. This enabled a framework to be applied later in the project to evaluate the transferability of instruments and best practices, especially considering the wide variations in administrative and planning structures in the European countries. The analysis showed that regional planning represents an important issue for coordinating and integrating transport and land-use planning in a horizontal direction (between planning departments and organizations at the local level) and in a vertical direction (between planning guidance and policy at the national, regional and local levels). Regional planning is therefore a key factor in the categories. As far as the local level is concerned, most member states include an institutionalized municipal planning level with binding land-use plans as important prerequisites for the co-ordination and integration of land-use and transport planning. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#)

Category A: Horizontal and vertical co-ordination of transport and land use planning Institutionalized regional planning with regional plans

- **Binding effect of regional plans or binding impact through directives or guidelines** Regional planning is the responsibility of a regional planning authority with powers in planning, decision-making and policy implementation in transport and land-use issues. The regional planning authority sets the basis for formal co-ordination as a framework for local departments and stakeholders. Vertical co-ordination is by regional planning, either through binding plans, directive powers or binding guidelines. Horizontal integration of land-use and transport issues takes place at the regional level as well as at the local level in comprehensive spatial plans. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#)

Category B: Horizontal co-ordination of transport and land use planning

Institutionalized regional planning without binding effects at the local level
Similar to the first category, regional planning institutions are responsible for regional planning. In countries of this category regional planning cannot influence local planning through binding plans, directive powers or binding

guidelines. Therefore, fulfilling regional objectives in local plans relies on voluntary forms of co-ordination. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#)

Category C: Co-ordination of transport and land use planning only at the local level

No institutionalized regional planning and/or regional plans This category includes countries where institutionalized regional planning is weak or absent, making co ordinated action difficult. Due to their informal character, regional plans do not have any binding effect on local plans .Therefore, local plans play an important role in integration. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#)

Chapter three: Case studies

Twenty-six case studies based on transport and land use integration were analysed to review the state of the practice. They were selected on the basis of their interactions between land-use and transport at the urban-regional level both in terms of study of the effects and in terms of co-ordination of planners and policy makers. The selection process gave particular emphasis to case studies which were innovative. ([TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#))

3.1 Case Studies

Twenty-six case studies were chosen on the basis of

- **Country:**

Denmark (1), Italy (2), France (5), Great Britain (4) Germany (6), Spain (1), Sweden (1) and Switzerland (2), Portugal (1), Netherlands (3).

- **Territorial scale:**

Local area (2 cases), regional or metropolitan areas (in 6 cases), urban areas (in 8 cases), central cities (2 cases) and parts of an urban area (in 13 cases).

- **Size of urban area:**

From less than 100 000 inhabitants to more than 2 million inhabitants;

- **Level of implementation:**

Case studies already implemented with monitoring data available enabling assessment of their effects and case studies still in the development phase without monitoring data;

- **Integration between transport and land use:**

- **Good practices and bad practices:**

Bad practices were included, as a way of illustrating what should be avoided. In addition, some of the cases of good practice also highlight factors that should be eliminated to make the implementation more successful.

([TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#))

Of the twenty-six case studies, 12 were studied in detail using interviews with the local authorities in charge of the case studies. The remaining 14 were difficult to analyse in detail, generally because the case studies that had not yet been fully implemented. The analysis of these case studies relied on published information and a limited amount of contact with some key decision makers. Tables 2 and 3 summarise the 26 case studies. ([TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#))

Table 2: Summary of Case Studies Analysed in Detail

Case Study	Country	Main Feature of Case Study
ABC Policy	Netherlands	The ABC location policy aims to match the mobility needs of businesses and services with the accessibility of different locations
Cycle Town Gavle	Sweden	A large level of investment has been made to improve cycle facilities and cycle modal share in

		a low density urban area.
Madrid	Spain	Creation of a regionalized planning department whose aim it is to promote the image of the city as a metropolitan region instead of 7 separate towns, whilst turning it into an integrated, efficient, and equitable community.
Messestadt Riem	Germany	Redevelopment of the former Munich airport as a mixed use, mostly independent and attractive district.
CentrO Oberhausen	Germany	A bad practice example of an urban entertainment and shopping centre that is mainly car oriented. However, a former freight railway line was converted to a public transport line for buses and light rail, offering a new public transport station
Potsdam-Kirschsteigfeld	Germany	A new community for about 7.000 new residents and 5.000 employees. This mix is concentrated at a new light rail-station.
Rennes	France	A long standing practice of regional urban planning in Rennes. The region also has fiscal harmonization of local taxes for companies.
Rome	Italy	The "Gates of Rome" project aims at increasing the rail mode within the metropolitan area through the creation of a series of node railway stations scattered around key access gates to the city. Institutional arrangements allow good co-ordination between the local authorities.
Strasbourg	France	A strong transport policy aimed at reducing car use and promoting bus and cycle journeys is operating in the city centre. The policy includes a complementary development plan.
Toulouse	France	Development of integrated planning at the urban level and the initial stages of a regional approach.
Vaud Geneva	Switzerland	Regional land use and transport policy concerning a network of three cities: Lausanne, Neuchatel and Montreaux. The approach is to co-ordinate land use and transport policies around railway stations for easier access for non-car modes.
VINEX Dwelling Locations	Netherlands	Urban development around a rail line in Twente is an example of the Dutch housing criteria of high-Locations density settlements, distance to urban agglomerations and public transport accessibility.

(TRANSLAND (2000) FINAL REPORT (FOR THE EC))

Table 3: Case Studies Analysed In Less Detail

Case Study	Country	Main Feature of Case Study
Basel	Switzerland	An example of integrated land use and transport planning and strong promotion of public transport.
Bilbao	Spain	The city has agreed upon the creation of a public private partnership, Bilbao Metropoli - 30, to coordinate and implement the strategic plan for the revitalization of Bilbao.
Bologna	Italy	Car restriction in Bologna's historical centre. The project seeks to increase mobility through public transportation, cycling and walking and to raise the quality of life.
Camden	United Kingdom	Car free housing is part of Camden's Green Transport Strategy. This strategy contains many initiatives outlined in the Government's White Paper.
Greater Copenhagen	Denmark	Long term promotion of public transport and the protection of green space between the fingers. This illustrates the importance of a consistent policy towards regional and local land use and transport planning.
Edinburgh	United Kingdom	Car free residential housing
Euralille	France	A new business district in Lille with close links to the Channel Tunnel and a new TGV station.
Fraiburg Rieselfeld	Germany	An example of environment-oriented urban land use and transport planning in Germany. Recently a new tramway line was constructed simultaneously with a new residential development (Fraiburg Rieselfelder). Mixed use is concentrated at the tramline in the center of this district, connecting "Rieselfeld" with the city centre of Freiburg.
Groningen	Holland	Groningen Structure Plan. Groningen is one example of the 'compact city' structure now promoted in Dutch landuse policy. Cycling policy plays a major part and the concentration of institutions and employment-intensive development near the station is being strengthened. New housing areas are located near the city centre
Manchester Metrolink	United Kingdom	Phase 2 of the Manchester Metrolink at Salford Quays is a good example of

		integration between land use and transport. Allocating space for public transport during the planning phase makes public transport more effective.
Nantes	France	The effects of a light public transport network on modal split linked with an urban policy on public space.
Poundbury	United Kingdom	Poundbury as social housing mixed with private housing, as well as office, shops and light industrial uses. The development has been innovative, putting built form and urban space ahead of traffic requirements.
Saalepark	Germany	Saalepark is a new shopping centre where the only opportunity for using modes of public transport are shuttle-buses. In 1993 about 91.6% of the visitors travelled by car. It is an example of bad practice.
Tubingen Sudstadt	Germany	An example for re-using a military residential area in order to develop a mostly independent, mixed use district in Tubingen. Primary aims of the reorganization are short walking distances between dwellings, shops, workspaces and social facilities for the new inhabitants.

(TRANSLAND (2000) FINAL REPORT (FOR THE EC))

3.2 BEST PRACTICE AND TRANSFERABILITY

In Transland an attempt was made to define best practice. In the context of Transland, 'best practices' were 'good practices' that worked successfully in a wide range of situations and were shown to produce results satisfying integration and sustainability objectives. It was considered that an important dimension to best practice was that it should be transferable to other cities and countries, with differing geographic and institutional backgrounds. For the purposes of the Transland project, sustainability was mainly seen as the promotion of environmentally friendly modes, and their accessibility for different social groups, while reducing dependence on the private car.

(TRANSLAND (2000) FINAL REPORT (FOR THE EC))

A multi-criteria analysis was used to identify best practice from the twenty-six case studies. The first part of the analysis included a group discussion with experts and practitioners who attended the Transland Workshop based on a list of questions concerning best practice. The second part of the analysis was based on inputs delivered by experts concerning the definition of best practice, and the third part was the evaluation of case studies based on a questionnaire.

(TRANSLAND (2000) FINAL REPORT (FOR THE EC))

3.2.1 Determining best practice based on a five-level-framework



Figure 3: Every case study was examined on a five-level-framework

The five-level-framework was useful as a 'filtering down' process of case studies. Only case studies that were successful in every one of the five levels were considered as best practice. Other case studies remained on a level between 1 and 5. The following figure provides an overview of the 'filtering down' process of the twenty-six case studies. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#).

3.3 Results of best practice analysis

Level 1: Good idea?

Twenty-one of the case studies examined have a good concept with respect to the goals defined in Transland. Three of these case studies remain at level 1 because implementation has not yet taken place: Rome, Bilbao, Canton de Vaud / Canton Geneve. Four case studies show an idea which cannot yet be estimated as successful in reaching the goals set out in Transland: Toulouse, Basel, Saalepark and Greater Nantes. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#).

Level 2: Well / fully implemented?

19 case studies reached this level. All of these case studies are well implemented with at least important building stages finished. Six case studies remain in level 2 because although they are implemented, their effectiveness in achieving their

objectives cannot yet be measured. These case studies are: Camden, Edinburgh, VINEX dwelling location, Poundbury, Messestadt Riem and Rennes. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#).

Level 3: Effective according to direct goals of the project?

Thirteen case studies reached this level. Whilst well implemented the case study CentrO did not achieve its stated objectives. Five case studies remain in this level because they are evaluated only as successful according to the goals of the project; successful promotion of sustainability cannot be seen at this stage of implementation. These case studies are: Strasbourg, Freiburg- Rieselfeld, Tubingen-Sudstadt-Suedstadt, Potsdam-Kirchsteigfeld and Madrid. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#).

Level 4: Effective in overall objectives of sustainability?

Seven case studies passed level 4 of the framework for determining best practice. Two cases remain in this level: ABC-policy and Greater Copenhagen. ABC-policy refers to a specific planning process while the Finger Plan of Greater Copenhagen is the product of an ongoing vision which has lasted for 50 years. Because of their very specific framework, transferability to other countries may be difficult. Transferability could be possible if some fundamental changes in the planning framework of other EU countries took place. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#).

Level 5: Best practice case studies being transferable Five case studies succeeded in passing the five levels of the framework for determining best practice. These case studies are Gavle, Manchester Metrolink, Bologna, Euralille and Groningen. But it is important to note that except Groningen, these case studies are mainly successful in promoting sustainable transport, although they considered aspects of land use. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#).

3.4 CONCLUSION

To evaluate best practice in the field of integrated transport and land use planning twenty-six case studies were chosen. Special consideration was given to case studies with innovative policies. A range of case studies were chosen depending on country, territorial scale, size of urban area, level of implementation, integration between transport and land use, and good practices and bad practices. Five case studies were chosen as best practice; Gavle, Manchester Metrolink, Bologna, Euralille and Groningen. Of these case studies, all except Groningen are mainly successful in the field of transport. Elements of transport planning could be realised and shown to be successful in the short run, whilst the success of land use planning is more difficult to assess as its effects can only be measured in the longer term. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#)

As part of the evaluation of best practice evaluation, transferability was considered. The results of case study examination shows that most successful elements are transferable. However, no project or planning approach is completely transferable. A precondition for transferability is, in some cases, the structure of locations. Some elements of best practice are mainly transferable to the same structures, e.g. connection to attractive public transport depends on an existing nearby network of public transport, whilst other elements of best practice can be implemented elsewhere e.g. implementation of an infrastructure which promotes cycling could be implemented in existing structures as well as locations being newly developed. Most of the elements of best practice are transferable to other EU countries, mainly to countries of category A and B according to their planning framework. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#).

Another important finding is the role of 'soft' policies for success of integrated transport and land use planning. Most of the innovative planning approaches examined include 'soft' policies to ensure the acceptance of measures and influence citizen's behaviour, for example, citizens' participation was identified as a key factor to success. The best practices identified show that good spatial organisation linked by a well balanced transport network can a precondition for enabling sustainable mobility. [\(TRANSLAND \(2000\) FINAL REPORT \(FOR THE EC\)\)](#).

**Case study (2): Ways to better integrate land use planning and Public transport.
Case studies from Sweden.**

About the study

Aim:

- to identify critical factors for a successful integration of public transport and land use planning in the local urban context

Focus:

- formal and informal institutional conditions in the local planning and decision making process

Institutional conditions :

“Institutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights).” North 1991, p 97

Method:

- A qualitative case study
- Three medium-sized Swedish cities
- Three illustrative examples:
Östra Lugnet in Växjö
Kristianstadlänken in Kristianstad
Grundviken in Karlstad
- The study was funded by SKL, carried out 2012-2013

Research questions:

- What goals and visions have been formulated regarding the role of urban transport in urban development in the three cases?
- How were these goals and visions operationalized in the planning and decision making processes?
- What critical situations appeared in the processes? How were they managed?
- What was the end result of each process?

Östra Lugnet/Växjö

- New housing area, 750 new dwellings
- Mixed development
- The planning process started 2005
- High ambitions to integrate public transport (PT) and land use planning
- Municipal comprehensive plan from 2005 emphasising the importance to explore conditions for PT early
- The old railway as a potential structure for PT
» In the end the old railway turned into a biking lane. Buses can not go through the area.



Figure 4: Källa: Växjö kommun

Key features of the planning process :

- PT competence not represented in the core project team.
- Time pressure in the detailed planning process.
- Urban design principles emphasising high density, narrow streets and local traffic safety.
- Conditions for public transport were not explored in detail until at a very late stage in the process.
- Unclear who had the responsibility for the integration of PT in this project.



Figure 5: Källa: Växjö kommun

- A new bus route through the central parts of Kristianstad.
- Aim: to reduce travel time through the city centre, increase bus frequency by better coordinated local and regional buses.
- Under construction.



Figurer 6 :Källa: Kristianstad kommun

Key features of the process

- The project was based on a idea formulated jointly by the city and the region.
- Comprehensive study 2003/2004.
- Joint letter of intent 2006.
- Several years of investigations.
- Decision by the municipal board 2010.
- Local resistance 2010-2011 almost stopped the project.
- Complementary investigations and a local information and communication campaign needed to regain political support.



Källa: FOJAB arkitekter

Grundviken/Karlstad

- » Part of a larger development project.
- » 500 new dwellings.
- » Mixed development, dense urban design, eco-friendly profile.
- » Connected to Karlstadsstråket.
- » Comprehensive plan for the area 2009, detailed development planning 2012-2013.

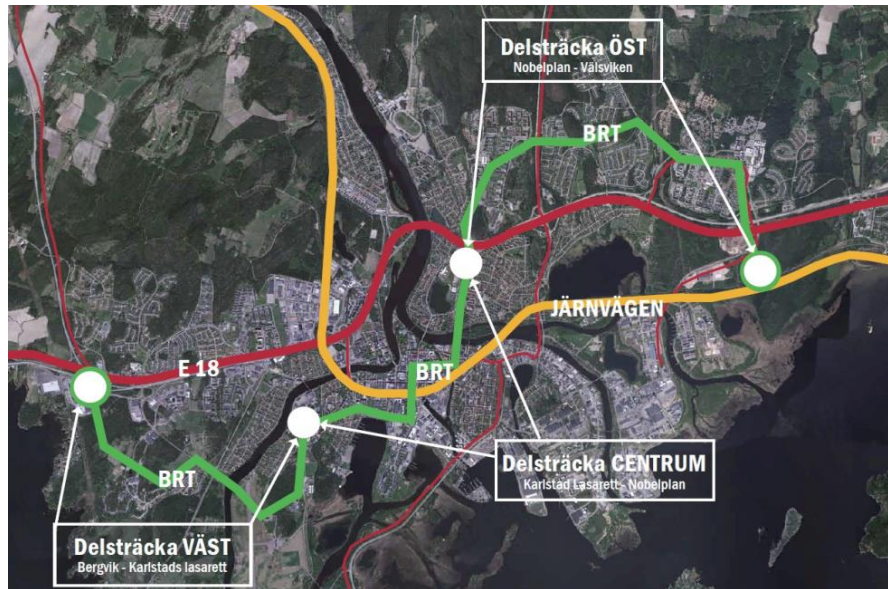


Figure 7 :Källa: Karlstad kommun

Key challenges in the three cases :

- » The role of strategic goals, visions and strategies.
- » Are there any clearly stated goals and visions expressing a political ambition for PT and/or sustainable transport?
- » How are these being operationalized in concrete standards and guidelines?
- » How are they being communicated and embedded locally (local residents, stakeholders etc)?
- » What happens in the local planning process.
- » In the case of goal conflicts – how are these supposed to be managed?
- » How are various competences being coordinated and integrated in the local planning process?
- » Everything can not be solved with new formal arrangements. It is very much a matter of mindsets and culture.
- » The link between local, regional and national perspectives.
- » The cases are not only of local importance, but also of regional importance.
- » How can regional and national actors work to support local planning administrations in these situations? (In a way that really makes a difference).
- » A need for new arenas, routines and processes to support a better integration between PT and land use planning.

Concluding reflections

- **A combination of formal and informal institutional conditions structure the integration between PT and land use planning.**
- **”Everybody knows” it is important. But who is supposed to take the lead to safeguard a good integration? How can it be done? What forms are there today and how can they be further developed?**

Critical:

- **Building knowledge among players who drive land use development.**
- **The link and dialogue between strategic and operative level.**
- **The link and dialogue between actors between various administrative levels.**

Chapter three: Study area diagnosis and data collection

3.1 Qalqilia city importance (Why Qalqilia city for the project)

It is one of the occupied Palestinian cities located near the Green Line. It dates back to the Canaanite period and dates back to the Roman era. It is divided administratively into thirty-four villages, towns and towns, such as Azabat al-Tabib, Kafr Lakhef, Ras Tira, Kafr Zeibad, Ramadin al-Shamali, , Kufr Thulth, Habla, the Cave of Dabaa and Hajjah.

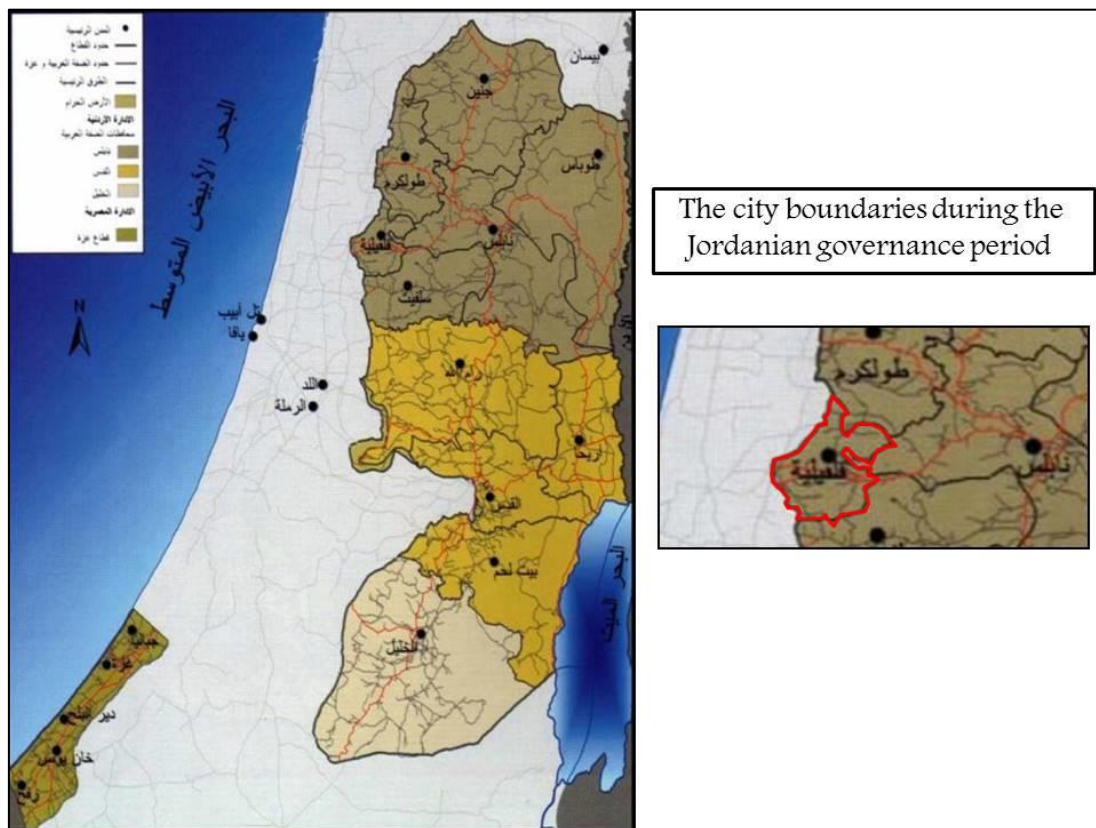
It connects between the city of Beer al-seba, the city of Majdal and the city of Gaza to the south. It connects the city of Safad, the city of Acre, the city of Haifa, and the city of Tulkarm to the north. And from the east side of Jaffa and all its villages to the west.

The population of Qalqilya has a population of 59,965, with a population density of 12,000 people per km². According to 2007 statistics, the population speaks Arabic, which is the official language of the State of Palestine. Religion is predominantly Muslim and a minority is Christian.



Map(1) : Palestine division during the British governance period

After becoming a part of the Tulkarem district in the 1950s, since 1965 it has become the center of an independent judiciary called Qalqiliya. It is followed by the neighboring villages of Jayyus, Habla, Azzun, El-Nabi Elias, Falameya, Kafr Thulth, Ras Atiya, Kafr Abush, Kafr Jamal, and the surrounding villages.

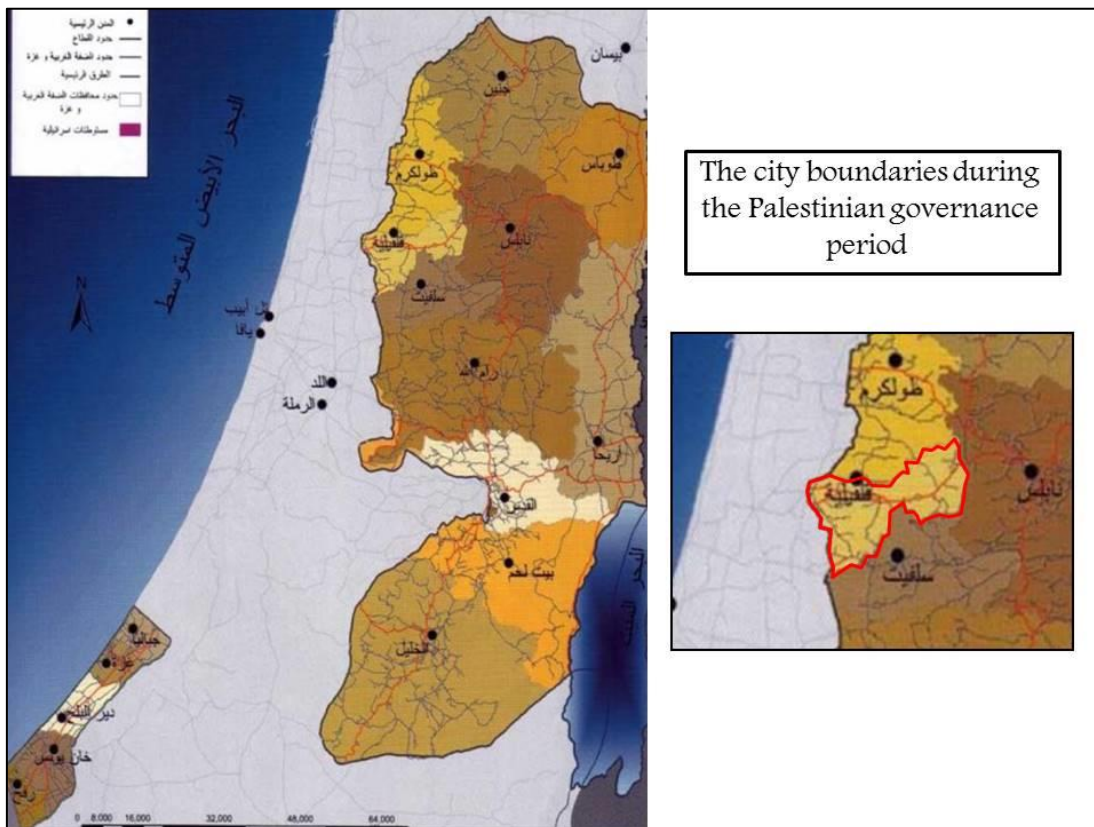


Years of Occupation:

Since June 1967 and the occupation of Israel by the West Bank, Gaza Strip, the Golan Heights and Sinai, the intentions of Qalqiliya have emerged. The Israeli occupation forces displaced the people of the city and blew up more than 80% of their homes. The occupation forces applied the policy of the mandate to retaliate against Qalqiliya, and annexed to the district of Tulkarm, on the pretext of following the last administrative division during the British Mandate. Qalqiliya remained deprived throughout the years of occupation despite the tremendous development of the city and its remarkable economic superiority

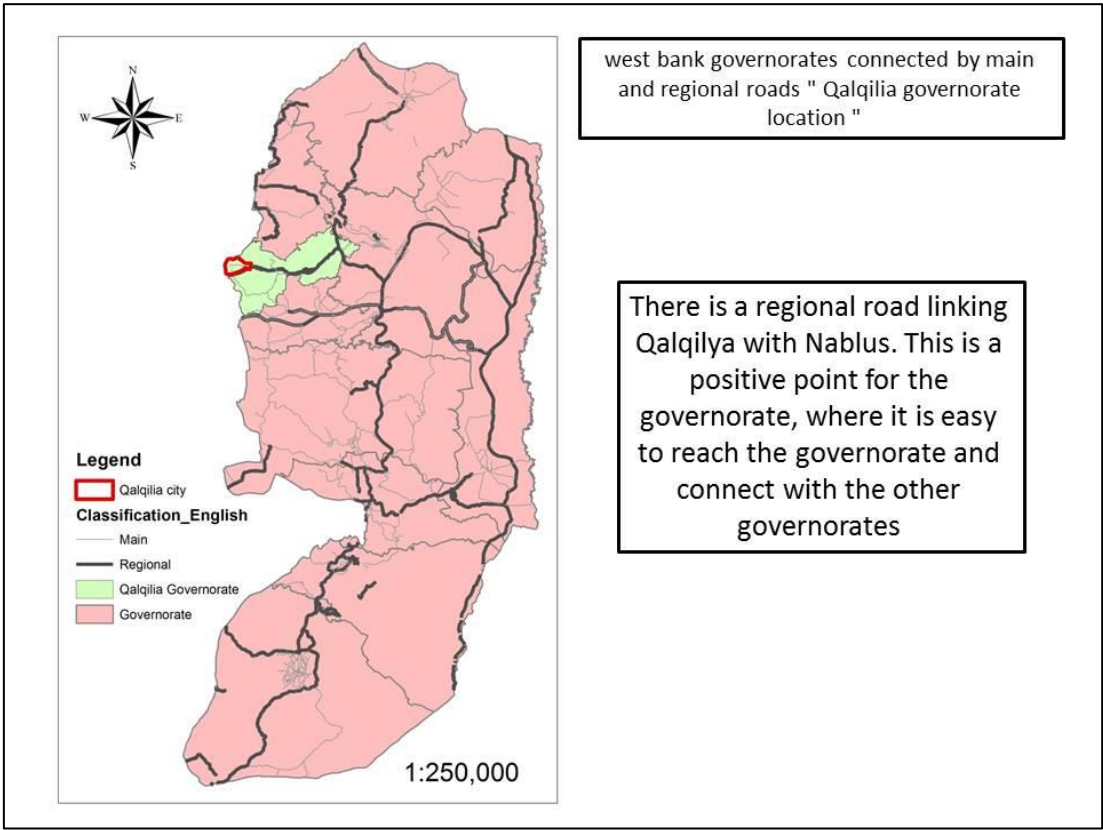
Palestinian National Authority:

After the departure of the last Israeli soldiers from the city of Qalqiliya at 5:30 pm on 17/12/1995, with the entry of the first Palestinian forces, Qalqiliya became liberated and Yasser Arafat, the Head of State of Palestine, announced the official designation of Qalqiliya.



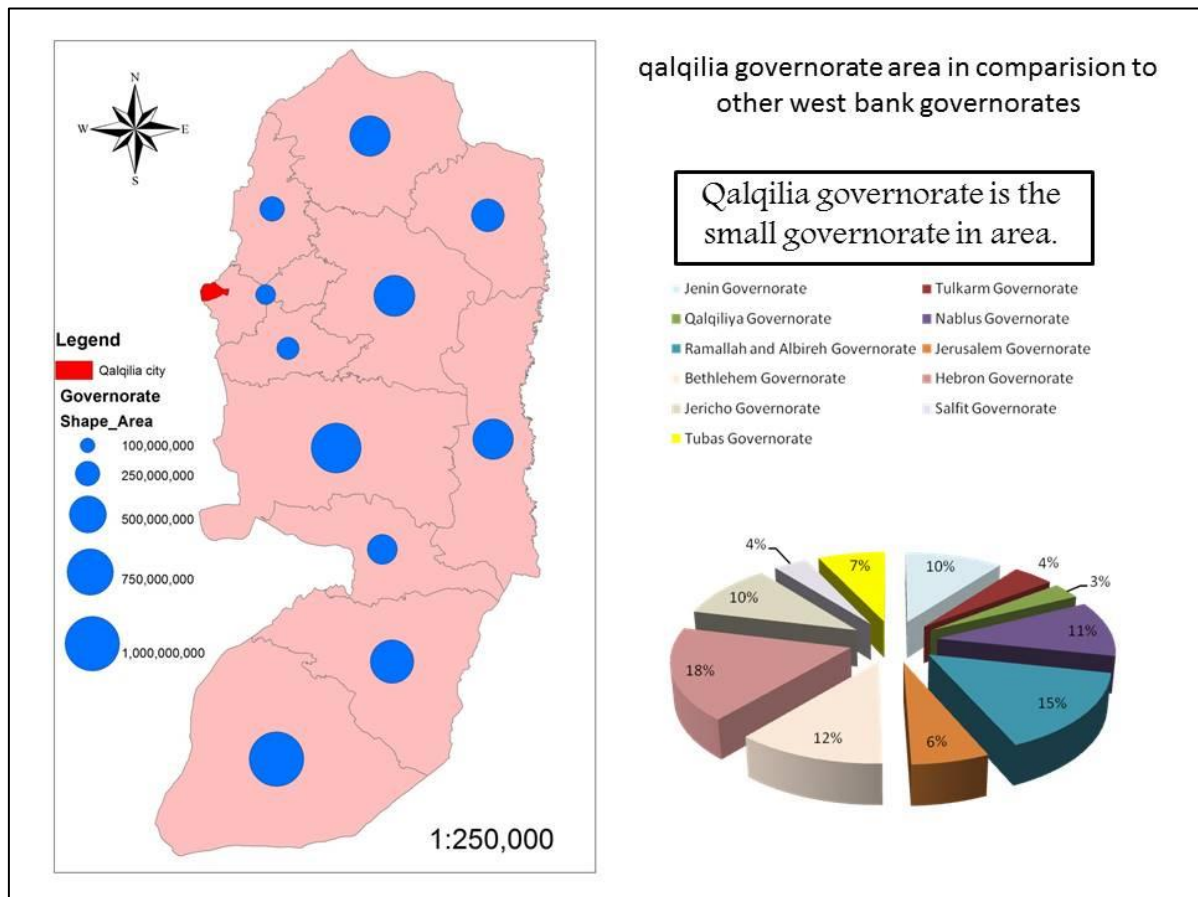
Map (3) West Bank division during Palestinian period

Map 3 shows the distribution of the regional and main roads in the West Bank and shows that Qalqiliya is connected to the rest of the West Bank by one regional route and one main road.



Map 3 shows the distribution of the regional and main roads in the West Bank.

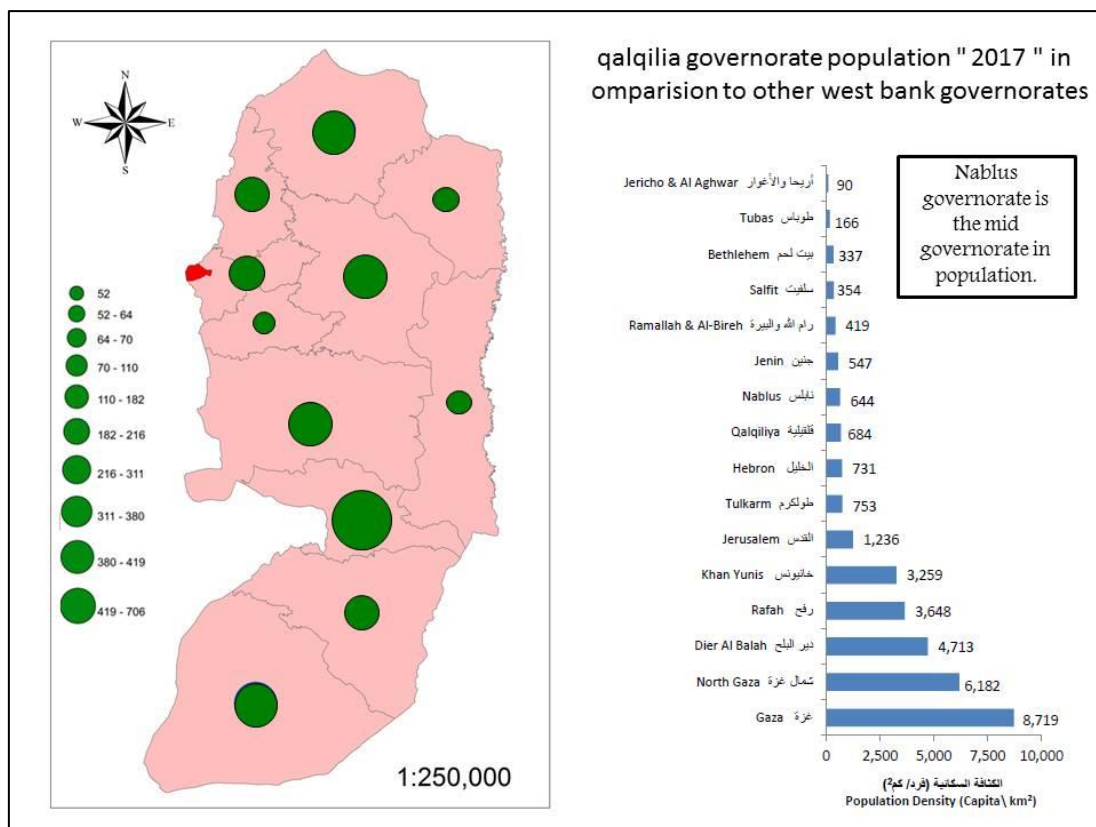
The area of Qalqiliya Governorate is about 166 km², which constitutes 3% of the area of the governorates in the West Bank. Hence, we note that the governorate, although small in size, is densely populated with population, construction and others.



Map (3) shows the area of Qalqiliya governorate for the other governorates

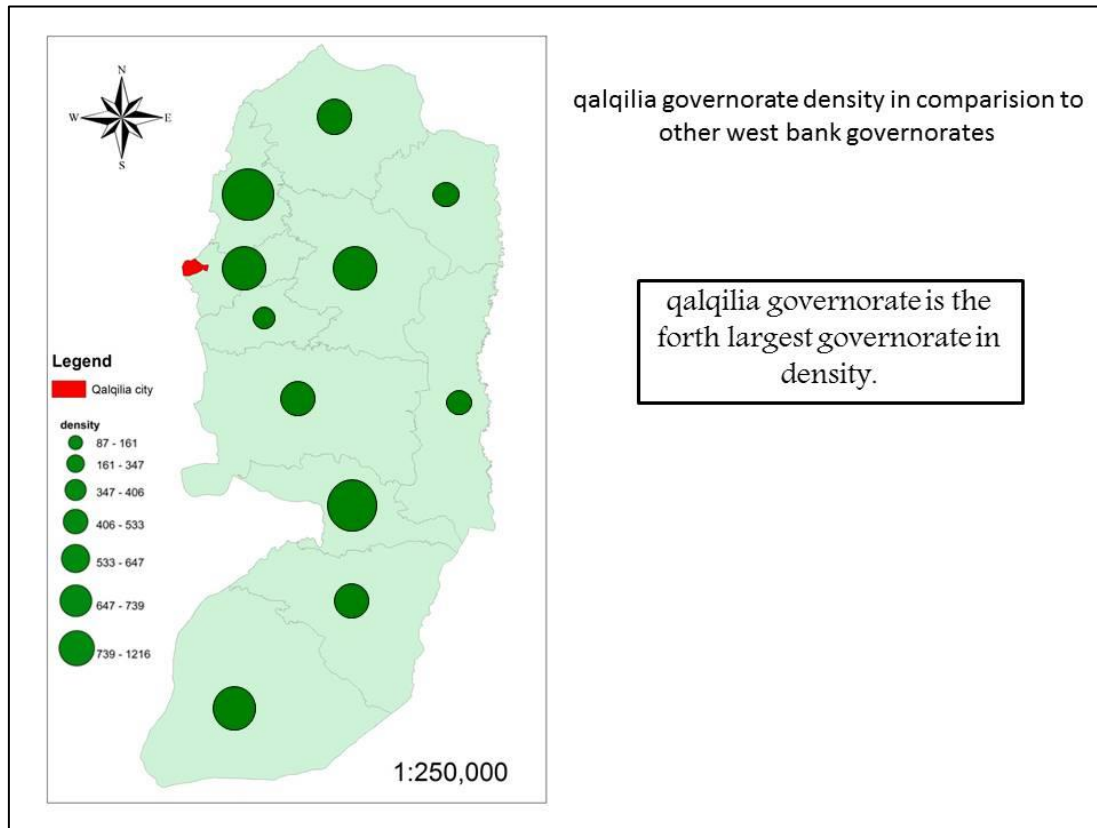
Qalqilia is one of the most populous cities in Palestine in recent decades. This is due to the migration of thousands of residents of the neighboring villages after the 1948 Nakba, and the result of this Nakba from the loss of the land and the destruction of many of the many villages and the displacement of its people, the population is currently about 59,965 named.

This shows the significant increase in the population over the years, which causes many problems for the governorate in general and the city in particular.



Map (4) qalqilia governorate population " 2017 " in comparison to other west bank governorates

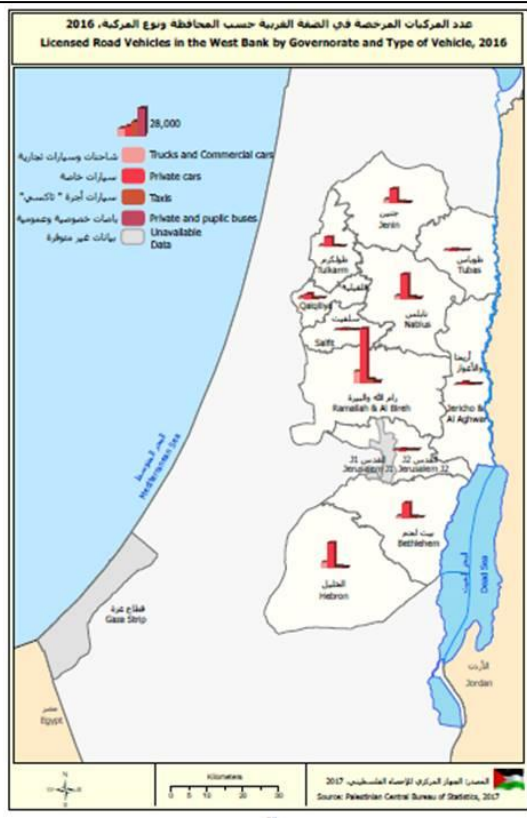
Map 5 shows the population density of Qalqiliya Governorate for the rest of the governorates. Qalqiliya is one of the highest densities in the population. The fourth place is densely populated in the governorates. This negatively affects the city planning and increases population pressure.



Map(5) shows the population density of Qalqiliya Governorate for the rest of the governorates.

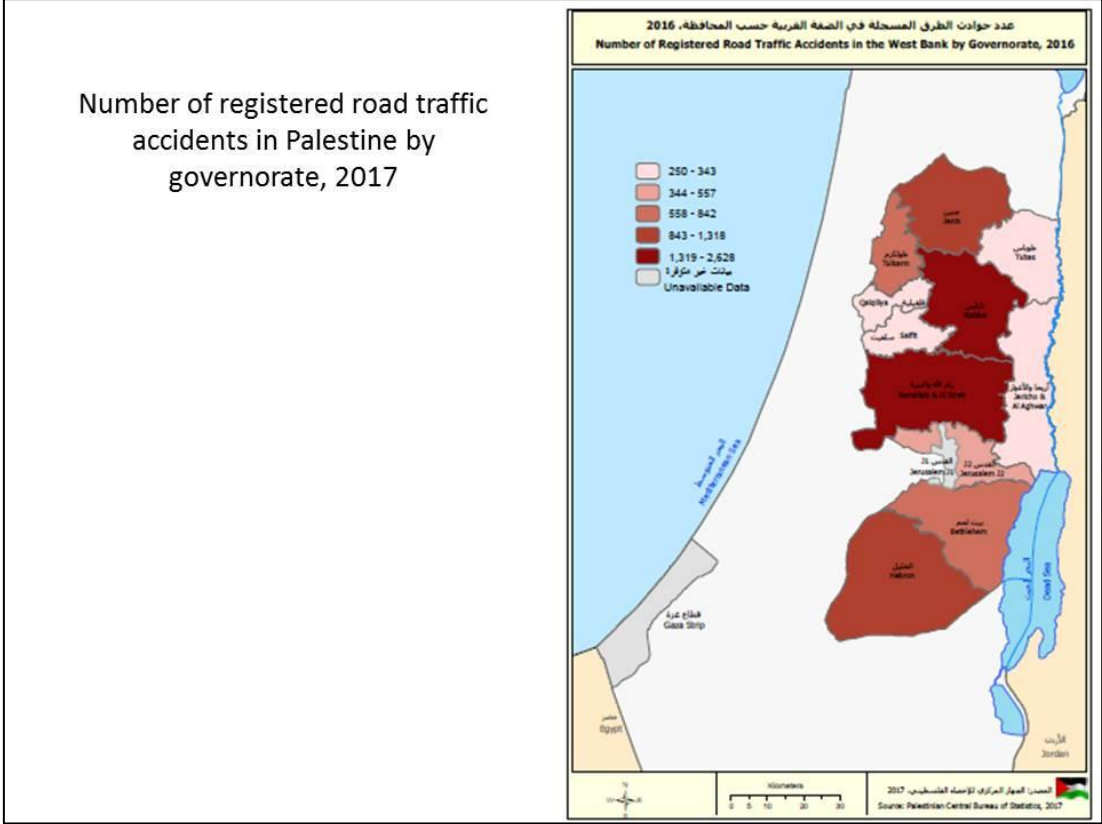
Qalqiliya governorate is one of the lowest in terms of the number of vehicles. However, the entry of vehicles into the area by 48 workers from the rest of the governorates (Tulkarm, Nablus, Salfit, etc.) is very large. The population of the city, residents of the villages of Qalqiliya, and the large turnout by university students and others, causing a suffocating crisis inside the city.

Licensed road vehicles
in Palestine by
governorate and type of
vehicle, 2017



Map (6) Licensed road vehicles in Palestine by governorate and type of vehicle, 2017

The percentage of accidents in the province of Qalqilya is very low for the rest of the provinces and this is a positive point, except I happen accidents that are very dangerous and must study this aspect through the project.



Map (7) Accidents in Qalqilya Governorate for the other governorates.

3.2 The importance of Nablus city on the Local level:

Historical epochs

The Roman era:

Despite the lack of historical information about administrative divisions in Palestine in general before the Islamic conquest, the sources indicate that Palestine in that era - in the fourth century AD - was divided into three sections or states: Palestine first, second and third (desert), while part of North of Palestine - Acre plain and Haifa area - followed by the state of Phenicia.

Qalqilia was mentioned in these divisions in the first region of Palestine from the district of Ras al-Ain, known as Antipatris, and was administratively followed by 10 villages in the forefront of Qalqiliya.

The era of the Islamic state:

After the Islamic conquest of the Levant during the reign of Caliph Umar ibn al-Khattab, the Levant was divided into four armies: Homs, Damascus, Jordan and Palestine. Jund Palestine included the southern central regions of present Palestine and a section of eastern Jordan. Lod was the head of this group and therefore Qalqiliya was part of this group. This division continued throughout the period of the Umayyad and Abbasid state with modifications in the line of this soldier between Khalifa and another.

Fatimid state: Qalqiliya became one of the areas of Kor (Kafr) Saba.

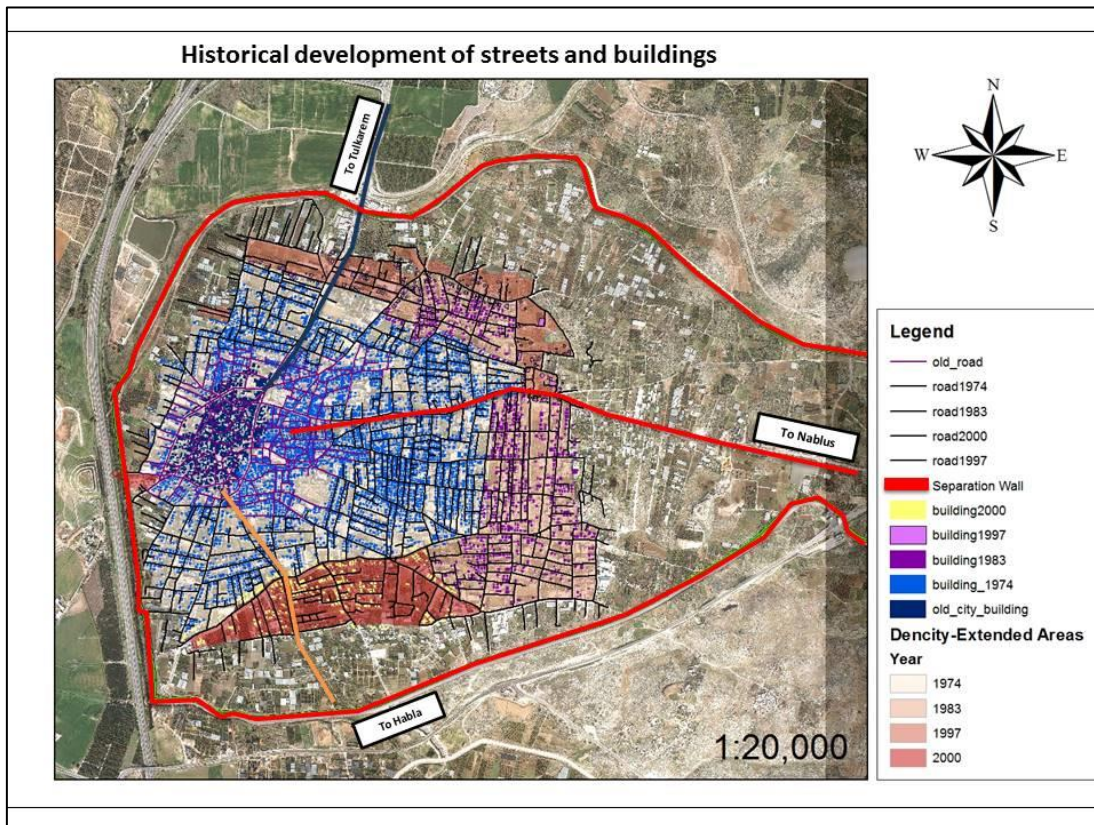
The Mamluk State: Neighboring Jaljulia was a prominent place and had a leading position in the region. Qalqiliya was one of the works of Jaljuliya in this era. During this period, Qalqiliya scientists emerged from the center of the region, Jaljulia, to practice education and reading, including Shamsuddin Muhammad ibn Ahmad al-Qalqili.

Ottoman Empire: At the beginning of the Ottoman era, the Levant was divided into three states, including the State of Palestine, which was divided into five brigades (Sanjak in Turkish) namely Jerusalem, Gaza, Safed, Nablus and Lajon. Qalqiliya followed one of those snaggers, namely, Sanjak, Nablus. In 1660 another state was formed in the Levant, the province of Sidon, which included parts of Palestine.

And took their loyalty to their influence and power interfere in the affairs of all the Palestinian areas, so considered most of the communities, including Qalqiliya within the jurisdiction of Sidon and influence. It is noteworthy that the governor of Damascus (which was followed by Palestine) was forced to seek help from Suleiman Pasha and the ruler of Saida after he failed to confront the revolution of Abu Odeh al-Jayyousi in Sufyan in the 19th century.

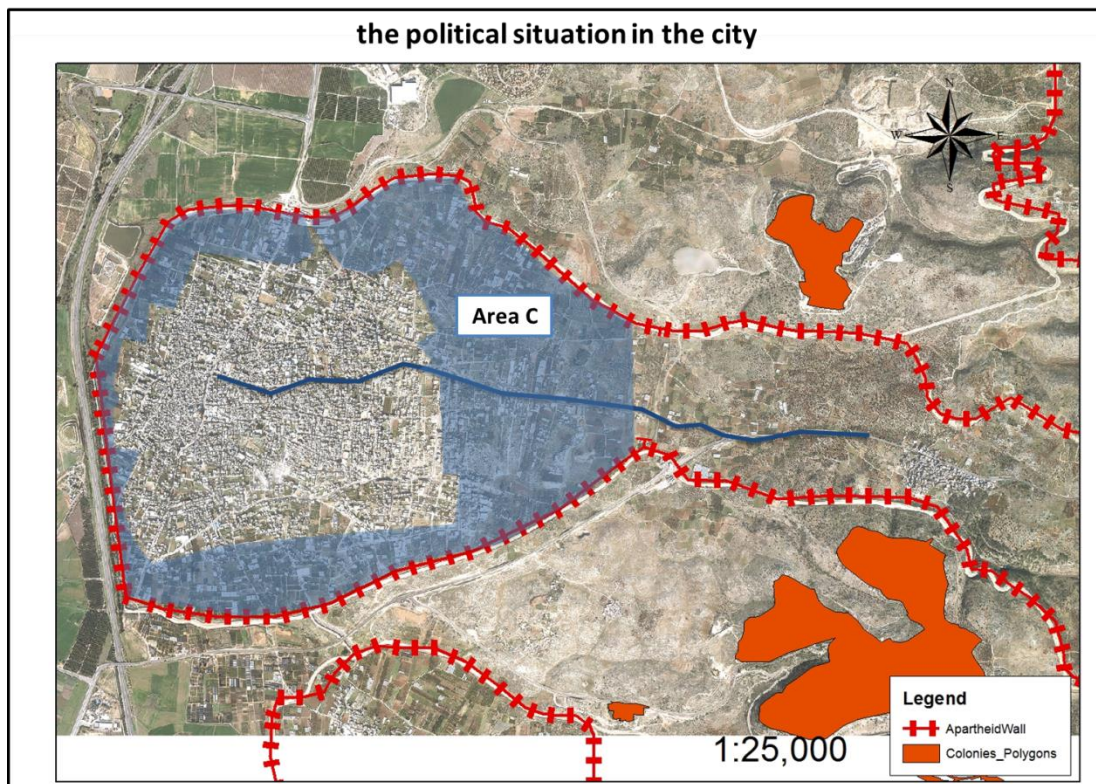
In 1864, the law of the formation of the Ottoman states was promulgated, whereby the Levant was divided into two states, Syria (Damascus) and Aleppo. All of Palestine followed the jurisdiction of Damascus and made it a Jerusalem-based metropolis. Al-Mutasrifiya was divided into districts: Hebron, Gaza, Lod, Nablus and Samaria, Beqif, Houran, and East Ghor. Soon, Nablus and Acre were turned into brigades within Damascus. Throughout this period Qalqiliya was part of Nablus. In 1887, the state of Beirut was established in the Levant and included the cities of Sanjak, Acre, Sanjak Balqa and Nablus. The center of the Sanjak and Nablus brigades were divided into two districts: Jenin and Salt. Qalqilya was one of the main areas of the Nablus Brigade.

In 1893, a new district was established in the city of Sanjak, which is Bani Bani Saab. Qalqiliya became the center of the Haram to the Haram Ali and the villages of Ajlil, Maska, Kafr Saba, Tira, Jaljulia, Umm Khaled, Wadi Al-Hawarath and Al-Haram. This area extended from north to south and from east to west.



Map (8) Historical development of streets and building

The political situation in the city

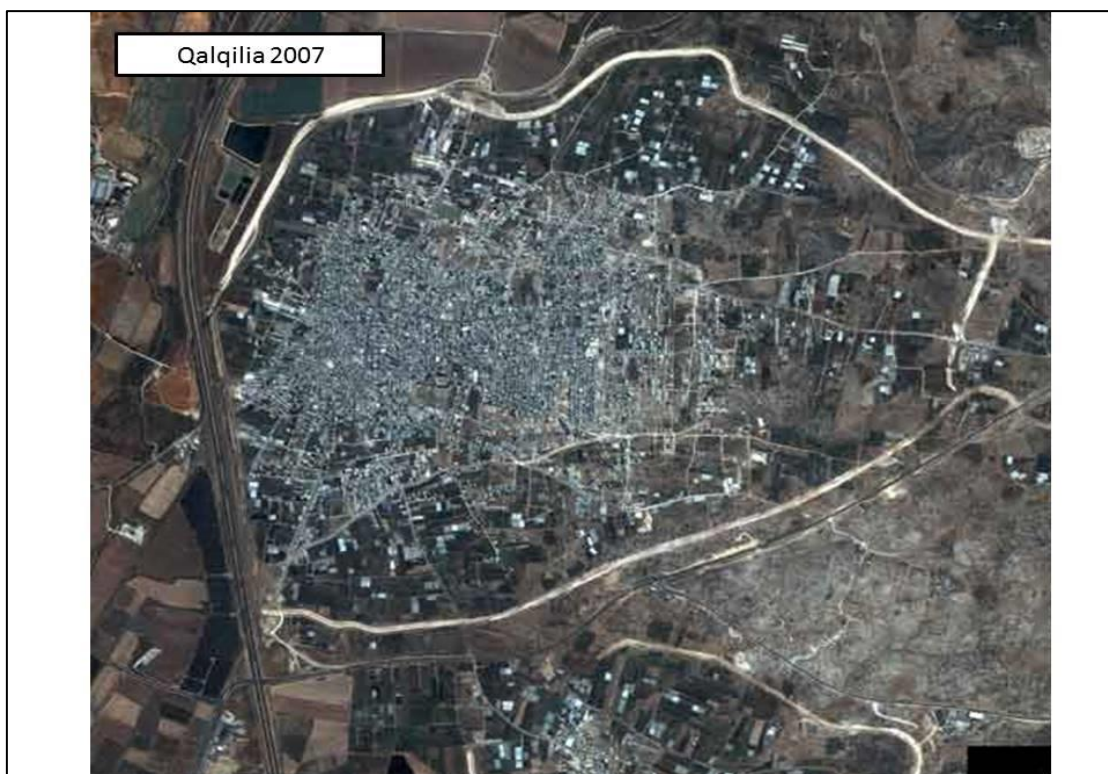


Qalqilia expansion during the years

Map 9 shows the borders of Qalqilya in 2000 , 2007 , 2017 . It was found to be surrounded by a wall of apartheid and overcrowding, concentrated in the center of the city.



Map 9 shows the borders of Qalqilya in 2000.



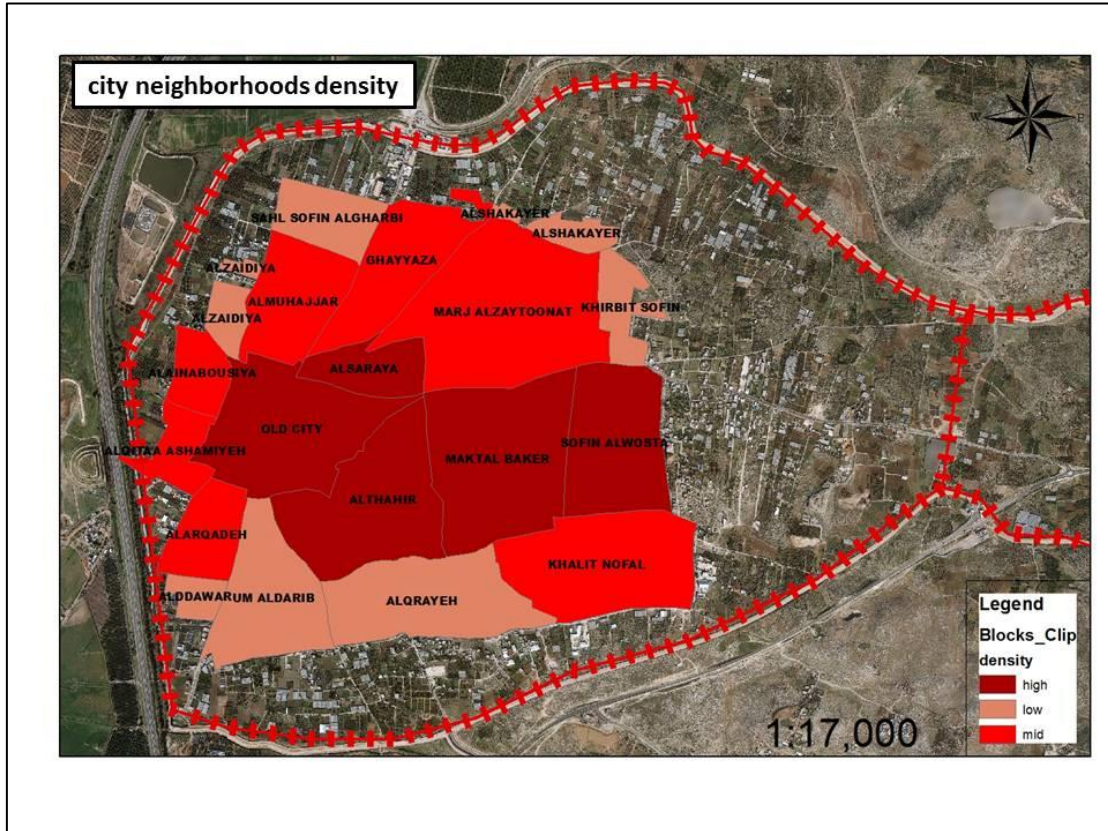
Map 10 shows the borders of Qalqilya in 2007.



Map 11 shows the borders of Qalqilya in 2017.

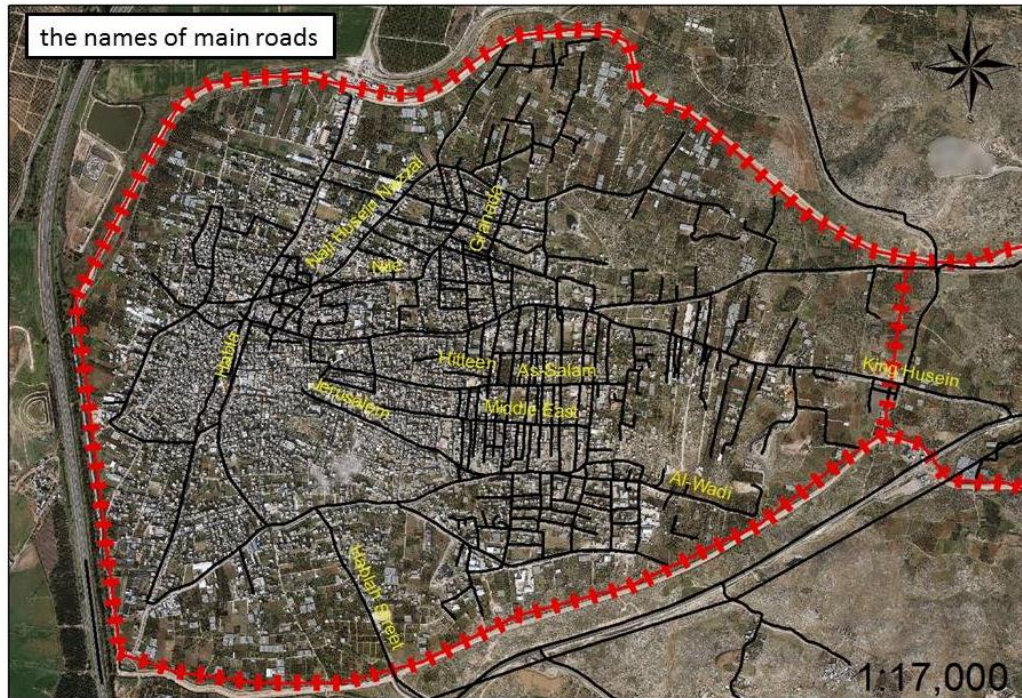
To understand the expansion and the amount of transit needed in city we need to study the density in each neighborhood. Map (12) shows the density in city according to each neighborhood.

We note that the population density is concentrated in the neighborhoods in the center of the city, especially on the main streets and the city center, which is very bad for traffic and overcrowding on the street network.



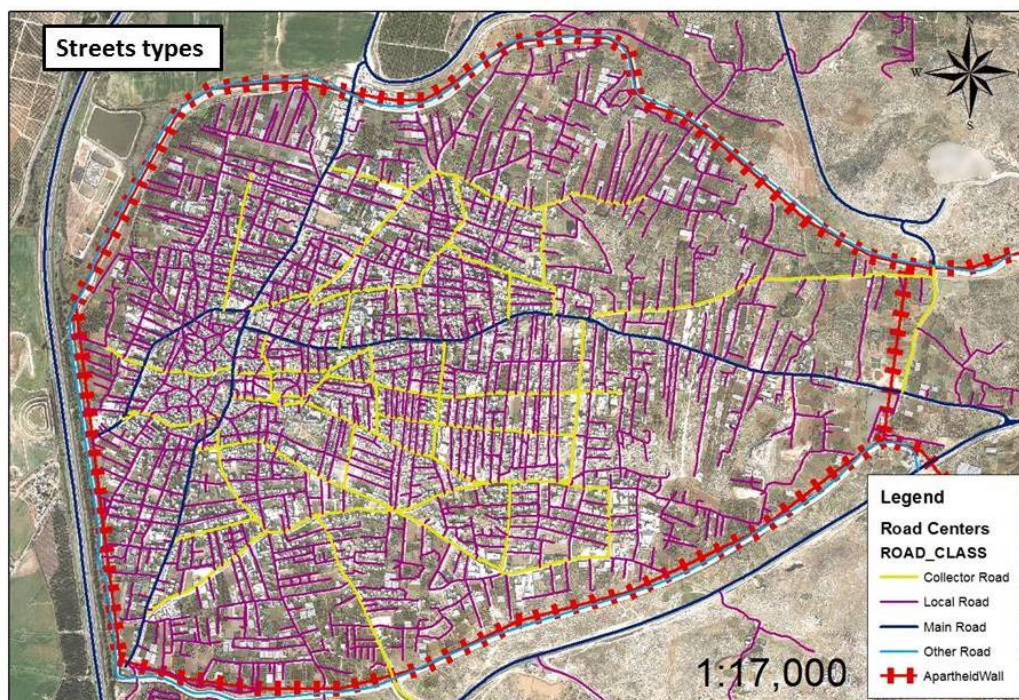
3.3 Qalqilia city roads Diagnosis

Map (13) shows the names of main roads in Qalqilia city to introduce places and roads.

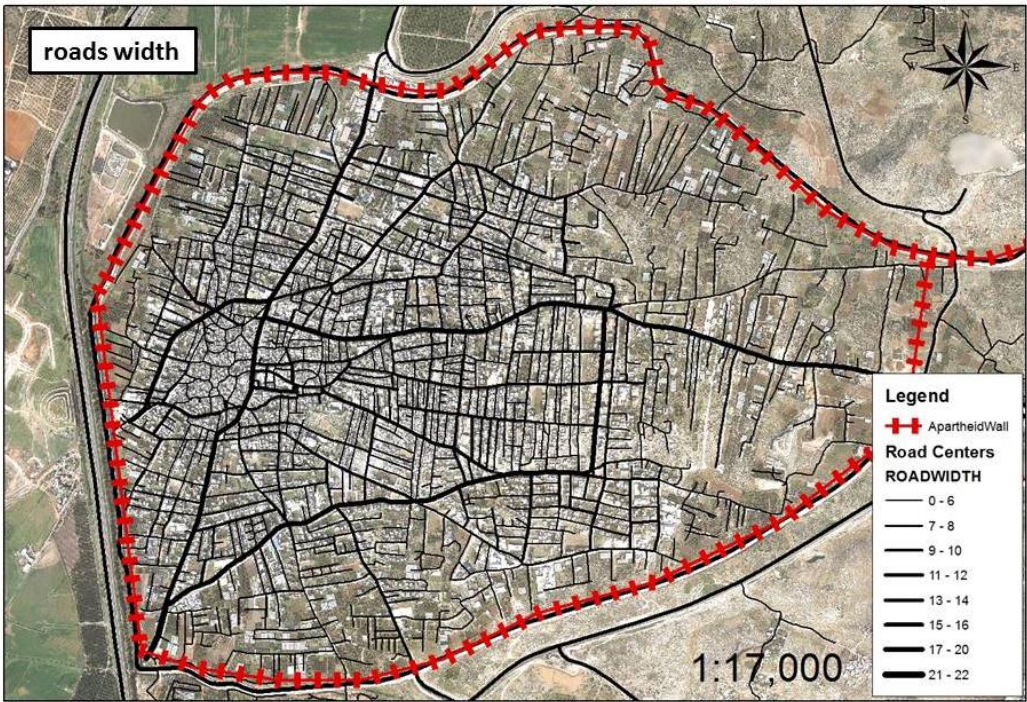


Map (13) shows the names of main roads in Qalqilia city

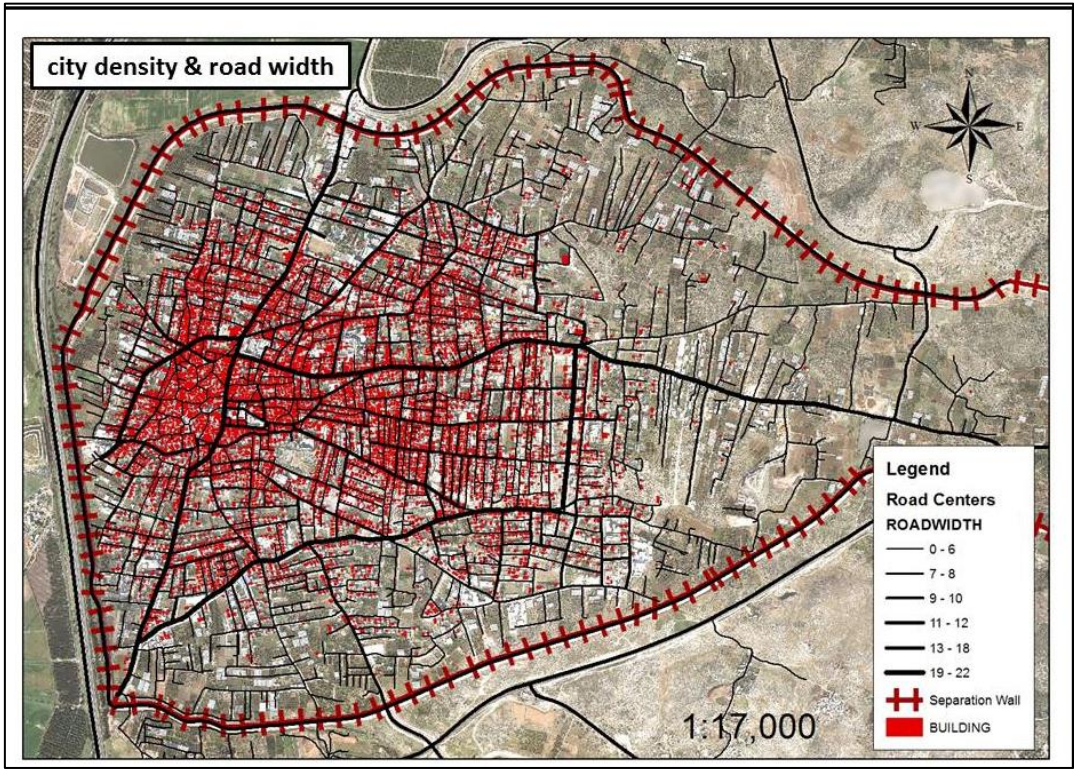
The streets of Qalqiliya are classified into four types, as shown in the map: 14 main roads, residential, secondary and tertiary roads. There is only one main road, and the road connecting the city to the outside is "Nablus Street".



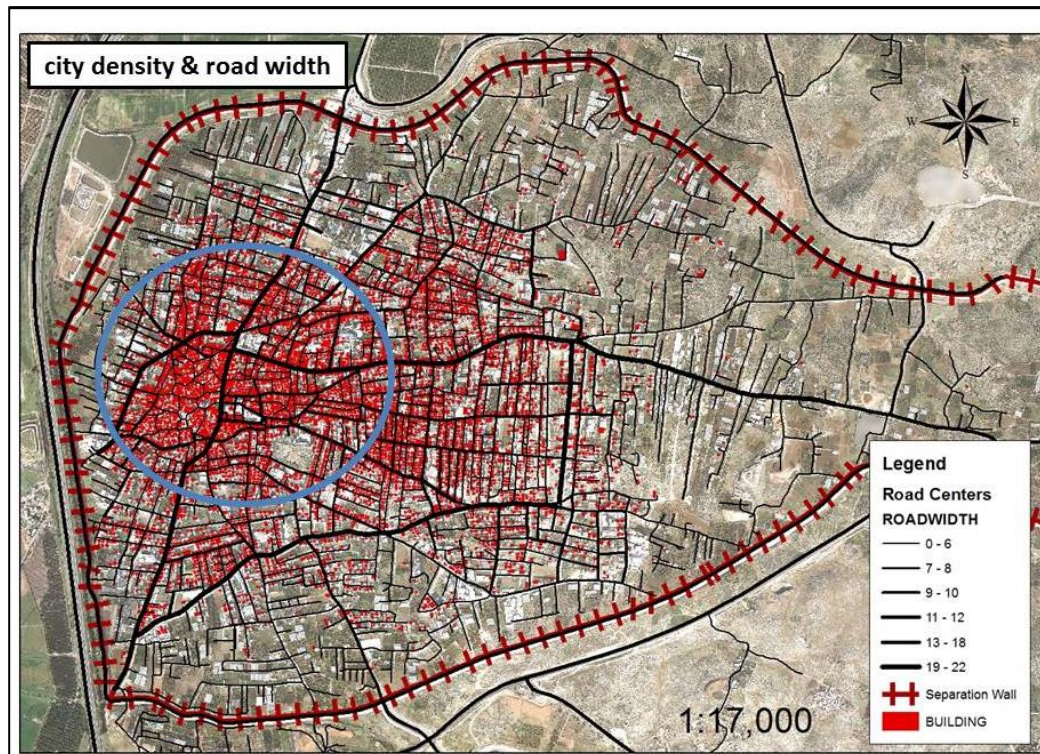
The width of the streets of Qalqiliya is between 4 and 22 meters, as shown in the map 15. We note that the building density is concentrated on the streets with wide displays and very high streets.



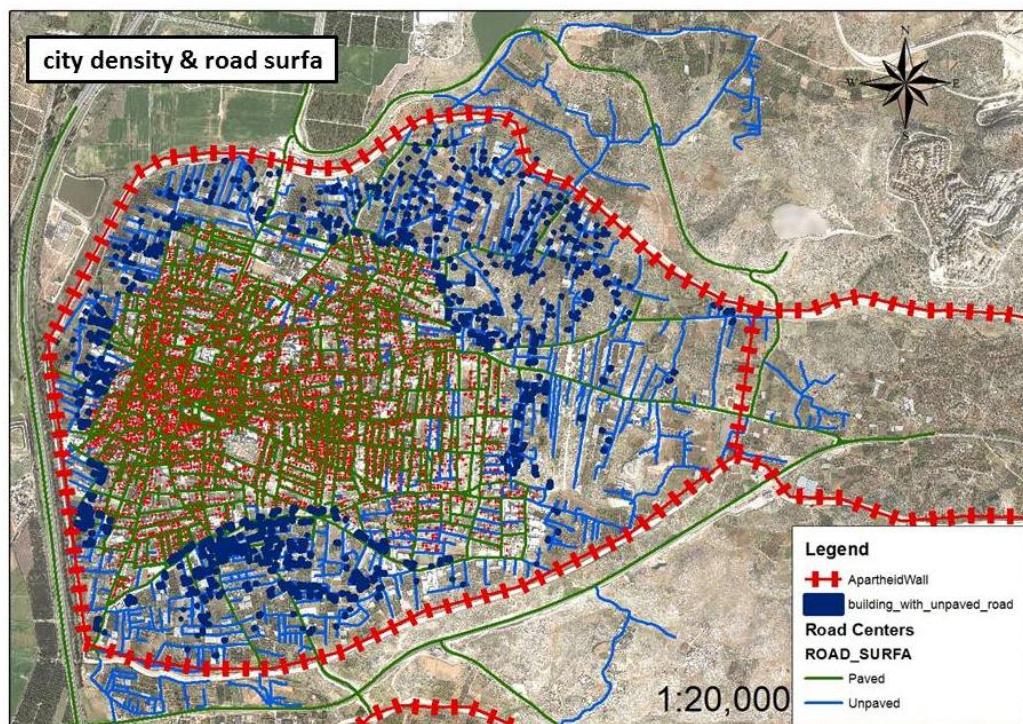
Map 15 The width of the streets of Qalqiliya



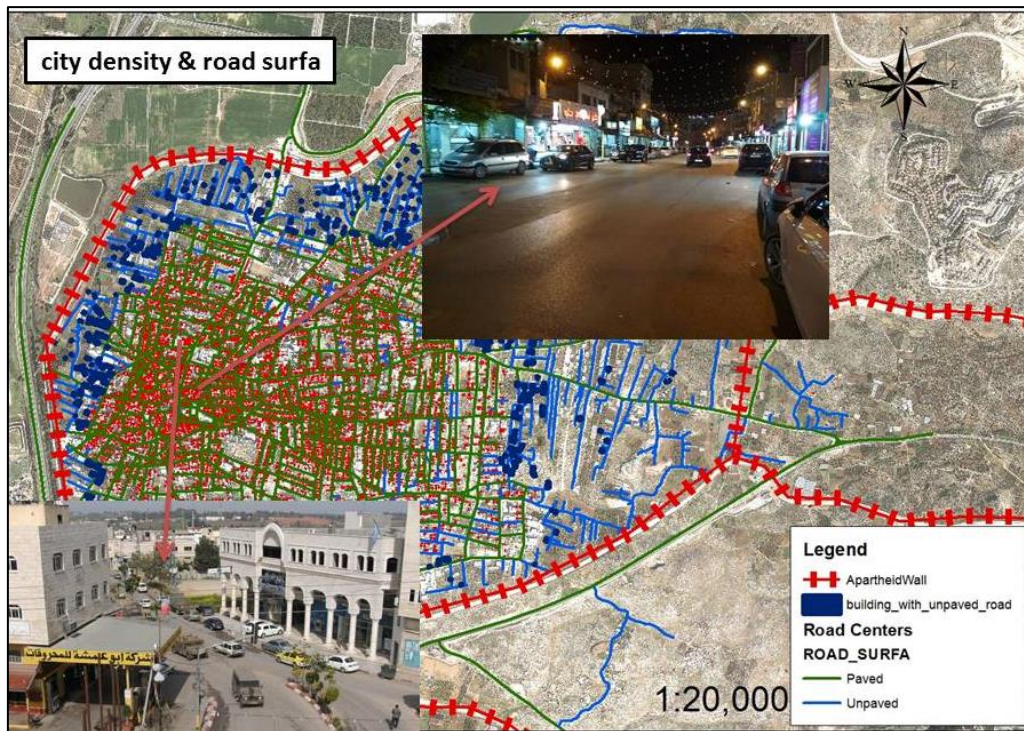
Map 16 city density & road width



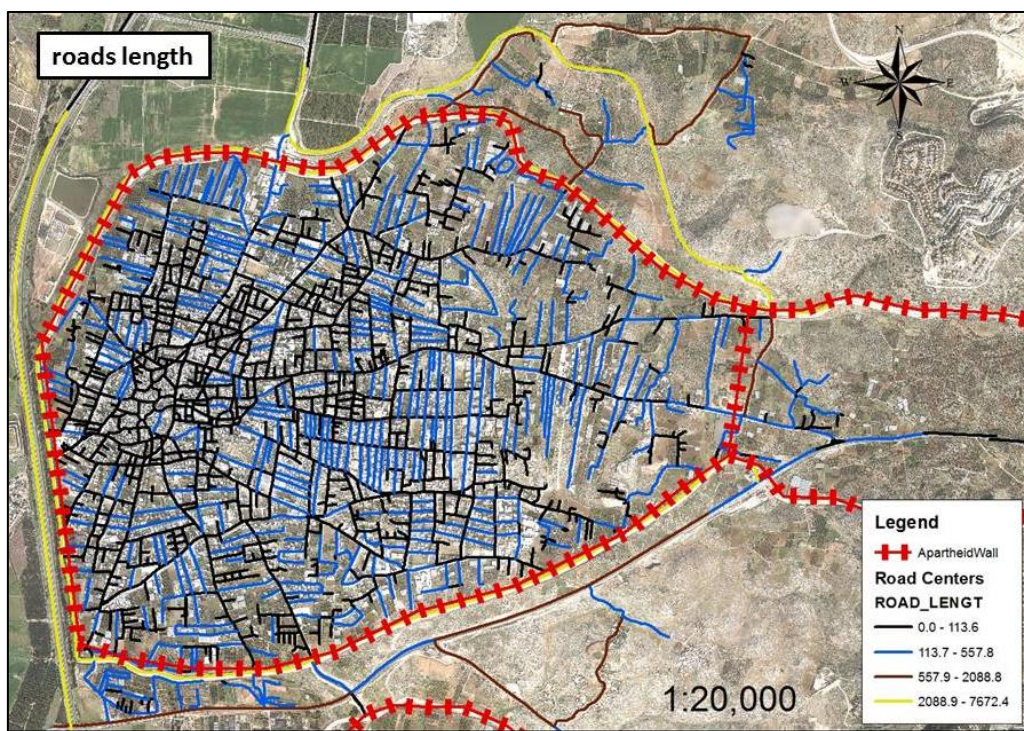
Map 17 city density & road width



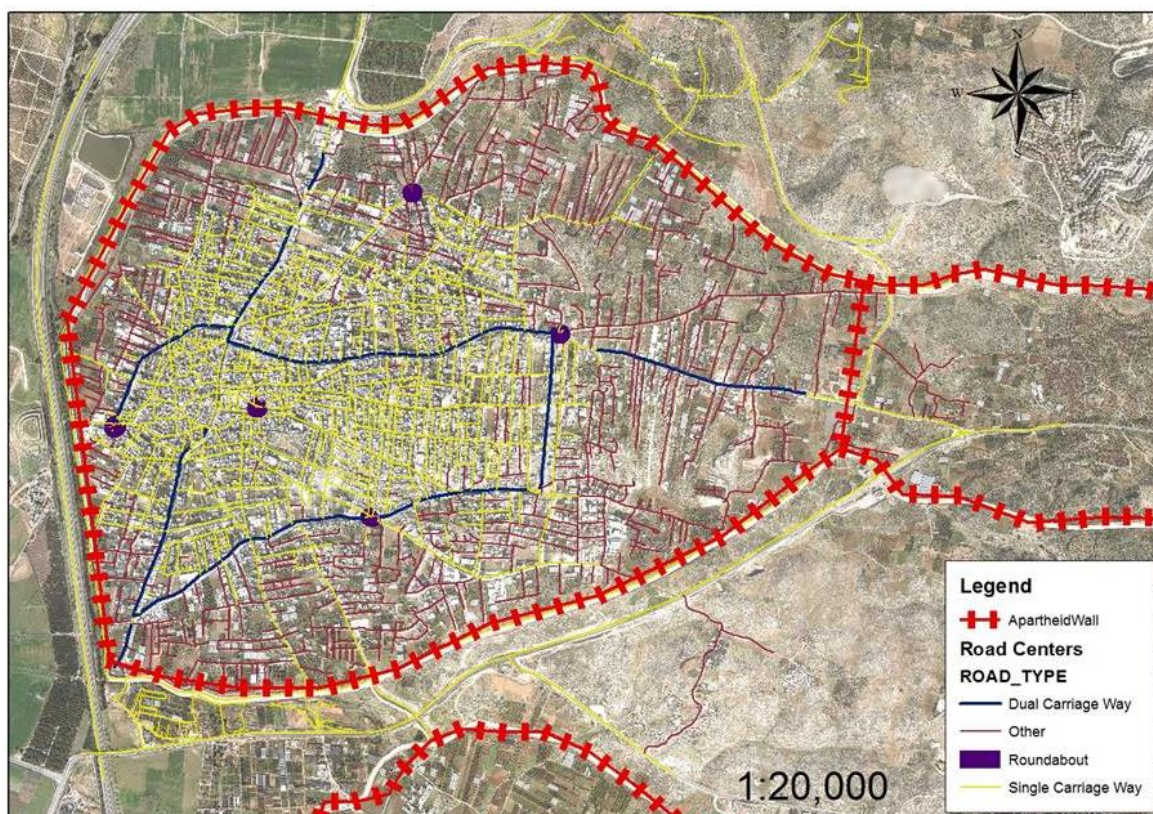
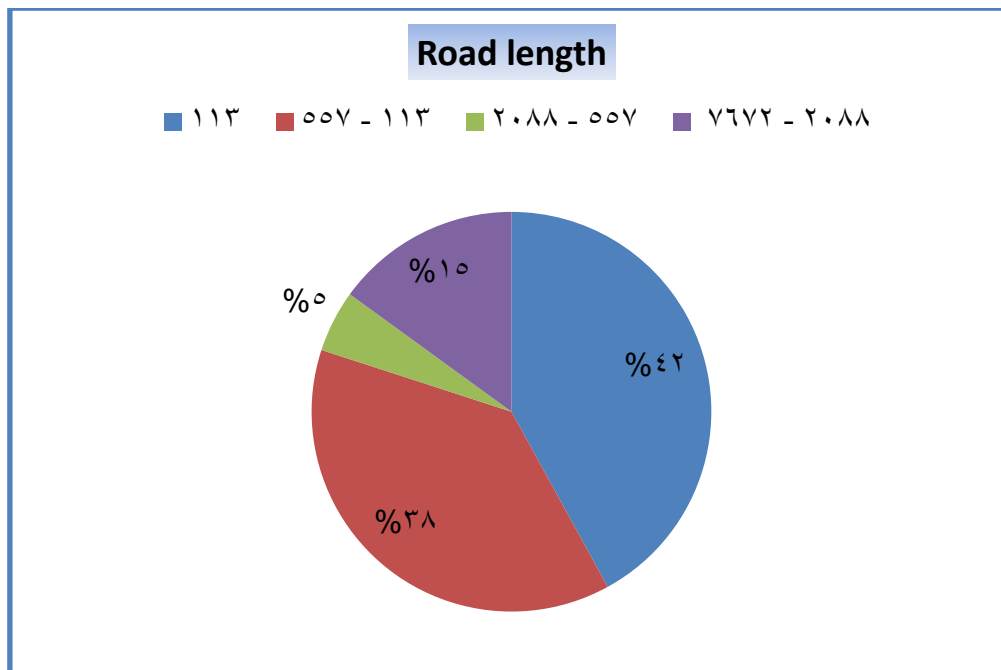
Map 18 city density & road surfa



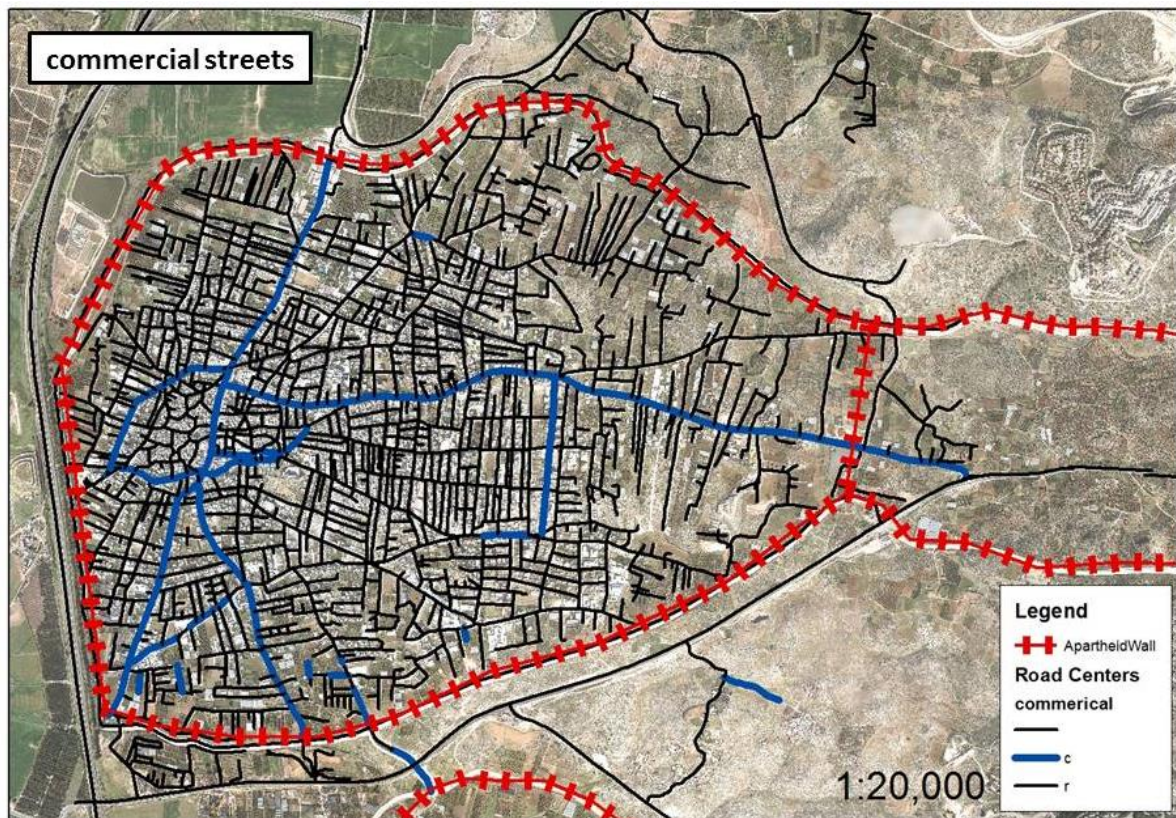
Map 18 city density & road surfa



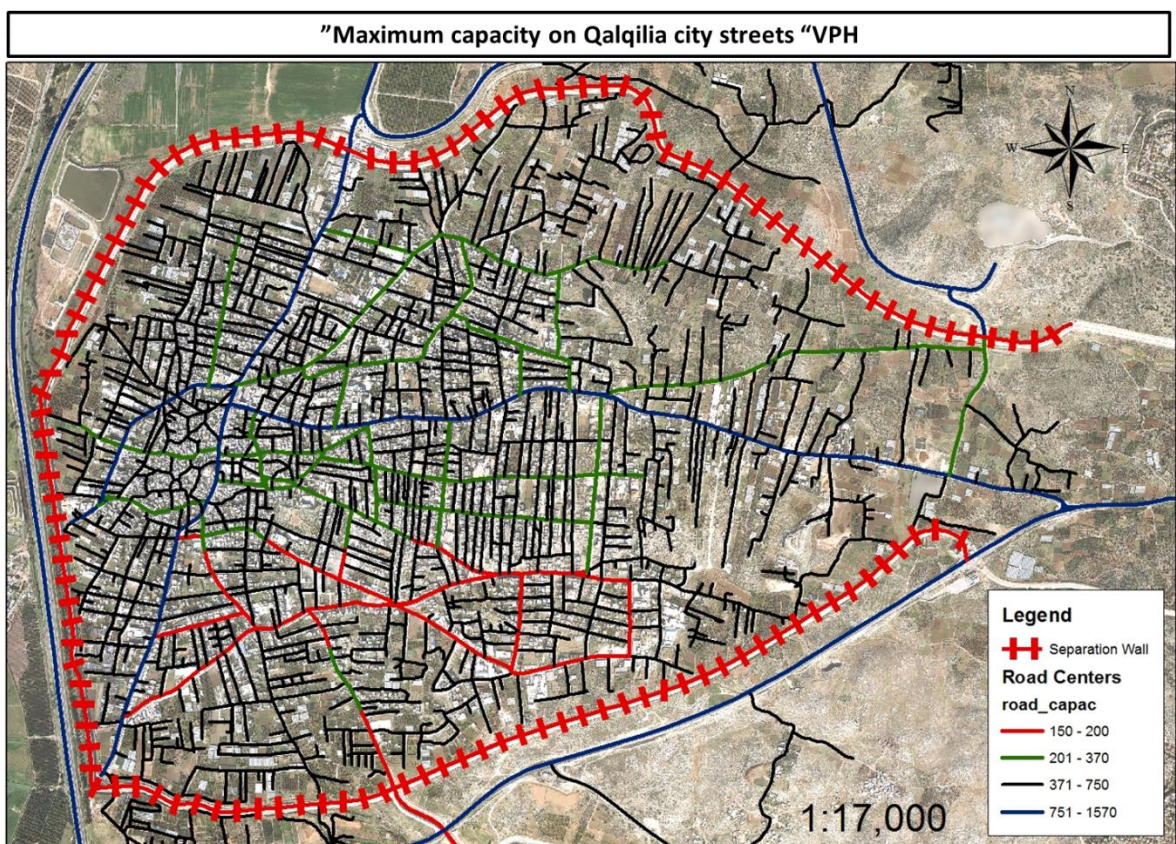
Map 19 roads length



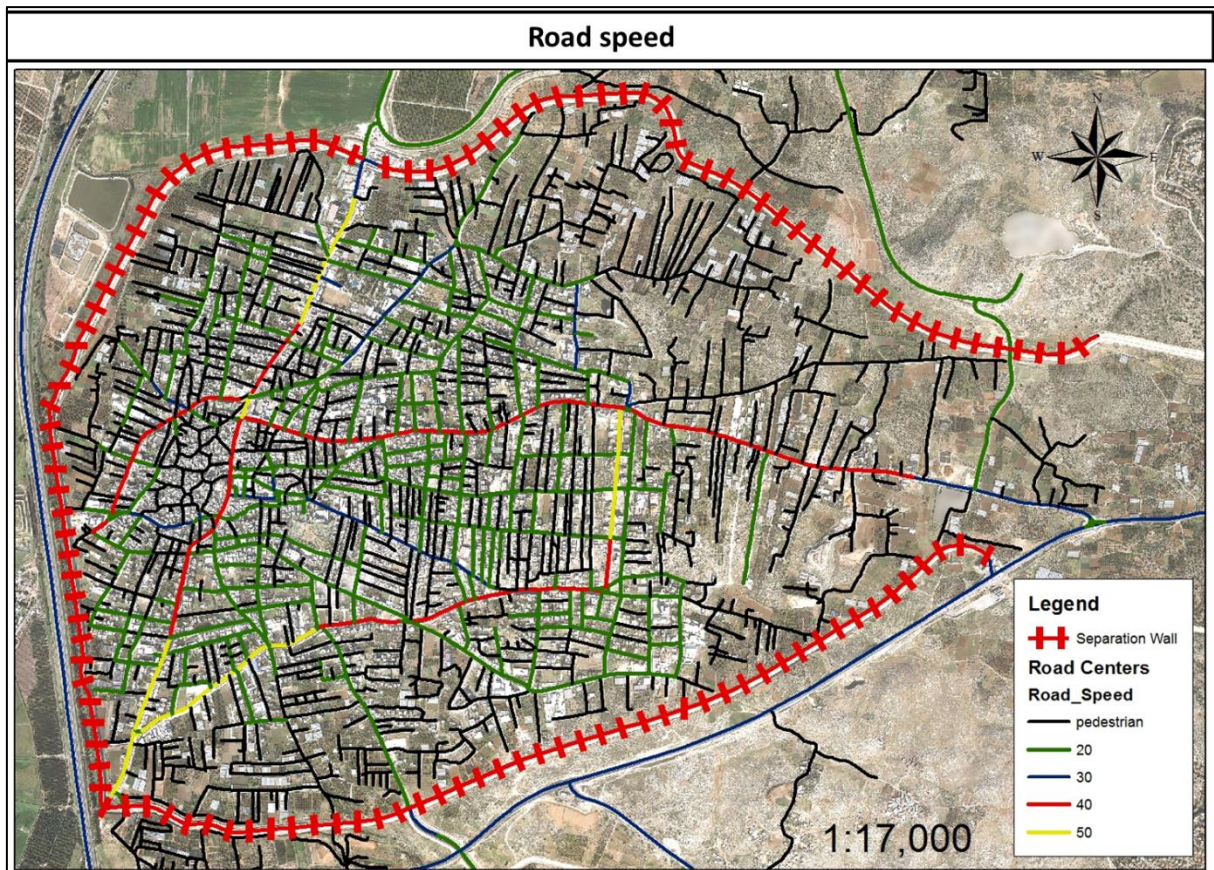
Map 20 roads type (carriage way)



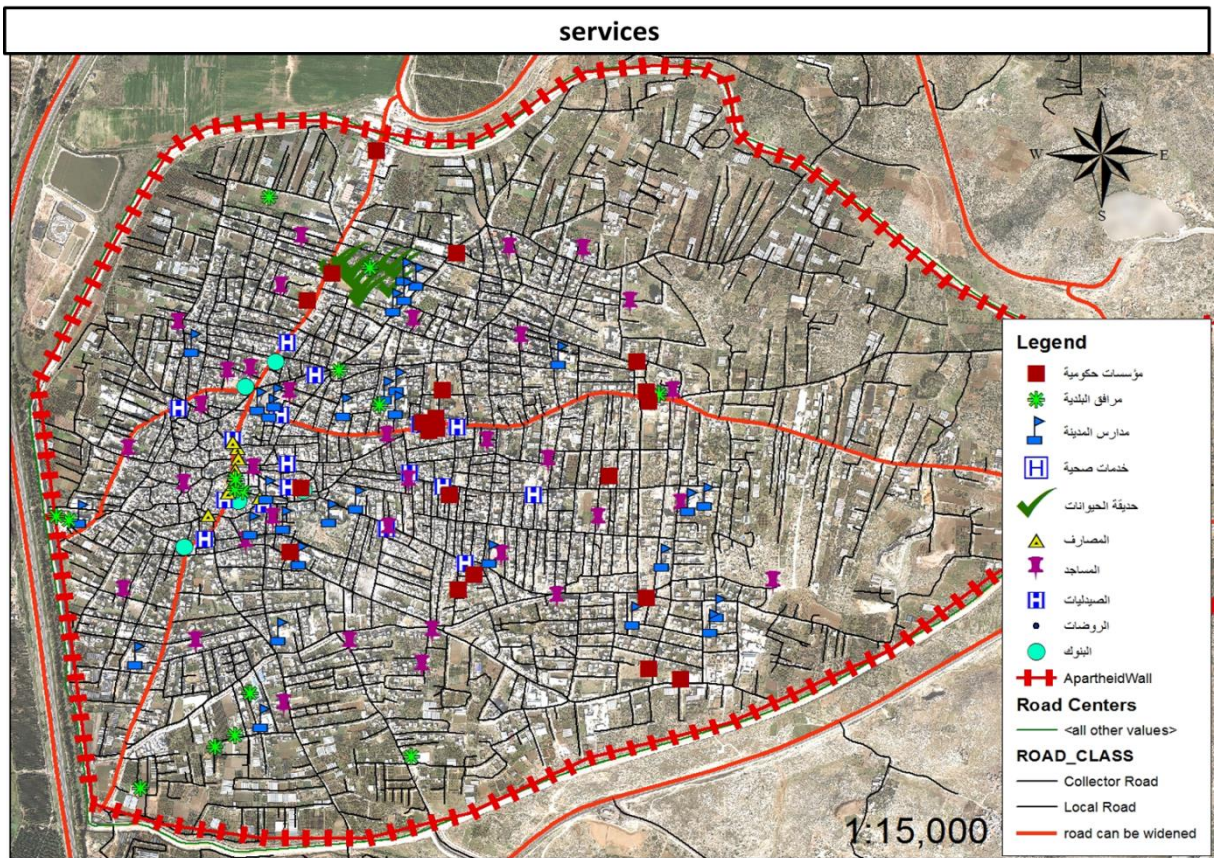
Map 21 commercial streets



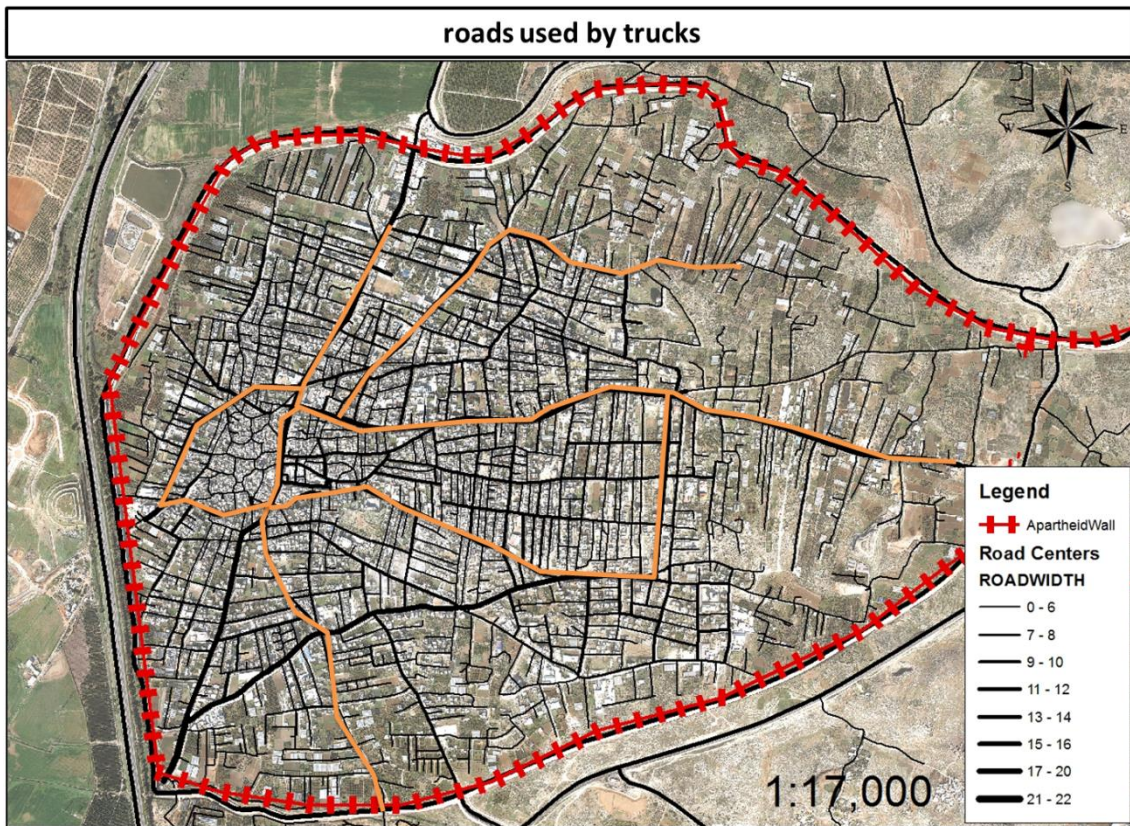
Map 22 Maximum capacity on Qalqilia city streets "VPH"



Map 23 Road speed



Map 24 services



Map 25 roads used by trucks

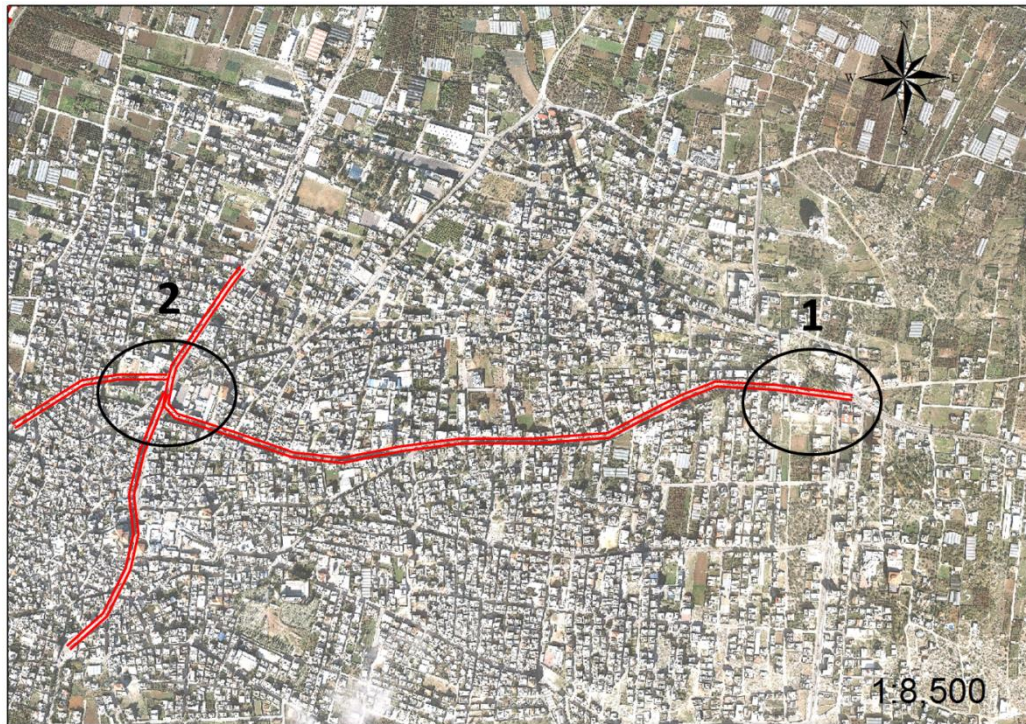
3.4 Traffic volume counts

Inventory study

Before embarking on any project development process, the existing physical and geometry is conducted need to be known, to indicate these are modifiable, acceptable or not, and this assist in planning and design of space.

Right Of Way:





Figer 1Areas of study



Figure 2: Inventory study area (east side)

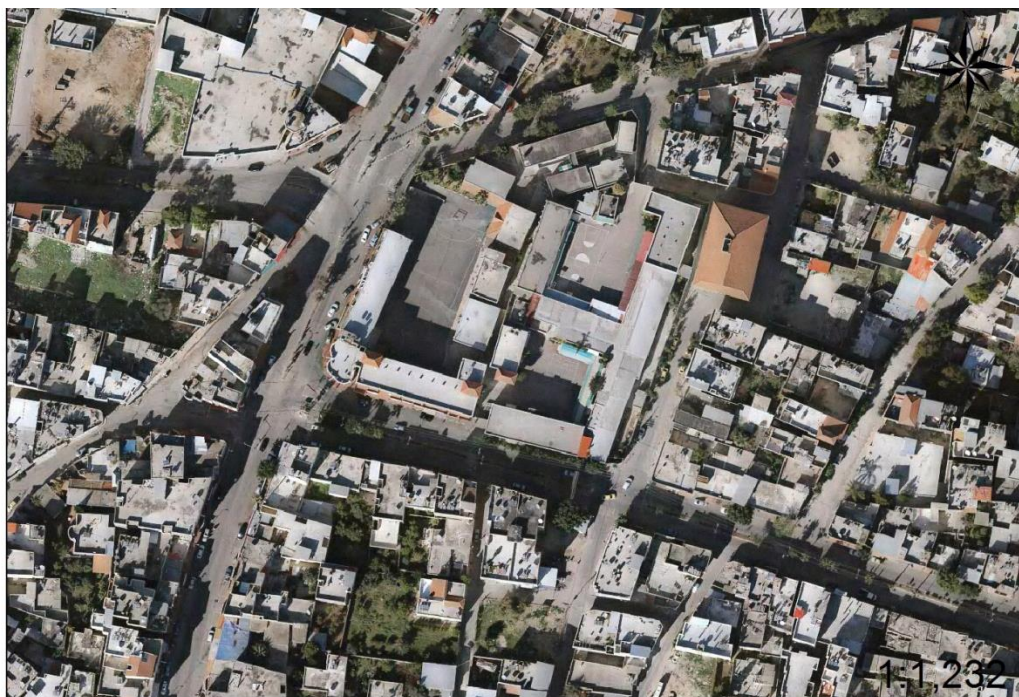


Figure 3: Inventory study area (west side)

The two areas were selected based on the previous analysis, where they were found to be the most problematic, and the traffic in them is continuous and very large.

No.of Link	East to West (m)			West to East(m)		
	Side walk width	Width of lane	Width of parking	Side walk width	Width of lane	Width of parking
1	2	19	No parking	2	19	2
2	2	15	No parking	2	15	No parking
3	No	12	No parking	No	12	No parking
4	No	7	No parking	No	7	2
5	2	20	No parking	2	20	2
6	2	19	No parking	2	19	2
7	1.4	8	No parking	1.4	8	No parking
8	3	8	No parking	3	8	No parking
9	No	8	No parking	No	8	2
10	2	10	No parking	2	10	No parking
11	3	19	No parking	3	19	2

12	3	20	No parking	3	20	2
13	3	20	No parking	3	20	No parking
14	2	20	No parking	2	20	No parking
15	2	10	No parking	2	10	No parking
16	3	19	No parking	3	19	No parking
17	2	18	No parking	2	18	No parking
18	3	20	No parking	3	20	No parking

Tabel 1: summarizes the basic width elements for each of the links.

The above table shows the two areas in terms of sidewalks, parking lots, road widths, pavement widths, access to major problems of areas.

Map No. 26 The first area studied and the work of traffic counting is based on the criteria we studied. It is located in the area of Muhammad al-Fateh Circle, which is located between Abu Ali Street and Iyad Street, and 22 secondary roads, one to the east and the other to the north.



Map 26 The first area studied

Table 2 shows the traffic count of Mohammed Al Fateh roundabout at several times. We note from the tables the large numbers of cars passing through the area within a quarter of an hour and the resulting traffic crisis.

Mohamad Al -Fateh Main Entrance intersection

7:30am – 8:30 am

	To Street (1)			To Street (2)			sum
Time \vehicle class	cars	Bus	truck	cars	bus	truck	
7.30-7.45	32	4	8	30	1	5	80
7.45-8.00	51	2	5	44	1	7	110
8.00-8.15	56	2	7	50	1	9	125
8.15-8.30	50	1	8	36	0	9	104

Peak hour	7:30am – 8:30 am
Peak hour volume	419
Peak hour factor	
Design Heavy vehicles (Bus + truck) %	16.7%



Mohamad Al -Fateh Main Entrance intersection

11.00 pm – 12.00 pm

	To Street (1)			To Street (2)			sum
Time \vehicle class	cars	Bus	truck	Cars	bus	Truck	
11.00 - 11.15	102	4	7	74	0	8	195
11.15 – 11.30	97	5	9	55	0	5	171
11.30 – 11.45	76	3	5	70	0	6	160
11.45 – 12.00	85	3	6	68	2	8	172

Peak hour	11.00 pm – 12.00 pm
Peak hour volume	698
Peak hour factor	
Design Heavy vehicles (Bus + truck) %	97.5%



Mohamad Al –Fateh Main Entrance intersection

16:00pm – 17:00 pm

	To Street (1)			To Street (2)			sum
Time \vehicle class	cars	Bus	truck	Cars	bus	Truck	
16:00 – 16:15	40	0	4	45	0	6	95
16:15 – 16:30	38	2	4	36	0	5	85
16:30 – 16:45	51	0	6	51	0	5	113
16:45 -17:00	62	0	3	34	0	7	106

Peak hour	16:00pm – 17:00 pm
Peak hour volume	399
Peak hour factor	
Design Heavy vehicles (Bus + truck) %	1.1%

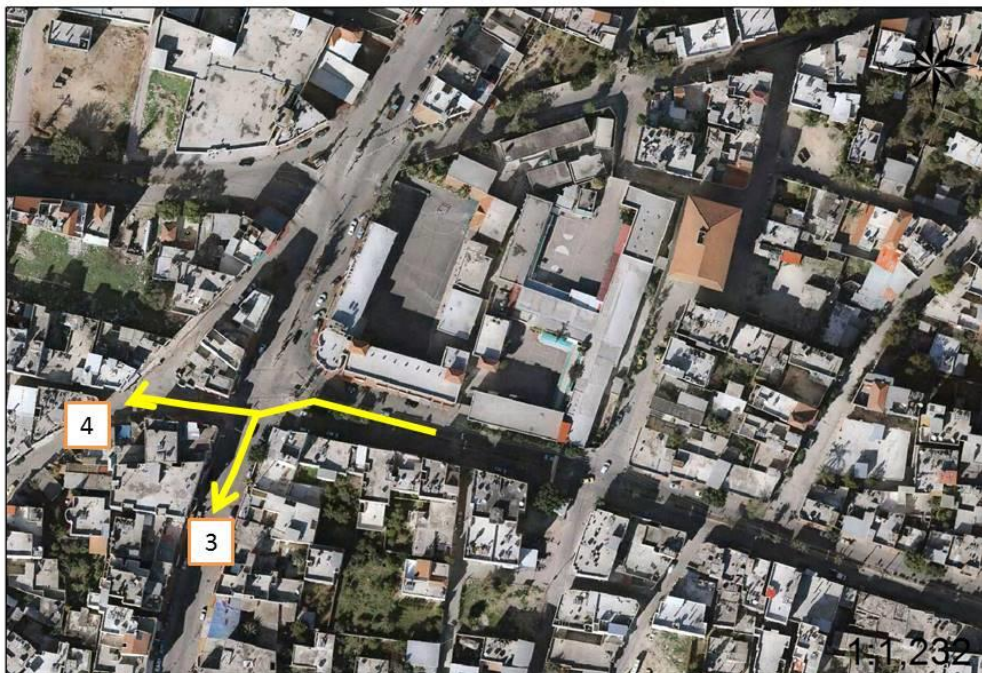


Tables 2 shows the traffic count of an area in several times.

Figure 4 shows the second area studied.

Traffic volume counts

Fatooh intersection



Tables 3 show the count of Area 2 (Fattouh Junction), which is an important area connecting the city center and the most popular services area.

Fatoooh intersection

7:30am – 8:30 am

	To Street (3)			To Street (4)			sum
Time \vehicle class	Cars	Bus	truck	cars	bus	truck	
7.30-7.45	50	2	7	47	2	5	113
7.45-8.00	52	2	5	56	0	3	118
8.00-8.15	38	3	8	42	0	7	98
8.15-8.30	42	1	8	51	0	5	107

Peak hour	7:30am – 8:30 am
Peak hour volume	436
Peak hour factor	
Design Heavy vehicles (Bus + truck) %	13.3%



Fatoooh intersection

11.00 pm – 12.00 pm

	To Street (3)			To Street (4)			sum
Time \vehicle class	Cars	Bus	truck	cars	bus	truck	
11.00 - 11.15	72	0	6	60	1	8	147
11.15 – 11.30	60	2	5	45	0	6	118
11.30 – 11.45	46	3	6	66	1	4	126
11.45 – 12.00	52	2	8	43	0	6	111

Peak hour	11.00 – 12.00 pm
Peak hour volume	502
Peak hour factor	
Design Heavy vehicles (Bus + truck) %	90.2%



Fatooh intersection

16:00pm – 17:00 pm

	To Street (3)			To Street (4)			sum
Time \ vehicle class	Cars	Bus	truck	cars	bus	truck	
16:00 – 16:15	43	0	4	35	0	2	84
16:15 – 16:30	45	1	7	40	0	2	95
16:30 – 16:45	36	0	4	44	0	1	85
16:45 -17:00	48	0	5	37	0	4	94

Peak hour	16:00pm – 17:00 pm
Peak hour volume	358
Peak hour factor	
Design Heavy vehicles (Bus + truck) %	0.98%



Tables 3 show the count of Area 2 (Fattouh Junction)

Figure 5 shows the area 3 that has been worked on and the traffic count, and shows through tables 4 traffic count in detail as the number of cars and parking problems accumulated in this region.

Traffic volume counts Al_Morabeteen intersection



Al_Morabeteen intersection

7:30am – 8:30 am

	To Street (5)			To Street (6)			To Street (7)			sum
Time \ vehicle class	Cars	Bus	truck	cars	bus	truck	cars	bus	truck	
7.30-7.45	40	0	2	46	0	5	68	1	4	166
7.45-8.00	53	0	1	62	1	7	53	2	6	185
8.00-8.15	57	0	3	42	1	4	72	0	6	185
8.15-8.30	65	0	1	58	1	6	56	2	8	197

Peak hour	7:30am – 8:30 am
Peak hour volume	733
Peak hour factor	
Design Heavy vehicles (Bus + truck) %	4.4%



Al_Morabeteen intersection

11.00 pm – 12.00 pm

	To Street (5)			To Street (6)			To Street (7)			sum
Time \ vehicle class	Cars	Bus	Truck	Cars	Bus	Truck	cars	bus	truck	
11.00 - 11.15	58	0	3	38	0	5	61	1	6	172
11.15 –11.30	43	1	2	50	0	5	45	0	4	150
11.30 –11.45	38	0	2	34	0	4	50	0	4	132
11.45 –12.00	50	0	3	46	0	6	53	0	3	161

Peak hour	11:00 pm – 12:00 pm
Peak hour volume	615
Peak hour factor	
Design Heavy vehicles (Bus + truck) %	1.08%



Al_Morabeteen intersection

16:00pm – 17:00 pm

	To Street (5)			To Street (6)			To Street (7)			sum
Time \vehicle class	Cars	Bus	Truck	Cars	Bus	Truck	cars	bus	truck	
16:00 – 16:15	34	1	5	40	1	6	48	1	3	139
16:15 – 16:30	46	0	3	43	1	5	38	1	4	141
16:30 – 16:45	52	1	3	50	0	2	40	1	5	154
16:45 -17:00	37	0	7	48	1	4	50	0	4	151

Peak hour	16:00pm – 17:00 pm
Peak hour volume	585
Peak hour factor	
Design Heavy vehicles (Bus + truck) %	0.98%

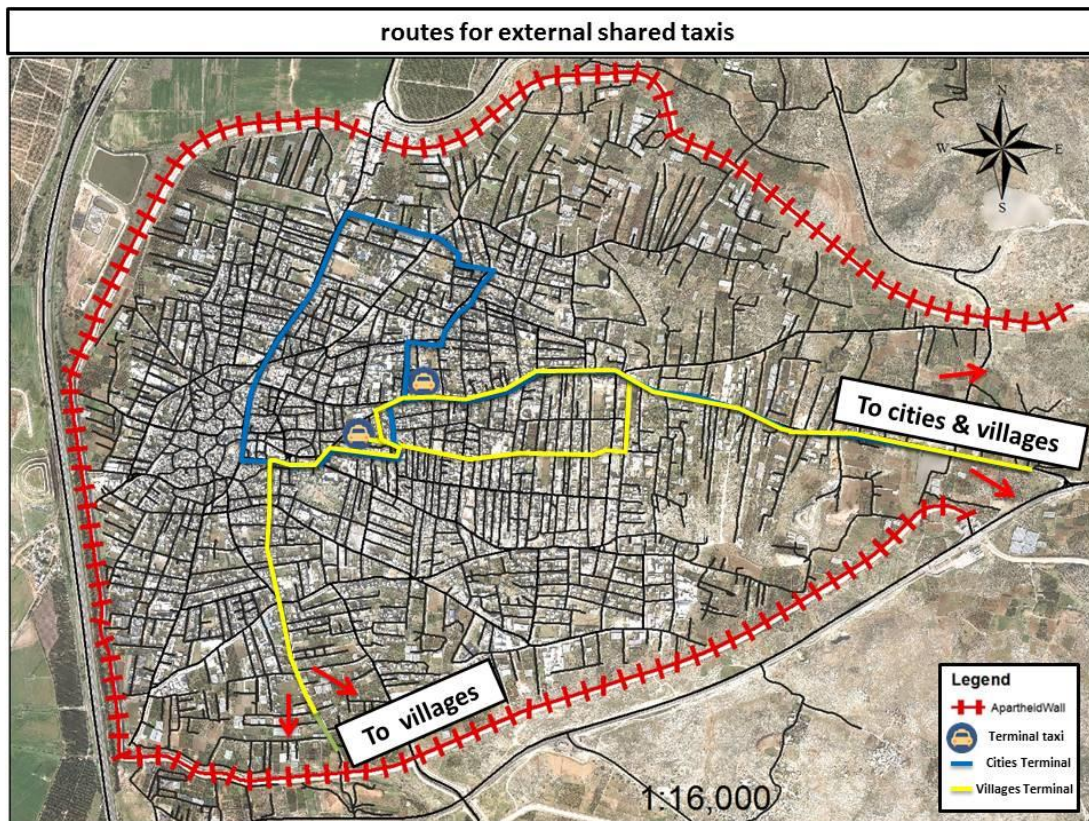


Tables 4 show the count of Area 3 (Al_Morabeteen intersection)

3.5 Public transportation movements analysis

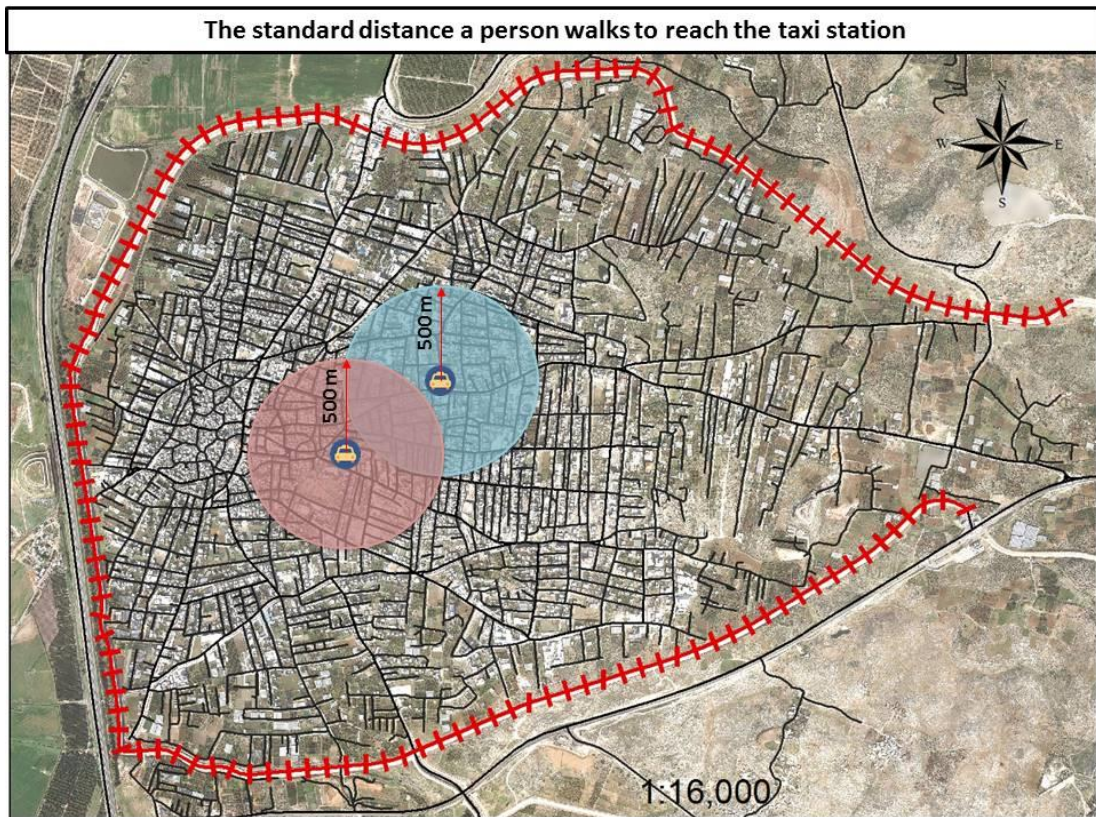
In this part, a complete analysis of the study area will be presented, and accordingly a set of hypotheses and constraints will be reached and then results and solutions will be reached so that they are logical and effective.

Map 27 The taxi route from the car park (cities and villages) shows that one Marwah line is Abu Ali Ayad Street, which is the only main road connecting the city with the rest of the cities and villages.

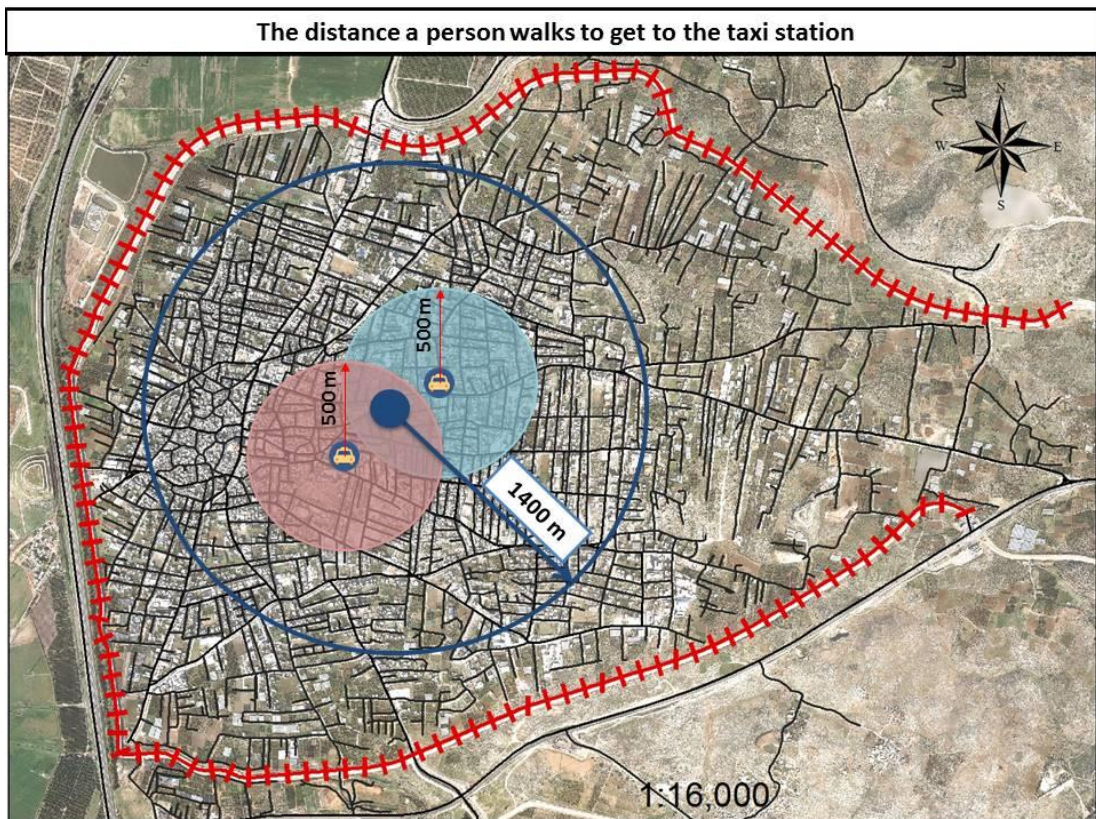


Map 27 routes for external shared taxis

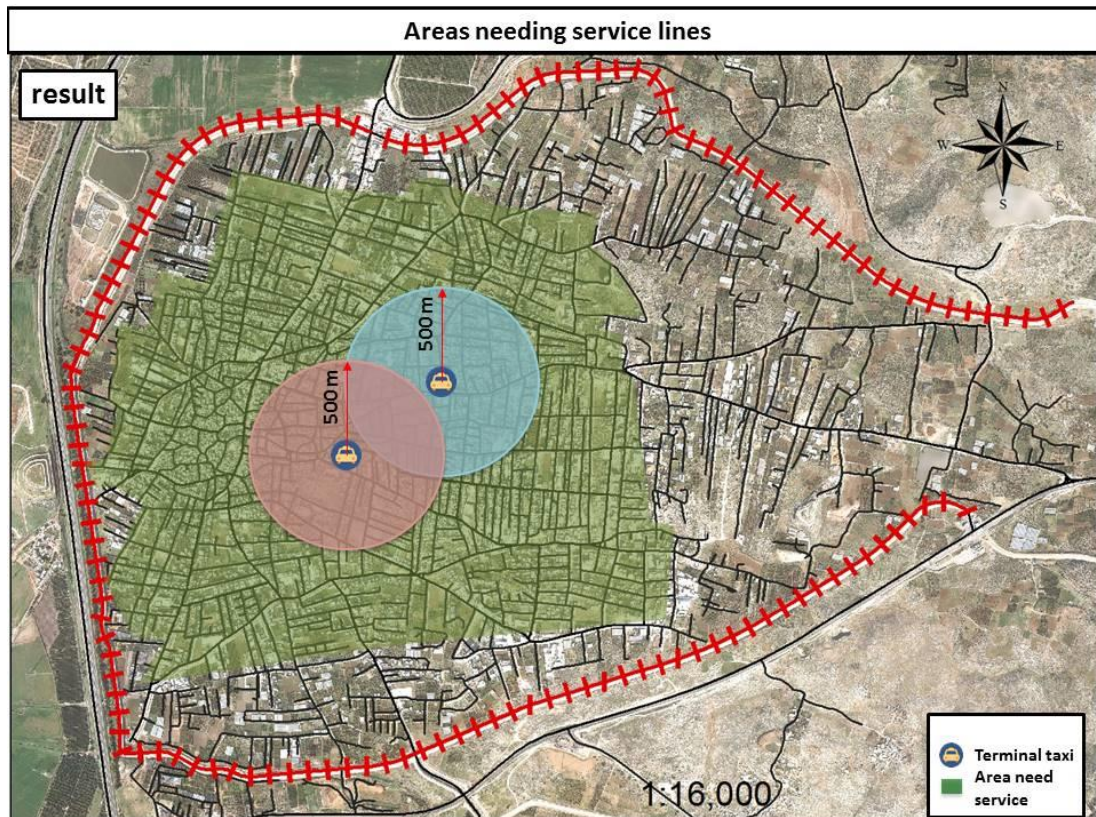
Map 28 shows the standard distance possible for a normal person. I walk to get to the car park and on map 29 show that the population is actually shooting twice as much as the standard distance to get to the car park. This means there is a shortage of service and a problem with access to car parks. Service lines serve the city as well as the cost of taxiing is very high for the residents.



Map 28 The standard distance a person walks to reach the taxi station

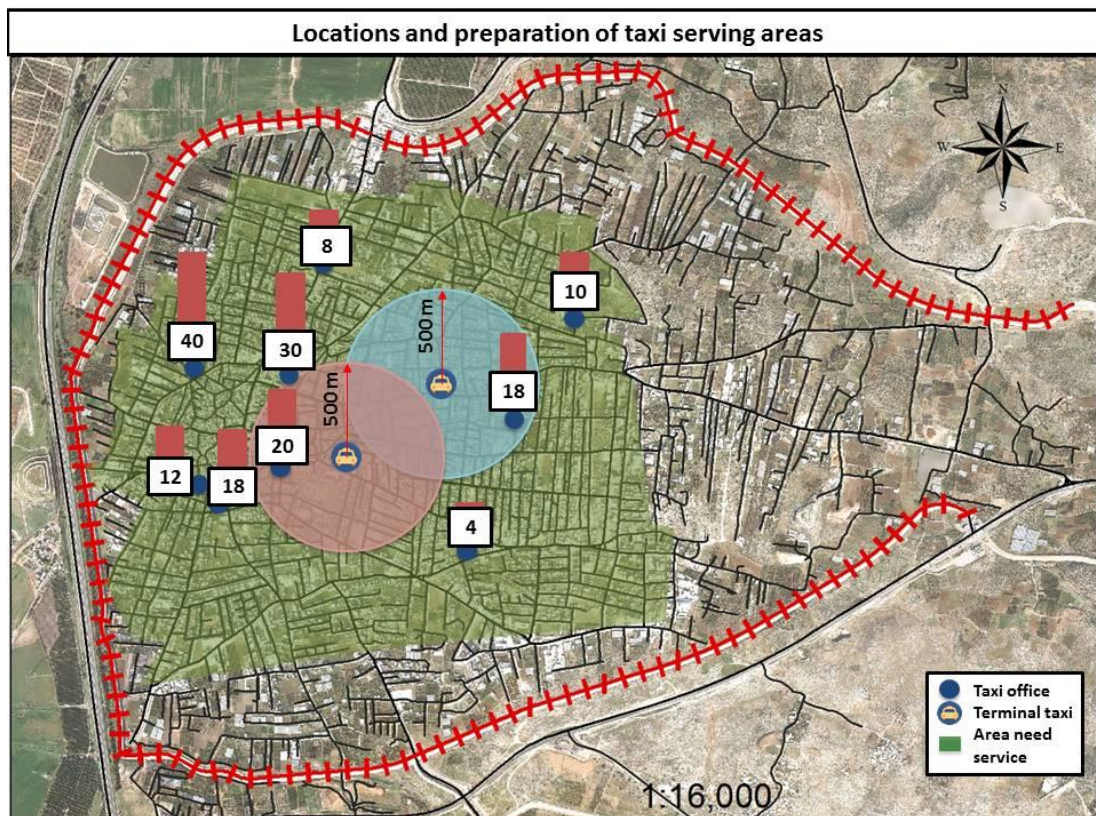


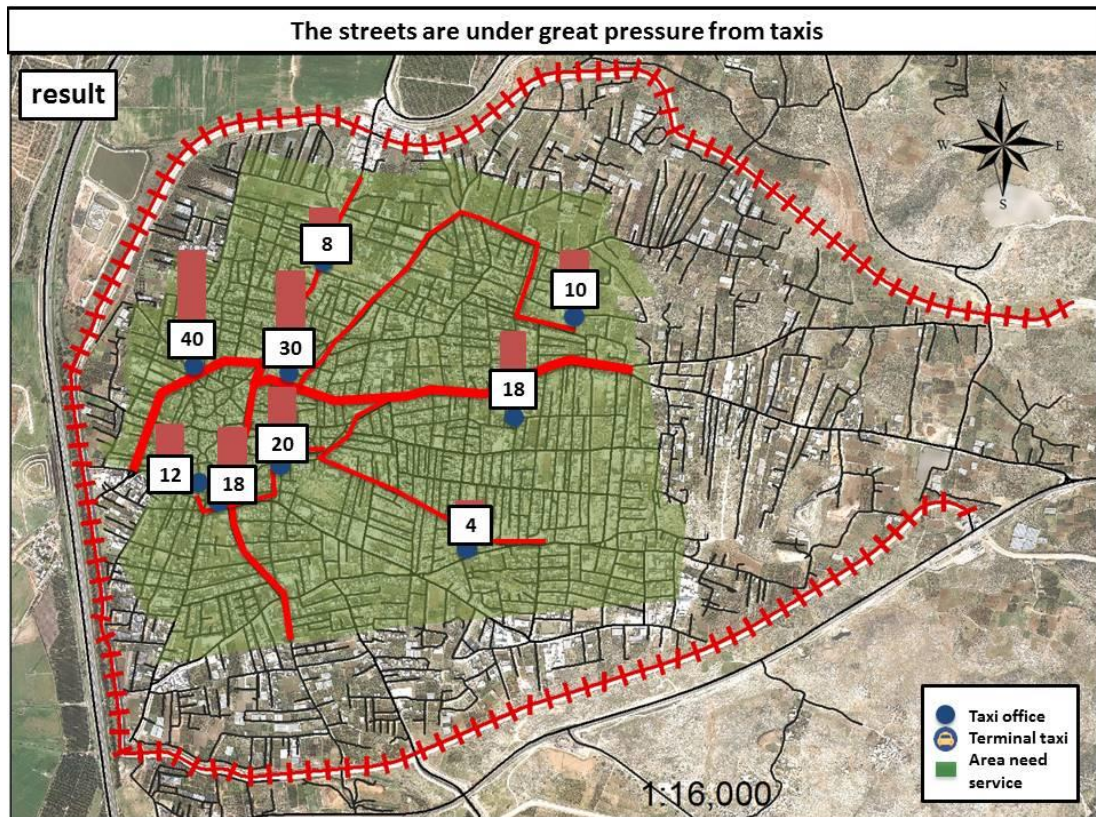
map 29 show that the population is actually shooting



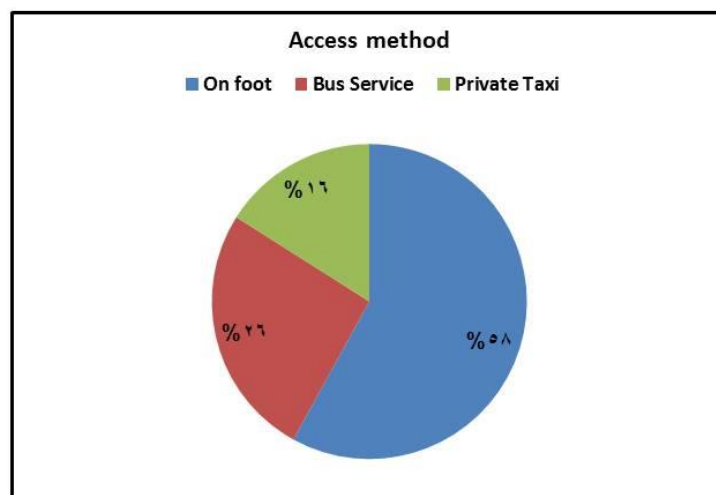
Map 30 Areas needing service lines

Map 31 shows the locations of private taxi offices and the number of cars available in each office, and note from map 32 that the taxi traffic is more crowded and continuous on the main streets.





map 32 The streets are under great pressure from taxis

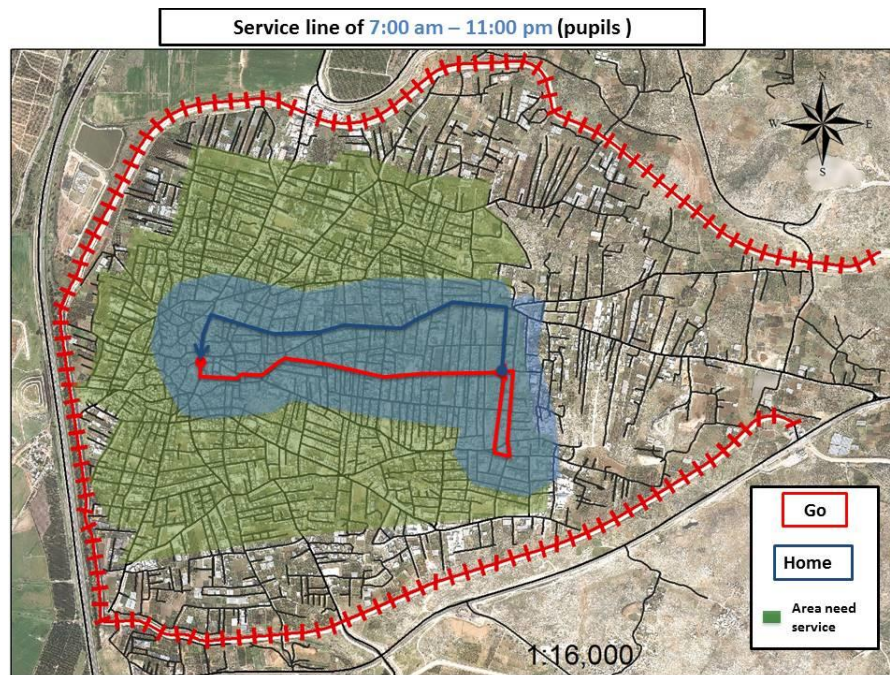


(Based on a student survey), they prefer to go to the travel complex on foot, due to the lack of a number of buses first, and secondly because of the high cost of taxis (NIS 7), and the lack of a line of service cars at a lower cost.

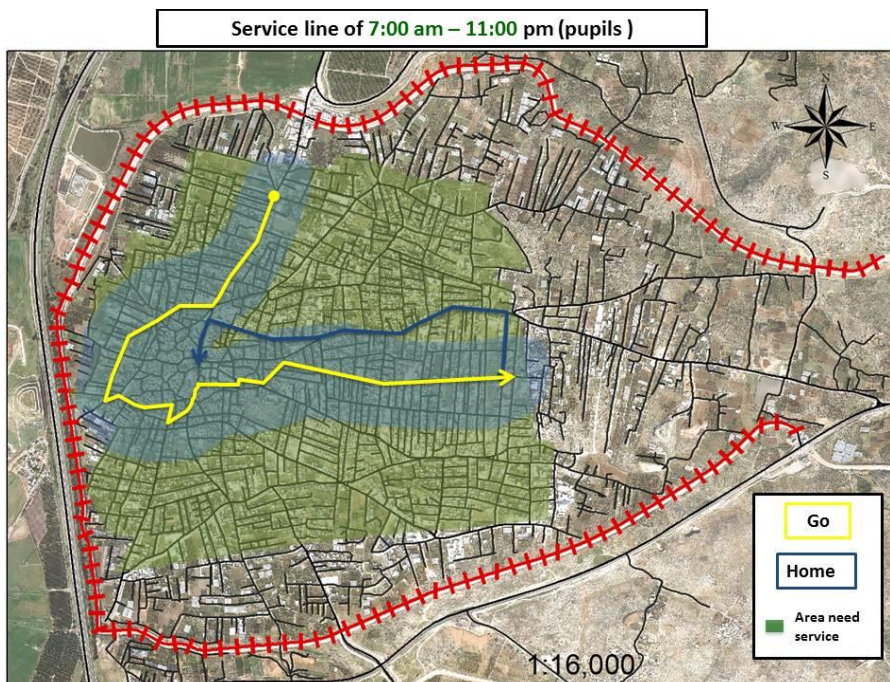
3.6 The service lines inside the city of Qalqilya

In this part we will talk about the shortage of services in the city, the traffic and the scope of the existing service and how it can be developed and improved to serve all parts of the city.

Map 33 shows the service line at a specific time and the scope of its service, and it is reported that it is confined to one area and to the main street (Abu Ali Iyad), which increases the crisis on the street.

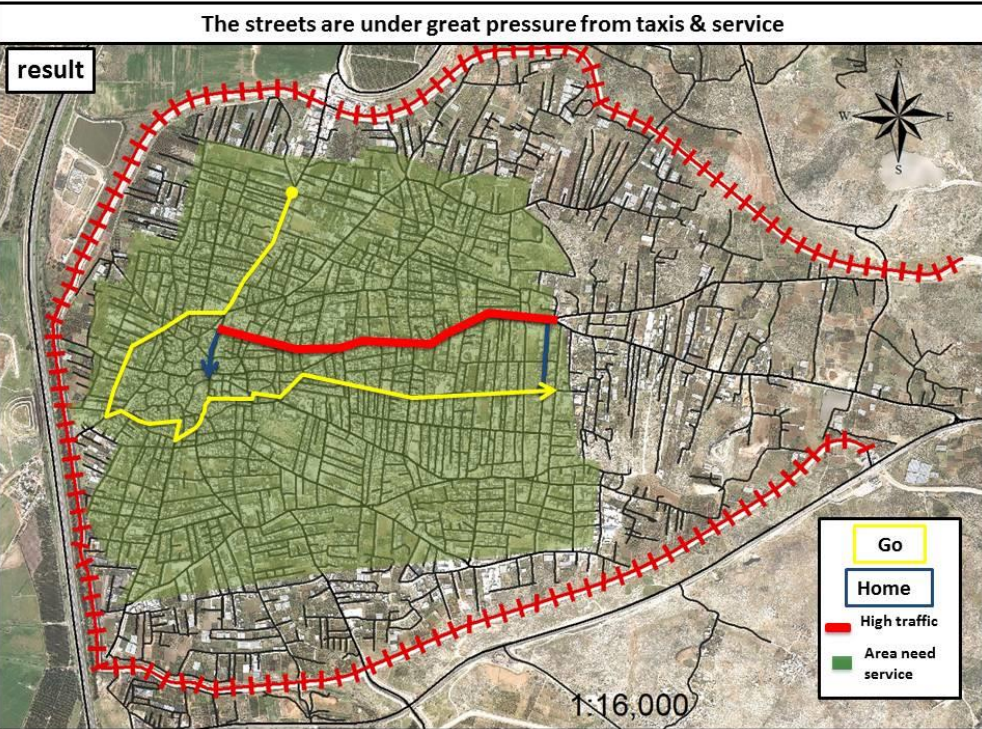
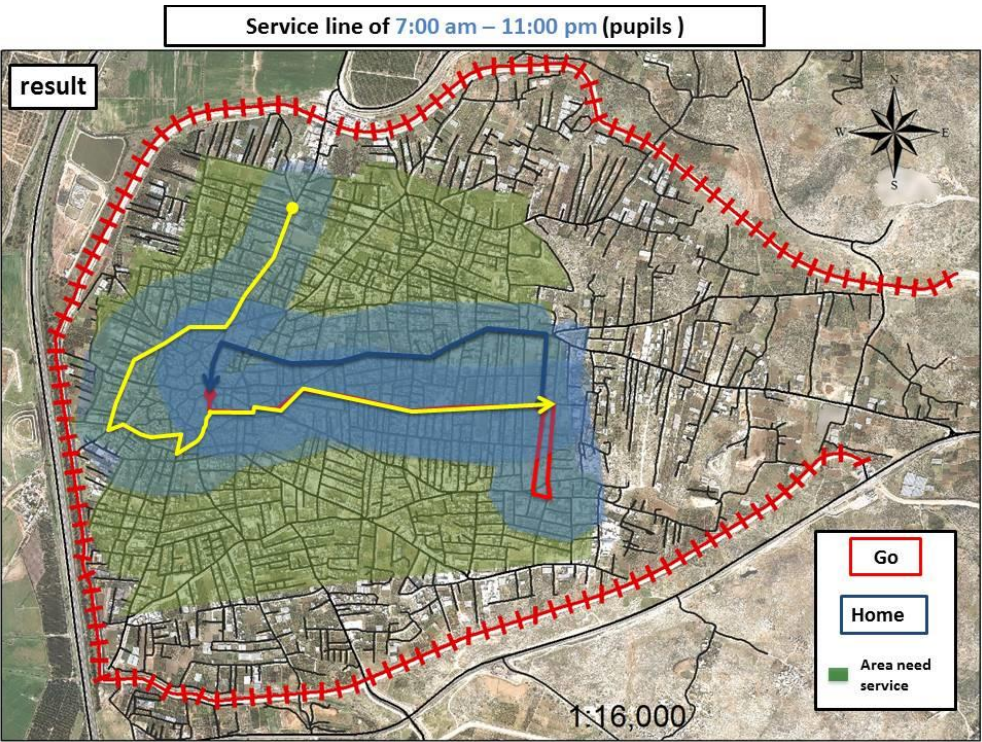


Map 33 shows the service line at a specific time(7:00-11:00pm)



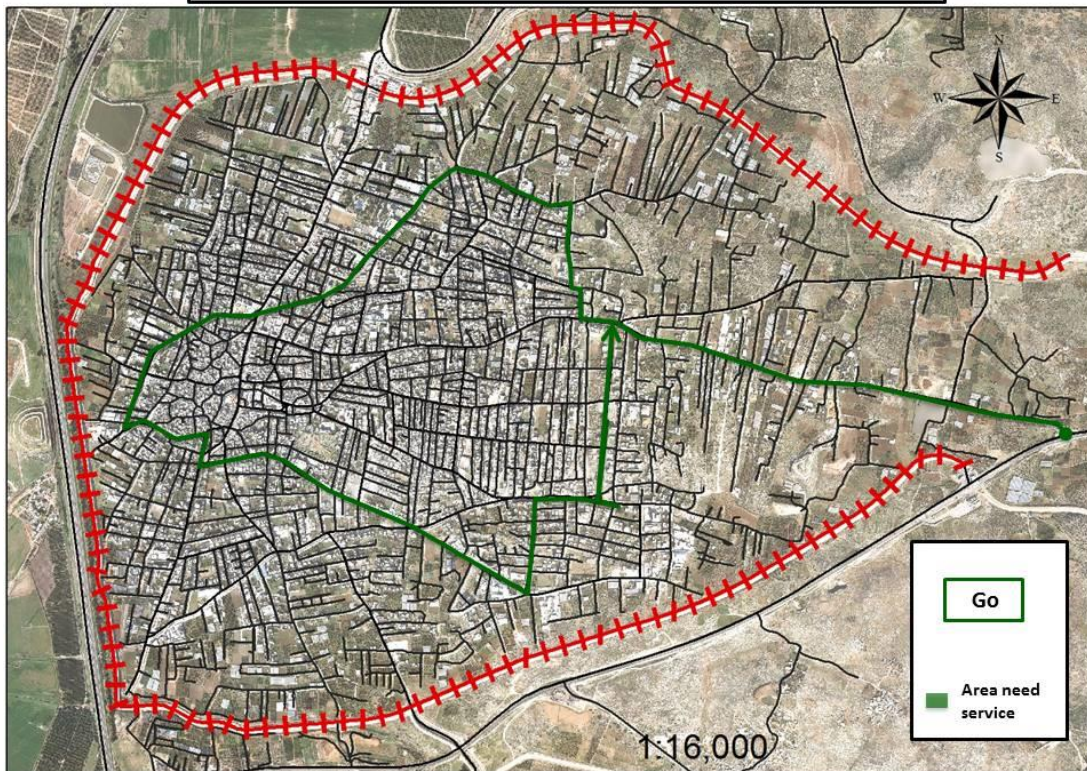
Map 34 shows the service line at a specific time(7:00-11:00pm)

In the maps below we show the results reached, namely, that the area serviced by the service is limited. Second, the traffic crisis due to the traffic of cars and cars on Abu Ali Ayad Street.



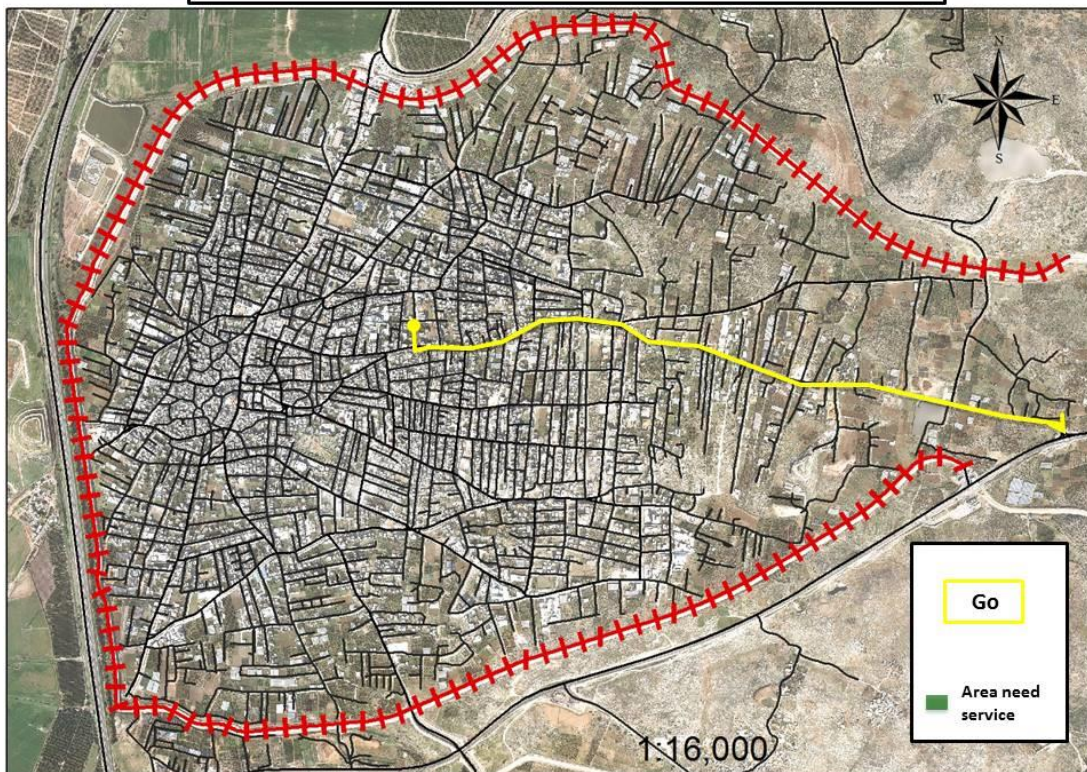
3.7 The service lines outside the city of Qalqiliya

Service line of 3:00 pm _ 5:00 pm (Laborers)

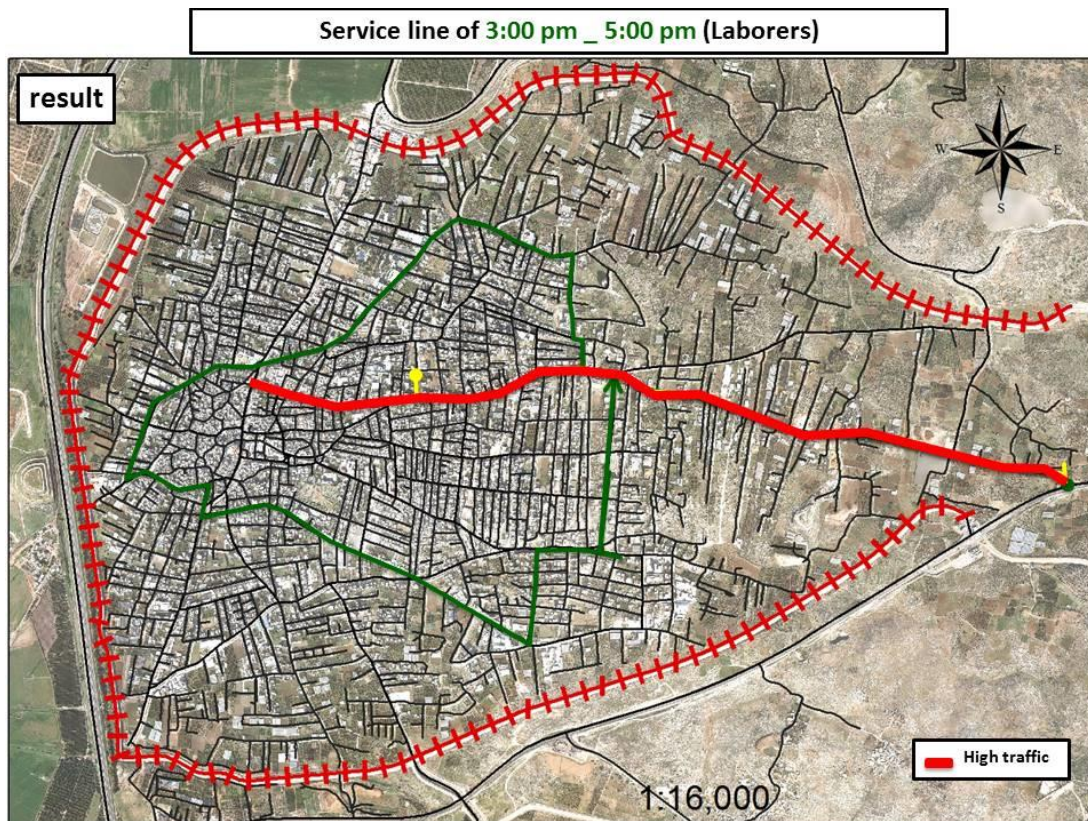


Map 35 Service line of 3:00 pm _ 5:00 pm (Laborers)

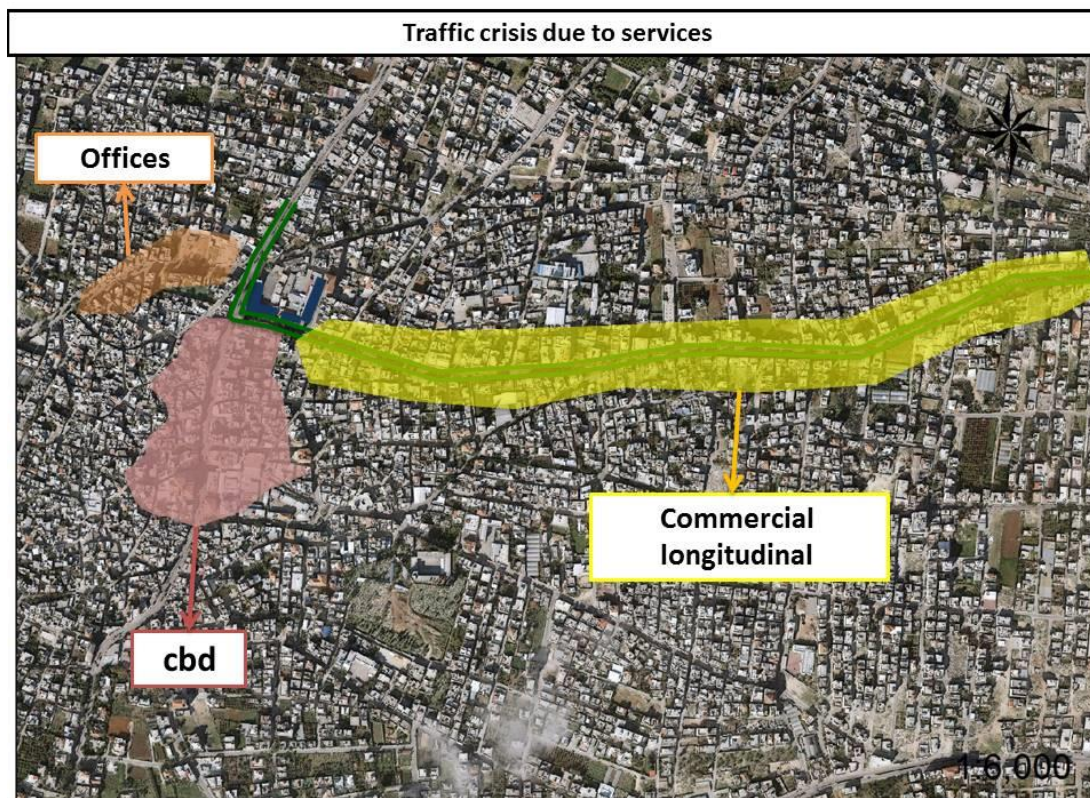
Service line 7:00 am – 5:00 pm (pupils)



Map 36 Service line 7:00 am – 5:00 pm (pupils)

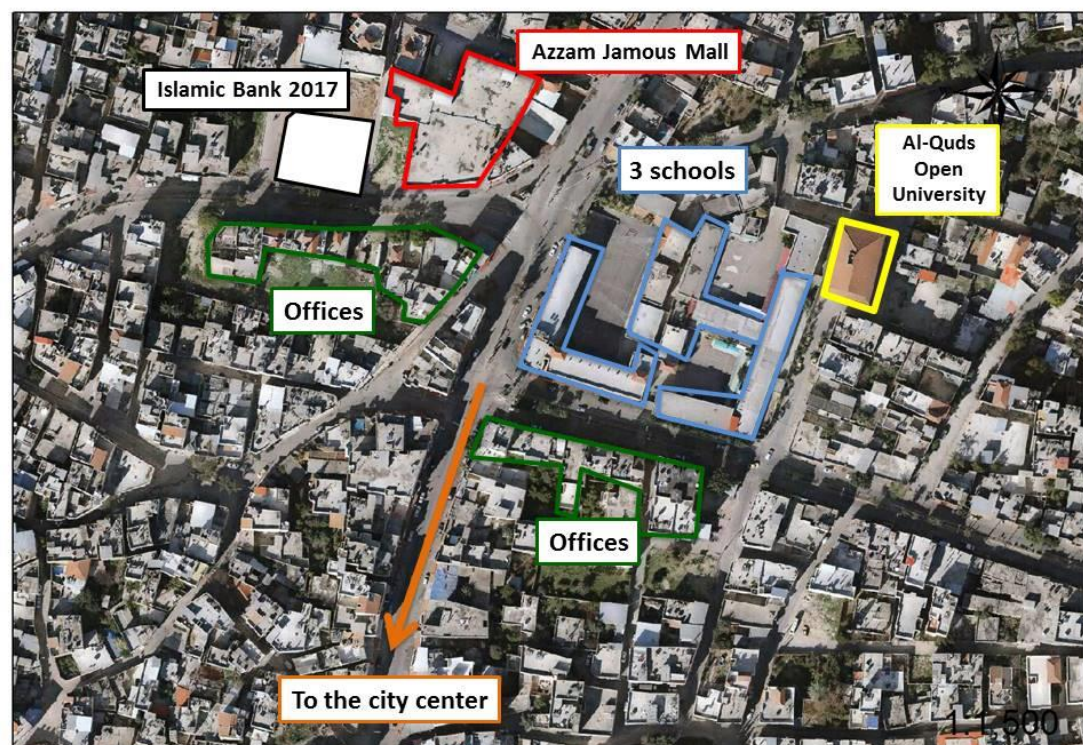
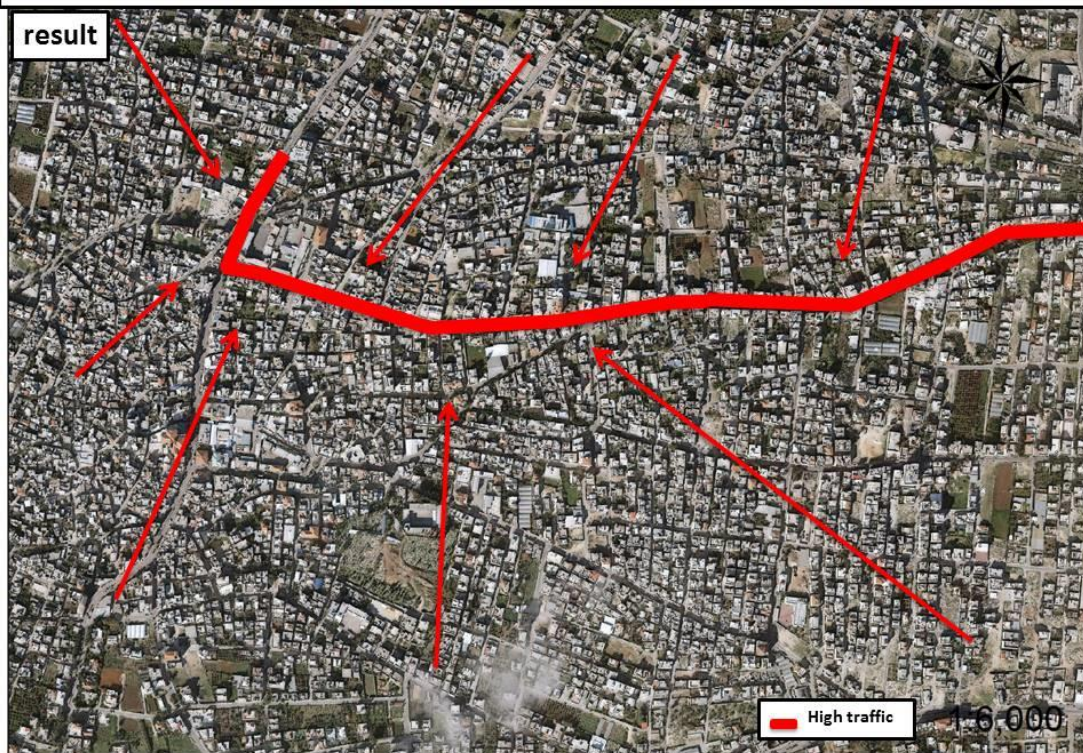


3.8 Traffic crisis with services



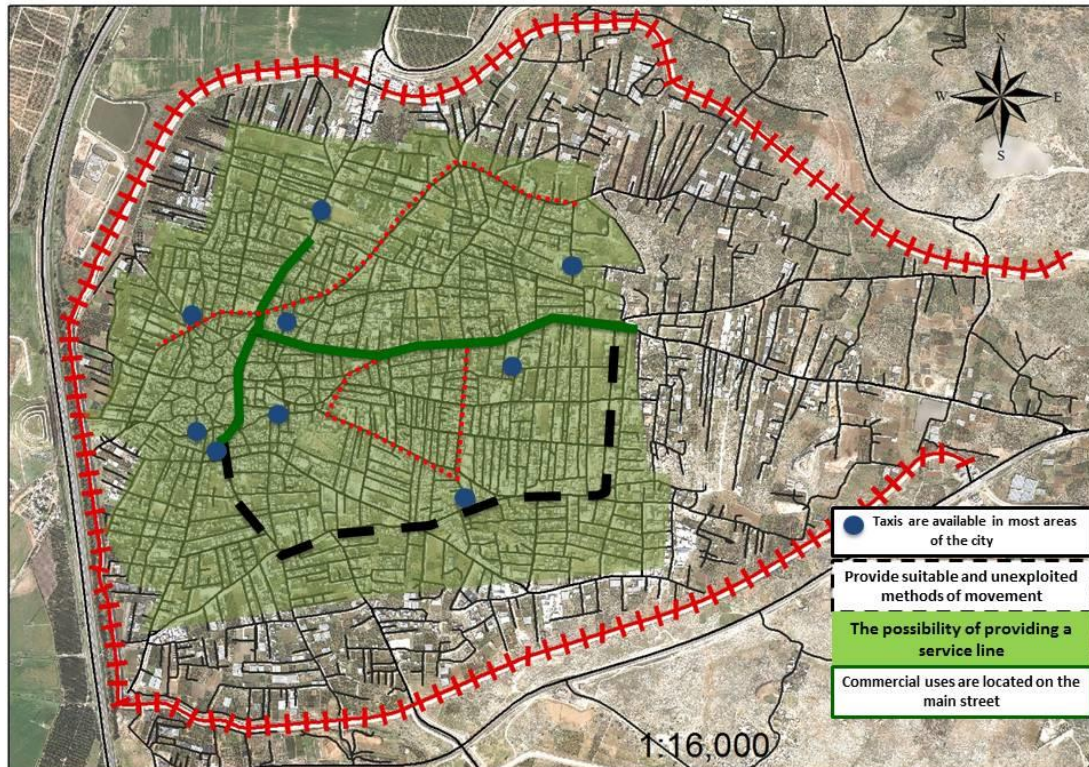
Map 37 Traffic crisis due to services

Traffic crisis due to services



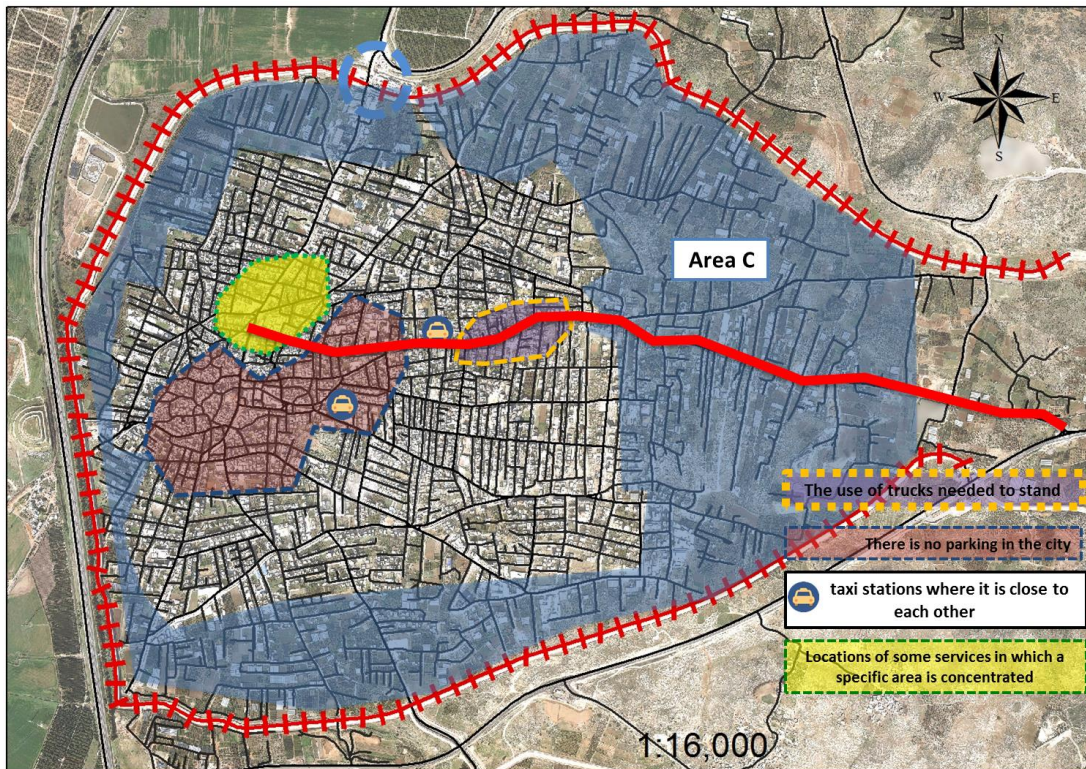
3.9 Strength

- Taxis are available in most areas of the city
- Provide streets with suitable offers for movement
- The possibility of providing a service line to serve all areas away from Abu Ali Iyad main street
- Provide suitable and unexploited methods of movement
- Commercial uses are located on the main street (Abu Ali Ed, Abdul Rahim Al Sabaa)



3.10 Weaknesses

- The location of the taxi stations where it is close to each other
- Locations of some services in which a specific area is concentrated
- The great pressure from the movement on the main street (Abu Ali Iyad)
- Pass of buses of all kinds from trucks, private cars, taxis and other main street (Abu Ali Ayad)
- There are no laws governing movement and traffic in the region
- There is no parking in the city
- Lack of green spaces in the streets "aesthetic view"
- Blocking the visibility of traffic lights due to buildings and goods on the Roadsides
- The use of trucks needed to stand on the main street (Abu Ali Iyad)



Map 39 Weaknesses

Table 5 Main Goals

Economic Benefits	Social Benefits	Environmental Benefits
Savings in transportation costs	Improved transportation options and choices	Green space
Increasing the demand for public services	Community cohesion	Reduced air pollution
Transfer more efficient	Increased physical activity and health	Reduced resource consumption
	Congestion reduction	Reduced water pollution
		Reduced “heat Island” effect

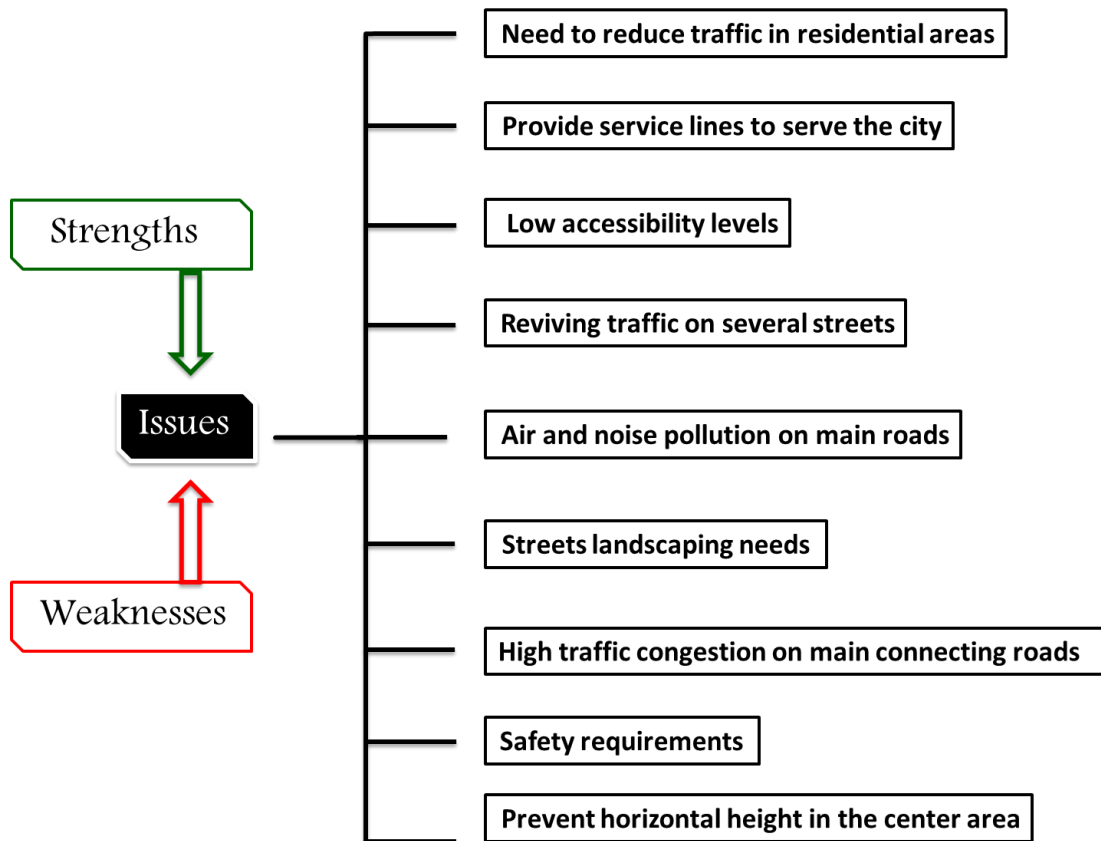
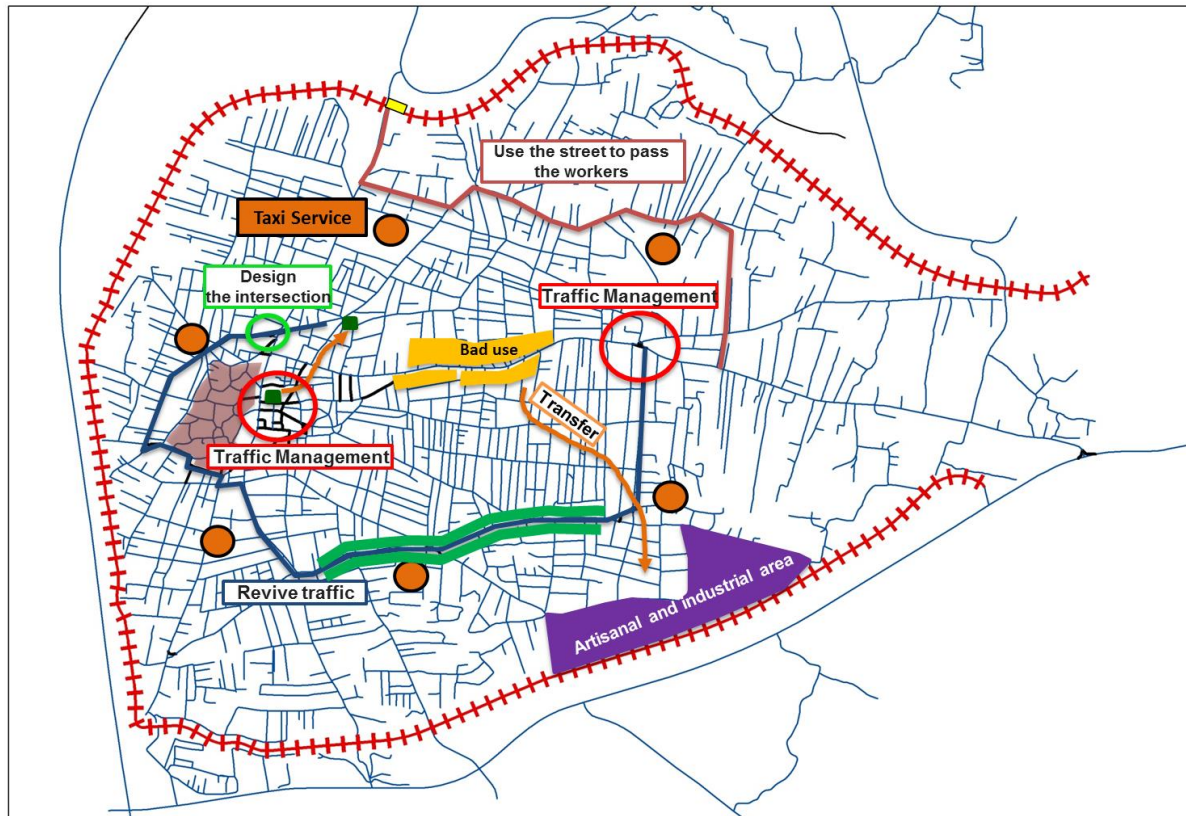


Table 6 the issues of the peoject

Chapter 4 : PLAN PREPARATION AND DETAILED PLANNING

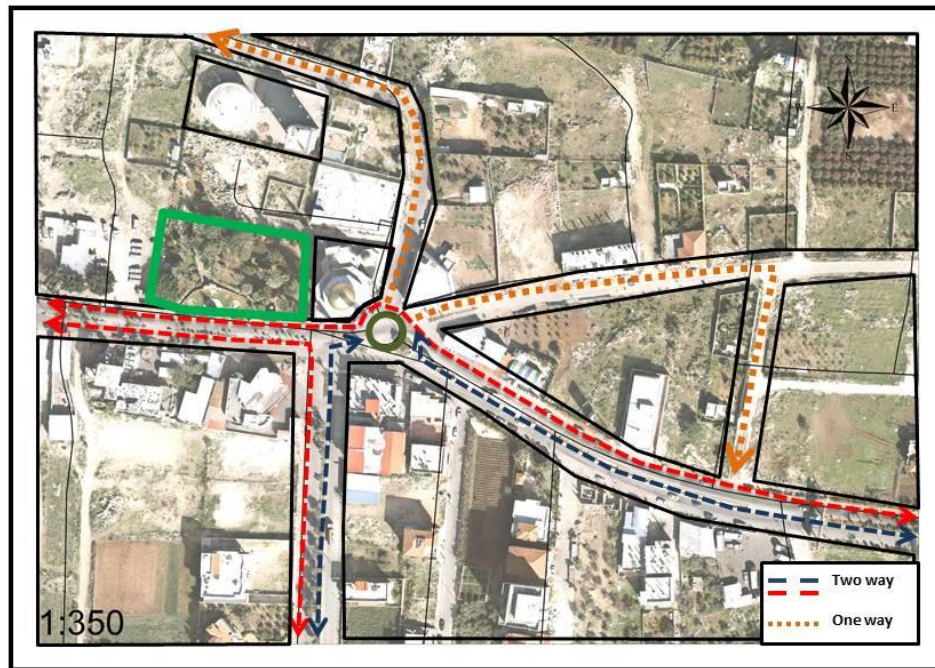
Problems (transportation and land use)



Map 40 Problems (transportation and land use)

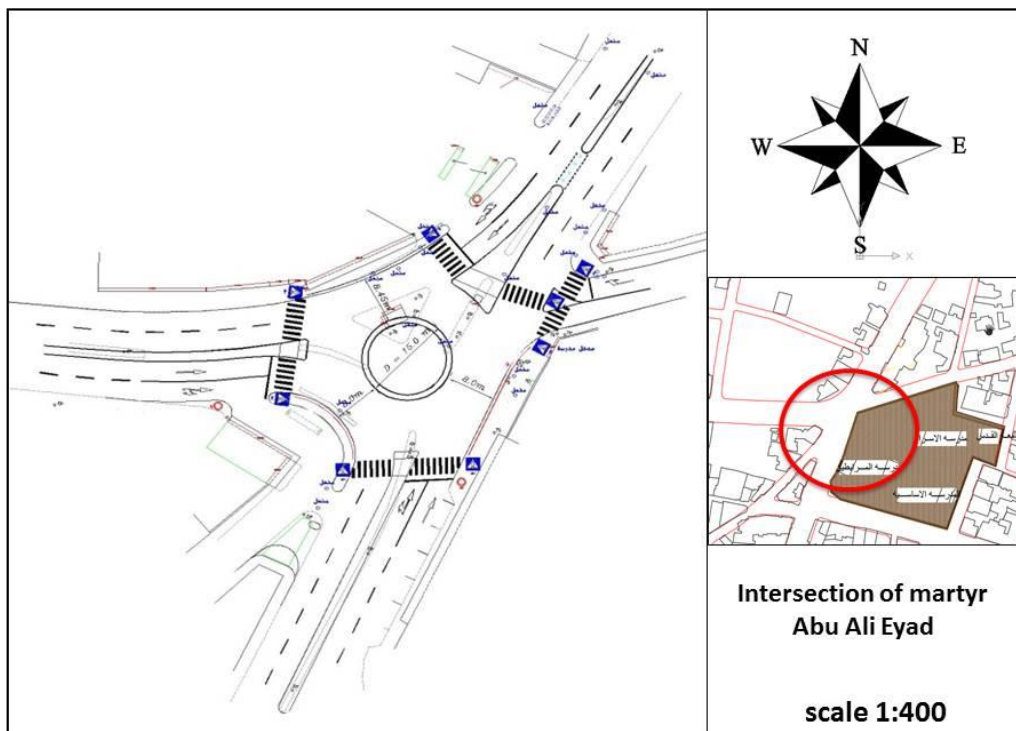
Traffic Management

Mohammed Al Fateh Roundabout



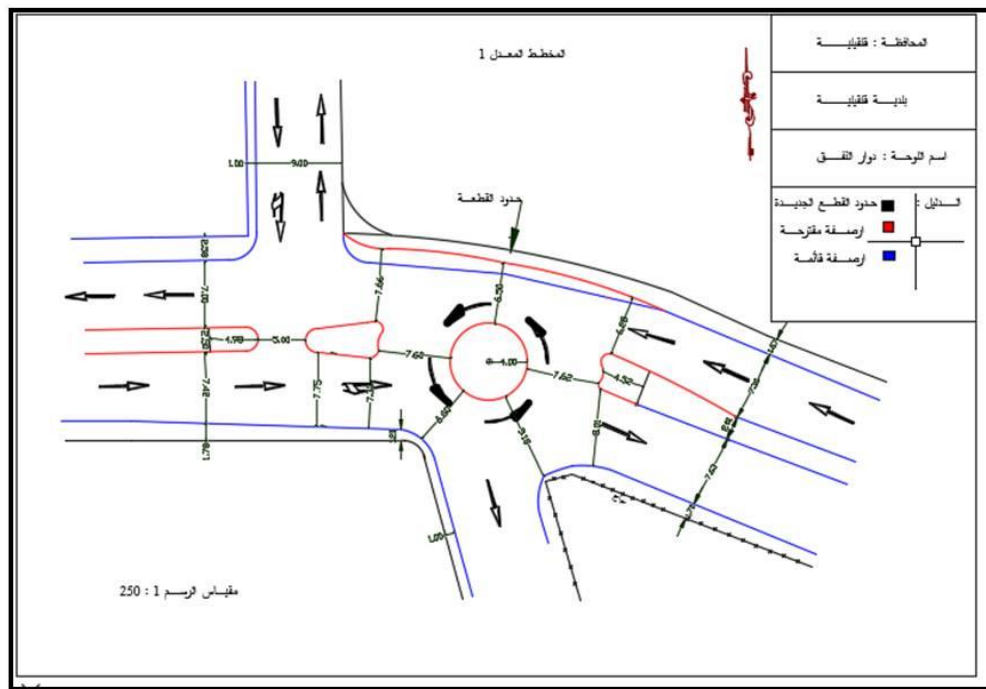
Map 41 traffic management

Design the intersection



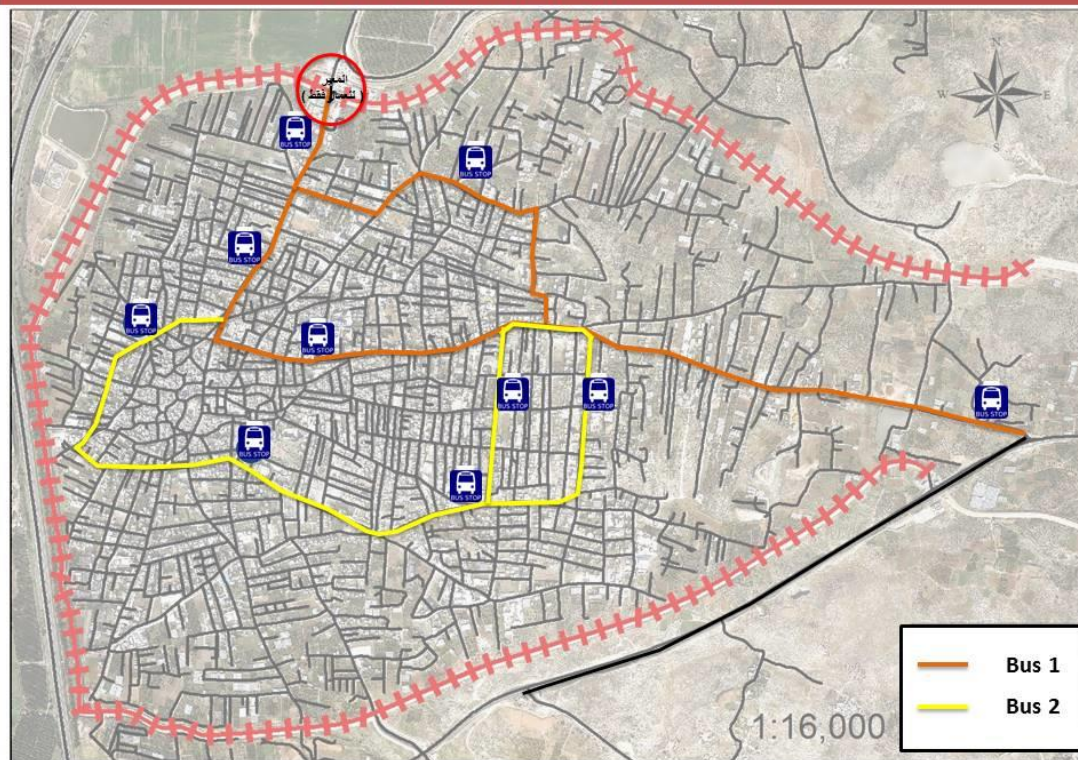
Map 42 design the intersection 1

Design the intersection

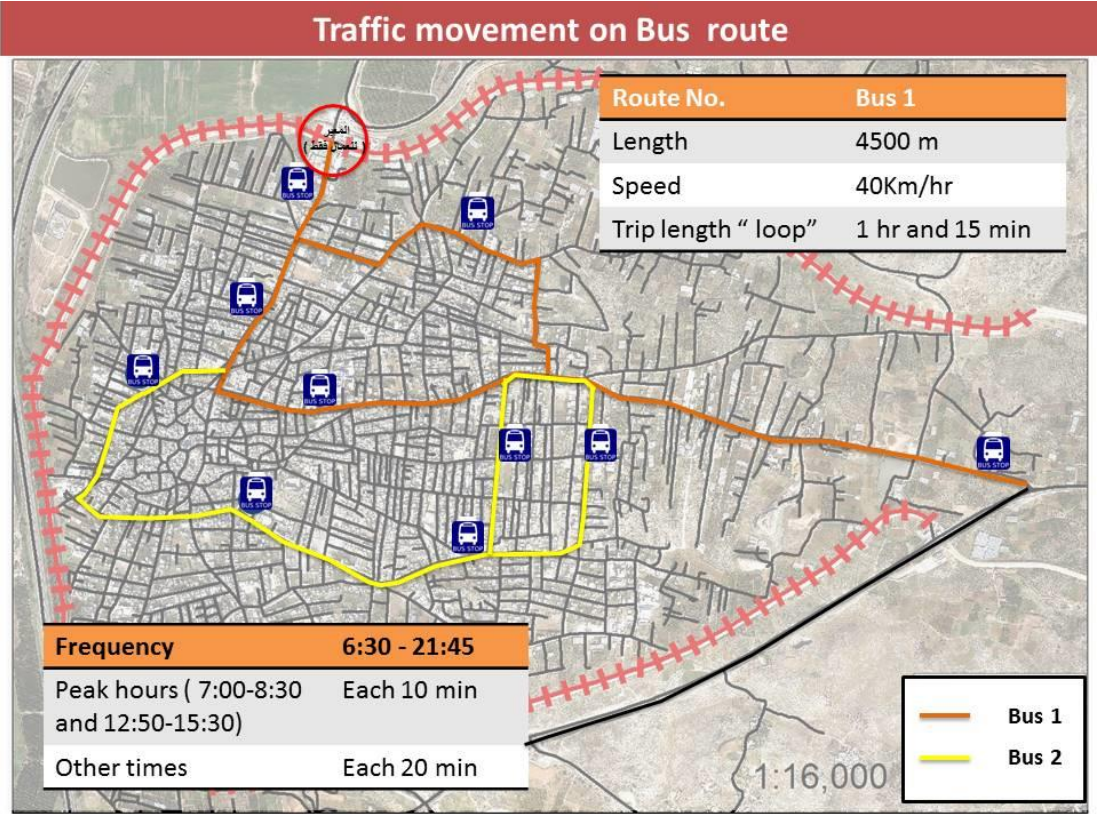


Map 43 design the intersection 2

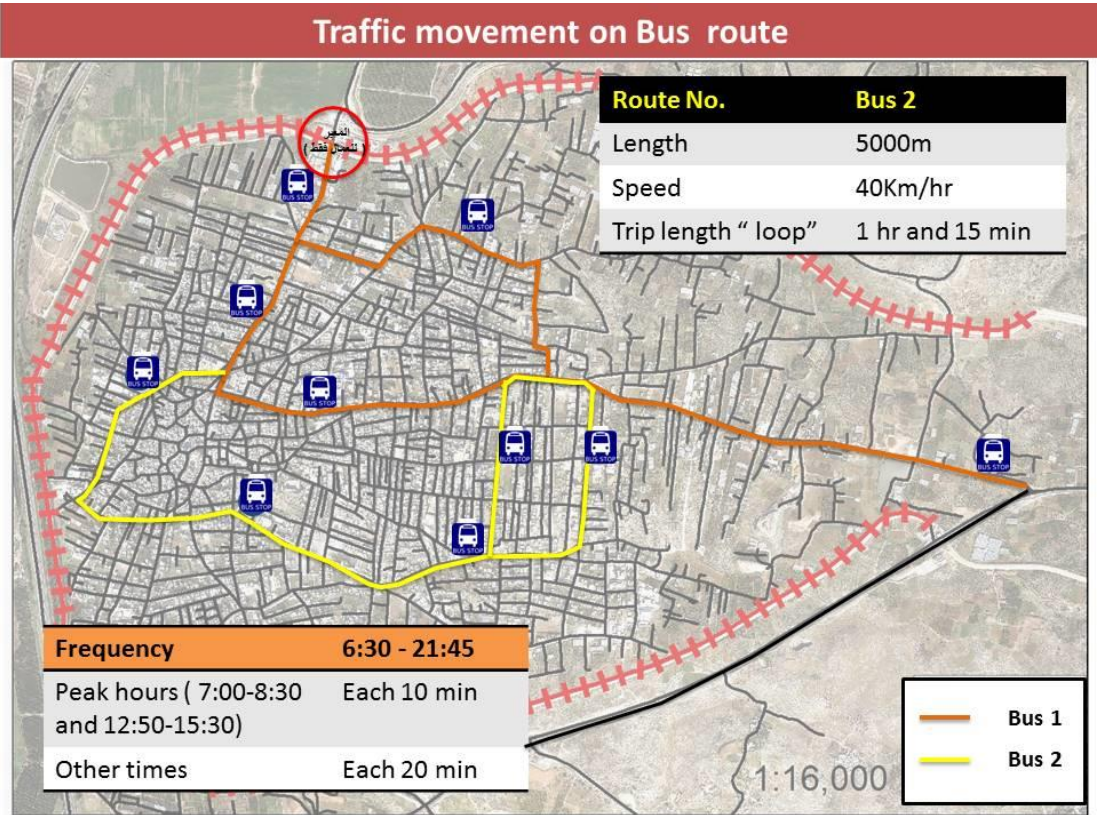
Traffic movement on Bus route



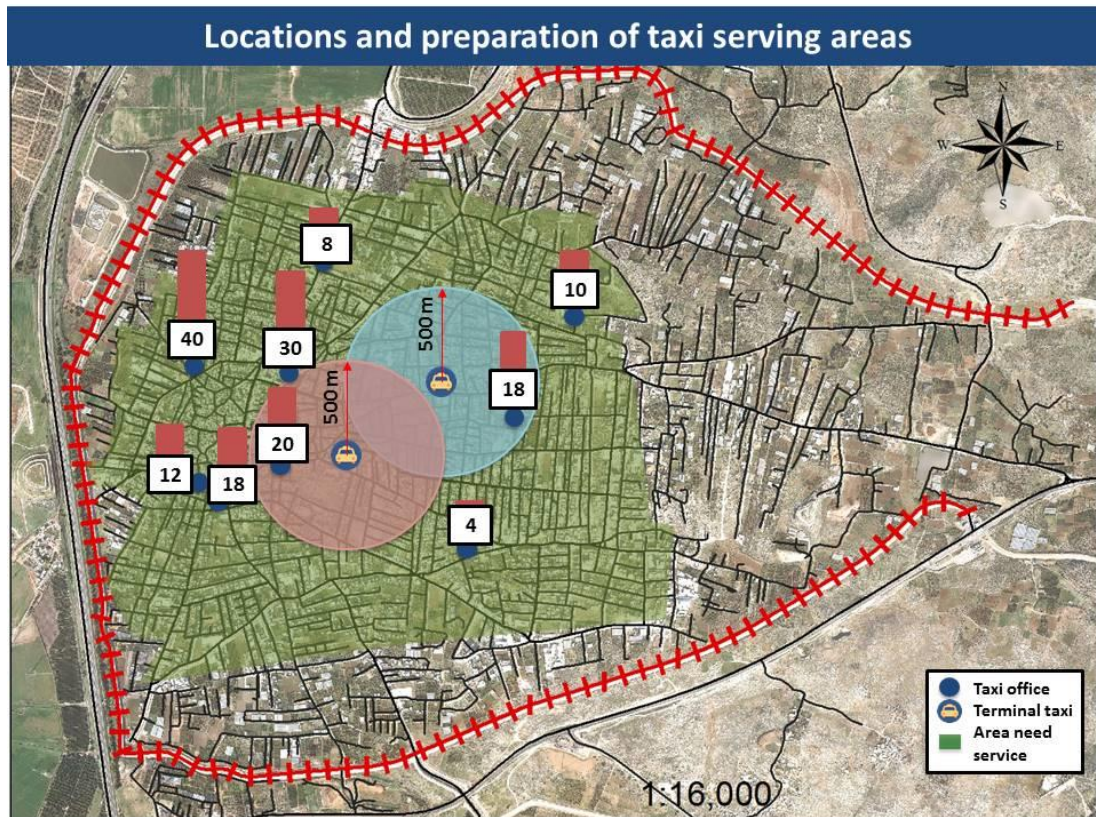
Map 44 traffic movement on bus route



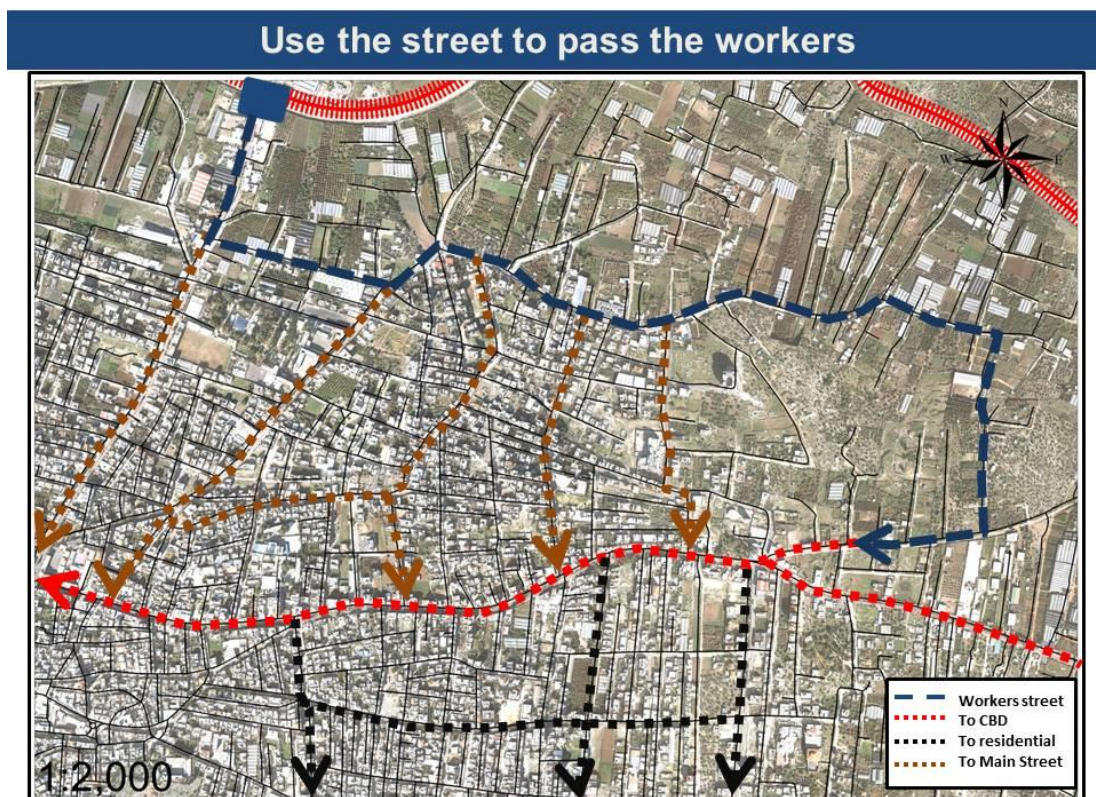
Map 45 traffic movement on bus route



Map 46 traffic movement on bus route

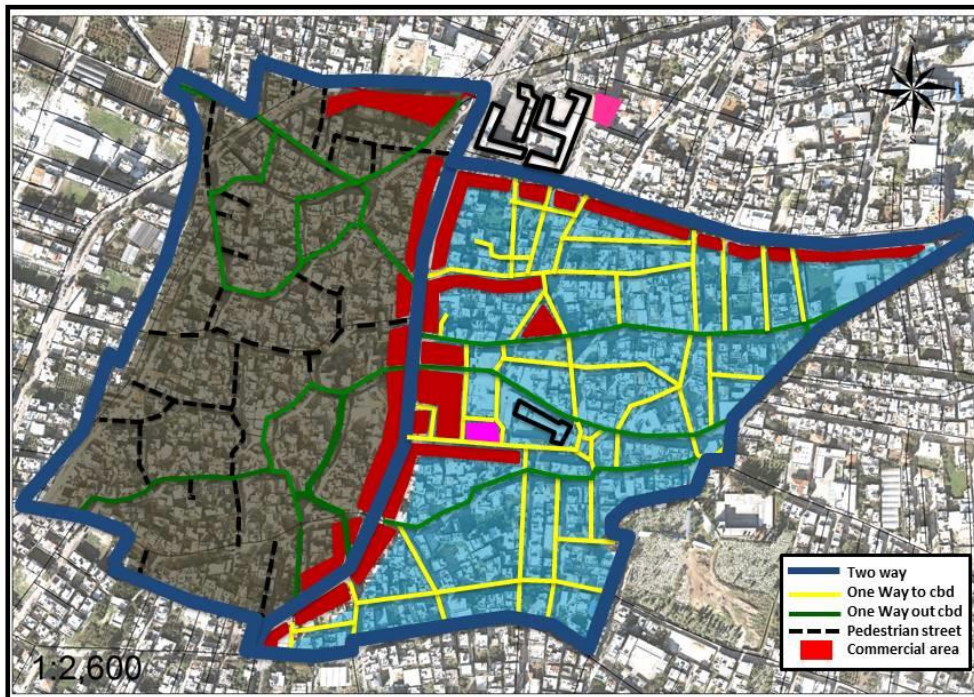


Map 47 Locations and preparation of taxi serving areas



Map 48 workers the pass to street the Use

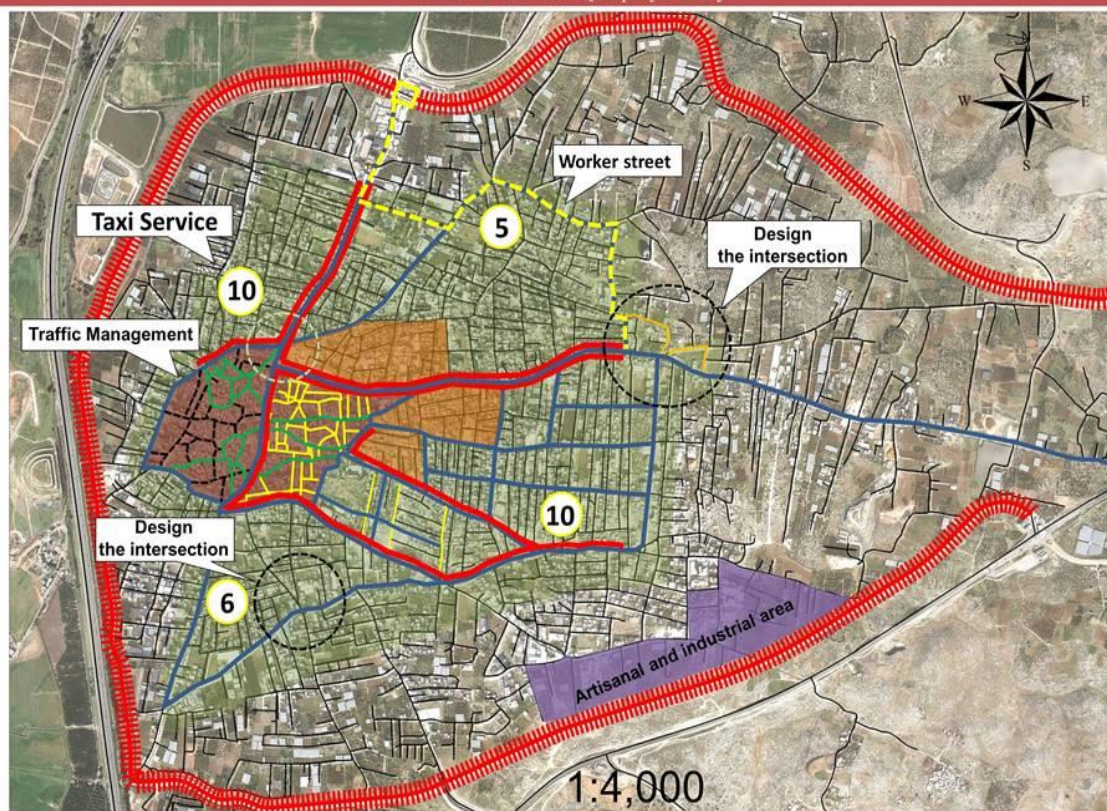
CBD Rout



Map 49 CBD roads

Conclusion

Traffic Plan for Qalqiliya City



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