

# **POLICIES & SOLUTIONS FOR PREVENTING LINEAR SETTLEMENT**

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## **ABSTRACT**

Linear settlement along the roads especially near the main roads represent a big problem in developing countries including Syria.

Developing countries face hard challenges in approaching the problem.

Linear settlement along the roads in Syria is affected by many factors such as:

- Slow implementation of regional planning
- High population growth
- Attractiveness of main roads
- Lack of lands dedicated to urban extension.
- Lack of awareness of decision makers regarding understanding the problem
- Pressures of proprietors nearby the roads.
- Legislations
- Road network planning.

In my paper I am going try to explain the negative impacts of linear settlement on :

- Road safety
- Road network performance.
- Additional costs to ensure adequate infrastructure.
- Deterioration in urban environment

The paper will also review the actual policies and propose new solutions and policies for preventing the extension of linear settlement in the future, taking into consideration the interest of land users, ensuring road safety and good performance of roads, and meeting the requirements of economic growth.

## **1. INTRODUCTION**

Linear settlement represents a big problem in developing countries including Syria, where the social and economic negative effects of linear settlement are highly noticed, especially those related to traffic safety: accidents increase and many people die when crossing the roads, among them are children & old men.

Discussing Syrian experience with its own proposed solutions can be useful for planners in other developing countries with similar conditions.

## 2. MAIN FACTORS OF LINEAR SETTLEMENT

The following factors are the main reasons of linear settlement in Syria [1],[2]

### 2.1. Slow Implementation of Regional Planning

Regional planning implementation is very important for stopping the expansion of linear settlement through land use planning and providing lands for urban, commercial & industrial expansion.

In Syria, regional planning studies were carried out for some regions, but their implementation is still at the beginning, and in 2010, the General Commission for Regional planning was established.

Even though the policy of the Government stresses on more coordination between local & central authorities for determining land use planning where the coordination is currently still weak.

### 2.2. High Growth of Population

Syrian population increased from 7.049 million inhabitants in 1981 to 20.886 million inhabitants in 2009 where 37% of them are children with age less than 14 years. Population growth factor is actually 24.5 per thousand inhabitants [3].

The big population increase puts pressure on land use planning, taking into account that most of inhabitants are concentrated in some regions with limited areas. Limited areas of lands and actual urban plans can't meet all population need, therefore people look for other solutions including linear settlement.

### 2.3. Road Attractiveness

Many factors attract people to construct and invest along the roads especially main roads for the following reasons:

- Main roads ensure good mobility & direct connection with big cities ,saving travel time & cost and better access to services & infrastructure.
- Better & cheap access to infrastructures such as electricity , water and telephone taking into account that infrastructures exist mostly along the main roads.
- High traffic volume on main roads generates demand on various services.

### 2.4. Weak Awareness of Decision Makers:

Although many seminars related to linear settlement were held in the presence of decision makers, linear settlement prevention was not given priority.

The short-term policies neglect the sustainable development and fail to find solutions for population needs. There is a dominant justification: (let people find their own solutions if we cannot offer sustainable solutions).

The present procedures of regional planning implementation are not enough to prevent linear settlement, and we need urgent sustainable policies, otherwise we'll face critical situations in the future.

## 2.5. Pressure of Land Owners

The value of land nearby the road is higher than the value of land situated far from the road. The road offers added value to land taking into account road attractiveness, though land owners invest money on land to gain more benefits by building houses & commercial service centres instead of land cultivation. Some of land developers already know about the new road projects and buy the lands from farmers where land price increases after the construction of the new road.

Land developers put pressure on planners to allow the construction of commercial centers near the road and to expand the urban settlements toward their lands, though the land price increases. This kind of linear settlement is authorized by the law.

Fig.1 shows an example of urban expansion along an expressway.

## 2.6. Legislation

The Road Protection Law issued in 2006 allows the construction of houses and any kind of economic & commercial centers nearby roads including expressways and permits free access to these roads. Permission for any kind of construction is not allowed in freeways. In Syria there is only one freeway with 100 km length.

The authorization of construction especially along the expressways leads to the decrease of service level and road asset value. These roads may change into streets by the time, creating the need for new roads. Fig.2 shows an example of authorized linear settlement along an expressway.

The current legislation facilitates the authorized linear settlement which expands quickly as a result of planning failing to meet the population needs. Most of linear settlement in Syria is authorized.

The amendment of legislation faces big resistance from land developers and property owners. Their main justifications are the right of access and the absence of alternatives for development.

We consider the amendment of legislation as a main goal to prevent the expansion of linear settlement.

Studies focusing on the negative effects of linear settlement on the sustainable development may help in convincing decision makers.

## 2.7. Road Network Planning

The length of main roads is 8076 km including expressways with 1472 km length. Main roads are managed by Public Establishment for Road Communications (PERC), whereas local asphalt roads with 36000 km length are managed by local authorities.

Local road network are planned separately without coordination with the main road network planning. The separate planning has a negative effect on the performance of road network. There are many gaps in the integration between the main and local roads.

The local roads don't meet the needs of mobility, hence a big volume of local traffic moves on the main roads. This fact leads to the concentration of linear settlement on main roads.

## 3. NEGATIVE EFFECTS OF LINEAR SETTLEMENT

The main negative effects are:

### 3.1. Deterioration of Road Safety

Linear settlement generates local movement of pedestrians and vehicles along and across the roads. This movement is exposed to high risks especially in the case of high speed roads. The vulnerable road users are the main victims of accidents.

In 2007, the number of injured people and fatalities per 100000 inhabitants was 73 and 13 respectively. The fatalities of young people with age less than 18 years represent 24% of total fatalities [5].

Planners try to ensure safe access control by constructing suitable facilities such as : service roads, speed change lanes, turning lanes, underpasses, bridges,..etc. The cost of these facilities is very high; therefore facilities construction can be justified only for dense populated linear settlement sections.

### 3.2. Road Network Planning

Linear settlement generates unsafe local traffic. There are many consecutive exits and entrances from and to settlements, stretching along short distances. Traffic speed on local roads is lower than the one on main roads. The speed difference decreases road capacity & the level of service and increases travel time & number of accidents which results in high economic losses.

### 3.3. Additional Costs Needed to Ensure Relevant Infrastructure

To ensure safer traffic between a road and linear settlement, we should construct facilities such as: exits with acceleration and deceleration lanes, service roads, guard rails , turning lanes , underpasses , overpasses, interchanges ..etc.

The cost of these facilities is high, therefore it is impossible to provide all linear settlement sections with these facilities.

#### 3.4. Deterioration of Quality of Life

Quality of life in Linear settlement is lower than the acceptable ones. People face serious problems such as: deterioration of traffic safety, pollution, noise, lower security, poor infrastructure. To improve the quality of life we need enormous financial resources.

### 4. ACTUAL POLICIES APPLIED TO TACKLE LINEAR SETTLEMENT PROBLEM

The actual policies consist of incomplete policies, some of these policies are good and comply with sustainable development principle, for example:

- Establishing industrial zones in some regions.
- Expanding urban settlement and planning new settlement to meet the demand partially.
- Carrying out regional planning studies for some regions, but their implementation is very slow.
- Public Commission for Regional Planning was created in 2010.
- Issuing new firm legislation to stop illegal linear settlement.
- Constructing service roads along some sections of expressways.

Fig.3 shows an example of a town with service road parallel to an expressway.

### 5. PROPOSED FUTURE POLICIES & SOLUTIONS

The population boom puts high pressure on planners. There is a big gap between needs and plans to meet these needs. This fact forced decision makers to make concessions, so they authorize some kind of linear settlement. The legal linear settlement expands more than the illegal ones. This policy reflects the tendency to adopt temporary solutions without future vision. Some of decision makers consider the legal linear settlement as a suitable solution, which mitigates the crisis.

Land developer has an evident influence on the actual policies, and corruption is not excluded in some situations.

The above-mentioned temporary solutions could bring many risks such as: deterioration of traffic safety, decrease of road asset value & poor quality of life.

At present there are some good solutions, but these solutions are not sufficient to build a general sustainable policy.

We should admit that it is difficult to find solutions for linear settlement in high population density regions where there is a land shortage.

In conclusion, we propose the following policies in short, medium & long terms.

### 5.1. Short-term Policies

Regional planning implementation is a long-term process, therefore we need to adopt some intermediate solutions and policies, which facilitates gradual implementation of regional planning. Without intermediate policies we may reach to a critical situation where the cost in the future becomes high.

Based on local experience, short-term policy includes the following measures:

- Constructing more service roads especially near densely populated settlement.
- Reviewing legislations that facilitate linear settlement.
- Establishing industrial zones covering all regions.
- Improving road network planning to ensure uniform distribution of economic and demographic development.
- Settlement redistribution through encouraging settlement along local roads situated near the main roads. People can change their decisions if an alternative option exists.

In the case of urban settlements situated in both sides of the road, it is recommended to divide the settlement into two settlements with separate administrations. This measure decreases the mobility on the road and improves traffic safety.

### 5.2. Long & Medium-term Policies

The absence of regional planning policy in the past aggravated the problem of linear settlement, therefore it is very important to implement regional planning in all regions giving priority to the densely populated regions where planning should begin as soon as possible.

## **CONCLUSIONS**

The main problem which affects all kinds of land use including roads is the absence of sound regional planning. Any partial policy intended to face linear settlement problem and to ensure sustainable road network planning, should be integrated in comprehensive regional planning policy, otherwise it will fail.

We believe that developing countries need assistance from developed countries in the field of legislations and regional planning, and this kind of assistance is more important than assistance in financing new road projects.



“Figure 1- Urban expansion along an expressway”



“Figure 2 - Authorized linear settlement along an expressway”





“Figure 3 - Town with service road parallel to an expressway”

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