



Highways' Impact on Economic Activities Related To Urbanization: A Case Study of the Northeastern Sector of the Regional Ring Road in Egypt

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Abstract

Background: This research aims to clarify highways' impact on the economic activities related to urbanization. By presenting the Egyptian experience in the construction of the Regional Ring Road. This research follows the analytical and comparative method, to analyze the different effects of highways on economic activities in the urban areas it passes through. By presenting previous studies and experiences on this relationship. This research is divided into three parts; A: is concerned with clarifying the basic concepts and classifications related to highways and economic activities. B: explains some previous studies of the same issue while adding some examples of global or local methodologies for each economic activity. Finally, C: studies the Egyptian experience in constructing the Regional Ring Road while clarifying the most important effects resulting from the construction of the northeastern part and elaborating on the impact it had on economic activities in the urban areas that it has been penetrating through

Keywords: Highway, Regional Ring Road, Economic activities, Urbanization, Urban Development, Economic Development.

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Introduction

Highways play a vital role in the spatial interaction between humans and various economic activities, as they affect the spatial distribution of all economic activities, and restructure them within urban areas, by concentrating economic growth in the areas through which the road passes, and attracting economic activities to the neighboring lands[1].

This process is called investment in highways, which means the process of developing and

constructing a network of highways linking distant areas, to achieve investment returns resulting from the emergence of economic activities in the areas through which it passes[2].

Taking into account that highways are an important element, but not sufficient to increase activities and achieve economic and urban development for a region[3]. In order for economic activities to grow and arise in a region, production to increase, and economic and urban development to occur, several elements must be present, namely:



Availability of suitable lands, manpower, capital, and finally achieving communication between areas of production and areas of consumption [2]. And here comes the role of highways, whose main function is to link distant areas and reduce time, effort, and cost[4].

In this research, the northeastern sector of the regional ring road (RRR) was chosen to study its impact on the emergence of urbanization, manufacturing industries, the demand for labor, the service of transporting people and goods by road, the selection of warehouse locations and activities related to storage, and finally its impact on agricultural lands. Based on previous studies of similar experiences.

1.1. The Research Question.

With the state's great interest in investing in highways to achieve economic and urban development[5]. According to the theories related to economic growth, highways are considered the ideal model for investment in the public sector. And it emphasizes the relationship of highways with economic activities and increased production, as an investment in highways leads to a reduction in the cost of transportation, an increase in economic activities, and the economic production of the state[6]. To confirm this role, the following two questions must be discussed:

- What are the effects resulting from investment in highways on economic activities?
- How does the construction of the regional ring road (RRR) affect the various economic activities in the urban areas it passes through?

Therefore, the purpose of this research is to answer these two questions.

1.2. Aim.

The main objective of this research is to clarify the effect of construction (RRR) as a highway on

some economic activities in the areas it passes through.

The sub-objective of the research is to clarify whether highways have a positive or negative impact on various economic activities, during the study of some of the economic activities related to urbanization, and some explanations of the extent to which they are affected by the development of highways in the following cities (Sydney, Cairo, Tokyo, Los Angeles, Georgia, Birmingham, Wisconsin State, California).

1.3. Methodology.

To answer these questions, the comparative method was used to present and compare the different experiences with the Egyptian experience in the construction of the (RRR). The analytical method was used to study and analyze the relationship between highways and economic activities related to urbanization. Moreover, the analysis of the northeastern part of the (RRR), which extends from its intersection with the Ismailia Desert Road to the intersection with the Alexandria Agricultural Road, As shown in figure No. (1).



Fig. 1: showing the northeastern arc of the (RRR) [41]

To clarify the role of highways in achieving economic growth at the state level through the emergence and growth of economic activities.

1. Concepts.

Transport is one of the most important elements of economic development throughout the ages, as scholars have agreed that paying attention to the transport infrastructure represented in construction a strong network by constructing new roads or improving old roads is a necessary step for the growth of economic activities and achieving economic and urban development for a region[7].

Highways are the key to economic growth, as their construction entails the emergence and growth of economic activities on both sides of these roads[8].

2.1. Highways.

A motorway is a road that provides the highest level of service at the fastest speed for the longest distance without intersections[9]. And the speed specified on it varies from country to country, as well as the name. (freeways or motorways in Spain, Canada, and Greece[10], Principal or minor arterial in the USA and China[9], and freeways in Egypt). Highways are divided into 3 categories [11]: -

- Regional roads, that connect the different regions.
- Metropolitan roads, which connect the central cities.
- Citywide road that connects separate parts of the city, such as the ring roads around cities.

2.2. Economic Activities.

It is a term given to all business or services practiced or provided by any institution. It does not require the institution to earn a financial return from its work, such as charities[12]. In this paper, we will discuss the economic activities that achieve financial returns.

2.2.1. Classification of economic activities[13].

The ISIC4 classification has been used for all economic activities. It is a classification approved by most countries in the world, in addition to the following bodies (The United Nations, United Nations Industrial Development Organization (UNIDO), International Labor Organization (ILO), Food and Agriculture Organization of the United Nations (FAO), United Nations Educational, Scientific and Cultural Organization (UNESCO)). And other international bodies use ISIC when publishing and analyzing statistical data as a global system for classifying economic activities.

2.2.2. Concept of Classification (ISIC4)

It is a guide that unifies the description of economic activities for each sector and economic activity at the level of all countries, within a unified classification and code, issued by the United Nations Economic and Social Council. So that the whole world can speak one language related to the economy[12]. To cover all economic activities from agriculture to services and classify economic entities such as institutions, establishments, and local and other statistical units according to the economic activity in which they operate[13].

2.2.3. Classification of economic activities[12].

In the classification of (ISIC4), the term economic activity is given to the productive activities in which capital, labor, energy, and materials are used to produce products that are transported and sold in the market, placed in warehouses, or recycled for use in the production of new materials. The economic activities are classified into 21 parts as shown in figure No. (2).

1	Agriculture and Fishing	12	Real Estate
5	Mining and Quarrying	13	Professional, scientific and technical activities
3	manufacturing industry	14	Administrative and support services activities
4	Supply of electricity, gas, steam, and air conditioning	15	public administration and defense; compulsory social security
5	water supplies; sewer structure	16	Education
6	Urbanization	17	Human health and social service activities
7	Wholesale and retail trade; Vehicles Maintenance.	18	Arts, entertainment, and creativity
8	Transportation and Storing	90	Other services projects
9	Accommodation and food service activities	20	Household activities
10	Communication	21	Activities of extraterritorial organizations and bodies
11	Financial and insurance activities		

Fig 2 showing the economic activities classification[13].



Highways affect all economic activities by achieving accessibility and a high level of mobility services between producer and consumer. This results in an impact on economic activity, and this effect may be positive or negative. And this is what is clarified in the research.

And architecture is the mean through which the requirements of individuals are achieved within the urban space in which they live [14]. Therefore, any economic activity within the urban area that benefits the lives of people living within the same area is related to architecture. Therefore, we can say that all of the previous activities are related to architecture.

Some activities are directly related to the architecture and considered part of it, through the provision of physical space for people's service, such as electricity, gas, steam, air conditioning, water supply; Sewage activities).

Some activities are directly related to architecture but through the fulfillment of their function of personal service, such as construction, agriculture, forestry and fishing, manufacturing, transport and storage, information and communications, education, human health, and social service activities, arts, entertainment and recreation, wholesale and retail trade; Vehicle repair - accommodation and food services - administrative and support services activities), That Economic activities have a direct impact on individuals living in the same physical area and adjacent areas by providing a direct benefit may be the provision of employment opportunities, food source, communication between urban areas and improving the living standard of the publicEtc.

Some activities are indirectly related to architecture, through the service of a certain group of individuals, such as real estate - professional, scientific, and technical activities - mining and quarrying - household activities as employers - financial and insurance activities - public administration and defense; compulsory

social security - activities of organizations and bodies beyond territorial jurisdiction). These activities benefit some, which is the category that works only with these activities, not all of them, as in previous activities.

In this research, we will only study the impact of the (RRR) as a highway on some of the economic activities related to the architecture by direct means[12]:-

- Urbanization:-

This section covers general construction and civil engineering activities. Like the construction of buildings for housing, offices, shops, or public buildings. In addition to the construction of new infrastructures such as road networks, tunnels, pipelines, electricity lines, and utilities.

Then, starting with the division of land and the planning of road network, residential or public buildings, and services and facilities.

- Manufacturing industry.

This section includes the natural or chemical conversion of raw materials to new products, and these processes are performed in factories, mills, bakeries, and other places where raw materials are converted into commodities.

- Administrative and support services activities.

This section includes activities that support general business processes, such as user activities. These include job listings and employment activities, as well as activities to search for and hire candidates for administrative positions.

- Transport and Storage:-

This section includes the provision of transport services for passengers and cargo, rail, pipeline, land, sea, and air transport, as well as activities related to transport and storage such as port facilities, warehouses, cargo handling and storage, distribution, ports, warehouses, and so on.

- **Agriculture.**

This section covers the exploitation of plant and animal natural resources, consisting of crop cultivation, animal husbandry, and other agricultural activities.

Based on the above, we will present the impact of the construction of highways on the following economic activities (Urbanization, Manufacturing industry, Labor, Transport of people and goods by road, Warehouses and storage activities, Agricultural land).

3. Background review.

3.1. Economic activities and highways:-

The main means of communication that leads to the growth and emergence of different economic activities is highway networks[15]. This applies to the study prepared by the Boston City Planning Commission for 2000, which emphasizes the impact of highways on various types of development, including economic development[16].

3.2. Previous studies.

Many studies have discussed the impact of improved or constructed highways on economic activities, including the following:-

3.2.1. Urbanization.

When a highway passes through an area, it affects the surrounding land uses. (Robert Cervero) conducted a study between 1980 and 1994 in California. The result is that by improving the existing traditional roads, converting them into highways, and increasing their efficiency by up to 10%, the increase in economic activities related to construction and building on the side of the road is offset by an increase of 6.4%[17]. One example is the roads that have had an impact on this economic activity:-

- *The ring road around the greater Cairo region.*

The first ring road in Egypt, which was completed in 2005, it is 100 km long, surrounds the greater Cairo region, and is designed to connect the greater Cairo governorates, direct traffic outside the area without penetrating the urban block, develop the desert areas and establish new urban communities[18].

It is surrounded by the middle ring road and the (RRR). The road was the cause of its emergence and the growth of new urban cities in the areas that passed through. As shown in figure No. (3).

It also played a role in developing the desert areas urbanely that were surrounding the road by creating the activities requiring large spaces such as Carrefour, GOC, and new police faculties.



Fig 3 showing cities that spread around the ring road [40]

3.2.2. The manufacturing industries.

When highways pass through an industrial area, they affect the industrial activities that exist, by increasing its growth, expansion, restructuring or creating new economic activities in new areas that were difficult to reach before the highway.

A study was conducted by Amitabh Chandra, Eric Thompson, in the period from 1969 to 1993 to illustrate the impact of interstate highway construction on the economic activity of the manufacturing industry. By collecting historical data on interstate highway construction and economic activity at the provincial level, it was found that highways had an impact on industries, causing some industries to grow as a result of low transport costs and spatial distribution by raising the level of economic activity in the provinces they directly pass

through. The profit share in manufacturing increased by 2:10 % in most years[4]. Examples of roads that have had an impact on this economic activity:

- *29Wisconsin State Road.*

It is an example of improving traditional roads and converting them to highways. The twin road was expanded and converted into a 4-lane highway, 293 km long between Green Bay and Chippewa in the United States of America, construction began in 1988 and the entire road opened in August 2000[19]. As shown in figure No. (4).



Fig 4 showing 29Wisconsin State Road [411]

The road links local and international markets. This helped the manufacturing industries based on agriculture, food industries, and other manufacturers to expand around it. According to the WSDot report, traffic along the corridor has increased significantly because of heavy truck transport as a result of a significant increase in the industrial field[19]. The road links Green Bay at one end, famous for its packaging and distribution industries, and all parts of the Midwest at the other end, providing a gateway to raw materials. The road has thus increased productivity and focused economic activity around it. Between 1990-2001, 151 factories were expanded, and between 1995-2003, the number of companies in communities along the highway increased by 55% from 10,464:16,256 [20].

- *M6 Toll, Greater Birmingham.*

The Birmingham Northern Relief Road is three-lane highway, 27 miles long, which opened in December 2003. As shown in figure No. (5).

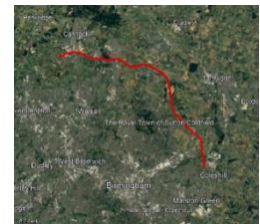


Fig 5 showing M6 Toll[411]

It helped in connectivity between Birmingham, which consider home to manufacturing and logistics activity, with other industrial areas, which has been instrumental in increasing economic activity, whether by growing existing activities, or attracting new activities to nearby areas. According to the 2004 study, a year after the road opening, the economic activity of the transformed industries increased on lands that is 30 km² away by 22%, and lands that is 125 m² away by 33% [21].

3.2.3. Labor.

With the construction of a new highway, many different economic activities emerged, such as the new urban communities in the lands around the road, production increases as a result of reduced transport costs, achieving access to previously inaccessible places. This, in turn, increases the demand for labor[22].

(Kaan, Dilruba, Joseph) prepared their study over the 1990-2000 period, on 18 counties in New Jersey/New York. The result is that the rate of employment growth increased by 2.2, 4.8, and 7.9% on average as a result of an increase of 5, 10, and 15% in the level of accessibility, respectively. Similarly, when accessibility decreases by 5, 10, and 15% in these provinces, employment growth rates fall by 1.9, 3.6 and 5%, respectively[15]. Examples of roads that have had an impact on this economic activity:-



- *Interstate 105, Los Angeles.*

A highway linking East and West through Central Los Angeles, completed in 1993, linking Los Angeles highways. It is about 28 km long. As shown in figure No. (6). connecting the industrial areas with LAX International Airport in the west and residential areas in the east.

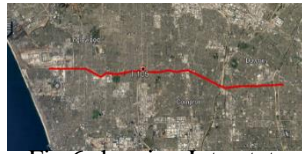


Fig 6 showing Interstate 105, Los Angeles[41]

It aims to connect the airline industry center and Los Angeles International airport to residential areas. The aim is to facilitate greater access to labor and increase productivity. The number of jobs increased by 19% after its establishment, according to a study conducted in 2001[20].

- *The ring road around Sydney.*

Australia's first complete ring road, completed in 2007, has a 110 km long ring around Sydney (the capital of New South Wales in Australia), consisting of 11 highways forming the ring road. As shown in figure No. (7).

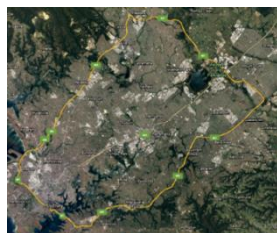


Fig 7 shows the road of the Sydney Ring Road[41]

Australia's regional government has highlighted the importance of the ring road for rural and remote suburbs to stimulate their competitiveness and improve the lives of those living in these rural areas by providing employment opportunities for those areas[23].

the road has helped to increase employment over time by an average of 100 additional jobs per year in 1986 to 4,000 jobs in 2020, because of the new industries in the areas and suburbs near the road[24].

Highways serve transportation by facilitating traffic, reducing traffic jams, reducing time and distance through the main intersections between them and the main roads, achieving a high level of mobility service in the least time, cost, and the best condition of the product. And the growth of economic and urban activities .

(Forken brock) prepared his study in 1990 on four alternative highways linking two major mid-western areas of the United States, which are approximately 805 km long. By calculating the distance and time of travel for each road, the percentage of total transportation costs is estimated, and the reductions in total transportation costs range from 18 % to 40 % for the four roads. This is reflected in the production costs of all the economic activities served by each track. The areas served by the four roads will see competitive advantages in terms of transport costs. It results in a direct increase in domestic trade from about \$19 million[25]. Examples of roads that have had an impact on this economic activity:-

- *Ring Road around Sydney.*

The road was built for the transport of people and goods, the resolution of traffic problems, and the attraction of other types of development in Sydney[26]. By transporting traffic to Sydney beyond the city's center and connecting important economic centers such as (ports, airports, shipping stations, industrial areas, and many transport stations), through the ring road connectivity to other highways[27]. This played a major role in stimulating the economic growth of activities, increasing productivity and achieving high economic returns due to the provision of transportation at an annual rate of 89% per annum, which in 1986 was \$1.6 million and in 2020 it reached \$3.4 billion[24].

3.2.4. Transport of people and goods by road:-

- *Interstate 105, Los Angeles.*



It is designed to help facilitate the movement of goods and people to the areas of its aviation and military industries. It is also connected to the Los Angeles highways, improving access to the Long Beach Port and Hawthorne domestic Airport.

The road has led to significant improvements in flight times. By improving average vehicle speeds between east and west from 23:28 mph before construction, to 45:55 mph after construction[20].

3.2.5. Warehouses and storage activities

Logistics areas are provided at important points on the highways to facilitate the transport of goods from their production sites to store them to be distributed again in consumption areas. According to a study conducted in the period from 2003:2013 on the logistics areas in Tokyo, to know the relationship between the distance between the locations, sizes, and distribution places, in which the logistics facilities in the city center were replaced with larger facilities in the suburbs near the road. As a result, the average size of logistics facilities doubled from 585 to 1077 m². The percentage of services based in these areas increased from 34% to 49% [28]. Examples of roads that have had an impact on this economic activity:-

- *Tokyo 3rd Ring Road (Ken-O Expressway).*

It is 300 km long and has been opened in phases since 1996, consisting of three highways (National road 1 / National road 126 / National road 468). As shown in figure No. (8).



Fig 8 shows the Third Ring Road in Tokyo [41]

The area of logistics areas of 400 m² or smaller located in central Tokyo away from highways represented 43% of the total in 2003, the percentage dropped to 29% in 2013. On the other hand, the proportion of logistics areas over 3000 m² increased by 12.1% in 2013. Most of

them are located on the third ring road. The logistics facilities moved abroad only 26% in 10 years to the periphery of the second and third ring road[28].

3.2.6. Agricultural lands:-

When a highway passes through an area with agricultural lands, we find that the road will have an effect on those lands, either by increasing or decreasing their area. According to the study prepared by (Chris Mothorpe, Andrew Hanson, Kurt Schnier) over the period 2007: 1945 over the state of Georgia. Because of its exposure to large losses of agricultural land amounting to 57.1%, as a result of the emergence of a network of interstate highways estimated at 1995 km during this time. The United States as a whole lost 19.3% of its agricultural land. The results also demonstrated that each additional mile of interstate highway reduces farmland by 468 acres[29]. Examples of roads that have had an impact on this economic activity are:

- *The ring road around the greater Cairo region.*

The road has contributed to the transformation of most of the surrounding agricultural lands into populated areas as in figures (9), (10).



Fig 9 shows the size of agricultural land in 2020[40]



Fig 10 shows the size of agricultural land in 1984[40]

3.3. Observations.

Based on previous studies of the impact of highways on economic activities. From examples of global or local experiences of every economic activity, we can observe the following:

- **Urbanization:** - the highway has a large capacity in the area of various economic and urban activities in the land around the road,

which contributes to the reconstruction of the land in the area around the road and its transformation into urban areas that contain various economic activities, thus having a positive impact on the economic activities related to urbanization.

- Manufacturing industry: - we note that highways provide connectivity between areas of raw materials production, areas of processing and their conversion into goods, and areas of consumption such as markets. This is done through its transport service at the lowest cost and time. This has played a role in increasing economic activities, whether through their expansion and growth or through the establishment of new activities in new areas that were difficult to reach before the construction of the road, which has had an impact on the increase in productivity, and a positive impact on this activity.
- Labor: - the establishment of a network of new or improved highways has a positive impact on the flow of labor traffic and thus on increasing employment rates and profit ratios for companies, as a result of achieving access to different economic activities. This indicates that highways have a positive impact on that activity.
- Transport of people and goods by road: - we note that the establishment of new highway or improved roads will reflect the growth of different economic activities and the increase of economic production, thus achieving the economic and physical development of the country. As a result, transport costs are reduced compared to other methods. This means that highways have a positive impact on that activity.
- Warehouses and storage activities: - the construction of a highway encourages the movement of logistics and storage activities from the city center to the suburbs near the road, or the establishment of new logistic areas around the road, as a result of achieving communication between production and consumption areas, thus

facilitating the transport of goods. Away from its bustle of central areas. This indicates that highways have a positive impact on that activity.

- Agricultural land: - it is noted that when a highway passes through agricultural land, the land is reduced as a result of the construction of the road on agricultural land or as a result of urban encroachment. This indicates that the construction of highways near agricultural land harms the size of agricultural land.

Based on the above, we can know how the construction of the (RRR) affects the growth of different economic activities in the urban areas through which it passes?

4. The case study of the regional ring road.

4.1. Road identification.

Regional ring road (RRR) is the second ring road in Egypt, surrounded the Middle and first ring road surrounding greater Cairo, is located about 42 km (on average) from the first ring road in the southwest.



Fig11, shows the (RRR), middle and ring road[41]

Construction started in 2008, fully opened on 9 September 2018, and costs a total of £8 billion. As in figures (11).

Three ministries participated in its implementation and they are [30]: -

- The Ministry of defense (The Engineering Authority of the Armed Forces) carried out 200 km of the Southern Arch.
- The Ministry of Housing, carried out 49 km of the South Arch.
- The Ministry of Transport, carried out the northern arch with a length of 151 km.

The total length of the road is about 400 km, with an average radius of 60 km. It was built with



the highest international standards in terms of the number of lanes, safety factors, and was limited to 120 km per hour, isolated from the surroundings. The road is designed to be in freeway specifications, i.e. without intersections, and bridges and tunnels are used to turn back[31].

It links between five regions (Cairo, Alexandria, Delta, Canal, and North Upper Egypt) out of seven regions. As in figures (12). It also serves

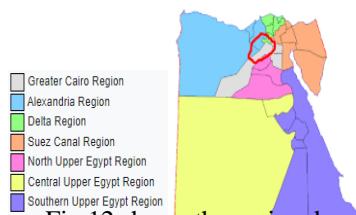


Fig 12 shows the regional ring road and the regions of Egypt [37]

15 different provinces out of 27 provinces.

The (RRR) is divided into four main sections (the North-West Arch, the Northeast Arch, the Southwest Arch, and the Southeastern Arch).

In this research, we will only examine the impact of the northeastern part of the road on the physical development of greater Cairo by discussing its effects on economic activities in the surrounding regions and the regions through which it passes.

4.2. Effects of the northeast section of the (RRR) on economic activities.

The road is expected to have several direct and indirect effects on economic activities. The direct effects are to obtain economic returns directly from the exploitation of the land around it by offering investment, either by the state or by the private sector. Or through the fees imposed on the passage of vehicles through it, it will therefore play a role in increasing the economic returns of the country. The indirect way is:-

4.2.1. Urbanization.

The regional ring road passes through the desert area, which is between of Al-Obour, the 10th of Ramadan, and Balbes. Therefore, there is a proposal to restructure it and develop it (the north-western part of 10th of Ramadan, east of the Ismaili canals, the area between Belbis and Al-Obour) through the establishment of medium-level housing projects for the labor in the industrial areas. interspersed with some industrial activities dependent on agriculture and animal wealth because of its proximity to the agricultural area of the delta[32]. As in figures (13).

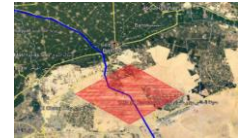


Fig 13 shows the area to be developed located between Al-Obour, 10 of Ramadan and Belbeis, which the (RRR)

Therefore, the expansion of the desert lands through the deliberate planning of the establishment of Al-Obour new city, the growth of the 10th of Ramadan, will be the direction of Balbis, in order to match the future urban and population growth. In addition to the reclamation of arable land, especially in the area of the South area of Ismailia canal, which is characterized by its fertile soil, thus the agricultural land of the Delta will be protected. The establishment of this project will result in: -

- Provide special job opportunities in the agricultural and related industries.
- The reclamation of new agricultural land and the consequent increase in agricultural economic activity.
- Provide housing for labor and halt urban growth on agricultural land in the Delta. This is through the establishment of housing projects suitable for workers on desert lands in that area, which will lead to the development of the region urbanely and economically.

When comparing the area of the urban block between 2006 and 2020, the area of urban

blocks increased by 26,858 acres[33]. As in figures (14).

Year	2020	2006
urban area	60613	33755
	Acres	Acres
Increase	26,858 acres	

Fig 14 shows the urban block area between 2006 and 2020[33].

This indicates that the northeast section of the (RRR) has a positive impact on the growth of urban economic development.

4.2.2. Manufacturing industries:-

The northeast side of the road includes the most important industrial cities in Egypt. As the passage of the (RRR) near those industrial cities, a high level of transportation services will be achieved, first for raw materials from their production areas to those industrial areas to start converting them into new products, and second, those new products (goods) will be moved to places of consumption and markets all over the Republic. By the (RRR) and its main road network. The most important industrial cities based on manufacturing industries located in the north-eastern part of the road: -

- The major industrial area in Port said houses many factories and exports its products such as paints, oils, tires, shoes, clothes, and food industries...Etc. to local and international markets[34].
- The industrial area of East Ismailia includes several factories in many fields that serve most of the Egyptian market, such as (electronics, interlock bricks, cement bricks, compressed wood panels, cooling and storage of vegetables and fruits, chemicals, refining and drying of all kinds of salt, and fodder filling ... Etc). [34].

The industrial area of Portsaid and Ismailia is connected to the main transport network in Egypt by the Ismaili agricultural or desert road then the (RRR).

- The 10th of Ramadan is considered the biggest industrial city, as it is an integrated industrial city where most industrial economic activities such as (electricity, lighting, textile, ready-made clothes, carpets, ceramics, and other industries are established... Etc).

The industrial zone is connected to the main transport network by the (RRR).

- The Al-Obour industrial area is one of the most important industrial cities in Egypt, with factories in various fields such as (operation and formation of metals, paper and cardboard, plastic and plastics, packaging, car spare parts, and Home appliance, equipment Etc).

It has a very important geographical location on the outskirts of greater Cairo, the Ismailia desert road near the ring road, and the (RRR) linking all the governorates of Egypt, enabling it to provide quick services to all seaports and all other industrial cities.

the (RRR) contributes to the transportation of raw materials from their places of production to those industrial cities (Port said, Ismailia, 10th of Ramadan, Al-Obour) and then transport goods again between different regions, which will lead to increased movement of economic activities, which will result in a boom in economic activity, increased productivity, and expansion of the economic activities of

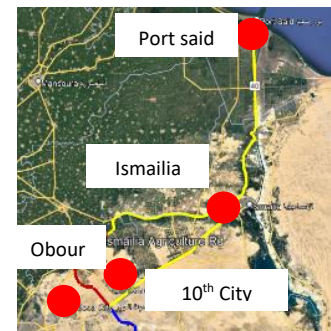


Fig 15 shows the location of the industrial areas in relation to the (RRR)[41].



the manufacturing industries. As in figures (15).

When comparing the industrial area In 2006 and 2020, the area of industrial zones increased by 1869 acres [33]. As in figures (16).

Year	2020	2006
Industrial area	3980	2111
	Acres	Acres
Increase	1869 acres	

Fig 16 shows the Industrial area between 2006 and 2020[33].

This indicates that the northeast section of the (RRR) has a positive impact on the growth of manufacturing industries.

4.2.3. Labor.

The (RRR) will play a major role in the flow of labor traffic. The increase in the demand for labor is due to the emergence of new urban communities in the land around the road, the increase in profit rates as a result of increased production and the development of economic activities, and the availability of services and facilities in the areas it passes through.

New urban communities through the urban community that was proposed in its previous point (Urbanization).

Increasing the production rate. The (RRR), as mentioned before, connects most parts of the Egypt, it connects important economic centers such as the main industrial areas, the central agricultural sectors, and the important commercial centers, and therefore it helps in reducing time, cost and effort used in mobility are compared to the above. And have helped to reach places that were previously difficult to reach by linking them to the central areas. This will help increase the productivity or expansion of these important economic centers and increase their spread, which will result in increased demand for workers. Among these economic centers: -

- Main industrial areas (Portsaid, Ismaila, 10th of Ramadan, Al Obour).
- Ports are like: -

- The port of Damietta is one of the oldest in Egypt, located on the northern coast of Egypt, between Portsaid and Alexandria. The port has been significantly developed over the last period to serve the Egyptian export movement[35].

The port is connected to the main transport network by (Damietta, Mansoura, Benha) road and the (RRR).

- The port of Alexandria is located on the northern coast of the Mediterranean in the east of Alexandria, the leading position in the ports of Egypt in terms of the volume of trade, where about 60% of the commercial economic activities[36].

The port is connected to the main transport network by Alexandria agricultural or desert road then the (RRR).

Based on the location of the (RRR) for the ports of Damietta and Alexandria, we find that the road helped the ports to be a main distribution and reception center for all areas of storage, sale and consumption within the Egyptian regions[32]. The main role in the boom of economic activities was the export from the different regions of Egypt, through the two ports or import from abroad through the two ports and then distribution to the rest of the Republic. As in figures (17).

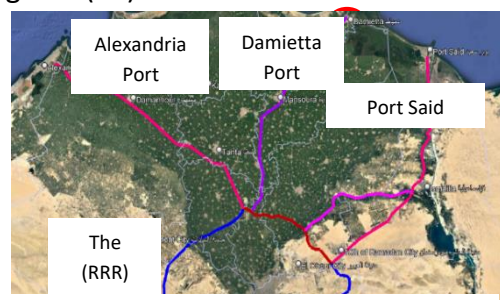


Fig 17 shows the location of Alexandria, Damietta and Port Said ports in relation to the (RRR)[40].



- Port said Port[37].

The Western Port is located at the northern entrance of the Suez Canal, it is one of the most important Egyptian ports due to its privileged position at the entrance of the biggest international navigational corridor (Suez Canal) that links Europe to the East and is considered the biggest transit port in the world.

The eastern port is one of the major national projects, the first phase was opened in 2004 to serve the international trade and maritime transport industry. The port is located in a unique location east of the northern entrance to the East Suez Canal, at the junction of three continents and on the main road to the East and West junction.

The two-ports are connected to the main transport network by the Portsaid Ismailia road, the Ismailia desert or agricultural road, and the (RRR). As in figures (17).

When comparing the investment volume in 2006 and 2020, the investment volume increased by 37 acres[33]. As in figures (18).

Year	2020	2006
Investment area	37	0
	Acres	Acres
Increase	37 acres	

Fig 18 shows the Investment area between 2006 and 2020[33].

This indicates that the (RRR) helped increase the demand for labor and thus increase production, which has had an impact on its emergence, economic growth, and increased investments.

4.2.4. Transport of people and goods by road ((RRR) and its intersections.).

Facilitating the service of transporting people and goods as follows:-

- The link between the governorates of Lower Egypt and the Cairo region.
- Traffic coming from Belbis and industrial zones (10th of Ramadan, Al-Obour, Port said, Ismailia) will be transported in the direction of Banha and Cairo/Alexandria agricultural road. This leads to increased movement of commercial, agricultural, and industrial activities between the different regions and the delta. Through the main intersections between him and the main highways such as:

- The (RRR) Intersection with Alexandria Agricultural Road, which is 540 m long and 42 m wide, the two roads were fully connected and the problem of traffic congestion in this area was solved[31].



Fig 19, the intersection of the (RRR) with the Alexandria Agricultural Road [40]

In addition to linking the Port of Alexandria with other urban economic activities with region of Cairo and other parts of Egypt. As in the figure (19).

- The (RRR) Intersection with Al-Mansoura Benha Road this intersection contacted between Damietta Port and the greater Cairo region and other parts of the Republic, and it passes through Dakahleh Province and near the greater Mahaleh, Tanta. As in the figure (20). They are from producing governorates, which helped facilitate the transport of people and goods to and from these governorates and increase production.

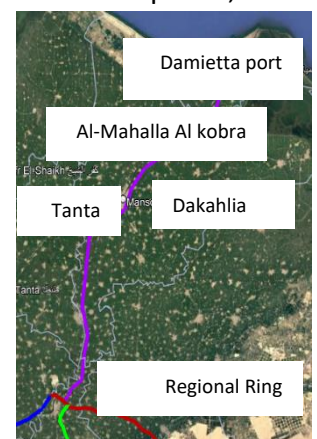


Fig 20 shows the intersection of Mansoura/Benha Road with the (RRR)[40].

- The (RRR) Intersection with Shubra Binha Freeway. Which is 40 km long, it is the first



free agricultural road without a traffic intersection in Egypt, which will help relieve the traffic jam on Cairo-Alexandria agricultural road, and represent a new axis directly linking the ring road and the (RRR) without access to crowded residential blocks. As in the figure (21). This will help solve the traffic problems resulting from the traffic congestion and the traffic pressure in greater Cairo, and ease the high traffic on the first ring road around Cairo.



Fig 21 shows the Shubra-Banaha Freeway, the first ring road and the (RRR)[40].

- The (RRR) Intersection with the Ismaili agricultural and desert roads helped to achieve greater connectivity and solve traffic problems in these areas, by linking the industrial area of Ismailis, with the free market, the industrial area in Port Said port, as well as the industrial city of 10th of Ramadan with the rest of the Republic. As in the figure (15).
- The (RRR) Intersection with Belbis Cairo Road, which connects the first ring road and the (RRR), the industrial area of Belbes, and the 10th of Ramadan. As in the figure (22). Which was instrumental in reducing traffic problems that are caused by traffic in this area.



Fig 22 Belbeis Cairo Desert Road, Ring Road and the (RRR) [40].

such as major industrial areas, central agricultural sectors, and important commercial centers that already exist in the regions through which the (RRR) passes.

Based on this, there was a need to establish a logistic area in the area located between the intersection of (RRR) with Alexandria agricultural and Mansoura/Banha road with the (RRR) to accommodate the huge amount of economic flow back and forth between the northern part of the Republic, especially the port of Alexandria and Damietta. And the rest parts of the Republic.

- The logistic area of Banha: -

The state has established a logistics zone in Banha, specifically in Ezba Najib. As in the figure (23).

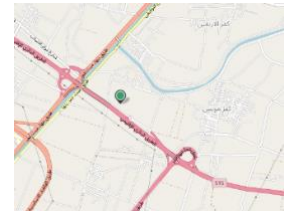


Fig 23 shows location of the logistic area of Banha to the (RRR)[30]

Where the first plan was drawn up in 2018, on an area of 500 acres, aimed at attracting the various economic activities in many areas of the region. One of the most prominent economic activities that were opened in the logistic area of Banha[31]:-

- Housing projects where the total number of units in the investment zone 147 whose area ranges between 240 and 360 m², 6 fridges, 18 stores, and 16 outlets.
- Economic and industrial activities are dedicated to dairy activity and food industries.

4.2.5. Warehouses and storage activities (logistics areas and its activities)

Logistical areas can be located the on the north-east sector of the (RRR) by identifying the locations of important economic activity centers

This logistical zone will have a direct impact on the economy through[38]: -

- Opening the door for foreign investments, which are expected to reach 2 billion pounds, within 10 years, in addition to domestic

investments, which are estimated at 1 billion pounds.

- This project is expected to provide approximately 3,500 job opportunities, according to the rates found in similar areas (7 jobs per acre), and other indirect job opportunities created by the project in the surrounding areas, thus adding an economic, urban, and social addition to the area.
- Reducing the cost of transportation and distribution as a result of the existence of the (RRR) and its interconnections with the main roads.
- The goods will be transported directly from different ports or places of manufacture to be stored or recycled in this logistics area without passing through the Cairo region, thereby reducing the traffic jam in the region.
- Encouraging the export of agricultural products from northern Upper Egypt and the Delta through storing or remanufacturing them in these logistic areas and then exporting them abroad through ports.

The following is the indicative program of the different activities planned for the project as in the figure (24).



Fig 24 shows the indicative program for the various activities planned to be established in the logistics zone.[31]

- River harbor. River harbors are a key element in logistics areas that are indispensable for the development of foreign trade and the vitality of the regions. As a result of their connection between highways, rivers, and railways, they also contribute to the growth of various economic activities[39].

Egypt is characterized by the Nile River, which is an important means of transportation, where Egypt owns about 47 river ports owned by many companies, factories and the General Authority for River Transport[40]. The (RRR) intersection with the Nile helps to connect northern and southern Egypt through the Nile River and its east and west through the (RRR). Accordingly, there is a proposal to establish a river harbor in that area and develop the Cairo/Damietta



Fig 25 shows location of a river harbour[41].

waterway, as in the figure (25). To facilitate river transport[32]. So In this area (delta), we can only establish storage areas and not allow any other industrial activity to be held to keep the agricultural land. These storage areas serve the delta and neighboring areas.

4.2.6. Agricultural land:-

- First part: - the confined area between the intersection of the (RRR) with the Ismailia Agricultural Road and the Alexandria Agricultural Road. Over the years 2006 to 2020, the area of agricultural land decreased by 8,858 acres[33]. As in the figure (26).

	2020	2006
A picture of the area		
agricultural land	148721 acres	157579 Acres

Fig 26 shows the Agricultural land between 2006 and 2020[33]

This indicates that the (RRR) has a bad effect on agricultural land and agricultural activity, in this part.

- Second part: - the confined area of the (RRR) intersection with the Ismailia agricultural and desert roads, over the years 2006 to



2020, the area of agricultural land has increased by 7,527 acres. As in the figure (27).

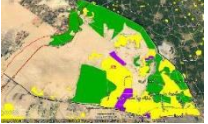
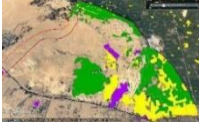
2020	2020	2006
A picture of the area		
agricultural land	43244	35717

Fig 27 shows the Agricultural land between 2006 and 2020[33]

This indicates that the (RRR) has positively effect on agricultural land and agricultural activity, in this part.

So the northeast section of the (RRR) has a positive impact on the part passing through the agricultural land, but when it passes through the desert area it has had a positive impact.

5. Conclusion.

Based on the above studies of previous experiments on highways, we find that they have a positive impact on the following economic activities (Urbanization, manufacturing, labor, Transport of people and goods by road, warehouses and storage activities). It has contributed to its growth, expansion, and increased productivity, thus achieving significant economic returns. But it negatively effects on agricultural land.

When the results were dropped on the study of the case in that research (the north-eastern part of the (RRR) in the area which it passes, it was found that the road affects those activities through:-

- It contributed to increase the area of urbanization by 26,858 acres.
- The area of industrial zones increased by 1869 acres.
- It contributed to increase the area of investment areas by 37 acres, which reflected on the increase in the demand of labor.
- Contribute increasing the transport of people and goods by directly linking different areas or important intersections with major highways, thus achieving high connectivity for important economic areas, and helping to reduce the total cost of transport, time and distance, Increase in investments and the creation of different economic activities on the road.
- Contribute to establish new logistics areas on the road, such as the logistics area in Banha, and helped to connect storage areas with areas of production and consumption, which had an impact on the growth, expansion and development of these economic activities.

The road harmed agricultural land in a part of the road (the area between the Ismaili agricultural road and the Alexandria agricultural road), the construction of the road resulted in the loss of approximately 8,858 acres of agricultural land. However, it passes through the desert area between the Ismailis agricultural and desert roads, the area of agricultural land increased by 7,527 acres. This means that when a highway passes through agricultural land, the road will have a negative impact on it, but when it passes through desert land it will have a positive impact by contributing to the rehabilitation of those lands.



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