City's Gateways and Corridors Development

A Network of movement corridors, Alexandria City- Egypt

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In the Name of Allah, the Most Gracious, the Most Merciful

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Abstract:

A gateway is an entrance creating access to tributary areas making the city in charge of connections between tributary areas and the outside world. These connections are “Corridors” that are generally referred to in terms of transport infrastructures.

Like a gateway, a corridor has been particularly as valuable and a complementary tool with new world urban frontier systems. In transport planning, the relationship between gateways and corridors has become a main focus of attention. Special attention is paid to freight and passenger traffic flows in the latter half of the twentieth century which demands a consideration of gateways and corridors essential to support urban and regional development.

Alexandria city has several kinds of gateways that are not supported fully with connections and corridors that maximize their efficiency. Thus, these gates create additional pressure on metropolitan areas. In addition, the marine gates of Alexandria and Dekheila face inefficiency in their capacities. The aim of this study is to find a mechanism of change necessary in promoting the globalization Alexandria through strengthening inter-city freight transport.

The study hypothesizes that relocating the city gates to inland dry port, alongside implementing new transport corridors. These corridors would act as ring roads that surround the city in three development stages that meet the growing demand of freight transport. As a result, there will be an increase in connectivity, proximity, and accessibility. Moreover, it should re-balance the existing development patterns, orient territorial development, find new land potential and form the spatial policy of future growth of Alexandria. Alexandria will then be declared a nodal and global city with a multi international connection and movement corridors, for people and commodities, which connect the city to the global economy system. The reform and development of this issue can lead to discovering a lot of Small Medium Enterprises (SMEs) in Alexandria as well as in Mediterranean Cross- borders and thus create a balance to the social class and recent inequalities.

Alongside the improvement of truck facilities and access, the study recommends to shift cargo transport from trucks to rail and waterway vessels and activate the role of natural waterway means in the transport of commodities. The basic solution could be found when the study integrates the use of Hub-and-Spoke in cargo distribution and transshipment.

The study advises politicians and decision makers to establish policies that can put in order global connections between their countries and other cities gateways without the consideration of variances and political frontier borders as well as shifting their geo-political relationships.

Keywords: *Freight transport, gateways, dry ports, corridor transport*.

Introduction

With an increase in product specializations and globalization, cities need well-connected transportation networks, however, tend to neglect freight transport. Although freight transportation benefits the urban economy through offering a number of jobs and services, it has been overlooked and seldom included in transport surveys, transport strategies, and regional planning, (Lasalle, 2015).

The capability of transporting goods to nearby cities is, therefore, put a critical situation. The transport system in general and the intermodal transport terminals, in particular, have now been relocated or redesigned in many cities. However, such expansion may face some constraints. For example, a city gate must be relocated in the middle of the city rather than at the edge because of the city's possible expansion. The demand for land in central areas is stresses on the need to relocate large-scale internal dry gates or ports to less central city locations.

The study should adopt a strategy of directing cities to benefit from their gateways as a method of improving their freight transportation system which can lead to reducing the traffic congestion in urban regions and making them more livable. This category of urban transport, however, should be regulated by road transport policies on an economical basis in an attempt to decrease the difficulty that excessive congestion places upon both travelers and urban dwellers along the urban road network.

The study is composed of three main parts and each part consists of two chapters. Part one explains how gateways can help the city develop its features, potential, and aspects instead of causing congestion. Chapter one of this part discusses the main problem and defines the role of city gateways and their functions. It clarifies the locations and spaces of flows and how the study's aims are to be validated. Chapter two, on the other hand, explores the growing demand for transport and how it affects the urban form. It explains the procedures and processes of transport systems using the Four Step Travel Model (FSM).

Part two discusses the development and relocation of city gateways and facilitates locating a dry port to assist and support the sea harbor. Chapter three explains the influences on the movement and their potential Catalysts that certainly affect the movement patterns of urban workers, it presents a clear explanation of the criteria of dry port selection as well as discussing the thought of finding new axis and transport corridors can offer effective and appropriate land use. It would also assist in finding new corridors for successful transportation services which are essential to provide accessibility in congested urban areas. This can integrate efficient land use to transport planning and coordinate the development of all transport modes while considering high-quality access needed in large urban areas. Chapter four reviews three international case studies successful in solving the congestion problem and led to a well-connected freight transport network.

Moreover, part three discusses the thesis case study in Alexandria while chapter five studies the spatial analysis of the city gates. Moreover, this chapter presents a complete study of trip distribution by allocating existing freight movements and traffic capacity. It defines the spaces of flows and the Origin – Destination (OD) of Freight Movements. Chapter six presents the proposal of finding Alexandria's dry port through employing the criteria of selection to the dry port's location using Geographic Information System (GIS). The chapter also presents three stages to propose a new corridor in short, medium and long-term solutions. Validation is given using the Space Syntax and DepthMap software.

The goal of this study is to create a new action plan that is needed to employ Gateways and Corridors concept in finding strategies of creating an effective freight network at national and local levels, especially when infrastructure and services are sufficient. Therefore, this should be taken into considerations when the study analyzes the **Locations and Spaces of Flows** where the gateways are often apparent as hubs in networks of flows of goods and people. At the same time, they also support the economic and social places where many services and infrastructure are available and can be accessed. Therefore, it has a unique territorial character and is at the same time a matter of scale.

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Abbreviations:

Small Medium Enterprises	(SMEs)
Four Step Travel Model	(FSM)
Origin – Destination	(OD)
Geographic Information System	(GIS)
City Logistics	(CL)
City Distribution Centers	(CDC)
Transportation Analysis Zones	(TAZ)
Carbon dioxide	(CO2)
Volatile organic compounds	(VOCs)
Nitrogen oxides	(NOX)
Sulfur Oxides	(SO2)
Hydrocarbons	(HCs)
Twenty Foot Equivalent Units	TBUs
Traffic Analysis Zones	(TAZs)
Information and communication technologies	(ICT)
THE Union Pacific	(UP)
The Burlington Northern and Santa Fe	(BNSF)
volume to capacity ratio	(V/C)
Traffic Assignment Model	(SAM)
Alexandria Port Authority	(APA)
Alexandria International Container Terminals	(AICT)
Egyptian National Railways	(ENR)
River Transport Authority	(RTA)
Inland Water Transport	(IWT)
Japan International Cooperation Agency	(JICA)
Growth Domestic Product	(GDP)
The Passenger Car Equivalent	(PCE)
Passenger Car Unit	(PCU)
Digital Elevation Modeling	(DEM)

PART 1: City gateways: The concept and perspective

1. Chapter 1: Definitions, role and functions

This chapter begins by discussing the importance of city gateways, which act as the medium through which people and commodities enter and exit. Therefore, a gateway organizes daily movements and controls economic development. This chapter discusses current problems that result from neglecting the vital role of city gates. It also discusses logical ways as to strengthen the inland transport system as well as explores the spaces of flow and defines the context and contents of a transport network.

1.1. Locations and Spaces of flows

Locations are subjected to the level of spatial aggregation of socio-economic activities that characterize demand of mobility and determine its place. Connectivity is mostly the tool of the nodes' accessibility to the demand services. (Jean et al., 2006).

The density of traffic on the network can be attributed to the flow of people, freights, and services available in urban regions, city' edges, or core centers; they define the mobility function and linkage capacity. Whereas the freight transport is mainly affected by the locations of flow spaces, public transportation is influenced by urban land use. Therefore, all of the transportation systems respond to private actors to adjustments in the land use of the city and as well as in the regional scale. The development of land use and transport is closely related and is considered conventional sense to both; decision makers and citizens. In addition, traveling, transportation of goods, and the essential principle of transport analysis are needed due to the spatial disconnection of human activities. According to this principle, the suburbanization of cities is understood to lead to increasing the labors opportunities, and the transport demand.

Hinterlands are the most permanent concepts in city gateways development, especially those applied to the ports gateways. They refer to the port market area, the area from which the gate draws and distributes traffic (Jean et al., 2006). In addition to the connectivity, gateways require hinterlands to include inland intermodal facilities to receive, distribute, exchange and transshipment commodities to many destinations or to further networks, (ESPON Program, 2013).

Hubs and Spoke - or transshipment nodes that support the movement by offering the network with a large number of direct connections. The hub-and-spoke is an approach to transportation that includes the centralization of routes, it decreases the network construction costs, integrate commodity handling and sorting, and enable transportation providers to use economies of scale through collecting the flows between network nodes, (Skipper, 2002).

Dry ports or inland ports are locations that provide multiple modes of transportation and many different services and where trade can be shifted from the local borders. An inland port supports international operations when customs clearance and International-Trade Zone

facilities are available. The efforts of the industry to generate more effective supply chains are supported by dry ports that offer value-added services in addition to trade processing. Multimodal corridors are now focused on as part of transportation planners' and policy makers' investment strategies. Dry ports provide an opportunity to improve corridor investment because of their ability to balance truckloads on the highway, air, rail, or water modes. Finally, inland ports are able to establish local employment, improve corridor efficiencies, and cut down both private and social costs at border points of entry.

Logistic vital choices involve assigning the position, amount, and types of facilities of a distribution framework, the client's decision regarding using these facilities, transport process, modes choice and trucks courses. All choices essentially influence the logistic aggregation cost and the client's benefits and satisfaction.

New ideas have been generated of City Logistics (CL), which define the inland freight flows inside the city. Its aim is to minimize the damage resulting from the freight transport towards improving the life quality and urban sustainable transport network. This could be achieved through finding a platform of City distribution centers (CDC) that might be located in the city inland dry port or within the city limits. The CDC carries the responsibilities of managing the process of distribution commodities, controlling traffic, consolidation and even the coordination and deployment, and running all facilities.

Trucks' platforms responsible for the definite circulation of freight using different modes of transportation, for instance, the platforms of trucks are responsible for definite circulation. Platforms have an awesome effect on viability of freight distribution in urban ranges. Be that as it may, their utilization in demonstrating a few inadequacies in view of two principle reasons: their position and the obliged structure of urban territories to conquer the boundaries.

The local level of financial improvement and national strategies have after some time affected the usefulness of gateways and formed the profile regarding what the individual gateway can offer as usefulness, (John Merry & Steven Broomhead, 2010). Meanwhile, freight operators have continued their businesses, which is to give the products required by shops, organizations and family units at the correct place and the perfect time. Much of the time, they succeed, however not generally in a good environmental or social way. In expansive urban communities, one fourth of CO2, 33% of nitrate oxides and half of the particulates that are emitted by transport are produced by trucks and vehicles. Municipalities, today, must target cargo transport as one of their needs with a specific end goal to make it more productive and sustainable.

A methodological foreword will quickly exhibit issues of urban cargo information gathering and examination and demonstrate the differences of urban cargo circumstances on the planet. Significant characteristics of urban cargo are then displayed including its ecological effects, trailed by a depiction of arrangements attempted by urban areas around the globe. Some

chosen issues are talked about to demonstrate the primary difficulties local governments confront on urban cargo. Arrangement proposals to local and neighboring governments are then given as a conclusion, with cases of best practice, (Giuliano et al., 2013).

1.2. Aim and objectives

The aim of this study is to employ the concept of gateways and corridors in order to have a new role and function; they should be mechanisms for change, which is necessary to promote the globalization of Alexandria city through strengthening the infrastructure of both a network of freight transportation corridors and an intercity transportation system.

The study aims at establishing a network of freight corridors through which movement can be transferred from the gates and distributed to places of flows. These corridors also connect the city gates with one another to transport goods and people. Through these corridors, the movement could be directly transferred to places of demand without the need to enter the city center or the high-density areas. This movement transfer will lessen the pressure on the inner network, which suffers from high-density congestion. Establishing such a network of corridors fulfills a number of objectives, such as:

1. Solving the traffic jams and congestion,
2. Enhancing the intercity movement with increasing the possibility of economic investment and encouraging a lot of Small Medium Enterprises (SMEs) in Alexandria as well as in neighboring cities.
3. Rebalancing the existing development patterns.
4. Orienting the territorial development, finding new land potential, and forming the spatial policy of Alexandria's future growth.
5. Empowering Alexandria to be a nodal global city with a multi international connection and movement corridors of people and commodities, which can connect the city to the global economy system.

1.3. Definitions: A gateway and a hub's functions

Gateways and corridors are nodes and links in a movement network; they often consume land within the context of cities and metropolitan regions. In a globalized world, gateway urban communities are imperative central points of social and financial advancement, and they get impressive policy consideration.

Gateway urban communities are transport hubs in the worldwide monetary frameworks that locate research organizations in front line global development systems and spots drawing in universal tourism. Parsons et al (2007) propose that gateway is a hub that has a fertile region on a side of dwellings and business opportunities, and it is the other side of fruitless.