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THE PROGRESSION TO LOGISTICS CITY AND ITS IMPLICATION OF ECONOMIES OF AGGLOMERATION

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ABSTRACT

Purpose of this paper – This paper identifies the essential activities at logistics facilities and describes the progression of these facilities to logistics city. The impact of the progression on economies of agglomeration is analysed, the practical implication is presented, and the need for government initiatives, intervention and coordination as a catalyst is explained.

Design/methodology/approach – Based on the sophistication of logistics facilities progression, the essential activities at various logistics facilities are collected and the impact on economies of agglomeration is analysed.

Findings – This paper finds that while agglomeration economies explain past development, agglomeration forces alone are insufficient and government intervention is required as a catalyst. This may be in the form of the development of a common user freight terminal with intermodal and customs capability, e.g. inland port to aggregate consolidation/deconsolidation activities.

Research implications and limitations – The identification of essential activities of logistics facilities can minimise or prevent inappropriate uses of these facilities to ensure effective and efficient logistics services planning and high utilisation of transport infrastructure. The impact analyse of economies of agglomeration points out the role a government should play in logistics facilities development.

Value of paper – The paper identifies essential activities for logistics facilities and therefore makes it possible for governing agencies to plan and protect the development of logistics facilities and ensure high utilisation and effective usage of such facilities. The gap identification of economies of agglomeration ensures tangible economic benefits can be achieved through appropriate government supported logistics facility developments.

INTRODUCTION

A number of cities around the world have established their international standing, competitiveness and attractiveness as freight hubs. In some examples, the ultimate progression of their logistics intensive component of their economy involved the concerted rise to logistics city status. Several of these exist and whilst they are not always refereed to as such, these logistics cities such as Dubai (Proffitt, 2006; MEED, 2006; Turner, 2006), Shanghai (Leach, 2006; Harmsen et al., 2006), Singapore and those in the USA and Europe (Tierney, 2004) are multi-faceted in terms of their characteristics e.g. infrastructure, business services, and urban amenity. Those inherit significant economic growth potential, as well as possess an ability to attract investments and projects from leading international and local logistics companies, thus securing further strength in their supply chain management and general logistics capability.

These logistics cities not only hold the core elements such as dedicated logistics infrastructure, but also integrate industrial parks and urban constructs and some are strategically associated with a free trade zone. These examples show leverage of the excellent international connectivity and superior freight handling efficiency of the associated airport or sea port that enables quick turnaround, value-added logistics, and local, regional as well as international distribution activities.

These logistics cities hold considerable potential towards regional economic growth (Meidute, 2005; Sengpiehl et al., 2008).

The development of various logistics facilities, which starts from freight terminal, follows by freight hub and logistics village, and with logistics city represents the more sophisticated combination, illustrates the progressive changes of services, infrastructure and beneficiaries of these facilities. There are distinguishing or differentiating aspects that allow a classification between each stage of the progression. The differentiation is in terms of infrastructure and business services that each stage can provide, and with each stage, there is increasing sophistication.

Industrial agglomeration has been considered a source of sustainable competitive advantage for a national or regional economy. Agglomeration economies derive benefits from the location of activities near a specific facility, provide powerful forces and explain the advantages of the clustering of services around a particular facility (Chatterjee, 2003). At the freight terminal level the agglomeration of activities related to freight transit and transhipment are directly linked to the nucleus terminal. The support to the industrialisation economies at the level of the freight hub as well as logistics village becomes important. At the level of logistics city, it sustains urbanization economies, deriving benefits from the agglomeration of population, namely common infrastructures (e.g. utilities or public transit), the availability and diversity of labour and market size.

However, we have found that while agglomeration economies explain past development, agglomeration forces alone are insufficient and government intervention is required as a catalyst for comprehensive logistics facilities development. This may be in the form of the development of a common user freight terminal with intermodal and customs capability, e.g. inland port to aggregate consolidation / deconsolidation activities. These common user freight terminals, together with well-built transport infrastructure, will initialise the progressive development towards logistics cities once the critical mass of development forms.

This paper identifies the essential activities of logistics facilities at each level of the progression and tries to examine the impact of the progression on economies of agglomeration, to present the practical implication, and to explain the need for government initiatives, intervention and coordination as a catalyst for logistics city development**.**

THE PROGRESSION OF LOGISTICS FACILITIES

The general perception is that while logistics is a necessary activity for any business, it has been traditionally regarded merely as a cost factor and therefore a non value-adding activity. It now appears that this view of seeing logistics as a non value-adding activity has changed in recent years. This changed perspective may have resulted from significant structural movements in the whole area of goods handling. As a consequence, there has been an increasing focus on logistics management and systems, and logistics has evolved to such an extent that it has become an essential factor for companies aiming to achieve a competitive advantage in the field (Rutner and Langley, 2000; Abrahamsson et al., 2003).

Further traditional logistics activities have been widened and now include sectors such as, customising, quality control, light assembly, supply chain design, etc. It is in this respect that logistics is now becoming explicitly understood as a value-adding activity that significantly reduces supply chain costs, increases the actual value of goods e.g. due to customising and contributes to measurable gains in competitive advantage in the marketplace.

The progression of the essential activities starts with less value adding ones that are related to the logistics industry. The lower value adding services have linkages to the connectivity and basic gateway activities such as terminal operation, transport and the simple storage activities. The principal notion of a logistics city, on the other side, is the presence of critical mass of higher logistics value-adding activities, which are commonly linked to the main gateway function.

The presence of supporting industry is an important element in the development of a logistics city. Various industry sectors as well as public services have direct linkages to the core logistics activities. Since these supporting services are essential to the logistics industry, they should be accessible and commonly located within or close to each of the progressions. The availability and accessibility of these services form a strong suite of supporting activities and create potential advantages for the logistics industry.

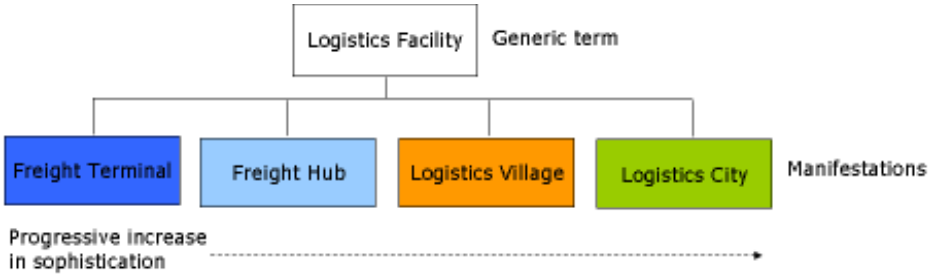

Figure 1: Progressions of logistics facilities

It is therefore desirable to classify the various instances of logistics facilities in terms of sophistication in planning for land use and access options, operations, advice on community and social issues and the potential impact of the development, as well as the essential activities related to these facilities. The principal stages of this progression and their relationship to the generic term "logistics facility" are illustrated in **Error! Reference source not found.**. It starts from the basic logistics facility of freight terminal, and then evolves to freight hub, logistics village and eventually to logistics city.

Freight Terminal
A freight terminal is a place equipped for the transhipment and storage of transport units, which is the nucleus for an agglomeration economy derived from localisation, where the benefits are derived from the attraction of a set of freight intensive activities near its precincts. The essential activities happen at a freight terminal basically deal with fundamental logistics operations, such as:

- Loading / unloading of container, general cargo and break bulk related to trucks, trains, airplanes and vessels;
- Freight receipting, freight sorting and freight tracking;
- Load building, e.g. LTL (less-than-truck-load) management, packing, pallet and container building;
- Last mile despatching;
- Container management, e.g. container storage, repairing and tracking;
- Hazardous materials and waste management

Freight Hub
A freight hub is a node used for the collection, sorting, transhipment and distribution of freight for a particular area, including at least a freight terminal. It transfers freight from one transport mode to another (McCalla et al., 2001). The functionality at the freight hub level is the provision of value adding services such as bulk cargo breaking, picking and packing, freight consolidation and deconsolidation. A freight hub therefore must provide the infrastructure that allows the consolidation and deconsolidation of freight such that the freight flows to and from associated distribution centres can be optimised.

A freight hub may augment a distribution network as an additional facility, but there may also be an opportunity for retailers or manufacturers to use this facility to bypass distribution centres through direct shipment to closely located retail outlets or manufacturing facilities. The freight hub provides a stage that allows companies to postpone inland shipping decisions until the arrival of goods. The contents of ocean containers can be sorted and aggregated to match any distribution pattern but within more immediate timeframes, thereby reducing forecasting errors.

Associated with the intermodal capability, especially with international transport routes, the following essential activities are required to support a freight hub:

- Freight consolidation and deconsolidation;
- Freight pooling;
- Warehousing and bonded warehousing.

Logistics Village

A logistics village is a geographical grouping of independent companies and bodies which are dealing with logistics, such as freight forwarders, shippers, transport operators, customs agencies, and with accompanying services, such as professional logistics related services, maintenance and human resources. The attraction of industrialisation economies, which is a type of agglomeration economies, generates benefits in terms of savings and cost reductions due to spatial concentration of industrial activities and convenient logistics support. They benefit from their joint utilisation of local industrial infrastructure and close proximity to respective suppliers and customers.

The logistics village therefore attracts a concentration of logistics related activities within a specific area, commonly planned for, built and managed for such a purpose. The core of the logistics village is the freight terminal. Although a logistics village can be serviced by a single mode of transport, association with an inter-modal freight hub with the added functionality of customs and hub activities (e.g. consolidation/de-consolidation) can offer direct access to global and regional markets. The development of logistics villages has many benefits to the management of freight flows generated by several unrelated users through sharing the same facilities and equipment around them. The essential activities happen at a logistics village aim to enhance the fundamental logistics services through:

- Export / import services;
- Customs agency services;
- Professional logistics services;
- Insurance and finance services;
- IT services.

Logistics City

A logistics city is a more compact and logistics intensive industrial development, within a logistics friendly precinct, served by strong and fast freight transport links, to reduce road dependency and provide a wide choice of logistics services, business services, civic amenities, and employment opportunities, focusing on appropriate urban design and freight transport applications, appropriate and opportunities for new land use mixes, a marketing and sales strategy for logistics city, amenities and planning approvals (Leach 2006; Harmsen et al. 2006). The logistics city is enabled by city constructs and provides benefits derived from the agglomeration of population, namely common infrastructures (e.g. utilities or public transit), the availability and diversity of workforce and market size.

The essential activities accessible from a logistics city expand significantly from that provided by the preceding logistics facilities, such as:

- Merchant banking, e.g. general corporate lending, asset-based and project finance of infrastructure, hedging instruments;
- Infrastructure and environmental planning and development;
- Peripheral activities, e.g. entertainment, hospitality, tourism and retail;
- Urban, town and residential planning and development.

THE IMPLICATION OF ECONOMIES OF AGGLOMERATION

The economies of agglomeration describe the benefits and advantages that companies can obtain when locating near each other. It relates to the idea of economies of scale and network effects. Hesse and Rodrigue (2004) argued that due to logistical integration, transport cannot be solely considered as a derived demand, but as an integrated demand where physical distribution and material management are interdependent. Logistics is a key organisational system for material flow and goods delivery. A well-designed logistics system can not only provide good logistics services, but also attract companies (logistics service users) to locate next to or in close proximity of such logistics facilities.

From the perspective of setting up new logistics facilities, logistics services are attracted by good transport infrastructure and vigorous market demand, and the availability of supporting services (Hong, 2007). The development of logistics facilities at freight terminal and freight hub level therefore can be established by individual companies, since they can select good locations for their logistics facilities. However, as the progression evolves to higher levels, simply relying on market force to form economies of agglomeration might not be sufficient due to the high cost of infrastructure planning and development. Therefore, government support or initiatives, such as setting up a common user freight terminal with intermodal and customs capability, e.g. inland port to aggregate consolidation and deconsolidation activities, will create the basic platform of logistics city and foster future development. The planning for land use and in determining compatible uses about the freight terminal precinct has to be justifiable and agglomeration economies (i.e. localisation, industrialisation and urbanisation economies) are underpinned by forces that result in the "clustering" of activities, ranging from manufacturing to retail, around a specific facility such as a transport terminal.

The development of a logistics city therefore forms an excellent platform for various industry developments to share the high efficient transportation infrastructure and low cost logistics services, where good transport conditions, sufficient workforce supply, and potential logistics services users attraction can accumulate. The analysis conducted by Oum and Park (2004) regarding the location of distribution centres of multinational enterprises across Northeast Asian countries confirms that market size, transport conditions, labour considerations and input costs are the location considerations. The areas where there was obvious concentration of existing industrial sites and freight activities were perceived to be good locations for the major part of logistics cities, since planning time and related investment cost can be minimised and agglomeration benefits already exist.

The logistics industry at logistics city level provides a mature foundation for economic development and fosters industrial agglomeration and attracts local, regional and international investment. Additionally the logistics city and its lower progressions need to take into account the associated freight transport network. The contained components of the associated network, as well as transport corridors, have many stakeholders with different objectives. These stakeholders, however, do have interdependency and share a competitive position as a region that needs to be coordinated and promoted by a unique governance model to achieve synergies and create benefits across the whole network. The services provided by a governance model aim for better utilisation of the logistics facilities and building competitive advantage through various private, public and governmental schemes and initiatives, such as:

- Government business collaboration;
- Enterprise / capability development and sustainability;
- Start-up enablement;
- Accreditation / recognition, policy development;
- Branding, marketing, and investment attraction;
- Large scale infrastructure planning and development.

The above mentioned activities go far beyond single or a group of companies can achieve. One may learn from the Singapore example, which has established a so called "Champion Agency" that is the bridge of all relevant private and public stakeholders in the area of transport and logistics. Its primary work is to promote, coordinate and develop the logistics industry in Singapore.

Identifying developmental needs of private industry, working with governmental departments and agencies to remove unnecessary impediments and aligning regulations as well as promotion are areas of responsibility for the Champion Agency (ERC Working Group, 2002).

The logistics city also underpins the land use planning. The purpose of this is to capture available knowledge about the elements that constitute a logistics city and also to define this in an unambiguous manner. The start point of this work was the freight terminal and how significant advances in land planning concepts may be developed around the terminal, to achieve the industrial agglomeration and sustainable growth with urban and environmental considerations.

The pursuit of an integrated logistics hub / village / city will require immense amount of coordination, effort and work from various sectors and government agencies. A "champion" agency to coordinate and push through difficult decisions is therefore necessary to ensure that implementation is not clouded and overwhelmed by the sheer amount of work, politics and sectors to be covered. This work has to look broadly at a diversity of interests and work cooperatively with government agencies and other stakeholders to achieve the best possible freight outcomes. The logistics city has to be developed on the basis of gaining the benefits from locating compatible activities in close proximity to key infrastructure where government intervention is necessary as a catalyst to economic agglomeration forces.

CONCLUSION

The concept of a logistics city, and achieving its status, is becoming recognised as a means for attaining sustainable economic growth, as evidenced by a number of examples around the world. Through identifying the essential activities of logistics facilities, this paper points out that government initiatives and intervention might be necessary to achieve economies of agglomeration. The identification of essential activities not only enables the governing agencies to plan and protect efficient and effective logistics development and achieve high utilisation of such facilities, but also recognises the gap to economies of agglomeration which eventually provides employment growth and economic development for a particular region. The gap may be filled, as a catalyst and an initiative, by a logistics facility in the form of the development of a common user freight terminal with intermodal and customs capability, e.g. inland port to aggregate consolidation and deconsolidation activities, together with the necessary transport infrastructure development. The government intervention in terms of planning and coordination is also required to ensure an integrated logistics city development.

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