Determination of Success and Deterrence Factors for Logistics Activity Center (LAC) Development

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ABSTRACT

Freight mobility is one of the most important elements in fulfilling the growing high demand for goods, commodities, and services in the United States and in doing so, affects a geographic area’s (state, region, etc.) economy, and overall quality of life. Its importance as a driving force for maintaining and creating jobs and fueling economic development has increasingly been recognized by local, state, and federal transportation programs in the United States.

Despite state, regional, and national level efforts to foster logistics led economic development, there is not much insight on the factors that define the success and failure of these investments. This research is intended to bridge this gap by examining the success and deterrence factors of logistics activity centers (LACs) by means of a case study analysis.

A list of factors, which could influence the potential success or failure of a LAC, was determined based on extensive literature review. These factors were divided into five major categories then applied to sites identified in the literature. To validate these success factors and to derive more nuanced insights that could not be obtained otherwise, case studies were performed including site visits and interviews of select LACs throughout United States.

The compilation of success and deterrence factors obtained through literature review and LAC site visits/interviews in the United States were found to closely match. These factors, highlighted in this paper, could help LACs, government entities, and businesses to better understand what major factors should affect their freight and logistics decision making process.
INTRODUCTION

The United States of America (USA) is the largest consumer market in the world with high demand for goods, commodities, and services. Freight mobility is not only essential for fulfilling this demand but also affects a geographic area’s (city, state, etc.) economy and overall quality of life. Its importance as a driving force for maintaining and creating jobs and fueling economic development has increasingly been recognized by local, state, and federal transportation programs in the United States (US DOT, 2015). To promote further growth in trade and logistics, it is vital to strategically invest in the freight mobility infrastructure.

According to Rodrigue (2013), logistics investments are the apportionment of funds to improve the efficiency of freight distribution through infrastructure (terminals, real estate, and telecommunications), operations (transport modes and equipment), and human resources (labor, management, governance, research and development). This research focuses on the infrastructure aspect of these three major categories, particularly on what this paper specifies as logistics activity centers (LACs). The term logistics activity centers (LACs) is used to steer away from the apparent lack of consensus on a precise definition for some of the commonly used terminologies such as intermodal logistics centers (ILCs), logistics clusters, satellite marine terminals, multimodal logistics parks, inland ports, major distribution hubs, etc. (Logistics Clusters – Sheffi, 2012). The reason behind these multiple terminologies is partly because such infrastructure has emerged in a variety of geographical settings and serves a wide variety of functions with multiple actors involved (Rodrigue et al., 2010). More specifically, this research highlights the factors that determine the success and deterrence of LACs, which are, in turn, associated with numerous economic benefits such as enhanced freight mobility, increased integration with national and global trade, better utilization of transport assets, lower cost of imports and exports, and job growth/economic development in their vicinity.

Despite state and national level efforts to foster logistics led economic development, there is not much insight on the factors that define the success and failure of these investments. This research is intended to bridge this gap by examining the success and deterrence factors of LACs by means of an extensive review of literature and case study analysis.
LITERATURE REVIEW

Measurement of Logistics Performance of Different Regions

Achieving excellence in logistics is a challenging task that requires adequate funds, political support, planning capacity, technical knowledge, and continuous measurement and evaluation of the logistics performance. Comprehensive performance indices such as the World Bank’s Logistics Performance Index (LPI) are being used when evaluating a geographic location’s trade and logistics performance.

World Bank’s Logistics Performance Index (LPI)

The Logistics Performance Index (LPI), which was introduced by the World Bank in 2007, is a comprehensive index that was created to assist countries in identifying challenges and opportunities they face in trade and logistics performance (Jhawar et al., 2014). Six parameters are used to assess the performance of countries and the calculated LPI is an equal weighted average of these six parameters (Arvis et al., 2012). These six parameters include the following:

2. Infrastructure: The quality of trade and transport infrastructure.
3. International shipments: The ease of arranging competitively priced shipments.
4. Logistics quality and competence: The competence and quality of logistics services.
5. Tracking and tracing: The ability to track and trace consignments.
6. Timeliness: The frequency with which shipments reach consignees within scheduled or expected delivery times.

The Agility Emerging Markets Logistics Index

Transport Intelligence (2015) released their sixth edition of “The Agility Emerging Markets Logistics Index.” This index ranks 45 emerging markets across the world using three broad criteria to measure each country’s score – market size and growth attractiveness (50% of the overall score), market compatibility (25% of the overall score) and market connectedness (25% of the overall score).
Factors Influencing the Success of Logistics Investments

Khan (2003) examined case studies from across the world to develop a logistics attractiveness ranking framework for assessing successful investments in logistics in order to achieve economic development. This framework was subsequently used to rank 75 countries by using data from the World Bank and World Economic Forum.

The main success factors obtained from the case studies by Khan (2003) include the following:

- The need for a highly skilled logistics labor force.
- The need for a strategic location.
- The need for an integrated logistics strategy.
- The need for setting up exclusive regional authorities to help facilitate active development of the logistics sector.
- The need for a long term vision.

On the other hand, Munoz and Rivera (2010) employed cluster analysis to propose a structure of seven critical factors needed for developing logistics hubs. Resulting from case study analysis of major logistics hubs in Dubai and Singapore, the structure identifies the critical factors behind the success of a logistics hub. The proposed structure was then used to analyze the development of a logistics hub in Panama by Brito (2010), indicating strategic location, infrastructure, government commitment, availability of a skilled workforce as key elements for a successful logistics hub.

Additionally, Tioga Group (2006) presented 29 case studies of LACs within United States and abroad to understand the key factors that led to the success or failure of each LAC. Results from these case studies stressed the importance of location and government support along with the utilization of the available transportation infrastructure as key factors for the success of inland ports and other related logistics developments.

CONCEPTUALIZATION OF SUCCESS AND DETERRENCE FACTORS

Based on the literature review that included a number of LACs as well as logistics performance indices, a list of factors that could influence the potential success or failure of a LAC was
developed. The factors were divided into five major categories: strategic location, economic incentives to promote development, champion, government, and other factors. Each category was further divided into associated sub-categories that are explained in detail in this section.

4 Strategic Location

Strategic location is highlighted as the foundation for the success of a LAC (Munoz & Rivera, 2010 and Brito, 2010). Since this is an expected major factor for a successful LAC, it was divided into three sub-categories, which are further divided into several sub-sub-categories to give more detail: (1) demand elements; (2) supply elements; and (3) transport infrastructure and accessibility.

4 Demand Elements

Access to a Large Market

A crucial element of the strategic location factor is the access to a large population market. A large market in close proximity will ensure that there are adequate avenues for supplying goods/commodities that come into an LAC.

4 Supply Elements

Availability of Cheap Land

Companies often choose to locate themselves in an LAC due to the availability of cheap and developable land. The major factors that govern the availability of cheap land are the actual land prices in a particular location, land ownership, issues related to current and prospective regional development, plans of local governments and regulation etc. (Tantsuyev, 2012).

4 Labor Cost

Affordable labor is dependent on the local economy and, therefore, is an important parameter to be considered during the process of locating the LAC.

4 Local Supplier Quantity

This factor refers to the presence or absence of local suppliers in the area of the LAC, which would then use these suppliers once operational.
Local Supplier Quality
This factor refers to the capabilities of the local suppliers in the area of the LAC. These could range from inefficient suppliers with a little know-how of technological innovation to internationally competitive suppliers with the know-how of new product and process development.

Transport Infrastructure and Accessibility
Under this sub-section, it should be noted that the utilization of major roadway networks can serve both local population and national and international markets, however the utilization of a railroad carrier, air cargo, and port facilities most likely serves national and international markets only (Rivera et al., 2014).

Utilization of Major Road Networks
The success of an LAC often correlates with its connectivity to major freeways and other roadway networks. Easy and quick access to high-speed roadways makes the transportation of goods/commodities more efficient, therefore making an LAC very attractive for investment.

Utilization of a Willing Railroad Carrier (if present)
Railroad carriers have the potential to transport a greater amount of goods/commodities more economically in comparison with over-the-road transportation. Additionally, railroad carriers help achieve economies of scope through their ability to use the same track structure and locomotives to move both light and heavy weight freight. (Bereskin, 2009).

Utilization of Air Cargo Facilities (if present)
Air transport is important to the movement of goods/commodities across national and international supply chains. This is especially significant in high value-to-weight freight cargo that incurs a significant decrease in value with higher than acceptable delay (Kasarda et al., 2006). Therefore, this factor acts as an enabler for a LAC, if businesses that require air cargo are interested in locating in an LAC (Kasarda et al, 2006).

Utilization of Port Facilities (if present)
The development of an LAC was found to be strongly correlated with the level of activity at nearby ports due to the fact that ports are major nodes on the global supply chain map (Rodrigue,
2013). Therefore, locating an LAC close to a port increases the success of the LAC due to decreased container travel times and drayage costs.

3 Economic Incentives for Development

Another crucial factor that contributes to the success or failure of LACs was found to be economic incentives provided to companies that are interested in locating their operations in these LACs. The economic incentives category is further sub-divided into (1) provision of foreign trade zones; (2) provision of tax abatements; (3) providing avenues for job creation in the local community; and (4) enabling innovation in LACs as a means to attract new business.

9 Provision of Foreign Trade Zones
Foreign Trade Zones (FTZs) are considered to be outside of the customs territory and act as catalysts for economic development. The presence of an FTZ in an LAC allows onsite inventory to be exempt from state inventory taxes a great tax advantage to companies (KMI, 2005).

13 Provision of Tax Abatements
Tax abatements are seen as a way to attract companies. This is an incentive provided by the cities or local governments to the businesses that consider locating in a specific LAC in their jurisdiction. The most common form of tax abatements provided is in the form of a 10 year, 50% tax allowance.

18 Job Creation
The ability of an LAC to provide regional benefits such as overall regional economic development through job creation is a strong indicator for the overall success of the LAC and will also garner support from local and regional.

22 Innovation
Innovative measures undertaken by the LACs play a key role in their success. These range from providing vocational/educational and technical training programs to improve the skill level of the workforce to establishing public-private partnerships (PPPs).
Champion

Every project with a large scope and complexity requires a champion to carry it forward, and LACs are no different. The champion category is further sub-divided into: (1) a long-term vision and commitment; and (2) a flexible and effective plan.

Long Term Vision and Commitment

Long-term vision and commitment by the LAC’s developers tend to push the project in the direction of success whereas the lack of vision and commitment are detrimental to the LAC.

Flexible and Effective Plan

In order to account for the unexpected, it is common practice to make plans that are viable and flexible enough to accommodate change. Successful LACs ensure that their plans are flexible enough to accommodate any unforeseen changes.

Government Support

Projects such as LACs, which have a large scope and complexity, cannot be successful without the support of the local and regional government. Governmental support is further sub-categorized into: (1) political consensus and support; (2) adequate funding/capital; and (3) burden or flexibility of regulations.

Political Consensus and Support

High level political consensus among political parties and support for the long term are crucial elements in defining a LAC’s overall success or failure.

Adequate Funding/Capital

The presence of adequate capital is a fundamental need of any LAC since it needs this capital to start off. It can be observed in the literature that when funding (seed money) has been secured and is adequate, the LAC did not have barriers to growth.

Burden or Flexibility of Regulations

This factor basically takes into consideration the burdensome nature of administrative regulations of the local or regional government of the LAC. Regulation is one of the pillars identified as essential for the successful development of a logistics hub (Munoz and Rivera,
2010) and it includes important factors such as the government’s willingness to invest in logistics, tax abatement decisions, freight friendly land use considerations, the flexibility of local environmental regulations, etc.

Other factors

In addition to the first four categories of factors, some other factors were found to play a role in the success or failure of LACs such as: (1) success with competition; (2) delays in project completion; (3) corruption; and (4) security risks.

Success with Competition

The presence of competing facilities can be detrimental to the success of an LAC. This is especially true if the competing facilities are in close proximity, utilizing the same resources (roadway networks, railroad carrier(s)) and serving the same population market.

Delays in Project Completion

Delays in completion could be attributed to different reasons such as the inability to secure adequate funding and/or disputes with the construction company. In either case, a client will not want to wait longer than the agreed upon timeframe and is likely to cancel their contract with that LAC.

Corruption

This factor considers the presence or absence of corruption in the area of the LAC. Although this is not easily quantifiable, it was observed that the presence of corruption played a big role in the failure of LACs in emerging economies or other regions where it is prevalent.

Security Threats and Other Risks

This factor investigates the presence or absence of security threats and other risks in the geographic area of the LAC. The presence of security risks play a big role in the failure of LACs, since companies generally do not want to locate to areas with security threats and/or other risks.

Based on the preliminary analysis of success and deterrence factors as highlighted in this section, Figures 1 and 2 were constructed in a “success factors” matrix for a select set of major domestic and international LACs reviewed from literature in order to classify the success and
deterrence factors for each LAC. In these figures, each success and deterrence factor is displayed under its major success/deterrence category as discussed previously.
<table>
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<tr>
<th>OTHER FACTORS</th>
<th>ECONOMIC INCENTIVES FOR DEVELOPMENT</th>
<th>TRANSPORTATION INFRASTRUCTURE AND ACCESSIBILITY</th>
<th>STRATEGIC LOCATION</th>
<th>SUPPLY ELEMENTS</th>
<th>DEMAND ELEMENTS</th>
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<td>Job Creation</td>
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<td>Provision for RE commitments</td>
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<td>Presence of a regional core</td>
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**Figure 1.** Success and Deterrence Factors for Select Major U.S. LACs
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<thead>
<tr>
<th>Project name</th>
<th>LAC Category</th>
<th>Demand Elements</th>
<th>Supply Elements</th>
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<th>Economic Incentives for Development</th>
<th>Champion</th>
<th>Government</th>
<th>Other Factors</th>
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<tr>
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<tr>
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</tbody>
</table>

**Legend**:
- LAC Category:
  1. Satellite Marine Terminals
  2. Multimodal Logistics Parks
  3. Rail Intermodal Parks
  4. Logistics Airports
  5. Networks and Corridors
  6. Shuttle Services
  7. Trade Processing centers
  8. Economic Development Initiatives

- ✓: Success factor that could possibly lead to overall success of the project
- X: Deterrence factor that could possibly lead to overall failure of the project
<table>
<thead>
<tr>
<th>Security Threats and Other Risks</th>
<th>Government</th>
<th>Champion</th>
<th>Economic Incentives for Development</th>
<th>Strategic Location</th>
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</table>

**Figure 2.** Success and Deterrence Factors for Select Major International LACs
Literature review provided the basis for the major success and deterrence factors for each LAC as depicted in Figures 1 and 2. To summarize, the check marks in the figures depict success factors that were mentioned in the literature to contribute to the overall success of the LAC. On the other hand, the X-marks depict deterrence factors that were mentioned in the literature to contribute to the overall deterrence of the LAC either by not being utilized/considered at all or by being utilized inefficiently. It should be noted that all of the factors listed in the success factor matrices in Figures 1 and 2 can either be a success or deterrence factor interchangeably, depending on the presence or absence of that factor.

Through the analysis of these matrices, it was determined that general success factors such as access to a large market, utilization of available nearby major roadways, railyards, air cargo facilities, and seaports, presence of an FTZ, government tax exemptions, job creation, presence of a champion with an effective and flexible plan, initial government funding availability, and success with competition were the most repeated factors for the success of an LAC.

The five major success factors that were determined through further analysis of these matrices were found to be strategic location, economic incentives for development, champion, government and other factors. These factors were then divided into multiple sub-factors that contribute to the success of the LAC as depicted in the figures. As an example, strategic location was divided into three subsections, such as demand elements, supply elements, and transportation infrastructure and accessibility. Under the strategic location factor, access to large markets, availability of cheap land, labor costs, utilization of major nearby roadways, railroads, seaports, cargo airport, etc. were listed.

It was encouraging to observe that the five major categories obtained through this research are consistent with the work of Yossi Sheffi as described in his book Logistics Clusters (2012). In his book, Sheffi categorizes the attributes of successful logistics clusters under favorable geography, supporting infrastructure, supportive and efficient government, education-research and innovation, collaboration between stakeholders, and value-added services.
CASE STUDIES OF SELECTED LACs THROUGH SITE VISITS AND INTERVIEWS

In order to validate the success factors observed from the literature review as well as the LAC matrices developed and to derive more nuanced insights that could not be obtained from literature reviews, five domestic logistics activity centers were selected as case studies. The selection criteria were determined through discussions with a diverse expert task team, who consisted of industry executives in the supply chain and logistics teams of large companies such as 3M, TechData, CNL commercial real estate, etc. One of the selection criteria was to include a diversity of (as opposed to a single type of) LACs such as seaports, intermodal railyards, ILCs, freight/logistics led economic development entities. The second major section criterion was to include high capacity and highly successful LACs. The third selection criterion included geographical diversity as well as diversity in the ownership and management of LACs. Based on all these criteria, the seven LACs listed below were selected for case studies from across the U.S.

1. CenterPoint Joliet/Elwood Logistics Activity Center, Joliet/Elwood, Illinois
2. Alliance Texas Logistics Activity Center, Fort Worth, Texas
3. CenterPoint Logistics Activity Center, Kansas City, Missouri
4. KC SmartPort (Economic Development Initiative), Kansas City, Missouri
5. Global III Intermodal Terminal, Rochelle, Illinois
6. Port of NY and NJ, New York, New York
7. Port of Savannah, Savannah, Georgia

The research team travelled to each site and conducted interviews with executive level (vice-president and/or president) business development representatives of each facility. The interview questions ranged from the types of companies located at the LAC, the commodities represented, the reason of LAC being located at its current geographic location, benefits of the current location, challenges faced by LAC, actions/items making the LAC successful/unsuccesful, what can make it better, etc. The interviews were tape recorded with the permission of the respondents and were then scripted and analyzed. The success factors that resonated in the case studies were compared to the success factors found through the literature review to validate/improve them using additional insights obtained through the case analyses.
This section summarizes these case studies and interviews that were performed for the above listed seven highly successful and high volume LACs across continental U.S.

**CenterPoint, Joliet/Elwood LAC – Joliet/Elwood, IL**

CenterPoint Joliet/Elwood Intermodal Logistics Center in northern Illinois, south of Chicago, is one of the largest LACs in the USA. The research team met with an executive level employee of CenterPoint Properties, the developer, to conduct a site visit and interview.

Strategic location with direct access to the greater Chicago region, home to over 8 million residents, and easy access to markets (logistics density) was noted as a major success factor for this CenterPoint property. Access to surface transportation, including major roadway networks through trucking, was also seen as a success factor. The fact that Joliet/Elwood is just outside the City of Chicago, but close enough, allows the trucks to save on crucial travel time.

The presence of multiple modes of transportation was also identified as a success factor since companies can get more competitive shipping prices. Approximately 10,000-15,000 feet of rail track is located in the middle of the LAC so that containers can be taken directly from the rail to the warehouses which is considered a success factor for the LAC. This loading capability is attractive to companies because it significantly reduces drayage costs as well as travel time. Other success factors noted included tax abatement and the economic and development opportunities a P3 brings to an LAC’s success and the presence of shovel ready or pre-built sites.

**Alliance Texas LAC – Fort Worth, TX**

The well-established 18,000-acre Alliance Texas complex is located to the north of Fort Worth, Texas. The representative interviewed for this case study works for Hillwood Properties, the developer of Alliance Texas. He began by noting the importance of P3 (public private partnerships) in the success of the LAC during the early stages of development.

The strategic location, the presence of multimodal transportation, and the resulting economic benefits resonated as success factors and the reason many companies choose to locate at Alliance Texas. Clients have ready access to the Dallas/Fort Worth Metroplex, a large population base with over 6.5 million people. More importantly, direct access to major roadways (Interstate 35, 114 and 130) enables businesses to reach a large market and population of 48.8 million people within one day and 111 million (across the nation) within 2 days by truck.
The LAC has access to airports such as the DFW International Airport and a cargo-only international airport with US Customs on-site. BNSF, a Class I railroad, has an intermodal hub facility located inside the LAC thereby reducing drayage costs. The presence of Union Pacific (another Class I railroad) gives the LAC’s clients additional options to reduce their rail shipment costs through the competition between BNSF and Union Pacific. In addition, the presence of FedEx and UPS cargo hubs inside the LAC allows for late clearance times (by 6 pm), a great advantage for larger companies, especially those that offer overnight deliveries. The presence of heavy load trans-loading facilities on site also result in reduced transportation costs by over 200 percent in specific cases.

Another success factor revealed during the interview was the presence of a Foreign Trade Zone (FTZ) within the LAC. The presence of an FTZ works in favor of Alliance Texas’s clients, especially in the case of shipping tuna from abroad because they are able to store it in the FTZ without clearing customs. This helps Alliance Texas’s clients to store the product in FTZ even during seasons when shipping tuna into the U.S. is not allowed. Another advantage is that the product is taxed only when it clears customs and is ready for distribution. Finally, the availability of a skilled and qualified workforce in the LAC’s geographic area was identified as a success factor during the interview.

**CenterPoint LAC – Kansas City, MO**

CenterPoint LAC in Kansas City, Missouri houses Walmart’s Kansas City distribution center. The interview was conducted with a business development executive of the LAC and major success factors for this facility were pointed out as the easy access to the highway network and the availability of strong labor markets (with the presence of skilled labor force) for warehouse distribution. In addition, the presence of Class I railroads in the close vicinity of the LAC was also stressed as a benefit for companies since this lowers their drayage costs. As part of economic incentives for setting up business at CenterPoint Kansas, companies received 10 year, 50% tax abatements. One very important success factor for the LAC is shovel-ready sites, where the developer has sites ready for construction immediately once a client is interested in the property, rather than waiting three to six months for permitting process.
KC SmartPort – Kansas City, MO

A site visit and interview were conducted in Kansas City with a high level executive of SmartPort, a highly successful economic development entity in charge of marketing the Kansas City, Missouri area to prospective firms. KC SmartPort is a major champion for Kansas City, who advocates, meets and negotiates with prospective companies to bring their production and distribution centers to the area.

According to SmartPort, a major success factor for LACs in the Kansas City area is the ability to reach 85 percent of the US population via ground within two days. In addition, the multimodal nature of transportation (access to air, rail and road facilities) is considered a major attracting factor for companies to locate to LACs in Kansas City.

Contributing to the success of this central US location, companies can receive service from five of the seven Class I railroad carriers in the region. Other factors mentioned included the presence of zero inventory tax and lower labor costs in the Kansas City region. As part of economic incentives for setting up business in Kansas City, companies received 10 year, 50% tax abatements in return for the tens of thousands of jobs created in the region. One other success factor for the Kansas City area is the availability of a high quality workforce that was created through innovative educational/training programs.

Union Pacific’s Global III and IV Intermodal Terminals – Rochelle, IL

The research team conducted a site visit and interviews with the senior terminal managers of Global III and IV Intermodal Terminals that are located just outside of the Chicago, Illinois area.

Strategic location and access to the surface transportation system were major success factors listed for this LAC. Direct access to a strong customer base (supporting a Midwest operation) is provided including easy access to the interstate highway system so that trucks can get in, pick-up/drop-off their containers and leave without having to lose precious travel time.

Additionally, the presence of more than one major railroad carrier in the Chicago area, where both Union Pacific and BNSF operate, provides additional benefits for customers with easy access to the north-south and the east-west interstates faster than in-city trucking options.
Port of NY and NJ – New York, NY

To include different types of LACs, the research team also conducted site visits and interviews with a couple of major east coast ports. For the port of NY and NJ, three interviewees are involved in the port’s regional freight planning, economic analysis, and industrial data analysis.

In 2002, the Port Authority authorized the creation of a port inland distribution network (PIDN) which involved transporting container embargoed services between the Port of New York and five other locations. However, there were a number of assumptions that failed to materialize (e.g., 100% return rate with no revenues on empties, loss for opportunities for financial savings due to the lack of use by the ocean carriers, lack of barge use by the terminal operators, and increased fuel costs from running the barge – about $19,000 extra per round trip). The service terminated about 3 years later.

In addition, interviewees noted that economic impact studies for return on investments is very specific and should not be used as a decision-making tool since for the most part, its results are considered linear. The only economic impact work done on projects performed is input/output analysis for construction spending and viewing its cost-benefits in terms of a broad outlook.

In New Jersey, the cargo facility charge (CFC) was put in place as a means to recover rail costs, however, it was described as a type of tax and, therefore, the public was not in favor. This resulted in the Governor shutting down the CFC. The interviewees stated that the economic consequence, decision-making, and benefits of the services were being overlooked by the idea of simply having a “tax,” even though there was no difference in the overall numbers.

A program being implemented in the state DOTs of New York and New Jersey called GMAP (Goods Movement Action Program) involves structural, regulatory and policy changes. One benefit of the program would be the advantage of having access to markets from the ports by multiple roads, barge and rail, in addition to providing interconnectivity between terminals.

Port of Savannah – Savannah, GA

Port of Savannah was the last site visit and interview conducted by the research team. The interviewees held executive levels at the port in business development.
One of the well-documented major factors leading to the success of the Port of Savannah was their vision of the Port as a strategic gateway. Savannah is 100 miles closer to Atlanta than any other port in the country. This proximity to Atlanta, one of the most populous markets in the region, is considered a strategic advantage. The Port has easy access to the rail (CSX and Norfolk Southern) and highway networks (I-95 and I-16). Owing to their location at the crossroads, the hinterland of the Port covers 20% of the US population with a potential of reaching 45% of the total population within in 2 days.

Achieving transportation synergies is another main factor working in favor of the Port of Savannah. Being a single terminal design leads to significant transportation benefits owing to the presence of 2 Class I railroad carriers in addition to the major Interstates surrounding the Port. Support from the state government and GDOT in increasing access to these infrastructures has enabled the patrons of the port to significantly reduce their travel times and lead to achieving cost advantages in this regard.

Another significant cost cutting factor working in favor of the Port of Savannah is their gate fluidity (speed of goods moving in and out of the terminal). On an average, there are 8500 gate movements per day and the port is one of the fastest in the country in its ability to process single movement (loading or unloading) by 32 minutes and double movements (loading and unloading) by 53 minutes.

The interviewees also mentioned the advantages of clustering in the context of the port and the reasons for businesses to locate themselves close to the Port of Savannah. This explains the presence of more than 250 port-dependent distribution centers in the state of Georgia, mostly along the Interstates and in close proximity to Savannah.

When asked on some of the challenges faced by the port, the deepening project was brought up. Savannah is one of the shallowest container ports in the world at 42 feet and this was being perceived as an impediment for shippers to move in and move out of the port as they had to depend on the assistance of the high tide. Work is in place to deepen the port to 47 feet and is expected to be completed by 2018-19. Another major challenge was experienced from the railroads that had a lot of influence in the day-to-day activities. The interviewees both agreed on the fact that increased efficiency on the part of the railroad could potentially be of a lot of benefit to the Port in extending their hinterland and reach across the country.
Results Obtained from Case Studies/Site Visits and Interviews

Once the site visits/interviews were performed, their corresponding discussions were scripted and analyzed. The success factors that resonated in the case studies were compared to the success factors found through the literature review to validate/improve the latter using insights obtained through the case analyses. In general, there was a unity between the success factors obtained through literature review, the matrices in Figures 1 and 2, and the factors brought up in the site visits and interviews. Most of the factors the interviewees brought up were summarized under the five major success factor categories (strategic location, economic incentives for development, champion, government and other factors) that were determined through literature review and the analysis of the success-factors matrices developed.

However, additional success factors such as logistics work force development/education in the region, innovation/technology level of the LAC, importance of public-private-partnerships (P3s) in the region, counties/cities/states offering out-of-the-box saving packages for LACs, and the importance of value added services being located in the close proximity of the LAC were also observed through the site interviews to contribute to the success of several LACs and geographic regions such as Alliance Texas, CenterPoint Joliet/Elwood, KC SmartPort and the state of Georgia.

CONCLUSIONS AND RECOMMENDATIONS

The factors relating to the success and deterrence of logistics activity centers (LACs) were initially established after literature review analysis of LACs across the United States and abroad. These factors were then verified, prioritized and nuanced by case studies (site visits and interviews) of high capacity and highly successful LACs with the continental United States. A final list of 24 factors were grouped into five categories including strategic location, economic incentives for development, champion, government support and other factors as discussed in detail under the conceptualization of success and deterrence factors section of this paper. Strategic location, transport infrastructure and accessibility, and the presence of multimodal transportation (presence of Class I railroads, seaports, and air cargo facilities) to transport the goods to/from the LAC were seen as highly important success factors for an LAC. The presence
of a supportive political establishment with adequate funding for early developmental stage was also found to be crucial.

In addition, successful LACs ensured the maintenance of their competitive advantages by focusing on innovative measures such as the provision of a high quality workforce through educational and technical certifications/programs in collaboration with educational institutions around their vicinity.

On the other hand, during literature review it was observed that some LACs did not or could not satisfy some of the factors highlighted in this research such as the nonexistence of a champion, little or no government/political support, not enough initial capital and delays in final project completion. These factors in return worked as deterrence factors for each specific case as observed in Figures 1 and 2.

Therefore, a good understanding of the presence or absence of the success and deterrence factors highlighted in this paper will provide businesses and government entities with valuable insights regarding their involvement/investments in specific LACs. Businesses can use the research findings to analyze the LACs they are interested in and ensure that the specified success factors are present. Additionally, government entities (cities, counties, state DOTs) can increase job growth and economic development in their regions by showing commitment to the respective LAC champions and supporting them by shouldering a portion of the start-up capital necessary (supporting P3s), providing tax incentives, and expedite permitting to increase shovel-ready (construction ready) sites and move-in ready speculative buildings.

Finally, current and potential LACs can also learn from these factors highlighted in this study in order to better understand what major factors contribute to the successful development of a LAC and the factors prospective client companies are looking for before they make an investment decision.

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