



Detroit Logistics Center Review

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INFORMING THE DEBATE
MAPPR Policy Research Brief



Institute for Public Policy
and Social Research
MICHIGAN STATE UNIVERSITY

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The IPPSR program, Michigan Applied Public Policy Research Program or MAPPR, supports research on current issues held across communities within the State, and often, across the nation. Policy researchers from a variety of disciplines summarize research outcomes and their implications once they have completed the funded project.

When developing the paper series initiative in 1992, the topics of the papers were submitted following a two-day meeting with leaders from the business sector, nonprofit agencies, foundations, and university faculty and staff. That group evolved into the Urban Research Interest Group.

The Urban Research Interest Group recognized the pressure on urban core leaders to make critical decisions that continue to impact people long into the future. A commitment to generating background research to add to the core of debate on possible solutions to complex, urban problems was made. The dynamic connection between urban, suburban, and rural communities was quickly noted and the research support was extended to all communities.

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Authors

Daniel F. Lynch, Ph.D.
Associate Professor and Director
Centre for International Trade & Transportation
Dalhousie University and Michigan State University

Roger E. Hamlin, Ph.D.
Professor
School of Planning, Design and Construction
Michigan State University and Babes-Bolyai University

Sponsor

The Institute for Public Policy and Social Research
College of Social Science
Michigan State University

Series Editors

AnnMarie Schneider, M.S.
Institute for Public Policy and Social Research
Michigan Applied Public Policy Research (MAPPR) Grant Program Administrator
Michigan State University

Leah Owens
Institute for Public Policy and Social Research
Communications Assistant
Michigan State University



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INTRODUCTION

Background

Parsons Brinckerhoff completed a 2015 study of the state of Michigan's trade, transportation, and infrastructure needs. The study was funded by Michigan Department of Transportation (MDOT), Michigan State Housing Development Authority (MISHDA), and Michigan Economic Development Corporation (MEDC). The existence of high-tech, multi-modal, and multi-faceted logistics centers has become an important policy issue to the economy of any state or region. The Parsons Brinckerhoff Proposal is one that is significant to public policy.

The future development of the new Gordie Howe Bridge and other potential future transportation assets such as the Detroit Intermodal Freight Terminal (DIFT), expanded train tunnel, port improvements and improvements to I-75, to name a few, could dramatically increase the logistics potential of opportunities in the Detroit inner city area. One should be aware that the majority of large logistics centers are located on the outskirts of cities. However, currently Detroit has a unique opportunity to take advantage of its large number of vacant properties creating a cost effective inner-city option. The study proposes that a major logistics center opportunity is available for two neighborhoods in inner city Detroit. These are the Del Ray neighborhood and the Mt. Elliot neighborhood.

What this paper proposes is to seek funding to initiate an implementation feasibility study and an action-oriented development plan. This project will address the many public policy issues that surround such an idea, as well as costs, and other relative issues.

This project has formed an interdisciplinary team of logistics experts, legal experts, urban planners, urban social scientists, finance specialists, trade specialist and transportation engineers. Their input has been from individual engagement, interdisciplinary group brainstorming, and a survey. Students and faculty have identified the industry best practices and data needed to guide the analysis.

Audience

This paper is targeted for Michigan Federal, State, County and City Legislators and other policy makers as well as leaders in the logistics industry and industries highly dependent on logistics.

Outline of the Policy Brief

This paper will briefly discuss what a modern logistics center is and does. It will then discuss why a centralized, high-tech, multi-modal logistics operation is important in the described location. Thirdly, the paper will talk about how to make it happen, including a sample pro forma of project finance. Forth, the paper discusses the results of a survey designed by the project team and implemented by the Michigan State University (MSU) Survey Research Center to assess the feasibility of issues concerning the development of such a facility.

WHAT IS A LOGISTICS CENTER?

What Is A Supply Chain?

As defined by Parsons and Brinkerhoff, supply chains are the interconnected systems of suppliers, producers, and distributors that create goods, bring them to market, and ultimately put them in businesses and homes. Each product of each company might be said to have its own supply chain, although the actual items, such as parts, might physically mingle with those of other parts and other companies as they move through the chain.

What Is Supply-Chain Management?

Supply chain management is the management of a supply chain in terms of quantity, quality, cost and the timing of the various parts of the chain and the various items that pass along the chain. (Parsons Brinkerhoff, 2015)

What Is Logistics?

Logistics involves planning and managing all the details of a complex event or operation. In manufacturing, it is calculating the inputs that are needed and insuring that all of the pieces come together at the right place and time including raw materials, parts, human resources, and infrastructure and that manufacturing outputs reach markets. “Logistics are the methods by which goods are handled, encompassing freight transportation networks, facilities (such as rail yards and warehouses), and the operations of the companies that run the facilities. “(Parsons Brinkerhoff, 2015))

What Are The Basics Of A Logistics Center?

A logistics center is a place, which has the entire infrastructure, technology and human resources necessary to facilitate business’s ability to bring the totality of pieces together at the right place and time to produce what is needed and get it to where it is needed.

Historically, raw materials, parts, and finished goods were warehoused until they were transported to a manufacturing center, wholesaler, or retail center. But world competition has caused the high cost of maintaining inventory to be unacceptable. Also, large inventories can be wasteful because of the rapid change in demand for products and services. Just-in-time production demands that instead of warehouses, we have “through-put centers.” And, the trend toward more specialized finished products creates an environment less oriented to mass transportation. This means that parts in multi-tier supply chains might share transport facilities with other companies shipping between the same origins and destinations. Tracking and timing the complex and fast-moving supply chain is also critical.

What Does A Logistics Center Do?

Receive

A logistics center receives goods via all modes of transportation on loading and unloading docks appropriate to the good and the mode. This includes facilities such as airport freight terminals, truck docks, rail sidings with docking facilities, and cranes that lift containers from one mode to another, as well as bulk good facilities.

Sort

Received goods are quickly sorted to be shipped out to another location. The sorting process depends greatly on the type of good being sorted. One issue is how much a received item is broken down for sorting. In some cases, rail cars may be transferred from one train to another mode, like trucks or planes. In other cases, whole shipping containers will be transferred to another mode. Or, the contents of a container, rail car, or truck will be broken down into crate or box-sized units for detailed sorting. Dry bulk goods such as grain will be handled another way as well as liquids. Goods requiring refrigeration might require separate sorting.

When containers are broken down into smaller units, a large, often indoor, flat, hard surface facilitates sorting using forklift trucks.

Track

In the modern industrial and commercial environment, a critical component of a logistics center is tracking of goods in time and space. When did it arrive at the logistics center, from where, on what vehicle using which dock? When and where was it sorted to? When did the receiving vehicle depart, to where?

The degree to which a shipment might be broken down might determine the level of detail of the tracking, but with modern computer, bar code scanning and tracking technology, often every small box is tracked, even if it passes through the logistics center as a part of a larger container that is never broken down. Tracking is critical to computerized inventory systems that extend from the delivery of the final product back to obtaining necessary raw material.

If a sweater is purchased in a US big box retail store, the checkout cash register sends out a message that the shelf needs one more sweater of that size, that the retailer's warehouse must send one more sweater to that retail location. The system might also tell the manufacturer of the sweater in Italy that it must produce one more sweater of that size and style and might warn its shippers of the need to ship sweaters. It might also immediately notify the button maker in Croatia to produce five more buttons of that style and plan for the amount of labor and raw material needed to produce those buttons.

The shippers at all stages of the chain must inform logistics facilities of the volume of product that will be arriving when and where it must be shipped. Logistics tracking notifies everyone in the chain of flow of raw materials, parts, and finished product. Data might also include the price/value of a product as well as insurance information.

All of this data is also used to estimate the demand for various products in various parts of the world by various population sub-segments and compare that with the ever-changing cost of producing and shipping that particular product.

Inspect

Goods being transported are subject to inspections related to all kinds of health, environmental, and legal and tariff concerns. Transported goods will be inspected for weight, toxicity, explosives, perishability, and originality (vs. counterfeit), to name a few. At a border crossing such as the US/Canada border near Detroit, many legal, tariff, and safety questions arise. With the correct legal regime, many inspections and related paperwork can take place in a logistics center. After inspection, packages can be sealed and tracked to avoid multiple inspections at borders and elsewhere.

Ship

Following inspection, the logistics center must then send products to their next destination promptly, efficiently, and on the correct transport mode. A critical concern is avoiding bottlenecks that cause delays interfering with promised delivery times.

WHAT DOES A LOGISTICS CENTER LOOK LIKE? WHAT MUST IT HAVE?

A logistics center is not necessarily one building. Most have multiple buildings with special functions such as “picking” (sorting), short-term storage, and tracking, as described above. There might be special areas for refrigeration and flammable goods, for example. Buildings have many docking facilities for all modes of transportation. The important thing is that the entire facility can be coordinated and that goods can move from one part to another easily when appropriate.

Area Needs To Be Secure

For many reasons, logistics centers should have very secure perimeters and internal security. The most logical reason is to avoid theft. But, with so many kinds of vehicles moving about, safety is a critical concern. Unauthorized individuals should not be in the area. Verification is also a concern. Once a container of any kind is inspected, there should be no way for unauthorized people to add or subtract product from any box or container to be shipped. This concern relates to tariffs and trade issues where an inspection takes place in a logistics center at a border crossing. Homeland security might also be an issue if shipping receptacles are tampered with after inspection.

On-Site Storage for Inventory

Although a good logistics center can be described as an effective through-put operation, a certain amount of storage is necessary for, dry goods, containers, dry bulk, liquids, flammables, explosives, toxics, clean room storage, and cool and cold storage.

Rail Access

Rail access can be a significant advantage for a logistics center, providing access to intermodal freight opportunities, e.g., rail and truck.

Room for Truck Maneuverability

Logistics centers often consume a great deal of space in and around its facilities because of the size and maneuverability requirements of the various vehicles used to move product.

Flat Surface Areas

A forklift truck should be able to traverse the properties and its facilities with ease, moving items without obstacles or stairs.

Facility Flexibility

A facility will often have separate zones for full pallet, case, and individual item “picking.” However, flexibility in the boundary between areas and the use of various facilities should be built into the system. (Harps, 2005)

The facility should have the capacity to continually monitor the sorting operation throughout the day to be able to make adjustments. An example of this is the ability to shift pickers from the full pallet area to case picking to handle a surge of one type of inbound shipment. This might require not only shifting personnel but also expanding or contracting zones used for each type of shipment. (Harps, 2005)

Additional Requirements

Lodging

A logistics center should have adequate housing available near the center to accommodate both drivers and executives that are frequently away from home when they arrive at the facility. While lodging on-site might cause security and safety concerns, depending on how it is handled, arrangements are often made with nearby lodging facilities.

Worker Housing

In proximity to residential areas with easy access to work for a wide array of employee classifications, some of whom will have families.

Public Transportation

A good public transportation system that carries workers from their housing to work helps to insure a ready and reliable labor force to help ensure operation of the center. Centers are 24-hour facilities. If no public transportation serves the facility at night, then finding workers for

night shifts will be more difficult. Good public transportation means that less space – highly valuable space - is taken up with worker parking.

All of the following points of consideration are particularly true in an inner-city logistics center, like Detroit, where horizontal space is at a premium:

Human Resources

This consideration includes, but is not limited to, security staff, managers, border experts, IT staff, and experienced laborers such as fork lift operators and maintenance crew members.

Technology

This consideration includes the ability to electronically monitor each item, each case, each pallet, and each shipping container. It includes the ability to identify products with special handling requirements such as refrigeration, toxic chemicals and explosives.

Accessible And Reliable Technology Is Needed For:

- Priority Scheduling
- Inventory Tracking
- GPS Tracking
- Merging of Data Bases
- Advanced World-Wide Communication.

WHAT ARE BEST PRACTICES IN LOGISTICS CENTERS?

Advanced Shipping Notification (ASN)

A high-tech logistics center practices advanced shipping notification. An important part of the record in the database of the items passing through a logistics center is the contact information for the recipient of each shipment. This information can be used to notify the recipient of the coming shipment. This allows the recipient of the shipment to plan ahead for what docks will be used, whether storage is necessary, and how many employees of what type should be available. In other words, it allows recipients to avoid bottlenecks. It helps shippers avoid wait times. When bottlenecks become apparent, it allows the recipient to make immediate adjustments and prioritize receiving.

Advanced notification can also facilitate more efficient cross docking so as to shorten the distance and time for the most prominent sorting paths by placing incoming docks closest to the most common out-bound docks (Harps, 2005)

Hands-Free Order Selection

Using a hands-free order selection process is becoming increasingly important. "Having operators hold a piece of paper, read its contents, then go to a picking location is inefficient," McKnight says. "Even using a handheld RF gun, workers have to scan, set the gun down, then make their pick." In facilities where the technology is appropriate, McKnight recommends hands-free order picking enabled by technology.

The logistics center may want to communicate with vendors exactly how their product should arrive for this purpose. This may include specific labeling requirements, and standard case quantities for each individual item. (Harps, 2005)

Vendor Compliance Program

A vendor compliance program induces the initiator of a shipment to ship products in a form that fits the receiving facilities mode of operation. For example, if the receiving facility is highly automated, proper bar code or radio frequency labeling could be critical. For a labor intensive receiving facility package size and weight might be an important factor. Proper labeling of toxic, flammable, or fragile items promotes the safety of pickers and the security of the product.

Dynamic Slotting

Slotting a stock means keeping a unit in the optimum location, requiring ongoing analysis. "As items move through the maturity cycle, their velocity changes. Other items are seasonal in nature; slow-sellers may become fast sellers during peak months of the year. Don Derewecki, executive vice president of Gross & Associates, a materials handling logistics company based in Woodbridge, N.J. recommends a system that generates exception reports to make ongoing slotting changes."

On-Going Cycle Counting

Implementing an ongoing cycle count program enables one to eliminate taking a physical inventory count. Marc Wulfraat, a senior partner with KOM International, a global logistics and supply chain management firm headquartered in Montreal advises that "While many firms do cycle counting, they have not yet eliminated the physical inventory. Doing so cuts time and costs substantially."

Minimizing Touches

Several new techniques and technologies now help to eliminate multiple touches in the warehouse. An example is picking to a shipping carton rather than picking to a tote (plastic bin). This is made possible by an efficient warehouse management system, which enables picking directly to the carton. This process helps to eliminate the need for dedicated packing stations. In addition, print-and-apply labeling systems now allow an employee to print labels on the fly, and offer in-motion weighing and manifesting, as well as semi-automated or automated sealing and taping, all of which eliminate multiple touches, saving both time and money in the DC. Essentially, once the order is packed into a system-designated carton it is then scanned and confirmed and the pick-pack carton is then conveyed to a packaging and sealing operation, then on to an automated manifested operation, thus reducing a number of steps previously employed.

Third Party Logistic Operators (3PL'S)

Third-party logistics companies are often trucking, shipping or warehousing companies that have developed logistics expertise, software, and facilities as described above. They provide services to multiple production and retail companies and often mix shipments from various companies to maximize efficiency by minimizing cost and time. Some 3rd party logistics companies that operate in Michigan include Excel Global Logistics, Penske, J.B. Hunt, Schneider, DHL, UPS, and Crane.

WHY IS A CENTRALIZED, MULTI-MODAL, HIGH-TECH LOGISTICS CENTER IMPORTANT FOR MICHIGAN?

Being a peninsula, Michigan is sometimes slightly off the beaten path. US trucking from the East US to West of Chicago passes by Michigan to the South. The same is true for most rail service. While decades ago some trucking and rail service to or from New York and New England would utilize an Ontario short cut, heightened security concerns have isolated Michigan even more. Most transportation to or from Michigan specializes in serving Michigan industry, such as automobiles and aircraft parts. A comprehensive, multimodal and cutting-edge logistics facility would help to break bulk and provide better access to transportation for all kinds of businesses.

Also critical is the international border crossing. Based on the dollar value of the total volume of trade, depending on currency valuations, the U.S.-Canadian trade partnership is the first or second largest trade partnership in the world. The Ontario-Michigan border is by far the larger crossing point in that partnership, accounting for nearly 60 per cent of that trade.

Facilitating international cross-border trade can be a major force in mollifying the peninsular effect described above. A comprehensive, multimodal and cutting-edge logistics facility could help to facilitate the border crossing by adding efficiency to the inspection process. Pre-clearance services could be facilitated by such a logistics facility, and it could help to improve the tracking of products crossing the border.

A facility as described previously in this paper could also improve the efficiency of trucking services that cross the international border. Freight could be consolidated into fewer trucks for the border crossing. This could reduce fuel and driver costs associated with the crossing, improve handling of "paper work" associated with the border (most of which is or could be electronic), and pre-clear and seal trucks with common destinations. Also, the truck driver shortage that has plagued the industry for years on both sides of the border is most acute at the border since many drivers do not have border clearance. Freight consolidation would address the driver shortage.

WHY IS A LOCATION IN CENTRAL DETROIT NEAR THE BORDER IMPORTANT FOR A HIGH-TECH LOGISTICS CENTER?

Centralized, multi-modal high tech logistic centers are built on a need for a different population of workers than more traditional distribution centers. When one moves from traditional fork lift and paper pulled ordering and loading of trucks, a tremendous amount of technology is introduced to the supply chain processes. These processes create a need for a larger population of information technology workers and engineers than before, which in turn creates a 21st century work force with higher earning potential.

Michigan's universities and trade schools will need to supply workers for these new opportunities, which in turn, will allow Michigan's children the opportunity to stay in state, and perhaps not be an exported to other locations that embrace this growing opportunity. In addition to the four-year degree, two-year programs in robotics, HVAC, and other trades will be needed to supply the workers needed for maintenance and repair. This is an opportunity for a ready market for Michigan students outside of the current needs of other industries.

This will create an ecosystem that will allow Michigan residents to enter the workforce in multiple jobs at logistic centers and through education have a clear path to better paying jobs. This in turn will create other jobs surrounding the logistic centers in service industries for the workers and their families, which in turn will see a return of families seeking housing and schools for their children in Michigan.

In addition to the reasons mentioned in the previous section concerning the importance for Michigan, many infrastructure improvements are being planned over the long term for the area near the border. This includes the Gordie Howe International Bridge, a new train tunnel or improvements to the existing train tunnel, a major intermodal freight facility, a possible second span of the existing Ambassador bridge, port improvements, improvements to I-75 and the connections between I-75 and bridges, to name a few.

And, land is available for a major logistics facility in inner city Detroit near the border crossing points, increasing the possible positive impacts on Detroit and the Great Lakes region.

The importance of this border crossing plus all of the factors discussed create a one-of-a-kind opportunity for the city of Detroit and the state of Michigan. Logistics related industries are the wave of the future such as Amazon distribution centers. The logistics industry employs all of the latest technologies related to the movement of goods and services including such things as autonomous trucking. Encouraging this development through appropriate planning, finance and infrastructure development should pay substantial dividends for the people of the state. This industry, which takes advantage of the border, reduces the disadvantage of the state as a perceived peninsula.

WHAT WILL IT TAKE TO MAKE IT HAPPEN?

Introduction

This report looks at the possibility of a major, high-tech, centralized logistics center developing near the U.S. side of the Bridges. This is merely a hypothetical discussion, but, thinking through a set of concepts about such a center, one can get a better understanding of what might be possible. And, by working through a hypothetical pro forma or set of alternate pro forma, this report attempts to investigate the financial feasibility of such an idea.

Pro Forma

Attempting to formulate a pro form for the described logistics center is difficult. National figures for guidance about such issues as average cost of operation, revenues, and financing vary widely. This is in part because the industry is experiencing a substantial transformation that is creating definitional issues. In the long view, the industry is changing from an array of company-owned warehouses to distribution centers to logistics centers. They are moving from being necessary inventory-storage, cost burdens to the manufacturer to being independently owned, through-put, profit centers with minimal storage and significant technology. National data tends to statistically mix these functions. We take the trend a step further in the discussion of a centralized, high-tech, multi-modal, serving an important border crossing.

Two Possible Logistics Center Scenarios

We look at the pro forma for a new logistics center in two ways. One way is to think of the center as a real estate project of a developer that rents the facility as a fully functional, turnkey operation to a third part logistic (3PL) company. In this case, it is assumed that all operating costs are born by the operator. The second way to create a pro forma is to think of the center as being built for, owned and operated by a single 3PL entity. In this case, the pro forma includes revenues and expenditures of the logistics operation. We will look at the former approach first.

Scenario One

Creating the hypothetical pro forma requires determining land costs, the cost of any demolition, and land preparation costs. Then the cost of construction must be estimated, followed by soft costs, including contingencies. The combination of land, “vertical” costs and soft costs make up total development costs and therefore, by definition, total capital requirements.

Annual operating expenses for logistics centers are dominated by labor costs but include a variety of other day-to-day expenses. These are compared to annual operating revenues to determine annual operating profit or loss.

From this income we subtract annual financing expenses to determine cash flow. Taxes are based on the policies of the taxing jurisdictions and the nature of the ownership of the logistics center. Probably, some kind of public-private partnership would be necessary to induce its development. Each of these issues will be handled in the following sections.

Land Availability

For the sake of this discussion, several parcels have been identified as potential sites for development of bridge-induced economic activities including a logistics center.

On a per acre basis we found land costs for existing logistics centers around the country ran about \$15,000 to \$40,000 per acre, with many around \$28,000 to \$30,000 per acre. However, logistics centers are generally built in the urban fringe. The Detroit inner-city sites are much more expensive, with one prime site costing over \$100,000 per acre. For purposes of this report we use \$40,000 as the low end, \$100,000 as the high end and \$75,000 as the most probable cost of land.

For sake of comparison we will imagine a standard center of 300,000 sq. ft. on a 20-acre site. This means that the land cost would be \$20 per sq. ft. multiplied by \$75,000/ acre or \$1,500,000. Divide this by 300,000/sq. ft. land cost are estimated to be \$5 per sq. ft. of usable space.

Construction: Hard Costs & Vertical Costs

Construction cost can vary widely depending not only on location, but also on the quality of construction and what is included in the facility. We found that existing logistics facilities have cost about \$70 per square foot or about \$700 per square meter. Most of these centers can be described as distribution centers, although some are quite large. Construction costs quickly go over \$100 per square foot (more than \$1000 per sq. meter) when ceilings are raised to over 35 feet, which is the current recommendation. This allows stacking and shelving to be much higher, utilizing higher and larger fork lifts and reducing distances for automated equipment.

These costs do not include freight docks for railroad sidings, refrigeration storage for cool and cold chain operations, separate storage for flammable materials, dry bulk storage, robotics, autonomous operating fork lifts, advanced computer tracking and communication, or lodging. All of these items can be priced independently.

Since we are contemplating a central, multi-modal, high-tech logistics center with at least some of the best value-added options, we will estimate construction costs of between \$60 and \$100/ sq. ft. with \$80/sq. ft. being the most likely.

For a 300,000 square foot logistics center on 20 acres, this would mean \$80 multiplied by 300,000 or \$24,000,000.

Soft Costs and Contingencies

Soft cost for this kind of development project would include all professional fees (architect, attorneys, etc.), construction finance costs (interest and fees), a developer fee, and an addition for contingencies. While these expenses should be itemized, for the purposes of this report we suggest that soft costs and contingency be estimated at 30% of land prep and vertical costs. For the 300,000 sq. ft. logistics center this would mean 30% of \$24,000,000 or \$7,200,000.

Total Development Costs

Combining all development costs gives the likely total development cost figure of \$33,150,000. This represents the total financial capital requirement including both debt and equity.

Capitalization Rate & Revenues

While capitalization rates can vary by type of property, location and even by the person doing the investing, it is possible to think in terms of an overall metropolitan cap rate since all properties compete with all others for investment money. The cap rate for metropolitan Detroit is approximately 6% to 8% with 7% being the most likely.

This means that the annual operating profit for any development must be 7% of the cost of development. Annual operating profit is the annual revenues less all operating expenditures. Using the simple real estate analysis where the developer/landlord rents to an independent 3PL, all operational the renter covers expenses. Necessary rent revenues can be determined by applying the cap rate to total development costs, which equals total capital requirements. A total project cost of \$33,150,000 and a cap rate of 7% implies that a rent of \$2,320,500 must be charged, which is about \$7.74/sq. \$2,320,500 would also represent the projects NOI.

The rate of return on total capital is 7%.

Financing

Based on a loan to value ratio (LTV) of 70% the 300,000 sq. ft. Detroit logistics center could qualify for a \$23,205,000 mortgage. An amount this size would not necessarily come from a single bank. The source could be a consortium of banks, bond sales or other debt capital instruments. A likely mortgage would be amortized for 20 years with a 10-year balloon. Interest rates on such a loan would be between 4% and 8%. We choose 6% as the probable rate.

Based on a debt coverage ratio of 125% the maximum annual debt service payment would be $(2,320,500/1.25 = 1,856,400)$. A 6% loan for 20 years means an annual mortgage constant of .086 or a maximum debt of \$21,593,147.

Using the lower result of the two “banker rules” gives a mortgage debt of \$21,593,147. This means the project would require an equity injection for the remaining capital requirement, or \$11,556,853.

A 7% loan amortized for 20 years would produce an annual debt service payment of \$1,856,400. This would allow for a cash flow of approximately \$464,400 in the first years. At 7% interest, the annual interest in the first year would be \$3,244,800.

Cash flow is the difference between the net operating income and the debt service, which would be \$811,200 for the middle scenario.

Depreciation of the building and more accelerated depreciation of the large amount of equipment would produce a tax advantage in the early years.

These loan figures are based on a fixed-interest, fixed payment loan with a 20-year amortization and a 10-year balloon.

This scenario would require that a developer raise \$12,957,356 in equity initially and would have to come up with the remainder in 10 years or refinance at that time.

Many other kinds of loans are possible. An interest-only loan would not pay down the principal but would lower the payment to increase cash flow. A graduated loan could start with a lower payment but increase in future years.

There has been a growth in industrial real estate investment trusts (REITs) for financing the warehouses and distribution centers needed to fill all of the growth of online orders. According to a Liz Wolf article in Seeking Alpha, “E-Commerce Giving Industrial REITs A Big Boost, May 24, 2017”, Industrial REITs are showing more profit than the REITs in the brick and mortar sector. These REITs would be a good partner for public/private entities.

Scenario Two (Including Logistics Center Operations)

The second way to look at this project would be for a 3PL company or some other entity (perhaps a public authority) to build a center for profit operation. This requires that the revenues and expenses of operation be included in the analysis. This is more complicated than the first scenario since it depends on what facilities and services are actually provided.

The main component of annual operating expenses is labor. Logistics centers are still labor intensive despite the advent of new technologies. Pickers are still the primary expense of a logistics center. Logistics centers tend to hire about one employee per 3000 square feet or about 100 employees for a 300,000 sq. ft. center. About 3/4th can be described as labor and about 1/4th described as management. Labor costs an average of \$34,000 per employee while management requires about \$100,000 per employee. These human resource expenses include fringe benefits. Total human resource costs run about \$13 to \$18 per sq. ft. with \$16 per sq. ft. being most likely.

Another major component of logistics center operation is electricity. Because of the large space involved and high ceilings, lighting, air conditioning, operation of electrical vehicles such as forklifts and conveyors, among other things creates a major electrical load burden. Electrical costs depend on rates at local utilities, but major logistics centers report operating costs of \$2.00 US to \$3.00 US per square foot for electrical costs. A figure of \$2.50 means that electrical costs would be \$750,000 per year. This does not include the extensive energy requirements for running a cold storage facility or cold-chain logistics center.

Another major operating expense would be local property taxes, if the center were to be privately owned.

Total annual operating costs are about \$23 to \$30 per square foot. Because we are considering a more sophisticated operation, likely costs are estimated to be near the high end at \$28 /sq. ft. or about \$8,400,000 per year.

Revenues – Scenario Two

Logistics center revenues depend on the portfolio of services and space offered. The revenue of a logistics center is expected to be generated by: picking and sorting fees; rental of warehouses, storage spaces and offices including specialized spaces for refrigeration, flammables and agricultural dry bulk; rental of outdoor spaces for cargo and concessions from hotel and restaurant arrangements. Because revenues can vary widely, required revenues are estimated based on the cap rate.

Utilizing a 7% cap rate means that net operating income on a \$33,150,000 distribution facility would have to be \$2,320,500 to satisfy the metropolitan cap rate as is the case in the first scenario. With annual operating expenses equal to \$8,400,000, the annual operating revenues would have to exceed \$10,720,500 during and after the first stable year. Please note, this revenue level was applied to all cases in this white paper.

Gross Operating margins are estimated at 22%. Rate of return on total capital invested would be 7%.

For collateral purposes, the market value of the property could be estimated by the lender to be the NOI divided by the CAP rate or \$33,150,000. However, lenders can have their own CAP rate. Particularly in the first years, before a real income experience has been established, the collateral value is often some combination of total development costs and this market value estimate.

Financing – Scenario Two

Based on a loan to value ratio (LTV) of 70% the 300,000 sq. ft. Detroit logistics center could qualify for a \$23,205,000 mortgage. A likely mortgage would be amortized for 20 years with a 10-year balloon. Interest rates on such a loan would be between 4 and 8%. We choose 6% as the most likely.

Based on a debt-service coverage ratio of 125% the maximum annual debt service payment would be $(1.25 * 2,320,500 = 1,856,400)$. A 7% loan for 20 years means an annual mortgage constant of .086 or a maximum debt of \$21,593,147.

Cash flow is the difference between the net operating income and the debt service, which would be \$464,100 for the middle scenario. Depreciation of the building and more accelerated depreciation of the large amount of equipment would produce a tax advantage in the early years.

These loan figures are based on a fixed-interest, fixed-payment loan with a 20-year amortization and a 10-year balloon. This scenario would require that a developer raise \$11,556,835 in equity initially and would have to come up with the remainder in 10 years or refinance at that time.

Many other kinds of loans are possible. An interest only loan would not pay down the principal but would lower the payment to increase cash flow. A graduated loan could start with a lower payment but increase in future years.

Spread Sheet Example

The attached spreadsheet lays out the numbers for both scenarios as discussed above. It also shows the numbers for two other cases for both scenarios. With columns labeled as "BEST CASE" and "WORST CASE", it attempts to provide a range of possibilities. For each variable for which there was a range, the best point on the range and the worst point on the range were assigned to the appropriate column.

The results provided in these columns should be considered extreme since they were assigned the best and worst for every data point. The actual distribution of possibilities would look more like a bell curve with these cases near the extreme ends.

(Please see attached pro forma spread sheet)

Public-Private Partnerships (PPP's)

Some kind of public-private partnership is likely to be involved in inducing developers, 3PLs and financial investors to be involved in the logistics center project. In this situation, a public-private partnership could mean a variety of things. If structured as an infrastructure PPP, similar to that of the Bridge itself, PPP could mean any of the following:

- a concessionaire builds the center and turns it over to the public sector for a price:
- a concessionaire develops the center and turns it over to the public sector but manages it for a price for x number of years with reimbursement of the development cost built into the management fee.
- a concessionaire develops the center and then owns and operates it for x number of years collecting the revenues as reimbursement for development costs.
- a concessionaire develops the center owns it and then leases it to a public entity with the development cost built into the lease.

On the other hand, a private company, such as a 3PL could build the center and own it. Public-private partnerships in this sense could mean providing governmental carrots to induce developers to build the desired project.

The project could receive public incentives to improve the financial numbers in exchange for accomplishing certain public goals. Public goals could include creating jobs, increasing tax base or in this case helping to create a logistics Mecca near the new bridge to service one of the world's most important border crossings in terms of trade volume and truck traffic.

Public Incentives Could Include:

- low interest loans from a public economic development corporation
- loan guarantees to induce private lenders to provide better terms
- a subordinated, second mortgage to reduce private lender risk
- property tax breaks
- improved infrastructure around the logistics center, such as updated water, sewer, storm drainage, power, computer connections, etc. or improved access to rail or I-75,
- zoning breaks and other nonfinancial incentives, to name a few.

The driving force behind public/private partnerships is that the private sector ends up with an income stream that compensates it for its involvement in a project, and that the income stream is enough to compensate the private entity for the level of risk that it must take.

The Income Stream Can Come In A Variety Of Forms:

- The simplest form is when the private entity ends up owning a facility and can charge a rent or fee for use.
- A second form of income stream is if the private entity builds a facility and is able to rent it to the public sector
- A third kind of income stream is when the private entity leases a facility from a public owner and is able to rent it or charge a fee for service.
- A fourth kind of income stream is where the public owns and operates a facility but gives the private a management contract.
- In a joint venture, the income stream is the private's share of all benefits.
- Bond interest or stock dividends offer other forms of income stream.

In The Final Analysis A Set Of Questions Must Be Answered To Structure The Public-Private Partnership. They Are:

- Who manages construction?
- Who owns the completed facility?
- Who manages the physical facility?
- Who operates the services provided by the facility
- Who is responsible for construction finance?
- Who is responsible for capital finance?
- Who pays fees and how much how much?
- Who takes risks?

(SEE PPPIRC, 2017 for more details)

LOGISTICS SURVEY RESULTS

The following is a synopsis of the statistics from the Logistics Survey conducted through Michigan State University – Percentages are rounded.

Approximately 49.2% of the respondents were familiar with the Gordie Howe International Bridge Project (GHIBP). Notably, 89.4% of the respondents felt that the GHIBP would be beneficial to the State of Michigan (MI). This is also reflected in the responses that 91% see GHIBP as a potentially expanding market area for MI businesses with 92.5% feeling that GHIBP will expand the customer base for MI businesses. Also, 94% see GHIBP as a catalysis for increases in economic opportunities for the region, with 97% seeing an increase in trade with Canada.

Employment opportunities were also seen, as 88.4% agreed that the GHIBP would see an increase in professional employment opportunities along with 86.4% feeling that skilled labor in the region would see more opportunities. Then, 76.5% agreed that land use patterns in the Detroit area would be affected, along with 82.5% agreed that there would be opportunities for Public-Private partnerships. 91% of the respondents supported the construction of the GHIBP.

Well over half, 56.5%, were not familiar with the study conducted by Parsons Brinkerhoff examining the building of a logistics hub in the Detroit area.

Survey respondents' top four barriers to utilizing logistic services in Michigan were as follows:

1. Road conditions
2. Border delays
3. Traffic congestion
4. Existing logistic infrastructure

Survey respondents' top five benefits of having a new logistic center in Detroit region were as follows:

1. Improved logistic infrastructure
2. Increased regional employment
3. Improved customer service
4. Less border delays
5. Reduced traffic congestion

Overall, 84.8% felt that building a new logistics facility is needed due to the lack of existing logistics facilities. 91.2% agreed that this would improve the regional economy with 81.5% feeling it would increase employment opportunities in the region.

Survey respondents' background:

Which of the following best describes your current position? – 29% NFP Employees and 37.7% Government employees

- An employee of a company or business – **14.5%**
- An employee of a private not-for-profit organization – **29%**
- A local government employee (city, county, etc.) – 5.8%
- A state government employee – **17.4%**
- A federal government employee - **20.3%**
- Self-employed – 7.2%
- Retired – 5.8%
- Other 0%

Which of the following best describes your position, or level of responsibility? – Senior levels

- Top (Chief Executive, Chairperson, President) – **20.3%**
- Senior Executive (Departmental Head, Managing Director, Vice President, Board Level) – **31.9%**
- Upper Middle (Departmental Executives, Managers, Senior Professional Staff) – **10.1%**
- Middle (Office Managers, Professional Staff, Mid-Level Administrators) – **20.3%**
- First Level (Forepersons, Supervisors) – 0%
- Staff (Clerical/Secretarial and Support Staff, Technicians) – 1.5%
- Other – 16%

Which modes of transportation do you presently use and approximate percentage modal split? - 39 Responses.

- Truck – 11 people – Avg. 59%
- Rail – 8 people – Avg. 10.83%
- Intermodal – 5 people – Avg. 31.7%
- Air – 8 people – Avg. 12.5%
- Water – 6 people – Avg. 21%
- Pipeline – 1 person – 5%

Within the last year have you been denied or had difficulty with intermodal service? – 22 Responses

- Yes – 13.6%
- No – **86.4%**

SUMMARY AND CONCLUSION

Even with less than ideal infrastructure, the Canada/US border between Michigan and Ontario is the most important of such borders in the world as measured by the dollar volume of trade that crosses it. While this status is impressive, it may not reflect the tremendous potential that could be tapped. Existing trade does not effectively mitigate the peninsular disadvantage of the state. Much of the product that crosses the border either serves local industry (auto and aircraft parts) or just passes through the region to other industrial and trade centers.

As new infrastructure gradually comes on line, (e.g. Gordie Howe Bridge, improved rail tunnel, rail hub and multi-modal center, port improvements, etc.) greater opportunities and pressures for economic development should improve. One kind of infrastructure that would both take advantage of the new opportunities and promote them is the establishment of a new high-tech, logistics center in inner-city Detroit at the main crossing point near the new bridge.

As laid out in this report, this kind of facility would capitalize on industrial trends across the economy. Given land is available, it could be financially feasible and could take advantage of public-private partnership strategies. Discussions with a panel of experts, potential stakeholders and a formal survey to confirm the desire, need and feasibility of such a facility, would be a logical next step.

Public policy is critical to developing Detroit as a logistics hub. Public policy initiatives could help to improve infrastructure such as the I-75 corridor, promote completion of the bridge, and push for improvement of the tunnels and port facility, a rail hub, better air freight infrastructure and a multi-modal terminal. The public could also engage in public-private partnerships (PPP's) to promote the logistics hub. Perhaps public policy could address the financial considerations in building a 21st century logistics center which would become a benchmark in Michigan's history, thereby enhancing its position in both cross-border and global trade!

Although a small survey sample, the importance of the logistics survey conducted is evident by the types of people which replied, with 20.3% being top level executive and 31.9% being senior executives, or 52% being high level executives. Many of these respondents suggested that economic opportunities would greatly improve with 91.2% agreeing that a new logistics center could play a vital role in improving the local economy of SE Michigan, Detroit and the surrounding area as well.

It is also evident that Michigan needs a serious revamp of its existing transportation infrastructure as one of the logistics survey results showed that road conditions, border delays, traffic congestion, and a perceived lack of existing logistic infrastructure present serious barriers to both economic growth and increased logistic services in Michigan.

The trade and traffic that travels between Detroit and Windsor is extremely important to both the economies of the United States and Canada. The survey shows numerous results that show that respondents agree with the idea that a new logistics center could be very beneficial to handle trucks that cross the border, and that a new bridge would be extremely helpful as well.

The economy that exists in Detroit, Michigan is extremely important to the United States, with a huge number of auto manufacturers operating there, a common American phrase once stated that, "what's good for Detroit is what's good for America." The idea for a new multimodal logistics center in Detroit would be an excellent addition to the infrastructure that already handles freight coming across the border.

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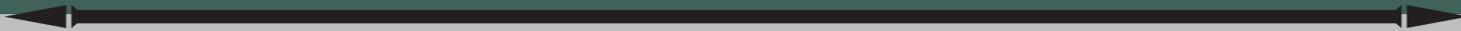
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