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We Have To Go Up

A White paper by ABCO Automation, Inc

Recently, I flew into Chicago to visit a company and drove through the I-55 corridor toward St. Louis. As I drove out of the city, I was visually stunned to see a stretch of distribution centers that seemed to go on for miles. I had never seen such a concentration of distribution activity, and it caused me to ask myself, “If I needed to build a distribution center to service the Chicago area, where would I find enough land to build? There simply isn’t any space here to do so.”

I also noticed that every distribution center I saw was no more than 40 feet high.

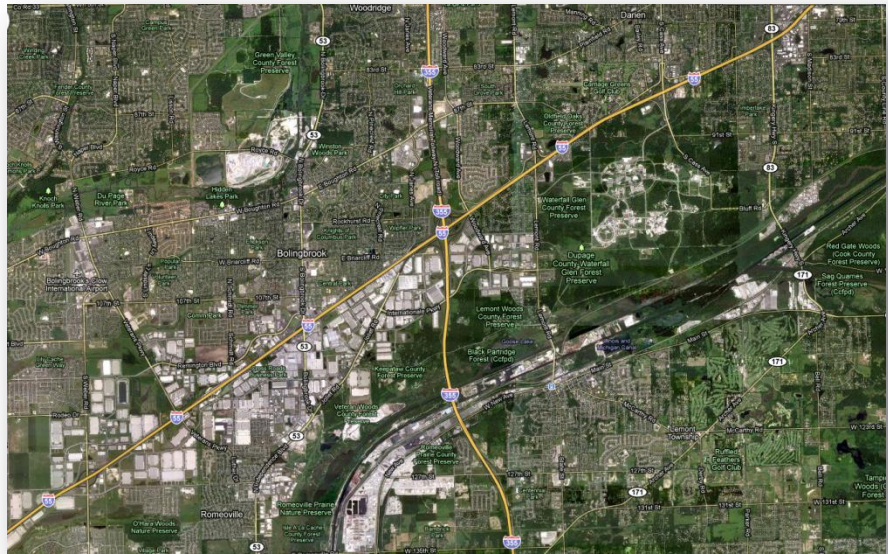


Figure 1: I-55 between Burr Brook and Plainsfield, IL, southwest of urban Chicago

Since that time, I have taken notice when I fly into major metropolitan areas of the same trend. For years, we Americans have assumed that there is plenty of land available, and there is no need to “go up” like the Europeans have. But is that really true? The real question to ask is this: is there still enough land available where we need it – close to the metropolitan areas and close to the transportation trunk lines – to continue to pour slabs for million square-foot distribution centers? Is that the best use of our country’s land? This white paper will argue that:

- going up – building high-bay distribution centers – yields a smaller footprint and requires less land
- It is easier to find smaller plots of land closer to intended distribution points and transportation trunk lines
- When the whole project cost is considered – land *and* building/material-handling equipment, high-bay warehouses can actually be cheaper than their conventional counterparts.

The Impact of Mega-regions on Distribution Center Design

The post-World War II days are over. Where the US once had enormous manufacturing capacity that we could turn on in months, we are now a part of the largest distribution economy in the world.

We no longer manufacture; we have things manufactured off-shore and brought into our country. "Globalization is changing the world in ways that we may not yet fully comprehend. For the United States, the enactment of new free trade agreements, the downsizing of our manufacturing base, and consumer demand for inexpensive products are all affecting both jobs and the environment, especially in those regions with ports and transportation corridors designed to distribute imported goods... the United States "is becoming nothing more than a distribution economy, importing, moving and selling consumer goods"¹

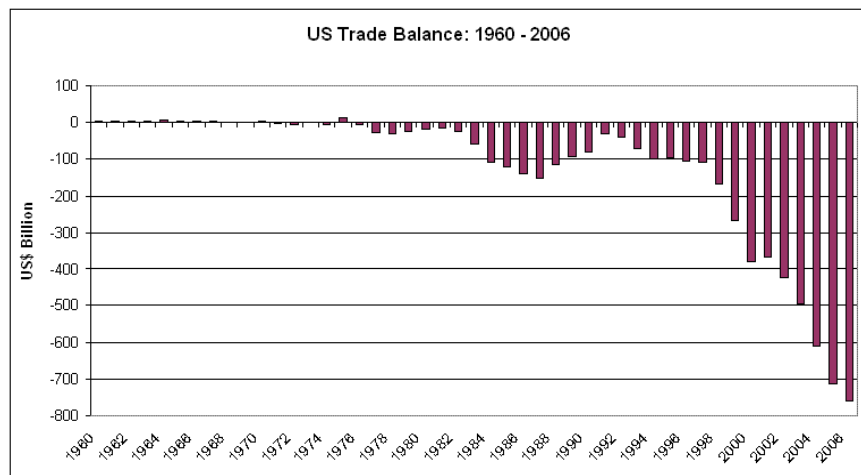


Figure 2 – US slide to a distribution economy

(Romans 2006).¹²

Nowhere is this seen to be truer than in the Chicagoland area:

“To the south and west of [Chicago], alongside six-lane expressways and at the terminus of transcontinental rail lines, the engine that drives Chicago's distribution economy is running all day and all night. Largely concealed inside windowless concrete buildings on the fringes of suburbia—and

¹ Romans C. 2006. New Bill Aims to Improve Port Security. Lou Dobbs Tonight, 14 March 2006. Available: <http://transcripts.cnn.com/TRANSCRIPTS/0603/14/ldt.01.html> [accessed 17 March 2006].

² Andrea M. Hricko, "Ships, Trucks, and Trains: Effects of Goods Movement on Environmental Health," Environmental Health Perspectives, Volume 114, No. 4, April 2006, p. A 204 available at <http://hydra.usc.edu/scehsc/pdfs/D-1-3%20Ships%20trucks%20trains.pdf>

farther—the region's distribution industry has been thriving, adding 31% more space from 2002 through 2004.

At the crossroads of America's railroads and interstate highways, Chicago has long been a convenient holding pen for goods moving from one part of the country to another. And as much as the rise in offshore manufacturing and the expansion of national retailers have hurt many old-line Chicago businesses, the distribution economy has thrived on those trends, with big-box retailers and overseas manufacturers building ever larger, more sophisticated warehouses around Chicago.”³

Between the years of 2003 and 2004 alone, developers added 17.5 million square feet of industrial distribution space, a 15% increase over 2003. “Nearly all of the new space is devoted to warehousing; 60% was built in the southwest suburbs along Interstate 55, ground zero for the warehouse boom.”⁴ [See Figure 1 above] As time goes on, it is getting more and more difficult to find land to build a distribution center near the urban centers and the transportation trunk lines that your company wants to be near.

While some of these numbers appear dated, the future appears to be even more alarming. “...Planners predict that the twenty-first [century] will be defined by the consolidation of supersized, multicentered urban areas, where the sprawl-related growth and interconnection of proximate...[that] appears to be a new species of human inhabitation. Indeed, we are on the eve of an era where scale, complexity, redundancy, and multiplicity will be the most urgent considerations for planners working to organize and integrate these new urban regions.”⁵

We need distribution centers near the locations to which we want to distribute and near major transportation trunks, yet it will no longer be feasible to build million-square-foot distribution centers in mega-regions, although there will certainly be a need for the volume such facilities would generate.

Greenspace

The problem is exacerbated by the concept of footprint allocation ratio. While local codes vary, the **Floor Area Ratio (FAR)** or **Floor Space Index (FSI)** is the ratio of the total floor area of buildings on a certain location to the size of the land of that location, or the limit imposed on

³ “All Roads Lead to Chicago,” Crain's Chicago Business, August 15, 2005.

⁴ According to Rosemont-based real estate firm Colliers Bennett & Kahnweiler Inc.

⁵ Geoffrey Thün Kathy Velikov RVTR, The Post-Carbon Highway, <http://alphabet-city.org/issues/fuel/articles/the-post-carbon-highway>

such a ratio.⁶ As the green movement in the US continues to gain momentum, even industrial areas will be required to maintain some “green space.” Obviously, the distribution center cannot cover the entire plot of land a company purchases to build. On a given plot of ground (depending upon local codes and regulations), the following developments on the property should not exceed 50%:

- Buildings
- Concrete truck turn-arounds
- Waste-water basins
- Easements
- Parking space pavement
- Other developments

The maximum utilization of land is 40% (in most places). We start with 33% to allow for additional out-buildings, truck turn pads, etc. Thus, if your building were to be a million sq. ft., you would need a minimum of 57.4 acres. On the other hand, if you build a 250,000 sq. ft. facility, you only need 14.3 acres.

Which is easier to find near mega-regions?

This is the strongest reason to link going up with building a new distribution center. Land costs in the mega-region are astronomical. The difference in the cost of required land demonstrated above alone can pay for most automated systems before they even start operation. *This is where automated projects really pay for themselves.*

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I once had a company come to me and say they needed to build a new distribution center for knock-down furniture. For the number of pallet locations they would need, the client had determined that they would need a conventional facility using 10 foot aisles that was a million sq. feet in two phases. The location of the facility was in northern California, so the land costs were around \$150,000 per acre. The client projected that they would need to double the size of the distribution center in the future, so they needed an option to buy additional land of the same size in the future. In the end, the land cost to build both phase I and phase II was \$13 million. The building and the material handling equipment for both phases worked out to \$59.6 million. Total price tag: \$72.6 million for a million square-foot conventional operation sitting on an 87.2 acre plot of ground.

By comparison, they considered a high-bay warehouse option. Because the high-bay warehouse could store pallets 16 layers high, the space required for the high-bay warehouse, was only 82,209 sq. ft.! The

⁶ http://en.wikipedia.org/wiki/Floor_Area_Ratio

whole distribution center was a footprint of 300,000, not a million sq. ft. The required acreage for this facility including the operations building was only 20.5 acres! Since the high-bay warehouse was a rack-supported building, the only construction required apart from the conventional operations building was a slab for the rack, and insulated metal panels for the walls and a roof affixed to the top. Total price tag: \$50.5 million for an automated operation sitting on a 20.5 acre plot of ground. This represented a savings of \$22 million before the operation even started up, where there was a 28% labor savings as well!

In summary, where many people think that building automated warehouses is cost-prohibitive, the truth is that where purchase of land is involved, it may even be *cheaper* to build an automated facility than a conventional facility. Beyond that, it would be much easier to find a 20-acre piece of property in Chicago close to the transportation trunk lines and your customers, than an 87 acre piece of property.

Other benefits of high-bay warehouses:

- Less labor
- Better inventory control
- Less shrinkage because there is less human access to the goods
- Less damage because of significantly reduced forklift handling (who has not seen the “Great Vodka Collapse” on YouTube?)
- Fewer workers’ compensation claims

ABCO Automation and high-bay warehouses

If your company is thinking about building a new distribution center, we would encourage you to contact us to consider the benefits your company might gain through automation. As you can see, you can save a lot of money by considering an automated facility *before* the purchase of land. Sadly, too few companies do.

ABCO AUTOMATION is an American engineering company that designs and implements turn-key, integrated-technology distribution systems. We focus on accurately generating more throughput in less space with fewer people generating “hyper productive” systems which offer a very attractive return on investment.

ABCO AUTOMATION can develop distribution concepts for you that are more financially efficient (the combination of capital cost, space and FTEs) than most American integrators. We possess 39 years of collective automation know-how and excel by virtue of having exposure to European distribution processes and technologies – concepts that most American integrators and operations professionals have never

⁷ <http://www.viddler.com/explore/FailPost/videos/47/>

seen. In a competitive scenario, we clearly outdistance our counterparts in the ideas we bring to the table. At the same time, we are *not* a manufacturer beholden to sell a particular brand AND have the ability to shop available suppliers for the lowest cost.

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