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Going Vertical with Industrial Facilities

THE SUPPLY OF DEVELOPABLE land in urban areas is dwindling, fuel prices are increasing, environmental concerns have leapt to the forefront, global trade is on the rise, and a weakening U.S. highway infrastructure is expected to present serious economic ramifications within the next decade. Yet, warehouses and distribution facilities continue to be pushed to outlying areas. This leads to longer transportation times for goods, which creates a bigger carbon footprint in fuel consumption, congestion, and greenfield development

Many international supply chain management innovations have been developed by Western companies distributing goods manufactured in Asia to meet the demand of U.S. consumers. While global shippers in Asia have adopted logistics best practices from the West, it is time for Western developers and land use planners to learn something from their counterparts in Asia: vertical development of industrial facilities.

Local government policies need to be changed to allow for more intensive use of land so that multistory facilities can be developed closer to the urban cores of major U.S. markets. Vertical development in the industrial sector is economically viable, and can be designed to be aesthetically pleasing and functional, while maximizing ever-shrinking land resources. Following the Asian model also offers logistics and retail customers, industrial developers, and urban municipalities the means to become better stewards of the environment. While there is great emphasis on sustainable building features these days, the benefit is at the "micro" level. Greater returns in greening the supply chain at the "macro" level can be gained by using infill land more intensively and going vertical with industrial facilities.

The major industrial hubs of Tokyo, Osaka, Singapore, and Hong Kong contain numerous examples of multistory distribution facilities. Early this year, for example, AMB Kasugai Distribution Center opened in the city of Nagoya, Japan. The 1,298,000-square-foot (120,600-sq-m) distribution center comprises six stories and two corkscrew truck ramps. Included are convenience store–like amenities, shower rooms, and rest areas for truck drivers and on-site personnel. The building office areas were designed to maximize the use of natural lighting, with floor-to-ceiling glass walls providing daylight for occupants. The facility includes an advanced earthquake warning system and offers parking spaces for more than 400 vehicles and close to 300 truck berths.

Developed on a 705,000-square-foot (65,500-sq-m) parcel, the distribution center was designed to accommodate an old-growth forest preserve on site. Because the distribution center has a multistory configuration, AMB Property Corporation was able to retain 60 percent of the trees on the land. The infill distribution facility is centrally located and building tenants are now closer to their customers, minimizing transportation-related impacts.

Stepping back and taking a more holistic view of the true costs associated with development—not only the land and building costs, but also the total costs to the population being served and related impacts to transportation infrastructure—reveals a number of benefits. These include less congestion, reduced wear and tear on roads, less consumption of fuel, and significantly lower environmental impacts.

Multistory distribution facilities are well suited for a number of urban port and airport markets in the United States. Although industrial real estate is far from popular and many community activists as well as planners oppose this property type in their districts, municipalities should be able to appreciate the tax revenue and economic stimulus that these facilities can generate. Yet, for the most part, industrial buildings are eschewed anywhere near dense populations in favor of other land uses.

This bias, along with a need to captalize on economies of scale, has spawned a distribution facility type that requires a sizable land footprint and that has, therefore, been pushed to the outer fringes of urban areas. Outdated zoning codes also are complicit in this trend, typically limiting floor/area ratios (FARs) to 40 percent or less for light warehousing and distribution centers, confining land use for industrial to one-story building development with space for truck parking, docks, and other necessary amenities. Yet, anyone who has driven from Long Beach to California's Inland Empire knows of the flaw—and the higher total costs—that this can create.

Cheaper land may be available at the far perimeter of cities, but moving goods 50 miles (80 km) away from the point of origin has economic and efficiency ramifications for the shipper—and environmental ramifications for the community at large. What is the

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Multistory distribution centers, prevalent in the industrial hubs of Tokyo, Osaka, Singapore, and Hong Kong, would be a workable solution to lessening the carbon footprint in the United States. In Nagoya, Japan, AMB Property Corporation was able to preserve 60 percent of the trees on a 705,000-square-foot (65,496-sq-m) parcel by building a six-story distribution center.

cost of keeping vehicles moving freely? What is the cost of burning diesel fuel while containers idle in traffic? What is the impact on deteriorating highway infrastructure or on the nerves of commuters sharing the roads with an increasing number of trucks? These factors are difficult to quantify, so the economic analysis that triggers the decision of where to locate distribution centers is often skewed.

By contrast, physical land constraints in the industrial hubs of Asia have precluded this trend of pushing industrial development to the perimeter. The need to maximize land use in island economies with high populations reveals a sound alternative. The basic premise is that a multistory industrial development will pencil out when land values increase to more than half the value of the building. This is when it becomes reasonable to incur the extra construction complexities and costs associated with going vertical.

In Japan, where vertical development has long been common, zoning ordinances reflect the realities of scarce land. The typical FAR for distribution facilities is around 200 percent, which enables developers to build vertically and still have ample room for trucks to maneuver around the facility. The seven-story AMB Ohta Distribution Center at the Port of Tokyo, for example, has a floor/area ratio in excess of 398 percent, which would be unheard of in the United States. Western urban planners systematically argue that higher FARs simply allow too many warehouses in densely populated areas, when in fact multistory developments encouraged under higher FAR allowances are more eco-friendly and less costly to their communities.

Asia has demonstrated that multistory development is economically viable in land-constrained areas such as Japan, China, Singapore, and Korea. (It has been tried in the U.K., but was not successful due to design issues with the building.) The United States is fast approaching a tipping point where this concept merits serious consideration. Two-story product has already emerged around London Heathrow Airport; in the United States, this practice is worth considering around Los Angeles International Airport, the ports of Los Angeles/Long Beach, New York's John F. Kennedy Airport, and the ports of New York/New Jersey.

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Brownfield redevelopment of the strategically located former Osaka Oil Tank Terminal site led to the development of two multistory AMB Amagasaki Distribution Centers I and II in the heart of the Osaka/Kobe port district of Japan.

A strong responsible land use argument should also accelerate the acceptance of multistory distribution facilities outside of Asia. Embracing multistory distribution facilities as an alternative to continuing sprawl offers an opportunity for all constituents—tenant companies, developers, local municipalities, and environmental activists—to align interests.

In Japan, for example, appropriate parcels identified in the site selection process are often opportunities for brownfield redevelopment. As in the West, Japanese heavy manufacturing is being outsourced to countries with lower labor cost. As a result, some of the best development opportunities are parcels that are functionally obsolete at best, or environmentally impaired at worst.

In the heart of the Osaka/Kobe port district of Japan, AMB acquired the strategically located former Osaka Oil Tank Terminal site and, after an extensive remediation effort, developed two multistory facilities named AMB Amagasaki Distribution Centers I and II, totaling approximately 2 million square feet (190,950 sq m). Situated on reclaimed land, an oil storage and distribution terminal operated on this site from 1967 through 2002. The land was affected by waste material and petroleum products. Though not required by law, AMB completed a voluntary cleanup of the site in anticipation of future regulatory requirements by the Japanese Ministry of the Environment. Remediation involved excavation and off-site treatment and recycling of soil affected by fuel, recovery of fuel from groundwater, and groundwater treatment to stimulate biological degradation of residual impacts.

Today, cargo streams in and out of these modern, multistory, fully ramped facilities that sit on once-tainted land. The former brownfield now supports global distribution activities and generates tax revenue. AMB Amagasaki Distribution Centers I and II are leased to leading companies, including Nippon Express, World Logi, Sagawa Global Logistics, and Ryoshoku. This outcome has been an agreeable one for environmentalists, land planners, and tenants alike, and both developments boast FARs of approximately 199 percent.

Early adopters of multistory industrial facilities in the United States will likely be global shippers already operating in multistory facilities in Asia. Assuming that a combination of rising land prices, environmental pressures, and more enlightened urban planning will accelerate this trend, it is still

necessary to address the engineering and design challenges associated with vertical development.

Construction costs are higher as stacking loads vertically necessitates unique structural considerations, especially in seismically active areas such as California. By necessity, multistory distribution facilities are steel-framed, fortified structures that are built to handle truck and container loads several floor plates up. They accommodate truck accessibility to every floor with sizable spiral ramps, often with two per building: one for ascending and another for descending trucks. Fortunately, existing engineering and design best practices from Asia can be emulated.

Addressing the eyesore stigma that has plagued this sector will also be critical in overcoming NIMBY (not-in-my-backyard) opposition, particularly as these facilities emerge in infill locations closer to densely populated city centers. But these facilities are designed to Class A standards, and, with form following function, typically look more like office buildings than distribution facilities. Developers purposely design them to high aesthetic standards because they are a significant statement on the urban landscape.

These developments can incorporate a range of green building features at the micro level, including the LEED-recognized attributes of natural lighting, high-efficiency low-energy lighting and mechanical systems, renewable energy systems such as cost-neutral photovoltaic and wind turbine systems, water conservation and recycling, groundwater recharge, high-efficiency insulation, and green roofs. Such design specifications are included in modern multistory facilities, and are both coveted for their compliance with lower carbon footprint protocols and significant operational savings, and are increasingly becoming priorities for image-conscious companies.

There now are strong arguments to locate multistory warehouse and distribution facilities in the United States close to urban cores. Given the pressures put on the current system, the time for multistory industrial development at the urban core should not be far off in the major transportation hubs of the country.

To gain widespread acceptance and emerge as a trend, multistory industrial development will require a cooperative effort by all constituents. Tenants will learn how to operate in a multistory environment, as companies operating in many Asia markets already know. Land use planners and municipalities must rethink zoning laws that push this asset type to exurbia, thereby creating traffic congestion, distribution inefficiencies, and a higher environmental impact. Designers and engineers will need to meet the needs of an evolving industry with functional and aesthetic buildings. UL

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