Executive Summary

Distribution warehouses link product manufacturers with consumers by providing essential storage and repackaging space for products of all types. Depending on their origination — domestic or international, a local or distant market — products and their parts may have spent time in multiple distribution warehouses before they make their way to the consumer. In fact, according to the Council of Supply Chain Management Professionals, the typical consumer product is stored in four or more distribution warehouses from point of manufacture to point of retail consumption.

Identifying the best locations for warehouses is accomplished by identifying where goods move from or to and the best point where they need to be transferred or switched. We identify these points using the “Path of Goods Movement” concept I developed in the early 1990s and thus locate the national distribution warehouse markets for our investments.

Distribution Warehouse Demand

The largest demand for distribution warehouses is driven by the movement of freight into and out of the United States. Ocean movements of freight as shown in Exhibit 1 are measured by “twenty-foot equivalent units” or TEUs. A TEU is the 20-foot long metal container loaded onto a ship. It is one-half the size of a normal freight truck on the highway — two TEUs equal one normal tractor trailer truck on the highway. Shipping is very significant in Southern California with the closest ports to Asia, and in New York where the United States is most densely populated. All import containers must be opened and inspected by customs before being shipped to their final manufacturing or retail destination.

Exhibit 1
Ocean Movements

Additionally, according to U.S. waterborne trade, more goods are being imported and exported. As shown in Exhibit 2, imports and exports have increased almost one and a third times from 2009 to 2014. As Exhibit 3 demonstrates, waterborne freight has increased even more significantly in certain U.S. customs ports.

Exhibit 2

U.S. Waterborne Foreign Trade

Exhibit 3

U.S. Waterborne Foreign Container Trade by U.S. Customs Ports (TEUs)

The second Path of Goods Movement comes from materials being shipped by trucks from ports, U.S. suppliers to U.S. manufacturers and from ports and manufacturers to U.S. retailers. Each state tracks movements across their highways by weight stations at their borders. Exhibit 4 shows the major goods movements across U.S. highways, with the wider lines indicating more freight movement.

**Exhibit 4**
*Truck Movements*

![Truck Movements](image)

*Source: Federal Highway Administration, 2014.*

Next, we look at the shipment of goods by train to understand the routes of the largest shipments. Again, the wider lines in Exhibit 5 indicate a greater amount of freight being shipped.

**Exhibit 5**
*Train / Intermodal Movements*

![Train / Intermodal Movements](image)

*Source: Association of American Railroads, 2014.*

We then look at the amount of occupied warehouse space per person in the United States. Note that the average has risen from more than 47 square feet per person in 1981 to more than 60 square feet per person today. This increase is attributable to three factors:

1. Increased consumer purchases
2. Increased product selection (it’s not just Coke® and Pepsi® like when I was a child, but a dozen or more flavors of these products, as well as diet and caffeine-free varieties)
3) More goods being ordered online that must be shipped quickly from a warehouse location

Finding the **Path of Goods Movement**

Now that we know the U.S. warehouse space average is more than 60 square feet per person, we can analyze individual cities. The cities shown on the map below in Exhibit 7 that have occupied warehouse stock per capita of less than 50 square feet store items for use and consumption by the local population, thus demonstrating demand is very local in nature. Cities on the map that are above 50 square feet help supply the nation, and demand for warehouse space in these locations may grow faster than the local population alone requires.

When we overlay water, truck and train freight movements on the city warehouse data, we find that those cities with higher occupied warehouse stock per capita numbers are on the **Path of Goods Movement** and therefore national warehouse markets versus local warehouse markets.
Exhibit 8
Higher Occupied Warehouse Square Feet Per Person Markets Are on the Path of Goods Movement


We updated the Path of Goods Movement research with the imports and exports from the 2014 U.S. Waterborne Container report published in 2015. The following graphs portray the supply chain in a little different fashion.

Exhibit 9
Top 20 International Freight Gateways

We added the major manufacturing locations in the United States as parts are stored near the manufacturer these days for “just-in-time” inventory control.

**Exhibit 10**
*Top 20 Manufacturing MSAs by Manufacturing Employment*


We also identified the largest population cities where finished goods are purchased.

**Exhibit 11**
*Use Locations = Top 20 Population Centers*

Source: U.S. Census Bureau, 2014.

Our results concluded that locations near major manufacturing and population centers have the highest occupied warehouse per capita numbers — thus confirming that the Path of Goods Movement still exists.

**Exhibit 12**
*Top 20 International Freight Gateways, Top 20 Manufacturing MSAs & Top 20 Population Centers*

Since the occupied warehouse stock per person in the United States has risen to 60 square feet per person, Exhibit 13 shows that there are 26 metro areas on the Path of Goods Movement that have occupied stock at or above 60 square feet per person. We continue to believe that these National Warehouse Markets should have higher demand long-term and provide solid investment potential.

**Exhibit 13**

**National Warehouse Markets on the Path of Goods Movement**

<table>
<thead>
<tr>
<th>No.</th>
<th>Markets</th>
<th>Square Feet Per Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Memphis, TN</td>
<td>138</td>
</tr>
<tr>
<td>2.</td>
<td>Columbus, OH</td>
<td>106</td>
</tr>
<tr>
<td>3.</td>
<td>Cleveland, OH</td>
<td>104</td>
</tr>
<tr>
<td>4.</td>
<td>Inland Empire, CA</td>
<td>101</td>
</tr>
<tr>
<td>5.</td>
<td>Kansas City, MO</td>
<td>100</td>
</tr>
<tr>
<td>6.</td>
<td>Indianapolis, IN</td>
<td>98</td>
</tr>
<tr>
<td>7.</td>
<td>Cincinnati, OH</td>
<td>98</td>
</tr>
<tr>
<td>8.</td>
<td>Milwaukee, WI</td>
<td>86</td>
</tr>
<tr>
<td>9.</td>
<td>Salt Lake City, UT</td>
<td>85</td>
</tr>
<tr>
<td>10.</td>
<td>Chicago, IL</td>
<td>83</td>
</tr>
<tr>
<td>11.</td>
<td>Atlanta, GA</td>
<td>82</td>
</tr>
<tr>
<td>12.</td>
<td>Detroit, MI</td>
<td>81</td>
</tr>
<tr>
<td>13.</td>
<td>Dallas-Fort Worth, TX</td>
<td>79</td>
</tr>
<tr>
<td>14.</td>
<td>Nashville, TN</td>
<td>76</td>
</tr>
<tr>
<td>15.</td>
<td>Los Angeles, CA</td>
<td>70</td>
</tr>
<tr>
<td>16.</td>
<td>Miami, FL</td>
<td>69</td>
</tr>
<tr>
<td>17.</td>
<td>St. Louis, MO</td>
<td>67</td>
</tr>
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<td>18.</td>
<td>Portland, OR</td>
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</tr>
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<td>19.</td>
<td>Hartford, CT</td>
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</tr>
<tr>
<td>20.</td>
<td>Charlotte, NC</td>
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</tr>
<tr>
<td>21.</td>
<td>Houston, TX</td>
<td>64</td>
</tr>
<tr>
<td>22.</td>
<td>Northern New Jersey</td>
<td>63</td>
</tr>
<tr>
<td>23.</td>
<td>Jacksonville, FL</td>
<td>62</td>
</tr>
<tr>
<td>24.</td>
<td>Oklahoma City, OK</td>
<td>62</td>
</tr>
<tr>
<td>25.</td>
<td>Orange County, CA</td>
<td>62</td>
</tr>
<tr>
<td>26.</td>
<td>East Bay, CA</td>
<td>61</td>
</tr>
</tbody>
</table>


More than 70% of the U.S. gross domestic product (GDP) is made up of consumers’ use of goods. The chart below in Exhibit 14 shows that growth of warehouse space is highly correlated with GDP growth. If you believe that the U.S. GDP may continue to grow in the future, there is a high probability that the demand for warehouse space should increase as well.

**Exhibit 14**

**GDP & Warehouse Growth**

We can also confirm that the national warehouse markets that are on the Path of Goods Movement have continued to grow in size per person and actually all warehouse markets on average as shown in Exhibit 15. This may indicate that storing goods on the Path of Goods Movement is more efficient than storing goods in other warehouse markets — this would also confirm that freight logistics have improved over time.

![Exhibit 15](source)


Next, in Exhibit 16, we confirm that U.S. industrial business loans have increased by more than 10% since mid-year 2010 when the recession ended by monitoring the growth in outstanding commercial and industrial business loans. Note the major jump in early 2014.

![Exhibit 16](source)

Source: Federal Reserve Bank of St. Louis, July 2016.
Finally, we confirm that warehouse space is being used by looking at the increasing occupancies and rents that have been occurring since 2010 and are forecast to increase in the future.

**Exhibit 17**

*Distribution Warehouse Occupancy Cycle and Rent Growth*

*Industrial*


**Conclusion**

Our analysis shows that the demand for distribution warehouses has grown with population growth, GDP growth and international trade growth which all drive industrial manufacturing businesses. In addition, the occupied warehouse square foot per person has continued to grow in the United States as people consume more goods in more variety. National warehouse markets are more stable as they have grown faster and have had consistently higher occupancies than local warehouse markets — as they are on the Path of Goods Movement and result in a good place to focus high quality industrial real estate investments.
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