THERE ARE TWO (2) OPTIONS TO CUSTOMIZE A LAYOUT WITH A NEW PICTURE:

1. 

The Value of Place: Logistics Real Estate and Urban Freight
Melinda McLaughlin, SVP, Global Head of Research
Executive Summary

1. Introduction – a pivotal moment
2. Persistent disruption
3. Challenges and the space shortage
4. The value of place and the future of logistics real estate
A pivotal moment for supply chains
Consumer demand surge

REAL GDP GROWTH, U.S.

$T/yr

% y/y


Volume (L)  Growth (R)

RETAIL GOODS SALES, U.S.

$B/yr

% y/y


Volume (L)  Growth (R)

1. Sources: WorldBank, Consensus Economics, FRED
E-commerce as essential infrastructure

ONLINE SALES, U.S.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume (L)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Penetration Rate (R)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ONLINE SHARE BY CATEGORY, U.S.

<table>
<thead>
<tr>
<th>Category</th>
<th>2018</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronics/Appliances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toys/Entertainment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apparel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Goods/Furniture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumer Goods</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% of retail sales

1. Source: U.S. Census, Euromonitor, Prologis Research
E-commerce adding to need for space

<table>
<thead>
<tr>
<th>E-COMMERCE SUPPLY CHAIN EFFICIENCY</th>
<th>SALES (US$, B)</th>
<th>SPACE (MSF)</th>
<th>EFFICIENCY (SF / $1B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online</td>
<td>234</td>
<td>265</td>
<td>1,174</td>
</tr>
<tr>
<td>Brick-and-Mortar</td>
<td>1,343</td>
<td>449</td>
<td>334K</td>
</tr>
</tbody>
</table>

Source: Internet Retailer, company filings, Prologis Research
Note: Based on 2019 company 10-K reports
A PIVOTAL MOMENT

Rising inventory levels

INVENTORIES

$, Trillions, Retailers excl. auto


INVENTORY TO SALES RATIO, U.S.

Ratio, Retailers excl. auto


1. Sources: FRED, U.S. Census
Shipping dislocated

CONTAINER TEU VOLUMES, U.S. PORTS

TEU, Billions, 12 Months Trailing

GLOBAL SCHEDULE RELIABILITY (NOVEMBER)

1. Sources: Port Volumes (variety of sources), Prologis Research
2. Source: Sea-Intelligence, GLP report issue 124
Surging activity in U.S. warehouses

PROLOGIS IBI ACTIVITY INDEX
50=neutral, 3-month moving average, SA

Sources: Prologis Research
Utilization rate slowly increasing
Above-average reading suggests little “shadow space”
Extreme Labor Scarcity

Sources: FRED, BLS.
Persistent disruption
Climate-related disruptions growing bigger, more frequent

MAJOR WEATHER DISASTERS BY DECADE, U.S.
(# of disasters with >$1B damage, inflation-adjusted 2021 dollars)

Note: 2021 projection straight-lined based on decade-to-date data as of September 2021
Labor scarcity a long-term trend

RATIO, LABOR FORCE TO POPULATION

Note: Mature Consumer Economies includes U.S., Eurozone, and Japan; Rising Production Economies includes Mexico, Brazil, Vietnam, Indonesia and India
Source: Oxford Economics, Prologis Research
Geopolitical risk climbing

GEOPOLITICAL RISK INDEX BY DECADE
(Average from 2000-2009=100)

Challenges and the space shortage
Record demand for logistics space

![Net Absorption, Global](chart)

Source: CBRE, CBRE-EA, JLL, Colliers, CoStar, Gerald Eve, C&W and Fraunhofer

Over 60% year-over-year growth in 2021
Record-setting scarcity of space

1. Source: CBRE, CBRE-EA, Colliers, JLL, Cushman and Wakefield, Prologis Research (forecast)
Shortage even more extreme in major trade gateways

LOGISTICS VACANCY RATE BY CONNECTION TO MAJOR SEAPORT, GLOBAL

(%)
Rents rising in response

MARKET RENT, U.S.

$, net effective rent

1. Source: Prologis Research
Build costs growing quickly

REPLACEMENT COST, U.S.\textsuperscript{1,2}

\textit{$/SF}

CONSTRUCTION TIME, U.S.\textsuperscript{3}

\textit{Months}

1. Source: Prologis Research estimates based upon Turner Construction, Engineering News Record, Prologis Research
2. Note: Inflation-adjusted is in 1998 dollars
3. Time between ground-breaking and delivery

\textbf{CHALLENGES AND THE SPACE SHORTAGE}

\textbf{Replacing costs growing quickly}

\textbf{CONSTRUCTION TIME, U.S.}

\textbf{Nominal}

\textbf{Inflation adjusted}

>25\% in 2020 and 2021
### Doubling of Replacement Costs

#### Inland Empire

<table>
<thead>
<tr>
<th>Year</th>
<th>Land</th>
<th>Hard Costs</th>
<th>Soft Costs</th>
<th>Finance + Leasing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>$60</td>
<td>$50</td>
<td>$11</td>
<td>$20</td>
<td>$141</td>
</tr>
<tr>
<td>2022</td>
<td>$205</td>
<td>$85</td>
<td>$15</td>
<td>$25</td>
<td>$330</td>
</tr>
</tbody>
</table>

#### Dallas

<table>
<thead>
<tr>
<th>Year</th>
<th>Land</th>
<th>Hard Costs</th>
<th>Soft Costs</th>
<th>Finance + Leasing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>$18</td>
<td>$55</td>
<td>$7</td>
<td>$9</td>
<td>$89</td>
</tr>
<tr>
<td>2022</td>
<td>$57</td>
<td>$69</td>
<td>$9</td>
<td>$11</td>
<td>$146</td>
</tr>
</tbody>
</table>
Fewer permits issued for logistics around the world

LOGISTICS BUILDING PERMITS IN THE NETHERLANDS

Count

Source: Dutch Bureau of Statistics
Environmental regulations add to operational complexity

ENvironmental Traffic Zones in Select European markets
% access to city center for low-emission vehicles only

- **Summer 2015**
  - No environmental zone: 80%
  - Low-emission zone: 20%

- **Summer 2020**
  - Low-emission zone: 60%

Note: Includes all Prologis EU markets
Source: European Commission, Urban Access Regulations, Prologis Research
The value of place and the future of logistics real estate
## Tracking e-commerce growth

Higher online revenues, new product categories will drive growth in #3-5

<table>
<thead>
<tr>
<th>5 MODELS</th>
<th>URGENCY</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Centralized e-fulfilment</strong></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Leverages other networks</td>
<td></td>
<td>H&amp;M</td>
</tr>
<tr>
<td>2. <strong>Bi-coastal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spaced-out multi-market distribution</td>
<td></td>
<td>Blue Apron</td>
</tr>
<tr>
<td>3. <strong>Key markets – National</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local presence, ability to serve region</td>
<td></td>
<td>Wayfair</td>
</tr>
<tr>
<td>4. <strong>Omni-channel positioning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategies 1-3 plus fulfilment from store</td>
<td></td>
<td>Home Depot</td>
</tr>
<tr>
<td>5. <strong>Built-out local network</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Localized e-fulfilment presence</td>
<td></td>
<td>Amazon</td>
</tr>
</tbody>
</table>

Source: company filings, Prologis Research
## Tracking e-commerce growth

Higher online revenues, new product categories will drive growth in #3-5

<table>
<thead>
<tr>
<th>5 MODELS</th>
<th>URGENCY</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Centralized e-fulfilment</strong></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Leverages other networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. <strong>Bi-coastal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spaced-out multi-market distribution</td>
<td></td>
<td>H&amp;M</td>
</tr>
<tr>
<td>3. <strong>Key markets – National</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local presence, ability to serve region</td>
<td></td>
<td>John Lewis</td>
</tr>
<tr>
<td>4. <strong>Omni-channel positioning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategies 1-3 plus fulfilment from store</td>
<td></td>
<td>Tesco</td>
</tr>
<tr>
<td>5. <strong>Built-out local network</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Localized e-fulfilment presence</td>
<td></td>
<td>Amazon</td>
</tr>
</tbody>
</table>

Source: company filings, Gerald Eve, Prologis Research
Logistics networks, including urban fulfillment centers, can reduce transportation-related emissions by **50%**

**TRANSPORT-ONLY EMISSIONS, LOGISTICS NETWORKS INCLUDING URBAN FULFILLMENT CENTERS VS. E-COMMERCE, BASE CASE**

kgCO₂ / item

Source: MIT, Prologis Research
Increasing value of infill locations

RENTAL RATE PREMIUM, INTRA-CITY DIFFERENCES
distance to city center (horizontal axis) vs. Rental rates indexed to 50 miles from city center (vertical axis)

Demand for infill space clearly reflected in pricing power
Top infill locations experience rents of 2-3x higher than those in peripheral locations

Source: Prologis Research
Note: Prologis’ infill premium is defined as the market rental rate in the given submarket divided by the median market rental rate for the entire market. Includes the market rents at the submarket level of seven major consumption markets as of Q1 2020
Segmented footprint limits supply chain disruption risks and decentralization

SUPPLY CHAIN STRATEGIES¹

- Agile & flexible
- Efficient & lowest costs
- Fast & continuous renewal
- Other

FUTURE SUPPLY CHAIN NETWORKS

* Segmented footprint limits supply chain disruption risks
* Decentralization

1. BCI Global, Prologis Research
Key sustainable building design features

Low-emission, energy-efficient HVAC
Reduces output when building is unoccupied.

Cool roofs
Reflect sunlight and repel heat, lowering indoor air temperature.

High-efficiency roofing and wall materials
Optimize interior temperatures.

20-30% regionally sourced building materials
Reduce transportation emissions and boost local economies. Use of bio based, circular building materials.

Solar panels
Turns rooftops into sources of clean energy.

Skylights
Reduce daytime electricity use.

Real-time energy monitoring
Informs employees and create awareness.

Solar panels
Turns rooftops into sources of clean energy.

LED lighting with dynamic controls
Improves illumination and reduces energy costs.

Energy-saving mode of dock equipment
Preserves energy when not in use.

Dock levers with gap sealing and dock shelters with bottom cushion
Seals interior to the elements.

Alternative transportation options
Public transport, shuttles, bicycle rental and car sharing.

Drought-tolerant plants and rainwater collection
Decrease water usage, reproduce local ecosystems and support biodiversity with insect hotels, bird houses, edible trees and greenery.

Secured bicycle shed with E-bike charging

Carpool/car-sharing dedicated parking spots

Electric car (EV) charging stations and dedicated car sharing parking spots
Reduce emissions for daily commuters.

Low-emitting paint, sealants and insulation
Lowers environmental impact in comparison to conventional paint products.

Areas for storage and collection of recyclables
Minimize environmental impact.

$ = Direct occupational cost savings
Wrap-up

Unique opportunity to collaborate on solutions among a broad group of stakeholders

We are a pivotal moment for supply chains.

Actions taken today will make supply chains more resilient in the face of persistent disruption.

Challenges to development have led to a space shortage, particularly in the largest consumption centers and global freight gateways.

Tomorrow’s supply chains will need to be more decentralized, closer to consumers and labor, more flexible and more sustainable.

Therefore, the future of logistics real estate is urban.

And the time has never been better to leverage data, technology, and development economics to seek solutions that can benefit all who rely on supply chains to facilitate modern life.