



Impacts of E-Commerce

February 2024

Local Context and Assessment

DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION



The Delaware Valley Regional Planning Commission

is the federally designated Metropolitan Planning Organization for the Greater Philadelphia region, established by an Interstate Compact between the Commonwealth of Pennsylvania and the State of New Jersey. Members include Bucks, Chester, Delaware, Montgomery, and Philadelphia counties, plus the City of Chester, in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties, plus the cities of Camden and Trenton, in New Jersey.

DVRPC serves strictly as an advisory agency. Any planning or design concepts as prepared by DVRPC are conceptual and may require engineering design and feasibility analysis. Actual authority for carrying out any planning proposals rest solely with the governing bodies of the states, local governments or authorities that have the primary responsibility to own, manage or maintain any transportation facility.



DVRPC's vision for the Greater Philadelphia Region is a prosperous, innovative, equitable, resilient, and sustainable region that increases mobility choices by investing in a safe and modern transportation system; that protects and preserves our natural resources while creating healthy communities; and that fosters greater opportunities for all.

DVRPC's mission is to achieve this vision by convening the widest array of partners to inform and facilitate data-driven decision-making. We are engaged across the region, and strive to be leaders and innovators, exploring new ideas and creating best practices.

TITLE VI COMPLIANCE | DVRPC fully complies with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Executive Order 12898 on Environmental Justice, and related nondiscrimination mandates in all programs and activities. DVRPC's website, www.dvrpc.org, may be translated into multiple languages. Publications and other public documents can usually be made available in alternative languages and formats, if requested. DVRPC's public meetings are always held in ADA-accessible facilities, and held in transit-accessible locations whenever possible. Translation, interpretation, or other auxiliary services can be provided to individuals who submit a request at least seven days prior to a public meeting. Translation and interpretation services for DVRPC's projects, products, and planning processes are available, generally free of charge, by calling (215) 592-1800. All requests will be accommodated to the greatest extent possible. Any person who believes they have been aggrieved by an unlawful discriminatory practice by DVRPC under Title VI has a right to file a formal complaint. Any such complaint must be in writing and filed with DVRPC's Title VI Compliance Manager and/or the appropriate state or federal agency within 180 days of the alleged discriminatory occurrence. For more information on DVRPC's Title VI program or to obtain a Title VI Complaint Form, please visit: www.dvrpc.org/GetInvolved/TitleVI, call (215) 592-1800, or email public_affairs@dvrpc.org.

DVRPC is funded through a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for the findings and conclusions herein, which may not represent the official views or policies of the funding agencies.

Table of Contents

Introduction..... 1

Changing Supply Chain..... 3

Forces Driving E-Commerce Warehouse Development..... 5

Shifts in Warehouse Typologies..... 11

Assessing Local Impact..... 15

Managing Local Impact..... 20

Conclusion..... 25

FIGURES

Figure 1: Diagram of E-Commerce Supply Chain Model..... 4

Figure 2: Industrial Warehouse Development Since 2012..... 5

Figure 3: E-Commerce as a Percent of Total Retail Spending..... 6

Figure 4: Consumer Desired Delivery Speed..... 7

Figure 5: Industrial Vacancy Rates..... 8

TABLES

Table 1: Warehouse Typologies..... 13



Introduction

The growth in e-commerce has disrupted the traditional supply chain of consumer goods. For the past two decades consumer spending habits have increasingly trended toward online purchasing, with the online retail market comprising 14.6 percent of all U.S. retail spending in 2022.¹ The COVID-19 pandemic accelerated this trend as consumers turned to alternative delivery methods for everyday goods and groceries and even large furniture and home improvement supplies. Major retailers responded to this demand with increased options for deliveries to homes and expanded capacity for curbside pickup.

This growth has had significant impacts on industrial warehousing and will continue to impact economic activity, land use, and the transportation network in our region.

It's challenging to say how far these trends may continue, but they will certainly have lasting impacts. As consumer patterns settle into a new framework, it appears that online retail is here to stay, with real estate firm CBRE projecting that global e-commerce will be 26 percent of all U.S. retail sales by 2025.²

This report provides a detailed explanation of the growing e-commerce supply chain. In addition, it discusses the specific conditions that e-commerce operators look for when siting new facilities. Lastly, the report outlines the issues that municipalities can consider when assessing new development, as well as strategies for mitigating common concerns.

The goals for this report are to improve the awareness around the forces in e-commerce that are driving shifts in regional industrial development; deliver relevant, actionable information on the characteristics of new development and impacts to be considered; and provide resources and strategies to address new development patterns and impacts of e-commerce.

What is E-Commerce?

With its common use and many meanings in everyday conversation, you might find yourself asking, "What is e-commerce?" The term e-commerce, short for electronic commerce, broadly refers to the buying and selling of goods and services over the internet. While e-commerce sales can be between a variety of sellers and consumers, for the purposes of this report we are primarily focusing on e-commerce transactions that are from business to consumer. How those orders are fulfilled and the types of goods that are sold, however, still vary greatly. You might imagine a package being delivered to your doorstep as the end point of an e-commerce transaction, but today the term can be used to represent a much more diverse set of goods and movements. It may incorporate large or oversized items such as furniture or appliances. It may be a grocery delivery with multiple bags being delivered by a personal vehicle. It might be an item purchased online and picked up in-store, or brought to your vehicle for curbside delivery.

Many retailers utilize omnichannel (see common terms section) fulfillment that offer options beyond the more traditional e-commerce model of buy online for shipment to your home. Some of these options are:

- Buy in-store for shipment to your home
- Buy online for in-store pick up
- Buy online for curbside delivery
- Purchase through a website, phone application, or third party
- Fulfillment from a warehouse or retail store location shipped to your home

The options available to maximize delivery efficiency have changed supply chains.

¹"Quarterly Retail E-Commerce Sales" (U.S. Census Bureau, 2023), U.S. Department of Commerce, https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf.

²"Global E-Commerce Outlook 2021," CBRE, 2021, <https://www.cbre.com/-/media/project/cbre/shared-site/insights/reports/global-e-commerce-outlook-2021/cbre-global-e-commerce-outlook-2021.pdf>.

Common Terms

Automated Fulfillment: The implementation of technology and resources to automatically manage the fulfillment process.

Break Bulk: Cargo that does not fit in a standard shipping container or cargo bin.

Clear Height: Usable height to which a warehouse tenant can store product on racks.

Cross-Docking: Products from a supplier or manufacturer are distributed directly to customer or retail chain with little handling and no storage time.

Distribution: Spreading product through market or to destination.

Distribution Center: A warehouse or other specialized building stocked with products to be redistributed to retailers, wholesalers, or directly to consumers. Usually has a stronger emphasis on distributing to retail functions rather than final consumers.

E-Commerce: Commercial transactions conducted electronically. Includes but not limited to grocery, clothing, pet supplies, furniture, large appliances, electronics, toys.

Fulfillment: Process of receiving, packaging, and shipping orders for goods.

Last-Mile: The last leg of a journey from a transportation hub to final destination.

Less-Than-Truckload (LTL): Transportation of products or goods that are too large for the post office but too small for an entire truck. May be packaged with other shipments on a single truck, including those of multiple shippers.

Market: A segment of the global retail industry. Can be considered at the national, state, MSA, or city level, depending on the scale of operations. In the DVRPC region, Philadelphia is the primary market.

Micro-Fulfillment Center: Small, often highly automated, aimed at ship-from-store and local pickup orders within a zip code.

Omnichannel: A marketing and business term that primarily refers to keeping customer experience seamless regardless of device used to access a website, and to making the process of placing e-commerce orders as easy as in-store purchases.

Pick-and-Pack: Selecting a customer's orders and placing them directly into a shipping box.

Reverse Logistics: Colloquially, returns. All operations related to the reuse of products and materials.

Sortation: Separating and routing items — such as parcels, boxes, parts, SKUs — within a facility, merging and conveying products to their specific destination.

Third-Party Logistics (3PL): The outsourcing of e-commerce logistics to a third-party company. Many small and mid-size e-commerce retailers make use of 3PL companies.

Changing Supply Chain

While one or two distribution centers between major metropolitan markets may have been sufficient for retailers in the past, current supply chain trends require fulfillment centers for each metropolitan market with smaller sortation centers and last mile delivery centers needed to achieve same- and next-day deliveries to consumers.

In the DVRPC region, there are two metropolitan market areas — one centered around Philadelphia and the other around Trenton. For some logistics models, each of these markets require several fulfillment centers to achieve the same- and next-day delivery that is becoming standard.

The demand for quicker deliveries is not the only factor driving the expansion of supply chains. The e-commerce supply chain also needs to be able to handle more reverse logistics as the number of

returns by mail have also increased. In the U.S., 21 percent of all online retail purchases were returned in 2021, up from 10 percent of purchases at the beginning of 2019.³ The need for shorter turnaround times between order and delivery is also diversifying supply chain models, particularly among major brick-and-mortar retailers that also provide groceries.



³ "A Tidal Wave of Returns Hits the E-Commerce Industry," The Economist, April 25, 2022, www.economist.com/business/2022/08/25/a-tidal-wave-of-returns-hits-the-e-commerce-industry.

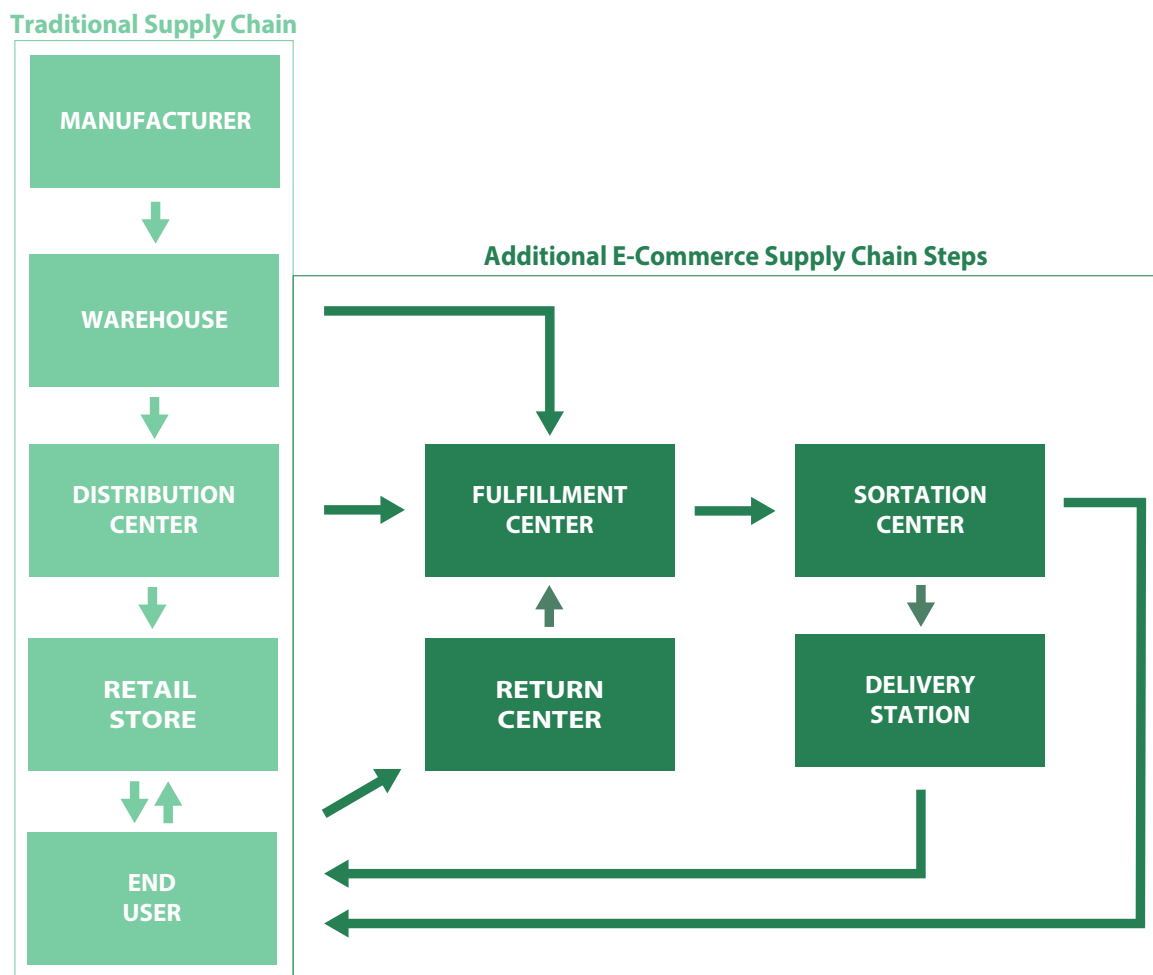
Traditional Supply Chain

In a traditional supply chain, manufacturers produce products in factories or other manufacturing facilities, which are then delivered to large, strategically-located distribution centers. These goods may be moved by truck, rail, ship, or plane. Distribution centers then distribute products to retail stores using tractor-trailer or box trucks, depending on the size of the retail store. End consumers use private vehicles, public transportation, or active modes of transportation to go to retail stores, purchase products, and return to their homes.

E-Commerce Supply Chain

In the modern e-commerce supply chain (Figure 1), manufacturers still deliver products to strategically-located distribution centers to fill brick-and-mortar stores. However, end consumers are also making online purchases through e-commerce retail websites. E-commerce retailers provide online purchase orders to a large, strategically-located fulfillment center. Fulfillment centers pick and pack online purchase orders, then deliver them to end consumers' homes via delivery vans. Fulfillment centers may also deliver packed goods to sortation centers and last-mile delivery stations as intermediate steps that optimize package delivery to local customers. Distribution, fulfillment, sortation, delivery station, and return center space needs are driving significant demand for warehouse space.

Figure 1: Diagram of E-Commerce Supply Chain Model



Source: DVRPC (2023)

Forces Driving E-Commerce Warehouse Development

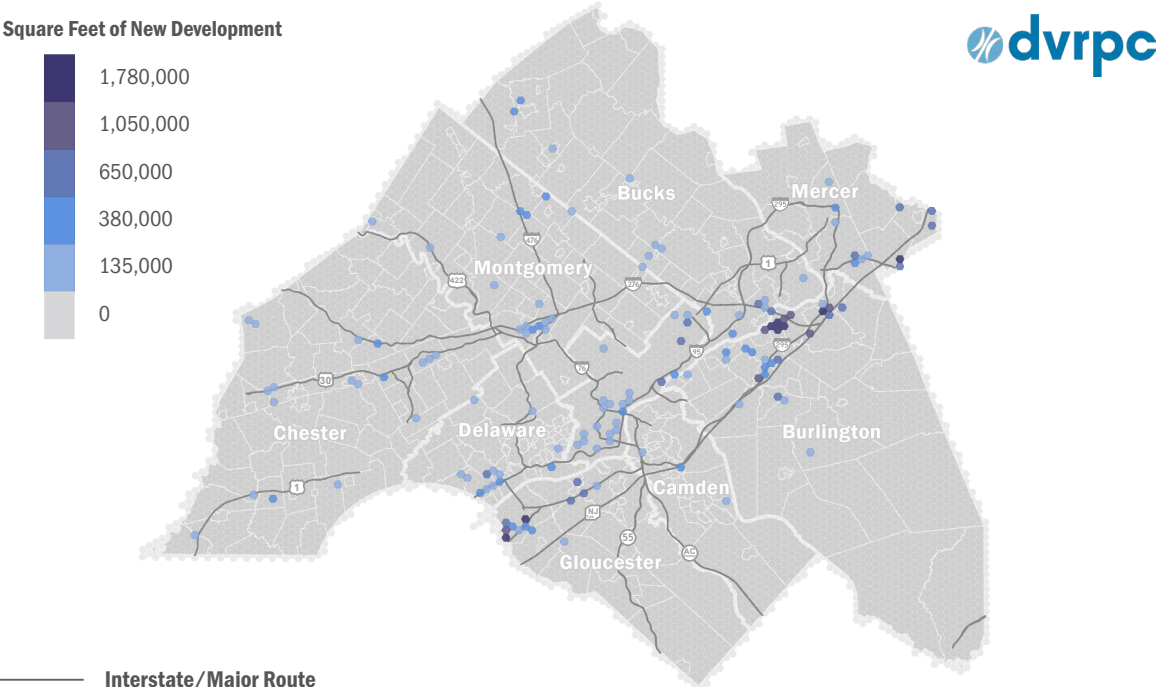
The main forces driving e-commerce warehouse siting are consumer needs, proximity to ample workforce, existing supply of space, and proximity to infrastructure. There are various parts of the DVRPC region that are well-suited for new warehouse locations based on these criteria. In addition, our location within the center of the northeast megalopolis makes our region a natural fit for distribution centers that are looking to be within a day’s drive of some of the largest markets in the United States and Canada.

DVRPC Region Development Trends

As supply chains have become more complex in order to optimize efficiency, warehouse development patterns have shifted to accommodate a wider variety of warehouse centers and an overall growth in the demand for warehouse space. Figure 2 shows the significant amount of new warehouse construction that has taken place across the DVRPC region over the last ten years, bringing the total square feet of logistics and flex space development to approximately 474 million square feet (MSF) in 2023, according to CoStar. Greater concentrations of new development

can be seen in areas with direct highway access, especially in locations with access at multiple points, such as in Burlington County along I-295 and the New Jersey Turnpike. Other areas of concentration can be seen in Delaware County along I-95, in Montgomery County between I-276 and I-476, and along I-295 in Gloucester County. Due to the desire to be closer to population centers, a number of new developments have also been built in denser urban areas as well as on undeveloped tracts of land further in the periphery of the region.

Figure 2: Industrial Warehouse Development Since 2012



Five factors have been identified as driving these changes in development patterns. They are consumer adoption of e-commerce, consumer desire for increased delivery speeds, need for proximity to a dense workforce, low existing industrial building supply, and access to supporting infrastructure.

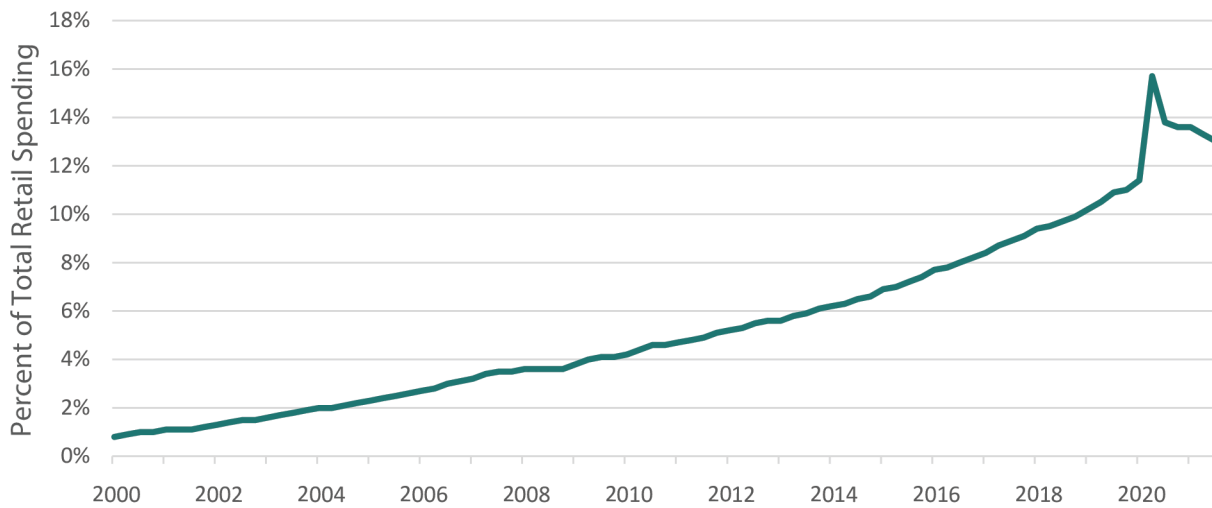


1. Consumer Adoption of E-Commerce

E-commerce has been expanding nationally at a steady pace since 2000. A faster increase was observed during the COVID-19 pandemic in 2020 (Figure 3), but has since returned to the historic trendline. As consumer adoption of e-commerce increases and more goods are being shipped that were previously purchased in stores, the demand for warehouses in the region has also increased.

New consumer habits are also driving the need for an increase in the amount of industrial space geared toward distribution. The growth in product returns has necessitated the creation of dedicated centers that serve this aspect of the e-commerce supply chain. Also, demand for next or same-day delivery has required the integration of smaller local centers that complete the last few miles of the delivery.

Figure 3: E-Commerce as a Percent of Total Retail Spending



Source: U.S. Census Bureau, Quarterly Retail E-Commerce Sales

2. Consumer Desire for Speedy Delivery

Not only has the demand for e-commerce increased, but so has consumer desire for faster and faster deliveries. A 2019 survey by Deloitte⁴ showed that speed and cost are the most important factors for consumers deciding to order online, and 50 percent of customers were unwilling to wait more than four days for e-commerce delivery (Figure 4). This desire for faster deliveries requires goods to be located closer to the end user and drives warehouses to the region to serve the local customer base.



Figure 4: Consumer Desired Delivery Speed



Source: Deloitte, 2019 Holiday Survey of Consumers



67% OF SHOPPERS WHO OPT FOR FAST OVER FREE SHIPPING WANT DELIVERY IN LESS THAN 2 DAYS

Source: Deloitte, 2019 Holiday Survey of Consumers

⁴ rep., 2019 Holiday Survey of Consumers (Deloitte, 2019), www2.deloitte.com/content/dam/Deloitte/sv/Documents/consumer-business/2019-holiday-survey.pdf.

3. Proximity to Dense Workforce

E-commerce facilities require a larger workforce than traditional warehouses and also have a higher personnel turnover rate than traditional retail. To staff the growing amount of warehouse space, warehouses benefit from being near a population center and having access to a large workforce. While the space needs of larger warehouses might push them away from dense city centers, workforce needs make it beneficial for these facilities to be located close to populations that can fulfill these jobs.



16.4 MSF OF NEW INDUSTRIAL SPACE UNDER CONSTRUCTION IN THE DVRPC REGION

Source: Colliers (2022)

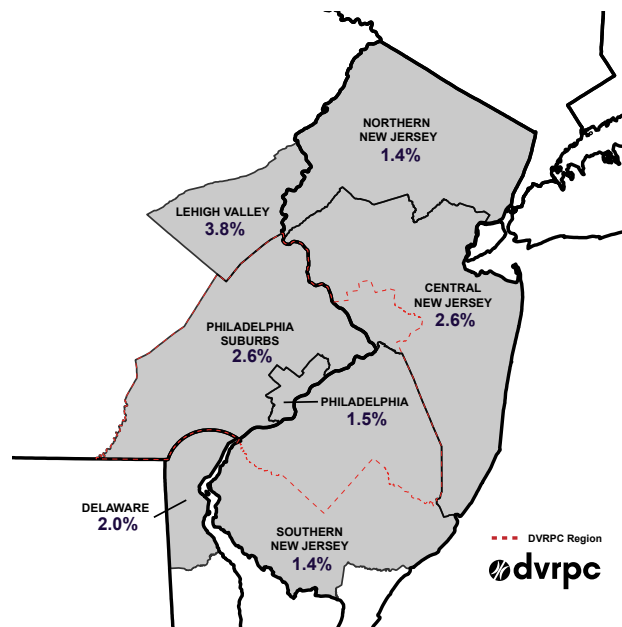


4. Existing Industrial Supply

There is a higher demand for industrial space in our region than there is space available. As a result, e-commerce is displacing lower priority uses — businesses that don't have to be close to population centers are moving away. Some examples of lower priority uses that are moving further away from population centers are long-term storage of goods and smaller, low-value manufacturers.

Industrial vacancy rates hit historic lows across the country last year, bottoming out at 1.5 percent in some submarkets in the DVRPC region, and are still below 4 percent in the extended Philadelphia submarket, which includes all of New Jersey, New Castle County in Delaware, and the Lehigh Valley (Figure 5). The markets closer to New York have less available industrial space, which is driving leasing and development toward the Philadelphia region.

Figure 5: Industrial Vacancy Rates by JLL Submarket



Source: JLL Industrial Insight Reports, Q4 2022

5. Proximity to Infrastructure

Warehouses need supporting infrastructure in order to operate effectively. Generally, warehouse development moves toward this region because it has access to international maritime and air gateways as well as to Philadelphia, New York, and Washington, DC consumers.

Developers are also looking for sites that already have highway access for trucks, utility access to support their development and future vehicle fueling, and transportation infrastructure that allows employees to get to the facility. Adding this supporting infrastructure is costly if it is not already in place.

Toward the Region

- Access to International Maritime Gateways
- Access to International Air Gateways
- Access to Philadelphia, New York, and Washington, DC consumers

Toward Specific Sites

- Highway Access
- Utility Access
- Workforce Access



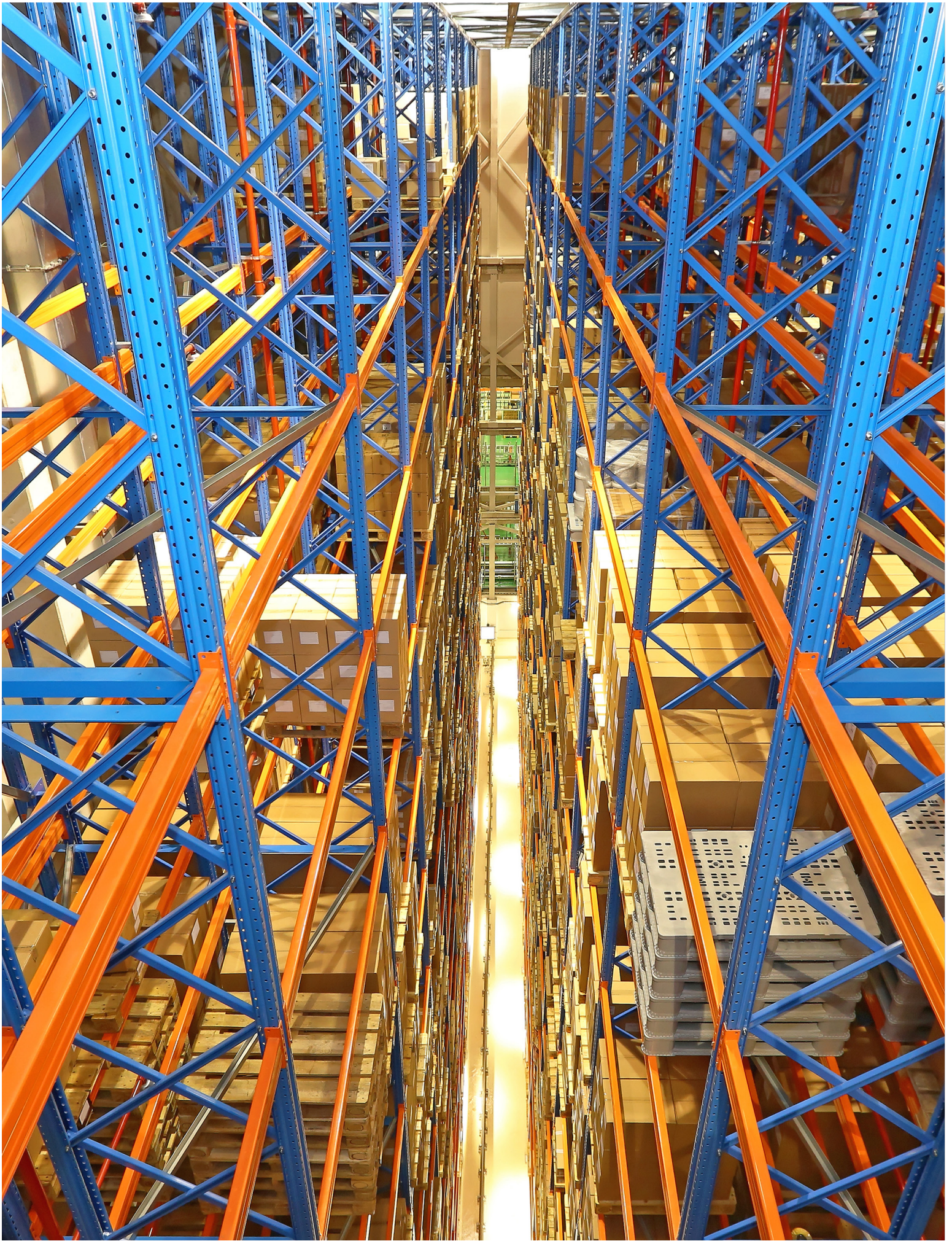
I-476's Lansdale/Exit 31 opening has spurred further warehouse growth in Hatfield Township, Montgomery County.

Source: Nearmap (2023)



INDUSTRIAL VACANCY RATE AT HISTORIC LOW OF 4.4% IN DVRPC REGION

Source: CoStar (2022)



Shifts in Warehouse Typologies

The shift in supply chain patterns and expansion of facilities needed to meet consumer demands has come with a change in warehouse typologies. The term warehouse is no longer synonymous with a single industrial building type; instead, a diverse set of building types has emerged.

General trends seen in warehouse development:

- **Larger building footprints.** Nationally, warehouses constructed since 2000 are 55 percent larger and sit on 66 percent more land than facilities of the 1990s, with average warehouse size increasing by 30 percent from 2017 to 2019. In spaces greater than 100,000 square feet, e-commerce was 30 percent of new industrial leasing.⁵
- **Increased parking capacity.** Facilities optimized for e-commerce need more parking to accommodate the increase in labor needed to staff facilities due to higher volumes and quicker turnover of goods. E-commerce distribution facilities average one employee for every 700-1,000 square feet, compared to traditional warehouses with an average of one employee for every 1,500-3,000 square feet.⁶
- **Taller ceiling heights.** 30 to 40-foot clear heights to fit modern equipment.
- **More dock doors.** Maximizing the number of dock doors facilitates the higher turnover of goods and increased truck trips to warehouses.
- **Increased power access and ventilation.** E-commerce facilities utilize more automated fulfillment technology than traditional logistics facilities, driving the increased need for power in e-commerce facilities. Previously, climate control was not a standard feature due to the size of buildings involved in distribution centers.⁷

There are multiple industry definitions used to characterize warehouses and their activity. DVRPC has identified the typologies below as distinctly different warehouses seen in the e-commerce supply chain. Table 1 summarizes the estimated characteristics used to define these building types.

Distribution Centers

Distribution centers, sometimes known as break-bulk facilities, are often where large quantities of goods are sent before being broken down into smaller pallets for transport to regional locations or fulfillment centers. These facilities typically distribute products to fulfillment centers or retail stores using tractor-trailers or box trucks.

Fulfillment Center (Sortable)

Parcel fulfillment centers, or sortable fulfillment centers, are locations where an inventory of goods is held before delivery to a customer. Often these facilities are run by Third-Party Logistics (3PL) operators that handle all of the inventory tracking, operations, and even customer service for their client businesses. Given the need to process a large variety and bulk of merchandise, sortable fulfillment centers are usually driven by the price of real estate and availability of large parcels of contiguous land rather than by proximity to customers.

Fulfillment Center (Non-Sortable)

Non-sortable fulfillment centers are similar to sortable fulfillment centers except they cater to less-than-truckload (LTL) need and handle bulky, oversized

⁵ rep., Logistics Real Estate: The Forces Governing Supply (Prologis, June 2021), <https://prologis.getbynder.com/m/756eecd27842d97/original/Logistics-Real-Estate-The-Forces-Governing-Supply.pdf>.

⁶ rep., Philadelphia Delivers (Philadelphia Industrial Development Corporation, 2018)

⁷ "Warehouse/DC Site Selection: Demand for Space Has Never Been Stronger," Logistics Management, July 10, 2019, https://www.logisticsmgmt.com/article/warehouse_dc_site_selection_demand_for_space_has_never_been_stronger.

items such as furniture, equipment, and rugs. These facilities are often run by 3PL operators and store inventory for associates to pick-and-pack for shipment to customers. These facilities may be less automated than sortable fulfillment centers due to the size of goods they are handling and require more employees per item. They may also require a larger footprint to handle the storage and packing of larger goods. Site selection of non-sortable fulfillment centers is driven primarily by size of land parcels and real estate cost.

Sortation Center

Sortation centers primarily serve to consolidate and deliver goods to individual customers by transferring parcels from tractor-trailers to delivery vans for their final destination. They rely on cross-docking for their functionality, necessitating a large number of truck docks. This also requires larger truck aprons, which makes lower-cost real estate in areas where larger parcels are available desirable. Site selection of sortation centers is driven primarily by proximity to customers and cross-docking capabilities.

Delivery Station

Delivery stations, or last-mile delivery stations, are facilities where goods collected from fulfillment centers and sortation centers are prepared for last-mile delivery to customers. Goods are usually packed on delivery vans for distribution within a narrow radius to maximize travel time efficiency. Site selection is based on proximity to customers and size of customer base.

Micro-fulfillment Center

Micro-fulfillment sites are usually aimed at enabling same-day or next-day delivery, using heavy automation. These sites need strong power availability and high ceilings for the use of automated picking systems, but the strongest driver is the speed with which parcels can be shipped out and brought to the customer. Micro-fulfillment center developers look for proximity to the largest number of doors possible within one-hour's drive at peak traffic, regardless of the quality or size of the location available.

High Cube Warehouse

High cube warehouses are another type of large distribution facility characterized by ceiling heights above 24 feet, the incorporation of automation, and a smaller workforce. High cube warehouses have begun to be proposed in neighboring regions, such as the Lehigh Valley, and other metros across the country. These facilities utilize automated storage and retrieval systems to facilitate the movement and retrieval of goods, which in turn requires less workers. Due to their automation, they are able to create efficiencies that allow for the swifter movement of goods into and out of the facility. With this enhancement in efficiency, more trucks are able to access the facility on a daily basis. Site selection of high cube warehouses is driven primarily by land availability, real estate costs, and access to the regional transportation network.

Table 1: Warehouse Typologies

	Distribution Center	Fulfillment Center (Sortable)	Fulfillment Center (Non-Sortable)	Sortation Center	Delivery Station	Micro-Fulfillment
Function	Large orders of inventory, ships inventory to fulfillment centers	Receives orders, packages items, ships to sortation center	Bulky items, similar function as sortable fulfillment center	Sorts customer packages for delivery or delivery stations	Delivers customer packages within a short radius	Small-scale facility near consumers that serves local deliveries and pick-ups
Size ⁽¹⁾⁽²⁾ (1,000 sq. ft.)	> 500 KSF	~800 KSF	600 KSF - 1 MSF	100-500 KSF	50-300 KSF	< 10 KSF
Employees and Shifts ⁽³⁾	700/ shift, 3 shifts	1000/ shift, 2 shifts	700/ shift, 2 shifts	250/ shift, 4 shifts	200	<50
Characteristics	May be high cube, not automated, often cross-docked	May be high cube, often automated	May be high cube, not automated	Often cross-docked for loading vehicles	Can utilize traditional warehouse space	Often in existing store or warehouse, often automated
ITE Land Use Definition ⁽⁴⁾ (11th Edition)	154: Transload	155: Short-term storage/ fulfillment center	155: Short-term storage/ fulfillment center	155: Short-term storage/ fulfillment center	156: Parcel Hub	156: Parcel Hub

Source:

(1) "Our Facilities." Our Workplace. Amazon, September 21, 2020. www.aboutamazon.com/workplace/facilities.

(2) "Distribution Warehousing and Goods Movement Guidelines." NJ State Planning Commission Office of Planning Advocacy, September 7, 2022. nj.gov/state/planning/assets/pdf/warehouse-guidance.pdf.

(3) DVRPC estimation. Not to be used for design purposes.

(4) 2021. Trip Generation. 11th ed. Institute of Transportation Engineers.



Assessing Local Impact

All developments, e-commerce or otherwise, have impacts on their surrounding communities, which may be negative, positive, or a combination of both. While environmental impact assessments or traffic impact studies may help assess some of the effects of these developments, the full extent of their impacts remain unknown.

Municipal governments control land use decisions in both Pennsylvania and New Jersey. As a result, they are on the front lines of e-commerce development issues. Zoning codes and other local controls allow municipalities the opportunity to try to mitigate negative impacts arising from non-complimentary land uses, but they still often fall short in addressing the critical concerns of local community members as evidenced by increasing backlash to e-commerce facility proposals⁸. Attempts to regulate warehouse development at the state level, such as in New Jersey⁹, have been met with a lukewarm response from state lawmakers. Therefore, local decision-makers involvement early in the development process is critical to mitigate the level of friction new land uses have with existing ones.

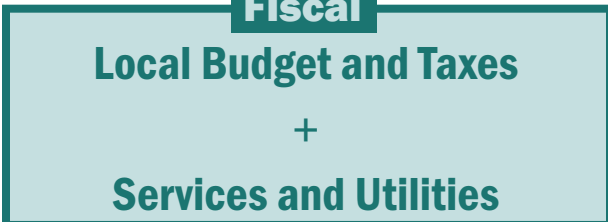
Common issues with assessing the impact of new e-commerce development are the lack of available data, cooperation of stakeholders, and municipal capacity. Municipal capacity can be a difficult challenge to overcome and it is helpful for officials to maintain good working relationships with other local stakeholders, such as school districts and utility providers. These stakeholders may be able to provide the data necessary to assess critical development impacts. For instance, utilities can provide information on the cost of providing service to existing, as well as proposed, development. Having a good working relationship with local stakeholders who can provide information may alleviate some of the burden that municipalities face when trying to devote resources to an extensive assessment of development impacts.

This section identifies eight aspects of impact, data sources available to measure impact, and strategies for assessing impacts that municipalities can use.

Impact Assessment Categories



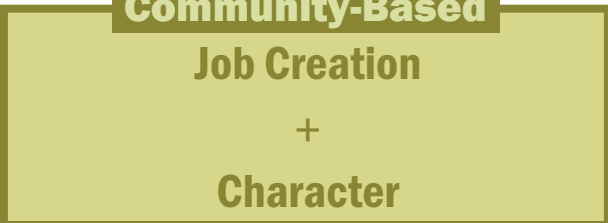
Environmental
Air Quality
+
Stormwater Runoff



Fiscal
Local Budget and Taxes
+
Services and Utilities



Transportation
Truck Parking and Fueling
+
Road Congestion and Wear



Community-Based
Job Creation
+
Character

⁸ Jan Heffer, "Near Amazon Centers in Rural Burlington County, Other Mega-Warehouse Plans Stir Fear of Rumbling Traffic," The Philadelphia Inquirer, July 21, 2018, www.inquirer.com/philly/news/new_jersey/margolis-amazon-va-florence-warehouses-mansfield-lawsuit-traffic-n-j-burlington-county-20180721.html.

⁹ Daniel Munoz, "Top New Jersey Lawmakers in No Rush to Have State Regulate 'Warehouse Sprawl,'" North Jersey Media Group, March 24, 2022, <http://www.northjersey.com/story/news/2022/03/24/nj-senate-assembly-warehouse-boom-legislation/7141395001/>.

AIR QUALITY



Air quality is a critical concern for many communities, both urban and rural, that see e-commerce development proposals. E-commerce facility impacts on air quality may result from initial construction activities, daily operations, and diesel vehicle trips generated. As a result of these impacts, residents are increasingly critical of new development proposals and often demand accountability for pollution generated by new developments.

Local decision-makers have a number of tools available to them to assess the air quality impacts of proposed development. One common way of accounting for air quality concerns is to require developers conduct an environmental impact assessment. These evaluate air quality impacts during both the construction phase and everyday operation.

Absent requiring developers to conduct an environmental impact assessment, municipalities may focus on a few key metrics, such as pollution generated by vehicle traffic during everyday operation. With the advent and steady acceleration of e-commerce activity, operational sources like trips generated are less likely to be reduced. It is important that this impact be clearly understood by local decision-makers when considering new developments. Data sources below can be used to evaluate the likely impact of new development based on the type and amount of vehicle trips generated.

Calculating the short- and long-term costs of these negative externalities will help municipalities assess the need for additional regulation to protect the residents living in the vicinity of a facility.

DATA SOURCES

- [DVRPC Traffic Count Data](#)
- [Traffic Impact Studies](#)
- [Estimated U.S. Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline and Diesel](#)
- [Heavy-Duty Truck Idle Reduction Requirement. Alternative Fuels Data Center, US Department of Energy](#)

STORMWATER RUNOFF



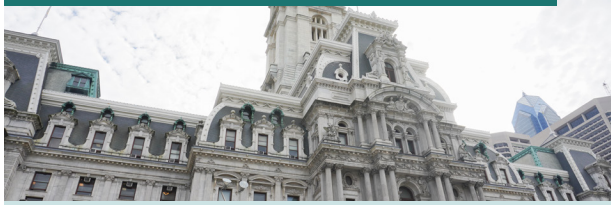
Stormwater runoff is an ever-present condition that needs to be accounted for with any new development. Large warehouse sites tend to include a significant amount of impervious surface, especially in the form of paving for truck and car parking. Projects on undeveloped land will require a host of new “grey” and “green” stormwater management tools to properly mitigate negative impacts to their neighbors. Grey stormwater infrastructure is traditional stormwater infrastructure such as pipes, ditches, swales, culverts, and retention ponds, and it is meant to slow the flow of stormwater during rain events to prevent flooding and reduce the amount of pollutants entering local waterways. Green infrastructure such as bioswales, permeable paving, and green roofs, among others, are a natural way to supplement an existing grey stormwater management system. It is important for municipalities to consider the long-term costs of an increase in stormwater runoff on their existing systems and whether or not any new development, especially large commercial developments like warehouses, will properly mitigate that increase with site-based solutions.

The Environmental Protection Agency has created a simple calculator the public can use to quantify the amount of stormwater runoff generated from a given development proposal. Specific data points — such as the amount of existing and proposed impervious surface — can be plugged into the calculator to evaluate the impacts of the site. In addition, users can add the type and coverage rate of stormwater management best practices to the tool to see their predicted effect on mitigating runoff. Local decision-makers can acquire the necessary data to evaluate stormwater runoff from the development plan set provided to the municipality by the developer.

DATA SOURCES

- [Development Plan Sets](#)
- [Local Water Authority or Municipal Engineer](#)
 - [Capacity and service cost estimates](#)
- [National Stormwater Runoff Calculator](#)

LOCAL BUDGET AND TAXES



A major concern for many residents when it comes to new e-commerce development is the effect on a municipality's fiscal well-being. Will a new development proposal add an additional financial burden by way of increased infrastructure spending, maintenance costs, service expansion, and subsidies?

Numerous states, including Pennsylvania and New Jersey, sometimes rely on economic development incentives to attract new business and stoke the growth of existing ones. Municipalities also have similar programs in order to grow their local economies. However, these types of incentives can go too far and wind up harming the limited budgets of some communities. These communities may not have properly accounted for how the financial incentives would affect the amount of tax collected or for the need for increased services for the new development.

Fiscal issues arising from large-scale e-commerce development can be anticipated and mitigated by conducting a fiscal impact analysis on new proposals. In addition, when local decision-makers consider zoning changes to allow for different types of development, they should consider the fiscal impact of multiple build-out scenarios. The data sources and attributes enumerated below are necessary for evaluating the budgetary impact of a given development proposal. It is increasingly important for municipalities to understand the fiscal impacts of new developments and to properly communicate them to the public.

DATA SOURCES

- Development Plan Sets
- Municipal Tax Code
 - Millage, incentives, impact fees
- Local Emergency Response and Utility Providers
 - Capacity and service cost estimates

SERVICES AND UTILITIES



E-commerce facilities, like any other land use, require connections to utilities and the provision of municipal services such as police, fire, and EMT. Providing utilities and services to e-commerce developments can be substantial and should be considered by municipalities before making investments in additional infrastructure.

New e-commerce developments are typically taller and larger than ones built in previous decades. This presents a number of challenges for emergency personnel when responding to a call. In rural or suburban areas, fire departments may not be equipped to service buildings this large or be able to contain fires if they spread fast. In order to provide adequate service to buildings like this, fire departments may need to acquire new vehicles and additional personnel. This can be a considerable cost, especially for a smaller or less developed municipality.

Encouraging development that utilizes existing infrastructure, such as emergency service capacity, is a key tenet of smart growth and should be employed whenever possible. In addition, municipalities should consider if their local services have the training, equipment, and personnel necessary to respond to emergencies on-site. For developments that require new or expanded utilities and services, decision-makers should consider if the capacity exists for this growth and what the fiscal impact will be if capacity needs to be added.

DATA SOURCES

- Development Plan Sets
- Local Emergency Response and Utility Providers
 - Capacity and service cost estimates

TRUCK PARKING AND FUELING



E-commerce facilities generate a significant amount of truck trips and, as a result, increase the demand for truck parking and fueling facilities. If there is not enough truck parking on site or a facility is gated with limited access, truck drivers may queue outside of the facility or search nearby streets in the community for a place to safely park their vehicle. This could lead to additional truck congestion on nearby roads.

Many municipalities in the region lack the necessary truck parking facilities to accommodate increases in truck activity generated by new e-commerce facilities. Offering a sufficient amount of parking internal to the site can help to minimize spillover into nearby communities.

In addition, trucks also need fueling locations, both diesel and electric, which could incentivize gas stations to co-locate nearby. Warehouse facilities themselves may also require additional fueling and electrical hook-ups — both for vehicles and refrigeration trailers.

All of these issues are likely to affect the behavior of freight carriers and impact nearby residents. It is critical for local decision-makers to understand the impact of increased truck activity and its ancillary needs on their communities. Utilizing development plan sets and the ITE Trip Generation Manual, decision-makers can conduct a quick analysis of the amount of truck activity to be generated by each development. This will help in assessing whether or not each development is designed with adequate parking.

DATA SOURCES

- [ITE Trip Generation Manual](#)
- Traffic Impact Studies
- Development Plan Sets

ROAD CONGESTION AND WEAR



Heavy trucks cause more wear and tear on roadways than personal vehicles do. The addition of a logistics center or warehouse could significantly increase the amount of truck traffic on local roads that might not be designed for heavy truck use. Municipalities can measure these impacts by considering what the additional truck traffic will be — compared to existing or other potential development options — and what routes vehicles are likely to take.

Another cost to consider is the wear and tear on intersection curbs and other areas where trucks might have a difficult time maneuvering. While they should not be driving out of the right-of-way, repeated truck traffic at narrow or difficult to navigate intersections might lead to additional costs for municipalities.

Congestion is another concern for municipalities and should be planned for accordingly. Various physical and policy interventions exist to mitigate congestion, such as signage, roadway design, and increased enforcement. However, most of these interventions cost money. Local decision-makers should assess these potential cost increases when considering any new development.

Data sources are available below that can help decision-makers estimate the cost of maintaining pavement in the face of increased truck traffic. Municipalities should consider these costs along with information on projected vehicle volumes provided by developers through traffic impact studies.

DATA SOURCES

- [DVRPC Traffic Count Data](#)
- Traffic Impact Studies
- [Curb Costs](#)
 - In PA, one ADA-compliant curb ramp costs \$5,500 on average
- [Guidance on Estimation of Pavement Maintenance Costs](#)

JOB CREATION



Localized job creation estimates are an important component of weighing the costs and benefits of new e-commerce space. New jobs can bring greater prosperity to an area by way of employees spending their money locally, but this incentive may be diminished in certain situations. Some municipalities require or encourage local procurement to ensure the benefits are multiplied even further.

While the facilities themselves may be large, the amount of square feet per job is often magnitudes larger than office and other commercial uses. Existing employment averages are available from the Commercial Buildings Energy Consumption Survey (CBECS) put out by the U.S. Energy Information Administration. The tables provided on the website can be broken down by a number of factors, including geographic location. This can give municipalities a more accurate view of the number of workers typically associated with e-commerce developments. When evaluating proposed developments, traffic studies may also provide decision-makers with employment estimates.

It is important for municipalities to compare the employment growth from a given project against the employment already projected for the area. This will help them maintain consistency with local planning efforts and to account for any needed changes to municipal services.

DATA SOURCES

- [Energy Information Administration \(EIA\)- About the Commercial Buildings Energy Consumption Survey \(CBECS\)](#)
 - These figures represent a nationwide sample of over 5,900 commercial buildings.
- [DVRPC Employment Projections](#)

CHARACTER



Community character can be difficult to quantify and measure, but it is often a key concern for residents when considering a potential development in their neighborhood. Many residents are able to identify specific aspects of their community that they value and therefore contribute to its sense of “character.” These aspects can be physical, environmental, or social. It is important for a municipality, based on community input, to decide which specific combination of characteristics they want to measure in order to assess the impact of a development on community character.

When evaluating e-commerce facility proposals, the most important characteristics are likely to be physical and environmental. Large distribution centers may be out of scale if placed adjacent to existing residential areas. Therefore, care should be taken when zoning for these types of uses within already developed areas. Smaller facilities may have a higher likelihood of affecting residential neighborhoods as their placement can be more decentralized if zoning allows for light industrial uses in or around existing residential and commercial zones. Traffic generation and its impacts, such as noise, can also affect community character.

Municipalities should consult with their residents on developing a set of criteria to assess impacts to community character from new development. Once a set of criteria is established, any new e-commerce development that comes before the municipality will be weighed against the concerns of local residents for neighborhood scale and quality of life.

DATA SOURCES

- Development Plan Sets
- Traffic Impact Studies

Managing Local Impact

Municipal Code

There are a number of policy strategies available to local decision-makers to allow for equitable, sustainable e-commerce development. The primary tool municipalities have for addressing development before it is proposed is the municipal code.

The zoning or subdivision and land development codes (SALDO) can set the limits necessary to protect local residents from the impacts of modern e-commerce development and the resulting truck traffic. An important question for municipalities to consider is to what degree to allow these various distribution facilities to be constructed within their jurisdiction. Providing opportunities for different land uses is advisable in order to build a diverse tax base not heavily reliant on any single use. In addition, outright bans open up municipalities to potential legal challenges from property owners seeking to develop their land.

Level of Municipal Review

Instead of permitting e-commerce logistics facilities “by right” in specific zoning districts — allowed without further restriction or special review — municipalities may choose to permit these uses by way of “conditional use” or “special exception.” These two mechanisms would only allow for the development of these facilities after meeting additional criteria and scrutiny from the municipality or zoning hearing board. This gives municipalities the ability to assess each development’s impact on the local environment, traffic, and resident quality of life as a matter of process before permitting construction.

Regional Cooperation

Multi-municipal planning agreements involve multiple municipalities collaborating to create comprehensive plans that coordinate land use, infrastructure, and transportation planning among other common concerns. For instance, a group of municipalities may designate specific areas where industrial development, such as e-commerce facilities, should be focused. This is done instead of each municipality deciding whether or not to allow this type of

development on their own and approving plans that may be in conflict with a neighboring community’s planning goals. Prohibitions on certain types of development may also open municipalities to legal challenges and the need for curative amendments.

Multi-municipal planning allows communities to plan effectively for the impacts that are felt across a wider area — not just by the host municipality but by neighboring ones as well. Neighboring municipalities often have to contend with increased truck traffic, air quality concerns, and stormwater runoff, in addition to other quality of life issues. A multi-municipal planning effort could allow for a smaller region to share the burden of planning for and dealing with new centers of e-commerce development.

Impact Fees

In the event that a new development requires investments in infrastructure to accommodate its operation, municipalities may consider adopting the use of impact fees. Impact fees are assessed during the development process and paid as a single payment. Impact fees collected by the municipality can help pay for necessary improvements in order to lessen the fiscal impact of new development on existing infrastructure and programs.

CASE STUDIES AND ADDITIONAL RESOURCES

The following municipalities have successfully enacted zoning ordinances to address expanding e-commerce facilities in their communities. These can serve as examples for municipalities looking to adopt provisions that further define different warehouse types and change them to a conditional use, even in industrial districts. In addition, the publication [“Living with Logistics: A Model Logistics Use Zoning Ordinance for Pennsylvania Municipalities.”](#) released by PennFuture in July 2023, provides a detailed primer on the use of zoning to provide for equitable and sustainable e-commerce development. The publication also provides a model ordinance and guidance on tailoring it to the needs of any municipality.

Moore Township, Northampton County, PA (Ordinance 2021-4)

This ordinance updates the definition of a warehouse to include fulfillment and logistics centers and changes the use of a warehouse from a permitted by-right use to a conditional use in the industrial district. The ordinance further outlines requirements that include an increased buffer between warehouse and residential zones with required landscape, lounges for truck drivers, and off-street parking.

North Whitehall Township, Lehigh County, PA (Ordinance 2021-4)

This ordinance amends the township zoning ordinance to include a set of revised definitions for warehouses, which now includes small warehouses less than 25,000 feet and large warehouses greater than 25,000 feet, both of which exclude trucking company terminals. The ordinance also changes the permitted use of warehouse in the commercial and industrial districts.

Site Planning

To limit sprawl and its increased costs, municipalities should encourage redevelopment and the use of existing infrastructure where possible and require site planning that is considerate of the development's context within the local built environment.

Examples of site planning interventions include, but are not limited to: adequate landscaping buffers and screening, appropriate setbacks from neighboring properties and structures, and the use of specific and contextually sensitive materials/design elements. These requirements can help soften the development's impact on neighboring uses and residents.

Providing Electric Vehicle Infrastructure

In an effort to reduce air quality concerns, municipalities may also consider requiring or incentivizing electrical hook-ups in the code as part of new e-commerce development. This can incentivize trucks to turn off engines that power truck cab heating, air conditioning, and refrigerated cargo containers. It can also support operators' fleet modernization goals by providing the enhanced infrastructure necessary to equip facilities with EV charging hookups. In addition, municipalities can require or incentivize exterior truck parking for new development gated facilities in the municipal code to ensure that trucks have a dedicated space to queue without spilling into neighboring communities.

Reducing Impact on Utilities

The adoption of rooftop solar and other sustainable practices can be encouraged by decision-makers through providing zoning bonuses or incentives. These practices can contribute to reducing the burden of new developments on local utilities. Another way to reduce the impact on local services and utilities, especially the sewer system, is to incentivize green stormwater infrastructure (GSI). This can be done by awarding stormwater credits to properties that functionally reduce the amount of impervious surface on-site through the use of GSI like underground storage and bioswales.

Emergency Planning

In preparation for an emergency, it is important for e-commerce facilities to coordinate with the local Office of Emergency Management and emergency services on a service plan. The code can require developers to work with local agencies to craft an emergency response plan.

Employee Access

Municipalities should make sure areas of employment are adequately served by more than one transportation mode, if possible. They can require or incentivize the construction of pedestrian amenities, such as sidewalks, within the municipal code.

Workforce Access

The e-commerce supply chain necessitates a wide range of unskilled and skilled labor alike. The DVRPC region contains a significant concentration of the types of labor needed to fill these positions. However, one principal concern of both employers and employees is the ability of workers to get to the facilities quickly and affordably.

While large developments such as The Bellwether District in South Philadelphia are due for construction within the densely populated core of the DVRPC region, many new distribution centers are located outside of the urban core as this is where sizable tracts of affordable land are still available for large-scale development. This complicates workforce access as it often increases the distance potential employees have to travel. One policy solution is to require large employers to incentivize transit use by allowing for commuter benefit accounts (see [Philadelphia](#)). However, public transit does not always reach these areas, so providing support for other alternatives is often necessary. The following strategies have been employed by various facilities, big and small, throughout the DVRPC region.

Carpooling

Carpooling is an often informal and affordable alternative to driving alone to work. Employers can help foster carpools by providing support in matching drivers with riders. A limitation of relying on carpools is the potential for multiple absences when the driver is unable to attend work.

Vanpooling

Similar to carpools, vanpools allow for an affordable option to those without access to a vehicle. These can be informal, but more often are formally organized services managed or contracted through the local

Transportation Management Association (TMA). TMAs are an important resource and partner when looking to organize commuting alternatives for employees. Vanpools are best in situations where a single facility needs a commute option for a smaller number of employees spread throughout the surrounding area.

Shuttle Service

A shuttle service is an option when there is a need to provide a robust alternative to a large workforce or across an entire industrial park with multiple operators. A shuttle is able to handle the demand of a site with thousands of employees and multiple shifts. Like vanpools, shuttle services can be organized with the assistance of a local TMA. Shuttle service is more expensive than vanpool service. State funding may be available to help subsidize the cost of operating a fixed-route commuter shuttle. Consulting with the TMA is the best place to start when determining what is possible.

Successful shuttle services often connect with nearby public transportation stops in order to increase their network effect. Because public transit alone might not connect to industrial employment centers, these shuttle connections allow for employees to come from farther away and be certain they will have a scheduled, reliable last-mile connection to their place of work.

THE Z-LINES – AMAZON SORTATION FACILITY SHUTTLE SERVICE

The Z-Lines are a shuttle service that provides transportation between the Matrix Business Park in Robbinsville Township and Hamilton Marketplace. Three NJ Transit bus lines connect with the shuttle at Hamilton Marketplace and provide employees access to the rest of Mercer County. This shuttle service was organized through the Greater Mercer TMA in conjunction with Amazon to primarily serve their two sortation facilities. The shuttle is free for employees.



Transportation Planning

Supply chain movements can produce a host of issues for local municipalities. Pedestrian safety and speed are often cited by residents as chief concerns when new e-commerce developments are proposed. In response, municipalities can incorporate a range of transportation planning interventions to address those concerns.

Understanding existing and potential truck activity is a critical first step in determining the interventions that are best suited for each affected area. Utilizing [DVRPC Traffic Count Data](#) and traffic impact studies provided by developers, local decision-makers can prioritize areas for intervention. In addition, they can begin to consider optimal routing for trucks in order to avoid sensitive areas like residential neighborhoods and school zones.

Truck Routing

The streets that connect e-commerce facilities to major roads are sometimes through areas that are not appropriate for heavy truck activity. School zones, main streets, and residential neighborhoods are all areas where trucks share close quarters with residents going about their daily lives. Routing trucks away from them, where viable alternatives exist, is a strategy for minimizing conflict. Therefore, municipalities seeing proposals for e-commerce facilities should consider engaging in a truck network planning process.

DVRPC's Freight Planning Program has developed a framework for truck network planning across the region. This network designation process includes the identification of multiple components that form the system through data analysis and local stakeholder input. Components of a network include regional freight corridors, primary truck routes, secondary truck routes, last-mile connectors, and truck restricted routes. A detailed breakdown of the framework can be found in Chapter 1 of the DVRPC report [Philadelphia Truck Network and Complete Streets Integration Guidebook](#). The outcome of the process is a community-driven plan that can be used to implement a wayfinding system for truck drivers and highlight areas for further transportation interventions.

Roadway Design

Once a truck network and areas for further improvement have been identified, municipalities can begin to consider the types of interventions best suited for each one. Existing choke points along designated truck routes should be prioritized for improvements that reduce conflicts with other road users. This can mean ensuring adequate turning space at critical intersections for heavy trucks, increasing the length of on-ramps, and providing wayfinding signage, among other improvements aimed at easing truck-related conflicts.

In addition to interventions aimed at truck appropriate routes, there are a number of changes that can be made to routes where trucks are less welcome and pedestrians are prioritized. Large trucks can be disincentivized from taking certain routes through the use of traffic calming techniques like constructing bump-outs, gateway medians, and signalized pedestrian crossings. In addition, providing passive speed enforcement by way of radar speed signs can help in increasing the time it takes trucks to traverse a specific route, thus making it less desirable. Implementing a combination of physical changes on both truck appropriate and truck restricted routes is recommended when trying to manage traffic-related impacts from e-commerce developments.

Conclusion

Gradual but consistent changes to the traditional supply chain model have occurred over the last two decades as e-commerce has gained popularity. While traditional retail still constitutes the majority of consumer spending, purchasers are increasingly turning to online retail to find products that are not as readily available in-store. As a result, retailers have adjusted how they do business.

Due to this shift in consumer spending habits, new methods of distribution are necessary to manage the complexities of delivering products where and how the consumer desires. In the past, goods would be produced and kept at a warehouse where they waited to be sent to a distribution facility that in turn delivered the goods to retail outlets.

Today there is a greater variety of facilities dedicated to not only moving goods to retail outlets but to consumers' homes as well. These facilities can range in size from 20,000 square feet up to over a million square feet and present numerous challenges and opportunities to the communities that house them. It is these challenges and opportunities that municipalities should seek to understand when evaluating e-commerce developments as they are proposed.

This report is meant for local decision-makers to use as a starting point in determining which factors are most important to evaluate and how to begin measuring them. As outlined in the latter half of this report, there are various aspects of these developments that municipal officials can evaluate when encountering proposals for these types of facilities. Issues regarding building size, stormwater management, air quality, local services, and economic impact are all important factors to consider, among others. If municipal officials understand these developments and their impacts, they are more likely to suggest contextually appropriate improvements and foster developer buy-in.

In addition to assessing e-commerce development impact, this report is meant to provide strategies for municipalities to employ that reduce conflict between supply chain operators and their surrounding neighbors — both before and after construction. Requiring contextual site planning, supporting a shuttle service, designating a truck network, and employing traffic calming techniques are some of the strategies highlighted to reduce conflicts.

As the region continues to attract e-commerce development, it is important that municipalities get involved in the process to effect better outcomes.

KEY TAKEAWAYS

- E-commerce spending continues to steadily grow as a share of overall retail spending.
- New types of distribution centers, of various size and scale, are being built across the region in response to increased demand for shipping and returning goods purchased online.
- Sites near major highway exits, maritime ports, airports, and potential employee concentrations are being eyed for e-commerce development.
- The changing demands are leading to bigger, busier, and more numerous warehouses, which are having impacts on the surrounding communities.
- Municipalities can enact appropriate policy to encourage developers to put forth plans that mitigate negative impacts while simultaneously planning for increased freight movement throughout their jurisdiction.

Impacts of E-Commerce

CONTEXT AND ASSESSMENT

Publication Number:

22220

Date Published:

February 2024

Geographic Area Covered:

Bucks, Burlington, Camden, Chester, Delaware, Gloucester, Mercer, Montgomery, and Philadelphia Counties

Key Words:

E-commerce, freight, transportation, supply chain, warehouse, distribution, delivery

Abstract:

The ongoing growth and evolution of retail trade has been a key trend driving freight transportation and development patterns in recent years. Acceleration of this trend, most notably during the coronavirus pandemic, has emphasized the need to better understand the local impacts of this evolving market. The Freight Program undertook this study to explore trends in e-commerce, the supporting supply chain changes, and local impacts that the region must consider to both support this important economic activity and ensure the efficiency of the transportation system that will support these new systems. This report explores strategies and considerations for accommodating new forms of distribution activity to assist the region and municipalities as they plan for new patterns of development and accommodate shifts in retail activity.

Staff Project Team:

Kristen Scudder, *Freight Program Manager*

Dan Farina Jr., AICP, *Senior Transportation Planner*

Stephanie Cavacini, *Associate Manager, Office of Creative & Print Services*

Staff Contact:

Kristen Scudder

Freight Program Manager

Phone: 215.238.2939

Email: kscudder@dvrpc.org



190 N Independence Mall West

8th Floor

Philadelphia, PA 19106-1520

215.592.1800

www.dvrpc.org



190 N Independence Mall West
8th Floor
Philadelphia, PA 19106-1520
215.592.1800
www.dvrpc.org

Connect With Us!  |  |  |  | 