

# Micro-fulfillment Centers

## The Macro Trends Behind Micro-fulfillment Centers

The rapidly evolving retail market is dictating innovative, flexible and automated approaches to e-commerce order fulfillment. To improve delivery windows and shorten the distance between distribution centers (DCs) and consumers, companies across the retail spectrum are adopting micro-fulfillment center (MFC) strategies.

### What are micro-fulfillment centers?



Highly automated, high-density, small-footprint, order fulfillment systems or structures



Installed in stand-alone facilities or in (or near) existing stores



Augment regional DC hubs and deliver robust fulfillment capabilities where they're needed most

## A perfect storm of omnichannel retail challenges

E-commerce pressures have created a perfect storm of market conditions for micro-fulfillment strategies to emerge.



### E-commerce growth

Worldwide e-commerce sales are poised to double between 2018 and 2023<sup>i</sup>.



### Rising delivery expectations

56% of consumers between the ages of 18–34 expect same-day delivery<sup>ii</sup>.



### Click-and-collect

67% of shoppers in the U.S. have used “buy online, pick up in store” (BOPIS)<sup>iii</sup>.



### Urbanization

54% of the world's population live in urban areas; this figure is expected to grow to 68% by 2050<sup>iv</sup>.



### Declining warehouse space

Industrial and logistics real estate vacancy rates remain near historic lows in 2020<sup>v</sup>.



### SKU proliferation

The seemingly limitless expansion of product varieties and diverse inventories magnify fulfillment complexities.



### Labor challenges

Nearly one-third of distribution and fulfillment (D&F) operations experience turnover rates between 25 and 100%<sup>vi</sup>.



### Online grocery

Grocers incur a loss of \$5–\$15 on every manually picked online grocery order<sup>vii</sup>.



### Fast, flexible implementation

Retailers need flexible and scalable micro-fulfillment solutions that can be implemented quickly and meet unpredictable e-commerce demands<sup>ix</sup>.

## Necessity is the mother of invention

With a micro-fulfillment strategy, retailers can expand their fulfillment capabilities by implementing high-density automation technologies in urban facilities and retail stores.

### Small physical footprint



MFCs typically occupy spaces less than 20,000 sq. ft.

### Distributed fulfillment agility



MFCs support a hub-and-spoke distribution model, with regional DCs as the hub and multiple spokes located within proximity to urban population centers.

### Flexible automation solutions



MFCs can maintain an inventory of 8,000–15,000 SKUs with the automated efficiencies to enable accurate, high-velocity fulfillment.

## Emerging micro-fulfillment technologies

Equipment manufacturers are leveraging existing automation technologies and emerging advancements to innovate new micro-fulfillment solutions.

### AS/RS goods-to-person (GTP) shuttle



Smaller-scale, automated storage and retrieval system (AS/RS) shuttles retrieve goods from one or more aisles of high-velocity inventory and deliver them directly to an operator station for picking and order consolidation. In a typical online grocery scenario, the MFC could handle 600–2,500 totes per hour.

### High-density storage



Cube-like storage structures combine robotics and AS/RS technologies to reduce storage space by up to 85%. MFCs provide fast, accurate robotic retrieval to ergonomic workstations — and can achieve up to 500 tote/bin presentations per hour at a single workstation.

### Enhanced robotic integration



For even less reliance on manual labor, both AS/RS shuttle and high-density storage systems can be equipped with mobile robots in a goods-to-robot (GTR) configuration or integrate robotic arm and artificial intelligence (AI) technologies for picking. Robotic MFC solutions are capable of processing high volumes of data for faster decision-making across a variety of process workflows.

i. <https://www.statista.com/topics/2477/online-shopping-behavior>

ii. <https://www.invespcro.com/blog/same-day-delivery>

iii. <https://www.invespcro.com/blog/buy-online-pick-up-in-store-bopis>

iv. <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>

v. <https://www.cbre.us/research-and-reports/2020-US-Real-Estate-Market-Outlook-Industrial-Logistics>

vi. <https://www.dcvelocity.com/articles/29021-nine-ways-to-boost-warehouse-performance-and-cut-turnover>

vii. <https://www.forbes.com/sites/brittainladd/2019/02/01/crossing-the-rubicon-why-2018-was-the-point-of-no-return-for-online-grocery/#45ffdba74467>

viii. <https://www.wsj.com/articles/traffic-jam-in-aisle-three-whole-foods-is-crowded-with-shoppers-filling-online-orders-11572281343>

ix. <https://www.forbes.com/sites/lanabandoim/2020/03/06/coronavirus-increases-demand-for-online-grocery-shopping-as-retailers-struggle-to-keep-up/#6503e8de761a>