

# FINAL MILE REPORT





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## What does final mile mean?

Final mile is synonymous with “last mile” and refers to the delivery of products along their last leg of transportation from a distribution hub, such as a distribution or fulfillment center, to the final destination and end user. It does not actually have to be a mile; it can range from less than a mile to up to 100 miles. Final mile can also refer to the transportation of people on their last leg of transportation, but for purposes of this report, we will solely focus on the goods transportation segment of final mile.

Last mile is primarily composed of business to consumer goods (B2C). Final-mile delivery can be separated into light goods and heavy goods.

Light goods weigh less than 150 pounds and fit within the size and weight limitations of the U.S. Postal Service and parcel carriers like DHL, FedEx and UPS. Amazon is a very important player in this segment, accounting for nearly 50% of e-commerce market share in the U.S.

Heavy goods weigh more than 150 pounds and are generally products like furniture, fitness equipment, health care equipment, office equipment, appliances, doors and windows, cabinets, televisions, and other larger-than-parcel products.

Final-mile delivery is not a new phenomenon, by any means. But in the old days, the product moved along a defined path — from the manufacturer to the retail distribution center and finally to the retail store before being purchased and ultimately delivered to the customer’s home by the store.

Now with e-commerce penetration rising, goods are increasingly purchased online and often directly shipped from the manufacturer or, if purchased from a retailer’s website, the goods are often pulled from inventory out of a warehouse or distribution center. Some big-box retailers in the U.S. are using their stores’ excess square footage as fulfillment centers of sorts, with success.

The big change in terms of final mile has come in the disintermediation of the physical retail store and the changing responsibilities for delivery, service and support from the retailer to the final-mile provider. This change has required adaptation and new skills by LTL carriers and specialized final-mile providers. Rather than trying to completely transform their historical business model, many LTL and truckload carriers are choosing to expand into final mile inorganically via acquisition.

There are two service levels associated with final mile: “ring and run” and “white glove.” Ring and run is primarily associated with the final-mile delivery of light goods



and occurs when a package is dropped on a doorstep — or at the front desk of a business — with no delivery time precisely scheduled, usually no signature required and very little service involved. For example, a ring-and-run final-mile delivery could involve your local UPS delivery person dropping an Amazon package on your doorstep, ringing the doorbell and moving on to the next stop.

Conversely, white glove means that final delivery actually takes place inside the house at a scheduled delivery time and usually involves a much greater level of service, including packing or unpacking, disassembly or installation, consumer product training and exchanges, returns, and haulaways of old products. White glove delivery requires additional skills and services from delivery personnel, such as when an individual orders a new washing machine and dryer from The Home Depot and the machines must be installed and connected to electrical or gas lines.

White glove delivery personnel are usually very professional today, often dressed head to toe in company merchandise (such as button-ups and hats) that has a neat, crisp appearance. Final-mile service offerings generally care about their image, with newer, sleeker trucks and delivery workers in pressed uniforms that represent a company's brand well. The latter is an example of changing old stereotypes such as the image of installers being dirty and unprofessional. Shippers and retailers want professional delivery personnel who foster a good customer experience, as they often serve as the face of the company.

Shippers today are increasingly adjusting and fine-tuning their final-mile strategies to respond to and accommodate consumers' ever-changing and higher-maintenance expectations for fast delivery. Consumers today often want rapid, free delivery without errors, with Amazon Prime driving much of their baseline expectations, as we will discuss later.

In short, shippers are figuring out that if they want to drive customer loyalty and repeat business, having a top-notch final-mile service offering is worth every penny of additional expense or investment required. Historically, LTL carriers have not been known for their personalized service and final-mile service providers have been able to exploit this fact to grow their market share.

Last mile, despite being a short journey, makes up a disproportionate portion of goods' total transportation cost from manufacturing to final delivery. The Bureau of Economic Analysis (BEA) reports that the last leg makes up as much as 28% of total logistics expenses. Capgemini Research Institute cites this figure as an even higher 41% of total transportation costs. Therefore, if we average these figures, it appears that about a third of total shipping cost can be attributed to last mile.



## How big is the final-mile market, and how fast is it forecast to grow over the next few years?

In our years of following and researching different industries, we have become accustomed to fairly clean and accurate industry size data due to government reporting or trade association data. However, there is very little clean data on final mile, likely partly because the category is so fragmented and many companies do not report or share data externally.

Estimates for the size of the final-mile market in the U.S. vary wildly (and we mean wildly), ranging [from \\$10 billion to over \\$400 billion](#). This is the widest range of estimates for a total addressable market (TAM) that we have ever seen. Rather than dismiss these estimates as worthless and move on, below we do our best to break down and make sense of the data and estimate the true size of the market as close as possible.

Perhaps the most important takeaway for us is that the final-mile market is large and growing, and it is going to grow rapidly and continue to get a lot bigger in the coming years.

On the low end, S.J. Consulting estimated the size of the final-mile market at \$8 billion in 2017 (keep in mind it has likely grown considerably since then). J.B. Hunt commented that just the “big and bulky” final-mile market was \$12 billion to \$14 billion in early 2019 when it acquired final-mile service provider Cory 1st Choice Home Delivery for \$100 million. And of that \$12 billion-14 billion, \$5 billion is said to derive from furniture, according to J.B. Hunt. XPO Logistics confirmed the size of the heavy-goods market at about \$13 billion in its third-quarter 2019 shareholder report. Given that this leaves out the light-goods segment of final mile, which is considerable and likely accounts for the majority of the market, the low end of estimates would initially appear to be too low. Based on this consideration, we believe that the true size of the market is probably closer to Statista’s estimate, which pegged the final-mile market in the U.S. at \$31 billion in 2018 (which would put the market size at \$35 billion-\$40 billion today given growth since).

Thus, the likely number is somewhere in the \$30 billion-\$50 billion range (and growing at a double-digit rate per annum) because the low end is too low and the high-end \$420 billion estimate is nonsensical in our view. The latter number represents the BEA’s 28% estimate of final mile’s proportion of the total \$1.5 trillion spent annually on transportation in the U.S.. That comes to \$420 billion or thereabouts. However, to put that number in context, this would mean final-mile transportation expenditures swamp the entire for-hire trucking market (of about \$360 billion in the U.S.) This is preposterous in our view, and were it true, we believe



that many publicly traded transportation companies would be focusing the majority of their efforts on this space.

One can also attempt to triangulate and back into the likely number by using the roughly \$600 billion e-commerce sales figure in the U.S. in 2019 and then assuming a material portion of that figure must be spent on final-mile transportation. Again, this exercise implies a final-mile market in the U.S. of about \$50 billion.

As far as how fast the final-mile market will grow in coming years, most estimates call for about 12% growth over the next several years and for this to continue well through 2025. Running through the math of compound growth using that figure and assuming an initial final-mile market size of \$40 billion in 2020 (the midpoint of our estimates) would suggest a final market size somewhere in the neighborhood of \$70 billion by 2025. Regarding the 12% compound annual growth rate (CAGR) that is forecast through 2025, we would note this estimate is virtually in line with the forecasts for e-commerce growth rates in the U.S. over that same time frame, which intuitively makes sense.

For further confirmation of the 12% growth rate estimate, FedEx (FDX) estimates that the number of parcels shipments should double to 100 million per day by 2026, which implies a CAGR of 10.5% for the light-goods segment of final mile (very similar to the 12% estimates above).

Given the overall transportation market in the U.S. is \$1.4 trillion and trucking alone is about \$800 billion, final mile (even at \$40 billion) remains a fast-growing, niche within transportation.

**“Most of us know all too well how frustrating it is when the delivery of an online order doesn’t meet our expectations. To combat this phenomenon, final mile providers should act as proactive consultants when setting up residential delivery programs for retailers. Partnering with the retailer to draft accurate, easy-to-understand language for their website helps to set clear expectations with consumers about shipment timeframes and white glove services. A pleased consumer is much more likely to become a loyal customer.”**

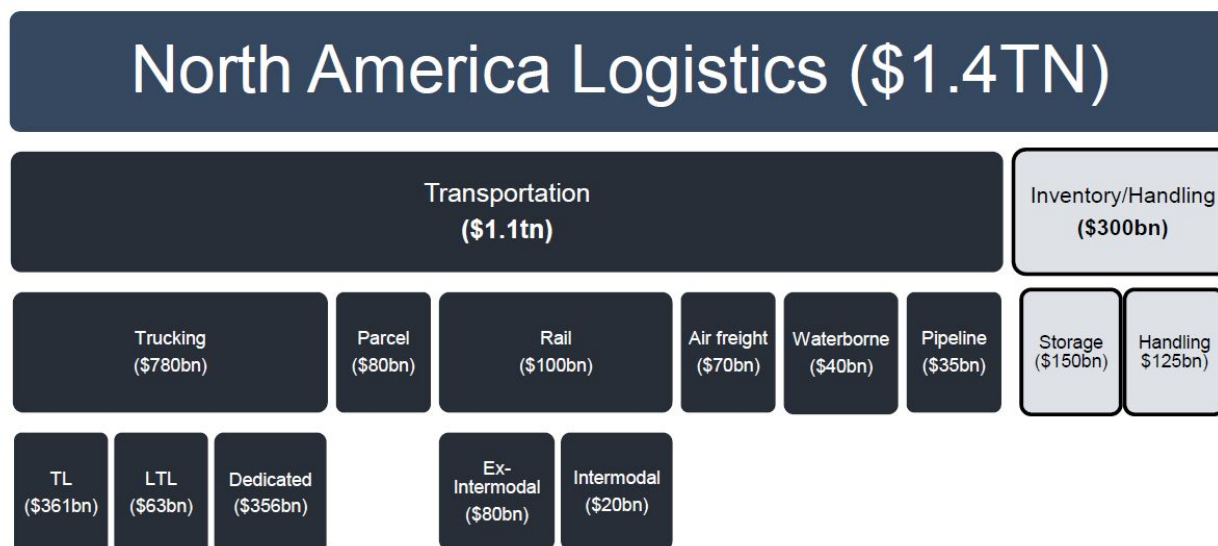
**John Hagi**

DIRECTOR, RESIDENTIAL DELIVERY AND SPECIAL SERVICES  
AIT WORLDWIDE LOGISTICS



**Figure 1: North America Logistics total addressable market (TAM) - 2019**

Exhibit 46: North American logistics market snapshot



Finally, in terms of who the major players are in the final-mile market in the U.S., let us first say that the market is very fragmented. Nonetheless, the list of the biggest players would likely include XPO, J.B. Hunt, Werner and others. XPO Logistics (XPO) derives about 6% of its total revenue, or roughly \$1 billion annually, from final mile so XPO is certainly a major player in this market. J.B. Hunt gets about 5% of its revenue from final mile (or \$500 million or more annually). J.B. Hunt’s acquisitions and expansion in final mile are said to leave them within 150 miles of 98% of the U.S. population.

**Final mile is a play on e-commerce, giving it very attractive secular growth characteristics**

No discussion of final mile is complete without touching on e-commerce, which is the primary driving force behind final-mile growth.

The effect of Amazon (and e-commerce in general) on transportation and supply chains is undeniable. Amazon currently accounts for just 3% of total U.S. retail spending but nearly 50% of total e-commerce sales.

Consumers in the U.S. spent \$601.75 billion online with merchants in 2019, up 14.9% from \$523.64 billion in 2018, according to the U.S. Department of Commerce.

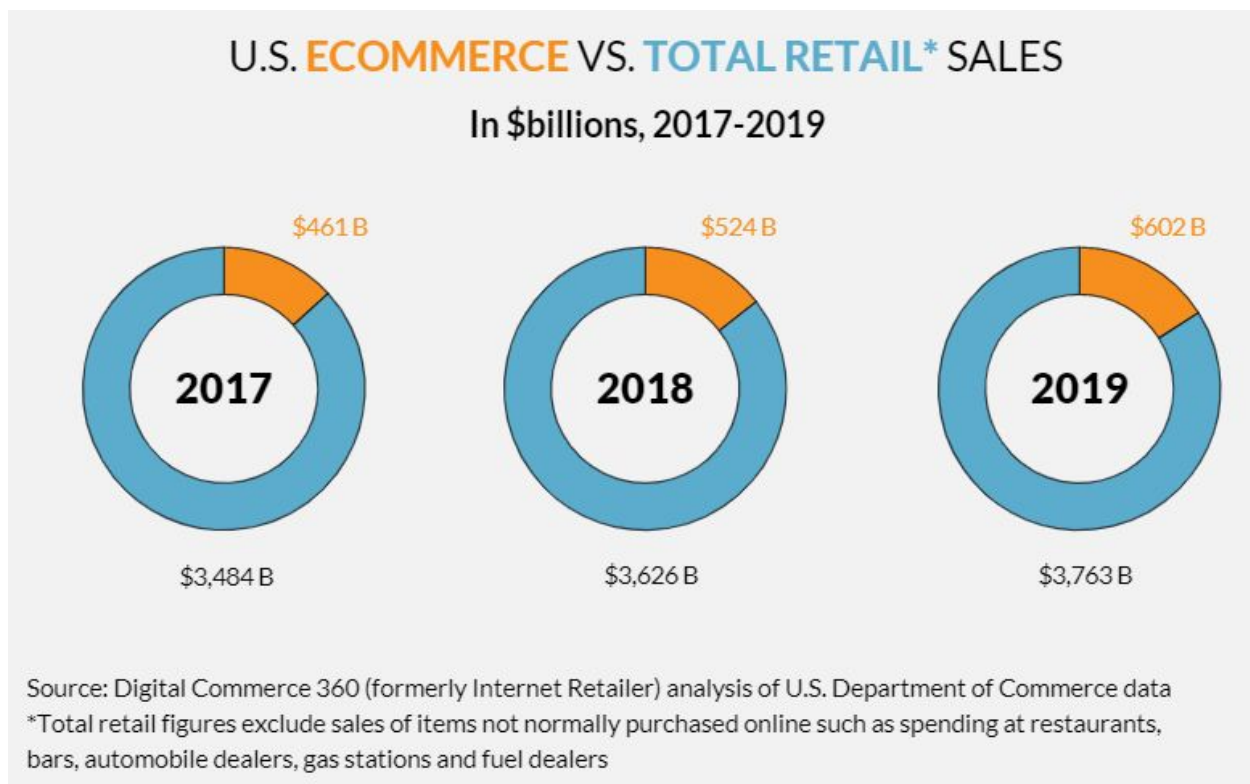




Not only Amazon is growing rapidly in the e-commerce space. With the total category growing 15%, it leaves plenty of room for other major players to establish a foothold. For example, the biggest retailer in the U.S., Walmart (which accounts for roughly 7% of total retail sales in the U.S.), is growing its online sales even faster than Amazon. Walmart’s e-commerce division grew 74% in the latest quarter and now accounts for about 5% of total U.S. e-commerce spending. This is just behind eBay, which has approximately 7% of the U.S.’s total e-commerce market share. Target, the fifth-largest retailer in the U.S., accounting for 2% of total retail sales, says its e-commerce sales increased 141% year-over-year in the latest quarter (about five times faster than Amazon). The third-, fourth- and sixth-biggest retailers in the U.S. — Costco, The Home Depot and Lowe’s, respectively — have each also seen their e-commerce sales soar recently. And companies like Shopify have made it so that small to midsize businesses have been able to rapidly grow their e-commerce and not be left behind.

There are three primary statistics to remember with e-commerce in the U.S.: total e-commerce sales were about \$600 billion in 2019, e-commerce penetration is just 11% (and just 16% after removing purchases inherently suited for brick-and-mortar stores), and e-commerce is forecast to grow at a double-digit CAGR for many years to come.

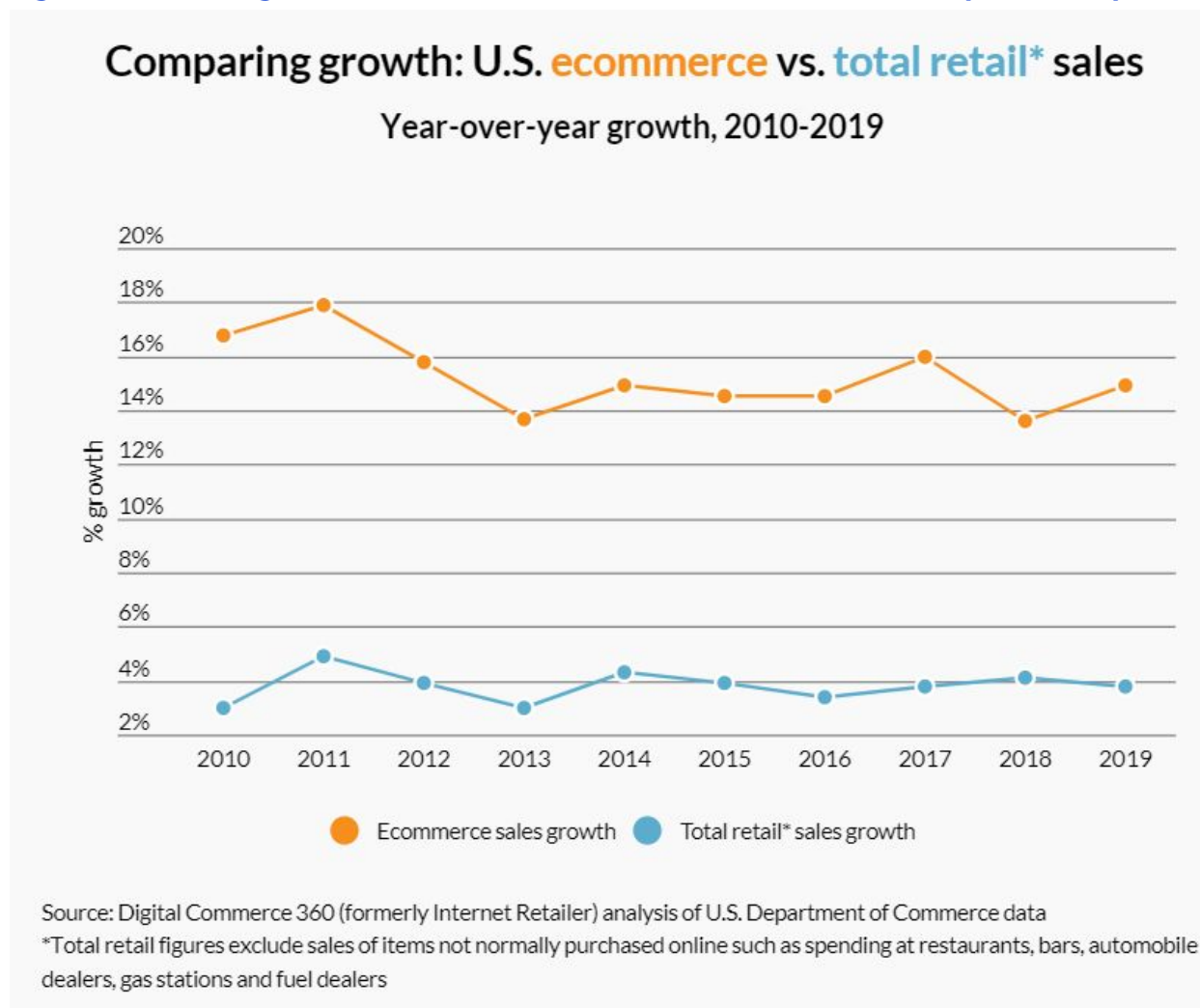
**Figure 2: U.S. e-commerce and total retail sales (excluding non-e-commerce-centric categories) 2017-2019**





Source: Digital Commerce 360, U.S. Department of Commerce

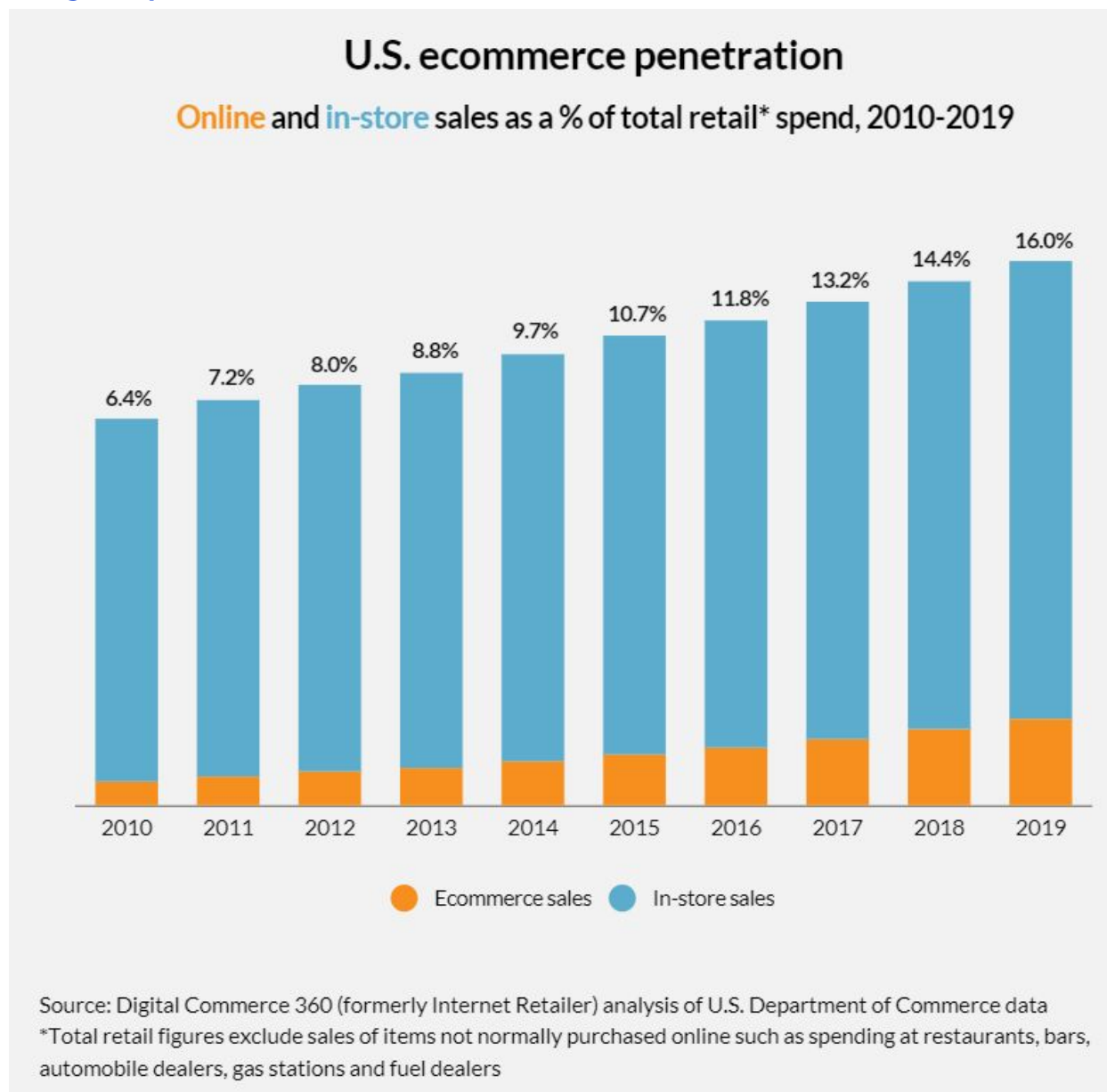
**Figure 3: Annual growth of U.S. e-commerce vs. total retail sales (2010-2019)**



Source: Digital Commerce 360, U.S. Department of Commerce



**Figure 4: U.S. e-commerce penetration (excluding non-e-commerce-centric categories) 2010-2019**



Source: Digital Commerce 360, U.S. Department of Commerce

We would note that Figures 2-4 above strip out the sale of items not normally purchased online, such as spending at restaurants, bars, automobile dealerships, gas stations and fuel dealers. It is possible that in the future, spending in several of these categories will increasingly move online.

Total retail sales in the U.S. in 2019 were \$5.5 trillion (up 3% year-over-year), according to the Census Bureau of the Department of Commerce, which means that e-commerce sales growth of 15% for the past several years has been about five times



faster than traditional retail (which is growing in line with GDP). Again, it must be noted that Figure 2 above cites \$3.8 trillion in 2019 for total retail sales in the U.S. because it excludes non-e-commerce-centric sectors of retail.

A penetration rate of 11% for e-commerce as a percentage of the U.S.'s total retail spending suggests the shift to online and e-commerce is still in the very early stages in the U.S. For context, the penetration of online retail has roughly quadrupled over the past 10 years from under 4% in 2009 and we believe it will at least triple again in the coming decades. E-commerce sales in the U.S. will likely continue to climb at a double-digit rate for many years to come, and penetration in the U.S. could easily triple and still be nowhere near reaching the highest penetration rates (about 60%) observed today across all categories in e-commerce.

The average individual in the U.S. spent just \$1,848 online in 2019 (about \$35 per week). This figure compares to total retail spending per capita of \$16,580 in 2019. We believe there is scope for this number to go much, much higher.

Turning back to final mile, in terms of e-commerce, many experts believe the race for final-mile dominance is unlikely to be fought over parcels (a space that is already dominated by FedEx, UPS, Amazon and the U.S. Postal Service and in which margins are compressing). Instead, it is likely to center around large and bulky items, such as appliances, furniture, bedding and fitness equipment. The big four in parcels have spent decades and billions of dollars laying the groundwork for their final-mile parcel infrastructure, so it will be incredibly difficult for any new entrant or nonincumbent to steal a meaningful amount of market share.

In addition to the fact that Amazon does not yet significantly compete in big and bulky items transportation, other factors make heavy good final-mile delivery relatively more attractive. For example, big and bulky items tend to have much higher labor, complexity and service intensity associated with them and hence command higher margins relative to parcels.

Furthermore, on top of the higher margins, the growth prospects are more attractive in final-mile heavy goods. People are increasingly buying a lot more big items (such as appliances and furniture) online. The reason that heavy goods are further behind in terms of e-commerce penetration is that a great deal of investments and learning were necessary before penetration inroads could be made.

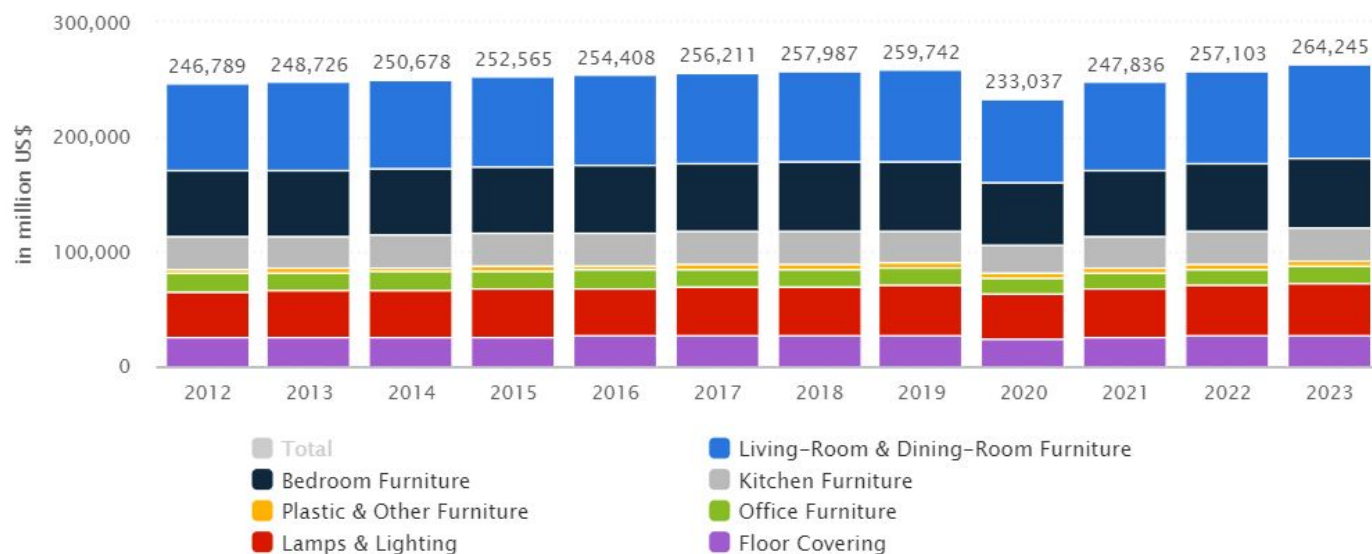
Wayfair is a great example of how difficult it is to efficiently and profitably deliver heavy goods like furniture. Wayfair has finally achieved consistent profitability in its U.S. operations (nearly 20 years after its founding in 2002), but the overall business has been unprofitable for its entire publicly traded existence since its IPO in 2014 as it has recently chosen to expand and heavily invest in Europe just as the U.S.



operations turned profitable. Wayfair has had difficulty because furniture often arrives broken or damaged, and this is an expensive loss that the company must absorb each time this occurs. Shoppers in the U.S. also often prefer to touch and feel furniture before buying so there was an incredible amount of website development, changes to legacy furniture manufacturing process and supply chains, brand building, and customer training needed to convince people to buy furniture and accessories online. However, we believe that Wayfair and other retailers in other nontraditional e-commerce categories (such as appliances) have reached escape velocity and the groundwork has been laid for future final-mile heavy goods growth.

The furniture market in the U.S. was \$233 billion in 2020 and the market is expected to grow by 4.3% annually through 2023, according to Statista. This amounts to spending of \$704 per person on furniture annually in the U.S. According to Restoration Hardware (RH) in its June 2020 shareholder letter, the isolated U.S. furniture-only market is \$200 billion and growing.

**Figure 5: U.S. furniture and home furnishings total retail revenue (2012-2023)**

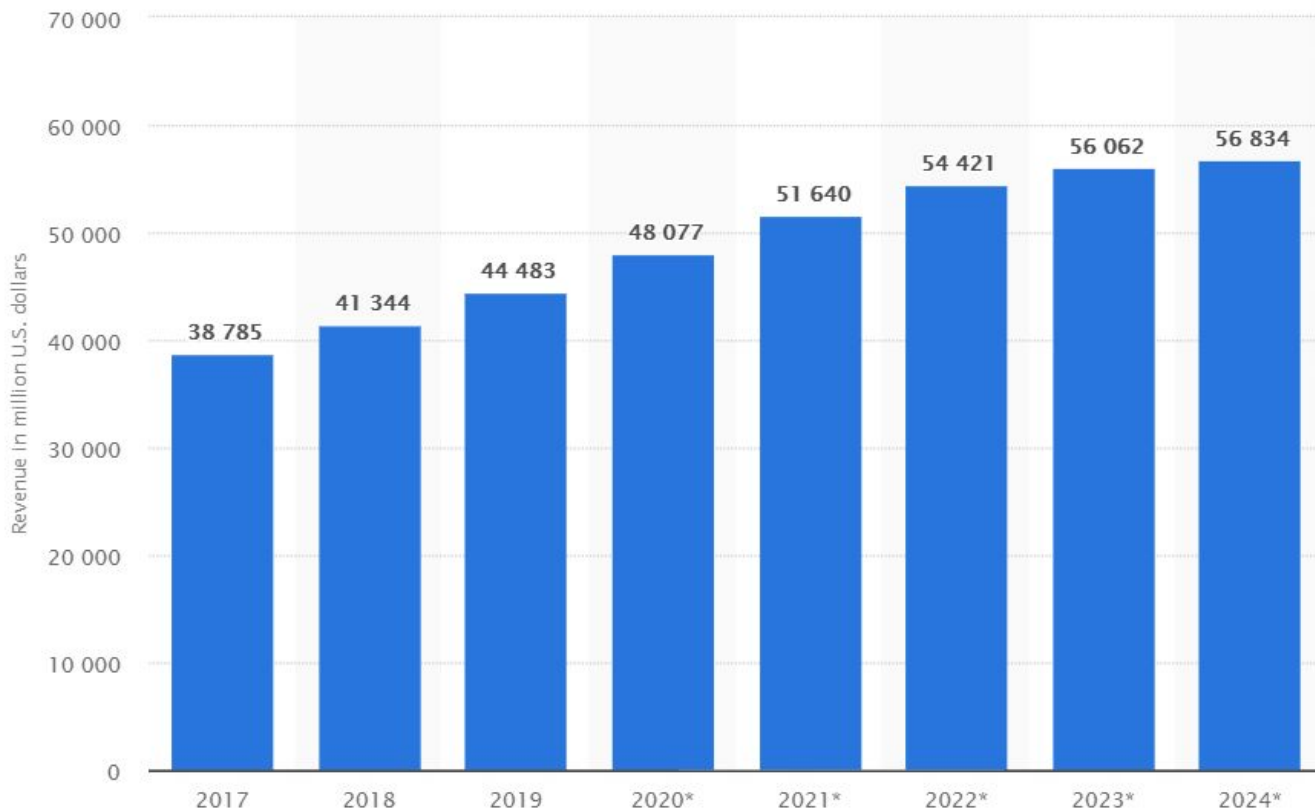


Source: Statista (forecasts adjusted for COVID-19 in April 2020)

Furniture (and homeware) e-commerce sales in the U.S. were \$44 billion in 2019, equating to a 17% rate penetration of the U.S. furniture and homeware market. Furthermore, furniture represents 12% of total retail e-commerce sales in the U.S. Furniture e-commerce sales are projected to increase by 6% annually over the next five years to \$57 billion by 2024.



**Figure 6: U.S. furniture and home furnishings e-commerce revenue (2017-2024)**

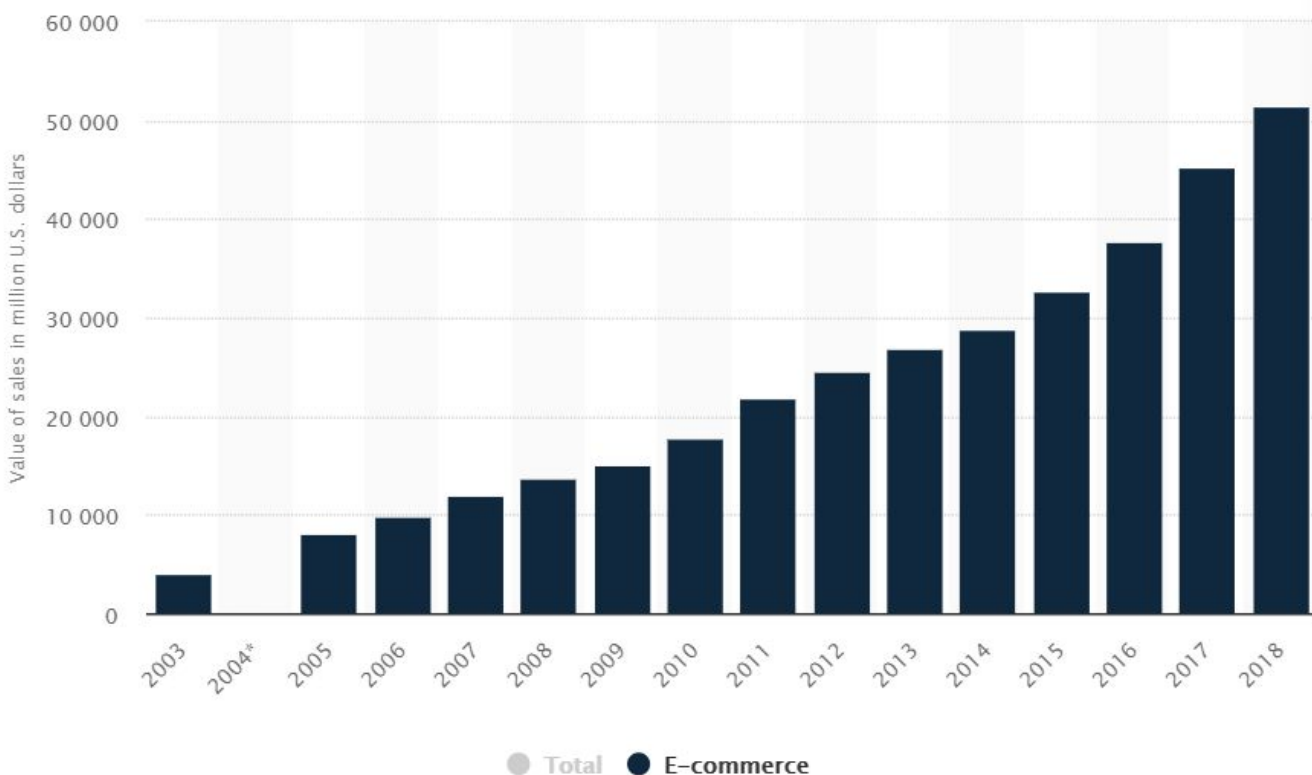


Source: Statista

In addition to considerable traction and growth left for furniture e-commerce sales in the U.S. being beneficial to final-mile demand, online sales of electronics and appliances have demonstrated similar growth and attractive future growth prospects. For example, according to Statista, e-commerce sales of electronics and appliances amounted to \$52 billion in 2018, up 36% from just \$38 billion in 2016. Data from IBISWorld confirms this robust growth as their data suggest online sales of large kitchen appliances grew at an 11% CAGR from 2013 to 2018.



**Figure 7: U.S. e-commerce sales of electronics and appliances (2003-2018)**



Source: Statista (note: the estimate for 2004 did not meet Statista’s publication standards because of high sampling variety or poor response quality)

To summarize, when Amazon originally IPO’d in 1997, consumers typically only ordered small and easy-to-fulfill and -deliver items online such as books. But we have come a long way over the last 20-plus years because e-commerce has extended to large and bulky heavy goods that many never dreamed were capable of being bought and delivered online. For example, even cars (perhaps the last bastion of e-commerce penetration milestones) are being increasingly sold online with websites like Carvana. We believe that almost anything will be able to be bought online in the future. Final-mile providers will reap the fruits of this growth for many years to come. However, the growth will not be without cost as it is putting pressure on final-mile infrastructure and requiring heavy investment and adaptation by the final-mile service providers.



## What are the challenges to final mile?

There are numerous complexities to final mile that do not impede its growth prospects but make execution challenging.

Notable challenges to last-mile delivery include minimizing cost, ensuring transparency, increasing efficiency, improving infrastructure and outsourcing. This list is a good overview but only scratches the surface of the challenges last-mile service providers face.

The single most important metric for measuring the efficiency of final-mile delivery is on-time deliveries. Customers care first and foremost about getting what they ordered on time. If a shipper or retailer fails in this respect (via its final-mile service provider), it really hurts its chances of earning repeat business from that particular customer. According to Convey, delivery “exceptions” (i.e., an unexpected event that changes a shipment’s delivery status) occur in 11% of final-mile deliveries, making on-time deliveries a significant issue for shippers.

Most final mile is outsourced as many shippers do not have their own trucks and delivery personnel for final mile. Matching shippers with delivery services to handle their last-mile demand is therefore an issue. Using outside service providers also necessitates the use of great technology that increases transparency and delivers notifications to both the shipper and receiver to ensure all parties are on the same page.

Finding and training qualified labor in final mile can be difficult. For example, the skills and equipment needed to deliver a sofa are much different than those needed to deliver and install a home theater, and both require a greater and more specialized skillset than a typical parcel or pizza delivery employee.

The “Amazon effect” presents several challenges to final mile. Thanks to Amazon, consumers have become accustomed to receiving free, fast shipping on standard parcel orders (or at least free in the sense that one receives unlimited free shipping for his or her \$119 annual Prime subscription).

However, the rub as we see it for competing retailers is that clearly the cost of final-mile transportation for a shipper is not free. This leaves a conundrum: Retailers must train customers to accept paying for final-mile delivery to maintain profitability (as sales increasingly shift online) or retailers can implement countermeasures such as pushing buy-online, pickup-in-store (BOPIS) measures that circumvent the problem and turn their stores into fulfillment centers. Regardless, retailers must have a sound omnichannel and online strategy; without one they will almost





certainly lose market share and cede customers. This is to say, one major challenge of final mile is that it is creating margin pressure for shippers and retailers.

Instead of explicitly charging for delivery (or breaking out a separate line item for final mile), a common method employed by many e-commerce and traditional retailers is to simply discreetly raise prices when a good is sold online, which creates consumer price inflation in exchange for the added convenience and value of shopping online and receiving delivery to their home.

The costs of last mile are often high. As previously noted, the BEA maintains that last mile accounts for 28% of total shipping costs on average, a disproportionate figure relative to its proportion of the total length of the journey from manufacturing to delivery to end consumer. This is a problem for retailers, which are facing margin pressure as a result of the mix shift of sales to online. Retailers and shippers must figure out how to keep up with Amazon in terms of speed and efficiency, and do so with low error rates and without destroying their own margins. This is an immense challenge.

Transporting goods by rail, container ship or barge (and even by truck, which is relatively more expensive than the other modes) is generally the most efficient and cost effective. Therefore, getting the products a business sells from the plant into its various distribution centers is relatively efficient because it can be aggregated and shipped, trucked or railed in. However, last mile is very expensive because when the products leave the distribution center or final-mile hub, they must be individually sorted then distributed into separate trucks and driven by an army of individual drivers (which then must be compensated as well for final assembly or installation). Parcels are inherently more efficient because they can be efficiently distributed and aggregated into a single truck, but large, bulky and customized items that go out for delivery are far less so. As a result, heavy goods command higher margins due to their inefficiencies.

Some final considerations of challenges to last mile include the following laundry list, which we briefly detail individually.

Heavy goods is the fastest-growing segment of final mile, but 10%-20% of heavy goods ordered online sustain damage during the fulfillment and delivery process (according to various industry sources) because heavy goods were really only meant to be shipped a couple of miles from store to home.

Delivering heavy goods to consumers (and restaurants and retailers) in dense, urban areas is difficult, highly regulated, causes traffic congestion and can be dangerous.



Complexity is an issue with final mile. Large products require seamless unpacking and skilled assembly without scratching a customer's floors or damaging their house.

Capacity is an issue with final mile as well. For this reason, the number of service providers has been multiplying in recent years and traditional LTL and truckload carriers are making acquisitions to gain a foothold in the space.

Theft is an issue in final mile, especially for parcel companies like UPS or FedEx. Unattended packages left at residences or businesses are often stolen (or damaged by the weather). Urban lockers have emerged as one popular solution to this problem that is gathering momentum in larger cities. This can also streamline the delivery process by consolidating multiple shipments.

There are many solutions and key metrics for final-mile service providers to streamline their processes. These include better route optimization technology to save time and costs and optimizing for total cost per item, per mile and per vehicle. This optimization process can be done via a bottom-up analysis of specific routes as well as a top-down analysis of the shipper's network as a whole. Other key metrics for final-mile service providers to always be improving upon include on-time deliveries, error rate, damage rates, the number of stops and the time per stop.

## **Technology investments in final mile are exploding**

In an effort to "keep up with the Joneses" and due to pressure from Amazon for broad next-day or even same-day delivery in the U.S., investment in last-mile technologies is rapidly accelerating to help non-Amazon retailers compete.

Industry sources suggest 25% of consumers are willing to pay extra for same-day delivery, and of those, a majority are willing to pay as much as 30% extra. Some estimates are calling for same-day delivery to reach 25% market share by 2025. The former catalyst suggests no abatement for the foreseeable future in final-mile technology investments.

The outsourced nature of much of the final-mile market is also playing a part in the rapid evolution and innovation taking place in final-mile technology. Matching shippers with delivery services to handle the last mile is an issue which requires technology. And, again, using outside service providers necessitates great technology that increases transparency and delivers notifications to both the shipper and receiver.



## **Large transportation companies are increasingly making acquisitions in the final-mile space to tap into its growth potential and diversify their portfolio**

The increase in bulkier items purchased online is causing some truckload carriers to acquire final-mile service providers with specialized services. Huge, well-regarded transportation companies such as J.B. Hunt, Werner, Schneider, XPO Logistics and several other prominent transportation providers have bought into final mile via mergers and acquisitions (M&A). We expect final-mile consolidation and acquisition activity to persist in coming years.

FedEx, UPS and the U.S. Postal Service are not well equipped to handle large items. This fact, combined with the secular growth potential and higher-margin nature of final mile is leading to an increase in the number of final-mile competitors and the amount of investment dollars flooding the space.

As opposed to inorganic, acquisition-driven expansion by truckload providers into final mile, LTL carriers are doing less acquiring and instead increasingly changing and adapting their services for final mile.

One obstacle facing both LTL and truckload carriers is the fierce competition already present in final mile. Moreover, many final-mile service providers specialize in services, personnel, technology and equipment in which traditional trucking companies' historical business models do not have a competitive advantage. Because there are already many last-mile, white glove firms effectively and efficiently handling deliveries, some truckload carriers have opted to buy rather than build.

## **LTL is defending its turf by adapting**

Companies that provide white glove delivery service offer levels of service that many LTL carriers do not, making it difficult for LTL providers to gain market share in final mile as larger items such as appliances and furniture are increasingly being purchased online. Historically, LTL is not known (in a good way, at least) for its service level, and this is an advantage for final-mile service providers that are narrowly focused, vastly experienced and experts in only final mile. But the attractive and rapid growth taking place as a result of e-commerce (and hence final mile) is drawing competition from LTL providers into the market.

LTL carriers are primarily adapting by investing in different equipment types (such as straight trucks with automatic lift gates). The logic is that these trucks can more easily navigate urban neighborhoods and city streets. This solves for one major



disadvantage facing LTL carriers because delivering bulky items in dense, urban areas using tractor trailers is not efficient. Traditional 53-foot trailers or even 28-foot pup trailers do not work nearly as well as 24- to 26-foot straight trucks with lift gates manned by two men (instead of just one driver armed with a pallet jack or hand truck). Furthermore, many of the service offerings, such as assembly, require two workers.

## **What if Amazon insources all of its final-mile operations?**

Amazon is already starting to insource many of both its final-mile and transportation initiatives in general, which poses a risk to existing final-mile service providers — either due to disintermediation or margin pressure if more business flows from Amazon (due to the former's superior scale and negotiating leverage relative to final-mile operators).

Amazon accounts for only about 3% of total U.S. retail sales (implying a long runway ahead) but nearly 50% of e-commerce in the U.S. If these two numbers continue to grow rapidly and unabated (as they have been despite Amazon scaling to hundreds of billions of revenue) and Amazon continues to take market share, it could damage industry economics. Many transportation industry analysts suspect that Amazon will not only part ways with its major service providers (such as UPS and FedEx) but that Amazon's ambitions include launching an Amazon Logistics Services (ALS) business similar to its Amazon Web Services (AWS). This would allow Amazon to use its scale and excess capacity to provide transportation services on behalf of others (including competitors).

For its final-mile operations, Amazon has historically used LTL providers (such as XPO) to drop off pallets at U.S. Postal Service delivery centers near the products' final destinations. However, Amazon is increasingly cutting out the middlemen by using its own trucks and trailers to drop off products from fulfillment centers to local Amazon depots and then using sprinter vans (with Amazon employees driving them) to deliver the product directly to their customers. In such a scenario played out to its logical end, the final-mile market ex-Amazon is increasingly at risk of declining revenue and profits and is thus a risk to projections for double-digit annual growth in final mile over the coming decade.

This is a low-probability event that is likely to take place very gradually and incrementally but it bears close watching.

## **Robotics, drones and automation could be a game changer but are a ways off**



One major way of reducing the cost of final mile, as well as the error rate and human and capital intensity, is to use robots and drones to deliver parcels and other final-mile items directly to consumers' homes. This is admittedly a much greater challenge for larger items, making it more of a risk for smaller items and parcels.

Headwinds to a more automated final-mile delivery infrastructure are numerous. For example, there are many regulatory hurdles precluding automation from becoming a reality, including getting approval from the Federal Aviation Administration (FAA) for drones.

This is less of an issue in undeveloped (and underdeveloped) regulatory regimes with high e-commerce penetration like China. Given the sheer number of people and the extreme density of urban areas, many of the final-mile issues in China are magnified, but they have been quite successful to date in coming up with innovative and revolutionary strategies around final mile. We expect similar technological advancements in the U.S. in the coming years but at a slower development pace relative to China.

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