Freight Logistics
eCommerce Trends

Prepared for:

STIFEL

Prepared by:

TandLA

Transportation and Logistics Advisors, LLC

January 12, 2018

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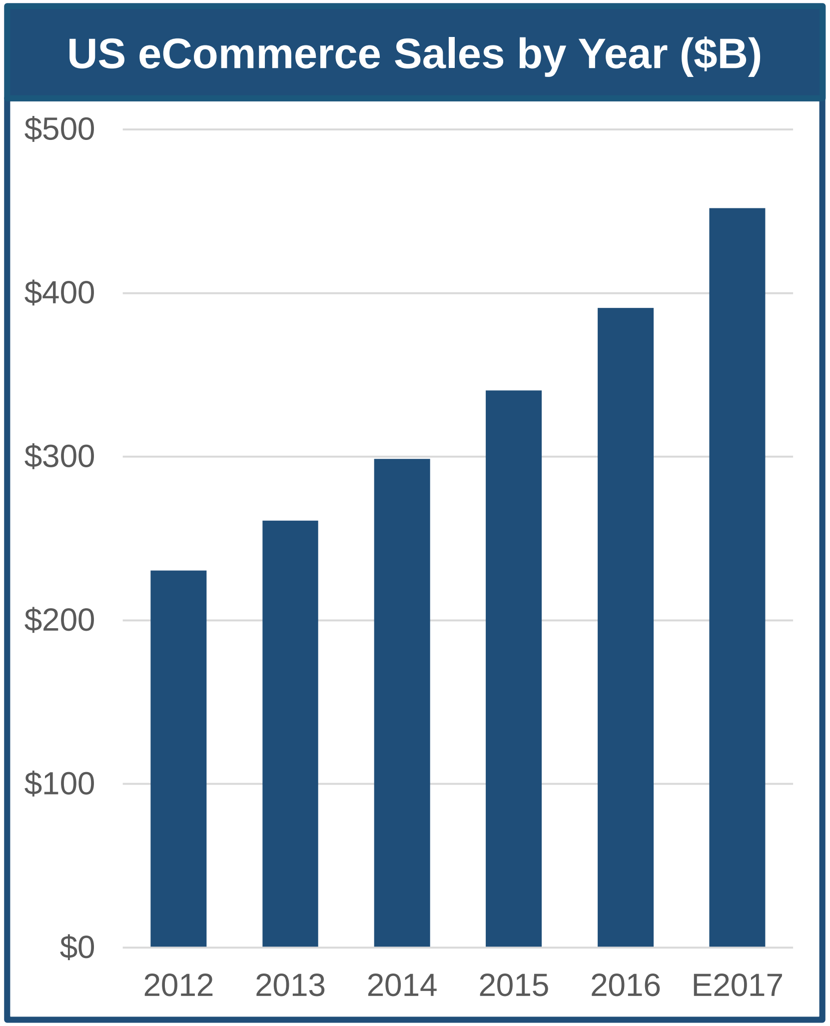
Agenda

- **Market Size and Characteristics**
- Key eCommerce Trends
- Potential Implications for Transportation

US eCommerce is a $450B market, growing nearly 15% per year

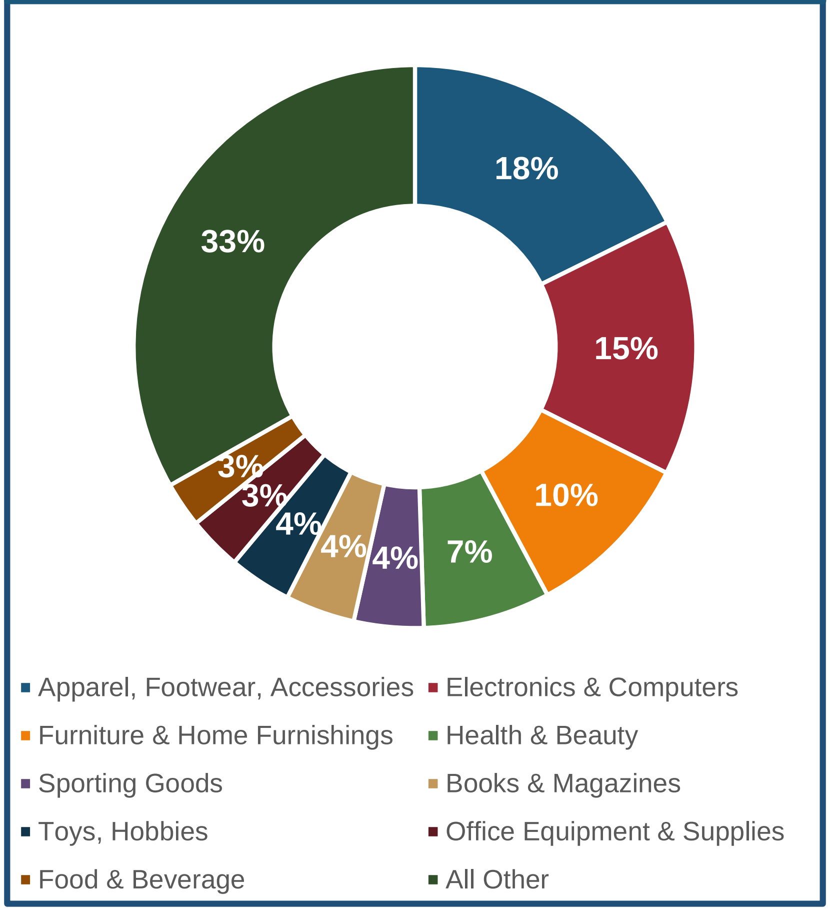


- Estimated US 2017 eCommerce sales of $450 B
- Growth is accelerating
  - Q1-Q3 2017 grew ~15.6% year over year
  - 2016 growth: 14.9%
  - 2015 growth: 14.0%
  - 2012 – E2017 CAGR: 14.4%
- eCommerce sales accounted for about 8.4% of Q1-Q3 2017 total US retail sales
  - 2016 eCommerce was 10.5% of US Retail Sales excluding autos and auto parts
  - Internet Retailer claims 2016 eCommerce penetration of 11.7%

Note: E2017 based on annualized Q1-Q3 2017 increase
Source(s): US Census Bureau; Internet Retailer

In the US, apparel and consumer electronics account for nearly one-third of eCommerce sales. Sales are dispersed across a range of product categories

E2015 US eCommerce Sales by Product Category

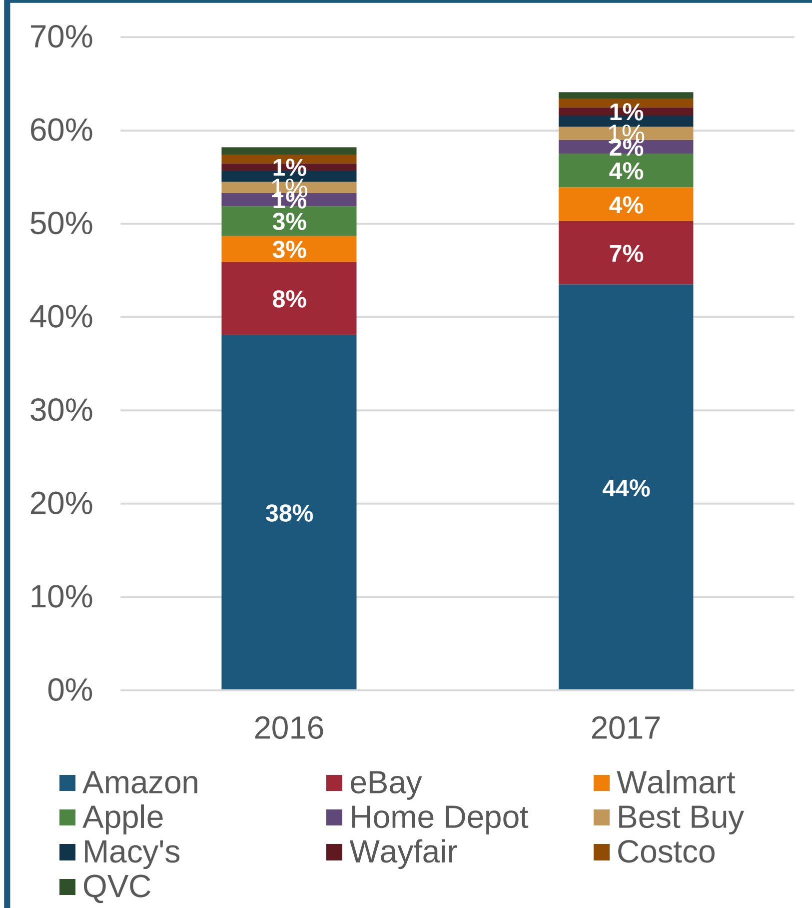


- eCommerce sales are across a wide range of product categories
- Apparel/footwear, electronics, and furniture/home furnishings are the largest eCommerce categories by spend
- “All Other” makes up a big percentage

Source(s): U.S. Census Bureau, 2017

Amazon.com is by far the largest eCommerce retailer – and a leading influencer of eCommerce supply chains

eCommerce Market by Retailer



- Amazon.com, including its marketplace, is far and away the leading U.S. eCommerce retailer with an estimated 43.5% of the market
- After Amazon, the market is relatively dispersed
  - Retailer #2-10: 20.5% of eCommerce sales
  - Retailer #11-500: 20%
  - Retailer #501 and higher: 16%
- Amazon's share of U.S. online sales is growing
- Amazon is a major influencer of eCommerce supply chains
  - Free shipping
  - Free returns
  - Same day delivery
  - Developing transportation capabilities
  - Driving eC DC network

Source(s): Chain Store Age/eMarketer 10/2017; Internet Retailer

Other retailers and carriers are starting to respond

Retailers	Carriers
• Walmart becoming more competitive – Acquires Jet.com (2016) – Lowering barriers for free shipping • Target – Acquires same day delivery platform Shipt (2017) – Free shipping with branded card • IKEA acquires “jobber” company TaskRabbit	• UPS investment in same day delivery company Deliv (2016) • Parcel carrier changes to pricing

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  - **Retailer/ e-Tailer Capabilities**
  - Transportation and Fulfillment Models
  - Relative Economics
- Potential Implications for Transportation

eCommerce is growing fast and still evolving — making it difficult to plan and manage the supply chain

How eCommerce is Changing			
How companies go to market	**Customer expectations on product delivery times**	**Customer expectations on ability to return products**	**Fast growth**
• Manufacturers/ distributors – Sell through traditional retailers? – Sell through Amazon and other eTailers? – Sell direct through brand website? – Channel conflicts? • Retailers – Omni-channel approach – Marketplaces	• Slow and cheap, or fast and expensive? • Free shipping expectations? • What will consumers demand and pay for? • Same-day? • How to compete with Amazon?	• Free shipping of returns? • Consumer mentality — buy 3, return 2 • Where and how to process returns?	• What volumes should be planned for • How to maintain flexibility

Most traditional/old-line companies have been set up to ship and receive pallets, not packages — companies have to add capabilities to facilitate eCommerce

	Traditional Retail	eCommerce Fulfillment
Outbound Shipment Volume	• DC to store • Low frequency of large shipments (TL, TL multi-stop)	• DC to consumer • High frequency of small shipments (parcel)
Warehouse Operations	• Racked pallets, moved with fork lifts • Staging of multiple pallets to move into trailers • Limited handling or packaging — some mixing, shrink wrapping	• At individual product level – “eaches” • Manual picking • Packaging lines • Can have pre-sort for packages for parcel carriers • Can be highly automated picking systems with large capex investment

Technology to support single pick is very different and requires additional capabilities

- Inventory management at various levels
  - Pallet
  - Case
  - Each
- Order picking
- Premium on real-time information — in both directions
  - What is in-stock
  - Applying orders immediately to inventory
  - Shipping cost
- Integration with various systems, often cross-company
  - Web “front end” (Demandware, IBM, Oracle, SAP)
  - Various order management systems (Jagged Peak)
  - Warehouse management systems (JDA, Manhattan)
  - Various ERPs (SAP, Netsuite)
- More complex returns

Web-only retailers have significant challenges as they scale

eCommerce Challenges	Options/Issues
• Typically begin with single point fulfilment – Insufficient scale to stock multiple DC's – Leads to high delivery costs, longer delivery times • When grow to multi-DC – Causes technology issues – Legacy DC's in wrong location – Requires more inventory	• DIY vs. Outsource • Single vs. multi-user facility • Managing returns • Returns restock vs. liquidation

Returns and sales spikes are two other eCommerce differences that increase the supply chain challenge

- Returns are much higher in many product categories – in store is typically low single digit percentages
  - 20-30% of apparel purchased online
  - ~10% of hard goods (home goods, toys) purchased online
  - 87% of retailers allow for online returns to their stores — encourages additional purchases
  - Free shipping encourages returns
  - Returns frequently are part of the sales model (buy 3, return 2)
- Sales spikes are greater than in physical stores
  - Flash sales
  - Subscription models

Source(s): Kurt Salmon; TandLA experience

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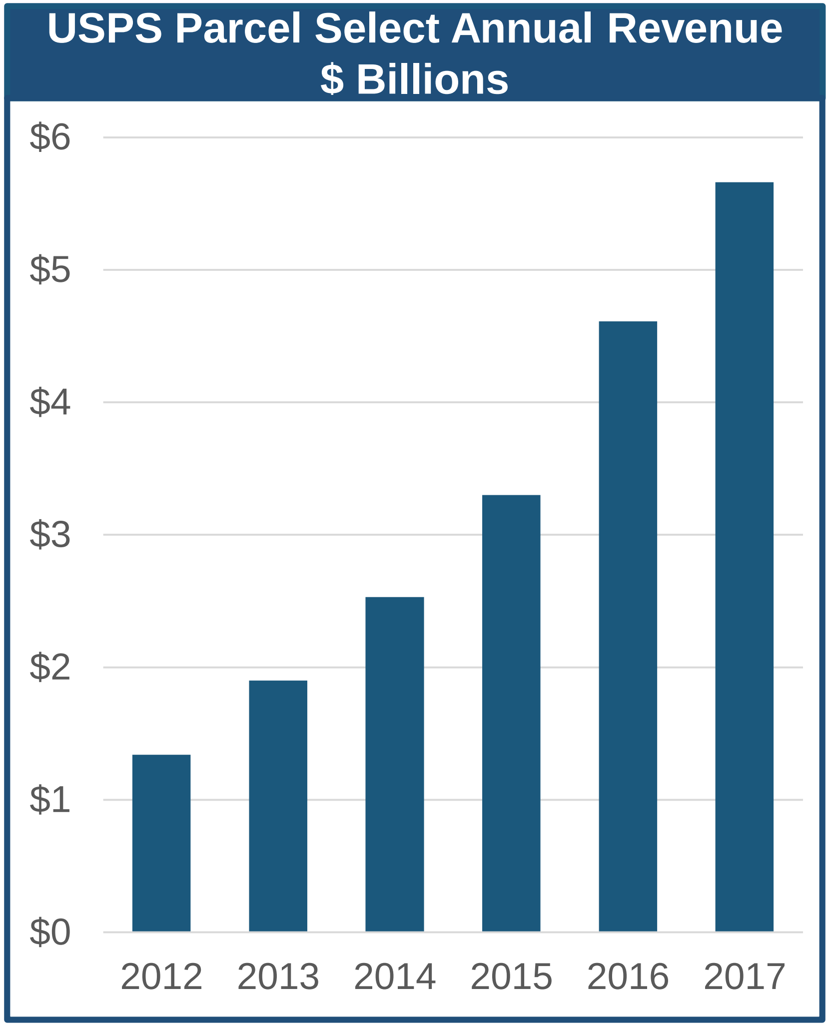
US final mile/delivery - there are a range of delivery options at different service levels and price points

	Express	Ground	USPS Delivery (Parcel Select)	Same Day
Service	• Parcel carrier air or ground • Time definite	• Parcel ground carrier	• Parcel carrier does bulk pick-up, sort, line haul • USPS provides final mile delivery	• Courier delivery
Speed	• Next day/ 2nd day	• 2-5 days	• 2-7 days	• Same day
Cost	• High	• Medium	• Lowest	• High
Position	• Easy • High quality • Expensive	• Easy, less expensive than Express • DIM issues	• Lowest service • Lowest cost • <5 Lb. packages	• Amazon in major metros • Difficult for most others to follow • Some via shared economy

Oversized products can come LTL or specialized 3PL

USPS Parcel Select products have grown fast as a low cost parcel option



- USPS Parcel Select product growth has been rapid
  - 2012 – 2017 Revenue CAGR: 33%
  - 2012 – 2017 Volume CAGR: 24%
- Providers such as FedEx SmartPost, Newgistics, and UPS SurePost have been growing fast
- Parcel Select has grown despite USPS pricing increases
  - Revenue Per Piece:
    - 2012: $1.43
    - 2017: $2.02
  - Revenue Per Lb.:
    - 2012: $0.77
    - 2017: $0.89

Source(s): USPS Revenue, Pieces & Weight data; TandLA experience

However, Parcel Select shipments with FedEx and UPS are converting to dimensional pricing (DIM). Ground shipments were already based on DIM

Description	Impact
• DIM pricing is used by carriers more effectively cost light, bulky shipments – Parcel pricing based on both package weight and dimensions – Light bulky shipments are assigned a higher weight and billed at that weight • FedEx and UPS instituted dimensional pricing for ground shipments around year end 2014 • More recently UPS changed SurePost product to DIM pricing, FedEx changing SmartPost to DIM pricing 1/22/2018*	• Shippers of relatively large, low weight packages pay higher parcel rates • Operational impact - Increased emphasis on better packaging. Smaller boxes • Merchandizing impact - Potential to add products to a shipment without adding shipping cost • Benefit of avoiding DIM pricing by using Parcel Select products is going away

*FedEx rate change except for shipment by the ounce
Source(s): UPS, FedEx websites; TandLA experience

In addition to the change in use of DIM pricing, there are other factors that could impact Parcel Select

Introduction of DIM Pricing by FedEx and UPS	Political Influences	USPS Capital Requirements
• Could decrease attractiveness of Parcel Select products vs. standard ground	• President Trump tweets that for delivering parcels to homes for Amazon, USPS “Should be charging MUCH MORE” 12/29/2017	• USPS fleet designed for mail delivery, not parcels • Could require a new fleet investment • New sort capabilities?

Source(s): UPS, FedEx websites; WSJ 12/29/2017; TandLA experience

Same day was considered too costly, but Amazon is making an aggressive push, leveraging its local fulfillment network

Advantages	Challenges
• Highest speed to customer • Best alternative to physical shopping - “need it now”	• Inventory must be close to customers • Very difficult to have density to make low cost delivery

- Amazon offerings
  - 1 and 2 hour delivery (Prime Now) currently available in 32 metro areas (not all zip codes)
  - Sunday delivery
- Retailers offering same day through 3PLs and crowd sourcing providers
- **Without a local network Same day is cost prohibitive**

2015 Amazon Prime
Same Day Free Shipping Cities

2016 Amazon Prime
Same Day Free Shipping Cities

Now claim 8,000 towns and cities

Source(s): Amazon.com, Best Buy website; Techcrunch; TandLA expertise

Companies fulfill orders with various models, each has its pros and cons as there is no “one-size fits all”

	Advantages	Disadvantages
Single Fulfillment Center	• Fits in existing technology/network as a “store” • Can start small, easy to start and manage • Minimize inventory safety stock	• High cost final mile delivery • Long and variable delivery transit
Multiple Fulfilment Centers	• Lower final mile costs • Better delivery transit	• Omni-channel technology issues/complexity • Inventory levels • Scale to make centers efficient
Stores	• Close to customers • Existing space and inventory • Facilitates same day	• Greatest omni-channel issues • High cost DC – labor, per sq ft • Interrupt merchandizing and store operations

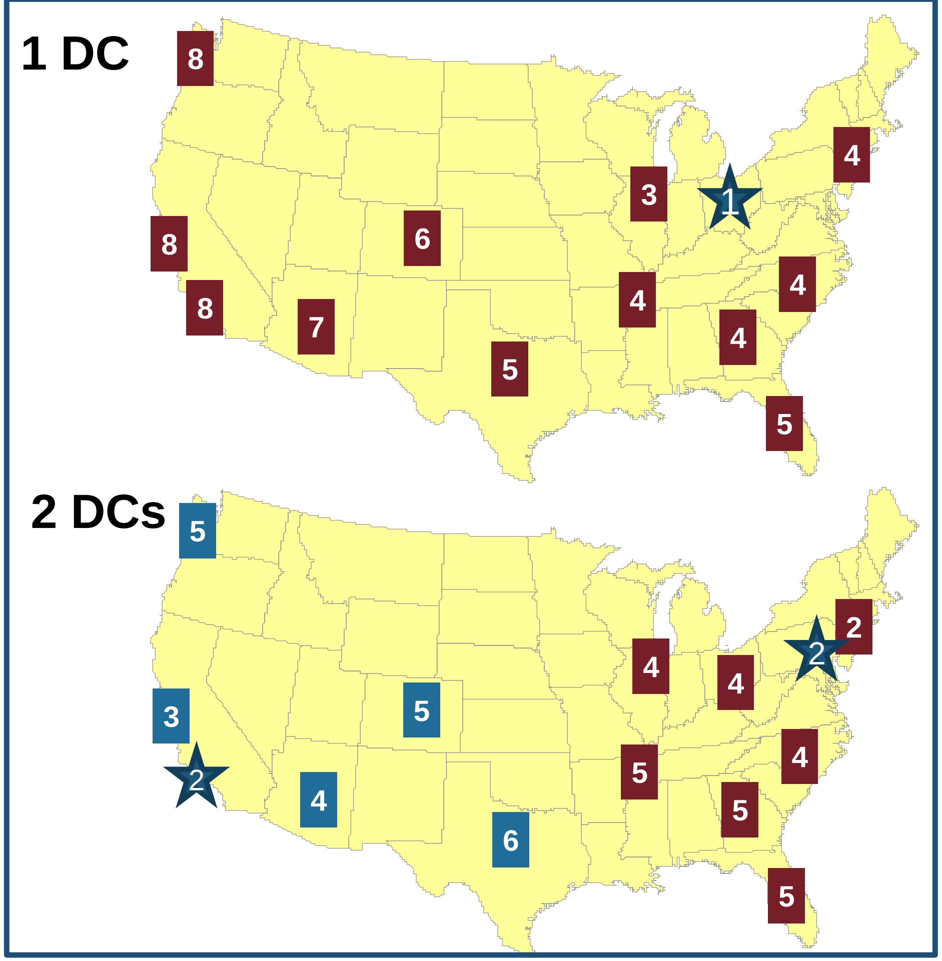
Source(s): TandLA expertise

Moving to multiple DC's dramatically lowers final mile costs, but adds significant complexity

- Significantly lowers average Zones
  - Lower cost
  - Faster delivery
  - Reduced variability
- However — Creates a lot of issues and challenges
  - Omni-channel technology and operations issues
  - Increased inventory
  - Required scale to support multiple operations

- ***Note: Optimal network requires moving the initial DC***

Example UPS Zones



Source(s): UPS website; TandLA expertise

Many companies outsource fulfillment to a 3PL to gain more sophisticated capabilities

Outsourcing Benefits	Example Providers
• 3PL invests in technology • 3PL expert in handling “eaches” • Can use space in a shared facility to gain scale benefits • Faster way to build capability • Can have lower cost labor • Can have lower cost transport – Leverages scale of 3rd party provider – Provider may have volume to pre-sort for carrier • Fulfillment is non-core for many companies	• Amazon Fulfillment • Radial (acquired by bpost, 2017) • PFSWeb • Newgistics • Saddle Creek

Source(s): TandLA expertise

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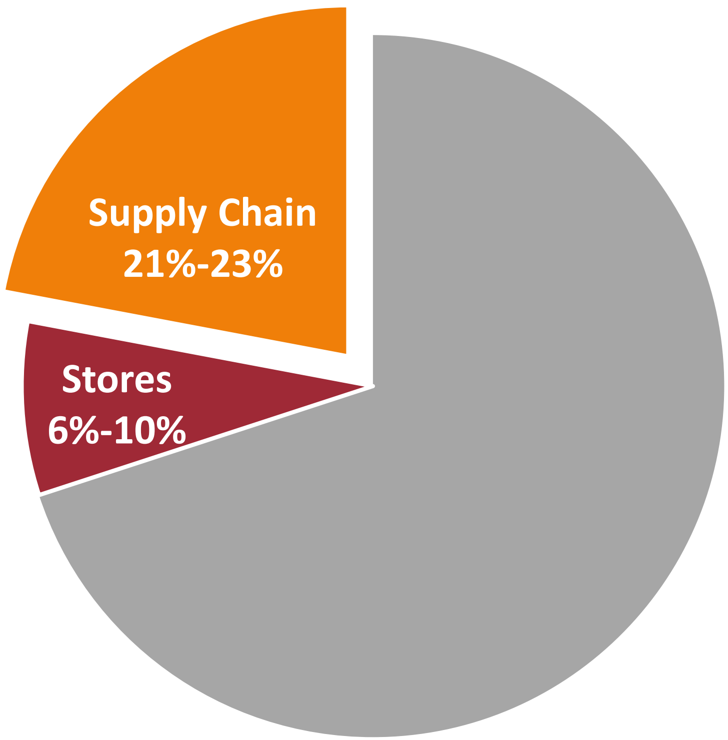
There are many drivers to lower eCommerce supply chain costs — companies must balance across them

Drivers to Lower eCommerce Supply Chain Costs				
Inbound Cost	**Facility Cost**	**Handling Cost**	**Inventory Cost**	**Delivery Cost**
• Volume to support full loads • Multiple facilities to limit distance, re-shipping	• Scale benefits, dedicated or shared • Low cost locations • Amount of inventory	• Increased automation • Managing staffing to volume • Intelligent picking logic • Less complex product profile • Multiple products per shipment	• Fewer facilities = less inventory • Tech to manage inventory as pool • Faster inventory turns • Cost of capital	• Service level • Distance from customer • Volume to support density • Number of products per shipment

Source(s): TandLA expertise

Supply chain costs are about 21%-23% of total store-based retail, or about three times the cost of the stores themselves

Est. US Store Retail Sales Cost Buildup Total $4.05 T*



Est. Retail Store Supply Chain Cost

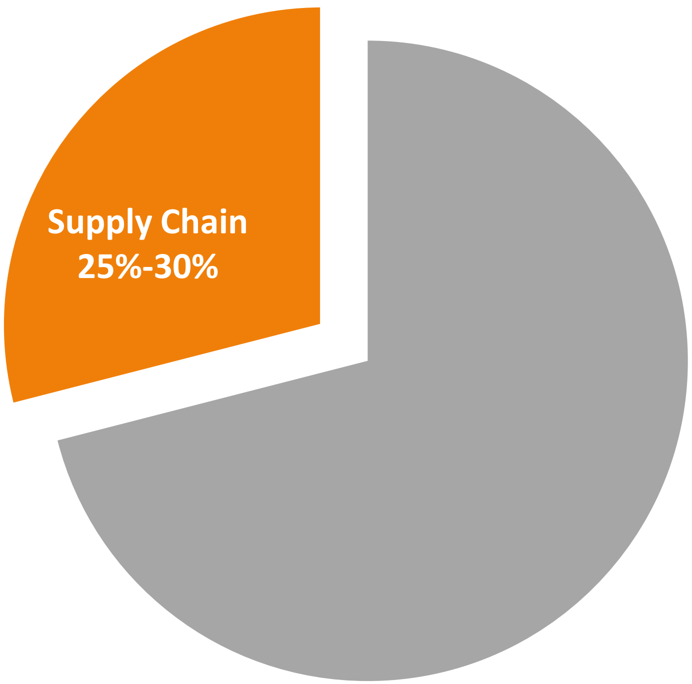
Category	% of Sales	Spend ($B)
Inbound Fgt.	7%	$283
Fulfillment	4%	$162
Inventory	5%	$202
Outbound	3%-5%	$121-$202
Returns	2%	$81
TOTAL Supply Chain	21%-23%	$850-$930

- Store costs can be 6-10% (or more) of sales, $243 B - $405 B

*US Retail sales excluding auto and auto parts, assumes 7.7% pre-tax unadjusted operating margin
Source(s): U.S. Census Bureau; NYU Stern Business School industry profitability database; TandLA expertise and model estimates

With eCommerce, supply chain costs are about 25% to 30% of the total cost

Est. 2015 US eCommerce Sales Cost Buildup Total $429 B*



Est. eCommerce Supply Chain Cost

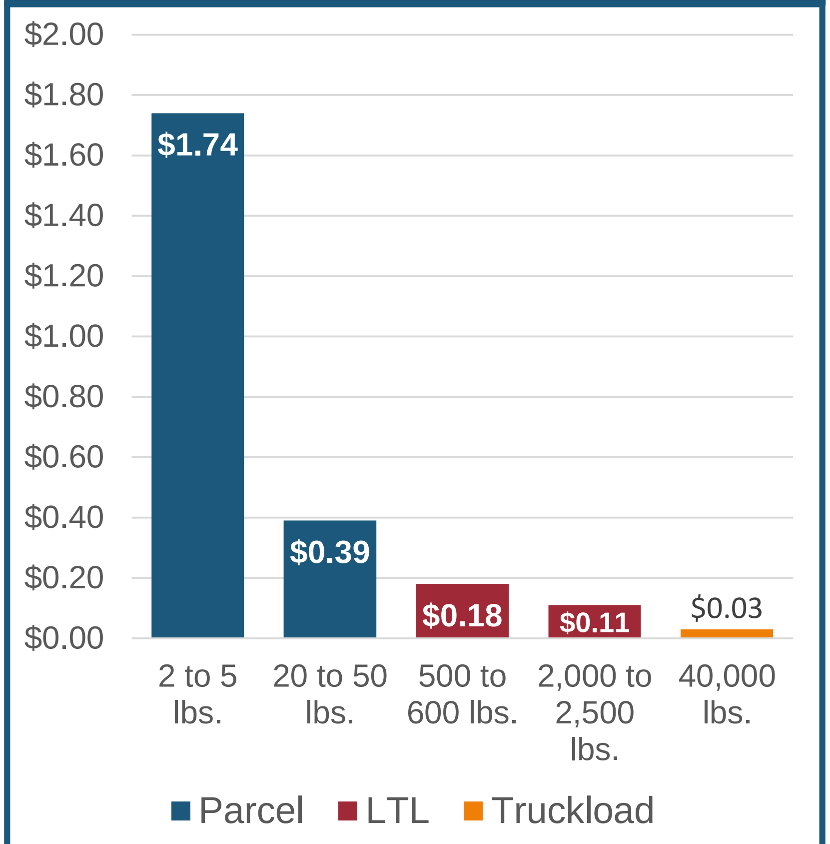
Category	% of Sales	Spend ($B)
Inbound Fgt.	4-6%	$17-$26
Fulfillment	5%	$21
Inventory	6%	$26
Outbound	6%-9%	$26-$39
Returns	4.5%	$19
TOTAL Supply Chain	25.5% - 30.5%	$109 - $131

- Assumes a well run supply chain
- If sub-optimal, costs escalate – fast!

*US eCommerce sales excluding, assumes 5.15% pre-tax unadjusted operating margin
Source(s): U.S. Census Bureau; NYU Stern Business School industry profitability database; TandLA expertise and model estimates

Outbound costs are critical - eCommerce turns a 40,000 pound truckload to a store into 10,000 four pounds shipments to homes

Example Relative Shipping Economics Per Pound (by shipment weight)

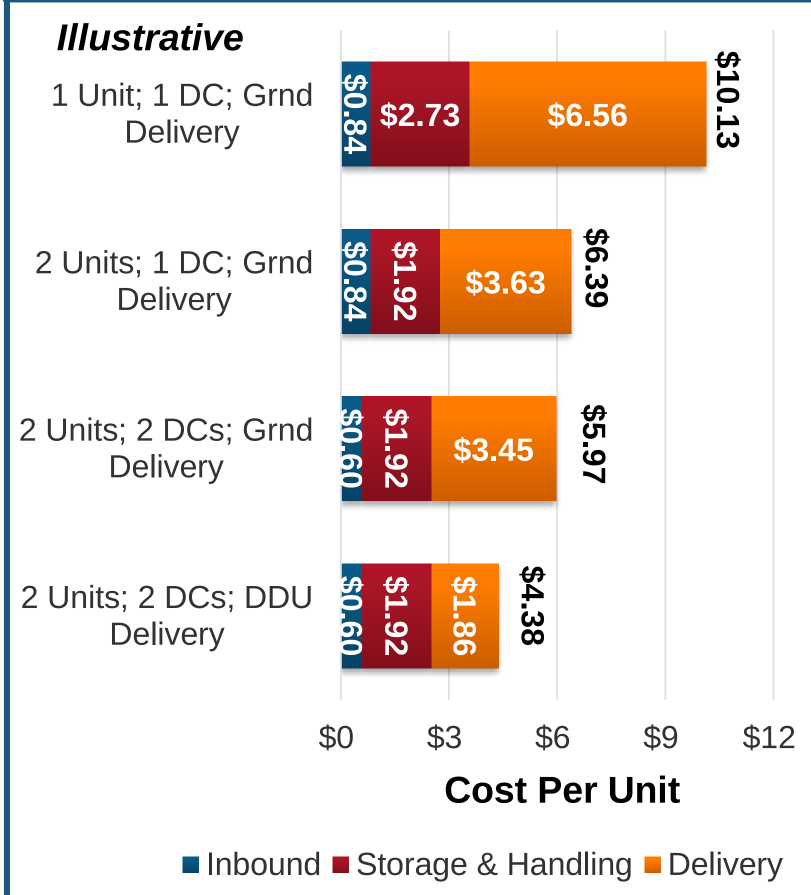


- Outbound transportation cost
  - Increase significantly in eCommerce environment
  - Parcel cost/pound can be over 10x the cost of LTL and TL to store
- Dimensional pricing further increases costs for light products

Source(s): TandLA expertise and model estimates

Based on some example moves TandLA has modeled, economics change significantly based upon number of DCs, products per shipment, and delivery service

Estimated Sample Cost/Unit
High Volume Shippers



- Inbound transportation cost benefits from local move from port in 2 DC scenarios
- Handling cost benefits from multiple products per customer shipment
- Delivery cost benefits from multiple products per shipment
- DDU induction rates are much lower than standard ground rates

Source(s): UPS and USPS websites, FedEx financial filings, client fulfillment economics, Stern School, Port of LA/LB; TandLA estimates

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Full truckload is likely to lose volume to LTL as products flow to smaller DCs in/near market – Positive for LTL carriers, minimal impact for TL carriers

	Truckload	LTL
Market	• Built around "old" retailing model • Likely to lose volume – More fragmented inbound results in smaller shipment sizes – Less dedicated store delivery • Truckload is huge, so doesn't significantly impact market	• Gains from eCommerce – Smaller shipments to more DC's/ fulfillment centers benefits LTL – Home delivery of larger items (> parcel) a high growth market – Increase in drop ship could convert some LTL to parcel (a negative) • LTL much smaller than TL, and traditionally less focus on retail, so gains could be meaningful to overall LTL industry volumes
Carriers	• Highly fragmented, share gains can more than make up difference • Performance remains based on execution, not market	• Shift to LTL shipments to more locations will be positive • Some LTL carriers struggling to develop home delivery model – who will be successful at B2C?

Oversized products can come LTL or specialized 3PL

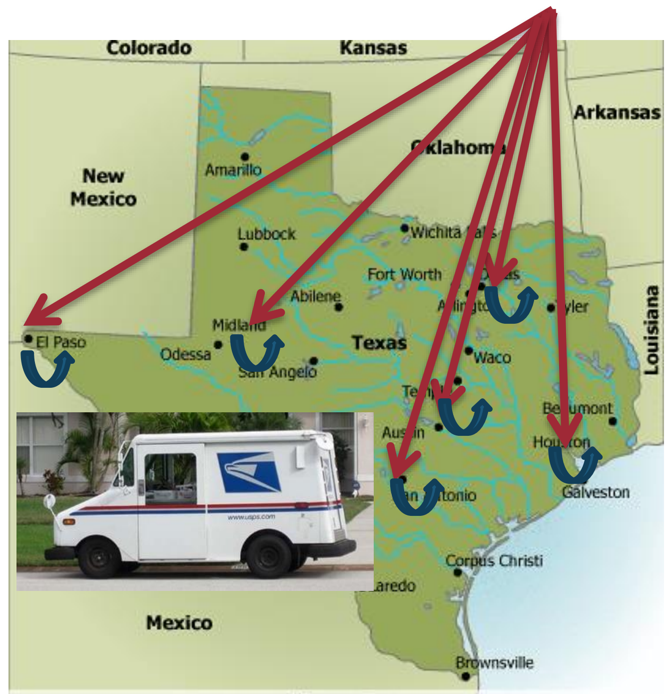
Rail carload is likely unaffected by eCommerce, while rail intermodal could be marginally hurt by shift to eCommerce

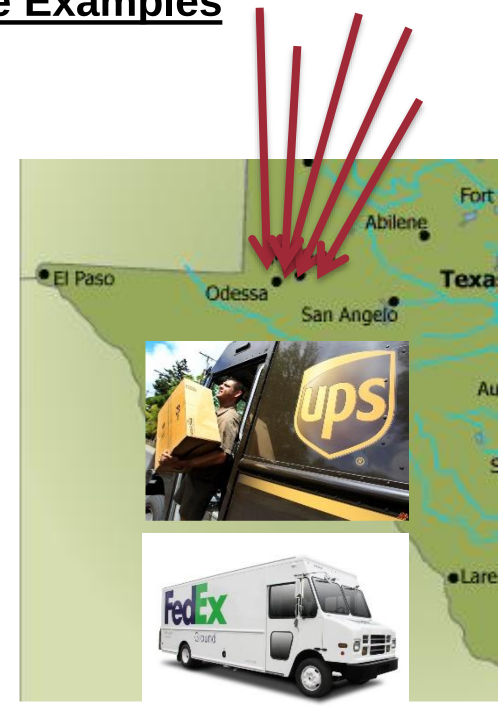
	Rail Carload	Rail Intermodal
Market	• Little to no impact on carload • Most commodities not B2C	• Likely to lose some volume due to eCommerce • International intermodal imports likely to be more fragmented – outside of core intermodal lanes • Increased transloading of ISO to domestic containers and OTR dry vans near ports • Domestic intermodal likely to be impacted as less volume between major markets more into secondary markets, closer to consumers • In Canada intermodal less impacted due to concentration of population around cities
Carriers	• Limited differences across railroads	• US impacted given dispersion of population and shift from large regional DC's to smaller in-market DC's • Canadian roads impacted less

In the US, the shift to market-based DCs will likely result in volume in lanes where railroads do not currently offer intermodal service. Shipments could go direct to consumer

Store-Based Example

eCommerce Examples





Traditional Store-Based

- Intermodal to DFW DC
  - DC 500,000 ft2
- Truck from DFW DC to stores in other Texas cities
- Customers shop at stores

eCommerce-Based

- TL or LTL to in-market fulfillment centers
  - DC 10,000 to 30,000 ft2
- Local package delivery from in-market fulfillment centers

eCommerce-Based

- Out of market fulfillment center parcel direct to consumer

Parcel carriers are experiencing volume surges from eCommerce – this is both good and bad

	Integrators	Alternative Small Package
Market	• Volume increases are good and bad – Significant volume increase – High B2C makes delivery economics worse – High seasonality and spikes (how much capacity to invest in?) • Love/hate Amazon relationship • Move in US to put home delivery on USPS	• Small companies focused on eCommerce space designed for B2C • Typically regional • Big upside growth • Often high customer concentration • Some have high reliance on USPS for delivery • Typically have lower cost structure than integrators
Carriers	• B2C likely to continue to grow for major integrators despite handling lower share of Amazon	• Many different models • Have to develop long-term sustainability (not Amazon insource)

Amazon.com has been developing its own transportation capabilities. It is not clear what its "end game" is

Integrators	Alternative Small Package
• Obtained NVOCC operating license for shipments from China to US • Added air cargo capacity through relationship with ATSG and DHL • Acquiring a private truck fleet to transport shipments between facilities • Developed several programs for final mile delivery – Amazon Flex (Uber-like) model – Use of local delivery companies – Fleet of branded delivery trucks for final mile delivery	• Amazon could follow a number of potential strategies: – <u>Support Peak</u>: Build guaranteed capacity to support holiday peak; other carriers will remain a core aspect of delivery network – <u>Handle Amazon Business</u>: Take control of shipments where density allows it beyond what is required for holiday peak; Support companies selling through Amazon marketplace – <u>For-Hire Parcel Carrier</u>: Leverage its own volume and capabilities to become full for-hire carrier

In many ways Amazon may be viewed as well on its way to becoming the largest 3PL in the world!

Air Freight carriers may win, but likely only in niches. Barge likely not impacted

	Air Freight	Barge
Market	• Grounded air freight networks are participating in eCommerce by doing line haul, sort and delivery for larger items (e.g., seasonal charcoal grills) • Extend two-day network Nationwide for B2C • Increased de minimis values in 2016 should increase eCommerce imports	• Little to no impact on Most commodities not B2C
Carriers	• Forward Air, other grounded air freight providers? • Providers to Amazon Air	• No differences across barge lines

eCommerce is a strong positive for warehousing and distribution

- eCommerce typically requires more warehousing space than brick and mortar stores
- Demand for new 1M+ sf. warehouses has skyrocketed
  - 120 built between 2010 and 2016
  - Totaled 141M sf. – average of 1.175M sf. per warehouse
  - ~30 more planned or being built
  - Most are near large population centers
  - Many built by Amazon
- eCommerce now driving demand for regional fulfillment centers
  - Shift in demand from a few large national DCs to many regional/local fulfillment centers (think Amazon)
  - Needs very closer to population to speed delivery
  - Limited land to build new
  - Older, smaller warehouses of all shapes and sizes back in strong demand
    - Historically abandoned in favor or mega-warehouses
    - Now adequate for eCommerce fulfillment -don't need high ceilings, and typically very close to population

3PLs and technology providers are in a position to manage complexity and provider better solutions

	3PLs	Tech Providers
Market	• eCommerce adds complexity – good for 3PLs • Retailers not used to “eaches” may outsource B2C fulfillment • Requirements of systems and processes very different for B2C • eCommerce start ups want to scale fast – often done more easily through a 3PL • Can be economic benefits to shared facilities • Requires re-think of inbound, too	• Strong positive from having to manage the complexity • Inventory and order management at the “eaches” level, not case or pallet • Integration between front end and back end, across partners • Management across more locations, including stores (OmniChannel) • Heavy returns component
Providers	• “Traditional” 3PLs frequently are not equipped to do eCommerce • Targeted eFulfillment providers – many have struggled to-date	• Likely to be some big winners • Major players and niche providers in the game

TandLA

Transportation and Logistics Advisors, LLC

Lee A. Clair
Managing Partner
312-961-4403
lclair@TandLA.net

Steven Fox
Principal
773-580-6115
sfox@TandLA.net

1910 First Street
Suite 300
Highland Park, IL
60035

TandLA.net