

Logistics Infrastructure:

Transformational
Opportunities



Culverhouse
College of Business

Alabama Center for Real Estate

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Author BIO and Acknowledgements

Author



K.C. Conway, MAI, CRE is the Director of Research and Corporate Engagement at the Alabama Center for Real Estate (ACRE) housed within the University of Alabama's Culverhouse College of Business. Conway also serves as the Chief Economist for the CCIM Institute and was previously the U.S. Chief Economist for Colliers International and the CRE Risk Specialty Officer at the NY Federal Reserve during the Financial Crisis. He is a frequent speaker to a wide array of audiences ranging from academic groups, the bank regulatory community, professional organizations, and industry associations such as NAR, the Appraisal Institute, CCIM Institute, Counselors of Real Estate, etc. In addition to being a frequent lecturer at international conferences, Conway has consulted with major governmental agencies, most notably briefing former Federal Reserve Chairman Ben Bernanke and the Board of Governors on the burgeoning subprime lending and housing crisis and its impact on the commercial real estate industry.

Co-Author



Stuart Norton is the Research Coordinator at the Alabama Center for Real Estate (ACRE) housed within the University of Alabama's Culverhouse College of Business. Norton frequently writes and speaks on residential real estate trends in the state of Alabama. He has authored articles for the Alabama NewsCenter, Real Estate Alabama, and Wallet Hub on a variety of topics including affordable housing, home price appreciation, adaptive reuse, new construction, and site selection. In addition, he is a frequent contributor to the Real Estate Matters podcast. As ACRE's Research Coordinator, he manages the Center's database of closed residential sales transactions, building permits and housing starts, and related demographic information while also supervising the production of monthly, quarterly, and annual sales reports for 24 residential markets across the state.

Additional Support

Ryan Cheng, Research Intern, Alabama Center for Real Estate
Christian Schoerner, Research Intern, Alabama Center for Real Estate
Clayton Knavel, Research Intern, Alabama Center for Real Estate
Spencer Sellers, Research Intern, Alabama Center for Real Estate
Britton Webb, Research Intern, Alabama Center for Real Estate
Dennis Harkey, Graphic Design, D.Harkey Design



Dear Reader:

In 2018 ACRE advanced its Real Estate Research principle through the publication of more research and a relationship with the CCIM Institute in which the ACRE Director of Research and Corporate Engagement also serves as the Institute's Chief Economist. In this relationship, ACRE and the CCIM Institute, have conducted and published papers on a wide range of topics that impact commercial real estate ranging from the Amazon HQ2 search to Adaptive Reuse and most recently CRE Finance Disruption. These research papers have drawn national recognition to ACRE as one of the nation's leading centers for the study of real estate.

This study, titled *Logistics Infrastructure: Transformational Opportunities* is the Alabama Center for Real Estate's inaugural research paper into matters and trends impacting the future development of commercial real estate. It is the first in a series of papers to come annually on topics that impact our commercial real estate industry at large, as well as the Southeast, Gulf-coast, and ALMA economic regions (Alabama, Louisiana, Mississippi and Arkansas). This continued advancement in real estate research at ACRE would not be possible without the support of the University of Alabama, Culverhouse College of Business, the Alabama Real Estate Commission, Alabama Realtors, the ACRE Corporate Cabinet, and ACRE's Advisory Board of Trustees. Under the leadership of Dr. Sam Addy (Associate Dean for Economic Development Outreach, Culverhouse College of Business, Senior Research Economist, Center for Business and Economic Research), ACRE Research is advancing its research guiding principle to produce "Scholarly Research focused on projects with broad and direct impact upon industry stakeholders."

With the support of our founding partners, we look forward to bringing you valuable insights for years to come.

Sincerely,

Grayson Glaze

Grayson Glaze, JD, CPM, CCIM
Executive Director
Alabama Center for Real Estate

The Key Takeaways

for this Logistics Infrastructure Paper:

1 The transportation statistics that validate a call to action on **Logistics Infrastructure (LI)** are compelling.

Whether it's the 4.1 million miles of public roads requiring maintenance, 1.2 billion hours of annual delays for the trucking industry, the 17X increase in annual spending required to maintain the railroads, or E-commerce warehouse demand growing from less than 5 percent of industrial leasing a decade ago to 20 percent today, there is no doubt of the need for Logistics Infrastructure investment.

2 A horseless-carriage, supply-chain from the 1950s cannot support a modern E-commerce Supply-Chain that is growing 25-30 percent per year.

The age and state of our vintage infrastructure is not just inhibiting future economic and real estate development, it is forcing existing industry to relocate toward destinations that have modern LI.

3 Build the Logistics Infrastructure and development will come is not a cliché - It is transformative logistics in action today.

Just as the steel and textile industries left the U.S. in the 1970s & 1980s in pursuit of cheap labor abroad, retail, distribution, and manufacturing businesses are at risk of leaving cities and states that don't invest in LI and update aging infrastructure.

4 LI is driving the why and where decisions for commercial real estate development.

The examples of this transformation in action are the locations of new Amazon and Wal-Mart fulfillment centers developing near intermodal - places like Bessemer and Mobile AL, OH, Polk County FL, and Tucson AZ. One can also look to the locations for new aircraft, auto and machinery manufacturing plants in AL, GA, SC and TX.

5 The shift from **shop-and-take-home** to **online-order and deliver** will result in less retail store square footage, but the tradeoff will be many new fulfillment centers and warehouses aligned with new LI.

E-commerce fulfillment centers will displace one-third of America's 1,100 malls.

6 The development metrics by the major commercial real estate brokerages suggest a boom is ahead for new industrial warehouse development.

Warehouse is the new department store or retail big-box due to E-commerce. Demand/absorption still exceeds supply resulting in another 800msf to 1.0 billion square feet of new development across the U.S. over the next 3 years.

7 Today the margins for **On-line-Shop-and Deliver** do not beat **Shop-and-Take-Home**, but retailers will not reverse course from E-commerce. Retailers will double-down on technology and LI to get the margins right.

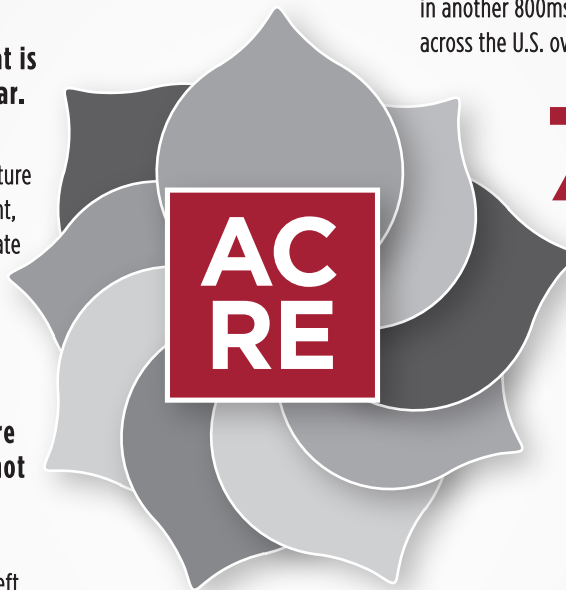
Alix Partners crunched the numbers for CNBC in 2017 and found that for apparel retailers the net margin from merchandise sold at brick-and-mortar stores was 32 percent compared to 30 percent for on-line apparel sales.

8 Reliance on the Federal government to Logistics Infrastructure for port projects, rail, intermodal or needed supply-chain components is too lottery-like a strategy to fund our economy's circulation system.

Of the billions of dollars available annually to fund our ports and inland waterways via the Harbor Maintenance Trust Fund, only 10 percent of BOY balances are distributed to ports.

9 The time has come to rank our No. American ports based on a more dynamic method than the current single variable of TEU container count.

A model that calibrates factors like port depth, Class I rail connectivity, number of PPMX Gantry Cranes, usage by Shipping Alliances, etc. should be used.



ACRE Logistics Outlook

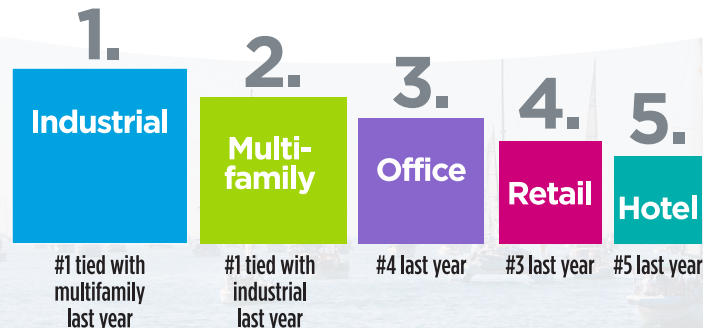
- 1. The E-commerce economy will drive on-line retail sales to 20 percent of total sales by 2022.** Using Black Friday 2018 on-line sales of a record \$6.2+ billion (up 20% over 2017) as a proxy, the ratio of logistics related leasing will rise from its current level of 20 percent of total industrial leasing to 30-35 percent over the next 3 years. As annual on-line retail activity grows by a mid-teen to twenty percent rate, expands into more merchandise categories - such as grocery, pharmacy, and big-and-bulky (like appliances, furniture, and automobiles), at least another 1.0 billion square feet of logistics warehouses will be needed by 2022 to meet with the growth of E-commerce. Although an estimated 800msf of new warehouse space is underway or planned for development by 2022 nationwide, ACRE estimates that development activity will rise even further from the current pipeline level of 800msf to 1.0 billion sf.
- 2. Industrial real estate will remain the top performing core commercial property type again in 2019.** For the third consecutive year, Industrial real estate was the top preferred core property type again in 2017 by foreign investors in the U.S. - according to the annual AFIRE (Association of Foreign Investors in Real Estate) report conducted by the James A. Graaskamp Center for Real Estate. And it is also outpacing all core-property types for price appreciation according to Green Street CPPI with 11-12 percent property-price-appreciation. ACRE forecasts continued double digit annual appreciation for industrial real estate, and no change to the current low vacancy rate of 5 percent despite more than 1.0 billion SF of new supply expected over the next 3 years. Why? It's as basic as demand exceeds supply due to growth in on-line retail. An expansion that's expanding into grocery, autos and everything we consume. There just aren't enough warehouse near LI to keep up with the growth in on-line consumption.
- 3. U.S. GDP will slow but remain above 2.0 percent in 2019, but it will**

bifurcate further between states that invest in LI and those that do not. States investing in LI are experiencing state-level GDP of at least 2.0 percent. Those states with less-than 2.0 percent GDP lag in LI investment. States that fail to invest in LI will experience sub-2.0 percent annual GDP and miss out on new economic development opportunities to states with modern or upgraded LI.

- 4. States that rely on the Harbor Maintenance Trust Fund (HMTF) or TIGER grants to budget needed LI investment will continue to find that strategy insufficient and lottery-like.** Recognizing the HMTF's poor track record for dispersing the billions in collected revenue for port and waterway projects from the 0.125% tax on the value of cargo handled at ports, states with ports need to accept responsibility for funding their capital projects to dredge, diversify from bulk cargo to container handling, add RoRo (roll-on/roll-off) automobile and equipment processing operations, and develop inland ports, rail, and intermodal infrastructure, etc. to lure additive manufacturing, E-commerce fulfillment centers, and industrial warehouse development.
- 5. The ports of Charleston SC and GA (collectively the ports of Savannah and Brunswick) will be the LA & Long Beach of the East coast and rival the combined ports of LA and Long Beach in container activity by 2030 with the development of the Jasper Ocean Terminal in Jasper SC.** Savannah ranks 4th in container activity in North America and surpassed the 4.0 million TEUs threshold in 2018. It has learned the benefit of inland ports from SC and is adding multiple new ones to extend its reach to users in TN and IL. Brunswick ranks 4th for handling auto imports and exports (630,000 units in 2017 according to Automotive Logistics) behind #1 Vera Cruz in Mexico (1.05 million autos in 2017), #2 Baltimore (800,000 units) and #3 Jacksonville FL (690,000 cars and trucks).

The SC State Port Authority (port of Charleston) led by Jim Newsome ranks 9th in container activity with 2.2 million TEUs - just behind Oakland CA and Houston - each with 2.5 million TEUs. The SCSPA is the model of economic development for states to emulate. Over the past decade its LI investment and growth have reached a \$50 billion impact level supporting nearly 190,000 jobs statewide. In aggregate, the port now accounts for 10 percent of the state's GDP. It has a \$2.3 billion CapEx plan in place addressing every LI item from port depth, rail connectivity, RoRo and automobile processing, to truck chassis management and port security. It ranks as a top-10 North American port and has been the

PROPERTY TYPE RANKINGS



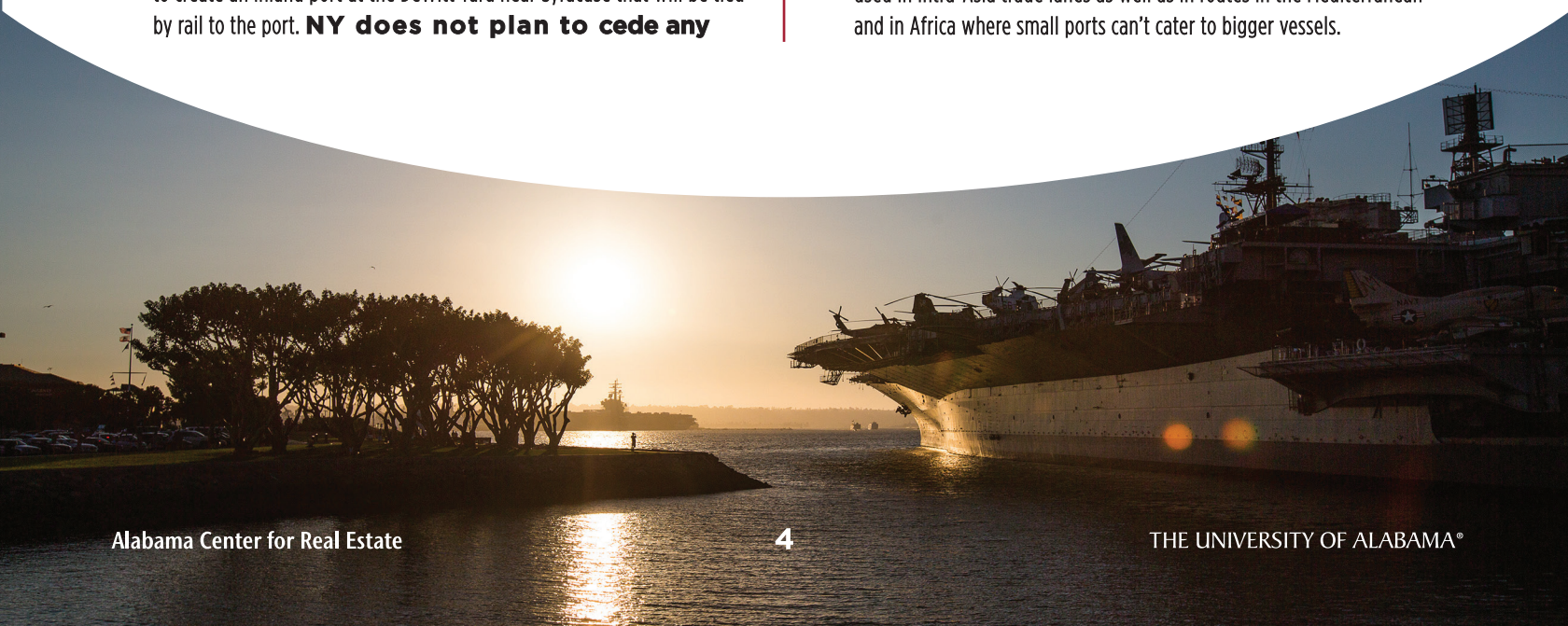
fastest growing container port 2009-2017 with an 8% CAGR. The aforementioned is why SC continues to attract or see expansion from the likes of BMW, Boeing, Michelin Tire, Volvo, Samsung, Harbor Freight, etc. The port of SC epitomizes “Develop LI and It will Come”. And finally, the port of SC handles the export of all U.S. German manufacturer cars made in the U.S. (BMW and Mercedes in both AL and SC), which now exceeds the number of vehicles made in the U.S. by either GM or Ford.

6. **The ports of Mobile (AL) and Freeport (TX) near Houston have the greatest opportunity for growth** if they make the needed LI investments and continue to develop their container terminal and rail infrastructure. Mobile has proximity to five Class 1 railroads and Freeport three. However, both ports handle less than one-half million containers today but have the potential to handle 2.0 to 3.0 million containers within 3-5 years. The port of Mobile is expanding container terminal capacity to accommodate the new addition of Wal-Mart’s distribution center. This addition will add an estimated 1.0 million TEUs to Mobile by 2020. The port is also adding Roll-on, Roll-off (RoRo) operations funded by a 2018 TIGER grant. And don’t forget about Port of Mobile’s importance to Airbus as it manufactures the competitive commercial jetliner to what Boeing is building in Charleston, SC. Port Freeport has the potential to be to Dallas what Port of Savannah is to Atlanta today. It will also become the Saudi Arabia of LNG (liquefied natural gas) gas exports to the rest of the world.
7. **Don’t under-estimate or count growth out at either the ports of NY or LA and Long Beach. Each will remain top 5 Container ports in North America for the next decade.** The NY Port Authority is finalizing the most comprehensive and long-range maritime master plan of all North American ports that will guide development of the port’s 3,000-plus acres of cargo-related property during the next 25 to 30 years. Forecasting a 68 percent rise in cargo traffic by 2045, authorities and freight industry stakeholders around the Port of New York and New Jersey aim to enhance rail systems, add barge routes, and make more efficient use of port facilities and to mitigate truck traffic. In addition, New York City officials have released a \$100 million plan to “overhaul the city’s aging freight distribution systems,” and the NY and NJ port authorities are jointly looking to develop a container terminal in Brooklyn to be largely served by barges or Feeder Vessels. And in July 2018, New York State awarded a grant of \$21 million to CSX Transportation to create an inland port at the DeWitt Yard near Syracuse that will be tied by rail to the port. **NY does not plan to cede any**

more growth to the Ports of Baltimore, Virginia, Savannah or Charleston.

A similar story is occurring at ports of LA and Long Beach. The real story at both these dominant North American container ports is that container activity at West-coast ports from Seattle/Tacoma and Portland on down to Oakland is consolidating to southern California as shipping alliances consolidate. What growth LA and Long Beach have lost from the expanded Panama Canal to the Gulf and East coast ports they are more than recouping from consolidation along the West coast. The ports of LA and Long Beach are just deeper, more modern with more gantry cranes and favored by shipping alliances.

8. **Monitor LI investment in Eastern Canada and America’s 4th coast (The Great Lakes) as both develop port and inland port projects.** The Port of Cleveland and Eastern Canada are emerging port markets. They are the Up & Comers to keep an eye on if you are ports of NY or Vancouver.
9. **Rail Consolidation is ahead.** With petroleum moving to pipelines freeing up carload capacity, and rail competition as fierce as in the shipping industry, not all seven Class 1 railroads can continue to exist independently. Keep an eye on CSX – especially with Norfolk Southern’s HQ move to Atlanta, and Kansas City Southern – the only Class 1 railroad with direct access to all of Mexico and its key ports. Subscribe to the American Association of Railroad’s monthly RailTime Indicators report to stay updated on rail traffic trends that are already flashing the merger signals.
10. **The Feeder Vessel concept to unload mega oil tanker vessels will be applied to mega containerships in North America to better access smaller ports in say Mexico - or River ports and inland waterways in the U.S.** Known as **Boxships**, ACRE forecasts this pioneering trend by A.P. Moller-Maersk shipping will be the strategy that drives container growth at shallow ports with less than 50-foot depth, river ports, and inland waterways. Shallow-water ports in Mexico, along with river ports in the U.S. lacking 50-foot depth (Savannah and Jacksonville) and ports with inland waterway connectivity, such as Mobile, could be beneficiaries. Orders for feeder vessels have been rising over the past two years as operators that run mega-containerships of 20,000 containers find it cheaper and less time consuming to move containers at sea rather than docking at ports. These Feeder-Vessels (aka Boxships) are also being used in intra-Asia trade lanes as well as in routes in the Mediterranean and in Africa where small ports can’t cater to bigger vessels.

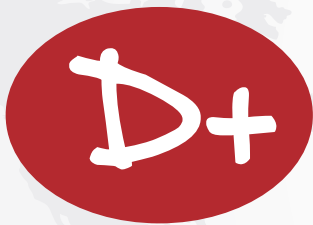


ACRE's Dozen Most Notable Logistics, Transportation, E-commerce and R.E. Statistics

At the onset to this paper, the leading Key Idea was presented and stated that: "The transportation statistics that validate a call to action on Logistics Infrastructure are compelling. In the course of this research many statistics and data points were uncovered, but the dozen most notable that communities, states, port authorities, logistics and supply-chain companies, as well as real estate developers and investors need focus upon within the context of the preceding sections that establish the historical context of how we got here are:



4.1 million miles of public municipal, county, state and federal roads requiring maintenance



grade for the state of infrastructure to the world's largest economy by the American Society of Civil Engineers (ASCE) for 2013-2017 period



+15-16%
ANNUAL GROWTH
for each of the
past 3 years

+32%

increase in average e-commerce retail traffic for the **2018 Monday before Thanksgiving through Black Friday** period over the same period in 2017



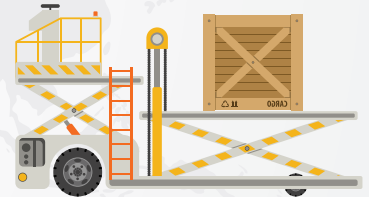
50 million containers handled annually

at Top 30 North American ports
80% from the top 10 US ports led by:
#1 Los Angeles (9.3 million),
#2 Long Beach (7.5 million),
#3 New York (6.7 million),
#4 Savannah (4.0 million),
#5 Seattle (3.7 million), and then
2.1 million to 2.8 million TEUs for
#6 Norfolk,
#7 Houston,
#8 Oakland and
#9 Charleston SC

9:1

collection to outlay/spending ratio
by the Harbor Maintenance

Trust Fund (HMTF) - primary federal fund to maintain and improve our ports and inland waterways. Since 1998, the Beginning-of-Year balances in this fund have increased from \$1.0 billion 20 years ago to over \$9 billion at start of 2017, while the annual outlays to our ports and waterways have averaged just a small fraction - or less than \$1.0 billion (2017)



+17X

increase in the necessary annual capital spending by our Class 1 railroads since 1960 from just under \$1.0 billion to more than \$17 billion¹



+6X

increase in Intermodal rail traffic since 1970 from 2.3 million containers to more than 14 million truck trailers and containers. At \$40 billion, the North American intermodal market is the largest in the world; and it relies on a fleet of more than 700,000 chassis to move 35 million containers annually to distribution centers throughout the U.S. Intermodal is a big deal in LI.



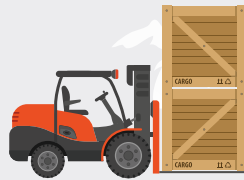
1.443

million Intermodal Rail Containers in October 2018

According to AAR.org, the U.S. originated 1,443,914 containers and trailers in October 2018, up 4.2% (58,546 units) over October 2017. The weekly average in October 2018 was the second most (behind June 2018) for any month in history.

1.2 billion

hours of delays for the trucking industry on our nation's highway system in CY 2016 as a result of traffic congestion. This delay is the equivalent of 425,533 commercial truck drivers sitting idle for an entire working year. Distributing this cost across the 11.5 million registered large trucks in the U.S. results in an average congestion cost per truck of \$6,478.



+12%

12% YOY increase in Freight Expenditures Oct 2018 in the Cass Freight Index

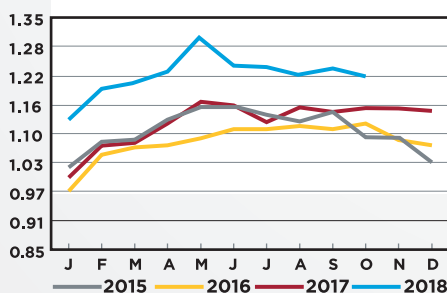


+20%

E-commerce distribution space demand exploding from less than 5 percent of industrial leasing to 20 percent.

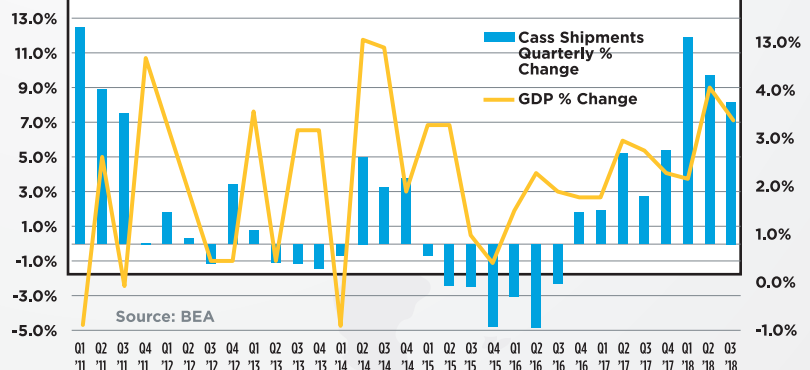
The volume of freight shipments was up 6.2% YOY in October, and the expenditures on freight shipments were up 12% (Q2 2018 was 2nd highest reading in the index since Q2 2014) Since 1995, the Cass Freight Index® has been a reliable measure of North American freight volumes and expenditures that is closely correlated to GDP. It provides valuable insight into freight trends on all domestic freight modes derived from \$25 billion in freight transactions processed by Cass annually on behalf of its client base of hundreds of large shippers. This is one metric where the picture - or two - are worth the thousand words of explanation.

Cass Freight Index® Shipments



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Cass Shipments Index vs. GDP





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