Are Home Deliveries Increasing during the Pandemic? Update 7

Sorin Garber 12/17/2021

In this 7th quarterly edition of *Are Home Deliveries Increasing during the Pandemic*?, I am again providing the latest quarterly data on E-Commerce (retail) sales, development of warehouses and distribution centers for E-Commerce products, and the changes in employment of those handling, assembling, packaging, and delivering E-Commerce products. This issue also includes some initiatives by municipalities to better manage all delivery traffic as well as very recent logistics and shipping changes being implemented by carriers and shippers to deal with continued increased demand, higher shipping costs, and more reliable delivery performance.

I start with…

E-commerce in the News

The flow of E-commerce traffic is being adversely impacted in a multitude of ways, and several of them are making headlines in the press and as soundbites for political parties.

That is, while we are continuing to experience significant growth in E-commerce sales, we are also suffering through the global Covid-19 pandemic which has resulted in a shrunken labor force in the carrier and shipper industries. Reduced demand at the start of the pandemic followed by China's national lockdown led to container ship lines cancelling many of their routes and dropping containers in ports globally. With containers not moving like they normally do, shippers and their carriers have had to delay their shipments.

The concerns above are referred to as the global supply chain problem. It is a massive surge in demand that outweighs the market's capacity. For example:

- The American Trucking Association projects a need for 80,000 truck drivers.
- E-commerce sales grew by 48% from pre-pandemic levels (see next section).
- The low inventory of containers led to an average cost of $6,160, which is 90% higher than their cost a year ago.
- The Labor Department in July reported that the warehouse industry had a record 490,000 job openings.

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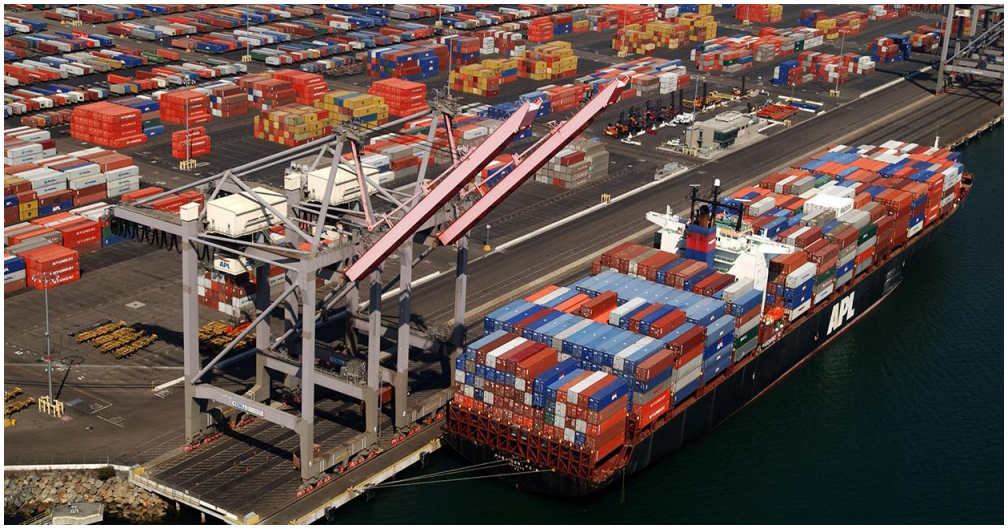


Courtesy of The Daily Signal What Is the Root Cause of Our Supply Chain Problems? (dailysignal.com)

Finally, there are also increasing fuel costs and the highest inflation rates we have had in nearly four decades.

- The price of a gallon of diesel fuel rose from $2.43 in 11/2020 to $3.73 in 11/2021
- Inflation surged by 6.8% in 11/2021, to its highest rate in 39 years

Despite these global transportation and logistics issues, E-commerce sales in the U.S. are continuing to climb.

2021 Third Quarter E-Commerce Indicators

Once again, this past quarter showed:

- ***E-Commerce Sales*** – Grew by **38.9%** while in-store sales grew 3.9% in comparison with the pre-pandemic 3rd quarter of 2019. For the first three quarters of 2021, E-commerce sales have grown by 48% from pre-pandemic levels (i.e., January-September 2019), compared with a 17% increase for in-store sales for the same periods.

  An interesting change appeared in this year's 3rd quarter – likely having to do with the increased number of vaccinated shoppers and the rise in shopper's comfort in shopping in stores – is the 14.1% increase in in-store sales from the 2nd quarter to the 3rd quarter of 2019.

Since 2015, E-commerce sales revenues grew by 158% compared to 31% for total in-store and e-commerce sales.

Table 1. U.S. Retail Sales in 1st, 2nd, and 3rd Quarters from 2015 to 2021 (in $millions)

	January-Sept 2015	January-Sept 2016	January-Sept 2017	January-Sept 2018	January-Sept 2019	January-Sept 2020	January-Sept 2021
In Stores	$3,266,922	$3,305,302	$3,446,696	$3,619,786	$3,631,112	$3,693,484	$4,248,721
Via E-commerce	$252,316	$291,689	$331,889	$387,999	$439,285	$617,244	$651,827
Total	$3,519,238	$3,596,991	$3,778,585	$4,007,785	$4,070,397	$4,310,728	$4,900,548
% E-commerce	7.20%	8.10%	8.80%	9.70%	10.80%	14.30%	13.30%

Source: *Quarterly Retail E-Commerce Sales*, US Dept of Commerce, https://www2.census.gov/retail/releases/historical/ecomm/21q3.pdf

- ***E-Commerce Employment*** – As shown in Table 2, total private sector employment, retail trade and relevant E-commerce delivery jobs (i.e., truck transportation, couriers, messengers) showed continued increases both statewide and in the Portland/Vancouver region in the first three quarters of 2021 from the same period in 2020. Courier and messenger jobs grew by the highest amount – 7.7% statewide and 6.7% in the region – and reversed the trend of job losses they experienced in the first quarter of 2021. Warehousing jobs grew statewide but declined by 2.6% (or 333 jobs) in the Portland/Vancouver region from the levels between the second and third quarter. The Bureau of Commerce data also shows major growth in courier and messenger jobs, which had fallen by double digit percentages in the second quarter.

  Further, continuing the trends of 2020 and 2021, employment growth during the pandemic has exploded for couriers, messengers, and warehouse workers (grown by 33.3% and 40%, respectively), while overall private sector employment declined by 5% statewide and 6% regionally.

Table 2. Changes in Selected Employment Categories State of Oregon and Portland Metropolitan Area, 2019, 2020 and 2021*

	Oregon-Statewide			Portland / Vancouver Region		
	2019	2020	2021*	2019	2020	2021*
Private Sector Employment	1,655,800	1,544,000	1,574,211	1,075,500	997,800	1,013,967
Truck Drivers	18,958	18,542	18,956	11,100	10,800	11,111
Couriers and Messengers	10,558	13,242	14,267	7,600	9,500	10,133
Warehouse & Storage Workers	13,717	18,767	19,378	9,000	12,900	12,567
Retail	210,083	200,517	207,389	118,100	111,400	114,567

Source: Oregon Employment Department https://www.qualityinfo.org/ed-ceest/?at=1&t1=4101000000~2~0~00000000~2021~or&t2=41010000000~0~0~00000000~2014~or

* January through September 2021 data

- ***E-Commerce Related Land Development.*** As shown in Table 3 an additional 90,000 square feet of industrial/manufacturing/warehouse development was added in the third quarter, growing the total inventory to 254 million square feet of such space. Moreover, 1,985,000 square feet is under construction. The overall vacancy rate

declined from 5.2% to 4.9% from the second quarter 2021, which may have contributed, in part, to the 0.03 cent/square foot lease rate reduction.

Table 3. Changes in Warehouse, Distribution and Flex Space in the Portland Metropolitan Area in 2020 and 2021

New Supply (in 1,000's of square feet)				
	1st Qtr.	*2nd Qtr.*	*3rd Qtr.*	*4th Qtr.*
2020	557	2,336	517	767
2021	1,302	314	90	
Under construction (in 1,000's of square feet)				
	1st Qtr.	*2nd Qtr.*	*3rd Qtr.*	*4th Qtr.*
2020	6,272	3,785	3,830	2,932
2021	3,486	3,620	1,985	
Vacancy Rate				
	1st Qtr.	*2nd Qtr.*	*3rd Qtr.*	*4th Qtr.*
2020	4.4%	4.2%	4.1%	4.8%
2021	5.1%	5.2%	4.9%	

Source: *Portland Metro Industrial Report*, Colliers International 2021 Q3 Portland Metro Industrial Market Report | Colliers

The 90,000 square foot of industrial development in the 3rd quarter was for a sole parcel in Canby. According to Colliers, the region's lack of available industrial space may be pushing development to the fringes of the region.

Potential Changes in E-Commerce Shipping

***Less-than-Truckload Trips now Outpacing Truck Load Trips*.** While we often talk about the non-motorized last-mile delivery modes (several of which have been reported on in earlier newsletters), trucks still make most of those trips. What is a new phenomenon is that the smaller quantity shipments and faster delivery requirements of E-commerce have led to a significant increase in the use of less-than-truckload (LTL) carriers and shipments over the more traditional truckload (TL) shipments and carriers.

> "You're not shipping full truckload now," said JP Wiggins, co-founder, and vice president of logistics at 3Gtms. "You're in a different type of supply chain environment" — one that centers around e-commerce and LTL shipments.

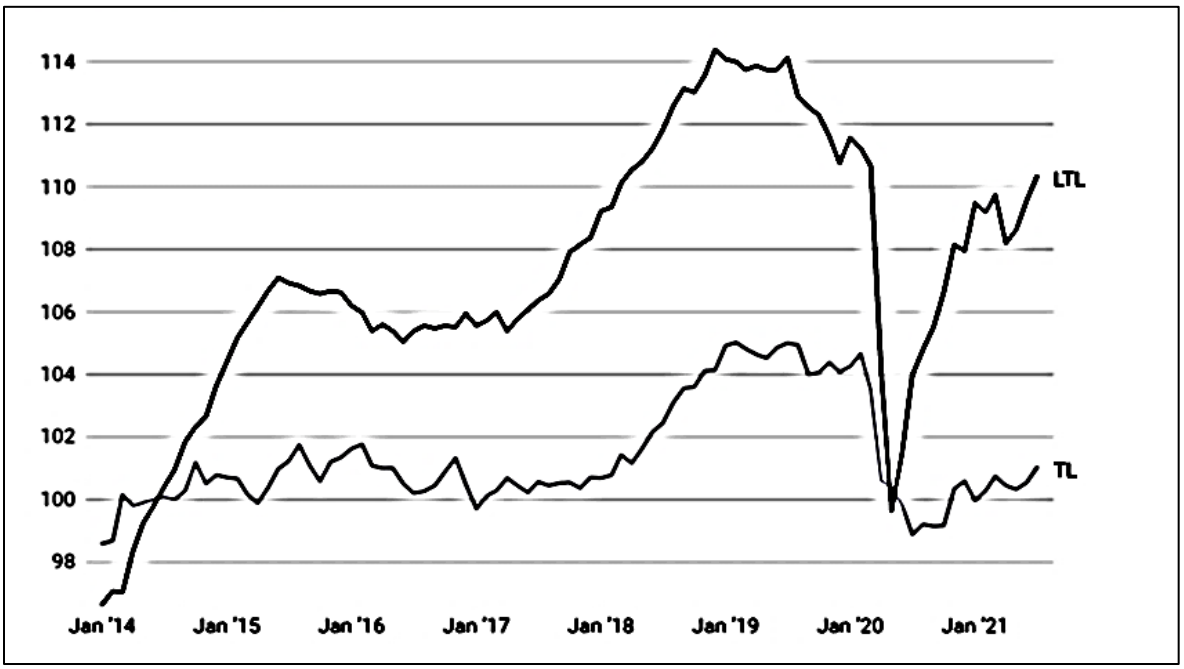
Less than truckload, or LTL, refers to using less than the full trailer space and consist of shipments weighing between 150 and 15,000 pounds. They often carry the cargo for multiple shippers between numerous origins and destinations.

Full truckload, or TL, is when a trailer is dedicated to one shipment that fills up the trailer. TL shipments are hauled between a single origin and destination.

Truck types and configurations are similar for both LTL and TL.

As shown in Figure 1, this statement is borne out by recent data showing significant growth in LTL jobs and stagnation in TL jobs.

Figure 1. Changes in LTL and TL Employment 2014 through 2021

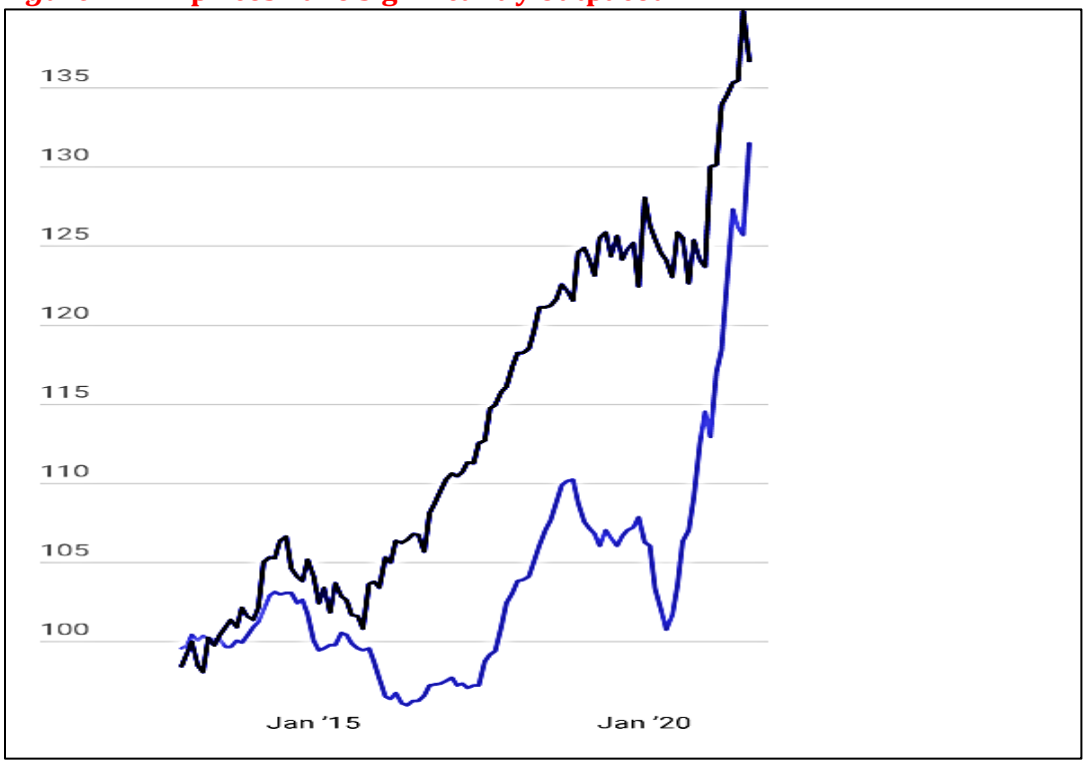


Source: U.S. Bureau of Labor Statistics, chart created by S.L Fuller/ Supply Chain Drive

While LTL may be better suited to E-commerce delivery operations, it is more costly and at this time has far has less capacity to move goods than TL carriers do.

> *"For many shippers, the LTL market is currently chaotic". Schmidt-Duncan said she receives emails every day from carriers saying they are booked up for the day or they are only taking limited amounts of freight in a certain market. Those notices could come before noon. "Shippers then have to decide whether to hold their freight and forfeit that on-time delivery or move to another carrier. If shippers want to move to the spot market, costs there are about 30% higher," Schmidt-Duncan said*

Figure 2. **LTL prices have significantly outpaced TL**



Source: U.S. Bureau of Labor Statistics, chart created by S.L Fuller/ Supply Chain Drive

LTL **TL**

Retailers are Increasingly Shipping Directly to Consumers. That is, lesser use of UPS, FedEx, USPS, and similar carriers. Even the largest retailers are using their own trucks, or contracting out to smaller companies, and increasing the competition in the shipping market.

In fact, UPS and FedEx are losing market share, and have been every year since 2016. Amazon has attracted most of their lost E-commerce delivery, but there has also been a slew of new players entering the package logistics industry, most commonly at the local level.

UPS dropped some customers and services that were not as profitable as others, while FedEx suffered an increasing lagging on-time performance, which led many retailers to seek new carriers.

Several of these new E-commerce logistics startups (many of which have been founded by ex-Amazon executives) are using technology to coordinate operations rather than creating networks of trucks, facilities, and drivers. And they are collaborating with retailers to create more localized, seamless, flexible, and efficient operations.

Reserving Loading Spaces. Several cities (including Boston, Washington, DC, Philadelphia, and Columbus, OH) have launched pilot programs using different software technologies (such as curbFlow and CoMotion) that allow carriers to reserve curb space for deliveries.

None of the pilots are permanent as different software applications are being tested and additional data is collected about curb usage and needs.

The programs rely on data provided in real time from sensors embedded in curbs (systems that are in place in Seattle, San Francisco, Miami, and Los Angeles) or through cameras. After registering as a user in the reservation system, drivers can reserve space through a web site and can pay either in the traditional manner at an on-street parking meter, or receive discounted rates for large sets of reservations, or for free if the curb space is designated as being reserved.

For the Washington, DC three-month pilot, according to CurbFlow founder Ali Vahabzadeh:

> "More than 6,350 drivers registered for the system, and more than 15,500 vehicles used the zones, including most who had not made a reservation. He said a company survey found that 85 percent of users rated the system a 9 or 10 as something they would recommend."

Truck drivers claimed that their delivery time was significantly reduced, and they avoided paying parking tickets. One driver who used the Georgetown area system said:

> "I could pull up right to the store, make my delivery and go on about my day," After the pilot ended (I) had to park two blocks away. That turned what had been a 10-minute delivery into 30 to 45 minutes of schlepping shoes via several trips with a dolly."

These programs hold great promise for cities that are seeking to balance limited curb space with the competing needs of long- and short-term residential parkers, shoppers, passenger car drop-offs and pick-ups, utility and emergency vehicles, service calls, and deliveries. They would also benefit carriers who can reduce their circulation time and mileage seeking available curb space, and for shippers who can better coordinate the schedules of their shipping and receiving staff.

However, there are many technical and practical issues that need to be resolved before these systems are implemented permanently. Most importantly, these systems often rely on predictive assessments based on historical data, and they also must be able to ensure that the space that is being reserved can remain reserved.

Low Emission Zones and Zero-Emission Zones. Another emerging initiative that affects not only E-commerce deliveries but all forms of motor vehicle traffic, are zero emission zones and low-emission zones. These are in place in London, Paris, Milan, Stockholm, Shenzhen, Singapore, and other densely populated international cities [1]. These programs either charge motorists to enter these zones to cut down on traffic congestion, or outright prohibit vehicles that emit higher pollution levels.

Central London Congestion Zone

A portion of downtown Santa Monica, CA is the lone zero-emissions delivery zone in the U.S; and it is a voluntary one-to-three-year pilot program that began in April 2020. This zone, which businesses participate in voluntarily, is used to test whether deliveries can be conducted by a variety of zero-emission modes such as e-cargo bikes and electric delivery vehicles, and in doing so can reduce congestion and air pollution levels.

While participation in the program is voluntary, there are benefits to doing so.. For example, the City of Santa Monica prioritizes curb space for zero-emissions delivery vehicles, and the state of California has provided funds to subsidize participation in the zone.

Innovations include an app that local businesses can use to schedule deliveries on a shared electric truck and new curb monitoring technology that allows the city to warn vehicles that do not comply with the standard. The curb monitoring technology should also allow the city to understand more about congestion levels, curb availability, and idling times for vehicles in the zone.

Changes to USPS First Class Delivery Times. On October 1, 2021, the USPS changed first class delivery times from 1-3 days to 2-5 days as a cost-cutting measure and to improve their on-time delivery performance. First class mail is one of primary shipment methods used by E-commerce sellers; especially those weighing under one pound. What's more is that postage rates are expected to increase, and commercial rate will now be dramatically curtailed.

The impact to E-commerce logistics is significant in that several shippers have tailored their processes to align with the USPS' network and standards.

[1] According to the Union of Concerned Scientists and the Greenlining Institute, "there are more than 250 of these zones across Europe" low-and-zero-emissions-zones.pdf (ucsusa.org)

Impacts to delivery times or shipping costs from these changes at the USPS have yet to be reported as of the date of this publication.

Frequently Asked Questions

(These FAQs were presented in an earlier update. Do you have any questions you would like to see considered?)

- Is the increase in e-commerce delivery resulting in increased vehicle miles of travel (vmt) and emissions overall?
    - I do not know of any comprehensive or credible analyses of these impacts. Some researchers claim that e-commerce deliveries are consolidations of trips in place of individual household trips. Others believe that deliveries of individual goods would otherwise be combined by a household resulting in added vmt and corresponding emissions. There are a lot of opinions out there and while some might make sense for delivery of certain products, others will not for different products. In addition, for the vmt generated by carriers, one must consider the mileage between origins and destinations, the number of returns, and the logistical practices that always seek to increase the density of delivery trips. For the household making those trips there is always the potential to combine their trip purposes and thus reduce their total vmt and emissions levels.
- Are e-commerce deliveries creating traffic congestion or aggravating already problematic transportation problems?
    - In general, we do not know the answer, though localized studies could confirm whether they do. Anecdotally, and especially while people have been working from home, many residents do mention a large number of UPS and FedEx vans traveling their neighborhood streets throughout the day. Moreover, it is common to observe packages being stacked on sidewalks such as this photo I took on NW 23rd Street.

- Will brick-and-mortar stores soon be a thing of the past? If so, how will that affect our neighborhood activity centers?

- It sure seems like they are part of a bygone era. One only needs to observe the number of vacant stores at shopping malls – many of which are being repurposed into different uses. This is not the only time that pundits and others thought the sky was falling regarding downtown shopping. For example, when people moved in droves from cities to the suburbs in the 1950s through 1980s, and in Portland when we had the downtown parking lid in the 1980s and 1990s, and these days with the impact of protests and vandalism in the past year, many felt that downtown retail would be no more.

  While many national retail chains and other mature retailers have been able to weather the storm through use of e-commerce, reorganizations, selling off assets, and promotions for their goods, we are witnessing a major change in the downtown storefront environment.

  As shown in Table 1 above, sales revenue at brick-and mortar stores is higher than it has been in any year since 2015. E-commerce has been eating away at their sales, but the in-store experience is evolving, and many surveys on customer shopping habits indicate that they enjoy having both options. In other words, it is unclear whether the growth in on-line retail sales will continue at its current pace or whether customers will return to brick-and-mortar stores in droves.

- Can rail be used to deliver e-commerce packages?
  - The U.S. Post Office, FedEx, UPS, and other delivery companies already use rail for many deliveries of retail products, however, there is little to no-use of rail for one-day or two-day delivery. In general, rail is the most cost-effective option for delivery of large quantities of non-perishable, non-fragile commodities. Because many e-commerce deliveries are delivered directly to a customer's home, use of rail would require a trip by truck or car from its origin to a rail terminal and by truck or car from a rail terminal to their destination – which would be more costly than simply using a truck or a car for that delivery.
- Can cargo-bikes replace trucks in delivering e-commerce packages?
  - Yes and they already do for many types of delivery trips. Not only are private cargo-bike delivery companies in Portland including B-Line and Portland Pedal Power keeping busy, but UPS uses cargo-bikes throughout downtown Portland from a hub on the PSU campus. Cargo-bikes can accommodate as much as 275-350 lbs., and many use electric assist or all-electric power. They are clearly advantageous for deliveries to dense urban areas and smaller delivery destinations. They also can play a strategic role in handoffs between trucks/passenger cars as well as from close-in distribution hubs.
- How many medium trucks, light-duty trucks, passenger cars, bicycles, bots, drones, and pedestrians are delivering e-commerce packages?

- No one knows. Much of the information about this is proprietary and public agencies do not distinguish the types of deliveries being made or whether a vehicle is performing services or making deliveries in their field surveys. Portland Metro will be using commodity flow data from the Freight Analysis Framework and INRIX, and origin-destination pairs by medium and heavy trucks to create a foundation for at least the contributions by trucks for this kind of analysis.

What does this all mean?

As I have mentioned in each of my updates, there are few consistent trends about how E-commerce customers and suppliers are reacting to the pandemic that we can rely on, due to so many unprecedented global events dictating both product availability and customer confidence.

First and foremost is the contraction of the U.S. economy – which shrank 9.5% in the second quarter of 2020; the worst quarter decline ever – including the Great Depression when the economy shrank by 7.2% in one quarter[2]. Further, the U.S. GDP shrank at an annual rate of 32.9%[3] in the second quarter, and the unemployment rate fluctuated between 11.1% and 14.7%[4].

But then in the 1st quarter of 2021 we experienced an economic rebound with GDP increasing at an annual rate of 6.4%, and 4.3% in the 4th quarter of 2020 and the unemployment rate declined to 6.7%. Skeptics then might say: 'how much of this positive economic news is due to one-time stimulus payments to U.S. taxpayers?'

Finally, we have near doubling costs of containers, a serious lack of needed employees, and a global pandemic, but retail sales are through the roof.

In other words, we need to exercise caution when reviewing data and anecdotes about the changes in the retail sector during the pandemic before reaching conclusions about what the future will bring. Retailers have always innovated to outperform their competitors, and suppliers and carriers have always responded to their changing demands. We can be confident, however, that there are many more changes to come in the e-commerce delivery industry and what we ask of it

This is the seventh installment of updates to the study - *E-Commerce and Emerging Logistics Technology* - I prepared for the City of Portland, which also describes strategies employed by shippers and carriers throughout the U.S. and around the world to meet the fast-growing volume of ecommerce deliveries, and recommendations for how cities can work with industry to help manage the delivery traffic.

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[2] *U.S. economy contracted at fastest quarterly rate on record from April to June as coronavirus walloped workers, businesses*, Washington Post, Rachel Siegel and Andrew Van Dam, July 30, 2020, https://www.washingtonpost.com/business/2020/07/30/gdp-q2-coronavirus/

[3] *Gross Domestic Product, 1st Quarter 2021 (Advance Estimate) and Annual Update*, U.S. Department of Commerce, April 29, 2021, Gross Domestic Product, First Quarter 2021 (Advance Estimate) | U.S. Bureau of Economic Analysis (BEA)

[4] *Unemployment Rates Seasonally Adjusted (USLAUS Tool),* Quality Info. Org, https://www.qualityinfo.org/ed

I'm going to continue tracking data e-commerce sales, employment by type of delivery worker, vacancy rates for industrial/warehouse space, and sales by retail category, and publishing them on both my web site (www.sgapdx.com) and LinkedIn site.

There is a wide range of data about ecommerce sales behaviors during the pandemic such as ecommerce sales by age group, ecommerce sales by commodity, ecommerce sales by company, and more.

If you are interested in learning more about these and other trends, or asking questions, or commenting on my answers, please contact me at sorin.garber@sgapdx.com