National Paper Trade Association

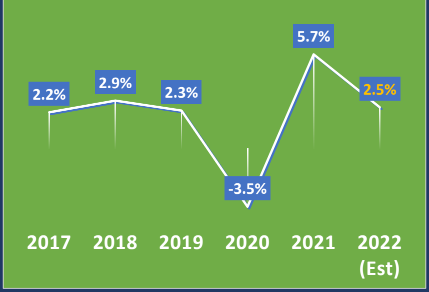
Quarterly Economic Report

Q1 2022

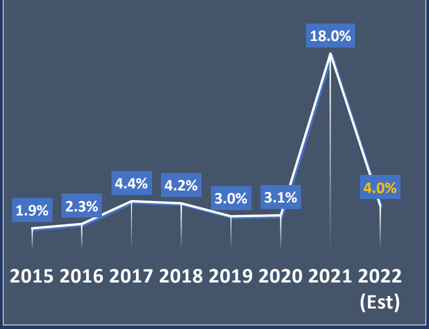
Executive Summary – Q1 '22

Selected Indices

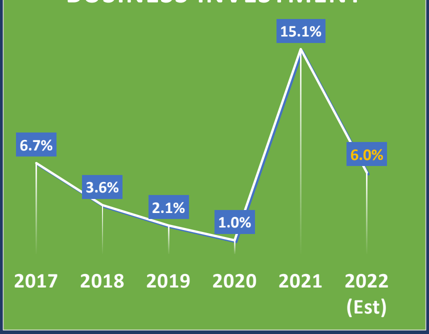
REAL GDP



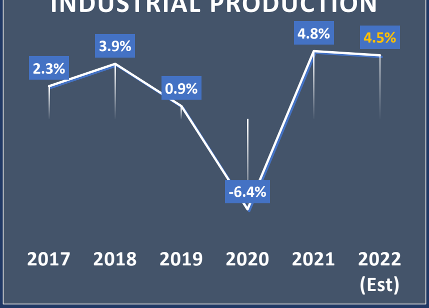
RETAIL SALES



BUSINESS INVESTMENT



INDUSTRIAL PRODUCTION



Big Items

Real GDP: The GDP projections continue to deteriorate but with all kinds of caveats attached. The prediction at the start of the year held that annual growth would be between 3.5% and 4.0% but now that has been scaled back to between 1.5% and 2.0%. The factor that would allow a resumption of solid GDP growth would be easing of the energy price driven inflation.

Paper Inventories-to-Sales: The inventory-to-sales-ratio is an important barometer of future orders for new paper (consumer paper). Currently, the sales ratio is back down into a range that was common prior to the pandemic. A low ratio (and the current ration could be considered to be low) would keep reorder activity flowing. With supply chain challenges now hitting Chinese markets once again (153 million civilians on lockdown, markets generating 20% of Chinese GDP under restrictions), the risk to product flows is strong again. This could directly impact paper production, but will also impact packaging demand and delay reorders until China can get its COVID situation under control. It will also potentially shift demand to other markets – creating opportunities for alternative sources.

Construction: Housing starts were still surging as of the latest data. They are 6.8% above the revised numbers for the previous month and are 22.3% above the numbers from February a year ago. There is some suggestion that impending mortgage rate hikes are driving some people off the fence but there is also the fact the US is still 5 million homes short of demand. Multi-family units are still growing faster than single family as more seniors opt to sell their homes and move to low maintenance options. Building papers are still in high demand and commercial construction activity was hitting an annual run rate of $840 billion, which would exceed pre-pandemic levels.

Retail: Despite inflationary pressures, broad retail categories are still performing well. Speculation held that consumers may begin to shift more of their spending to services, and the US consumer has still shown a tremendous amount of resilience and continues to purchase products. Retail spending was nearly 18% higher year-over-year in February against strong comparative data from a year ago. E-commerce is also still very strong and remains nearly 60% higher against pre-pandemic levels. We still expect e-commerce market share to eventually hit 40% of total retail sales, today is sits at roughly 20%.

Manufacturing: The latest PMI numbers are still very comfortable although they have dipped a little to 57.1. Given that anything over 50 indicates expansion there is nothing in the latest PMI to cause any alarm. The data on new orders also remains strong. This is a consistent message from the PMI globally as virtually every major nation is still in expansion territory. As with the last several months the only exceptions have been Mexico and Brazil as both are in contraction territory. Demand for packaging materials will stay strong as long as these manufacturing conditions persist.

Risks

Inflation the Primary Factor: Inflation is still the dominant concern and for more than just the obvious reason. The notion that the inverted yield curve indicates a recession is based on the assumption the Fed will increase rates to contend with inflation and thus usher in a recession (as happened under Paul Volcker in the 1980s). The problem is that 70% of current inflation stems from the energy sector and the Fed has little to do with that kind of inflation.

Macroeconomic Viewpoints

- Dr. Chris Kuehl

Contents:

It appears we have reached a crossroads of sorts. Is the economy teetering on the edge of a recession as some have suggested? There certainly are some indicators that are pointing that way – most notably the inverted yield curve. This development has preceded several past recessions, but the problem is timing – these recessions have emerged in a period ranging from a few months to two years. In truth it is not the inversion of the two year and ten-year bonds that actually trigger a recession, it is the actions of the Fed or more precisely the anticipated actions. If the Fed reacts to inflation aggressively and jacks interest rates the economy stutters and sinks. If one looks at the variety of economic indicators released thus far there is little or no threat of a downturn, much less an actual recession. The threat comes from what is expected to happen in the coming weeks and months.

First, the good news. These are the factors that clearly show the economy to be robust and growing. The rate of unemployment continues to be at record lows and most predictions have it remaining below 4.0% for the remainder of the year. The latest PMI numbers are still firmly in expansion territory with a reading of 57.1. Consumers are still spending, and corporations continue to build inventory as they seek to reverse the trend in inventory to sales ratios. Even with much higher fuel costs and inflation showing up in everything from food to consumer goods the retail numbers are holding. The housing market remains strong although the pace of new home sales has fallen from the peak of a few months ago. There has been some rise in mortgage rates and the prime rate, but they still remain at historic lows. There is just nothing in the current data that would send much of an alarm – at least for the time being.

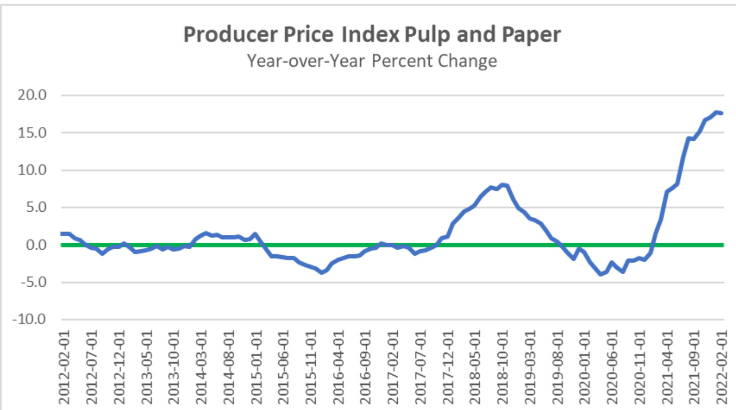
The question is whether the data has been slow to capture the extent of the economic angst. Is this the calm before the storm? The pressures on the economy are obvious enough and there are certainly actions underway designed to address them. Inflation is the topic of the moment with rates as high as they have been in four decades. The driver of these higher prices has been energy (for obvious reasons) but now there are additional motivators such as wage growth. The pace of labor costs has accelerated but not as fast as inflation, so workers are still falling behind. The wage rate has risen by an average of 5.6% and inflation has been at 7.5%. If wages catch up to inflation there will be a major problem – the development of the dreaded wage/price chase. Producers will have no choice but to hike prices if wages accelerate at this pace and that, in turn, triggers more wage demands.

The assumption has been that energy costs will slowly decline as more production comes online but this is based on some kind of end to the Ukraine war that allows Russian oil and gas to flow again. It is also based on the expectation that global oil producers will step up. Neither of these is a sure thing by any stretch. The negotiations between Russia and Ukraine are going nowhere and many of the oil producers have not been willing to go all out when there is a possibility that demand for oil will falter due to the higher prices and the fact that tens of millions of people continue to avoid the daily commute that drives most of the demand in the US.

At this point a full-scale recession as defined as two consecutive quarters of negative growth seems highly unlikely but the confident estimates of 4.0% GDP growth this year have been replaced by predictions around 2.0%.

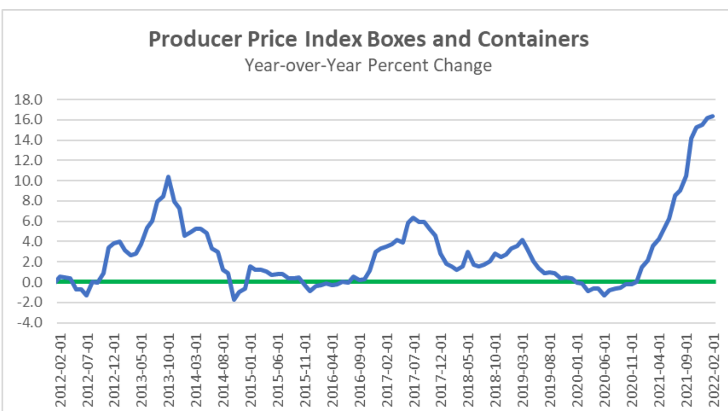
Upstream Conditions

The following section includes viewpoints on key commodities. Wherever possible, the Producer Price Index (PPI) is used as a gauge of prices for specific commodities. The PPI is derived from monthly Government surveys of those that purchase specific products and services. The PPI includes views on both spot and contract pricing for a given product or service and is more representative of general changes in street-level pricing trends. The most recent months of activity are used to provide the most accurate viewpoints.



Pulp and Paper Prices (WPU0913)

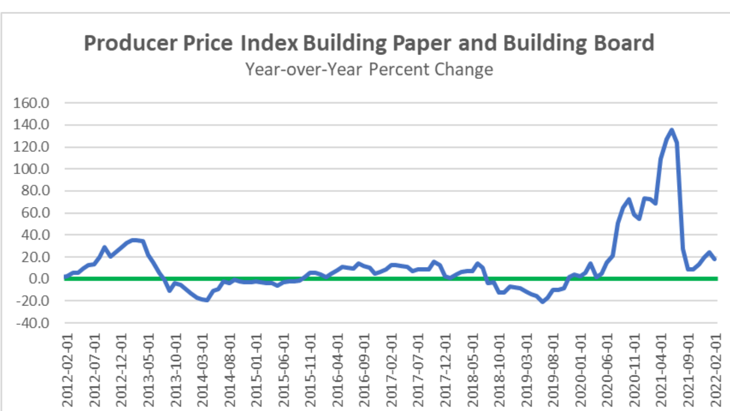
- The Producer Price Index (PPI) for February paper and pulp (latest PPI available) was up month-over-month by 1.1% (up 1.1% last month). It was higher year-over-year, rising by 17.6% Y/Y (up 17.8% last month). This marked an all-time high for the index.
- **Looking Ahead**: Demand remains strong according to the macro data that we see across the industry. Some concerns may start to surface as the economy shift from product consumption to more services spending. But segments of the broader paper industry will continue to do well even if the US economy starts to slow.



Paper Boxes and Container Prices

(WPU091503)

- The Producer Price Index (PPI) for February boxes and containers (latest PPI available) was up month-over-month by 0.9% (up 1.9% last month). It was higher year-over-year, rising by 16.4% Y/Y (up 16.2% last month). This also marked an all-time high for the index.
- **Looking Ahead**: Again, producers are still scrambling to keep pace with demand from several trends. E-commerce volumes are providing the biggest surge in demand, sales in the e-commerce sector is 70% higher than it was pre-pandemic. Other segments using boxes and containers are also expanding, US manufacturing construction expansions were up 30% year-over-year early in 2022.



Building Paper / Building Board Prices

(WPU092)

- The Producer Price Index (PPI) for February building paper and building board (latest PPI available) was up month-over-month by 0.4% (up 13.5% last month). It was higher year-over-year, rising by 17.7% Y/Y (up 24.4% last month).
- **Looking Ahead**: Many construction projects are hitting challenges with commodity inflation and labor shortages, creating a "fits and starts" environment that makes it difficult to plan for demand. There has been a tremendous amount of volatility in the sector. But the outlook should remain stable throughout 2022.

Manufacturing Producer Prices

The Producer Price Index (PPI) for key paper industry metrics is listed in the chart below including month-over-month and year-over-year comparisons. To the degree that the PPI is derived from monthly Government Surveys of actual purchasers and users of the following products, it provides a more accurate street-level pricing viewpoint. Some data is delayed and may not have been updated by the time of publication.

Producer Price Index - Key Manufacturing Sectors

Category	PPI Code	Feb-22	Jan-22	M/M% Chg	Feb-21	Y/Y % Chg
Paper Manufacturing	PCU322322	169.1	167.7	0.8%	145.4	16.3%
Pulp, Paper and Paperboard Mills	PCU32213221	164.7	163.9	0.5%	139.7	17.9%
Pulp Mills	PCU3221132211	224.1	223.5	0.3%	146.0	53.5%
Paper Mills	PCU3221232212	217.2	214.9	1.1%	191.3	13.6%
Paper Mills (Except Newsprint)	PCU322121322121	149.1	147.6	1.0%	132.4	12.6%
Newsprint	WPU091302	147.7	144.6	2.1%	110.3	33.9%
Paperboard (Primary Products)	PCU322130322130P	341.8	341.7	0.0%	283.4	20.6%
Recycled Paperboard	PCU3221303221307	403.5	403.1	0.1%	325.5	24.0%
Paper Container Manufacturing	PCU3222132221	302.1	299.6	0.9%	257.8	17.2%
Converted Paper Product Manufacturing	PCU32223222	174.0	172.5	0.9%	150.3	15.8%
Corrugated and Solid Fiber Box Manufacturing	PCU322211322211	418.2	417.6	0.1%	351.1	19.1%
Shipping Containers for food, beverages, carryout	PCU32221132221101	341.5	339.9	0.5%	304.9	12.0%
Shipping Containers for paper products	PCU32221132221102	448.3	448.3	0.0%	369.0	21.5%
Shipping Containers for Metal Machinery	PCU32221132221103	245.7	245.7	0.0%	204.0	20.4%
Corrugated Paperboard in Sheets and Rolls	WPU091405	331.0	331.0	0.0%	283.7	16.7%
Folding Paperboard Box Manufacturing	PCU322212322212P	196.3	191.2	2.6%	168.4	16.5%
Paper Bag and Coated and Treated Paper Manuf.	PCU322220322220	123.9	122.4	1.2%	106.6	16.2%
Stationery Product Manufacturing	PCU322230322230	134.3	133.5	0.6%	115.9	15.9%
Sanitary Paper Product Manufacturing	PCU322291322291	121.0	120.6	0.3%	113.2	6.9%
Disposable Sanitary Product Manufacturing	PCU3222913222912	99.4	99.4	0.0%	93.5	6.4%
Sanitary Tissue Product Manufacturing	PCU3222913222915	142.8	141.7	0.8%	134.9	5.9%

Downstream Market Demand

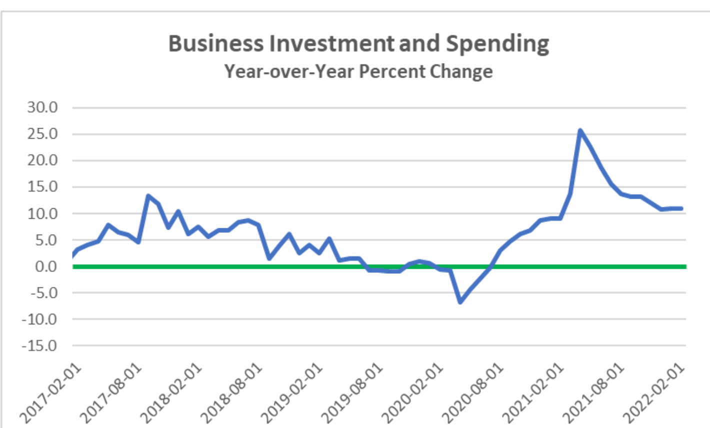
Kind of Business	Percent Change Feb. 2022 Advance from -- Jan. 2022	Percent Change Feb. 2022 Advance from -- Feb. 2021
Retail & food services, total	**0.3**	**17.6**
Retail	0.0	15.9
Motor vehicle & parts dealers	**0.8**	**17.2**
Furniture & home furn. stores	**-1.0**	**7.4**
Electronics & appliance stores	**-0.6**	**2.6**
Building material & garden eq. & supplies dealers	**0.9**	**14.8**
Food & beverage stores	**-0.5**	**7.9**
Grocery stores	-0.8	8.4
Health & personal care stores	**-1.8**	**8.9**
Gasoline stations	**5.3**	**36.4**
Clothing & clothing accessories stores	**1.1**	**30.6**
Sporting goods, hobby, musical instrument, & book stores	**1.7**	**11.7**
General merchandise stores	**-0.2**	**12.8**
Department stores	1.6	22.8
Nonstore retailers	**-3.7**	**13.8**
Food services & drinking places	**2.5**	**33.0**

Retail Sales (NEWORDER)

- Total retail sales were 17.6% higher year-over-year in February (the latest available). When stripping out fuel and food, sales were still up 15.9% (adjusting slightly more for inflation).
- General merchandise retailers saw sales 12.8% higher year-over-year and the critical e-commerce sector experienced an increase of 13.8%. These sectors obviously create significant demand for paper packaging and shipping materials, and direct purchases of consumer paper goods. Other sectors were also up sharply Y/Y.
- **Outlook**: Early in 2022, inflationary pressures were building on consumers, but those pressures were not yet showing up in macro retail data. Even Department store sales were up 22.8% Y/Y (against easier comparisons against a weaker 2021 volume).

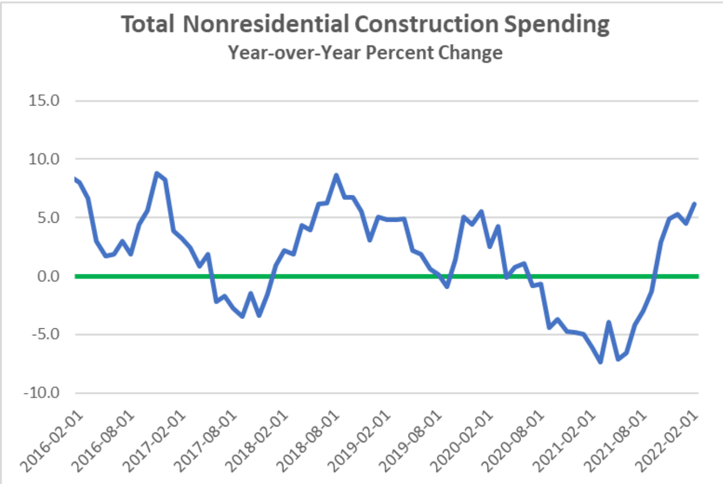
E-commerce sales are 70% higher than they were in 2019 prior to the pandemic, and analysts believe that even as brick-and-mortar sales start to improve (post-pandemic), there will likely be very little if any drop-off in e-commerce sales. Packaging demand for that sector will continue to be strong.

Food and grocery spending was experiencing month-over-month deceleration but was growing 7.9% and 8.4% respectively year-over-year. Institutional packaging demand for the leisure and hospitality sector will continue to see significant improvements over past year's performance, leisure travel is back to nearly 95% of pre-pandemic levels and conference attendance is up.



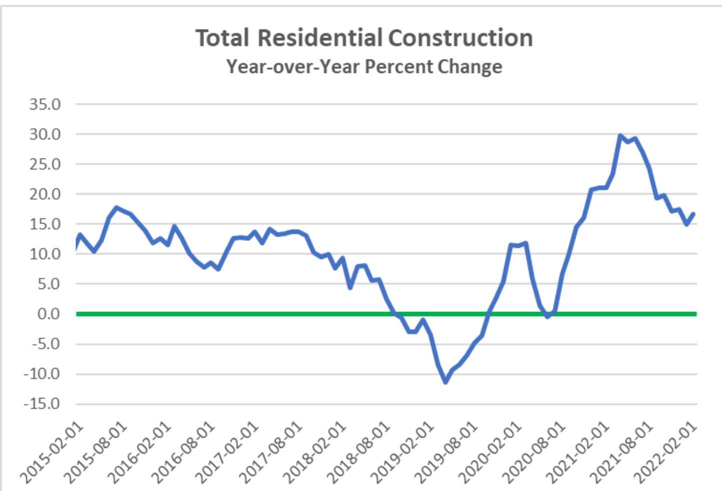
Capital Goods New Orders (NEWORDER)

- Value of manufacturers new orders for capital goods remained strong again in February (latest available) but were down sequentially 0.2% M/M (1.2% higher last month). They were up by 11.0% Y/Y (up 10.9% last month) and continued to be strong overall.
- **Outlook**: Corporate investments in structures and equipment were just shy of an all-time high hit in January. For now, corporate spending and investment continues to be on a record-setting pace, which leads to increases in construction and facility expansion (increases demand for building paper resources). Much of this was also in e-commerce warehousing expansion activities, which will also work to fit demand for increases in packaging. And generally, when this figure is positive, the US economy is healthy and consumers are spending on goods and services.



Total Non-Residential Constr. (TLNRESCONS)

- Total Non-Residential Construction was 6.2% higher than it was a year ago (4.5% higher last month) and was down 0.1% (+1.5% in the last report). Overall spending was at an annual rate of $844B (up from the January 2020 annualized run rate peak of $840B).
- **Outlook**: Nonresidential construction activity is still growing despite some interest rate headwinds. Again, building papers and packages used in materials and equipment deliveries will increase in demand as these projects increase. The infrastructure bill is expected to boost the annual growth rate of commercial construction by nearly 7% in each of the next 5 years, much of that will take place in areas where packaging and roofing materials will be in high demand.



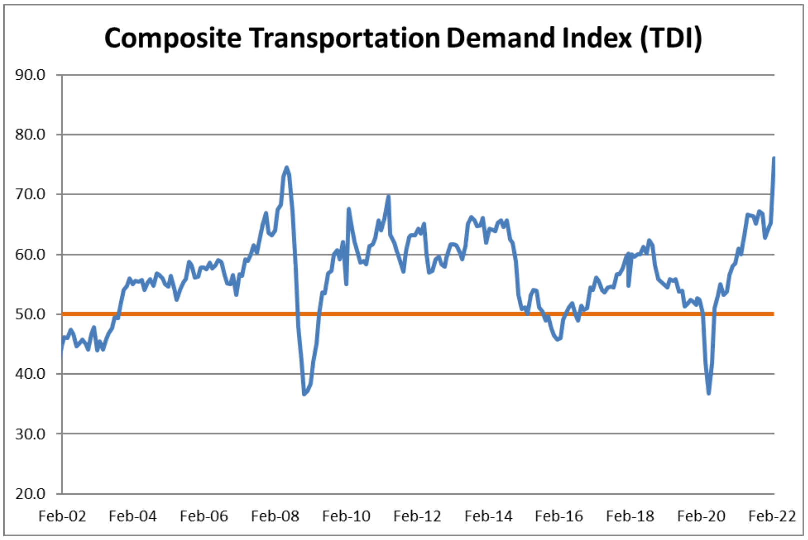
Total Residential Construction (PRRESCONS)

- Total residential construction in February (latest available), was up by 16.6% Y/Y (up 15.0% last month). It was up 1.1% M/M (1.7% last month).
- **Outlook**: Estimates still suggest that the US needs to build more than 5.4 million homes over the next several years to meet projected demand. The current monthly supply of homes according to the Census Bureau is 6.3 months on hand; 6 months on hand is a well-balanced market. Whereas it may not drive as much paper demand as retail and other sectors, household consumption and packaging for the materials used in home construction do have a strong correlation to overall paper demand. Watching these metrics help improve understanding of which direction the industry is trending and potentially some challenges that emerge from time to time when a home building cycle changes.

Wholesale Trade (R4241IM163SCEN)

- Merchant wholesalers' inventory to sales ratios of paper supplies were at 1.09 months of inventory-on-hand. This was in-range for the decade average. The ratio was lower by 6.0% Y/Y through January (latest available; down 5.9% Y/Y last month).
- **Outlook**: Wholesale inventory to sales ratios for paper products are back into a range that we saw throughout the decade prior to the pandemic. When the ratios are low (inventory is light), prices are higher. Seeing the ratio back down in a range that would be considered to be "normal", suggests that some pricing stability may continue. Input prices and transportation costs are still driving up the cost of operations, but as long as supplies remain tight, retail price stability will continue.

Supply Chain and Transportation Situation



Transportation Demand Still Near Record Highs

- The Transportation Demand Index shows the current demand environment for freight services (which dictates price). The current demand index at a broad level (across all modes of transportation) was 15.9% higher month-over-month in February and was 24.6% higher year-over-year.
- **Outlook:** For now, transportation capacity is still tight across the country. But there is a notion that capacity is softening slightly in the truckload and less-than-truckload sectors. This should make negotiations a bit easier on transportation managers. However, there is a risk of a work interruption at US West Coast ports this summer as the ILWU and PMA work toward a new contract (the current contract expires on July 1st). Other global supply chain issues are hitting the sector in China specifically, COVID outbreaks are disrupting inland logistics, some transportation executives saying that the current backlogs and challenges surrounding Shanghai are the worst since the pandemic started.

	22-Feb	22-Jan	21-Feb	Y/Y Change %	M/M Change %
Composite	76.0	65.6	61.0	24.6%	15.9%
Rail	72.1	62.8	58.8	22.6%	14.8%
Trucking	76.8	65.8	61.0	25.9%	16.7%
Air	74.9	70.7	69.6	7.6%	5.9%
Maritime	73.4	68.9	67.7	8.4%	6.5%

Mode Demand Still High

- Demand by mode of transportation continues to trend toward all-time highs through February. A reading over 50 here is considered to be an expanding market, a reading below 50 is contracting. Every mode had indexes well above normal, demand is still extremely strong. Capacity is also still tight generally across rail and Less-than-Truckload and air cargo. But it was just starting to soften in the truckload sector.
- **Outlook:** Trucking still has a problem with dislocated capacity. There is capacity available, but much of it is in areas of the country where freight volumes are weaker, and there isn't enough in areas where freight demand is strong. With the cost of diesel hitting all-time highs and is expected to stay there, the risk of trucking bankruptcies among smaller carriers (1-45 trucks in their fleets) is high. In 2008 when diesel hit all-time highs at the time, the industry lost @4,000 trucking firms. Paper producers should keep an eye on opportunities to work with truckload carriers that are looking for loads and currently should be in a position to negotiate on rates more aggressively than at any time over the past 12 months.

Industry Outlook

There is no question that the inflationary pressure on US households will become an issue for consumer-based paper consumption. Basics (toiletries, sanitary, and cleaning papers) will show some continuous improvement, but when higher inflationary conditions have hit in the past, consumers become more price concious and may start to shift to less expensive product choices.

Health care spending on paper materials will continue as a post-pandemic trend. As hospitals move from pandemic to endemic stages, they still will try to keep viral containment measures in place. The need for masking and PPE will continue despite some regulations easing and hospitalizations for COVID reducing. Even in the elective care sectors, the need for PPE will still be high. In fact, in some types of elective proceedures, PPE needs will go higher since some of those sectors have seen less demand and a post-pandemic world provides an opportunity for patients to catch up on those proceedures. That would especially be the case in older populations that avoided medical treatments during the pandemic. Facilities that had not needed high volumes of PPE will now face that prospect.

Construction would seem to be hot going into the front end of 2022. There are some hints that some projects are being cancelled due to high input costs and shortages of labor. But, on an annual basis, the country is still expected to see total spending on commercial construction to hit $850 billion in 2022, up from the $820 billion pace just prior to the pandemic in 2019. Residential construction will also continue to be strong with new home demand still at 5.5 million (with the ability to build approximately 1.6 million new homes a year). Multifamily will still be very popular, and although it doesn't create as much demand for roofing paper, it does increase demand for cartons and packaging for fixtures.

Economists were worried that the end to the pandemic could shift consumer spending from product-based consumption to services spending. And some of that trend has started, but product consumption has not shown signs of softening – yet. Retail sales across most categories was still higher by double-digits year-over-year against strong comparisons last year. E-commerce growth is still strong despite the rate of growth slowing slightly. Most forecasts still expect e-commerce spending to go from 20% of total retail market share to more than 40% over the next 5-7 years.

Lastly, two subsequent Black Swan events are hitting the global economy that need to be watched. The war in Ukraine will have a longer lasting effect on the global economy than originally thought. Specifically, rising fuel, food, and metal commodity prices could impact consumption over the next 12 months. Food insecurity is going to be high, and any paper producers that participate in bulk packaging will do well during this period. Exports of food products from the US will increase over the next 12 months and should remain high over the next 2 years.

A COVID outbreak in China is also impacting the global supply chain. At last count, nearly 153 million citizens were impacted by various forms of lockdowns and 23 cities comprising more than 20% of Chinese GDP were in similar lockdown or restricted phases. That will impact the output of certain products, and could impact the availability of paper products. If the US consumer gets word that items like toilet paper or other essentials are in short supply (or could be – especially with West Coast labor negotiation risk this summer), we could see another run on supplies.