COVID-19 Impacts on Cascade Gateway Cross-border Freight

Prepared by:

Whatcom Council of Governments

For:

Transport Canada

Final Report

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Introduction and Background

WCOG & IMTC

This report has been completed by the Whatcom Council of Governments (WCOG), the U.S. metropolitan planning organization (MPO) for the Whatcom County metropolitan planning area (MPA), based in Bellingham, Washington. The northern border of Whatcom County is also the Canada-United States border and includes five international land-border ports of entry (POEs). Since 1997, WCOG has been the lead agency of the binational, regional, cross-border planning coalition, The International Mobility and Trade Corridor Program (IMTC). The regional set of border crossings connecting Whatcom County and Lower Mainland British Columbia is a key node in the movement of goods and people in what is collectively referred to as the Cascade Gateway, a broader ecosystem of international trade that includes port facilities on both sides of the border.

Since mid-March 2020, and certainly following the designation of COVID-19 as a global pandemic on March 21 of that year, Canada-U.S. border restrictions and responsive policies have impacted operations. With federally declared limitations on cross-border travel to essential trips only, cross-border passenger vehicle traffic fell off dramatically to about three percent of typical volumes in the Cascade Gateway. Cross-border trade has been allowed to flow as normally as possible. COVID-related policies for land-border trade are applied to matters such as driver health screening and observation.

This report focuses primarily on COVID-19 impacts on regional cross-border trade, and beyond the present impacts, considers structural changes, if any, that could affect the long-term outlook and performance of the Cascade Gateway system. This work has been funded by Transport Canada to better ascertain and measure the tangible effects of the COVID-19 pandemic on cross-border trade in the Cascade Gateway region. The report is a resource

for governments, industry and the other agency partners that comprise the IMTC cross-border planning coalition. IMTC stakeholders with clearer connection to this research – an interest in conclusions as well as important sources of information and guidance – include:

- Transport Canada (TC)
- U.S. Customs & Border Protection (CBP)
- Canada Border Services Agency (CBSA)
- U.S. Federal Highway Administration (FHWA)
- British Columbia Ministry of Transportation and Infrastructure (BC MoTI)
- Washington State Department of Transportation (WSDOT)
- BC Trucking Association (BCTA) COVID-19 & the Cascade Gateway – the first few months

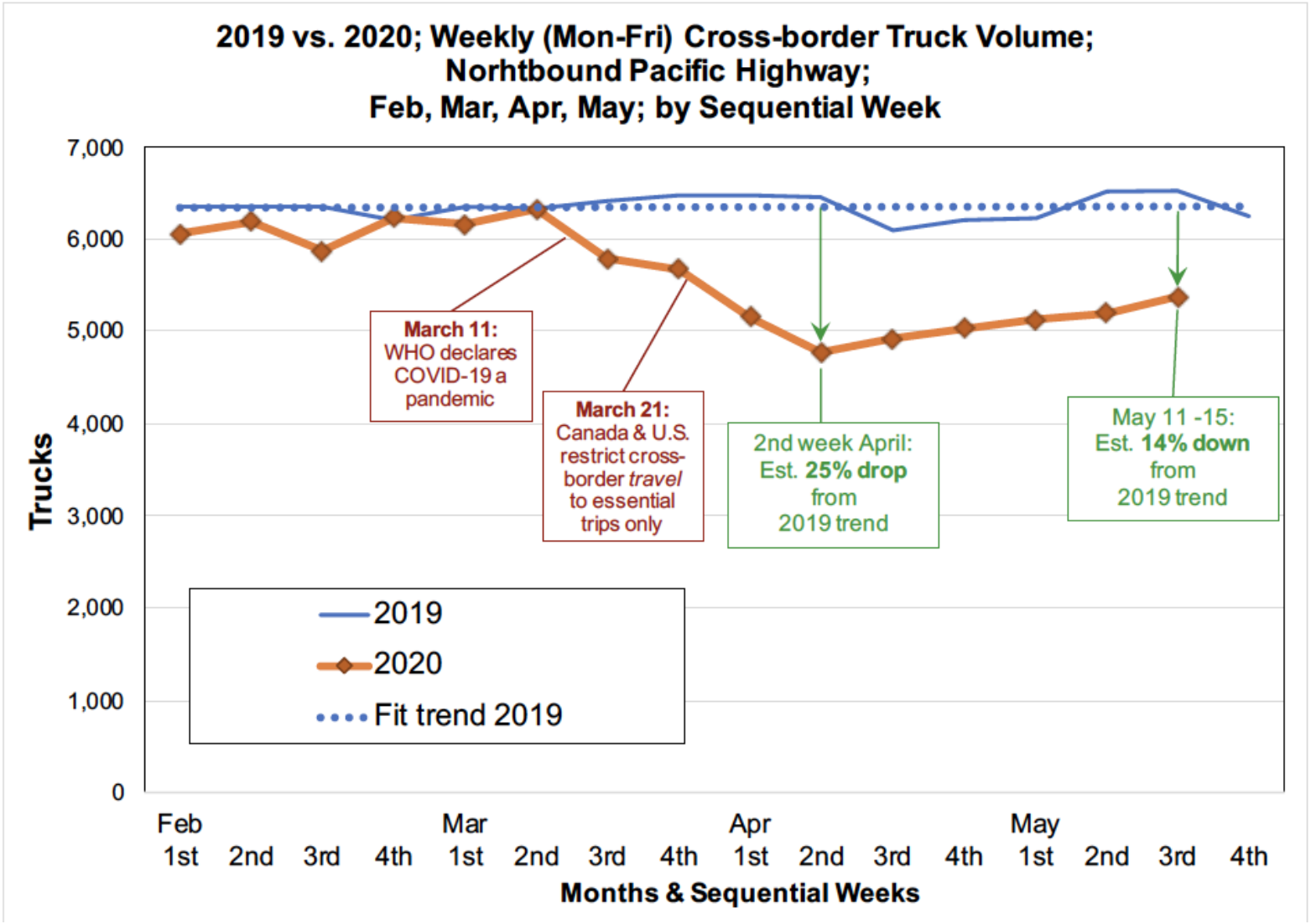
First signs of COVID's likely impact on freight flow

In March 2020, as COVID-19 concerns started to affect people and businesses world-wide and would soon result in Canada-U.S. border restrictions, WCOG began tracking available indicators of regional border traffic. While restrictions on passenger vehicle travel were very restrictive, cross-border trade, with the addition of public-health protocols for truck drivers, was allowed to continue. But still, the overall impact of COVID-19 on regional cross-border commercial traffic seemed significant.

Because trade data (freight value or freight weight with commodity categories) lags by approximately three months, WCOG turned to vehicle count data which is available monthly from border inspection agencies but also available in real time from in-road detectors owned and operated by the BC Ministry of Transportation (BCMoT) and the Washington State Department of Transportation (WSDOT). These data, which are primarily generated at the border for real-time estimation of current truck and personal-vehicle wait times, are also transferred to WCOG's Cascade Gateway Border Data Warehouse (BDW) – an archive of data from both countries' regional border wait-time systems accessible online with a full data dashboard, custom query tools, and more.

Chart 1 below is one of the early data summaries compiled by WCOG for IMTC Program. Using northbound truck counts taken at the Pacific Highway port of entry (POE) as a good general indicator, the chart compares, weekly (weekday) 2020 truck counts to the same weekly total in the previous year.

Chart 1:



Source: WSDOT via the Cascade Gateway Border Data Warehouse. Compiled by WCOG.

As is illustrated in Chart 1, truck volume had clearly gone down concurrent with the onset of COVID-19 and policies established in response. But we knew the vehicle counts, especially as they started to increase from their lowest point in mid-April, could only inform a partial understanding. Did the large vehicle volume drops pertain to all carriers or were they concentrated on certain commodities? Were trucks loaded at typical levels? Were there effects on empty-loaded ratios and the directionality of empty trips?

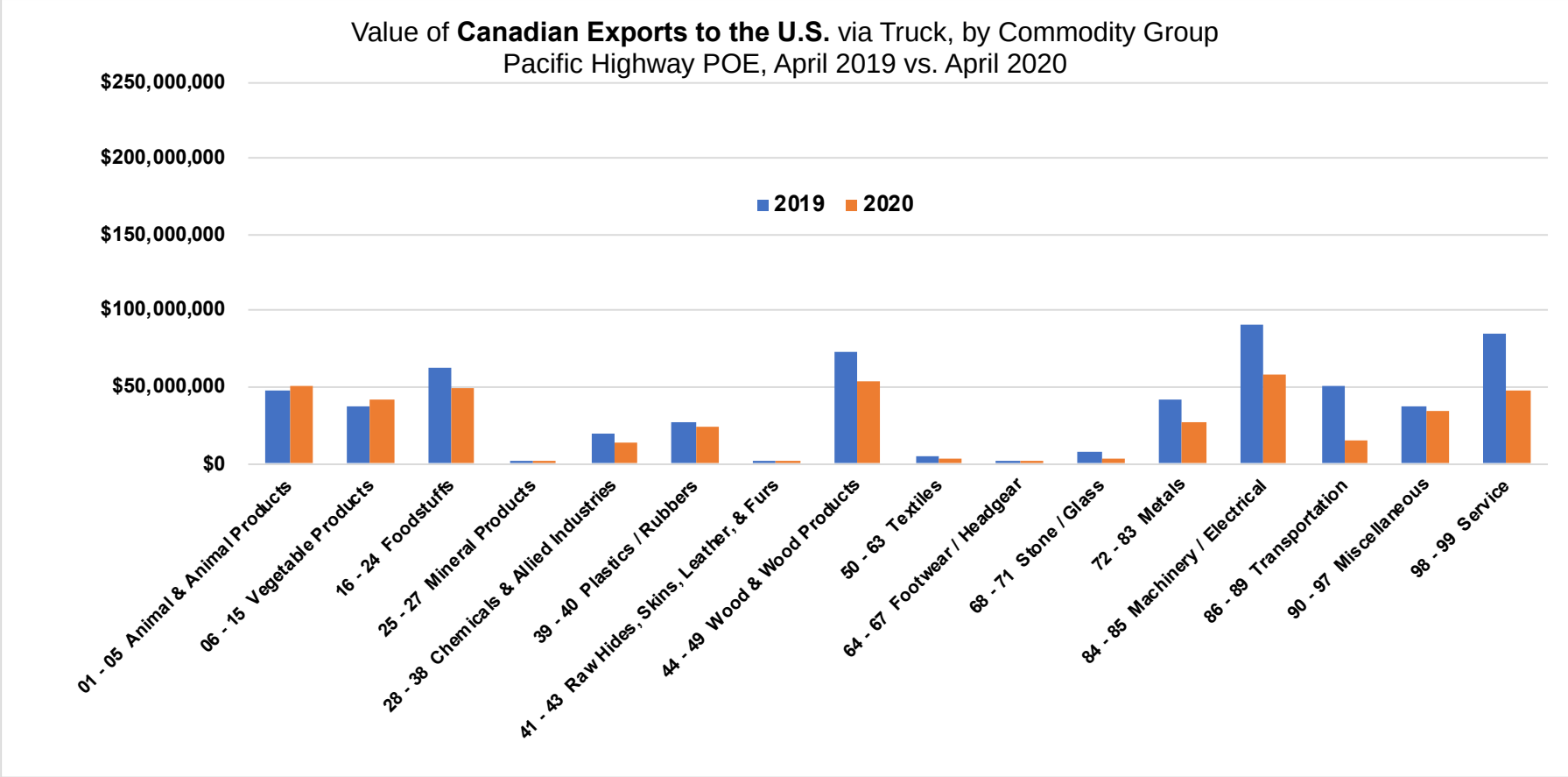
When the first month of trade data became available, WCOG was able to compile a year-to-year comparison for April 2019 and 2020 (Charts 2 & 3 below). Using the U.S. Bureau of Transportation Statistics (BTS) Transborder Surface Freight Database (TSFD), WCOG looked at the highest dollar value commodity groups that combined comprise 80 percent of the total value of trade through the Pacific Highway port of entry for the subject timeframe. (The TSFD uses groupings of 2-digit commodity codes.)

Data note 1 -- USD: Because the trade data sources used for this report are U.S. based, all dollar amounts used are U.S. Dollars.

Data note 2 – Focus on top value commodities: The analyses discussed in this report use commodity groupings at the 2-digit level. Even at this most generalized level, there are 97 categories, most of which do show up in the Cascade Gateway at some reported level. For practicality and clarity, most analyses and visualizations in this report focus in on the approximately 15-20 top value commodity categories that comprise 80 percent of the reported trade value for the subject time period in the subject direction.

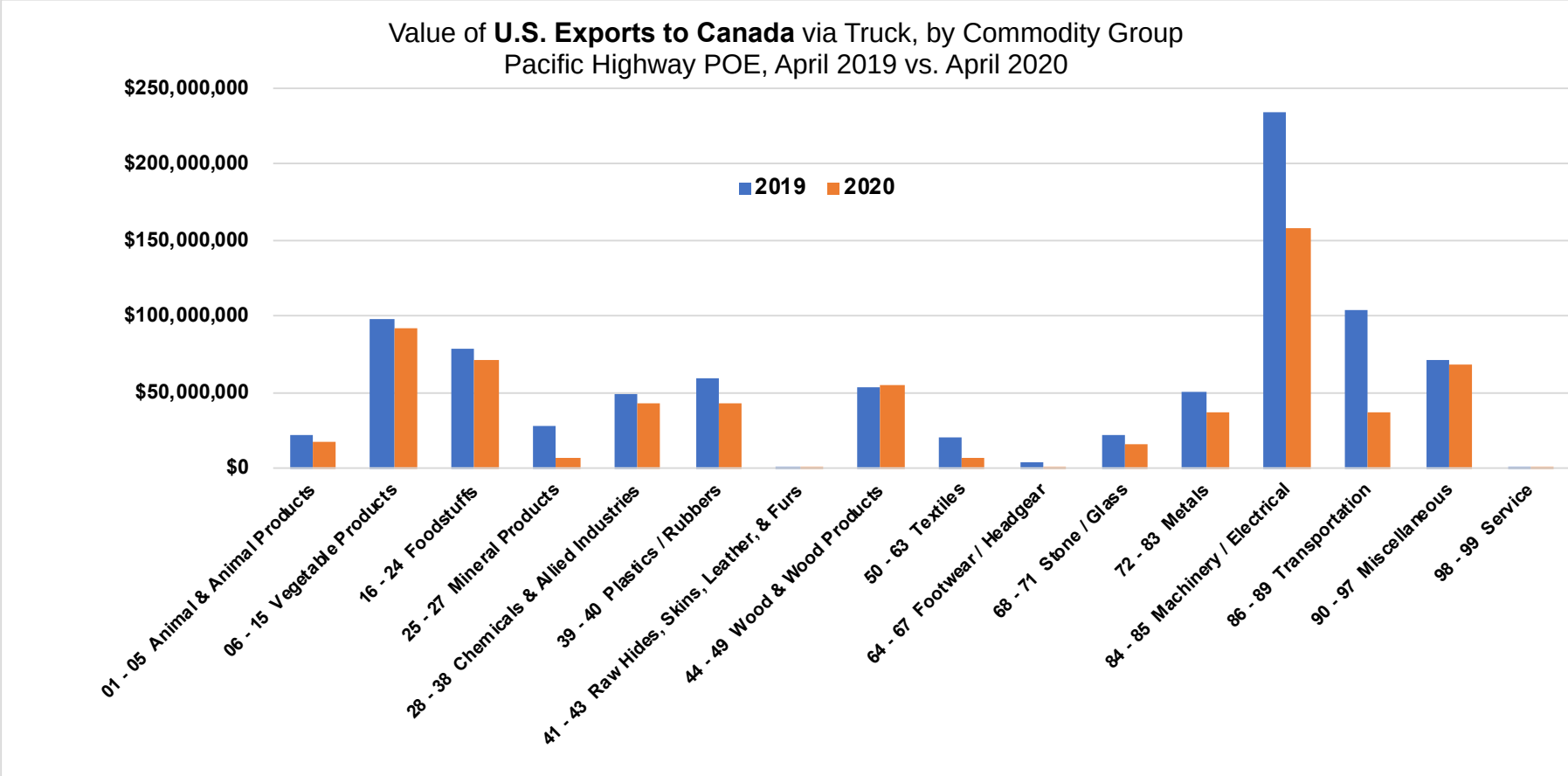
Charts 2 and 3 illustrate the additional information that trade-data could add to the assessment of COVID impacts on cross-border trade. Initial observations are listed below, following the charts.

Chart 2



Source: Data from U.S. Bureau of Transportation Statistics, Transborder Surface Freight Database. Chart by WCOG.

Chart 3



Source: Data from U.S. Bureau of Transportation Statistics, Transborder Surface Freight Database. Chart by WCOG.

Initial trade data observations

- As measured by trade value, the apparent negative impact from COVID-19 is greater than was approximated by observing truck counts – trucks down 21 percent for April vs. trade value down 26 percent.
- While the overall value of U.S. exports significantly exceeds the value of Canadian exports in this trade lane, the percentage drop in April 2020 was about the same in each direction (27 and 28 percent)

- As measured by dollar-value and lead by the high-value commodity group, machinery, etc. (84), U.S.-to-Canada truck borne freight through the Cascade Gateway (and Pacific Highway POE in particular) is significantly greater than the Canada-to-U.S. direction. This has been the case in the Cascade Gateway for many years.
- While most of the commodity groups saw a YoY monthly decline in the first month of "COVID times," certain commodity categories saw markedly larger YoY changes.
    - Machinery / Electrical in went down significantly in both directions.
    - Transportation goods (Vehicles, aircraft, vessels and associated transport equipment and parts thereof) down significantly in both directions.
    - Mineral Products, in the U.S.-to-Canada direction, which includes the typically higher amounts of jet fuel trucked to Vancouver International Airport (YVR), went down dramatically.
- In the Canada-to-U.S. direction, the commodity group inclusive of code 98 went down significantly. Code 98 is **Special Classification Provisions**. Unlike other codes, 98 and 99 do not pertain commodities but rather to the imported goods' duty or tariff-free status under current U.S. trade rules. Given that the total value of goods in this category is significant (about 12 percent of the U.S. bound trade flow value at Pacific Highway), subsequent discussion in this report will seek to better understand what the actual commodities involved are and why they may have been impacted more by COVID than other commodities.
- Curiously, three commodity groups saw YoY *increases* in April 2020: U.S.-to-Canada Wood & Wood Products and Canada-to-U.S. Animal Products and Vegetable Products.

Intermediate data and analysis

Following on the above YoY review of April 2020, WCOG did one more "preliminary" look at trade data prior to conducting the somewhat deeper analyses conducted for the continuing research activities funded by Transport Canada and described in subsequent sections of this report.

When trade data became available for the full second quarter of 2020 (April through June), WCOG produced Table 1 (below). The table summarizes the observed, year-over-year changes in Cascade Gateway, Canada-to-U.S. freight value in the second calendar quarter of 2020 – the first calendar quarter following the March 2020 declaration of COVID-19 as a global pandemic.

Table 1:

Canada-to-U.S. Cascade Gateway (Blaine, Lynden, Sumas) Apr-Jun 2020 vs. 2019					
Rank	Commodity Name	Apr-Jun 2019	% of Q2 2019 $ total	Apr-June 2020	YoY change
1	Wood and Articles	$308	15%	$284	-7.9%
2	Special Classification Provisions	$325	12%	$243	-25.3%
3	Computer-Related Machinery and Parts	$233	9%	$166	-28.7%
4	Fish and Crustaceans	$160	8%	$162	1.3%
5	Edible Vegetables and Roots	$84	5%	$102	21.5%
6	Plastics and Articles	$87	4%	$85	-1.4%
7	Furniture; Lamps and Prefabricated Buildings	$70	4%	$69	-2.3%
8	Electrical Machinery; Equipment and Parts	$111	3%	$68	-39.0%
9	Articles of Iron and Steel	$75	3%	$54	-27.6%
10	Preparations of Cereals and Flour	$56	3%	$53	-5.8%
11	Vehicles Other than Railway	$66	3%	$53	-20.4%
12	Miscellaneous Edible Preparations	$48	2%	$46	-3.7%
13	Measuring and Testing Instruments	$51	2%	$43	-15.9%
14	Live Trees and Plants	$41	2%	$42	2.0%
15	Aircraft; Spacecraft and Parts	$101	2%	$41	-59.1%
16	Aluminum and Articles	$49	2%	$36	-25.9%
17	Paper and Paperboard	$51	2%	$36	-29.4%
18	Animal or Vegetable Fats and Oils	$32	2%	$35	7.6%
19	Preparations of Vegetables; Fruits and Nuts	$30	1%	$27	-10.6%
20	Food Residues and Waste	$27	1%	$24	-10.3%
21	Edible Fruit and Nuts	$23	1%	$24	1.1%
22	Iron and Steel	$21	1%	$21	-1.1%

Source: Data from U.S. Bureau of Transportation Statistics. Summarization and table by WCOG.

Initial observations regarding 2nd quarter trade data

- Aircraft related commodities (included in Chart 2 & 3's Transportation category which exhibited one of the largest monthly YoY declines) are seen to have experienced the largest percentage YoY quarterly decline (59%) – both in percentage and absolute terms.
- Electrical Machinery continued a significant decrease (seen in Chart 2) from through May and June.
- Vegetable and Animal product categories continued to show YoY increases. (is this typical, what is normal, what is typical variance – goes for this table generally, April to April – is it typical variance to what you would see in another year? Is it related to the value of the goods themselves?)

2020 hindsight: Cascade Gateway freight data provides a window on COVID-19's wide-ranging effects on cross-border commerce

This section reports on the efforts following WCOG's initial analyses of early COVID-19 impacts. With funding to support more sustained and focused efforts, additional data and research included:

- Now-available trade data for the full 2020 calendar year.
- Compilation of relevant historical data (five-year history).
- Extraction and analysis of pertinent data from the 2016 IMTC Freight Study.
- Interviews with inspection agencies and customs brokers regarding commodity categories within certain tariff categories (the Special Classifications Provisions issue).
- Interviews with industry associations and other carrier and shipper industry representatives.

Primary questions

Based on the immediacy and scale of the early impacts seemingly related to COVID-19, multiple questions were raised that are important for cross-border transportation planning and operations.

- Which changes in commodity flow or composition have been more certainly related to COVID-19 effects?
- Which, if any, shifts in commodity flow are likely to remain following the COVID-19 pandemic?
- Can we gain a better understanding of the commodities that enter the U.S. under the Special Classifications Provisions category?

By answering the questions above, implications for cross-border transportation planning and operations are identified in the following sections.

Recent history as a gauge: five years of Cascade Gateway freight flow

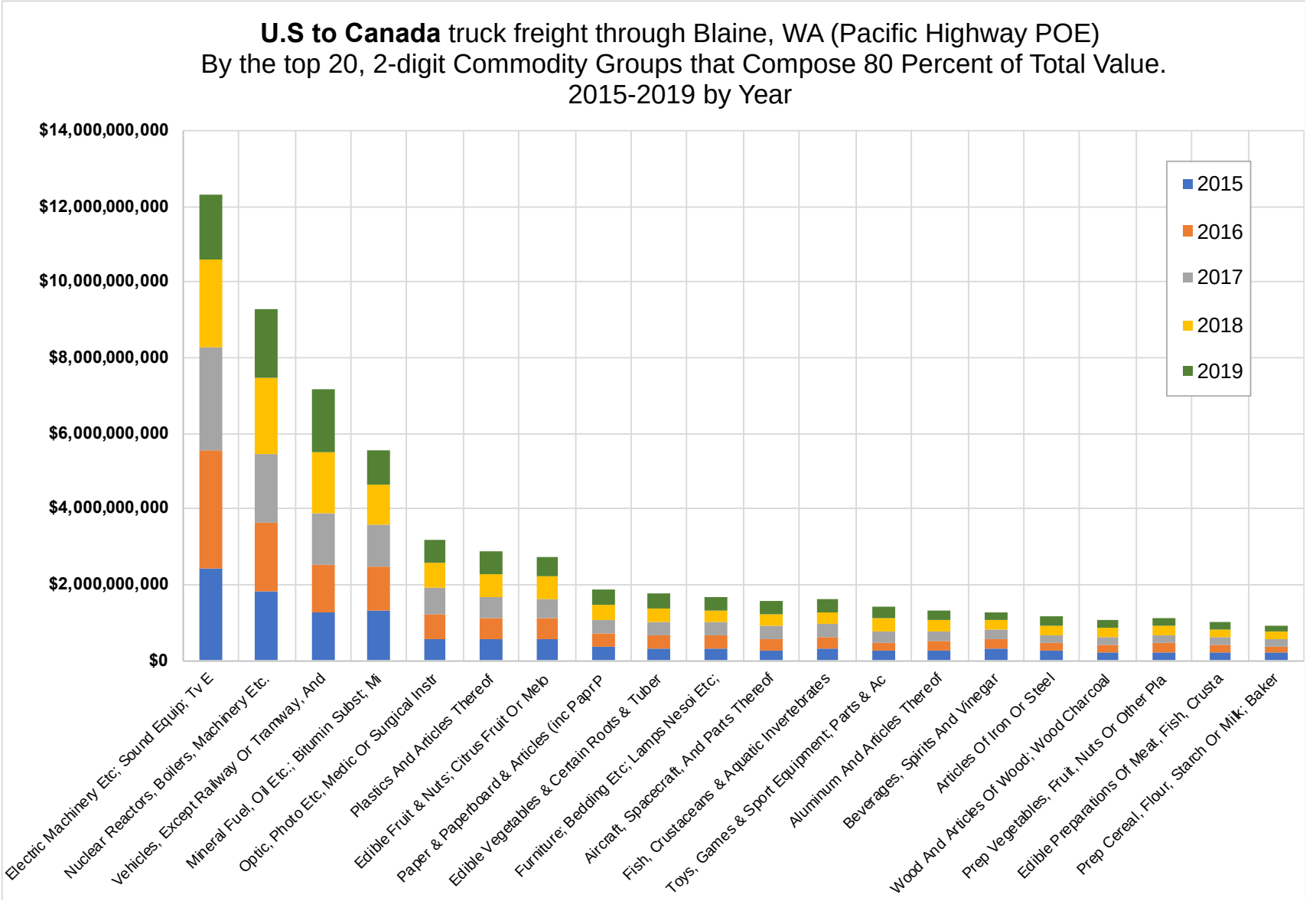
When looking to isolate and better understand which observed changes are more likely to be related to COVID-19 impacts, we first looked at recent years' annual trade characteristics to see what type and scale of annual or cyclical variations might be more typical in the Cascade Gateway trade lane.

The six charts below summarize the value (U.S. Dollars) of trade moving through **the Cascade Gateway's three commercial ports-of-entr**y (POE) over the last five years (2015-2019).

- Pacific Highway
- Aldergrove, BC – Lynden, WA
- Abbotsford-Huntingdon, BC – Sumas, WA

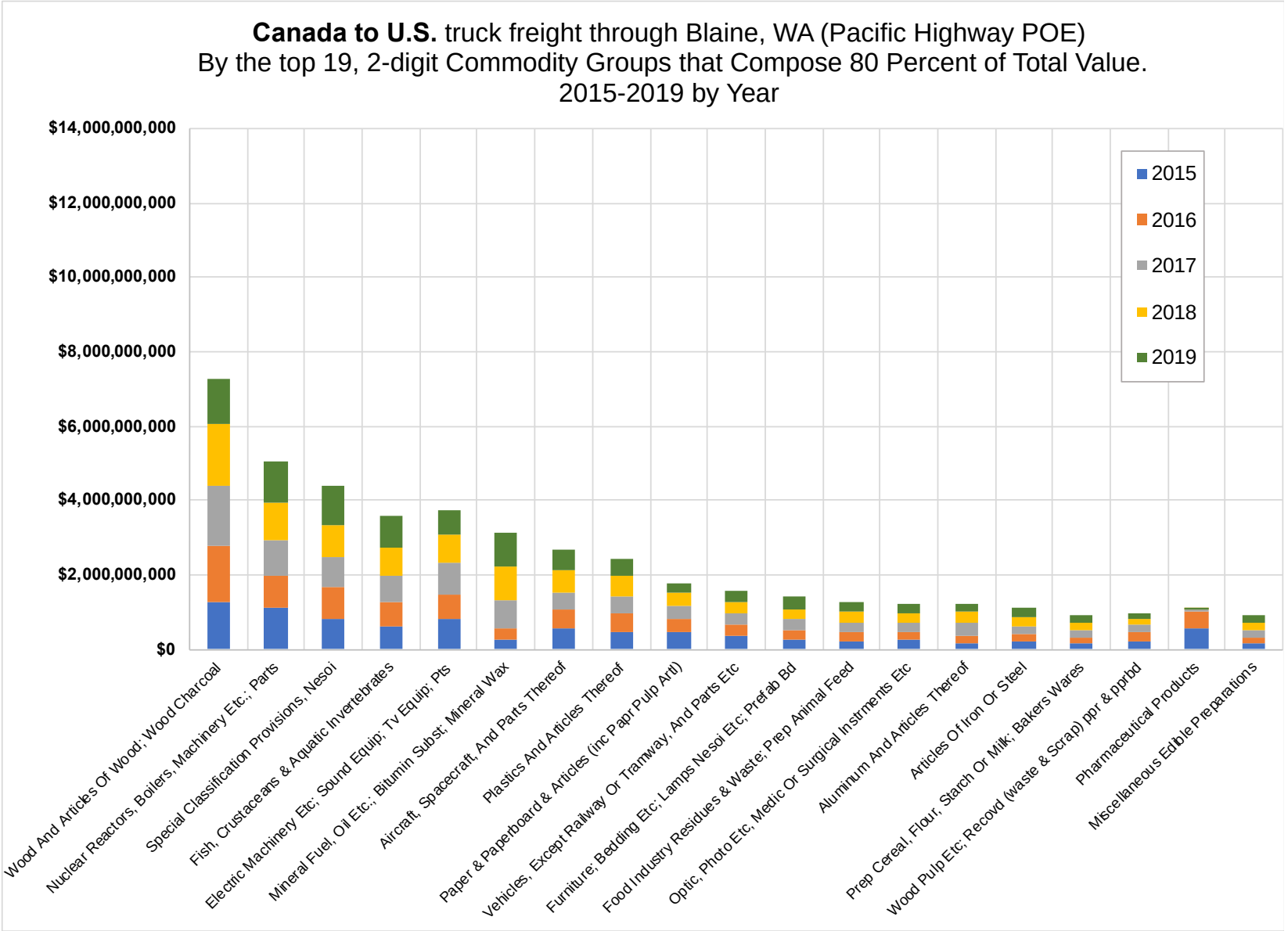
Each POE has separate charts for Canada-to-U.S. freight and U.S.-to-Canada freight, broken out by commodity group at the 2-digit level of the Harmonized System (HS). The charts are limited to those commodity groups that, in descending order of annual value, comprise 80 percent of the trade flow ($ value).

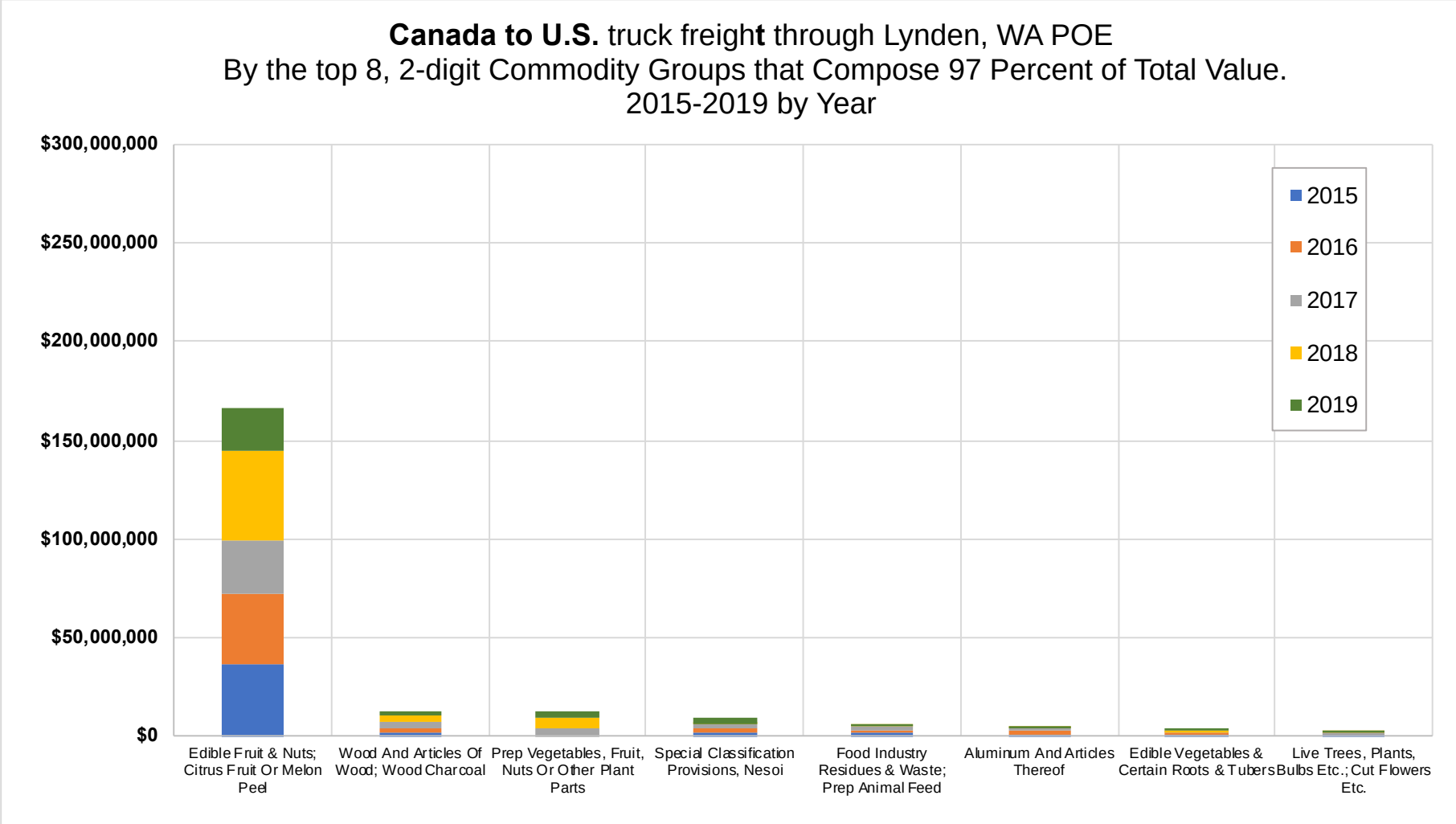
Charts 4 & 5

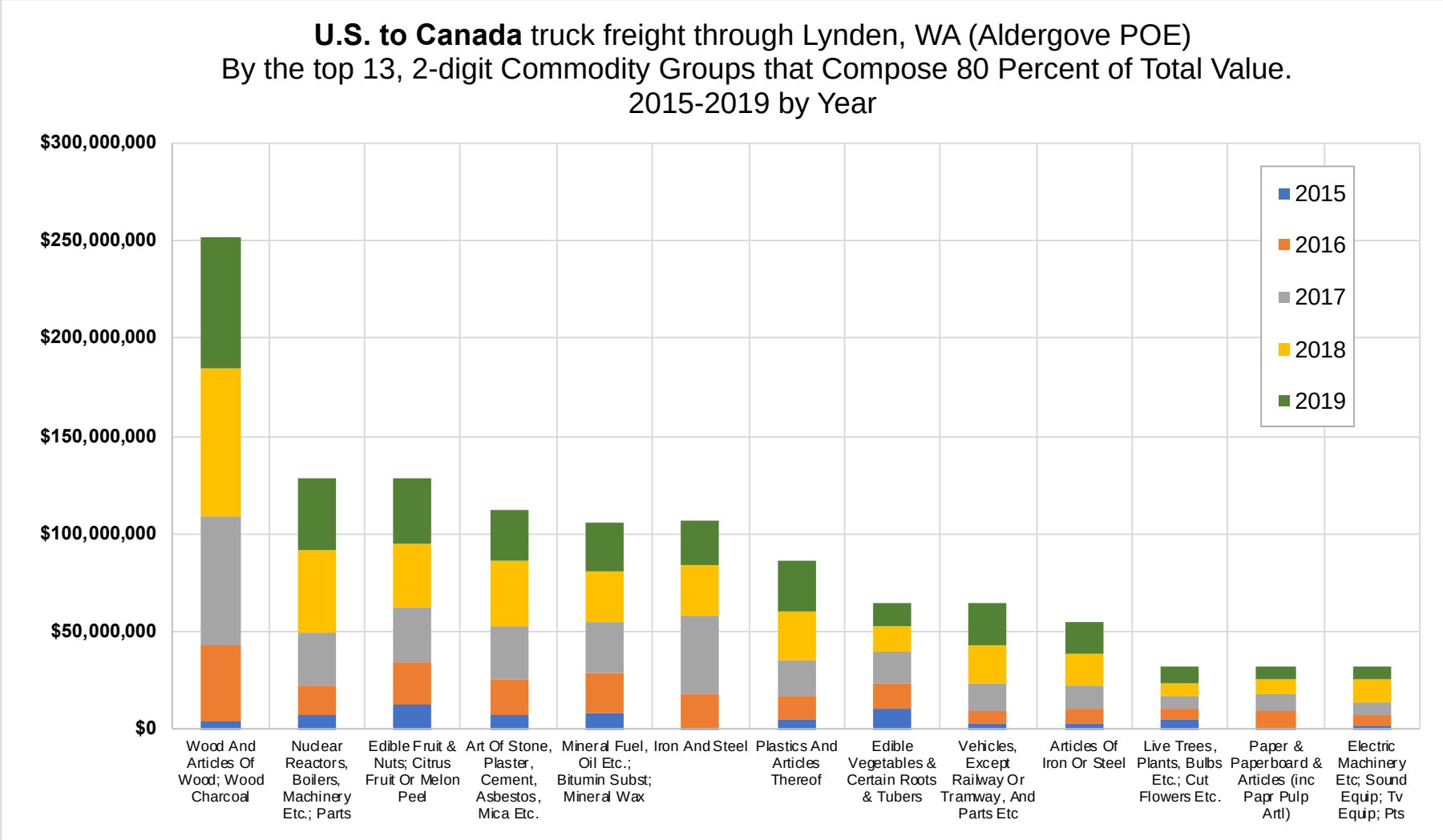


Source: USA Trade (usatrade.census.gov). Chart by WCOG

Charts 5 & 6:

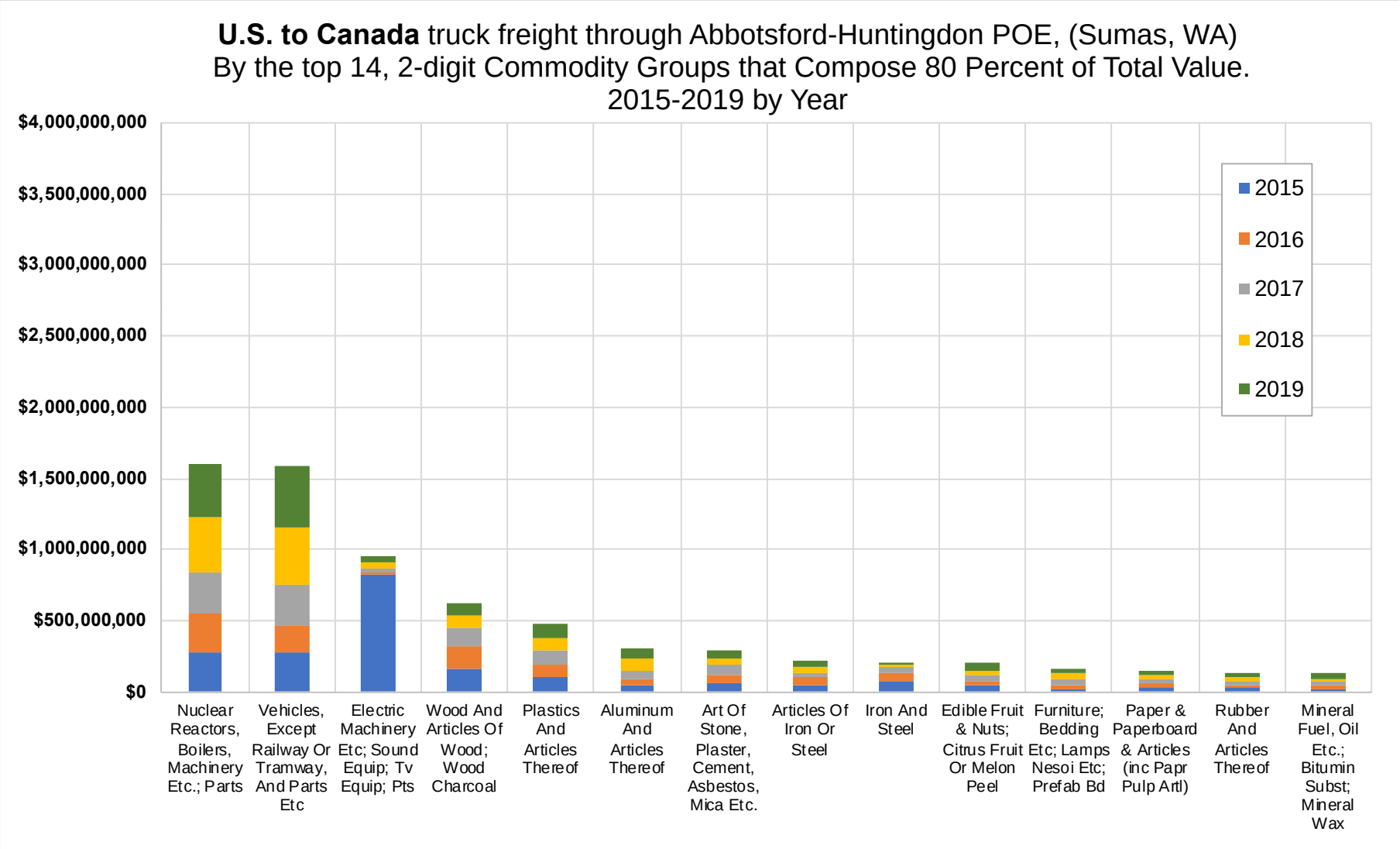

Canada to U.S. truck freight through Blaine, WA (Pacific Highway POE)
By the top 19, 2-digit Commodity Groups that Compose 80 Percent of Total Value.
2015-2019 by Year
$14,000,000,000
$12,000,000,000
$10,000,000,000
$8,000,000,000
$6,000,000,000
$4,000,000,000
$2,000,000,000
$0
2015
2016
2017
2018
2019
Wood And Articles Of Wood; Wood Charcoal
Nuclear Reactors, Boilers, Machinery Etc.; Parts
Special Classification Provisions, Nesoi
Fish, Crustaceans & Aquatic Invertebrates
Electric Machinery Etc; Sound Equip; Tv Equip; Pts
Mineral Fuel, Oil Etc.; Bitumin Subst; Mineral Wax
Aircraft, Spacecraft, And Parts Thereof
Plastics And Articles Thereof
Paper & Paperboard & Articles (inc Papr Pulp Artl)
Vehicles, Except Railway Or Tramway, And Parts Etc
Furniture; Bedding Etc; Lamps Nesoi Etc; Prefab Bd
Food Industry Residues & Waste; Prep Animal Feed
Optic, Photo Etc, Medic Or Surgical Instrments Etc
Aluminum And Articles Thereof
Articles Of Iron Or Steel
Prep Cereal, Flour, Starch Or Milk; Bakers Wares
Wood Pulp Etc; Recovd (waste & Scrap) ppr & pprbd
Pharmaceutical Products
Miscellaneous Edible Preparations

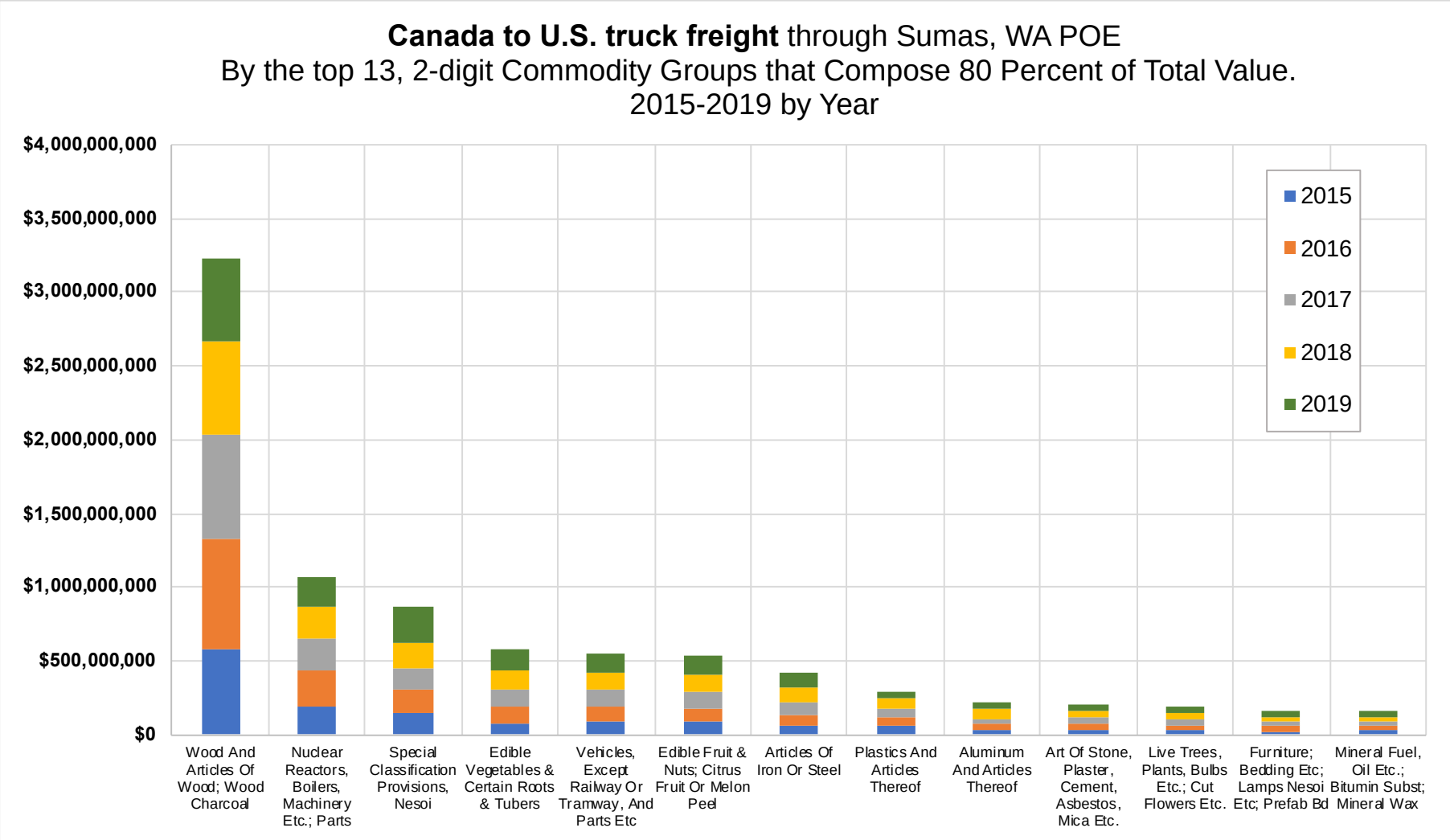

Canada to U.S. truck freight through Lynden, WA POE
By the top 8, 2-digit Commodity Groups that Compose 97 Percent of Total Value.
2015-2019 by Year
$300,000,000
$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$0
2015
2016
2017
2018
2019
Edible Fruit & Nuts; Citrus Fruit Or Melon Peel
Wood And Articles Of Wood; Wood Charcoal
Prep Vegetables, Fruit, Nuts Or Other Plant Parts
Special Classification Provisions, Nesoi
Food Industry Residues & Waste; Prep Animal Feed
Aluminum And Articles Thereof
Edible Vegetables & Certain Roots & Tubers
Live Trees, Plants, Bulbs Etc.; Cut Flowers Etc.



Source: USA Trade (usatrade.census.gov). Chart by WCOG

Charts 7 & 8:


U.S. to Canada truck freight through Abbotsford-Huntingdon POE, (Sumas, WA)
By the top 14, 2-digit Commodity Groups that Compose 80 Percent of Total Value.
2015-2019 by Year
$4,000,000,000
$3,500,000,000
$3,000,000,000
$2,500,000,000
$2,000,000,000
$1,500,000,000
$1,000,000,000
$500,000,000
$0
2015
2016
2017
2018
2019
Nuclear Reactors, Boilers, Machinery Etc.; Parts
Vehicles, Except Railway Or Tramway, And Parts Etc
Electric Machinery Etc; Sound Equip; Tv Equip; Pts
Wood And Articles Of Wood; Wood Charcoal
Plastics And Articles Thereof
Aluminum And Articles Thereof
Art Of Stone, Plaster, Cement, Asbestos, Mica Etc.
Articles Of Iron Or Steel
Iron And Steel
Edible Fruit & Nuts; Citrus Fruit Or Melon Peel
Furniture; Bedding Etc; Lamps Nesoi Etc; Prefab Bd
Paper & Paperboard & Articles (inc Papr Pulp Artl)
Rubber And Articles Thereof
Mineral Fuel, Oil Etc.; Bitumin Subst; Mineral Wax



Source: USA Trade (usatrade.census.gov). Chart by WCOG

Five-year commodity flow observations

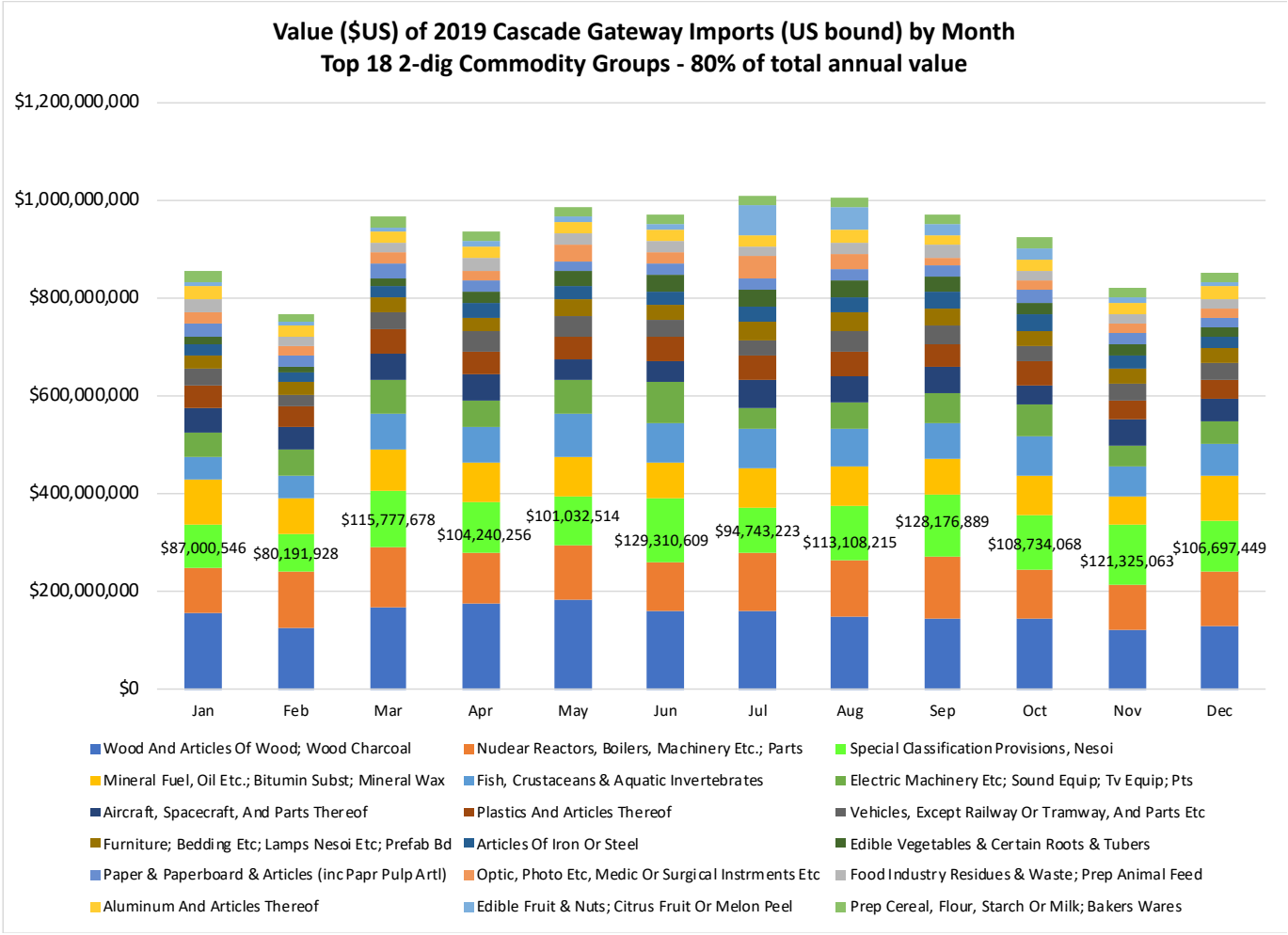
- **In the Cascade Gateway**, in terms of monetary value, significantly more *freight value* moves from the U.S. to Canada than from Canada to the U.S. (But freight value is not trucks which is what the system needs to accommodate).
- **At Pacific Highway**
  - Value declines in the highest-value commodity groups (both directions) were observed in 2019 after consistently higher values in the previous four years. So, more pronounced declines in those commodities observed in 2020 may also be part of a trend that was already underway.
  - Overall, annual value of goods moving in each commodity category has been fairly stable over the last five years – lending support to the perspective that significant changes in commodity composition have not been typical in recent years at this location.
- **At Aldergrove-Lynden**
  - This is a much lower volume crossing – especially in terms of freight value (and this makes annual variation look more significant)
  - Canada-to-U.S. commodity flow is heavily concentrated in one category and also relatively variable in annual total value. This will make it harder to attribute 2020 changes to COVID impacts here.
  - U.S.-to-Canada commodity composition is much more diversified and, compared to Canada-to-U.S .flows here, shows more consistent annual value totals.
- **At Abbotsford-Huntingdon – Sumas**
  - With the exception of a small 2019 reduction in the highest value Canada-to-U.S. commodity group (wood & articles of wood) and a 2015 spike in U.S.-to-Canada electrical machinery, freight flows at this location have been consistent over the last five years.

Having looked at annual characteristics over the last five years, we'll now look at 2019 monthly data to see what if any seasonal variation is observable that should be taken into account when assessing the degree to which COVID-19 may have impacted trade values.

Cascade Gateway freight, 2019 by month

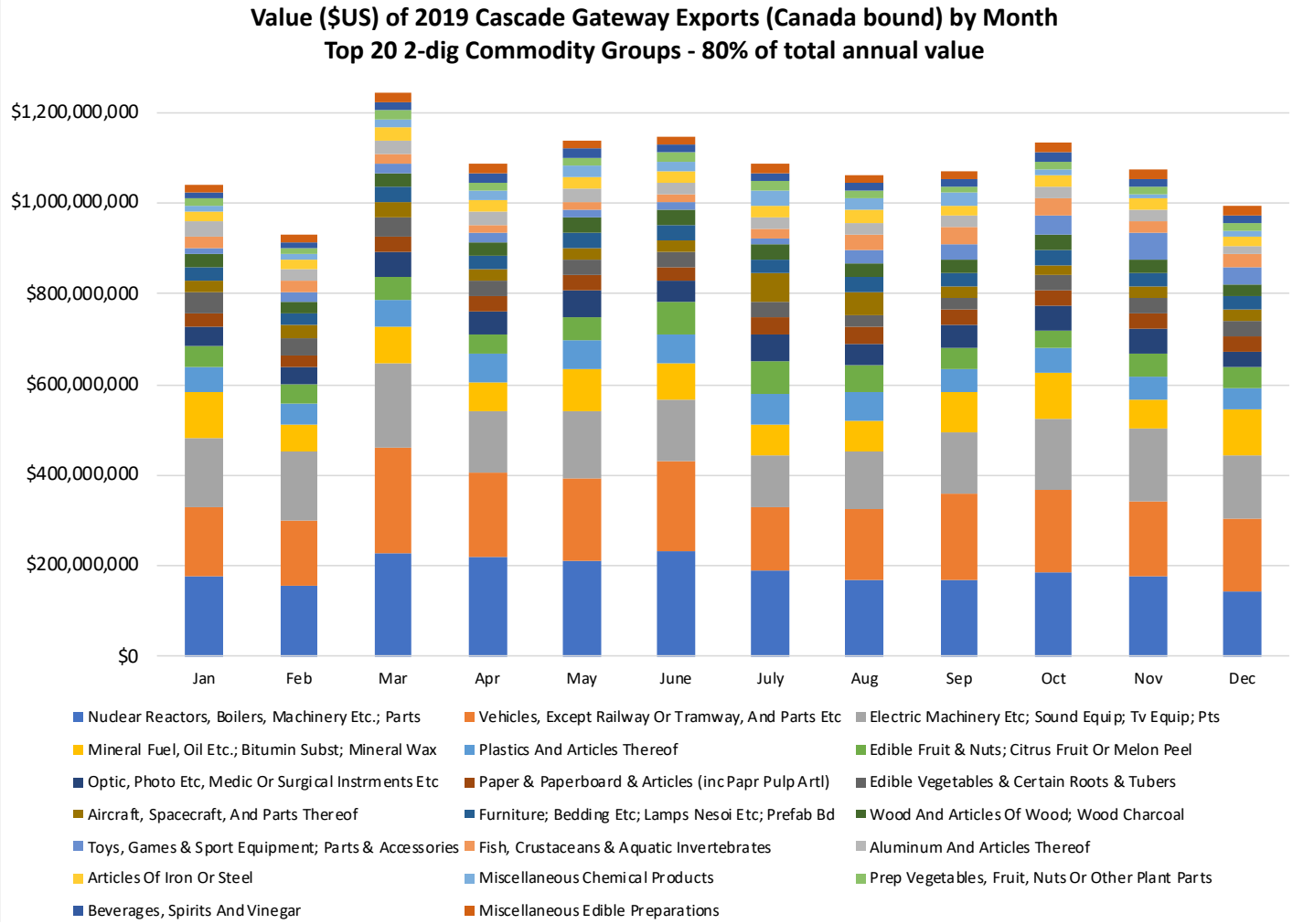
The following charts of monthly Cascade Gateway trade value by commodity were developed to evaluate if any of the major commodity groups exhibit large seasonal fluctuations that might offer an explanation for shifts in cross-border freight value other than COVID impacts.

Charts 9:



Source: USA Trade (usatrade.census.gov). Chart by WCO

Chart 10:



Source: USA Trade (usatrade.census.gov). Chart by WCOG

2019 monthly commodity flow observations

2019's monthly commodity-group values were fairly consistent throughout the year with modest rises and falls following many other commodities and generally following the slight ups and downs of the monthly total trade value in either direction. This seems to strengthen the interpretation that, in 2020, the larger, relatively observable shifts in specific commodity groups were influenced by COVID-19.

Chart 9 also includes value labels on HS code 98 – Special Classification Provisions – simply to underscore that portion of trade categorized by tariff status is both significant and still relatively "anonymous" in that available data sources don't include any actual commodity description.

Special Classifications Provisions (a slight but related detour)

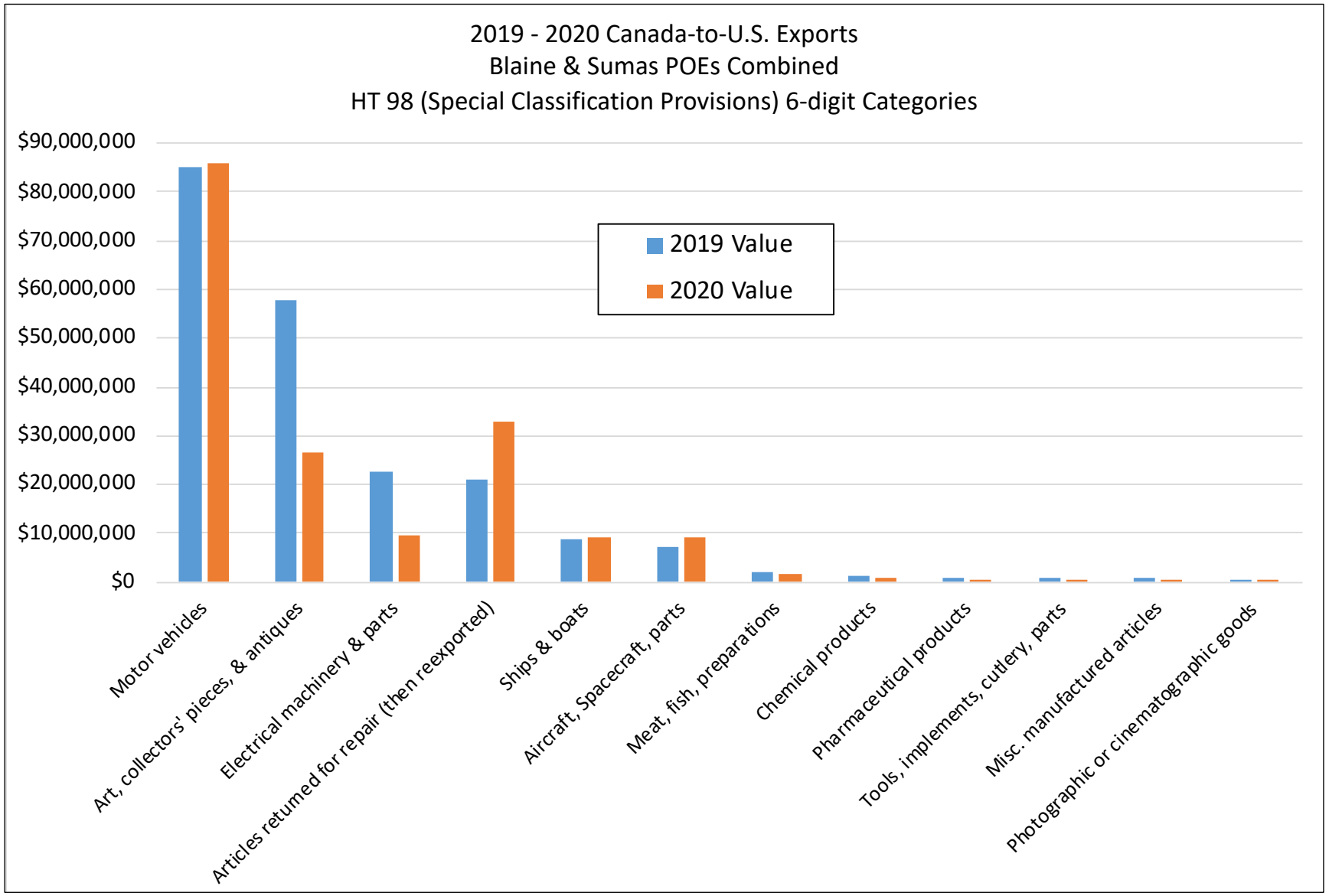
Having pointed it out in a few instances above, early observations of probable COVID impacts on specific commodity groups showed a significant share of Canada-to-U.S. trade in the two-digit 98 category of the Harmonized System (12 percent of Cascade Gateway U.S.-Canada trade value with a 25 percent YoY drop for the second quarter of 2020). With the assistance of U.S. CBP, more detailed, 6-digit HST data was compiled for the Blaine and Sumas POEs for 2019 and 2020.

Unlike all of the other HST codes, HST 98 is not a commodity but rather used to indicate that the goods being imported are exempt from tariff. So, the 98 designation does not convey any commodity information. This is a weak spot in the use of commodity-classification systems that were primarily developed for tariff assessment and collection.

The shared criterion that all subcategories of HST 98 meet is that the goods originated in the United States and are being imported back into the U.S. within three years of original export.

At the 6-digit level, we can make better inferences of what commodities are moving under HST 98. The data provided by US CBP is summarized as a comparison of 2019 and 2020 below.

Chart 11:

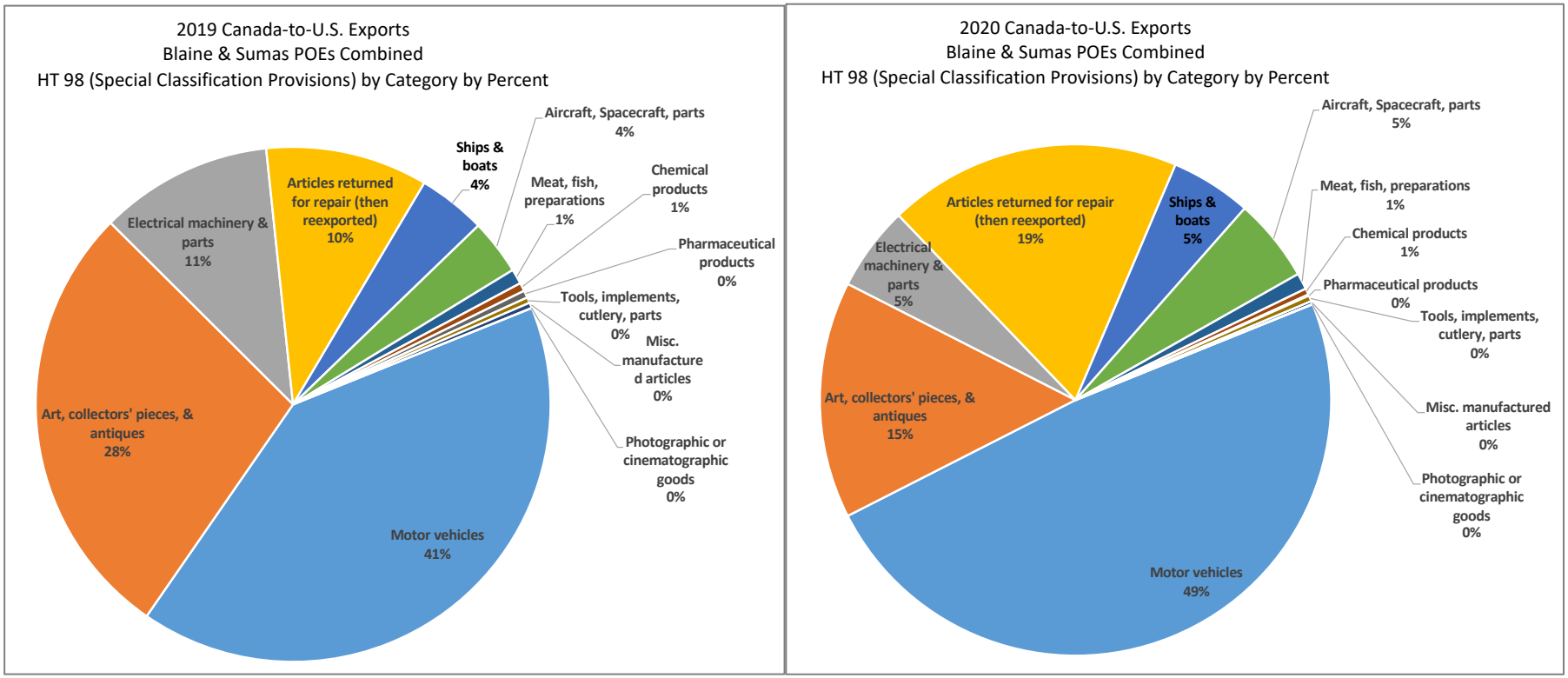


Source: Data from US CBP. Chart by WCOG

HST 98 observations

- The largest subcategory is motor vehicles. And, given the overall HST 98 criterion, these would be used vehicles manufactured in the United States. Because many used vehicles are driven through the POE (as opposed to shipped in multiples on a large-truck car carrier, this subcategory of regional cross-border trade is operationally impactful (on queues, inspection times, etc.) Additionally relevant when considering all of this data is that cars driven through the commercial entry booths for import are counted as a "truck."
- The other HST 98 sub-groups are (based on observations in subsequent sections) not likely to impact cross-border truck volume very much.
- Neither the large 2020 drop in art nor the 2020 rise in articles returned for repair, are obviously explained by COVID-19 impacts.

Charts 12 & 13: HST 98 subcategories – 2019 v. 2020 percentage distribution



Source: Data from US CBP. Chart by WCOG

[Almost] A year in review

With the release of trade data through the end of 2020, the tables below show monthly, year-over-year changes (both absolute and percentage) by HS 2-digit commodity group. The tables are also colorized (heat map) with darker red indicating the most negative change and darker green the most positive change with yellow being in little change zone. The tables are arrayed in descending order of each commodity group's total annual change from most negative to most positive.

Tables 2.1 & 2.2: 2019 – 2020, Canada to U.S., Year-over-Year comparison for the highest annual-value commodity groups (2-digit HS) that comprise 80% of total value ($USD)

	Annual '19-20 △	Q1			Q2			Q3			Q4		
		Jan YoY	Feb YoY	Mar YoY	Apr YoY	May YoY	Jun YoY	Jul YoY	Aug YoY	Sep YoY	Oct YoY	Nov YoY	Dec YoY
88 Aircraft, Spacecraft, And Parts Thereof	-$292,063,642	-$17,331,997	-$19,848,607	-$22,954,495	-$26,627,411	-$24,432,178	-$19,731,502	-$33,046,436	-$31,767,683	-$15,850,460	-$18,361,535	-$31,457,702	-$30,653,636
27 Mineral Fuel, Oil Etc.; Bitumin Subst; Mineral Wax	-$223,234,112	-$18,538,106	-$196,870	-$2,512,064	-$34,267,043	-$45,473,452	-$29,513,609	-$28,114,987	-$19,483,374	-$6,572,651	-$21,744,378	$8,433,534	-$25,251,112
84 Nuclear Reactors, Boilers, Machinery Etc.; Parts	-$171,660,619	-$6,690,497	-$17,245,789	$2,805,621	-$34,196,170	-$35,935,407	-$5,903,592	-$34,408,426	-$18,944,335	-$28,197,911	$8,906,202	$6,702,099	-$8,552,414
85 Electric Machinery Etc; Sound Equip; Tv Equip; Pts	-$50,232,429	-$7,232,001	-$7,468,663	-$17,344,458	-$10,955,502	-$27,278,129	-$40,307,538	$10,964,730	-$2,532,881	-$5,263,047	$13,897,043	$25,961,302	$17,326,715
94 Furniture; Bedding Etc; Lamps Nesoi Etc; Prefab Bd	-$41,693,764	$1,553,971	$3,811,604	-$3,112,024	-$3,792,638	-$11,206,331	-$4,186,319	-$3,913,558	-$5,931,662	-$9,264,606	$438,341	-$2,681,138	-$3,409,404
90 Optic, Photo Etc, Medic Or Surgical Instrments Etc	-$38,016,018	-$5,850,390	$462,247	-$4,641,550	-$2,454,666	-$15,916,729	$4,204,974	-$22,085,886	-$7,257,747	$4,836,607	$8,088,215	-$1,892,983	$4,491,890
73 Articles Of Iron Or Steel	-$31,012,396	$1,702,340	$5,080,562	$3,502,485	-$8,127,221	-$2,314,754	-$3,376,522	-$8,167,902	-$5,303,956	-$7,989,831	-$1,261,963	-$2,187,828	-$2,567,806
76 Aluminum And Articles Thereof	-$29,970,068	-$3,157,410	$1,893,557	-$342,059	$6,419,761	-$5,690,542	-$5,850,851	-$2,856,053	-$8,059,457	-$3,043,497	$647,180	$1,161,709	-$11,092,406
19 Prep Cereal, Flour, Starch Or Milk; Bakers Wares	-$4,747,478	-$1,121,505	$1,575,687	-$1,162,125	-$5,225,376	$240,246	$1,788,746	$358,545	-$2,271,784	$287,580	-$572,806	$226,524	$1,128,790
08 Edible Fruit & Nuts; Citrus Fruit Or Melon Peel	-$291,831	-$619,398	-$563,280	$1,058,443	-$720,836	$1,037,018	$165,194	-$19,197,480	-$1,140,085	$2,426,357	$9,010,627	$4,171,470	$4,080,139
98 Special Classification Provisions, Nesoi	$10,373,489	$13,147,038	$43,941,105	$1,476,765	-$35,853,229	-$21,170,937	-$22,607,097	$44,759,685	$19,719,275	$7,349,974	$3,252,345	-$21,985,443	-$21,655,992
21 Miscellaneous Edible Preparations	$21,019,733	$497,410	$1,393,902	$1,246,941	-$1,630,297	-$1,833,962	$2,212,619	$262,988	$4,022,033	$5,512,813	$1,362,123	$5,850,699	$2,122,464
39 Plastics And Articles Thereof	$33,292,843	-$1,674,097	$6,079,058	$9,485,792	-$2,648,640	-$3,627,644	-$1,882,603	-$1,507,076	$207,050	$793,759	$6,493,901	$10,900,938	$10,672,405
23 Food Industry Residues & Waste; Prep Animal Feed	$34,447,285	-$10,604,969	-$1,833,024	$2,681,318	$8,423,219	-$3,065,419	$4,129,175	-$2,550,485	-$4,036,445	-$7,413,658	$13,488,473	$19,800,166	$15,428,934
03 Fish, Crustaceans & Aquatic Invertebrates	$43,855,447	$7,500,949	$8,493,986	$372,607	$3,957,630	$2,857,250	$5,798,413	$19,723,586	$17,353,213	$3,171,871	-$32,570,265	-$23,127,438	$30,323,645
07 Edible Vegetables & Certain Roots & Tubers	$52,931,482	$1,245,086	$1,358,627	$3,327,389	$3,466,391	$9,027,658	$5,299,242	$7,366,019	$6,556,435	$5,667,919	$6,201,914	$1,750,197	$1,664,605
87 Vehicles, Except Railway Or Tramway, And Parts Etc	$57,542,084	$4,519,134	$18,815,892	$9,257,403	-$20,832,255	-$11,294,787	$17,169,650	$4,609,881	-$6,344,105	$546,389	$21,182,012	$21,449,563	-$1,536,693
44 Wood And Articles Of Wood; Wood Charcoal	$528,762,876	-$28,456,594	$26,421,754	$22,439,511	-$36,906,670	-$43,721,711	$10,539,699	$21,250,375	$63,793,674	$115,321,394	$143,473,369	$116,331,483	$118,276,592

	Annual '19-20 % △	Q1			Q2			Q3			Q4		
		Jan YoY %	Feb YoY %	Mar YoY %	Apr YoY %	May YoY %	Jun YoY %	Jul YoY %	Aug YoY %	Sep YoY %	Oct YoY %	Nov YoY %	Dec YoY %
88 Aircraft, Spacecraft, And Parts Thereof	-49.4%	-33.0%	-42.6%	-42.9%	-48.7%	-57.7%	-45.3%	-59.8%	-58.9%	-30.5%	-46.7%	-59.4%	-68.4%
27 Mineral Fuel, Oil Etc.; Bitumin Subst; Mineral Wax	-23.5%	-20.2%	-0.3%	-3.0%	-44.5%	-55.2%	-40.4%	-34.9%	-24.0%	-8.9%	-26.6%	13.9%	-27.6%
90 Optic, Photo Etc, Medic Or Surgical Instrments Etc	-13.2%	-27.1%	2.3%	-19.6%	-14.0%	-49.8%	18.8%	-50.5%	-24.8%	30.9%	41.7%	-8.6%	23.1%
84 Nuclear Reactors, Boilers, Machinery Etc.; Parts	-13.1%	-7.0%	-15.1%	2.2%	-32.8%	-32.9%	-5.9%	-29.1%	-16.2%	-22.5%	8.7%	7.2%	-7.9%
94 Furniture; Bedding Etc; Lamps Nesoi Etc; Prefab Bd	-11.3%	6.4%	16.3%	-10.8%	-13.7%	-30.9%	-13.6%	-10.8%	-16.2%	-25.9%	1.4%	-8.7%	-12.4%
76 Aluminum And Articles Thereof	-11.0%	-12.0%	9.0%	-1.5%	27.1%	-24.4%	-25.2%	-14.3%	-34.0%	-16.3%	2.9%	5.8%	-41.4%
73 Articles Of Iron Or Steel	-9.2%	6.5%	24.1%	13.5%	-26.8%	-8.5%	-12.4%	-27.0%	-17.7%	-23.6%	-4.0%	-7.6%	-9.9%
85 Electric Machinery Etc; Sound Equip; Tv Equip; Pts	-7.1%	-14.9%	-13.8%	-24.4%	-20.6%	-38.7%	-46.4%	24.5%	-4.4%	-8.8%	21.2%	58.7%	37.0%
19 Prep Cereal, Flour, Starch Or Milk; Bakers Wares	-2.1%	-5.6%	10.3%	-6.0%	-27.3%	1.3%	10.0%	1.9%	-12.1%	1.5%	-2.8%	1.2%	6.2%
08 Edible Fruit & Nuts; Citrus Fruit Or Melon Peel	-0.1%	-6.0%	-5.4%	11.3%	-7.1%	10.1%	1.5%	-30.3%	-2.3%	10.4%	35.8%	37.0%	44.2%
98 Special Classification Provisions, Nesoi	0.8%	15.1%	54.8%	1.3%	-34.4%	-21.0%	-17.5%	47.2%	17.4%	5.7%	3.0%	-18.1%	-20.3%
03 Fish, Crustaceans & Aquatic Invertebrates	5.2%	16.0%	18.3%	0.5%	5.3%	3.3%	7.3%	25.0%	23.7%	4.3%	-40.6%	-39.2%	45.8%
39 Plastics And Articles Thereof	6.0%	-3.6%	15.3%	20.1%	-5.6%	-7.6%	-3.8%	-3.1%	0.4%	1.7%	13.4%	27.5%	27.7%
21 Miscellaneous Edible Preparations	10.5%	2.9%	8.7%	6.5%	-10.6%	-10.9%	13.3%	1.5%	27.6%	35.9%	7.1%	37.1%	13.2%
23 Food Industry Residues & Waste; Prep Animal Feed	12.6%	-38.5%	-10.1%	13.6%	30.9%	-12.6%	18.3%	-11.4%	-15.3%	-27.1%	69.8%	101.3%	76.5%
87 Vehicles, Except Railway Or Tramway, And Parts Etc	13.7%	13.2%	73.2%	25.7%	-52.5%	-28.9%	53.1%	13.6%	-15.1%	1.5%	63.3%	67.3%	-4.3%
07 Edible Vegetables & Certain Roots & Tubers	17.9%	8.3%	10.4%	21.3%	15.5%	31.8%	15.4%	21.0%	18.0%	17.9%	24.7%	7.8%	10.0%
44 Wood And Articles Of Wood; Wood Charcoal	29.2%	-18.4%	21.2%	13.5%	-20.9%	-23.8%	6.6%	13.3%	43.5%	79.9%	100.0%	95.8%	90.7%

Source: USA Trade (usatrade.census.gov). Table by WCOG

Canada-to-U.S. Observations

- The commodity group with the largest annual negative change (Aircraft & Parts) was having a bad year before COVID impacts set in (March/April). But it continued to drop.
- Perhaps best observed in the percentage-based table (2.2), for those commodity groups that exhibited negative impacts from COVID-19, the impacts lessened by the 4th quarter (October).
- The commodity group with the largest annual positive change (Wood and articles of wood) was having an unremarkable year, experienced marked decline in April and May, and then moved into the 4th quarter with three months of essentially doubling the previous year's monthly trade value, which aligns with the corresponding surge in demand for wood products for use in home repair and renovation.
- Similar to the second bullet above, most of the commodity groups that exhibited positive impacts from COVID-19 (Food and Vehicles) transitioned to very strong YoY growth in September/October.

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Tables 2.3 & 2.4: 2019 – 2020, U.S. to Canada, Year-over-Year comparison for the highest annual-value commodity groups (2-digit HS) that comprise 80% of total value ($USD)

	Annual '19-'20 △	Q1			Q2			Q3			Q4		
		Jan YoY	Feb YoY	Mar YoY	Apr YoY	May YoY	Jun YoY	Jul YoY	Aug YoY	Sep YoY	Oct YoY	Nov YoY	Dec YoY
84 Nuclear Reactors, Boilers, Machinery Etc.; Parts	-$813,164,259	-$53,952,022	-$30,252,608	-$88,971,133	-$150,714,394	-$156,844,525	-$99,019,951	-$53,751,670	-$22,405,056	$12,663,901	-$68,489,624	-$63,936,732	-$37,490,445
87 Vehicles, Except Railway Or Tramway, And Parts Etc	-$622,335,239	-$35,767,145	-$55,674,646	-$100,906,140	-$74,614,331	-$86,411,541	-$53,983,126	-$36,600,018	-$35,799,863	-$21,189,608	-$32,939,656	-$47,826,167	-$40,622,998
85 Electric Machinery Etc; Sound Equip; Tv Equip; Pts	-$604,774,940	-$65,154,716	-$28,059,407	-$87,874,766	-$104,758,681	-$97,347,542	-$97,854,247	-$68,997,840	-$13,389,020	-$4,438,230	-$22,242,593	-$21,122,067	$6,464,169
27 Mineral Fuel, Oil Etc.; Bitumin Subst; Mineral Wax	-$330,320,856	-$42,534,181	$63,939,646	$83,605,885	-$8,412,529	-$71,034,449	-$56,964,742	-$42,874,209	-$5,129,342	-$47,747,326	-$90,637,878	-$38,385,256	-$74,146,475
08 Edible Fruit & Nuts; Citrus Fruit Or Melon Peel	-$159,422,385	-$5,522,327	-$2,943,898	-$10,433,021	-$11,135,897	-$24,521,252	-$17,228,252	-$21,761,270	-$10,334,235	-$7,612,424	-$17,868,944	-$25,138,151	-$4,922,714
39 Plastics And Articles Thereof	-$143,417,414	-$13,737,193	-$9,648,573	-$13,832,383	-$12,604,048	-$15,909,954	-$14,827,137	-$12,110,825	-$12,103,668	-$10,832,034	-$14,415,232	-$9,833,028	-$3,563,339
90 Optic, Photo Etc, Medic Or Surgical Instrments Etc	-$137,443,145	-$13,167,958	-$2,583,718	-$7,468,915	-$21,491,949	-$22,880,834	-$14,827,594	-$15,795,184	-$11,490,953	-$6,128,848	-$7,714,622	-$11,868,037	-$2,024,533
95 Toys, Games & Sport Equipment; Parts & Accessories	-$84,546,226	$3,197,560	$8,573,771	$4,131,591	$8,647,289	-$1,007,340	-$3,241,422	-$38,420,116	-$28,493,606	-$5,635,504	-$7,972,511	-$11,513,759	-$12,812,179
07 Edible Vegetables & Certain Roots & Tubers	-$63,612,043	-$3,340,828	-$947,462	-$6,568,393	-$11,275,521	-$12,352,358	-$3,375,604	-$6,386,551	-$8,075,972	-$3,647,357	-$2,315,062	-$4,829,585	-$497,350
48 Paper & Paperboard & Articles (inc Papr Pulp Artl)	-$59,980,319	-$480,776	-$5,608,713	$1,637,778	-$6,669,701	-$1,462,732	-$543,409	$926,280	-$9,173,478	-$13,222,471	-$8,882,839	-$5,763,306	-$10,736,952
94 Furniture; Bedding Etc; Lamps Nesoi Etc; Prefab Bd	-$50,019,057	-$3,784,751	$1,223,879	$2,782,530	-$1,834,986	-$850,615	-$7,507,617	-$19,214,657	-$18,079,941	-$6,046,648	$3,176,349	-$3,165,062	$3,282,462
88 Aircraft, Spacecraft, And Parts Thereof	-$42,276,400	-$1,562,404	$1,670,413	-$3,998,259	-$11,288,893	-$9,554,321	-$9,153,040	-$3,202,281	-$3,020,938	-$1,114,843	-$1,740,769	-$324,822	$1,013,757
03 Fish, Crustaceans & Aquatic Invertebrates	-$37,610,883	$33,939	$1,862,956	-$390,172	-$4,737,561	-$9,465,242	-$3,825,224	-$7,560,375	-$7,522,693	-$7,183,848	$1,619,366	-$866,042	$424,013
22 Beverages, Spirits And Vinegar	-$31,213,747	-$1,376,021	-$357,739	-$1,931,470	$2,048,164	-$2,734,470	-$3,117,159	-$12,291,435	-$4,478,501	-$9,931,206	$1,266,847	$2,192,362	-$503,119
73 Articles Of Iron Or Steel	-$27,150,106	-$1,164,960	-$2,478,912	-$2,076,969	-$688,081	-$2,099,935	-$476,780	-$6,987,621	-$5,456,708	-$2,719,995	-$1,590,884	-$721,475	-$687,786
44 Wood And Articles Of Wood; Wood Charcoal	-$25,310,890	-$2,303,044	-$1,785,403	-$1,742,947	-$7,809,630	-$2,999,140	-$2,152,607	-$3,751,252	-$2,834,675	-$2,380,432	$2,057,211	$64,744	$326,285
16 Edible Preparations Of Meat, Fish, Crustaceans Etc	-$23,359,946	$1,175,513	-$150,097	-$173,097	-$3,848,616	-$3,167,070	-$3,545,783	-$4,274,640	-$920,001	-$90,659	-$1,798,018	-$2,920,272	-$3,647,206
38 Miscellaneous Chemical Products	-$8,081,507	-$1,217,902	$2,841,337	$688,423	-$2,451,005	-$5,207,670	-$1,519,864	$457,024	-$1,103,144	-$971,070	$1,190,783	-$90,755	-$697,664
21 Miscellaneous Edible Preparations	$2,709,073	$406,752	$2,142,004	$2,178,695	-$1,503,571	-$1,229,839	-$1,305,734	$1,692,054	$23,738,023	-$17,928,704	-$2,544,109	$680,658	-$3,617,156
20 Prep Vegetables, Fruit, Nuts Or Other Plant Parts	$26,228,269	$664,015	$3,646,864	$1,184,152	-$302,439	-$3,334,093	$1,991,262	$2,476,241	$5,333,679	$5,790,020	$1,557,931	$2,044,371	$5,176,266
19 Prep Cereal, Flour, Starch Or Milk; Bakers Wares	$64,307,656	$450,660	$3,308,118	-$494,756	$15,638,679	$1,761,280	$2,081,298	$8,542,348	-$32,700	$13,814,902	-$1,540,975	$13,204,487	$7,574,315

	Annual '19-'20 %△	Q1			Q2			Q3			Q4		
		Jan YoY	Feb YoY	Mar YoY	Apr YoY	May YoY	Jun YoY	Jul YoY	Aug YoY	Sep YoY	Oct YoY	Nov YoY	Dec YoY
84 Nuclear Reactors, Boilers, Machinery Etc.; Parts	-39.1%	-45.6%	-36.8%	-46.5%	-41.5%	-46.5%	-45.5%	-36.7%	-37.3%	-36.9%	-41.5%	-34.1%	-14.2%
85 Electric Machinery Etc; Sound Equip; Tv Equip; Pts	-38.9%	-35.8%	-21.1%	-38.6%	-82.0%	-85.3%	-49.5%	-38.4%	-14.2%	6.6%	-38.1%	-38.0%	-23.1%
27 Mineral Fuel, Oil Etc.; Bitumin Subst; Mineral Wax	-35.7%	-23.2%	-36.5%	-53.5%	-53.9%	-58.7%	-39.1%	-32.5%	-28.6%	-16.1%	-21.0%	-29.7%	-29.2%
87 Vehicles, Except Railway Or Tramway, And Parts Etc	-34.4%	-43.3%	107.5%	104.0%	-13.8%	-77.1%	-72.7%	-63.6%	-7.5%	-53.2%	-89.1%	-64.0%	-71.5%
95 Toys, Games & Sport Equipment; Parts & Accessories	-27.2%	-13.3%	-8.0%	-18.5%	-23.5%	-43.8%	-37.0%	-38.0%	-23.3%	-15.3%	-31.4%	-43.7%	-14.0%
08 Edible Fruit & Nuts; Citrus Fruit Or Melon Peel	-26.8%	-36.5%	-18.1%	-38.3%	-47.5%	-46.2%	-42.6%	-36.2%	-7.9%	-2.6%	-12.0%	-12.1%	4.6%
90 Optic, Photo Etc, Medic Or Surgical Instrments Etc	-22.3%	11.2%	29.6%	11.3%	34.4%	-3.9%	-13.2%	-60.3%	-57.8%	-26.3%	-33.8%	-44.4%	-49.8%
39 Plastics And Articles Thereof	-21.3%	-15.7%	-4.0%	-23.2%	-42.6%	-43.3%	-13.4%	-25.6%	-29.1%	-15.1%	-9.7%	-20.7%	-2.4%
07 Edible Vegetables & Certain Roots & Tubers	-19.9%	-22.9%	-5.4%	-12.7%	-34.2%	-36.4%	-23.2%	-23.5%	-18.7%	-11.4%	-13.9%	-23.0%	-4.4%
48 Paper & Paperboard & Articles (inc Papr Pulp Artl)	-18.8%	-1.8%	-20.7%	7.9%	-34.6%	-8.8%	-3.3%	4.4%	-25.7%	-34.9%	-24.6%	-20.8%	-32.8%
22 Beverages, Spirits And Vinegar	-13.9%	-12.0%	-3.4%	-11.2%	10.0%	-12.0%	-13.7%	-38.0%	-18.9%	-37.4%	9.7%	20.1%	-4.2%
94 Furniture; Bedding Etc; Lamps Nesoi Etc; Prefab Bd	-12.5%	-6.8%	-15.8%	-10.5%	-4.0%	-11.5%	-2.7%	-31.5%	-26.6%	-16.7%	-9.5%	-4.5%	-3.7%
16 Edible Preparations Of Meat, Fish, Crustaceans Etc	-11.5%	-5.6%	6.0%	-12.3%	-36.7%	-30.0%	-26.3%	-10.6%	-9.1%	-3.6%	-5.5%	-1.2%	3.7%
03 Fish, Crustaceans & Aquatic Invertebrates	-11.0%	7.7%	-0.9%	-0.9%	-20.1%	-18.0%	-19.7%	-23.0%	-5.5%	-0.6%	-9.7%	-16.5%	-18.8%
88 Aircraft, Spacecraft, And Parts Thereof	-9.2%	0.1%	6.8%	-1.1%	-13.4%	-26.3%	-11.6%	-19.0%	-19.1%	-19.9%	4.8%	-2.7%	1.3%
73 Articles Of Iron Or Steel	-8.0%	-8.0%	2.8%	5.7%	-4.0%	-1.6%	-10.5%	-26.0%	-29.3%	-13.5%	8.0%	-6.2%	7.5%
44 Wood And Articles Of Wood; Wood Charcoal	-6.2%	-5.3%	-5.1%	-4.3%	-22.5%	-8.8%	-6.7%	-11.6%	-10.7%	-9.2%	6.6%	0.2%	0.9%
38 Miscellaneous Chemical Products	-4.2%	-7.7%	20.0%	4.0%	-15.6%	-31.7%	-9.6%	3.0%	-6.2%	-5.9%	7.1%	-0.6%	-4.4%
21 Miscellaneous Edible Preparations	1.4%	3.3%	23.1%	20.6%	-16.1%	-13.0%	-13.8%	12.3%	76.5%	-47.7%	-13.7%	4.9%	-21.6%
20 Prep Vegetables, Fruit, Nuts Or Other Plant Parts	12.2%	4.4%	27.9%	6.5%	-1.5%	-16.1%	10.4%	13.5%	33.3%	33.8%	6.8%	11.3%	30.8%
19 Prep Cereal, Flour, Starch Or Milk; Bakers Wares	20.0%	3.9%	18.0%	-2.2%	90.2%	11.3%	12.0%	57.7%	-0.1%	40.1%	-3.5%	21.9%	19.6%

Source: USA Trade (usatrade.census.gov). Table by WCOG

U.S.-to-Canada Observations

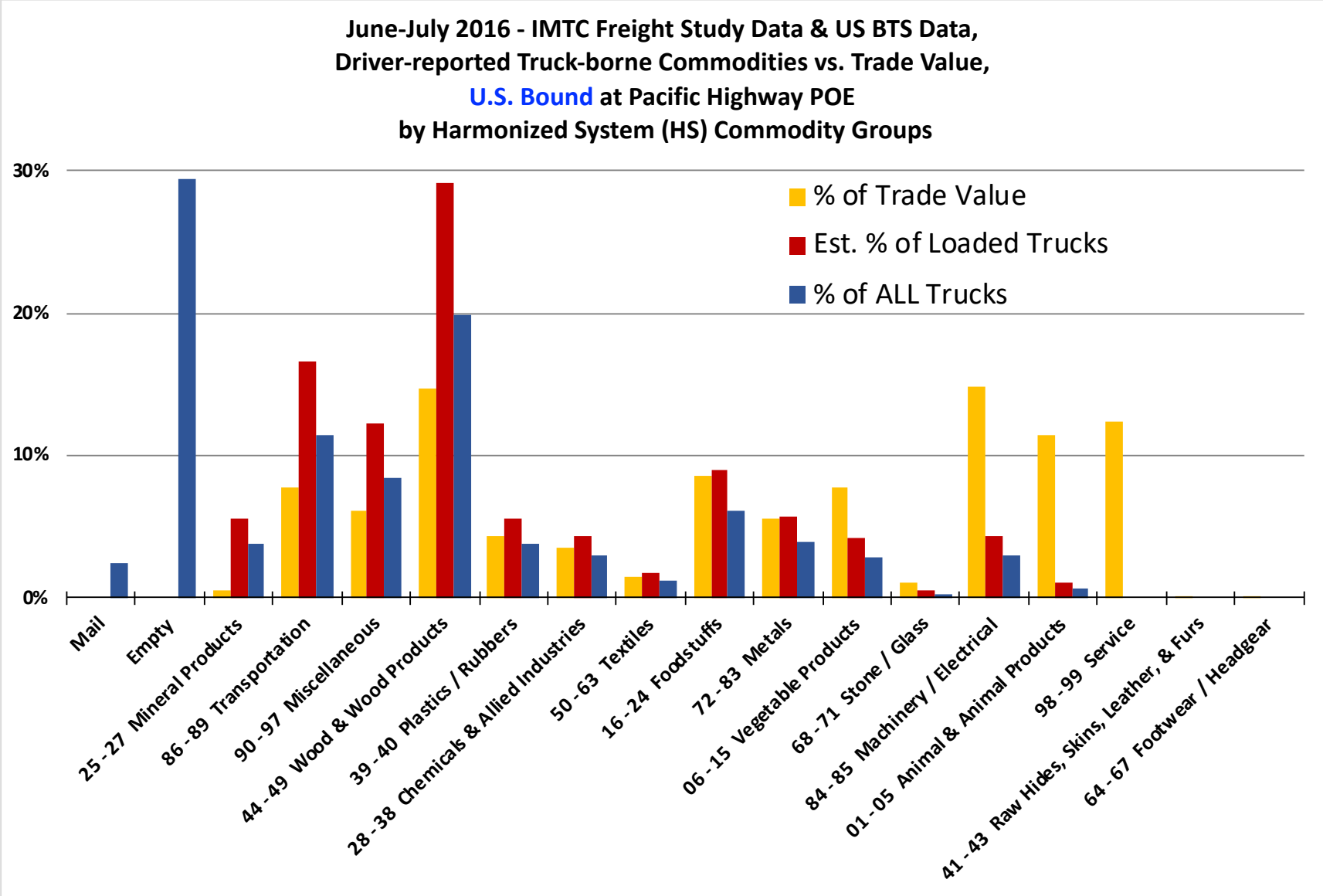
- The commodity group with the largest absolute annual negative changes (Machinery, vehicles, etc.) were having a bad year before COVID impacts set in (March/April) and it certainly continued.
- Perhaps best observed in the percentage-based table (2.4), for those commodity groups that exhibited negative impacts from COVID-19, unlike the trend in the Canada-to-U.S. direction, most of the significantly impacted groups continued to December in negative YoY territory.
- The commodity groups with the largest annual positive changes are primarily food commodities.

The relationships between commodities and conveyances (in this case trucks)

As seen in previous sections, trade data is usually monetary-value data and, for U.S. imports, commodity weights are also collected. But when considering the implications of changes in trade volume or value for the operations of transportation systems including land-border ports-of-entry (POEs), the most important data would probably be the number of trucks that get used to move the commodities through these systems.

For this and other reasons, the IMTC Program has conducted regional cross-border freight studies about every five years for the Cascade Gateway POEs. The most recent was conducted in 2016 with data collected in the field from thousands of cross-border truck drivers in June and July of that year.

Chart 11a: Comparing Truck Volume to Corresponding weight and value trade data (US imports, Pacific Highway)



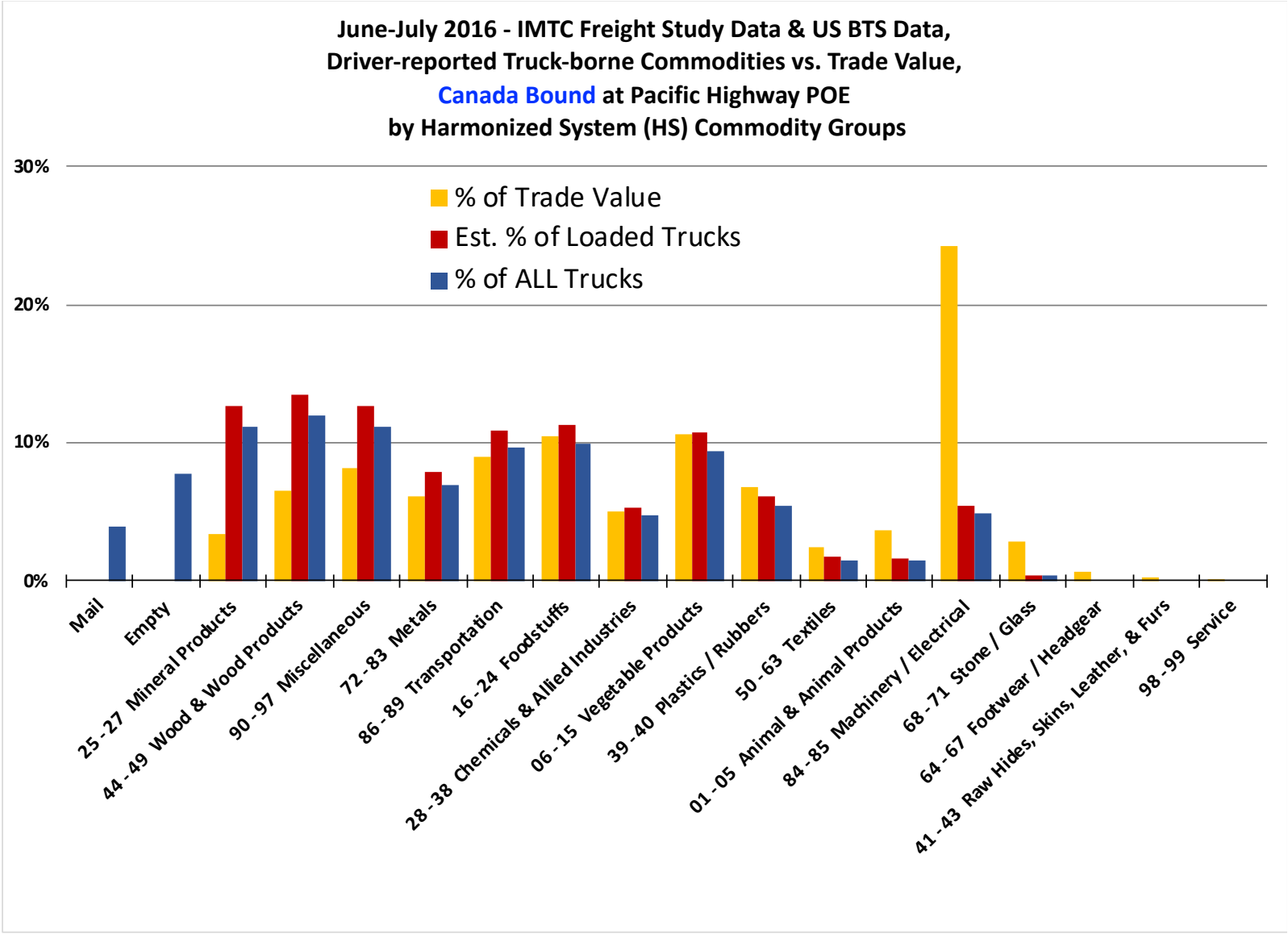
Sources: IMTC 2016 Freight Operations Study. U.S. DOT Bureau of Transportation Statistics – Transborder Freight Data. **Chart** by WCOG.

Vehicle-Value Observations

Charts 11a and 11b illustrate a few key points that are relevant to this assessment of COVID-19 impacts on cross-border freight.

- **Sufficient validation of 2016 commodity data collection:** Truck counts, freight weight, and freight value are each a different measure and it's not surprising that different commodity groups have different relationships between freight value and trucks. But it is important to be able to look at Chart 11 and say that there are no surprises here. E.g., compared to machinery, wood is much bulkier and heavier than it is expensive. Thus, having compiled this multi-measure comparison, the 2016 truck-based commodity data appears representative and can be used with sufficient confidence to inform subsequent discussion in this report of how recent and future shifts in commodity mix would likely affect vehicle demand at POEs and on the regional cross-border freight network in general.

Chart 11b: Comparing Truck Volume to Corresponding weight and value trade data (Canadian Imports, Pacific Highway)



Sources: IMTC 2016 Freight Operations Study. U.S. DOT Bureau of Transportation Statistics – Transborder Freight Data. **Chart** by WCOG.

- Again, while HS Code 98 (Special Classifications Provisions) shows up significantly in value and somewhat less significantly in weight (in the 98-99 HS Group), there is *no* associated truck volume in Chart 11 because HS 98, unlike the other codes, is not a commodity that the truck driver would describe. It's a tariff status. There are indeed trucks associated with HS Code 98, but in this truck-count data series, they are counted in the other commodity groups (creating a currently unknown amount of discrepancy for those categories' truck-value-weight comparisons).
- As will be discussed more later in this report, these charts remind us that, while policy makers and elected officials often describe international trade in monetary terms (e.g., "The trade between our nations totals almost 2 billion dollars a day…"), the assessed value of freight moving on the network is clearly not the best indicator of demand on transportation facilities and operations. In Chart 11a, while the highest-value Canadian export commodity group, machinery/electrical was 15 percent of total trade value, it only took 4 percent of loaded trucks to move that group of commodities. These commodity-specific relationships will be key to forecasting the impact of predicted shifts in commodity flow.
- For the purpose of estimating the correlation between the value of commodities and the corresponding number of trucks required to move those commodities, it is important to remove empty trucks from the population – as in Chart 11. In subsequent stages of facility planning for future system demand, it is important to keep the *total vehicle volume* in mind – inclusive of the empty trucks.

Applying observations to scenario development and forecasts

This section will use the above observations on commodity-group volume/value changes over the past year, current assessments of whether those fluctuations are short term or long term, and then simplified commodity-value-to-truck criterion to offer scenario-based assessment of changes to cross-border truck demand if one or more COVID-19 conditions persist.

Value to truck ratio

Using the percentage distribution of truck counts by commodity from the 2016 IMTC freight survey and applying that to the total truck counts from the corresponding months of the survey (June & July) and corresponding US BTS trade values for the matching commodity groups, the tables below show estimated value to truck ratios (est. trucks per $100,000 USD of the subject commodity group).

Table 3.1: June-July 2016 – Pacific Highway, **Canada to U.S.** Trade Value and Corresponding Estimated Truck Counts – by Est. Trucks per $100,000 of Value (USD) by Commodity Group.

HTS Commodity Group	Jun-Jul 2016 total USD($)	Value %	2016 Survey Trucks	Est Actual Trucks for Jun-Jul	All Truck %	Est. % of Loaded Trucks	Est. Value/Truck	Est. Trucks Per $100,000 by Commodity Group
Mail			31	1,493	2.4%		NA	NA
Empty			383	18,444	29.4%		NA	NA
25 - 27 Mineral Products	$5,296,755	0.5%	50	2,408	3.8%	5.6%	$2,200	45.5
86 - 89 Transportation	$81,800,952	7.7%	148	7,127	11.4%	16.6%	$11,477	8.7
90 - 97 Miscellaneous	$65,514,088	6.2%	109	5,249	8.4%	12.3%	$12,481	8.0
44 - 49 Wood & Wood Products	$156,216,461	14.7%	259	12,473	19.9%	29.1%	$12,525	8.0
39 - 40 Plastics / Rubbers	$46,423,672	4.4%	49	2,360	3.8%	5.5%	$19,673	5.1
28 - 38 Chemicals & Allied Industries	$37,761,940	3.6%	39	1,878	3.0%	4.4%	$20,106	5.0
50 - 63 Textiles	$16,283,015	1.5%	16	771	1.2%	1.8%	$21,133	4.7
16 - 24 Foodstuffs	$90,705,171	8.5%	80	3,853	6.1%	9.0%	$23,544	4.2
72 - 83 Metals	$58,887,319	5.5%	51	2,456	3.9%	5.7%	$23,977	4.2
06 - 15 Vegetable Products	$81,670,197	7.7%	37	1,782	2.8%	4.2%	$45,835	2.2
68 - 71 Stone / Glass	$10,734,224	1.0%	4	193	0.3%	0.4%	$55,725	1.8
84 - 85 Machinery / Electrical	$157,607,472	14.8%	38	1,830	2.9%	4.3%	$86,125	1.2
01 - 05 Animal & Animal Products	$121,533,510	11.4%	9	433	0.7%	1.0%	$280,408	0.4
98 - 99 Service	$132,135,517	12.4%						
41 - 43 Raw Hides, Skins, Leather, & Furs	$586,911	0.1%						
64 - 67 Footwear / Headgear	$297,153	0.0%						
	$1,063,454,357		1,303	62,749	100%	100%		

Table 3.1 Observations

- The high and low ends of the range portrayed in Table 3.1 (mineral products, animal products) seem exaggerated (high and low). If these are indeed meaningfully inaccurate estimates, it could be that:
  - A greater than actual number of trucks were recorded by survey workers as *loaded* with mineral products than was the case.
  - Trucks carrying Animal and Animal Products were somehow undercounted by survey workers (e.g. – do trucks carrying animals travel more at night?)
- The remainder of the range falls nicely into a "high, medium, low" correspondence between value of commodities in a group and the expected number of trucks needed to carry that dollar-value amount. Because that subgroup of vehicle imports are themselves counted as trucks – data

that provided more direct information about the commodity associated with the vehicles (unlike HST Code 98) would enable a meaningful refinement of this value-to-truck estimation.

- To continue a theme of this report, HST Code 98 (mostly composed of Special Classifications Provisions) is highlighted. We know that most of this value is made up of used U.S.-manufactured cars – a high percentage of which are driven through the port of entry under their own power.

Table 3.2: June-July 2016 – Pacific Highway, **U.S. to Canada** Trade Value and Corresponding Estimated Truck Counts – by Est. Trucks per $100,000 of Value (USD) by Commodity Group.

HTS Commodity Group	Jun-Jul 2016 total USD($)	Value %	2016 Survey Trucks	Est Actual Trucks for Jun-Jul	All Truck %	Est. % of Loaded Trucks	Est. Value/Truck	Est. Trucks Per $100,000 by Commodity Group
Mail			49	2,654	3.9%		NA	
Empty			96	5,200	7.7%		NA	
25 - 27 Mineral Products	$55,134,718	3.3%	138	7,476	11.1%	12.6%	$7,375	13.6
44 - 49 Wood & Wood Products	$108,418,838	6.6%	148	8,017	11.9%	13.5%	$13,523	7.4
90 - 97 Miscellaneous	$134,477,196	8.1%	139	7,530	11.2%	12.7%	$17,859	5.6
72 - 83 Metals	$101,456,198	6.1%	86	4,659	6.9%	7.8%	$21,778	4.6
86 - 89 Transportation	$148,995,821	9.0%	119	6,446	9.6%	10.9%	$23,113	4.3
16 - 24 Foodstuffs	$173,441,727	10.5%	123	6,663	9.9%	11.2%	$26,030	3.8
28 - 38 Chemicals & Allied Industries	$82,569,223	5.0%	58	3,142	4.7%	5.3%	$26,280	3.8
06 - 15 Vegetable Products	$175,183,847	10.6%	117	6,338	9.4%	10.7%	$27,640	3.6
39 - 40 Plastics / Rubbers	$113,142,647	6.8%	67	3,629	5.4%	6.1%	$31,173	3.2
50 - 63 Textiles	$39,834,331	2.4%	19	1,029	1.5%	1.7%	$38,702	2.6
01 - 05 Animal & Animal Products	$59,816,182	3.6%	18	975	1.5%	1.6%	$61,344	1.6
84 - 85 Machinery / Electrical	$400,455,368	24.2%	60	3,250	4.8%	5.5%	$123,206	0.8
68 - 71 Stone / Glass	$46,063,110	2.8%	4	217	0.3%	0.4%	$212,579	0.5
64 - 67 Footwear / Headgear	$10,373,042	0.6%						
41 - 43 Raw Hides, Skins, Leather, & Furs	$4,885,551	0.3%						
98 - 99 Service	$395,647	0.0%						
	$1,654,643,446		1,241	67,227	100%	100%		

Table 3.2 Observations

- Aside from mineral products, estimated in the U.S.-to-Canada direction at 13.6 trucks per $100,000 of commodity (most likely jet fuel), the progression down the list of from high estimated trucks-to-value is more discrete, group by group, than in the Canada-to-U.S. direction in this region.

Scenario based evaluation COVID-19 impacts

This discussion will focus on commodity groups that the data suggest were affected by COVID-19 circumstances, propose conceivable trajectories for those commodities over the next year or two, and consider the identified value-to-truck estimates to anticipate likely results for cross-border truck demand and operations.

The recent state of Cascade Gateway trade flow relative to the three comparable quarters of 2019 is best illustrated by tables 2.1, 2.2, 2.3, and 2.4. And, as discussed, the notable shifts have been both positive and negative across the most affected industries.

Impact 1: *Large declines in aircraft & parts, mineral fuels (jet fuel), machinery, and electrical machinery.*

Likely relation to COVID: Widespread suspension of air travel and resulting plunge in demand for fuel, aircraft industry maintenance, etc.

Probability of a sustained trend: Could take longer to return to pre-covid level of activity than other domestic travel related industries due to lingering caution around international travel.

Impact on cross-border truck volume: As seen in the above value-to-truck tables, the impact on freight-vehicle trip volume across the border could be mixed. Parts and machinery related to this industry would not impact vehicle volume very much. A sustained relative absence or resurgence in shipments of jet fuel would be expected to generate significant corresponding tanker-truck traffic.

Impact 2: *Strong YoY performance and growth by vehicles and wood product exports to the U.S. in the 4th quarter of 2020.*

Likely relation to COVID: After initial declines in the second quarter of 2020, the observed large increases align with widespread reports of COVID-19 related home improvement projects, furniture for remote work & school, outdoor eating and socializing facilities, etc. Spikes in used cars sales have been attributed to commuters seeking affordable alternatives to public bus and subway systems.

Probability of a sustained trend: As COVID-19 effects, there would seem to be a logical conclusion as these purchases are made and used. Continued strength in these industries (especially building supplies) could continue as a function of expected government spending on COVID-relief as well as overall public investment in infrastructure.

Impact on cross-border truck volume: Building supplies (e.g., wood & wood products) have a high truck-to-commodity value ratio (between 7 to 8 trucks per $100,000 USD). Continued strength and/or growth would likely result in corresponding truck volume growth.

Impact 3: *Strong 2020 performance of U.S. exports of food and beverage commodities.*

Likely relation to COVID: While not as clearly attributable to COVID as other commodity-based observations, the strong 3rd and 4th quarter YoY growth of these exports aligns well with declines in eating out at restaurants (increased consumption of staple foods) as well as reports of corresponding spikes in kitchen appliance purchases and alcohol consumption.

Probability of a sustained trend: Since these COVID-19 market responses are happening for the most part in a domestic context, successful public-health and vaccination efforts should temper heightened demand for these goods.

Impact on cross-border truck volume: These commodities show a "medium" value to truck ratio (e.g. foodstuffs 3 to 4 trucks per $100,000 USD).

Related issues and next steps

Goods move in passenger vehicles, too

While not analyzed in detail here (not that the data to do so is easily obtainable), cross-border shopping is a very large segment of passenger vehicle trip purposes and constitutes a regionally significant form of cross-border movement of goods with the related importance to retail and hospitality sectors. This has all but disappeared with COVID-19 cross-border travel restrictions.

Cross-border passenger bus and passenger rail travel

Scheduled bus services (e.g., Bolt Bus, Quick Shuttle, Greyhound) as well as Amtrak Cascades passenger rail service have all been suspended with cross-border travel restrictions. The business future of passenger bus companies is uncertain. This is important in the medium term because improvements to passenger-bus processing facilities are very much part of Canada Border Services Agency's redevelopment plans for Pacific Highway.

Opportunities to improve data collection

Looking deeper into the questions posed by observable COVID-19 impacts has underscored some important points about border data availability and use. In general, border crossings are relatively rich with data. But some observations and opportunities for improvement are worth pointing out.

- There are several commodity classification systems used across agencies concerned with trade flow and transportation (HS, HST, SCTG, NAICS, etc.) and different reporting levels used within these regimes. Pulling from multiple sources over time can quickly present challenges to consistent interpretation and development of multi-variate metrics. This reality should be considered when designing data-collection efforts in order to optimize the ability to relate raw data to existing regimes or at least to the preferred commodity classification system.
- The lack of shipment weight data for goods entering Canada is an opportunity to complement U.S. shipment weight data.
- It would be interesting to evaluate the transactions that trade data is extracted from and assess the ways in which commodity information could be improved. For example, could commodity information be preserved despite an import being coded under HST 98?

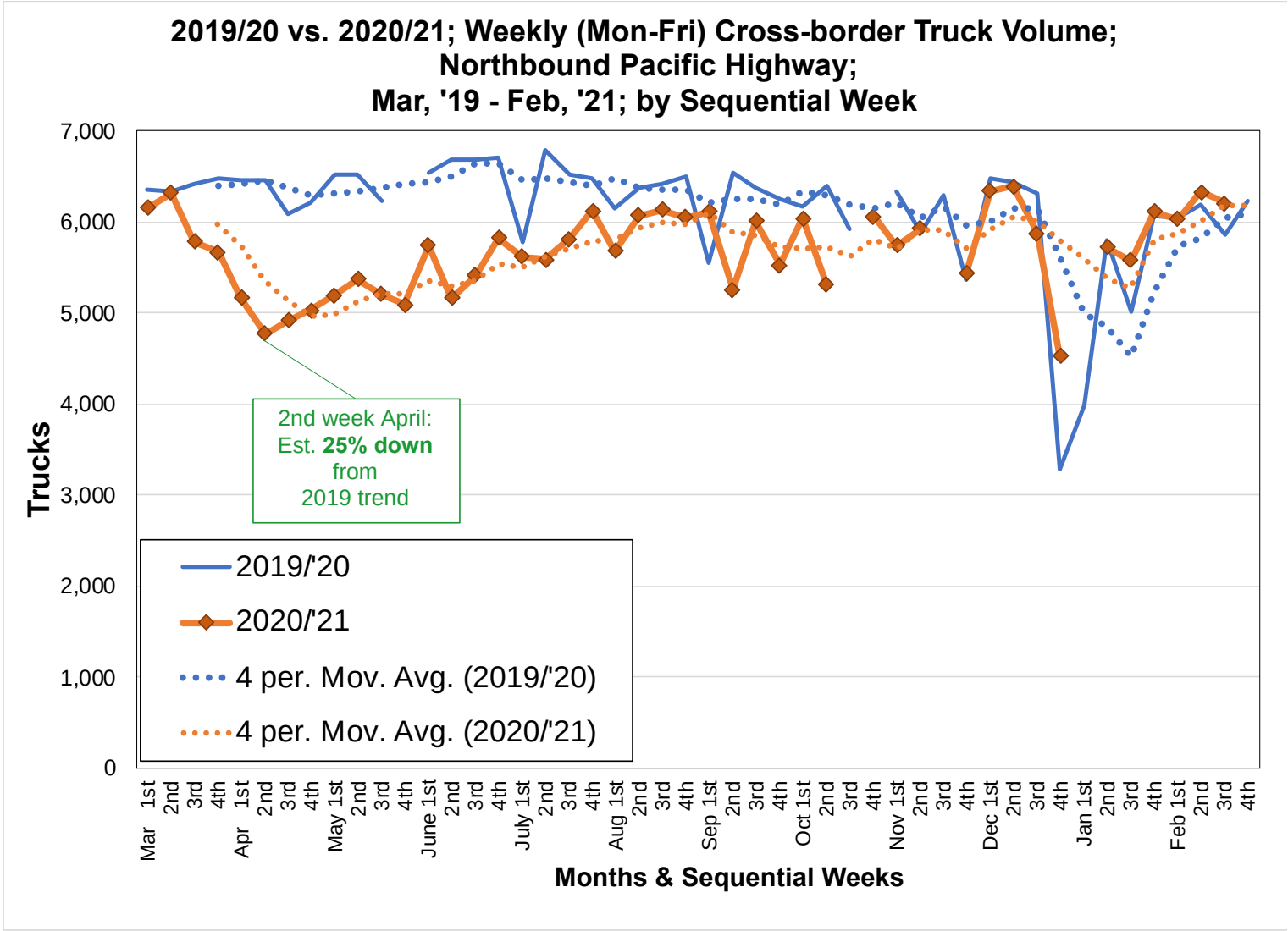
Some next steps

This analysis project point to the benefit of conducting related efforts in the near future.

- Present and discuss the findings from this work with IMTC participants – especially those planning commercial facility modifications.
- A five-year refresh of IMTC's cross-border freight study in 2022.
- A study of cross-border mail and parcel pickup and what COVID-19 and online shopping trends have done to that trip purpose and industry.
- Reestablishment of communication and understanding of how the border-brokerage industry has changed over the last 20 years.

One Year of Cascade Gateway Truck Volume

To check back on the earliest measures of COVID-19 impacts that started this discussion, the chart below shows the remainder of the year-over-year Pacific Highway truck volume comparisons.



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