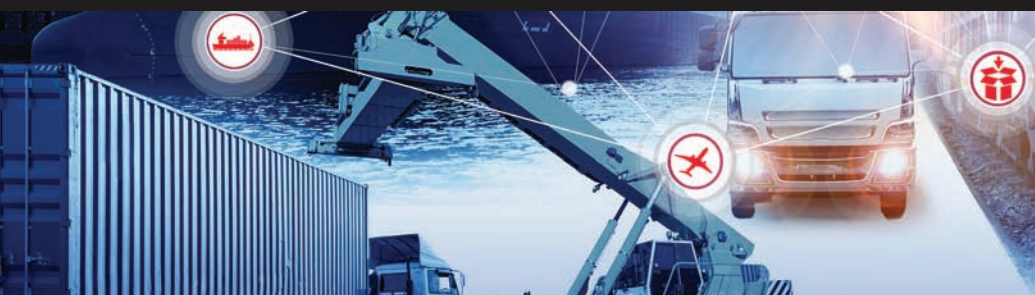


May 2021

Appendix C

Tech Memo #2:

Regional Freight Flow Analysis



Buffalo-Niagara

Regional Freight Plan

Summary

It is expected that the Buffalo-Niagara region's economy will grow by approximately 30% over the 25-year horizon period. As the region grows, it will see an increased demand for goods amounting to over 33 million additional tons of goods being hauled by a mix of modes. These 33 million tons represent an expansion of freight tonnage of approximately 47% over the period of (2018 – 2045), which equates to freight activity growing at a rate of approximately 1.7% per year. The growth of freight activity is higher than the national average, but slower than average New York growth over the same period. This growth in demand for freight is largely being driven by an expansion of wholesale/retail distribution, and manufacturing activities – slated to contribute over \$10 billion to the regional economy in 2045 (constant 2018 dollars).

Regarding the commodities driving this demand, we see goods such as chemical products, pharmaceuticals, and mixed freight as the top growing inbound commodities by value, whereas growth in outbound goods is seen in goods such as pharmaceuticals, machinery, and base metal products being manufactured and sent elsewhere. On a tonnage basis, we see a strong presence and growth in coal, agriculture, waste/ scrap, and base metal products both as inputs to production, as well as finished goods being shipped elsewhere. Increased production related to agriculture is primarily associated with sustained growth in domestic markets, while you have goods such as waste/scrap being meant for international audiences.

Due to Buffalo-Niagara's location, it should come as no surprise that Canada continues to grow as a prominent trade partner with the region. It is expected that the production of goods will shift towards international markets: up from 5.8% of exports in 2018 to approximately 17.6% in 2045. While the Buffalo-Niagara region relies on its gateways to Canada, the overwhelming geography of users of border crossings/ ports within the region are external to Buffalo: with 71% of international border crossing/ port volumes in 2018 being from other states. The volume of trade occurring at the region's border crossings/ ports is expected to more than triple across all modes in the 27-year period (2018 – 2045). When we look at the modes responsible for driving this trend in percentage terms, Rail and Pipeline activity stick out as showing higher percentage growths relative to volume average. These modes emphasize the movement of lots of bulk Coal, Petroleum, and mineral productions and speak to a future of increased trade with Canada.

Trade between the Buffalo-Niagara region and the ports associated with the PANYNJ are expected to increase by approximately 1.6 million tons. The 2045 FAF freight forecasts indicate decreasing highway tonnage on routes between the Buffalo-Niagara region and the New York City area, noting that freight will become increasingly served by rail connections rather than traditional truck traffic. This is likely due to an emphasis at PANYNJ to decrease dependence on truck traffic and utilize rail and inland ports to a greater extent. This likely requires additional capacity at Buffalo-Niagara region rail ports, transloading docks, and intermodal facilities. Buffalo-Niagara's freight traffic with the other ports along the northern New York border is expected to grow by 669,000 tons through 2045. According to FAF freight forecasts, this freight will predominantly be served by truck. As for the Buffalo-Niagara region's utilization of in-region ports, import and export tonnage handled is expected to increase by almost 4.6 million tons –

which represents approximately 4% of all tonnage going through the region's ports of entries, with truck traffic expected to grow almost 50%. This signals an increase in truck traffic expected for the Peace Bridge and Lewiston-Queenston bridge.

Due to the COVID-19 pandemic, there is a large amount of concern about potential longer-term economic implications of the global shutdown and restructuring of supply chains. Sustained closure on the one hand has gutted small businesses and severely hurt the economic performance of the country (at least on a short-term basis) as we continue to languish from the lasting effects of the virus. On the other hand, it has forced awareness concerning the need for diversified supply chains, and further made a case for re-shoring and near-shoring activity to support more diversified, closer distribution networks. Because of this uncertainty, we have included an analysis of FHWA's Freight Analysis Framework alternate forecast data, to look at how its modeled pessimistic growth scenario created a range in possible freight behaviors as a proxy way of trying to understand how economic shocks can alter the pattern of freight outcomes. On average, the alternate economic scenario reduced the volume of freight by approximately 10% on average, relative to the base.

This report emphasizes the evolving economy and its impact on demand for freight. In addition, we look at the usage of the ports and border crossings by other states, and the corresponding implication for growth in volume of goods traveling on the highway network over the interim 25-year period. To achieve this work, a special version of the FAF database was recreated, which merged the highway routing features of Transearch from an older available version, with the county level freight detail allowing the Buffalo-Niagara region to be split from the FAF defined Buffalo-Niagara-Cattaraugus, NY Combined Statistical Area.

- Section 1 discusses the methodology of analysis, as well as use and interpretation of data used in this report.
- Section 2 acknowledges the uncertainty being injected into the freight plan by the recent shocks, and puts forth a potential way of identifying the range of outcomes, to be built upon in Section 8
- Section 3 discusses the general growth in the regional freight economy.
- Section 4 goes into greater detail regarding the inbound and outbound freight markets.
- Section 5 provides a more in-depth assessment of goods moved on the highway system.
- Section 6 takes a look at users of international crossings and ports-of-entry that aren't inbound to or outbound from the Buffalo-Niagara region, but are passing through the region using one of the crossings or ports.
- Section 7 uses available highway data to identify potential bottlenecks.
- Section 8 compares the range of outcomes between differing freight forecasts as a proxy for understanding volatility of regional freight behavior.
- The Appendix provides further detail on data methodology and analysis.

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1 Freight Definitions and Data

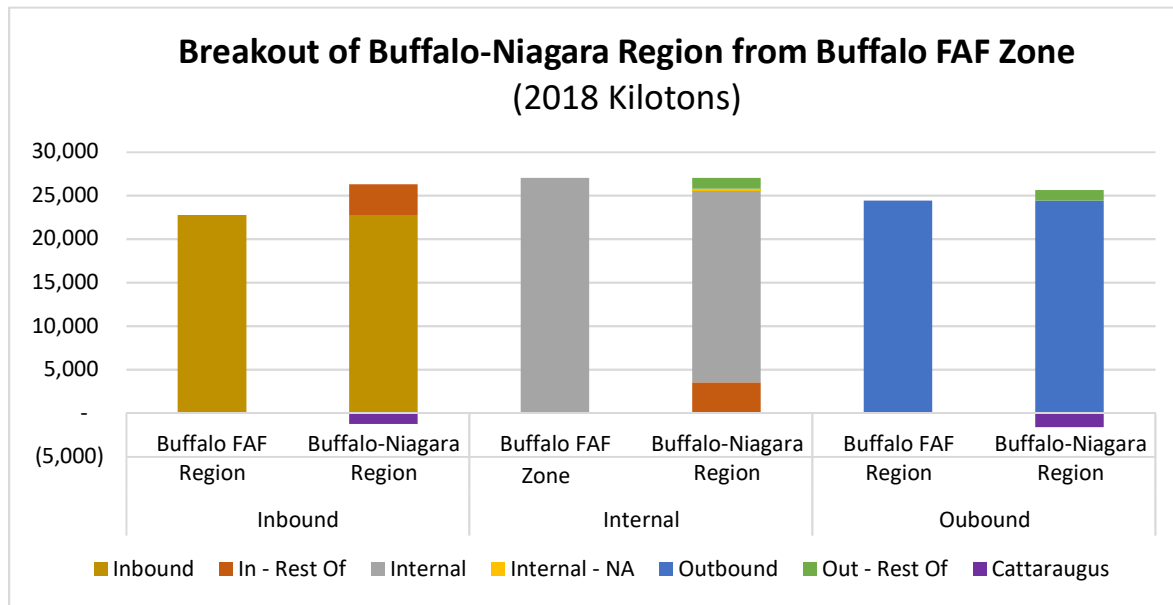
Before delving into the evolving freight patterns of the region, it is important to address key considerations involving the use and interpretation of the data in this report. The following data and forecasts are based on the most recent version of Federal Highway Administration's (FHWA) Freight Analysis Framework data (FAF) (version 4.5.1 – 2020 release, 2018 data year). FAF is a publicly available database that is “produced through a partnership between Bureau of Transportation Statistics (BTS) and FHWA, integrating data from a variety of sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation”¹. As such, there are several adjustments that must be done to the data to better describe the evolving pattern of freight activity taking place within the Buffalo-Niagara region. The Buffalo MSA FAF Zone is made up of the GBNRTC planning area (both Erie and Niagara Counties) as well as Cattaraugus County. Therefore, in order to focus only on the GBNRTC planning area specific freight, an adjustment had to be made to the data to split out Cattaraugus County from the Buffalo FAF zone. The GBNRTC planning area specific focus is hereby discussed as the Buffalo-Niagara region, and the larger Buffalo-Niagara-Cattaraugus MSA FAF area known as the Buffalo FAF zone.

To estimate the Buffalo-Niagara regional freight volumes from the broader FAF zone, economic data from Moody's² was used. This economic data describes the current and future magnitude of detailed industry activity by county, combined with an economic model describing the production functions of those industries to back into an estimate of how much of the freight was being produced and consumed by each county that comprised the Buffalo FAF zone. This allowed us to effectively peel off the portion of activity that occurred outside of the Buffalo-Niagara region. The following graph shows the pre- and post-adjustment by direction of flow (in relation to the Buffalo FAF zone).

¹ <https://www.bts.gov/faf>

² Moody's Economy is a subscription service that provides county – industry forecasts of employment, wages, and GDP.

Figure 1-1 Adjustment Process of FAF Flows



Note that the following definitions are functionally used to describe the flow of freight goods in moving in relation to the Buffalo-Niagara region.

- Inbound Flows:** Flows where the point of origination resides outside of the region, and the terminating point lies within the region. This type of flow represents trade of intermediate inputs to production – being sourced from external domestic markets or imported in from other countries.
- Outbound Flows:** Flows where the point of origination resides within the region, and the terminating point lies outside of the region. This type of flow represents the trade of region-produced goods with external markets: either of a domestic or international (export relation).
- Internal Flows:** Represent movements of goods where both the origin and destination lie within the same region. Movements between Erie and Niagara Counties are counted as ‘internal’ moves. It is important to note that the definitions are based on ultimate origin, and ultimate destination. To this end, an imported good that enters the country at one of the international ports of entry and is then transported to its final destination in Erie County is considered an Inbound good – despite the fact the domestic origin and destination are within the Buffalo-Niagara region. On the opposite side of the equation, goods imported from Canada via one of the international ports of entry, destined for say Connecticut, are considered through flows – they are not associated with the regional economy and represent goods ultimately passing through the region. These through flows do however impose wear and tear on the region’s transportation system.

In the process of adjusting FAF data to match the Buffalo-Niagara region boundaries, redefinition of directional freight flows was done to remain consistent with the above definitions. For example, in Figure 1-1, flows that were once internal moves between Cattaraugus County and Niagara County in the

FAF are reclassified as goods inbound to the Buffalo-Niagara region from external Cattaraugus County. When it comes to the source of the forecasts used to talk about growth in demand for freight services, we were consistent in our use of FAF sources. FAF also provides a base economic forecast which is derived from a regionalized global macro model that looks at issues including competitiveness, growth potential, and potential limiting factors of economic development – in addition to the regional growth in industry demand and known increases to capacity³. In addition to the base forecast, FAF produces higher and lower growth scenarios which model gross swings in either direction as it relates to economy, policy, and global trade. Given the turbulent nature of the times, the team made use of the alternate forecast as a way of addressing the variability in the future of the region's freight demand so that in addition to providing the base forecast, we can look at how sustained economic damage from the pandemic might impact regional growth.

³ <https://ops.fhwa.dot.gov/publications/fhwahop16043/index.htm#keyassumptions>

2 Current Events and the COVID Epidemic

The period in which this freight plan was developed was unfortunately interrupted by a global pandemic which has served to, at least temporarily, alter the way that people and businesses operate in their day to day activities. Forced temporary closures of businesses and a quarantining of the population have put financial pressures on smaller businesses, while those that are more able to adapt and have their workers pivot to telecommuting continue to operate where possible. Vulnerability of trade and shortages have caused industries to rethink about how diversified their supply chains are, while the shift towards telecommuting and quarantined households has caused a surge in demand for ecommerce services. Because of all these factors, it is not yet clear what the lasting impact of this outbreak will be.

When we look at the future regional demand for freight, we are doing so with the intent of planning for growth and to target needed infrastructure. The challenge, given the times, becomes how to estimate future demand when suffering through a major disruption in trade and economic activity that has not run its full course. There is an asymmetry of consequences in the planning world when it comes to investing in infrastructure. Planners and agencies must balance extremes between the risk of over investing in a region versus not investing enough in the necessary capacity in such events.

It is for this reason the forecasted levels we put forth are based on pre-covid forecasts of freight activity, to look at the direction of where the economy was heading. To help put these expectations in a broader context and look at the possible range of behaviors, we also re-evaluate those forecasts against a scenario of sustained low economic growth as a way of estimating how much variance there is in the forecasts. To do this, we make use of the FAF data to take advantage of their available forecasts of freight activity. This gives us a reasonable assessment of a 'confidence interval' around the data to build some certainty into the numbers in such uncertain times. The impact of this analysis was that the forecasted numbers had the potential to vary by about 10% - but the trends occurring in this memo were preserved.

3 Growth in Regional Freight Activity

Based on the preceding adjustments, the FAF zone encompassing the Buffalo-Niagara region can make use of the FAF data and its forecasts to look at the growth in demand for freight in the region over the next 25-year period. FAF makes use of a macro-economic forecast that takes information about domestic and international trends and applies them to economic models that examine the production function of regional industries. If freight activity is the physical manifestation of inter-industry transactions, then the economic models represent the supply and demand for goods to be physically executed via freight transportation. The following graphic depicts the change in freight tonnages moving in, out, and within the Buffalo-Niagara region. Proportionally we see that the volume of freight demanded will expand by nearly 47% – with a slight decrease in the share of internal freight flows signifying a broader integration with domestic and foreign markets both as a producer and consumer.

Figure 3-1 Growth in Regional Tonnage

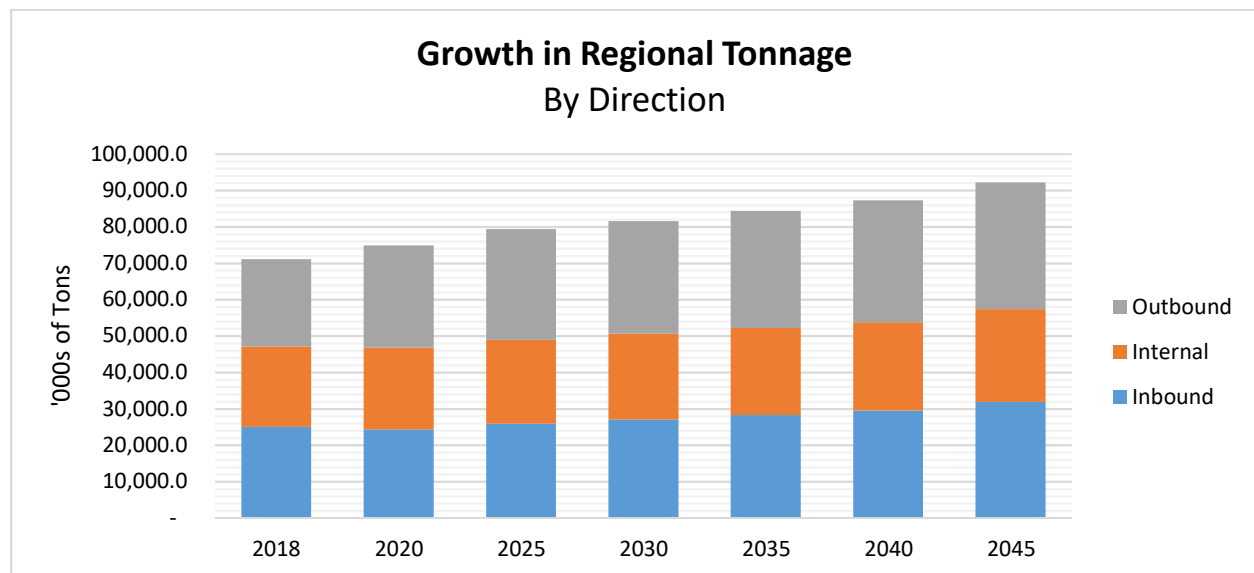


Table 3-1 on the following page portrays the change in freight tonnage and value of goods between 2018 and 2045 for inbound, internal, and outbound freight. In summary, between 2018 and 2045, the overall tonnage of goods either inbound, outbound, or within (internal) the region is expected to grow by 46.57%, with the value of the goods expected to increase by 72.15%. A further breakdown shows that with the exception of “other and unknown”, rail is expected to see the greatest percent increase (nearly 150%) in total tonnage handled (inbound, internal, and outbound) with truck expected to see the greatest volume increase (24,377,000 tons) in total tonnage handled (inbound, internal, and outbound). Air is the only mode expected to experience a decrease.

We can also see that despite the trending growth in tonnage, the value of goods being shipped is growing at a faster rate than the associated volumes. Again, with the exception of “other and unknown”, rail is expected to see the greatest percent increase (nearly 177%) in total value of goods handled (inbound, internal, and outbound) with truck expected to see the greatest overall value increase (\$56,566,000,000) in total value of goods handled (inbound, internal, and outbound). Like tonnage, air is the only mode expected to experience a decrease in the value of goods handled.

Note that the value of goods shipped being reported in this report is a price updated, constant 2018 dollars. This is because FAF reports the current value as well as constant 2012 dollars – and we did not want to mistake the inflationary effects of time on growth trends in the value of goods being shipped.

Table 3-1 Growth in Volume and Value

Volume of Goods Shipped ('000s of Tons)				
Domestic Mode	2018 Inbound	2045 Inbound	Numerical Change in Volume	% Change in Volume
Truck	17,483	25,342	7,859	44.95%
Rail	844	1,628	784	92.89%
Water	52	78	26	50%
Air (include truck-air)	25	15	-10	-40%
Multiple modes & mail	1,149	1,643	494	42.99%
Pipeline	5,493	7,464	1,971	35.88%
Other and unknown	1	11	10	1,000%
Total	25,047	36,181	11,134	44.45%

Volume of Goods Shipped ('000s of Tons)				
Domestic Mode	2018 Internal	2045 Internal	Numerical Change in Volume	% Change in Volume
Truck	21,907	28,661	6,754	30.83%
Rail	26	33	7	26.92%
Water	0	0	0	-
Air (include truck-air)	0	0	0	-
Multiple modes & mail	110	111	1	0.91%
Pipeline	0	0	0	-
Other and unknown	0	0	0	-
Total	22,043	28,805	6,762	30.68%

Volume of Goods Shipped ('000s of Tons)				
Domestic Mode	2018 Outbound	2045 Outbound	Numerical Change in Volume	% Change in Volume
Truck	17,862	27,626	9,764	54.66%
Rail	719	2,311	1,592	221.42%
Water	2	4	2	100%
Air (include truck-air)	18	14	-4	-22.22%
Multiple modes & mail	612	626	14	2.29%

Pipeline	4,707	8,641	3,934	83.58%
Other and unknown	94	11	-83	-88.30%
Total	24,014	39,233	15,219	63.38%

Volume of Goods Shipped ('000s of Tons)				
Domestic Mode	2018 Total	2045 Total	Numerical Change in Volume	% Change in Volume
Truck	57,252	81,629	24,377	42.58%
Rail	1,589	3,972	2,383	149.97%
Water	54	82	28	51.85%
Air (include truck-air)	43	29	-14	-32.56%
Multiple modes & mail	1,871	2,380	509	27.20%
Pipeline	10,200	16,105	5,905	57.89%
Other and unknown	95	22	-73	-76.84%
Total	71,104	104,219	33,115	46.57%

Value of Goods Shipped (Constant 2018 \$M)				
Domestic Mode	2018 Inbound	2045 Inbound	Numerical Change in Volume	% Change in Volume
Truck	29,320	58,166	28,846	98.38%
Rail	717	1,922	1,205	168.06%
Water	120	241	121	100.83%
Air (include truck-air)	4,039	1,077	-2,962	-73.33%
Multiple modes & mail	8,082	17,223	9,141	113.10%
Pipeline	1,517	2,064	547	36.06%
Other and unknown	75	289	214	285.33%
Total	43,870	80,982	37,112	84.60%

Value of Goods Shipped (Constant 2018 \$M)				
Domestic Mode	2018 Internal	2045 Internal	Numerical Change in Volume	% Change in Volume
Truck	15,276	23,802	8,526	55.81%
Rail	11	13	2	18.18%
Water	0	0	0	-
Air (include truck-air)	0	0	0	-
Multiple modes & mail	3,460	9,969	6,509	188.12%
Pipeline	0	0	0	-
Other and unknown	0	0	0	-
Total	18,747	33,784	15,037	80.21%

Value of Goods Shipped (Constant 2018 \$M)				
Domestic Mode	2018 Outbound	2045 Outbound	Numerical Change in Volume	% Change in Volume
Truck	31,622	50,816	19,194	60.70%

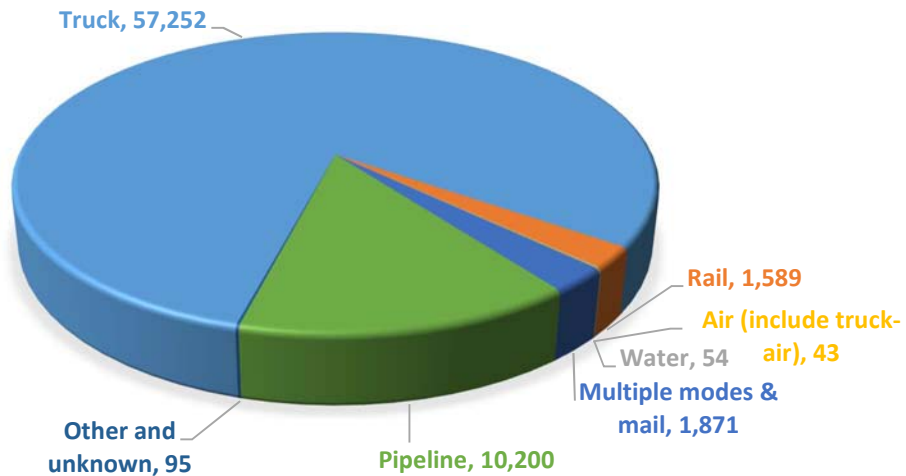
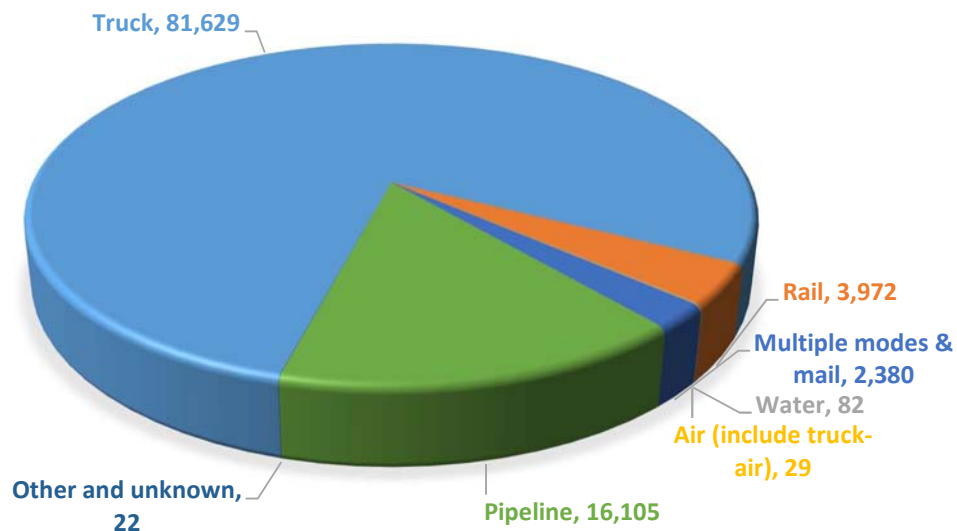
Rail	1,606	4,532	2,926	182.19%
Water	5	51	46	920%
Air (include truck-air)	4,823	1,783	-3,040	-63.03%
Multiple modes & mail	8,000	14,765	6,765	84.56%
Pipeline	1,517	3,371	1,854	122.21%
Other and unknown	334	184	-150	-44.91%
Total	47,907	75,502	27,595	57.60%

Value of Goods Shipped (Constant 2018 \$M)				
Domestic Mode	2018 Total	2045 Total	Numerical Change in Volume	% Change in Volume
Truck	76,218	132,784	56,566	74.22%
Rail	2,334	6,467	4,133	177.08%
Water	125	292	167	133.60%
Air (include truck-air)	8,862	2,860	-6,002	-67.73%
Multiple modes & mail	19,542	41,957	22,415	114.70%
Pipeline	3,034	5,435	2,401	79.14%
Other and unknown	409	473	64	15.65%
Total	110,524	190,268	79,744	72.15%

Figure 3-2 on the following page conveys the growth in tonnage handled. Truck continues to be a dominant mode of transportation, though it is expected to decrease in its overall share of tonnage transported – offset by growth in the rail and pipeline transportation sectors. In terms of the exact magnitude, it is expected to decrease from approximately 80% of tonnage handled in 2018, down to 78% by 2045. This slight rebalancing in mode preference is taking place with the backdrop of continuous growth in demand for all ground transportation services across the board. Note that this applies to the domestic mode of conveyance used to move goods to and from locations within the Buffalo-Niagara region.

There is a slight decrease in the tonnage of air freight expected to be handled by the region, and a disproportionately greater decrease in the value of goods handled by the region. The nature of the goods movement relative to the region (domestic versus international trade related) will be expanded upon in a later section.

Figure 3-2 Mode Share of Freight Traffic: Buffalo-Niagara Region

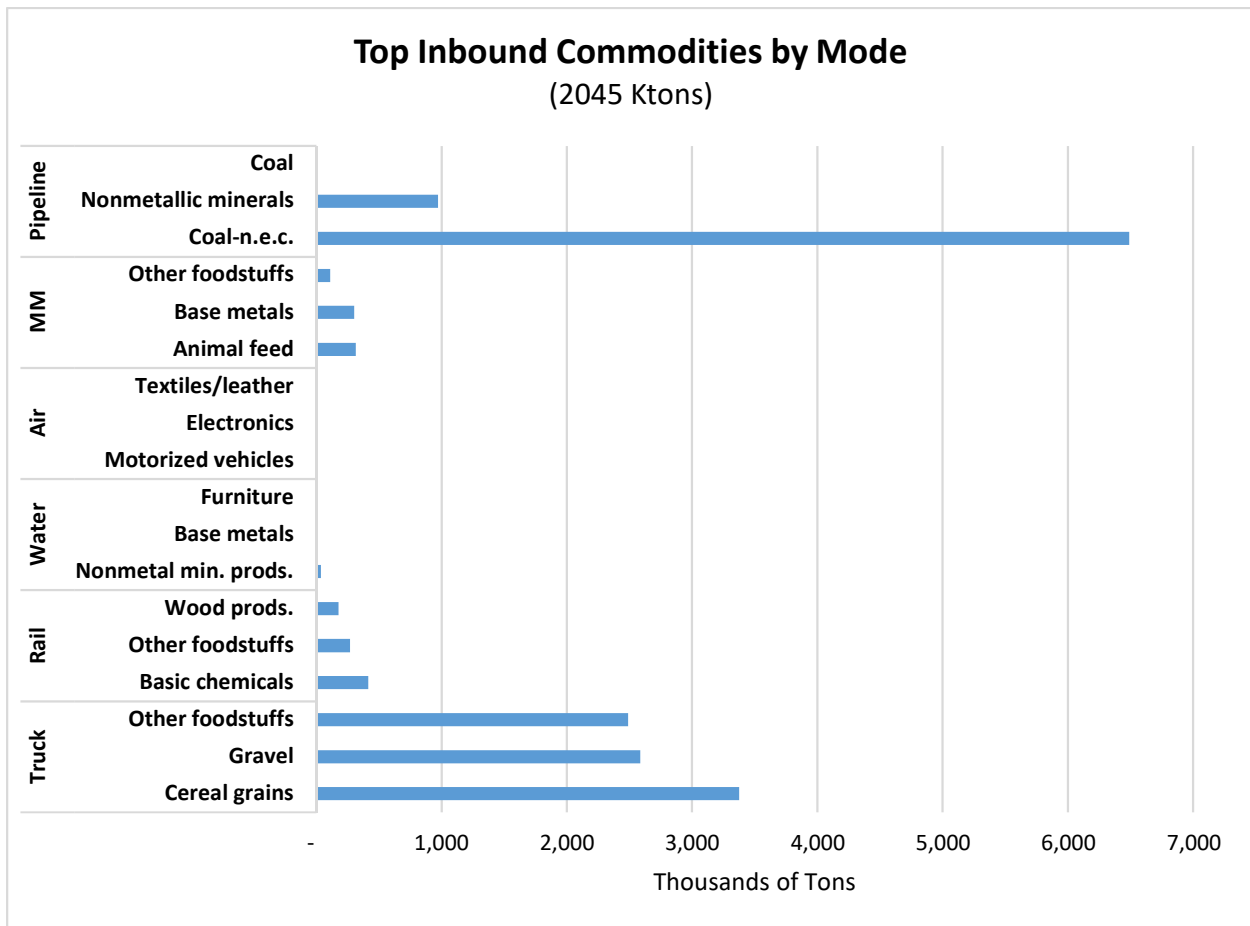
**2018 COMPARISON OF MODE SHARE: BUFFALO-NIAGARA
REGION (000'S OF TONS)****2045 COMPARISON OF MODE SHARE: BUFFALO-NIAGARA
REGION (000'S OF TONS)**

Note that focus is placed on tonnage to help frame planning for future freight needs. That in no way minimizes the importance of lower volume, higher value modes – each has a role to play within the economy, and specializes in bridging connections to different markets, or cost efficiencies in handling

certain types of goods. As an example, the volume of air cargo with its origin or destination in the Buffalo-Niagara region is seemingly small in volume when compared to the amount of cargo on rail. However, when we look at the implied value per ton, we can see that the ratios tell us more about the role of specific modes in satisfying freight needs for the region. For example, Figure 3-3 enumerates the top three commodities on board each mode of transportation. We can see a logical pattern in the types of goods handled:

- Water cargo being more bulk, time insensitive cargo;
- Air cargo being higher value per weight, sensitive goods; and,
- Pipeline being liquid bulk coal and byproducts related goods movement.

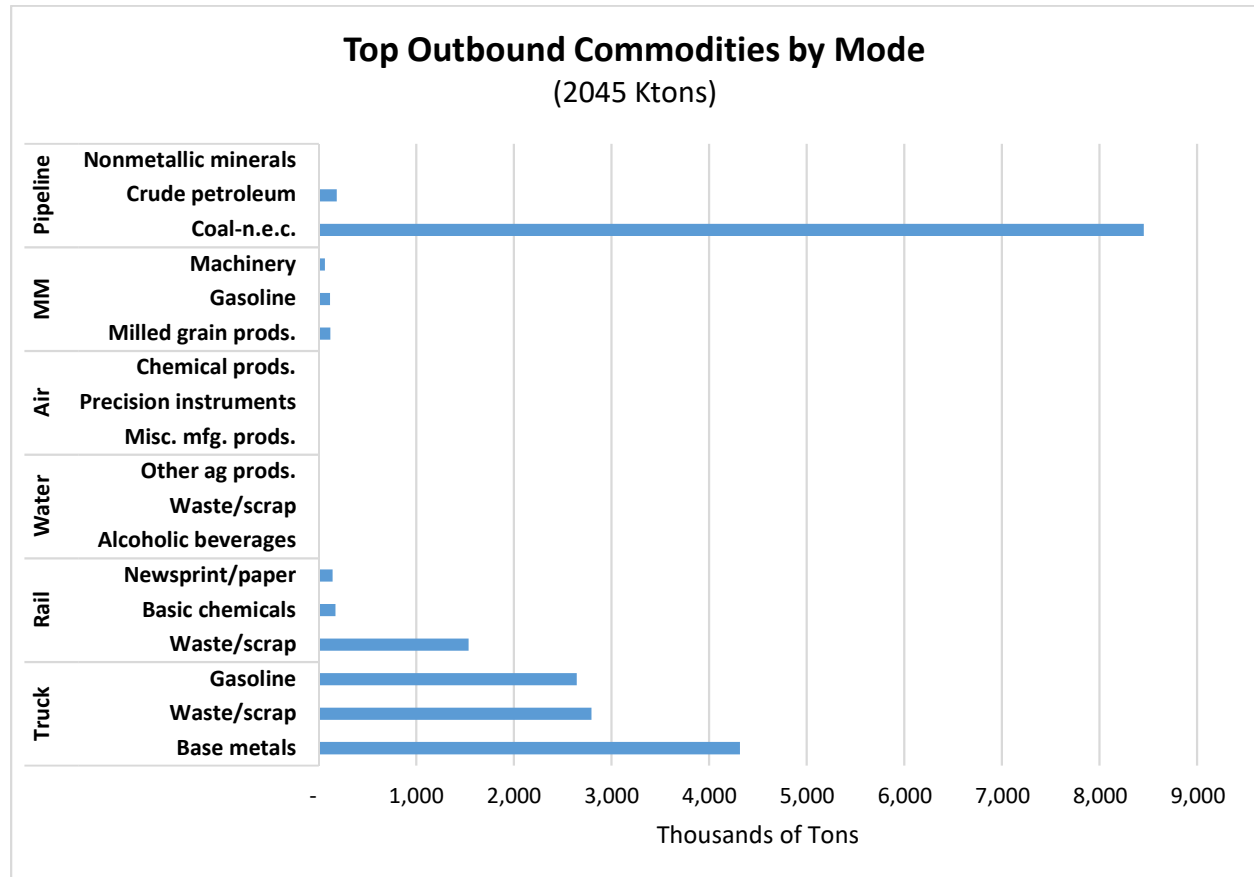
Figure 3-3 Top Inbound Commodities by Mode



Comparatively, we can note the differences between goods on board vehicles coming into the Buffalo-Niagara region as opposed to the mix of goods onboard modes leaving the region, shown in Figure 3-4 on the following page. This differentiation in mix of commodities by direction of movement represents the regional economy and its external supply chains. Whereas the average mix of goods coming into the region represented raw and intermediate inputs for industry production, the goods leaving the region are of a more finished state. Explicitly, we see modes servicing supply chains, with goods such as grains and gravel being trucked into the

Buffalo-Niagara region, while more processed goods such as scrap materials, gasoline, and metallic mineral products are then being trucked out of region. Much of this value-added chain is about processing raw materials and turning them into more final form products – often referred to as primary and secondary manufacturing. One thing that was noticed during the analysis is the extremely high growth in regional commodity inbound and outbound activity for the Coal-N.E.C. commodity. This commodity typically includes industrial oils, propane, petroleum coke, LNG, and other coal products. Based on the magnitude of change, relative to industry activity, it is believed that much of these pipeline flows are administratively marked as inbound and outbound because they are temporarily stored or handled within facilities in buffalo, but their ultimate destinations are likely elsewhere: making them more pass through in volume.

Figure 3-4 Top Outbound Commodities by Mode



3.1 REGIONAL GROWTH BENCHMARKING

Given the projected growth shown in the earlier section, it is important to put the change in freight volumes into proper context by looking at Buffalo-Niagara's growth in freight volumes relative to regional and national benchmarks. While freight is expected to grow by approximately 47% over the course of the next 25 years, this equates to the region growing at a compound annual growth rate of approximately 1.7% per year in freight volumes. But what is growth like in comparable regions? To facilitate easier comparison the freight data at all spatial scales was aggregated to total productions and attraction of freight activity according to the following:

- **Production:** defined as the sum of outbound freight (all domestic and international exports). This is calculated based on where the origin of a freight flow is said to reside. Nationally, this is just all domestic freight plus exports, but to match the definition, the New York and Buffalo-Niagara regions were aggregated by combining domestic and international outbound flows, plus all internal freight flows (because they have an origin in region).
- **Attraction:** defined as the sum of inbound freight (all domestic and international imports). This is calculated based on where the destination of a freight flow is said to reside. Nationally, this is just all freight, but to match the definition, the New York and the Buffalo-Niagara regions were aggregated by combining domestic and international inbound flows, plus all internal freight flows (because they have a destination in region).

Based on these definitions, we can compare freight activity on an equal footing at various spatial scales. Table 3-2 compares the growth in tonnage for each of the three spatial levels of freight. As you can see, the volume of freight activity is growing at a faster rate relative to the US, though the Buffalo-Niagara Region is growing at a slower pace than the statewide average (but still faster than the background U.S. trend).

Table 3-2 Comparison of Regional Growth in Tonnage

Comparison of Regional Tonnage Growth Rates (000's of Tons)			
Directional Traffic	2018	2045	% Growth
Productions			
Buffalo-Niagara	46,058	68,038	48%
New York	447,710	678,900	52%
U.S.	17,511,558	23,213,488	33%
Attractions			
Buffalo-Niagara	47,090	64,986	38%
New York	514,351	760,585	48%
U.S.	17,578,706	23,190,474	32%
Total			
Buffalo-Niagara	93,148	133,024	43%
New York	962,061	1,439,485	50%
U.S.	35,090,264	46,403,962	32%

What is interesting about this table is that it shows that the production of outbound freight is much closer to overall trends in New York, despite Buffalo-Niagara regional freight volumes making up approximately 10% of overall New York volumes. By contrast there is a more pronounced gap in the attraction of inbound freight flows.

3.2 ECONOMIC GROWTH DRIVERS OF THE REGION

To understand the reasons for increased demand for freight services in the region, it is helpful to first understand the economic growth expected to take place over the next 25 years. Adequate planning for

regional needs requires first categorizing the kinds of changes taking place in the region and understanding the needs these changes may precipitate for the Buffalo-Niagara region.

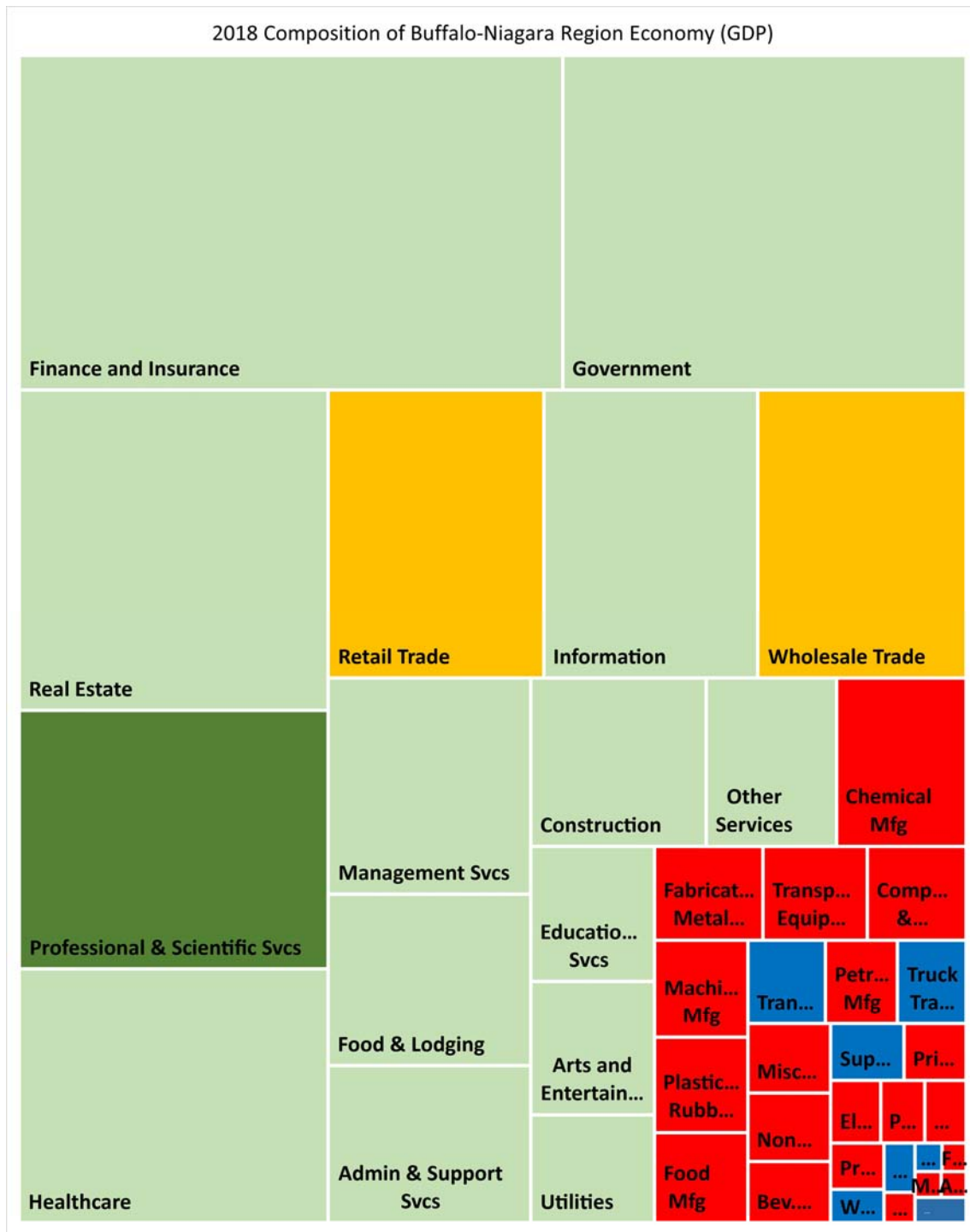
Suppose we were to take a snapshot of the economy in 2018⁴ and represent it as a rectangle, such that the size represented the total Gross State Product (GSP) of the metropolitan region. Next, if we were to subdivide that box to represent the relative shares of industries contributing to that GSP, we would have Figure 3-5. These ‘boxes’ represent sectors of the economy ranging from non-basic industries, which are population serving such as finance, healthcare, food and lodging, education, and entertainment, to more basic sectors – involved in production and trade of products with external markets. To highlight the compositional differences, we have colored the economic space the following:

- Non-basic sectors as **light green**
 - These sectors are population serving, or involved in knowledge processing endeavors
- Non-basic sectors that are still heavily involved in freight/trade generated activities in **Dark Green**
 - Which is knowledge intensive industries that still produce and consume sizeable volumes of freight goods
- Distribution outlets encapsulating the Wholesale and Retail sectors in **Orange**
- Basic sectors heavily involved in freight to source and ship their goods in **Red**
 - These are classic manufacturing sectors, which are where the bulk of freight supply and demand occur within a region
- Transportation related sectors in **Dark Blue**
 - These encapsulate all forms of transportation, as well as supporting services

Note that all industries to varying degrees are involved in consumption of freight directly or indirectly. It is important the transportation planning be framed by acknowledging that the efficient movement of goods affects even restaurants, office buildings, and hospitals. They all order goods that must be transported – though they may go through unique distribution chains in the region or through wholesalers/retailers who directly handle the goods.

⁴ We do 2018 instead of more recent economic data because we want to match the freight and economic data years.

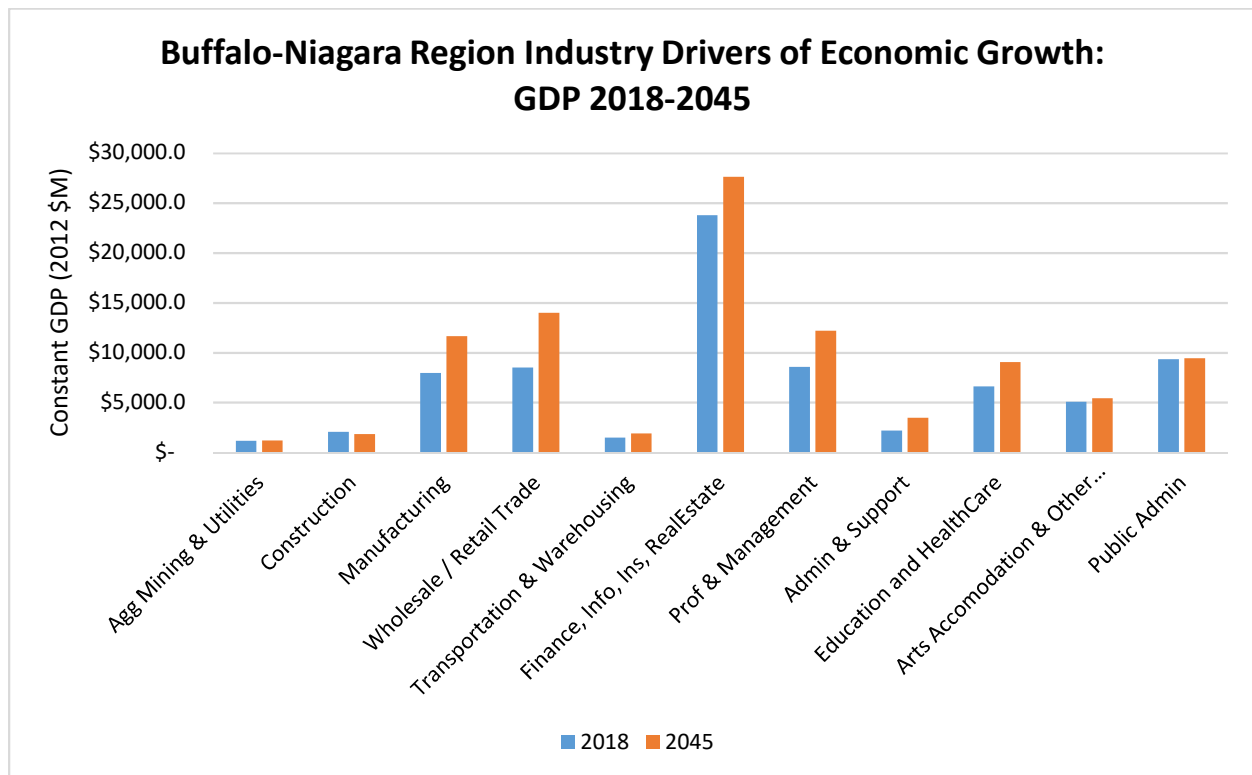
Figure 3-5 2018 Buffalo-Niagara Regional Economic Composition



- Non-Basic Sectors
 - Non-Basic Sectors Heavily Involved in Freight & Logistics
 - Distribution Outlets Encapsulating the Wholesale and Retail Sectors
 - Basic Sectors Heavily Involved in Freight to Source and Ship their Goods
 - Transportation Related Sectors
- Source: Moodys

Moody's Economy.com forecasts of county-industry GDP growth were used to look at how regional growth is expected to occur over the next 25 years. Based on Figure 3-6 below, we can see that some of the fastest growing sectors are going to be related industries involved in the production of physical goods, and the sectors involved in the distribution of those goods within the region. While non-basic industries such as the finance/insurance and real-estate sectors continue to comprise a significant portion of the economy, their overall share of that economy is expected to decline from approximately 31% in 2018 to 28.2% by the year 2045⁵.

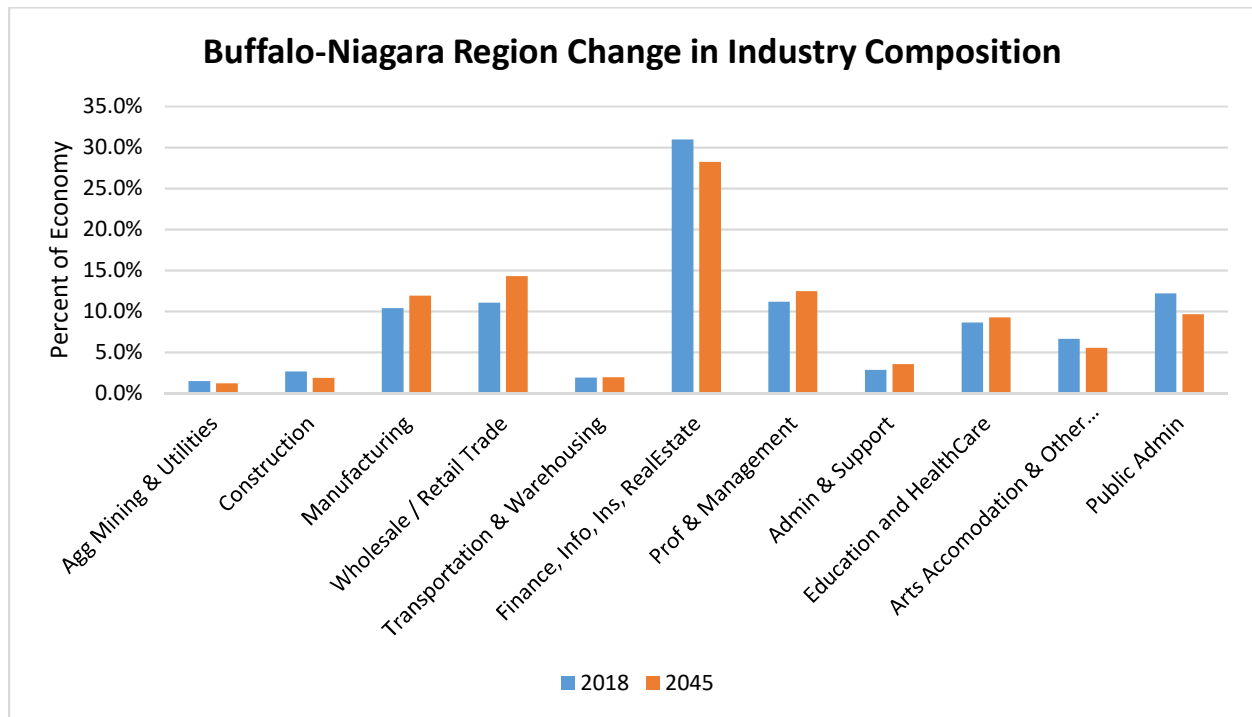
Figure 3-6 Expected GDP Growth in Region



Source: Moodys

⁵ We are using Constant 2012 dollars here to mitigate the distortion of using nominal dollars to talk about economic growth due to inflation.

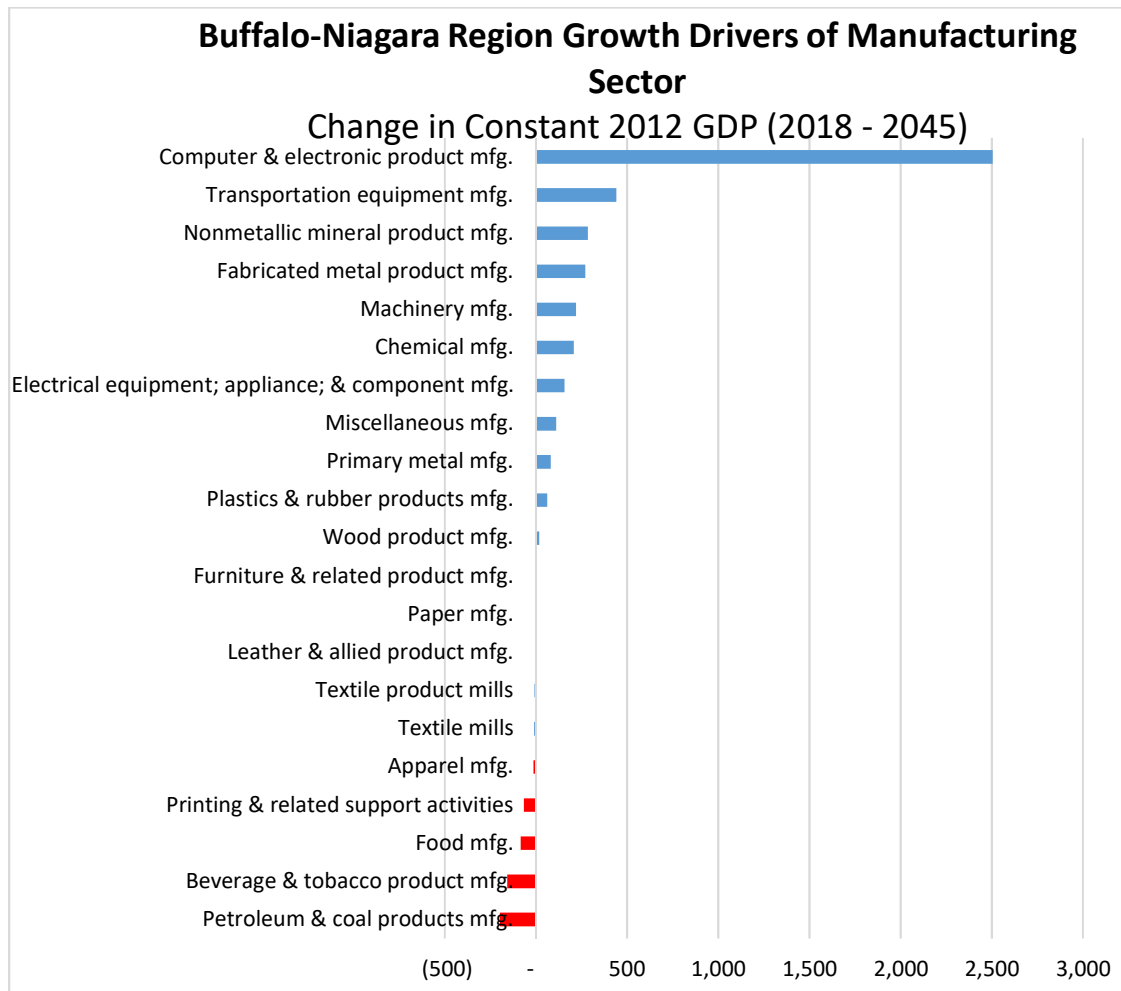
Figure 3-7 Change in Composition of Economy



Source: Moodys

If we look within the manufacturing sector to see the kinds of industries driving this growth, we can see from Figure 3-8 on the following page that much of this growth is related to high-tech manufacturing of computer and electronics production, as well as transportation equipment manufacturing and nonmetallic mineral products. In contrast, we see some modest declines in industry activity expected for petroleum and coal products, as well as beverage and tobacco producing industries. These detailed growth sectors represent industries whose freight are of greatest interest for planning purposes – to avoid handicapping their growth through misaligned transportation system improvements that do nothing to reduce their operating efficiency.

Figure 3-8 Growth Drivers of the Manufacturing Sector



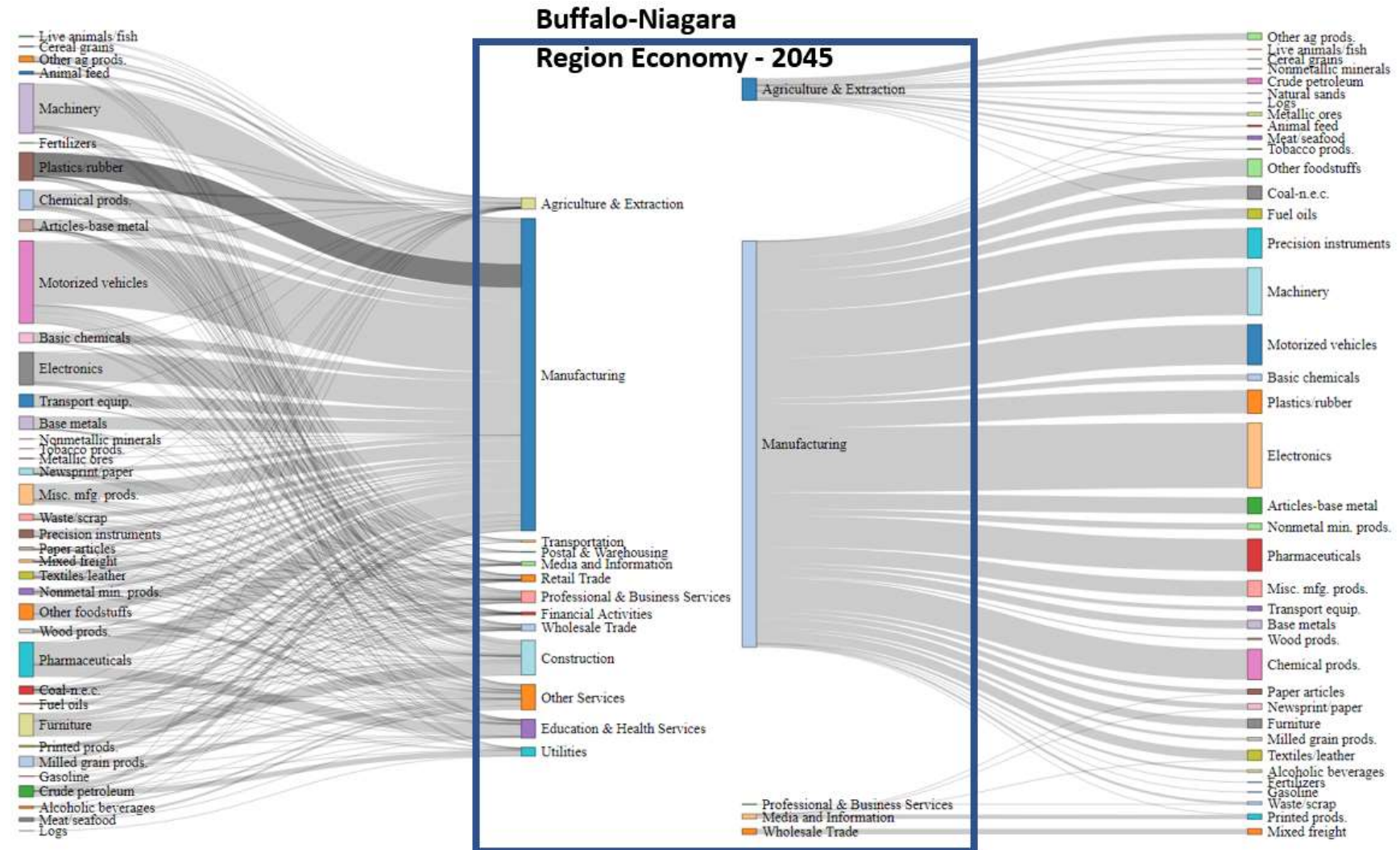
By combining the available data about commodities being moved by freight in 2045 with the expected growth in regional economies using our economic models⁶, we are able to represent the regional supply chain as a flow diagram to look at how freight commodities are brought into the region as inputs to production, which then undergo value adding activities and are then ultimately shipped out of the region, as shown by Figure 3-9 on the following page. This tells a comprehensive story of the raw extractive materials being brought in (from the left of the Buffalo-Niagara region Economy rectangle), their usage within the economy – as well as explicit linkages to the industry in region, and export material for use in other markets (to the right of the Buffalo-Niagara region Economy rectangle). This helps to explicitly show the linkages between industry growth and the relation to added commodity shipments into or out of a region.

⁶ The team leveraged a 2017 national model to harvest the production functions detailing the types of commodities produced or consumed by industry from implan, and associated the industry data to work with the NAICS sectoring of the Moody's forecasts of industry activity to make a linked freight-economics model to help explain the growth in supply and demand for freight based on changes in economic activity.

Figure 3-9 The Economic Flow of Goods in the Buffalo-Niagara Region Economy, 2045

Import

Export



4 Identifying Domestic and International Markets

In the previous section we focused on broader trends in commodity movements – focusing solely on the overall composition of goods coming into and leaving the Buffalo-Niagara region. The following section delves into greater detail regarding the markets responsible for supplying goods to the region. Splitting out the directional flow allows the reader to isolate key markets where growth is likely, effectively setting the stage to talk about the critical facilities necessary to support regional growth the Buffalo-Niagara region. Note that the FAF data does not distinguish by specific port/crossing/airport – it reports international moves based on the FAF zone in which goods enter/leave the country, and the accompanying mode used to enter/exit the country. Despite these limitations, we can infer the ports involved – for truck crossings we are going to be predominantly talking about the Lewiston-Queenston bridge (394,678 truck crossings in 2019), and the Peace Bridge (530,809 truck crossings in 2019). For marine, the Port of Buffalo; and for air the Buffalo Niagara International Airport or Niagara Falls International Airport.

4.1 INBOUND FREIGHT

By 2045, the volume (in tons) of inbound freight to the Buffalo-Niagara region will have grown from 25 million tons to over 36 million, a nearly 45% increase in the volume of goods being imported to the region, as shown in Table 4-1. What is perhaps more interesting is that there is an increasing trend in sourcing these goods from international markets, though predominantly the bulk of goods on a tonnage basis are still being sourced from other states. There is a short-term contraction in the share of international imports, representing a potential reshoring: followed by a period of economic resurgence emphasizing a broader emphasis of change. This can be seen in Figure 4-1 on the following page by the increasing thickness of the back representing the volume of imports: going from 7.9% of total volume of goods, to approximately 10% of all inbound goods.

Table 4-1 Volume of Inbound Freight Goods Shipped

Volume of Goods Shipped ('000s of Tons)									
Mode	Inbound Domestic			Inbound (International)			Inbound (Total)		
	2018	2045	% Change in Volume	2018	2045	% Change in Volume	2018	2045	% Change in Volume
Truck	16,252	22,738	39.9%	1,231	2,604	111.4%	17,483	25,342	44.9%
Rail	496	1,063	114.5%	348	565	62.3%	844	1,628	93.0%
Water	-	-	na	52	78	50.7%	52	78	50.7%
Air (include truck-air)	6	10	62.8%	19	5	-75.5%	25	15	-39.9%
Multiple modes & mail	820	1,290	57.4%	330	353	7.0%	1,149	1,643	42.9%
Pipeline	5,493	7,464	35.9%	-	-	Na	5,493	7,464	35.9%
Other and unknown	-	-	na	1	11	1,514.7%	1	11	1,514.7%
Total	23,067	32,566	41.2%	1,980	3,614	82.6%	25,047	36,180	44.5%

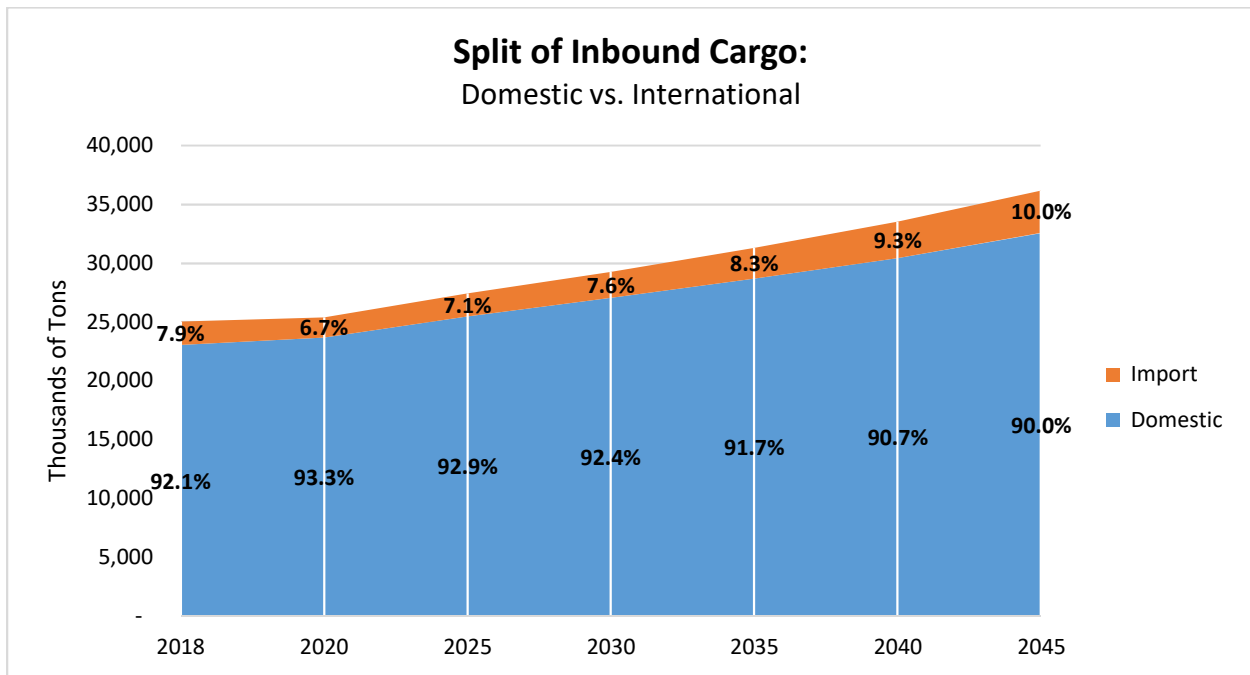
Figure 4-1 Trends in Split of Inbound Cargo

Table 4-2 on the following page depicts the volume and value of inbound commodities – highlighting the composition of goods being sourced from domestic and international markets. We can see the breakout of inbound goods based on the commodities in terms of the associated tonnage and value mix of commodities. There is significantly more concentration in the mix of inbound domestic commodities – with 37% of all domestically sourced inbound freight being associated with either coal or gravel related products on a tonnage basis. By comparison, the top two imported commodities (non-metallic mineral products, waste/scrap) account for only 19.2% of all imported goods.

Below is a breakout of the domestic inbound commodities expected to experience the greatest increase in volume (in tons) through 2045.

1. Coal N.E.C.
2. Chemical products
3. Cereal grains
4. Other foodstuffs
5. Milled grain products

Below is a breakout of the import inbound commodities expected to experience the greatest percent increase in volume (in tons) through 2045.

1. Articles-based Metal
2. Other foodstuffs
3. Base metals
4. Basic chemicals
5. Plastics/ rubbers

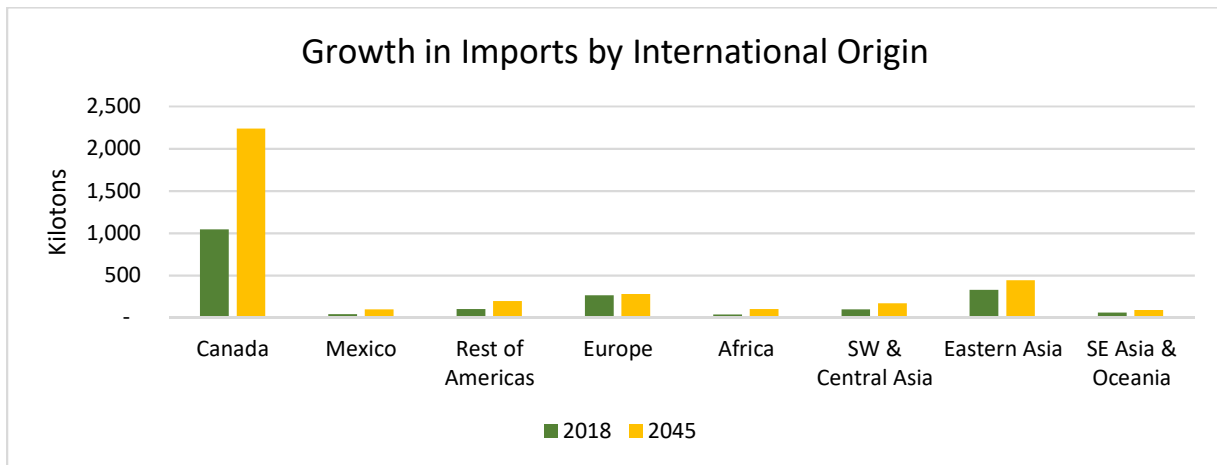
Table 4-2 Breakout of Inbound Freight

	2018 Inbound Freight				2045 Inbound Freight			
	Domestic		Import		Domestic		Import	
	000's of Tons	Value of Goods Shipped (2018 \$M)	000's of Tons	Value of Goods Shipped (2018 \$M)	000's of Tons	Value of Goods Shipped (2018 \$M)	000's of Tons	Value of Goods Shipped (2018 \$M)
Chemical prods.	530	\$ 1,184.3	62	\$ 236.5	1,947	\$ 8,378.2	116	\$ 378.4
Pharmaceuticals	33	\$ 2,063.2	5	\$ 120.9	118	\$ 7,197.6	11	\$ 301.5
Mixed freight	1,181	\$ 4,822.2	3	\$ 55.1	1,529	\$ 6,874.5	14	\$ 117.7
Misc. mfg. prods.	162	\$ 2,352.8	24	\$ 2,842.0	280	\$ 4,434.4	46	\$ 1,739.6
Plastics/rubber	241	\$ 1,329.6	72	\$ 252.2	912	\$ 4,955.0	216	\$ 735.5
Motorized vehicles	358	\$ 4,589.2	17	\$ 112.3	429	\$ 5,504.4	18	\$ 143.8
Electronics	86	\$ 1,799.5	49	\$ 697.6	174	\$ 3,796.7	46	\$ 909.1
Machinery	90	\$ 1,136.2	51	\$ 446.1	224	\$ 2,768.4	178	\$ 1,484.3
Base metals	1,002	\$ 2,106.7	143	\$ 278.8	1,307	\$ 3,003.6	310	\$ 731.0
Basic chemicals	241	\$ 818.0	67	\$ 161.6	811	\$ 3,136.8	212	\$ 300.3
Other foodstuffs	1,630	\$ 1,822.6	85	\$ 246.5	2,595	\$ 2,807.1	279	\$ 345.1
Coal-n.e.c.	5,164	\$ 1,834.0	77	\$ 39.8	7,016	\$ 2,453.8	58	\$ 37.1
Articles-base metal	223	\$ 1,105.0	59	\$ 215.8	302	\$ 1,615.9	294	\$ 625.9
Precision instruments	14	\$ 641.3	11	\$ 253.1	36	\$ 1,835.9	9	\$ 356.8
Furniture	125	\$ 624.7	31	\$ 203.9	208	\$ 1,032.9	78	\$ 535.2
Milled grain prods.	424	\$ 487.0	25	\$ 52.2	1,210	\$ 1,460.7	69	\$ 102.9
Textiles/leather	42	\$ 622.8	121	\$ 1,054.0	24	\$ 418.6	77	\$ 1,029.7
Other ag prods.	781	\$ 1,163.4	87	\$ 117.2	763	\$ 1,130.9	158	\$ 199.0
Cereal grains	2,095	\$ 765.1	60	\$ 33.1	3,384	\$ 1,240.4	58	\$ 18.0
Meat/seafood	125	\$ 483.1	27	\$ 134.0	265	\$ 1,064.1	30	\$ 126.1
Animal feed	709	\$ 479.1	60	\$ 33.1	1,424	\$ 826.0	112	\$ 89.6
Nonmetal min. prods.	458	\$ 332.2	235	\$ 88.3	734	\$ 517.5	270	\$ 169.9
Wood prods.	580	\$ 385.0	75	\$ 58.0	814	\$ 577.3	134	\$ 86.7
Alcoholic beverages	109	\$ 147.1	50	\$ 190.8	287	\$ 392.1	148	\$ 134.7
Newsprint/paper	477	\$ 492.7	98	\$ 85.1	362	\$ 372.7	151	\$ 140.9
Paper articles	92	\$ 231.1	27	\$ 49.9	130	\$ 328.2	41	\$ 88.6
Transport equip.	8	\$ 118.2	5	\$ 61.1	13	\$ 250.2	5	\$ 156.3
Gasoline	544	\$ 548.1	26	\$ 28.8	360	\$ 356.5	39	\$ 37.8
Waste/scrap	203	\$ 264.5	146	\$ 122.3	140	\$ 187.1	246	\$ 129.0
Printed prods.	33	\$ 196.7	17	\$ 46.8	43	\$ 260.9	9	\$ 52.5
Fuel oils	230	\$ 203.2	85	\$ 74.5	87	\$ 74.7	79	\$ 59.0
Nonmetallic minerals	971	\$ 46.0	49	\$ 8.0	1,320	\$ 69.4	74	\$ 10.3
Live animals/fish	30	\$ 57.0	1	\$ 18.5	39	\$ 72.3	1	\$ 3.8
Logs	134	\$ 26.3	1	\$ 0.3	234	\$ 66.0	3	\$ 1.9

Metallic ores	8	\$ 23.8	6	\$ 2.0	2	\$ 3.2	8	\$ 44.0
Fertilizers	37	\$ 18.7	13	\$ 6.3	57	\$ 25.2	14	\$ 7.7
Gravel	3,421	\$ 38.1	7	\$ 0.6	2,589	\$ 30.2	0	\$ 0.0
Coal	113	\$ 16.8	-	\$ -	80	\$ 13.3	0	\$ 0.0
Tobacco prods.	1	\$ 42.1	1	\$ 12.2	0	\$ 5.3	1	\$ 5.3
Natural sands	339	\$ 9.6	1	\$ 0.1	314	\$ 8.7	1	\$ 0.1
Building Stone	19	\$ 3.1	1	\$ 0.3	2	\$ 0.3	3	\$ 0.2
Crude petroleum	-	-	-	\$ -	-	\$ -	-	\$ -
Total	23,067	\$ 5,430	1,980	\$ 8,440	32,566	\$ 69,547	3,614	\$ 11,435

By comparing the volume and value shown for 2018 and 2045, we can see less imported textiles/leather products and miscellaneous manufactured products, with an increasing emphasis in manufactured machinery and plastics/rubber. In terms of the specific markets involved – on the international side we can see that, in part due to its favorable location, the Buffalo-Niagara region relies mainly on Canada for its sourcing of goods, followed by China (East Asia). This trend is expected to continue to grow over the next 25-year period. Figure 4-2 portrays growth in imports by international origin.

Figure 4-2 International Sources of Inbound Shipments (Imports)



The presence of this increasing share of goods being sourced from international markets means the movement of goods, and therefore transportation vehicles, is influenced by the geography of the markets being traded with. Figure 4-3 depicts trends in concentration/specialization of inputs being sourced and expected changes over time by tracking and displaying three dimensions of behavior using the FAF data:

- The X-axis represent the ratio of share of commodity being traded by a specific country relative to all other commodities being imported from that country. The ratio is meant to include the time dimension to look at whether, over time, the inputs being sourced from a country are becoming more or less concentrated along supporting specific supply chains. We can express the growing concentration using the following formula:

$$\frac{N_{c,i+1} / \sum_1^{c,i+1} N}{N_{c,i} / \sum_1^{c,i} N}$$

Where N represents the nation, C is the commodity being evaluated, and I represents the period (i+1 being 2045, and I being 2018). Increasing ratios signify that trade with that country is becoming increasingly concentrated around particular commodities, whereas decreasing ratios mean that patterns of trade are becoming more diffuse across a broader spectrum of goods.

- The Y-axis looks at the ratio change in share of total inputs of a given commodity are increasing or decreasing in relation to a specific countries volume of imported goods. This measure looks at whether the pattern of sourcing a critical input is becoming more concentrated among specific countries. Whereas the x-axis was about a specific country's concentration of trade, this looks at whether that country-commodity pair is becoming concentrated relative to ALL inbound shipments (including domestic shipments). The ratio, like the other axis. Is mean to look at the ratio change between 2018 and 2045 – capturing a time trend of changes.

$$\frac{C_{N,i+1} / \sum C}{C_{N,i} / \sum C}$$

Similarly N represents the nation, C the commodity, and I representing the time period of either 2018 (i) or 2045 (I + 1). In this case however, this measure looks at whether or not the demand for a specific commodity coming from a country is becoming increasingly more concentrated relative to the total volume of inbound (or outbound) goods moving.

- The Z-axis (SIZE) denotes the magnitude of change in value of goods being shipped between 2018 and 2045. Note that to better portray growth and decline, we have explicitly colored the bubbles blue for decrease and yellow for increases in the volume of trade. We include the size variable here as a way of counteracting the ratio nature of the axis measurement. Ratios of small values tend to produce very large changes, so inclusion of the difference in trade between years is a way of focusing only on major trends that dictate broader swings of the market.

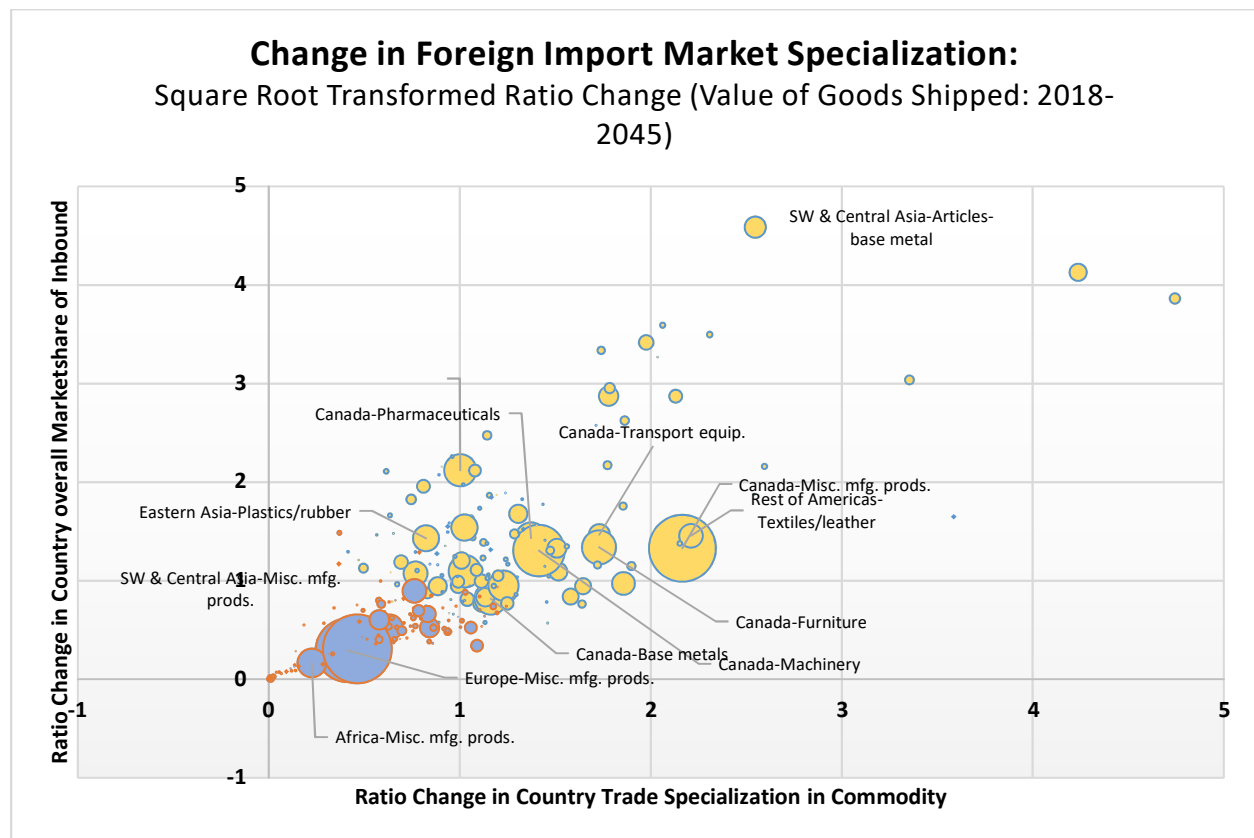
Because we are dealing with ratios, the intersection of the Y=1 and X=1 axis depicts a four-quadrant matrix of trends from which important conclusions can be drawn. Moving clockwise from the top left quadrant, we see four kinds of behaviors demonstrating different kinds of growth:

- **Top Left** – Depicts countries that are becoming more prominent trade partners for the specific goods represented by the dots. However, these goods are a subset of an increasingly diversifying set of offering that that country trades with the US.
- **Top Right** – Demonstrates an increasingly fast-growing trade partner whose growth is becoming increasingly defined by its ability to provide specific goods feeding into a Buffalo-Niagara region supply chain. This growth is most certainly linked to growth industries within the region. An example of this would be the machinery being imported from Canada, or the articles made of base metal coming from South-Western and Central Asia.

- **Bottom Right** – Represent countries increasingly specializing in trade with the Buffalo-Niagara region who are specialized in their offerings, but who are becoming less dominant in the market compared to the overall share sourced from domestic and other international competitors. An example of one of these goods would be base metal products coming from Canada.
- **Bottom Left** – represent countries whose overall market share of imported goods are decreasing, and they are becoming less specialized in their role in satisfying regional needs. An example of this would be manufactured products coming from South-Western and Central Asia.

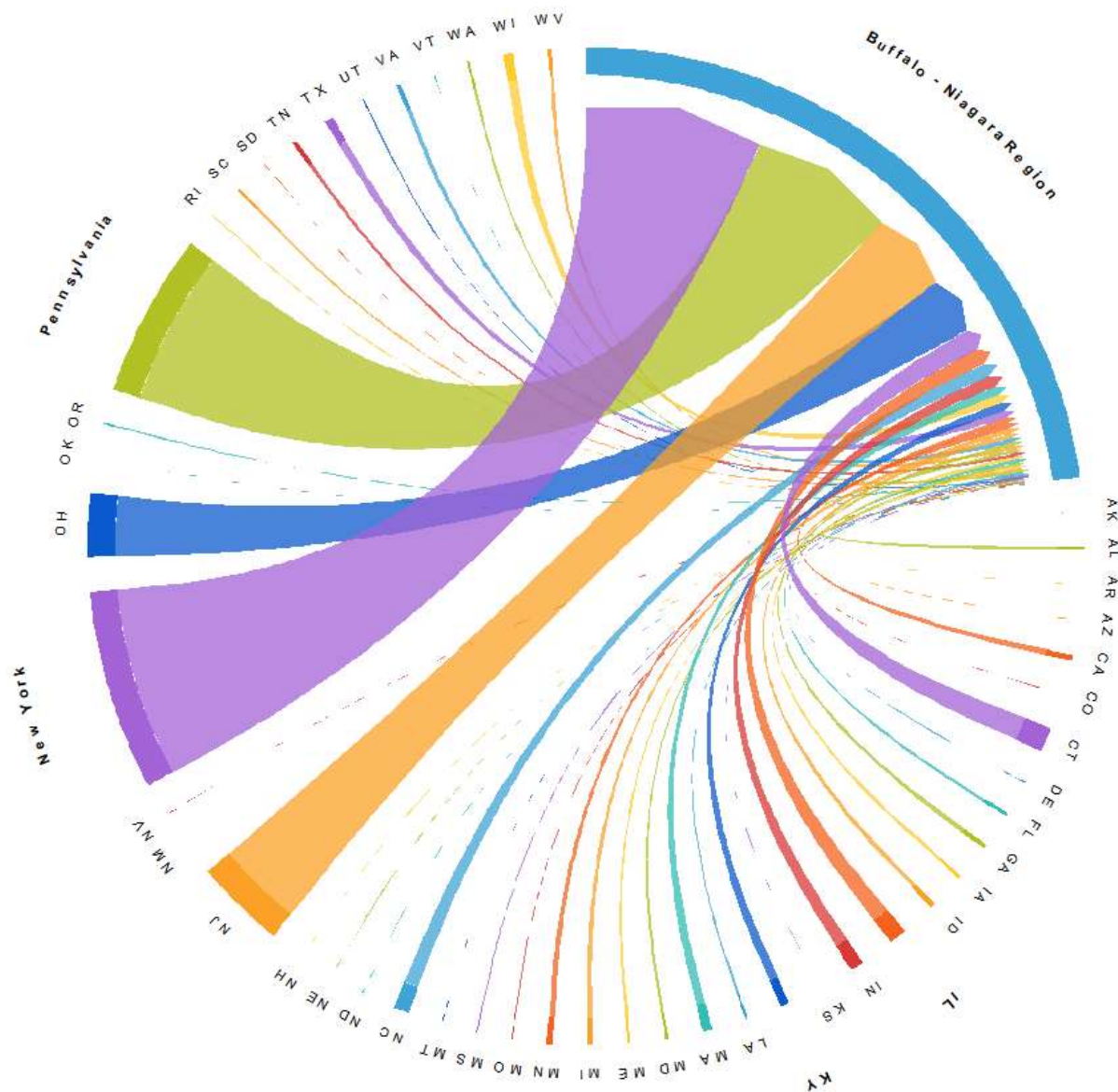
Note: for both export and import versions of this graphic, the values computed from the FAF used to make this graphic are attached in appendix 2 due to the overwhelming size of the data points.

Figure 4-3 Market Specialization: Imports



Separate from the international markets, the following figure highlights the top domestic trading partners in the U.S. responsible for supplying goods to the Buffalo-Niagara region. The circle plot, Figure 4-4 on the following page, depicts the volume of trade (measured in tons) based on the thickness of the flow lines. Notably, there is a strong reliance on surrounding states to source goods.

Figure 4-4 Market Specialization: Domestic Inbound Freight Markets



4.2 OUTBOUND FREIGHT

Like the trends present in the sourcing of inbound inputs for Buffalo-Niagara region consumption, there is a predominant trend of increasing interaction with the international markets. Production of goods meant for external consumption are slated to rise from 24 million tons of produced goods, to over 39 million over the next 25 years. This represents a staggering trend more than tripling the share of international exports as ultimate consumers of the Buffalo-Niagara region's products – going from approximately 6% in 2018 to over 17.5% by 2045. This surge in international traffic represents approximately a 395% increase in traffic – driven by a large growth in pipeline and rail traffic volumes, as shown in Table 4-3 and Figure 4-4.

Table 4-3 Volume of Outbound Freight Goods Shipped

Volume of Goods Shipped ('000s of Tons)									
Mode	Outbound Domestic			Outbound (International)			Outbound (Total)		
	2018	2045	% Change in Volume	2018	2045	% Change in Volume	2018	2045	% Change in Volume
Truck	17,178	25,530	48.6%	684	2,097	206.5%	17,862	27,626	54.7%
Rail	396	444	12.1%	323	1,867	477.7%	719	2,311	221.4%
Water	-	-	Na	2	4	77.6%	2	4	77.6%
Air (include truck-air)	6	10	71.0%	13	5	-63.9%	18	14	-22.1%
Multiple modes & mail	521	529	1.5%	91	97	7.1%	612	626	2.4%
Pipeline	4,517	5,807	28.6%	190	2,833	1390.3%	4,707	8,641	83.6%
Other and unknown	-	-	Na	94	11	-88.6%	94	11	-88.6%
Total	22,618	32,320	42.9%	1,397	6,913	395.0%	24,014	39,233	63.4%

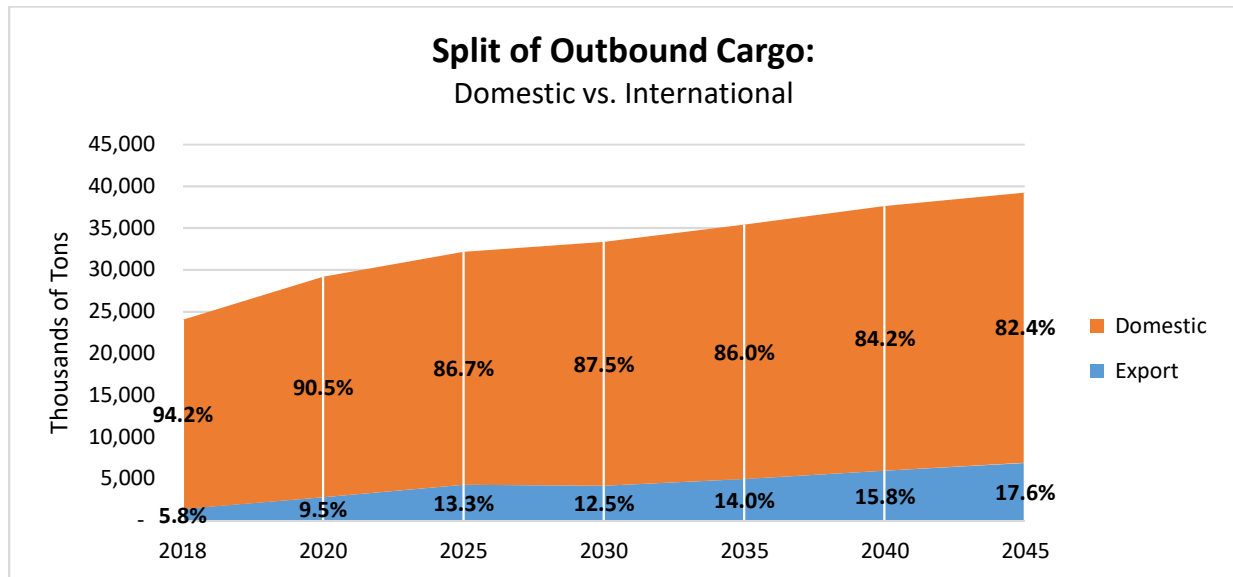
Figure 4-5 Market Specialization: Imports

Table 4-4 shows that the commodities being shipped that predominantly drive this surge in international share of final production are related to coal and scrap related products.

Below is a breakout of the domestic outbound commodities expected to experience the greatest percent increase in volume through 2045.

1. Base metals
2. Waste/ scrap
3. Coal N.E.C.
4. Natural sands
5. Other foodstuffs

Below is a breakout of the export outbound commodities expected to experience the greatest percent increase in volume through 2045.

1. Coal N.E.C.
2. Waste/ scrap
3. Newsprint/ paper
4. Other foodstuffs
5. Nonmetal products

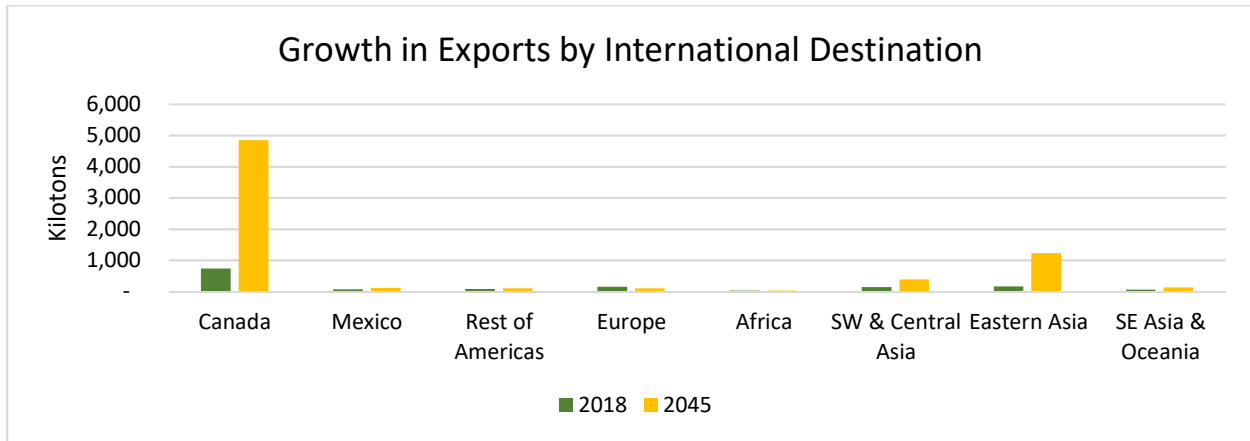
Table 4-4 Breakout of Outbound Freight

	2018 Outbound Freight				2045 Outbound Freight			
	Domestic		Export		Domestic		Export	
	000's of Tons	Value of Goods Shipped (2018 \$M)	000's of Tons	Value of Goods Shipped (2018 \$M)	000's of Tons	Value of Goods Shipped (2018 \$M)	000's of Tons	Value of Goods Shipped (2018 \$M)
Pharmaceuticals	56	\$4,047.0	5	\$83.5	118	\$8,635.8	2	\$405.4
Machinery	141	\$2,975.7	45	\$507.7	289	\$5,936.9	61	\$1,364.6
Base Metals	2,274	\$3,539.7	88	\$191.8	4,171	\$6,747.0	233	\$421.4
Mixed Freight	1,403	\$4,915.5	59	\$175.3	1,512	\$5,299.0	67	\$837.8
Misc. Mfg. Prods.	112	\$1,679.1	34	\$3,380.7	268	\$3,262.7	41	\$1,355.1
Electronics	34	\$966.4	25	\$661.2	93	\$2,692.2	45	\$1,493.9
Articles- Base Metal	220	\$1,898.4	30	\$140.0	424	\$3,508.7	154	\$515.7
Coal-n.e.c.	4,488	\$1,552.2	271	\$83.1	5,972	\$2,104.5	2,938	\$1,552.4
Gasoline	2,267	\$2,409.3	15	\$16.7	2,763	\$2,939.3	6	\$5.0
Other Foodstuffs	1,200	\$1,631.3	48	\$127.4	1,913	\$2,458.9	273	\$450.4
Chemical Prods.	53	\$864.3	55	\$228.7	127	\$2,019.7	105	\$651.1
Plastics/rubber	394	\$2,404.0	37	\$186.0	335	\$1,994.9	119	\$460.2
Waste/scrap	943	\$383.8	138	\$200.5	2,749	\$1,161.9	1,591	\$867.0
Motorized Vehicles	176	\$1,958.3	35	\$178.4	127	\$1,401.1	42	\$297.3
Transport Equip.	6	\$630.2	11	\$132.2	15	\$1,413.6	8	\$274.5
Precision Instruments	11	\$499.6	6	\$258.2	22	\$1,001.4	12	\$651.8
Alcoholic Beverages	440	\$976.3	9	\$18.6	624	\$1,378.8	19	\$52.4
Basic Chemicals	839	\$1,190.3	45	\$114.6	761	\$1,017.3	48	\$141.4
Milled Grain Prods.	799	\$1,048.1	12	\$28.3	846	\$1,054.4	50	\$87.3
Newsprint/Paper	652	\$995.7	92	\$76.9	506	\$772.1	339	\$296.5
Nonmetal Min. Prods.	334	\$326.0	34	\$63.7	564	\$583.8	199	\$325.1
Textiles/leather	55	\$832.0	12	\$90.8	44	\$681.4	20	\$227.5
Paper Articles	117	\$428.4	27	\$29.0	197	\$708.3	33	\$98.0
Furniture	45	\$327.5	4	\$37.3	71	\$520.2	28	\$153.5
Printed Prods.	40	\$183.6	45	\$51.1	86	\$394.8	39	\$219.6

Wood Prods.	404	\$580.2	47	\$21.3	430	\$554.4	61	\$54.3
Fuel Oils	342	\$317.7	73	\$59.8	529	\$453.3	71	\$47.1
Cereal Grains	424	\$148.2	3	\$1.4	1,049	\$372.6	8	\$7.4
Meat/Seafood	91	\$360.9	2	\$11.1	55	\$218.2	7	\$32.0
Animal Feed	360	\$127.2	18	\$27.7	359	\$143.8	44	\$60.9
Other Ag. Prods.	113	\$100.8	17	\$23.8	98	\$89.3	72	\$95.6
Metallic Ores	0	\$0.0	6	\$8.2	0	\$0.0	26	\$149.7
Crude Petroleum	275	\$182.6	-	\$-	190	\$136.3	-	\$-
Non-Metallic Minerals	7	\$26.0	16	\$4.2	25	\$51.2	88	\$9.0
Live Animals/fish	16	\$41.8	1	\$4.8	16	\$43.9	2	\$4.6
Gravel	2,325	\$33.2	0	\$0.0	2,485	\$35.3	1	\$0.1
Logs	22	\$2.7	28	\$8.8	33	\$2.8	47	\$13.8
Natural Sands	1,132	\$7.2	0	\$0.1	2,451	\$14.7	8	\$0.3
Tobacco Prods.	4	\$78.6	0	\$1.3	1	\$8.8	0	\$5.6
Fertilizers	0	\$0.2	3	\$2.0	0	\$0.2	5	\$2.6
Building Stone	4	\$0.2	0	\$0.0	1	\$0.0	0	\$0.3
Coal	-	\$-	0	\$0.0	-	\$-	-	\$-
Total	22,618	40,670	1,397	7,236	32,320	61,814	6,913	13,688

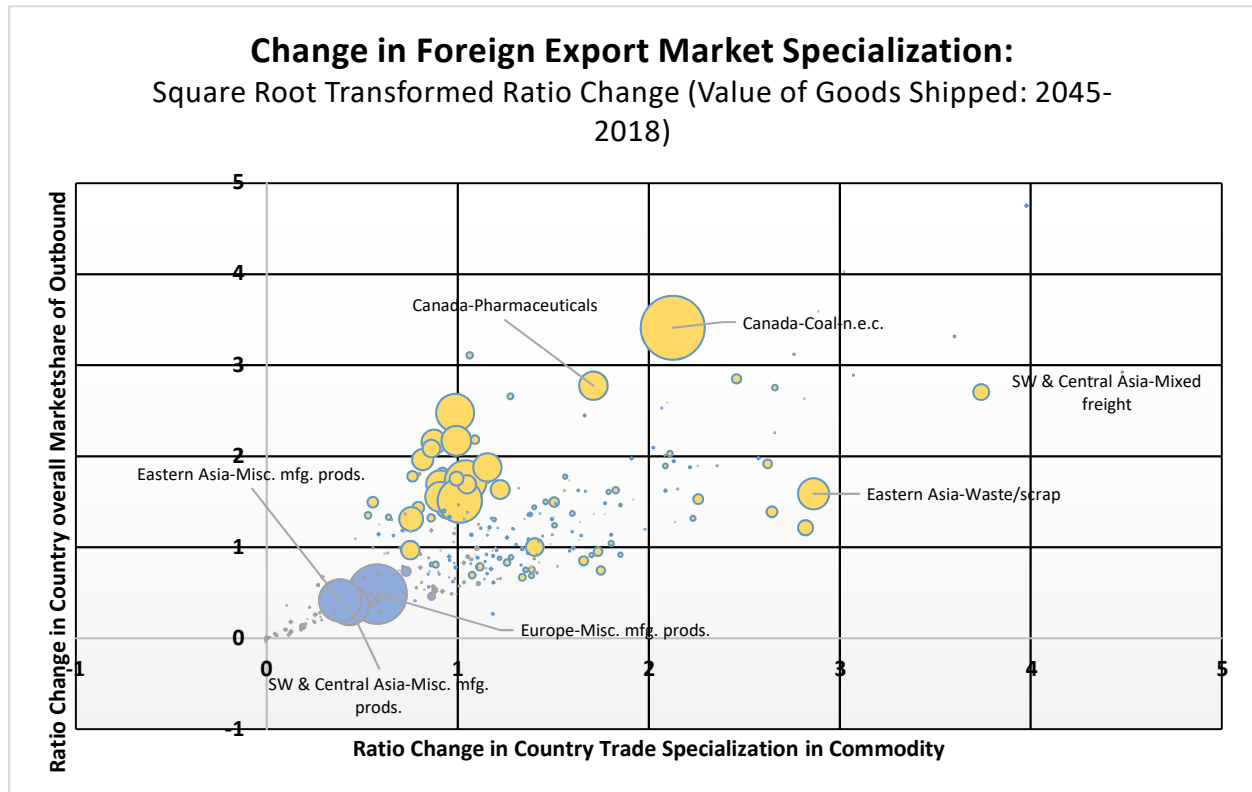
Based on Figure 4-6 below, we can see a pattern of continued trade with Canada and Eastern Asia as the predominant markets growing in demand for buffalo goods.

Figure 4-6 International Sources of Outbound Shipments (Exports)



Based on the concentration of the export market, we can see that the Buffalo-Niagara region is becoming an increasingly concentrated supplier of coal exports to Canada, while they are seeing a decline in shipments of manufacturing products and miscellaneous manufacturing goods to Asia as demand for those goods declines.

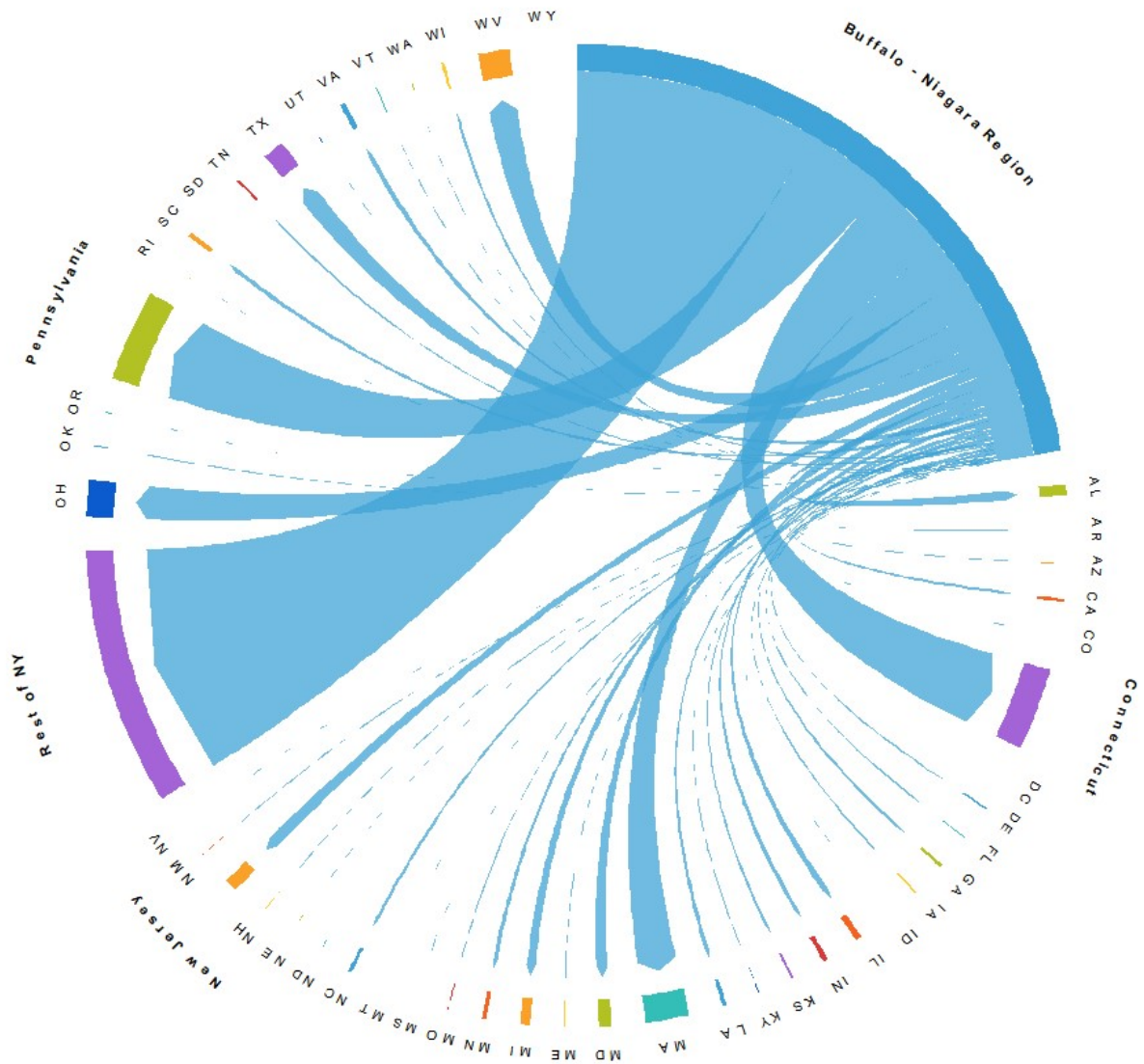
Figure 4-7 Market Specialization: Exports



In Figure 4-7, we see a consistent story of increasing emphasis of coal exports to Canada, but also can witness the large growth potential of pharmaceutical products to Canada as well as rising demand for the Buffalo-Niagara region's production of scrap and mixed freight meant for Asia. The increase in demand from Asia, among other countries, serves to add demand for ports facilities outside of the region, while the increasing emphasis on Canadian trade shifts traffic towards border crossings, of which Lewiston-Queenston, Peace Bridge, and Champlain-Rouses are most dominant.

For domestic trade partners, much of the Buffalo-Niagara region freight goods are shipped within the northeast. Figure 4-8 shows the outbound domestic trade partners.

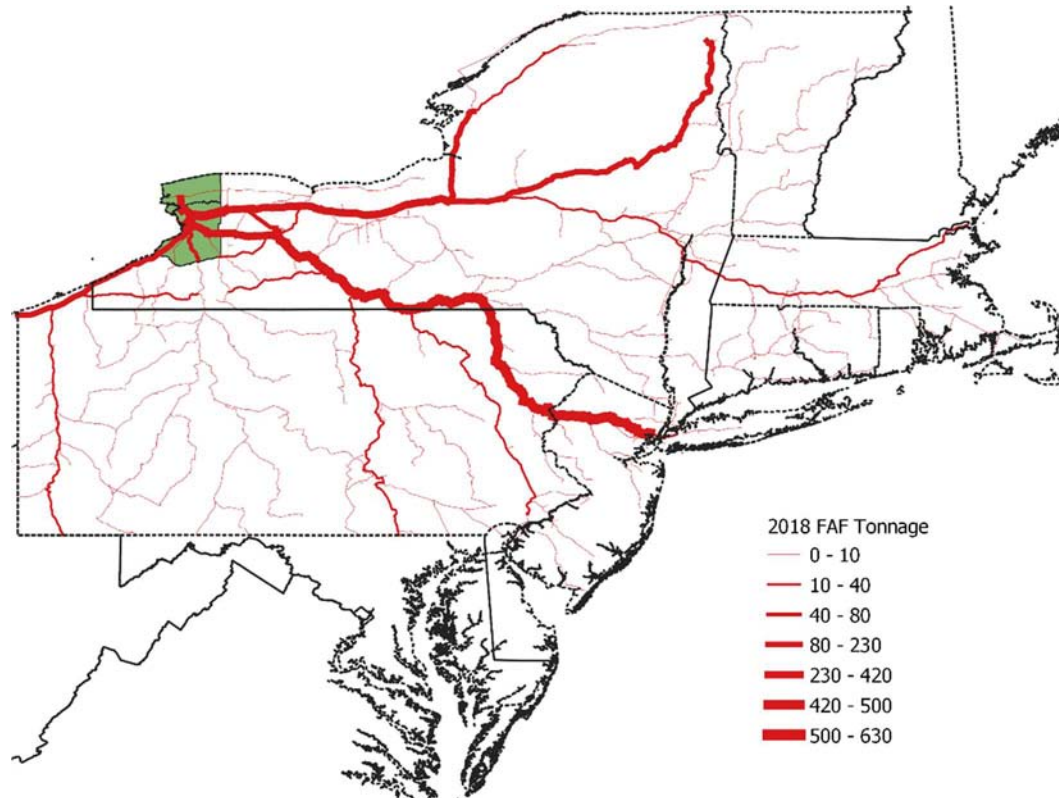
Figure 4-8 Market Specialization: Domestic Outbound Freight Markets



5 Buffalo-Niagara Regional Growth in Highway Volume

Using the methodology outlined in the appendix, we can take the FAF highway volumes for 2018 and 2045 and apply the routing algorithms in Transearch to look at implications of the growth in trade. Figure 5-1 shows the 2018 volume of tonnage moving via highway corridors to and from other regions.

Figure 5-1 Buffalo-Niagara 2018 Highway Tonnage for Exports/Imports



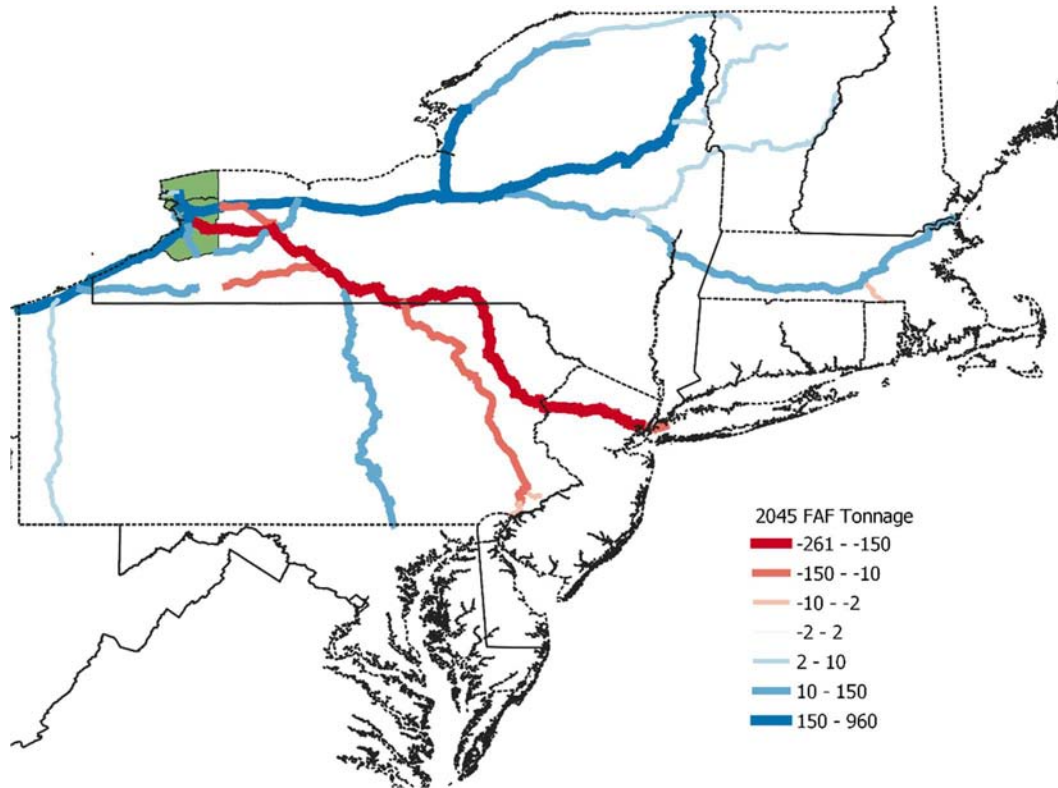
The resulting routing shows a heavy reliance on I-90, and I-390 to route goods to and from ports across the US. As the graphic depicts, a significant tonnage of the highway movement between the Buffalo-Niagara region and New York/ New Jersey ports uses a combination of surface streets (US 20A and NYS Route 63 through Mount Morris) to reach I-390 rather than the NYS Thruway (I-90).

Note that the routing is limited to the screen space which Transearch was capable of routing – so it cannot go beyond the Pennsylvania border to look at routes west in Michigan. Due to the differences in the datasets, routing for border traffic was done by routing to the county in which the port is in (Transearch does not identify border crossings explicitly in their data). For more information on the technical process, we encourage the reader to look at the appendix material.

Taking FAF freight forecasts and applying the same routing algorithms, we can compare future 2045 volumes to the 2018 routed tonnages to show the corridors of growth in Figure 5-2 on the following page. Based on the growth in Canada trade, we can see a shift towards border crossings in the Buffalo-Niagara region and Champlain-Rouses. This graphic also indicates a decrease in the amount of highway tonnage using US 20A and

NYS Route 63 (through Mount Morris), with an overall decrease in truck traffic to/from New York/ New Jersey as truck traffic becomes increasingly concentrated along routes accessing ports of entry along the northern border.

Figure 5-2 Change in Buffalo-Niagara Highway Tonnage for Exports/Imports

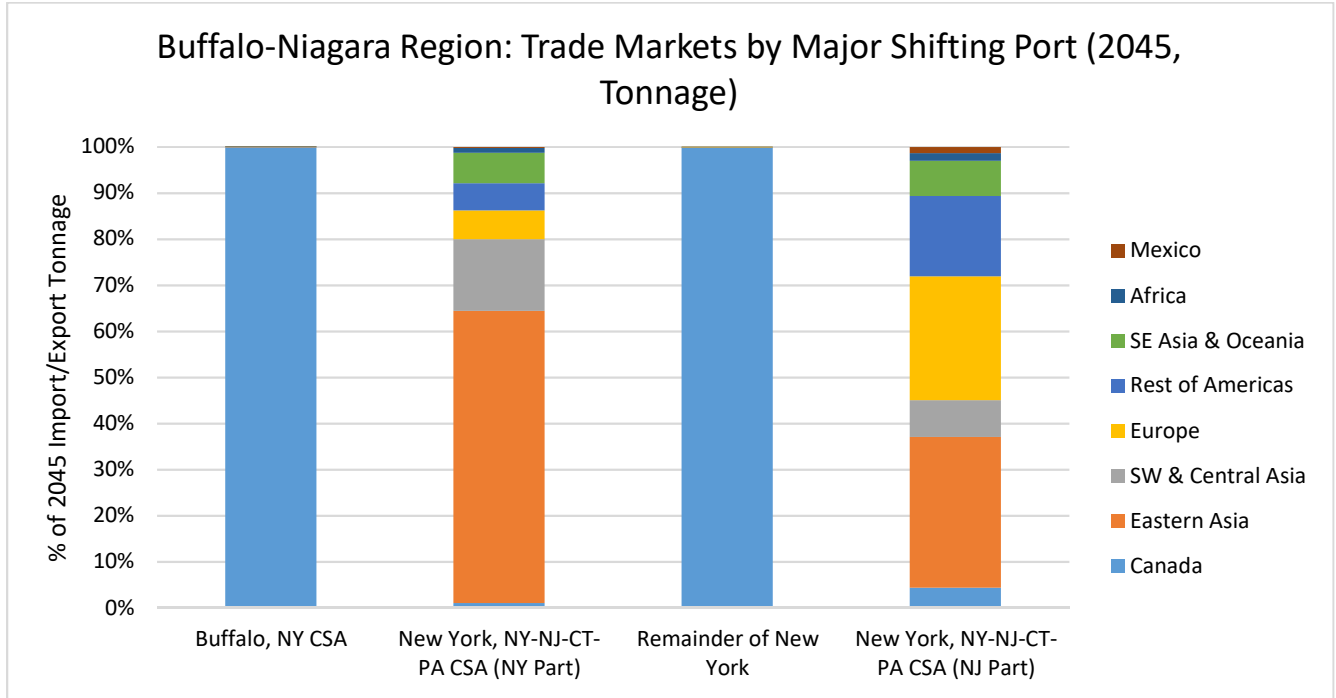


Note that while Figure 5-2 shows decreasing highway tonnage on routes between the Buffalo-Niagara region and the New York City area, traffic with the PANYNJ is expected to rise by approximately 1.6 million tons – but according to the FAF freight forecasts, it will become increasingly served by rail connections rather than traditional truck traffic, thus the noted decrease in highway tonnage on the highway network map. On the other end of the spectrum, we have Buffalo-Niagara’s freight traffic with the ports along the northern New York border, which is expected to grow by 669,000 tons through 2045, predominantly served by truck. As for the Buffalo-Niagara region’s utilization of in-region ports, import and export tonnage handled is expected to increase by almost 4.6 million tons – which represents approximately 4% of all tonnage going through the region’s ports of entries, with truck traffic expected to grow almost 50%.

Through 2045, FAF data shows activity is not only growing in the Buffalo-Niagara region ports of entry, but also growing across New York State as a whole, and surging in PANYNJ. The PANYNJ 2050 Plan indicates the port is expecting a 2.1% to 3.4% annual growth in container freight, an increase from 7.2 million twenty-foot equivalent units (TEU) in 2018 to 12-17 million TEU by 2050. Approximately 85% of that traffic is destined for the truck market. The intermodal rail market is expected to handle an increased load as well, and by 2050 there is expected to be between 1.5 million and 2.8 million intermodal rail lifts.

Note that the markets served by these ports are largely distinct from one another: Figure 5-3 shows the markets for goods associated with the region. Much of the traffic at non-border ports in 2045 are associated with Asia.

Figure 5-3: International Markets for Top Buffalo-Niagara Port Flows



The same can be represented in Table 5-1, showing the international markets for the top growing ports in terms of 2045 tonnage (thousands).

Table 5-1 International Markets for Top Buffalo-Niagara Port Flows

International Destinations of Buffalo-Niagara Regional Port Traffic (2045 Kilotons)				
Country	Buffalo, NY CSA	New York, NY-NJ-CT-PA CSA (NY Part)	Remainder of New York	New York, NY-NJ-CT-PA CSA (NJ Part)
Canada	5,768	20	1,063	17
Eastern Asia	2	1,212	0	130
SW & Central Asia	0	298	0	32
Europe	2	119	0	107
Rest of Americas	0	112	-	69
SE Asia & Oceania	0	127	0	30
Africa	0	20	-	6
Mexico	0	4	0	5
Total	5,773	1,911	1,064	398

6 External Demand for International Facilities in the Buffalo-Niagara Region

Separate from our discussion on the economic trends and drivers of Buffalo-Niagara region centric freight activity is the emphasis on utilization by non-region users of ports/border crossings/ airports within the region. While not explicitly tied to the economy of the Buffalo-Niagara region, this traffic is part of the background activity taking place at sites of international commerce within the region. Trade with Canada, stemming from external states passing through the Buffalo-Niagara region, has an implicit effect on the health of the transportation system. This added traffic represents more vehicles and congestion to the region's highway system. From Table 6-1, we can see that a significant volume of international traffic taking place at ports and border crossings in the Buffalo-Niagara region is not associated with regional businesses.

Table 6-1 Regional Summary of Users of Buffalo-Niagara Region Ports of Entry

Domestic Markets of Buffalo-Niagara Region Ports of Entry		Tonnage		Value of Goods (2018 \$)	
		2018	2045	2018	2045
Import	Buffalo	705.2	1,541.6	\$ 1,137.3	\$ 3,869.6
	Rest of U.S.	12,262.6	36,232.9	\$ 30,471.8	\$ 106,531.3
	Rest of NY	4,283.1	10,183.4	\$ 7,121.6	\$ 24,058.2
	Total	17,250.9	47,958.0	\$ 38,730.7	\$ 134,459.1
Export	Buffalo	503.0	4,231.2	\$ 1,057.1	\$ 6,803.2
	Rest of U.S.	10,547.3	56,899.7	\$ 37,635.7	\$ 150,717.5
	Rest of NY	3,761.7	7,644.5	\$ 10,804.0	\$ 26,692.6
	Total	14,812.0	68,775.4	\$ 49,496.7	\$ 184,213.4

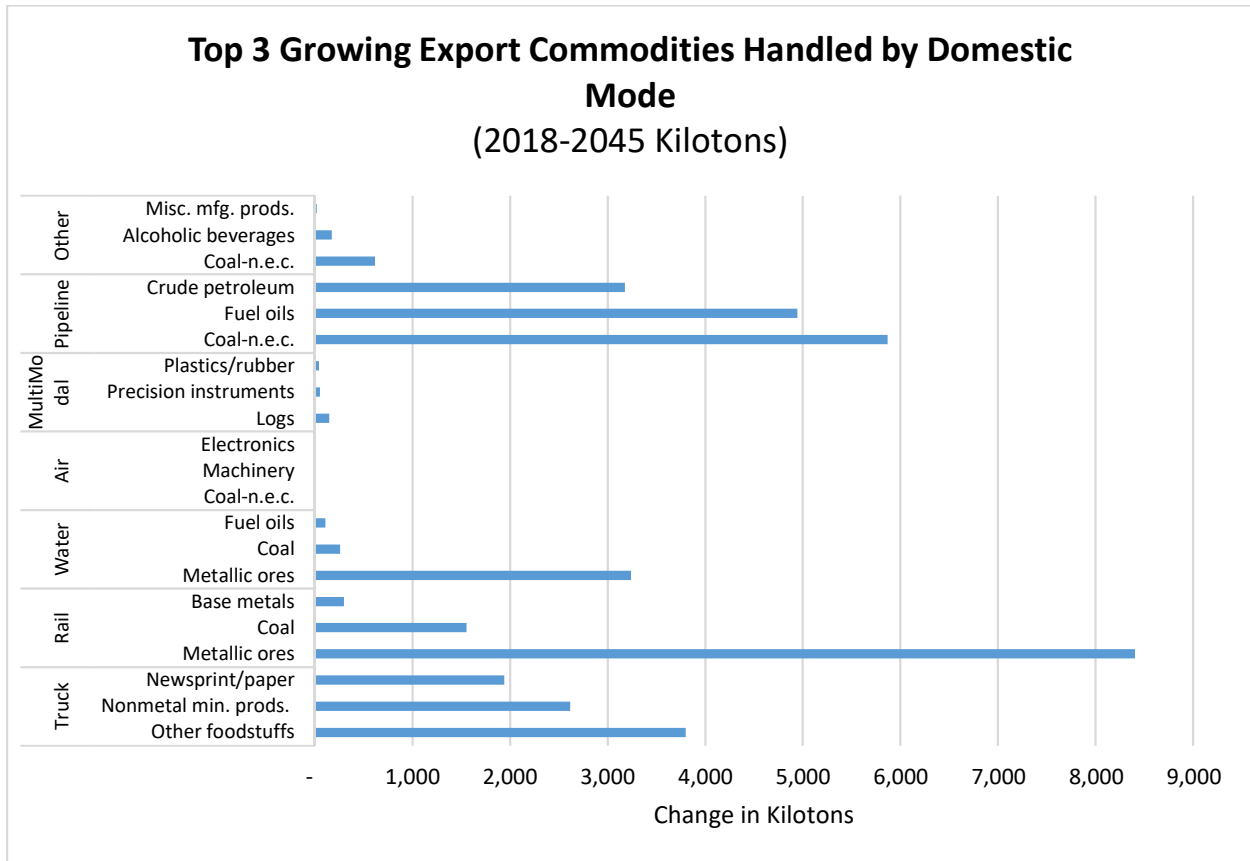
6.1 DOMESTIC MODES FEEDING INTERNATIONAL TRAFFIC

We can see from Table 6-2 that much of this usage is tied to a surge in domestic pipeline and rail-related traffic. The spike in pipeline import activity comes from Pennsylvania and Illinois bringing in Coal-N.E.C., and Crude Petroleum from Canada via Buffalo, while simultaneously we have Crude Petroleum Fuel Oils, and Coal NEC being exported via Buffalo from states such as Michigan, Pennsylvania, Illinois, and New York. Much of this activity is due to the Northern Access Pipeline – bringing a surge in coal and oil related commodities over to Western New York and Canada. With respect to international rail traffic, we see the top 4 state rail importers (Pennsylvania, New York, New Jersey, California) being responsible for approximately 65% of imports moving domestically by rail. The goods being imported are primarily Newsprint/Paper, Basic Chemicals, Transportation Equipment, and non-metallic mineral products. Simultaneously we have a surge in exports from Minnesota and Pennsylvania – expected to surge in their exportation of Metallic Ores and Coal.

Table 6-2 Domestic Mode Utilization of Buffalo-Niagara Region Ports of Entry/Exit Traffic

Domestic Modes to get to/from Buffalo-Niagara Region Ports of Entry		Tonnage		Value of Goods (2018 \$M)	
		2018	2045	2018	2045
Import	Truck	9,545	24,644	\$ 25,889.1	\$ 93,062.9
	Rail	3,880	12,577	\$ 5,992.0	\$ 21,317.4
	Water	483	691	\$ 356.4	\$ 754.8
	Air (include truck-air)	4	6	\$ 410.5	\$ 548.9
	Multiple modes & mail	546	1,378	\$ 4,233.8	\$ 13,077.8
	Pipeline	2,792	8,573	\$ 1,759.4	\$ 5,071.5
	Other and unknown	1	89	\$ 89.5	\$ 625.9
	Total	17,251	47,958	\$ 38,730.7	\$ 134,459.1
Export	Truck	10,338	34,412	\$ 39,068.2	\$ 151,575.7
	Rail	1,984	13,306	\$ 4,807.5	\$ 10,919.1
	Water	-	3,685	\$ -	\$ 1,595.8
	Air (include truck-air)	7	36	\$ 613.1	\$ 3,368.4
	Multiple modes & mail	486	538	\$ 4,137.4	\$ 4,437.6
	Pipeline	1,856	15,851	\$ 500.3	\$ 10,742.7
	Other and unknown	140	947	\$ 370.2	\$ 1,574.1
	Total	14,812	68,775	\$ 49,496.7	\$ 184,213.4

Figure 6-1 illustrates the growth in top commodities driving the surge in pipeline and rail demand. Note that these are in descending order of change in tonnage so the relative difference in length of the bar for commodities handled by each mode also serves as an indicator of the diverse range of commodities being handled. Modes such as rail and water heavily specialize in the movement of a few specific goods.

Figure 6-1 Value of Imports from Canada Handled by Ports of Entry in the Buffalo-Niagara Region

6.2 INTERNATIONAL MODES OF TRAFFIC

Putting aside the mode in which imports and exports exit and arrive into the Buffalo-Niagara region respectively, there still is the question as to which facilities they enter and leave the country by. FAF data does not report the port of entry or exit by specific port name, rather it tabulates them by the FAF zone which encompasses the port. However, given the mode by which it enters or leaves, we can infer which facilities are in play. Table 6-3 classifies the ports of entry relative to mode. Furthermore, we have distinguished between whether the traffic was tied to the Buffalo-Niagara region, coming from the rest of New York (which implicitly includes Cattaraugus County), or from the rest of the US. This serves to lend perspective as to the diversity of regional customers reliant on the Buffalo-Niagara region's ports of entry.

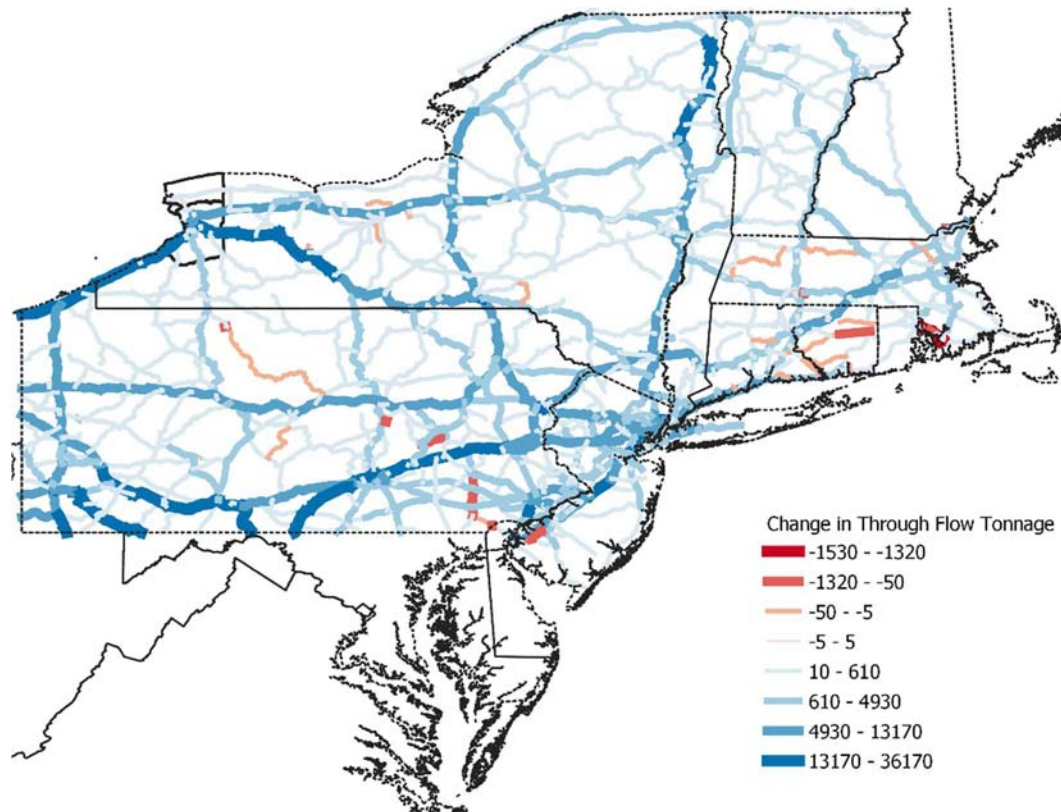
Table 6-3 International Modes of Traffic

Who Uses Buffalo-Niagara International Ports and Border Crossings?									
Crossing Mode	Domestic Market	Import				Export			
		2018		2045		2018		2045	
		Value of Goods Shipped (2018\$M)	000's of Tons	Value of Goods Shipped (2018\$M)	000's of Tons	Value of Goods Shipped (2018\$M)	000's of Tons	Value of Goods Shipped (2018\$M)	000's of Tons
Truck Crossings	Buffalo	\$996.7	666.0	\$3,719.6	1,500.3	\$756.3	276.6	\$5,343.0	1,457.2
	Rest of NY	\$4,399.5	2,934.0	\$16,386.5	6,609.6	\$9,908.8	2,098.0	\$23,538.2	6,420.1
	Rest of US	\$20,348.7	5,921.8	\$72,878.1	16,509.7	\$28,343.6	7,962.4	\$122,703.9	26,485.6
Rail Crossings	Buffalo	\$24.1	40.1	\$83.8	92.1	\$6.9	10.0	\$13.1	7.6
	Rest of NY	\$365.7	609.2	\$1,906.8	2,067.0	\$73.4	106.5	\$228.0	92.2
	Rest of US	\$5,590.9	3,205.5	\$19,239.9	10,385.5	\$4,727.2	1,867.9	\$8,735.5	3,135.5
Marine Ports	Buffalo	\$21.7	30.8	\$30.3	29.4	\$-	-	\$44.5	8.6
	Rest of NY	\$329.6	468.0	\$701.9	682.1	\$-	-	\$880.1	164.8
	Rest of US	\$35.4	32.3	\$106.3	19.9	\$-	-	\$2,659.5	13,629.7
Airports	Buffalo	\$31.3	0.3	\$41.5	0.4	\$4.2	0.1	\$162.4	2.9
	Rest of NY	\$475.4	4.7	\$470.3	4.9	\$44.6	1.1	\$217.7	1.0
	Rest of US	\$35.0	0.4	\$147.8	1.3	\$623.7	7.2	\$2,936.2	36.3
Multi Modal	Buffalo	\$97.7	14.5	\$227.5	31.6	\$26.3	2.8	\$57.5	21.8
	Rest of NY	\$1,483.7	220.1	\$4,223.4	484.5	\$276.4	29.1	\$1,001.3	373.4
	Rest of US	\$2,646.4	310.7	\$8,587.4	860.1	\$3,834.7	454.3	\$3,370.3	134.1
Pipeline	Buffalo	\$-	-	\$-	-	\$38.0	140.9	\$1,558.6	2,874.6
	Rest of NY	\$-	-	\$30.6	193.2	\$403.9	1,498.5	\$233.4	430.5
	Rest of US	\$1,759.4	2,791.8	\$5,051.6	8,397.4	\$58.4	216.5	\$8,955.3	12,552.8
UNK	Buffalo	\$33.2	0.6	\$4.3	1.2	\$298.1	100.6	\$12.6	1.2
	Rest of NY	\$0.3	0.0	\$101.3	28.6	\$24.1	0.5	\$205.5	19.8
	Rest of US	\$56.0	0.0	\$520.2	59.0	\$48.1	38.9	\$1,356.8	925.7
Sum of Above	Buffalo	\$1,204.6	752.3	\$4,107.0	1,655.1	\$1,129.8	531.0	\$7,191.7	4,374.0
	Rest of NY	\$7,054.3	4,236.0	\$23,820.7	10,070.0	\$10,731.3	3,733.7	\$26,304.2	7,501.7
	Rest of US	\$30,471.8	12,262.6	\$106,531.3	36,232.9	\$37,635.7	10,547.3	\$150,717.5	56,899.7
Total		\$38,730.7	17,250.9	\$134,459.1	47,958.0	\$49,496.7	14,812.0	\$184,213.4	68,775.4

Furthermore, if we take national, non-Buffalo-Niagara region, highway traffic and route it on the Transearch network, we can see the pattern of corridors being used by shippers and receivers. This further accentuates the significance of I-90 and I-390 as corridors supporting more than just regional traffic. Again, high use of US 20A and NYS Route 63 through Mount Morris between the Buffalo-Niagara region and I-390 is experienced. Also, a much larger volume of highway tonnage passing through the Buffalo-Niagara region to the Peace Bridge

or Lewiston-Queenston Bridge uses US 219 than does freight inbound to or outbound from the Buffalo-Niagara region. Notice that almost all major highway routes in the Buffalo-Niagara region are expected to experience an increase in pass through freight flow tonnage.

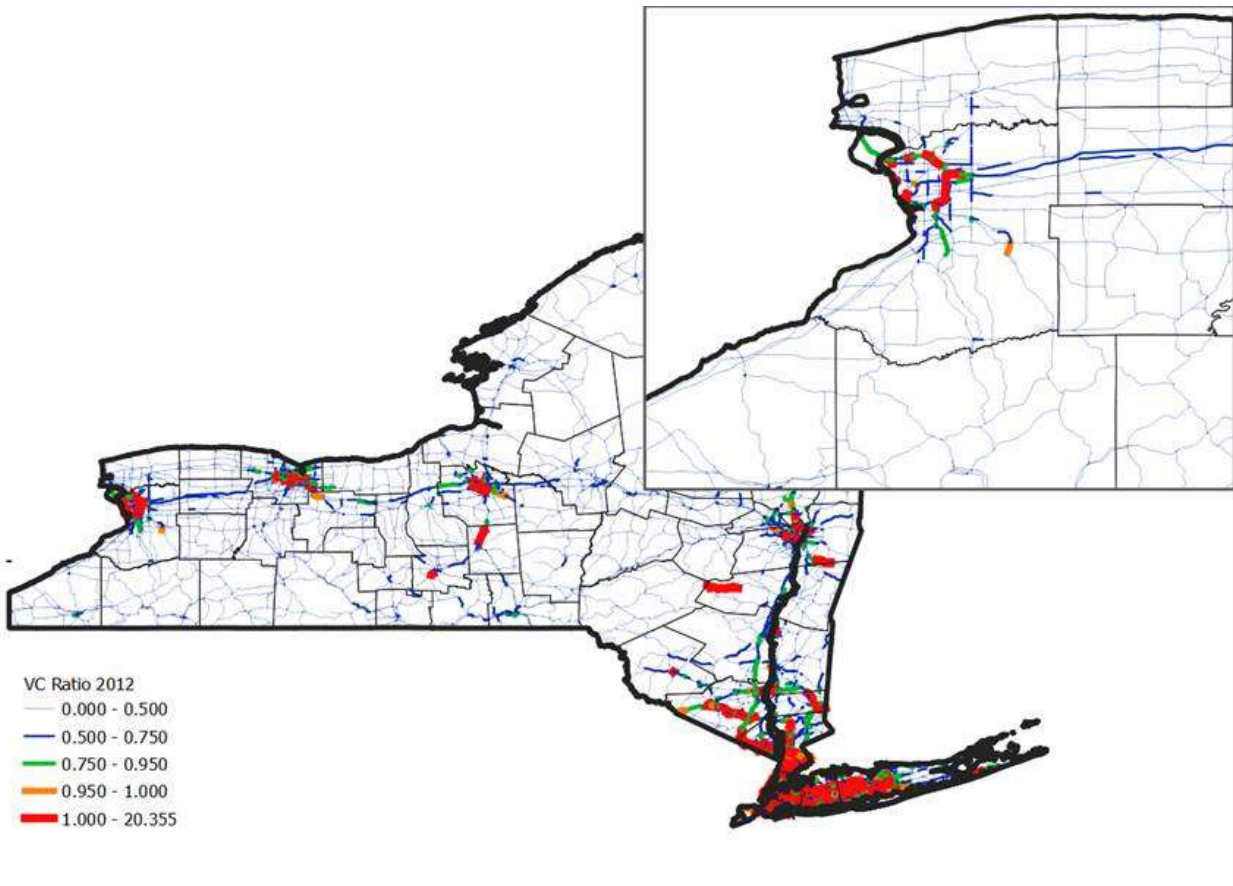
Figure 6-2 International Modes of Traffic



7 Capacity of Road Networks

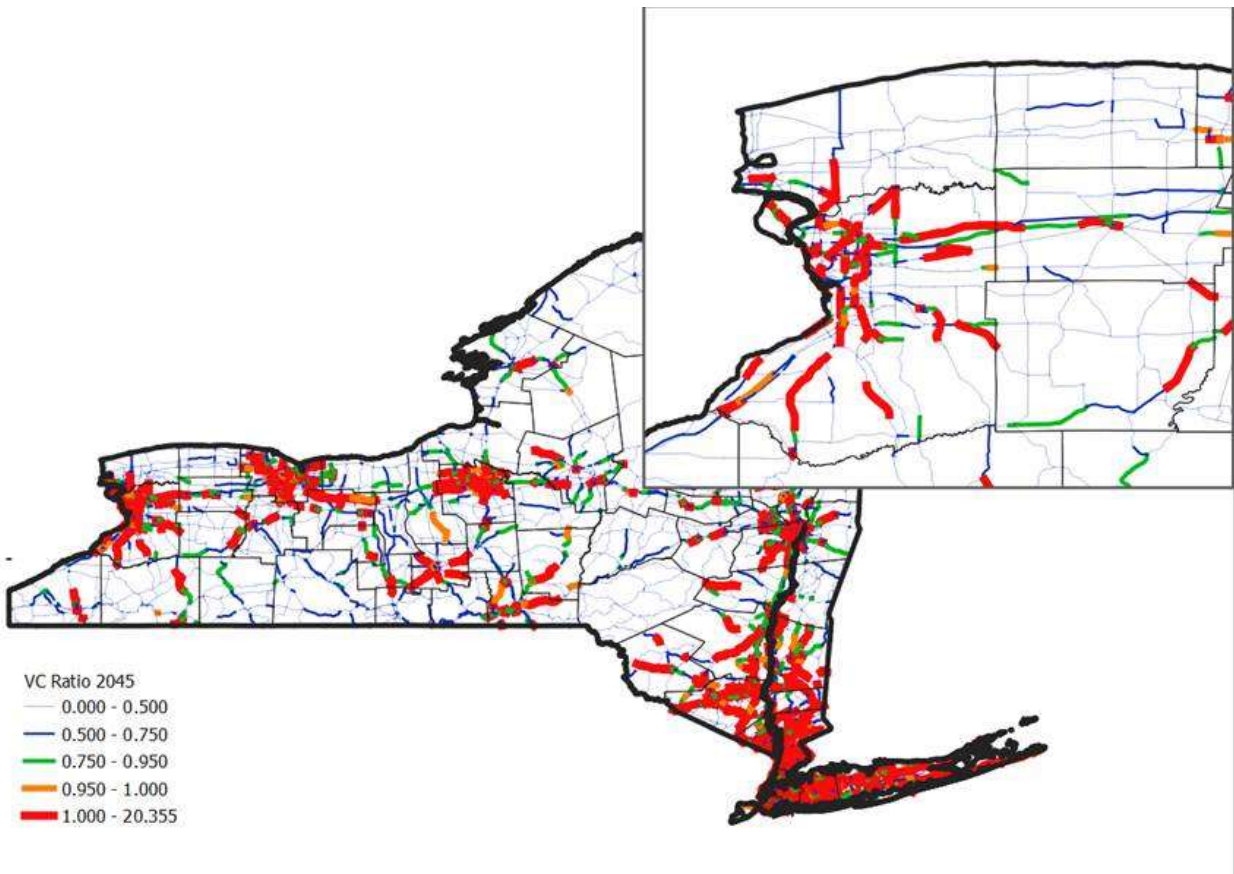
What does the growth in freight tonnage mean in the context of capacity and transportation performance? Given the forecasted growth expected to take place in the region, what can we say about the stress it will place on asset performance? Tech Memo #1 included a bottleneck analysis, which involves a look at where bottlenecks occur based on existing peak or recurring delay. Figures 7-1 and 7-2 shows the change in Volume to Capacity (V/C) Ratio, a measure of the operating capacity of roadways for both 2012 and 2045 years. Ratios greater than 1.0 (shown in red) mean that there are more vehicles traveling on a roadway segment than it is designed to handle, indicating that it is likely to suffer delay and reliability issues. This data is estimated and distributed by the Federal Highway Administration, as part of its offerings for FAF when it updates the underlying commodity flow data. As you can see the worst of the truck capacity issues historically have been centered around the downtown ring of I-90 and I-290, and much of this is confirmed in the Bottleneck analysis. Beyond the urban areas, there isn't much in the way of V/C issues in the 2012 analysis.

Figure 7-1: 2012 Volume to Capacity Analysis



Compared to 2012, the increased volumes in 2045 show V/C ratios that are indicative of congestion in and around the region – especially on the major interstates and highway. We also begin to see additional V/C constraints outside of the urban areas, especially on I-90 and some rural highways.

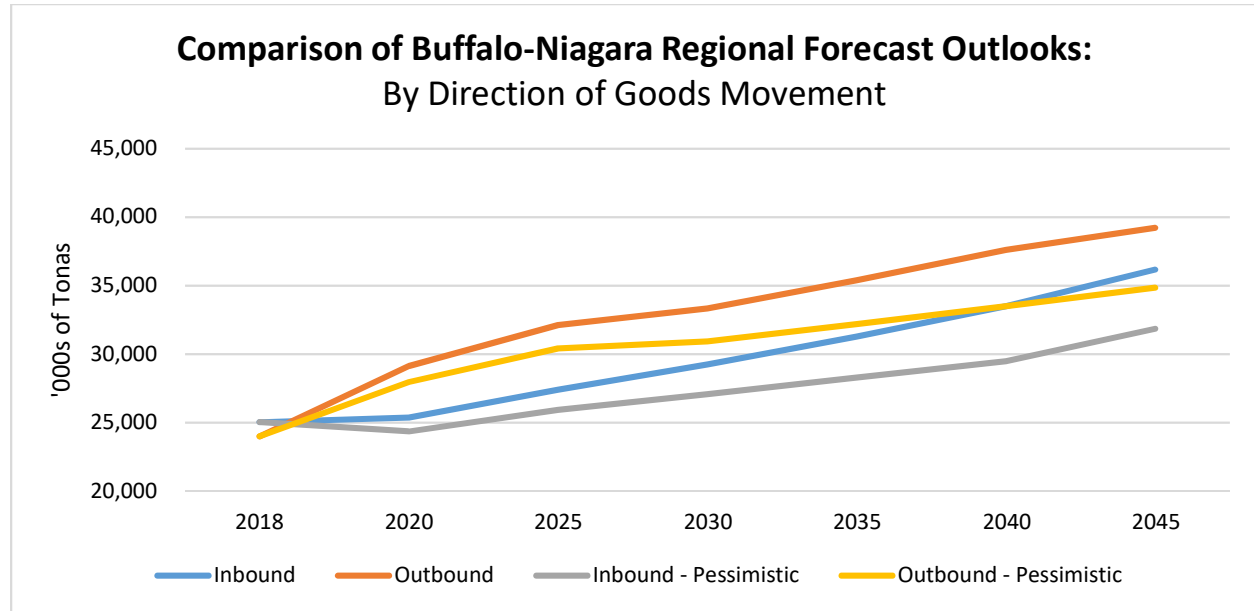
Figure 7-2: 2045 Volume to Capacity Analysis



8 Defining the Range of Economic Futures Based on Current Events

Using the alternate scenarios provided by the FAF, we can construct a range around likely future behavior to look at the sensitivity of expected future demand to current events. Forecasts by their own merit attempt to capture future events, predicated around a continuation of known trends. To mitigate this, the following Figure 8-1 presents the variation in forecasted volume – with the distance between normal and pessimistic forecasts representing a range of freight activity that we might expect sustained COVID activity to range within.

Figure 8-1 Alternate Scenario Volumes of Behavior



If we take the information contained in the preceding figure and split the directions of freight hauls into domestic versus international associated traffic, we see the following Table 8-1. Note that the difference in forecasted tonnage between scenarios varies by less than 17% in aggregate when we look at variation on a tonnage basis (because it is the closest analogue to vehicles). In terms of the differences in market share being emphasized in the 2045 variants of the forecast, we see that there is only an ever so small shift towards emphasizing the sourcing of domestic inputs over international, and a small shift towards international markets of outbound production, over domestic. Looking at the behavior of the lower bound forecast, the trend towards increased emphasis of international trade continues even with a more pessimistic forecast. We can see the evidence of this in comparing the split of domestic versus international trade for inbound and outbound freight. The trend is more muted for inbound, but still present.

Table 8-1 Volatility in Freight Demand by Direction of Freight Flow (Tonnage)

Variability in Tonnage (Thousands of Tons)					
Direction	2018	2045	% Growth	2045 Pessimistic	% Growth
Domestic Inbound	23,067	32,566	41.2%	28,991	25.7%
International Inbound	1,980	3,614	82.6%	2,874	45.2%
Internal	22,043	28,805	30.7%	25,522	15.8%

International Outbound	1,397	6,913	395.0%	6,326	352.9%
Domestic Outbound	22,618	32,320	42.9%	28,535	26.2%
Total	71,105	104,219	46.6%	92,249	29.7%

When looking at the value of goods shipped, the same tabulations are done based on shipment value in Table 8-2. There is a wider discrepancy in terms of the value of goods – with a swing of up to 22% reduction in the value of freight moving.

Table 8-2 Volatility in Freight Demand by Direction of Freight Flow (Value of Goods Shipped)

Variability in Value of Goods Shipped (2018 \$M)					
Direction	2018	2045	% Growth	2045 Pessimistic	% Growth
Domestic Inbound	\$ 35,430.1	\$ 69,547.0	96.3%	\$ 61,641.4	74.0%
International Inbound	\$ 8,439.8	\$ 11,435.4	35.5%	\$ 7,745.4	-8.2%
Internal	\$ 18,746.9	\$ 33,784.1	80.2%	\$ 29,800.5	59.0%
International Outbound	\$ 7,236.0	\$ 13,688.3	89.2%	\$ 11,363.8	57.0%
Domestic Outbound	\$ 40,670.1	\$ 61,813.5	52.0%	\$ 54,900.5	35.0%
Total	\$ 110,522.9	\$ 190,268.3	72.2%	\$ 165,451.6	49.7%

Overall, there is still a surge expected in rail and pipeline traffic for the region regardless of expected economic outcome. Differing expectations on economic performance creates a noticeable range in activity overall, as shown in Table 8-3. Trucking experiences a wider range in possible growth rates, but overall continues to represent the predominant mode of transportation by a long shot. Air and other modes present a consistent decline in activity that becomes magnified in the more pessimistic forecast of freight.

Table 8-3 Volatility in Freight Demand by Mode

Modal Variability in Tonnage ('000s of Tons)					
Mode	2018	2045	% Change	2045 Pessimistic	% Change
Truck	57,252	81,629	42.6%	72,166	26.0%
Rail	1,589	3,972	150.0%	3,537	122.6%
Water	54	82	51.9%	68	26.2%
Air (include truck-air)	43	29	-32.3%	24	-43.6%
Multiple modes & mail	1,871	2,380	27.2%	2,043	9.2%
Pipeline	10,200	16,105	57.9%	14,396	41.1%
Other and unknown	95	21	-77.5%	14	-85.0%
Total	71,105	104,219	46.6%	92,249	29.7%

From Table 8-3 we can see the variation volume by mode between normal and pessimistic forecasts. Regarding any implications these might have on overall commodities, Figure 8-2 highlights the variability in commodity movements by calculating the percent difference in tonnage from the baseline by direction of flow (inbound versus outbound). Note that there are some commodities which have more extreme swings than others, such as Tobacco, Textiles and Stone.

Figure 8-2 Volatility in Commodity Volumes by Direction

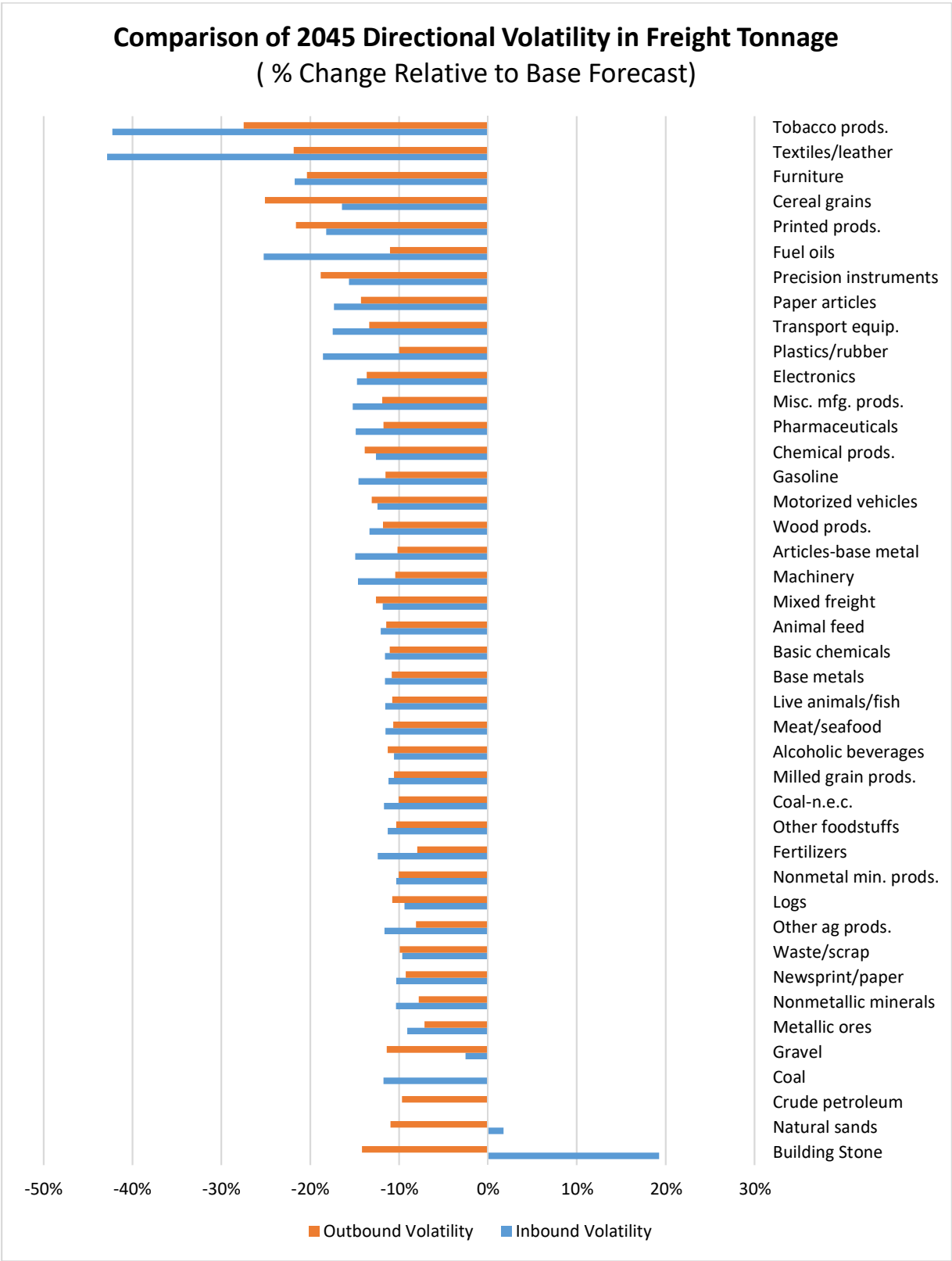


Table 8-4 below presents the above bar graph data in tabular form so that the magnitude of the change can be put into perspective relative to the base forecast volumes as a way of preventing mis identification of the prior mentioned commodities. Between the table and figure, what is most striking is that in aggregate the average deviation from the base forecast as a result of the pessimistic one, is a reduction in volume of approximately 10-11%. On a commodity by commodity basis, we can see that for the most part this is a relatively well-behaved trend. Given the nature of the alternative scenarios, it is therefore reasonable to have confidence in the presented base forecast if the presented lower bound confidence interval of an economic slump falls within 10% of the range when we are talking about the volume of regional freight activity for the region.

Table 8-4 Commodity Volatility by Direction

Comparison of Volatility in Commodity Movements: Inbound versus Outbound Freight								
Commodity Codes	Inbound Freight				Outbound Freight			
	Base	Pessimistic	Difference	% Difference	Base	Pessimistic	Difference	% Difference
Live animals/fish	39.74	35.15	(4.58)	-12%	17.97	16.03	(1.93)	-11%
Cereal grains	3,442.10	2,877.06	(565.04)	-16%	1,057.18	792.02	(265.17)	-25%
Other ag prods.	920.62	813.64	(106.99)	-12%	169.58	155.85	(13.73)	-8%
Animal feed	1,536.40	1,351.38	(185.02)	-12%	402.75	356.73	(46.02)	-11%
Meat/seafood	294.88	260.89	(33.99)	-12%	62.05	55.45	(6.60)	-11%
Milled grain prods.	1,279.19	1,136.24	(142.96)	-11%	895.74	801.22	(94.52)	-11%
Other foodstuffs	2,873.35	2,549.64	(323.71)	-11%	2,185.60	1,959.99	(225.60)	-10%
Alcoholic beverages	435.16	389.16	(46.00)	-11%	643.72	571.19	(72.54)	-11%
Tobacco prods.	0.71	0.41	(0.30)	-42%	1.02	0.74	(0.28)	-27%
Building Stone	5.50	6.56	1.06	19%	1.70	1.46	(0.24)	-14%
Natural sands	314.17	319.77	5.59	2%	2,459.46	2,189.87	(269.59)	-11%
Gravel	2,589.32	2,524.24	(65.08)	-3%	2,486.07	2,203.24	(282.82)	-11%
Nonmetallic minerals	1,393.99	1,249.93	(144.06)	-10%	112.93	104.14	(8.79)	-8%
Metallic ores	9.52	8.66	(0.86)	-9%	25.79	23.95	(1.84)	-7%
Coal	80.42	70.97	(9.44)	-12%	-	-	-	na
Crude petroleum	-	-	-	na	189.63	171.29	(18.34)	-10%
Gasoline	398.37	340.35	(58.02)	-15%	2,768.24	2,449.21	(319.03)	-12%
Fuel oils	165.56	123.80	(41.76)	-25%	600.09	534.01	(66.08)	-11%
Coal-n.e.c.	7,073.70	6,247.30	(826.40)	-12%	8,910.47	8,016.41	(894.06)	-10%
Basic chemicals	1,022.99	904.53	(118.45)	-12%	809.10	719.71	(89.39)	-11%
Pharmaceuticals	128.39	109.32	(19.07)	-15%	119.98	105.91	(14.08)	-12%
Fertilizers	71.68	62.79	(8.89)	-12%	5.66	5.21	(0.45)	-8%

Chemical prods.	2,062.81	1,803.36	(259.45)	-13%	231.51	199.44	(32.06)	-14%
Plastics/rubber	1,128.35	918.95	(209.41)	-19%	453.67	408.39	(45.28)	-10%
Logs	237.13	214.90	(22.23)	-9%	79.75	71.17	(8.58)	-11%
Wood prods.	947.81	821.51	(126.29)	-13%	491.19	433.27	(57.92)	-12%
Newsprint/paper	513.23	460.26	(52.97)	-10%	844.47	766.50	(77.97)	-9%
Paper articles	170.80	141.21	(29.59)	-17%	229.61	196.84	(32.77)	-14%
Printed prods.	51.94	42.50	(9.44)	-18%	125.98	98.79	(27.19)	-22%
Textiles/leather	100.86	57.64	(43.22)	-43%	64.55	50.45	(14.10)	-22%
Nonmetal min. prods.	1,004.87	901.29	(103.58)	-10%	763.34	686.76	(76.58)	-10%
Base metals	1,616.29	1,429.04	(187.25)	-12%	4,404.31	3,927.41	(476.90)	-11%
Articles-base metal	595.76	506.87	(88.89)	-15%	578.49	519.67	(58.82)	-10%
Machinery	402.20	343.39	(58.81)	-15%	349.94	313.51	(36.44)	-10%
Electronics	220.64	188.15	(32.49)	-15%	138.10	119.29	(18.81)	-14%
Motorized vehicles	447.64	392.07	(55.57)	-12%	168.34	146.34	(22.00)	-13%
Transport equip.	18.32	15.12	(3.20)	-17%	22.29	19.32	(2.97)	-13%
Precision instruments	45.63	38.50	(7.13)	-16%	34.52	28.02	(6.50)	-19%
Furniture	286.30	224.10	(62.20)	-22%	98.95	78.81	(20.14)	-20%
Misc. mfg. prods.	325.95	276.36	(49.59)	-15%	309.66	272.86	(36.80)	-12%
Waste/scrap	385.16	348.03	(37.13)	-10%	4,340.05	3,909.52	(430.54)	-10%
Mixed freight	1,543.02	1,360.44	(182.58)	-12%	1,579.58	1,380.87	(198.71)	-13%
Total	36,180.49	31,865.47	(4,315.02)	-12%	39,233.02	34,860.88	(4,372.15)	-11%

The preceding analysis of variability is in relation to industry activity within the Buffalo-Niagara region, and the change in draw for freight. But what is the demand for international facilities within the Buffalo-Niagara region by the rest of New York, and US? We have summarized the swings in international trade activity in Table 8-5. We break down the Use of the Facilities by Mode, and the US market making use of it as a way of differentiating between users. We find the same exaggerated impact on imports over exports, with a wider range in the volume of activity by non-NY users. Modally, the volatility in tonnage activity is similar between NY and the rest of the US when it comes to airports and cross border rail traffic, but we see wider swings in usage for trade crossing via truck and pipeline. With the completion of the Northern Access Pipeline, this isn't unexpected.

Table 8-5 Volatility in Border Traffic by Mode and Market

Variability in Demand for International Ports and Border Crossings									
Crossing Mode	Domestic Market	Import				Export			
		Forecasted 2045 Tonnage		Change in Tonnage	% Change in Tonnage	Forecasted 2045 Tonnage		Change in Tonnage	% Change in Tonnage
		Base Forecast	Slow Growth			Base Forecast	Slow Growth		
Truck Crossings	Buffalo	1,500.3	1,237.6	(262.7)	-17.5%	1,457.2	1,301.0	(156.2)	-10.7%
	Rest of NY	6,609.6	5,452.2	(1,157.4)	-17.5%	6,420.1	5,731.9	(688.3)	-10.7%
	Rest of US	16,509.7	12,694.5	(3,815.2)	-23.1%	26,485.6	23,532.7	(2,952.9)	-11.1%
Rail Crossings	Buffalo	92.1	68.6	(23.5)	-25.5%	7.6	7.1	(0.5)	-7.2%
	Rest of NY	2,067.0	1,563.9	(503.2)	-24.3%	92.2	85.5	(6.7)	-7.3%
	Rest of US	10,385.5	7,827.3	(2,558.2)	-24.6%	3,135.5	2,818.7	(316.7)	-10.1%
Marine Ports	Buffalo	29.4	25.7	(3.7)	-12.7%	8.6	8.0	(0.6)	-6.7%
	Rest of NY	682.1	598.4	(83.7)	-12.3%	164.8	154.1	(10.7)	-6.5%
	Rest of US	19.9	15.9	(4.0)	-20.3%	13,629.7	12,658.5	(971.2)	-7.1%
Airports	Buffalo	0.4	0.3	(0.1)	-33.0%	2.9	2.4	(0.4)	-14.4%
	Rest of NY	4.9	3.4	(1.5)	-30.3%	1.0	0.8	(0.2)	-18.8%
	Rest of US	1.3	0.8	(0.5)	-36.6%	36.3	29.6	(6.6)	-18.3%
Multi Modal	Buffalo	31.6	21.3	(10.2)	-32.4%	21.8	19.7	(2.1)	-9.6%
	Rest of NY	484.5	363.0	(121.5)	-25.1%	373.4	337.9	(35.5)	-9.5%
	Rest of US	860.1	643.2	(216.9)	-25.2%	134.1	107.9	(26.2)	-19.5%
Pipeline	Buffalo	-	-	-	0.0%	2,874.6	2,670.1	(204.5)	-7.1%
	Rest of NY	193.2	172.5	(20.7)	-10.7%	430.5	399.9	(30.6)	-7.1%
	Rest of US	8,397.4	5,410.1	(2,987.2)	-35.6%	12,552.8	11,659.8	(893.0)	-7.1%
UNK	Buffalo	1.2	0.6	(0.7)	-52.9%	1.2	1.0	(0.2)	-13.4%
	Rest of NY	28.6	13.9	(14.6)	-51.3%	19.8	17.3	(2.5)	-12.5%
	Rest of US	59.0	29.0	(30.0)	-50.8%	925.7	860.3	(65.4)	-7.1%
Sum of Above	Buffalo	1,655.1	1,354.1	(301.0)	-18.2%	4,374.0	4,009.5	(364.5)	-8.3%
	Rest of NY	10,070.0	8,167.3	(1,902.7)	-18.9%	7,501.7	6,727.3	(774.5)	-10.3%
	Rest of US	36,232.9	26,620.9	(9,612.1)	-26.5%	56,899.7	51,667.6	(5,232.1)	-9.2%
Total		47,958.0	36,142.3	(11,815.7)	-24.6%	68,775.4	62,404.3	(6,371.1)	-9.3%

A1 Appendix

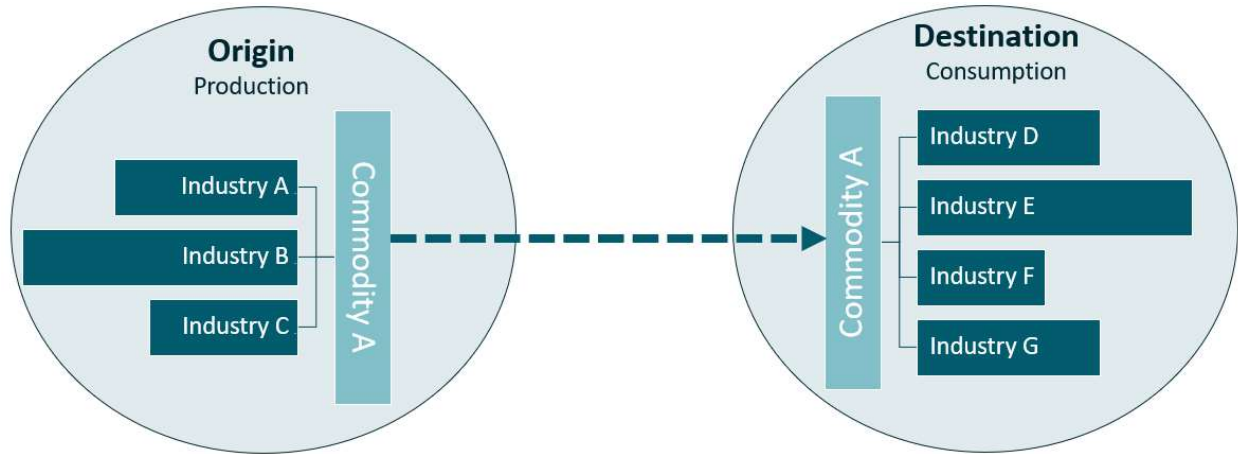
THE DATA CREATION PROCESS

The following section outlines, at a high level, the methodology that was employed to convert the FAF data, and its forecasts, into its final form as used in this document. The necessity for this customization was the result of three driving factors:

- First, the available Transearch data was from 2012 – which covers the period of recovery after the last major financial crises, so its snapshot of freight activity and forecasts were drastically different in their view of freight activity. This is what originally guided the usage of FAF – with its publicly available, multimodal, annually released data providing a more recent snapshot of freight activity.
- Second, upon settling on the use of FAF data, we had to adjust the geography because the FAF Zone encapsulating the Buffalo-Niagara region was too wide and included Cattaraugus County.
- Third, the desire to be able to route cargo to look at the growth implications on specific highway corridors was important enough to create a methodology of adapting Transearch’s routing for use with the FAF. It was expected that while the spatial pattern would have varied significantly, the routes used to traverse between regions would not have changed significantly, so could still be salvaged. To be able to route the FAF data, we would have to convert the FAF data to a pseudo county level database to match the geography of the Transearch data.

PROCESS OF DISAGGREGATING FREIGHT DATA

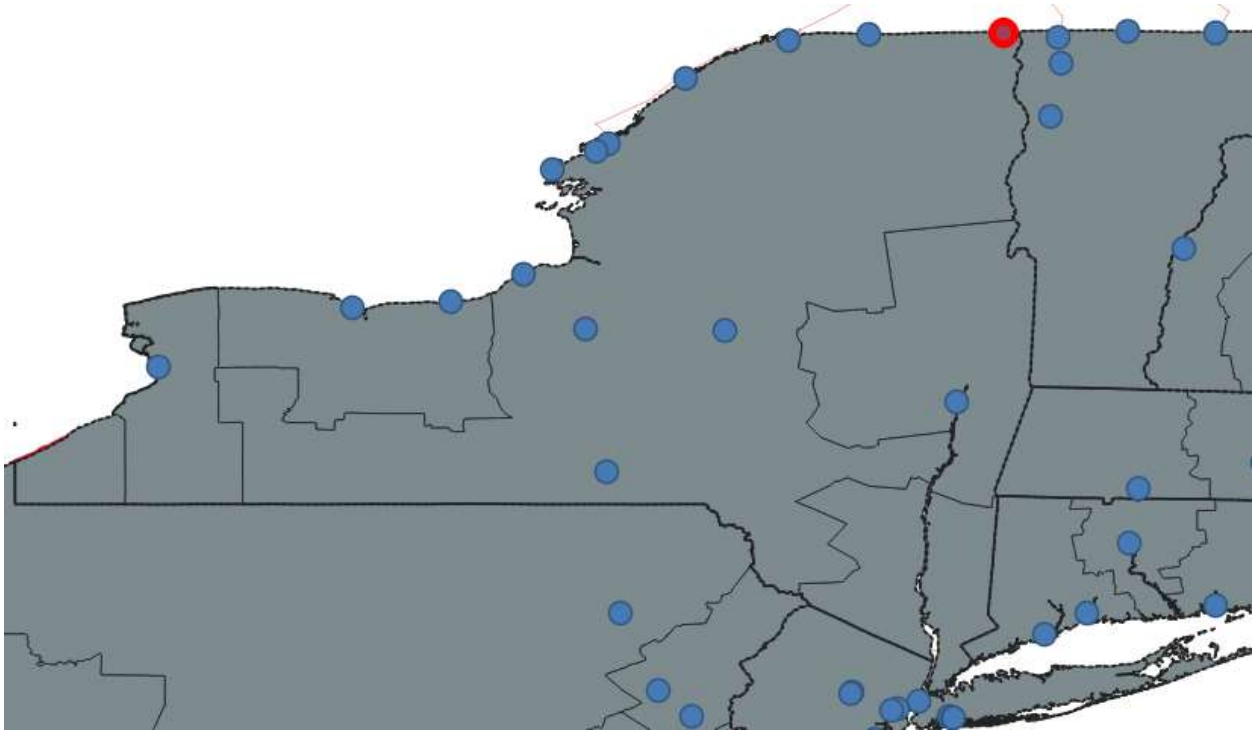
To adjust the geography from FAF zone to County, we are fundamentally addressing ways in which we could down allocate freight to a finer resolution of detail. Freight is the physical enactment of trade between industries and geographies. We employed the methodology used to produce the regional supply chain diagrams to down allocate regional data. The driving principal is to take county level industry activity, measured in gross output, trended over time from Moody’s, and combine it with an industry production function from an old national US model from IMPLAN as the basis to identifying the county level pattern of industry demand driving broader regional freight patterns. This effectively tells us the relative proportion of commodities produced and consumed by industries corresponding with the Moody’s sectors to allocate the originating FAF Zone based on its mix of industries producing the good, and similarly at the destination based on the consuming industries. The diagram below shows a stylized depiction of this process.



A variation on this process had to be repeated for international shipments. Transearch at heart is a transborder, NAFTA emphasizing freight dataset – it has a wealth of information about trade with Canada and Mexico at a provincial level, but it does not represent border crossings and other ports explicitly like the BTS transborder dataset. This runs contrary to the detail of the FAF data – which captures explicit non-NAFTA trade partners and has FAF Zones encapsulating ports of origin/destination, but no provincial detail on NAFTA trade.

A NOTE ON THE HIGHWAY ROUTING AND PORT SPECIFIC ROUTING

The challenge is that some FAF zones represent rest of areas encompassing non MSA portions of the state. These larger areas can encompass quite a few ports. Shown below, we can see such a case in New York. We can see the relationship between the FAF Zones and the port locations (blue dots). To get around this, we use the base 2018 port import/export patterns to allocate traffic between ports. Thus, the growth in traffic between ports in a FAF Zone remains fixed and scales up or down based on changes in explicit FAF flows being imported or exported in that region. Additionally, because the Transearch data had no explicit port locations built into the routing, we had to route import export traffic to the county centroids in which the port resides as a way of counteracting this limitation.



LEVERAGING TRANSEARCH ROUTING

To effectively make use of the Transearch routing, we made a critical assumption that the route of goods movement is by and large independent of the type of good on board. Based on this, we can create a distribution of paths taken based on the historical volume of cargo. This distribution of paths falls along different combination of the First and Last Node combination of variables in the Transearch data. Once the FAF zones have been disaggregated to match the geography of the Transearch data, these First and Last Nodes can be assigned based on the origin and destination. Following this, the segmentID routing from Transearch can be applied as normal to produce routed corridors based on the logic encapsulated in the Transearch database.

A2. Supporting Data on Breaking Down Growth in Market Activity

Flow Type	Country Code	Country Name	sctg2	SCTG2 Description	Value of Goods Shipped		X	Y	Z
					2018	2045			
Import	801	Canada	1	Live animals/fish	2.36	3.75	0.50	1.58	1.39
Import	801	Canada	2	Cereal grains	21.51	16.55	0.24	0.49	(4.95)
Import	801	Canada	3	Other ag prods.	35.33	99.35	0.89	2.71	64.02
Import	801	Canada	4	Animal feed	20.07	39.00	0.62	1.09	18.94
Import	801	Canada	5	Meat/seafood	43.49	90.57	0.66	1.08	47.08
Import	801	Canada	6	Milled grain prods.	30.14	86.02	0.90	0.98	55.87
Import	801	Canada	7	Other foodstuffs	90.52	172.29	0.60	1.25	81.78
Import	801	Canada	8	Alcoholic beverages	8.11	58.11	2.27	4.59	50.00
Import	801	Canada	9	Tobacco prods.	12.10	5.22	0.14	2.21	(6.88)
Import	801	Canada	10	Building Stone	0.03	0.11	1.21	28.58	0.08
Import	801	Canada	11	Natural sands	0.06	0.11	0.61	2.12	0.05
Import	801	Canada	12	Gravel	0.61	0.04	0.02	0.08	(0.57)
Import	801	Canada	13	Nonmetallic minerals	4.01	5.53	0.44	0.93	1.52
Import	801	Canada	14	Metallic ores	0.12	0.05	0.13	0.22	(0.07)
Import	801	Canada	15	Coal	0.00	-	-	-	(0.00)
Import	801	Canada	16	Crude petroleum	-	-	-	-	-
Import	801	Canada	17	Gasoline	20.48	37.65	0.58	2.69	17.17
Import	801	Canada	18	Fuel oils	57.44	58.97	0.33	2.13	1.53

Import	801	Canada	19	Coal-n.e.c.	34.21	36.07	0.33	0.79	1.87
Import	801	Canada	20	Basic chemicals	22.91	55.46	0.77	0.69	32.55
Import	801	Canada	21	Pharmaceuticals	39.66	256.88	2.05	1.89	217.22
Import	801	Canada	22	Fertilizers	4.30	7.35	0.54	1.30	3.05
Import	801	Canada	23	Chemical prods.	50.17	182.60	1.15	0.59	132.43
Import	801	Canada	24	Plastics/rubber	83.20	315.62	1.20	1.05	232.41
Import	801	Canada	25	Logs	0.15	0.43	0.90	1.11	0.28
Import	801	Canada	26	Wood prods.	32.58	74.83	0.73	1.53	42.25
Import	801	Canada	27	Newsprint/paper	51.84	115.16	0.70	2.50	63.32
Import	801	Canada	28	Paper articles	30.93	73.07	0.75	1.59	42.14
Import	801	Canada	29	Printed prods.	16.01	28.00	0.55	1.36	11.99
Import	801	Canada	30	Textiles/leather	60.73	180.90	0.94	3.45	120.17
Import	801	Canada	31	Nonmetal min. prods.	27.84	104.69	1.19	2.30	76.85
Import	801	Canada	32	Base metals	207.96	440.03	0.67	1.35	232.07
Import	801	Canada	33	Articles-base metal	69.96	152.64	0.69	1.29	82.68
Import	801	Canada	34	Machinery	128.92	693.44	1.70	2.00	564.51
Import	801	Canada	35	Electronics	110.58	314.88	0.90	1.51	204.30
Import	801	Canada	36	Motorized vehicles	47.50	88.99	0.59	1.56	41.49
Import	801	Canada	37	Transport equip.	18.07	122.77	2.15	3.00	104.70
Import	801	Canada	38	Precision instruments	18.74	104.59	1.77	2.28	85.85
Import	801	Canada	39	Furniture	54.90	310.62	1.79	2.99	255.72
Import	801	Canada	40	Misc. mfg. prods.	205.04	1,142.93	1.77	4.69	937.89
Import	801	Canada	41	Waste/scrap	109.35	114.59	0.33	1.28	5.25

Import	801	Canada	43	Mixed freight	5.08	21.59	1.34	2.96	16.50
Import	801	Canada	99	Unknown	-	-	-	-	-
Import	802	Mexico	1	Live animals/fish	0.27	-	-	-	(0.27)
Import	802	Mexico	2	Cereal grains	0.00	-	-	-	(0.00)
Import	802	Mexico	3	Other ag prods.	7.23	12.58	0.74	1.68	5.35
Import	802	Mexico	4	Animal feed	0.23	0.11	0.21	0.27	(0.12)
Import	802	Mexico	5	Meat/seafood	0.66	0.86	0.55	0.68	0.20
Import	802	Mexico	6	Milled grain prods.	0.67	1.97	1.26	1.02	1.31
Import	802	Mexico	7	Other foodstuffs	7.58	16.04	0.90	1.39	8.46
Import	802	Mexico	8	Alcoholic beverages	13.99	2.24	0.07	0.10	(11.74)
Import	802	Mexico	9	Tobacco prods.	-	0.04	-	-	0.04
Import	802	Mexico	10	Building Stone	-	-	-	-	-
Import	802	Mexico	11	Natural sands	-	-	-	-	-
Import	802	Mexico	12	Gravel	-	-	-	-	-
Import	802	Mexico	13	Nonmetallic minerals	0.74	0.64	0.37	0.59	(0.10)
Import	802	Mexico	14	Metallic ores	0.32	0.88	1.18	1.52	0.57
Import	802	Mexico	15	Coal	-	-	-	-	-
Import	802	Mexico	16	Crude petroleum	-	-	-	-	-
Import	802	Mexico	17	Gasoline	-	0.10	-	-	0.10
Import	802	Mexico	18	Fuel oils	0.00	-	-	-	(0.00)
Import	802	Mexico	19	Coal-n.e.c.	-	0.00	-	-	0.00

Import	802	Mexico	20	Basic chemicals	2.22	3.25	0.62	0.42	1.04
Import	802	Mexico	21	Pharmaceuticals	0.55	0.43	0.33	0.22	(0.13)
Import	802	Mexico	22	Fertilizers	-	-	-	-	-
Import	802	Mexico	23	Chemical prods.	1.33	10.92	3.48	1.33	9.59
Import	802	Mexico	24	Plastics/rubber	4.22	19.18	1.93	1.26	14.96
Import	802	Mexico	25	Logs	-	1.49	-	-	1.49
Import	802	Mexico	26	Wood prods.	0.06	0.14	1.07	1.69	0.09
Import	802	Mexico	27	Newsprint/paper	0.67	0.34	0.21	0.57	(0.33)
Import	802	Mexico	28	Paper articles	0.11	0.34	1.31	2.09	0.23
Import	802	Mexico	29	Printed prods.	0.25	2.04	3.52	6.46	1.80
Import	802	Mexico	30	Textiles/leather	9.60	29.91	1.32	3.61	20.31
Import	802	Mexico	31	Nonmetal min. prods.	1.02	11.27	4.66	6.74	10.24
Import	802	Mexico	32	Base metals	0.88	30.88	14.93	22.51	30.00
Import	802	Mexico	33	Articles-base metal	3.21	4.95	0.65	0.91	1.74
Import	802	Mexico	34	Machinery	71.86	151.20	0.89	0.78	79.34
Import	802	Mexico	35	Electronics	35.80	83.68	0.99	1.24	47.88
Import	802	Mexico	36	Motorized vehicles	3.43	8.86	1.09	2.15	5.43
Import	802	Mexico	37	Transport equip.	2.71	9.45	1.48	1.54	6.74
Import	802	Mexico	38	Precision instruments	20.12	58.42	1.23	1.18	38.30
Import	802	Mexico	39	Furniture	4.58	11.35	1.05	1.31	6.77
Import	802	Mexico	40	Misc. mfg. prods.	10.80	11.45	0.45	0.89	0.65
Import	802	Mexico	41	Waste/scrap	0.32	0.26	0.34	0.99	(0.06)
Import	802	Mexico	43	Mixed freight	0.39	0.60	0.64	1.05	0.20

Import	802	Mexico	99	Unknown	-	-	-	-	-
Import	803	Rest of Americas	1	Live animals/fish	0.13	0.00	0.00	0.00	(0.13)
Import	803	Rest of Americas	2	Cereal grains	0.96	0.09	0.05	0.06	(0.87)
Import	803	Rest of Americas	3	Other ag prods.	33.21	22.00	0.33	0.64	(11.21)
Import	803	Rest of Americas	4	Animal feed	3.26	20.07	3.09	3.44	16.80
Import	803	Rest of Americas	5	Meat/seafood	20.88	9.34	0.22	0.23	(11.54)
Import	803	Rest of Americas	6	Milled grain prods.	1.74	6.60	1.90	1.30	4.85
Import	803	Rest of Americas	7	Other foodstuffs	26.19	57.54	1.10	1.44	31.34
Import	803	Rest of Americas	8	Alcoholic beverages	7.55	5.54	0.37	0.47	(2.01)
Import	803	Rest of Americas	9	Tobacco prods.	0.01	0.00	0.13	1.37	(0.01)
Import	803	Rest of Americas	10	Building Stone	0.00	0.04	15.02	223.36	0.04
Import	803	Rest of Americas	11	Natural sands	0.00	-	-	-	(0.00)
Import	803	Rest of Americas	12	Gravel	-	0.00	-	-	0.00
Import	803	Rest of Americas	13	Nonmetallic minerals	1.02	0.71	0.35	0.47	(0.31)
Import	803	Rest of Americas	14	Metallic ores	0.03	0.00	0.02	0.02	(0.03)
Import	803	Rest of Americas	15	Coal	-	-	-	-	-
Import	803	Rest of Americas	16	Crude petroleum	-	-	-	-	-
Import	803	Rest of Americas	17	Gasoline	1.22	-	-	-	(1.22)
Import	803	Rest of Americas	18	Fuel oils	2.65	-	-	-	(2.65)
Import	803	Rest of Americas	19	Coal-n.e.c.	0.89	0.08	0.04	0.07	(0.81)
Import	803	Rest of Americas	20	Basic chemicals	10.95	12.99	0.60	0.34	2.04

Import	803	Rest of Americas	21	Pharmaceuticals	0.13	0.34	1.35	0.78	0.21
Import	803	Rest of Americas	22	Fertilizers	0.00	-	-	-	(0.00)
Import	803	Rest of Americas	23	Chemical prods.	0.97	4.48	2.31	0.75	3.50
Import	803	Rest of Americas	24	Plastics/rubber	3.29	13.52	2.06	1.14	10.23
Import	803	Rest of Americas	25	Logs	0.00	0.01	1.73	1.35	0.01
Import	803	Rest of Americas	26	Wood prods.	8.05	2.48	0.15	0.21	(5.58)
Import	803	Rest of Americas	27	Newsprint/paper	6.08	0.82	0.07	0.15	(5.26)
Import	803	Rest of Americas	28	Paper articles	0.32	0.32	0.50	0.67	(0.00)
Import	803	Rest of Americas	29	Printed prods.	0.28	0.22	0.40	0.61	(0.06)
Import	803	Rest of Americas	30	Textiles/leather	40.08	169.23	2.12	4.89	129.15
Import	803	Rest of Americas	31	Nonmetal min. prods.	1.33	24.55	9.23	11.25	23.21
Import	803	Rest of Americas	32	Base metals	7.98	27.13	1.71	2.17	19.15
Import	803	Rest of Americas	33	Articles-base metal	3.47	7.79	1.13	1.32	4.31
Import	803	Rest of Americas	34	Machinery	3.90	8.62	1.11	0.82	4.72
Import	803	Rest of Americas	35	Electronics	6.60	10.30	0.78	0.83	3.70
Import	803	Rest of Americas	36	Motorized vehicles	0.14	0.17	0.62	1.03	0.03
Import	803	Rest of Americas	37	Transport equip.	1.49	1.99	0.67	0.59	0.50
Import	803	Rest of Americas	38	Precision instruments	5.79	1.27	0.11	0.09	(4.53)
Import	803	Rest of Americas	39	Furniture	2.19	74.38	17.05	17.96	72.19
Import	803	Rest of Americas	40	Misc. mfg. prods.	59.56	41.19	0.35	0.58	(18.36)
Import	803	Rest of Americas	41	Waste/scrap	3.13	11.85	1.90	4.63	8.72
Import	803	Rest of Americas	43	Mixed freight	3.79	1.18	0.16	0.22	(2.60)
Import	803	Rest of Americas	99	Unknown	-	-	-	-	-

Import	804	Europe	1	Live animals/fish	14.94	0.00	0.00	0.00	(14.94)
Import	804	Europe	2	Cereal grains	1.36	0.15	0.19	0.07	(1.21)
Import	804	Europe	3	Other ag prods.	10.37	7.59	1.22	0.70	(2.78)
Import	804	Europe	4	Animal feed	3.58	4.52	2.10	0.71	0.94
Import	804	Europe	5	Meat/seafood	13.82	7.02	0.85	0.26	(6.80)
Import	804	Europe	6	Milled grain prods.	11.56	4.90	0.71	0.15	(6.66)
Import	804	Europe	7	Other foodstuffs	66.87	55.50	1.38	0.54	(11.36)
Import	804	Europe	8	Alcoholic beverages	153.34	65.25	0.71	0.27	(88.08)
Import	804	Europe	9	Tobacco prods.	0.11	0.00	0.00	0.00	(0.11)
Import	804	Europe	10	Building Stone	0.06	0.00	0.12	0.52	(0.05)
Import	804	Europe	11	Natural sands	0.00	-	-	-	(0.00)
Import	804	Europe	12	Gravel	0.00	0.00	2.32	1.78	0.00
Import	804	Europe	13	Nonmetallic minerals	0.64	0.47	1.22	0.50	(0.17)
Import	804	Europe	14	Metallic ores	1.47	11.42	12.91	4.25	9.95
Import	804	Europe	15	Coal	-	-	-	-	-
Import	804	Europe	16	Crude petroleum	-	-	-	-	-
Import	804	Europe	17	Gasoline	4.47	0.00	0.00	0.00	(4.47)
Import	804	Europe	18	Fuel oils	8.58	0.00	0.00	0.00	(8.57)
Import	804	Europe	19	Coal-n.e.c.	3.08	0.30	0.16	0.07	(2.78)
Import	804	Europe	20	Basic chemicals	33.55	77.23	3.83	0.66	43.68
Import	804	Europe	21	Pharmaceuticals	64.87	12.41	0.32	0.06	(52.46)
Import	804	Europe	22	Fertilizers	1.60	-	-	-	(1.60)
Import	804	Europe	23	Chemical prods.	128.44	91.71	1.19	0.12	(36.73)

Import	804	Europe	24	Plastics/rubber	26.48	52.95	3.33	0.56	26.47
Import	804	Europe	25	Logs	0.18	-	-	-	(0.18)
Import	804	Europe	26	Wood prods.	5.38	2.87	0.89	0.36	(2.51)
Import	804	Europe	27	Newsprint/paper	13.48	4.64	0.57	0.39	(8.84)
Import	804	Europe	28	Paper articles	3.41	0.21	0.10	0.04	(3.20)
Import	804	Europe	29	Printed prods.	11.96	13.14	1.83	0.85	1.18
Import	804	Europe	30	Textiles/leather	191.96	46.44	0.40	0.28	(145.52)
Import	804	Europe	31	Nonmetal min. prods.	25.41	11.34	0.74	0.27	(14.07)
Import	804	Europe	32	Base metals	22.90	113.51	8.25	3.17	90.61
Import	804	Europe	33	Articles-base metal	27.47	27.52	1.67	0.59	0.04
Import	804	Europe	34	Machinery	135.43	365.78	4.50	1.00	230.35
Import	804	Europe	35	Electronics	103.74	128.61	2.06	0.66	24.87
Import	804	Europe	36	Motorized vehicles	33.06	9.63	0.49	0.24	(23.43)
Import	804	Europe	37	Transport equip.	30.43	16.04	0.88	0.23	(14.40)
Import	804	Europe	38	Precision instruments	112.62	75.72	1.12	0.27	(36.90)
Import	804	Europe	39	Furniture	33.26	28.53	1.43	0.45	(4.73)
Import	804	Europe	40	Misc. mfg. prods.	946.54	96.77	0.17	0.09	(849.77)
Import	804	Europe	41	Waste/scrap	5.51	0.65	0.20	0.14	(4.86)
Import	804	Europe	43	Mixed freight	19.74	31.66	2.67	1.12	11.92
Import	804	Europe	99	Unknown	-	-	-	-	-
Import	805	Africa	1	Live animals/fish	0.01	0.00	0.15	0.09	(0.01)
Import	805	Africa	2	Cereal grains	0.05	0.00	0.02	0.01	(0.05)
Import	805	Africa	3	Other ag prods.	4.95	4.50	1.43	0.88	(0.45)

Import	805	Africa	4	Animal feed	0.30	0.48	2.52	0.89	0.18
Import	805	Africa	5	Meat/seafood	4.07	1.10	0.43	0.14	(2.97)
Import	805	Africa	6	Milled grain prods.	0.14	0.03	0.40	0.09	(0.10)
Import	805	Africa	7	Other foodstuffs	12.71	1.31	0.16	0.07	(11.40)
Import	805	Africa	8	Alcoholic beverages	0.69	1.52	3.50	1.42	0.84
Import	805	Africa	9	Tobacco prods.	-	-	-	-	-
Import	805	Africa	10	Building Stone	0.00	0.00	2.72	12.86	0.00
Import	805	Africa	11	Natural sands	-	-	-	-	-
Import	805	Africa	12	Gravel	-	-	-	-	-
Import	805	Africa	13	Nonmetallic minerals	0.31	0.70	3.57	1.54	0.39
Import	805	Africa	14	Metallic ores	0.01	0.00	0.15	0.05	(0.01)
Import	805	Africa	15	Coal	-	-	-	-	-
Import	805	Africa	16	Crude petroleum	-	-	-	-	-
Import	805	Africa	17	Gasoline	-	-	-	-	-
Import	805	Africa	18	Fuel oils	-	-	-	-	-
Import	805	Africa	19	Coal-n.e.c.	0.09	0.09	1.62	0.77	0.00
Import	805	Africa	20	Basic chemicals	2.01	6.51	5.10	0.92	4.50
Import	805	Africa	21	Pharmaceuticals	0.04	0.12	4.30	0.79	0.07
Import	805	Africa	22	Fertilizers	0.00	0.01	70.89	34.27	0.01
Import	805	Africa	23	Chemical prods.	0.58	0.62	1.67	0.17	0.04
Import	805	Africa	24	Plastics/rubber	0.37	1.08	4.65	0.82	0.72
Import	805	Africa	25	Logs	0.00	0.00	0.09	0.02	(0.00)
Import	805	Africa	26	Wood prods.	0.14	0.05	0.57	0.24	(0.09)

Import	805	Africa	27	Newsprint/paper	0.30	0.07	0.36	0.26	(0.23)
Import	805	Africa	28	Paper articles	0.02	0.00	0.10	0.04	(0.02)
Import	805	Africa	29	Printed prods.	0.17	0.03	0.29	0.14	(0.14)
Import	805	Africa	30	Textiles/leather	26.75	17.98	1.06	0.78	(8.77)
Import	805	Africa	31	Nonmetal min. prods.	0.20	1.37	10.68	4.15	1.17
Import	805	Africa	32	Base metals	5.72	10.93	3.01	1.22	5.21
Import	805	Africa	33	Articles-base metal	1.37	105.07	121.08	45.25	103.70
Import	805	Africa	34	Machinery	0.71	0.17	0.37	0.09	(0.55)
Import	805	Africa	35	Electronics	0.35	0.09	0.38	0.13	(0.26)
Import	805	Africa	36	Motorized vehicles	0.02	0.05	3.33	1.76	0.03
Import	805	Africa	37	Transport equip.	0.01	0.58	72.91	20.40	0.56
Import	805	Africa	38	Precision instruments	0.11	0.06	0.91	0.23	(0.05)
Import	805	Africa	39	Furniture	0.17	0.06	0.52	0.18	(0.11)
Import	805	Africa	40	Misc. mfg. prods.	191.50	6.18	0.05	0.03	(185.32)
Import	805	Africa	41	Waste/scrap	0.01	-	-	-	(0.01)
Import	805	Africa	43	Mixed freight	0.08	0.33	6.64	2.94	0.26
Import	805	Africa	99	Unknown	-	-	-	-	-
Import	806	SW & Central Asia	1	Live animals/fish	0.04	0.00	0.01	0.01	(0.04)
Import	806	SW & Central Asia	2	Cereal grains	3.40	0.63	0.35	0.12	(2.77)
Import	806	SW & Central Asia	3	Other ag prods.	8.22	29.65	6.89	3.47	21.43
Import	806	SW & Central Asia	4	Animal feed	0.48	0.56	2.22	0.65	0.08
Import	806	SW & Central Asia	5	Meat/seafood	14.22	2.64	0.35	0.10	(11.58)
Import	806	SW & Central Asia	6	Milled grain prods.	2.58	0.99	0.74	0.13	(1.58)

Import	806	SW & Central Asia	7	Other foodstuffs	13.86	7.43	1.02	0.35	(6.43)
Import	806	SW & Central Asia	8	Alcoholic beverages	0.76	0.15	0.38	0.13	(0.61)
Import	806	SW & Central Asia	9	Tobacco prods.	0.01	0.00	0.62	1.66	(0.00)
Import	806	SW & Central Asia	10	Building Stone	0.07	0.00	0.08	0.32	(0.06)
Import	806	SW & Central Asia	11	Natural sands	-	-	-	-	-
Import	806	SW & Central Asia	12	Gravel	0.01	0.00	0.27	0.18	(0.01)
Import	806	SW & Central Asia	13	Nonmetallic minerals	0.79	0.64	1.55	0.55	(0.15)
Import	806	SW & Central Asia	14	Metallic ores	0.02	0.00	0.08	0.02	(0.02)
Import	806	SW & Central Asia	15	Coal	-	-	-	-	-
Import	806	SW & Central Asia	16	Crude petroleum	-	-	-	-	-
Import	806	SW & Central Asia	17	Gasoline	-	-	-	-	-
Import	806	SW & Central Asia	18	Fuel oils	5.82	-	-	-	(5.82)
Import	806	SW & Central Asia	19	Coal-n.e.c.	0.43	0.51	2.23	0.88	0.07
Import	806	SW & Central Asia	20	Basic chemicals	18.19	20.42	2.14	0.32	2.22
Import	806	SW & Central Asia	21	Pharmaceuticals	9.39	1.75	0.36	0.05	(7.64)
Import	806	SW & Central Asia	22	Fertilizers	0.03	0.05	3.41	1.36	0.02
Import	806	SW & Central Asia	23	Chemical prods.	6.41	14.94	4.45	0.38	8.53
Import	806	SW & Central Asia	24	Plastics/rubber	15.81	22.89	2.76	0.40	7.07
Import	806	SW & Central Asia	25	Logs	0.00	-	-	-	(0.00)
Import	806	SW & Central Asia	26	Wood prods.	0.71	0.03	0.09	0.03	(0.68)
Import	806	SW & Central Asia	27	Newsprint/paper	3.30	0.15	0.09	0.05	(3.15)
Import	806	SW & Central Asia	28	Paper articles	0.66	0.16	0.47	0.17	(0.50)
Import	806	SW & Central Asia	29	Printed prods.	1.39	0.71	0.98	0.40	(0.67)

Import	806	SW & Central Asia	30	Textiles/leather	170.40	251.22	2.82	1.71	80.82
Import	806	SW & Central Asia	31	Nonmetal min. prods.	4.44	2.97	1.28	0.41	(1.47)
Import	806	SW & Central Asia	32	Base metals	10.51	64.23	11.68	3.91	53.72
Import	806	SW & Central Asia	33	Articles-base metal	10.60	116.75	21.04	6.49	106.15
Import	806	SW & Central Asia	34	Machinery	10.75	12.32	2.19	0.43	1.57
Import	806	SW & Central Asia	35	Electronics	16.31	7.49	0.88	0.24	(8.82)
Import	806	SW & Central Asia	36	Motorized vehicles	2.09	13.37	12.23	5.33	11.28
Import	806	SW & Central Asia	37	Transport equip.	1.00	0.65	1.24	0.29	(0.35)
Import	806	SW & Central Asia	38	Precision instruments	9.80	31.40	6.12	1.31	21.61
Import	806	SW & Central Asia	39	Furniture	4.95	2.61	1.01	0.28	(2.34)
Import	806	SW & Central Asia	40	Misc. mfg. prods.	1,116.95	125.75	0.22	0.09	(991.19)
Import	806	SW & Central Asia	41	Waste/scrap	0.80	0.04	0.10	0.06	(0.76)
Import	806	SW & Central Asia	43	Mixed freight	8.37	38.24	8.73	3.19	29.87
Import	806	SW & Central Asia	99	Unknown	-	-	-	-	-
Import	807	Eastern Asia	1	Live animals/fish	0.23	0.00	0.00	0.00	(0.23)
Import	807	Eastern Asia	2	Cereal grains	0.15	0.00	0.00	0.00	(0.15)
Import	807	Eastern Asia	3	Other ag prods.	8.58	13.96	1.36	1.57	5.38
Import	807	Eastern Asia	4	Animal feed	4.21	23.69	4.72	3.15	19.47
Import	807	Eastern Asia	5	Meat/seafood	13.93	7.45	0.45	0.28	(6.48)
Import	807	Eastern Asia	6	Milled grain prods.	3.90	1.46	0.31	0.13	(2.44)
Import	807	Eastern Asia	7	Other foodstuffs	16.62	17.36	0.88	0.69	0.74
Import	807	Eastern Asia	8	Alcoholic beverages	1.42	0.40	0.24	0.18	(1.02)
Import	807	Eastern Asia	9	Tobacco prods.	0.00	0.07	16.04	97.72	0.07

Import	807	Eastern Asia	10	Building Stone	0.16	0.01	0.03	0.30	(0.16)
Import	807	Eastern Asia	11	Natural sands	0.01	-	-	-	(0.01)
Import	807	Eastern Asia	12	Gravel	0.00	0.00	0.22	0.34	(0.00)
Import	807	Eastern Asia	13	Nonmetallic minerals	0.51	1.47	2.43	1.97	0.96
Import	807	Eastern Asia	14	Metallic ores	0.03	0.13	3.15	2.06	0.09
Import	807	Eastern Asia	15	Coal	-	0.00	-	-	0.00
Import	807	Eastern Asia	16	Crude petroleum	-	-	-	-	-
Import	807	Eastern Asia	17	Gasoline	2.65	0.01	0.00	0.01	(2.64)
Import	807	Eastern Asia	18	Fuel oils	0.00	-	-	-	(0.00)
Import	807	Eastern Asia	19	Coal-n.e.c.	1.09	0.02	0.01	0.01	(1.08)
Import	807	Eastern Asia	20	Basic chemicals	69.97	117.84	1.41	0.48	47.87
Import	807	Eastern Asia	21	Pharmaceuticals	4.62	10.71	1.94	0.67	6.09
Import	807	Eastern Asia	22	Fertilizers	0.38	0.26	0.57	0.52	(0.12)
Import	807	Eastern Asia	23	Chemical prods.	45.29	68.59	1.27	0.25	23.30
Import	807	Eastern Asia	24	Plastics/rubber	107.20	261.38	2.05	0.68	154.18
Import	807	Eastern Asia	25	Logs	-	-	-	-	-
Import	807	Eastern Asia	26	Wood prods.	8.70	5.68	0.55	0.44	(3.02)
Import	807	Eastern Asia	27	Newsprint/paper	7.07	15.30	1.82	2.43	8.23
Import	807	Eastern Asia	28	Paper articles	13.73	13.90	0.85	0.68	0.17
Import	807	Eastern Asia	29	Printed prods.	15.66	7.76	0.42	0.38	(7.90)
Import	807	Eastern Asia	30	Textiles/leather	422.20	292.65	0.58	0.80	(129.55)
Import	807	Eastern Asia	31	Nonmetal min. prods.	26.87	12.59	0.39	0.29	(14.28)
Import	807	Eastern Asia	32	Base metals	15.39	39.90	2.17	1.66	24.51

Import	807	Eastern Asia	33	Articles-base metal	93.18	161.08	1.45	1.02	67.90
Import	807	Eastern Asia	34	Machinery	86.45	243.95	2.37	1.05	157.49
Import	807	Eastern Asia	35	Electronics	377.86	311.40	0.69	0.44	(66.46)
Import	807	Eastern Asia	36	Motorized vehicles	25.87	22.37	0.73	0.72	(3.50)
Import	807	Eastern Asia	37	Transport equip.	6.57	4.31	0.55	0.29	(2.26)
Import	807	Eastern Asia	38	Precision instruments	71.94	79.67	0.93	0.45	7.74
Import	807	Eastern Asia	39	Furniture	85.09	97.38	0.96	0.60	12.29
Import	807	Eastern Asia	40	Misc. mfg. prods.	229.39	268.05	0.98	0.98	38.67
Import	807	Eastern Asia	41	Waste/scrap	2.22	1.17	0.44	0.64	(1.06)
Import	807	Eastern Asia	43	Mixed freight	11.86	21.40	1.51	1.26	9.54
Import	807	Eastern Asia	99	Unknown	-	-	-	-	-
Import	808	SE Asia & Oceania	1	Live animals/fish	0.50	0.01	0.02	0.02	(0.50)
Import	808	SE Asia & Oceania	2	Cereal grains	5.70	0.60	0.11	0.07	(5.11)
Import	808	SE Asia & Oceania	3	Other ag prods.	9.26	9.39	1.09	0.98	0.13
Import	808	SE Asia & Oceania	4	Animal feed	0.93	1.18	1.36	0.71	0.25
Import	808	SE Asia & Oceania	5	Meat/seafood	22.93	7.14	0.33	0.16	(15.79)
Import	808	SE Asia & Oceania	6	Milled grain prods.	1.46	0.90	0.66	0.21	(0.56)
Import	808	SE Asia & Oceania	7	Other foodstuffs	12.16	17.62	1.55	0.95	5.46
Import	808	SE Asia & Oceania	8	Alcoholic beverages	4.94	1.52	0.33	0.20	(3.42)
Import	808	SE Asia & Oceania	9	Tobacco prods.	-	-	-	-	-
Import	808	SE Asia & Oceania	10	Building Stone	0.01	-	-	-	(0.01)
Import	808	SE Asia & Oceania	11	Natural sands	-	-	-	-	-
Import	808	SE Asia & Oceania	12	Gravel	0.00	-	-	-	(0.00)

Import	808	SE Asia & Oceania	13	Nonmetallic minerals	0.00	0.15	75.93	48.08	0.15
Import	808	SE Asia & Oceania	14	Metallic ores	0.00	31.47	20,670.70	10,594.70	31.47
Import	808	SE Asia & Oceania	15	Coal	-	-	-	-	-
Import	808	SE Asia & Oceania	16	Crude petroleum	-	-	-	-	-
Import	808	SE Asia & Oceania	17	Gasoline	-	-	-	-	-
Import	808	SE Asia & Oceania	18	Fuel oils	-	-	-	-	-
Import	808	SE Asia & Oceania	19	Coal-n.e.c.	0.01	0.00	0.02	0.02	(0.01)
Import	808	SE Asia & Oceania	20	Basic chemicals	1.80	6.55	3.89	1.04	4.75
Import	808	SE Asia & Oceania	21	Pharmaceuticals	1.81	18.85	11.13	3.03	17.03
Import	808	SE Asia & Oceania	22	Fertilizers	0.02	0.00	0.01	0.01	(0.02)
Import	808	SE Asia & Oceania	23	Chemical prods.	3.35	4.58	1.46	0.22	1.23
Import	808	SE Asia & Oceania	24	Plastics/rubber	11.65	48.84	4.49	1.16	37.18
Import	808	SE Asia & Oceania	25	Logs	0.00	0.00	2.40	0.88	0.00
Import	808	SE Asia & Oceania	26	Wood prods.	2.39	0.59	0.26	0.16	(1.80)
Import	808	SE Asia & Oceania	27	Newsprint/paper	2.39	4.44	1.99	2.09	2.05
Import	808	SE Asia & Oceania	28	Paper articles	0.72	0.56	0.83	0.52	(0.16)
Import	808	SE Asia & Oceania	29	Printed prods.	1.05	0.58	0.59	0.43	(0.47)
Import	808	SE Asia & Oceania	30	Textiles/leather	132.30	41.40	0.33	0.36	(90.90)
Import	808	SE Asia & Oceania	31	Nonmetal min. prods.	1.20	1.08	0.96	0.55	(0.12)
Import	808	SE Asia & Oceania	32	Base metals	7.47	4.43	0.63	0.38	(3.04)
Import	808	SE Asia & Oceania	33	Articles-base metal	6.50	50.08	8.25	4.54	43.58
Import	808	SE Asia & Oceania	34	Machinery	8.05	8.85	1.18	0.41	0.79
Import	808	SE Asia & Oceania	35	Electronics	46.38	52.69	1.22	0.60	6.31

Import	808	SE Asia & Oceania	36	Motorized vehicles	0.19	0.39	2.20	1.71	0.20
Import	808	SE Asia & Oceania	37	Transport equip.	0.80	0.55	0.74	0.30	(0.25)
Import	808	SE Asia & Oceania	38	Precision instruments	14.03	5.69	0.43	0.17	(8.34)
Import	808	SE Asia & Oceania	39	Furniture	18.73	10.31	0.59	0.29	(8.43)
Import	808	SE Asia & Oceania	40	Misc. mfg. prods.	82.26	47.26	0.61	0.48	(35.00)
Import	808	SE Asia & Oceania	41	Waste/scrap	0.93	0.47	0.55	0.63	(0.45)
Import	808	SE Asia & Oceania	43	Mixed freight	5.74	2.68	0.50	0.33	(3.06)
Import	808	SE Asia & Oceania	99	Unknown	-	-	-	-	-
Flow Type	Country Code	Country Name	sctg2	SCTG2 Description	Value of Goods Shipped		X	Y	Z
					2018	2045			
Export	801	Canada	1	Live animals/fish	3.66	4.56	0.22	1.20	0.89
Export	801	Canada	2	Cereal grains	0.80	1.76	0.38	0.86	0.96
Export	801	Canada	3	Other ag prods.	14.95	72.95	0.85	3.29	58.00
Export	801	Canada	4	Animal feed	13.41	31.40	0.41	1.77	17.99
Export	801	Canada	5	Meat/seafood	4.30	27.99	1.13	9.67	23.68
Export	801	Canada	6	Milled grain prods.	22.55	75.75	0.58	3.17	53.19
Export	801	Canada	7	Other foodstuffs	80.06	379.63	0.82	2.87	299.57
Export	801	Canada	8	Alcoholic beverages	6.37	43.64	1.19	4.76	37.27
Export	801	Canada	9	Tobacco prods.	0.01	5.46	118.30	3,764.22	5.45
Export	801	Canada	10	Building Stone	0.02	0.05	0.34	1.31	0.02
Export	801	Canada	11	Natural sands	0.07	0.20	0.50	1.41	0.13
Export	801	Canada	12	Gravel	0.02	0.01	0.08	0.46	(0.01)
Export	801	Canada	13	Nonmetallic minerals	2.74	6.93	0.44	1.27	4.19

Export	801	Canada	14	Metallic ores	7.83	0.73	0.02	0.01	(7.10)
Export	801	Canada	15	Coal	0.02	-	-	-	(0.02)
Export	801	Canada	16	Crude petroleum	-	-	-	-	-
Export	801	Canada	17	Gasoline	9.77	4.07	0.07	0.34	(5.70)
Export	801	Canada	18	Fuel oils	2.43	22.79	1.63	7.07	20.36
Export	801	Canada	19	Coal-n.e.c.	59.44	1,547.68	4.52	11.64	1,488.25
Export	801	Canada	20	Basic chemicals	40.24	65.18	0.28	1.82	24.94
Export	801	Canada	21	Pharmaceuticals	19.93	335.94	2.92	7.70	316.01
Export	801	Canada	22	Fertilizers	1.15	2.30	0.35	1.56	1.15
Export	801	Canada	23	Chemical prods.	75.60	398.02	0.91	2.15	322.43
Export	801	Canada	24	Plastics/rubber	70.39	310.63	0.77	4.66	240.24
Export	801	Canada	25	Logs	2.47	6.05	0.43	1.70	3.59
Export	801	Canada	26	Wood prods.	6.59	24.36	0.64	3.65	17.77
Export	801	Canada	27	Newsprint/paper	64.54	247.94	0.67	3.86	183.39
Export	801	Canada	28	Paper articles	24.10	87.44	0.63	2.06	63.34
Export	801	Canada	29	Printed prods.	26.04	165.69	1.10	2.43	139.65
Export	801	Canada	30	Textiles/leather	39.85	170.72	0.74	4.35	130.86
Export	801	Canada	31	Nonmetal min. prods.	19.29	145.45	1.31	3.23	126.16
Export	801	Canada	32	Base metals	100.04	329.57	0.57	1.71	229.54
Export	801	Canada	33	Articles-base metal	93.19	443.60	0.83	2.41	350.41
Export	801	Canada	34	Machinery	124.43	777.27	1.08	2.98	652.85
Export	801	Canada	35	Electronics	149.85	881.91	1.02	2.29	732.07
Export	801	Canada	36	Motorized vehicles	70.03	124.46	0.31	2.24	54.44

Export	801	Canada	37	Transport equip.	26.44	167.47	1.10	2.86	141.03
Export	801	Canada	38	Precision instruments	46.91	360.75	1.33	3.53	313.84
Export	801	Canada	39	Furniture	18.44	104.85	0.99	3.08	86.41
Export	801	Canada	40	Misc. mfg. prods.	118.27	662.72	0.97	6.14	544.45
Export	801	Canada	41	Waste/scrap	62.96	204.93	0.56	0.94	141.97
Export	801	Canada	43	Mixed freight	73.44	417.00	0.99	4.71	343.55
Export	801	Canada	99	Unknown	-	-	-	-	-
Export	802	Mexico	1	Live animals/fish	0.23	-	-	-	(0.23)
Export	802	Mexico	2	Cereal grains	0.05	-	-	-	(0.05)
Export	802	Mexico	3	Other ag prods.	0.70	1.50	1.68	1.44	0.80
Export	802	Mexico	4	Animal feed	0.53	0.89	1.33	1.28	0.37
Export	802	Mexico	5	Meat/seafood	0.36	0.34	0.74	1.40	(0.02)
Export	802	Mexico	6	Milled grain prods.	0.58	1.87	2.51	3.01	1.28
Export	802	Mexico	7	Other foodstuffs	3.44	9.76	2.23	1.72	6.32
Export	802	Mexico	8	Alcoholic beverages	0.16	0.18	0.91	0.81	0.03
Export	802	Mexico	9	Tobacco prods.	-	-	-	-	-
Export	802	Mexico	10	Building Stone	-	-	-	-	-
Export	802	Mexico	11	Natural sands	0.00	-	-	-	(0.00)
Export	802	Mexico	12	Gravel	-	-	-	-	-
Export	802	Mexico	13	Nonmetallic minerals	0.14	0.24	1.32	0.85	0.10
Export	802	Mexico	14	Metallic ores	0.00	1.02	1,702.58	118.91	1.02
Export	802	Mexico	15	Coal	-	-	-	-	-
Export	802	Mexico	16	Crude petroleum	-	-	-	-	-

Export	802	Mexico	17	Gasoline	0.06	-	-	-	(0.06)
Export	802	Mexico	18	Fuel oils	5.54	0.07	0.01	0.01	(5.47)
Export	802	Mexico	19	Coal-n.e.c.	3.10	1.87	0.47	0.27	(1.23)
Export	802	Mexico	20	Basic chemicals	5.72	2.63	0.36	0.52	(3.09)
Export	802	Mexico	21	Pharmaceuticals	0.57	3.34	4.63	2.69	2.78
Export	802	Mexico	22	Fertilizers	0.03	0.12	2.66	2.64	0.08
Export	802	Mexico	23	Chemical prods.	11.73	22.16	1.49	0.77	10.43
Export	802	Mexico	24	Plastics/rubber	21.90	17.95	0.64	0.86	(3.96)
Export	802	Mexico	25	Logs	-	-	-	-	-
Export	802	Mexico	26	Wood prods.	0.18	0.31	1.39	1.74	0.13
Export	802	Mexico	27	Newsprint/paper	4.98	7.79	1.23	1.57	2.80
Export	802	Mexico	28	Paper articles	0.32	2.88	7.07	5.10	2.56
Export	802	Mexico	29	Printed prods.	0.72	2.03	2.21	1.07	1.31
Export	802	Mexico	30	Textiles/leather	6.04	18.74	2.44	3.15	12.70
Export	802	Mexico	31	Nonmetal min. prods.	5.50	9.14	1.31	0.71	3.64
Export	802	Mexico	32	Base metals	33.80	34.68	0.81	0.53	0.88
Export	802	Mexico	33	Articles-base metal	10.43	16.15	1.22	0.78	5.72
Export	802	Mexico	34	Machinery	78.90	81.78	0.82	0.49	2.88
Export	802	Mexico	35	Electronics	50.34	79.71	1.25	0.62	29.37
Export	802	Mexico	36	Motorized vehicles	7.36	10.00	1.07	1.71	2.64
Export	802	Mexico	37	Transport equip.	1.58	1.32	0.66	0.38	(0.26)
Export	802	Mexico	38	Precision instruments	6.87	12.28	1.40	0.82	5.41
Export	802	Mexico	39	Furniture	1.24	2.26	1.44	0.99	1.02

Export	802	Mexico	40	Misc. mfg. prods.	29.26	12.96	0.35	0.49	(16.31)
Export	802	Mexico	41	Waste/scrap	1.73	5.53	2.51	0.92	3.80
Export	802	Mexico	43	Mixed freight	8.72	23.63	2.13	2.25	14.91
Export	802	Mexico	99	Unknown	-	-	-	-	-
Export	803	Rest of Americas	1	Live animals/fish	0.01	0.00	0.02	0.03	(0.01)
Export	803	Rest of Americas	2	Cereal grains	0.16	4.47	12.97	11.00	4.31
Export	803	Rest of Americas	3	Other ag prods.	2.81	0.70	0.12	0.17	(2.10)
Export	803	Rest of Americas	4	Animal feed	1.72	0.87	0.23	0.38	(0.86)
Export	803	Rest of Americas	5	Meat/seafood	0.75	0.50	0.31	0.99	(0.25)
Export	803	Rest of Americas	6	Milled grain prods.	1.00	1.05	0.49	0.99	0.05
Export	803	Rest of Americas	7	Other foodstuffs	7.13	9.98	0.65	0.85	2.86
Export	803	Rest of Americas	8	Alcoholic beverages	0.78	1.64	0.97	1.46	0.86
Export	803	Rest of Americas	9	Tobacco prods.	0.60	0.01	0.01	0.13	(0.58)
Export	803	Rest of Americas	10	Building Stone	0.00	0.01	15.82	22.59	0.01
Export	803	Rest of Americas	11	Natural sands	0.01	0.00	0.06	0.07	(0.00)
Export	803	Rest of Americas	12	Gravel	0.00	-	-	-	(0.00)
Export	803	Rest of Americas	13	Nonmetallic minerals	0.16	0.85	2.43	2.63	0.69
Export	803	Rest of Americas	14	Metallic ores	0.02	0.00	0.01	0.00	(0.02)
Export	803	Rest of Americas	15	Coal	0.01	-	-	-	(0.01)
Export	803	Rest of Americas	16	Crude petroleum	-	-	-	-	-
Export	803	Rest of Americas	17	Gasoline	0.05	0.91	9.14	16.24	0.87
Export	803	Rest of Americas	18	Fuel oils	13.54	3.83	0.13	0.21	(9.71)
Export	803	Rest of Americas	19	Coal-n.e.c.	1.56	0.15	0.05	0.04	(1.40)

Export	803	Rest of Americas	20	Basic chemicals	10.45	12.70	0.56	1.37	2.25
Export	803	Rest of Americas	21	Pharmaceuticals	1.48	1.37	0.43	0.42	(0.11)
Export	803	Rest of Americas	22	Fertilizers	0.23	0.07	0.13	0.23	(0.17)
Export	803	Rest of Americas	23	Chemical prods.	18.32	29.42	0.74	0.66	11.10
Export	803	Rest of Americas	24	Plastics/rubber	10.99	20.37	0.86	1.95	9.38
Export	803	Rest of Americas	25	Logs	0.04	0.34	4.27	6.40	0.31
Export	803	Rest of Americas	26	Wood prods.	0.29	0.63	1.01	2.15	0.34
Export	803	Rest of Americas	27	Newsprint/paper	0.95	5.67	2.77	5.99	4.72
Export	803	Rest of Americas	28	Paper articles	0.85	0.93	0.51	0.62	0.08
Export	803	Rest of Americas	29	Printed prods.	1.78	16.70	4.36	3.59	14.92
Export	803	Rest of Americas	30	Textiles/leather	4.74	4.10	0.40	0.88	(0.64)
Export	803	Rest of Americas	31	Nonmetal min. prods.	2.17	20.84	4.45	4.12	18.67
Export	803	Rest of Americas	32	Base metals	2.01	3.60	0.83	0.93	1.59
Export	803	Rest of Americas	33	Articles-base metal	3.06	8.98	1.36	1.49	5.92
Export	803	Rest of Americas	34	Machinery	22.90	26.70	0.54	0.56	3.81
Export	803	Rest of Americas	35	Electronics	31.81	53.61	0.78	0.66	21.80
Export	803	Rest of Americas	36	Motorized vehicles	5.19	5.73	0.51	1.39	0.54
Export	803	Rest of Americas	37	Transport equip.	3.62	14.85	1.90	1.85	11.23
Export	803	Rest of Americas	38	Precision instruments	11.53	56.33	2.27	2.24	44.80
Export	803	Rest of Americas	39	Furniture	1.99	4.11	0.96	1.12	2.11
Export	803	Rest of Americas	40	Misc. mfg. prods.	50.16	80.09	0.74	1.75	29.93
Export	803	Rest of Americas	41	Waste/scrap	5.35	11.27	0.98	0.61	5.92
Export	803	Rest of Americas	43	Mixed freight	67.18	216.31	1.49	2.67	149.13

Export	803	Rest of Americas	99	Unknown	-	-	-	-	-
Export	804	Europe	1	Live animals/fish	0.59	0.02	0.06	0.04	(0.57)
Export	804	Europe	2	Cereal grains	0.16	0.10	0.94	0.24	(0.06)
Export	804	Europe	3	Other ag prods.	1.91	3.30	2.68	1.16	1.39
Export	804	Europe	4	Animal feed	2.52	0.38	0.24	0.11	(2.14)
Export	804	Europe	5	Meat/seafood	0.63	0.92	2.29	2.19	0.30
Export	804	Europe	6	Milled grain prods.	1.19	1.59	2.08	1.26	0.41
Export	804	Europe	7	Other foodstuffs	13.04	16.46	1.96	0.76	3.42
Export	804	Europe	8	Alcoholic beverages	4.78	4.06	1.32	0.59	(0.72)
Export	804	Europe	9	Tobacco prods.	0.45	0.15	0.52	1.86	(0.30)
Export	804	Europe	10	Building Stone	0.02	0.20	20.07	8.55	0.18
Export	804	Europe	11	Natural sands	0.00	0.00	0.84	0.26	(0.00)
Export	804	Europe	12	Gravel	0.01	0.03	4.36	2.63	0.02
Export	804	Europe	13	Nonmetallic minerals	0.29	0.19	1.02	0.33	(0.10)
Export	804	Europe	14	Metallic ores	0.01	126.93	17,379.62	614.32	126.92
Export	804	Europe	15	Coal	0.00	-	-	-	(0.00)
Export	804	Europe	16	Crude petroleum	-	-	-	-	-
Export	804	Europe	17	Gasoline	0.15	-	-	-	(0.15)
Export	804	Europe	18	Fuel oils	17.35	0.40	0.04	0.02	(16.95)
Export	804	Europe	19	Coal-n.e.c.	5.43	0.11	0.03	0.01	(5.32)
Export	804	Europe	20	Basic chemicals	25.93	18.49	1.11	0.80	(7.44)
Export	804	Europe	21	Pharmaceuticals	43.78	34.61	1.23	0.36	(9.17)
Export	804	Europe	22	Fertilizers	0.15	0.06	0.61	0.31	(0.09)

Export	804	Europe	23	Chemical prods.	52.85	93.61	2.75	0.72	40.75
Export	804	Europe	24	Plastics/rubber	32.13	46.94	2.27	1.54	14.81
Export	804	Europe	25	Logs	0.07	1.40	29.64	13.24	1.33
Export	804	Europe	26	Wood prods.	1.33	2.51	2.93	1.87	1.18
Export	804	Europe	27	Newsprint/paper	1.16	4.17	5.56	3.59	3.00
Export	804	Europe	28	Paper articles	1.68	1.91	1.77	0.65	0.24
Export	804	Europe	29	Printed prods.	11.03	24.34	3.43	0.84	13.31
Export	804	Europe	30	Textiles/leather	17.68	13.09	1.15	0.75	(4.59)
Export	804	Europe	31	Nonmetal min. prods.	15.71	70.75	7.00	1.93	55.04
Export	804	Europe	32	Base metals	15.25	31.90	3.25	1.09	16.65
Export	804	Europe	33	Articles-base metal	12.88	10.76	1.30	0.42	(2.12)
Export	804	Europe	34	Machinery	81.58	96.46	1.84	0.56	14.88
Export	804	Europe	35	Electronics	178.01	205.13	1.79	0.45	27.12
Export	804	Europe	36	Motorized vehicles	46.37	36.08	1.21	0.98	(10.29)
Export	804	Europe	37	Transport equip.	26.14	24.54	1.46	0.42	(1.60)
Export	804	Europe	38	Precision instruments	92.22	114.21	1.92	0.57	21.99
Export	804	Europe	39	Furniture	7.62	24.42	4.98	1.74	16.80
Export	804	Europe	40	Misc. mfg. prods.	1,639.73	352.66	0.33	0.24	(1,287.07)
Export	804	Europe	41	Waste/scrap	24.07	123.29	7.96	1.48	99.22
Export	804	Europe	43	Mixed freight	11.40	50.45	6.88	3.67	39.06
Export	804	Europe	99	Unknown	-	-	-	-	-
Export	805	Africa	1	Live animals/fish	0.00	-	-	-	(0.00)
Export	805	Africa	2	Cereal grains	0.01	0.58	39.27	23.81	0.57

Export	805	Africa	3	Other ag prods.	0.16	0.02	0.07	0.07	(0.14)
Export	805	Africa	4	Animal feed	0.14	0.26	1.26	1.46	0.13
Export	805	Africa	5	Meat/seafood	0.25	0.02	0.05	0.11	(0.23)
Export	805	Africa	6	Milled grain prods.	0.07	0.04	0.34	0.50	(0.03)
Export	805	Africa	7	Other foodstuffs	1.62	1.61	0.65	0.60	(0.01)
Export	805	Africa	8	Alcoholic beverages	0.02	0.09	4.10	4.39	0.08
Export	805	Africa	9	Tobacco prods.	0.00	-	-	-	(0.00)
Export	805	Africa	10	Building Stone	-	-	-	-	-
Export	805	Africa	11	Natural sands	-	-	-	-	-
Export	805	Africa	12	Gravel	-	-	-	-	-
Export	805	Africa	13	Nonmetallic minerals	0.01	0.02	1.58	1.22	0.01
Export	805	Africa	14	Metallic ores	0.00	-	-	-	(0.00)
Export	805	Africa	15	Coal	-	-	-	-	-
Export	805	Africa	16	Crude petroleum	-	-	-	-	-
Export	805	Africa	17	Gasoline	0.08	-	-	-	(0.08)
Export	805	Africa	18	Fuel oils	2.88	0.68	0.15	0.18	(2.20)
Export	805	Africa	19	Coal-n.e.c.	0.88	0.11	0.08	0.05	(0.77)
Export	805	Africa	20	Basic chemicals	0.86	1.47	1.10	1.91	0.60
Export	805	Africa	21	Pharmaceuticals	0.13	1.02	5.09	3.58	0.89
Export	805	Africa	22	Fertilizers	0.04	0.00	0.00	0.00	(0.04)
Export	805	Africa	23	Chemical prods.	2.88	8.31	1.88	1.18	5.43
Export	805	Africa	24	Plastics/rubber	1.55	2.88	1.21	1.96	1.33
Export	805	Africa	25	Logs	0.01	0.05	3.65	3.90	0.04

Export	805	Africa	26	Wood prods.	0.21	1.44	4.40	6.70	1.23
Export	805	Africa	27	Newsprint/paper	0.16	2.00	8.34	12.90	1.85
Export	805	Africa	28	Paper articles	0.09	0.23	1.66	1.45	0.14
Export	805	Africa	29	Printed prods.	0.63	1.11	1.14	0.67	0.48
Export	805	Africa	30	Textiles/leather	0.38	1.02	1.74	2.72	0.64
Export	805	Africa	31	Nonmetal min. prods.	2.59	4.51	1.13	0.75	1.92
Export	805	Africa	32	Base metals	0.19	0.27	0.92	0.73	0.08
Export	805	Africa	33	Articles-base metal	0.62	2.15	2.26	1.76	1.53
Export	805	Africa	34	Machinery	5.18	20.42	2.56	1.88	15.24
Export	805	Africa	35	Electronics	10.35	7.88	0.49	0.30	(2.47)
Export	805	Africa	36	Motorized vehicles	18.33	25.78	0.91	1.77	7.46
Export	805	Africa	37	Transport equip.	2.34	2.58	0.71	0.50	0.24
Export	805	Africa	38	Precision instruments	1.81	3.31	1.19	0.84	1.51
Export	805	Africa	39	Furniture	0.94	6.59	4.54	3.79	5.65
Export	805	Africa	40	Misc. mfg. prods.	12.33	4.90	0.26	0.44	(7.44)
Export	805	Africa	41	Waste/scrap	1.01	1.12	0.72	0.32	0.11
Export	805	Africa	43	Mixed freight	0.34	3.95	7.62	9.74	3.61
Export	805	Africa	99	Unknown	-	-	-	-	-
Export	806	SW & Central Asia	1	Live animals/fish	0.10	0.00	0.04	0.03	(0.09)
Export	806	SW & Central Asia	2	Cereal grains	0.04	0.01	0.35	0.09	(0.03)
Export	806	SW & Central Asia	3	Other ag prods.	0.46	0.22	0.77	0.33	(0.23)

Export	806	SW & Central Asia	4	Animal feed	1.12	0.27	0.39	0.19	(0.84)
Export	806	SW & Central Asia	5	Meat/seafood	0.35	0.61	2.78	2.61	0.26
Export	806	SW & Central Asia	6	Milled grain prods.	1.41	2.78	3.13	1.86	1.37
Export	806	SW & Central Asia	7	Other foodstuffs	10.98	17.83	2.58	0.98	6.85
Export	806	SW & Central Asia	8	Alcoholic beverages	0.04	0.05	1.99	0.87	0.01
Export	806	SW & Central Asia	9	Tobacco prods.	0.07	0.00	0.10	0.37	(0.06)
Export	806	SW & Central Asia	10	Building Stone	0.00	-	-	-	(0.00)
Export	806	SW & Central Asia	11	Natural sands	0.00	-	-	-	(0.00)
Export	806	SW & Central Asia	12	Gravel	0.00	0.01	6.63	3.92	0.01
Export	806	SW & Central Asia	13	Nonmetallic minerals	0.72	0.39	0.85	0.27	(0.33)
Export	806	SW & Central Asia	14	Metallic ores	0.01	-	-	-	(0.01)
Export	806	SW & Central Asia	15	Coal	0.01	-	-	-	(0.01)
Export	806	SW & Central Asia	16	Crude petroleum	-	-	-	-	-
Export	806	SW & Central Asia	17	Gasoline	6.57	-	-	-	(6.57)
Export	806	SW & Central Asia	18	Fuel oils	17.72	3.36	0.30	0.14	(14.35)

Export	806	SW & Central Asia	19	Coal-n.e.c.	5.75	2.19	0.60	0.17	(3.56)
Export	806	SW & Central Asia	20	Basic chemicals	6.00	3.64	0.96	0.68	(2.36)
Export	806	SW & Central Asia	21	Pharmaceuticals	3.44	3.24	1.49	0.43	(0.20)
Export	806	SW & Central Asia	22	Fertilizers	0.14	0.01	0.06	0.03	(0.13)
Export	806	SW & Central Asia	23	Chemical prods.	14.02	17.69	2.00	0.52	3.68
Export	806	SW & Central Asia	24	Plastics/rubber	10.45	9.21	1.40	0.93	(1.25)
Export	806	SW & Central Asia	25	Logs	0.09	1.01	18.70	8.18	0.92
Export	806	SW & Central Asia	26	Wood prods.	1.40	1.50	1.70	1.06	0.10
Export	806	SW & Central Asia	27	Newsprint/paper	1.24	2.87	3.68	2.33	1.63
Export	806	SW & Central Asia	28	Paper articles	0.91	2.63	4.57	1.63	1.71
Export	806	SW & Central Asia	29	Printed prods.	3.03	1.89	0.99	0.24	(1.14)
Export	806	SW & Central Asia	30	Textiles/leather	7.02	5.83	1.32	0.84	(1.20)
Export	806	SW & Central Asia	31	Nonmetal min. prods.	4.80	7.01	2.32	0.63	2.21
Export	806	SW & Central Asia	32	Base metals	7.10	8.50	1.90	0.62	1.40
Export	806	SW & Central Asia	33	Articles-base metal	7.75	9.39	1.92	0.61	1.63

Export	806	SW & Central Asia	34	Machinery	42.57	80.72	3.01	0.90	38.16
Export	806	SW & Central Asia	35	Electronics	75.22	91.12	1.92	0.47	15.89
Export	806	SW & Central Asia	36	Motorized vehicles	20.96	44.10	3.34	2.65	23.14
Export	806	SW & Central Asia	37	Transport equip.	49.04	23.00	0.74	0.21	(26.04)
Export	806	SW & Central Asia	38	Precision instruments	16.39	29.88	2.89	0.84	13.49
Export	806	SW & Central Asia	39	Furniture	3.45	4.42	2.03	0.69	0.97
Export	806	SW & Central Asia	40	Misc. mfg. prods.	657.90	77.26	0.19	0.13	(580.64)
Export	806	SW & Central Asia	41	Waste/scrap	39.11	75.44	3.06	0.56	36.33
Export	806	SW & Central Asia	43	Mixed freight	13.83	122.01	13.99	7.32	108.18
Export	806	SW & Central Asia	99	Unknown	-	-	-	-	-
Export	807	Eastern Asia	1	Live animals/fish	0.20	0.02	0.08	0.08	(0.18)
Export	807	Eastern Asia	2	Cereal grains	0.03	0.05	1.38	0.58	0.02
Export	807	Eastern Asia	3	Other ag prods.	1.24	6.52	4.91	3.53	5.28
Export	807	Eastern Asia	4	Animal feed	5.53	18.92	3.20	2.59	13.39
Export	807	Eastern Asia	5	Meat/seafood	3.90	1.05	0.25	0.40	(2.86)
Export	807	Eastern Asia	6	Milled grain prods.	1.15	1.79	1.46	1.47	0.65
Export	807	Eastern Asia	7	Other foodstuffs	7.97	9.14	1.07	0.69	1.18
Export	807	Eastern Asia	8	Alcoholic beverages	5.56	1.33	0.22	0.17	(4.23)

Export	807	Eastern Asia	9	Tobacco prods.	0.23	-	-	-	(0.23)
Export	807	Eastern Asia	10	Building Stone	0.00	-	-	-	(0.00)
Export	807	Eastern Asia	11	Natural sands	0.00	-	-	-	(0.00)
Export	807	Eastern Asia	12	Gravel	0.00	-	-	-	(0.00)
Export	807	Eastern Asia	13	Nonmetallic minerals	0.09	0.24	2.56	1.37	0.15
Export	807	Eastern Asia	14	Metallic ores	0.17	20.82	118.09	6.93	20.66
Export	807	Eastern Asia	15	Coal	0.01	-	-	-	(0.01)
Export	807	Eastern Asia	16	Crude petroleum	-	-	-	-	-
Export	807	Eastern Asia	17	Gasoline	0.01	-	-	-	(0.01)
Export	807	Eastern Asia	18	Fuel oils	0.28	14.86	49.13	39.58	14.58
Export	807	Eastern Asia	19	Coal-n.e.c.	2.63	0.23	0.08	0.04	(2.39)
Export	807	Eastern Asia	20	Basic chemicals	21.46	32.46	1.42	1.70	11.00
Export	807	Eastern Asia	21	Pharmaceuticals	11.52	24.21	1.97	0.96	12.69
Export	807	Eastern Asia	22	Fertilizers	0.11	0.03	0.30	0.25	(0.07)
Export	807	Eastern Asia	23	Chemical prods.	35.27	59.64	1.58	0.69	24.37
Export	807	Eastern Asia	24	Plastics/rubber	29.02	35.60	1.15	1.29	6.58
Export	807	Eastern Asia	25	Logs	5.88	4.57	0.73	0.54	(1.31)
Export	807	Eastern Asia	26	Wood prods.	10.63	22.27	1.96	2.07	11.63
Export	807	Eastern Asia	27	Newsprint/paper	2.95	22.33	7.08	7.59	19.38
Export	807	Eastern Asia	28	Paper articles	0.63	1.80	2.69	1.63	1.17
Export	807	Eastern Asia	29	Printed prods.	4.78	4.85	0.95	0.39	0.07
Export	807	Eastern Asia	30	Textiles/leather	12.46	9.57	0.72	0.78	(2.89)
Export	807	Eastern Asia	31	Nonmetal min. prods.	10.82	58.99	5.10	2.34	48.16

Export	807	Eastern Asia	32	Base metals	26.04	9.33	0.34	0.19	(16.71)
Export	807	Eastern Asia	33	Articles-base metal	9.28	17.74	1.79	0.97	8.46
Export	807	Eastern Asia	34	Machinery	119.93	252.13	1.97	1.00	132.19
Export	807	Eastern Asia	35	Electronics	107.68	132.98	1.16	0.48	25.30
Export	807	Eastern Asia	36	Motorized vehicles	7.76	50.13	6.05	8.13	42.37
Export	807	Eastern Asia	37	Transport equip.	18.93	33.10	1.64	0.79	14.17
Export	807	Eastern Asia	38	Precision instruments	62.56	60.99	0.91	0.45	(1.57)
Export	807	Eastern Asia	39	Furniture	2.21	5.27	2.24	1.29	3.07
Export	807	Eastern Asia	40	Misc. mfg. prods.	792.63	124.84	0.15	0.17	(667.78)
Export	807	Eastern Asia	41	Waste/scrap	48.20	421.88	8.19	2.52	373.68
Export	807	Eastern Asia	43	Mixed freight	0.37	3.72	9.43	8.36	3.35
Export	807	Eastern Asia	99	Unknown	-	-	-	-	-
Export	808	SE Asia & Oceania	1	Live animals/fish	0.05	0.00	0.01	0.01	(0.05)
Export	808	SE Asia & Oceania	2	Cereal grains	0.12	0.45	3.92	1.43	0.32
Export	808	SE Asia & Oceania	3	Other ag prods.	3.26	10.36	3.43	2.14	7.10
Export	808	SE Asia & Oceania	4	Animal feed	2.73	7.95	3.14	2.20	5.22
Export	808	SE Asia & Oceania	5	Meat/seafood	0.62	0.55	0.96	1.33	(0.07)
Export	808	SE Asia & Oceania	6	Milled grain prods.	0.33	2.43	7.92	6.93	2.10
Export	808	SE Asia & Oceania	7	Other foodstuffs	3.17	5.94	2.02	1.13	2.78
Export	808	SE Asia & Oceania	8	Alcoholic beverages	1.47	1.45	1.06	0.69	(0.02)
Export	808	SE Asia & Oceania	9	Tobacco prods.	0.01	0.01	0.64	3.26	(0.00)
Export	808	SE Asia & Oceania	10	Building Stone	-	0.00	-	-	0.00
Export	808	SE Asia & Oceania	11	Natural sands	0.00	0.09	39.99	18.00	0.09

Export	808	SE Asia & Oceania	12	Gravel	0.00	0.07	67.61	58.80	0.06
Export	808	SE Asia & Oceania	13	Nonmetallic minerals	0.08	0.14	1.87	0.87	0.06
Export	808	SE Asia & Oceania	14	Metallic ores	0.18	0.23	1.40	0.07	0.05
Export	808	SE Asia & Oceania	15	Coal	-	-	-	-	-
Export	808	SE Asia & Oceania	16	Crude petroleum	-	-	-	-	-
Export	808	SE Asia & Oceania	17	Gasoline	0.01	-	-	-	(0.01)
Export	808	SE Asia & Oceania	18	Fuel oils	0.04	1.12	33.81	23.66	1.08
Export	808	SE Asia & Oceania	19	Coal-n.e.c.	4.35	0.01	0.00	0.00	(4.34)
Export	808	SE Asia & Oceania	20	Basic chemicals	3.90	4.87	1.35	1.41	0.98
Export	808	SE Asia & Oceania	21	Pharmaceuticals	2.66	1.68	0.68	0.29	(0.99)
Export	808	SE Asia & Oceania	22	Fertilizers	0.13	0.02	0.13	0.09	(0.11)
Export	808	SE Asia & Oceania	23	Chemical prods.	18.02	22.26	1.33	0.51	4.24
Export	808	SE Asia & Oceania	24	Plastics/rubber	9.50	16.60	1.88	1.84	7.10
Export	808	SE Asia & Oceania	25	Logs	0.27	0.36	1.45	0.93	0.09
Export	808	SE Asia & Oceania	26	Wood prods.	0.70	1.32	2.05	1.88	0.63
Export	808	SE Asia & Oceania	27	Newsprint/paper	0.92	3.69	4.35	4.05	2.78
Export	808	SE Asia & Oceania	28	Paper articles	0.41	0.16	0.42	0.22	(0.25)
Export	808	SE Asia & Oceania	29	Printed prods.	3.07	3.04	1.07	0.38	(0.03)
Export	808	SE Asia & Oceania	30	Textiles/leather	2.63	4.44	1.82	1.71	1.81
Export	808	SE Asia & Oceania	31	Nonmetal min. prods.	2.80	8.43	3.25	1.29	5.64
Export	808	SE Asia & Oceania	32	Base metals	7.38	3.53	0.52	0.25	(3.85)
Export	808	SE Asia & Oceania	33	Articles-base metal	2.75	6.91	2.71	1.27	4.16
Export	808	SE Asia & Oceania	34	Machinery	32.22	29.12	0.97	0.43	(3.10)

Export	808	SE Asia & Oceania	35	Electronics	57.90	41.59	0.77	0.28	(16.32)
Export	808	SE Asia & Oceania	36	Motorized vehicles	2.40	1.06	0.48	0.56	(1.34)
Export	808	SE Asia & Oceania	37	Transport equip.	4.10	7.62	2.00	0.84	3.51
Export	808	SE Asia & Oceania	38	Precision instruments	19.96	14.04	0.76	0.32	(5.93)
Export	808	SE Asia & Oceania	39	Furniture	1.41	1.57	1.21	0.61	0.17
Export	808	SE Asia & Oceania	40	Misc. mfg. prods.	80.40	39.69	0.53	0.54	(40.70)
Export	808	SE Asia & Oceania	41	Waste/scrap	18.02	23.55	1.41	0.38	5.53
Export	808	SE Asia & Oceania	43	Mixed freight	0.01	0.78	149.80	115.27	0.78
Export	808	SE Asia & Oceania	99	Unknown	-	-	-	-	-