



FLUID INTELLIGENCE
HOPA-MCMASTER
SUPPLY CHAIN ANALYTICS

Compendium Of Goods Movement Related Information On City Of Hamilton

NOVEMBER 2023



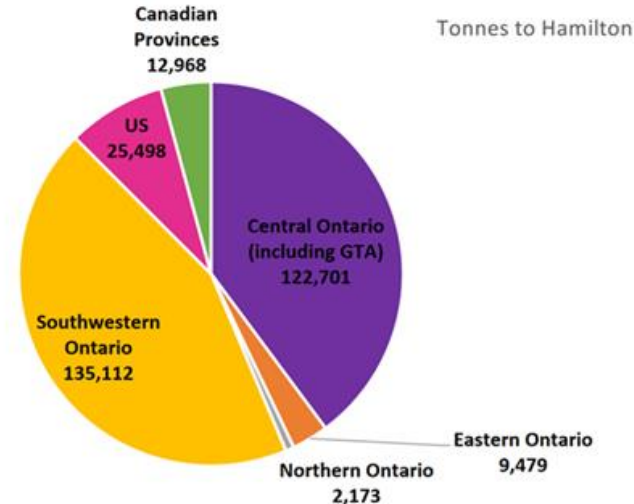
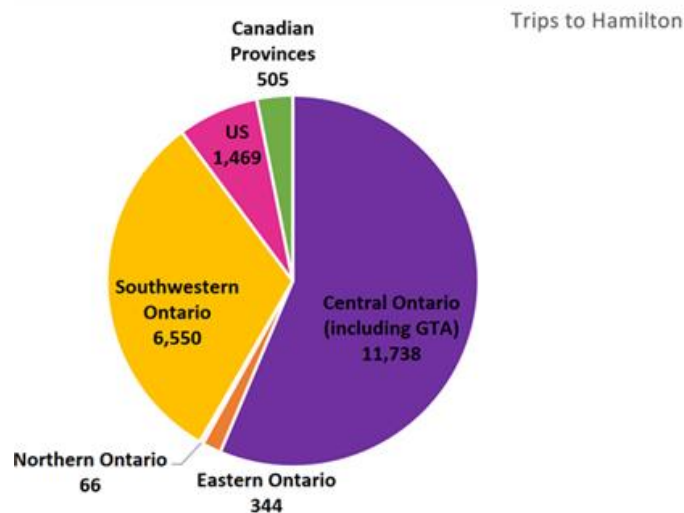
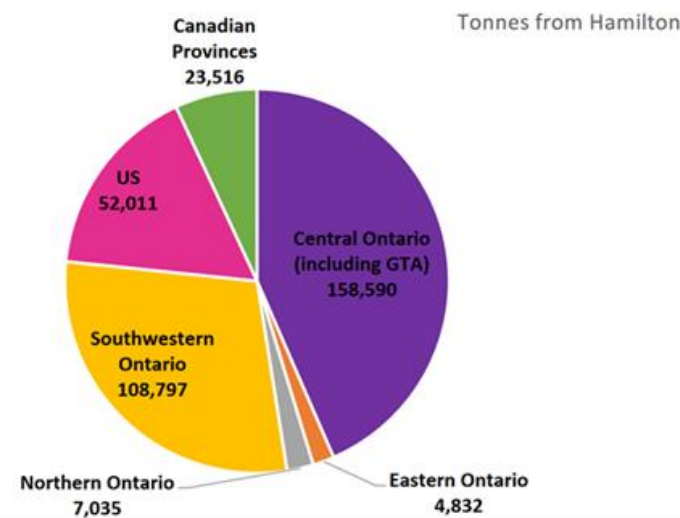
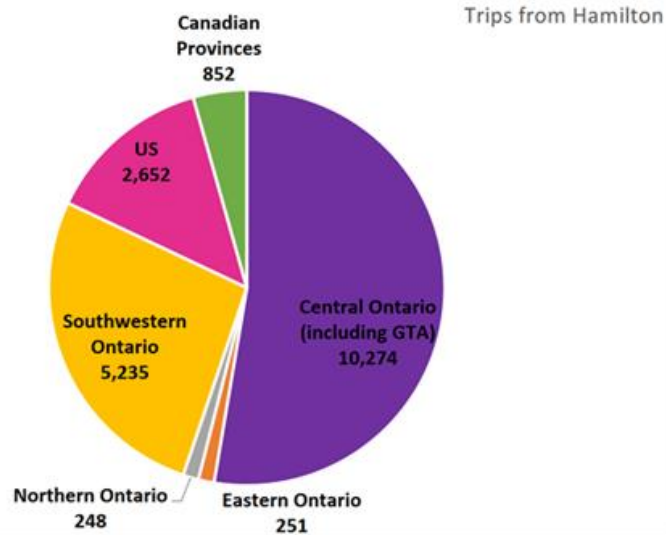


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CVS-Based

Regional Weekly Trucking Flows To/From Hamilton (Including Ontario Regions)



- Derived from CVS and based on cargo-carrying trips
- These pies do not include intra-Hamilton trips
- 19,512 weekly trips that exit Hamilton and 20,672 trips that enter Hamilton from elsewhere
- 18% of trips leaving Hamilton depart Ontario whereas 10% of trips entering Hamilton are from outside Ontario
- Ontario associated with most trip activity
- The US and other provinces more important for flows from Hamilton than to Hamilton
- Central Ontario more important for trips than tonnage
- Southwest Ontario a major source of tonnage into Hamilton

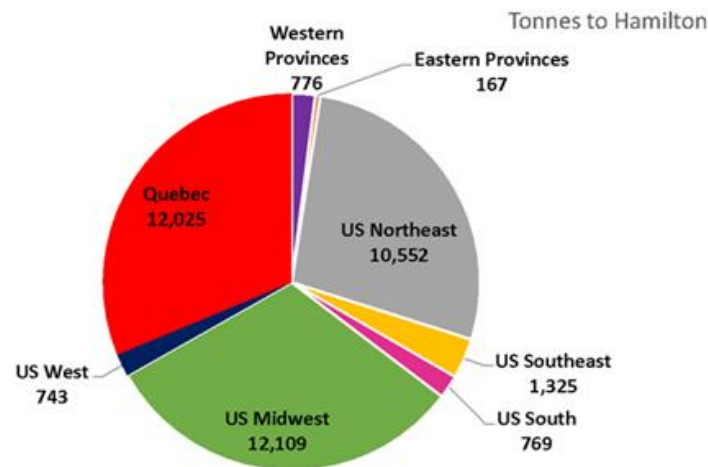
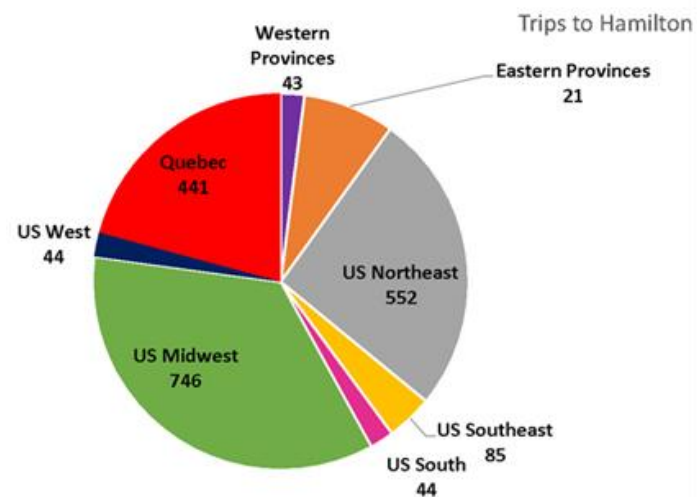
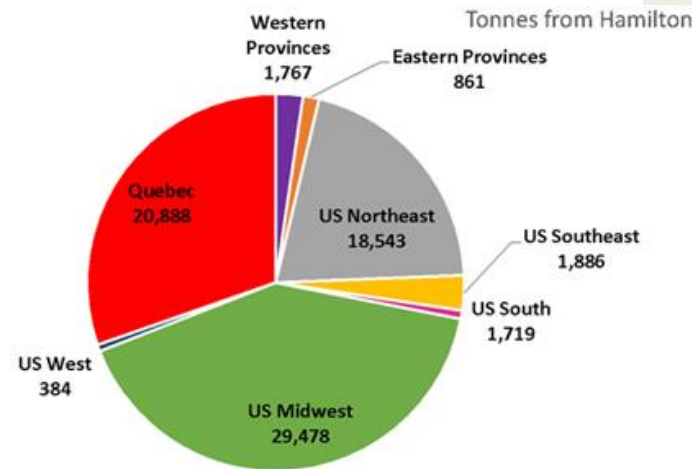
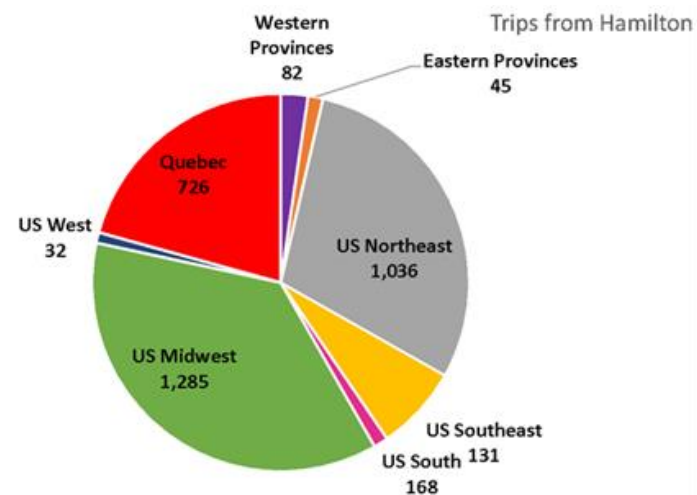
Regional Weekly Trucking Flows To/From Hamilton (Excluding Ontario)



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- Derived from CVS
- Focus is on flows outside Ontario (but to and from City of Hamilton)
- Quebec is more relevant for tonnage than for trips
- Despite Hamilton proximity to the Niagara border, Midwest states are more prominent than Northeast states

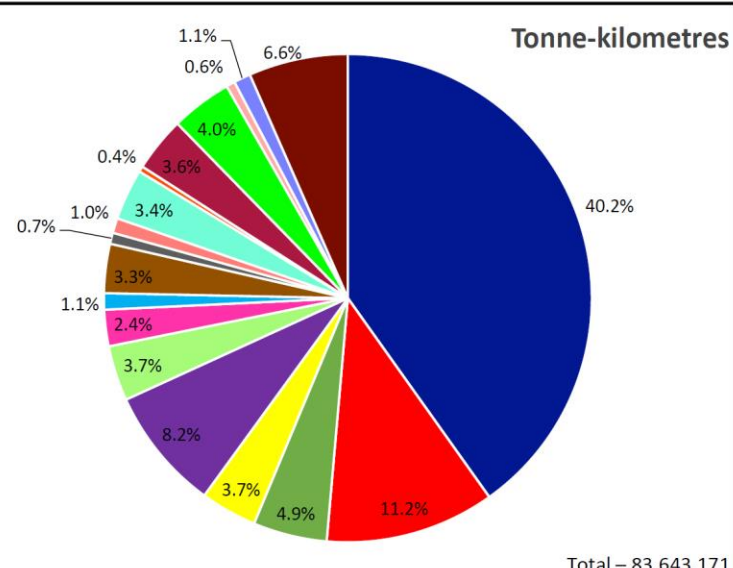
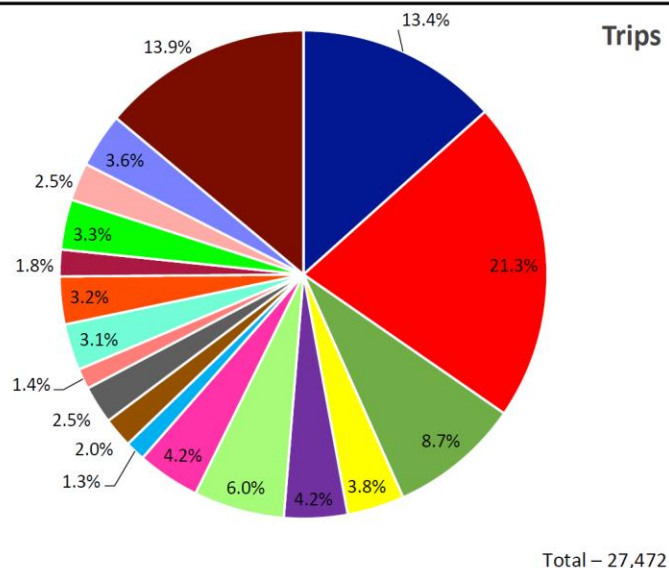
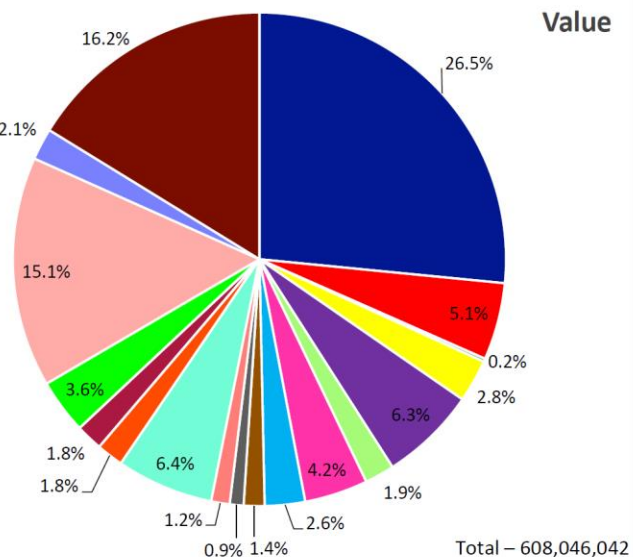
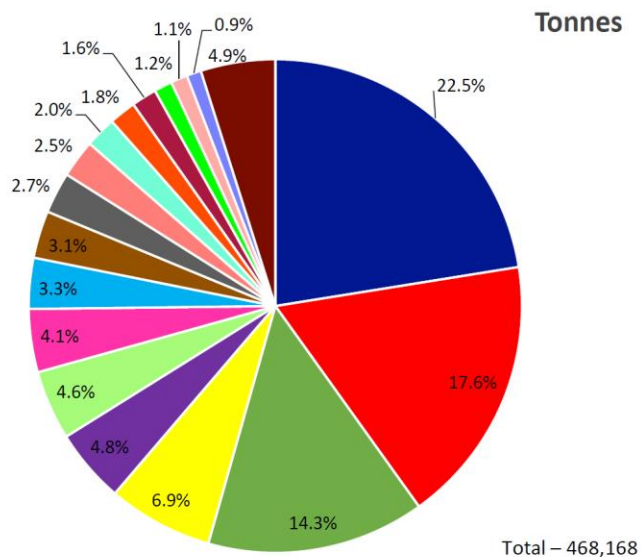
Weekly Truck Outflows From City Of Hamilton



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- 32 Base Metal in Primary or Semi-finished Forms and in Finished Basic Shapes
- 41 Waste and Scrap
- 12 Gravel and Crushed Stone
- 19 Products of Petroleum Refining n.e.c. and Coal Products
- 07 Prepared Foodstuffs n.e.c. and Fats and Oils
- 31 Non-metallic Mineral Products
- 03 Agricultural Products Except Live Animals, Cereal Grains, and Forage Products
- 17 Gasoline and Aviation Turbine Fuel
- 04 Animal Feed and Feed Ingredients, Cereal Straw, and Eggs and Other Products of Animal Origin n.e.c.
- 13 Non-metallic Minerals n.e.c.
- 18 Fuel Oils
- 24 Plastics and Rubber
- 26 Wood Products
- 20 Basic Chemicals
- 33 Articles of Base Metal
- 34 Machinery
- 43 Mixed Freight
- NA Other

- The steel sector (Code 32) is very prominent and especially in tonne-km terms
- Code 41 -“Waste and Scrap” have significant commercial value though it is a less prominent aspect of that cargo type
- Cargoes leaving Hamilton are fairly diversified as seen in value terms especially
- Code 34 – Machinery stands out for its high value and low tonnage
- Tonne-km based partly on the length of associated trips whether 10km or 1000km

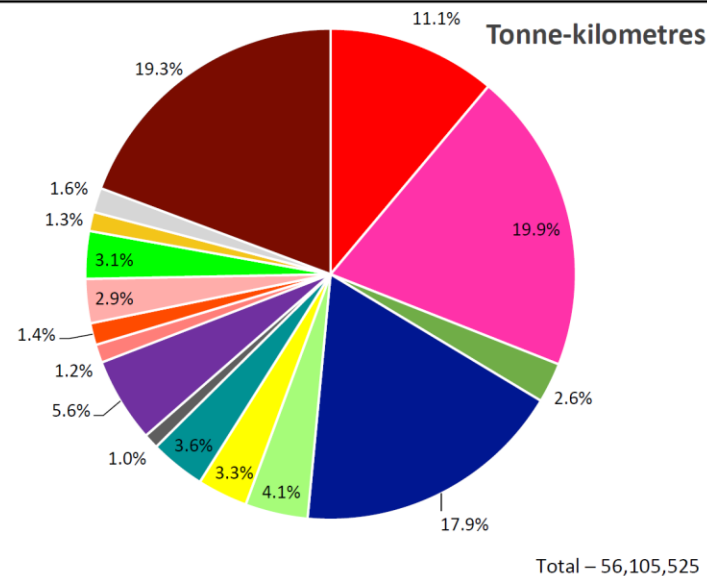
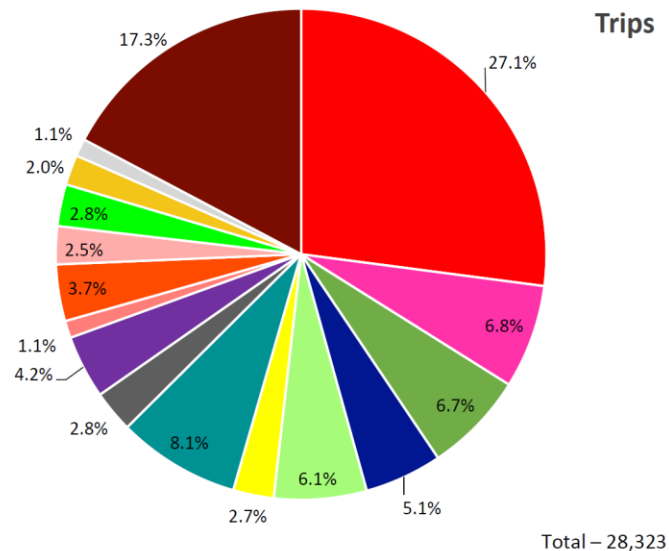
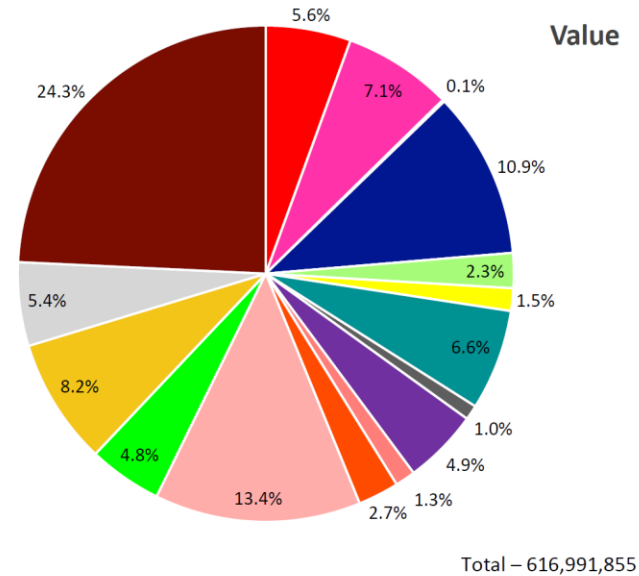
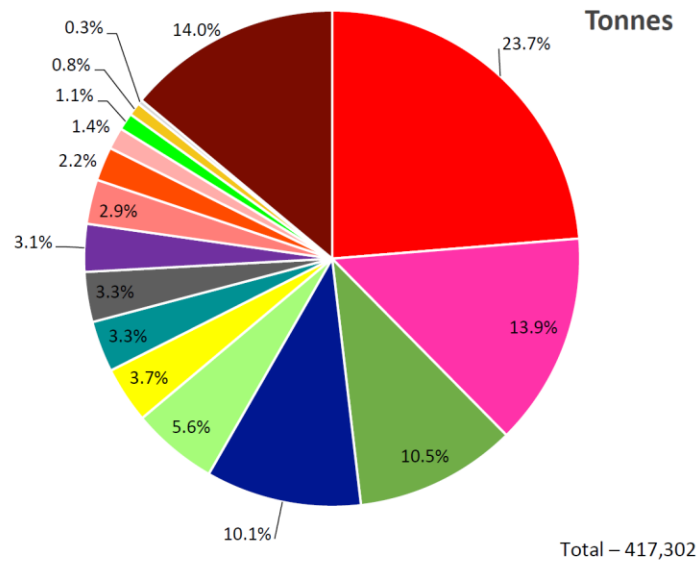
Weekly Truck Inflows To The City Of Hamilton



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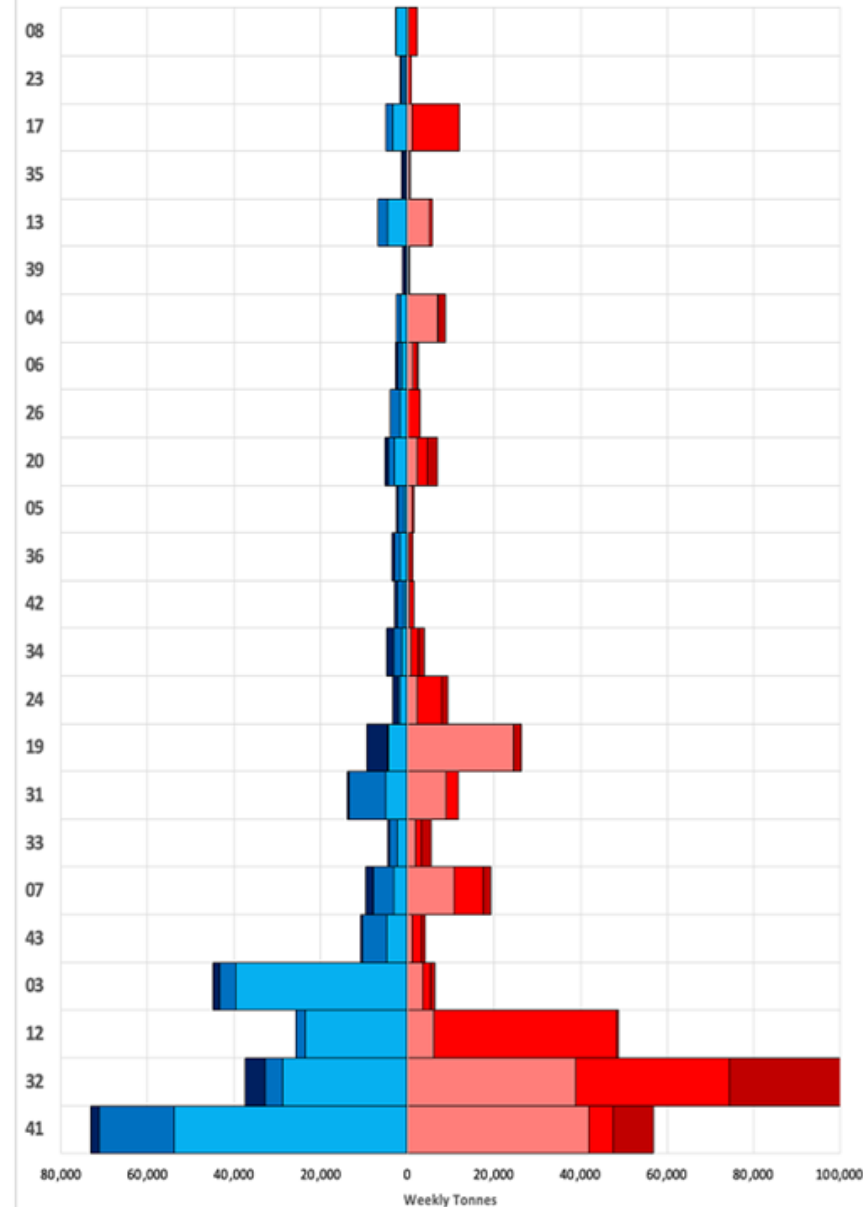
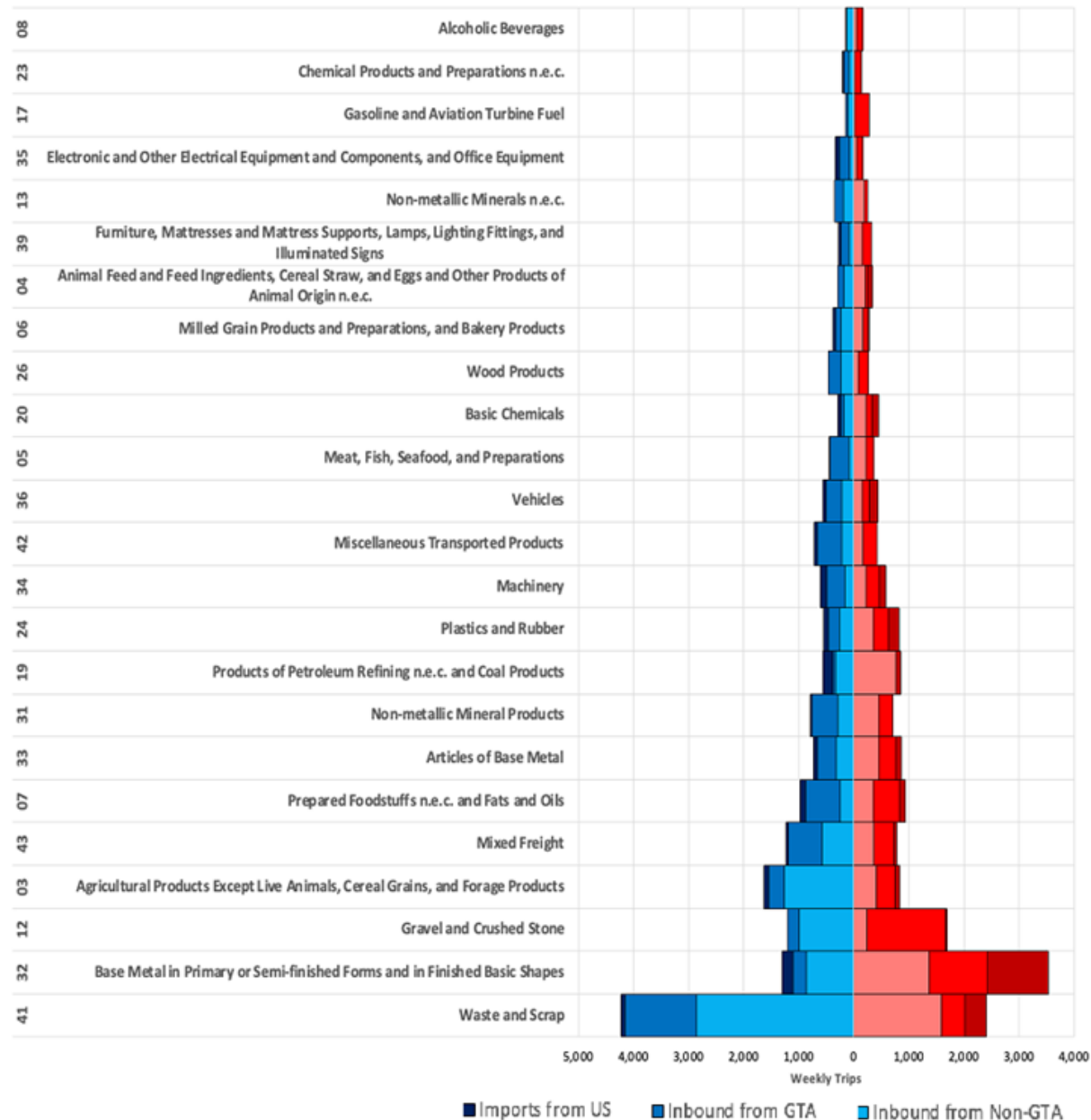
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- 41 Waste and Scrap
- 03 Agricultural Products (excludes Animal Feed, Cereal Grains, and Forage Products)
- 12 Gravel and Crushed Stone
- 32 Base Metal in Primary or Semi-Finished Forms and in Finished Basic Shapes
- 31 Non-Metallic Mineral Products
- 19 Other Coal and Petroleum Products, not elsewhere classified
- 42 Mixed Freight
- 13 Other Non-Metallic Mineral not elsewhere classified
- 07 Other Prepared Foodstuffs, Fats and Oils
- 18 Fuel Oils (includes Diesel, Bunker C, and Biodiesel)
- 26 Wood Products
- 34 Machinery
- 33 Articles of Base Metal
- 36 Motorized and Other Vehicles (includes parts)
- 35 Electronic and Other Electrical Equipment and Components, and Office Equipment
- NA Other

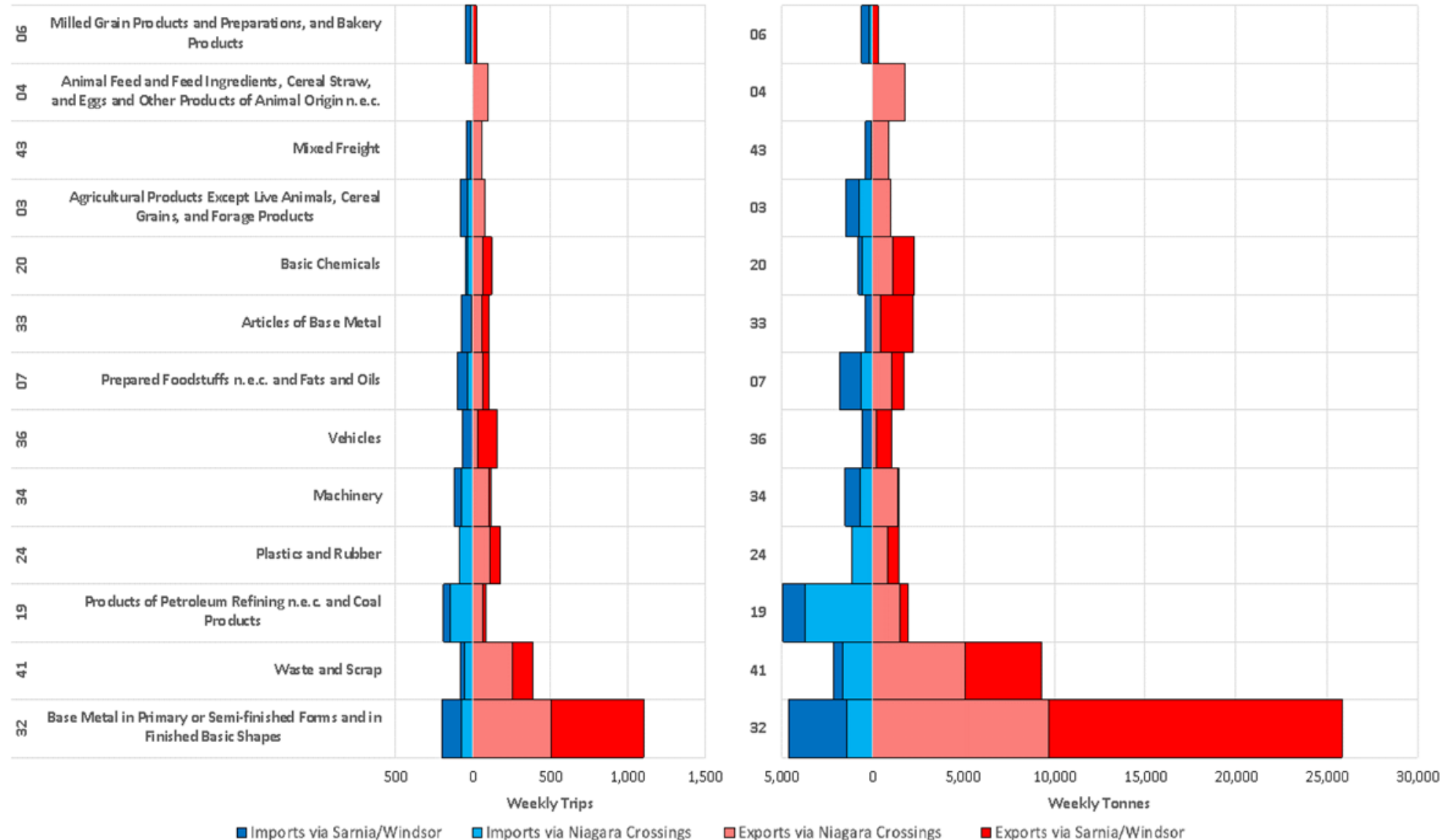
- Waste and scrap movements are associated with a lot of tonnage and trips but generate less tonne-km
- A lot of value in inflowing goods is generated from proportionally much less tonnage
- Mixed freight cargoes, more associated with consumer goods and the like, is much more prominent for truck inflows than truck outflows

Weekly Cross-Jurisdictional Flows to/from City of Hamilton by Truck



- Essentially a “commodity pyramid” for goods that cross Hamilton boundaries either departing or arriving
- Non-GTA includes all other locations in Ontario and Canada
- Code 41 and 32 quite prominent for both trips and tonnage and these are skewed to outflows

Weekly Cross-Border Commodity Flows to/from City of Hamilton by Truck



- Focus on cross-border activity to and from Hamilton by border crossing areas
- Export movements of key commodities stand out (especially in tonnage terms)

Niagara Cross-border Tonnage : Hamilton Relative To Other Jurisdictions (100km+ Trips)

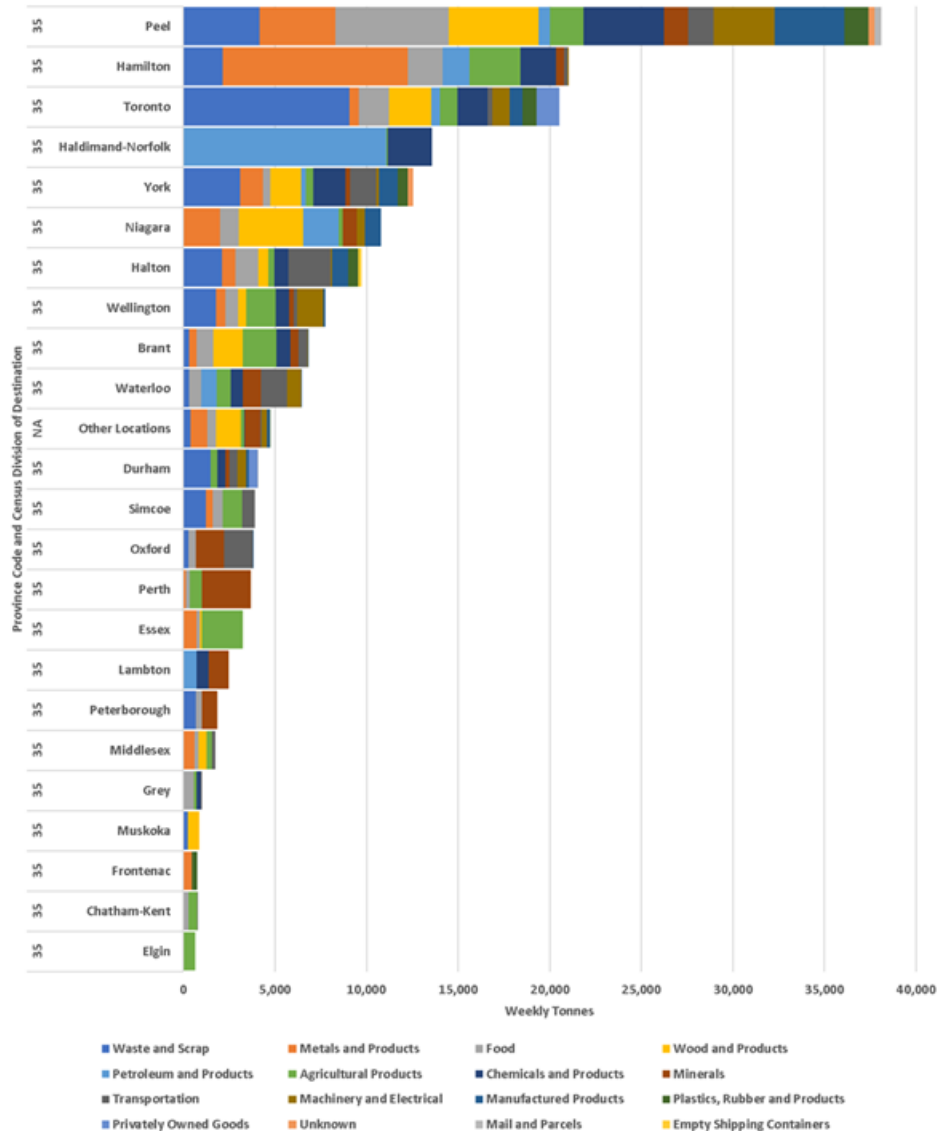
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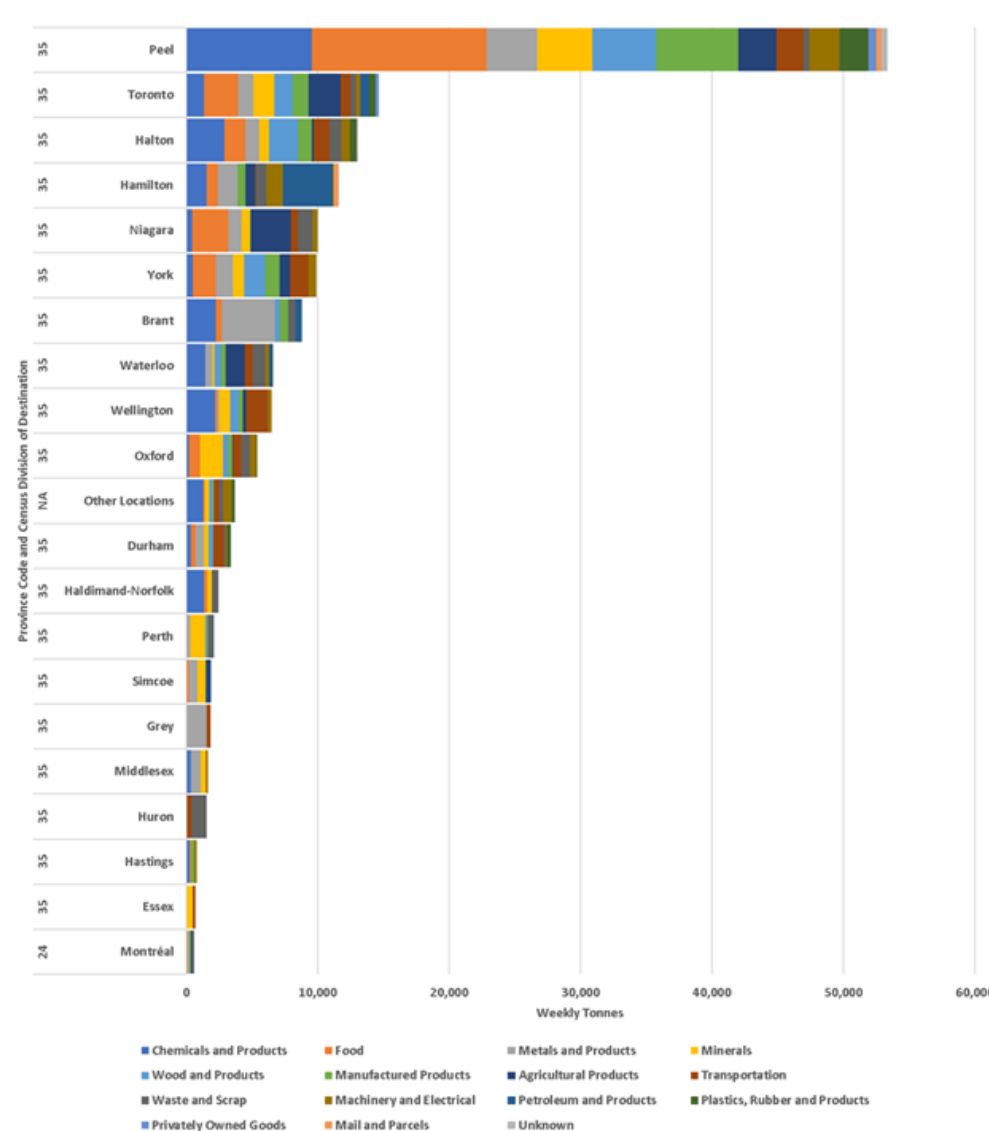
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Weekly Export Tonnage Crossing from US via Niagara by Commodity and Canadian Origin (100km+ truck trips) Source: 2019 CVS



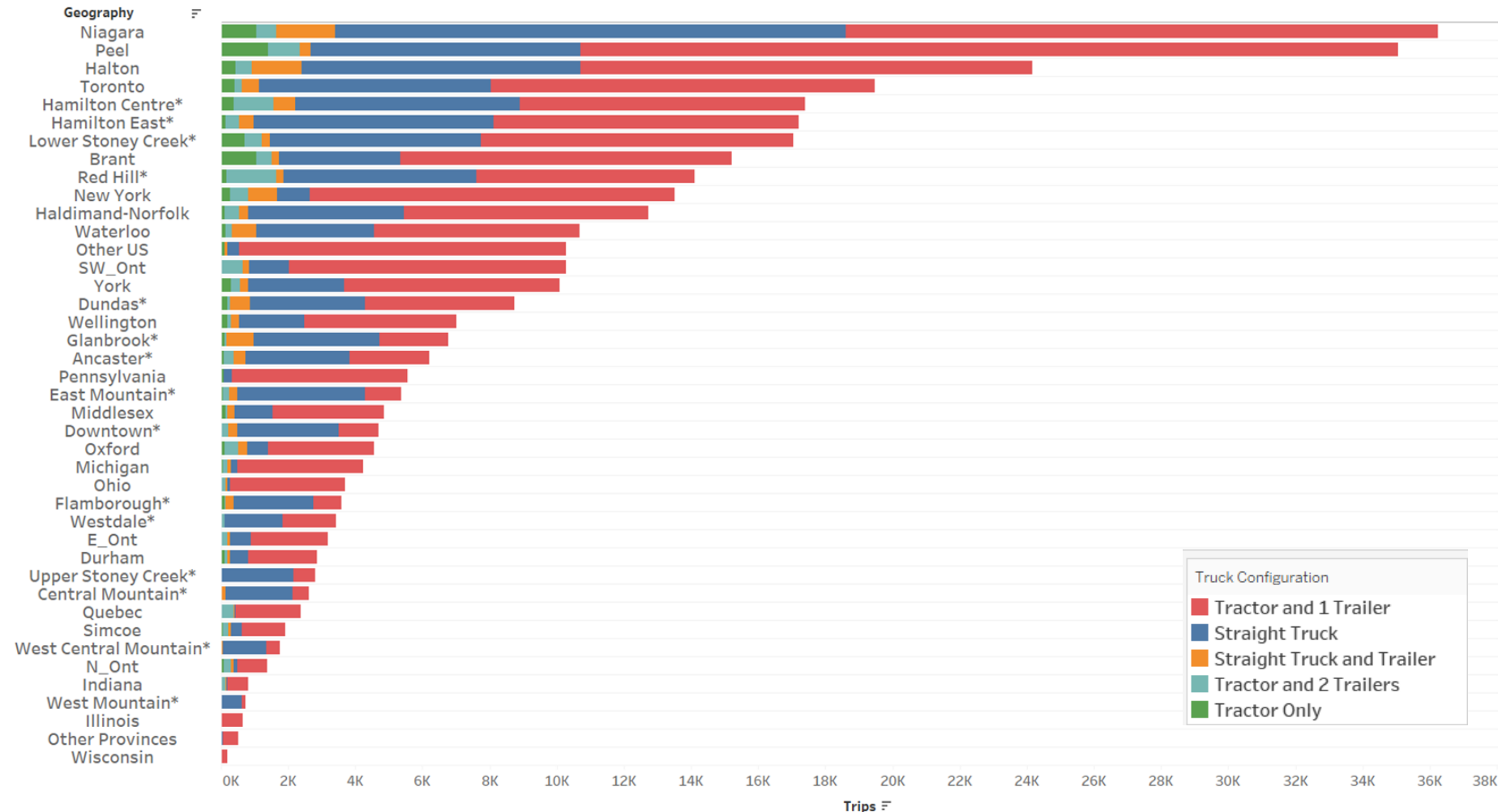
Weekly Import Tonnage Crossing from US via Niagara by Commodity and Canadian Destination (100km+ truck trips) Source: 2019 CVS



- From the entire 2019 CVS sample (not Hamilton-focused) but only for trips 100km+
- These charts focus on crossings at Niagara
- Some trips to Buffalo area are filtered
- For cross-border tonnage, Hamilton ranks highly among census divisions and especially for export trips
- Peel is relatively more dominant as a receiver of import truck trips via Niagara than as a generator

Truck Configurations By Hamilton And Other Geographies

- Derived from CVS
- Trip originations-arrivals per zone
- Straight trucks and Tractor with 1 trailer dominate
- Straight trucks would typically be allowed in the central city whereas tractor/trailer combos would not
- From GTA and beyond, straight trucks are in the minority
- From far off (e.g., US states) there are hardly any straight trucks
- Tractor trailer combos seem quite prominent for most Hamilton zones but small, delivery-oriented trucks are not well captured by the CVS
- Note that Peel and Niagara interact similarly with Hamilton for aggregate trips. Peel is a much larger freight hub, but Niagara is nearby.



Trips is sum of outflows + inflows and includes trips with no cargo

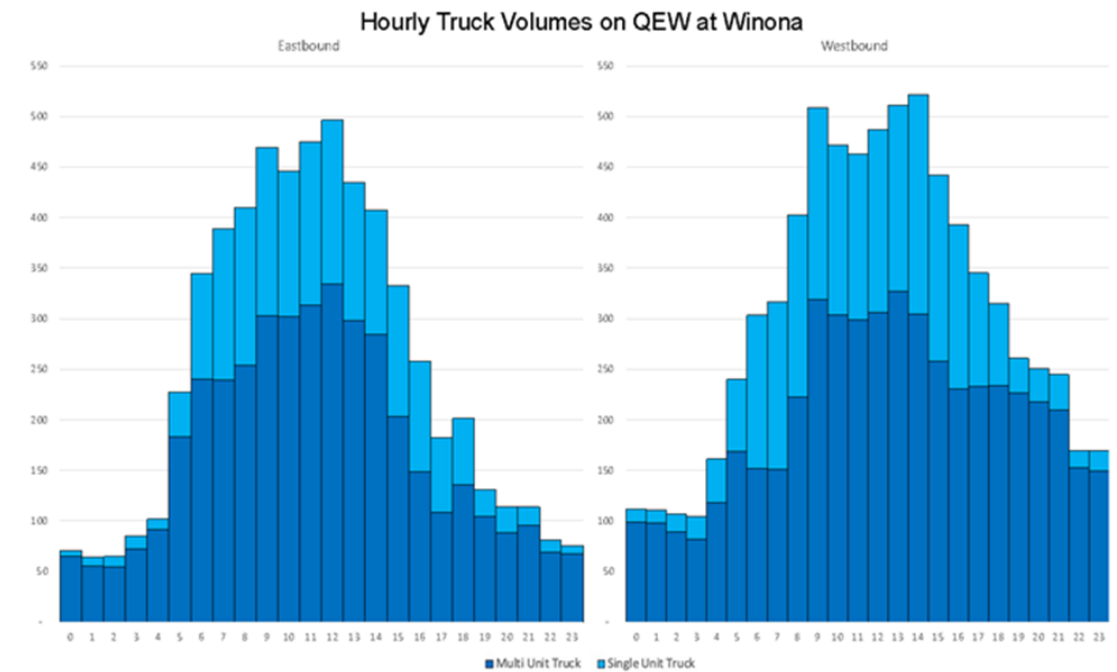
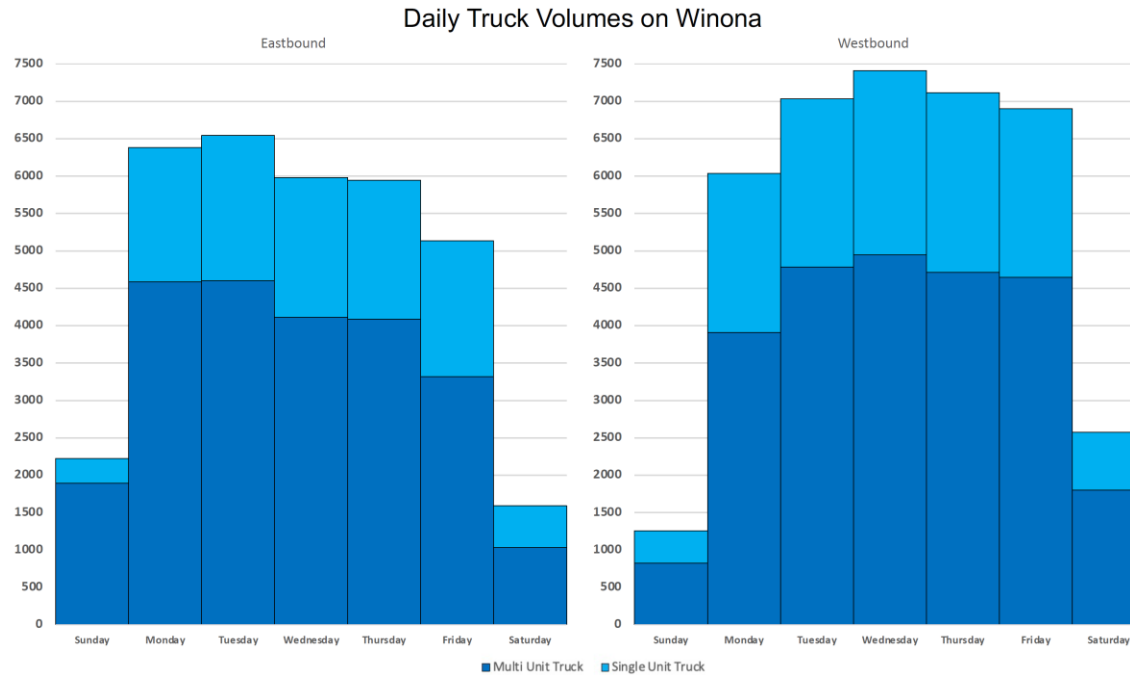
Daily And Hourly Truck Volumes On QEW



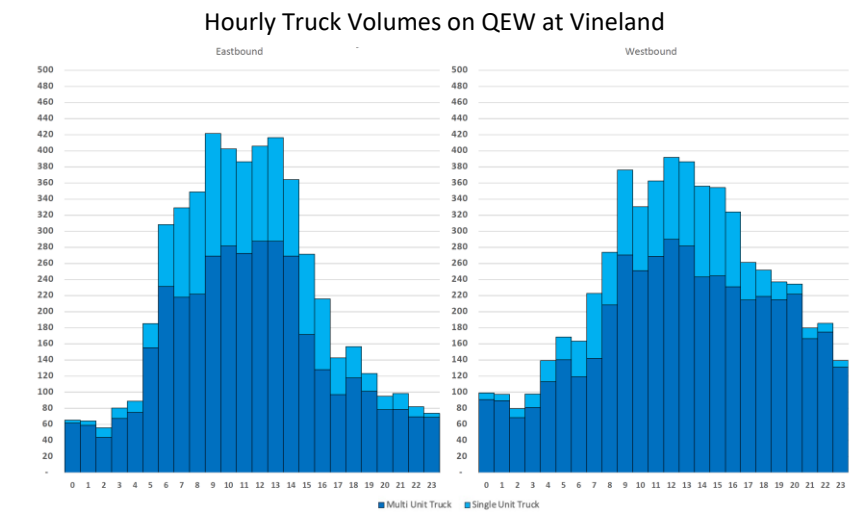
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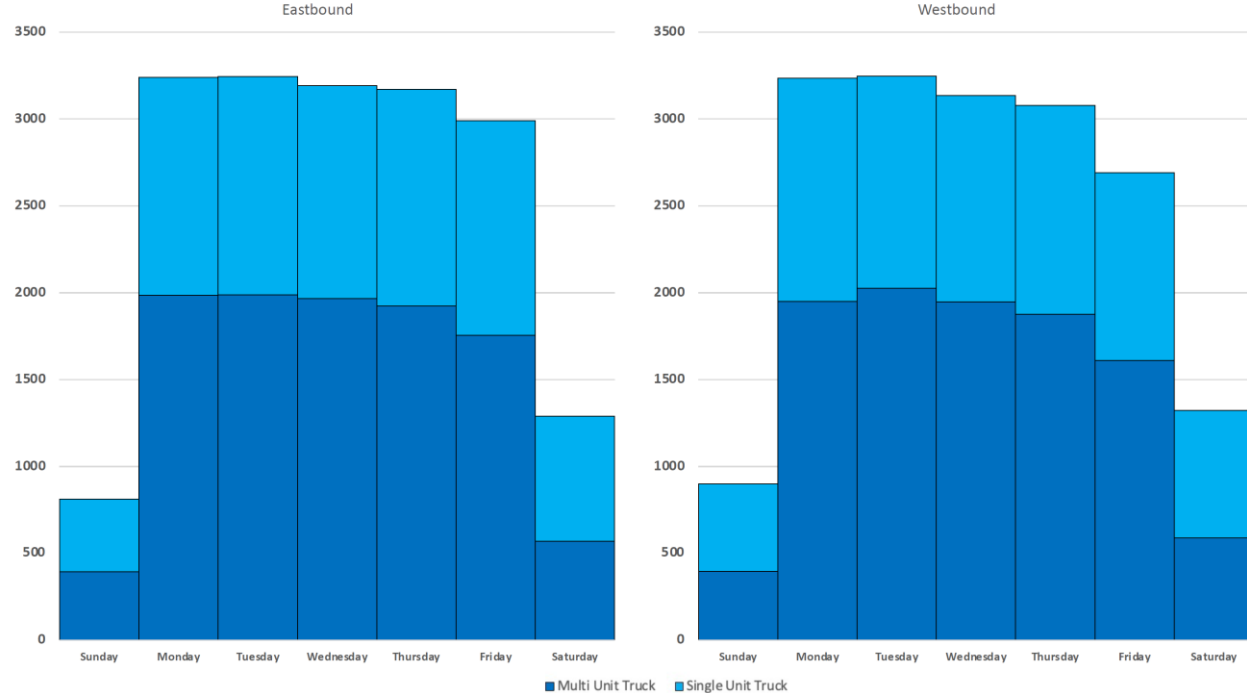


- Data for this and following charts collected as part of the 2019 Commercial Vehicle Survey process
- Hourly charts in the series are based on data for Wednesday
- Approximately **13,500 trucks per day** during the peak days on QEW near Winona
- Peaks at over **500 trucks per hour** in both directions
- EB movements, towards Niagara and the border, peak earlier in the week
- WB movements increase or sustain for most of the week
- Straight trucks are prominent, but in the minority
- More trucks near Winona than what we see closer to St. Catharines at Vineland (which maxes out near 11,000 trucks per day)

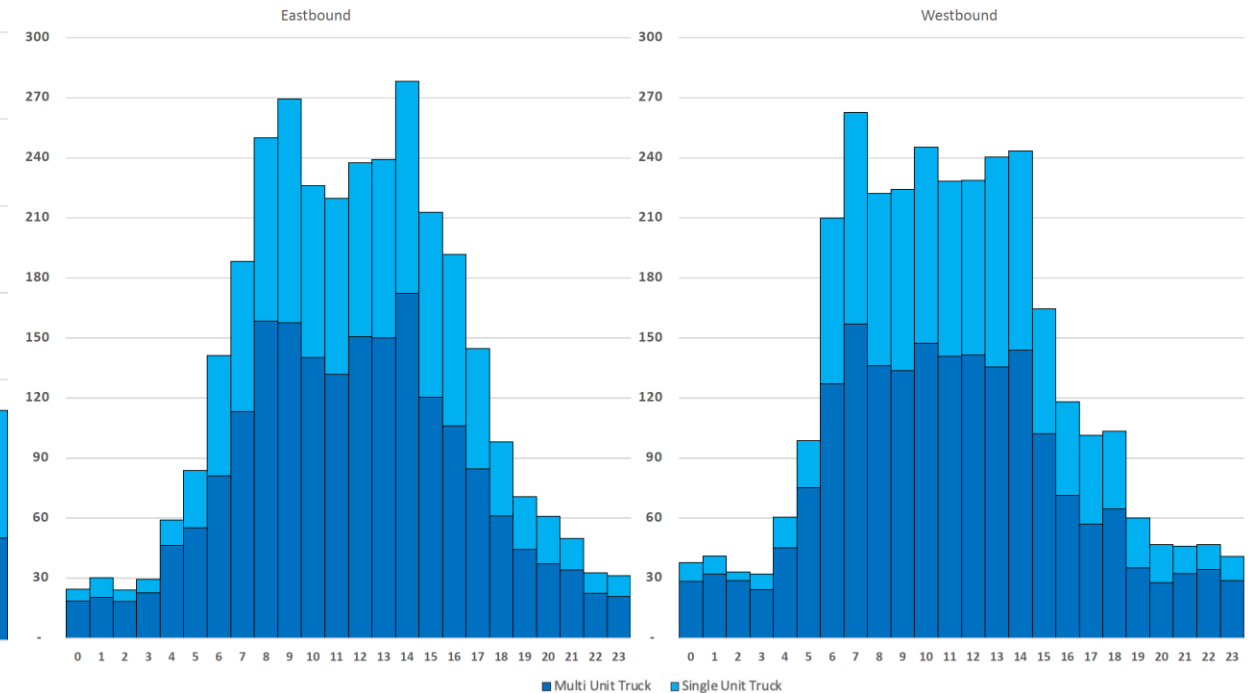


Daily And Hourly Truck Volumes on LINC

Daily Truck Volumes on Lincoln Alexander Parkway (near Dartnall Road)



Hourly Truck Volumes on Lincoln Alexander Parkway (near Dartnall Road)

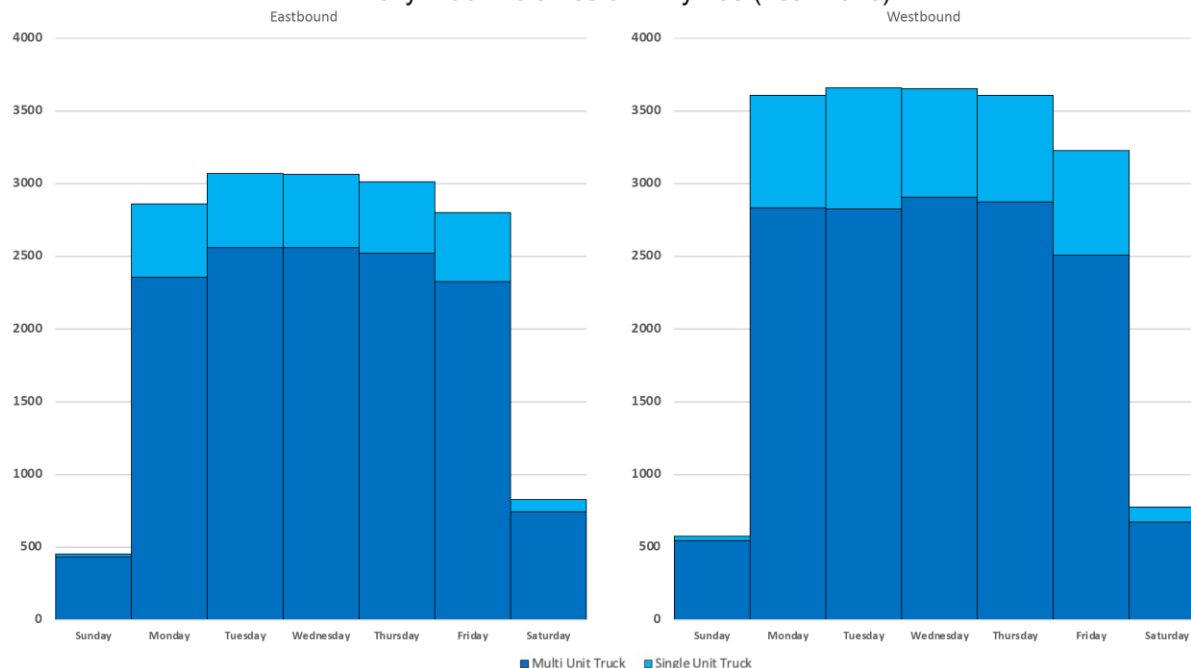


- Approximately 6,500 trucks per day during the peak days
- Peaks near 300 trucks per hour but generally a bit higher EB
- Slight decline in trucks as the week goes on, with Friday being notably lower
- More early AM peak urgency in the WB direction perhaps due to congestion worries towards Toronto
- Straight trucks in the minority but see vast majority of activity during the day

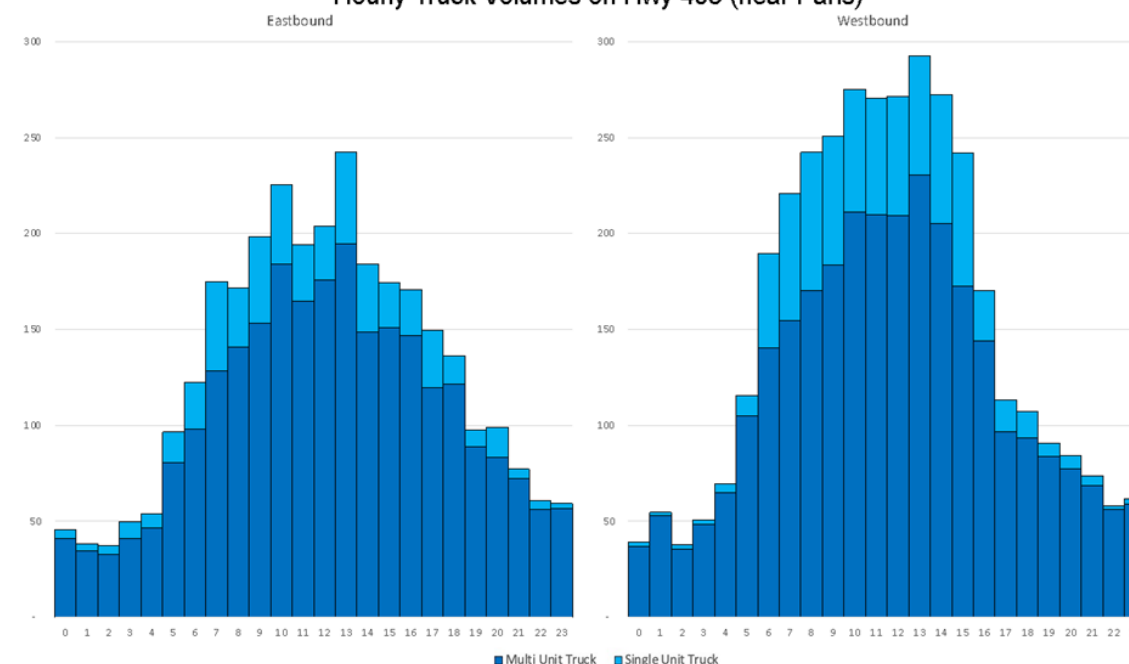


Daily And Hourly Truck Volumes on 403

Daily Truck Volumes on Hwy 403 (near Paris)

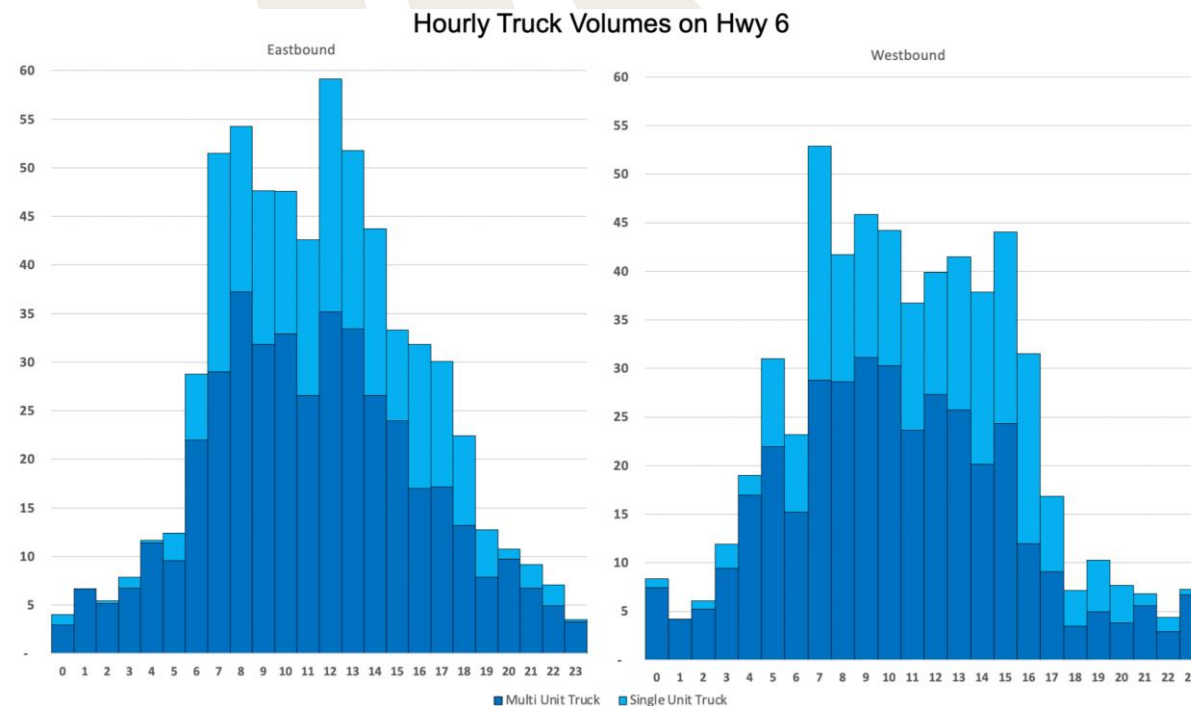
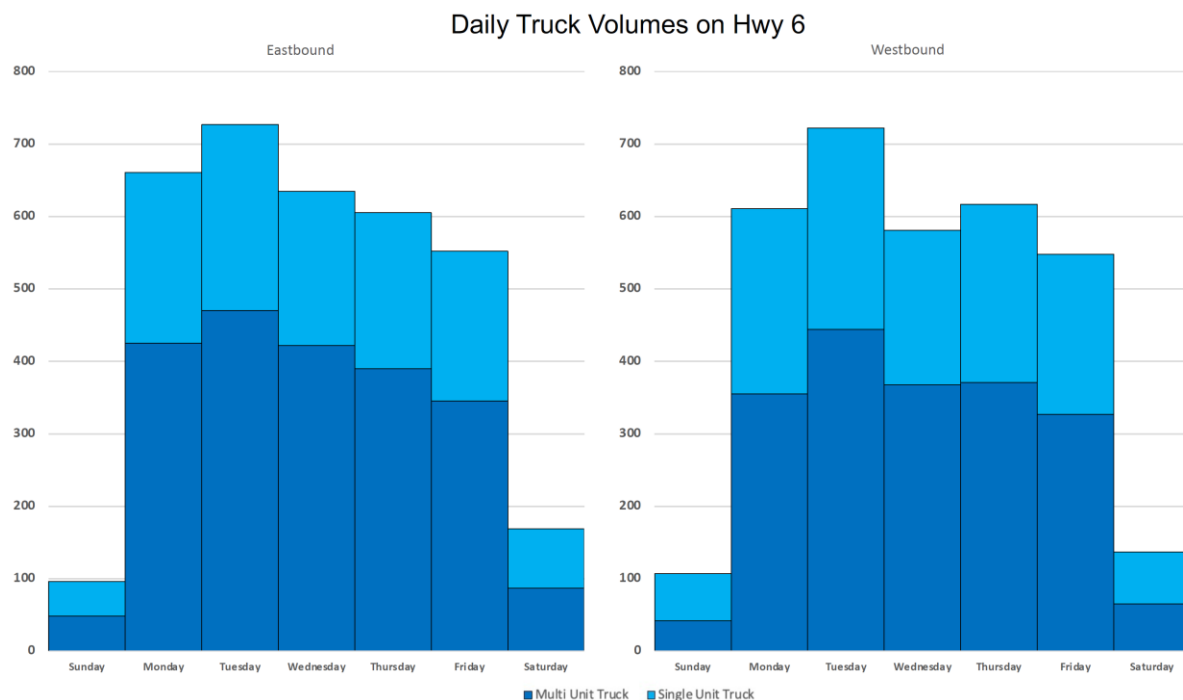


Hourly Truck Volumes on Hwy 403 (near Paris)

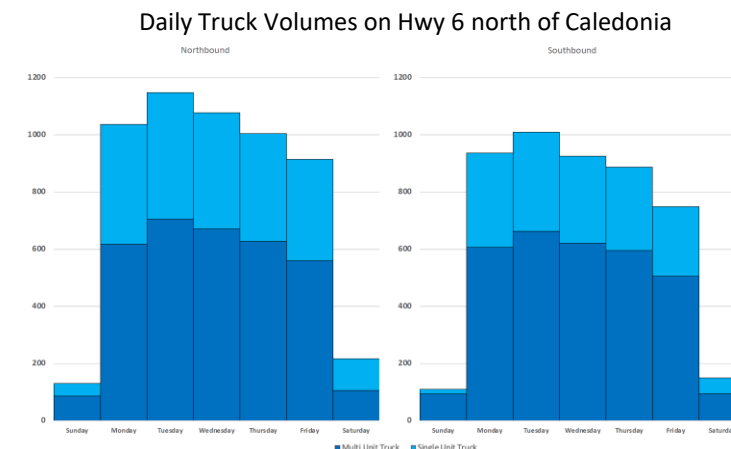


- Note that the site is west of Brantford let alone Hamilton and likely underestimates 403 volumes in Hamilton, especially for straight trucks
- There are approximately 6700 trucks per day on the highest volume days
- Peak hourly volumes WB exceed 300 per hour on certain days and approach 250 trucks per hour EB
- Truck volumes peak mildly at mid-week
- Straight trucks are notably less prominent at this location but are moving WB toward Hwy 401 at a much higher rate

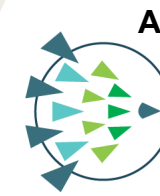
Daily And Hourly Truck Volumes On Hwy 6S Near YHM



- Total trucks average about 1300 per day during the week but there is a Tuesday peak over 1400
- Peak hourly volumes approach or exceed 70 per hour on Tuesday but less than 60 per hour is more typical
- Volumes generally decline as the week goes on
- Truck volumes are notably higher on Hwy 6 near Caledonia (up to 2100) which also contains many trucks linked to Upper James Street



Breakdown Of Outflowing Trips from Origins (Left) And Inflowing Trips to Destinations (Right)

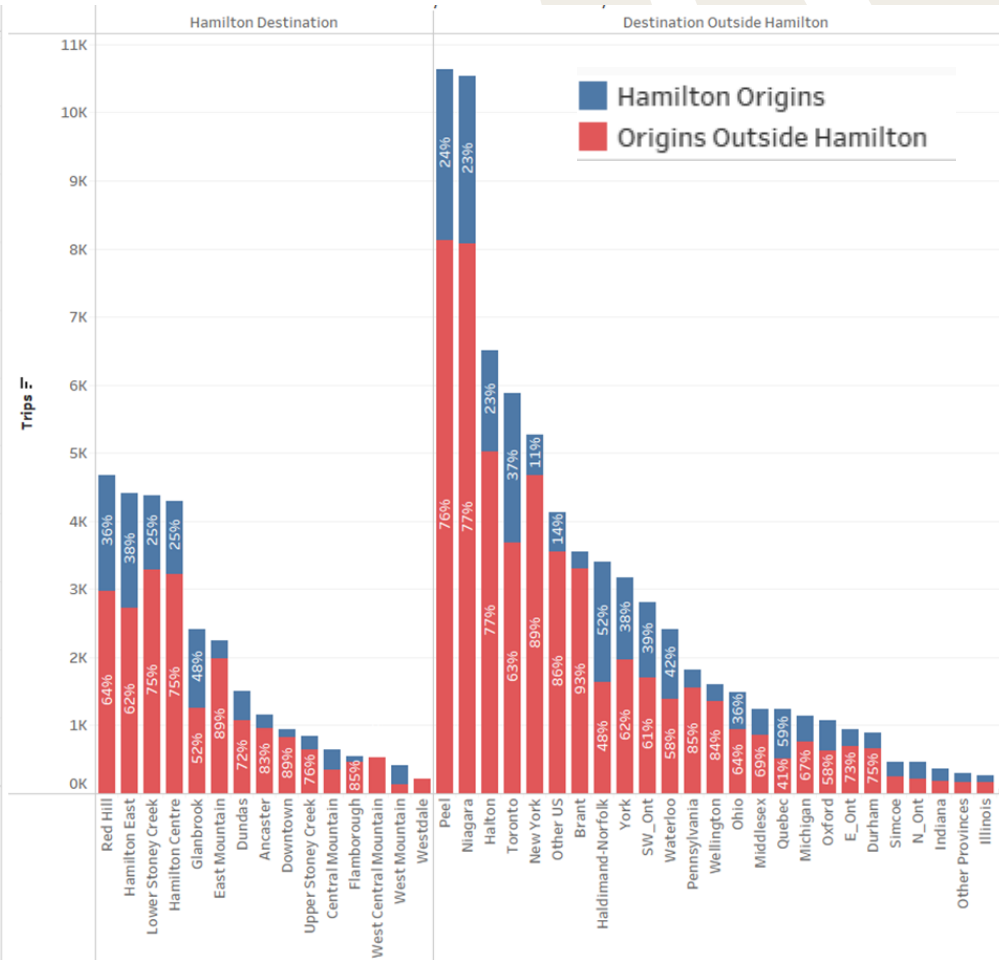
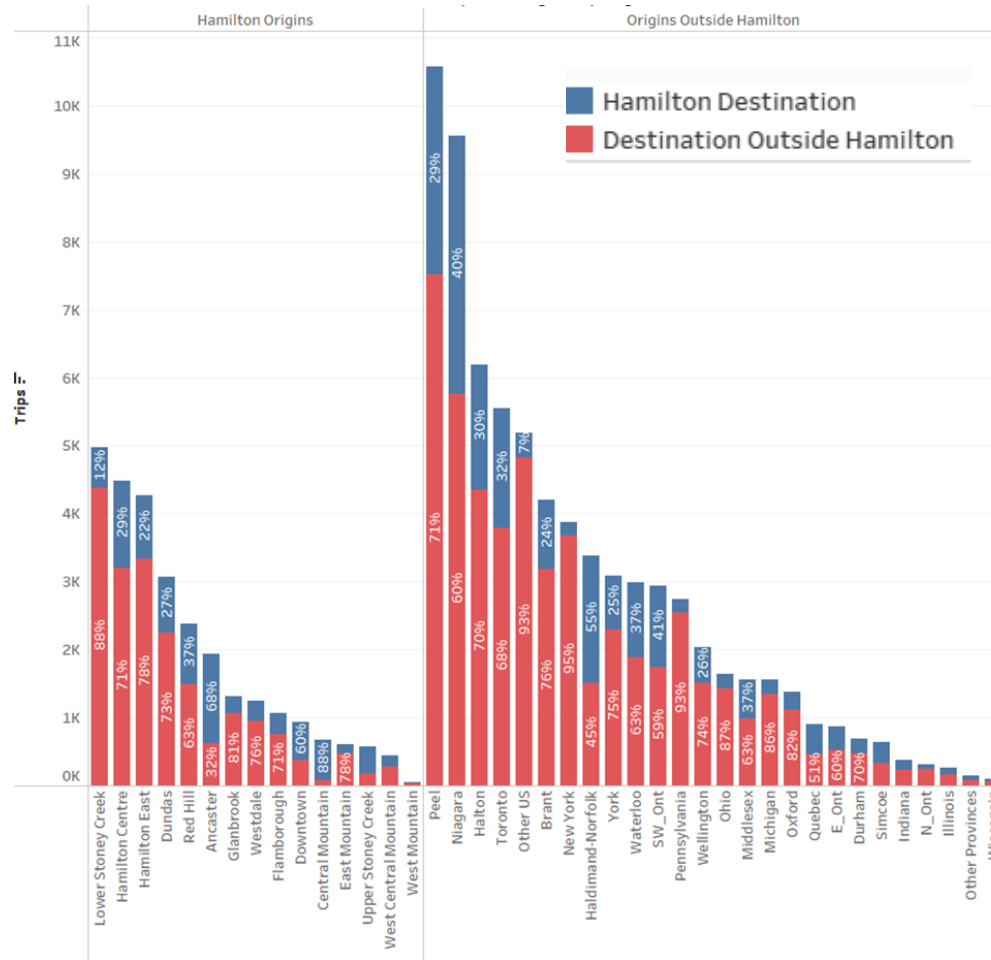


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- These are cargo-carrying trips
- Left chart shows that most trucks seen in Hamilton at any given time originated outside Hamilton
- Right chart indicates that most of the trucks above will arrive at destinations outside Hamilton
- 40% of Niagara originations are bound for Hamilton but only 23% of Niagara arrivals come from Hamilton
- Trucks seen in Hamilton from the US are highly likely to end their trip outside Hamilton
- But Hamilton is more prominent in generating trips that end in the US
- Lower Stoney Creek generates the most outflowing trips of Hamilton zones and a very high % end outside Hamilton
- Red Hill more prominent for receiving cargo trips than generating them
- Dundas ward generates many more cargo-carrying trips than are received



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Weekly Truck Tonnage Flow Patterns From The Hamilton-Oriented CVS

Origin	Destination																												GrandTotal	
	Peel	Niagara	Halton	New York	Red Hill	Toronto	Hamilton Centre	Hamilton East	Haldimand-Norfolk	SW_Ont	Other US	York	Brant	Lower Stoney Creek	Glanbrook	East Mountain	Quebec	Oxford	Michigan	Pennsylvania	Ohio	Waterloo	Dundas	Downtown	Wellington	E_Ont	Ancaster	Middlesex		N_Ont
Hamilton Centre	9,750	4,021	8,241	4,402	14,389	2,730	1,556	4,440	17,228	6,025	2,855	1,895	20	5,066			7,517	4,627	1,115	1,640	3,184	1,671	1,348		918	126	83	291	1,028	106,164
Peel	94	14,895	123	15,352	7,631	33	6,433	3,368	3,039	2,327	13,509		9,018	7,653	862	959		81	1,954	6,473	4,369	1,335	824	395	432		2,468	545		104,173
Niagara	11,596	480	15,747	2	1,050	4,300	2,423	4,639	483	5,084	1,164	1,164	2,275	3,132	322	22,257	1,590	3,201	1,149		150	4,285	2,510	4,056	374	819	383	2,333	1,054	98,022
Hamilton East	9,541	3,653			5,089	2,909	383	25	20,248	15,247	2,597	6,015			10	5,855	4	1,188		2,445	640	2,089				843	383	650	1,195	80,623
Haldimand-Nor...	5,713	2,233	3,805		1,724	2,771	13,941	11,144		1,884	162	5,028		2,498	10,956	1,139	3,814		645							2,776	1,910	300	356	72,798
Toronto	38	13,656	276	10,165	1,324		1,908	3,356	1,971	3,179	6,711	59	10,696	1,322	3,531			124	3,122	3,321	657	224	3,471	210	1,792			1,332		72,446
Dundas	5,479	1,710	12,071		2	17,927	1,846	3,634	666			4,498			9,750		1,268	2,082		522		2,234	591	1,349		444	415	233	382	67,104
Other US	24,579	599	7,901		463	7,620	375	639	584	1,362	265	3,219	1,344	2,974	796		452	1,111				3,530	736		1,619	689		202	290	61,348
Halton	521	17,358	103	4,207	1,617	3,402	1,249	1,372	477	3,624	4,722	35	3,228	2,826	389	1,134		1,802	2,301	1,219	1,407	2,082	702	175	1,352	4	119	1,109		58,535
SW_Ont	5,685	3,550	3,051	8,231	5,112	718	12,252	6,011	965		2,542		607	744			437		606			11	1,088	5,645			416	10		57,682
Lower Stoney C..	10,370	4,135	669	3,081		1,408	576	185	149	4,253	2,277	701	34	79			2,973	5,723	6,668	959	4,447	553	208		82	1,335		1,964	2,928	55,755
New York	12,085		3,333		4,657	1,846	741	834	5,676			3,163	3,419	459	14	612	687	1,772	4,138			2,042			2,177	349	47	684	150	48,886
Brant	12,268	1,660	3,775	1,409	2,278	2,319	4,427				3,696	3,715		914			1,162			1,699					793	1,913			146	42,174
Pennsylvania	13,698		3,281		3,285	3,043		846	503	289		2,577	3,244				180	2,221				801			1,398	73		620	468	36,526
Waterloo	1,214	6,878	3,413	2,451	751	541	1,013	4,786	943	15	2,192	1	325	641	1,666	577			1,389	599	208	267			374		1,414	110		31,767
York	506	5,269	16	6,008	2,249	12	1,169	990	2,902	2	3,034		2,428	2,322		508			509	1,994	1,446	19	116	5	17	18	25			31,566
Wellington	332	2,916	7,278	3,906	1,798	288	1,300	3,537	54		1,584		518	404	1,563				1,849	421			629	564	1,844		20			30,806
Ancaster	561	1,596			14,304	946		2,733	7		170		58	997	2,135		255		450		218	16				61	1,836			26,343
Red Hill	1,286	1,342	72	1,892	10	731	65	97	203	1,375	427	10,084		9	497	1,361	1,141		385		347	293			2,362	817			1,292	26,087
Oxford	633	5,613	759	2,777	3,287	3,623	2,676				254	177								546	224		1,477	1,555					844	24,444
Michigan	635	1,805	7,532	7,406	98	696	1,424	182			476			1,298	239								839		0					22,630
Middlesex	3,996	1,698	2,185	447	1,640	2,153	1,669	1,546	234	1	670		43	725	234	557		5		229	396	16	1,239	712			76			20,473
Quebec		1,587	281	463	1,398		3,218	4,781	2,102		528		2,400	1,037		302		38			942	106		31			855			20,067
Westdale	5,001	500	4,707	262		1,963	843	957	252	445	175	1,117		396			746			250	467	127			1,680					19,888
Ohio	5,682	467	4,027	220		1,770	250	639		107		1,039	1,008	1,532	115			297			251				1,296	679	203	130		19,710
E_Ont		2,205		1,999	3,305		1,032	760	3,124	17	661			228	951	330	91		661		252	841	19	703	2,289			123		19,589
Glanbrook	1,249	1,691	3	784		228		1,383	596			316	3,827	5,434			575					1,448		691	232			188	211	18,557
Flamborough	5	1,932	2,693			1,556	447	646	1,867	22		2,410									282	49	1,906	1			671	2		14,489
Simcoe	11	774	21	2,298	1,078	666	1,811	1,184			1,166		107							307	143			2,365						11,931
Downtown		1,791	37			27	16	136		1,590		237		1,210	4,367		558									958				10,927
Grand Total	142,528	106,014	95,401	77,762	73,882	69,035	66,146	63,374	60,219	53,119	51,834	47,450	44,827	44,625	37,768	29,506	29,212	23,710	23,662	23,255	22,983	21,960	20,743	20,043	18,741	11,903	10,941	10,828	10,343	1,311,810

Intra-hamilton Weekly Trip (L) And Tonnage (R) Flows



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Origin	Destination	Downtown	Hamilton Centre	Hamilton East	Red Hill	East Mountain	Central Mountain	Upper Stoney Creek	Lower Stoney Creek	Glanbrook	Ancaster	Dundas	West Mountain	Flamborough	Grand Total
Westdale			75	209					11						295
Downtown			75	70					203	213					561
Hamilton Centre			154	296	446				285		20	75			1,276
Hamilton East			154	250	171	4						80	279	5	942
Red Hill			123	27	5	250	250		39	137				50	880
East Mountain			41	16							43	32			133
Central Mountain					590										590
West Central Mountain								163							163
Upper Stoney Creek			50						105	250					404
Lower Stoney Creek			115	104			50	39	177			102			587
Glanbrook		38							213						252
Ancaster				513	468				59	213	60				1,313
Dundas		40	189	116	10					349	44	44			818
West Mountain				11							32	94			11
Flamborough		26	75	82											310
Grand Total		104	1,061	1,683	1,689	254	300	202	1,091	1,162	200	427	279	81	8,533

Origin	Destination	Downtown	Hamilton Centre	Hamilton East	Red Hill	East Mountain	Central Mountain	Upper Stoney Creek	Lower Stoney Creek	Glanbrook	Ancaster	Dundas	West Mountain	Flamborough	Grand Total
Westdale			843	957					396						2,196
Downtown			16	136					1,210	4,367					5,729
Hamilton Centre			1,556	4,440	14,389				5,066		83	1,348			26,882
Hamilton East			383	25	5,089	10						2,089	4,305	4	11,905
Red Hill			65	97	10	1,361	2,199		9	497				116	4,355
East Mountain			1,261	58							59	19			1,398
Central Mountain					3,001										3,001
West Central Mountain								3,099							3,099
Upper Stoney Creek			1,068						1,810	3,000					5,878
Lower Stoney Creek			576	185			25	26	79			208			1,099
Glanbrook		691							5,434						6,126
Ancaster				2,733	14,304				997	2,135	1,836				22,006
Dundas		1,349	1,846	3,634	2					9,750	415	591		57	17,644
West Mountain				35											35
Flamborough		1	447	646							671	1,906			3,671
Grand Total		2,041	8,096	12,912	36,796	1,371	2,224	3,125	15,002	19,749	3,064	6,161	4,305	178	115,023

- These are based on a wider-scale sample and are for general guidance
- A range of local truck trips, especially smaller trucks and vans, likely not captured
- An estimated 8533 intra-Hamilton truck trips are associated with the movement of 115k tonnes per week

- The magnitude of movement by trucks that are not carrying any cargo is very large
- These are derived from the CVS which tracks that aspect among trucks that are intercepted





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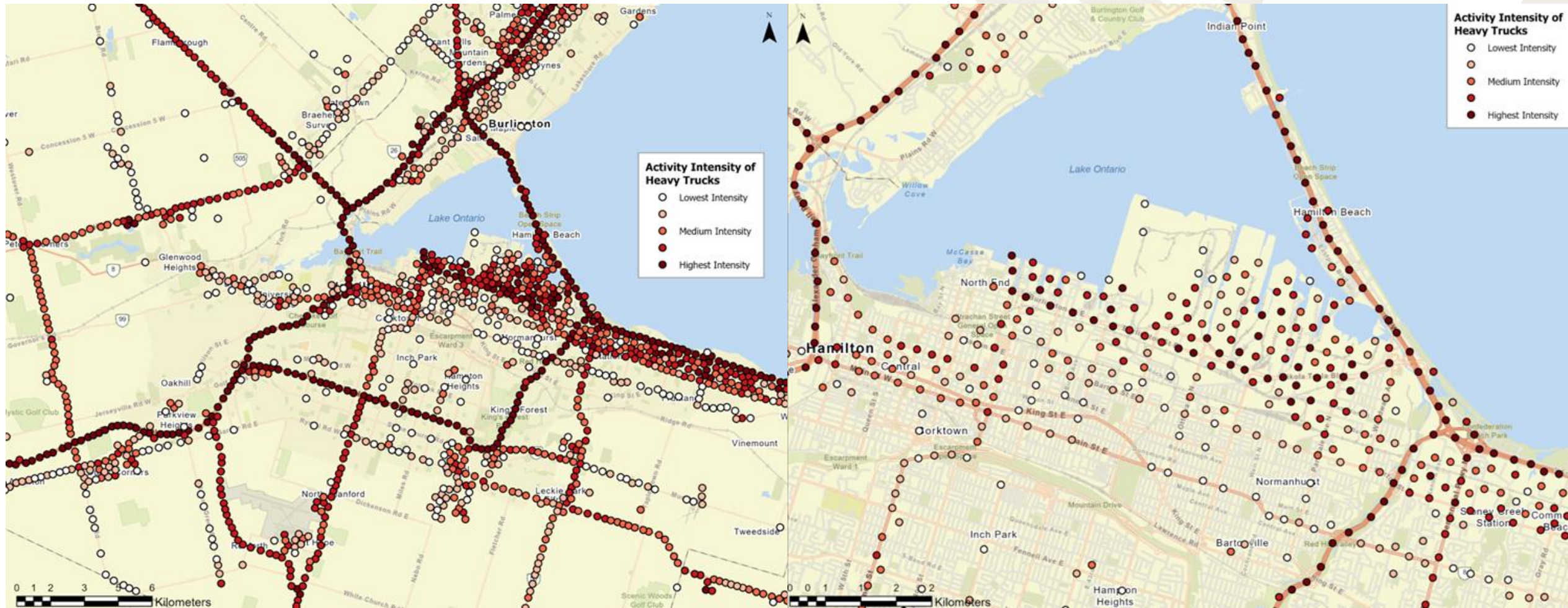


ATRI And Other GPS-based Sources



Intensity of Trucking Activity

Based on sampled ATRI data from September 2022 to February 2023 and spatial aggregation

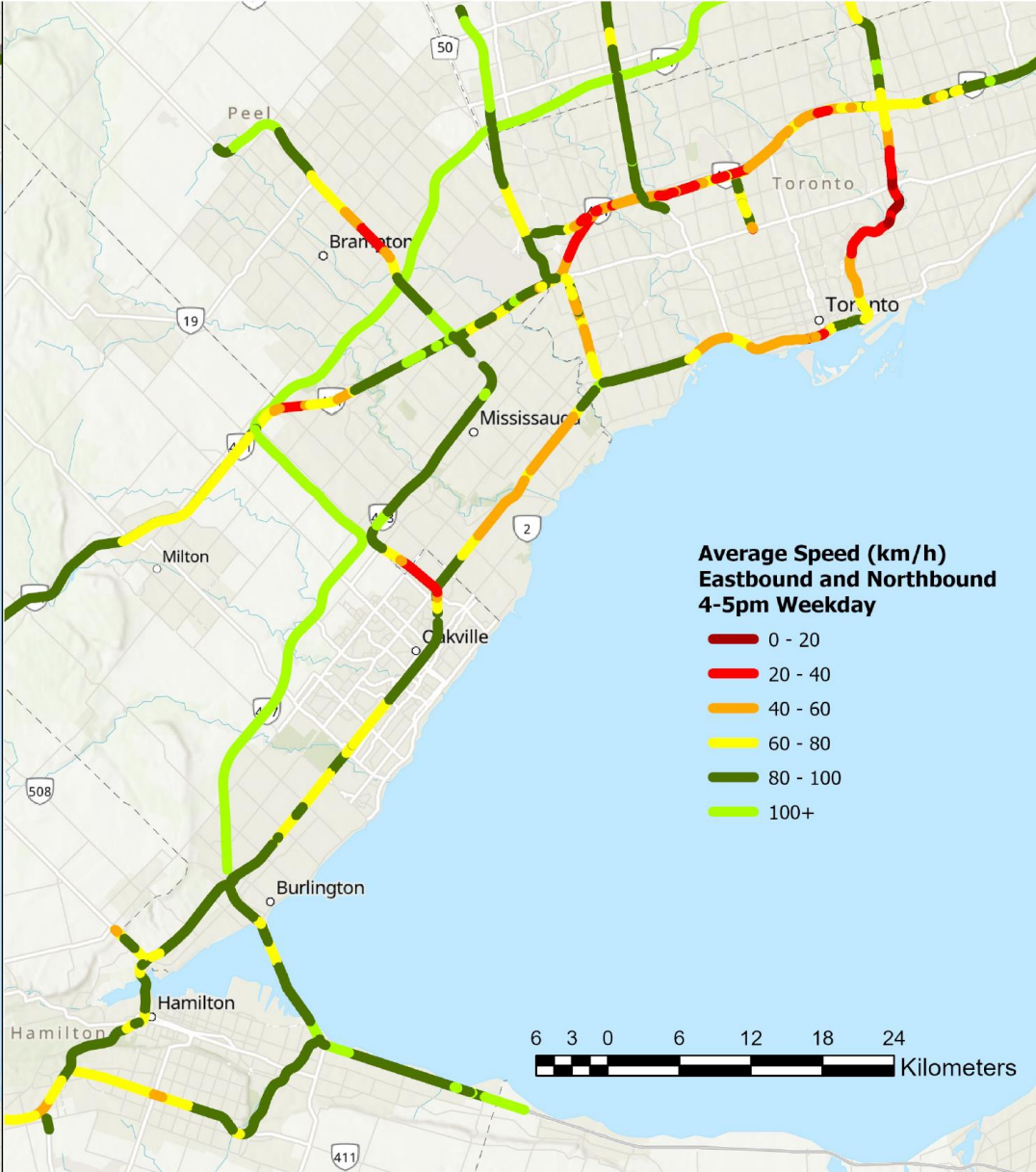




Notes on Trucking Intensity

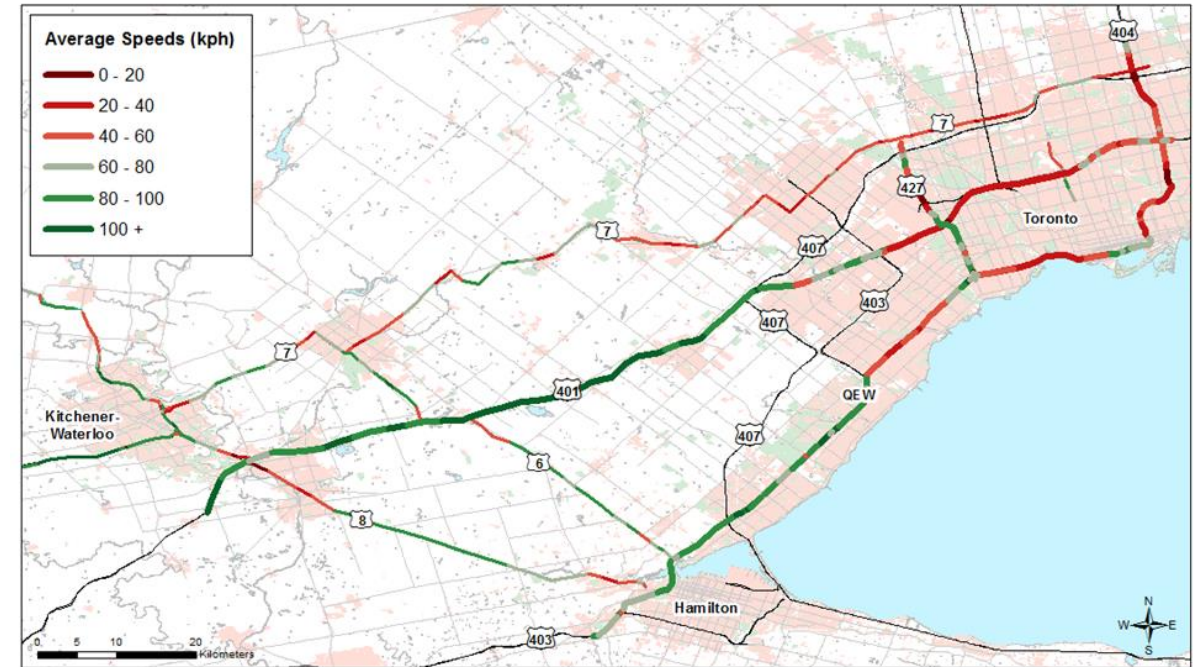
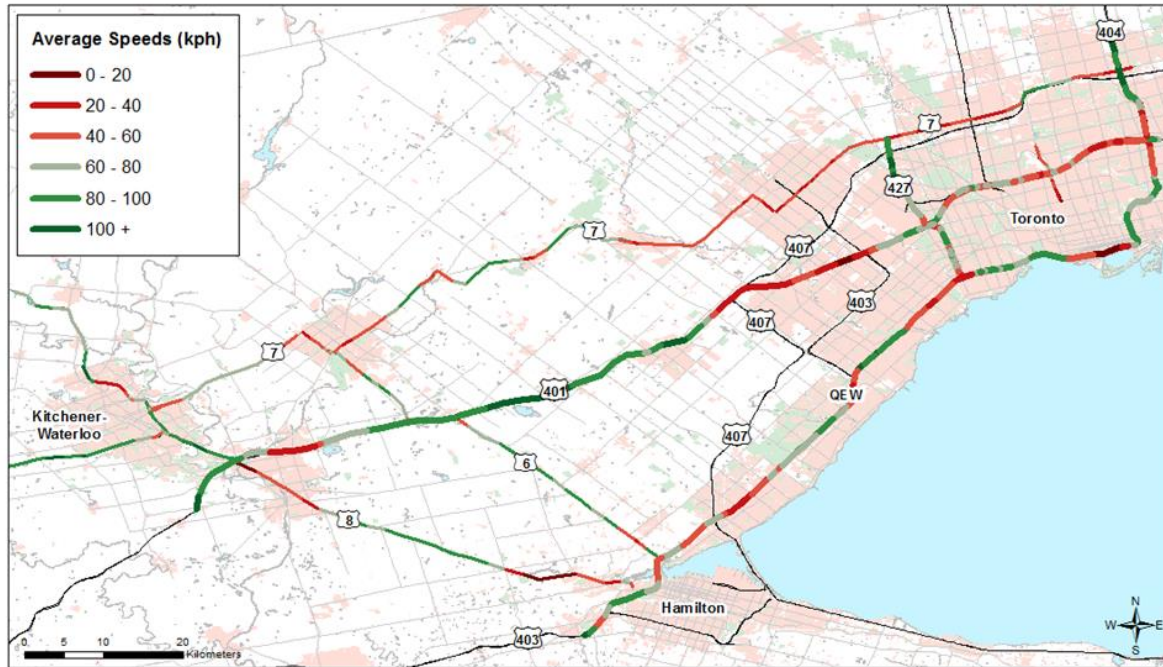
- Major highways show intense trucking activity with a majority of it passing through the City (based on other sources)
- The Linc and Red Hill Valley Parkway are integral to the truck network and to supporting business parks/ new industrial development
- Upper James is already a very busy commercial strip and is not ideally suited as a main conduit to get trucks to and from the Linc
- Upper James more heavily used south of the Linc than north of it
- Significant trucking activity around the new Amazon facility is evident
- Main St. west of the downtown is far more intense for heavy trucks than Main St. nearer the Red Hill
- Hwy 407 shows up as a notable truck route despite high tolls
- The main business parks are all readily identifiable through their associated truck activity
- Hwy 6 up to and north of Clappison's Corner stands out as busy for trucks
- Methodological notes: through a spatial aggregation process, representative points were selected and ping information was allocated to nearest representative point. Generally, road link movements are well captured by chosen representative points
- Pings with zero speeds were excluded from the process
- Note that these maps above will be annotated to identify key locations such as business parks

Results From 2022 HERE Data (A Period Of Lower Traffic Congestion)





Weekday 5:30pm: Selected Corridors (2014)



- From MITL 2016 for a project on Toronto-Waterloo Innovation Corridor – only the 403 is included for Hamilton
- The report utilized INRIX data from 2014
- This is for PM Peak, the left map covers WB and SB directions and the right map covers EB and NB directions
- The GTA shows high levels of congestion in most directions at that time and more so for EB and NB
- Hwy 403 near Hamilton shows notable WB congestion in reaching Main Street exit
- Three lanes going up the Ancaster Hill helps with WB 403 speeds
- QEW/403 WB in Burlington WB a big problem then and now
- EB 403 near Hamilton appears to perform better than now
- GTA congestion appears materially lower in 2022 than it was in 2014 (comparison not quite apples to apples)

Average Highway Truck Speeds In Hamilton By Day And Time Of Day (2022)

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
12:00 AM	86 km/h	86 km/h	87 km/h	87 km/h	87 km/h	86 km/h	86 km/h
	87 km/h	87 km/h	87 km/h	87 km/h	87 km/h	86 km/h	85 km/h
02:00 AM	87 km/h	86 km/h	87 km/h	87 km/h	87 km/h	86 km/h	86 km/h
	87 km/h	86 km/h	87 km/h	87 km/h	87 km/h	86 km/h	86 km/h
04:00 AM	87 km/h	86 km/h	87 km/h	87 km/h	87 km/h	86 km/h	87 km/h
	87 km/h	86 km/h	86 km/h	85 km/h	86 km/h	85 km/h	87 km/h
06:00 AM	87 km/h	81 km/h	78 km/h	78 km/h	79 km/h	84 km/h	87 km/h
	87 km/h	75 km/h	70 km/h	71 km/h	72 km/h	82 km/h	87 km/h
08:00 AM	87 km/h	80 km/h	76 km/h	77 km/h	78 km/h	83 km/h	87 km/h
	87 km/h	84 km/h	83 km/h	84 km/h	84 km/h	85 km/h	86 km/h
10:00 AM	86 km/h	85 km/h	85 km/h	85 km/h	85 km/h	85 km/h	85 km/h
	84 km/h	85 km/h	85 km/h	85 km/h	85 km/h	84 km/h	81 km/h
12:00 PM	81 km/h	85 km/h	86 km/h	86 km/h	86 km/h	83 km/h	78 km/h
	80 km/h	85 km/h	85 km/h	86 km/h	86 km/h	82 km/h	78 km/h
02:00 PM	80 km/h	85 km/h	86 km/h	85 km/h	84 km/h	77 km/h	79 km/h
	80 km/h	82 km/h	81 km/h	81 km/h	78 km/h	70 km/h	81 km/h
04:00 PM	83 km/h	77 km/h	74 km/h	73 km/h	69 km/h	65 km/h	83 km/h
	84 km/h	75 km/h	71 km/h	70 km/h	67 km/h	67 km/h	84 km/h
06:00 PM	84 km/h	83 km/h	82 km/h	81 km/h	79 km/h	78 km/h	83 km/h
	84 km/h	85 km/h	85 km/h	85 km/h	84 km/h	84 km/h	84 km/h
08:00 PM	84 km/h	85 km/h	86 km/h	86 km/h	85 km/h	86 km/h	85 km/h
	83 km/h	85 km/h	87 km/h	86 km/h	85 km/h	86 km/h	84 km/h
10:00 PM	85 km/h	87 km/h	86 km/h	86 km/h	85 km/h	86 km/h	85 km/h
	86 km/h	86 km/h	87 km/h	86 km/h	86 km/h	86 km/h	86 km/h

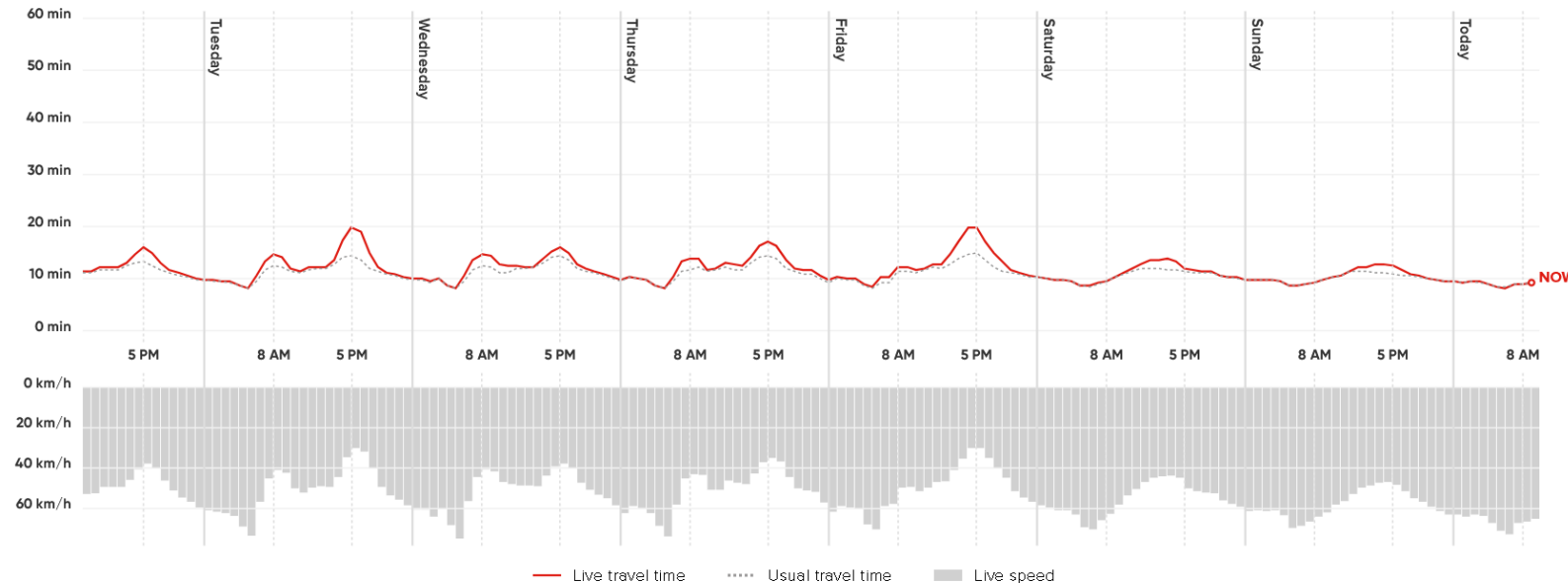
- These are estimates from TomTom for 2022 and it is noted that these apply to highways only and not local arterials
- Certain corridors would have been slower or faster at any given time
- AM Peak was slowest mid-week when there was more commuting activity
- PM peak was more severe than AM peak and especially on Fridays
- AM peak on Friday was the lightest of week

Source: <https://www.tomtom.com/traffic-index/hamilton-traffic>

Hamilton-wide Traffic Speeds Oct. 2-9, 2023

HOURLY SPEED AND TRAVEL TIME PER 10 KM

Last 48 hours **Last 7 days**



- This is from TomTom
- This chart is a blend of arterials and highways and different vehicle types
- Red line suggests that travel times in the week were worse than usual
- Grey bars indicate citywide speed averages between 30km/h and 75 km/h (calculated under varying circumstances)
- The slowest average speed from October 2nd to 9th 2023 (of 30km/h) occurred during PM peak on the Friday.

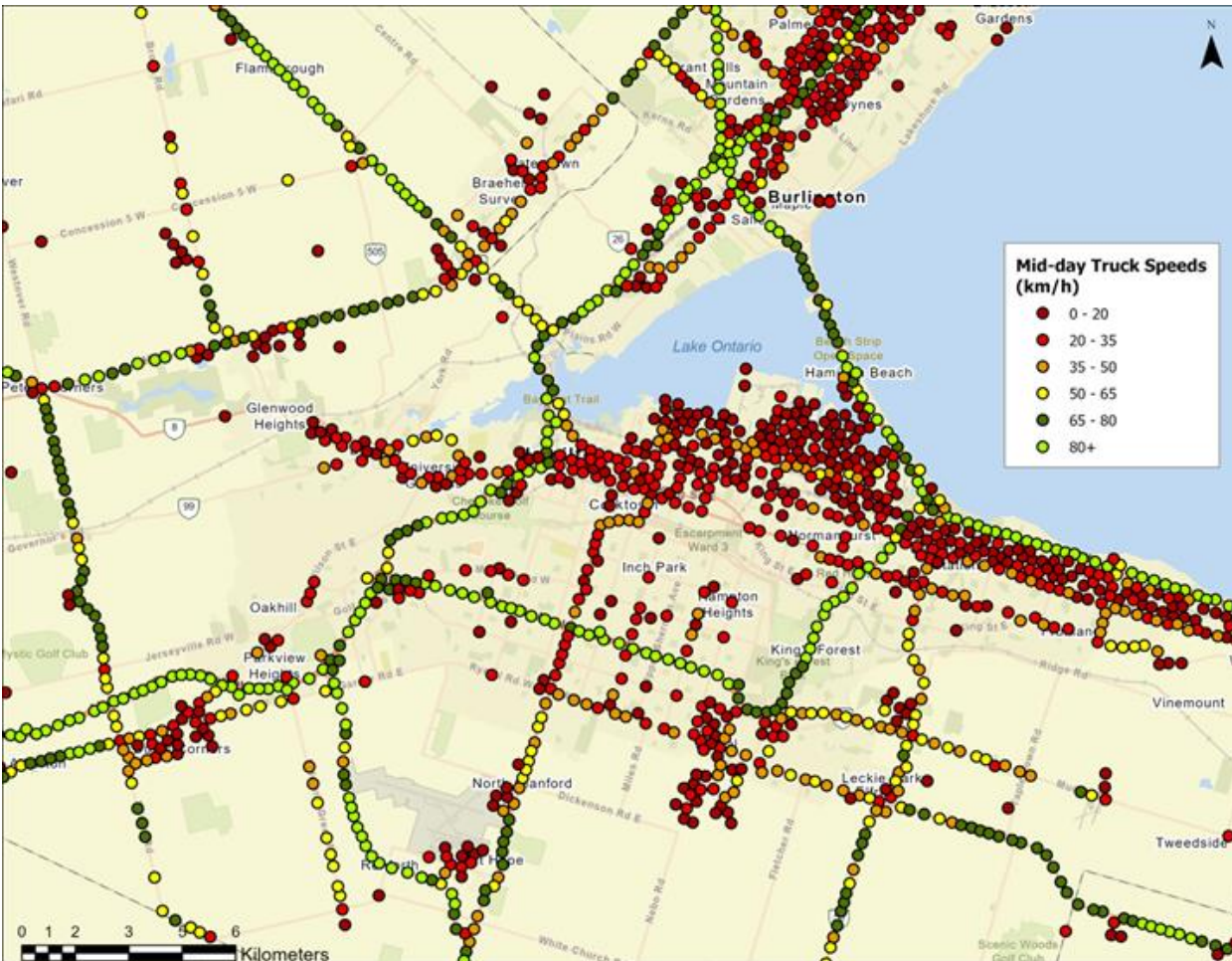
Truck Speeds Experienced At Key Locations During Mid-Day (Source: Atri)



Appendix "B" to PED24049

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Notes On Truck Speeds

- Results reflect several hours in the mid-day period when trucks are at the peak of their operations
- The speeds reflect the same time period indicated in the “Intensity of Trucking Activity” slides
- Results shown do not break down the two directions per road link
- Speeds have likely deteriorated since February
- Results do not reflect enforcement of central city changes to truck routes
- A lot of evidence of trucks operating at sub-optimal speeds of 50-65km/h on highways (e.g., Highway 6N between 403 and Clappison’s Corners, Hwy 5 near Clappison’s Corners, 403 Ancaster Hill, Highway 6S at Book Road
- Burlington Street is typically in the 35-50 km/h range but slows notably west of Wentworth
- Speeds are 20-35 km/h on Upper James near the Linc
- Speeds are slow for getting to/from the Downtown (more so on King St.)

One Week Trip Matrix For Trucks That Visit Hamilton – 1+ Hour Stop Durations

Origin	Destination																																					
	Peel	SW_Ont	Halton	Toronto	York	Niagara	E_Ont	New York	Waterloo	Michigan	Middlesex	Wellington	Brant	Oxford	Haldimand-Norfolk	Ohio	Durham	Hamilton East	Simcoe	Lower Stoney Creek	Red Hill	Hamilton Centre	Pennsylvania	Dundas	Ancaster	N_Ont	Downtown	Glanbrook	Westdale	East Mountain	Upper Stoney Creek	Flamborough	West Central Mountain	Central Mountain	West Mountain	Total		
Peel	0	1021	1140	1167	1052	842	608	730	675	580	480	429	451	374	314	240	285	238	240	225	115	63	53	55	45	40	29	23	14	13	9	5	2	1	3	11561		
SW_Ont	1031	0	415	370	420	358	257	290	379	584	429	287	189	282	208	201	105	174	131	109	66	35	19	30	20	24	18	14	11	1	4	2	2	0	0	6465		
Halton	1142	464	0	429	437	357	245	302	268	230	179	237	195	143	136	92	137	118	126	132	83	82	23	26	31	9	14	19	8	9	17	3	3	0	1	5697		
Toronto	1199	338	389	0	470	300	312	220	265	183	167	164	203	155	245	70	152	81	103	88	64	44	23	34	23	22	33	6	10	5	2	0	1	2	3	5376		
York	1128	355	445	455	0	339	266	265	261	212	171	188	170	130	114	107	122	59	130	93	54	20	21	17	21	16	10	11	6	1	5	2	2	1	0	5197		
Niagara	852	387	389	303	305	0	202	463	243	180	153	168	130	180	125	78	70	139	83	130	51	49	26	25	14	16	11	14	6	9	1	7	0	2	2	4813		
E_Ont	608	276	220	306	264	183	0	157	181	125	101	121	146	123	122	66	131	78	59	57	49	13	15	17	9	11	6	7	5	1	2	1	0	0	1	4144		
New York	696	252	293	235	276	549	172	0	186	114	133	98	100	67	72	227	52	73	58	59	33	28	134	13	17	6	15	5	8	4	2	2	0	0	0	3979		
Waterloo	649	375	351	281	271	248	167	152	0	158	139	213	138	149	106	68	77	65	94	86	36	16	13	21	30	9	16	14	4	3	6	4	1	0	0	3960		
Michigan	494	707	222	158	204	171	129	158	144	0	147	97	87	101	70	236	60	69	40	62	31	9	14	5	17	12	14	8	3	2	1	0	0	0	0	3472		
Middlesex	500	390	190	164	133	145	112	106	138	188	0	113	94	171	90	49	61	58	60	47	34	12	20	18	7	4	5	9	6	3	2	1	0	0	0	2930		
Wellington	443	265	262	163	175	173	107	112	213	93	116	0	87	97	66	41	50	42	71	54	30	19	5	43	9	3	7	3	1	2	2	7	2	1	0	2764		
Brant	395	218	214	181	162	137	142	101	155	108	106	96	0	84	89	46	63	35	38	45	38	18	9	13	10	8	11	8	1	0	2	0	0	0	0	2533		
Oxford	352	266	159	159	132	165	103	93	154	111	152	95	103	0	98	44	64	49	47	52	24	16	7	17	9	9	7	5	2	1	2	2	0	1	0	2500		
Haldimand-Norfolk	318	190	120	223	117	139	94	92	118	82	86	68	97	101	0	26	39	58	40	38	34	19	5	13	10	6	6	5	7	9	1	1	1	4	0	2167		
Ohio	268	201	81	85	108	98	71	228	59	214	40	38	31	28	42	0	27	25	25	30	11	8	30	3	9	2	3	0	1	2	0	0	0	0	0	1768		
Durham	263	105	131	167	133	76	143	61	65	44	50	44	62	57	41	24	0	28	30	34	16	7	3	11	5	5	2	3	2	3	0	0	1	0	0	1616		
Hamilton East	247	151	133	89	81	95	74	85	76	51	59	59	44	65	71	15	26	0	31	45	26	17	8	11	5	5	5	7	0	4	1	0	0	0	0	1591		
Simcoe	225	141	111	90	163	90	62	62	92	58	58	66	38	48	38	27	18	22	0	28	13	8	8	7	2	46	5	3	0	1	2	1	0	0	0	1533		
Lower Stoney Creek	238	113	133	77	90	134	53	62	71	54	51	52	57	47	33	30	31	59	26	0	24	17	6	6	12	4	3	3	5	1	0	5	0	1	0	1498		
Red Hill	123	69	109	72	54	60	48	33	59	28	34	28	25	22	19	16	17	45	11	20	0	14	2	23	5	2	2	1	2	2	0	1	0	0	0	946		
Hamilton Centre	56	35	39	29	20	39	12	17	30	12	13	8	24	23	14	11	7	33	3	22	65	0	0	6	5	0	0	1	4	0	0	1	0	0	1	530		
Pennsylvania	69	26	16	21	27	20	15	129	16	14	7	5	11	7	6	38	7	1	4	2	4	0	0	0	2	0	0	1	1	0	0	0	0	0	0	449		
Dundas	49	24	28	34	20	22	14	11	35	7	16	53	12	18	8	1	1	11	10	11	27	4	0	0	0	1	0	0	0	1	2	0	0	0	0	421		
Ancaster	51	25	33	29	28	14	10	14	24	11	6	9	9	3	7	2	5	8	7	7	6	7	0	2	0	0	0	1	1	0	1	0	0	0	0	321		
N_Ont	36	17	9	27	13	14	11	10	8	5	9	8	6	10	6	4	2	2	54	6	3	0	1	0	0	2	0	0	1	0	0	0	0	0	0	264		
Downtown	34	17	13	19	17	10	14	11	11	10	5	11	11	5	6	6	2	6	7	3	1	0	2	0	0	1	0	0	0	0	0	1	0	0	0	223		
Glanbrook	35	15	17	9	6	9	6	4	18	3	11	6	4	3	8	1	1	2	1	5	0	1	0	3	1	0	0	0	0	1	2	0	0	0	0	172		
Westdale	17	8	12	7	6	3	1	6	5	8	6	0	2	2	6	0	3	9	3	2	2	2	1	0	1	0	0	0	0	0	0	1	3	0	0	116		
East Mountain	20	6	3	10	6	6	0	3	3	2	3	1	0	0	4	1	0	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	1	0	0	74		
Upper Stoney Creek	6	5	10	7	2	10	4	1	5	2	3	1	0	0	2	1	0	2	1	1	3	1	0	2	0	0	0	2	0	0	0	0	0	0	0	71		
Flamborough	8	3	8	3	0	6	5	0	2	1	0	0	4	3	1	0	1	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50		
West Central Mountain	5	0	1	3	1	0	0	0	0	0	0	0	1	2	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	16		
Central Mountain	2	0	0	1	2	0	1	0	0	1	0	0	1	2	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	14		
West Mountain	2	0	1	3	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	12		
Total	11561	6464	5697	5376	5197	4813	4143	3979	3960	3473	2930	2764	2533	2500	2167	1768	1616	1591	1533	1498	946	530	449	421	321	264	223	172	116	74	71	50	16	14	12	79920		

- Based on a full week of ATRI sample data from February 2023
- Trucks that do not visit City of Hamilton during that week are not included
- It is assumed that one trip ends and another begins when a truck stops for an hour or more
- “Centre of gravity” during the week is Peel Region and the GTA
- Several Hamilton regions (wards) are not at all prominent as places where stops are made

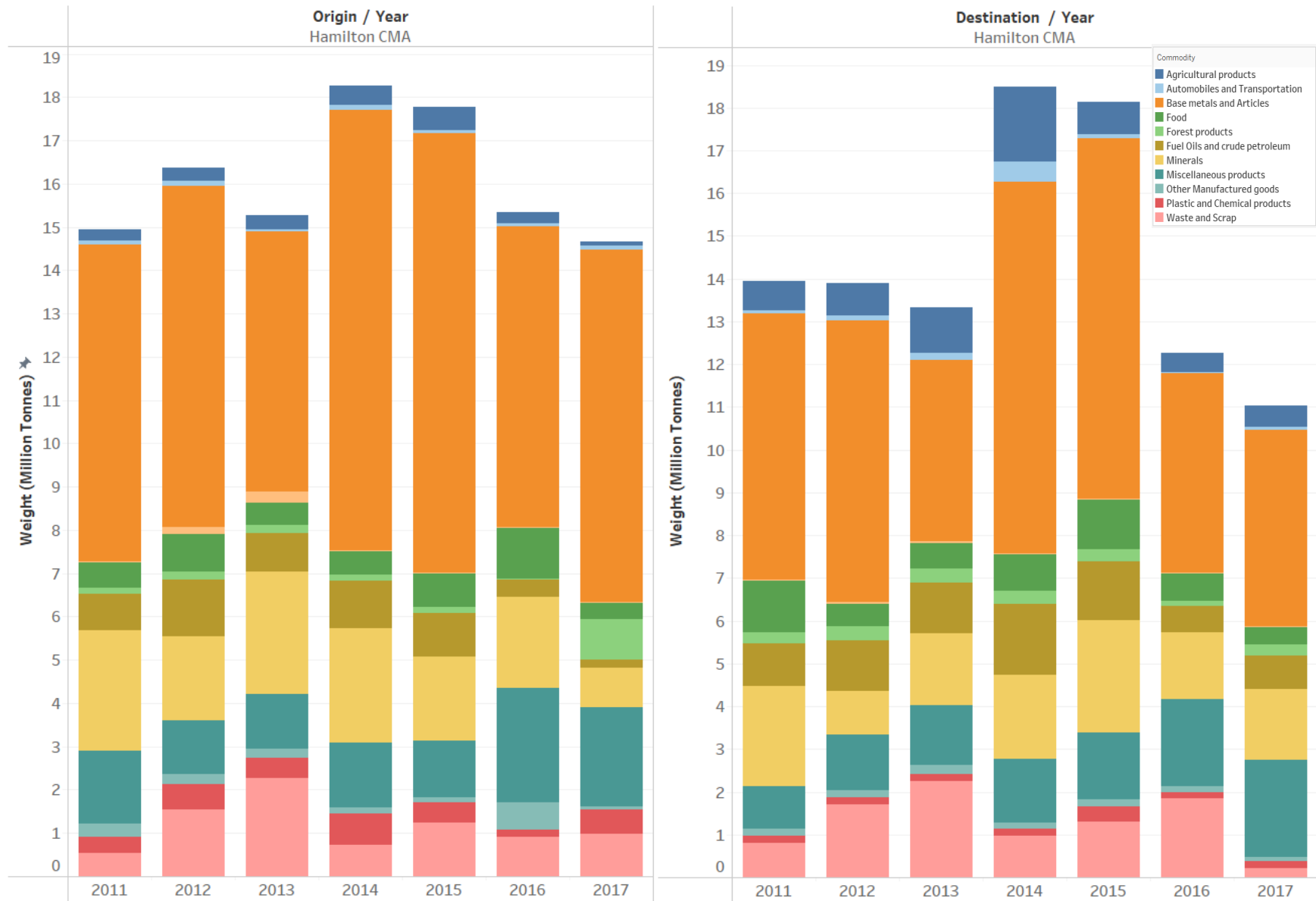


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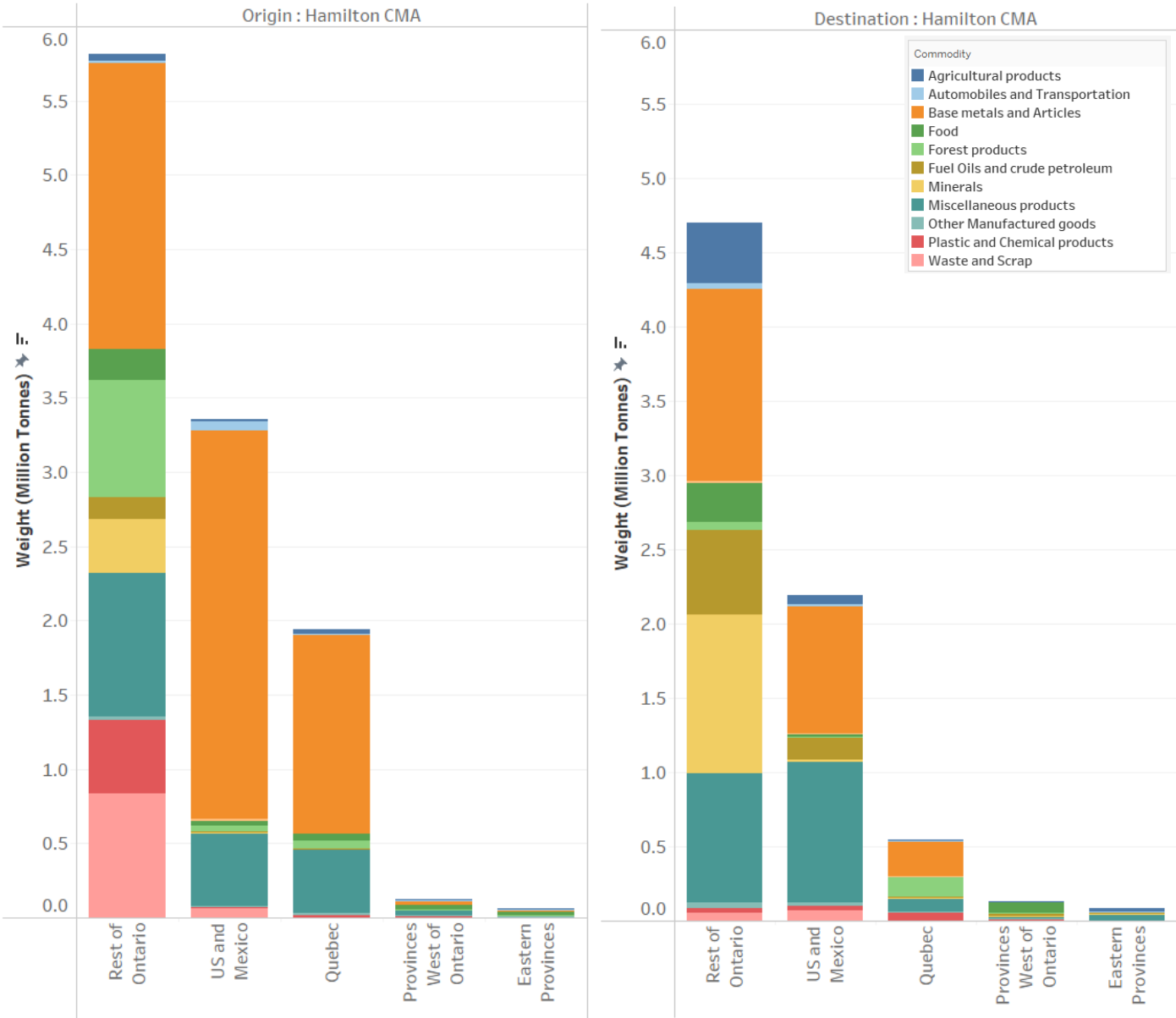
Canadian Freight Analysis Framework (CFAF-road)



CMA of Hamilton: Trucking Tonnage Outflows and Inflows by Commodities (2011 – 2017)



Geography Of Trucking Tonnage To/From CMA Of Hamilton By Commodity Groups (2017)



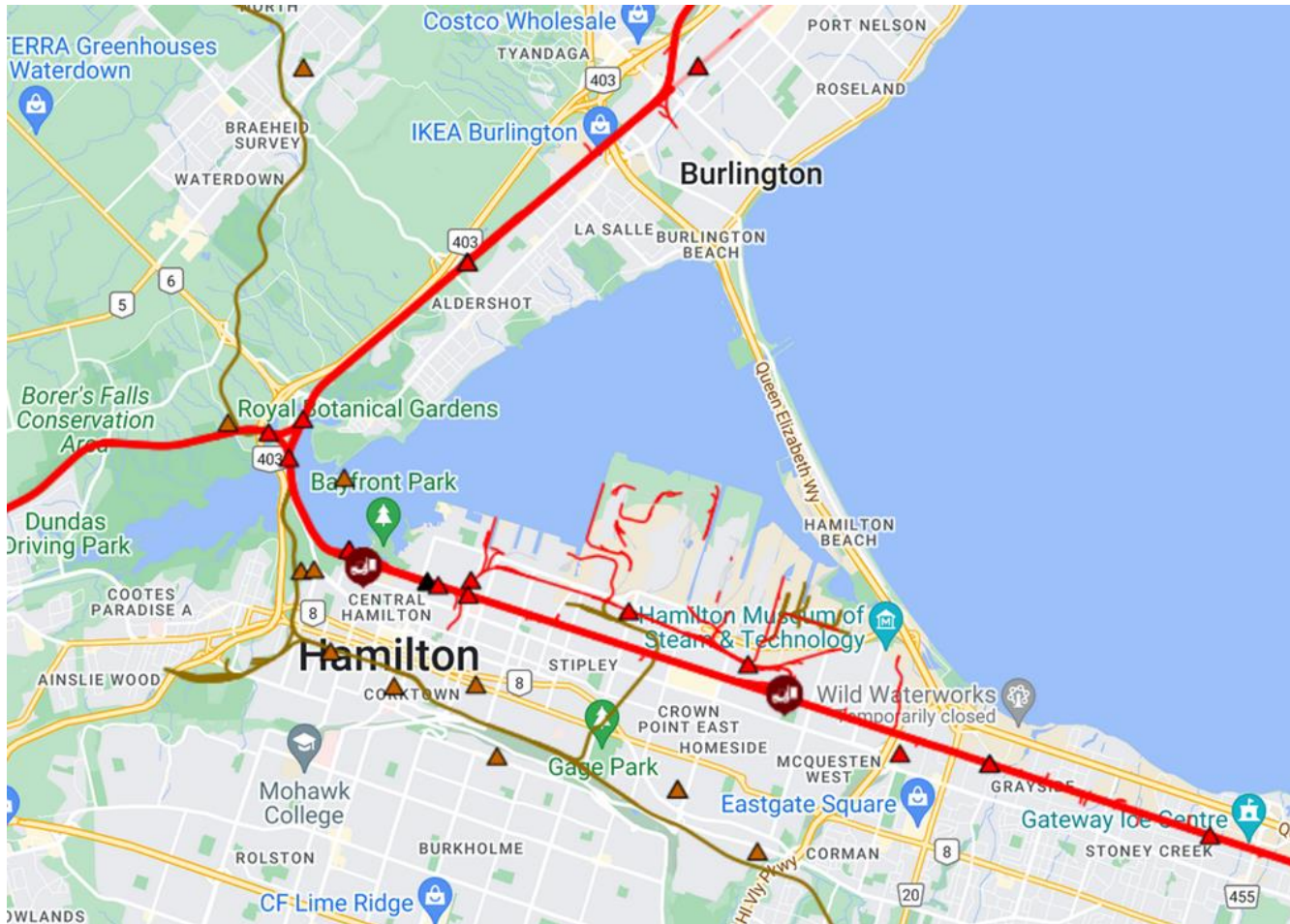


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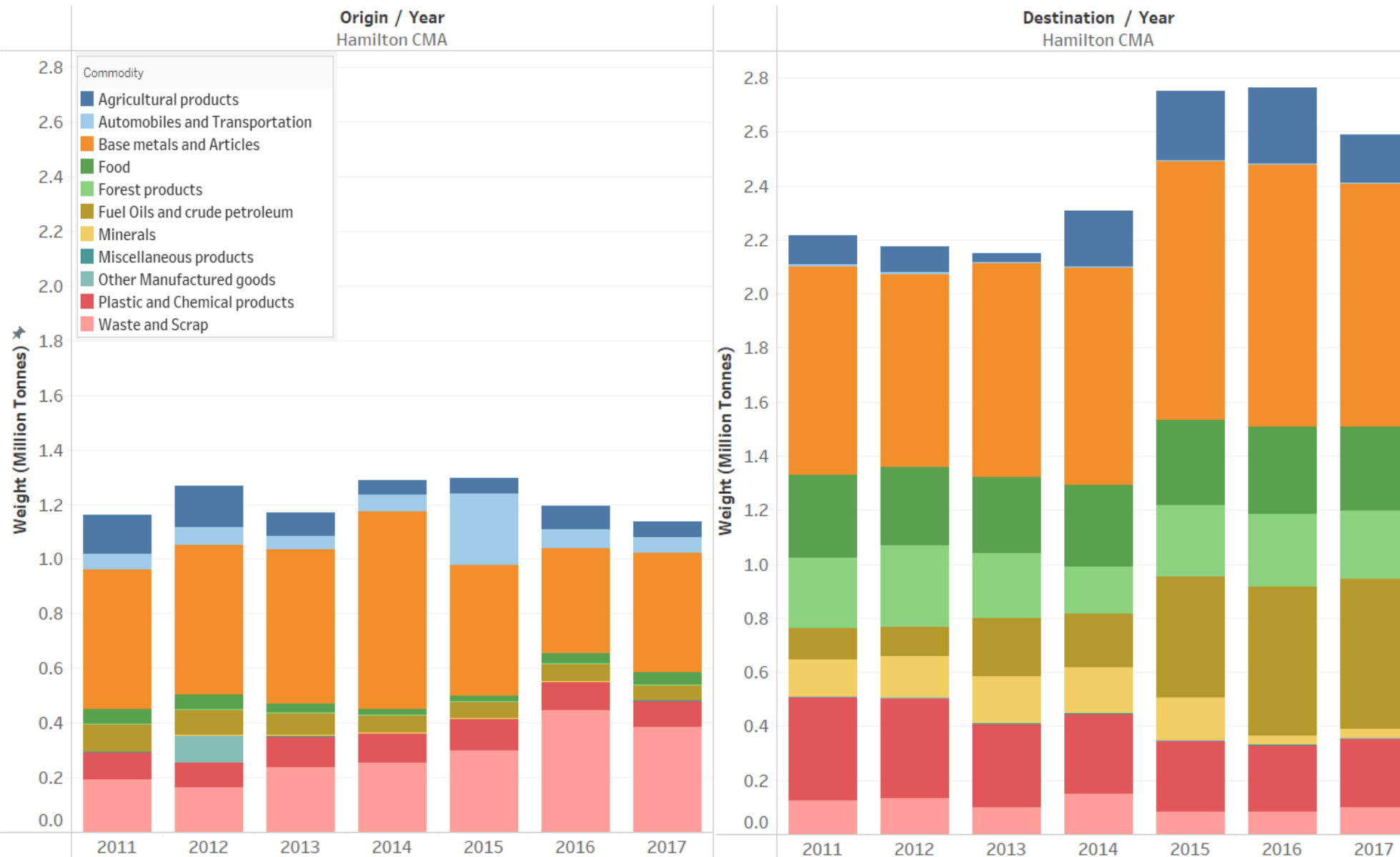
Rail

Significant Rail Infrastructure



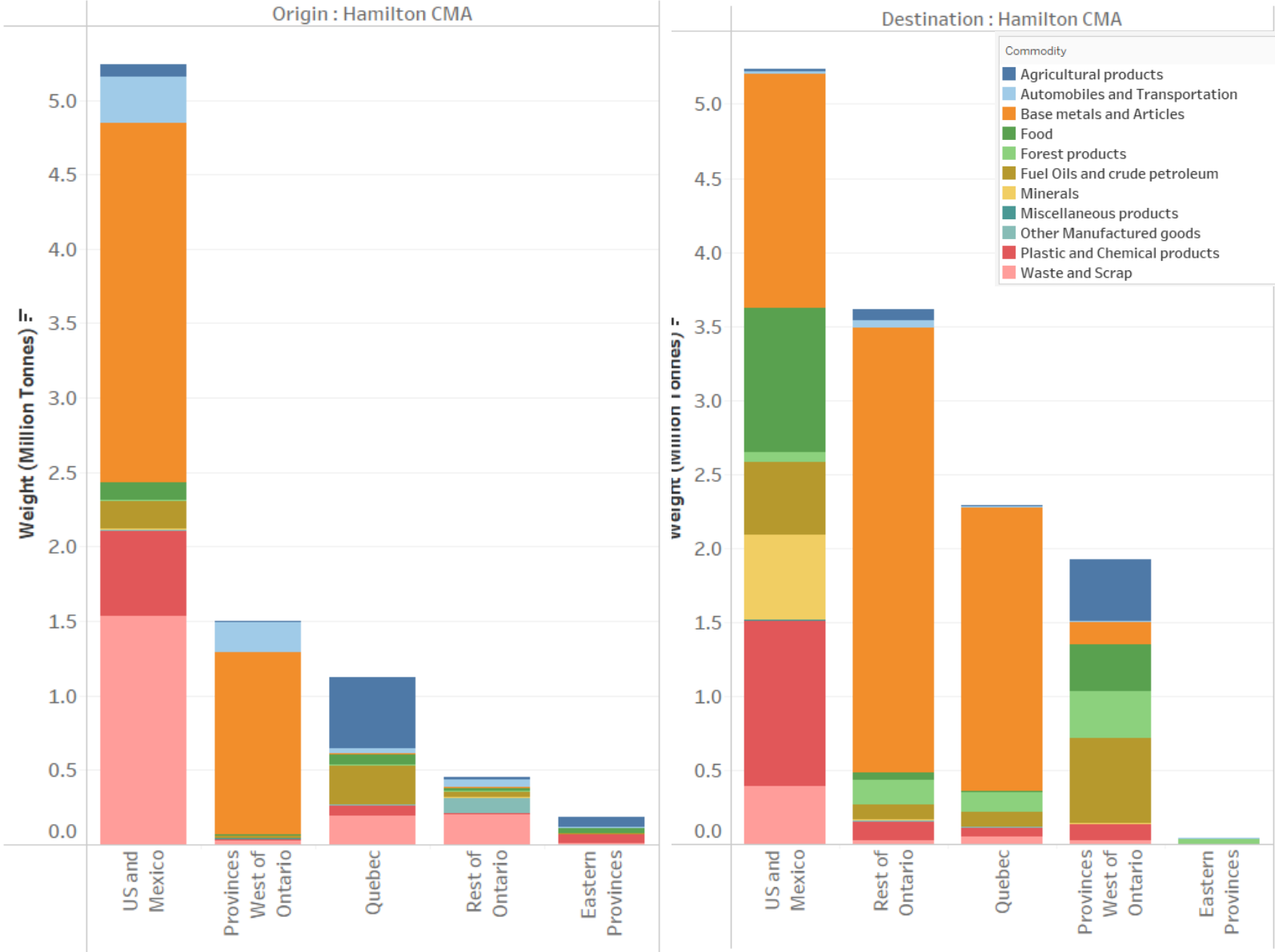
- Two major CN facilities in Hamilton are the Stuart Street classification yard near the Bayfront and a Metal Distribution Centre on Parkdale Ave.
- For CPKC, the Transcare Transload facility near the Innovation Park stands out
- Both firms interact extensively with the port lands
- Regarding rail data for Hamilton, the Canadian Freight Analysis Framework is the best available source

CMA of Hamilton Rail Outflows And Inflows (2011 – 2017) - Tonnage

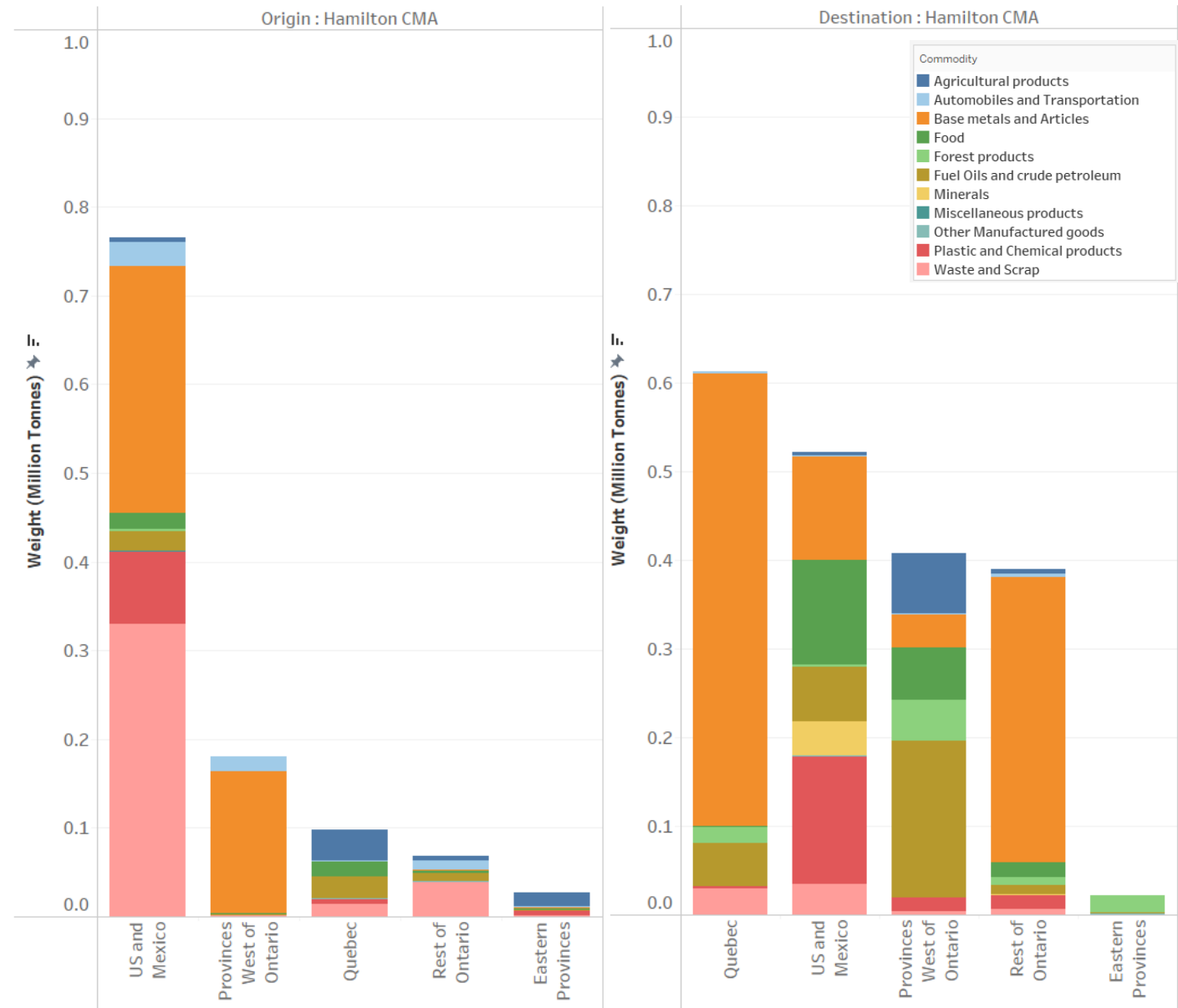


- Derived from the Federal Freight Analysis Framework
- Not supported after 2017
- Should be very accurate for rail (i.e., empirical not sampled)
- Data for City of Burlington is mixed in
- Results suggest that Hamilton CMA receives about twice the rail freight that it generates, and inflows are more diversified
- Contributions of heavy industry are apparent

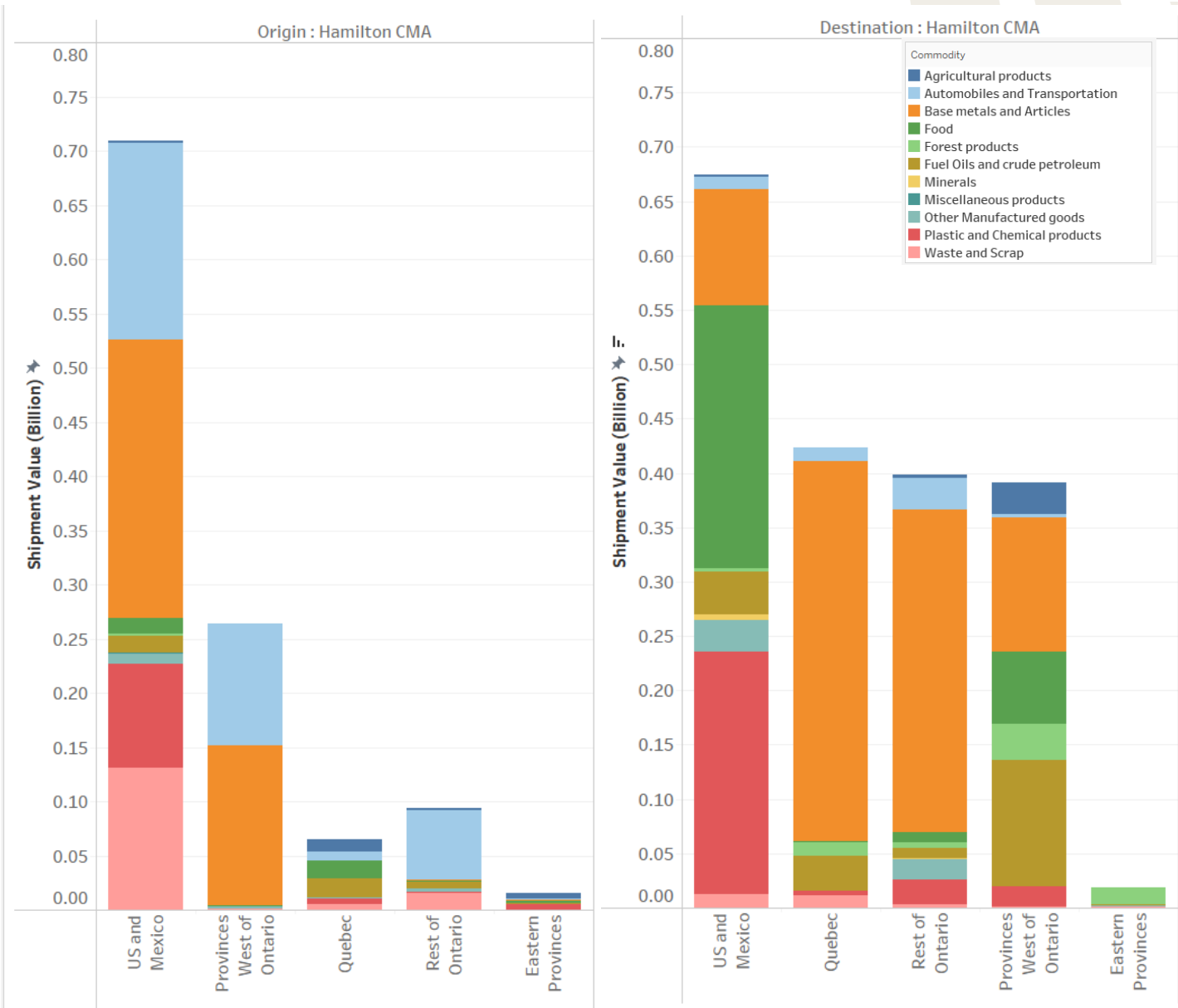
Geography Of Rail Tonnage To/From CMA Of Hamilton By Commodity Groups (2011-2017)



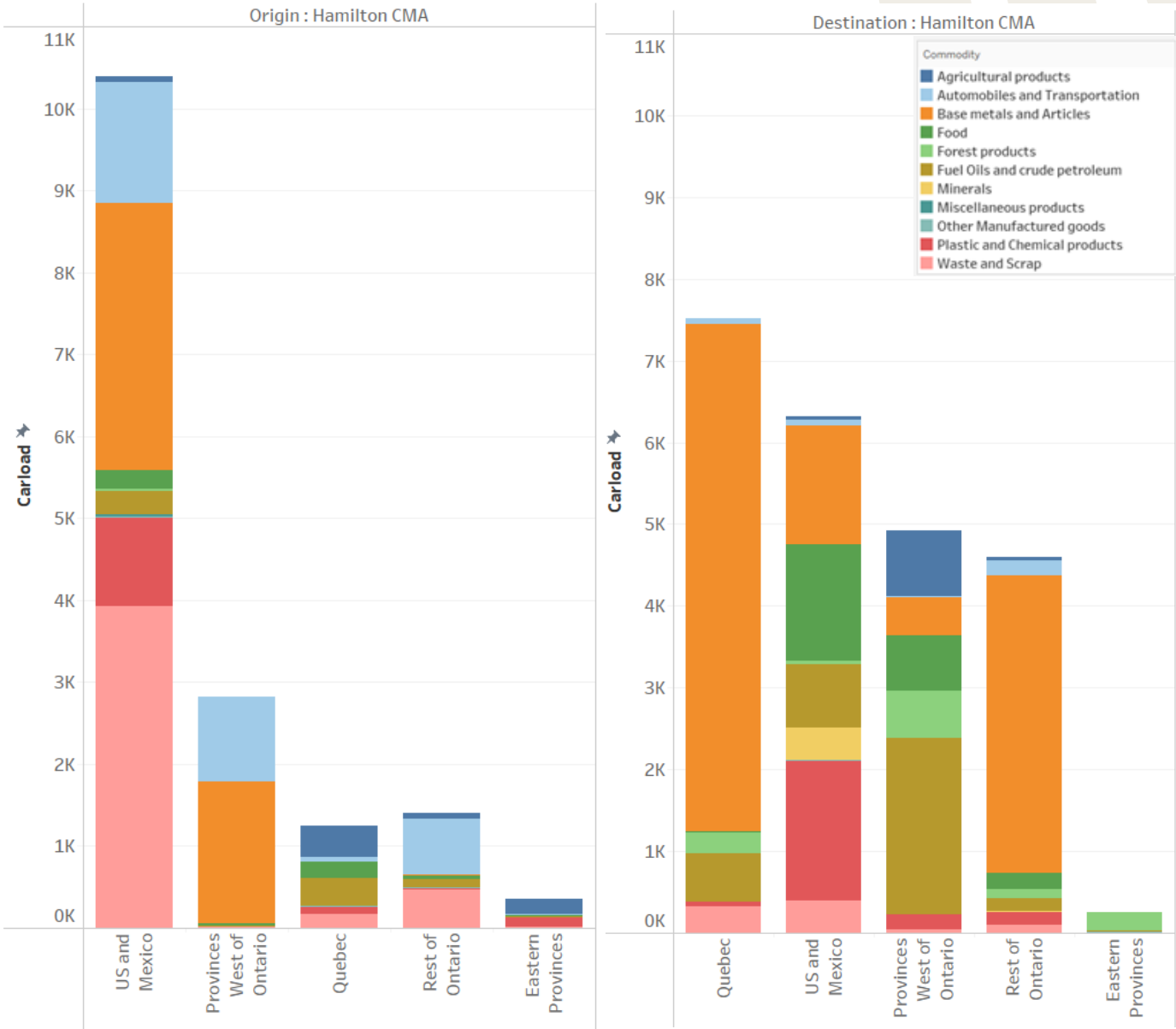
Geography Of Rail Tonnage To/From CMA Of Hamilton By Commodity Groups (2017)



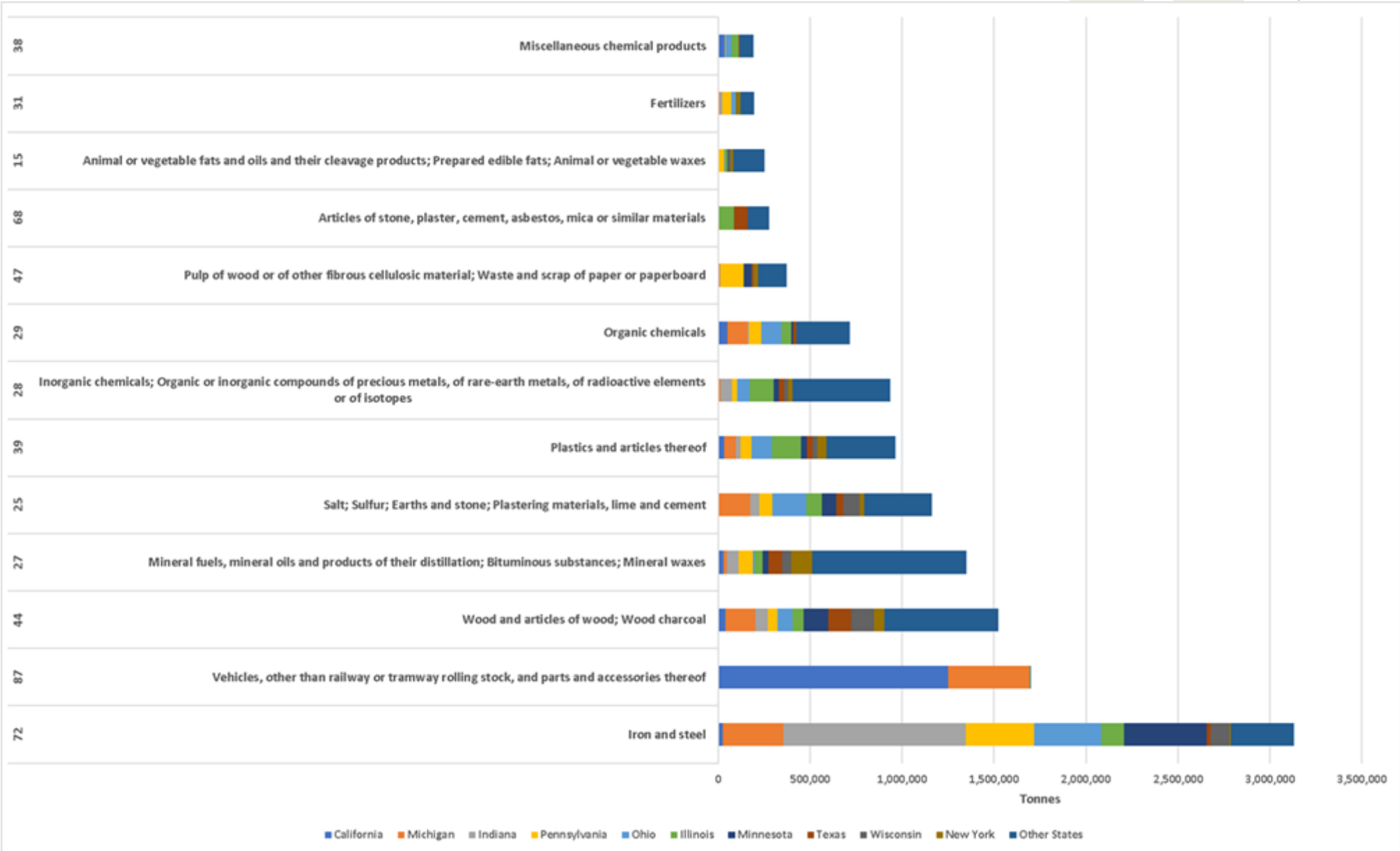
Geography Of Rail Value Of Goods To/From CMA Of Hamilton (2017)



Geography Of Rail Carloads To/From CMA Of Hamilton (2017)



Rail Exports To Us (2021) Originating From Ontario



- For 2021, there were 12 million tonnes that cleared into the US by rail
- Note that iron and steel is prominent and Hamilton plays a significant role



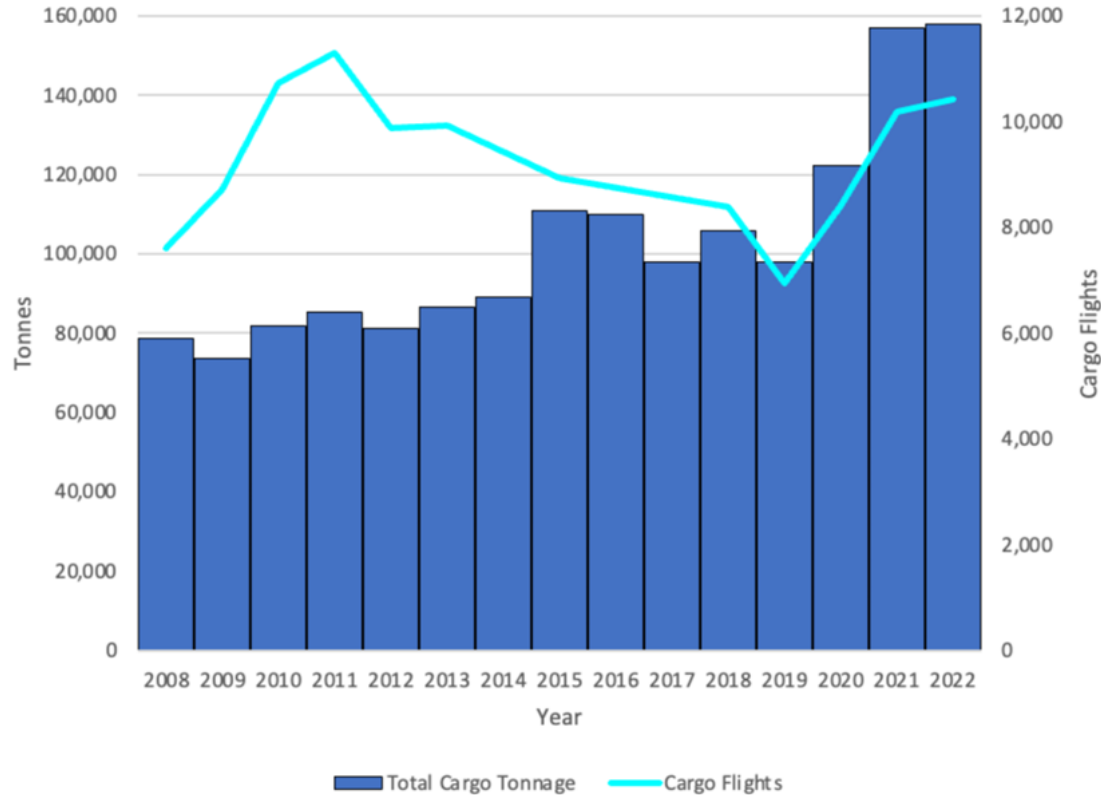
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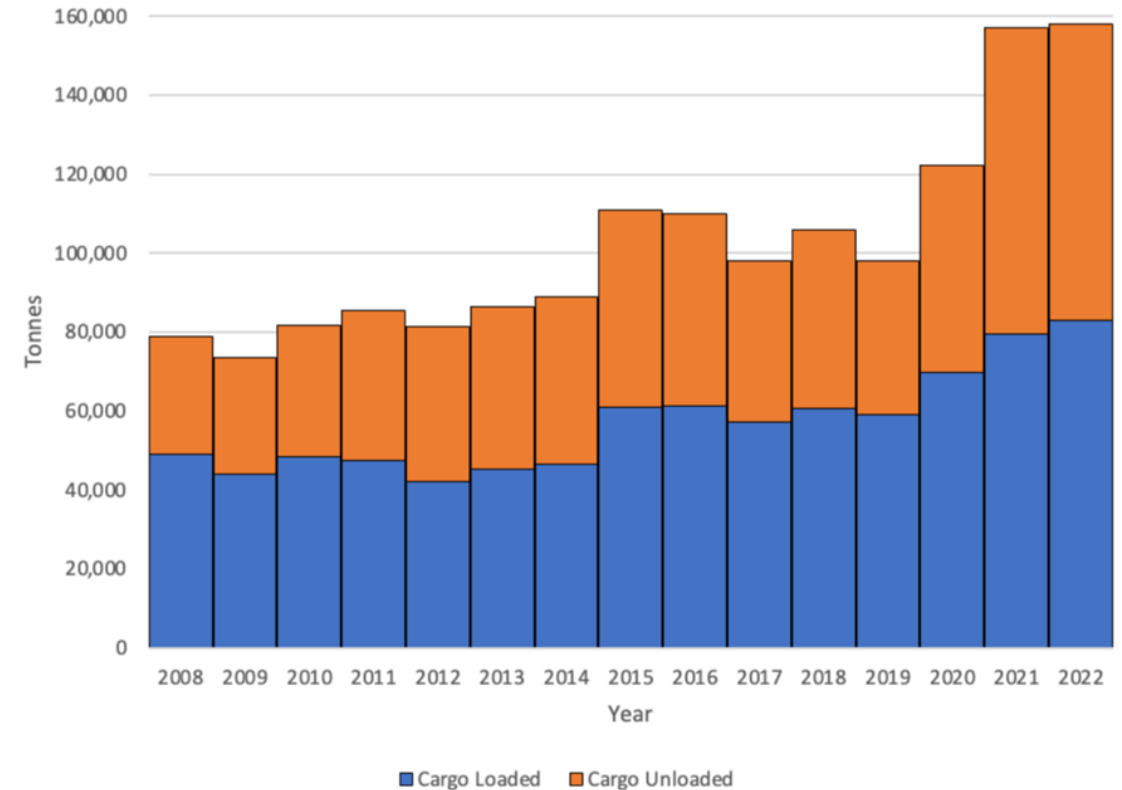
Air

Air Cargo Tonnage And Flights

YHM Cargo Tonnage Vs. Cargo Flights

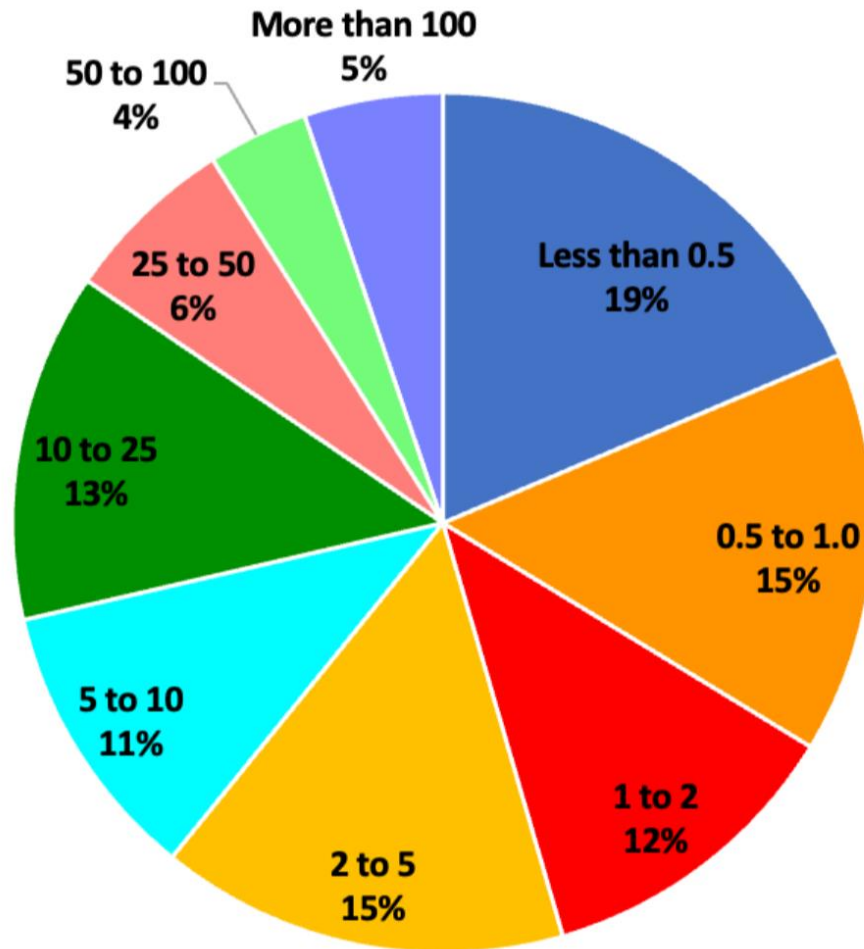


Air Cargo Loaded Vs Unloaded at YHM



- Cargo tonnage through YHM divided into Domestic, Transborder, International but data are not broken down for Hamilton by Statscan
- Air cargo has steadily increased since the bottom of the great recession (has more than doubled)
- Cargo flights actually declined from 2011 to 2019 likely reflecting the consolidation efforts of Cargojet
- An increase in flights from 2019 reflects an e-commerce effect
- There is better balance now between cargo being load and unloaded with the latter proportionally increasing in recent years

YHM Air Cargo Imports: Distribution Of Shipment Weights (Kilograms)



- Derived from CBSA air cargo data (international origins)
- Reflects 12-month period from Nov 21 to Nov 22
- About a third of import shipments are a kilogram or less
- Only 5% are more than 100kg but some of those are very large (i.e., over 20 tonnes)



YHM Observations For Flight Data



- On the typical weeknight there are a series of Cargojet flights (usually 1am to 3am) departing to various Canadian cities such as Moncton, Calgary, Vancouver, Winnipeg)
- Similarly, there is a concentration of Cargojet flights arriving from 3am to 5am with much of the days goods to be distributed (from Vancouver, Calgary, Cincinnati, Winnipeg)
- UPS flights from Louisville tend to arrive around 6am
- There is a definite lull in cargo flight activity on the weekends and near the weekends
- Castle Aviation is prominent as a cargo operator that moves cargo to and from the US Midwest
- Amazon flights (mostly to and from Vancouver) are evident along with varied international flights
- More detailed observations are possible from flight data that has gradually been collected

Source: [flightradar.com](https://www.flightradar.com)

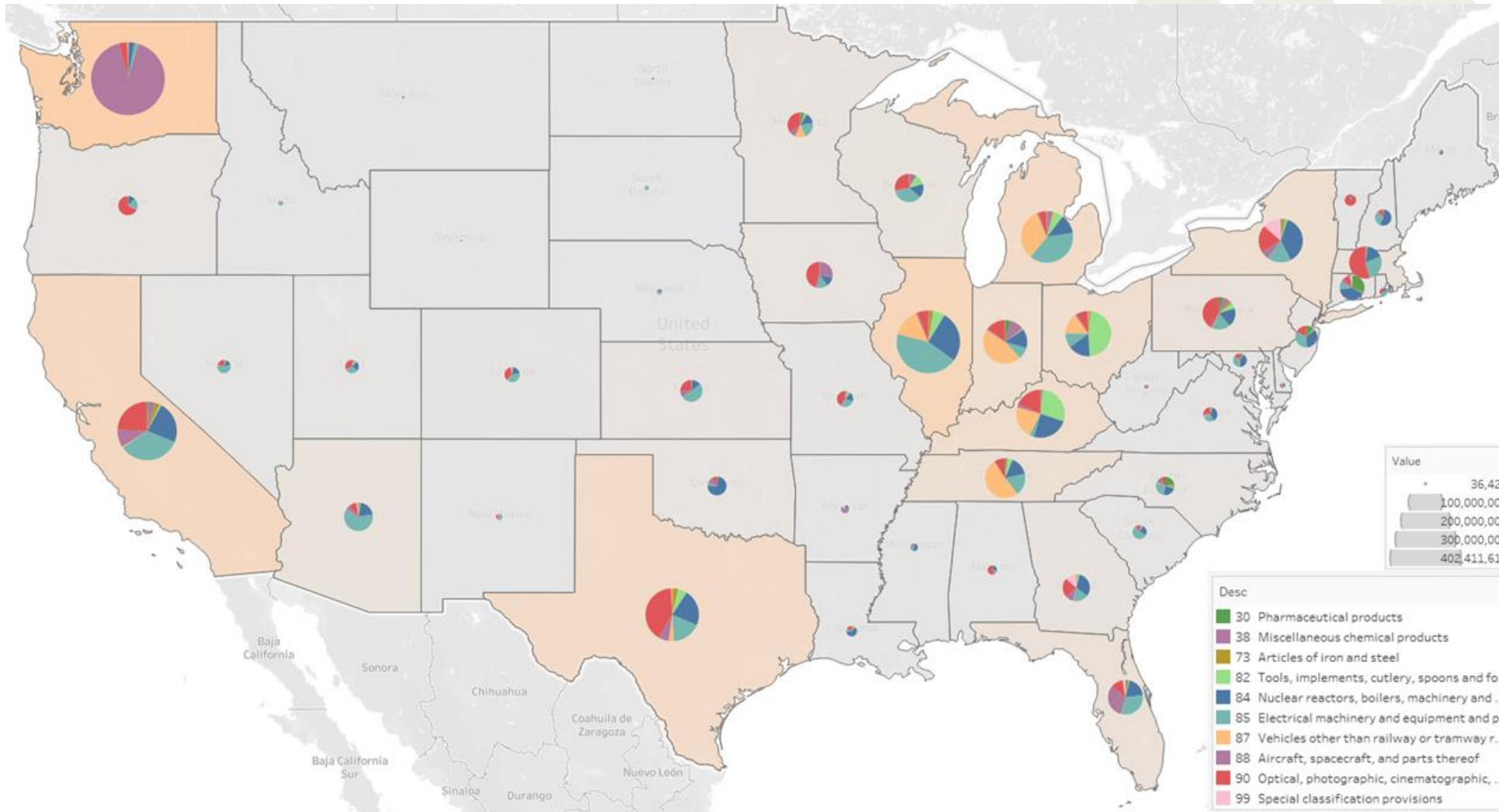
Value Of Imported Air Cargo From US States Clearing Via YHM (2016-2020)



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- Source is StatsCan Trade Data
- Shown at the level of 2-digit HS trade codes
- Total air import values from US sources is \$9.96 B from 2016-2020
- \$6.66 B is code 71 precious metals/jewellery which is omitted here to highlight industrial
- Strong evidence of support from air cargo for keeping industry and supply chains working
- Many of the cargoes are parts-oriented
- Strong aerospace theme from Pacific Northwest
- Strong Midwest theme from states that are within a day by truck – automotive parts are prominent
- California and Texas are prominent

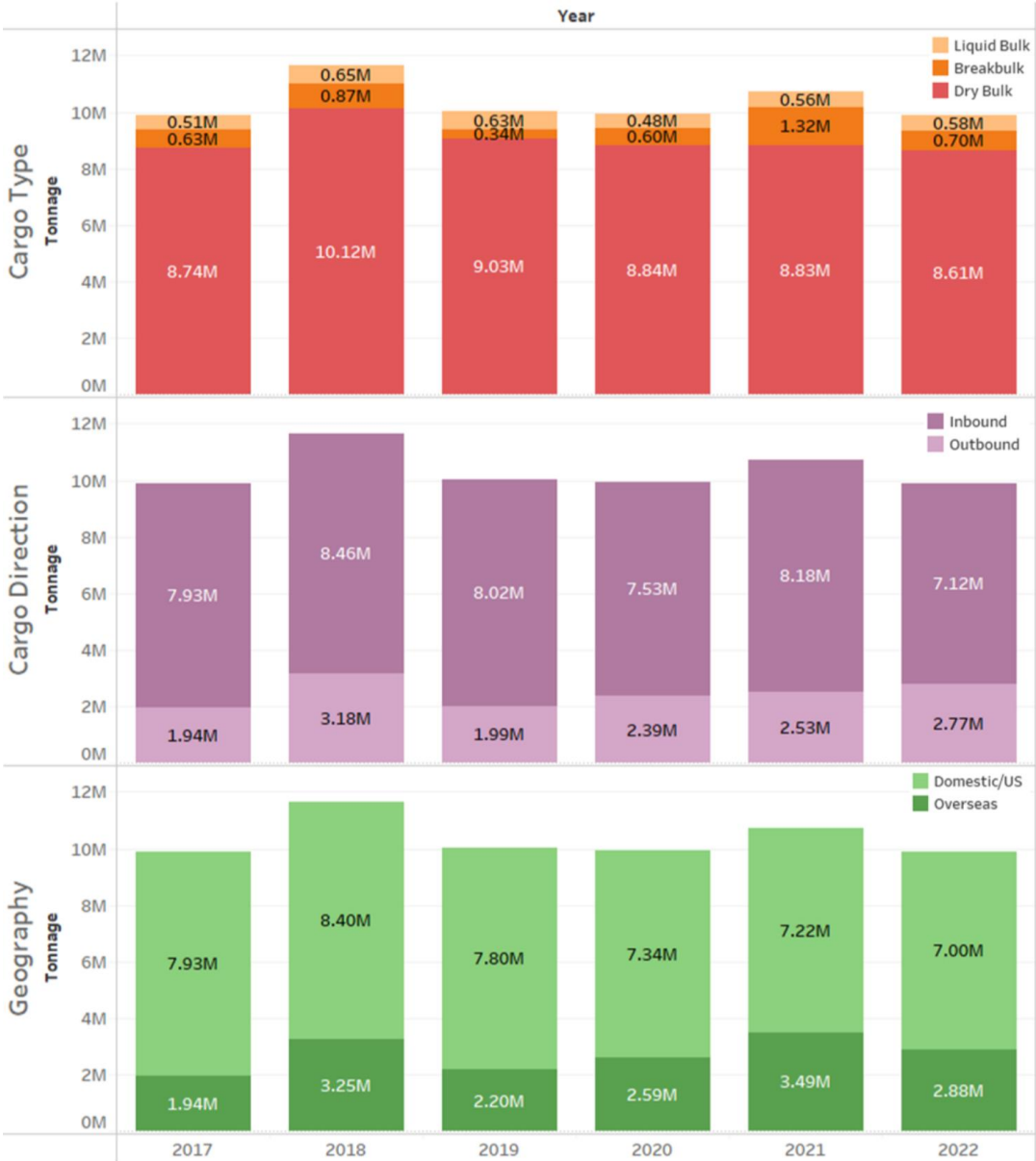


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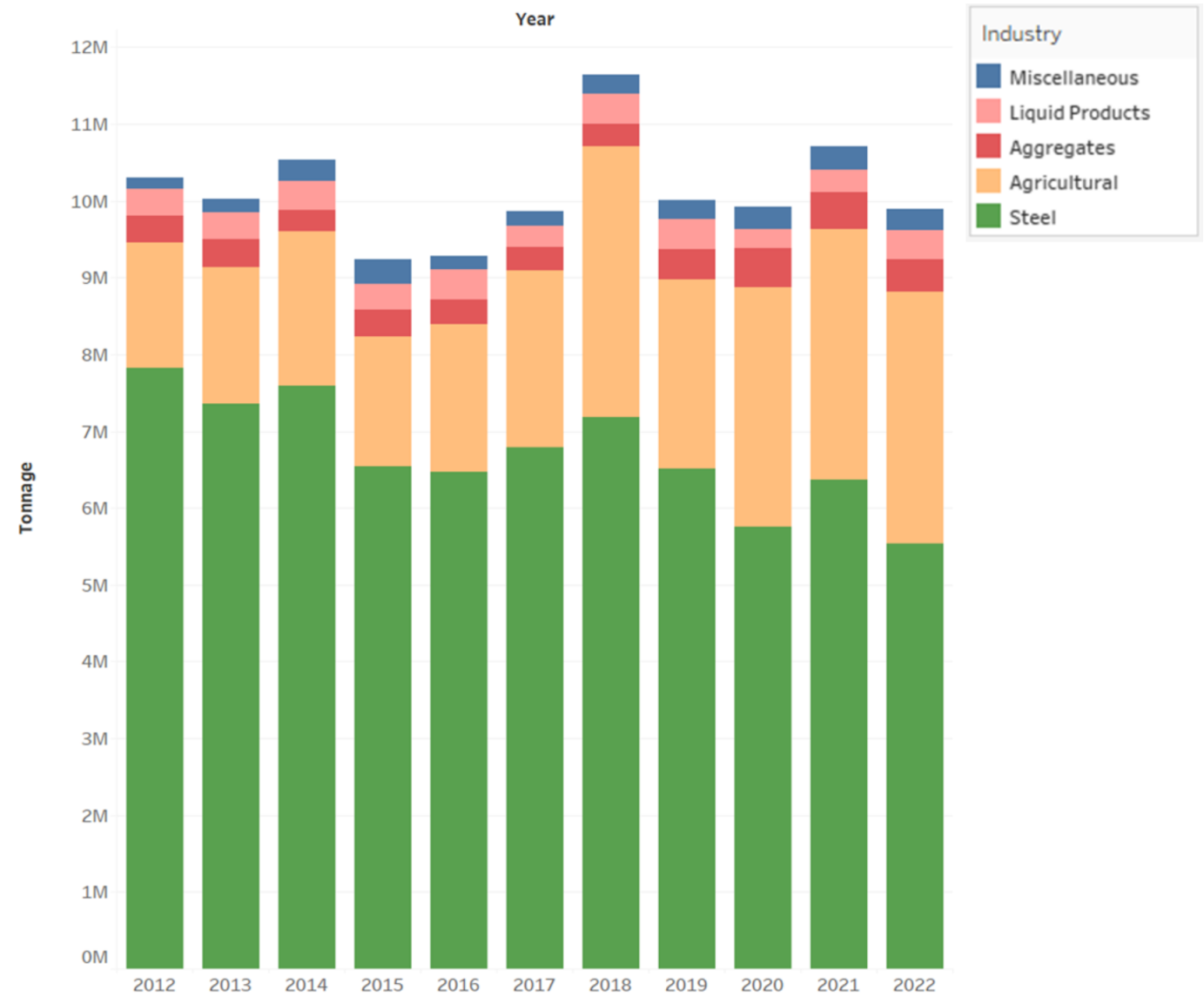


Marine

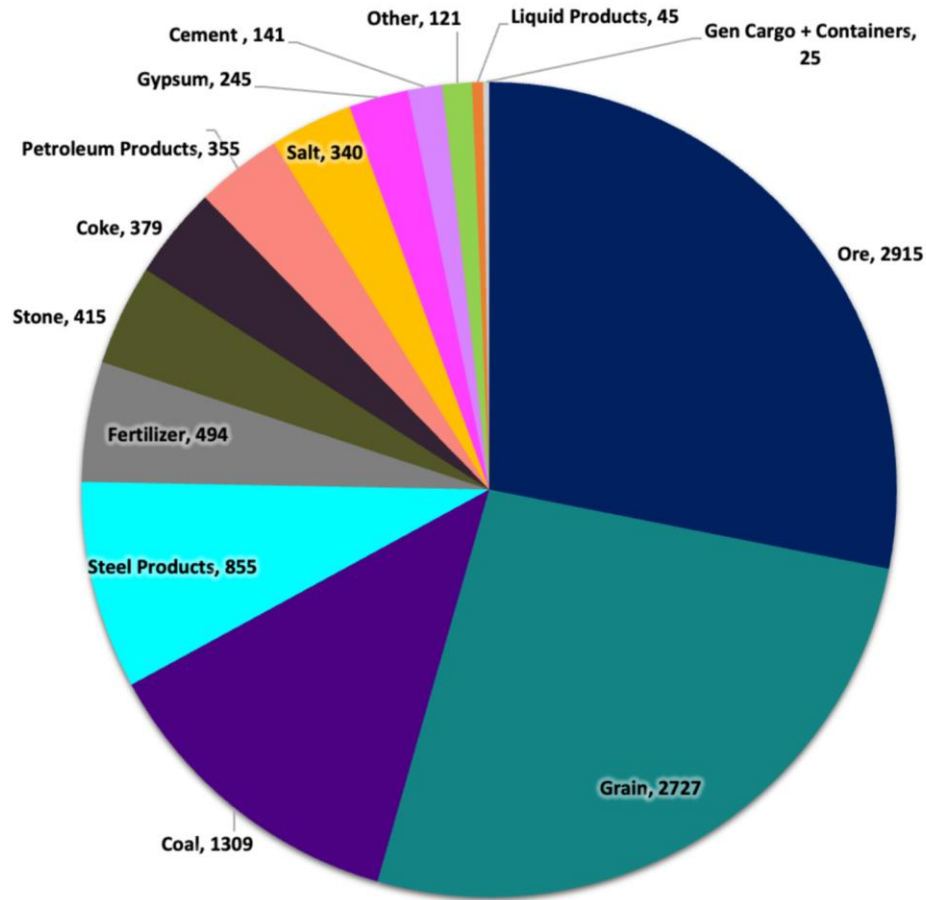
Port Of Hamilton Tonnage Breakdowns (2017-2022)



Port Of Hamilton Tonnage By Main Industry Of Commodities (2012-2022)



Marine Tonnage Handled By HOPA Ports In 2022



- Chart shows detailed commodity allocation of 10.37 million tonnes of what are almost entirely bulk commodities
- The chart mixes inbound and outbound cargoes
- 54% is composed of Ore (typically inbound) and grain (typically outbound)
- Note that 481k tonnes of this (about 4.6%) was handled at Port of Oshawa – the total Oshawa slice, aggregated across commodities, is similar to the Fertilizer slice shown



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SUPPLY CHAIN ANALYTICS

Small And Medium Enterprises (SME's) In The Goods Movement Sector

Medium SME Business Count By Census Division And Freight-related NAICS Codes



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SUPPLY CHAIN ANALYTICS

- For medium enterprises (June 2022):
- Hamilton appears most developed for food manufacturing in SME context
- Hamilton and Niagara region seem broadly comparable
- Region of Waterloo noteworthy for 3 distinct clusters of medium enterprises that stand out

Naics	1209 - Halifax	2466 - Montréal	3518 - Durham	3519 - York	3520 - Toronto	3521 - Peel	3524 - Halton	3525 - Hamilton	3526 - Niagara	3530 - Waterloo	3539 - Middlesex	4611 - Winnipeg	4806 - Calgary	4811 - Edmonton	5915 - Greater Vancouver	Grand Total
111 - Crop production	0	0	5	2	0	0	2	2	17	3	2	2	2	2	1	53
112 - Animal production and aquaculture	0	0	0	1	0	0	0	0	0	3	1	0	0	0	0	5
115 - Support activities for agriculture and forestry	0	1	0	1	0	0	0	0	0	0	1	0	0	2	2	18
236 - Construction of buildings	5	15	5	13	27	12	2	4	2	4	2	7	14	25	31	168
237 - Heavy and civil engineering construction	2	8	1	13	20	13	5	1	2	2	1	6	31	47	31	183
311 - Food manufacturing	4	31	1	21	41	33	8	11	4	12	5	7	13	16	47	254
312 - Beverage and tobacco product manufacturing	1	4	1	2	4	2	0	1	8	1	2	1	4	1	8	40
313 - Textile mills	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
314 - Textile product mills	0	3	0	1	2	0	0	1	0	0	0	0	0	0	0	7
315 - Clothing manufacturing	0	7	0	2	6	0	0	1	0	0	0	4	0	0	2	22
316 - Leather and allied product manufacturing	0	2	0	1	1	0	0	0	0	1	0	0	0	0	0	5
331 - Primary metal manufacturing	0	9	1	2	2	5	2	2	3	3	6	4	0	2	2	43
336 - Transportation equipment manufacturing	1	13	3	25	7	22	6	5	3	13	14	8	1	2	7	130
411 - Farm product merchant wholesalers	1	0	0	1	0	2	0	1	2	0	0	2	0	1	4	14
412 - Petroleum and petroleum products merchant whol..	0	0	0	0	1	0	0	0	0	0	1	0	8	2	0	12
413 - Food, beverage and tobacco merchant wholesalers	4	24	2	6	25	22	3	3	1	3	2	6	15	7	31	154
414 - Personal and household goods merchant wholesal..	1	46	1	15	26	22	9	1	1	1	2	2	4	4	15	150
415 - Motor vehicle and motor vehicle parts and accesso..	0	4	4	6	5	11	1	1	0	0	0	1	4	6	5	48
416 - Building material and supplies merchant wholesal..	2	12	2	10	11	21	5	4	2	7	1	2	10	5	10	104
417 - Machinery, equipment and supplies merchant who..	1	27	2	33	20	35	14	1	1	10	3	2	12	17	18	196
418 - Miscellaneous merchant wholesalers	0	9	3	7	8	20	2	1	1	1	1	1	3	1	7	65
419 - Business-to-business electronic markets, and age..	1	2	0	2	6	7	2	0	0	1	1	0	3	1	9	35
481 - Air transportation	1	5	0	0	1	3	0	1	0	1	0	6	4	4	5	31
482 - Rail transportation	1	3	0	1	0	0	0	0	0	0	0	2	0	0	1	8
483 - Water transportation	2	3	0	0	0	0	1	0	1	0	0	0	0	0	4	11
484 - Truck transportation	2	12	4	4	3	16	5	2	0	5	4	6	15	15	5	98
485 - Transit and ground passenger transportation	2	6	4	6	6	7	4	3	3	3	2	0	4	9	4	63
488 - Support activities for transportation	7	22	1	5	6	36	3	4	1	1	3	3	8	6	26	132
492 - Couriers and messengers	3	9	1	5	11	10	5	3	2	2	2	4	3	8	10	78
493 - Warehousing and storage	0	6	1	10	14	34	8	0	0	1	0	6	8	5	22	115
Grand Total	41	285	42	195	253	333	87	53	54	78	56	82	168	187	330	2,244

Small Sme Counts By Census Division And Freight-related NAICS Codes (10 To 99 Employees)



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SUPPLY CHAIN ANALYTICS

Naics	GEO															Grand Total
	1209 - Halifax	2466 - Montréal	3518 - Durham	3519 - York	3520 - Toronto	3521 - Peel	3524 - Halton	3525 - Hamilton	3526 - Niagara	3530 - Waterloo	3539 - Middlesex	4611 -Winnipeg	4806 - Calgary	4811 - Edmonton	5915 - Greater Vancouver	
111 - Crop production	4	17	27	43	13	16	23	51	148	21	38	6	22	45	169	643
112 - Animal production and aquaculture	2	2	7	11	3	5	6	8	9	15	21	5	27	23	25	169
115 - Support activities for agriculture and forestry	2	7	2	4	4	2	0	4	6	7	5	8	17	11	53	132
236 - Construction of buildings	102	238	79	284	306	142	90	82	74	94	75	131	259	279	512	2,747
237 - Heavy and civil engineering construction	32	82	24	120	110	60	43	25	26	39	37	45	154	169	214	1,180
311 - Food manufacturing	16	216	16	99	224	107	38	37	36	36	20	57	97	76	283	1,358
312 - Beverage and tobacco product manufacturing	15	22	7	6	35	9	8	7	54	6	8	18	42	19	67	323
313 - Textile mills	0	16	2	1	10	9	2	1	1	2	1	2	4	2	2	55
314 - Textile product mills	2	16	1	9	20	9	4	6	0	4	3	4	4	8	21	111
315 - Clothing manufacturing	2	66	1	8	64	6	2	2	2	2	1	7	3	3	35	204
316 - Leather and allied product manufacturing	0	7	0	3	5	0	1	2	0	0	0	3	1	0	0	22
331 - Primary metal manufacturing	0	13	2	6	9	16	7	11	6	8	3	6	7	17	18	129
336 - Transportation equipment manufacturing	7	31	10	27	27	38	13	5	13	32	20	14	13	17	44	311
411 - Farm product merchant wholesalers	0	12	0	4	8	23	3	3	7	1	7	10	13	7	16	114
412 - Petroleum and petroleum products merchant whol..	2	7	4	3	9	6	2	2	2	4	3	4	31	13	6	98
413 - Food, beverage and tobacco merchant wholesalers	19	212	12	111	287	132	24	7	13	24	17	46	72	40	305	1,321
414 - Personal and household goods merchant wholesal..	16	381	21	168	198	174	49	12	14	18	9	31	40	43	209	1,383
415 - Motor vehicle and motor vehicle parts and accesso..	16	83	19	52	52	96	22	19	10	33	27	31	66	89	89	704
416 - Building material and supplies merchant wholesal..	64	222	47	219	179	244	85	66	27	92	64	91	212	214	413	2,239
417 - Machinery, equipment and supplies merchant who..	78	345	50	260	210	460	124	51	40	108	66	108	280	346	362	2,888
418 - Miscellaneous merchant wholesalers	31	135	30	105	144	150	48	28	33	32	42	56	119	96	187	1,236
419 - Business-to-business electronic markets, and age..	12	49	4	34	56	51	14	7	5	10	5	16	36	17	57	373
481 - Air transportation	6	9	0	4	11	15	1	4	1	1	2	10	19	13	30	126
482 - Rail transportation	0	8	1	0	4	0	2	1	3	2	2	4	3	4	5	39
483 - Water transportation	4	10	0	1	4	0	1	1	1	0	0	1	0	0	24	47
484 - Truck transportation	40	179	56	82	84	281	56	45	47	72	49	119	192	242	393	1,937
485 - Transit and ground passenger transportation	6	21	9	20	27	23	9	6	11	16	8	13	23	25	32	249
488 - Support activities for transportation	42	190	13	67	74	210	48	19	27	29	14	59	93	69	291	1,245
492 - Couriers and messengers	17	44	10	27	36	34	12	13	7	10	14	25	39	33	74	395
493 - Warehousing and storage	12	80	14	40	45	135	27	20	11	12	10	26	56	55	129	672
Grand Total	549	2,720	468	1,818	2,258	2,453	764	545	634	730	571	956	1,944	1,975	4,065	22,450