

Multi-Modal Transportation & Warehousing: Durham Region

Definition and Context

In the North American Industrial Classification System¹, the transportation & warehousing sector comprises establishments primarily engaged in transporting passengers and goods, warehousing and storing goods, and providing services to these establishments. This sector uses multi-modal use of transports (trucking, transit and ground passenger), rail, water, air and pipeline. (Statistics Canada, 2017)

The transport and storing systems are subdivided according to the way in which businesses in each mode organize their establishments. National post office and courier establishments, which also transport goods, are included in this sector. Warehousing and storage establishments are subdivided according to the type of service and facility that is operated. The subsectors are broadly categorised into:

Sub sectors
481 Air transportation
482 Rail transportation
483 Water transportation
484 Truck transportation
485 Transit and ground passenger transportation
486 Pipeline transportation
487 Scenic and sightseeing transportation
488 Support activities for transportation
491 Postal service
492 Couriers and messengers
493 Warehousing and storage

In recent decades, transportation has grown in importance. Efficient transportation reduces costs in many economic sectors and likewise, inefficient transportation increase cost. Economically, the impact of transportation relates to the movement of people and goods. A good transport system needs to be reliable and beneficial as passengers and freight are conveyed more rapidly and consistently. Improved transportation systems provide access to a wider market base and improve the supply management chain on a macroeconomic level. Transport systems also impact the location of activities as well as land value of an area. (Rodrigue & Notteboom, 2017)

Transportation and Warehousing in Durham Region

Durham Region, regarded as a new commuter community close to the city of Toronto, has a crucial transportation network in the Central Ontario region, both in terms of goods and passenger transport. Literature suggests that as cities become more economically active the need for improved

¹ The North American Industry Classification System (NAICS) is a hierarchical classification system for industries, developed by the national statistical agencies of Canada, United States and Mexico. (Statistics Canada, 2017). This classification system divides the economy into 20 major sectors grouped by production criterion, which are further divided into 102 sub-sectors and 324 industry groups (Statistics Canada, 2017). To know more about NAICS visit <http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=307532>.

transportation system gain importance. Adding transit modes in built-up urban areas increase aggregate economic activity. Moreover, increase in the bus public transit system is also found to have more positive impact on arts/entertainment/recreation service/public sector jobs compared to manufacturing jobs. (LMSID, 2016)

In addition, Census 2016 shows that out of 324,375 employed Durham Region residents, 144,415 people work in Durham Region, the rest leaving the Region and sometimes the Province for employment. This means that more than 50 percent of Durham Region residents work outside of Durham Region, reinforcing the importance of transportation network.

Durham Region is part of the Toronto economic region and the Toronto economic region has nearly 50 percent of the transportation and warehousing employment in Ontario. The Toronto economic region is expected to grow moderately in the next three years. (LMSID, 2016) Durham Region stands at an integral position in the transport activities of this economic region and benefits from a number of multi-modal transport systems such as three 400 series freeways, provincial roads, transit projects by sub-regional transit operators such as Metrolinx and Via Rail, a port and an airport. Details of pertinent Durham Region transport and warehousing system is provided according the subsector breakdowns.

Air Transportation

Air transport in Durham Region is carried out through the Oshawa Executive (Municipal) Airport. It is maintained by the City of Oshawa and provides general aviation as well as emergency services. Additionally, the airport generates approximately \$ 1.5 million in total property tax revenue. Flight training, air ambulance, passenger charter services, freight services, aerial police operations, aircraft maintenance and aircraft restoration services are all provided at the airport. The airport currently averages 61,500 movements annually and provides employment to approximately 215 persons. The local aircraft movement is expected to grow to approximately 102,345 because of increased revenue. In 2019, the total income from airport fees are projected to be \$ 5,219,510. (City of Oshawa, 2014)

Rail Transportation

Durham Region falls under the Metrolinx Board's first Regional Transportation Plan for the Greater Toronto and Hamilton Areas (GTHA). Currently Metrolinx operated Lakeshore East Go Train operates from South Oshawa to Union Station in downtown Toronto. For the future, the plan also includes an electrified high capacity regional express rail on the Lakeshore East Go rail line and the extension of inter-regional rail service from Oshawa to Bowmanville in Clarington.

VIA Rail operates under federal jurisdiction with passenger train service through Durham on the CN Rail line, which forms part of the Windsor-Quebec City corridor. VIA Rail has a station in Oshawa, at the same location as the Oshawa GO Station. (Region of Durham, 2017)

Durham Region also accommodates freight through the Canadian National (CN) Rail and the Canadian Pacific (CP) Railway. CN Rail connects Durham Region with transcontinental connections throughout North America and carries approximately C\$ 250 billion worth of goods annually. On the other hand, CP Railway provides direct links to eight major ports and is part of the Montreal-Chicago rail corridor. (Durham Region, 2014)

Water Transportation

Water transportation in Durham Region consists of Port Oshawa, and transports cargo through the St. Lawrence Seaway. Port Oshawa handled 408,000 metric tonnes of cargo in 2017. A report on the economic impact of Port Oshawa estimates that 398 jobs are supported by the cargo moving through the Port, out of which 150 jobs are directly generated by the marine cargo and vessel activity at the marine terminals. (Marine Associates of Lancaster, Pennsylvania, 2018)

Truck Transportation

The trucking industry conducts three main types of activities, i) for hire trucking services; ii) courier operators; and iii) private carriers. 41.9 percent of Canadian trucking companies are in Ontario. (GoC, 2017) Most freight in Durham Region is carried by truck. (Region of Durham, 2017) The truck route of the strategic good movement network in Durham Region contains freeways (401, 407 & 412) and Durham Region arterial road network spread out across Durham including to North Durham. As of 2001, at the Durham east boundary at 401, the Annual Average Daily Traffic (AADT) was 7,940 commercial vehicles carrying freight of \$ 377 in economic value. (MTO, 2004) Up to 2011, the total value of Canada-U.S. trade (inbound and outbound) increased more than nine percent. In Canada, for hire-trucking activity has increased in value by 6.3 percent from 2006 to 2011, (GoC, 2012) and thus truck transportation along Durham Region freeways are expected to have grown simultaneously.

Transit and Ground Passenger Transportation

Durham Region has multiple transit services amalgamated into a regional transit services, which includes the Durham Region Transit buses running on inter-regional routes, PULSE- a high frequency bus service from Scarborough to Oshawa, as well as GO transit bus services to Bowmanville, Newcastle and Courtice. The road network is envisioned to be developed to integrate a high frequency network and accommodate buses and high occupancy vehicles. The current Durham Region Transport Masterplan also pays some importance on active ground transportation such as walking and cycling, with the recommending a Primary Cycling Network, the Regional trail network as well as the Greenbelt cycling route. With increasing number of Durham Region residents commuting to work, on a daily basis, the 401 freeway experiences somewhere between 60,500 vehicles (New Castle) and 226,000 vehicles (Pickering).²

Postal Service and Couriers & Messengers

Durham Region is home to a variety of postal services, in addition to Canada Post. There are 25 Canada Post offices between Ajax and Bowmanville, and additional post offices in the townships in North Durham. In addition, there is presence of international postal services such as UPS and FedEx, accompanied by smaller private courier services such as **Durham Metro Courier** in Ajax and **Enjoy Port Perry** in Scugog.

Warehousing and Storage

Durham Region is gradually emerging as a destination for distribution centres due to the availability of well-connected road networks as well as land development for employment opportunities. (Region of Durham, 2017). Some of the current large-scale warehouses in Durham Region are as follows:

² From <http://www.raqsa.mto.gov.on.ca/techpubs/TrafficVolumes.nsf/tvweb?OpenForm&Seq=3>

Municipalities	Company name
Ajax	Loblaw Companies
Oshawa	Kruger Products Distribution centre
Oshawa	U-haul trailer hitch super centre
Whitby	Sobeys
Pickering	Warehouse and Tech Services Support
Ajax	Agropur Cooperative warehouse
Whitby	Beer Store Distribution Warehouse
Ajax	Dominion Colour Corporation Distribution Centre
Oshawa	Canada Post
Clarington	Markol Bowmanville

In addition, at least two large-scale distribution centres are in the planning and construction phase, i.e, the **Maple Reinders** distribution centre in Ajax and **Kubota Canada** Head-office in Pickering. In addition, there are at least 11 self-storage centres in South Durham, including the Airport self-storage at Oshawa Executive Airport.

Employment in Durham Region Transport & Warehousing

Transport and warehousing is one of the main source of employment for Durham Region employees, with potential for increase in the future with increased economic activity.

Table 1 Total employment in Transport & Warehousing in Durham Region (POW)³ ; from Census 2016 custom purchased data

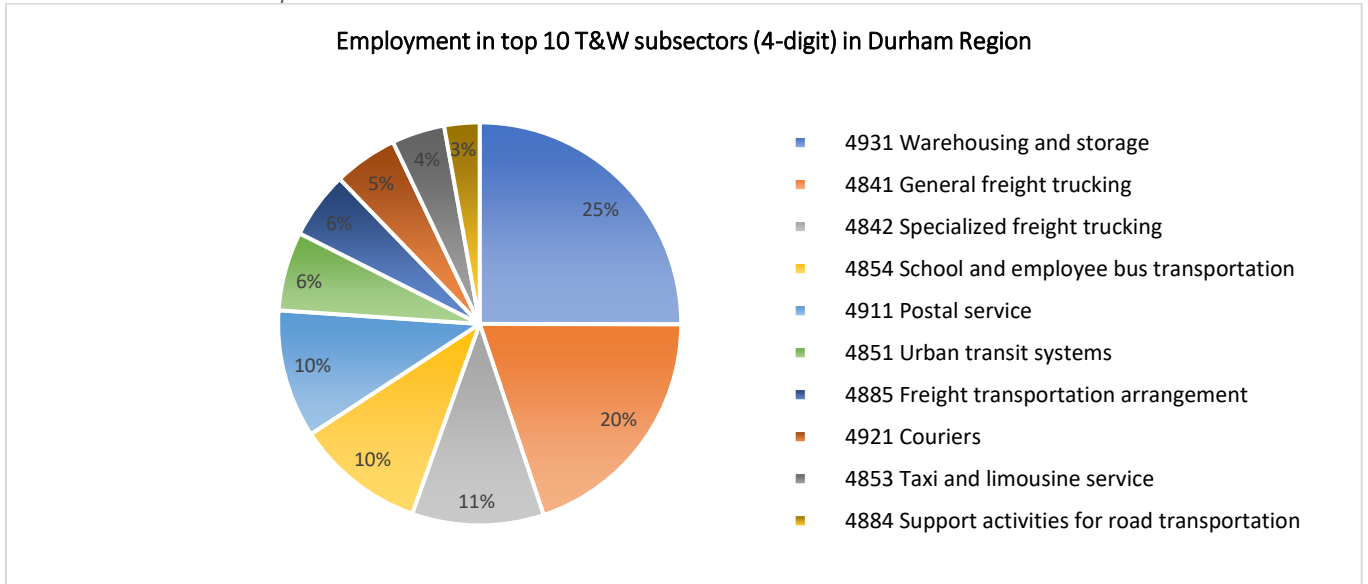
Subsectors	Total employed
4931 Warehousing and storage	1,680
4841 General freight trucking	1,330
4842 Specialized freight trucking	710
4854 School and employee bus transportation	695
4911 Postal service	690
4851 Urban transit systems	425
4885 Freight transportation arrangement	360
4921 Couriers	345
4853 Taxi and limousine service	285
4884 Support activities for road transportation	190
4881 Support activities for air transportation	80
4855 Charter bus industry	75

³All numbers are provided on the basis of *Place of Work* estimation, i.e., employees who work in Durham Region, to avoid conflation with employees who may reside in Durham Region but are employed outside of Durham Region

4889 Other support activities for transportation	75
4922 Local messengers and local delivery	70
4821 Rail transportation	60
4883 Support activities for water transportation	60
4811 Scheduled air transportation	35
4859 Other transit and ground passenger transportation	35
4882 Support activities for rail transportation	35
4812 Non-scheduled air transportation	10
4831 Deep-sea, coastal and great lakes water transportation	10
4852 Interurban and rural bus transportation	10
Grand Total	7,265

The table above shows the total employment in Durham region in the Transportation & Warehousing subsectors according to Census 2016. The subsectors are separated by the four-digit NAICS, which is one level below the broad subsectors mentioned initially. The table shows that NAICS 4931 *Warehousing and storage* employs the most number of employees at 1,680, followed by NAICS 4841 *General freight trucking* at 1,330. Overall, rural bus transportation, air transportation and water transportation employ the least number of people.

Figure 1 Employment breakdown in Transport & Warehousing subsectors in Durham Region; from Census 2016 custom purchased data



The figure above presents a clear snapshot of the subsector breakdown in terms of employment. NAICS 4931 *Warehousing & storage* and NAICS 4841 *General Freight Trucking* employ 25 and 20 percent of the top 10 subsectors in this industry. Thus, total freight trucking subsector employ 31 percent of the top 10 subsectors. NAICS 4854 *School and employee bus transportation* employ 10 percent of employees and NAICS 4911 *Postal service* employs another 10 percent of employees in the top 10 subsectors in this industry.

Occupations

In Durham Region, the Transportation & warehousing industry employs people in approximately 104 different occupations, ranging from managers to farmworkers to cooks. Thus, the top 10 occupations in this sector are presented below:

Figure 2 Top 10 occupations in Durham Region transportation and warehousing; from Census 2016 custom purchased data

Occupations ⁴	Total employed
7452 Material handlers	1,175
7511 Transport truck drivers	1,175
7512 Bus drivers, subway operators and other transit operators	900
1512 Letter carriers	385
1521 Shippers and receivers	310
6622 Store shelf stockers, clerks and order fillers	225
1511 Mail, postal and related workers	220
1525 Dispatchers	215
7513 Taxi and limousine drivers and chauffeurs	190
0731 Managers in transportation	185

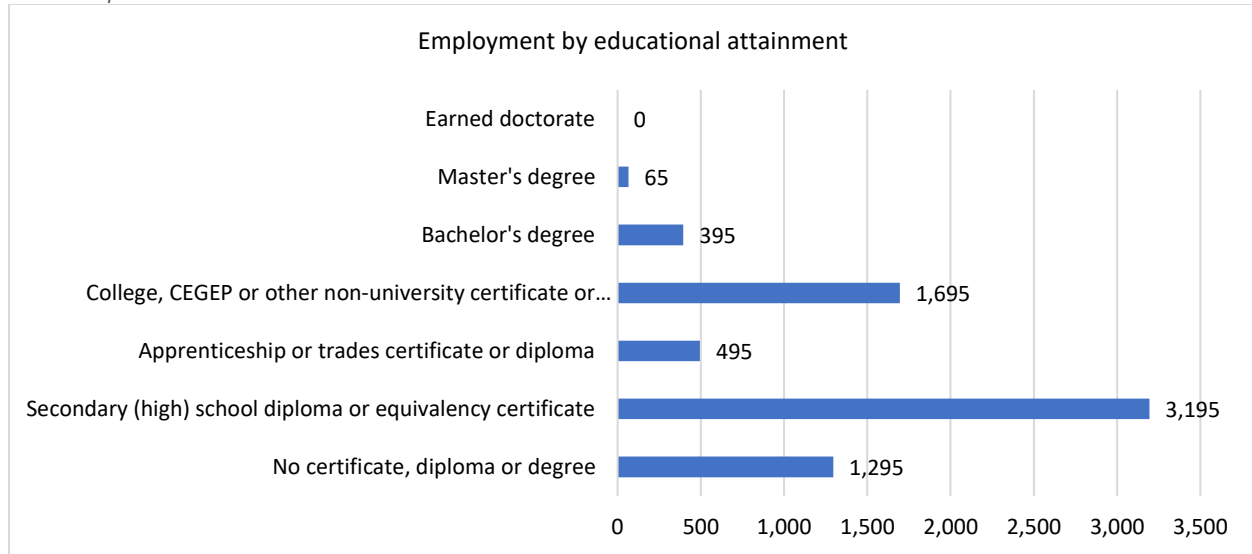
As the table above shows, there are 1,175 material handlers and transport truck drivers in Durham Region respectively. There are 900 bus and other transit operators and 220 mail, postal or related workers.

Education

Due to varied occupations in the transport and warehousing industry, educational attainment level in the sectors also varies.

⁴ The National Occupational Classification System (NOCS) is developed by the government of Canada, as the Canadian standardized taxonomy and framework for communicating about labour market information, and is sorted by skill levels and skill types (Government of Canada, 2018x). Occupations within this taxonomy are grouped by the type of work required for each job, including the employment requirements, job description and responsibilities, tasks and duties (Government of Canada, 2018x).

Figure 3 Educational attainment in Transport & Warehousing in Durham Region; from Census 2016 custom purchased data



The figure above shows employment in Durham Region transport and warehousing industry by educational attainment. Nearly 45 percent of the employees in transport and warehousing sector have a secondary or equivalency certificate, and another 28 percent have a college or non-university certificate. There are 65 employees with a Master's degree and 395 employees with a Bachelor's degree. Approximately seven percent of the employees have a trade certificate or a diploma.

Table 2 Educational attainment in Transport & Warehousing in Durham Region; from Census 2016 custom purchased data

Multi-modal transportation sub-sectors	No certificate, diploma or degree	Secondary (high) school diploma or equivalency certificate	Apprenticeship or trades certificate or diploma	College, CEGEP or other non-university certificate or diploma	Bachelor's degree	Master's degree
481 Air transportation	0	10	0	30	10	10
482 Rail transportation	0	15	30	0	0	0
483 Water transportation	0	0	0	10	0	0
484 Truck transportation	450	920	185	335	115	20
485 Transit and ground passenger transportation	195	625	120	445	65	20
486 Pipeline transportation	0	0	0	0	0	0

487 Scenic and sightseeing transportation	0	0	0	0	10	0
488 Support activities for transportation	135	280	65	235	65	0
491 Postal service	105	350	15	165	35	10
492 Couriers and messengers	100	150	15	100	30	0
493 Warehousing and storage	305	850	60	370	70	0

Educational attainment by occupations in Multi-modal transportation

Table 3 Table 2 Educational attainment in Transport & Warehousing occupations in Durham Region; from Census 2016 custom purchased data

Top 10 occupations in multi-modal transportation	No certificate, diploma or degree	Secondary (high) school diploma or equivalency certificate	Apprenticeship or trades certificate or diploma	College, CEGEP or other non-university certificate or diploma	Bachelor's degree	Master's degree
0731 Managers in transportation	40	135	15	90	40	0
1511 Mail, postal and related workers	40	135	15	60	15	0
1512 Letter carriers	65	200	20	90	15	0
1521 Shippers and receivers	240	710	70	295	45	10
1525 Dispatchers	50	180	20	220	50	0
6222 Retail and wholesale buyers	35	160	15	145	70	10

7452 Material handlers	670	1730	125	460	100	15
7511 Transport truck drivers	555	1015	215	230	65	15
7512 Bus drivers, subway operators and other transit operators	140	500	85	300	25	15
7513 Taxi and limousine drivers and chauffeurs	55	140	30	75	20	10

Multimodal Transportation and Warehousing Education Opportunities

Durham Region provide accessible opportunities for credentials in the transport and warehousing sector, which are as follows:

Name of institutions	Degree	Program
Durham College	Ontario College Diploma	Supply Chain and Operations (Business Administration)
	N/A	Drivers training for Class A, D, F & Taxi Cab
Durham Continuing Education	Grade 12 Diploma	Logistics and distribution

In addition, Durham Flight Centre, located at the Oshawa Executive Airport, provide Private Pilot License (PPL) Night Rating, Instrument Rating, Multi Engine Rating, Multi Engine IFR/IR, Multi Engine Sim Training⁵ and Commercial Pilot training.

Key Performance Indicators: Durham College

Each year, Durham College produces a Graduate Employment Report based on information compiled from the KPI survey. The information contained in the report profiles the employment status of Durham College graduates from post-secondary programs in 2016. Six months after graduation, graduates are contacted by an independent consulting firm (hired by the Ministry of Training, Colleges and Universities), regarding their employment status. The table below represents programs within the multi-modal transportation sector:

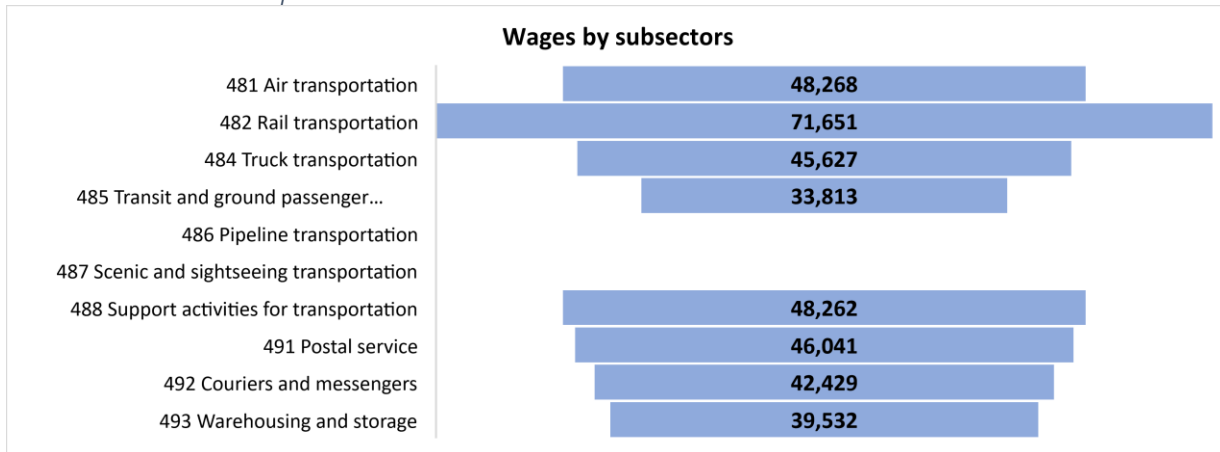
⁵ From Pilot Career Centre Global at <https://www.pilotcareercentre.com/Pilot-Training-Flight-School/Canada/Ontario/6952/Durham-Flight-Centre>

Program Name	Total Graduates	Percentage Working (Related occupation)	Percentage Working (total)
Business Administration-Operations Management	19	67	83

Wages

Due to the existence of multiple modes in the transportation system, wages in this sector may vary by subsectors as well as occupations.

Figure 4 Average employment income in Durham Region transport & warehousing subsectors; from Census 2016 custom purchased data



The chart above shows how wages differ by sub-sectors. In Durham Region, the average employment income in rail transportation is \$ 71,651 whereas in Transit and ground passenger subsector, it is \$ 33, 813. Support services for transportation includes support services for all level of transportation and is third highest in terms of average employment income. The data for *pipeline transportation* and *scenic & sightseeing transportation* are likely suppressed for privacy concerns due to very low number of people working in these sub-sectors.

Table 4 Employment income in top 5 T&W subsectors in Durham Region; from Census 2016 custom purchased data

Top 5 occupations by employment	Average Employment Income (\$)
1512 Letter carriers	50,438
7511 Transport truck drivers	43,215
1521 Shippers and receivers	38,910
7452 Material handlers	37,136
7512 Bus drivers, subway operators and other transit operators	28,530

In terms of the top 10 occupations selected for this sector, the wages range from \$ 50, 438 for Letter carriers to \$ 28,530 for bus drivers. Material handlers, the top occupation in this sector earn \$ 37, 136, while transport truck drivers earn \$ 43, 215 on average on a yearly basis.

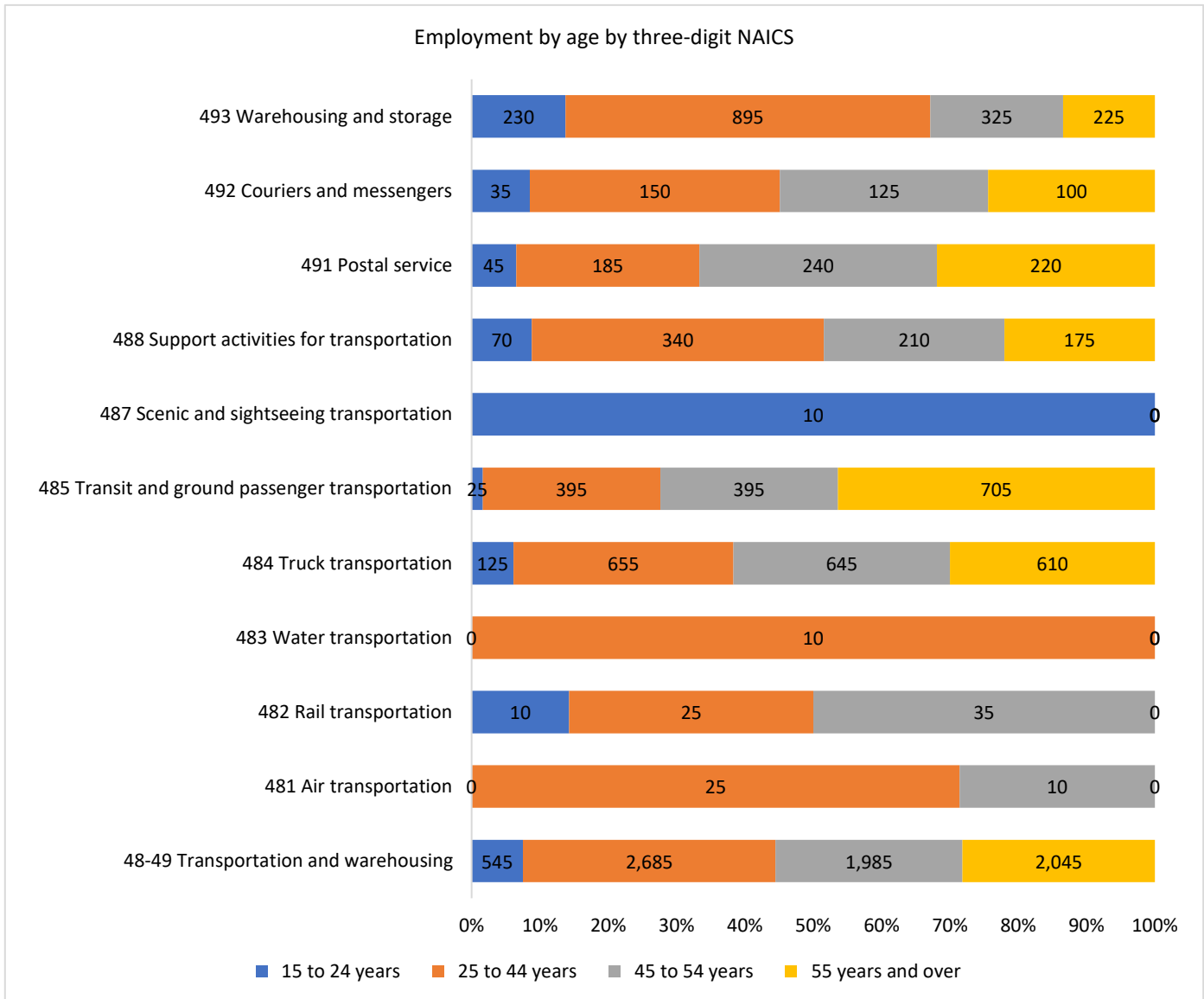
Table 5 Employment income in top 10 T&W occupations in Durham Region; from Census 2016 custom purchased data

Occupations (Top 10 highly paid)	Average employment income (\$)
6411 Sales and account representatives - wholesale trade (non-technical)	87,942
0731 Managers in transportation	83,449
7305 Supervisors, motor transport and other ground transit operators	66,173
1215 Supervisors, supply chain, tracking and scheduling co-ordination occupations	63,145
2263 Inspectors in public and environmental health and occupational health and safety	62,566
1214 Supervisors, mail and message distribution occupations	60,867
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	59,228
1311 Accounting technicians and bookkeepers	51,281
1512 Letter carriers	50,438
0714 Facility operation and maintenance managers	46,176

The table above provides the highest employment income in the subsector by occupation, and NOC 6411 *wholesale sales and account representatives* earn \$ 87,942 followed by *managers in transportation* with \$ 83, 942. The top 10 occupations are followed by employees mainly in the supply chain and warehousing sector.

Age Breakdown

Figure 5 Age breakdown in Durham Region MMTW industry; from Census 2016 custom purchased data



The chart above shows that employees aged 15-24 years old form the smallest percentage of employees, being 10 percent of overall transportation and warehousing. In air transportation, people aged 25-44 years form 70 percent of the total employment and the rest are between 45-54 years old. Overall, employees over 55 years and over form 30 percent of employment force in the industry and with almost half of the transit and ground passenger transportation being 55 years and over.

Sources

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