Appendix B:
Review of Similar Projects and Related Studies
As identified in the task assignment for this feasibility study a review was undertaken of similar projects in other cities to compare to a potential downtown Ottawa truck tunnel. Although the initial task assignment had identified seven cities this was expanded and a total of 24 tunnel sites were selected and evaluated based on their similarity to the potential downtown Ottawa truck tunnel project.

The following tunnel projects were examined:

1. Port Miami Tunnel
2. Dublin Port Tunnel
3. Blanka Tunnel Complex (Prague)
4. Seattle Alaskan Way Viaduct Replacement Tunnel
5. Oakland Caldecott Tunnel
6. Auckland Waterview Connection Tunnel
7. Brisbane Clem Jones Tunnel
8. Calgary Airport Trail Tunnel
9. Detroit-Windsor Tunnel
10. Louis-Hippolyte Lafontaine Bridge-Tunnel
11. Robertson Tri-Met Tunnel (Portland)
12. New Portsmouth Midtown Immersed Tunnel
13. George Massey Tunnel (Vancouver)
14. Vancouver Trans-Canada Cassiar Connector Tunnel
15. Joseph-Samson Tunnel (Quebec City)
16. Palm Jumeirah Vehicular Tunnel (Dubai)
17. Ville-Marie and Viger Tunnels (Montreal)
18. Wacker Drive Chicago
19. Thorold Stone Road Tunnel
20. Dulles International Airport AeroTrain Tunnel
21. Al Salam Street Tunnel (Abu Dhabi)
22. Fraser Canyon Highway Tunnels
23. East-West Access Road (Algeria)
24. Laerdal Tunnel (Norway)

Although the task assignment identifies a preference for the evaluation of tunnels solely used for trucks, no tunnels used exclusively for trucks were found. Therefore all the tunnels examined utilize a combination of truck and vehicular traffic. However, it was individually identified how each type of vehicle is treated, as in some cases truck and vehicular traffic is managed differently.

Information was primarily collected via the internet. All websites where information was collected was recorded. In the cases of the “world famous” or high profile tunnels, most information was readily available. In the cases of some of the low profile, smaller, or older tunnel projects, some of the information was not found or missing. Further investigation such as contacting local agencies would need to be completed in order to attempt to obtain the missing information, although it was not felt necessary at this time. In the cases of tunnel projects completed by Parsons (such as the East-West Access Road in Algeria), information was available through Parsons’ records.
The following criteria were included in the evaluation of each of the tunnels:

<table>
<thead>
<tr>
<th>Location</th>
<th>City and Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>Length of the Tunnel in Metres</td>
</tr>
<tr>
<td>Type</td>
<td>Underwater or Underground (also - where available, depth of tunnel)</td>
</tr>
<tr>
<td>AADT</td>
<td>Annual Average Daily Traffic utilizing the Tunnel</td>
</tr>
<tr>
<td>Number of Lanes</td>
<td>Total Number of Lanes in the Tunnel</td>
</tr>
<tr>
<td>Date Constructed</td>
<td>Start Date of Tunnel Construction and Date of Tunnel Opening</td>
</tr>
<tr>
<td>Construction Costs</td>
<td>Total Project Cost in Canadian Dollars</td>
</tr>
<tr>
<td>Construction Method</td>
<td>Type of Construction Method Utilized</td>
</tr>
<tr>
<td>Problem Being Solved</td>
<td>Initial Issue triggering the need for a Tunnel</td>
</tr>
<tr>
<td>Community Impacts</td>
<td>How the tunnel has impacted the surrounding community from an economic or social perspective etc.</td>
</tr>
<tr>
<td>Tolling/Other Funding for Operating and Maintenance</td>
<td>Identifies what kind of tolling strategy (if any) the tunnel utilizes and for what types of vehicles this affects</td>
</tr>
<tr>
<td>Unforeseen Problems</td>
<td>Any construction or operational issues the tunnel has experienced and why</td>
</tr>
<tr>
<td>Dangerous Goods Treatment</td>
<td>How vehicles/trucks carrying hazardous goods are managed</td>
</tr>
<tr>
<td>Inclusion of Vehicles Other than Trucks Permitted</td>
<td>What types of vehicles are permitted to use the tunnel</td>
</tr>
<tr>
<td>Success of the Tunnel</td>
<td>Whether the tunnel is considered a success or not and why</td>
</tr>
<tr>
<td>Other Comments</td>
<td>Any other interesting facts or comments found</td>
</tr>
</tbody>
</table>

All information was researched and a table containing all relevant information was completed. Example projects were ordered based on similarity to the Downtown Ottawa Truck Tunnel proposed project and quality/quantity of information available.
<table>
<thead>
<tr>
<th>Tunnel Name</th>
<th>Location</th>
<th>Length</th>
<th>Type</th>
<th>AADT</th>
<th>Number of Lanes</th>
<th>Date Constructed</th>
<th>Construction Costs</th>
<th>Construction Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>PortMiami Tunnel</td>
<td>Miami, Florida, USA</td>
<td>1.30km</td>
<td>Underwater</td>
<td>4,000</td>
<td>4 Lanes (2 per tunnel)</td>
<td>May 24th, 2010</td>
<td>$1 Billion (USD) /$745 Million CAD</td>
<td>Public-Private Partnership (PPP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tunnel Depth (Lowest Elevation) = ~37m</td>
<td>Heavy Traffic = ~96%</td>
<td></td>
<td>August 3rd, 2014</td>
<td>Design and Construction Costs = $667 Million USD</td>
<td>Tunnels constructed using a Tunnel Boring Machine (TBM)</td>
</tr>
<tr>
<td>Dublin Port Tunnel</td>
<td>Dublin, Ireland</td>
<td></td>
<td>Underground</td>
<td>15,000</td>
<td>4 Lanes (2 per tunnel)</td>
<td>June 1st, 2001</td>
<td>€752 Million (Euro) /$1.1 Billion CAD</td>
<td>Built in 5 Sections using 3 Methods: - Cut and Cover - Tunnel Boring - Pipe Jacking (Under existing Railway)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tunnel Depth (Ground Level to top of Tunnel) = ~21-23m</td>
<td>Heavy Traffic = ~60%</td>
<td></td>
<td>December 20th, 2006</td>
<td>Construction Tender Costs = €448 Million (Euro)</td>
<td></td>
</tr>
<tr>
<td>Blanka Tunnel Complex</td>
<td>Prague City, Czech Republic</td>
<td>6.4km</td>
<td>Underground</td>
<td></td>
<td>4 Lanes (2 in each direction)</td>
<td>Start of Construction: 2006</td>
<td>$37 Billion (Koruna) /$2 Billion CAD</td>
<td>Driven (mined) and Cut and Cover (divided into small sections) Geological Conditions: Generally Rock formed by Sediment (old sea bed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Opened: Expected Early 2015</td>
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<tr>
<td>Seattle Alaskan Way Viaduct Replacement Tunnel</td>
<td>Seattle, Washington, USA</td>
<td>3.0km</td>
<td>Underground</td>
<td>110,000</td>
<td>4 Lanes (1 Tunnel, Stacked)</td>
<td>Start of Construction: July 30th, 2013</td>
<td>$4.25 Billion (USD) /$5.7 Billion CAD</td>
<td>Single TBM (World’s Largest)</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Opening: Unknown (Under Construction)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oakland Caldecott Tunnel</td>
<td>Oakland, California, USA</td>
<td>1,100m - 1,149m</td>
<td>Underground</td>
<td>160,000</td>
<td>4 Lanes (2 per tunnel)</td>
<td>Start of Construction: Bore 1 &amp; 2 - 1929 Bore 3 - 1960 Bore 4 - 2010</td>
<td>$417 Million (USD) /$560 Million CAD</td>
<td>New Austrian Tunneling Method (NATM)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>Bore 4 - New Austrian Tunneling Method (NATM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auckland Waterview Connection Tunnel</td>
<td>Auckland, New Zealand</td>
<td>2.50km Underground, 6.30km Total Length</td>
<td>Underground</td>
<td>83,000</td>
<td>4 Lanes (2 Tunnels, 3 Lanes Each)</td>
<td>Start of Construction: 2013</td>
<td>$1.7 Billion (NZD) /$1.5 Billion CAD</td>
<td>Public-Private Partnership (PPP) Earth Pressure Balance TBM</td>
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<td></td>
<td>Opening: 2017</td>
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<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Location</td>
<td>Length</td>
<td>Type</td>
<td>AADT</td>
<td>Number of Lanes</td>
<td>Date Constructed</td>
<td>Construction Costs</td>
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</tr>
<tr>
<td>Brisbane-Gold Coast Tunnel</td>
<td></td>
<td>Brisbane, Australia</td>
<td>4,800m</td>
<td>Underground and Underwater</td>
<td>4 Lanes</td>
<td>4 (2 per tunnel)</td>
<td>September 2006</td>
<td>$2.2 Billion (AUD) / $3.1 Billion (CAD)</td>
</tr>
<tr>
<td>Calgary Airport Y-Caret Tunnel</td>
<td></td>
<td>Calgary, Alberta, Canada</td>
<td>825m</td>
<td>Underground (under Calgary Airport Runway)</td>
<td>4 Lanes</td>
<td>3 in each direction</td>
<td>July 2011</td>
<td>$250 Million (CAD)</td>
</tr>
<tr>
<td>Detroit-Windsor Tunnel</td>
<td></td>
<td>Windsor, Ontario, Canada</td>
<td>1,575m</td>
<td>Underground and Underwater</td>
<td>2 Lanes</td>
<td>1 in each direction</td>
<td>1927</td>
<td>$25 Million (USD) / $33 Million (CAD)</td>
</tr>
<tr>
<td>Louis-Hippolyte LaFontaine Bridge-Tunnel</td>
<td></td>
<td>Montreal, Quebec, Canada</td>
<td>1,391m</td>
<td>Underground</td>
<td>2 Lanes</td>
<td>3 Tunnels, 3 Lanes Each</td>
<td>1963</td>
<td>$75 Million (CAD)</td>
</tr>
<tr>
<td>Robertson-Y-Met Tunnel</td>
<td></td>
<td>Portland, Oregon, USA</td>
<td>2,105m</td>
<td>Underground and LRT Tunnel</td>
<td>2 Rail Lines</td>
<td>1 per tunnel</td>
<td>June 1st, 1993</td>
<td>$184 Million (USD) / $247 Million (CAD)</td>
</tr>
<tr>
<td>New Portsmouth Midtown Immersed Tunnel</td>
<td></td>
<td>Portsmouth, Virginia, USA</td>
<td>1,278m</td>
<td>Underground</td>
<td>2 Lanes</td>
<td>1-way traffic</td>
<td>September 12th, 1996</td>
<td>$82.1 Billion (USD) / $5.8 Billion (CAD)</td>
</tr>
<tr>
<td>George Massey Tunnel</td>
<td></td>
<td>Vancouver, British Columbia, Canada</td>
<td>629m</td>
<td>Underground</td>
<td>4 Lanes</td>
<td>2 in each direction</td>
<td>March 1st, 1957</td>
<td>$25 Million (CAD)</td>
</tr>
<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Location</td>
<td>Length</td>
<td>Type</td>
<td>AADT</td>
<td>Number of Lanes</td>
<td>Date Constructed</td>
<td>Construction Costs</td>
</tr>
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</tr>
<tr>
<td>Vancouver Trans-Canada Cassiar Connector Tunnel</td>
<td><img src="image1.jpg" alt="Image" /></td>
<td>Vancouver, British Columbia, Canada</td>
<td>1744m</td>
<td>Underground</td>
<td>6 Lanes</td>
<td>6 Lanes (3 per lane)</td>
<td>Originally opened with 4 lanes but was designed to accommodate 6 lanes total (was expanded ~2006).</td>
<td>Unknown</td>
</tr>
<tr>
<td>Joseph-Bramson Tunnel</td>
<td><img src="image2.jpg" alt="Image" /></td>
<td>Quebec City, Quebec, Canada</td>
<td>280m</td>
<td>Underground</td>
<td>Unknown</td>
<td>6 Lanes (dynamic lane reversal technology)</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Palm Jumeirah Vehicular Tunnel</td>
<td><img src="image3.jpg" alt="Image" /></td>
<td>Dubai, United Arab Emirates</td>
<td>1,398m</td>
<td>Underwater</td>
<td>Unknown</td>
<td>6 Lanes (3 per direction/tunnel)</td>
<td>Estimated visitors per day is 20,000.</td>
<td>Start of Construction: 2005</td>
</tr>
<tr>
<td>Ville-Marie and Viger Tunnels Montreal A-720</td>
<td><img src="image4.jpg" alt="Image" /></td>
<td>Montreal, Quebec, Canada</td>
<td>1,500m</td>
<td>Underground</td>
<td>A-720 AADT = 160,000</td>
<td>6 Lanes (3 per direction/tunnel), plus single lanes for on/off ramps.</td>
<td>Late 1960's</td>
<td>Unknown</td>
</tr>
<tr>
<td>Harold Stone Road Tunnel</td>
<td><img src="image6.jpg" alt="Image" /></td>
<td>Hornsby, Ontario, Canada</td>
<td>840m</td>
<td>Underwater</td>
<td>Unknown</td>
<td>4 Lanes (2 per tunnel)</td>
<td>Start of Construction: 1965</td>
<td>Opened 1967</td>
</tr>
<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Location</td>
<td>Length</td>
<td>Type</td>
<td>AADT</td>
<td>Number of Lanes</td>
<td>Date Constructed</td>
<td>Construction Costs</td>
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<tr>
<td>Dulles International Airport AeroTrain Tunnel</td>
<td></td>
<td>Dulles Airport, Virginia, USA</td>
<td>6,080m</td>
<td>Underground</td>
<td>N/A</td>
<td>2 People Mover Lines (1 per tunnel)</td>
<td>Start of Construction: 2004</td>
<td>Start of Construction: October 2007</td>
</tr>
<tr>
<td>Fraser Canyon Highway Tunnels (7 Total)</td>
<td></td>
<td>Fraser Canyon, British Columbia, Canada</td>
<td>7 Tunnels (Shortest: 57m Longest: 610m)</td>
<td>Underground</td>
<td>Unknown</td>
<td>8 Lanes (1 in each direction, 1 Tunnel)</td>
<td>Start of Construction: 1957</td>
<td>Start of Construction: 1964</td>
</tr>
<tr>
<td>East-West Access Road, Annaba, Algeria</td>
<td></td>
<td>Highway stretching the northern border of Algeria</td>
<td>Total Highway Length = 1,216km</td>
<td>Highway/Underground</td>
<td>Unknown</td>
<td>8 Lanes</td>
<td>Start of Construction: 2009</td>
<td>Start of Construction: August 2014</td>
</tr>
<tr>
<td>Lærdal Tunnel</td>
<td></td>
<td>Connects the cities Bergen and Oslo in Norway</td>
<td>24.51km</td>
<td>Underground</td>
<td>AADT = 1,000</td>
<td>8 Lanes (1 in each direction, 1 Tunnel)</td>
<td>Start of Construction: 1995</td>
<td>Start of Construction: 2000</td>
</tr>
<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Problem Being Solved</td>
<td>Community Impacts</td>
<td>Tolling/Other Funding for Operating and Maintenance</td>
<td>Unforeseen Problems</td>
<td>Dangerous Goods Treatment</td>
<td></td>
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<td>---------------------</td>
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</tr>
<tr>
<td>Port Miami Tunnel</td>
<td><img src="image1" alt="Port Miami Tunnel" /></td>
<td>Before the tunnel was opened, the only route for Port Miami traffic was through Downtown Miami. As future plans to expand port capacity proceeded, there was concern on how the increased truck vehicle traffic would affect and improve the area surrounding downtown Miami’s economy and growth. Therefore a tunnel was needed to connect Miami Port traffic directly to the MacArthur Causeway (which connects to I-95 via I-395).</td>
<td>The port has been losing cruise ship and cargo traffic to Port Everglades and Fort Lauderdale over the years due to the port layout and access issues. The new tunnel will help provide better access to the cruise ship and cargo ports, making them a more competitive port in the area. Also, due to the decrease in Port Traffic through downtown Miami, the economic growth and expansion of the downtown core will not be hindered.</td>
<td>Port Department of Transportation fully funds the tunnel operation and maintenance. No Toll for all commercial vehicles above 3.5 tonnes, buses with more than 25 seats, and vehicles driven by physically disabled drivers that have been adapted for physically disabled drivers.</td>
<td>During the hard rock boring vibration caused some damage to houses in the area. A total of 241 claims were reimbursed. There was a problem with the height as many critics argued that the 4.65m height isn't enough and rather a 5.5m height would be needed in order to accommodate all sizes of trucks.</td>
<td>Dangerous goods are prohibited.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dublin Port Tunnel</td>
<td><img src="image2" alt="Dublin Port Tunnel" /></td>
<td>To remove heavy goods trucks from the city-centre streets of Dublin as they travel to the surrounding highways from the Dublin Port.</td>
<td>The tunnel construction employed 9000 people. The tunnel used the TBM cutterhead technology.</td>
<td>No Toll for all commercial vehicles above 3.5 tonnes, buses with more than 25 seats, and vehicles driven by physically disabled drivers that have been adapted for physically disabled drivers. For all other vehicles, tolling ranges from €3 to €10. This is to deter non-commercial vehicles from using this route.</td>
<td>During the hard rock boring vibration caused some damage to houses in the area. A total of 241 claims were reimbursed. There was a problem with the height as many critics argued that the 4.65m height isn't enough and rather a 5.5m height would be needed in order to accommodate all sizes of trucks.</td>
<td>Dangerous goods are prohibited.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atlanta Tunnel Complex</td>
<td><img src="image3" alt="Atlanta Tunnel Complex" /></td>
<td>To relieve heavy traffic through the historic center of Prague (congestion issues).</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seattle Alaskan Way Viaduct Replacement Tunnel</td>
<td><img src="image4" alt="Seattle Alaskan Way Viaduct Replacement Tunnel" /></td>
<td>Replacing the 58.96 Arakan Way Viaduct which is a 60-year old double-deck highway that spans Seattle's downtown waterfront. Due to a significant earthquake in 2001 (magnitude 6.8), the existing structure suffered several inches and needed significant repairs - which were completed. If the earthquake had hit a few seconds earlier, engineers say the structure would have collapsed.</td>
<td>The improved transportation and accessibility will help create better economic and social prospects for those living in the area.</td>
<td>Post-Construction tunnel was already a week behind schedule due to problems with fiberglass near the front of the drill and a labor dispute. In Dec 2013, the TBM struck a steel pipe which had been installed for exploratory drilling in the planning phase of the project. This damaged the TBM, requiring a 37m shaft to be constructed to repair the TBM. This delay lasted over 1 year.</td>
<td>Unknown</td>
<td>Unknown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oakland Caldecott Tunnel</td>
<td><img src="image5" alt="Oakland Caldecott Tunnel" /></td>
<td>To ease traffic congestion and end the process of manually reversing the flow of traffic twice a day along the middle bore.</td>
<td>Unknown</td>
<td>No Toll</td>
<td>Weather conditions can vary greatly from one end of the tunnel to the other. Weather conditions should be taken into consideration for safety reasons. Due to the Caldecott Tunnel fire in 1982 which killed 7 people, it is illegal to transport hazardous material in a tanker truck through the tunnel except during the hours of 10:00 am and 10:00 am (right traffic times).</td>
<td>Due to the Caldecott Tunnel fire in 1982 which killed 7 people, it is illegal to transport hazardous material in a tanker truck through the tunnel except during the hours of 10:00 am and 10:00 am (right traffic times).</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Auckland Waterview Connection Tunnel</td>
<td><img src="image6" alt="Auckland Waterview Connection Tunnel" /></td>
<td>The tunnels will connect the Southwestern and Northwestern Motorways to complete the Western Ring Route – a 7km long alternative Motorway around the city. In addition, the tunnels will take traffic off local roads.</td>
<td>Unknown</td>
<td>No Toll</td>
<td>Unknown</td>
<td>Unknown</td>
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<tr>
<td>Notes:</td>
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</tbody>
</table>

- Tunnel Name: Port Miami Tunnel, Dublin Port Tunnel, Atlanta Tunnel Complex, Seattle Alaskan Way Viaduct Replacement Tunnel, Oakland Caldecott Tunnel, Auckland Waterview Connection Tunnel.
- Problem Being Solved: Concerns about increased truck traffic affecting downtown Miami's economy and growth, need for a tunnel to connect MacArthur Causeway to I-95 via I-395, need for better access to Port Everglades and Fort Lauderdale, need to remove heavy goods trucks from Dublin Port, need to relieve heavy traffic through the historic center of Prague, need to replace an old double-deck highway.
- Community Impacts: Loss of cruise ship and cargo traffic to Port Everglades and Fort Lauderdale, decreased Port Traffic through downtown Miami, economic growth and expansion of the downtown core will not be hindered, need for better access to cruise ship and cargo ports, need to deter non-commercial vehicles from using the tunnel.
- Tolling/Other Funding: Port Department of Transportation fully funds the tunnel operation and maintenance, no toll for all commercial vehicles above 3.5 tonnes, buses with more than 25 seats, and vehicles driven by physically disabled drivers that have been adapted for physically disabled drivers. For all other vehicles, tolling ranges from €3 to €10.
- Unforeseen Problems: Damage to houses, problem with the height, damage to fiberglass, TBM strike, steel pipe installation, labor dispute, earthquake, fiberglass near the front of the drill.
- Dangerous Goods Treatment: Dangerous goods are prohibited.
<table>
<thead>
<tr>
<th>Tunnel Name</th>
<th>Photos</th>
<th>Problem Being Solved</th>
<th>Community Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brisbane-Clem Jones Tunnel</td>
<td></td>
<td>Designed to help alleviate traffic congestion in the downtown core of the Brisbane (Central Business District and Fortitude Valley).</td>
<td>Due to the high cost of tolling, only a small reduction (~5%) in vehicles on by-passed areas was observed, while during a free promotion period, a ~10-20% decrease in vehicles in by-passed areas was observed.</td>
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<tr>
<td></td>
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<td>Connects to the Airport Link Tunnel which connects to Brisbane Airport, reducing travel times.</td>
<td>Utilizes an Electronic Tolling System (vehicles either use a transponder or license plate technology is implemented)</td>
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<td>Due to the high cost of tolling, utilization of the tunnels after opening was significantly less than expected.</td>
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<td></td>
<td>Unseen problems: Controversy over environmental hazards from construction and operations. Moreover, the expected air pollution from the ventilation stacks and their proposed locations. Issues due to difficult drilling conditions were encountered (Brisbane Tuff Rock).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dangerous Goods Treatment: Dangerous goods are prohibited. Any vehicles carrying commercial quantities of dangerous goods are prohibited.</td>
</tr>
<tr>
<td>Calgary Airport Trail Tunnel</td>
<td></td>
<td>Improved connectivity to Calgary Airport.</td>
<td>Improved connectivity between the community and airport. No major impacts as land was previously farm land (issues more related to the airport expansion).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No toll. 6 Month delay due to existing soil conditions. 9 Month delay due to electrical scope of work.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dangerous goods are prohibited.</td>
</tr>
<tr>
<td>Detroit-Windsor Tunnel</td>
<td></td>
<td>In the early 1900’s, private boats and ferries would carry passengers and freight between Canada and the USA (particularly difficult with ice in the winter). Therefore, building a tunnel or bridge-based access between the 2 countries.</td>
<td>The tunnel has led to an increase in trade and ease of movement between the 2 countries. Entering the USA there is a $4.50 (USD) Toll. Entering Canada there is a $4.75 (USD) Toll.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All hazardous products are prohibited (oil, gas, paint, fuel) in the tunnel. The tunnel is not dedicated for commercial use.</td>
</tr>
<tr>
<td>Louis-Hippolyte Lachine Bridge-Tunnel</td>
<td></td>
<td>Constructed to connect the Trans-Canada Highway (was the last link). A tunnel was chosen for half the structure in order to minimize impacts on nearby port operations.</td>
<td>Built in time for Expo-67 which was held in Montreal in 1967. No toll.</td>
</tr>
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<td></td>
<td></td>
<td>Unknown</td>
</tr>
<tr>
<td>Robertson Tr-Met Tunnel</td>
<td></td>
<td>After the MAX west line was designated, it was originally planned to run adjacent to the Sunset Highway. However, due to weather condition, public opinion, and environmental concerns, it was determined that the better alignment was a tunnel through the Tualatin Mountains.</td>
<td>Unknown</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Due to unexpected geological conditions (loose layers of silt, gravel, basalt etc.), the tunnel boring machine did not always work properly, contributing heavily to the project cost moving from $103.7 Million to $184 Million.</td>
</tr>
<tr>
<td>New Portsmouth Midtown Immersed Tunnel</td>
<td></td>
<td>Due to congestion issues, a second tunnel is needed to help increase capacity for east-west travel in Portsmouth across the river.</td>
<td>Reduced travel time and congestion for east-west travel. Tolls began February 1, 2014 and is expected to continue until April 13, 2017 to help fund the expansion (new tunnel) project. Rates = $1-3 (USD) each way Electronic Tolling (E-Z Pass or License Plate)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dangerous goods are prohibited.</td>
</tr>
<tr>
<td>George Massey Tunnel</td>
<td></td>
<td>The tunnel helps to connect the Tri-C of Richmond with the Corporation of Delta. At peak rush hour periods, a reversible lane technology is used to help with congestion (dynamic arrows and swing gates).</td>
<td>The tunnel is a part of the Vancouver to Tsawassen Ferry route. Due to bicycle restrictions, this is argued as a major choking point on the route. Here have been no tolls since 1988.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The tunnel is reaching its lifespan (~10 years left). The government of BC has decided to replace the tunnel with a new bridge, with construction slated to begin in 2017.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Unknown</td>
</tr>
<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Problem Being Solved</td>
<td>Community Impacts</td>
</tr>
<tr>
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</tr>
<tr>
<td>Vancouver Trans-Canada Cassiar Connector Tunnel</td>
<td>![Photo]</td>
<td>The tunnel eliminates at-grade intersections of the Trans Canada Highway and the city street system, and improves traffic flow to and from the Second Narrows Bridge.</td>
<td>The tunnel has led to the removal of the last remaining traffic lights on the Trans Canada.</td>
</tr>
<tr>
<td>Joseph-Baronson Tunnel</td>
<td>![Photo]</td>
<td>To connect the east side of downtown Quebec City to the Riviere Saint Charles Bridge.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Palm Jumeirah Vehicular Tunnel</td>
<td>![Photo]</td>
<td>A tunnel was needed in order to connect the spine of The Palm Island to the outer Crescent.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Ville-Marie and Viger Tunnels (Montreal A-720)</td>
<td>![Photo]</td>
<td>To create a fast and effective way to move through the downtown core of Montreal.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Wacker Drive Chicago</td>
<td>![Photo]</td>
<td>Originally, the highway was built to help beautify the city and relieve congestion. The highway was built to replace South Water and River Street. Extensions were built in latter years to extend the highway to the east.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Thorold Stone Road Tunnel</td>
<td>![Photo]</td>
<td>Highway 58 had to be continued so this tunnel was constructed underneath the Welland Canal.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Problem Being Solved</td>
<td>Community Impacts</td>
</tr>
<tr>
<td>-----------------------------------------</td>
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<td>--------------------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Dulles International Airport AeroTrain Tunnel</td>
<td><img src="image1.png" alt="Image" /></td>
<td>The system was built to replace &quot;mobile lounges&quot; (buses) which moved passengers from the Concourse to the Terminal.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Al Salam Street Tunnel (renamed Sheikh Zayed Tunnel)</td>
<td><img src="image2.png" alt="Image" /></td>
<td>Al Salam Street is the main street in Abu Dhabi. It connects the downtown business sector with the 2 main bridges to the city. Adding a tunnel under the main road helps with congestion and reducing travel times along the corridor.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Fraser Canyon Highway Tunnels (7 Total)</td>
<td><img src="image3.png" alt="Image" /></td>
<td>To complete the Trans-Canada Highway (Highway 1)</td>
<td>Unknown</td>
</tr>
<tr>
<td>East-West Access Road, Annaba, Algeria</td>
<td><img src="image4.png" alt="Image" /></td>
<td>The project will help reduce travel times and provide better and safer access to the north side of the country, helping to stimulate economic development.</td>
<td>Construction generated over 100,000 jobs.</td>
</tr>
<tr>
<td>Jambli Tunnel</td>
<td><img src="image5.png" alt="Image" /></td>
<td>Due to harsh winters, highways and ferries between the two cities could not remain open during the winter. The tunnel provides all-season access between the two cities.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Inclusion of Vehicles Other than Trucks Permitted</td>
<td>Success of the Tunnel</td>
</tr>
<tr>
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</tr>
<tr>
<td>Port Miami Tunnel</td>
<td><img src="image1" alt="Photo" /> <img src="image2" alt="Photo" /></td>
<td>Trucks use right lane and cars/motorcycles use left lane. Pedestrians and cyclists are prohibited from the tunnel.</td>
<td>The project coincides with other projects which will increase port traffic such as the Port of Miami Deep Dredge Project and Panama Canal Expansion. Much public speculation that the project was unnecessary and a waste of taxpayer dollars.</td>
</tr>
<tr>
<td>Dublin Port Tunnel</td>
<td><img src="image3" alt="Photo" /> <img src="image4" alt="Photo" /></td>
<td>Tolls for all non-truck/bus traffic to deter other vehicles from using the tunnel.</td>
<td>The tunnel did in the end remove trucks from the streets of Dublin but many problems were encountered during construction including water leaks, cost overruns, height controversy, and house damage.</td>
</tr>
<tr>
<td>Atlanta Tunnel Complex</td>
<td><img src="image5" alt="Photo" /> <img src="image6" alt="Photo" /></td>
<td>Unknown</td>
<td>Tunnel is still under construction.</td>
</tr>
<tr>
<td>Seattle Alaskan Way Viaduct Replacement Tunnel</td>
<td><img src="image7" alt="Photo" /> <img src="image8" alt="Photo" /></td>
<td>All types of vehicles permitted.</td>
<td>Tunnel is still under construction.</td>
</tr>
<tr>
<td>Oakland Caldecott Tunnel</td>
<td><img src="image9" alt="Photo" /> <img src="image10" alt="Photo" /></td>
<td>All types of vehicles permitted. Pedestrians and cyclists are prohibited from the tunnel.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Auckland Waterview Connection Tunnel</td>
<td><img src="image11" alt="Photo" /> <img src="image12" alt="Photo" /></td>
<td>Unknown</td>
<td>Tunnel is still under construction.</td>
</tr>
<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Inclusion of Vehicles Other than Trucks Permitted</td>
<td>Success of the Tunnel</td>
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</tr>
<tr>
<td>Brisbane Clem Jones Tunnel</td>
<td><img src="image1" alt="Image" /></td>
<td>Any vehicles are permitted except the following: - Vehicles and loads exceeding 4.6m high - Vehicles carrying commercial quantities of dangerous goods and specifically any vehicle displaying a dangerous goods placard - Motorbikes - Tractors - Bicycles</td>
<td>Due to the high toll costs and inherent low demand for the tunnel, the bridge has not been as successful as planned due to extremely low usage. Tunnel was sold in 2013 to Queensland Motorways for $618 Million (AUD), well below the cost of $3.1 Billion (AUD) to build it.</td>
</tr>
<tr>
<td>Calgary Airport Trail Tunnel</td>
<td><img src="image2" alt="Image" /></td>
<td>All types of vehicles permitted.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Detroit-Windsor Tunnel</td>
<td><img src="image3" alt="Image" /></td>
<td>Motorcycles are prohibited in the tunnel. About 13,000 vehicles travel through the tunnel daily, 98% of them are cars.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Louis-Hippolyte Lafontaine Bridge-Tunnel</td>
<td><img src="image4" alt="Image" /></td>
<td>All types of vehicles permitted. Pedestrians and cyclists are prohibited from the tunnel.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Robertson-Mt-Blat Tunnel</td>
<td><img src="image5" alt="Image" /></td>
<td>NA</td>
<td>Unknown</td>
</tr>
<tr>
<td>New Portsmouth Midtown Immersed Tunnel</td>
<td><img src="image6" alt="Image" /></td>
<td>All types of vehicles permitted. Pedestrians and cyclists are prohibited from the tunnel.</td>
<td>Tunnel is still under construction.</td>
</tr>
<tr>
<td>George Massey Tunnel</td>
<td><img src="image7" alt="Image" /></td>
<td>The tunnel is illegal for cyclists or pedestrians to traverse. Shuttle buses operate to provide access through the tunnel for pedestrians and cyclists (the tunnel is part of the Tsawwassen-Ferry Bicycle Route).</td>
<td>Successful. However, 50 years later it does have traffic congestion issues.</td>
</tr>
<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Inclusion of Vehicles Other than Trucks Permitted</td>
<td>Success of the Tunnel</td>
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<tr>
<td>Vancouver Trans-Canada Cassiar Connector Tunnel</td>
<td><img src="image1" alt="Image" /> <img src="image2" alt="Image" /></td>
<td>All types of vehicles permitted. No pedestrians are permitted.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Joseph-Samson Tunnel</td>
<td><img src="image3" alt="Image" /> <img src="image4" alt="Image" /></td>
<td>All types of vehicles permitted. Pedestrians and cyclists are prohibited from the tunnel.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Palm Jumeirah Vehicular Tunnel</td>
<td><img src="image5" alt="Image" /> <img src="image6" alt="Image" /></td>
<td>All types of vehicles permitted. Pedestrians and bicycles are prohibited from the tunnel.</td>
<td>Unknown</td>
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<td>Ville-Marie and Viger Tunnels (Montreal A-720)</td>
<td><img src="image7" alt="Image" /> <img src="image8" alt="Image" /></td>
<td>All types of vehicles permitted.</td>
<td>Unknown</td>
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<td>Wacker Drive Chicago</td>
<td><img src="image9" alt="Image" /> <img src="image10" alt="Image" /></td>
<td>Unknown</td>
<td>Unknown</td>
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<tr>
<td>Thorold Stone Road Tunnel</td>
<td><img src="image11" alt="Image" /> <img src="image12" alt="Image" /></td>
<td>All types of vehicles permitted. There is a walkway in the westbound side for pedestrians.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Inclusion of Vehicles Other than Trucks Permitted</td>
<td>Success of the Tunnel</td>
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<tr>
<td>Dulles International Airport AeroTrain Tunnel</td>
<td><img src="https://via.placeholder.com/150" alt="Image" /></td>
<td>Pedestrians &amp; Cyclists (AeroTrain)</td>
<td>Unknown</td>
</tr>
<tr>
<td>All Salam Street Tunnel (renamed Sheikh Zayed Tunnel)</td>
<td><img src="https://via.placeholder.com/150" alt="Image" /></td>
<td>All types of vehicles under 5.5m and under 2.5 tonnes are permitted. Pedestrians and cyclists are prohibited from the tunnel. Cameras are used to detect vehicle height and detect when a vehicle taller than 5.5m has entered the tunnel.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Fraser Canyon Highway Tunnels (7 Total)</td>
<td><img src="https://via.placeholder.com/150" alt="Image" /></td>
<td>All types of vehicles permitted. Cyclists are also permitted.</td>
<td>Unknown</td>
</tr>
<tr>
<td>East-West Access Road, Annaba, Algeria</td>
<td><img src="https://via.placeholder.com/150" alt="Image" /></td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Lærdal Tunnel</td>
<td><img src="https://via.placeholder.com/150" alt="Image" /></td>
<td>All types of vehicles permitted. Pedestrians and cyclists are prohibited from the tunnel. Tunnel is very rural.</td>
<td>Unknown</td>
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<tr>
<td>Tunnel Name</td>
<td>Photos</td>
<td>Web LINKS</td>
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<td><img src="image5.png" alt="Blanka Tunnel Complex" /> <img src="image6.png" alt="Blanka Tunnel Complex" /></td>
<td><a href="http://www.radio.cz/en/section/curraffrs/massive-blanka-tunnel-has-been-completed-after-years-of-delays">http://www.radio.cz/en/section/curraffrs/massive-blanka-tunnel-has-been-completed-after-years-of-delays</a></td>
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<td><a href="http://en.wikipedia.org/wiki/Blanka_tunnel_complex">http://en.wikipedia.org/wiki/Blanka_tunnel_complex</a></td>
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<td><a href="http://www.wsdot.wa.gov/Projects/Viaduct/About/Tunneling">http://www.wsdot.wa.gov/Projects/Viaduct/About/Tunneling</a></td>
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</table>
| Calgary Airport Trail Tunnel      | ![Image] | [http://en.wikipedia.org/wiki/Calgary_International_Airport](http://en.wikipedia.org/wiki/Calgary_International_Airport)  
[http://www.calgary.ca/Transportation/TF/Pages/Road-projects/Airport-Trail-Tunnel.aspx](http://www.calgary.ca/Transportation/TF/Pages/Road-projects/Airport-Trail-Tunnel.aspx)  
[http://www.dwtunnel.com/AboutUs.aspx](http://www.dwtunnel.com/AboutUs.aspx)  
[http://conferences.wsu.edu/forms/bridgeinspectors/presentations/1366.pdf](http://conferences.wsu.edu/forms/bridgeinspectors/presentations/1366.pdf) |
| New Portsmouth Midtown Immersed Tunnel | ![Image] | [http://www.fhwa.dot.gov/ipd/project_profiles/va_midtown_tunnel.aspx](http://www.fhwa.dot.gov/ipd/project_profiles/va_midtown_tunnel.aspx)  
[https://www.driveert.com/construction/midtown-tunnel/](https://www.driveert.com/construction/midtown-tunnel/)  
[http://www.roadsinthefuture.com/Mid_Tunn_Port_Nort_MLV.html](http://www.roadsinthefuture.com/Mid_Tunn_Port_Nort_MLV.html)  
[https://www.driveert.com/faq/](https://www.driveert.com/faq/)  
[http://engage.gov.bc.ca/masseytunnel/](http://engage.gov.bc.ca/masseytunnel/) |

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<table>
<thead>
<tr>
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<td><img src="http://www.metwashairports.com/files/aerotrain_paper.pdf" alt="Photo" /></td>
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</tr>
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<td>Fraser Canyon Highway Tunnels (7 Total)</td>
<td><img src="http://en.wikipedia.org/wiki/Fraser_Canyon#Tunnels" alt="Photo" /></td>
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</tr>
</tbody>
</table>
Trucking dangerous goods in Canada, 2004 to 2012

by Sagal Searag, Greg Maloney and Larry McKeown
Environment, Energy and Transportation Statistics Division

Release date: February 11, 2015
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- National telecommunications device for the hearing impaired 1-800-363-7629
- Fax line 1-877-287-4369

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- Fax line 1-800-565-7757

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Note of appreciation
Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued co-operation and goodwill.

Standard table symbols
The following symbols are used in Statistics Canada publications:

. not available for any reference period
.. not available for a specific reference period
... not applicable
0 true zero or a value rounded to zero
0* value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
p preliminary
r revised
x suppressed to meet the confidentiality requirements of the Statistics Act
E use with caution
F too unreliable to be published
* significantly different from reference category (p < 0.05)
Introduction

Recent events have heightened public awareness concerning the transportation of dangerous goods. While economic regulation of Canada’s transportation sector has been reduced over the last 25 years, the movement of dangerous goods continues to be carefully regulated. Compared to other freight, shipments of explosives, gases, flammable liquids, flammable solids, oxidizing substances, poisonous and infectious substances, nuclear substances, corrosives and other products pose public safety and environmental risks. The consequences of accidents or spills can be severe, particularly if shipments travel through population centres or fragile ecosystems.

Regulations on the movement of dangerous goods can vary by jurisdiction but generally require accurate classification, appropriate means of containment, and correct marking, labelling and documentation. In Canada, federal legislation currently prohibits the transportation of certain high risk dangerous goods unless an Emergency Response Assistance Plan (ERAP) has been submitted and approved. The plan outlines how specialized emergency response personnel will react to an accident and their overall capacity to respond. As dangerous goods are likely to remain a significant portion of the overall freight moved across the country, there is a recognized need to further enhance the monitoring of these shipments.

For instance, in June of 2014 Transport Canada amended the Transportation of Dangerous Goods Regulations to clarify the criteria for displaying safety marks. The regulation now requires safety marks to be displayed on trucks, rail cars and bulk containers used to transport dangerous goods, identifying the type of goods and the nature of the risk posed. And in August, Transport Canada launched the second stage of consultations concerning adequate railway third party liability insurance in order to cover, among other costs, the spill of contaminants and environmental damage related to railway operation.

Surface transportation (i.e., road and rail excluding pipelines) is estimated to move almost 95% of the total tonnage of dangerous goods in Canada with trucking accounting for the largest share. The possibility that accidents might occur at any time or any location

1. Dangerous goods are defined by the Transportation of Dangerous Goods Act, 1992 as products, substances or organisms in any of these nine classes. Based on their inherent nature, these goods are further classified from Packing Group I indicating great danger to Packing Group III indicating minor danger.
between the origin and destination raises questions concerning the nature of these types of shipments. To provide some perspective, this study examines the dangerous goods transported by the Canadian for-hire trucking industry from 2004 to 2012, focusing on tonnage, types of goods and average distance per shipment.

**What you should know about this study**

Statistics Canada’s Trucking Commodity Origin and Destination Survey (TCOD) targets large (annual revenue > $1.3 million) establishments in the Canadian for-hire trucking industry (North American Industry Classification System 484). It excludes foreign-based trucking establishments operating in Canada and non-trucking establishments with their own fleets (i.e., private trucking). As such, TCOD estimates should be considered as a lower boundary of total trucking activity in Canada. For comparison, for-hire trucking establishments in the United States accounted for just 58% of dangerous goods trucked by weight in 2012, but averaged over 4.5 times the distance shipped.

Over the study period, the number of target establishments ranged roughly from 2,100 to 2,900; in 2012, 92% of 2,196 establishments responded to the survey. Statistics Canada interviewers visit each establishment and, using a systematic sample of shipping documents, record information on the origin and destination of shipments as well as the weight and type of goods. The coefficient of variation (CV) by weight was calculated at less than 5% for all types of shipments in 2012.

Commodities are classified to a Standard Classification of Transported Goods (SCTG) aggregation, which includes about 500 groups. In many cases, all commodities in a group are considered dangerous while, in other groups, some are dangerous and others are not. In the second case, an algorithm based on Transport Canada information is used to apply a flag that reflects the likelihood that the shipment includes dangerous goods. In 2012, 97% of shipments by weight flagged as dangerous goods were classified to SCTG groups in which all goods are dangerous, such as Petroleum products. In comparison, shipments of Glues and prepared glues were considered as dangerous 18% of the time.

**Increasing weight shipped**

In 2012, the combined weight of all commodities moved by Canadian for-hire trucking establishments reached over 650 million tonnes, a record amount culminating from steady growth experienced following the 2009 economic downturn (Chart 1). A key portion of these shipments in 2012 consisted of dangerous goods at just over 107 million tonnes (17% of all goods), up from the 81 million tonnes (or 14%) trucked in 2004. This represents an increase of 32% since 2004, almost twice the rate of growth of the industry’s overall shipments (17%) during this same period.

**Road versus rail**

Recent derailments have served to increase the level of scrutiny associated with the movement of dangerous goods by rail. However, a larger tonnage of dangerous
Trucking dangerous goods in Canada, 2004 to 2012

Chart 2
Surface transportation1 of dangerous goods in Canada, 2012

- Rail transportation (NAICS 482): 26.1 million tonnes
- Truck transportation (NAICS 484): 107.4 million tonnes

1. Excluding pipelines.

Note: NAICS: North American Industry Classification System.
Sources: Statistics Canada, Environment, Energy and Transportation Statistics Division, Trucking Commodity Origin and Destination Survey (survey number 2741) and Monthly Railway Carloadings Survey (survey number 2732), 2012.

Goods is transported by truck. In 2012, the for-hire trucking industry handled approximately four times the dangerous goods by weight than did the mainline railways (Chart 2).7

In the United States, but including private trucking carriers, about 93% of the more than 1.6 billion tons of dangerous goods transported by surface moved by truck.8

Despite carrying more dangerous goods by weight, the consequences of an accident by truck are limited to a small number of trailers on a per truck basis. And moreover, the average shipments by truck involve shorter distances.9

Shipments of dangerous goods by truck and rail would be therefore more comparable on a per tonne-kilometre basis. However, it should also be noted that most accidents and spills of dangerous goods occur during handling rather than during actual transit.10

The top four dangerous goods

Although the top four dangerous goods trucked by weight remained the same over the study period, they accounted for almost 80% of the total by 2012, up from 71% in 2004 (Chart 3). The increase was driven largely by the trucking of crude petroleum products, which more than doubled to reach over 40 million tonnes by 2012, accounting for more than one-third (38%) of the total.

Over the same period, shipments of gasoline and aviation turbine fuel rose 11% to 26 million tonnes, while fuel oils increased 16% to 12.4 million tonnes and non-metallic minerals (such as sulphur) rose 43% to 5.2 million tonnes. Fertilizers and fertilizer materials (including nitric acid, sulphonitrile acids and ammonia), the fifth largest category of dangerous goods trucked in 2012 at 2.6 million tonnes, increased by approximately 180% over the study period.

Average distance

An interesting factor is the distance that dangerous goods travel to reach their destination. From 2004 to 2012, the average distance of all shipments trucked in Canada was estimated to have increased from 608 to 632 kilometres. However, shipments of dangerous goods declined from an average of 316 to 269 kilometres. This decline reflects an increase in energy-related shipments, particularly crude petroleum products since, on average, shipments of these products travelled about one-third (35%) of the distance than did other dangerous goods (Table 1).

7. The rail proportion is estimated from the Monthly Railway Carloadings Survey based on the U.N. dangerous good designation identified by Standard Transportation Commodity Codes for revenue-generated freight moved by the two mainline freight railways only.
9. In the United States, the average distance per hazardous material shipment by for-hire truck was 150 miles versus 808 by rail (2012 U.S. Commodity Flow Survey).
A shorter average distance for trucking crude petroleum products is partly tied to extraction areas in Alberta and Saskatchewan and proximity to trans-loading facilities.

For Alberta, the oil sands region in the north of the province has limited rail service and pipeline access. Consequently, heavy oil is often trucked to feeder pipelines which serve consolidation points in the Edmonton area for rail and further southeast for pipeline. In 2012, shipments of crude petroleum products were trucked an average distance of 95 km in Alberta.

For Saskatchewan, although its Bakken region in the south of the province has extensive rail coverage, there has been insufficient feeder pipeline infrastructure. Although the majority of crude is shipped out of the region by rail, it must first be trucked to a rail loading facility. On average, crude petroleum products were trucked a distance of 118 km in Saskatchewan.

**Provincial perspectives**

By province of origin, Alberta accounted for almost half of the national total weight of dangerous goods transported by truck in 2012 (Chart 4). The province also experienced the largest growth, increasing by over 19 million tonnes from 2004 to 2012. Again, this growth was driven largely by crude petroleum products as shipments of these products that originated in Alberta more than doubled from almost 15 million tonnes in 2004 to over 30 million tonnes by 2012.

Similarly for Saskatchewan, crude petroleum products shipped by truck rose from about 5 million tonnes to over 9 million tonnes. Combined with increased shipments of gasoline and aviation turbine fuel as well as fuel oils, fertilizers and fertilizer materials, the weight of dangerous goods shipped in the province reached 14.7 million tonnes by 2012.

Over the study period, British Columbia and Manitoba experienced some growth in shipments while Ontario and Quebec both experienced a decline in the tonnage of dangerous goods transported by truck.

Although provincial patterns of dangerous goods shipped by truck will evolve, crude petroleum products in the west are likely to continue driving national estimates by weight. In Alberta for instance, total crude oil production per month
has risen from an average of 9.3 million cubic metres in 2010 to 12.5 million cubic metres during the first half of 2014, largely from synthetic crude oil and crude bitumen extraction. And truck-to-rail delivery is now considered as a medium term alternative to access those areas not served directly by pipelines.

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ACKNOWLEDGEMENTS

TRANS would like to acknowledge the funding support received from the following member Agencies:

- National Capital Commission
- Ministère des Transports du Québec
- Ministry of Transportation Ontario
- Ville de Gatineau (formerly Communauté Urbain de l’Outaouais)
- City of Ottawa (formerly Regional Municipality of Ottawa-Carleton)

The roadside surveys while funded by TRANS Agencies, were carried out in 1999 and 2000 by EarthTech Canada Inc, under contract to the Province of Ontario (Ministry of Transportation), for the administration of all the roadside surveys across the province as part of the National Roadside Truck Survey. Special thanks to Mr. Rob Tardif, Coordinator, Commercial Vehicle Survey for the Ministry of Transportation of Ontario (MTO) who oversaw the survey work on behalf of TRANS Agencies and to Mr. David Smith Manager, Data Management and Analysis Office (MTO) for ongoing project support.

The “1999/2000 INTERPROVINCIAL ROADSIDE TRUCK SURVEY” report was prepared by McLean Transportation Engineering Consultants Ltd. The consultant acknowledges the invaluable assistance of Mr. Petar Grubor, of the City of Ottawa, in the preparation of tabulations, Mr. Don Stephens, Manager, TRANS Programme and the Steering Committee Members in the provision of advice during the preparation of this report.

REMERCIEMENTS

TRANS souhaite remercier les organismes membres pour leur soutien financier:

- La Commission de la Capitale nationale
- Le ministère des Transports du Québec
- Le ministère des Transports de l’Ontario
- La Ville de Gatineau (autrefois la Communauté urbaine de L’Outaouais)
- La Ville d’Ottawa (autrefois la Municipalité régionale d’Ottawa-Carleton)

L’enquête routière bien que financée par les membres du groupe TRANS fût exécutée par Earthtech Canada Inc. en 1999 et 2000, pour le compte de la province d’Ontario (ministère des Transports) pour effectuer toutes les enquêtes routières de la province en tant que participant dans l’enquête nationale sur le camionnage. Au nom des membres du groupe TRANS, nous tenons à remercier monsieur Robert Tardif, coordonnateur au Service des enquêtes sur les véhicules commerciaux pour le ministère des Transports de l’Ontario (MTO) pour son travail de supervision dans cette enquête. Nous tenons à remercier également monsieur David Smith, gestionnaire au Bureau de la gestion des données et des analyses (MTO), pour son soutien dans ce projet.

McLean Transportation Engineering Consultants Ltd qui a prepare le rapport “ENQUÊTE ROUTIÈRE INTERPROVINCIALE SUR LE CAMIONNAGE 1999/2000” remercie monsieur Petar Grubor de la Ville d’Ottawa pour son aide précieuse dans la préparation des tables, monsieur Don Stephens, gestionnaire du groupe TRANS ainsi que les membres du comité technique pour leurs conseils lors de la préparation de ce rapport.
EXECUTIVE SUMMARY

Background

In the autumns of 1999 (October) and 2000 (September) surveys, co-ordinated by TRANS, were undertaken to establish a comprehensive database on interprovincial truck travel characteristics in the National Capital Region. Surveys were carried out only on the Chaudière and Macdonald-Cartier bridges as the movement of “heavy trucks” is prohibited on the remaining three bridges - the Alexandra, Portage and Champlain bridges. The roadside surveys were part of a broader national roadside survey program led by Transport Canada with participation of the provinces.

The purpose of this study was the development of "a good understanding of the interprovincial movement patterns, origins, destinations and characteristics of heavy trucks in the National Capital Region" and the satisfaction of the TRANS mandate “to furnish high quality and meaningful transportation data required for transportation planning and decision making in the National Capital Region". In this context, the study was undertaken to establish a comprehensive database of information regarding the characteristics of trucks crossing the Ottawa River and thus provide a basis for future studies and analysis. *In meeting this objective, this study does not directly address specific transportation issues but rather provides TRANS Agencies with a database for this purpose. Detailed analysis of the comprehensive data base would be necessary to assess the impact of new*

SOMMAIRE

Contexte

En octobre 1999 et en septembre 2000, une enquête, coordonnée par le groupe TRANS, a été réalisée dans le but de constituer une base de données complète au sujet du transport interprovincial de marchandises par camions qui traversent la rivière des Outaouais. L’enquête routière a été effectuée seulement sur les ponts Chaudière et Macdonald-Cartier puisqu’il est interdit aux poids lourds de circuler sur les trois autres ponts (Alexandra, Portage et Champlain). Cette enquête s’inscrivait dans un programme d’étude national dirigé par Transports Canada, en collaboration avec les provinces.

Cette étude visait à brosser un tableau de la situation en ce qui a trait aux itinéraires, aux points de départ, aux destinations et aux caractéristiques des camions, poids lourds, dans la région de la capitale nationale. Elle permettait aussi à TRANS de réunir des données pertinentes et de qualité pouvant faciliter la planification et la prise de décisions concernant le transport dans la région de la capitale nationale, conformément au mandat qui lui avait été confié. Dans ce contexte, l’enquête avait pour but de constituer une base de données exhaustive au sujet des camions qui franchissent la rivière des Outaouais, et d’établir ainsi un point de départ pour des études et des analyses ultérieures. *Compte tenu de cet objectif, le rapport ne traite directement d’aucun enjeu précis en matière de transport mais fournit aux organismes de TRANS les données*
or improved infrastructure on interprovincial truck traffic, and would be a prerequisite for reaching any meaningful conclusions regarding future interprovincial transport needs.

The database, which is available for future studies, provides significant information regarding the movement of heavy trucks across the Ottawa River, historical heavy truck trends, their composition in the traffic stream and their associated travel patterns.

Roadside driver interview surveys gathered specific data on the characteristics of the trucks, the travel patterns, including detailed information on the trip origins and destinations and the commodity/goods carried. The surveys revealed that approximately 3,450 trucks cross the Ottawa River on a daily basis. Trip characteristics were obtained from a sample of 14.3% of the vehicles and this sample was considered to be of sufficient magnitude and strength to allow expansion of the data by bridge and by certain time periods.

**Truck Classification**

The classification system applied three key categories of trucks (heavy trucks) as follows:

- 2 axle trucks - which represent trucks with six wheels such as tow trucks, large (3/4 ton, 1 ton) pick-up trucks, small vans, small dump trucks etc. defined as "heavy trucks";


La base de données, qui pourra servir pour de futures études, contient des renseignements importants sur la circulation des poids lourds qui traversent la rivière des Outaouais, sur l’évolution de la situation au fil des ans, sur la place des poids lourds dans le flot de circulation et sur leurs itinéraires.

Les camionneurs interrogés ont fourni des données précises sur les caractéristiques de leurs véhicules et sur leurs itinéraires, y compris leurs points de départ et leurs destinations et la nature de leurs cargaisons. L’enquête a révélé qu’environ 3 450 camions franchissent chaque jour la rivière des Outaouais. Les caractéristiques des déplacements ont été obtenues à partir d’un échantillon de 14.3% des camions. Ceci constitue un échantillon de taille et d’importance suffisantes pour effectuer une expansion des résultats par pont et par période de la journée.

**Catégories de camions**

Le système de classement prévoyait trois catégories de poids lourds:
• 3+ axle trucks - which represent medium size trucks such as large dump trucks, straight trucks, concrete mix trucks etc. which are also defined as "heavy trucks";
• tractor trailer trucks - which represent the largest trucks such as tractor-trailer trucks, flat-bed trucks etc.

Of the total of approximately 3,450 trucks observed over a 24 hour period as crossing the Ottawa River, there were 1,550 2 axle (45%), 880 3+ axle (25%) and 1,020 tractor trailer (30%) trucks.

• camions à deux essieux – comprenant notamment les camions à six roues comme les dépanneuses, les grosses camionnettes de trois quarts de tonne à une tonne, les petits camions et les petits camions à benne, considérés comme des poids lourds;
• camions à trois essieux et plus – comprenant notamment les camions de taille moyenne comme les gros camions à benne, les camions porteurs et les camions malaxeurs, considérés aussi comme des poids lourds;
• camions gros porteurs – comprenant notamment les camions les plus gros, comme les semi - remorques et les camions à plate-forme.
Truck Volumes

Daily heavy truck volumes crossing the Ottawa River were, in 2000, approximately 3,450, which is 5% higher than the recorded ten year average (3,285). For comparative purposes overall traffic levels crossing the Ottawa River on all five bridges are about 200,000 vehicles per day (traffic counts undertaken in 2000 indicate an average one way volume of approximately 94,000 vehicles).

Truck movements are more predominant during the mid-day hours than in the commuter peak hours. The mid-day peaking phenomenon may be attributed to the need to meet the expectations of the business day and quite possibly trucker attempt to avoid the commuter peak periods. The tractor trailer trucks (which represented about 30% of all interprovincial truck trips) reported longer trip lengths and consequently were, as a category, responsible for approximately 50% of the total trip distance travelled by all trucks. In contrast, the 3+ axle trucks (representing 25% of the truck trips) were responsible for 20% of the distance travelled by all trucks while the 2 axle trucks (45% of interprovincial truck trips) were associated with 30% of the distance travelled by trucks.

Most truck traffic across the Ottawa River occurs between 06:00 and 21:00. Approximately 95% of the 3+ axle trucks, 93% of the 2 axle trucks and 80% of the tractor trailer crossings of the Ottawa River have occurred by 21:00. This suggests that the tractor trailer vehicles tend to be more spread out across the 24 hour period than the other two categories of trucks.

Volumes des camions

En 2000, environ 3 450 camions poids lourds franchissaient la rivière des Outaouais chaque jour, ce qui constituait une légère augmentation de 5% par rapport à la moyenne enregistrée il y a dix ans (3 285). À des fins de comparaison, au total, près de 200 000 véhicules empruntent chaque jour les cinq ponts qui enjambent la rivière des Outaouais (les relevés effectués en 2000 indiquent quelque 94 000 véhicules en moyenne dans une direction).

La circulation des camions est plus dense au milieu de la journée que pendant les heures de pointe. L’heure de pointe qui se forme ainsi en milieu de journée peut être attribuée au besoin de se conformer aux heures d’ouverture des commerces, et peut-être aussi aux efforts des camionneurs pour éviter les heures d’arrivée et de départ des navetteurs. Ce sont les gros porteurs (environ 30% des déplacements interprovinciaux de camions) qui effectuent les trajets plus longs, parcourant à eux seuls près de 50% des distances couvertes par des camions, toutes catégories confondues. Les camions à trois essieux ou plus (25% des déplacements interprovinciaux de camions) en parcourent 20% et les camions à deux essieux (45% des déplacements interprovinciaux de camions) en parcourent 30%.
The Macdonald-Cartier bridge carried a total of 2,580 trucks per day with, by far, the largest number of the tractor-trailers (870). When compared with the other two classes of trucks the tractor trailers represented about 34% of the total trucks on that bridge. On the Chaudière bridge, which carried approximately 870 trucks per day in total, the 2 axle truck is the largest vehicle class of truck (520) and dominates the composition (60%) of the truck stream.

La plupart des camions franchissent les ponts de la rivière des Outaouais entre 06h00 et 21h00. Environ 95% des camions à trois essieux ou plus, 93% de ceux à deux essieux et 80% des gros porteurs les franchissent avant 21h00.

Ces statistiques portent à croire que les déplacements des gros porteurs s'échelonnent davantage sur une période de vingt-quatre heures que les deux autres catégories de camions.

Chaque jour, 2 580 camions passent sur le pont Macdonald-Cartier, dont 870 gros porteurs, ce qui représente de loin le plus grand nombre de camions. Comparativement aux deux autres catégories de camions, les gros porteurs constituent environ 34% de la circulation de camions sur ce pont. Sur le pont Chaudière, où circulent environ 870 camions par jour, ce sont les camions à deux essieux (520) qui sont les plus nombreux et qui représentent la
Travel Patterns

Local trips between the two cities on each side of the Ottawa River are understandably the largest component of travel, about two-thirds (2,300 trips) of all truck trips.

A review of the remaining trips revealed that 975 (28%) of the trucks made "inter-regional" trips (either an origin or a destination outside the National Capital area), while 175 (5%) of the trucks made a "through" trip (neither an origin nor a destination within the National Capital area).

The key characteristics of the trip patterns are:

- the dominance of the Hull district, part of the new City of Gatineau as an attractor-generator of truck trips (1,360); more than fifty percent of these truck classes are the smaller 2 axle category;
- the distribution of generated and attracted trips to/from the nine remaining "districts" varies from 400 to 930 truck trips;
- the variability of the truck classifications from "district to district" is evident; although the two eastern "districts" one on each side of the Ottawa River, which also include origins and destinations outside the National Capital area (e.g. Montreal), have a large proportion of tractor trailer trucks.

The daily distribution of trips ("all trucks") clearly indicates the strength of the Hull district as compared with each of the other three districts (Aylmer, Gatineau West and Gatineau East) on the Québec side of the Ottawa River.

Itinéraires

Naturellement, les deux tiers (2 300) des déplacements des camions s’effectuent entre les deux villes qui se trouvent de chaque côté de la rivière.

L’examen des autres itinéraires permet de constater que 975 camions (28%) effectuent des déplacements interrégionaux (c’est-à-dire dont le point de départ ou la destination se trouve à l’extérieur de la région de la capitale nationale-RCN) et que 175 camions (5%) ne font que traverser la région (c’est-à-dire que ni leur point de départ, ni leur destination ne se trouvent dans la RCN). Principales caractéristiques des itinéraires:

- C’est dans le district de Hull, dans la nouvelle ville de Gatineau, qu’on compte le plus grand nombre de points de départ et d’arrivée (1 360); il s’agit, dans plus de cinquante pour cent des cas, de petits camions à deux essieux.
- Dans les neuf autres districts, le nombre de points de départ et d’arrivée varie entre 400 et 930.
- La disparité des catégories de camions d’un district à l’autre est évidente; toutefois, les deux districts “Est” situés de part et d’autre de la rivière des Outaouais, qui comprennent également des points de départ et d’arrivée à l’extérieur de la région de la capitale nationale (ex. Montréal), accueillent un pourcentage élevé de gros porteurs.
La répartition des itinéraires quotidiens, toutes catégories de camions confondues, montre clairement l’importance du district de Hull par rapport aux trois autres districts (Aylmer, Gatineau-Ouest et Gatineau-Est) du côté québécois de la rivière des Outaouais.

**Commodities**

The five most frequently reported commodities carried by trucks crossing the Ottawa River are:

- construction materials (475 trips)
- food and beverage (415 trips)
- general merchandise (360 trips)
- paper and paper products (310 trips)
- wood and wood products (195 trips)

**Cargaison**

Voici les cinq types de marchandises transportées le plus souvent par les camions qui franchissent la rivière des Outaouais:

- matériaux de construction (475 déplacements)
- aliments et boissons (415 déplacements)
While “construction materials” tops the list of goods carried, paper and wood products if taken together as a single group would become the prominent group of commodities.

The movement of various commodities across the Ottawa River was identified from the survey results and some key characteristics are:

- for construction materials, while widely distributed, an Aylmer to Ottawa Central trip pattern represented approximately 50 percent of the origins/destinations for that pairing;
- for general merchandise, a widely dispersed trip pattern was expected and no single prominent origins/destinations pairing emerged;
- for paper/paper products, the dominant interchange of trips exists between Hull and Ottawa (both East and West) and between Gatineau East and Ottawa South;
- for wood/wood products, Aylmer and Gatineau West trips to Ottawa South stand out to the exclusion of other pairings as the primary movements for these commodities.

Most frequently reported commodities in the “Petroleum/Chemicals” category were gasoline and furnace fuel. Other notable petroleum / chemicals commodities included propane, oxygen and other gases.

Detailed information regarding the flow of commodities on each of the two bridges was collected as part of truck roadside survey. On the Macdonald-Cartier bridge, for example, the various commodities for each of 3 truck types indicate that the 1,030 2 axle trucks on

• fournitures générales (360 déplacements)
• papier et produits de papier (310 déplacements)
• bois et produits du bois (195 déplacements)

Bien que les matériaux de construction dominent cette liste, le papier et le bois formeraient la catégorie la plus importante s’ils étaient considérés comme un seul groupe.

L’étude a permis de déterminer l’itinéraire de diverses marchandises qui franchissent la rivière des Outaouais. Voici quelques-unes des caractéristiques principales:

• matériaux de construction: bien que les itinéraires soient répartis sur l’ensemble de la RCN, les déplacements entre Aylmer et Ottawa-Centre représentent à eux seuls environ la moitié des trajets.
• fournitures générales: les points de départ/destinations sont très dispersées et aucun point de départ ou d’arrivée ne se distingue de façon particulière.
• papier et produits de papier: la plupart des déplacements s’effectuent entre Hull et Ottawa (tant Est que Ouest) et entre Gatineau-Est et Ottawa-Sud.
• bois et produits du bois: les déplacements s’effectuent pour la plupart d’Aylmer et de Gatineau-Ouest à destination d’Ottawa-Sud, à l’exclusion des autres districts.

Les cargaisons, le plus souvent relevées dans la catégorie “produits chimiques/dérivés du pétrole”, étaient l’essence ou combustible de chauffage. Les autres produits chimiques ou
this bridge carry mainly food and beverage (19%), general merchandise (18%) and construction materials (16%). The 680 trucks in the 3+ axle classification, carry mainly construction materials (16%) and wood products (11%), while tractor trailers (870) carry predominantly paper products (19%), wood products (12%) and construction materials (12%).

dérivés du pétrole les plus souvent présents dans les cargaisons étaient le gaz propane, l’oxygène et d’autres gaz.

Les informations détaillées concernant le flot des cargaisons sur chacun des deux ponts étaient recueillis durant l’enquête routière. Sur le pont Macdonald-Cartier, par exemple, les différentes cargaisons pour chacune des trois sortes de camions, indiquent que 1030 camions à 2 essieux transportent sur ce pont essentiellement l’aliment et la boisson (19%), fournitures générales (18%) et les matériaux de construction (16%). Les camions à 3 essieux et plus (680), transportent essentiellement les matériaux de construction (16%) et des produits de bois (11%). Les camions gros porteurs (870) transportent principalement des produits de papier (19%), produits de bois (12%) et des matériaux de construction (12%).
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1.0 BACKGROUND

In the autumns of 1999 (October) and 2000 (September), several types of surveys, co-ordinated by TRANS, were undertaken to establish a comprehensive database on interprovincial truck travel characteristics in the National Capital Region. Surveys were carried out on the Chaudière and Macdonald-Cartier bridges as the movement of “heavy trucks” is prohibited on the remaining three bridges - the Alexandra, Portage and Champlain bridges.

The roadside surveys, which were undertaken, were part of a broader national roadside survey program led by Transport Canada with participation of the provinces.

TRANS undertook an extensive amount of work in organizing and establishing the database for this project and prepared numerous data tabulations establishing relationships among the various components of the database. Coding of the origins and destinations to the traffic zone system currently in use and applying preliminary expansion factors to some of the data were also undertaken by TRANS.

The purpose of this study was the development of "a good understanding of the interprovincial movement patterns, origins, destinations and characteristics of heavy trucks in the National Capital Region" and the satisfaction of the TRANS mandate "to furnish high quality and meaningful transportation data required for transportation planning and decision making in the National Capital Region". In this context, the study was undertaken to establish a comprehensive database of information regarding the characteristics of trucks crossing the Ottawa River and thus provide a basis for future studies and analysis. In meeting this objective, this study does not directly address specific transportation issues but rather provides TRANS Agencies with a database for this purpose. The database, which is available for future studies, provides significant information regarding the movement of heavy trucks across the Ottawa River, historical heavy truck trends, their composition in the traffic stream and their associated travel patterns.

In the establishment of the database of truck characteristics and patterns, it was relevant to investigate various relationships and rationalize them as appropriate for practical application in transportation planning activities. It was also necessary to identify and rationalize other relationships, which are valuable in transportation planning activities. These relationships are important in the background analytical work necessary to assess the impacts of a future Ottawa River crossing on the movement of goods between the two regions on each side of the Ottawa River.
Once all relationships were identified, the appropriate data tabulations were prepared and evaluated. When the findings were complete and valid, this report, which explains the process and the reliability of the findings, was prepared. The details of the work are described in this report.

The consultant acknowledges the invaluable assistance of the TRANS Agencies' staff in the establishment of the survey database as well as the ongoing assistance in preparing tabulations and the provision of advice in the preparation of this report.

2.0 STUDY METHODOLOGY

The methodology/key tasks that were involved in carrying out the project involved a collaborative effort on the part of the TRANS Agencies’ staff and the consultant. The results are described in this report. The methodology included the preparation of several tabulations and graphical representations of the relationships among various elements of the data, which were collected. This culminated in the information, which was deemed to be the most useful, and the most effective means of presenting the findings from the analysis.

3.0 1989 TRUCK SURVEY


In the 1989 Region-wide survey, truck origin-destination characteristics were collected for the movement of goods on a Region-wide basis, including the movement of goods across the Ottawa River.

The 1989 survey differed from the 2000 survey in two key aspects:

- As part of the 1989 survey, licence plate information (characters) was recorded for 2,964 trucks. From these trucks, a sample of 700 trucks for which registry information was available was drawn to attempt to obtain trip itineraries for this sample. Complete information was obtained for 96 trucks. From the study information, it has been determined that a total of 5,955 “local” (“internal/internal”), (plus an indeterminate number of “external”) truck trips was estimated as having crossed the Ottawa River. Thus, the sample of 96 trucks represented a sampling rate of approximately 1.6% of the universe of approximately (more than) 6,000 trucks. As a point of comparison, the truck survey in the autumn of 2000 obtained data on 495 trucks in a universe of 3,450 trucks (a sample size of 14.3%) observed as having crossed the Ottawa River.
For the purposes of the 1989 survey, vehicles were classified as light trucks (2 axles/4 wheels), medium trucks (2 axles/6 wheels) and heavy trucks (single unit/3+ axles). Any registered commercial vehicle qualified as a candidate to be included in the survey. In comparing the previous survey with the current survey, the inclusion of two axle/four wheel trucks in the previous survey skewed the results considerably. Of importance is the lack of compatibility between the classification system used in the 1989 study and the classification system used in the 1999/2000 surveys. The 2 axle/4 wheel truck classification which was included in the 1989 survey is currently a much larger component of the vehicle fleet as a consequence of the increased popularity of SUVs (sport utility vehicles) and vans as a means of personal transport. The 1999/2000 survey applied a more realistic classification system which excluded the 2 axle/4 wheel truck from the scope of the survey.

The current study is significantly more focussed, having been designed to provide more detailed origin-destination information on the flow of trucks across the Ottawa River.

In summary, aside from other problems related to the sample size, comparisons between the 1989 and 1999/2000 surveys would be difficult, particularly since the in-scope vehicles established for each survey are significantly different.

4.0 1999/2000 SURVEY PROGRAM and METHODOLOGY

In this section of the report, the survey program and the methodologies applied in the application of the data are described.

4.1 Historical Vehicle Data

The Regional Municipality of Ottawa-Carleton (predecessor of the City of Ottawa) had undertaken, annually, traffic counts along major travel corridors to establish trends related to vehicle classifications/occupancy. With the exception of the years between 1995 and 1998 inclusive, in which years data were collected for an eight hour period, these data have been collected for one 12 hour period (07:00 to 19:00) each year. These traffic classification and vehicle occupancy data were available to supplement the data collected as part of the 1999/2000 survey to create a comprehensive database. A significant part of the on-going traffic count program includes the collection of information on interprovincial travel on an annual basis.

From the vehicle classification and occupancy surveys for the Chaudière and Macdonald-Cartier bridges, the historical data are, to varying degrees, relevant and have been applied when appropriate.
4.2 Driver Interviews

The purpose of the driver interview surveys was to gather specific data on the characteristics of the trucks, the travel patterns, including detailed information on the trip origins and destinations and the commodity/goods carried. The roadside driver interview surveys were carried out by trained surveyors (under contract to the Ministry of Transportation of Ontario) familiar with the form of data collection programs of the type applied in this study. Survey crews were stationed on the south side of the Ottawa River - on King Edward Avenue in the vicinity of Boteler Street and on Booth Street south of the Ottawa River Parkway Bridge over Booth Street - and interviewed drivers of candidate trucks.

Illustrations of a typical survey station set-up and lane closures are provided in EXHIBIT 1 - ILLUSTRATION OF SURVEY STATION.

Driver interviews were conducted on separate days for northbound and southbound traffic movements. The surveys were undertaken as follows:

<table>
<thead>
<tr>
<th>DIRECTION/YEAR</th>
<th>1999</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Midnight to midnight (24 hours)</td>
<td>07:00 to 07:00 (24 hours)</td>
</tr>
<tr>
<td>NORTHBOUND</td>
<td>October 25(^{th}) &amp; 28(^{th})</td>
<td>September 6(^{th}) &amp; 7(^{th})</td>
</tr>
<tr>
<td>SOUTHBOUND</td>
<td>October 26(^{th}) &amp; 27(^{th})</td>
<td>September 7(^{th}) &amp; 8(^{th})</td>
</tr>
</tbody>
</table>
From the interview surveys, each record in the database contains responses collected from the questionnaire used in the 2000 survey (a modified version of the questionnaire that was used in the 1999 survey). In the 1999 survey, the origins and destinations of the truck trip were recorded using a "macro" description whereas in the 2000 survey, trip origins and destinations were recorded in very precise and specific terms in order to apply the existing "traffic zone" system to yield valid origin-destination information. Consequently the roadside surveys carried out in 2000 have been used exclusively to establish trip patterns and trip tables for future analysis.

A comprehensive description of the database fields is provided in Appendix A. The following sections and database fields from the interview surveys are considered to be relevant, in varying degrees, to the purpose of the study, as identified in the Terms of Reference as:

- the development of "a good understanding of the interprovincial movement patterns, origins, destinations and characteristics of medium and heavy trucks in the National Capital Region" and the satisfaction of the TRANS mandate "to furnish high quality and meaningful transportation data required for transportation planning and decision making in the National Capital Region".

A - the direction of travel of the truck;
B - the configuration of the truck (number of tires/axles);
C - additional descriptors identifying the configuration/body style of the truck (tractor trailer, straight truck, van, dangerous goods placards etc.);
F - commodity information such as cargo on board, capacity (available/used), category and amount, origin/destination, dangerous goods etc.
H - information on characteristics including number of stops, trip origin/destination details, trip start/end date/time etc.
J - information on axle groupings of trucks etc.

Electronic "boards" were used to record the responses by the drivers. That is, there are no paper records of the responses.

4.3 Vehicular Traffic Classification Count Observations

Observers were stationed at the locations described earlier and recorded all (100%) of the trucks passing the station.

The purpose of the separate classification counts undertaken as part of the project was to provide the identification of vehicles by classification (type), in order to derive expansion factors for application in the study and ensure that the results of the surveys were consistent with the results of the historical on-going program of collecting vehicle classification data.

---

1 Appendix A – Survey Database Fields

Interprovincial Roadside Truck Survey

REPORT
As part of the data collection program, truck classification counts were undertaken:

<table>
<thead>
<tr>
<th>BRIDGE/YEAR</th>
<th>1999</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>05:00 to 22:00 (17 hours)</td>
<td>07:00 to 07:00 (24 hours)</td>
</tr>
<tr>
<td>Macdonald-Cartier</td>
<td>October 25th to 28th</td>
<td>September 6th to 8th</td>
</tr>
<tr>
<td>Chaudière</td>
<td>October 25th to 28th</td>
<td>September 6th to 8th</td>
</tr>
<tr>
<td>Cumberland/Masson Ferry</td>
<td>September 5th to 8th</td>
<td></td>
</tr>
</tbody>
</table>

A graphical representation of the various types of vehicles that are classified in this study as "Trucks" (Heavy Trucks) is provided in Appendix B. This truck classification system was used by the (former) Regional Municipality of Ottawa-Carleton and is consistent with that used in the Outaouais Region.

The classification system applied by the observers was detailed. It was later refined to present information by three key categories of trucks (heavy trucks) as follows:

- **2 axle trucks** - which represent trucks with six wheels such as tow trucks, large (3/4 ton, 1 ton) pick-up trucks, small vans, small dump trucks etc. which create very few traffic operational problems, but are defined as "heavy trucks";

- **3+ (3 or more) axe trucks** - which represent medium size single unit trucks such as large dump trucks, straight trucks, concrete mix trucks etc. which contribute to environmental concerns (noise, vibration) but do not create undue traffic operational concerns; although these are also defined as "heavy trucks";

- **tractor trailer trucks** - which represent the largest trucks such as tractor-trailer trucks, flat-bed trucks etc. which contribute to both environmental concerns and traffic operational concerns due to the time headway utilization (in starting from a stopped position) and the large turning radius (particularly in the case of right turns).

Trucks with four wheels are not included in the study and are considered to be light trucks. These include small (1/2 ton) pick-up trucks, such as the Toyota Tacoma/Chevrolet Sonoma, or the Jeep, or any SUV etc.

---

2 Appendix B – Heavy Truck Classification System

*Interprovincial Roadside Truck Survey*

REPORT 6
4.4 Automatic Traffic Recorder (ATR) Counts

Automatic traffic recorders are devices, which record impulses from tires or vehicle masses passing the site of the detecting devices (road tubes, cable loops in the pavement, etc.). The impulses are translated into vehicle counts and, in some cases, into a count of vehicles, by classification (e.g. various sizes of trucks). The sensitivity of automatic traffic recorders is affected by the number of lanes of traffic included in a survey. When road tubes are used to record vehicles in four or more lanes, results can be quite variable.

The intended purpose of undertaking traffic counts, using automatic traffic recorders during the period 12:00, October 17, 1999 to 07:00, October 31, 1999 (fourteen days) was to ensure representativeness of the classification counts, which were undertaken during a limited period of time (four days). In 2000, traffic volume information was not collected using automatic traffic recorders as part of the program.
5.0 KEY RELATIONSHIPS

In this section of the report, the key relationships identified in respect to the historical data, the truck count characteristics and the travel patterns are discussed.

5.1 Historical traffic volumes

From the historical (1991 to 2000) vehicle classification (light trucks, heavy trucks, passenger cars, buses, taxis, bicycles and others) and occupancy surveys, data are available, by direction of traffic flow across the Ottawa River bridges by time period (8 or 12 hours, morning and afternoon peak periods/hours). This enabled the preparation of profiles for various periods of the day.

"All vehicle" historical volumes are presented for each direction of travel (northbound and southbound), for all five bridges across the Ottawa River in EXHIBIT 3 - HISTORICAL ALL VEHICLE VOLUMES for 12-hour periods (07:00-19:00) and for 24-hour periods (note that the 12 hour data for 1995 to 1998 have been factored from 8 hour data and the 24 hour data are factored from 8 or 12 hour data).

Factors that were established in the early 1980’s from the on-going traffic survey counts conducted by the former Regional Municipality of Ottawa Carleton suggested...
that 12 hour traffic volumes could be factored by 1.39 to represent a daily 24 hour volume. This factor has been applied in several studies (including those undertaken by TRANS) to all vehicles including trucks. In comparison, the data collected in the 2000 surveys determined that an appropriate factor for trucks crossing the Ottawa River would be 1.27 and this value has been applied in factoring 12 hour historical truck traffic counts to derive 24 hour values.

One element to consider in evaluating the data which are presented in this section is the time of year at which the data were collected - in the annual program, data are collected in May/June whereas the data collected for this survey were collected in late October, 1999 and in early September, 2000.

As illustrated in Exhibit 3, daily (24 hour) “all vehicle” traffic volumes, in 2000, were at a level similar to that which was experienced 10 years earlier (1991). After a steady growth in the first half of the decade, a modest decline was experienced in the latter half.

At the peak (1993), there were, in the 24 hour period, approximately 105,600 vehicles (average for each direction) crossing the river, while, in 2000, there were approximately 93,800 vehicles (average for each direction) - a decline of approximately 12% from the peak (average for each direction) crossing the river.

Relevant to this project are the data for the Chaudière and Macdonald-Cartier bridges, which are bridges on which “heavy trucks” are allowed. “Heavy trucks” are prohibited on the Alexandra, Portage and Champlain bridges.

EXHIBIT 4 - HISTORICAL TRUCK VOLUMES presents the historical truck data for the Macdonald-Cartier and the Chaudière bridges collectively.

As illustrated in Exhibit 4, daily (24 hour) truck traffic volumes were, in both the spring and autumn of 2000, at a level slightly lower than that which was experienced 10 years earlier (1991). The lowest level of approximately 1,400 trucks (average number for each direction) occurred in the mid-1990s.

After a steady decline in the first half of the decade, a modest growth was experienced in the latter half. At the peak (1992), there were, in the 24 hour period, approximately 1,950 trucks (average for each direction) crossing the river, while, in the surveys in the autumn of 2000, there were approximately 1,725 trucks (average for each direction) - a decline of approximately 10% from the peak truck traffic crossing the river.

The profiles for the truck volumes may appear to be more pronounced because of the relatively low numbers when compared to the "all vehicle" values.
A summary of relevant data for two way truck traffic on the two bridges combined, for the 24 hour period and the morning and afternoon peak hours is provided in TABLE 1 - CURRENT AND HISTORICAL TWO WAY TRUCK TRAFFIC VOLUMES.

<table>
<thead>
<tr>
<th>INFORMATION SOURCE</th>
<th>24 HOURS</th>
<th>MORNING COMMUTER PEAK HOUR</th>
<th>AFTERNOON COMMUTER PEAK HOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000 SURVEY, AUTUMN</td>
<td>3,450</td>
<td>205</td>
<td>170</td>
</tr>
<tr>
<td>2000 ANNUAL SURVEY, SPRING</td>
<td>3,335</td>
<td>215</td>
<td>170</td>
</tr>
<tr>
<td>5 YEAR AVERAGE (1996-2000)</td>
<td>3,120</td>
<td>235</td>
<td>180</td>
</tr>
</tbody>
</table>

* - Ottawa river crossing includes the Macdonald-Cartier and Chaudière Bridges, as heavy trucks are prohibited on the Alexandra, Portage and Champlain bridges.
The 24-hour truck volume levels observed in the autumn of 2000 compare reasonably well with previous counts undertaken over the past ten year period.

Further, the historical data for the two bridges (Macdonald-Cartier and Chaudière) crossing the Ottawa River have been tabulated for each bridge separately, for the two bridges and for all bridges, and are provided in Appendix C³. From the historical traffic volume information, time period relationships have been determined for the peak hour/peak period, peak hour/12 hour and peak hour/24 hour relationships. These are provided, in detail, in Appendix D⁴.

The most relevant information has been extracted and displayed in TABLE 2 – RATIO OF PEAK HOUR TO 24 HOUR TRAFFIC VOLUMES 1991 to 2000. The values for trucks are followed by the values for all vehicles (in parenthesis).

<table>
<thead>
<tr>
<th>BRIDGE</th>
<th>COMMUTER PEAK/24 HOUR RATIO FOR TRUCKS (ALL VEHICLES)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FOR BOTH DIRECTIONS</td>
</tr>
<tr>
<td>Macdonald-Cartier</td>
<td>Range</td>
</tr>
<tr>
<td></td>
<td>Weighted Average</td>
</tr>
<tr>
<td>Chaudière</td>
<td>Range</td>
</tr>
<tr>
<td></td>
<td>Weighted Average</td>
</tr>
</tbody>
</table>

xx% - trucks, (yy%) - all vehicles

A review of the information in Table 2 and in Appendix D indicates that:

- For **truck** classifications
  - in all cases, the most stable relationships are the commuter peak hour/24-hour relationships. The weighted averages for commuter peak hour/24-hour range from 6 to 8%.

³ Appendix C – Summary of Historical Ottawa River Crossing Truck Traffic Volumes
⁴ Appendix D – Time Period Relationships
Interprovincial Roadside Truck Survey
REPORT 11
- For all vehicle classifications,
  
  - in all cases, the variations in the relationships are reasonably confined;
  - the average of the relationships over 10 years has been identical and therefore has been consistent particularly when both directions are considered;
  - the relationship of the peak hour/24 hour, when both directions are considered, is consistent (although not precisely the same as) with the conventional "rule of thumb" relationship which suggests that the peak hour can be represented by 10% of the AADT.

5.2 Truck Classification and Characteristics

The candidate trucks were grouped into sub-classifications (2 axle, 3+ axle [3 or more axle] trucks and tractor trailers as described in Section 4.3.

Of the total of approximately 3,450 trucks, observed over 24 hour period as crossing the Ottawa River, there were 1,550 2 axle (45%), 880 3+ axle (25%) and 1,020 tractor trailer (30%) trucks.

Information on truck volumes as obtained from the classification counts in 1999 and 2000 is presented, by direction, for each of the Macdonald-Cartier and Chaudière bridges, in EXHIBIT 5 – DAILY TRUCK VOLUMES BY CLASSIFICATION.

For the Macdonald-Cartier Bridge, the volume of trucks was significantly higher (approximately 24%) in 2000 than was the case in 1999; however, the 2000 truck volumes are considered to be more representative for planning purposes (see comparative analysis in Table 1) than the 1999 truck volumes. Truck volumes, averaged over the two days, were consistent in terms of the direction of travel and composition (2 axle, 3+ axle and tractor trailers). For the Chaudière Bridge, truck volumes in 1999 and 2000 were reasonably consistent in magnitude, by direction and by composition. As would be expected, the foregoing characteristics are also apparent when the volumes from both bridges are combined.
The data from the Masson/Cumberland ferry, when included with the totals from the two bridges, had a minimal impact in terms of the total number of trucks (65 in each of the northbound and southbound directions) as well as in the 2 axle truck classification (10 in each direction). There is a disproportionate impact in the 3+ axle (30 in each direction) and tractor trailer (25 in each direction) classifications which would suggest that the smaller vehicles have less propensity to use the ferry probably due to its rural location.

The recorded number of trucks, by hour of the day, is presented, graphically, in EXHIBIT 6 - HOURLY TRUCK VOLUMES, MACDONALD-CARTIER BRIDGE and in EXHIBIT 7 - HOURLY TRUCK VOLUMES, CHAUDIÈRE BRIDGE.

It is clear, from the exhibits, that truck movements are more predominant during the mid-day hours than in the commuter peak hours. The mid-day peaking phenomenon is more apparent on the Chaudière Bridge than on the Macdonald-Cartier Bridge. It is postulated that this is attributable to the attraction of the Chaudière Bridge for short trips (Central Hull to Ottawa) in particular those made by smaller trucks. The need to meet the expectations of the business day no doubt contributes to this phenomenon. These characteristics also reinforce the historical trend, which indicates that the relationship between the peak hour and the 24-hour volumes is lower for trucks than for mixed traffic. The composition of the truck traffic stream is discussed in some detail in Sections 8.1 and 8.3.
EXHIBIT 7
HOURLY TRUCK VOLUMES
MACDONALD-CARTIER BRIDGE

Peak hour 10:00-11:00
2 Axles = 81
3+ Axles = 69
Trailers = 56

EXHIBIT 6
HOURLY TRUCK VOLUMES
MACDONALD-CARTIER BRIDGE

Peak hour 9:00-10:00
2 Axles = 49
3+ Axles = 23
Trailers = 12
In EXHIBIT 8 - HOURLY VEHICLE TRAFFIC VOLUMES, for all Ottawa River Bridges illustrates the typical daily peak traffic periods in the morning and afternoon and more significantly, the relatively small proportion of trucks in the total traffic stream, particularly during the peak traffic periods.

5.3 Automatic Traffic Recorder (ATR) Counts

As indicated earlier, there are significant challenges in collecting classification data using automatic traffic recorders. The "all vehicle" survey data collected in 1999 are available from the TRANS Agencies; however the survey results were not considered to be sufficiently reliable to be subjected to any form of analysis.

No truck counts (by ATR) were taken as part of the Interprovincial Roadside Truck Survey in 2000. Any ATR data, which are available, were obtained from the annual traffic count program undertaken by the Regional Municipality of Ottawa-Carleton.
6.0 ZONE/DISTRICT SYSTEM

In this report, reference is made to the "National Capital area". This "area" closely replicates, but does not precisely follow, the boundaries of the new cities of Ottawa and Gatineau and Municipalité Régionale des Collines de l'Outaouais (MRC) or the boundaries of the National Capital Region.

The traffic zone system, which has been in use for more than 10 years in the National Capital area, is comprised of 258 zones (including 15 "external" zones) and all origin-destination information was coded to this 258-zone system. This zone system has been respected in the development of a "district" system in all of the analyses, which have been undertaken in the context of this study. The "district" system was established to allow the recognition of relevant geographical characteristics and the presentation of relevant travel patterns and is illustrated in EXHIBIT 9 - DISTRICT SYSTEM. The zones, which comprise each of the "districts", are identified in Appendix E. The "districts" have been identified by a geographical reference. The preface "IGB" identified with some "districts" connotes a "district" which is "Inside Green Belt".

---

5 Appendix E – Traffic Zones Comprising the Districts
Interprovincial Roadside Truck Survey
REPORT 16
There are ten “districts” in the current version of the “district” system. External traffic zones in what can be considered to be “remote” areas (e.g. Montreal and contiguous areas in Quebec) have been incorporated into one of the “districts”. In the presentation of the result of the analysis, this factor must be borne in mind. Modifications to the “district” system can be achieved with little effort for any study related to Interprovincial truck traffic.

The “district” system was utilized to create origin-destination matrices for all trucks as well as each of the individual classifications of 2 axle, 3+ axle and tractor trailer trucks.

7.0 DATA EXPANSION

Drivers of 549 trucks were interviewed and the survey yielded 495 (in-scope) valid (and completed) responses representing the characteristics of 3,450 trucks - a sample size of 14.3%. The data were considered to be of sufficient magnitude and strength to allow expansion by bridge and by certain time periods. The methodology and expansion factors are discussed in the following.

7.1 Expansion Methodology

The interview survey data are available for the morning and afternoon peak hours and peak periods as well as for the 07:00 to 19:00 [day] and 19:00 to 07:00 [night] and for the 24 hour period. In order to determine the efficacy of utilizing the peak hour or peak period (as distinct from the 12 or 24 hour) data and applying a relationship factor (as discussed in Section 5.1) to establish origin-destination trip tables for transportation planning purposes, two analytical processes have been applied.

Origin-destination tables, based on the "district" system were prepared to compare, using percentages, the results produced by the "day" data, the "night" data and the full 24 hour data. These tabulations were prepared for all trucks and, individually, for 2 axle trucks, 3+ axle trucks and tractor trailers. These tabulations are provided in Appendix F6 and Appendix G7.

Out of a potential of 100 origin-destination pairs, there were:

- for all trucks, of which there were 47 pairs, there were 42 pairs in which the values for the "day + night" and the "24 hour" were the same;
- for 2 axle trucks, of which there were 42 pairs, there were 38 pairs in which the values for the "day + night" and the "24 hour" were the same;

---

6 Appendix F – “District” Comparison of Trucks by Number
7 Appendix G – “District” Comparison of Trucks by Percent
for 3+ axle trucks, of which there were 36 pairs, there were only 22 pairs in which the values for the "day + night" and the "24 hour" were the same;
- for tractor trailer trucks, of which there were 44 pairs, there were only 28 pairs in which the values for the "day + night" and the "24 hour" were the same;

Since peak hour (normally the afternoon peak hour) values are typically used for transportation planning and road design principles, it is essential to ensure that the peak hour (in particular, the afternoon peak hour) values provide representative information for these purposes.

It became apparent that the use of the afternoon peak period matrix would yield less reliable results than would the use of the 24 hour period accompanied by the application of a factor to estimate the peak period values. The reliability of this procedure is enhanced by the consistency in the relationships between the peak period and the 24-hour period as determined from the results of the analysis presented earlier (Section 5.1).

It is apparent that the use of the values derived for all trucks by summing the two twelve hour survey periods 07:00 to 19:00 [day] and 19:00 to 07:00 [night]) would yield sufficiently reliable results to which a factor to estimate the peak period values could be applied.

In the final analysis, acceptable sampling rates were achieved by considering the utilization of the data by bridge and by direction for either one time period (24 hours) or two time periods (07:00 to 19:00 and 19:00 to 07:00) combined. Intuitively, it was collectively considered that the utilization of a process in which the two time periods were factored separately and combined to provide a strong sample would be the superior of the two methods.

7.2 Expansion Factors

Survey expansion factors were required to expand the interview sample to the universe of the trucks observed crossing the Ottawa River. Initially, expansion factors were developed based on grouping the trucks by bridge, by direction of travel, by vehicle type and by time period. The results indicated a very low (as small as 1%) sampling rate for certain classifications of vehicles during certain time periods. A sampling rate of 5% would be considered to be acceptable. This was as a consequence of, for example,

- the necessity to discontinue the survey during some peak traffic periods due to the congestion being created by the survey procedures, resulting in very few, and, in some cases, no, interviews;
certain types of trucks (e.g. 3+ axle trucks such as those used for construction materials, empty dump trucks) being directed away from the interview stations on the perception that an interview of the driver was unnecessary. This was, in particular, relevant on the Macdonald-Cartier Bridge.

Based on the proportion of empty 3+ axle trucks, a further examination of this classification of truck was undertaken. TABLE 3 - SUMMARY OF 3+ AXLE TRUCKS BY BODY TYPE AND CARGO provides detailed information on the 3+ axle trucks in terms of the body type and whether or not cargo was being transported. A significant number of the 3+ axle trucks are comprised of the dump truck/tractor cab body types.

<table>
<thead>
<tr>
<th>TRUCK BODY TYPE</th>
<th>WITH CARGO</th>
<th>EMPTY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DUMP TRUCK</td>
<td>65</td>
<td>225</td>
<td>290</td>
</tr>
<tr>
<td>FLATBED</td>
<td>90</td>
<td>85</td>
<td>175</td>
</tr>
<tr>
<td>TANKER</td>
<td>40</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>VAN – not refrigerated</td>
<td>50</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td>VAN – refrigerated</td>
<td>20</td>
<td>25</td>
<td>45</td>
</tr>
<tr>
<td>CONTAINER CARRIER</td>
<td>10</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>FLOAT</td>
<td>-</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>TRACTOR CAB (only)</td>
<td>-</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>OTHER</td>
<td>-</td>
<td>65</td>
<td>25</td>
</tr>
<tr>
<td>TOTAL</td>
<td>340</td>
<td>540</td>
<td>880</td>
</tr>
</tbody>
</table>

By utilizing longer time periods for the development of the expansion factors, it was possible to achieve better sampling rates and thus provide more reliable results. Following on from the foregoing, the use of the two twelve hour survey periods (07:00 to 19:00 [day] and 19:00 to 07:00 [night]) was examined. Sample sizes for the two periods differ. There were significantly more trucks included in the 07:00 to 19:00 survey period while the sample size from the 19:00 to 07:00 survey period was significantly greater.

The expansion factors are presented graphically, for the three vehicle classifications for each bridge, in the form of the sample size for two 12 hour time periods (07:00 to
19:00 [day] and 19:00 to 07:00 [night]) in EXHIBIT 10 - SAMPLE SIZE BY TIME OF DAY. The large sample size for tractor trailers during the night period on the Chaudière Bridge can be attributed to the small number of tractor trailers using the bridge during this period.

The numerical values for the expansion factors are provided in TABLE 4 - EXPANSION FACTORS BY BRIDGE, BY DIRECTION AND BY TIME OF DAY.

**TABLE 4**

<table>
<thead>
<tr>
<th>BRIDGE</th>
<th>PERIOD</th>
<th>NORTHBOUND</th>
<th>SOUTHBOUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2 Axles</td>
<td>3+ Axles</td>
</tr>
<tr>
<td>MACDONALD-CARTIER</td>
<td>Day (07:00–19:00)</td>
<td>12.8</td>
<td>15.7</td>
</tr>
<tr>
<td></td>
<td>Night (19:00–07:00)</td>
<td>12.1</td>
<td>7.6</td>
</tr>
<tr>
<td>CHAUDIÈRE</td>
<td>Day (07:00–19:00)</td>
<td>5.1</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td>Night (19:00–07:00)</td>
<td>2.8</td>
<td>11.0</td>
</tr>
</tbody>
</table>

* - Sampling rate less than 5%
The complete analysis, in tabular as well as in graphical form, is provided in Appendix H in which the expansion factors are presented graphically, for the three vehicle classifications for each bridge, in the form of the sample size for various time periods (24 hours, 12 hours (07:00 to 19:00 and 19:00 to 07:00) the morning peak period [06:00 to 10:00], the afternoon peak period [15:00 to 19:00], the mid-day period [10:00 to 15:00] and the night period [19:00 to 06:00].

Generally speaking, the sample size is adequate particularly in the case of the tractor-trailer classification which is considered to be of the greatest significance of the three truck classifications in the context of this study.

The 3+ axle trucks have the lowest sample size (as low as 2% for the southbound direction). The three axle category, in particular the dump and tractor-trailer (without a trailer) type trucks, dominate the "empty" trucks identified in the survey and were, subjectively, considered to form a large part of the trucks (affected by the exclusion actions discussed earlier in this section).

The "empty" 3+ axle truck aspect has been discussed earlier in Section 7.2 (Table3).

8.0 TRIP CHARACTERISTICS AND PATTERNS

In this section of the report, the vehicle types, inter-regional/external travel, origin-destination information and vehicle loading and commodities are examined to establish trip characteristics and patterns.

8.1 Vehicle Types

As indicated earlier, of the total of approximately 3,450 trucks per day observed in the surveys as crossing the Ottawa River, there were 1,550 2 axle (45%), 880 3+ axle (25%) and 1,020 tractor trailer (30%) trucks.

EXHIBIT 11 - DAILY TRUCK VOLUMES BY CLASSIFICATION illustrates the variation in the number of trucks on the two bridges for the three classifications of trucks.

The Macdonald-Cartier bridge carries, by far, the largest number (870) and proportion (34%) of the tractor-trailer classification of truck. The 2 axle truck dominates the composition (60%) on the Chaudière bridge.
EXHIBIT 12 - CUMULATIVE TRUCK TRAFFIC illustrates the profile of the truck travel, for all trucks (by each classification) crossing the Ottawa River, over the course of the day, commencing with the 06:00 time point. By 21:00, 95% of the 3+ axle trucks, 93% of the 2 axle trucks and 80% of the tractor trailer crossings of the Ottawa River have occurred.
In **TABLE 5 -TRUCK TRAVEL COMPOSITION AND TRIP DISTANCE**, an analysis of travel, by truck classification, is provided. Data in the table indicate that the composition of the trucks on the network, for trucks crossing the Ottawa River, is attributable to 2 axle trucks to the extent of 45%, to 3+ axle trucks to the extent of 25% and to tractor trailer trucks to the extent of 30%. The tractor trailer trucks (which represent only 30% of the total trucks have the longest trip lengths with 50% of the total trip distance compared to 3+ axle trucks with 20% of the total trip distance and 2 axle trucks with 30% of the total trip distance.

<table>
<thead>
<tr>
<th>TRUCK CLASSIFICATION</th>
<th>TRUCK TRIPS (1)</th>
<th>TRIP DISTANCE (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 AXLE</td>
<td>45%</td>
<td>30%</td>
</tr>
<tr>
<td>3+ AXLE</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>TRACTOR TRAILER</td>
<td>30%</td>
<td>50%</td>
</tr>
</tbody>
</table>

(1) As determined from the classification counts  
(2) As determined by assigning truck trips to the road system

### 8.2 Trip Tables

Origin-destination trip tables, based on the "district" system, were prepared solely for the purposes of the analysis presented in this report in order to test the sufficiency of the base data in the context of the "district" system described earlier. The results of this application are discussed in this section of the report. The objective of the analysis is for the foregoing purpose only. The application of the data for any subsequent transportation planning activity and/or project can be undertaken with a much finer level of detail, particularly in terms of the zone and "district" system which can be applied. The determination in this regard will be the responsibility of the agency/firm/person undertaking the activity.

### 8.3 Travel Patterns

In approximate terms, there was a total of 3,450 trucks per day in 2000, of which 2,580 used the Macdonald-Cartier bridge - 1,290 northbound and 1,290 southbound - and 870 used the Chaudière bridge - 460 northbound and 410 southbound.
Three trip types are identified:

- a "local" trip which is also called an "internal/internal" trip which has both an origin and a destination within the "National Capital area". A trip from Hull to the west end of Ottawa would be a "local" trip;

- a "through" trip which is also called an "external/external" trip which has both an origin and a destination outside the "National Capital area". A trip from Montreal to Maniwaki which crosses the Ottawa River would be a "through" trip;

- an "inter-regional" trip which is also called either an "internal/external" or an "external/internal" trip which, in the case of an "internal/external" trip, has an origin within the "National Capital area" and a destination outside the "area" ("internal/external") and, in the case of an "external/internal" trip has an origin outside the "National Capital area" and a destination within the National Capital area ("external/internal"). A trip from Gatineau to Montreal (crossing the Ottawa River) would be an "internal/external" trip and a trip from Kingston to Gatineau would be an "external/internal" trip with both trips classed as an "inter-regional" trip;

An overview of the trip characteristics reveals that 2,300 (67%) of the trucks per day made "local" trips (an origin and destination generally within the National Capital area), 975 (28%) of the trucks made "inter-regional" trips (either an origin or a destination outside the National Capital area), while 175 (5%) of the trucks made a "through" trip (an origin and destination outside the National Capital area). The tabulations of the trips for each bridge separately by direction and by truck classification are provided in Appendix I9.

EXHIBIT 13 - DAILY TRUCK COMPOSITION BY CLASSIFICATION - MACDONALD-CARTIER BRIDGE and EXHIBIT 14 - DAILY TRUCK COMPOSITION BY CLASSIFICATION - CHAUDIÈRE BRIDGE illustrate the variation in the trip patterns of trucks on each of the two bridges for the three classifications of trucks.

The key characteristics identified are:

- 60% of the truck traffic on the Macdonald-Cartier bridge are "local" trips (i.e. 40% of the trips have at least one end outside the limits of the National Capital area) while the trucks on the Chaudière bridge are predominantly (87%) "local" trips (internal/internal);

- tractor trailer trucks are dominant on both the Macdonald-Cartier bridge and the Chaudière bridge in the "through" trip type as well as, but in a less prominent way, in the "inter-regional" trip type indicating the fact that the tractor trailer is used for the longer trips;

---

9 Appendix I – Trip Characteristics
Interprovincial Roadside Truck Survey
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the two axle truck is the most prominent classification for "local" trips, particularly on the Chaudière bridge.
EXHIBIT 15 - TRIP ITINERARIES provides the trip end (destination) facility for, in one case on the left of the exhibit, the trips ending in Ontario and in the other case on the right of the exhibit, the trips ending in Québec. With the exception of the imbalance in the retail trip ends (10% ending in Ontario and 24% ending in Québec) and the truck/rail terminal trip ends (23% ending in Ontario and 14% ending in Québec), the end point of trips is, more or less, in an equilibrium condition.

8.4 Origin-Destination Patterns

The most relevant relationships from a transportation planning perspective are the vehicle size and the origin/destination information for the various time periods. Using this information a database was prepared which is as valid and useful as possible and can be applied at the traffic zone system level (258 zones).

As discussed earlier, a 10 district system (an aggregate of the 258 zone system) has been established to present origin/destination information in as clear a format as possible. In this context, origins/destinations beyond the National Capital area have been included in the adjacent district. For example, the “Hull” District includes origin/destinations from a large area extending northerly along Highway 5 and likewise “Ottawa East” includes origin/destinations for a large portion of eastern Ontario as well as areas of Québec east of the Québec-Ontario border (e.g. Montreal).

As an overview of the origins and destinations of all trucks, EXHIBIT 16 - DISTRIBUTION OF ORIGINS/DESTINATIONS BY CLASSIFICATION illustrates the distribution, by "district", of all of the origins/destinations recorded in the survey. There is a reasonably balanced distribution, ranging from a low of 400 (Ottawa Centre and IGB West) to a high of 1360 (Hull) origins/destinations, based on the "district" system which has been applied in the study.
The key characteristics as portrayed on the exhibit are:

- the dominance of the Hull District as an attractor/generator of truck trips (1,360 Origins and Destinations);
- the distribution of generated and attracted trips to/from the nine remaining "districts" varies from 400 to 930 truck trips;
- the variability of the truck classifications from “district to district” is evident; although the two eastern "districts" one on each side of the Ottawa River, which also include origins and destinations outside the National Capital area (e.g. Montreal), have a large proportion of tractor trailer trucks.

Additional data and information are presented, graphically, in Appendix J for the northbound and southbound trips individually.

The concentration of the origins and destinations for individual traffic zones is portrayed in EXHIBIT 17. As would be expected truck trip ends (at least one) are
focussed in lands used for industrial purposes - notably in the Industrial Avenue area, in business parks in Ottawa and in the industrial areas of the former cities of Aylmer, Hull and Gatineau.

Thirteen of the 220 urban traffic zones account for approximately 40% of all truck trip ends and a further twenty urban traffic zones account for a further 20% of all truck trip ends.

The data are presented, in tabular form, in Appendix K\(^\text{11}\).

\[\text{EXHIBIT 17 DAILY CONCENTRATION OF TRUCK TRIP ORIGINS AND DESTINATIONS}\]

Daily Origin-Destination desire lines for all trucks as well as for each truck type are presented in the following four, four-panel exhibits:

- **EXHIBIT 18 - DAILY ORIGIN-DESTINATION DESIRE LINES, ALL TRUCK TRIPS (AUTUMN 2000).**

- **EXHIBIT 19 - DAILY ORIGIN-DESTINATION DESIRE LINES, 2 AXLE TRUCK TRIPS (AUTUMN 2000).**

\(^{11}\) Appendix K – Concentration of Truck Trip Ends

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On each of these four-panel exhibits, each panel illustrates the desire lines (daily) for trucks to and from each of the four “districts” on the north side of the Ottawa River from and to each of the six “districts” on the south side of the Ottawa River in the autumn of 2000. The information is also provided, numerically, in Appendix L\textsuperscript{12}.

The “all trucks” trip patterns (Exhibit 18) highlight the role of Hull as a major generator/attractor of truck trips when compared with Aylmer, Gatineau West and Gatineau East. The exhibit also presents trip interchanges with each of six districts on the Ottawa side of the Ottawa River.

Two axle truck patterns (Exhibit 19) are similar to the patterns of “all trucks” with downtown Hull again dominating the generation and attraction of trips. East Gatineau trips have an orientation to the eastern “districts” in Ottawa.

Three axle trucks (Exhibit 20) seem to have an “affinity” for the corresponding “districts” on the opposite side of the river. That is, west “districts” on the north side of the Ottawa River attract trips to/from west “districts” on the south side of the Ottawa River. Similarly, east “districts” on the north side attract trips to/from east “districts” on the south side of the Ottawa River.

For tractor trailers (Exhibit 21), Hull again has the largest number of trips with strong interchanges with Ottawa East and Ottawa West. Gatineau East and, to a slightly less extent, Aylmer, are also prominent with strong interchanges with Ottawa East, Ottawa West and Ottawa South.

The Ottawa Central “district” serves as a destination for the fewest number of tractor trailer trips.

More detailed comments are provided in Appendix M\textsuperscript{13}.

\textsuperscript{12} Appendix L – Tabulations of Trip Origins-Destinations by Truck Classification
\textsuperscript{13} Appendix M - Detailed Comments on Trip Origins and Destinations

\textit{Interprovincial Roadside Truck Survey REPORT}
EXHIBIT 18
ORIGIN-DESTINATION DESIRED LINES
ALL TRUCK TRIPS (AUTUMN 2000)
EXHIBIT 19
ORIGIN-DESTINATION DESIRE LINES
2 AXLE TRUCK TRIPS (AUTUMN 2000)

LEGEND:
33 Number of truck trips and direction
265 Number of O-D’s for District
EXHIBIT 20
ORIGIN-DESTINATION DESIRE LINES
3+ AXLE TRUCK TRIPS (AUTUMN 2000)

LEGEND:

26  Number of truck trips and direction
120  Number of O-D’s for District
EXHIBIT 21
ORIGIN-DESTINATION DESIRE LINES
TRACTOR TRAILER TRIPS (AUTUMN 2000)

LEGEND:

65 Number of truck trips and direction

323 Number of O-D's for District
8.5 Vehicle Loading and Commodities

The survey reported that 2,075 trucks were carrying goods while 1,375 trucks were empty for a total of 3,450 trucks per day.

Of those drivers responding to the type of commodity carried, 185 different commodities were identified. The commodities were grouped into eight categories. A complete listing of the commodities and the group with which the commodity is categorized is provided in Appendix N\textsuperscript{14}.

A graphical and numerical representation of the frequency with which a particular commodity was identified as having been carried is provided, subdivided into the three truck classifications, in EXHIBIT 22 – GOODS CARRIED PER DAY.

Also indicated on Exhibit 22 are the distributions of the truck classification/commodity by time of travel [day (07:00 to 19:00) and night (19:00 to 07:00)].

The five most frequently reported commodities as illustrated in Exhibit 22 for all trucks are:

- construction materials (475 trips)
- food and beverage (415 trips)
- general merchandise (360 trips)
- paper and paper products (310 trips)
- wood and wood products (195 trips)

Origin-destination trip tables have been prepared for those commodities for which it was deemed likely to provide some defined pattern of desire lines - construction materials, general merchandise, paper/paper products and wood/wood products.

The exclusion of the "food and beverage" category was based on the expected widely dispersed trip patterns associated with this category. The purpose here is to highlight significant differences among the trip patterns associated with the major commodity groups and is not intended to influence the perception of anyone who will conduct a more thorough analysis of the data.

The key characteristics for individual commodities are as follows:

- for construction materials, the dominance of the Aylmer to Ottawa Central trip pattern;

\textsuperscript{14} Appendix N – Categories of Commodities

Interprovincial Roadside Truck Survey

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- for general merchandise, the expected widely dispersed trip patterns;
- for paper/paper products, the dominant interchange of trips between Hull and Ottawa (both East and West) and between Gatineau East and Ottawa South;
- for wood/wood products, the dominance of the Aylmer and Gatineau West trips to Ottawa South.

Additional information on commodity patterns is presented in Appendix O\textsuperscript{15}.  

EXHIBIT 23 -DAILY COMMODITY FLOW - MACDONALD-CARTIER BRIDGE and EXHIBIT 24 -DAILY COMMODITY FLOW - CHAUDIÈRE BRIDGE illustrates commodity flow for each bridge, by the three truck classifications and by the type of commodity carried (including "empty" trucks). Of particular interest is:

- the proportion of tractor trailers in the truck stream on the Macdonald-Cartier Bridge (34%) compared to the Chaudière Bridge (17%);
- the approximately equal proportions of 3+ axle trucks in the truck stream on each of the Macdonald-Cartier Bridge and Chaudière Bridge;
- the proportion of trucks carrying petroleum/chemical products hauled by 3+ axle trucks is 13% and by tractor trailers is 11% on the Chaudière Bridge;
- the proportion of the tractor trailer trucks hauling paper products is 19% on the Macdonald-Cartier and 17% on the Chaudière Bridge;
- the proportion of tractor trailer trucks carrying wood products on the Macdonald-Cartier Bridge is 12%;
- the proportion of the empty trucks, notably the 3+ axle trucks is 64% on the Macdonald-Cartier and 54% on the Chaudière Bridge, as discussed in Section 7.2.

\textsuperscript{15} Appendix O – Trip Origins and Destinations for Specific Commodities and Detailed Comments

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9.0 SUMMARY

Information in this report is presented at the most aggregate level with the purpose of developing a good understanding of the interprovincial trip patterns, origins, destinations and characteristics of trucks in Canada’s Capital Region. This report is not intended to deal with specific interprovincial transportation issues. Detailed analysis of the comprehensive data base would be necessary to assess the impact of new or improved infrastructure on interprovincial truck traffic, and would be a prerequisite for reaching any meaningful conclusions regarding future interprovincial transport needs.

The 1999 / 2000 Interprovincial roadside truck survey provides:

- An effective database of high quality, strong and meaningful information for application in future transportation planning activities;
- The basis for a more thorough understanding of interprovincial truck movements;
- An efficient means of evaluating costs and benefits in assessing alternative solutions to interprovincial truck travel issues;
- A thorough understanding of the interprovincial movement patterns, origins and destinations, and characteristics of heavy trucks in the National Capital Region.
10.0 LIST OF APPENDICES

The 1999/2000 Interprovincial Roadside Truck Survey Technical Appendices have been bound separately and contain the following:

Appendix A  Survey Database Fields
Appendix B  Heavy Truck Classification System
Appendix C  Summary of Historical Ottawa River Crossing Truck Traffic Volumes
Appendix D  Time Period Relationships
Appendix E  Traffic Zones Comprising the Districts
Appendix F  “District” Comparison of Trucks by Number
Appendix G  “District” Comparison of Trucks by Percent
Appendix H  Survey Expansion Factors
Appendix I  Trip Characteristics
Appendix J  Origin and Destination of Truck Trips by Direction
Appendix K  Concentration of Truck Trip Ends
Appendix L  Tabulations of Trip Origins-Destinations by Truck Classification
Appendix M  Detailed Comments on Trip Origins and Destinations
Appendix N  Categories of Commodities
Appendix O  Trip Origins and Destinations for Specific Commodities and Detailed Comments
1999/2000
INTERPROVINCIAL ROADSIDE TRUCK SURVEY
TECHNICAL APPENDICES

ENQUÊTE ROUTIÈRE INTERPROVINCIALE SUR LE CAMIONNAGE 1999/2000
ANNEXES

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1999/2000
INTERPROVINCIAL ROADSIDE
TRUCK SURVEY

TECHNICAL APPENDICES

Prepared for

TRANS
A Joint Technical Committee on Transportation Systems Planning

By

McLean Transportation Engineering Consultants Ltd

June 2002
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Appendix A: Survey Database Fields
Answer Output Database

Note: This version of the description includes the field and answer changes made in July 1999 when the questionnaire was shortened.

Each record in the answer output database contains the answers collected from one questionnaire. The fields of the database, which is named STUDY.DBF, are explained in the table at the end of this appendix. For each field the table lists the following information.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Field Specification</th>
<th>Type</th>
<th>Length</th>
<th>Decimals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionnaire</td>
<td>A cross-reference between the field and other documents.</td>
<td>A code of format &quot;c.nn&quot; that denotes the question on the 1999 Questionnaire to which the field corresponds, where:</td>
<td>Type of information stored (&quot;N&quot;=numeric; &quot;C&quot;=character; &quot;L&quot;=logic; “D”=Date).</td>
<td>Length of the field (total number of digits or characters (including the &quot;.&quot; used for floating point numbers but excluding the &quot;/&quot; that appears in dates).</td>
</tr>
<tr>
<td></td>
<td>A code of format &quot;aaabbbbbbbb&quot;, where:</td>
<td>A code of format “aaabbbbbbbb”, where:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• “aaa” is the number of the question on the 1999 Questionnaire to which the field corresponds (the same number “c.nn” as discussed above except that the “.” is not included); and</td>
<td>• “aaa” is the number of the question on the 1999 Questionnaire to which the field corresponds (the same number “c.nn” as discussed above except that the “.” is not included); and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• “bbbbbbb” represents 1 or more words that describe the related question and the field contents. The following rules are applied when creating “bbbbbbb”.</td>
<td>• “bbbbbbb” represents 1 or more words that describe the related question and the field contents. The following rules are applied when creating “bbbbbbb”.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• A word is presented in full or as a short form, the short form being:</td>
<td>• A word is presented in full or as a short form, the short form being:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• the first 1 letter;</td>
<td>• the first 1 letter;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• the first 3 letters; or</td>
<td>• the first 3 letters; or</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• the first 6 letters.</td>
<td>• the first 6 letters.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• “S” as the last letter usually means that the field marks the “status” of the contents of another field.</td>
<td>• “S” as the last letter usually means that the field marks the “status” of the contents of another field.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• “D” as the last letter usually means that the field contains a hand-written “description” that has been entered because the predetermined list of answers does not capture the actual answer.</td>
<td>• “D” as the last letter usually means that the field contains a hand-written “description” that has been entered because the predetermined list of answers does not capture the actual answer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• “U” as the last letter usually means that the field records the “units of measurement” that apply to the contents of another field.</td>
<td>• “U” as the last letter usually means that the field records the “units of measurement” that apply to the contents of another field.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Following are notes on various aspects of the table.

**Concerning Field Order**: The order in which the fields are listed in the table matches the order of the questions on the questionnaire to which the fields relate. The software internal fields (fields used by the software that are not related to particular questions) are listed at the beginning of the table.

**Concerning Answer Codes**: There are several codes used in answers that are reserved for specific situations (to the extent possible). These are listed below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Meaning of Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>Other (the answer is not one of the choices specifically identified by the question).</td>
</tr>
<tr>
<td>96</td>
<td>X Not Applicable (the question was not asked because it was not applicable).</td>
</tr>
<tr>
<td>97</td>
<td>T Terminated (driver terminated interview before this question could be asked).</td>
</tr>
<tr>
<td>98</td>
<td>R Refused (driver refused to answer this question).</td>
</tr>
<tr>
<td>99</td>
<td>D Don’t Know (driver/surveyor did not know the answer to the question).</td>
</tr>
</tbody>
</table>

**Concerning the Usability of the Record**: The state of a record is marked by answers stored in 2 fields. These answers are used to identify whether the record contains a valid observation for the NRS.

- **QTYPE** -- This marks whether the record was generated by a “live” questionnaire (actual observation of a truck that is part of the NRS data collection) or by a “practice” questionnaire (completed for training purposes).
- **QSTATUS** -- This marks whether the record was “study usable” (questionnaire completed by answering the necessary questions (specifically the “Confirm Completion” screen was reached)), “abandoned (questionnaire not completed by surveyor’s choice to use “abandonment” button) or “failure” (questionnaire not completed because of computer malfunction).

**Concerning Date and Time Stamp Fields**: Certain fields contain dates and times that are entered automatically by the QS using values from the handheld computer’s internal clock. Values are entered into these fields only during the original entry of answers session with the...
questionnaire. During subsequent editing of answers sessions with the questionnaire the date and time fields are not changed by the QS and can not be changed by the surveyor, with the exception of the A05QSDATE, A06HOUR, and A06MIN field values. The date and time stamp fields are described below.

- **A05QSDATE, A06HOUR, A06MIN** -- These contain the date/time at which the questionnaire was started. Specifically, the date/time at which the QS reached the first screen of the Scope section of the questionnaire (the screen that asks if the truck is a cargo type, etc.). The purpose of this date/time is to mark when the truck was observed. The values are automatically entered by the QS, but the values can be edited by the surveyor during the original entry of answers session or during subsequent editing of answers sessions.

- **PA05QSDATE, PA06HOUR, PA06MIN** -- These permanently contain the first values that were automatically entered by the QS to A05QSDATE, A06HOUR and A06MIN.

- **QEDATE, QEHOUR, QEMINUTE** -- These contain the date/time at which the original entry of answers session ended. Specifically, the date/time at which the QS passed the “Confirm Completion” screen.

- **ISTDATE, ISTHOUR, ISTMINUTE** -- These contain the date/time at which the driver interview started. Specifically, the date/time at which the QS reached the first screen of the Interview Start section of the questionnaire (the screen that asks for the driver's participation/refusal).

- **IENDDATE, IENDHOUR, IENDMINUTE** -- These contain the date/time at which the driver interview ended. Specifically, the date/time at which the QS exits the driver interview sections of the survey, by the surveyor either (1) pressing the *End Survey* button option on any of the screens or (2) pressing the *Next Screen* button after completing the last screen (the screen that asks about the driver's recent training).

**Concerning Geographic Coordinates Format**

- **Longitude** -- Longitude is expressed in decimal degrees. The values range from -180 to +180. A positive value denotes a location west of the prime meridian. A negative value denotes a location east of the prime meridian.

- **Latitude** -- Latitude is expressed in decimal degrees. The values range from -90 to +90. A positive value denotes a location in the northern hemisphere. A negative value denotes a location in the southern hemisphere.

**Concerning Out-of-Scope Trucks**: Trucks in the scope of the NRS are "heavy cargo trucks", which are defined as trucks:

- of a type normally used to move cargo from one point to another point;
- that meets the definition of *commercial vehicle* under the National Safety Code (meaning a truck, tractor or combination thereof with a registered gross vehicle weight greater than 4,500 kilograms).
Concerning the size of a heavy truck, the following two practical definitions will be used.

- To facilitate visual identification, heavy trucks will consist of *trucks that have 6 or more tires*.
- To facilitate identification by automatic vehicle classifier equipment that use vehicle length as the basis for differentiating between sizes of vehicle, heavy trucks will consist of *trucks that are longer than 20 feet*.

Therefore, trucks are out of the scope of the NRS for the following reasons.

- Light trucks of 4,500 kilograms or less, which is defined as any straight truck with 4 tires (with or without a trailer).
- Non-cargo type trucks, which include:
  - mobile machines (any straight truck without a trailer that has a permanently attached machine (i.e., the truck exists to move the machine around) -- examples include:
    - crane
    - drill rig
    - seismic rig
    - boom/cherry picker/ladder
    - curb/road/sidewalk cutter
    - concrete pump
    - rock crusher
    - carnival ride
  - emergency truck -- examples include:
    - fire truck
    - ambulance
    - police vehicle
  - service truck -- examples include
    - hydro truck
    - road painter
    - snow plow
    - road sweeper
  - a tow truck (with or without vehicle) that moves a vehicle by means of a sling/hook mounted at the back (i.e., some of the vehicle's wheels are on the road)

But, if any of the above listed trucks has a trailer attached that can be used to carry cargo, then the truck is a cargo truck for the purposes of the NRS. For example, a hydro service truck that is pulling a trailer loaded with telephone poles is a cargo truck.

Note that cargo truck includes:

- any tractor pulling a trailer regardless of the trailer (for example the trailer could be a permanently attached machine);
- a concrete mixer; and
- a sewer cleaning truck if it has a holding tank.
Concerning Definition of a Trip -- Refer to Reference 6.

Concerning Border Crossings -- Refer to Reference 6.
## Answer Output Database Fields

<table>
<thead>
<tr>
<th>Reference</th>
<th>Field</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questi-</td>
<td>Name</td>
<td></td>
<td>Z. <strong>Software Internal Fields</strong> (not related to questions on the Study Questionnaire)</td>
</tr>
<tr>
<td>onnaire</td>
<td></td>
<td></td>
<td>QID</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C 8 0 N</td>
<td>Questionnaire IDentifier -- Uniquely identifies one questionnaire among all questionnaires generated on all computers used in the NRS.</td>
</tr>
<tr>
<td></td>
<td>QSTATUS</td>
<td>C 1 0 N</td>
<td>Questionnaire STATUS -- Marks whether the “necessary” questions were completed in the original entry of answers session.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S = Study usable (completed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A = Abandoned (not completed -- “abandon” button used)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>F = Failure (did not pass “Confirm Completion” screen)</td>
</tr>
<tr>
<td></td>
<td>QTYPE</td>
<td>C 1 0 N</td>
<td>Questionnaire Type -- Marks why the questionnaire was entered.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = Live (actual observation of a truck for the NRS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P = Practice (training)</td>
</tr>
<tr>
<td></td>
<td>DISTATUS</td>
<td>C 1 0 N</td>
<td>Driver Interview STATUS -- Marks whether all the driver interview questions were asked (conversely whether the driver terminated the interview).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A = All questions asked</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I = Incomplete interview (driver terminated before all questions asked)</td>
</tr>
<tr>
<td></td>
<td>DILAST</td>
<td>C 3 0 N</td>
<td>Driver Interview LAST questions completed -- Identifies the last screen of questions completed before the driver terminated the interview.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>blank = not applicable (driver interview not terminated)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ccc = section letter and tab number for the last screen with all answers completed (e.g., “F02”)</td>
</tr>
<tr>
<td></td>
<td>PA01JUR</td>
<td>C 4 0 N</td>
<td>Permanent copy of the original value of A01JUR</td>
</tr>
<tr>
<td></td>
<td>PA02SITE</td>
<td>C 8 0 N</td>
<td>Permanent copy of the original value of A02SITE</td>
</tr>
<tr>
<td></td>
<td>PA02DCSSEL</td>
<td>C 75 0 N</td>
<td>Permanent copy of the original value of A02DCSSEL</td>
</tr>
<tr>
<td></td>
<td>PA04DIRECT</td>
<td>C 1 0 N</td>
<td>Permanent copy of the original value of A04DIRECT</td>
</tr>
<tr>
<td></td>
<td>PA05QSDATE</td>
<td>D 8 0 N</td>
<td>Permanent copy of the original value of A05QSDATE</td>
</tr>
<tr>
<td></td>
<td>PA06QSHOUR</td>
<td>N 2 0 N</td>
<td>Permanent copy of the original value of A06QSHOUR</td>
</tr>
<tr>
<td></td>
<td>PA06QSMIN</td>
<td>N 2 0 N</td>
<td>Permanent copy of the original value of A06QSMIN</td>
</tr>
<tr>
<td></td>
<td>QEDATE</td>
<td>D 8 0 N</td>
<td>Questionnaire End DATE -- When questionnaire completed. Format: YYYYMDD. <em>See description of date and time fields that precedes this table.</em></td>
</tr>
<tr>
<td></td>
<td>QEHOUR</td>
<td>N 2 0 N</td>
<td>Questionnaire End HOUR -- When questionnaire completed. Format: 24 hour clock. <em>See description of date and time fields that precedes this table.</em></td>
</tr>
<tr>
<td></td>
<td>QEMINUTE</td>
<td>N 2 0 N</td>
<td>Questionnaire End MINUTE -- When questionnaire completed. <em>See description of date and time fields that precedes this table.</em></td>
</tr>
</tbody>
</table>
## Answer Output Database Fields

<table>
<thead>
<tr>
<th>Reference</th>
<th>Field</th>
<th>Name</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionnaire</td>
<td></td>
<td>ISTDATE</td>
<td>D 8 0 N</td>
<td>Interview START DATE - When driver interview section of questionnaire started. Format: YYYYMMDD. See description of date and time fields that precedes this table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISTHOUR</td>
<td>N 2 0 N</td>
<td>Interview START HOUR - When driver interview section of questionnaire started. Format: 24 hour clock. See description of date and time fields that precedes this table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISTMINUTE</td>
<td>N 2 0 N</td>
<td>Interview START MINUTE - When driver interview section of questionnaire started. See description of date and time fields that precedes this table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IENDDATE</td>
<td>D 8 0 N</td>
<td>Interview END DATE - When driver interview sections of questionnaire completed. Format: YYYYMMDD. See description of date and time fields that precedes this table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IENDHOUR</td>
<td>N 2 0 N</td>
<td>Interview END HOUR - When driver interview sections of questionnaire completed. Format: 24 hour clock. See description of date and time fields that precedes this table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IENDMINUTE</td>
<td>N 2 0 N</td>
<td>Interview END MINUTE - When driver interview sections of questionnaire completed. See description of date and time fields that precedes this table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XOBSERV</td>
<td>L 1 0 N</td>
<td>Questionnaire Observations Section: F (or 0) = not started T (or 1) = partially or completely filled in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XSCOPE</td>
<td>L 1 0 N</td>
<td>Scope Section Results -- Whether truck is in-scope. F (or 0) = not-in-scope T (or 1) = in-scope</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XWEIGHTS</td>
<td>L 1 0 N</td>
<td>Questionnaire Weights and Measures Section: Same answers as for Questionnaire Observations Section</td>
</tr>
</tbody>
</table>

### A. Identification Section

| A.01 | A01JUR | C 4 0 N | JURisdiction -- Province/territory in which DCS is located. The codes are listed in Appendix H. |
| A.02 | A02SITE | C 8 0 N | SITE ID -- Unique identifier assigned to the DCS. The codes are listed in Appendix H. Note: Identifier is filled automatically by the computer when DCSSEL is selected from the pick-list. |
| A.02 | A02DCSSEL | C 75 0 N | DCS SELECTor -- Specification of the DCS that is used for selection (the pick-list entry). Format: DCS name + traffic direction description. |
| A.02 | A02DCSLON | N 11 6 N | DCS LONGitude -- Longitude of the DCS. Format defined in description of geographic coordinates that precedes this table. Note: Longitude is filled automatically by the computer when DCSSEL is selected from the pick-list. |
### Answer Output Database Fields

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Name</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.02</td>
<td>A02DCSLAT</td>
<td>N 11 6 N DCS LATitude -- Latitude of the DCS. <em>Defined in description of geographic coordinates that precedes this table.</em>&lt;br&gt;&lt;br&gt;<em>Note:</em> Latitude is filled automatically by the computer when DCSSEL is selected from the pick-list.</td>
<td></td>
</tr>
<tr>
<td>A.03</td>
<td>A03SURVEY</td>
<td>C 3 0 N SURVEYor - ID assigned to the surveyor filling-in the questionnaire. Unique at the DCS.</td>
<td></td>
</tr>
<tr>
<td>A.04</td>
<td>A04DIRECT</td>
<td>C 1 0 N DIRECTION -- Direction of traffic being interviewed at DCS.&lt;br&gt;N = Northbound&lt;br&gt;E = Eastbound&lt;br&gt;S = Southbound&lt;br&gt;W = Westbound</td>
<td></td>
</tr>
<tr>
<td>A.05</td>
<td>A05QSDATE</td>
<td>D 8 0 N Questionnaire Start DATE -- When questionnaire started. <em>Format: YYYYMMDD. See description of date and time fields that precedes this table.</em></td>
<td></td>
</tr>
<tr>
<td>A.06</td>
<td>A06QSHOUR</td>
<td>N 2 0 N Questionnaire Start HOUR -- When questionnaire started. <em>Format: 24 hour clock. See description of date and time fields that precedes this table.</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A06QSMIN</td>
<td>N 2 0 N Questionnaire Start MINute -- When questionnaire started. <em>See description of date and time fields that precedes this table.</em></td>
<td></td>
</tr>
</tbody>
</table>

### B. Scope Section

<table>
<thead>
<tr>
<th>Reference</th>
<th>Name</th>
<th>Type; Length; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.01</td>
<td>B01CARTYP</td>
<td>C 1 0 N CARgo TYPe truck -- Whether the type of truck or type of truck body is capable of carrying cargo or usually used for carrying cargo.&lt;br&gt;Y = Yes&lt;br&gt;N = No&lt;br&gt;<em>Note:</em> “N” marks an out-of-scope truck. &lt;br&gt;<em>Note:</em> <em>See description of out-of-scope trucks that precedes this table.</em></td>
<td></td>
</tr>
<tr>
<td>B.02</td>
<td>B02OOSTYP</td>
<td>C 20 0 N Out-Of-Scope truck TYPe&lt;br&gt;blank = not applicable (truck is cargo type)&lt;br&gt;something = description of the non-cargo type truck&lt;br&gt;<em>Note:</em> <em>See description of out-of-scope trucks that precedes this table.</em></td>
<td></td>
</tr>
<tr>
<td>B.03</td>
<td>B03STR4T</td>
<td>C 1 0 N STRaight truck with 4 Tires -- Whether truck is a straight truck with 4 tires (with or without a trailer).&lt;br&gt;Y = Yes&lt;br&gt;N = No&lt;br&gt;<em>Note:</em> “Y” marks an out-of-scope truck.</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Name</td>
<td>Type; Length; Decimals; Index</td>
<td>Information</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
<td>------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>B.04</td>
<td>B04AXLOOS</td>
<td>N 2 0 N</td>
<td>AXLes on Out-Of-Scope truck -- Number of axles on the truck if it is out-of-scope (all axles on the straight truck/tractor and trailers). 2 to 12 = number of axles, 96 = not applicable (truck is in-scope)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.01</td>
<td>C01CONF</td>
<td>N 2 0 N</td>
<td>CONFIGuration of truck -- Type of configuration. 1 = tractor &amp; 1 trailer, 2 = tractor &amp; 2 trailers, 3 = tractor &amp; 3 trailers, 4 = straight truck, 5 = straight truck &amp; trailer, 6 = tractor only, 95 = other. Note: Type “6” applies only if the tractor is “bob tail”. If a tractor is towing/carrying other tractors or if tractor is towing/carrying trucks or if a tractor is carrying a trailer piggyback, then the type is “95”. Note: Type “95” covers: tractor towing/carrying other tractors; tractor towing/carrying a truck; and tractor carrying a trailer piggyback. Note: A jeep/booster used to support heavy loads is treated as part of the trailer.</td>
</tr>
<tr>
<td>C.02</td>
<td>C02CONFD</td>
<td>C 20 0 N</td>
<td>CONFIGuration Description blank = not applicable (truck fits a predefined configuration), something = description of the “other” configuration</td>
</tr>
<tr>
<td>C.03</td>
<td>C03HITCH</td>
<td>C 1 0 N</td>
<td>HITCH -- Type of connection used to join the 1st and 2nd trailer in a truck train (a tractor pulling 2 or 3 trailers). A = &quot;A&quot; train, B = &quot;B&quot; train, C = &quot;C&quot; train, X = not applicable (not truck train)</td>
</tr>
<tr>
<td>C.04</td>
<td>C04CAB</td>
<td>C 1 0 N</td>
<td>CAB style -- Type of the driver cab. C = Conventional (long nose or cab after engine), O = cab-Over-engine</td>
</tr>
</tbody>
</table>
### Reference Field Information

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Name</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
</table>
| C.05          | C05BODY1 | N 2 0 N | BODY #1 style -- Classification of the style or intended freight or intended use of the 1st cargo unit of the truck. The 1st cargo unit is either: a straight truck; the first trailer pulled by a tractor; or a tractor without a trailer. 1 = van -- not refrigerated 2 = van -- refrigerated 3 = container carrier 4 = van -- soft sided 5 = flatbed 6 = stake/rack 7 = float 8 = tanker 9 = hopper 10 = dump 11 = chip 12 = garbage truck 13 = vehicle carrier 14 = animal carrier 15 = none (applies only when the truck consists of a “bob tail” tractor, that is a tractor neither pulling a trailer nor towing/carrying other tractors) 95 = other  
Note: Concerning the assignment of unusual body styles:  
• a flatbed or stake/rack with a mounted loading crane as a “flatbed” or “stake/rack”  
• a deckless frame used to carry logs/polls as a "stake/rack"  
• a glass carrier as "other"  
• a boat carrying frame as "other"  
• a permanently attached machine as "other"  
• a concrete mixer as "other"  
• a sewer cleaner as "other" (a sewer cleaning truck: would be in-scope if it had a holding tank; would be out-of-scope if it was only a pump)  
• a pick-up truck box as "other" |
| C.06          | C06BODY1D | C 20 0 N | BODY #1 style Description  
blank = not applicable (1st cargo unit fits predefined style)  
something = description of “other” style of 1st cargo unit |
<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Name</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
</table>
| C.07         | C07BODY2| N 2 0 N                       | BODY #2 style -- Classification of the style or intended freight or intended use of the 2nd cargo unit of the truck. The 2nd cargo unit is either: the trailer pulled by a straight truck; or the 2nd trailer pulled by a tractor.  
1 = van -- not refrigerated  
2 = van -- refrigerated  
3 = container carrier  
4 = van -- soft sided  
5 = flatbed  
6 = stake/rack  
7 = float  
8 = tanker  
9 = hopper  
10 = dump  
11 = chip  
12 = garbage truck  
13 = vehicle carrier  
14 = animal carrier  
15 = none (no such unit on the truck)  
95 = other  
Note: See note under BODY #1 style. |
| C.08         | C08BODY2D| C 20 0 N                      | BODY #2 style Description  
blank = not applicable (2nd cargo unit fits predefined style or no 2nd cargo unit)  
something = description of “other” style of 2nd cargo unit |
| C.09         | C09BODY3| N 2 0 N                       | BODY #3 style -- Classification of the style or intended freight or intended use of the 3rd cargo unit of the truck. The 3rd cargo unit is the 3rd trailer pulled by a tractor.  
1 = van -- not refrigerated  
2 = van -- refrigerated  
3 = container carrier  
4 = van -- soft sided  
5 = flatbed  
6 = stake/rack  
7 = float  
8 = tanker  
9 = hopper  
10 = dump  
11 = chip  
12 = garbage truck  
13 = vehicle carrier  
14 = animal carrier  
15 = none (no such unit on the truck)  
95 = other  
Note: See note under BODY #1 style. |
<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Name</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.10</td>
<td>C10BODY3D</td>
<td>C 20 0 N</td>
<td>BODY #3 style Description blank = not applicable (3rd cargo unit fits predefined style or no 3rd cargo unit) something = description of “other” style of 3rd cargo unit</td>
</tr>
<tr>
<td>C.11</td>
<td>C11LIGHTS</td>
<td>C 1 0 N</td>
<td>LIGHTS on -- Whether the headlights are on. Y = Yes N = No X = not applicable Note: “Not applicable” because the question was not asked after being eliminated from the questionnaire.</td>
</tr>
<tr>
<td>C.12</td>
<td>C12SLEEP</td>
<td>C 1 0 N</td>
<td>SLEEPer -- Whether the tractor/straight truck has a sleeper (a compartment immediately behind the driver cab that contains a bed). Y = Yes N = No</td>
</tr>
<tr>
<td>C.13</td>
<td>C13DROME</td>
<td>C 1 0 N</td>
<td>DROME -- Whether the tractor has a drome (a box for carrying cargo that is mounded on a tractor in front of the fifth wheel). Y = Yes N = No</td>
</tr>
<tr>
<td>C.14</td>
<td>C14REFLEC</td>
<td>C 1 0 N</td>
<td>REFLECTive markers -- Whether the truck has reflective markers on the back and sites (reflective tape on the edges that increases truck visibility at night). Y = Yes N = No</td>
</tr>
<tr>
<td>C.15</td>
<td>C15UNDER</td>
<td>C 1 0 N</td>
<td>UNDER-ride guard -- Whether the truck has a rear under-ride guard (beam that prevents a car from sliding under the back of the truck). Y = Yes N = No</td>
</tr>
<tr>
<td>C.16</td>
<td>C16DGP1</td>
<td>N 2 0 N</td>
<td>Dangerous Goods Placard #1 -- If there is at least 1 dangerous goods placard or placard holder, what is on/in the 1st placard/placard holder. 1 to 9 = class marked on placard 10 = placard holder is empty. 11 = no such placard or holder. 95 = other class (not 1 through 9) 96 = not applicable 99 = unable to determine class Note: “Not applicable” because the question was not asked after being eliminated from the questionnaire.</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>Field</td>
<td>Information</td>
<td></td>
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<tr>
<td>---------------</td>
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<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| C.17          | C17DGP2 | Dangerous Goods Placard #2 -- If there are at least 2 dangerous goods placards or placard holders, what is on/in the 2\textsuperscript{nd} placard/placard holder.  
1 to 9 = class marked on placard  
10 = placard holder is empty.  
11 = no such placard or holder.  
95 = other class (not 1 through 9)  
96 = not applicable  
99 = unable to determine class  
**Note:** “Not applicable” because the question was not asked after being eliminated from the questionnaire. |
| C.18          | C18DGP3 | Dangerous Goods Placard #3 -- If there are at least 3 dangerous goods placards or placard holders, what is on/in the 3\textsuperscript{rd} placard/placard holder.  
1 to 9 = class marked on placard  
10 = placard holder is empty.  
11 = no such placard or holder.  
95 = other class (not 1 through 9)  
96 = not applicable  
99 = unable to determine class  
**Note:** “Not applicable” because the question was not asked after being eliminated from the questionnaire. |
| C.19          | C19FLPJURS | Front Licence Plate JURisdiction Status -- Whether the identity of the jurisdiction (Canadian province/territory; U.S. state; Mexico) that issued the front licence plate of the straight truck or tractor is available.  
Y = Yes  
N = No (unable to read)  
X = not applicable  
**Note:** “Not applicable” because the question was not asked after being eliminated from the questionnaire. |
| C.19          | C19FLPJUR | Front Licence Plate JURisdiction -- The jurisdiction that issued the front licence plate.  
blank = not available (see status field)  
cccc = jurisdiction code *The codes are listed in Appendix H.*  
**Note:** If a truck has 2 or more places, select according to the following rules.  
• first choice -- a plate issued by the province in which the DCS is located.  
• second choice -- the left most plate (driver side plate) if plates are arranged horizontally, and the top plate if plates are arranged vertically. |
| C.20          | C20FLPNUMS | Front Licence Plate NUMber Status -- Whether the number on the front licence plate is available.  
Y = Yes  
N = No (unable to read)  
X = not applicable  
**Note:** “Not applicable” because the question was not asked after being eliminated from the questionnaire. |
<table>
<thead>
<tr>
<th>Questionnaire</th>
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<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.20</td>
<td>C20FLPNUM</td>
<td>Front Licence Plate Number -- The number on the front licence plate. blank = not available (see status field) ccccccc = number</td>
</tr>
<tr>
<td>C.21</td>
<td>C21RLPJURS</td>
<td>Rear Licence Plate Jurisdiction Status -- Whether the identity of the jurisdiction (Canadian province/territory; U.S. state; Mexico) that issued the rear licence plate on the last trailer of the truck is available. Y = Yes N = No (unable to read) X = not applicable Note: “Not applicable” if no trailer or because the question was not asked after being eliminated from the questionnaire.</td>
</tr>
<tr>
<td>C.21</td>
<td>C21RLPJUR</td>
<td>Rear Licence Plate Jurisdiction -- The jurisdiction that issued the rear licence plate. blank = not available/applicable (see status field) ccccc = jurisdiction code The codes are listed in Appendix H.</td>
</tr>
<tr>
<td>C.22</td>
<td>C22RLPNUMS</td>
<td>Rear Licence Plate Number Status -- Whether the number on the rear licence plate is available. Y = Yes N = No (unable to read) X = not applicable Note: “Not applicable” if no trailer or because the question was not asked after being eliminated from the questionnaire.</td>
</tr>
<tr>
<td>C.22</td>
<td>C22RLPNUM</td>
<td>Rear Licence Plate Number -- The number on the rear licence plate. blank = not available/applicable (see status field) ccccccc = number</td>
</tr>
<tr>
<td>C.23</td>
<td>C23COMNAMS</td>
<td>Company Name Status -- Whether there is a truck company name on the driver door of the straight truck or tractor. Y = Yes N = No X = not applicable Note: “Not applicable” if jurisdiction containing the DCS does not require that the question be asked.</td>
</tr>
<tr>
<td>C.23</td>
<td>C23COMNAM</td>
<td>Company Name -- Truck company name on the driver door. blank = not applicable (see status field) something = company name</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>Name</td>
<td>Type; Length; Decimals; Index</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------</td>
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</tr>
<tr>
<td>C.23</td>
<td>C23COMID</td>
<td>C 10 0 N</td>
</tr>
<tr>
<td>C.24</td>
<td>C24LOCH1</td>
<td>N 2 0 N</td>
</tr>
<tr>
<td>C.24</td>
<td>C24LOCH2</td>
<td>N 2 0 N</td>
</tr>
<tr>
<td>C.24</td>
<td>C24LOCH3</td>
<td>N 2 0 N</td>
</tr>
<tr>
<td>C.25</td>
<td>C25AXLAG1</td>
<td>N 1 0 N</td>
</tr>
<tr>
<td>C.25</td>
<td>C25AXLAG2</td>
<td>N 1 0 N</td>
</tr>
<tr>
<td>C.25</td>
<td>C25AXLAG3</td>
<td>N 2 0 N</td>
</tr>
<tr>
<td>C.25</td>
<td>C25AXLAG4</td>
<td>N 2 0 N</td>
</tr>
<tr>
<td>C.25</td>
<td>C25AXLAG5</td>
<td>N 2 0 N</td>
</tr>
<tr>
<td>C.25</td>
<td>C25AXLAG6</td>
<td>N 2 0 N</td>
</tr>
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</table>
### Answer Output Database Fields

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<tbody>
<tr>
<td>C.25</td>
<td>C25AXLAG7</td>
<td>N 2 0 N</td>
<td>AXLes in Axle Group #7 --Same answers as for AXLes in Axle Group #3.</td>
</tr>
<tr>
<td>C.25</td>
<td>C25AXLAG8</td>
<td>N 2 0 N</td>
<td>AXLes in Axle Group #8 --Same answers as for AXLes in Axle Group #3.</td>
</tr>
<tr>
<td>C.25</td>
<td>C25AXLALL</td>
<td>N 2 0 N</td>
<td>AXLes ALL -- Total number of axles on the truck.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,2,...,12 = Number of axles</td>
</tr>
<tr>
<td>C.26</td>
<td>C26UPAG1</td>
<td>N 1 0 N</td>
<td>UP axles in Axle Group #1 -- Number of axles that are lifted (raised so they are not in contact with the ground) in the 1st group of axles on the truck.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 = no axles are lifted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,2,... = number of axles lifted</td>
</tr>
<tr>
<td>C.26</td>
<td>C26UPAG2</td>
<td>N 1 0 N</td>
<td>UP axles in Axle Group #2 -- Same answers as for UP axles in Axle Group #1.</td>
</tr>
<tr>
<td>C.26</td>
<td>C26UPAG3</td>
<td>N 2 0 N</td>
<td>UP axles in Axle Group #3 -- Number of axles that are lifted in the 3rd group of axles on the truck.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 = no axles are lifted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,2,... = number of axles lifted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Note</strong>: To decide whether “0” means “no axles lifted” or means “not applicable”, check C25AXLAG3 to determine if the 3rd axle group exists.</td>
</tr>
<tr>
<td>C.26</td>
<td>C26UPAG4</td>
<td>N 2 0 N</td>
<td>UP axles in Axle Group #4 -- Same answers as for UP axles in Axle Group #3.</td>
</tr>
<tr>
<td>C.26</td>
<td>C26UPAG5</td>
<td>N 2 0 N</td>
<td>UP axles in Axle Group #5 -- Same answers as for UP axles in Axle Group #3.</td>
</tr>
<tr>
<td>C.26</td>
<td>C26UPAG6</td>
<td>N 2 0 N</td>
<td>UP axles in Axle Group #6 -- Same answers as for UP axles in Axle Group #3.</td>
</tr>
<tr>
<td>C.26</td>
<td>C26UPAG7</td>
<td>N 2 0 N</td>
<td>UP axles in Axle Group #7 -- Same answers as for UP axles in Axle Group #3.</td>
</tr>
<tr>
<td>C.26</td>
<td>C26UPAG8</td>
<td>N 2 0 N</td>
<td>UP axles in Axle Group #8 -- Same answers as for UP axles in Axle Group #3.</td>
</tr>
<tr>
<td>C.26</td>
<td>C26UPALL</td>
<td>N 1 0 N</td>
<td>UP axles ALL -- Total number of axles that are lifted on the truck.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 = no axles are lifted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,2,...,9 = number of axles lifted</td>
</tr>
</tbody>
</table>

### D. Interview Start Section

<table>
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<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.01</td>
<td>D01AGREE</td>
<td>C 1 0 N</td>
<td>AGREEs to interview -- Whether driver agrees to participate in an interview.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Y = Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N = No</td>
</tr>
<tr>
<td>D.02</td>
<td>D02REFUSE</td>
<td>C 40 0 N</td>
<td>REFUSE -- Reason given by driver for refusing to be interviewed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>blank = not applicable (driver agreed to interview)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>something = reason for refusing</td>
</tr>
</tbody>
</table>
### E. Interview Part 1 - Vehicle Profile Section

<table>
<thead>
<tr>
<th>Reference</th>
<th>Name</th>
<th>Type</th>
<th>Length</th>
<th>Decimals</th>
<th>Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.01</td>
<td>E01TBS</td>
<td>C</td>
<td>1</td>
<td>0</td>
<td>N</td>
<td>Truck Base Status -- Whether an answer is available. Y = Yes (driver identified a base) N = No base (driver’s answer) R = driver Refused to answer T = driver Terminated interview before question asked <strong>Note</strong>: The base is the place in Canada, U.S. or Mexico where the straight truck or tractor is usually garaged or serviced, or the operating centre to which it is assigned. Some trucks may not be based at a specific place.</td>
</tr>
<tr>
<td>E.01</td>
<td>E01TBJUR</td>
<td>C</td>
<td>4</td>
<td>0</td>
<td>N</td>
<td>Truck Base JURisdiction -- The jurisdiction in which the truck base is located. blank = not applicable (see status field) something = jurisdiction code <em>The codes are listed in Appendix H.</em></td>
</tr>
<tr>
<td>E.01</td>
<td>E01TBPLA</td>
<td>C</td>
<td>50</td>
<td>0</td>
<td>N</td>
<td>Truck Base PLAce -- The name of the place in which the truck base is located. blank = not applicable (see status field) something = place name</td>
</tr>
<tr>
<td>E.01</td>
<td>E01TBID</td>
<td>C</td>
<td>11</td>
<td>0</td>
<td>N</td>
<td>Truck Base ID -- Unique identifier assigned to the record containing the place name. blank = not applicable (see status field) something = identifier <strong>Note</strong>: Identifier is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
</tr>
<tr>
<td>E.01</td>
<td>E01TBLON</td>
<td>N</td>
<td>11</td>
<td>6</td>
<td>N</td>
<td>Truck Base LONgitude -- Longitude of the place. 0 = not applicable (see status field) something = longitude <em>Format defined in description of geographic coordinates that precedes this table.</em> <strong>Note</strong>: Longitude is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
</tr>
<tr>
<td>E.01</td>
<td>E01TBLAT</td>
<td>N</td>
<td>11</td>
<td>6</td>
<td>N</td>
<td>Truck Base LATitude -- Latitude of the place. 0 = not applicable (see status field) something = latitude <em>Format defined in description of geographic coordinates that precedes this table.</em> <strong>Note</strong>: Latitude is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
</tr>
</tbody>
</table>
# Answer Output Database Fields

<table>
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<th>Questionnaire</th>
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<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.02</td>
<td>E02LIFTS</td>
<td>C 1 0 N</td>
<td>LIFT Status -- Whether the answer is available for the total number of liftable axles on the truck. Y = Yes (driver answered &quot;1 or more&quot;) N = None (driver answered &quot;no lift axles&quot;) D = driver Doesn’t know the answer R = driver Refused to answer T = driver Terminated interview before question asked Note: Liftable axles are counted whether they are currently raised (off the ground) or lowered (on the ground).</td>
</tr>
<tr>
<td>E.02</td>
<td>E02LIFT</td>
<td>N 1 0 N</td>
<td>LIFT -- Total number of liftable axles. 0 = none or not available (see status field) 1,2,... = total number of liftable axles</td>
</tr>
<tr>
<td>E.03</td>
<td>E03LENT1S</td>
<td>C 1 0 N</td>
<td>LENght of Trailer #1 Status -- Whether the answer is available for the length of the 1st trailer. Y = Yes D = driver Refused to answer T = driver Terminated interview before question asked X = not applicable (no such trailer)</td>
</tr>
<tr>
<td>E.03</td>
<td>E03LENT1</td>
<td>N 5 2 N</td>
<td>LENght of Trailer #1 -- Length of the 1st trailer. 0 = not applicable (see status field) something = length Note: Units of measurement are defined in field E06LENTU.</td>
</tr>
<tr>
<td>E.04</td>
<td>E04LENT2S</td>
<td>C 1 0 N</td>
<td>LENght of Trailer #2 Status -- Same answers as for LENght of Trailer #1 Status.</td>
</tr>
<tr>
<td>E.04</td>
<td>E04LENT2</td>
<td>N 5 2 N</td>
<td>LENght of Trailer #2 -- Same answers as for LENght of Trailer #1.</td>
</tr>
<tr>
<td>E.05</td>
<td>E05LENT3S</td>
<td>C 1 0 N</td>
<td>LENght of Trailer #3 Status -- Same answers as for LENght of Trailer #1 Status.</td>
</tr>
<tr>
<td>E.05</td>
<td>E05LENT3</td>
<td>N 5 2 N</td>
<td>LENght of Trailer #3 -- Same answers as for LENght of Trailer #1.</td>
</tr>
<tr>
<td>E.06</td>
<td>E06LENTU</td>
<td>C 1 0 N</td>
<td>LENght of Trailer Units -- Units in which the length of the trailers are measured. F = Feet/inches (digits before the decimal point are feet; digits after the decimal point are inches) M = Metres X = not applicable (no trailers or no measurements) T = driver Terminated interview before question asked</td>
</tr>
<tr>
<td>Reference</td>
<td>Name</td>
<td>Type; Length; Decimals; Index</td>
<td>Information</td>
</tr>
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<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| E.07      | E07LENC1S  | C 1 0 N                       | LENgth of Container #1 Status -- Whether the answer is available for the length of the 1st container carried by the truck.  
Y = Yes  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
**Note:** “Not applicable” if no such container or because the question not asked after being eliminated from the questionnaire.                                                                                      |
| E.07      | E07LENC1   | N 5 2 N                       | LENgth of Container #1 -- Length of the 1st container.  
0 = not applicable (see status field)  
something = length  
**Note:** Units of measurement are defined in field E10LENCU.                                                                                                                                          |
| E.08      | E08LENC2S  | C 1 0 N                       | LENgth of Container #2 Status -- Same answers as for LENgth of Container #1 Status.                                                                                               |
| E.08      | E08LENC2   | N 5 2 N                       | LENgth of Container #2 -- Same answers as for LENgth of Container #1.                                                                                                           |
| E.09      | E09LENC3S  | C 1 0 N                       | LENgth of Container #3 Status -- Same answers as for LENgth of Container #1 Status.                                                                                                                                                                                                 |
| E.09      | E09LENC3   | N 5 2 N                       | LENgth of Container #3 -- Same answers as for LENgth of Container #1.                                                                                                                                                                                                                                                                   |
| E.10      | E10LENCU   | C 1 0 N                       | LENgth of Container Units -- Units in which the length of the containers are measured.  
F = Feet/inches (digits before the decimal point are feet; digits after the decimal point are inches)  
M = Metres  
X = not applicable (no containers or no measurements)  
T = driver Terminated interview before question asked  
**Note:** A tachograph is a mechanical device that records truck speed, engine speed and distance travelled. It operates by drawing thin lines on a circular card, each card covering 24 hours. |
| E.11      | E11TACHOG  | C 1 0 N                       | TACHOGraph -- Whether there is a tachograph on-board the truck.  
Y = Yes  
N = No  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
**Note:** A tachograph is a mechanical device that records truck speed, engine speed and distance travelled. It operates by drawing thin lines on a circular card, each card covering 24 hours. |
<table>
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</tr>
</thead>
</table>
| E.12      | E12LOG   | C 1 0 N                     | electronic drive LOG -- Same answers as for TACHOGRAPH.  
**Note:** An electronic drive log is a device that automatically records the hours of operation of the vehicle in some type of memory. Usually it has a keyboard so the driver can enter events that occur. |
| E.13      | E13COMPUT| C 1 0 N                     | COMPUTer -- Same answers as for TACHOGRAPH.  
**Note:** A computer that is adapted to the environment of the driver cab. It is used to enter information on the events of the day.                                                                                                                                               |
| E.14      | E14TAG   | C 1 0 N                     | electronic vehicle identification TAG -- Same answers as for TACHOGRAPH.  
**Note:** An electronic vehicle identification tag is a magnetically encoded device that can be read by equipment located in the roadway or at the roadside. The tag contains information about the identity of the truck and the load.|
| E.15      | E15SATELL| C 1 0 N                     | SATELLite -- Same answers as for TACHOGRAPH.  
**Note:** Satellite based communications use a transmitter-receiver that is usually curcular in shape, approximately 15 to 30 centimetres in diameter, and located on the roof of the driver cab, often behind the wind deflector. It is used by a carrier to track the location of its truck. If equipped with a keyboard and screen in the cab, the driver can send and receive information. |
| E.16      | E16CELLPH| C 1 0 N                     | CELLular telePHone -- Same answers as for TACHOGRAPH.  
**Note:** This covers standard cellular telephones. There may or may not be an antenna mounted on the truck.                                                                                                                                                                  |
| E.17      | E17PAGER  | C 1 0 N                     | PAGER -- Same answers as for TACHOGRAPH.  
**Note:** This covers standard pagers                                                                                                                                                                                                                                          |
| E.18      | E18RADIO  | C 1 0 N                     | company RADIO -- Same answers as for TACHOGRAPH.  
**Note:** Company radio means a two-way radio that operates on a private frequency dedicated to the company. It is used for voice messages between the driver and dispatcher.                                                                                                                                 |
| E.19      | E19MASTER | C 1 0 N                     | tripMASTER -- Same answers as for TACHOGRAPH.  
**Note:** A TripMaster provides the driver with information about the best route for a trip.                                                                                                                                                                                  |
### Answer Output Database Fields

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<th>Information</th>
</tr>
</thead>
</table>
| E.20          | E20OTHER| C    | 1      | 0        | N     | OTHER electronic equipment Whether there is other electronic equipment on-board the truck.  
Y = Yes  
N = No  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
**Note:** “Not applicable” because the question was not asked after being eliminated from the questionnaire.  
**Note:** Other electronic equipment covers communications, information or recording equipment except electronics equipment that has to do with the operation of the engine, transmission, suspension or other vehicle systems, radar detectors or CB radios. |
| E.21          | E21OTHERD| C    | 20     | 0        | N     | OTHER electronic equipment Description  
blank = not applicable (no “other”)  
something = description of the “other” electronic equipment |
| E.22          | E22MSAS  | C    | 1      | 0        | N     | Manual Slack Adjustors Status -- Whether there are manual slack adjusters on the truck.  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
**Note:** “Not applicable” if no manual slack adjusters on truck or if driver refused/ doesn’t know previous answer whether manual slack adjusters on truck. |
| E.23          | E23MSAU1 | C    | 1      | 0        | N     | Manual Slack Adjustors on Unit #1 -- Whether there are manual slack adjusters on the 1st unit of the truck (straight truck or tractor).  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
**Note:** “Not applicable” if no manual slack adjusters on truck or if driver refused/ doesn’t know previous answer whether manual slack adjusters on truck. |
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<tbody>
<tr>
<td>E.24</td>
<td>E24MSAU2</td>
<td>C 1 0 N</td>
<td><strong>Manual Slack Adjustors on Unit #2 -- Whether there are manual slack adjustors on the 2\textsuperscript{nd} unit of the truck (first trailer).</strong>&lt;br&gt;Y = Yes&lt;br&gt;N = No&lt;br&gt;D = driver Doesn’t know the answer&lt;br&gt;R = driver Refused to answer&lt;br&gt;T = driver Terminated interview before question asked&lt;br&gt;X = not applicable&lt;br&gt;&lt;strong&gt;Note:&lt;/strong&gt; “Not applicable” if no 2\textsuperscript{nd} unit on truck or if no manual slack adjusters on truck or if driver refused/doesn’t know previous answer whether manual slack adjusters on truck.</td>
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<tr>
<td>E.25</td>
<td>E25MSAU3</td>
<td>C 1 0 N</td>
<td><strong>Manual Slack Adjustors on Unit #3 -- Whether there are manual slack adjustors on the 3\textsuperscript{rd} unit of the truck (second trailer).</strong> Same answers as for Manual Slack Adjustors on Unit #2.</td>
</tr>
<tr>
<td>E.26</td>
<td>E26MSAU4</td>
<td>C 1 0 N</td>
<td><strong>Manual Slack Adjustors on Unit #4 -- Whether there are manual slack adjustors on the 4\textsuperscript{th} unit of the truck (third trailer).</strong> Same answers as for Manual Slack Adjustors on Unit #2.</td>
</tr>
<tr>
<td>E.27</td>
<td>E27MSADK</td>
<td>C 1 0 N</td>
<td><strong>Manual Slack Adjustments Driver Knowledge -- Whether the driver knows how to make manual slack adjustments.</strong>&lt;br&gt;Y = Yes&lt;br&gt;N = No&lt;br&gt;R = driver Refused to answer&lt;br&gt;T = driver Terminated interview before question asked&lt;br&gt;&lt;strong&gt;Note:&lt;/strong&gt; All drivers are asked, even drivers of trucks without manual slack adjusters.</td>
</tr>
<tr>
<td>E.28</td>
<td>E28MSACP</td>
<td>C 1 0 N</td>
<td><strong>Manual Slack Adjustment Company Policy -- Whether the truck company allows a driver to make manual slack adjustments.</strong>&lt;br&gt;Y = Yes&lt;br&gt;N = No&lt;br&gt;D = driver Doesn’t know the answer&lt;br&gt;R = driver Refused to answer&lt;br&gt;T = driver Terminated interview before question asked&lt;br&gt;&lt;strong&gt;Note:&lt;/strong&gt; All drivers are asked, even drivers who do not know how to make manual slack adjustments.</td>
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<tr>
<td>Reference</td>
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</table>
| E.29      | E29ALBS    | C 1 0 N                       | Anti-Lock Brakes Status -- Whether there are anti-lock brakes on the truck.  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked |
| E.30      | E30ALBU1   | C 1 0 N                       | Anti-Lock Brakes on Unit #1 -- Whether there are anti-lock brakes on the 1st unit of the truck (straight truck or tractor).  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
Note: “Not applicable” if no anti-lock brakes on truck or if driver refused/doesn’t know previous answer whether anti-lock brakes on truck. |
| E.31      | E31ALBU2   | C 1 0 N                       | Anti-Lock Brakes on Unit #2 -- Whether there are anti-lock brakes on the 2nd unit of the truck (first trailer).  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
Note: “Not applicable” if no 2nd unit on truck or if no anti-lock brakes on truck or if driver refused/doesn’t know previous answer whether anti-lock brakes on truck. |
| E.32      | E32ALBU3   | C 1 0 N                       | Anti-Lock Brakes on Unit #3 -- Whether there are anti-lock brakes on the 3rd unit of the truck (second trailer). Same answers as for Anti-Lock Brakes on Unit #2. |
| E.33      | E33ALBU4   | C 1 0 N                       | Anti-Lock Brakes on Unit #4 -- Whether there are anti-lock brakes on the 4th unit of the truck (third trailer). Same answers as for Anti-Lock Brakes on Unit #2. |
### Answer Output Database Fields

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<td>E.34</td>
<td>E34ASS</td>
<td>C</td>
<td>1 0 N</td>
<td>Air Suspension Status -- Whether there is air suspension on the truck.</td>
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<td></td>
<td>Y = Yes</td>
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<td>N = No</td>
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<td></td>
<td>D = driver Doesn’t know the answer</td>
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<td></td>
<td>R = driver Refused to answer</td>
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<td>T = driver Terminated interview before question asked</td>
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</table>

Air Suspension on Unit #1 -- Whether there is air suspension on the 1<sup>st</sup> unit of the truck (straight truck or tractor).  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
**Note:** “Not applicable” if no air suspension on truck or if driver refused/doesn’t know previous answer whether air suspension on truck.

E.35 | E35ASU1 | C | 1 0 N | Air Suspension on Unit #1 -- Whether there is air suspension on the 1<sup>st</sup> unit of the truck (straight truck or tractor).  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
**Note:** “Not applicable” if no air suspension on truck or if driver refused/doesn’t know previous answer whether air suspension on truck.

E.36 | E36ASU2 | C | 1 0 N | Air Suspension on Unit #2 -- Whether there is air suspension on the 2<sup>nd</sup> unit of the truck (first trailer).  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
**Note:** “Not applicable” if no 2<sup>nd</sup> unit on truck or if no air suspension on truck or if driver refused/doesn’t know previous answer whether air suspension on truck.

E.37 | E37ASU3 | C | 1 0 N | Air Suspension on Unit #3 -- Whether there is air suspension on the 3<sup>rd</sup> unit of the truck (second trailer).  
Same answers as for Air Suspension on Unit #2.  

E.38 | E38ASU4 | C | 1 0 N | Air Suspension on Unit #4 -- Whether there is air suspension on the 4<sup>th</sup> unit of the truck (third trailer).  
Same answers as for Air Suspension on Unit #2.  

### F. Interview Part 2 - Commodity Information Section

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<thead>
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<th>Field</th>
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</table>
| F.01      | F01CARGO   | C           | 1 0 N                        | CARGO -- Whether the truck is carrying cargo.  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked |
<table>
<thead>
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<th>Field</th>
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<th>Information</th>
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<tbody>
<tr>
<td>F.02</td>
<td>F02CAPUSE</td>
<td>N 2 0 N</td>
<td>CAPacity USEd -- How much of the truck’s cargo capacity is used.</td>
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<td></td>
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<td>1 = ¼ full</td>
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<td></td>
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<td>2 = ½ full</td>
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<td>3 = ¾ full</td>
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<td></td>
<td>4 = full</td>
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<td></td>
<td>96 = not applicable</td>
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<td></td>
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<td>97 = driver terminated interview before question asked</td>
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<td>98 = driver refused to answer</td>
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<td></td>
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<td>99 = driver does not know the answer</td>
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<tr>
<td>Note:</td>
<td></td>
<td></td>
<td>“Not applicable” if truck is empty or if unknown whether cargo is on-board.</td>
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<tr>
<td>F.03</td>
<td>F03SPACE</td>
<td>C 1 0 N</td>
<td>SPACE -- Whether the truck is fully loaded because the space limit has been reached.</td>
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<td></td>
<td></td>
<td></td>
<td>Y = Yes</td>
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<td>N = No</td>
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<td>D = driver Doesn’t know the answer</td>
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<td>R = driver Refused to answer</td>
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<td></td>
<td>X = not applicable</td>
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<td>T = driver Terminated interview before question asked</td>
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<td>Note:</td>
<td></td>
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<td>“Not applicable” if truck is not full or if truck is empty or if unknown whether cargo is on-board or if driver refused/ doesn’t know previous answer on capacity used.</td>
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<tr>
<td>F.04</td>
<td>F04WEIGHT</td>
<td>C 1 0 N</td>
<td>WEIGHT -- Whether the truck is fully loaded because the weight limit has been reached. Same answers as for SPACE.</td>
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<td>F.05</td>
<td>F05PICKUP</td>
<td>C 1 0 N</td>
<td>PICK-UP -- Whether the cargo was picked up at one address (location).</td>
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<td>Y = Yes</td>
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<td>N = No</td>
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<td>D = driver Doesn’t know the answer</td>
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<td>R = driver Refused to answer</td>
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<td>T = driver Terminated interview before question asked</td>
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<td>Note:</td>
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<td>“Not applicable” if truck is empty or if unknown whether cargo is on-board.</td>
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<td>F.06</td>
<td>F06DELIVE</td>
<td>C 1 0 N</td>
<td>DELIVERed -- Whether the cargo will be delivered to one address (location). Same answers as for PICK-UP.</td>
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<td>F.10</td>
<td>ONECOMmodity</td>
<td>F10ONECOM</td>
<td>C 1 0 N</td>
<td>ONE COMmodity -- Whether the cargo consists of one commodity. Y = Yes N = No D = driver Doesn’t know the answer R = driver Refused to answer X = not applicable T = driver Terminated interview before question asked Note: “Not applicable” if truck is empty or if unknown whether cargo is on-board.</td>
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<tr>
<td>F.11</td>
<td>CATegory of Commodity #1 Status</td>
<td>F11CATC1S</td>
<td>C 1 0 N</td>
<td>CATegory of Commodity #1 Status -- Whether the category of the 1st largest commodity on-board is available. Y = Yes D = driver Doesn’t know the answer R = driver Refused to answer X = not applicable T = driver Terminated interview before question asked Note: Size (&quot;large&quot;) is measured by amount of the commodity. Note: “Not applicable” if truck is empty or if unknown whether cargo is on-board.</td>
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<td>F.11</td>
<td>CATegory of Commodity #1</td>
<td>F11CATC1</td>
<td>C 40 0 N</td>
<td>CATegory of Commodity #1 -- Description of the category of the 1st largest commodity. blank = not applicable (see status field) something = description</td>
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<tr>
<td>F.12</td>
<td>AMOunt of Commodity #1</td>
<td>F12AMOC1S</td>
<td>C 1 0 N</td>
<td>AMOunt of Commodity #1 -- Whether a measurement of the amount of the 1st largest commodity is available. Y = Yes D = driver Doesn’t know the answer R = driver Refused to answer X = not applicable T = driver Terminated interview before question asked Note: “Not applicable” if truck is empty or if unknown whether cargo is on-board.</td>
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<td>F.12</td>
<td>AMOunt of Commodity #1</td>
<td>F12AMOC1</td>
<td>N 6 0 N</td>
<td>AMOunt of Commodity #1 -- The weight or volume of the 1st largest commodity. 0 = not applicable (see status field) something = amount Note: Units of measurement are defined in field F13AMOC1U.</td>
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### Answer Output Database Fields

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<td>F.13</td>
<td>F13AMOC1U</td>
<td>N 2 0 N</td>
<td>AMOunt of Commodity #1 Units -- Units in which the amount of the 1st largest commodity is measured.</td>
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<td></td>
<td></td>
<td></td>
<td>1 = kilograms</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>2 = pounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 = litres</td>
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<td></td>
<td></td>
<td></td>
<td>4 = gallons</td>
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<td></td>
<td></td>
<td>96 = not applicable (see status field)</td>
</tr>
<tr>
<td></td>
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<td>97 = driver Terminated interview before question asked</td>
</tr>
<tr>
<td>F.14</td>
<td>F14OC1S</td>
<td>C 1 0 N</td>
<td>Origin of Commodity #1 Status -- Whether the origin of shipment of the 1st largest commodity is available.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Y = Yes</td>
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<td></td>
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<td></td>
<td>D = driver Doesn’t know the answer</td>
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<tr>
<td></td>
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<td></td>
<td>R = driver Refused to answer</td>
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<td>X = not applicable</td>
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<td></td>
<td>T = driver Terminated interview before question asked</td>
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<td><strong>Note</strong>: The origin is the place in the world where the shipper put the cargo on the transportation system. The waybill or the bill of lading should list the origin.</td>
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<td><strong>Note</strong>: “Not applicable” if truck is empty or if unknown whether cargo is on-board.</td>
</tr>
<tr>
<td>F.14</td>
<td>F14OC1JUR</td>
<td>C 4 0 N</td>
<td>Origin of Commodity #1 JURisdiction -- The jurisdiction in which the shipment origin is located.</td>
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<td>blank = not applicable (see status field)</td>
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<td>something = jurisdiction code <strong>The codes are listed in Appendix H.</strong></td>
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<td>F.14</td>
<td>F14OC1PLA</td>
<td>C 50 0 N</td>
<td>Origin of Commodity #1 PLAce -- The name of the place in which the shipment origin is located.</td>
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<td>blank = not applicable (see status field)</td>
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<td>something = place name</td>
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<td>F.14</td>
<td>F14OC1ID</td>
<td>C 11 0 N</td>
<td>Origin of Commodity #1 ID -- Unique identifier assigned to the record containing the place name.</td>
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<td>blank = not applicable (see status field)</td>
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<td></td>
<td>something = identifier <strong>Note</strong>: Identifier is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
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<td>F.14</td>
<td>F14OC1LON</td>
<td>N 11 6 N</td>
<td>Origin of Commodity #1 LONgitude -- Longitude of the place.</td>
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<td></td>
<td>0 = not applicable (see status field)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>something = longitude <strong>Format defined in description of geographic coordinates that precedes this table.</strong></td>
</tr>
<tr>
<td></td>
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<td></td>
<td><strong>Note</strong>: Longitude is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
</tr>
<tr>
<td>Reference</td>
<td>Name</td>
<td>Type; Length; Decimals; Index</td>
<td>Information</td>
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</tr>
</tbody>
</table>
| **F.14**  | **F14OC1LAT** | N 11 6 N                     | Origin of Commodity #1 LATitude --Latitude of the place.  
0 = not applicable (see status field)  
something = latitude Format defined in description of geographic coordinates that precedes this table.  
**Note**: Latitude is filled automatically by the computer, but only if the place is selected from the pick-list. |
| **F.15**  | **F15DC1S**   | C 1 0 N                      | Destination of Commodity #1 Status -- Same answers as for Origin of Commodity #1 Status.  
**Note**: The destination is the place in the world where the receiver will remove the cargo from the transportation system. The waybill or the bill of lading should list the destination. |
| **F.15**  | **F15DC1JUR** | C 4 0 N                      | Destination of Commodity #1 JURisdiction -- Same answers as for Origin of Commodity #1 JURisdiction. |
| **F.15**  | **F15DC1PLA** | C 50 0 N                     | Destination of Commodity #1 PLAce -- Same answers as for Origin of Commodity #1 PLAce. |
| **F.15**  | **F15DC1ID**  | C 11 0 N                     | Destination of Commodity #1 ID -- Same answers as for Origin of Commodity #1 ID. |
| **F.15**  | **F15DC1LON** | N 11 6 N                     | Destination of Commodity #1 LONgitude -- Same answers as for Origin of Commodity #1 LONgitude. |
| **F.15**  | **F15DC1LAT** | N 11 6 N                     | Destination of Commodity #1 LATitude -- Same answers as for Origin of Commodity #1 LATitude. |
| **F.16**  | **F16DG0B**   | C 1 0 N                      | Dangerous Goods On-Board -- Whether there are dangerous goods on-board.  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer answer  
X = not applicable  
T = driver Terminated interview before question asked  
**Note**: “Not applicable” if truck is empty or if unknown whether cargo is on-board. |
<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Name</th>
<th>Field</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>F.17</td>
<td>F17DGC1CS</td>
<td>C 1 0 N</td>
<td>Dangerous Goods Commodity #1 Class Status -- Whether the class of the 1st largest dangerous goods commodity is available.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F17DGC1C</td>
<td>N 3 1 N</td>
<td>Dangerous Goods Commodity #1 Class -- The class of the 1st largest dangerous goods commodity. 0.0 = unknown* or not applicable something = class Dangerous goods classes are listed in Appendix H.</td>
<td></td>
</tr>
<tr>
<td>F.18</td>
<td>F17DGC1UNS</td>
<td>C 1 0 N</td>
<td>Dangerous Goods Commodity #1 UN number Status - Whether the UN number of the 1st largest dangerous goods commodity is available.</td>
<td></td>
</tr>
</tbody>
</table>

* See note under Dangerous Goods Commodity #1 UN number.

Note: Size (“large”) is measured by amount of the commodity.

Note: “Not applicable” if no dangerous goods on-board or if truck is empty or if unknown whether cargo is on-board or if driver refused/doesn’t know previous answer whether dangerous goods on-board or if interview terminated.

Note: “Not applicable=X” if no dangerous goods on-board or if truck is empty or if driver refused/doesn’t know previous answer whether dangerous goods on-board.

Note: “Not applicable=blank” because the question was not asked until being added to the questionnaire software.
### Answer Output Database Fields

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Reference</th>
<th>Name</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>F.18</td>
<td>F18DG1UN</td>
<td>C 8 0 N</td>
<td>Dangerous Goods Commodity #1 UN number -- The UN number of the 1st largest dangerous goods commodity. blank = not applicable something = number or the word &quot;UNKNOWN&quot;** Dangerous goods UN numbers are listed in Appendix H. Note: ** The computer program requires that a &quot;UN Number&quot; or a &quot;Class&quot; be entered if the answer to Dangerous Goods On-Board is &quot;Yes&quot;. If neither the UN number nor the class is known, the surveyors are been directed to enter &quot;UNKNOWN&quot; in the UN number field. Note: “Not applicable” if no dangerous goods on-board or if truck is empty or if unknown whether cargo is on-board or if driver refused/ doesn’t know previous answer whether dangerous goods on-board or if interview terminated.</td>
<td></td>
</tr>
</tbody>
</table>

### G. Interview Part 3 - Carrier Information Section

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Reference</th>
<th>Name</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.01</td>
<td>G01CTYPE</td>
<td>N 2 0 N</td>
<td>Company TYPE -- Type of trucking company. 1 = for-hire 2 = private 97 = driver Terminated interview before question asked 98 = driver Refused to answer 99 = driver Doesn’t know the answer Note: A for-hire trucking company earns its money by transporting cargo belonging to someone else. A private trucking company is part of a parent company such as a retailer or a manufacturer, and exists to transport cargo belonging to the parent company.</td>
<td></td>
</tr>
<tr>
<td>G.02</td>
<td>G02PRIFH</td>
<td>C 1 0 N</td>
<td>Private company carrying cargo For-Hire -- Whether the private trucking company is carrying cargo for-hire on this trip. Y = Yes N = No D = driver Doesn’t know the answer R = driver Refused to answer X = not applicable Note: A private trucking company is mainly engaged in transporting the cargo of its parent company, but on occasion will carry cargo on a for-hire basis (to minimize empty mileage). Note: “Not applicable” if trucking company is for-hire or if truck is empty or if unknown whether cargo is on-board or if driver refused/ doesn’t know previous answer on company type or if interview terminated.</td>
<td></td>
</tr>
</tbody>
</table>
### Answer Output Database Fields

<table>
<thead>
<tr>
<th>Reference</th>
<th>Field</th>
<th>Information</th>
</tr>
</thead>
</table>
| **G.03** | G03CDS  | Company Dispatch centre Status -- Whether an answer is available.  
\(Y\) = Yes (driver identified a base)  
\(N\) = No dispatch centre (driver’s answer)  
\(R\) = driver Refused to answer  
\(T\) = driver Terminated interview before question asked  
\(X\) = not applicable  
**Note**: “Not applicable” because the question was not asked after being eliminated from the questionnaire.  
**Note**: The dispatch centre is the trucking company office that coordinates the driver’s work (provides instructions on where to pick-up and deliver cargo; tracks the progress of the cargo). It is located in Canada, U.S. or Mexico. A driver does not necessarily deal with a dispatch centre. |
| **G.03** | G03CDJUR | Company Dispatch centre JURisdiction -- The jurisdiction in which the dispatch centre is located.  
blank = not applicable (see status field)  
something = jurisdiction code *The codes are listed in Appendix H.* |
| **G.03** | G03CDPLA | Company Dispatch centre PLAce -- The name of the place in which the dispatch centre is located.  
blank = not applicable (see status field)  
something = place name |
| **G.03** | G03CDID  | Company Dispatch centre ID -- Unique identifier assigned to the record containing the place name.  
blank = not applicable (see status field)  
something = identifier  
**Note**: Identifier is filled automatically by the computer, but only if the place is selected from the pick-list. |
| **G.03** | G03CDLON | Company Dispatch centre LONgitude -- Longitude of the place.  
0 = not applicable (see status field)  
something = longitude *Format defined in description of geographic coordinates that precedes this table.*  
**Note**: Longitude is filled automatically by the computer, but only if the place is selected from the pick-list. |
| **G.03** | G03DLAT  | Company Dispatch centre LATitude -- Latitude of the place.  
0 = not applicable (see status field)  
something = latitude *Format defined in description of geographic coordinates that precedes this table.*  
**Note**: Latitude is filled automatically by the computer, but only if the place is selected from the pick-list. |
### H. Interview Part 4 - Trip Information Section

#### H.01 H01TRITYP

<table>
<thead>
<tr>
<th>Field</th>
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<th>Length</th>
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<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>H01TRITYP</td>
<td>C</td>
<td>1</td>
<td>0</td>
<td>N</td>
</tr>
</tbody>
</table>

**TRIP TYPE** -- Whether the trip is a linehaul or a peddle run.

- **P** = Peddle run
- **L** = Linehaul
- **R** = driver refused to answer
- **T** = driver terminated interview before question asked

**Note:** A linehaul trip transports the entire cargo load from one point to another point. A peddle run makes stops for cargo pick-up and delivery between its first cargo pick-up point and last cargo delivery point. See discussion of trip definition that precedes this table.

#### H.02 H02TRISTOS

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
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<th>Decimals</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>H02TRISTOS</td>
<td>C</td>
<td>1</td>
<td>0</td>
<td>N</td>
</tr>
</tbody>
</table>

**TRIP STOPS STATUS** -- Whether the number of stops on the peddle run is available.

- **Y** = Yes
- **D** = driver doesn’t know the answer
- **R** = driver refused to answer
- **X** = not applicable
- **T** = driver terminated interview before question asked

**Note:** “Not applicable” if not a peddle run or if driver refused previous answer on trip type.

#### H.02 H02TRISTO

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Length</th>
<th>Decimals</th>
<th>Index</th>
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</thead>
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<tr>
<td>H02TRISTO</td>
<td>N</td>
<td>2</td>
<td>0</td>
<td>N</td>
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</tbody>
</table>

**TRIP STOPS** -- Number of stops on the peddle run.

- **0** = not applicable (see status field)
- **something** = number

#### H.03 H03SECOND

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Length</th>
<th>Decimals</th>
<th>Index</th>
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</thead>
<tbody>
<tr>
<td>H03SECOND</td>
<td>C</td>
<td>1</td>
<td>0</td>
<td>N</td>
</tr>
</tbody>
</table>

**SECOND** -- Whether there is a second driver on-board the truck, so that the trip is being driven by a driver team.

- **Y** = Yes
- **N** = No
- **R** = driver refused to answer
- **T** = driver terminated interview before question asked

#### H.04 H04TOS

<table>
<thead>
<tr>
<th>Field</th>
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<th>Decimals</th>
<th>Index</th>
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</thead>
<tbody>
<tr>
<td>H04TOS</td>
<td>C</td>
<td>1</td>
<td>0</td>
<td>N</td>
</tr>
</tbody>
</table>

**TRIP ORIGIN STATUS** -- Whether an answer is available.

- **Y** = Yes (driver identified a base)
- **D** = driver doesn’t know the answer
- **R** = driver refused to answer
- **T** = driver terminated interview before question asked

**Note:** The trip origin is a location in Canada, U.S. or Mexico. See discussion of trip definition that precedes this table.

#### H.04 H04TOJUR

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Length</th>
<th>Decimals</th>
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</thead>
<tbody>
<tr>
<td>H04TOJUR</td>
<td>C</td>
<td>4</td>
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<td>N</td>
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</table>

**TRIP ORIGIN JURISDICTION** -- The jurisdiction in which the trip origin is located.

- **blank** = not applicable (see status field)
- **something** = jurisdiction code. The codes are listed in Appendix H.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Name</th>
<th>Type</th>
<th>Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.04</td>
<td>H04TOPLA</td>
<td>C</td>
<td>50; 0; N</td>
<td>Trip Origin PLAce -- The name of the place in which the trip origin is located. blank = not applicable (see status field) something = place name</td>
</tr>
<tr>
<td>H.04</td>
<td>H04TOID</td>
<td>C</td>
<td>11; 0; N</td>
<td>Trip Origin ID -- Unique identifier assigned to the record containing the place name. blank = not applicable (see status field) something = identifier Note: Identifier is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
</tr>
<tr>
<td>H.04</td>
<td>H04TOLON</td>
<td>N</td>
<td>11; 6; N</td>
<td>Trip Origin LONGitude -- Longitude of the place. 0 = not applicable (see status field) something = longitude Format defined in description of geographic coordinates that precedes this table. Note: Longitude is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
</tr>
<tr>
<td>H.04</td>
<td>H04TOLAT</td>
<td>N</td>
<td>11; 6; N</td>
<td>Trip Origin LATitude -- Latitude of the place. 0 = not applicable (see status field) something = latitude Format defined in description of geographic coordinates that precedes this table. Note: Latitude is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
</tr>
<tr>
<td>H.05</td>
<td>H05TOADD5</td>
<td>C</td>
<td>1; 0; N</td>
<td>Trip Origin ADDress Status -- Whether the trip origin address is available or needed. Y = Yes D = driver Doesn’t know the answer R = driver Refused to answer T = driver Terminated interview before question asked X = not applicable Note: “Not applicable” if origin place does not require that the question be asked or if driver refused/doesn’t know previous answer on origin place.</td>
</tr>
<tr>
<td>H.05</td>
<td>H05TOADD1</td>
<td>C</td>
<td>40; 0; N</td>
<td>Trip Origin ADDress line #1: blank = not applicable (see status field) something = part of address</td>
</tr>
<tr>
<td>H.05</td>
<td>H05TOADD2</td>
<td>C</td>
<td>40; 0; N</td>
<td>Trip Origin ADDress line #2: Same answers as for Trip Origin ADDress line #1.</td>
</tr>
<tr>
<td>H.05</td>
<td>H05TOADD3</td>
<td>C</td>
<td>40; 0; N</td>
<td>Trip Origin ADDress line #3: Same answers as for Trip Origin ADDress line #1.</td>
</tr>
<tr>
<td>H.06</td>
<td>H06TDS</td>
<td>C</td>
<td>1; 0; N</td>
<td>Trip Destination Status -- Same answers as for Trip Origin Status. Note: The trip destination is a location in Canada, U.S. or Mexico. See discussion of trip definition that precedes this table.</td>
</tr>
<tr>
<td>Reference</td>
<td>Field</td>
<td>Type; Length; Decimals; Index</td>
<td>Information</td>
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</tr>
<tr>
<td>H.06</td>
<td>H06TDJUR</td>
<td>C 4 0 N</td>
<td>Trip Destination JURisdiction -- Same answers as for Trip Origin JURisdiction.</td>
<td></td>
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<tr>
<td>H.06</td>
<td>H06TDPLA</td>
<td>C 50 0 N</td>
<td>Trip Destination PLAce -- Same answers as for Trip Origin PLAce.</td>
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<tr>
<td>H.06</td>
<td>H06TDID</td>
<td>C 11 0 N</td>
<td>Trip Destination ID -- Same answers as for Trip ID.</td>
<td></td>
</tr>
<tr>
<td>H.06</td>
<td>H06TDLON</td>
<td>N 11 6 N</td>
<td>Trip Destination LONgitude -- Same answers as for Trip Origin LONgitude.</td>
<td></td>
</tr>
<tr>
<td>H.06</td>
<td>H06TDLAT</td>
<td>N 11 6 N</td>
<td>Trip Destination LATitude -- Same answers as for Trip Origin LATitude.</td>
<td></td>
</tr>
<tr>
<td>H.07</td>
<td>H07TDADD5</td>
<td>C 1 0 N</td>
<td>Trip Destination ADDRess Status: Same answers as for Trip Origin ADDRessStatus.</td>
<td></td>
</tr>
<tr>
<td>H.07</td>
<td>H07TDADD1</td>
<td>C 40 0 N</td>
<td>Trip Destination ADDRess line #1: Same answers as for Trip Origin ADDRess line #1.</td>
<td></td>
</tr>
<tr>
<td>H.07</td>
<td>H07TDADD2</td>
<td>C 40 0 N</td>
<td>Trip Destination ADDRess line #2: Same answers as for Trip Origin ADDRess line #2.</td>
<td></td>
</tr>
<tr>
<td>H.07</td>
<td>H07TDADD3</td>
<td>C 40 0 N</td>
<td>Trip Destination ADDRess line #3: Same answers as for Trip Origin ADDRess line #3.</td>
<td></td>
</tr>
<tr>
<td>H.08</td>
<td>H08LSS</td>
<td>C 1 0 N</td>
<td>Last Stop Status -- Whether an answer is available on the location of the last stop made before the DCS. Y = Yes (driver identified a base) D = driver Doesn’t know the answer R = driver Refused to answer T = driver Terminated interview before question asked Note: The last stop is a location in Canada, U.S. or Mexico. See discussion of trip definition that preceeds this table.</td>
<td></td>
</tr>
<tr>
<td>H.08</td>
<td>H08LSJUR</td>
<td>C 4 0 N</td>
<td>Last Stop JURisdiction -- The jurisdiction in which the last stop was made. blank = not applicable (see status field) something = jurisdiction code The codes are listed in Appendix H.</td>
<td></td>
</tr>
<tr>
<td>H.08</td>
<td>H08LSPLA</td>
<td>C 50 0 N</td>
<td>Last Stop PLAce -- The name of the place in which the last stop was made. blank = not applicable (see status field) something = place name</td>
<td></td>
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<tr>
<td>H.08</td>
<td>H08LSID</td>
<td>C 11 0 N</td>
<td>Last Stop ID -- Unique identifier assigned to the record containing the place name. blank = not applicable (see status field) something = identifier Note: Identifier is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Name</td>
<td>Type; Length; Decimals; Index</td>
<td>Information</td>
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<td></td>
</tr>
<tr>
<td>H.08</td>
<td>H08LSLON</td>
<td>N 11 6 N</td>
<td>Last Stop LONgitude -- Longitude of the place. 0 = not applicable (see status field) something = longitude Format defined in description of geographic coordinates that precedes this table. <strong>Note:</strong> Longitude is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
<td></td>
</tr>
<tr>
<td>H.08</td>
<td>H08LSLAT</td>
<td>N 11 6 N</td>
<td>Last Stop LATitude -- Latitude of the place. 0 = not applicable (see status field) something = latitude Format defined in description of geographic coordinates that precedes this table. <strong>Note:</strong> Latitude is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
<td></td>
</tr>
<tr>
<td>H.09</td>
<td>H09NSS</td>
<td>C 1 0 N</td>
<td>Next Stop Status -- Same answers as for Last Stop Status. <strong>Note:</strong> The next stop is a location in Canada, U.S. or Mexico. See discussion of trip definition that precedes this table.</td>
<td></td>
</tr>
<tr>
<td>H.09</td>
<td>H09NSJUR</td>
<td>C 4 0 N</td>
<td>Next Stop JURisdiction -- Same answers as for Last Stop JURisdiction.</td>
<td></td>
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<tr>
<td>H.09</td>
<td>H09NSPLA</td>
<td>C 50 0 N</td>
<td>Next Stop PLAce -- Same answers as for Last Stop PLAce.</td>
<td></td>
</tr>
<tr>
<td>H.09</td>
<td>H09NSID</td>
<td>C 11 0 N</td>
<td>Next Stop ID -- Same answers as for Last Stop ID.</td>
<td></td>
</tr>
<tr>
<td>H.09</td>
<td>H09NSLON</td>
<td>N 11 6 N</td>
<td>Next Stop LONgitude -- Same answers as for Last Stop LONgitude.</td>
<td></td>
</tr>
<tr>
<td>H.09</td>
<td>H09NSLAT</td>
<td>N 11 6 N</td>
<td>Next Stop LATitude -- Same answers as for Last Stop LATitude.</td>
<td></td>
</tr>
<tr>
<td>H.10</td>
<td>H10EPS</td>
<td>C 1 0 N</td>
<td>Entered Province crossing Status -- Whether the trip entered the province/territory containing the DCS from another jurisdiction. Y = Yes D = driver Doesn’t know the answer R = driver Refused to answer X = not applicable (not entering province/territory) T = driver Terminated interview before question asked <strong>Note:</strong> The border crossing could be domestic (between Canadian jurisdictions) or international (between Canada and the U.S.). <strong>Note:</strong> See discussion of border crossings that precedes this table.</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Field</td>
<td>Name</td>
<td>Type; Length; Decimals; Index</td>
<td>Information</td>
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<td>-------------</td>
</tr>
<tr>
<td>H.10</td>
<td>H10EPPLA</td>
<td>C 60 0 N</td>
<td>Entered Province crossing PLACE -- Description of the border crossing. blank = not applicable (see status field) something = description</td>
<td></td>
</tr>
<tr>
<td>H.10</td>
<td>H10EPID</td>
<td>C 10 0 N</td>
<td>Entered Province crossing ID -- Unique identifier assigned to the border crossing. 0 = not applicable (see status field) something = identifier</td>
<td></td>
</tr>
<tr>
<td>H.10</td>
<td>H10EPLON</td>
<td>N 10 6 N</td>
<td>Entered Province crossing LONGitude -- Longitude of the border crossing. 0 = not applicable (see status field) something = longitude</td>
<td></td>
</tr>
<tr>
<td>H.10</td>
<td>H10EPLAT</td>
<td>N 10 6 N</td>
<td>Entered Province crossing LATitude -- Latitude of the border crossing. 0 = not applicable (see status field) something = latitude</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Crossing could be between Canadian two jurisdictions or between a Canadian and a U.S. jurisdiction.
- Description consists of name of facility or jurisdiction and place or jurisdiction and highway number from the perspective of either side of the border.
- Identifier is filled automatically by the computer, but only if the location is selected from the pick-list.
- Longitude is filled automatically by the computer, but only if the location is selected from the pick-list.
- Latitude is filled automatically by the computer, but only if the location is selected from the pick-list.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Field</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.11</td>
<td>H11LPS</td>
<td>C 1 0 N</td>
<td>Leaving Province crossing Status -- Whether the trip will leave the province/territory containing the DCS for another jurisdiction. Y = Yes, D = driver Doesn’t know the answer, R = driver Refused to answer, X = not applicable (not leaving province/territory), T = driver Terminated interview before question asked. <strong>Note:</strong> The border crossing could be domestic (between Canadian jurisdictions) or international (between Canada and the U.S.). <strong>Note:</strong> See discussion of border crossings that precedes this table.</td>
</tr>
<tr>
<td>H.11</td>
<td>H11LPPLA</td>
<td>C 60 0 N</td>
<td>Leaving Province crossing PLAce: Same answers as for Entered Province PLAce.</td>
</tr>
<tr>
<td>H.11</td>
<td>H11LPID</td>
<td>C 10 0 N</td>
<td>Leaving Province crossing ID -- Same answers as for Entered Province ID.</td>
</tr>
<tr>
<td>H.11</td>
<td>H11LPLON</td>
<td>N 10 6 N</td>
<td>Leaving Province crossing LONgitude -- Same answers as for Entered Province LONgitude.</td>
</tr>
<tr>
<td>H.11</td>
<td>H11LPLAT</td>
<td>N 10 6 N</td>
<td>Leaving Province crossing LATitude -- Same answers as for Entered Province LATitude.</td>
</tr>
<tr>
<td>H.12</td>
<td>H12EC1S</td>
<td>C 1 0 N</td>
<td>Entered Canada crossing #1 Status -- Whether the trip entered Canada from the U.S. at a crossing in a province/territory other than the province/territory containing the DCS. Y = Yes, D = driver Doesn’t know the answer, R = driver Refused to answer, X = not applicable (no such crossing), T = driver Terminated interview before question asked. <strong>Note:</strong> See discussion of border crossings that precedes this table.</td>
</tr>
<tr>
<td>H.12</td>
<td>H12EC1PLA</td>
<td>C 60 0 N</td>
<td>Entered Canada crossing #1 PLAce: Same answers as for Entered Province PLAce.</td>
</tr>
<tr>
<td>H.12</td>
<td>H12EC1ID</td>
<td>C 10 0 N</td>
<td>Entered Canada crossing #1 ID -- Same answers as for Entered Province ID.</td>
</tr>
<tr>
<td>H.12</td>
<td>H12EC1LON</td>
<td>N 10 6 N</td>
<td>Entered Canada crossing #1 LONgitude -- Same answers as for Entered Province LONgitude.</td>
</tr>
<tr>
<td>H.12</td>
<td>H12EC1LAT</td>
<td>N 10 6 N</td>
<td>Entered Canada crossing #1 LATitude -- Same answers as for Entered Province LATitude.</td>
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Interprovincial Roadside Truck Survey
Technical Appendices 39
<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Name</th>
<th>Type</th>
<th>Length; Decimals; Index</th>
<th>Information</th>
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<tr>
<td>H.13</td>
<td>H13EC2S</td>
<td>C</td>
<td>1 0 N</td>
<td>Entered Canada crossing #2 Status -- Whether the trip entered Canada from the U.S. at a 2nd crossing in a province/ territory other than the province/territory containing the DCS.</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>Y = Yes</td>
</tr>
<tr>
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<td>D = driver Doesn’t know the answer</td>
</tr>
<tr>
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<td></td>
<td>R = driver Refused to answer</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>X = not applicable (no such crossing)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>T = driver Terminated interview before question asked</td>
</tr>
<tr>
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<td><strong>Note:</strong> See discussion of border crossings that precedes this table.</td>
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<tr>
<td>H.13</td>
<td>H13EC2PLA</td>
<td>C</td>
<td>60 0 N</td>
<td>Entered Canada crossing #2 PLAce: Same answers as for Entered Province PLAce.</td>
</tr>
<tr>
<td>H.13</td>
<td>H13EC2ID</td>
<td>C</td>
<td>10 0 N</td>
<td>Entered Canada crossing #2 ID -- Same answers as for Entered Province ID.</td>
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<tr>
<td>H.13</td>
<td>H13EC2LON</td>
<td>N</td>
<td>10 6 N</td>
<td>Entered Canada crossing #2 LONgitude -- Same answers as for Entered Province LONgitude.</td>
</tr>
<tr>
<td>H.13</td>
<td>H13EC2LAT</td>
<td>N</td>
<td>10 6 N</td>
<td>Entered Canada crossing #2 LATitude -- Same answers as for Entered Province LATitude.</td>
</tr>
<tr>
<td>H.14</td>
<td>H14LC1S</td>
<td>C</td>
<td>1 0 N</td>
<td>Leaving Canada crossing #1 Status -- Whether the trip will leave Canada for the U.S. at a crossing in a province/ territory other than the province/territory containing the DCS.</td>
</tr>
<tr>
<td></td>
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<td>Y = Yes</td>
</tr>
<tr>
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<td></td>
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<td>D = driver Doesn’t know the answer</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>R = driver Refused to answer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X = not applicable (no such crossing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T = driver Terminated interview before question asked</td>
</tr>
<tr>
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<td></td>
<td><strong>Note:</strong> See discussion of border crossings that precedes this table.</td>
</tr>
<tr>
<td>H.14</td>
<td>H14LC1PLA</td>
<td>C</td>
<td>60 0 N</td>
<td>Leaving Canada crossing #1 PLAce: Same answers as for Entered Province PLAce.</td>
</tr>
<tr>
<td>H.14</td>
<td>H14LC1ID</td>
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<td>Leaving Canada crossing #1 ID -- Same answers as for Entered Province ID.</td>
</tr>
<tr>
<td>H.14</td>
<td>H14LC1LON</td>
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<td>10 6 N</td>
<td>Leaving Canada crossing #1 LONgitude -- Same answers as for Entered Province LONgitude.</td>
</tr>
<tr>
<td>H.14</td>
<td>H14LC1LAT</td>
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<td>Leaving Canada crossing #1 LATitude -- Same answers as for Entered Province LATitude.</td>
</tr>
<tr>
<td>Reference</td>
<td>Name</td>
<td>Type; Length; Decimals; Index</td>
<td>Information</td>
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<tr>
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<td>-------------</td>
<td></td>
</tr>
</tbody>
</table>
| H.15      | H15LC2S | C 1 0 N                       | Leaving Canada crossing #2 Status -- Whether the trip will leave Canada for the U.S. at a 2nd crossing in a province/territory other than the province/territory containing the DCS.  
Y = Yes  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
X = not applicable (no such crossing)  
T = driver Terminated interview before question asked  
Note: See discussion of border crossings that precedes this table. |
| H.15      | H15LC2PLA | C 60 0 N                  | Leaving Canada crossing #2 PLace: Same answers as for Entered Province PLace. |
| H.15      | H15LC2ID | C 10 0 N                   | Leaving Canada crossing #2 ID -- Same answers as for Entered Province ID. |
| H.15      | H15LC2LON | N 10 6 N                   | Leaving Canada crossing #2 LONgitude -- Same answers as for Entered Province LONgitude. |
| H.15      | H15LC2LAT | N 10 6 N                   | Leaving Canada crossing #2 LATitude -- Same answers as for Entered Province LATitude. |
| H.16      | H16UM1S | C 1 0 N                     | Us/Mexico crossing #1 Status -- Whether the trip will cross the U.S./Mexico border.  
Y = Yes  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
X = not applicable (no such crossing)  
T = driver Terminated interview before question asked  
Note: See discussion of border crossings that precedes this table. |
| H.16      | H16UM1PLA | C 60 0 N                  | Us/Mexico crossing #1 PLace: Same answers as for Entered Province PLace. |
| H.16      | H16UM1ID | C 10 0 N                   | Us/Mexico crossing #1 ID -- Same answers as for Entered Province ID. |
| H.16      | H16UM1LON | N 10 6 N                   | Us/Mexico crossing #1 LONgitude -- Same answers as for Entered Province LONgitude. |
| H.16      | H16UM1LAT | N 10 6 N                   | Us/Mexico crossing #1 LATitude -- Same answers as for Entered Province LATitude. |
| H.17      | H17HWYS | C 1 0 N                     | HighWaY route Status -- Whether the highways on the trip route are available.  
Y = Yes  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
Note: “Not applicable” if jurisdiction containing the DCS does not require that the question be asked.  
Note: “Yes” is triggered if something has been entered in H17HWY1.
### Answer Output Database Fields

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Name</th>
<th>Type</th>
<th>Length</th>
<th>Decimals</th>
<th>Index</th>
<th>Information</th>
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<tr>
<td>H.17</td>
<td>H17HWY1</td>
<td>C</td>
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<td>0</td>
<td>N</td>
<td>HighWay route line #1: blank = not applicable (see status field) something = highway description.</td>
</tr>
<tr>
<td>H.17</td>
<td>H17HWY2</td>
<td>C</td>
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<td>N</td>
<td>HighWay route line #2: blank = none or not applicable (see status field) something = highway description.</td>
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<td>H.17</td>
<td>H17HWY3</td>
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<td>N</td>
<td>HighWay route line #3: Same answers as for HighWay route line #2.</td>
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<td>H.17</td>
<td>H17HWY4</td>
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<td>HighWay route line #4: Same answers as for HighWay route line #2.</td>
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<td>HighWay route line #5: Same answers as for HighWay route line #2.</td>
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<td>H.17</td>
<td>H17HWY6</td>
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<td>HighWay route line #6: Same answers as for HighWay route line #2.</td>
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<tr>
<td>H.17</td>
<td>H17HWY7</td>
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<td>N</td>
<td>HighWay route line #7: Same answers as for HighWay route line #2.</td>
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<tr>
<td>H.18</td>
<td>H18PTOD</td>
<td>C</td>
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<td>N</td>
<td>Previous Trip Origin and Destination -- Whether the origin and destination of the previous trip were the same as the origin and destination of the current trip. Y = Yes N = No D = driver Doesn’t know the answer R = driver Refused to answer T = driver Terminated interview before question asked X = not applicable Note: “Not applicable” because the question was not asked after being eliminated from the questionnaire.</td>
</tr>
<tr>
<td>H.19</td>
<td>H19PTHWY</td>
<td>C</td>
<td>1</td>
<td>0</td>
<td>N</td>
<td>Previous Trip HighWaYs -- Whether the highways used on the previous trip were the same as the highways used on the current trip. Y = Yes N = No D = driver Doesn’t know the answer R = driver Refused to answer X = not applicable T = driver Terminated interview before question asked Note: “Not applicable” if previous trip origin or destination different or if driver refused/ doesn’t know previous answer on previous trip origin/ destination or if previous question was not asked.</td>
</tr>
<tr>
<td>Quest-</td>
<td>Name</td>
<td>Type; Length; Decimals; Index</td>
<td>Information</td>
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</tr>
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<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| H.20 | **H20TSDATES** | C 1 0 N | Trip Start DATE Status -- Whether the date on which the trip started from the trip origin is available.  
Y = Yes  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
**Note:** “Not applicable” because the question was not asked after being eliminated from the questionnaire. |
| H.20 | **H20TSDATE** | D 8 0 N | Trip Start DATE  
blank = not applicable (see status field)  
something = date Format: YYYYMMDD. |
| H.21 | **H21TSHOURS** | C 1 0 N | Trip Start HOUR Status -- Whether the hour during which the trip started from the trip origin is available.  
Y = Yes  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked  
X = not applicable  
**Note:** “Not applicable” because the question was not asked after being eliminated from the questionnaire. |
| H.21 | **H21TSHOUR** | N 2 0 N | Trip Start HOUR  
blank = not applicable (see status field)  
something = hour Format: 24 hour clock. |
| H.22 | **H22TSINT** | C 1 0 N | Trip Start cargo INTerlined -- Whether the cargo picked-up at the trip start was received from another trucking company.  
Y = Yes  
N = No  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
X = not applicable  
T = driver Terminated interview before question asked.  
**Note:** “Not applicable” if no cargo on-board or because the question was not asked after being eliminated from the questionnaire.  
**Note:** The interlining could be accomplished by transferring the cargo itself from one truck to another, or by transferring the trailer containing the cargo from one company to another. |
<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Reference</th>
<th>Name</th>
<th>Type; Length; Decimals; Index</th>
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<tbody>
<tr>
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<td>H.23</td>
<td>H23TSFAC</td>
<td>N 2 0 N</td>
<td>Trip Start FACility -- The type of facility at which the trip started.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 = Truck Terminal - Your Carrier</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>2 = Truck Terminal - Another Carrier</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>3 = Rail Terminal</td>
</tr>
<tr>
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<td></td>
<td>4 = Marine Terminal</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>5 = Airport Terminal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6 = Primary Producer</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>7 = Manufacturer</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>8 = Warehouse/Distribution Centre</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>9 = Retail Outlet</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>95 = Other</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>97 = driver Terminated interview before question asked</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>98 = driver Refused to answer</td>
</tr>
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<td>99 = driver Doesn’t know the answer</td>
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<tr>
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<td>H.24</td>
<td>H24TSFACD</td>
<td>C 20 0 N</td>
<td>Trip Start FACility Description blank = not applicable (see status field)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>something = description of “other” type of facility</td>
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<tr>
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<td>H.25</td>
<td>H25TEDATES</td>
<td>C 1 0 N</td>
<td>Trip End DATE Status -- Whether the date on which the trip will end at the trip destination is available. Same answers as for Trip Start DATE Status.</td>
</tr>
<tr>
<td></td>
<td>H.25</td>
<td>H25TEDATE</td>
<td>D 8 0 N</td>
<td>Trip End DATE -- Same answers as for Trip Start DATE.</td>
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<tr>
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<td>H.26</td>
<td>H26TEHOURS</td>
<td>C 1 0 N</td>
<td>Trip End HOUR Status -- Same answers as for Trip Start HOUR Status.</td>
</tr>
<tr>
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<td>H.26</td>
<td>H26TEHOUR</td>
<td>N 2 0 N</td>
<td>Trip End HOUR -- Same answers as for Trip Start HOUR.</td>
</tr>
<tr>
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<td>H.27</td>
<td>H27TEINT</td>
<td>C 1 0 N</td>
<td>Trip End cargo INTerlined -- Same answers as for Trip End cargo INTerlined.</td>
</tr>
<tr>
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<td>H.28</td>
<td>H28TEFAC</td>
<td>N 2 0 N</td>
<td>Trip End FACility -- Same answers as for Trip Start FACility.</td>
</tr>
<tr>
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<td>H.29</td>
<td>H29TEFACD</td>
<td>C 20 0 N</td>
<td>Trip End FACility Description -- Same answers as for Trip Start FACility Description.</td>
</tr>
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</table>

### I. Interview Part 5 - Driver Information Section

<table>
<thead>
<tr>
<th>I.01</th>
<th>I01DBS</th>
<th>C 1 0 N</th>
<th>Driver Base Status -- Whether an answer is available.</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td>Y = Yes (driver identified a base)</td>
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<tr>
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<td></td>
<td>N = No base (driver’s answer)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R = driver Refused to answer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>T = driver Terminated interview before question asked</td>
</tr>
</tbody>
</table>

**Note:** The base is the place in Canada, U.S. or Mexico where the driver lives.
## Answer Output Database Fields

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Field</th>
<th>Name</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
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</thead>
<tbody>
<tr>
<td>1.01</td>
<td>I01DBJUR</td>
<td>C 4 0 N</td>
<td>Driver Base JURisdiction -- The jurisdiction in which the driver base is located. blank = not applicable (see status field) something = jurisdiction code The codes are listed in Appendix H.</td>
<td></td>
</tr>
<tr>
<td>1.01</td>
<td>I01DBPLA</td>
<td>C 50 0 N</td>
<td>Truck Base PLAce -- The name of the place in which the driver base is located. blank = not applicable (see status field) something = place name</td>
<td></td>
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<tr>
<td>1.01</td>
<td>I01DBID</td>
<td>C 11 0 N</td>
<td>Driver Base ID -- Unique identifier assigned to the record containing the place name. blank = not applicable (see status field) something = identifier Note: Identifier is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
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<tr>
<td>1.01</td>
<td>I01DBLON</td>
<td>N 11 6 N</td>
<td>Driver Base LONgitude -- Longitude of the place. 0 = not applicable (see status field) something = longitude Format defined in description of geographic coordinates that precedes this table. Note: Longitude is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
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<tr>
<td>1.01</td>
<td>I01DBLAT</td>
<td>N 11 6 N</td>
<td>Driver Base LATitude -- Latitude of the place. 0 = not applicable (see status field) something = latitude Format defined in description of geographic coordinates that precedes this table. Note: Latitude is filled automatically by the computer, but only if the place is selected from the pick-list.</td>
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<tr>
<td>1.02</td>
<td>I02OWNER</td>
<td>C 1 0 N</td>
<td>OWNER -- Whether driver owns the straight truck or tractor. Y = Yes N = No R = driver Refused to answer T = driver Terminated interview before question asked</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Name</td>
<td>Type; Length; Decimals; Index</td>
<td>Information</td>
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</tr>
</tbody>
</table>
| I.03      | I03CONTRA | C 1 0 N | CONTRAAct -- Whether the driver-owner of the truck has a contract with a trucking company to haul cargo for that company.  
Y = Yes  
N = No  
R = driver Refused to answer  
X = not applicable  
T = driver Terminated interview before question asked  
**Note:** “Not applicable” if the driver is not the owner of the truck or if the driver refused to answer the previous question on truck ownership. |
| I.04      | I04EMPLOY | C 1 0 N | EMPLOYer -- What type of company is the employer of a driver-non-owner.  
C = Trucking Company  
L = Leasing Agency  
O = Other  
R = driver Refused to answer  
X = not applicable  
T = driver Terminated interview before question asked  
**Note:** “Not applicable” if the driver is the owner of the truck or if the driver refused to answer the previous question on truck ownership. |
| I.05      | I05OTHER | C 20 0 N | OTHER -- Description of the employer type if it was classified as "Other".  
blank = not applicable  
something = description |
| I.06      | I06AGES | C 1 0 N | AGE Status -- Whether the driver’s age is available.  
Y = Yes  
R = driver Refused to answer  
T = driver Terminated interview before question asked |
| I.06      | I06AGE | N 2 0 N | AGE  
0 = not applicable (see status field)  
something = age in years |
| I.07      | I07DRITOTS | C 1 0 N | DRIVING TOTal Status -- Availability of how many years the driver has driven a truck for a living.  
Y = Yes  
L = yes -- Less than 1 year  
D = driver Doesn’t know the answer  
R = driver Refused to answer  
T = driver Terminated interview before question asked |
| I.07      | I07DRITOT | N 2 0 N | DRIVING TOTal  
0 = none or less than 1 or not available (see status field)  
something = years of driving |
<table>
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<td>1.08</td>
<td>I08DRICONS</td>
<td>C 1 0 N</td>
<td>DRIving CONfiguration Status -- Availability of how many years the driver has driven the observed configuration of truck for a living.</td>
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<tr>
<td></td>
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<td></td>
<td>Y = Yes</td>
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<td></td>
<td></td>
<td></td>
<td>L = yes -- Less than 1 year</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D = driver Doesn’t know the answer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R = driver Refused to answer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>X = not applicable</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>T = driver Terminated interview before question asked</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: “Not applicable” if truck configuration is not a tractor or a tractor-trailer combination.</td>
<td></td>
</tr>
<tr>
<td>1.08</td>
<td>I08DRICON</td>
<td>N 2 0 N</td>
<td>DRIving CONfiguration 0 = none or less than 1 or not available or not applicable (see status field) something = years of driving</td>
<td></td>
</tr>
<tr>
<td>1.09</td>
<td>I09NSCRTR</td>
<td>C 1 0 N</td>
<td>National Safety Code Requirements TRaining -- Whether in the past 3 years the driver has received at least 1 day of training on the requirements of the National Safety Code.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Y = Yes</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>N = No</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R = driver Refused to answer</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td>T = driver Terminated interview before question asked</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: Training could cover topics such as: licences necessary; maintaining an hours of service log; and performing a daily vehicle trip inspection.</td>
<td></td>
</tr>
<tr>
<td>1.10</td>
<td>I10NSCRSP</td>
<td>C 1 0 N</td>
<td>National Safety Code Requirements SPonsor -- Whether the driver’s employer sponsored the training.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td>Y = Yes</td>
<td></td>
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<td></td>
<td>N = No</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>X = not applicable</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R = driver Refused to answer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>T = driver Terminated interview before question asked</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: The driver’s employer sponsored the training if the employer paid the cost of the training outside of working hours or if the training occurred during working hours while the driver was being paid.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: “Not applicable” if no training or if driver refused previous answer whether training received or because the question was not asked after being eliminated from the questionnaire.</td>
<td></td>
</tr>
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</table>
### Answer Output Database Fields

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</tr>
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<tr>
<td>I.11</td>
<td>I11DGHTR</td>
<td>C 1 0 N</td>
<td>Dangerous Goods Handling Training -- Same answers as for National Safety Code Requirements Training. Note: Training could cover topics such as: documents and safety markings necessary; handling characteristics of the product; and responding to an emergency.</td>
</tr>
<tr>
<td>I.12</td>
<td>I12DGHSP</td>
<td>C 1 0 N</td>
<td>Dangerous Goods Handling Sponsor -- Same answers as for National Safety Code Requirements Sponsor.</td>
</tr>
<tr>
<td>I.13</td>
<td>I13DSTR</td>
<td>C 1 0 N</td>
<td>Driving Skills Training -- Same answers as for National Safety Code Requirements Training. Note: Training could cover topics such as: recognizing unsafe practices; handling characteristics of the vehicle configuration; and driving techniques to increase efficiency. Not included is vehicle maintenance training.</td>
</tr>
<tr>
<td>I.14</td>
<td>I14DSSP</td>
<td>C 1 0 N</td>
<td>Driving Skills Sponsor -- Same answers as for National Safety Code Requirements Sponsor.</td>
</tr>
<tr>
<td>I.15</td>
<td>I15BSTR</td>
<td>C 1 0 N</td>
<td>Business Skills Training -- Same answers as for National Safety Code Requirements Training. Note: Training could cover topics such as: dealing with customers; tracking and analysing costs and revenues; and understanding contracts.</td>
</tr>
<tr>
<td>I.16</td>
<td>I16BSSP</td>
<td>C 1 0 N</td>
<td>Business Skills Sponsor -- Same answers as for National Safety Code Requirements Sponsor.</td>
</tr>
<tr>
<td>I.17</td>
<td>I17EEUTR</td>
<td>C 1 0 N</td>
<td>Electronic Equipment Usage Training -- Same answers as for National Safety Code Requirements Training. Note: Training could cover topics such as: purpose and use of communications and information recording equipment.</td>
</tr>
<tr>
<td>I.18</td>
<td>I18EEUSP</td>
<td>C 1 0 N</td>
<td>Electronic EquipmentUsage Sponsor -- Same answers as for National Safety Code Requirements Sponsor.</td>
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### J. Weights and Measures Section

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<th>Information</th>
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</thead>
<tbody>
<tr>
<td>J.01</td>
<td>J01COUS</td>
<td>C 1 0 N</td>
<td>COUnt of axle groupings weighed Status -- Whether the axles are weighted in groups that are the same as, or different from the groups recorded in C25AXLAG1 through C25AXLAG8. M = Modified (weighed groupings of axles different from recorded axle groups) S = Same (weighed in same groupings) X = not applicable (no weight information available)</td>
</tr>
</tbody>
</table>
### Answer Output Database Fields

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Name</th>
<th>Type; Length; Decimals; Index</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>J.01</td>
<td>J01COUAG1</td>
<td>N 1 0 N</td>
<td>COUnt of Axles in weighed Grouping #1 -- How many axles are in the 1st grouping to be weighed. 1,2,... = number of axles (including lifted axles) Note: The number of axles includes any axles in the grouping that are lifted at the time of the weighing.</td>
</tr>
<tr>
<td>J.01</td>
<td>J01COUAG2</td>
<td>N 1 0 N</td>
<td>COUnt of Axles in weighed Grouping #2 -- Same answers as for COUnt of Axles in weighed Group #1.</td>
</tr>
<tr>
<td>J.01</td>
<td>J01COUAG3</td>
<td>N 2 0 N</td>
<td>COUnt of Axles in weighed Grouping #3. How many axles are in the 3rd grouping to be weighed. 1,2,... = number of axles 96 = not applicable (no 3rd group)</td>
</tr>
<tr>
<td>J.01</td>
<td>J01COUAG4</td>
<td>N 2 0 N</td>
<td>COUnt of Axles in weighed Grouping #4 -- Same answers as for COUnt of Axles in weighed Group #3.</td>
</tr>
<tr>
<td>J.01</td>
<td>J01COUAG5</td>
<td>N 2 0 N</td>
<td>COUnt of Axles in weighed Grouping #5 -- Same answers as for COUnt of Axles in weighed Group #3.</td>
</tr>
<tr>
<td>J.01</td>
<td>J01COUAG6</td>
<td>N 2 0 N</td>
<td>COUnt of Axles in weighed Grouping #6 -- Same answers as for COUnt of Axles in weighed Group #3.</td>
</tr>
<tr>
<td>J.01</td>
<td>J01COUAG7</td>
<td>N 2 0 N</td>
<td>COUnt of Axles in weighed Grouping #7 -- Same answers as for COUnt of Axles in weighed Group #3.</td>
</tr>
<tr>
<td>J.01</td>
<td>J01COUAG8</td>
<td>N 2 0 N</td>
<td>COUnt of Axles in weighed Grouping #8 -- Same answers as for COUnt of Axles in weighed Group #3.</td>
</tr>
<tr>
<td>J.02</td>
<td>J02WEIS</td>
<td>C 1 0 N</td>
<td>WEIght Status -- Whether the weight of the truck is available. Y = Yes N = No</td>
</tr>
<tr>
<td>J.02</td>
<td>J02WEIAG1</td>
<td>N 5 0 N</td>
<td>WEIght for Axles in Grouping #1 -- Weight of the 1st grouping of axles to be weighed. 0 = not applicable (see status field) something = weight Note: Units of measurement are defined in field J02WEIU.</td>
</tr>
<tr>
<td>J.02</td>
<td>J02WEIAG2</td>
<td>N 5 0 N</td>
<td>WEIght for Axles in Grouping #2 -- Weight of the 2nd grouping of axles to be weighed. 0 = zero or not applicable something = weight Note: Units of measurement are defined in field J02WEIU. Note: “Zero” means that all axles in the grouping are lifted. Note: “Not applicable” if no such grouping or if weight not available (see status field).</td>
</tr>
<tr>
<td>J.02</td>
<td>J02WEIAG3</td>
<td>N 5 0 N</td>
<td>WEIght for Axles in Grouping #3 -- Same answers as for WEIght for Axles in Grouping #2.</td>
</tr>
<tr>
<td>J.02</td>
<td>J02WEIAG4</td>
<td>N 5 0 N</td>
<td>WEIght for Axles in Grouping #4 -- Same answers as for WEIght for Axles in Grouping #2.</td>
</tr>
<tr>
<td>J.02</td>
<td>J02WEIAG5</td>
<td>N 5 0 N</td>
<td>WEIght for Axles in Grouping #5 -- Same answers as for WEIght for Axles in Grouping #2.</td>
</tr>
<tr>
<td>J.02</td>
<td>J02WEIAG6</td>
<td>N 5 0 N</td>
<td>WEIght for Axles in Grouping #6 -- Same answers as for WEIght for Axles in Grouping #2.</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>Name</td>
<td>Type; Length; Decimals; Index</td>
<td>Information</td>
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<td>-------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>J.02</td>
<td>J02WEIAG7</td>
<td>N 5 0 N</td>
<td>WEIght for Axles in Grouping # 7 -- Same answers as for WEIght for Axles in Grouping #2.</td>
</tr>
<tr>
<td>J.02</td>
<td>J02WEIAG8</td>
<td>N 5 0 N</td>
<td>WEIght for Axles in Grouping # 8 -- Same answers as for WEIght for Axles in Grouping #2.</td>
</tr>
<tr>
<td>J.02</td>
<td>J02WEIALL</td>
<td>N 6 0 N</td>
<td>WEIght of ALL axles -- Total weight of the truck. 0 = not applicable (see status field) something = weight Note: Units of measurement are defined in field J02WEIU.</td>
</tr>
<tr>
<td>J.03</td>
<td>J03WEIU</td>
<td>C 1 0 N</td>
<td>WEIght Units -- Units in which the weight of the truck is measured. K = Kilograms P = Pounds X = not applicable (no measurements)</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MS</td>
<td>C 1 0 N</td>
<td>Measurement of length Status -- Whether the measurements of the truck length are available. Y = Yes N = No</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MFB</td>
<td>N 6 2 N</td>
<td>Measurement for Front Bumper -- Reading on the measuring tape for the location of the front bumper. 0 = not applicable (see status field) something = reading on tape Note: Units of measurement are defined in field J04MU.</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MAXL1</td>
<td>N 6 2 N</td>
<td>Measurement for Axle #1 -- Reading on the measuring tape for the location of the 1st axle. 0 = not applicable (see status field) something = reading on tape Note: Units of measurement are defined in field J04MU.</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MAXL2</td>
<td>N 6 2 N</td>
<td>Measurement for Axle #2: Same answers as for Measurement for Axle #1</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MAXL3</td>
<td>N 6 2 N</td>
<td>Measurement for Axle #3 -- Reading on the measuring tape for the location of the 3rd axle. 0 = not applicable something = reading on tape Note: Units of measurement are defined in field J04MU. Note: “Not applicable” if no such axle or if measurement not available (see status field).</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MAXL4</td>
<td>N 6 2 N</td>
<td>Measurement for AXLe #4: Same answers as for Measurement for AXLe #1.</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MAXL5</td>
<td>N 6 2 N</td>
<td>Measurement for AXLe #5: Same answers as for Measurement for AXLe #1.</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MAXL6</td>
<td>N 6 2 N</td>
<td>Measurement for AXLe #6: Same answers as for Measurement for AXLe #1.</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MAXL7</td>
<td>N 6 2 N</td>
<td>Measurement for AXLe #7: Same answers as for Measurement for AXLe #1.</td>
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### Answer Output Database Fields

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<td>J.04</td>
<td>J04MAXL8</td>
<td>N 6 2 N</td>
<td>Measurement for AXLe #8: Same answers as for Measurement for AXLe #1.</td>
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<tr>
<td>J.04</td>
<td>J04MAXL9</td>
<td>N 6 2 N</td>
<td>Measurement for AXLe #9: Same answers as for Measurement for AXLe #1.</td>
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<td>J.04</td>
<td>J04MAXL10</td>
<td>N 6 2 N</td>
<td>Measurement for AXLe #10: Same answers as for Measurement for AXLe #1.</td>
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<tr>
<td>J.04</td>
<td>J04MAXL11</td>
<td>N 6 2 N</td>
<td>Measurement for AXLe #11: Same answers as for Measurement for AXLe #1.</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MAXL12</td>
<td>N 6 2 N</td>
<td>Measurement for AXLe #12: Same answers as for Measurement for AXLe #1.</td>
</tr>
<tr>
<td>J.04</td>
<td>J04MBB</td>
<td>N 6 2 N</td>
<td>Measurement for Back Bumper -- Reading on the measuring tape for the location of the back bumper. 0 = not applicable (see status field) something = reading on tape  Note: Units of measurement are defined in field J04MU.</td>
</tr>
</tbody>
</table>
| J.05          | J05MU      | C 1 0 N                      | Measurement Units -- Units in which the truck length is measured.  
M = Metres  
F = Feet/inches (digits before the decimal point are feet; digits after the decimal point are inches)  
X = not applicable (no measurements) |
| J.06          | J06WEICHES | C 1 0 N                      | WEIght CHEck Status -- Whether the check of truck weight against the minimum and maximum criteria for that configuration is active.  
Y = Yes  
N = No  
blank = not applicable  
Note: “Not applicable” because the question was not asked before being added to the questionnaire software. |

---

### K. Early Interview Termination Section

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Appendix B: Heavy Truck Classification System
<table>
<thead>
<tr>
<th>Truck ID</th>
<th>Truck Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Tow truck with 2 axles</td>
</tr>
<tr>
<td>2</td>
<td>Tow truck with 3 or more axles</td>
</tr>
<tr>
<td>3</td>
<td>¾ or 1 ton pick-up truck with 2 axles</td>
</tr>
<tr>
<td>4</td>
<td>Single unit with 2 axles. Cube van, step van, small dump trucks. Some types include soft drink companies, cabs without trailers &amp; flat-bed tow trucks.</td>
</tr>
<tr>
<td>5</td>
<td>Single unit with 3 axles. Includes dump trucks, cabs without trailers, garbage trucks, flat-bed trucks with hydraulic arms.</td>
</tr>
<tr>
<td>6</td>
<td>Single unit truck with 4 or more axles</td>
</tr>
<tr>
<td>7</td>
<td>Single unit truck with “pup”. Usually a 3 or 4 axle truck pulling a 2 or 3 axle pup. Also includes some single flat-beds with attached trailer</td>
</tr>
<tr>
<td>8</td>
<td>Single trailer with 4 or less axles.</td>
</tr>
<tr>
<td>9</td>
<td>Single trailer with 5 axles</td>
</tr>
<tr>
<td>10</td>
<td>Single trailer with 6 or more axles</td>
</tr>
<tr>
<td>11</td>
<td>Multi-trailer with 5 or less axles</td>
</tr>
<tr>
<td>12</td>
<td>Multi-trailer with 6 axles</td>
</tr>
<tr>
<td>13</td>
<td>Multi-trailer with 7 or more axles</td>
</tr>
<tr>
<td>14</td>
<td>Other truck style. If a particular heavy truck does not fit any of the above-noted configurations, indicate by #14 on your field sheet.</td>
</tr>
</tbody>
</table>

Note: This truck classification system was used by the former Regional Municipality of Ottawa-Carleton and is consistent with that used in the Outaouais Region.
Appendix C: Summary of Historical Ottawa River Crossing Truck Traffic Volumes
### Heavy Trucks on the Macdonald-Cartier Bridge

<table>
<thead>
<tr>
<th>YEAR</th>
<th>HEAVY TRUCKS_Southbound (12H)</th>
<th>HEAVY TRUCKS_Northbound (12H)</th>
<th>List of count dates</th>
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<tbody>
<tr>
<td></td>
<td>2A</td>
<td>3A TT Southbound</td>
<td>Southbound</td>
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<tr>
<td>1991</td>
<td>1071</td>
<td>1360</td>
<td>1083</td>
</tr>
<tr>
<td>1996*</td>
<td>806</td>
<td>1024</td>
<td>826</td>
</tr>
<tr>
<td>1997*</td>
<td>981</td>
<td>1246</td>
<td>887</td>
</tr>
<tr>
<td>1998*</td>
<td>823</td>
<td>1045</td>
<td>920</td>
</tr>
<tr>
<td>1999</td>
<td>872</td>
<td>1107</td>
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</tr>
<tr>
<td>2000</td>
<td>988</td>
<td>1255</td>
<td>980</td>
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### Heavy Trucks on the Chaudière Bridge

<table>
<thead>
<tr>
<th>YEAR</th>
<th>HEAVY TRUCKS_Southbound (12H)</th>
<th>HEAVY TRUCKS_Northbound (12H)</th>
<th>List of count dates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2A</td>
<td>3A TT Southbound</td>
<td>Southbound</td>
</tr>
<tr>
<td>1991</td>
<td>382</td>
<td>485</td>
<td>423</td>
</tr>
<tr>
<td>1997*</td>
<td>317</td>
<td>403</td>
<td>381</td>
</tr>
<tr>
<td>1998*</td>
<td>236</td>
<td>300</td>
<td>299</td>
</tr>
<tr>
<td>1999*</td>
<td>329</td>
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<td>405</td>
</tr>
<tr>
<td>1999**</td>
<td>177</td>
<td>87</td>
<td>47</td>
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</tbody>
</table>

### Heavy Trucks on the Macdonald-Cartier and Chaudière bridges

<table>
<thead>
<tr>
<th>YEAR</th>
<th>HEAVY TRUCKS_Southbound (12H)</th>
<th>HEAVY TRUCKS_Northbound (12H)</th>
<th>List of count dates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2A</td>
<td>3A TT Southbound</td>
<td>Southbound</td>
</tr>
<tr>
<td>1991</td>
<td>1453</td>
<td>1845</td>
<td>1506</td>
</tr>
<tr>
<td>1996*</td>
<td>1109</td>
<td>1409</td>
<td>1162</td>
</tr>
<tr>
<td>1997*</td>
<td>1298</td>
<td>1649</td>
<td>1268</td>
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<tr>
<td>1999</td>
<td>1201</td>
<td>1525</td>
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</tr>
<tr>
<td>1999**</td>
<td>500</td>
<td>260</td>
<td>1410</td>
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### Heavy Trucks on the all 5 bridges

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Source of data: Annual Classification and Occupancy Counts
* Number of vehicles factored to 12 hours from 8 hour counts
** Roadside Truck Survey Data
Appendix D: Time Period Relationships
### TIME PERIOD RELATIONSHIPS FOR ALL VEHICLES

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### TIME PERIOD RELATIONSHIPS FOR TRUCKS

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*IGB - "Inside Green Belt"
Appendix F: District Comparisons of Trucks by Number
## TOTAL NUMBER OF ALL TRUCKS (12 HOURS_DAY)

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<th>7-Hull</th>
<th>8-Aylmer</th>
<th>9-Gatineau West</th>
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**IGB-Inside Green Belt**

## TOTAL NUMBER OF 2A TRUCKS (12 HOURS_DAY)

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<th>8-Aylmer</th>
<th>9-Gatineau West</th>
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## TOTAL NUMBER OF 3A+ TRUCKS (12 HOURS_DAY)

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<th>8-Aylmer</th>
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Interprovincial Roadside Truck Survey  
Technical Appendices  
62
### TOTAL NUMBER OF ALL TRUCKS (12 HOURS, NIGHT)

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Interprovincial Roadside Truck Survey  
Technical Appendices  
65
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#### IGB-Inside Green Belt

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Interprovincial Roadside Truck Survey

Technical Appendices 66
### ABSOLUTE DIFFERENCE BETWEEN TOTAL NUMBERS OF ALL TRUCKS ([12H_DAY+12H_NIGHT]-24H)

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IGB-Inside Green Belt

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### ABSOLUTE DIFFERENCE BETWEEN TOTAL NUMBERS OF 3A+ TRUCKS ([12H_DAY+12H_NIGHT]-24H)

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### ABSOLUTE DIFFERENCE BETWEEN TOTAL NUMBERS OF TRACTOR TRAILERS ([12H_DAY+12H_NIGHT]-24H)

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Interprovincial Roadside Truck Survey  
Technical Appendices  
67
### COMPARISON OF TOTAL NUMBER OF ALL TRUCKS FOR DIFFERENT PERIOD OF TIME

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**IGB-Inside Green Belt**

D* = DAY (7:00 - 17:00)

N* = NIGHT (19:00 - 7:00)

24H* = 24 HOUR PERIOD

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### COMPARISON OF TOTAL NUMBER OF 2A TRUCKS FOR DIFFERENT PERIOD OF TIME

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**IGB-Inside Green Belt**

D* = DAY (7:00 - 17:00)

N* = NIGHT (19:00 - 7:00)

24H* = 24 HOUR PERIOD

---

Interprovincial Roadside Truck Survey
Technical Appendices 68
### COMPARISON OF TOTAL NUMBER OF 3A+ TRUCKS FOR DIFFERENT PERIOD OF TIME

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### COMPARISON OF TOTAL NUMBER OF TRACTOR TRAILERS FOR DIFFERENT PERIOD OF TIME

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Interprovincial Roadside Truck Survey
Technical Appendices

69
Appendix G: District Comparisons of Trucks by Percent
## COMPARISON OF PERCENTS OF ALL TRUCKS FOR DIFFERENT PERIOD OF TIME (%)

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**Note:**
- **D** - DAY (7:00 - 17:00)
- **N** - NIGHT (19:00 - 7:00)
- **24H** - 24 HOURS

### COMPARISON OF PERCENTS OF 2A TRUCKS FOR DIFFERENT PERIOD OF TIME (%)

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**Note:**
- **D** - DAY (7:00 - 17:00)
- **N** - NIGHT (19:00 - 7:00)
- **24H** - 24 HOURS

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Interprovincial Roadside Truck Survey
Technical Appendices 71
### COMPARISON OF PERCENTS OF 3A+ TRUCKS FOR DIFFERENT PERIOD OF TIME (%)

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Interprovincial Roadside Truck Survey  
Technical Appendices  
72
Appendix H: Survey Expansion Factors
EXPANSION FACTORS FOR TRUCKS BY BRIDGE, DIRECTION, TIME PERIOD AND TYPE OF TRUCKS

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2000 Interprovincial Roadside Truck Survey
Sample Size by Time of Day

Interprovincial Roadside Truck Survey
Technical Appendices
Appendix I: Trip Characteristics
## Truck trip characteristics

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<th>BRIDGE</th>
<th>DIRECTION</th>
<th>Location O</th>
<th>Location D</th>
<th>SUM 2A</th>
<th>SUM 3A+</th>
<th>SUM Trailer</th>
<th>SUM TRUCKS</th>
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**Summary for 'DIRECTION' = Northbound**

| Sum       | 274.00  | 109.00 | 73.00 | 456.00 |

| Chaudière | Southbound| EXTERNAL   | EXTERNAL   | 5.17 | 5.17 |
|           |           | EXTERNAL   | INTERNAL   | 10.64 | 12.93 | 23.57 |
|           |           | INTERNAL   | EXTERNAL   | 5.32 | 4.33 | 28.45 | 38.10 |
|           |           | INTERNAL   | INTERNAL   | 234.04 | 86.67 | 28.45 | 349.16 |

**Summary for 'DIRECTION' = Southbound**

| Sum       | 250.00 | 91.00 | 75.00 | 416.00 |

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| Macdonald-Cartier | Northbound| EXTERNAL   | EXTERNAL   | 25.30 | 61.67 | 86.97 |
|                   |           | EXTERNAL   | INTERNAL   | 88.55 | 28.08 | 231.28 | 347.91 |
|                   |           | INTERNAL   | EXTERNAL   | 37.95 | 14.04 | 20.56 | 72.55 |
|                   |           | INTERNAL   | INTERNAL   | 354.20 | 294.88 | 128.49 | 777.56 |

**Summary for 'DIRECTION' = Northbound**

| Sum       | 506.00 | 337.00 | 442.00 | 1285.00 |

| Macdonald-Cartier | Southbound| EXTERNAL   | EXTERNAL   | 11.89 | 65.61 | 77.50 |
|                   |           | EXTERNAL   | INTERNAL   | 47.55 | 42.63 | 75.71 | 165.88 |
|                   |           | INTERNAL   | EXTERNAL   | 47.55 | 42.63 | 186.74 | 276.91 |
|                   |           | INTERNAL   | INTERNAL   | 416.02 | 255.75 | 100.94 | 772.71 |

**Summary for 'DIRECTION' = Southbound**

| Sum       | 523.00 | 341.00 | 429.00 | 1293.00 |

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| Grand Total                 | 1553.00 | 878.00 | 1019.00 | 3450.00 |
Appendix J: Origins and Destinations of Truck Trips by Direction
Origins and Destinations of Truck Trips (Northbound direction)

Origins and Destinations of Truck Trips (Southbound Direction)
Appendix K: Concentration of Truck Trip Ends
### Number of trucks by traffic zone (Origin+Destination)

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**Interprovincial Roadside Truck Survey**

**Technical Appendices**
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IGB-Inside Green Belt

## Total Number of 2A Trucks (12 Hours Day+12 Hours Night)

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## Total Number of Tractor Trailers (12 Hours Day+12 Hours Night)

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Appendix M: Detailed Comments on Trip Origins and Destinations
DETAILED COMMENTS ON TRIPS ORIGINS AND DESTINATIONS

Detailed daily origin-destination desire lines are presented in the Report in Exhibit 18 for all truck trips, in Exhibit 19 for 2 axle truck trips, in Exhibit 20 for 3+ axle truck trips and in Exhibit 21 for tractor trailer trips. Here are summarized some key characteristics.

The number of truck trips higher than 50, for all truck classifications collectively or individually, is considered to represent strong orientation, while 25-50 truck trips are considered to represent a modestly strong orientation. Number of truck trips is presented in parenthesis.

EXHIBIT 18 (all truck trips) as illustrated in exhibit panel:
A – Trips from the Aylmer district demonstrate a strong orientation to Ottawa East (56), Ottawa Central (80), Ottawa South (68) and IGB West (88). Trips to Aylmer district demonstrate a strong orientation from IGB East (73) and from Ottawa West (61).
  The trips to Aylmer demonstrate a modestly strong orientation from Ottawa South (34) and from IGB West (36). The Modestly strong orientation of truck trips from Aylmer is demonstrated to IGB East (32) and to Ottawa West (46);
B – Trips from the Hull district demonstrate a strong orientation to Ottawa Central (69), Ottawa South (73), IGB West (90), Ottawa East (102), Ottawa West (106), IGB East (172). Trips to Hull district demonstrate a strong orientation from Ottawa Central (53), IGB West (100), Ottawa West (104), Ottawa East (126), Ottawa South (155) and IGB East (209);
C – Trips from the Gatineau West district demonstrate a strong orientation to Ottawa Central (75), Ottawa South (81) and IGB East (92). The trips to Gatineau West demonstrate strong orientation from IGB East (120).
  Modestly strong orientation is demonstrated from Gatineau West to Ottawa East (32) and Ottawa West (43). In other direction, a modestly strong orientation is demonstrated to Gatineau West from Ottawa East (29) and Ottawa Central (49);
D – Trips from the Gatineau East district demonstrate a strong orientation to Ottawa West (52), IGB East (66) and Ottawa South (124). The trips to Gatineau East demonstrate a strong orientation from Ottawa West (74), Ottawa South (97), Ottawa East (99) and IGB East (115).
  Modestly strong orientation is demonstrated from Gatineau East to Ottawa East (27) and from IGB West to Gatineau East (28);

EXHIBIT 19 (2 axle truck trips) as illustrated in exhibit panel:
A – Modestly strong orientation of trips from the Aylmer district is demonstrated to Ottawa West (27) as well as from IGB East to Aylmer (46);
B – Trips from Hull district demonstrate a strong orientation to Ottawa West (51), Ottawa East (52), Ottawa Central (53), Ottawa South (58), IGB West (64) and IGB East (88). The trips to Hull demonstrate a strong orientation from Ottawa East (62), Ottawa South (63) and IGB East (123)
  Modestly strong orientation is demonstrated to Hull from Ottawa Central (33), Ottawa West (36) and IGB West (41);
C – Trips to the Gatineau West district demonstrate a strong orientation from IGB East (59).
Modestly strong orientation is demonstrated from Gatineau West to Ottawa East (29), Ottawa South (33), Ottawa West (35) and IGB East (44). In opposite direction, a modestly strong orientation is demonstrated from Ottawa East to Gatineau West (25);

**D** – Trips to the Gatineau East district demonstrate a strong orientation from Ottawa East (53) and from IGB East (66).

Modestly strong orientation of trips is demonstrated from Gatineau East to Ottawa South (33) and IGB East (40) as well as from Ottawa South to Gatineau East (35);

**EXHIBIT 20** (3+ axle truck trips) as illustrated in exhibit panel:

**A** – Trips from the Aylmer district demonstrate a strong orientation to IGB West (58) and Ottawa Central (61), while a modestly strong orientation is demonstrated from Aylmer to Ottawa East (26);

**B** – Trips to Hull district demonstrate a strong orientation from Ottawa South (79). Modestly strong orientation is demonstrated to Hull from IGB East (26) and from IGB West (49) as well as from Hull to IGB East (48);

**C** – Trips to the Gatineau West district demonstrate a strong orientation from IGB East (51).

Modestly strong orientation is demonstrated from Gatineau West to IGB East (48), Ottawa South (48) and Ottawa Central (48) as well as from Ottawa Central to Gatineau West (31);

**D** – Modestly strong orientation of trips is demonstrated from Gatineau East to Ottawa South (26) and from IGB East to Gatineau East (39);

**EXHIBIT 21** (tractor trailer trips) as illustrated in exhibit panel:

**A** – Trips to the Aylmer district demonstrate a modestly strong orientation from Ottawa West (32) and from Ottawa East (37). In opposite direction, a modestly strong orientation is demonstrated from Aylmer to Ottawa South (46);

**B** – Trips to Hull district demonstrate a strong orientation from Ottawa East (58) and from IGB East (60).

Modestly strong orientation is demonstrated to Hull from Ottawa West (46) as well as from Hull to Ottawa West (50);

**C** – There is no a strong or modestly strong orientation of trips to/from the Gatineau West district to/from the districts on the Ottawa side of the National Capital Region;

**D** – Trips to Gatineau East district demonstrate a strong orientation from Ottawa South (62). In the opposite direction, a strong orientation of trips is demonstrated from Gatineau East to Ottawa South (65).

Modestly strong orientation of trips is demonstrated from Gatineau East to Ottawa East (27) and Ottawa West (33). In the opposite direction, a modestly strong orientation of trips is demonstrated from Gatineau East from Ottawa East (30) and from Ottawa West (46).
Appendix N: Categories of Commodities
Commodity carried and number of All trucks during the day (7:00-19:00)

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Where: Drivers reported some commodity 1617
Empty trucks 1092

*) Commodity names are modified in some cases because of typing errors in the questionnaire
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Empty trucks 286

*) Commodity names are modified in some cases because of typing errors in the questionnaire.
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*Interprovincial Roadside Truck Survey*

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Where: Drivers reported some commodity
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Empty trucks
1378

*) Commodity names are modified in some cases because of typing errors in the questionnaire
Appendix O: Trip Origins and Destinations for Specific Commodities and Detailed Comments
The characteristics as portrayed on the exhibit (Appendix O) are summarized in the following:

Construction materials trips are portrayed on Panel A. These trips are widely dispersed with the stronger links being from Aylmer to Ottawa Central (56 trips), from Ottawa South to Hull (44), from Ottawa Central to Gatineau West (44), from IGB East to Hull (32) and from IGB East to Gatineau West (23).

General merchandise trips are portrayed on Panel B. As would be expected, there are no particularly strong orientations. The stronger bi-directional desire lines being from Hull to Ottawa West (20+21), from Gatineau West to IGB East (26+13), from Gatineau East to IGB East (11+25) and from Hull to Ottawa South (11+17). Some of the stronger uni-directional desire lines being from IGB East to Hull (27), from Ottawa South to Gatineau East (19), from IGB West to Hull (18), from Ottawa South to Aylmer (17) and from Gatineau West to Ottawa West (14).

Paper and paper products trips are portrayed on Panel C. As illustrated, there are some strong orientations with the stronger bi-directional desire lines being from Gatineau East to Ottawa South (44+31), from Ottawa East to Hull (41+22). Bi-directional desire lines are also presented from Hull to IGB East (19+17) and from Hull to Ottawa West (18+17). Uni-directional desire lines are presented from IGB East to Gatineau East (13), from Ottawa West to Gatineau East (12) and from Hull to IGB East (11).

Wood and wood products trips are portrayed on Panel D. As illustrated, strong uni-directional desire lines are from Gatineau West to Ottawa South (48) and from Aylmer to Ottawa South (31), while there is a modestly strong orientation from Ottawa East to Gatineau East (16).