

## Age Analysis of Drayage Trucks Operating at the Port of Seattle August 2007

### Prepared by:

Sarah Flagg, Environmental Management Specialist 2, Seaport Environmental Programs  
Amy Meyer, College Intern, Seaport Environmental Programs

### Key Data Findings:

- Average model year of the Port of Seattle drayage truck fleet: 1996
- Average model year of the statewide Class 8 heavy-duty vehicle fleet: 1995
- Average model year for Class 8 heavy-duty vehicle fleet in the Puget Sound Clean Air Agency region: 1998

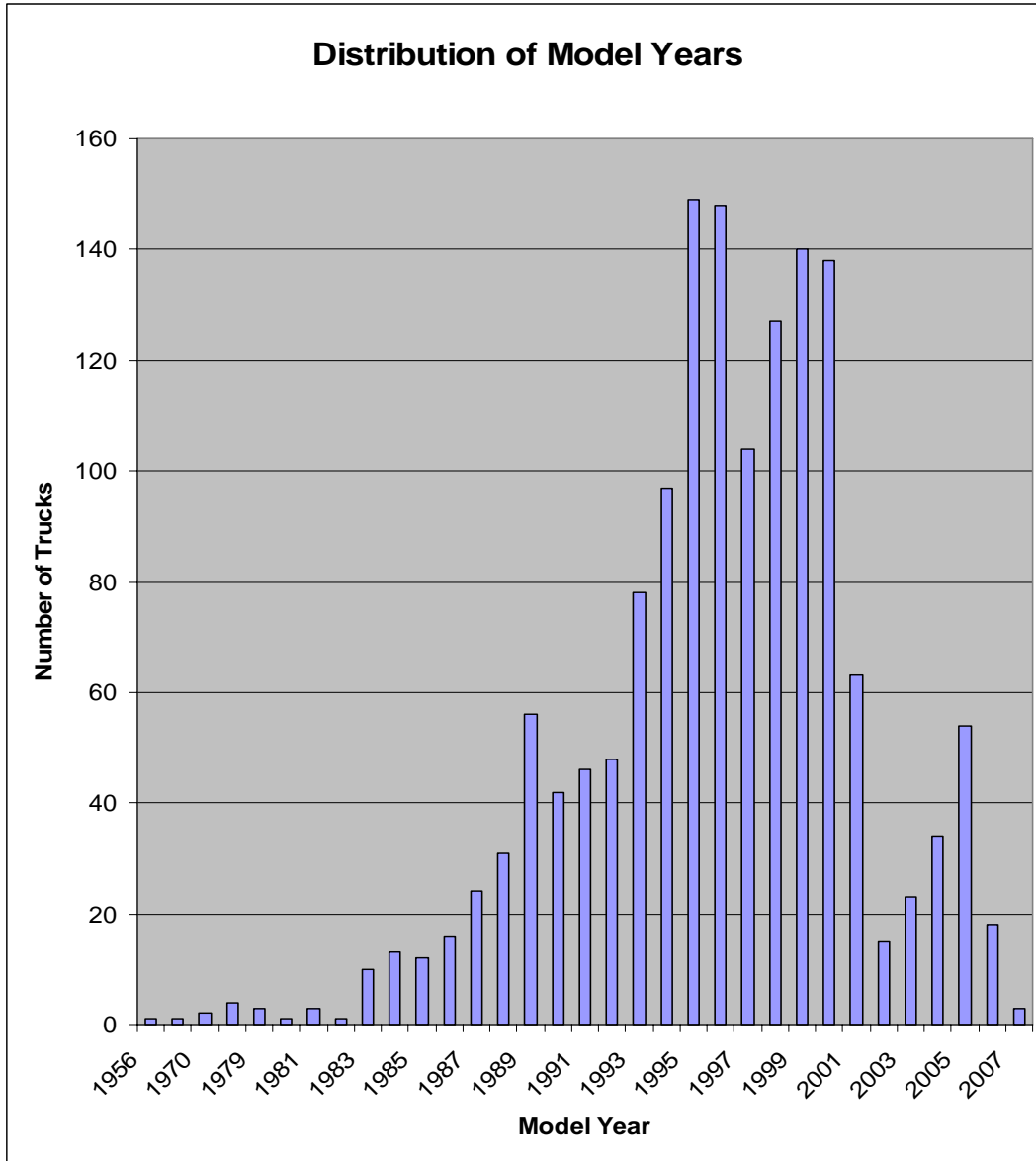
In 2006, the Port of Seattle began a pilot project with SSA Terminals to tag high volume trucks with radio frequency identification (RFID) tags. Each WhereNet RFID tag has a unique identifier which, when read by readers at the entrance to the terminal gate queuing area, corresponds with eModal database that contains information such as truck license, company and driver. Currently, there are 1,505 trucks registered with eModal for the Port of Seattle/SSA pilot. In order to obtain information on the age of the drayage truck fleet, the Port cross referenced the license plate data in the eModal database for the 1,505 registered trucks with the Washington Department of Licensing Vehicle/Vessel Inquiry system. This analysis is compared to the 2007 Washington Trucking Association Intermodal Fleet survey and the 2007 Washington Dept. of Ecology heavy-duty vehicle fleet age analysis. Based on this data, the average model year of a drayage truck operating at the Port of Seattle is 1996.<sup>1</sup>

**Table 1: Port of Seattle Drayage Truck Age Distribution**

Model Year	# Trucks	% Trucks		Model Year	# Trucks	% Trucks
1956	1	0.1%		1992	48	3.2%
1966	1	0.1%		1993	78	5.2%
1970	2	0.1%		1994	97	6.4%
1978	4	0.3%		1995	149	9.9%
1979	3	0.2%		1996	148	9.8%
1980	1	0.1%		1997	104	6.9%
1981	3	0.2%		1998	127	8.4%
1982	1	0.1%		1999	140	9.3%
1983	10	0.7%		2000	138	9.2%
1984	13	0.9%		2001	63	4.2%
1985	12	0.8%		2002	15	1.0%
1986	16	1.1%		2003	23	1.5%
1987	24	1.6%		2004	34	2.3%
1988	31	2.1%		2005	54	3.6%
1989	56	3.7%		2006	18	1.2%
1990	42	2.8%		2007	3	0.2%
1991	46	3.1%				

<sup>1</sup> Average (Mean) = 1996, Mode = 1995, Median = 1996

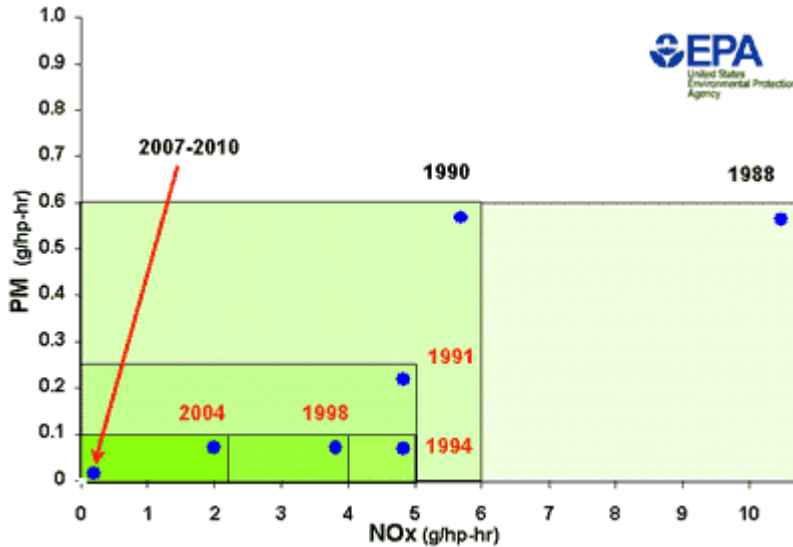
**Figure 1: Port of Seattle Drayage Truck Age Distribution**



### Comparison to the U.S. EPA Heavy-Duty Engine Standards

In order to better understand the emissions impacts of each truck model year, the Port of Seattle analysis was broken out based on U.S. EPA heavy-duty engine emissions standards. The chart below shows how the U.S. EPA heavy-duty engine standards have been strengthened over time:<sup>2</sup>

**Figure 2: U.S. EPA Heavy-Duty Engine Standards**



**Table 2: Fleet Age Profile Based on U.S. EPA Heavy-Duty Engine Emissions Standards**

Age Range	# Trucks	% Trucks
1987 and older	91	6%
1988-1989	87	5.8%
1990	42	3%
1991-1993	172	11.4%
1994-1997	498	33%
1998-2003	506	33.6%
2004-2006	106	7%
2007	3	0.2%
<i>Total</i>	<i>1,505</i>	<i>100%</i>

<sup>2</sup> Source: U.S. Department of Transportation Federal Highway Administration, <http://www.fhwa.dot.gov/environment/airtoxic/msatcompare/index.htm>

## Comparison to the Washington Trucking Association 2007 Intermodal Fleet Survey

In 2007, the Washington Trucking Association (WTA) conducted an age fleet survey of intermodal carriers.<sup>3</sup> The companies included in this survey were:

American Motor Freight	Northwest Carriers Inc.
Bluestar Transportation Inc.	Pacer Cartage
Castan Inc.	Pacific Coast Express
City Delivery Inc.	Premier Transport
Elliot Bay Transport	Puget Sound International
D&B Trucking	Seattle Transport
Graham Trucking	West Coast Trucking
Lions Trucking	Western Ports Trucking
MacMillan-Piper	

Table 3 compares the results of the WTA survey to the Port of Seattle drayage truck fleet age analysis. The results for each analysis were within the range of the other.

**Table 3: Comparison of the WTA and Port of Seattle Fleet Age Analyses**

Age Range	WTA		Port of Seattle	
	# Trucks	% Trucks	# Trucks	% Trucks
1984 and older	---	---	39	2.6%
1985-1989	60	13%	139	9.2%
1990-1994	94	20%	311	21%
1995-1999	215	47%	668	44%
2000-2006	91	20%	345	23%
2007	---	---	3	0.2%
<i>Total</i>	<i>460</i>	<i>100%</i>	<i>1,505</i>	<i>100%</i>

<sup>3</sup> Data obtained on 8/9/2007 via hard copy from Larry Pursley, Washington Trucking Association.

## Comparison to the 2007 Washington Department of Ecology Heavy-Duty Vehicle Analysis

In 2007, the Washington Department of Ecology conducted a fleet age analysis of heavy-duty vehicles using 2007 Washington Department of Licensing data.<sup>4</sup> As of July 2007, there were 56,976 Class 8 vehicles registered in Washington State.<sup>5</sup> Using this data, the average model year for Class 8 heavy-duty trucks in the statewide fleet is 1995.<sup>6</sup> Based on this comparison, the drayage truck fleet operating at the Port of Seattle is approximately 1 year newer than the statewide Class 8 heavy-duty vehicle fleet.

**Table 4: Washington Department of Ecology Statewide Class 8 Heavy-Duty Vehicle Age Distribution in 2007**

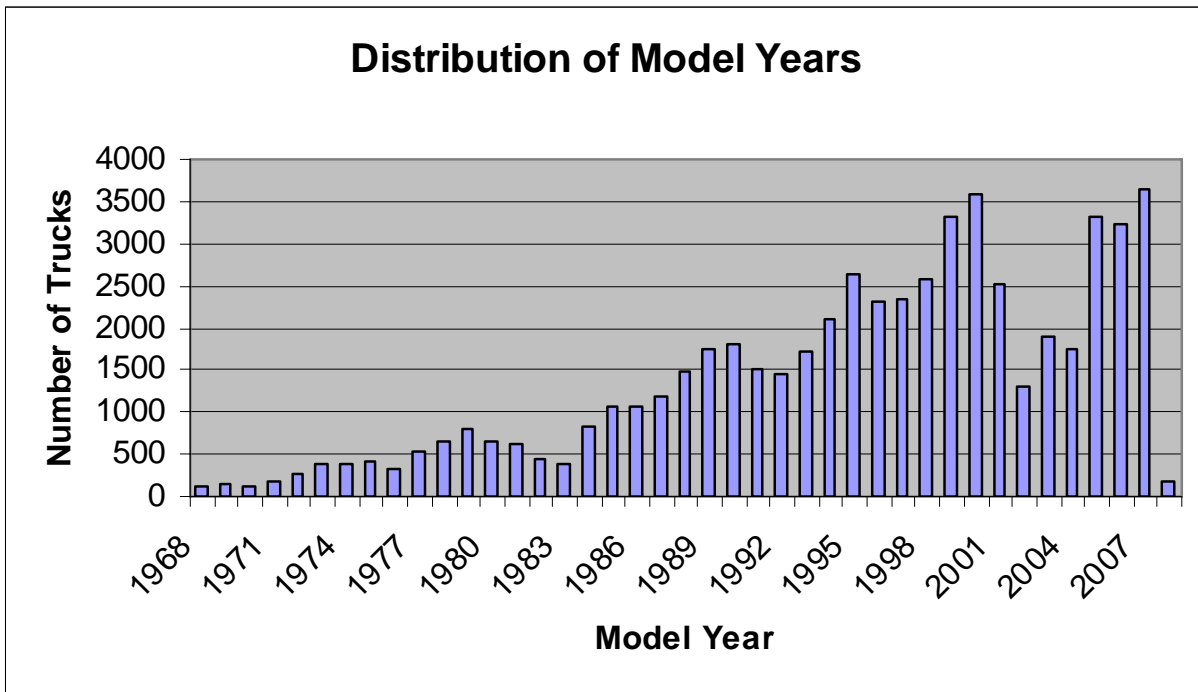
Model Year	# Trucks	% Trucks		Model Year	# Trucks	% Trucks
1968	105	0.2%		1989	1,753	3.1%
1969	137	0.2%		1990	1,806	3.2%
1970	127	0.2%		1991	1,522	2.7%
1971	172	0.3%		1992	1,442	2.5%
1972	265	0.5%		1993	1,714	3.0%
1973	381	0.7%		1994	2,105	3.7%
1974	384	0.7%		1995	2,636	4.6%
1975	420	0.7%		1996	2,309	4.1%
1976	318	0.6%		1997	2,355	4.1%
1977	533	0.9%		1998	2,584	4.5%
1978	651	1.1%		1999	3,317	5.8%
1979	806	1.4%		2000	3,599	6.3%
1980	665	1.2%		2001	2,514	4.4%
1981	619	1.1%		2002	1,293	2.3%
1982	446	0.8%		2003	1,903	3.3%
1983	373	0.7%		2004	1,741	3.1%
1984	829	1.5%		2005	3,308	5.8%
1985	1,071	1.9%		2006	3,219	5.6%
1986	1,069	1.9%		2007	3,645	6.4%
1987	1,187	2.1%		2008	163	0.3%
1988	1,490	2.6%				

<sup>4</sup> Data obtained 8/15/2007 via email from Sally Otterson, Washington State Department of Ecology.

<sup>5</sup> Class 8 heavy-duty vehicles are defined as Class 8A (33,001 - 60,000 lbs gvwt) and Class 8B (>= 60,000 lbs gvwt).

<sup>6</sup> Average (Mean) = 1995, Mode = 2007, Median = 1997. Average calculation verified by Sally Otterson via email 8/20/2007.

**Figure 3: Statewide Class 8 Heavy-Duty Vehicle Age Distribution in 2007**



**Table 5: Comparison of the Statewide Washington Department of Ecology and Port of Seattle Fleet Age Analyses Based on U.S. EPA Engine Emissions Standards**

Age Range	Statewide		Port of Seattle	
	# Trucks	% Trucks	# Trucks	% Trucks
1987 and older	10,558	18.5%	91	6%
1988-1989	3,243	5.7%	87	5.8%
1990	1,806	3.2%	42	3%
1991-1993	4,678	8.2%	172	11.4%
1994-1997	9,405	16.5%	498	33%
1998-2003	15,210	26.7%	506	33.6%
2004-2006	8,268	14.5%	106	7%
2007+	3,808	6.7%	3	0.2%
<i>Total</i>	<i>56,976</i>	<i>100%</i>	<i>1,505</i>	<i>100%</i>

## Comparison to the 2007 Washington Department of Ecology Heavy-Duty Vehicle Analysis for the Puget Sound Clean Air Agency Region

From the Washington Department of Ecology statewide data set, Class 8 heavy-duty vehicle information for the Puget Sound Clean Air Agency (PSCAA) region<sup>7</sup> was obtained. In 2007, 24,810 Class 8 heavy-duty vehicles were registered in the PSCAA region.<sup>8</sup> Using this data, the average model year for Class 8 heavy-duty trucks in the statewide fleet is 1998.<sup>9</sup> Based on this comparison, the drayage truck fleet operating at the Port of Seattle is approximately 2 years older than the PSCAA region Class 8 heavy-duty vehicle fleet.

**Table 6: Washington Department of Ecology Class 8 Heavy-Duty Vehicle Age Distribution in the PSCAA Region in 2007**

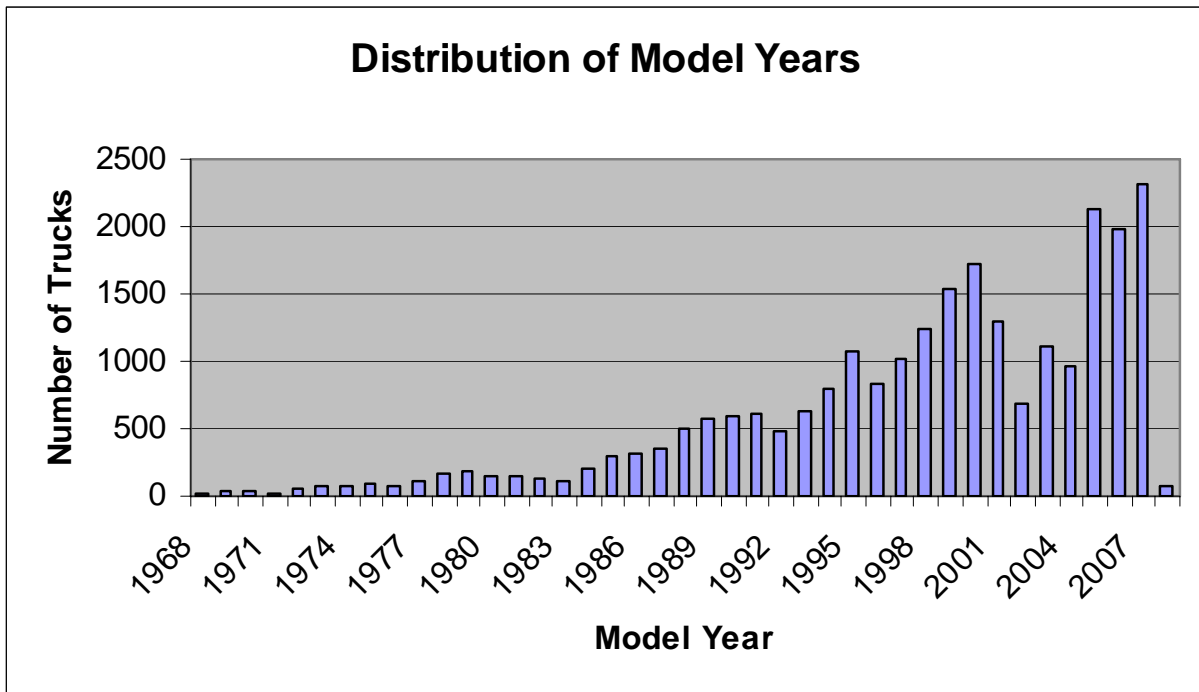
Model Year	# Trucks	% Trucks		Model Year	# Trucks	% Trucks
1968	26	0.1%		1989	570	2.3%
1969	37	0.1%		1990	587	2.4%
1970	34	0.1%		1991	618	2.5%
1971	27	0.1%		1992	487	2.0%
1972	59	0.2%		1993	625	2.5%
1973	77	0.3%		1994	790	3.2%
1974	79	0.3%		1995	1,081	4.4%
1975	88	0.4%		1996	831	3.3%
1976	65	0.3%		1997	1,018	4.1%
1977	113	0.5%		1998	1,232	5.0%
1978	172	0.7%		1999	1,530	6.2%
1979	179	0.7%		2000	1,727	7.0%
1980	148	0.6%		2001	1,294	5.2%
1981	155	0.6%		2002	679	2.7%
1982	121	0.5%		2003	1,105	4.5%
1983	103	0.4%		2004	961	3.9%
1984	212	0.9%		2005	2,126	8.6%
1985	302	1.2%		2006	1,973	8.0%
1986	323	1.3%		2007	2,317	9.3%
1987	352	1.4%		2008	82	0.3%
1988	505	2.0%				

<sup>7</sup> King, Kitsap, Pierce, and Snohomish Counties

<sup>8</sup> King = 11,455, Kitsap = 878, Pierce = 8,549, Snohomish = 3,928

<sup>9</sup> Average (Mean) = 1997.8, Mode = 2007, Median = 1999. Average calculation verified by Sally Otterson via email 8/20/2007.

**Figure 4: PSCCA Region Class 8 Heavy-Duty Vehicle Age Distribution in 2007**



**Table 7: Comparison of the 2007 Washington Department of Ecology Heavy-Duty Vehicle Analysis for the Puget Sound Clean Air Agency Region and the Port of Seattle Fleet Age Analyses Based on U.S. EPA Engine Emissions Standards**

Age Range	PSCAA Region		Port of Seattle	
	# Trucks	% Trucks	# Trucks	% Trucks
1987 and older	2,672	10.8%	91	6%
1988-1989	1,075	4.3%	87	5.8%
1990	587	2.4%	42	3%
1991-1993	1,730	7.0%	172	11.4%
1994-1997	3,720	15.0%	498	33%
1998-2003	7,567	30.5%	506	33.6%
2004-2006	5,060	20.4%	106	7%
2007+	2,399	9.7%	3	0.2%
<i>Total</i>	<i>24,810</i>	<i>100%</i>	<i>1,505</i>	<i>100%</i>