

**VEHICLE FLEET CHARACTERIZATION  
STUDY OF THE CITY OF MADRID  
Year 2017**

**General Direction of Sustainability and  
Environmental Control**



medio ambiente y  
movilidad

**MADRID**

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*General Direction of Sustainability and Environmental Control*

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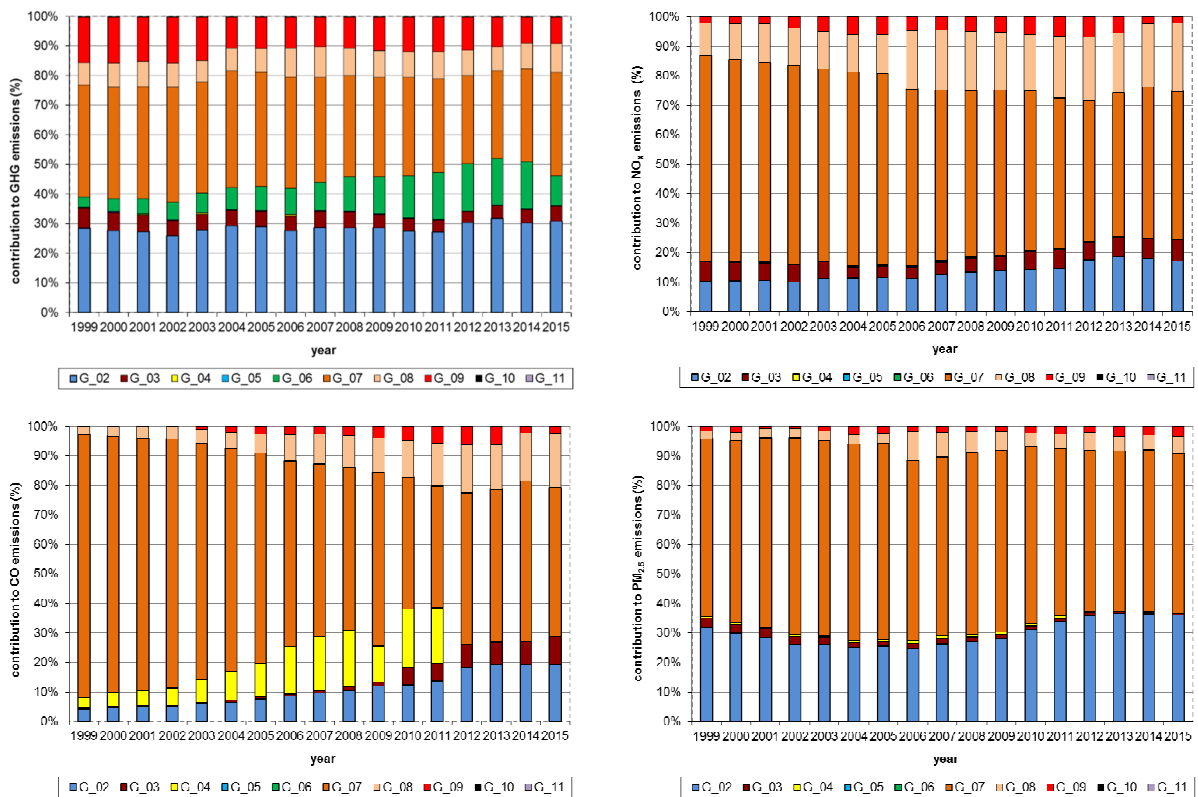
## TABLE OF CONTENTS

1	INTRODUCTION.....	4
2	BACKGROUND .....	5
3	METHODOLOGY.....	5
3.1	Zoning .....	6
3.2	Sampling period.....	6
3.3	Sampling points.....	7
3.4	Data cleaning and information provided from DGT .....	9
3.5	Entering and processing the information.....	9
3.5.1	Processing data from taxis.....	11
3.5.2	Processing data from buses (Municipal Transport Company) .....	11
3.5.3	Integration of manual sampling data results.....	12
3.6	Data aggregation.....	12
3.6.1	Aggregation at zone level .....	12
3.6.2	Aggregation at municipality level.....	13
4	RESULTS .....	13
4.1	The 'standard vehicle' .....	13
4.2	Age of the vehicle fleet .....	15
4.3	Results by ZIP code .....	16
4.4	Comparison with the VFCS 2013.....	17
5	ACKNOWLEDGEMENTS.....	19
	ATTACHMENT .....	20

# 1 INTRODUCTION

Road traffic is the activity that contributes most to air-polluting emissions in the city of Madrid, as is the case in most of the world's major metropolitan areas. Its emissions are relevant for the pollutants that affect local air quality and for greenhouse gases (GHG).

Madrid City Council's Department for the Environment and Mobility, in line with its proposal to use the most appropriate instruments for developing its competences in the field of air quality protection, energy efficiency and climate change prevention, annually completes the Air Pollutant Emissions Inventory of the city of Madrid through the General Direction of Sustainability and Environmental Control. According to data from the latest available version of the abovementioned inventory, road traffic in 2015 was responsible for 50.4% of NO<sub>x</sub> emissions, 50.5% of CO emissions, 54.2% of PM<sub>2.5</sub> emissions and 41.8% of CO<sub>2</sub> emissions. As may be seen in Figure 1, this sector totalled the main contribution to emissions of these compounds in the period 1999-2015.



**Figure 1.** Road traffic's contribution (G\_07= SNAP 07 group, road traffic) to GHG and air pollutants emissions (NO<sub>x</sub>, CO and PM<sub>2.5</sub>) in Madrid

In the development of on-road mobile source emission inventories, reliable data on the vehicle fleet characteristics such as age or fuel type distribution are as important as accurate data concerning vehicle activity and emission rates. This involves an appropriate characterisation of the vehicles that are actually moving around the municipality (unlike what would be an exploitation of available vehicle registration databases), making it possible to estimate the mileage per type of vehicle (e.g. passenger

car, light commercial vehicle, ...), type of fuel consumed (e.g. gasoline, diesel, ...) and age distribution (which is related to the emission standards applied).

The data from the national traffic authority (Dirección General de Tráfico, DGT) can vary significantly from Madrid-specific moving vehicle fleet data. Accordingly, the General Direction of Sustainability and Mobility Planning contracted the Technical University of Madrid to conduct a field campaign to characterize the Madrid-specific moving vehicle fleet. This study is the third edition (year 2017), which updates the previous two elaborated in 2008-2009 and 2013.

The main result of this study is establishing what is known as a "standard vehicle", defined as the representative mileage distribution per type of vehicle in a specific area. The concept of standard vehicle is used for calculating aggregated emissions in the area under study, the city of Madrid.

This report includes the main methodological issues considered to design and complete the field campaign carried out in 2017, as well as the main results obtained.

## 2 BACKGROUND

The importance of the road traffic sector in air pollutant emissions and the continuous adoption of policies and measures to improve air quality require to update the information of the vehicle fleet characteristics currently moving around the municipality.

Madrid City Council elaborated a preliminary version of the vehicle fleet characterization in 2008-2009, limited to the internal area of M30 ring-road, which had the following characteristics:

- Field campaigns in different areas within the M30 ring-road
- discontinuous manual sampling at 30 points, from June to December 2008, registering a total of 104,335 vehicles
- complementary sampling with cameras at a subset of 9 points, carried out in March 2009
- weighting of readings gathered in the different studies with data on average daily traffic (ADT), provided by Madrid City Council
- relative mileage distribution for a "standard vehicle".

Afterwards, the second edition of the study was elaborated in 2013, with a similar methodology to that used in 2017. Due to the important methodological differences between the study carried out in 2008-2009, and 2013/2017 editions, the results obtained in 2017 are only compared to the results of 2013.

## 3 METHODOLOGY

The study was designed to satisfy the information requirements specified by the EMEP/EEA methodology for calculating road traffic emissions, taking the most of the available municipal resources.

The field campaigns have been designed to count the number of each vehicle type according to the three hierarchical levels of COPERT 4 (*COmputer Programme to calculate emissions from Road Transport, version 4*), software that integrates the EMEP/EEA methodology. In this respect, the registration numbers of vehicles are captured, enabling characterisation of vehicle type, its fuel and its emissions standard (EURO standard). The three hierarchical levels of COPERT are sector, subsector and technology, as described in the following sections of this report.

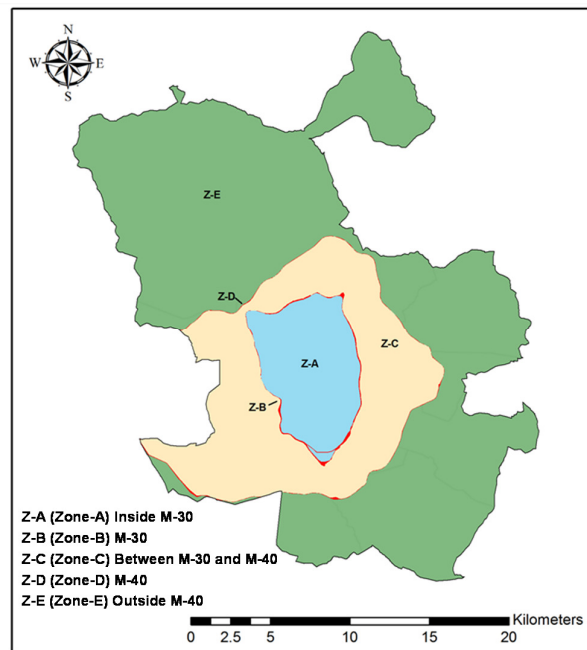
The municipal resources consisted of video cameras to capture licence plate numbers (such as red-light traffic cameras), data from traffic count stations and data provided by the municipal traffic model. Furthermore, the results of the previous study were used for comparison purposes.

### 3.1 Zoning

The municipality of Madrid has been geographically divided into five areas (called A, B, C, D and E), according to their relevance in terms of mileage and to possible differences in the composition of traffic circulating in them. Accordingly, it was decided to group the previous 9 administrative areas considered by the municipal traffic model, into just these 5 areas, as in the study of 2013 (Table 1 and Figure 2).

**Table 1.** Zoning for the Vehicle Fleet Characterization Study (VFCS, year 2017)

Zone	Description	Correspondence with traffic model
A	Inside M30/Calle 30	1-5
B	M30/Calle 30 (inner ring road)	6
C	Between M30/Calle 30 and M40	7
D	M40 (outer ring road)	8
E	Outside M40	9



**Figure 2.** Zoning for the Vehicle Fleet Characterization Study (VFCS, 2017)

### 3.2 Sampling period

The field campaign to capture licence plates was carried out from Monday 27 May to Thursday 6 April 2017, both inclusive. The campaign lasted more than seven days in order to gather representative information for every day of the week and, therefore, avoid possible deviations in the results, arising from possible differences in the composition of traffic between working day and the weekend.

Manual sampling was completed from 29 May to 6 June 2017.

### 3.3 Sampling points

The sampling points were selected to be representative of each of the five areas defined, also considering the municipal resources available. These resources are:

- Red light cameras of Madrid City Council located at 35 points of zones A, B, C and E (Table 2). They collected a total of 3,477,162 records during the campaign.

**Table 2.** Location of red-light cameras used in the study

Red light No.	Address	Zone
1	C/ Paseo de la Castellana 167	A
2	Avda. Cardenal Herrera Oria 83	C
3	C/ Hermanos García Noblejas 123	C
4	C/ Paseo de la Castellana 105	A
5	Avda. Poblados - estación Aluche	C
6	Avda. de las Filipinas 18	A
7	Avda. Ventisquero Condesa 42	C
8	Avda. Logroño esquina C/ Joaquín Ibarra	E
9	Avda. Ilustración equina C/ Betanzos	B
10	Avda. Andalucía Metro San Cristóbal	E
11	Camino de los Vinateros 47	C
12	C/ O'Donnell con C/ Doctor Esquerdo	A
13	Avda. Mediterráneo 32	A
14	C/ Menéndez Pelayo - Hospital Niño Jesús	A
15	C/ Francisco Silvela 62	A
16	C/ Sinesio Delgado - Glorieta Piedrafrita de Cebrero	A
17	Avda. Herrera Oria esquina C/ La Masó	C
18	Avda. Francisco Pi y Margall esquina C/ Ana de Austria	C
19	C/ de la Fuente de Carrantona esquina C/ Hacienda de Pavones	C
20	Avda. Andalucía esquina C/ Alcocer	E
21	Avda. Marqués de Corbera - C/ Ricardo Ortiz	C
22	C/ de Alcalá - C/ de San Romualdo	C
23	C/ de Ascao - C/ de Emilio Ferrari	C
24	Avda. Ciudad de Barcelona - C/ Menéndez Pelayo	A
25	C/ de Alberto Aguilera - C/ Baltasar Gracián	A
26	C/ de Joaquín Costa - C/ de Velázquez	A
27	C/ Vía Lusitana - Plaza Fernández Ladreda	C
28	C/ de José Abascal - C/ de Santa Engracia	A
29	Avda. Monforte de Lemos - C/ de Finisterre	A
30	Avda. de América - C/ Cartagena	A
31	Camino del Barrial - C/ Fernando Lázaro Carreter	C
32	Crta. De Carabanchel a Aravaca - C/ Villaviciosa	C
33	Avda. La Peseta - Crta. Barrio de la Fortuna	C
34	C/ del General Ricardos - Paseo del Quince de Mayo	C
35	C/ de Cea Bermúdez - C/ Vallehermoso	A

- Calle 30 cameras (zone B). They registered 2,630,696 licence plates.
- M30 cameras at 2 sites (surface). Two cameras: one located in the Ventas neighbourhood and another at the exit from Calle Costa Rica (zone B). They captured a total of 874,881 licence plates.
- Cameras in access highways to the city of Madrid. Four cameras located in A2 (zone C), A3, M13 and M14 (zone E). They registered a total of 1,607,644 licence plates.

Table 3 summarises the data captured for the study.

**Table 3.** Summary of data captures

Survey	Number of sampling points	Zone	Number of records
<b>Red light cameras</b>	35	A, B, C y E	3,447,162
<b>Calle 30</b>	1	B	874,881
<b>M30</b>	2	B	2,630,696
<b>A2</b>	1	C	650,854
<b>A3</b>	1	E	568,739
<b>M13</b>	1	E	92,900
<b>M14</b>	1	E	295,151
<b>TOTAL</b>	<b>42</b>	<b>A, B, C y E</b>	<b>8,560,383</b>

Additionally, and after entering and processing the data, it was necessary to take manual readings at certain points where sampling was done with cameras, as it was detected that these devices were not registering licence plates from certain lanes and/or type of vehicles properly:

- the existence of bus-taxi lanes or side lanes where there is no registration of licence numbers and the composition of the traffic is characteristic and different from central lanes where licence numbers were registered without difficulty (greater presence of taxis, buses, motorcycles and mopeds)
- cameras unable to register licence plates on mopeds
- difficulty when registering licence plates on motorcycles, depending on the lane and part of the lane they are circulating on, and traffic conditions.

In this respect, manual sampling completed data obtained from the red light cameras in 13 of the 35 red light cameras (Table 4), with the aim of correcting the limitations of the cameras used in those sampling points. During the manual samplings only number of vehicles by type (COPERT sector) were registered, instead of licence plate's numbers. The sampling in each of the points was carried out in two different times (morning and afternoon) to obtain a traffic distribution by sector more representative, due to it is variable along the day.

**Table 4.** Manual counting at red lights

Red light No.	Adress	Zone
4	C/ Paseo de la Castellana 105	A
6	Avda. de las Filipinas 18	A
12	C/ O'Donnell con C/ Doctor Esquerdo	A
15	C/ Francisco Silvela 62	A
16	C/ Sinesio Delgado - Glorieta Piedrafrita de Cebrero	A
20	Avda. Andalucía esquina C/ Alcocer	E
24	Avda. Ciudad de Barcelona - C/ Menéndez Pelayo	A
25	C/ de Alberto Aguilera - C/ Baltasar Gracián	A
26	C/ de Joaquín Costa - C/ de Velázquez	A
27	C/ Vía Lusitana - Plaza Fernández Ladreda	C
30	Avda. de América - C/ Cartagena	A
34	C/ del General Ricardos - Paseo del Quince de Mayo	C
35	C/ de Cea Bermúdez - C/ Vallehermoso	A



### 3.4 Data cleaning and information provided from DGT

During the field campaign, a total of 8,560,383 licence numbers were captured. To obtain data associated with these licence numbers, the vehicle registration database managed by the national traffic authority (Dirección General de Tráfico, DGT) was consulted. Before requesting this information, data were checked and cleaned:

- to eliminate incorrect or incomplete readings
- to eliminate duplicates

After data cleaning, the sample consisted of 1,777,065 registers. The following attributes were obtained from each licence number:

- date of first registration
- brand
- model
- vehicle type
- service
- number of seats
- propulsion technology
- hybrid indicator (yes/no)
- engine displacement
- maximum weight
- ZIP code of the vehicle
- ZIP code of the owner

It should be noted that the exclusion of duplicate records was only carried out in order to reduce the volume of information requested to DGT. All records, including duplicates, were considered in the study.

### 3.5 Entering and processing the information

The next step consisted of establishing correspondence between each of the licence numbers registered and each of the vehicle types collected in the EMEP/EEA methodology. This methodology, implemented in the software COPERT 4, classifies vehicles according to three hierarchical levels:

- Sector: passenger cars, light commercial vehicles, heavy duty trucks, buses, motorcycles and mopeds
- Subsector: disaggregation of each sector by fuel, cylinder capacity and/or authorised maximum weight. Accordingly,
  - passenger cars are disaggregated by fuel and cylinder capacity,
  - light commercial and heavy duty vehicles by fuel and weight
  - buses by weight
  - motorcycles and mopeds by engine displacement

The subsector "electric" has been established for certain sectors, in order to include this propulsion technology, which, due to its lack of exhaust emissions, does not appear as such in COPERT.

- **Technology:** each subsector is separated according to emission reduction standards.

Similarly, some new categories have been created with the same COPERT structure to classify the vehicles that use unusual energy sources for its sector. Although they are a minority, its distinction has been considered relevant.

To assign sector, subsector and technology to each licence number, a series of attributes provided by DGT was used for each of the licence numbers registered. Accordingly, in general:

- to define the sector, the attributes "vehicle type", "number of seats" and "maximum weight" were used;
- to establish the subsector, the attributes "propulsion", "engine displacement", "maximum weight" and "hybrid indicator" were used (the attributes "brand" and "model" were also used to identify hybrids);
- to establish "technology", the attribute used is "date of first registration", thus determining the emission standards, as shown in Table 5.

**Table 5.** Classification of vehicles (EMEP/EEA-COPERT methodology)

COPERT Sector	Fuel/ Propulsion	Emission standards	European Emission Standard time frame		
			< 1.4l	>=1.4l y <=2.0l	> 2.0l
Passenger cars	Gasoline	PRE ECE	- 1971	- 1971	- 1971
		ECE 15/00-01	1972 – 1977	1972 - 1977	1972 - 1977
		ECE 15/02	1978 – 1979	1978 - 1979	1978 - 1979
		ECE 15/03	1980 – 1984	1980 - 1984	1980 - 1984
		ECE 15/04	1985 – 1992	1985 - 1992	1985 - 1989
		<b>Euro 1</b> - 91/441/CEE	1993 – 1996	1993 - 1996	1990 - 1996
		<b>Euro 2</b> - 94/12/CE	1997 – 1999	1997 - 1999	1997 - 1999
		<b>Euro 3</b> - 98/69/CE S 2000	2000 – 2004	2000 - 2004	2000 - 2004
		<b>Euro 4</b> - 98/69/CE S 2005	2005 – 2010	2005 – 2010	2005 – 2010
		<b>Euro 5</b> - 715/2007/CE S 2011	2011 – 2014	2011 – 2014	2011 – 2014
		<b>Euro 6</b> - 715/2007/CE S 2015	2015 -	2015 -	2015 -
		2-stroke engine			
		Diesel			<=2.0l
	Conventional			- 1992	- 1992
	<b>Euro 1</b> - 91/441/CEE		1993 – 1996	1993 – 1996	1993 – 1996
	<b>Euro 2</b> - 94/12/CE		1997 – 1999	1997 – 1999	1997 – 1999
	<b>Euro 3</b> - 98/69/CE S 2000		2000 – 2004	2000 – 2004	2000 – 2004
	<b>Euro 4</b> - 98/69/CE S 2005		2005 – 2010	2005 – 2010	2005 – 2010
	<b>Euro 5</b> - 715/2007/CE S 2011		2011 – 2014	2011 – 2014	2011 – 2014
	<b>Euro 6</b> - 715/2007/CE S 2015		2015 -	2015 -	2015 -
	LPG	Conventional		- 1992	
		<b>Euro 1</b> - 91/441/CEE		1993 - 1996	
		<b>Euro 2</b> - 94/12/CE		1997 - 1999	
		<b>Euro 3</b> - 98/69/CE S 2000		2000 - 2004	
		<b>Euro 4</b> - 98/69/CE S 2005		2005 - 2010	
		<b>Euro 5</b> - 715/2007/CE S 2011		2011 - 2014	
		<b>Euro 6</b> - 715/2007/CE S 2015		2015 -	
CNG	<b>Euro 4</b> - 98/69/CE S 2005		2005 - 2010		
	<b>Euro 5</b> - 715/2007/CE S 2011		2011 - 2014		
	<b>Euro 6</b> - 715/2007/CE S 2015		2015 -		
Hybrid	<b>Euro 4</b> - 98/69/CE S 2005		2005 -		
Light commercial vehicles < 3.5t (N1)	Gasoline	Conventional		- 1992	
		<b>Euro 1</b> - 93/59/CEE		1993 – 1996	
		<b>Euro 2</b> - 96/69/CE		1997 – 1999	
		<b>Euro 3</b> - 98/69/CE S 2000		2000 – 2004	
		<b>Euro 4</b> - 98/69/CE S 2005		2005 – 2010	
		<b>Euro 5</b> - 715/2007/CE S 2011		2011 – 2014	
	<b>Euro 6</b> - 715/2007/CE S 2015		2015 -		
	Diesel	Conventional		- 1992	
		<b>Euro 1</b> - 93/59/CEE		1993 – 1996	

COPERT Sector	Fuel/ Propulsion	Emission standards	European Emission Standard time frame			
		<b>Euro 2 - 96/69/CE</b>	1997 – 1999			
		<b>Euro 3 - 98/69/CE S 2000</b>	2000 – 2004			
		<b>Euro 4 - 98/69/CE S 2005</b>	2005 – 2010			
		<b>Euro 5 - 715/2007/CE S 2011</b>	2011 – 2014			
		<b>Euro 6 - 715/2007/CE S 2015</b>	2015 -			
<b>Heavy-duty trucks &gt; 3.5t (N2 and N3)</b>	<b>Gasoline</b>	Conventional				
		<b>Diesel</b>				
		Conventional	<=7.5t - 1991	<b>7.5t- 16t</b> - 1991	<b>16t - 32t</b> - 1991	<b>&gt;32t</b> - 1991
		<b>Euro I - 91/542/CEE S I</b>	1992 - 1994	1992 - 1994	1992 - 1994	1992 - 1994
		<b>Euro II - 91/542/CEE S II</b>	1995 - 1999	1995 - 1999	1995 - 1999	1995 - 1999
		<b>Euro III - 1999/96/CE S I</b>	2000 - 2004	2000 - 2004	2000 - 2004	2000 - 2004
		<b>Euro IV - 1999/96/CE S II</b>	2005 – 2007	2005 – 2007	2005 – 2007	2005 – 2007
		<b>Euro V - 1999/96/CE S III</b>	2008 - 2013	2008 - 2013	2008 - 2013	2008 - 2013
	<b>Euro VI – 595/2009/CE</b>	2014 -	2014 -	2014 -	2014 -	
<b>Buses</b>	<b>Diesel</b>	Conventional				
		<b>Euro I - 91/542/CEE S I</b>				
		<b>Euro II - 91/542/CEE S II</b>				
		<b>Euro III - 1999/96/CE S I</b>				
		<b>Euro IV - 1999/96/CE S II</b>				
		<b>Euro V - 1999/96/CE S III</b>				
		<b>Euro VI – 595/2009/CE</b>	2014 -	2014 -	2014 -	2014 -
	<b>Natural gas</b>	<b>Euro I - 91/542/CEE S I</b>				
		<b>Euro II - 91/542/CEE S II</b>				
		<b>Euro III - 1999/96/CE S I</b>				
<b>EEV – 1999/96/CE</b>						
<b>Mopeds &lt; 50cm<sup>3</sup></b>	<b>Gasoline</b>	Conventional				
		<b>Euro I - 97/24/CE S I</b>				
		<b>Euro II - 97/24/CE S II</b>				
		<b>Euro III - 2002/51/CE S II</b>				
		<b>Euro IV - 168/2013/CE</b>				
<b>Motorcycles</b>	<b>Gasoline</b>		<b>2-stroke &gt; 50cm<sup>3</sup></b>	<b>4-stroke 50–250cm<sup>3</sup></b>	<b>4-stroke 250–750cm<sup>3</sup></b>	<b>4-stroke &gt; 750cm<sup>3</sup></b>
		Conventional				
		<b>Euro I - 97/24/CE</b>	1999 - 2002	1999 – 2002	1999 – 2002	1999 - 2002
		<b>Euro II - 2002/51/CE S I</b>	2003 - 2005	2003 – 2005	2003 – 2005	2003 - 2005
		<b>Euro III - 2002/51/CE S II</b>	2006 - 2016	2006 - 2016	2006 - 2016	2006 - 2016
		<b>Euro IV - 168/2013/CE</b>	2017 -	2017 -	2017 -	2017 -

### 3.5.1 Processing data from taxis

The special relevance of the taxi sector requires establishing an additional COPERT sector, called TAXI, in order to separate this type of vehicle from the "Passenger cars" group. To do so, the attribute "service", provided by DGT, was used.

### 3.5.2 Processing data from buses (Municipal Transport Company)

A close collaboration with the Municipal Transport Company (EMT) has provided detailed information about:

- number of buses on each line and mileage
- routes of the different lines
- licence number, fuel and European emission standard of each vehicle operating on each line.

This information allowed us to complete the data obtained at the sampling points where certain lanes (bus-taxi or side lanes) are not registered by red-light cameras. It also allows EMT buses to be disaggregated within the COPERT sector "buses" and therefore differentiate emissions from a segment of vehicles dependent on Madrid City Council, for which specific measures can be adopted.

Figure 3 shows the different EMT bus lines.

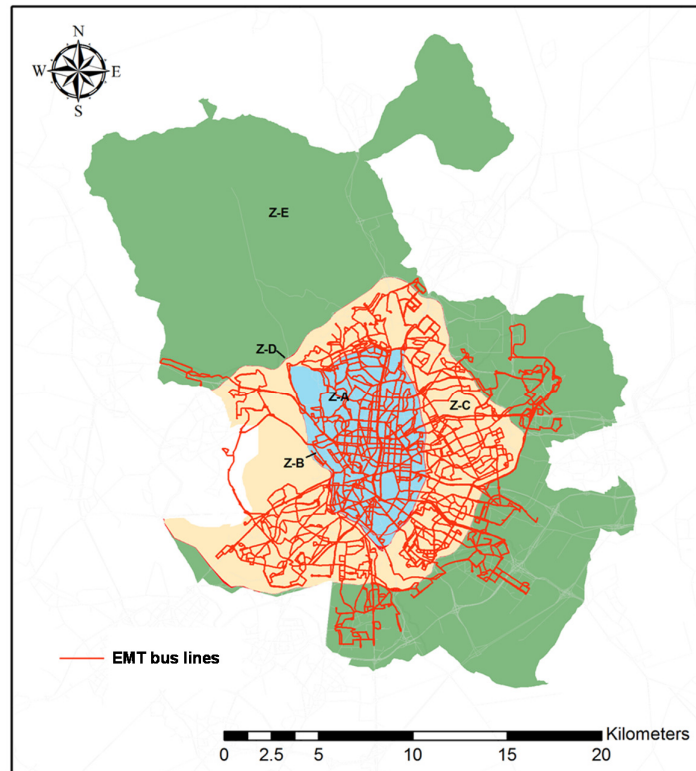


Figure 3. EMT bus lines

### 3.5.3 Integration of manual sampling data results

Manual sampling data, together with detailed information of buses, were used to complete a redistribution of traffic by sector at a sampling point level. Each sector maintained the distribution by subsector and technology obtained by records from cameras at each sampling point.

## 3.6 Data aggregation

### 3.6.1 Aggregation at zone level

The data obtained at zone level were aggregated to get the composition of the road traffic in each of the five zones. This process of aggregation considered the following hypotheses:

- assuming a homogeneous composition of road traffic within each of the five zones studied
- not weighting between sampling points or between type of vehicles within a zone, that is, assuming that the distance travelled by a vehicle whose licence number has been registered is the same within each zone
- considering that the mileage by vehicle type within each zone are directly proportional to the number of records of that vehicle type in that zone

### 3.6.2 Aggregation at municipality level

Obtaining a single "standard vehicle" for the whole municipality requires a procedure of weighting among the 5 different zones. The municipal traffic model was used for this. Accordingly, the composition in each zone have been weighted with the percentage distribution of total mileage by zone in the year 2016 (Table 6).

**Table 6.** Percentage distribution of mileage by zone according to the traffic model. Year 2016

A	B	C	D	E	TOTAL
17.4%	13.1%	26.8%	15.8%	26.9%	100.0%

The macroscopic traffic simulation model is capable of providing information in GIS format (Geographic Information System). It comprises the city of Madrid's road network divided into more than 11,000 sections (in its 2016 version), which are characterised by a set of parameters, including hourly traffic flow and average speed.

## 4 RESULTS

This study establishes what is known as a "standard vehicle", defined as the representative mileage distribution of journeys by type of vehicle in a specific area.

### 4.1 The 'standard vehicle'

Table 6 includes the composition of the standard vehicle at sector level for each studied zone. Figure 4 shows this same information for the whole municipality and for zone A (inside the M30).

**Table 7.** Composition of the 'standard vehicle' at sector level and by zone

Sector	ZONES					TOTAL Municipality
	A	B	C	D	E	
<b>Passenger cars</b>	<b>72.13%</b>	<b>83.71%</b>	<b>78.36%</b>	<b>83.71%</b>	<b>78.77%</b>	<b>78.93%</b>
<b>Light commercial vehicles</b>	<b>5.01%</b>	<b>8.88%</b>	<b>6.97%</b>	<b>8.88%</b>	<b>7.63%</b>	<b>7.36%</b>
<b>Heavy duty trucks</b>	<b>1.60%</b>	<b>2.56%</b>	<b>2.15%</b>	<b>2.56%</b>	<b>3.03%</b>	<b>2.41%</b>
<b>Buses</b>	<b>2.20%</b>	<b>0.97%</b>	<b>2.17%</b>	<b>0.97%</b>	<b>1.76%</b>	<b>1.72%</b>
EMT	1.86%	0.08%	1.28%	0.01%	0.35%	0.77%
Non-EMT	0.33%	0.89%	0.89%	0.96%	1.41%	0.94%
<b>Mopeds</b>	<b>0.34%</b>	<b>0.00%</b>	<b>0.20%</b>	<b>0.00%</b>	<b>0.03%</b>	<b>0.12%</b>
<b>Motorcycles</b>	<b>8.25%</b>	<b>0.43%</b>	<b>2.33%</b>	<b>0.43%</b>	<b>0.86%</b>	<b>2.42%</b>
<b>Taxis</b>	<b>10.47%</b>	<b>3.46%</b>	<b>7.83%</b>	<b>3.46%</b>	<b>7.93%</b>	<b>7.05%</b>
<b>TOTAL</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

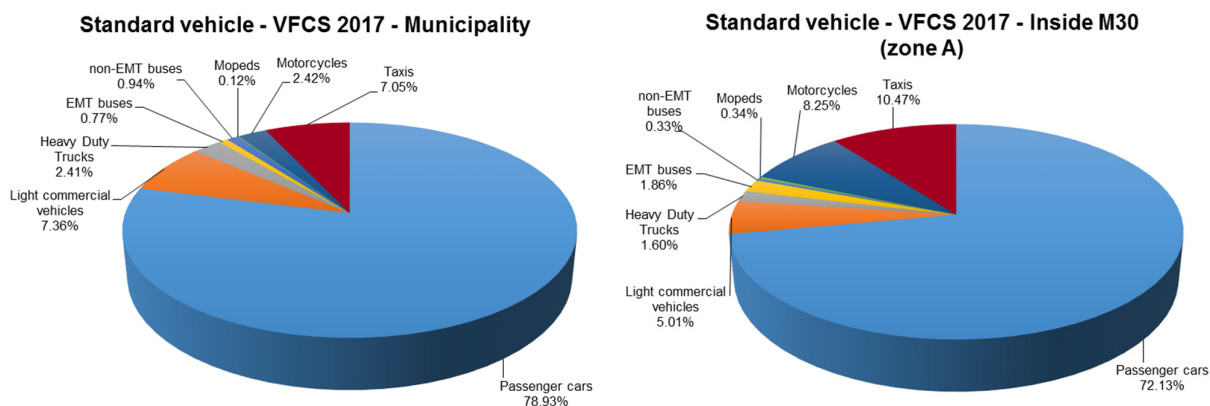


Figure 4. Composition of the 'standard vehicle' at sector level

Table 8 shows the same information disaggregated by fuel for each sector.

Table 8. Disaggregation of 'standard vehicle' by type of fuel for each sector and zone

Sector	ZONES					TOTAL Municipality
	A	B	C	D	E	
<b>Passenger cars</b>	<b>72.13%</b>	<b>83.71%</b>	<b>78.36%</b>	<b>83.71%</b>	<b>78.77%</b>	<b>78.93%</b>
Gasoline	21.77%	24.11%	23.15%	24.11%	19.88%	22.31%
Diesel	48.02%	58.20%	53.85%	58.20%	57.78%	55.15%
Others (LPG, CNG, hybrids, electric)	2.33%	1.40%	1.35%	1.40%	1.11%	1.47%
<b>Light commercial vehicles</b>	<b>5.01%</b>	<b>8.88%</b>	<b>6.97%</b>	<b>8.88%</b>	<b>7.63%</b>	<b>7.36%</b>
Gasoline	0.09%	0.23%	0.12%	0.23%	0.14%	0.15%
Diesel	4.88%	8.61%	6.82%	8.61%	7.47%	7.17%
Others (LPG, CNG, hybrids, electric)	0.04%	0.04%	0.03%	0.04%	0.03%	0.03%
<b>Heavy-duty trucks</b>	<b>1.60%</b>	<b>2.56%</b>	<b>2.15%</b>	<b>2.56%</b>	<b>3.03%</b>	<b>2.41%</b>
Gasoline	0.004%	0.01%	0.01%	0.01%	0.01%	0.01%
Diesel	1.57%	2.53%	2.12%	2.53%	2.97%	2.37%
Others (LPG, CNG, hybrids, electric)	0.03%	0.02%	0.03%	0.02%	0.05%	0.03%
<b>Buses</b>	<b>2.20%</b>	<b>0.97%</b>	<b>2.17%</b>	<b>0.97%</b>	<b>1.76%</b>	<b>1.72%</b>
<b>EMT Buses</b>	<b>1.86%</b>	<b>0.08%</b>	<b>1.28%</b>	<b>0.01%</b>	<b>0.35%</b>	<b>0.77%</b>
Gasoline	-	-	-	-	-	-
Diesel	0.87%	0.04%	1.02%	0.00%	0.30%	0.51%
Others (LPG, CNG, hybrids, electric)	1.00%	0.04%	0.26%	0.00%	0.05%	0.26%
<b>non-EMT Buses</b>	<b>0.33%</b>	<b>0.89%</b>	<b>0.89%</b>	<b>0.96%</b>	<b>1.41%</b>	<b>0.94%</b>
Gasoline	-	-	-	-	-	-
Diesel	0.27%	0.80%	0.78%	0.84%	1.31%	0.84%
Others (LPG, CNG, hybrids, electric)	0.07%	0.09%	0.11%	0.13%	0.10%	0.10%
<b>Mopeds</b>	<b>0.34%</b>	<b>0.00%</b>	<b>0.20%</b>	<b>0.00%</b>	<b>0.03%</b>	<b>0.12%</b>
Gasoline	0.34%	0.00%	0.20%	0.00%	0.03%	0.12%
Diesel	-	-	-	-	-	-
Others (LPG, CNG, hybrids, electric)	-	-	-	-	-	-
<b>Motorcycles</b>	<b>8.25%</b>	<b>0.43%</b>	<b>2.33%</b>	<b>0.43%</b>	<b>0.86%</b>	<b>2.42%</b>
Gasoline	8.18%	0.42%	2.32%	0.42%	0.86%	2.40%
Diesel	-	-	-	-	-	-
Others (LPG, CNG, hybrids, electric)	0.07%	0.00%	0.01%	0.00%	0.00%	0.02%
<b>Taxis</b>	<b>10.47%</b>	<b>3.46%</b>	<b>7.83%</b>	<b>3.46%</b>	<b>7.93%</b>	<b>7.05%</b>

Sector	ZONES					TOTAL Municipality
	A	B	C	D	E	
Gasoline <sup>1</sup>	-	-	-	-	-	-
Diesel	6.62%	2.24%	4.99%	2.24%	5.17%	4.53%
Others (LPG, CNG, hybrids, electric)	3.85%	1.22%	2.84%	1.22%	2.76%	2.53%
<b>TOTAL</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>
<b>Gasoline</b>	<b>30.39%</b>	<b>24.77%</b>	<b>25.79%</b>	<b>24.77%</b>	<b>20.91%</b>	<b>24.98%</b>
<b>Diesel</b>	<b>62.22%</b>	<b>72.42%</b>	<b>69.58%</b>	<b>72.42%</b>	<b>75.00%</b>	<b>70.57%</b>
<b>Others (LPG, CNG, hybrids, electric)</b>	<b>7.39%</b>	<b>2.82%</b>	<b>4.63%</b>	<b>2.82%</b>	<b>4.10%</b>	<b>4.44%</b>

The Attachment of this report includes a detailed breakdown of the ‘standard vehicle’ by sector, subsector and technology.

The ‘passenger cars’ sector (excluding taxis) is especially relevant due to is responsible for 78.9% of total mileage made in the municipality and 72.1% inside Calle30/M30. **¡Error! No se encuentra el origen de la referencia.** shows the mileage distribution by fuel. Most passenger cars (excluding taxis) circulating around the municipality of Madrid consume diesel, representing 69.9% of total mileage, compared to 28.3% of gasoline-fuelled cars. Electric, hybrid and alternative fuelled passenger cars (compressed natural gas, CNG or liquefied petroleum gas, LPG) represent 1.9%. Of them, hybrid gasoline vehicles represent 1.4%, and electric vehicles 0.3%.

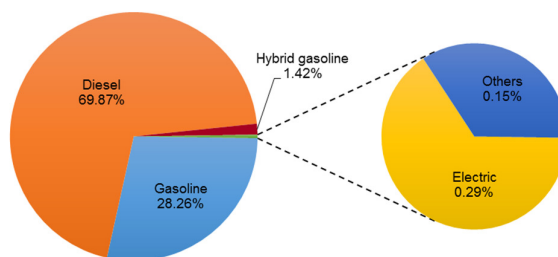


Figure 5. Distribution of the passenger cars (exc. taxis) by fuel (total municipality)

## 4.2 Age of the vehicle fleet

Table 9 shows the average age of all vehicles in each sector (results referred to the whole municipality).

Table 9. Average age by sector level

SECTOR	Average age (years)
Passenger cars	9.8
Light commercial vehicles	10.7
Heavy-duty trucks	10.6
Buses	8.6
Motorcycles	8.9
Taxis	4.3

<sup>1</sup> Dual Gasoline-LPG taxis are considered to be LPG.

The average age of passenger cars moving in the whole municipality stands at 9.8 years (the age distribution is shown in Figure 6).

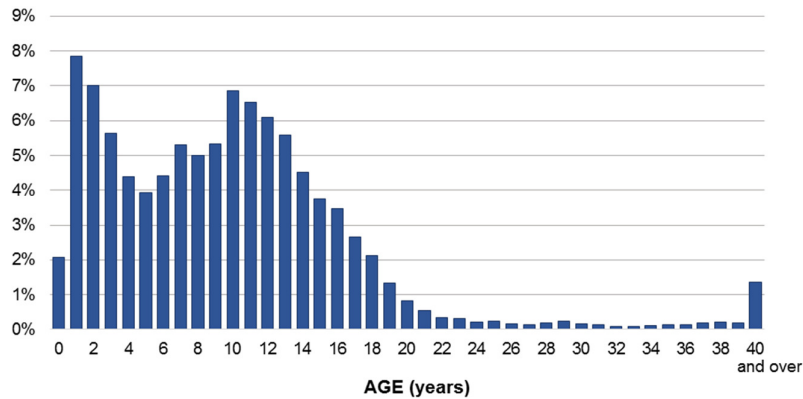


Figure 6. Age distribution of passenger cars

### 4.3 Results by ZIP code

The data obtained from DGT provides information about the vehicle's origin, using the ZIP code of the vehicle's owner attribute. Table 10 shows the results distinguishing municipality of Madrid, other municipalities in the Madrid's region and other provinces, whereas Figure 7 shows the same results differentiated by zone.

Table 10. Distribution of licence number records according to the vehicle owner's ZIP code

Origin	%
Municipality of Madrid	56.2
Other municipalities in the Madrid's region	30.7
Other provinces	12.8
Unknown	0.3
<b>TOTAL</b>	<b>100</b>

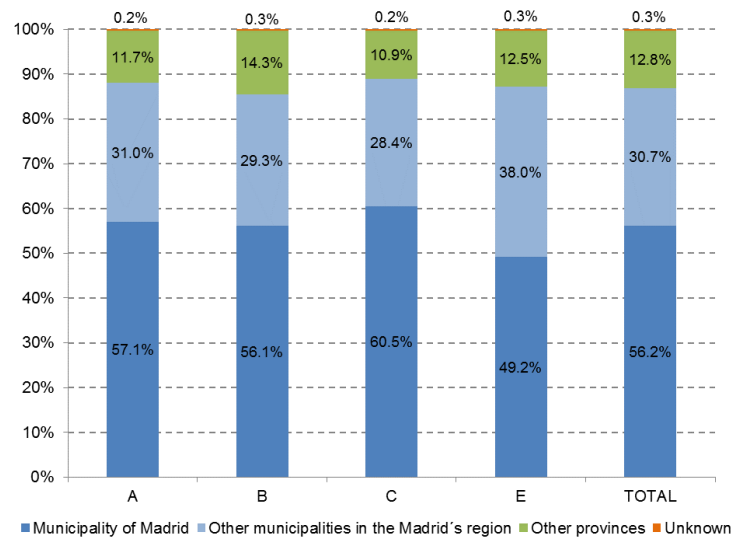


Figure 7. Breakdown of passenger cars by ZIP code



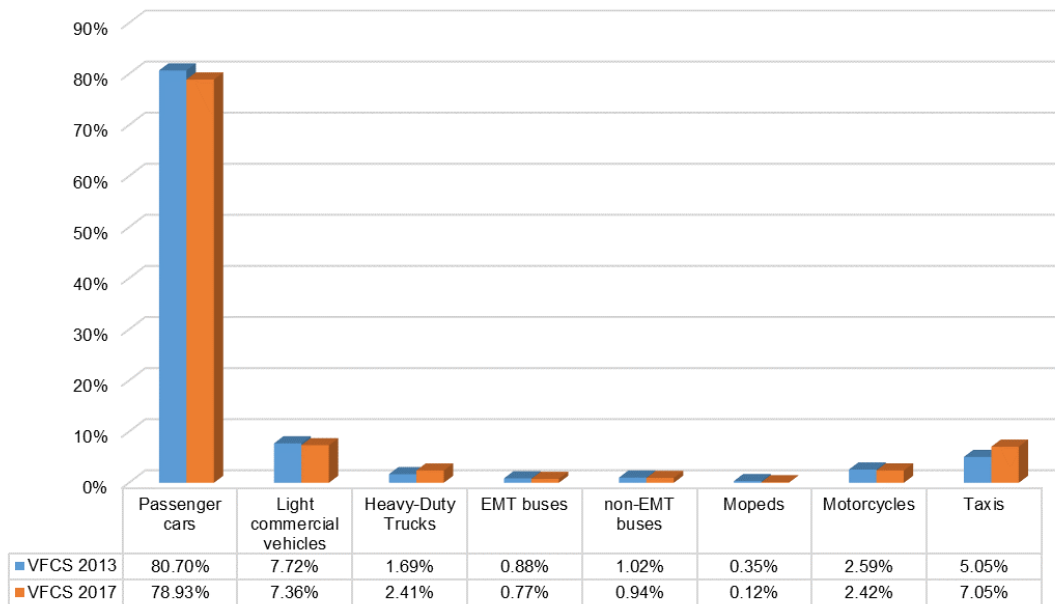
#### 4.4 Comparison with the VFCS 2013

This section compares the results obtained in VFSC, 2013 and VFCS, 2017. Table 11 compares the results from these studies, showing results by sector and fuel for the whole municipality.

**Table 11.** Comparison of results from the 2013 and 2017 studies for the total of the municipality

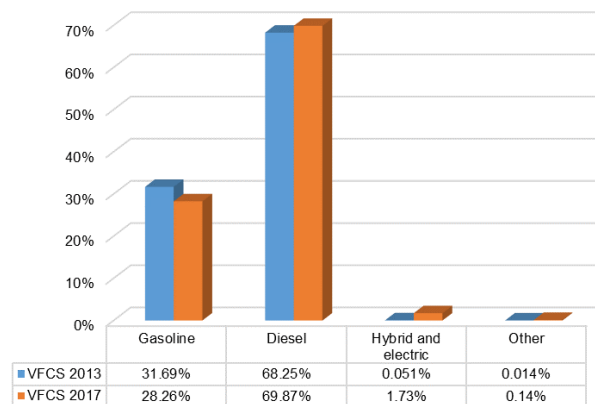
Sector and fuel	VFCS, 2013	VFCS, 2017
<b>Passenger cars</b>	<b>80,70%</b>	<b>78,93%</b>
Gasoline	25,57%	22,31%
Diesel	55,08%	55,15%
Others (LPG, CNG, hybrids, electric)	0,05%	1,47%
<b>Light commercial vehicles</b>	<b>7,72%</b>	<b>7,36%</b>
Gasoline	0,24%	0,15%
Diesel	7,48%	7,17%
Others (LPG, CNG, hybrids, electric)	0,00%	0,03%
<b>Heavy-duty trucks</b>	<b>1,69%</b>	<b>2,41%</b>
Gasoline	0,01%	0,01%
Diesel	1,68%	2,37%
Others (LPG, CNG, hybrids, electric)	0,00%	0,03%
<b>Buses</b>	<b>1,90%</b>	<b>1,72%</b>
<b>EMT Buses</b>	<b>0,88%</b>	<b>0,77%</b>
Gasoline	-	-
Diesel	0,60%	0,51%
Others (LPG, CNG, hybrids, electric)	0,28%	0,26%
<b>non-EMT Buses</b>	<b>1,02%</b>	<b>0,94%</b>
Gasoline	-	-
Diesel	0,99%	0,84%
Others (LPG, CNG, hybrids, electric)	0,03%	0,10%
<b>Mopeds</b>	<b>0,35%</b>	<b>0,12%</b>
Gasoline	0,35%	0,12%
Diesel	-	-
Others (LPG, CNG, hybrids, electric)	-	-
<b>Motorcycles</b>	<b>2,59%</b>	<b>2,42%</b>
Gasoline	2,59%	2,40%
Diesel	-	-
Others (LPG, CNG, hybrids, electric)	0,00%	0,02%
<b>Taxis</b>	<b>5,05%</b>	<b>7,05%</b>
Gasoline	-	-
Diesel	3,93%	4,53%
Others (LPG, CNG, hybrids, electric)	1,12%	2,53%
<b>TOTAL</b>	<b>100,00%</b>	<b>100,00%</b>
Gasoline	28,76%	24,98%
Diesel	69,76%	70,57%
Others (LPG, CNG, hybrids, electric)	1,48%	4,44%

It is remarkable the decrease of the contribution of gasoline vehicles (from 28.8% to 25%), as well as the increase of electric vehicles and alternative fuelled propulsion (hybrid, LPG and CNG), from 5.1% to 7.1%. The increase of taxis percentage from 5.1% a 7.1%, it is mainly due to the inclusion of the licence plate's numbers registered in A2, M3, M13 and M14 roads in the study of 2017. In these access highways to the municipality, the number of taxis in regard to the total of vehicles is higher than in the other sampling points of zones C and E. Figure 8 illustrates this comparison by sector.



**Figure 8.** Comparison of results from the 2003 and 2017 studies for the total of the municipality

Figure 9 shows that the contribution from gasoline passenger cars have decreased from 31.7% to 28.3% in 2017, whereas diesel passenger cars have increased by 2.4%. Hybrid and electric vehicles have reached 1.7% in 2017, being 82% of them hybrid gasoline.



**Figure 9.** Fuel type distribution for passenger cars

Table 12 compares the average age of vehicles by sector obtained in the two studies. According to these results, the average age of passenger cars have increased 0.5 years

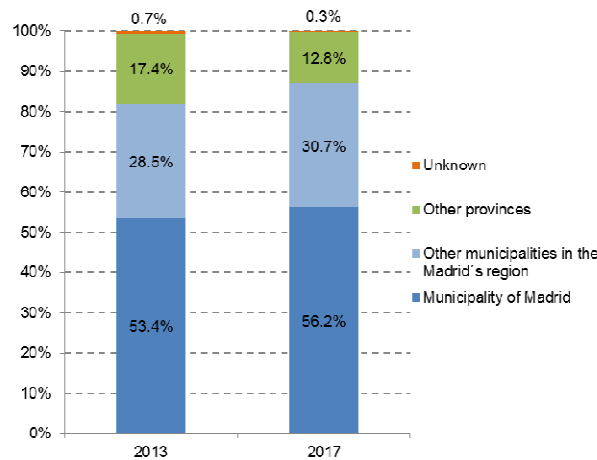
**Table 12.** Average age of road traffic by sector

SECTOR	VFCS, 2013	VFCS, 2017
<b>Passenger cars</b>	9.3	9.8
<b>Light-duty vehicles</b>	10.0	10.7
<b>Heavy-duty trucks</b>	10.8	10.6
<b>Buses</b>	8.1	8.6
<b>Motorcycles</b>	9.8	8.9
<b>Taxis</b>	4.4	4.3

Regarding to passenger car distribution by origin (Table 13 and Figure 10), it is observed an increase of 6.1% in the vehicles coming from Madrid’s region, whereas vehicles coming from other provinces have decreased by 26.4%.

**Table 13.** Comparison of passenger car owner's ZIP code distribution

Origin	VFCS, 2013 (%)	VFCS, 2017 (%)
Municipality of Madrid	53,4	56,2
Other municipalities in the Madrid's region	28,5	30,7
Other provinces	17,4	12,8
Unknown	0,7	0,3
<b>TOTAL</b>	<b>100</b>	<b>100</b>



**Figure 10.** Comparison of passenger car owner's ZIP code distribution of the whole municipality

## 5 ACKNOWLEDGEMENTS

This study was possible thanks to the collaboration of the national traffic authority (Dirección General de Tráfico, DGT), the Municipal Transport Company (EMT, S.A.), Madrid Calle 30, S.A. and the General Direction of Traffic Management (Environment and Mobility Area, Madrid City Council).

# ATTACHMENT

Sector	Subsector	Technology	Zone A	Zone B	Zone C	Zone D	Zone E	Total
Passenger Cars	Gasoline <0,8 l	PC Euro 4 - 98/69/EC Stage2005	0.143%	0.166%	0.135%	0.166%	0.123%	0.142%
Passenger Cars	Gasoline <0,8 l	PC Euro 5 - EC 715/2007	0.000%	0.000%	0.001%	0.000%	0.000%	0.000%
Passenger Cars	Gasoline <0,8 l	PC Euro 6 up to 2016	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Passenger Cars	Gasoline 0,8 - 1,4 l	PRE ECE	0.001%	0.004%	0.003%	0.004%	0.008%	0.004%
Passenger Cars	Gasoline 0,8 - 1,4 l	ECE 15/00-01	0.043%	0.427%	0.098%	0.427%	0.304%	0.239%
Passenger Cars	Gasoline 0,8 - 1,4 l	ECE 15/02	0.004%	0.155%	0.008%	0.155%	0.014%	0.052%
Passenger Cars	Gasoline 0,8 - 1,4 l	ECE 15/03	0.006%	0.211%	0.012%	0.211%	0.011%	0.068%
Passenger Cars	Gasoline 0,8 - 1,4 l	ECE 15/04	0.050%	0.255%	0.080%	0.255%	0.084%	0.126%
Passenger Cars	Gasoline 0,8 - 1,4 l	PC Euro 1 - 91/441/EEC	0.100%	0.189%	0.180%	0.189%	0.154%	0.162%
Passenger Cars	Gasoline 0,8 - 1,4 l	PC Euro 2 - 94/12/EEC	0.312%	0.441%	0.436%	0.441%	0.358%	0.395%
Passenger Cars	Gasoline 0,8 - 1,4 l	PC Euro 3 - 98/69/EC Stage2000	1.374%	1.808%	1.875%	1.808%	1.557%	1.683%
Passenger Cars	Gasoline 0,8 - 1,4 l	PC Euro 4 - 98/69/EC Stage2005	2.810%	3.172%	3.133%	3.172%	2.627%	2.952%
Passenger Cars	Gasoline 0,8 - 1,4 l	PC Euro 5 - EC 715/2007	2.340%	2.573%	2.422%	2.573%	1.923%	2.317%
Passenger Cars	Gasoline 0,8 - 1,4 l	PC Euro 6 up to 2016	2.787%	3.111%	2.940%	3.111%	2.600%	2.871%
Passenger Cars	Gasoline 0,8 - 1,4 l	PC Euro 6 2017-2019	0.445%	0.462%	0.435%	0.462%	0.472%	0.455%
Passenger Cars	Gasoline 1,4 - 2,0 l	PRE ECE	0.001%	0.001%	0.001%	0.001%	0.003%	0.001%
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/00-01	0.009%	0.082%	0.020%	0.082%	0.060%	0.047%
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/02	0.001%	0.055%	0.003%	0.055%	0.004%	0.018%
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/03	0.003%	0.075%	0.005%	0.075%	0.006%	0.025%
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/04	0.111%	0.307%	0.150%	0.307%	0.141%	0.186%
Passenger Cars	Gasoline 1,4 - 2,0 l	PC Euro 1 - 91/441/EEC	0.292%	0.375%	0.385%	0.375%	0.337%	0.353%
Passenger Cars	Gasoline 1,4 - 2,0 l	PC Euro 2 - 94/12/EEC	0.735%	0.904%	0.975%	0.904%	0.827%	0.873%
Passenger Cars	Gasoline 1,4 - 2,0 l	PC Euro 3 - 98/69/EC Stage2000	2.552%	3.014%	3.025%	3.014%	2.695%	2.851%
Passenger Cars	Gasoline 1,4 - 2,0 l	PC Euro 4 - 98/69/EC Stage2005	3.265%	3.192%	3.389%	3.192%	2.758%	3.141%
Passenger Cars	Gasoline 1,4 - 2,0 l	PC Euro 5 - EC 715/2007	1.138%	1.006%	1.004%	1.006%	0.798%	0.973%
Passenger Cars	Gasoline 1,4 - 2,0 l	PC Euro 6 up to 2016	0.812%	0.628%	0.681%	0.628%	0.569%	0.658%
Passenger Cars	Gasoline 1,4 - 2,0 l	PC Euro 6 2017-2019	0.120%	0.081%	0.099%	0.081%	0.080%	0.092%
Passenger Cars	Gasoline >2,0 l	PRE ECE	0.001%	0.001%	0.001%	0.001%	0.000%	0.001%
Passenger Cars	Gasoline >2,0 l	ECE 15/00-01	0.001%	0.004%	0.003%	0.004%	0.006%	0.004%
Passenger Cars	Gasoline >2,0 l	ECE 15/02	0.001%	0.002%	0.001%	0.002%	0.001%	0.001%
Passenger Cars	Gasoline >2,0 l	ECE 15/03	0.001%	0.010%	0.001%	0.010%	0.001%	0.004%
Passenger Cars	Gasoline >2,0 l	ECE 15/04	0.014%	0.020%	0.011%	0.020%	0.009%	0.014%
Passenger Cars	Gasoline >2,0 l	PC Euro 1 - 91/441/EEC	0.130%	0.112%	0.118%	0.112%	0.102%	0.114%
Passenger Cars	Gasoline >2,0 l	PC Euro 2 - 94/12/EEC	0.216%	0.162%	0.189%	0.162%	0.154%	0.177%
Passenger Cars	Gasoline >2,0 l	PC Euro 3 - 98/69/EC Stage2000	0.793%	0.550%	0.655%	0.550%	0.548%	0.620%
Passenger Cars	Gasoline >2,0 l	PC Euro 4 - 98/69/EC Stage2005	0.886%	0.452%	0.542%	0.452%	0.438%	0.548%
Passenger Cars	Gasoline >2,0 l	PC Euro 5 - EC 715/2007	0.148%	0.061%	0.074%	0.061%	0.064%	0.081%

Passenger Cars	Gasoline >2,0 l	PC Euro 6 up to 2016	0.110%	0.038%	0.052%	0.038%	0.037%	0.054%
Passenger Cars	Gasoline >2,0 l	PC Euro 6 2017-2019	0.018%	0.006%	0.011%	0.006%	0.006%	0.010%
Passenger Cars	Diesel <1,4 l	PC Euro 4 - 98/69/EC Stage2005	1.738%	2.574%	2.375%	2.574%	2.548%	2.368%
Passenger Cars	Diesel <1,4 l	PC Euro 5 - EC 715/2007	0.643%	0.967%	0.785%	0.967%	0.822%	0.823%
Passenger Cars	Diesel <1,4 l	PC Euro 6 up to 2016	0.278%	0.423%	0.342%	0.423%	0.369%	0.361%
Passenger Cars	Diesel <1,4 l	PC Euro 6 2017-2019	0.015%	0.034%	0.024%	0.034%	0.027%	0.026%
Passenger Cars	Diesel 1,4 - 2,0 l	Conventional	0.018%	0.097%	0.027%	0.097%	0.028%	0.046%
Passenger Cars	Diesel 1,4 - 2,0 l	PC Euro 1 - 91/441/EEC	0.108%	0.231%	0.193%	0.231%	0.241%	0.202%
Passenger Cars	Diesel 1,4 - 2,0 l	PC Euro 2 - 94/12/EEC	0.790%	1.421%	1.343%	1.421%	1.508%	1.314%
Passenger Cars	Diesel 1,4 - 2,0 l	PC Euro 3 - 98/69/EC Stage2000	5.306%	8.847%	7.981%	8.847%	9.072%	8.058%
Passenger Cars	Diesel 1,4 - 2,0 l	PC Euro 4 - 98/69/EC Stage2005	12.922%	17.711%	16.108%	17.711%	17.230%	16.317%
Passenger Cars	Diesel 1,4 - 2,0 l	PC Euro 5 - EC 715/2007	8.957%	10.216%	9.154%	10.216%	9.438%	9.503%
Passenger Cars	Diesel 1,4 - 2,0 l	PC Euro 6 up to 2016	7.777%	7.927%	7.435%	7.927%	8.062%	7.805%
Passenger Cars	Diesel 1,4 - 2,0 l	PC Euro 6 2017-2019	1.066%	0.874%	0.889%	0.874%	1.038%	0.956%
Passenger Cars	Diesel >2,0 l	Conventional	0.020%	0.064%	0.024%	0.064%	0.022%	0.034%
Passenger Cars	Diesel >2,0 l	PC Euro 1 - 91/441/EEC	0.048%	0.072%	0.067%	0.072%	0.077%	0.068%
Passenger Cars	Diesel >2,0 l	PC Euro 2 - 94/12/EEC	0.153%	0.206%	0.204%	0.206%	0.216%	0.199%
Passenger Cars	Diesel >2,0 l	PC Euro 3 - 98/69/EC Stage2000	1.196%	1.425%	1.318%	1.425%	1.476%	1.370%
Passenger Cars	Diesel >2,0 l	PC Euro 4 - 98/69/EC Stage2005	3.275%	2.944%	2.936%	2.944%	2.914%	2.992%
Passenger Cars	Diesel >2,0 l	PC Euro 5 - EC 715/2007	1.962%	1.230%	1.415%	1.230%	1.413%	1.456%
Passenger Cars	Diesel >2,0 l	PC Euro 6 up to 2016	1.572%	0.842%	1.116%	0.842%	1.159%	1.128%
Passenger Cars	Diesel >2,0 l	PC Euro 6 2017-2019	0.180%	0.093%	0.118%	0.093%	0.123%	0.123%
Passenger Cars	Hybrid Gasoline <1,4 l	PC Euro 4 - 98/69/EC Stage2005	0.040%	0.026%	0.023%	0.026%	0.027%	0.028%
Passenger Cars	Hybrid Gasoline 1,4 - 2,0 l	PC Euro 4 - 98/69/EC Stage2005	1.024%	0.875%	0.818%	0.875%	0.677%	0.833%
Passenger Cars	Hybrid Gasoline >2,0 l	PC Euro 4 - 98/69/EC Stage2005	0.434%	0.189%	0.273%	0.189%	0.202%	0.258%
Passenger Cars	LPG	Conventional	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Passenger Cars	LPG	PC Euro 1 - 91/441/EEC	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Passenger Cars	LPG	PC Euro 2 - 94/12/EEC	0.001%	0.001%	0.001%	0.001%	0.002%	0.001%
Passenger Cars	LPG	PC Euro 3 - 98/69/EC Stage2000	0.012%	0.013%	0.017%	0.013%	0.018%	0.015%
Passenger Cars	LPG	PC Euro 4 - 98/69/EC Stage2005	0.019%	0.022%	0.018%	0.022%	0.019%	0.019%
Passenger Cars	LPG	PC Euro 5 - EC 715/2007	0.022%	0.035%	0.032%	0.035%	0.024%	0.029%
Passenger Cars	LPG	PC Euro 6 up to 2016	0.027%	0.028%	0.026%	0.028%	0.024%	0.026%
Passenger Cars	CNG	PC Euro 4 - 98/69/EC Stage2005	0.001%	0.002%	0.001%	0.002%	0.000%	0.001%
Passenger Cars	CNG	PC Euro 5 - EC 715/2007	0.001%	0.003%	0.003%	0.003%	0.001%	0.002%
Passenger Cars	CNG	PC Euro 6 up to 2016	0.008%	0.016%	0.014%	0.016%	0.010%	0.013%
Light Commercial Vehicles	Gasoline <3,5t	Conventional	0.010%	0.108%	0.018%	0.108%	0.037%	0.047%
Light Commercial Vehicles	Gasoline <3,5t	LD Euro 1 - 93/59/EEC	0.004%	0.006%	0.006%	0.006%	0.005%	0.006%
Light Commercial Vehicles	Gasoline <3,5t	LD Euro 2 - 96/69/EEC	0.004%	0.008%	0.007%	0.008%	0.004%	0.006%

Light Commercial Vehicles	Gasoline <3,5t	LD Euro 3 - 98/69/EC Stage2000	0.027%	0.038%	0.033%	0.038%	0.033%	0.034%
Light Commercial Vehicles	Gasoline <3,5t	LD Euro 4 - 98/69/EC Stage2005	0.031%	0.045%	0.037%	0.045%	0.045%	0.040%
Light Commercial Vehicles	Gasoline <3,5t	LD Euro 5 - 2008 Standards	0.003%	0.007%	0.004%	0.007%	0.003%	0.005%
Light Commercial Vehicles	Gasoline <3,5t	LD Euro 6 up to 2017	0.008%	0.014%	0.010%	0.014%	0.008%	0.010%
Light Commercial Vehicles	Diesel <3,5 t	Conventional	0.021%	0.141%	0.033%	0.141%	0.051%	0.067%
Light Commercial Vehicles	Diesel <3,5 t	LD Euro 1 - 93/59/EEC	0.035%	0.075%	0.062%	0.075%	0.059%	0.060%
Light Commercial Vehicles	Diesel <3,5 t	LD Euro 2 - 96/69/EEC	0.131%	0.242%	0.205%	0.242%	0.222%	0.207%
Light Commercial Vehicles	Diesel <3,5 t	LD Euro 3 - 98/69/EC Stage2000	0.733%	1.377%	1.178%	1.377%	1.291%	1.188%
Light Commercial Vehicles	Diesel <3,5 t	LD Euro 4 - 98/69/EC Stage2005	1.892%	3.186%	2.641%	3.186%	2.970%	2.756%
Light Commercial Vehicles	Diesel <3,5 t	LD Euro 5 - 2008 Standards	1.004%	1.703%	1.359%	1.703%	1.397%	1.407%
Light Commercial Vehicles	Diesel <3,5 t	LD Euro 6 up to 2017	1.066%	1.887%	1.339%	1.887%	1.477%	1.487%
Heavy Duty Trucks	Gasoline >3,5 t	Conventional	0.004%	0.008%	0.006%	0.008%	0.008%	0.007%
Heavy Duty Trucks	Rigid <=7,5 t	Conventional	0.004%	0.037%	0.008%	0.037%	0.016%	0.018%
Heavy Duty Trucks	Rigid <=7,5 t	HD Euro I - 91/542/EEC Stage I	0.003%	0.009%	0.008%	0.009%	0.007%	0.007%
Heavy Duty Trucks	Rigid <=7,5 t	HD Euro II - 91/542/EEC Stage II	0.026%	0.067%	0.050%	0.067%	0.058%	0.053%
Heavy Duty Trucks	Rigid <=7,5 t	HD Euro III - 2000 Standards	0.178%	0.347%	0.272%	0.347%	0.312%	0.288%
Heavy Duty Trucks	Rigid <=7,5 t	HD Euro IV - 2005 Standards	0.229%	0.407%	0.355%	0.407%	0.410%	0.363%
Heavy Duty Trucks	Rigid <=7,5 t	HD Euro V - 2008 Standards	0.354%	0.513%	0.480%	0.513%	0.525%	0.480%
Heavy Duty Trucks	Rigid <=7,5 t	HD Euro VI	0.487%	0.773%	0.603%	0.773%	0.708%	0.660%
Heavy Duty Trucks	Rigid 7,5 - 12 t	Conventional	0.002%	0.008%	0.002%	0.008%	0.004%	0.004%
Heavy Duty Trucks	Rigid 7,5 - 12 t	HD Euro I - 91/542/EEC Stage I	0.001%	0.002%	0.002%	0.002%	0.004%	0.002%
Heavy Duty Trucks	Rigid 7,5 - 12 t	HD Euro II - 91/542/EEC Stage II	0.008%	0.010%	0.009%	0.010%	0.016%	0.011%
Heavy Duty Trucks	Rigid 7,5 - 12 t	HD Euro III - 2000 Standards	0.024%	0.023%	0.035%	0.023%	0.054%	0.035%
Heavy Duty Trucks	Rigid 7,5 - 12 t	HD Euro IV - 2005 Standards	0.027%	0.023%	0.034%	0.023%	0.057%	0.036%
Heavy Duty Trucks	Rigid 7,5 - 12 t	HD Euro V - 2008 Standards	0.035%	0.026%	0.051%	0.026%	0.065%	0.044%
Heavy Duty Trucks	Rigid 7,5 - 12 t	HD Euro VI	0.023%	0.019%	0.026%	0.019%	0.034%	0.026%
Heavy Duty Trucks	Rigid 12 - 14 t	Conventional	0.000%	0.002%	0.002%	0.002%	0.002%	0.002%
Heavy Duty Trucks	Rigid 12 - 14 t	HD Euro I - 91/542/EEC Stage I	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Rigid 12 - 14 t	HD Euro II - 91/542/EEC Stage II	0.001%	0.001%	0.001%	0.001%	0.002%	0.001%
Heavy Duty Trucks	Rigid 12 - 14 t	HD Euro III - 2000 Standards	0.002%	0.002%	0.003%	0.002%	0.008%	0.004%
Heavy Duty Trucks	Rigid 12 - 14 t	HD Euro IV - 2005 Standards	0.004%	0.004%	0.006%	0.004%	0.016%	0.008%
Heavy Duty Trucks	Rigid 12 - 14 t	HD Euro V - 2008 Standards	0.002%	0.002%	0.003%	0.002%	0.008%	0.004%
Heavy Duty Trucks	Rigid 12 - 14 t	HD Euro VI	0.001%	0.001%	0.002%	0.001%	0.001%	0.001%
Heavy Duty Trucks	Rigid 14 - 20 t	Conventional	0.001%	0.011%	0.002%	0.011%	0.005%	0.005%
Heavy Duty Trucks	Rigid 14 - 20 t	HD Euro I - 91/542/EEC Stage I	0.000%	0.003%	0.001%	0.003%	0.002%	0.002%
Heavy Duty Trucks	Rigid 14 - 20 t	HD Euro II - 91/542/EEC Stage II	0.005%	0.009%	0.006%	0.009%	0.015%	0.009%
Heavy Duty Trucks	Rigid 14 - 20 t	HD Euro III - 2000 Standards	0.022%	0.034%	0.022%	0.034%	0.119%	0.051%
Heavy Duty Trucks	Rigid 14 - 20 t	HD Euro IV - 2005 Standards	0.024%	0.043%	0.023%	0.043%	0.137%	0.060%

Heavy Duty Trucks	Rigid 14 - 20 t	HD Euro V - 2008 Standards	0.020%	0.035%	0.022%	0.035%	0.088%	0.043%
Heavy Duty Trucks	Rigid 14 - 20 t	HD Euro VI	0.016%	0.029%	0.013%	0.029%	0.066%	0.032%
Heavy Duty Trucks	Rigid 20 - 26 t	Conventional	0.001%	0.006%	0.002%	0.006%	0.004%	0.003%
Heavy Duty Trucks	Rigid 20 - 26 t	HD Euro I - 91/542/EEC Stage I	0.001%	0.001%	0.000%	0.001%	0.000%	0.000%
Heavy Duty Trucks	Rigid 20 - 26 t	HD Euro II - 91/542/EEC Stage II	0.002%	0.002%	0.001%	0.002%	0.004%	0.002%
Heavy Duty Trucks	Rigid 20 - 26 t	HD Euro III - 2000 Standards	0.007%	0.008%	0.007%	0.008%	0.029%	0.013%
Heavy Duty Trucks	Rigid 20 - 26 t	HD Euro IV - 2005 Standards	0.007%	0.010%	0.008%	0.010%	0.022%	0.012%
Heavy Duty Trucks	Rigid 20 - 26 t	HD Euro V - 2008 Standards	0.008%	0.007%	0.006%	0.007%	0.019%	0.010%
Heavy Duty Trucks	Rigid 20 - 26 t	HD Euro VI	0.003%	0.003%	0.003%	0.003%	0.009%	0.005%
Heavy Duty Trucks	Rigid 26 - 28 t	Conventional	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Rigid 26 - 28 t	HD Euro II - 91/542/EEC Stage II	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Rigid 26 - 28 t	HD Euro III - 2000 Standards	0.001%	0.000%	0.000%	0.000%	0.001%	0.000%
Heavy Duty Trucks	Rigid 26 - 28 t	HD Euro IV - 2005 Standards	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Rigid 26 - 28 t	HD Euro V - 2008 Standards	0.000%	0.000%	0.001%	0.000%	0.001%	0.000%
Heavy Duty Trucks	Rigid 26 - 28 t	HD Euro VI	0.000%	0.000%	0.000%	0.000%	0.001%	0.000%
Heavy Duty Trucks	Rigid 28 - 32 t	Conventional	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Rigid 28 - 32 t	HD Euro II - 91/542/EEC Stage II	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Rigid 28 - 32 t	HD Euro III - 2000 Standards	0.003%	0.001%	0.000%	0.001%	0.005%	0.002%
Heavy Duty Trucks	Rigid 28 - 32 t	HD Euro IV - 2005 Standards	0.002%	0.003%	0.003%	0.003%	0.008%	0.004%
Heavy Duty Trucks	Rigid 28 - 32 t	HD Euro V - 2008 Standards	0.000%	0.001%	0.000%	0.001%	0.002%	0.001%
Heavy Duty Trucks	Rigid 28 - 32 t	HD Euro VI	0.001%	0.000%	0.001%	0.000%	0.002%	0.001%
Heavy Duty Trucks	Rigid >32 t	Conventional	0.001%	0.008%	0.001%	0.008%	0.003%	0.003%
Heavy Duty Trucks	Rigid >32 t	HD Euro I - 91/542/EEC Stage I	0.000%	0.000%	0.000%	0.000%	0.001%	0.000%
Heavy Duty Trucks	Rigid >32 t	HD Euro II - 91/542/EEC Stage II	0.000%	0.000%	0.000%	0.000%	0.003%	0.001%
Heavy Duty Trucks	Rigid >32 t	HD Euro III - 2000 Standards	0.001%	0.001%	0.004%	0.001%	0.017%	0.006%
Heavy Duty Trucks	Rigid >32 t	HD Euro IV - 2005 Standards	0.001%	0.001%	0.003%	0.001%	0.015%	0.005%
Heavy Duty Trucks	Rigid >32 t	HD Euro V - 2008 Standards	0.002%	0.000%	0.002%	0.000%	0.015%	0.005%
Heavy Duty Trucks	Rigid >32 t	HD Euro VI	0.000%	0.000%	0.004%	0.000%	0.020%	0.006%
Heavy Duty Trucks	Articulated 14 - 20 t	Conventional	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Articulated 14 - 20 t	HD Euro I - 91/542/EEC Stage I	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Articulated 14 - 20 t	HD Euro II - 91/542/EEC Stage II	0.002%	0.002%	0.001%	0.002%	0.004%	0.002%
Heavy Duty Trucks	Articulated 14 - 20 t	HD Euro III - 2000 Standards	0.003%	0.004%	0.004%	0.004%	0.005%	0.004%
Heavy Duty Trucks	Articulated 14 - 20 t	HD Euro IV - 2005 Standards	0.003%	0.006%	0.005%	0.006%	0.004%	0.004%
Heavy Duty Trucks	Articulated 14 - 20 t	HD Euro V - 2008 Standards	0.007%	0.007%	0.004%	0.007%	0.008%	0.007%
Heavy Duty Trucks	Articulated 14 - 20 t	HD Euro VI	0.006%	0.015%	0.011%	0.015%	0.012%	0.012%
Heavy Duty Trucks	Articulated 20 - 28 t	Conventional	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Articulated 20 - 28 t	HD Euro I - 91/542/EEC Stage I	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Articulated 20 - 28 t	HD Euro II - 91/542/EEC Stage II	0.000%	0.000%	0.000%	0.000%	0.001%	0.000%



Heavy Duty Trucks	Articulated 20 - 28 t	HD Euro III - 2000 Standards	0.001%	0.002%	0.002%	0.002%	0.004%	0.002%
Heavy Duty Trucks	Articulated 20 - 28 t	HD Euro IV - 2005 Standards	0.001%	0.001%	0.002%	0.001%	0.004%	0.002%
Heavy Duty Trucks	Articulated 20 - 28 t	HD Euro V - 2008 Standards	0.001%	0.002%	0.001%	0.002%	0.007%	0.003%
Heavy Duty Trucks	Articulated 20 - 28 t	HD Euro VI	0.001%	0.001%	0.001%	0.001%	0.002%	0.001%
Heavy Duty Trucks	Articulated 28 - 34 t	HD Euro III - 2000 Standards	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Articulated 28 - 34 t	HD Euro IV - 2005 Standards	0.001%	0.000%	0.001%	0.000%	0.002%	0.001%
Heavy Duty Trucks	Articulated 28 - 34 t	HD Euro V - 2008 Standards	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Articulated 28 - 34 t	HD Euro VI	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Articulated 34 - 40 t	Conventional	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Articulated 34 - 40 t	HD Euro IV - 2005 Standards	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Articulated 40 - 50 t	HD Euro III - 2000 Standards	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Articulated 40 - 50 t	HD Euro VI	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Buses	Urban Buses Midi <=15 t	Conventional	0.000%	0.003%	0.001%	0.003%	0.003%	0.002%
Buses	Urban Buses Midi <=15 t	HD Euro I - 91/542/EEC Stage I	0.000%	0.000%	0.001%	0.000%	0.001%	0.001%
Buses	Urban Buses Midi <=15 t	HD Euro II - 91/542/EEC Stage II	0.003%	0.005%	0.006%	0.005%	0.011%	0.006%
Buses	Urban Buses Midi <=15 t	HD Euro III - 2000 Standards	0.022%	0.023%	0.020%	0.023%	0.043%	0.027%
Buses	Urban Buses Midi <=15 t	HD Euro IV - 2005 Standards	0.021%	0.028%	0.032%	0.028%	0.048%	0.033%
Buses	Urban Buses Midi <=15 t	HD Euro V - 2008 Standards	0.049%	0.055%	0.078%	0.055%	0.225%	0.106%
Buses	Urban Buses Midi <=15 t	HD Euro VI	0.026%	0.034%	0.038%	0.034%	0.173%	0.071%
Buses	Urban Buses Standard 15 - 18 t	Conventional	0.000%	0.003%	0.000%	0.003%	0.000%	0.001%
Buses	Urban Buses Standard 15 - 18 t	HD Euro I - 91/542/EEC Stage I	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Buses	Urban Buses Standard 15 - 18 t	HD Euro II - 91/542/EEC Stage II	0.005%	0.007%	0.009%	0.007%	0.016%	0.010%
Buses	Urban Buses Standard 15 - 18 t	HD Euro III - 2000 Standards	0.024%	0.034%	0.030%	0.034%	0.056%	0.037%
Buses	Urban Buses Standard 15 - 18 t	HD Euro IV - 2005 Standards	0.037%	0.054%	0.072%	0.054%	0.082%	0.063%
Buses	Urban Buses Standard 15 - 18 t	HD Euro V - 2008 Standards	0.021%	0.076%	0.118%	0.076%	0.061%	0.073%
Buses	Urban Buses Standard 15 - 18 t	HD Euro VI	0.002%	0.019%	0.009%	0.019%	0.006%	0.010%
Buses	Urban Buses Articulated >18 t	Conventional	0.000%	0.001%	0.001%	0.001%	0.000%	0.001%
Buses	Urban Buses Articulated >18 t	HD Euro I - 91/542/EEC Stage I	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Buses	Urban Buses Articulated >18 t	HD Euro II - 91/542/EEC Stage II	0.000%	0.001%	0.000%	0.001%	0.000%	0.000%
Buses	Urban Buses Articulated >18 t	HD Euro III - 2000 Standards	0.138%	0.086%	0.221%	0.086%	0.015%	0.112%
Buses	Urban Buses Articulated >18 t	HD Euro IV - 2005 Standards	0.203%	0.046%	0.316%	0.046%	0.085%	0.156%
Buses	Urban Buses Articulated >18 t	HD Euro V - 2008 Standards	0.501%	0.199%	0.702%	0.199%	0.567%	0.486%
Buses	Urban Buses Articulated >18 t	HD Euro VI	0.082%	0.168%	0.147%	0.168%	0.212%	0.159%
Buses	Urban CNG Buses	HD Euro III - 2000 Standards	0.004%	0.000%	0.004%	0.000%	0.001%	0.002%
Buses	Urban CNG Buses	EEV	1.058%	0.101%	0.332%	0.101%	0.152%	0.344%
Motorcycles	4-stroke <250 cm³	Conventional	0.096%	0.060%	0.020%	0.060%	0.018%	0.044%
Motorcycles	4-stroke <250 cm³	Mot - Euro I	0.128%	0.009%	0.030%	0.009%	0.012%	0.036%
Motorcycles	4-stroke <250 cm³	Mot - Euro II	0.363%	0.026%	0.127%	0.026%	0.046%	0.117%

Motorcycles	4-stroke <250 cm <sup>3</sup>	Mot - Euro III	3.687%	0.163%	1.101%	0.163%	0.311%	1.068%
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	Conventional	0.098%	0.027%	0.026%	0.027%	0.013%	0.035%
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	Mot - Euro I	0.125%	0.006%	0.032%	0.006%	0.011%	0.035%
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	Mot - Euro II	0.235%	0.012%	0.079%	0.012%	0.035%	0.075%
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	Mot - Euro III	2.243%	0.071%	0.632%	0.071%	0.282%	0.657%
Motorcycles	4-stroke >750 cm <sup>3</sup>	Conventional	0.046%	0.005%	0.008%	0.005%	0.005%	0.013%
Motorcycles	4-stroke >750 cm <sup>3</sup>	Mot - Euro I	0.047%	0.004%	0.017%	0.004%	0.005%	0.015%
Motorcycles	4-stroke >750 cm <sup>3</sup>	Mot - Euro II	0.105%	0.006%	0.026%	0.006%	0.013%	0.031%
Motorcycles	4-stroke >750 cm <sup>3</sup>	Mot - Euro III	1.008%	0.035%	0.223%	0.035%	0.108%	0.275%
Buses	Electric		0.000%	0.002%	0.003%	0.002%	0.000%	0.001%
Buses	Hybrid Diesel - Urban Buses Standard 15 - 18 t	HD Euro V	0.000%	0.002%	0.000%	0.002%	0.000%	0.001%
Buses	Hybrid Diesel - Urban Buses Standard 15 - 18 t	HD Euro VI	0.000%	0.000%	0.010%	0.000%	0.000%	0.003%
Buses	Hybrid Diesel - Urban Buses Articulated >18 t	HD Euro III	0.000%	0.000%	0.004%	0.000%	0.000%	0.001%
Buses	Hybrid Diesel - Urban Buses Articulated >18 t	HD Euro VI	0.000%	0.026%	0.012%	0.026%	0.000%	0.011%
Buses	Hybrid CNG - Urban CNG Buses	EEV	0.000%	0.000%	0.006%	0.000%	0.000%	0.002%
Heavy Duty Trucks	CNG-Rigid <=7,5 t	HD Euro II - 91/542/EEC Stage II	0.000%	0.000%	0.001%	0.000%	0.000%	0.000%
Heavy Duty Trucks	CNG-Rigid <=7,5 t	HD Euro IV - 2005 Standards	0.001%	0.001%	0.000%	0.001%	0.001%	0.001%
Heavy Duty Trucks	CNG-Rigid <=7,5 t	HD Euro V - 2008 Standards	0.002%	0.001%	0.003%	0.001%	0.002%	0.002%
Heavy Duty Trucks	CNG-Rigid <=7,5 t	HD Euro VI	0.007%	0.009%	0.006%	0.009%	0.007%	0.008%
Heavy Duty Trucks	CNG-Rigid 7,5 - 12 t	HD Euro IV - 2005 Standards	0.002%	0.000%	0.001%	0.000%	0.002%	0.001%
Heavy Duty Trucks	CNG-Rigid 7,5 - 12 t	HD Euro V - 2008 Standards	0.001%	0.000%	0.000%	0.000%	0.001%	0.001%
Heavy Duty Trucks	CNG-Rigid 14 - 20 t	HD Euro II - 91/542/EEC Stage II	0.000%	0.000%	0.000%	0.000%	0.003%	0.001%
Heavy Duty Trucks	CNG-Rigid 14 - 20 t	HD Euro IV - 2005 Standards	0.003%	0.001%	0.001%	0.001%	0.007%	0.003%
Heavy Duty Trucks	CNG-Rigid 14 - 20 t	HD Euro V - 2008 Standards	0.000%	0.000%	0.000%	0.000%	0.001%	0.000%
Heavy Duty Trucks	CNG-Rigid 14 - 20 t	HD Euro VI	0.002%	0.001%	0.003%	0.001%	0.001%	0.002%
Heavy Duty Trucks	CNG-Rigid 20 - 26 t	HD Euro II - 91/542/EEC Stage II	0.002%	0.000%	0.001%	0.000%	0.009%	0.003%
Heavy Duty Trucks	CNG-Rigid 20 - 26 t	HD Euro IV - 2005 Standards	0.003%	0.001%	0.001%	0.001%	0.009%	0.004%
Heavy Duty Trucks	CNG-Rigid 20 - 26 t	HD Euro V - 2008 Standards	0.000%	0.000%	0.000%	0.000%	0.001%	0.000%
Heavy Duty Trucks	CNG-Rigid 20 - 26 t	HD Euro VI	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	CNG-Rigid 26 - 28 t	HD Euro VI	0.000%	0.001%	0.000%	0.001%	0.000%	0.000%
Heavy Duty Trucks	CNG-Rigid 28 - 32 t	HD Euro II - 91/542/EEC Stage II	0.000%	0.000%	0.000%	0.000%	0.001%	0.000%
Heavy Duty Trucks	CNG-Rigid 28 - 32 t	HD Euro IV - 2005 Standards	0.001%	0.000%	0.000%	0.000%	0.001%	0.000%
Heavy Duty Trucks	CNG-Articulated 14 - 20 t	HD Euro IV - 2005 Standards	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Hybrid Diesel Rigid <=7,5 t	HD Euro VI	0.002%	0.003%	0.004%	0.003%	0.001%	0.002%
Heavy Duty Trucks	LPG Rigid 14 - 20 t	Euro II	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	LPG Rigid 14 - 20 t	Euro V	0.004%	0.000%	0.003%	0.000%	0.001%	0.002%
Heavy Duty Trucks	LPG Rigid 14 - 20 t	Euro VI	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Heavy Duty Trucks	Electric	Electric	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

Light Commercial Vehicles	CNG	LD Euro 4 - 98/69/EC Stage2005	0.001%	0.001%	0.000%	0.001%	0.000%	0.001%
Light Commercial Vehicles	CNG	LD Euro 5 - 2008 Standards	0.000%	0.002%	0.004%	0.002%	0.001%	0.002%
Light Commercial Vehicles	CNG	LD Euro 6 up to 2017	0.001%	0.002%	0.002%	0.002%	0.005%	0.002%
Light Commercial Vehicles	LPG	LD Euro 3 - 98/69/EC Stage2000	0.000%	0.001%	0.000%	0.001%	0.000%	0.000%
Light Commercial Vehicles	LPG	LD Euro 4 - 98/69/EC Stage2005	0.000%	0.001%	0.000%	0.001%	0.001%	0.001%
Light Commercial Vehicles	LPG	LD Euro 5 - 2008 Standards	0.003%	0.002%	0.001%	0.002%	0.001%	0.001%
Light Commercial Vehicles	LPG	LD Euro 6 up to 2017	0.011%	0.018%	0.014%	0.018%	0.013%	0.014%
Light Commercial Vehicles	Electric	Electric	0.020%	0.016%	0.012%	0.016%	0.007%	0.013%
Motorcycles	Electric	Electric	0.072%	0.003%	0.006%	0.003%	0.002%	0.015%
Passenger Cars	E85	PC Euro 5 - EC 715/2007	0.001%	0.000%	0.000%	0.000%	0.000%	0.000%
Passenger Cars	Electric	Electric	0.727%	0.176%	0.111%	0.176%	0.093%	0.232%
Passenger Cars	Hybrid CNG	PC Euro 4 - 98/69/EC Stage2005	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Passenger Cars	Hybrid CNG	PC Euro 5 - EC 715/2007	0.000%	0.001%	0.000%	0.001%	0.000%	0.000%
Passenger Cars	Hybrid diesel - Diesel 1,4 - 2,0 l	PC Euro 3 - 98/69/EC Stage2000	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Passenger Cars	Hybrid diesel - Diesel 1,4 - 2,0 l	PC Euro 4 - 98/69/EC Stage2005	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Passenger Cars	Hybrid diesel - Diesel 1,4 - 2,0 l	PC Euro 5 - EC 715/2007	0.005%	0.005%	0.006%	0.005%	0.006%	0.005%
Passenger Cars	Hybrid diesel - Diesel 1,4 - 2,0 l	PC Euro 6 up to 2016	0.001%	0.001%	0.001%	0.001%	0.000%	0.001%
Passenger Cars	Hybrid diesel - Diesel 1,4 - 2,0 l	PC Euro 6 2017-2019	0.000%	0.001%	0.000%	0.001%	0.000%	0.001%
Passenger Cars	Hybrid diesel - Diesel >2,0 l	PC Euro 4 - 98/69/EC Stage2005	0.001%	0.001%	0.000%	0.001%	0.000%	0.001%
Passenger Cars	Hybrid diesel - Diesel >2,0 l	PC Euro 5 - EC 715/2007	0.004%	0.001%	0.003%	0.001%	0.002%	0.002%
Passenger Cars	Hybrid diesel - Diesel >2,0 l	PC Euro 6 up to 2016	0.002%	0.000%	0.002%	0.000%	0.002%	0.001%
Passenger Cars	Hybrid LPG	PC Euro 3 - 98/69/EC Stage2000	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Passenger Cars	Hybrid LPG	PC Euro 4 - 98/69/EC Stage2005	0.002%	0.001%	0.002%	0.001%	0.002%	0.002%
Passenger Cars	Hybrid LPG	PC Euro 5 - EC 715/2007	0.002%	0.002%	0.001%	0.002%	0.002%	0.002%
Passenger Cars	Hybrid LPG	PC Euro 6 up to 2016	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Taxi	CNG	PC Euro 4 - 98/69/EC Stage2005	0.013%	0.002%	0.007%	0.002%	0.004%	0.006%
Taxi	CNG	PC Euro 5 - EC 715/2007	0.041%	0.009%	0.027%	0.009%	0.021%	0.023%
Taxi	CNG	PC Euro 6 up to 2016	0.000%	0.000%	0.000%	0.000%	0.002%	0.001%
Taxi	Diesel <1,4 l	PC Euro 4 - 98/69/EC Stage2005	0.001%	0.000%	0.000%	0.000%	0.001%	0.001%
Taxi	Diesel <1,4 l	PC Euro 5 - EC 715/2007	0.000%	0.000%	0.001%	0.000%	0.000%	0.000%
Taxi	Diesel <1,4 l	PC Euro 6 up to 2016	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Taxi	Diesel <1,4 l	PC Euro 6 2017-2019	0.005%	0.001%	0.003%	0.001%	0.002%	0.003%
Taxi	Diesel 1,4 - 2,0 l	PC Euro 4 - 98/69/EC Stage2005	1.470%	0.462%	1.109%	0.462%	1.116%	0.987%
Taxi	Diesel 1,4 - 2,0 l	PC Euro 5 - EC 715/2007	3.086%	1.091%	2.334%	1.091%	2.322%	2.103%
Taxi	Diesel 1,4 - 2,0 l	PC Euro 6 up to 2016	1.703%	0.579%	1.277%	0.579%	1.351%	1.170%
Taxi	Diesel 1,4 - 2,0 l	PC Euro 6 2017-2019	0.192%	0.066%	0.137%	0.066%	0.128%	0.124%
Taxi	Diesel >2,0 l	PC Euro 4 - 98/69/EC Stage2005	0.038%	0.008%	0.027%	0.008%	0.053%	0.031%
Taxi	Diesel >2,0 l	PC Euro 5 - EC 715/2007	0.061%	0.016%	0.047%	0.016%	0.095%	0.053%

Taxi	Diesel >2,0 l	PC Euro 6 up to 2016	0.062%	0.012%	0.054%	0.012%	0.102%	0.056%
Taxi	Diesel >2,0 l	PC Euro 6 2017-2019	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Taxi	Electric	Electric	0.016%	0.003%	0.017%	0.003%	0.010%	0.011%
Taxi	Hybrid CNG	PC Euro 4 - 98/69/EC Stage2005	0.008%	0.001%	0.007%	0.001%	0.007%	0.006%
Taxi	Hybrid CNG	PC Euro 5 - EC 715/2007	0.058%	0.013%	0.044%	0.013%	0.034%	0.035%
Taxi	Hybrid CNG	PC Euro 6 up to 2016	0.009%	0.003%	0.010%	0.003%	0.008%	0.007%
Taxi	Hybrid LPG	PC Euro 4 - 98/69/EC Stage2005	0.242%	0.083%	0.178%	0.083%	0.174%	0.161%
Taxi	Hybrid LPG	PC Euro 5 - EC 715/2007	1.567%	0.494%	1.142%	0.494%	1.047%	1.004%
Taxi	Hybrid LPG	PC Euro 6 up to 2016	0.526%	0.140%	0.405%	0.140%	0.419%	0.353%
Taxi	LPG	PC Euro 4 - 98/69/EC Stage2005	0.113%	0.044%	0.085%	0.044%	0.085%	0.078%
Taxi	LPG	PC Euro 5 - EC 715/2007	0.477%	0.164%	0.353%	0.164%	0.336%	0.316%
Taxi	LPG	PC Euro 6 up to 2016	0.784%	0.263%	0.561%	0.263%	0.610%	0.527%
Mopeds			0.341%	0.000%	0.196%	0.000%	0.025%	0.119%