SULPITER PROJECT

DELPHI ANALYSIS

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A. Introduction

1. Scope of work

This work was developed by the Institute for Transport and Logistics (ITL), within the SULPiTER project (code CE222), funded by the Interreg Central Europe Programme 2014 – 2020 (European Regional Development Fund).

SULPiTER is coordinated by ITL and it kicked-off in June 2016. Its core technical focuses on the development of Sustainable Urban Logistics Plans (SULP) in the participating Functional Urban Areas (FUA)[1], which are Bologna, Budapest, Poznan, Brescia, Stuttgart, Maribor and Rijeka.

The analysis describes the results of a DELPHI survey on scenarios and trends in urban freight transport, conducted worldwide to gather the view of experts and institutions/organisations with competencies in technical areas relevant to urban freight transport. The analysis wants to inform and support project partners in developing Sustainable Urban Logistics Plans in the cities participating to the SULPiTER project.

2. Structure

This report is structured in the following Sections:

- **Section 2** describes the **methodology and approach**.
- **Section 3** analyses **trends and factors impacting on logistics in functional urban areas**.
- **Section 4** provides a **focus on the specific factors and trends**.
- **Section 5** includes the **conclusions**.

This analysis is complemented by a parallel work developed by ITL, which concerns a Benchmark Analysis (D.T3.1.2) of logistics plans and low carbon logistics measures. The latter work is delivered in a separate report. In fact, despite the benchmark and the DELPHI analyses share the goal of supporting the project FUAs in developing SULPs, they present different methodological approaches and they are two separate strands of activities in the SULPiTER project.

[1] Source: https://www.oecd.org/gov/regional-policy/Definition-of-Functional-Urban-Areas-for-the-OECD-metropolitan-database.pdf

B. Methodology and approach

1. Introduction

Urban freight transport and logistics are by nature inter-disciplinary and they are influenced by multiple factors which relate to the behaviours of different stakeholders. In particular citizens of urban areas, transport and logistics providers, manufacturing and industrial companies, ICT providers, authorities live in complex urban environment that they shape and which at the same time moves their choices.

This report tries to understand how these complex interactions will shape freight transport and logistics in functional urban areas. It does it in simple and straight way, by asking experts' opinions on which are the main trends and scenarios which will affect urban freight in the future.

1.1. The DELPHI methodology

The Delphi methodology is a structured technique, originally developed as a systematic, interactive forecasting and policy-making methodology, which relies on a panel of experts. It has been widely applied in business forecasting, and it is based on the principle that forecasts (or decisions) from a structured group of individuals are more accurate than those from unstructured groups.

The experts involved in the Delphi survey are asked to answer a questionnaire in at least two rounds. After each round, a *facilitator* or *change agent* provides a summary of the experts' answers from the previous round, as well as, when possible, a reasoned analysis of the reasons provided for their judgments. Experts are thus encouraged to revise their earlier answers in light of the replies of other members of their panel.

The major rationale behind the Delphi methodology is the belief that during this process the range of the answers will converge towards the 'correct' answer. The process is stopped when a predefined stop criterion is reached (e.g. number of rounds, achievement of consensus, stability of results) and the mean or median scores of the final rounds determine the final results.

The Delphi survey has been developed in two rounds:

1. Online questionnaire sent to a total of 415 contacts, with 63 answers;
2. Expert workshop involving a selected number of experts.

2. The methodological approach

The Delphi survey's methodological approach can be described as in the following list:

- Selection of relevant topics and identification of survey's questions;
- Selection of experts and contact modalities;
- Characteristics of the panel of respondents;
- Analysis of results;
- Experts' workshop.

The phases of the analysis are subsequently described.

A. SELECTION OF RELEVANT TOPICS AND IDENTIFICATION OF SURVEY'S QUESTIONS

Literature review and selection of relevant topics

The selection of relevant topics has been developed based on the review of relevant literature in the field of urban logistics, research & innovation in freight transport, and clean fuel transport.

The most relevant reports and research can be listed as follows:

- Andrea Meyer and Dana Meyer, City Logistics Research: A Transatlantic Perspective, Conference Proceedings, Summary of the First EU-U.S. Transportation Research Symposium, Washington, D.C., May 2013;
- European Commission, COM (2016) 501 final, A European Strategy for Low-Emission Mobility, Brussels, 20/7/2016;
- EPSC Strategic Notes, Issue 17, Towards Low-Emission Mobility, Driving the Modernisation of the EU Economy, 20/07/2016;
- Fraunhofer-Institut für Materialfluss und Logistik, Daimler Ag, Db Mobility Logistics Ag, Visions of the Future: Transportation and Logistics 2030, February 2014;
- Martin Savelsbergh and Tom Van Woensel, City Logistics: Challenges and Opportunities, SCL Report Series, February 2016;
- DHL Trend Research, Logistics Trend Radar – Delivering insight today. Creating value tomorrow!, 2016;
- Deutsche Post AG, Delivering Tomorrow – Logistics 2050, A Scenario Study, February 2012
- MDS Transmodal Limited, Centro di Ricerca per il Trasporto e la Logistica, Study on Urban Freight Transport, European Commission, DG MOVE, April 2012
- Cambridge Systematics Inc., Comsis Corporation, University Of Wisconsin-Milwaukee, Quick Response Freight Manual, Federal Highway Administration, September 1996
- Regional Plan Association (RPA), Volvo Research and Educational Foundations (VREF), Why Goods Movement Matters, Strategies for Moving Goods in Metropolitan Areas, June 2016;
- Teodor Gabriel Crainic, Measuring Efficiency & Inefficiency in Urban Freight Transport, City Logistics Research: A Trans-Atlantic Perspective, Washington, D.C., 2013

Based on the review of the relevant literature, nine topics have been identified belonging to the following four core areas:

- consumption;
- land and road use;
- distribution and supply chain management;
- technologies and equipment.

For each topic, one or more drivers of urban logistics have been selected, in the shape of trends occurring/developing or factors having an impact on urban logistics.

The selected topics and drivers are shown in Table below.

Table 1: Selection of relevant topics and drivers

Area	Topic	Driver	
Consumption	Demographic trends	1	Grey power logistics
	Trends in consumers' behaviour	2	Environment & sustainability
		3	E-commerce
		4	Sharing economy
Land and road use	Government side	5	Public planning
	Industry side	6	Industry plans
Distribution and supply chain management	Trends in world production and trade	7	Globalization trends
	New business models and trends in Supply Chain Management	8	Desire for speed
		9	Omni-channel logistics
Technologies and equipment	Clean fuel	10	CNG and EV for urban freight
	Intelligent Transportation Systems	11	Internet of Things and Big Data
	Frontier technologies	12	Unmanned Aerial Vehicle (UAV)
		13	Automated vehicles

Source: elaboration by Steer Davies Gleave

Identification of survey's questions

A number of questions have been developed to be included in the Expert Survey, relating to the 13 drivers selected. The 13 drivers have been presented to the experts in terms of trends occurring/developing and factors influencing urban logistics (the terminology 'driver' will be adopted hereinafter).

Each trend has been introduced by a short paragraph to provide context to the questions.

For each driver, the Expert has been asked to:

- specify its impact on urban logistics, on a qualitative scale from 1 to 5 (1 meaning very low impact / influence / diffusion / probability, while 5 meaning very high);
- choose a time frame in which it is likely to occur / have influence on urban logistics, choosing between four options: 'Before 2020', 'Before 2030', 'After 2030', and 'Never'.

The full text of the Survey is provided as an Appendix at the end of this report. A summary of the questions included in the Experts' Survey is reported in Table below.

Table 2: Survey's questions (summary)

Driver		Category	Question	
1	Grey power logistics	*Introduction*	*Grey power logistics, that is the logistics for an aging society, is likely to drive consuming and logistics.*	
		Impact	1A	How do you assess the future impact of population aging on the development of e-commerce?
			1B	How do you assess the future impact of population aging on the development of convenience stores (e.g. mini-marts or 'corner stores' in urban areas)?
			1C	How do you assess the future impact of population aging on the development of medical, pharma, home care logistics networks?
		Time horizon	1D	In which time frame do you think that population ageing will become a driver of logistics?
2	Environment & sustainability	*Introduction*	*In recent years, consumers have raised their awareness on the environmental sustainability of the products they buy.*	

Driver		Category	Question	
		Impact	2A	To what extent consumers' behaviours will be driven by the environmental sustainability of a product, including the sustainability of its delivery mode?
		Time horizon	2B	In which time frame do you think the environmental sustainability of a product will become a key driver of consumers' behaviours?
3	E-commerce	*Introduction*	*E-commerce is expected to continue growing. Several studies expect that home delivery generates more freight traffic, but cuts private mobility to shops.*	
		Impact	3A	Will e-commerce be a core factor influencing urban freight?
			3B	How do you expect e-commerce to impact on the total urban traffic as a consequence of the trade-off described above? (from 'high decrease' to 'high increase')
		Time horizon	3C	In which time frame do you expect e-commerce to be the main sales channel?
4	Sharing economy	*Introduction*	*A number of start-ups have recently entered the logistics industry claiming they will be the next 'Uber of trucking'.*	
		Impact	4A	To what extent could these new start-ups impact on urban transport and logistics providers with the same magnitude as Uber did on the taxi industry?
		Time horizon	4B	In which time frame will these initiatives be a consolidated practice in urban freight?
5	Public planning	*Introduction*	*Which of the following public planning practices you expect to become common, and in which time frame?*	
		Impact	5A	Road Usage Charging for freight vehicles in the metropolitan area with revenues earmarked for transport investments.
		Time horizon	5B	
		Impact	5C	Public regulations for dedicated logistics facilities or space in real estate urban projects.
		Time horizon	5D	
		Impact	5E	Planning of logistics facilities in urban areas accessible by rail or river.
		Time horizon	5F	
		Impact	5G	Applying 'complete streets' principles that include freight needs.
		Time horizon	5H	
		Impact	5I	Shifting deliveries to off peak times.
		Time horizon	5J	
6	Industry plans	*Introduction*	*Please consider the following types of Distribution Centres: i. mega-sized Regional-National Distribution Centres; ii. mid-sized, cross-docked city Distribution Centres; iii. small, flexible urban warehouses-access centres located in urban communities.*	
		Impact	6A	To what extent do you expect type (iii) to significantly diffuse as means to exploit proximity to clients and related optimization of routes and delivery time?
		Time horizon	6B	In which time frame do you think that type (iii) will be a widespread practice?
7	Globalization trends	*Introduction*	*While globalization (i.e. production being distributed across multiple locations around the world, driven by production cost factors) is a continuing trend, a number of companies have started considering investments in the opposite direction.*	
		Impact	7A	To what extent do you expect such practices to consolidate?
		Time horizon	7B	In which time frame?

Driver		Category	Question	
8	Desire for speed	*Introduction*	*In recent years, many e-tailers have started offering customers a same-day delivery option, sometimes up to 1-hour delivery.*	
		Impact	8A	To what extent do you think that the 'desire for speed' will increase freight transport impacts in urban areas?
		Time horizon	8B	In which time frame will these types of deliveries become a practice on all main commodities?
9	Omni-channel logistics	*Introduction*	*Omni-channel retailing foresees the integration of several on-line and off-line retail channels in which consumers can buy, pick up or receive goods and manage payments.*	
		Impact	9A	To what extent do you think that this trend will grow?
		Time horizon	9B	In which time frame?
10	CNG and EV for urban freight	*Introduction*	*Many factors are affecting the uptake of alternative fuel (e.g. Compressed Natural Gas, electric) vehicles.*	
		Impact	10A	To what extent do you expect that alternative fuel freight vehicles will be a mainstream practice in urban areas?
		Time horizon	10B	In which time frame?
11	Internet of Things and Big Data	*Introduction*	*To what extent do you expect that Internet of Things will change logistics in cities in terms of:*	
		Impact	11A	Freight traffic reduction
			11B	Transport safety
			11C	Better utilization of urban space
			11D	Better logistics operations planning
			11E	Improved public planning in transport
		Time horizon	11F	In which time frame do you expect Internet of Things to diffuse in city logistics?
12	Unmanned Aerial Vehicles	*Introduction*	*Amazon is currently testing UAVs, aiming at delivering parcels from distribution centres directly to customers via Amazons Prime Air.*	
		Impact	12A	To what extent do you expect that UAVs will become a practice in the parcel sector, also considering safety and regulatory issues?
		Time horizon	12B	In which time frame do you think that cities should develop a policy framework to take into consideration UAV deliveries?
13	Automated vehicles	*Introduction*	*Urban environment systems are expected to follow a pathway where application of highly automated vehicles will initially be limited to specific environments and then gradually open up to less protected circumstances.*	
		Impact	13A	Which level of impact do you expect on authorities' regulatory and planning practices?
		Time horizon	13B	In which time frame do you expect the diffusion of pilot applications of automated freight vehicles at urban level?

Source: elaboration by Steer Davies Gleave

B. SELECTION OF EXPERTS AND CONTACT MODALITIES

A number of experts have been identified to be contacted, with the aim of maintaining a balance between four categories of respondents:

- Business sector;
- Authorities;

- Research;
- Others[2].

Some of these contacts have been indicated by some of the SULPiTER's project partners.

The total number of contacts in the panel amounts to 415.

The Expert Survey has been uploaded on the EUSurvey portal (the European Commission's online survey-management system).

Experts have been contacted by mail and been asked to complete the online questionnaire. In a second time, a reminder was sent to all contacts not having answered yet, in order to boost the number of answers received.

C. CHARACTERISTICS OF THE PANEL OF RESPONDENTS

A total of 63 responses to the Expert Survey have been received.

The disaggregation of the number of respondents by category is provided in Table below. The most numerous category is 'Authorities' (27 responses), followed by 'Research' (16 responses), 'Business sector' (12 responses), and 'Others (including associations)' (7 responses).

Table 3: Number of respondents by category

	Number of respondents	% on the total
Business sector	13	21%
Authorities	27	43%
Research	16	25%
Others (including associations)	7	11%
Total	**63**	**100%**

Source: elaboration by Steer Davies Gleave

The geographical distribution of the panel of respondents is wide and includes the following EU Member States and extra-EU countries:

- Austria;
- Australia;
- Belgium;
- Bulgaria;
- Croatia;
- Czech Republic;
- Denmark;
- France;
- Germany;
- Greece;

[2] The category main includes associations.

- Hungary;
- India;
- Italy;
- Latvia;
- Netherlands;
- Poland;
- Portugal;
- Romania;
- Slovenia;
- Spain;
- Sweden;
- Switzerland;
- United Kingdom;
- United States of America.

The list of respondents to the Expert Survey is provided in an Appendix to this Report[3].

D. EXPERTS' WORKSHOP

The results of the survey have been discussed in an on-line workshop with a selected group of experts, in accordance with the provisions of the Delphi methodology. We involved the following experts, who agreed to be mentioned in this report:

- Georgia Ayfantopoulou;
- Andrea Campagna;
- Laetitia Dablanc;
- Jacques Leonardi.

[3] The name and organisation of respondents are included based on their authorisation to do it.

C. Analysis of trends and factors impacting on logistics in functional urban areas

1. Introduction

This Chapter includes the analysis of the Expert Survey's main results.

Firstly, the view of the experts concerning the impact of the thirteen drivers is analysed and discussed, as well as their assessment of the likely time horizon over which such drivers will deploy their effects on urban logistics.

Secondly, similarities and differences in the answers provided by experts belonging to the business sector, the authorities' group, the research's group, and those not classified in these three categories, are analysed and discussed.

2. The overview of trends and factors and their timeline

The overall results of the Expert Survey are shown in Figure 1. Each driver is represented by means of a bubble.

For each driver, the Figure shows information belonging to three dimensions:

Time horizon: the average of the respondents' answers with respect to the time frame in which the driver is likely to have influence on urban logistics is specified on the x-axis; the values on the time horizon are:

- 'Before 2020', meaning that a driver is likely to have influence in the short run;
- 'Before 2030', meaning that a driver is likely to have influence in the medium run;
- 'After 2030', meaning that a driver is likely to have influence in the long run;
- 'Never'.

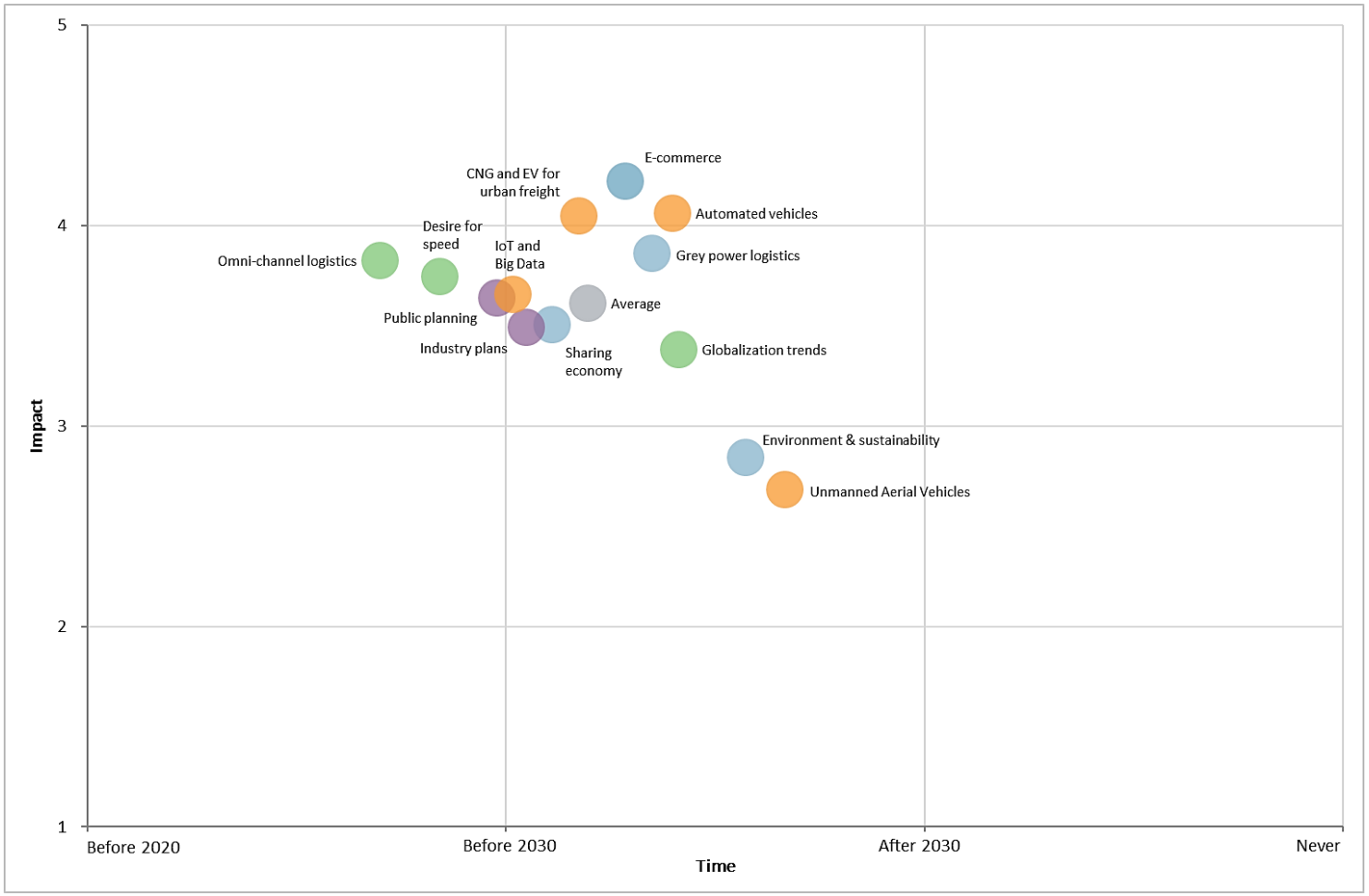
Impact: the average of the respondents' answers with respect to the impact of the driver on urban logistics, is specified on the y-axis on a qualitative scale from 1 to 5, which can be interpreted as follows:

- 1 = very low impact;
- 2 = low impact;
- 3 = moderate impact;
- 4 = high impact;
- 5 = very high impact.

Core areas: the reference category of each driver is specified by the balls' colour:

- blue: consumption;
- purple: land and road use;
- green: distribution and supply chain management;
- orange: technologies and equipment;
- grey: average of all drivers.

Figure 1: Urban logistic drivers' impact and time positioning



Source: elaboration by Steer Davies Gleave

2.1. Overall results

Impact

With respect to the 'impact' dimension, all drivers are comprised between a minimum value of 2.7 ('Unmanned Aerial Vehicles') to a maximum of 4.2 ('E-commerce'). The expert panel's assessment on the overall relevance of the thirteen drivers is positive, the range being turned towards the upper side of the axis.

The average of all drivers with respect to the 'impact' dimension is equal to 3.6.

The following table reports the list of the drivers sorted by the value associated to the 'impact' dimension. The table therefore shows the expert panel's overall assessment of the likely impact's strength of all drivers, from the most to the least significant. To ease reading and interpretation, values on a scale from 0 to 100 are accompanied to the corresponding values on a scale from 1 to 5.

Table 4: Drivers' impact, from the most to the least significant

	Impact On a scale from 1 to 5	Impact On a scale from 0 to 100
E-commerce	4.22	81
Automated vehicles	4.06	77
CNG and EV for urban freight	4.05	76
Grey power logistics	3.86	72
Omni-channel logistics	3.83	71
Desire for speed	3.75	69
Internet of Things and Big Data	3.66	66
Public planning	3.64	66
Average	**3.61**	**65**
Sharing economy	3.51	63
Industry plans	3.49	62
Globalization trends	3.38	60
Environment & sustainability	2.84	46
Unmanned Aerial Vehicles	2.68	42

Source: elaboration by Steer Davies Gleave

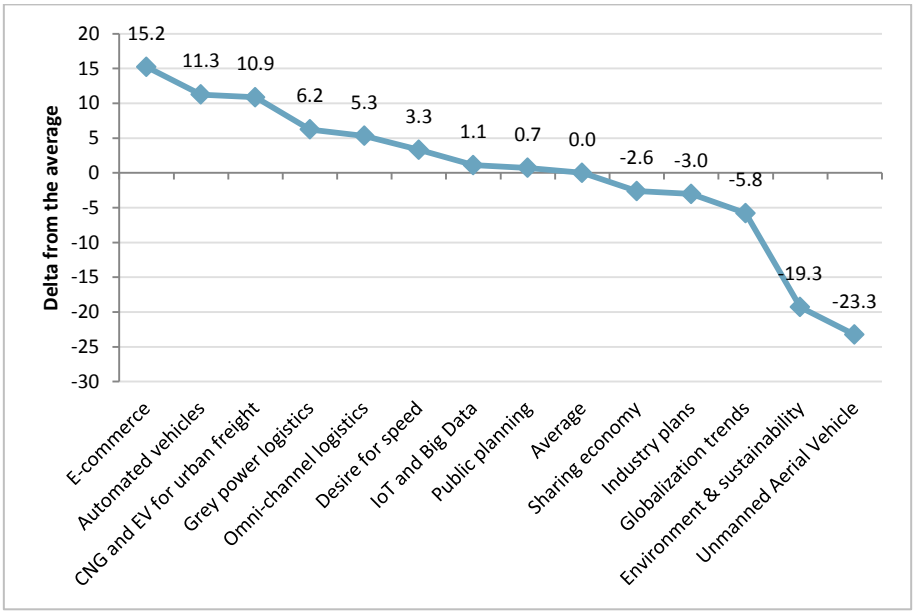
The next Figure shows the distance from the average (on the scale from 0 to 100) of each driver. Four groups can be identified:

- An impact higher than the average by at least 10 points is associated with 3 drivers: 'E-commerce', 'Automated vehicles', and 'CNG and EV for urban freight'.
- These drivers have received an average score higher than 4 ('high impact'), therefore are assessed by the experts as those likely to have a more significant impact on urban logistics;
- A distance (either positive or negative) from the average by less than 10 points is associated with 8 drivers – these drivers have received an average score between 3 ('moderate impact') and 4 ('high impact'), therefore are all assessed by the experts as capable of having a tangible impact on urban logistic; within this group:
  - a positive distance from the average is associated with 'Grey power logistics', 'Omni-channel logistics', 'Desire for speed', 'IoT and Big Data', and 'Public planning';

- a negative distance from the average is associated with 'Sharing economy', 'Industry plans', and 'Globalization trends'.
- An impact lower than the average by at least 10 points is associated with 2 drivers: 'Environment & sustainability', and 'Unmanned Aerial Vehicles' – these drivers have received an average score between 2 ('low impact') and 3 ('moderate impact'), therefore are assessed by the experts as those likely to have a less significant impact on urban logistic.

An impact higher than the average by at least 10 points is associated with 3 drivers: 'E-commerce', 'Automated vehicles', and 'CNG and EV for urban freight'.

Figure 2: Impact, distance from the average



Source: elaboration by Steer Davies Gleave

Time horizon

To compute a numerical average of the experts' answers referred to the 'time horizon' dimension, the following scale has been adopted:

- 1 = 'Before 2020';
- 2 = 'Before 2030';
- 3 = 'After 2030';
- 4 = 'Never'.

With respect to this scale, all drivers are comprised between a minimum value of 1.7 ('Omni-channel logistics') to a maximum of 2.7 ('Unmanned Aerial Vehicles'). The average of all drivers with respect to the 'time horizon dimension is equal to 2.2 (i.e. close to the value of 2 meaning 'Before 2030'). That means that the overall assessment of the expert panel points towards the medium range of the spectrum rather than the short range (i.e. 'Before 2020') or the long range (i.e. 'After 2030' and 'Never').

The following table reports the list of the drivers sorted by the value associated to the 'time horizon' dimension. The table shows the expert panel' overall assessment of the time frame in which the driver is likely to occur / impact on urban logistic, from the most to the least close in time. To ease reading and interpretation, values on a scale from 0 to 100 are accompanied to the corresponding values on a scale from 1 to 4.

Table 5: Drivers' time horizon, from the most to the least close in time

	Time horizon On a scale from 1 to 4	Time horizon On a scale from 0 to 100
Omni-channel logistics	1.70	23
Desire for speed	1.84	28
Public planning	1.98	33
Internet of Things and Big Data	2.02	34
Industry plans	2.05	35
Sharing economy	2.11	37
CNG and EV for urban freight	2.17	39
Average	**2.20**	**40**
E-commerce	2.29	43
Grey power logistics	2.35	45
Automated vehicles	2.40	47
Globalization trends	2.41	47
Environment & sustainability	2.57	52
Unmanned Aerial Vehicles	2.67	56

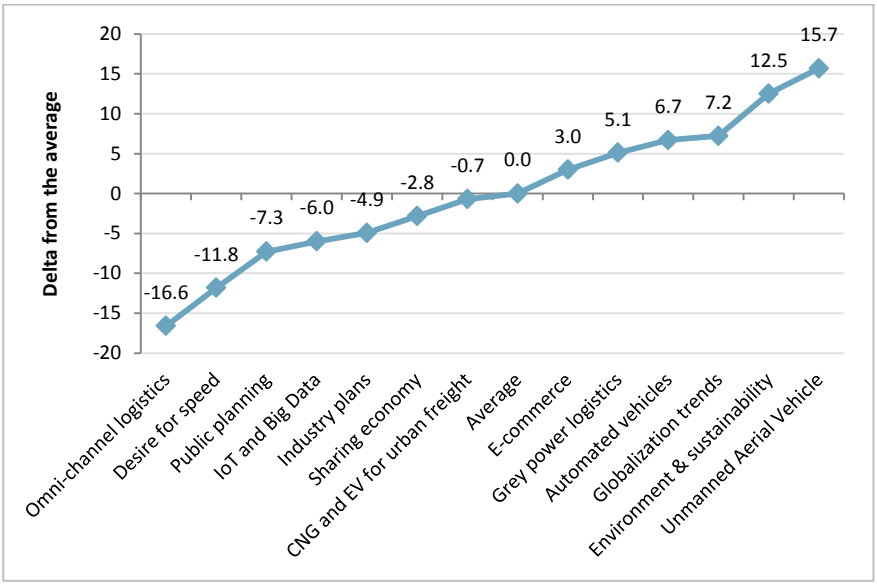
Source: elaboration by Steer Davies Gleave

The next figure shows the distance from the average (on the scale from 0 to 100) of each driver. Three groups can be identified:

- A positioning on the time horizon lower than the average by at least 10 points is associated with 2 drivers: 'Omni-channel logistics, and 'Desire for speed'; such drivers are assessed by the experts as those more likely to occur / impact on urban logistic in a closer timeframe.
- A distance (either positive or negative) from the average by less than 10 points is associated with 9 drivers; within this group:
  - a negative distance (shorter time range) from the average is associated with 'Public planning', 'IoT and Big Data', 'Industry plans', 'Sharing economy', 'CNG and EV for urban freight';
  - a positive distance (longer time range) from the average is associated with 'E-commerce', 'Grey power logistics', 'Automated vehicles', and 'Globalization trends';
- A positioning on the time horizon higher than the average by at least 10 points is associated with 2 drivers: 'Environment & sustainability', and 'Unmanned Aerial Vehicles'
  - these drivers are assessed by the experts as those more likely to occur / impact on urban logistic in a farther timeframe.

'Omni-channel logistics', and 'Desire for speed' are assessed by the experts as those more likely to occur / impact on urban logistic in a closer timeframe.

Figure 3: Time horizon, distance from the average



Source: elaboration by Steer Davies Gleave

Clustering

Based on the combination of information from the 2 dimensions – 'impact' and 'time horizon' – we propose the grouping in clusters reported in the following Table.

Table 6: Clustering of drivers

Cluster	Drivers	Impact	Time horizon
Cluster A	Omni-channel logistics Desire for speed	**Medium-high** Close to the overall average but tending towards 4. Average: 3.8	**Relatively close** Close to 'Before 2030' but tending towards 'Before 2020'. Average: 1.8
Cluster B	Public planning Industry plans Internet of Things and Big Data Sharing economy	**Medium** In line with the overall average. Average: 3.6	**Medium** Around 'Before 2030' and in line with the overall average. Average: 2.0
Cluster C	E-commerce CNG and EV for urban freight Automated vehicles Grey power logistics	**High** Close to 4. Average: 4.0	**Relatively far** Close to 'Before 2030' but tending towards 'After 2030'. Average: 2.3
Cluster D	Environment & sustainability Unmanned Aerial Vehicles	**Low** Lower than 3. Average: 2.8	**Far** Tending towards 'After 2030'. Average: 2.6
No cluster	Globalization trends	**Medium-low** Close to the overall average but tending towards 3. Value: 3.4	**Relatively far** Between 'Before 2030' and 'After 2030'. Value: 2.4

Source: elaboration by Steer Davies Gleave

Cluster A includes drivers which are expected to have a medium-high impact on urban logistics over a relatively close time horizon (close to 'Before 2030' but tending towards 'Before 2020').

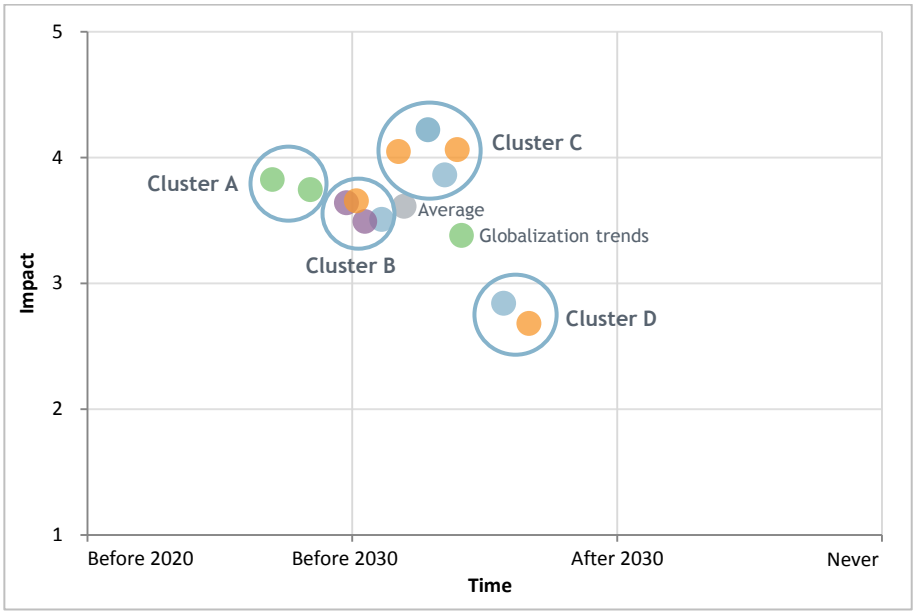
Cluster B includes drivers which are expected to have a medium impact on urban logistics after 2020 but before 2030.

Cluster C includes drivers which are expected to have a high impact on urban logistics over a relatively far time horizon (close to 'Before 2030' but tending towards 'After 2030').

Cluster D includes drivers which are expected to have a low impact on urban logistics over a far time horizon (tending towards 'After 2030').

'Globalization trends' has not been included in any cluster. It is expected to have a medium-low impact over a relatively far time horizon (between 'Before 2030' and 'After 2030').

Figure 4: Clusters



Source: elaboration by Steer Davies Gleave

3. Public, business and research: similarities and differences in their perceptions

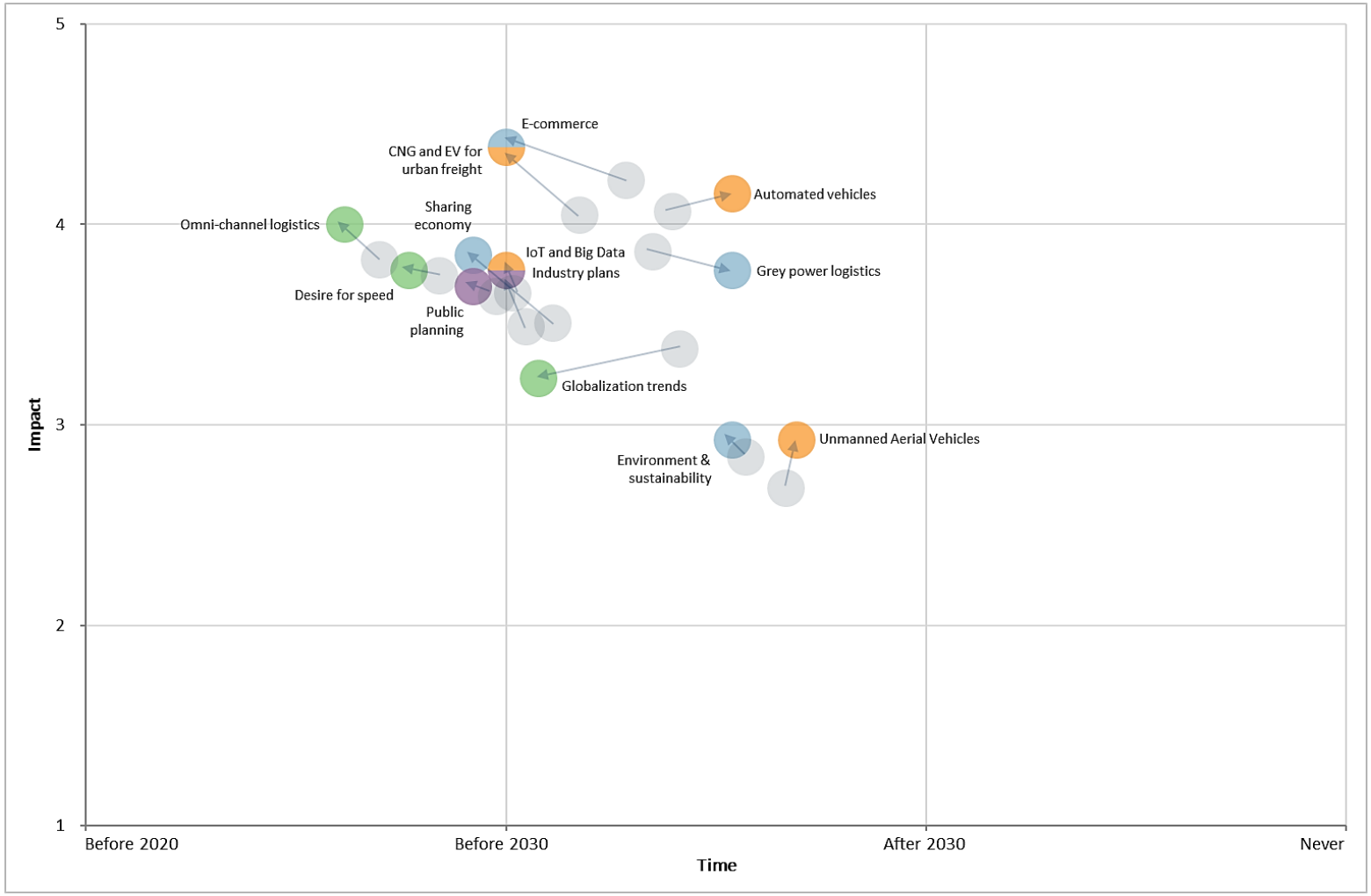
The following paragraphs discuss the Expert Survey's results with reference to the four categories of respondents:

- Business sector;
- Authorities;
- Research;
- Other (including associations).

The average of the responses to the Survey, grouped by category, are displayed in Figure 5, Figure 6, Figure 7 and Figure 8. Each driver is represented by means of a bubble.

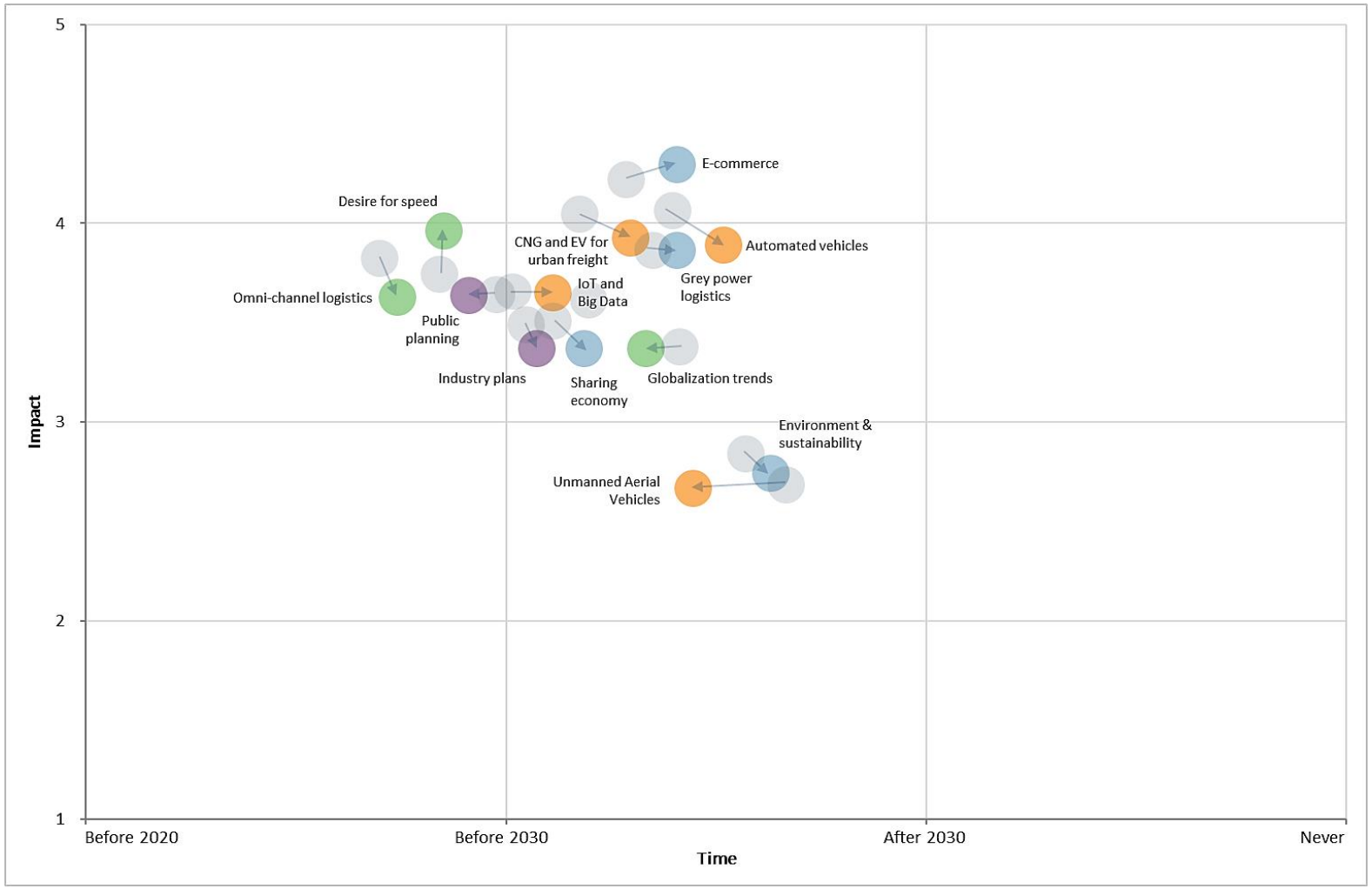
The Figures shows also a comparison of the answers received from respondents belonging to each category, with the average values observed for the whole panel of respondents (displayed as light grey bubbles). The deviation of each category's answers from the whole panel's average is represented by means of arrows.

Figure 5: Urban logistic drivers' impact and time positioning – Business sector



Source: elaboration by Steer Davies Gleave

Figure 6: Urban logistic drivers' impact and time positioning – Authorities

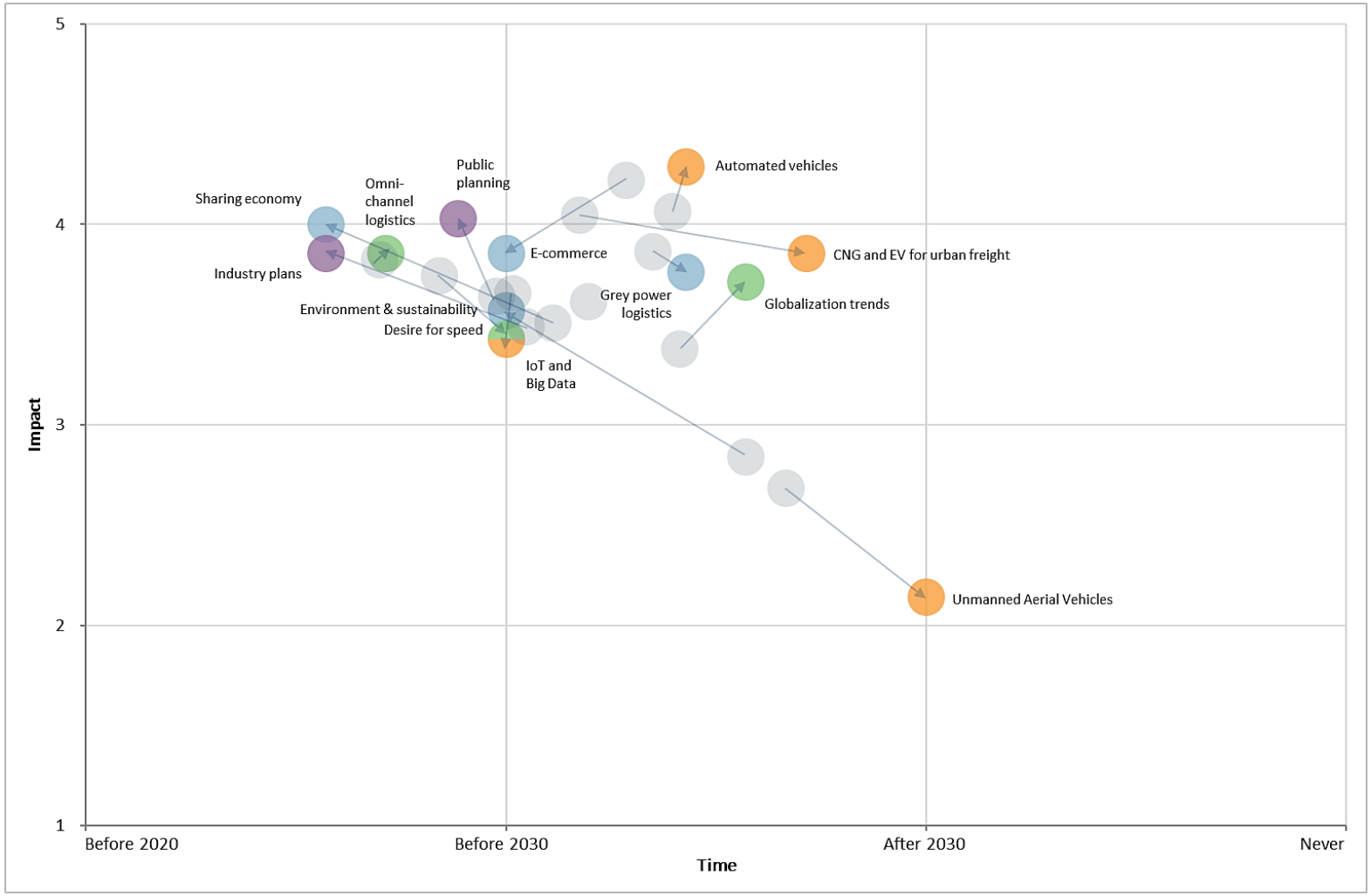


Source: elaboration by Steer Davies Gleave

Figure 7: Urban logistic drivers' impact and time positioning – Research

Source: elaboration by Steer Davies Gleave

Figure 8: Urban logistic drivers' impact and time positioning – Other



Source: elaboration by Steer Davies Gleave

3.1. Business sector

Table 7 reports the coordinates of the business sector's bubbles (please see Figure 5), in terms of values for 'impact' and 'time horizon', on the scales from 1 to 5, and from 1 to 4 respectively, as well as on the scale from 0 to 100.

For each driver, Table 7 reports also the deviation ('Δ') of the two business sector's bubbles' coordinates from the average values observed over the whole survey's sample (represented in Figure 5 by the arrows' length).

Table 7: Drivers' impact and time horizon, business sector's answers vs. whole sample's average

	Impact			Time horizon		
	Scale: 1 to 5	Scale: 0 to 100		Scale: 1 to 4	Scale: 0 to 100	
	Business sector	Business sector	Δ from whole sample	Business sector	Business sector	Δ from whole sample
Grey power logistics	3.77	69.2	-2.3	2.54	51.3	6.3
Environment & sustainability	2.92	48.1	2.0	2.54	51.3	-1.1
E-commerce	4.38	84.6	4.1	2.00	33.3	-9.5
Sharing economy	3.85	71.2	8.5	1.92	30.8	-6.3
Public planning	3.69	67.3	1.3	1.92	30.8	-1.8
Industry plans	3.77	69.2	6.9	2.00	33.3	-1.6
Globalization trends	3.23	55.8	-3.8	2.08	35.9	-11.2
Desire for speed	3.77	69.2	0.6	1.77	25.6	-2.4
Omni-channel logistics	4.00	75.0	4.4	1.62	20.5	-2.8
CNG and EV for urban freight	4.38	84.6	8.4	2.00	33.3	-5.8
IoT and Big Data	3.77	69.2	2.8	2.00	33.3	-0.5
Unmanned Aerial Vehicle	2.92	48.1	6.0	2.69	56.4	0.9
Automated vehicles	4.15	78.8	2.3	2.54	51.3	4.7
Average	**3.74**	**68.5**	**3.2**	**2.12**	**37.5**	**-2.4**

Source: elaboration by Steer Davies Gleave

The values reported in the two columns 'Δ from whole sample' in the previous table are plotted in the following scatter diagram. The following Figure, therefore, displays the specific feeling of the business sector with respect to the drivers' impact and time horizon, when compared to the average results observed over the whole survey's sample.

Figure 9: Business sector – Drivers' impact and time horizon, Δs from whole sample

Source: elaboration by Steer Davies Gleave

Overall, the selected drivers are perceived by the business sector as likely to have a more significant impact on urban logistics, and to deploy such impact closer in time.

Most of the deviations plotted in the previous Figure are located in the upper-left quadrant of the scatter diagram.

The following differences in the business sector's perception when compared with the assessment which results from the whole sample, can been underlined:

- Two drivers in the 'Consumption' group ('Sharing economy' and 'E-commerce') are perceived as being able to have a greater impact on urban logistics, over a closer time horizon; conversely, 'Grey power logistics' is the only driver located in the lower-right quadrant of the scatter diagram.
- The two drivers in the 'Land and road use' group are perceived as being able to have a greater impact on urban logistics; the deviation of 'Industry plans' on the y-axis from the whole sample's average is particularly significant.
- One driver in the 'Distribution and supply chain management' group ('Globalization trends') is perceived as capable of deploying its effects on urban logistics closer in time; however, its impact is assessed as less significant than the results from the full sample.

- The four drivers in the 'Technologies and equipment' group are perceived as being able to have a greater impact on urban logistics; the deviation of 'CNG and EV for urban freight' and 'Unmanned Aerial Vehicles' on the y-axis is particularly significant; moreover, 'CNG and EV for urban freight' is perceived as capable of deploying its effects on urban logistics closer in time – on the contrary, the effects of 'Automated vehicles' on urban logistics are perceived as likely to deploy farther in time.

Drivers which are not commented in the previous bullet list are perceived by the business sector in a similar way to that of the whole sample's average (i.e. deviations from the average over the two axes are not significant).

3.2. Authorities

Table 8 reports the coordinates of the authorities' bubbles (please see Figure 6), in terms of values for 'impact' and 'time horizon', on the scales from 1 to 5, and from 1 to 4 respectively, as well as on the scale from 0 to 100.

For each driver, Table 8 reports also the deviation ('Δ') of the two authorities' bubbles' coordinates from the average values observed over the whole survey's sample (represented in Figure 6 by the arrows' length).

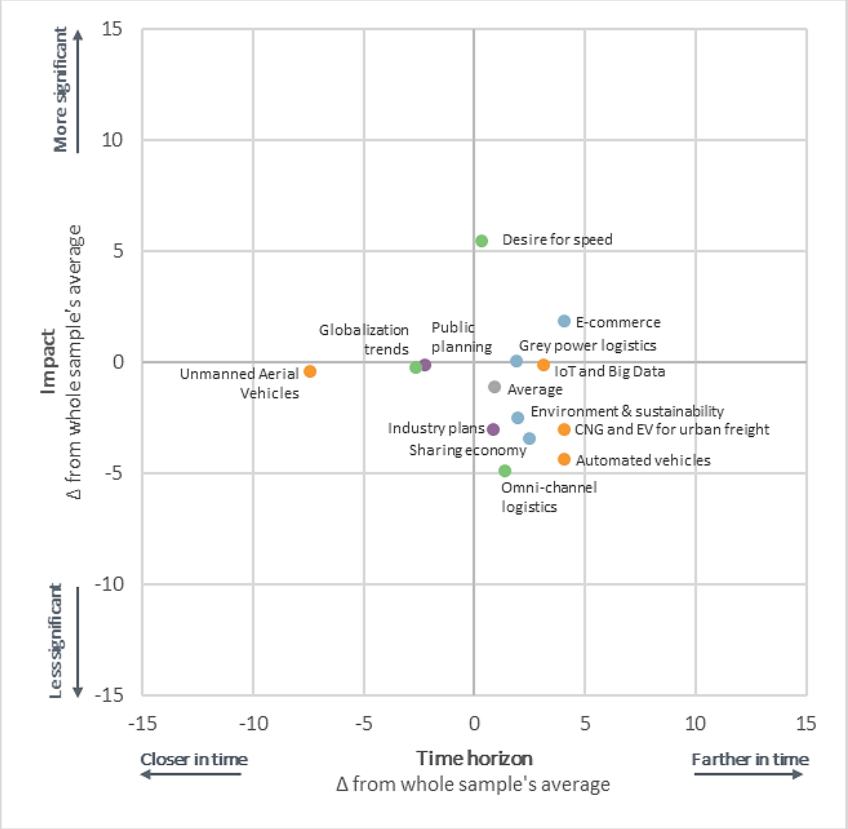
Table 8: Drivers' impact and time horizon, authorities' answers vs. whole sample's average

	Impact			Time horizon		
	Scale: 1 to 5	Scale: 0 to 100		Scale: 1 to 4	Scale: 0 to 100	
	Authorities	Authorities	Δ from whole sample	Authorities	Authorities	Δ from whole sample
Grey power logistics	3.86	71.6	0.0	2.41	46.9	1.9
Environment & sustainability	2.74	43.5	-2.5	2.63	54.3	1.9
E-commerce	4.30	82.4	1.9	2.41	46.9	4.1
Sharing economy	3.37	59.3	-3.4	2.19	39.5	2.5
Public planning	3.64	65.9	-0.1	1.91	30.4	-2.2
Industry plans	3.37	59.3	-3.0	2.07	35.8	0.9
Globalization trends	3.37	59.3	-0.3	2.33	44.4	-2.6
Desire for speed	3.96	74.1	5.4	1.85	28.4	0.4
Omni-channel logistics	3.63	65.7	-4.9	1.74	24.7	1.4
CNG and EV for urban freight	3.93	73.1	-3.0	2.30	43.2	4.1
IoT and Big Data	3.65	66.3	-0.1	2.11	37.0	3.2
Unmanned Aerial Vehicle	2.67	41.7	-0.4	2.44	48.1	-7.4
Automated vehicles	3.89	72.2	-4.4	2.52	50.6	4.1
Average	**3.57**	**64.2**	**-1.1**	**2.2**	**40.8**	**0.9**

Source: elaboration by Steer Davies Gleave

The values reported in the two columns 'Δ from whole sample' in the previous table are plotted in the following scatter diagram. The following Figure, therefore, displays the specific feeling of the authorities with respect to the drivers' impact and time horizon, when compared to the average results observed over the whole survey's sample.

Figure 10: Authorities – Drivers' impact and time horizon, Δ from whole sample



Source: elaboration by Steer Davies Gleave

Overall, the selected drivers are perceived by the authorities' group as likely to have a less significant impact on urban logistics, and to deploy such impact farther in time.

Most of the deviations plotted in the previous Figure are located in the lower-right quadrant of the scatter diagram.

The following differences in the authorities' perception when compared with the assessment which results from the whole sample, can be underlined:

- The four drivers in the 'Consumption' group are perceived as being able of deploying their effects on urban logistics farther in time; of such drivers, two ('Environment & sustainability' and 'Sharing economy') are perceived as capable of having a lower impact on urban logistics, while 'E-commerce' is perceived as capable of having a higher impact.
- Among the drivers in the 'Land and road use' group, 'Industry plans' is perceived as capable of having a lower impact on urban logistics.
- One driver in the 'Distribution and supply chain management' group ('Desire for speed') is perceived as capable of having a higher impact on urban logistics; on the contrary, 'Omni-channel logistics' is perceived as capable of having a lower impact;
- Of the four drivers in the 'Technologies and equipment' group, three ('IoT and Big Data', 'CNG and EV for urban freight', and 'Automated vehicles') are perceived as capable of deploying their

effects on urban logistics farther in time; on the contrary, 'Unmanned Aerial Vehicles' is perceived as being able of deploying its effects on urban logistics closer in time.

Drivers which are not commented in the previous bullet list are perceived by the authorities' group in a similar way to that of the whole sample's average (i.e. deviations from the average over the two axes are not significant).

3.3. Research

Table 9 reports the coordinates of the research's bubbles (please see Figure 7), in terms of values for 'impact' and 'time horizon', on the scales from 1 to 5, and from 1 to 4 respectively, as well as on the scale from 0 to 100.

For each driver, Table 9 reports also the deviation ('Δ') of the two research's bubbles' coordinates from the average values observed over the whole survey's sample (represented in Figure 7 by the arrows' length).

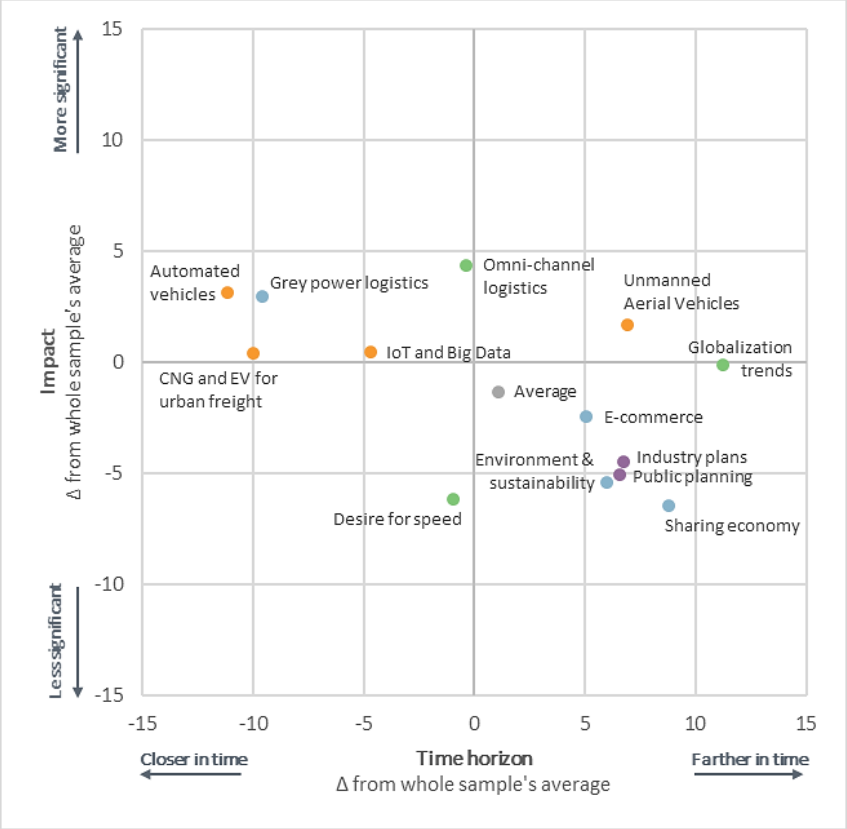
Table 9: Drivers' impact and time horizon, research's answers vs. whole sample's average

	Impact			Time horizon		
	Scale: 1 to 5	Scale: 0 to 100		Scale: 1 to 4	Scale: 0 to 100	
	Research	Research	Δ from whole sample	Research	Research	Δ from whole sample
Grey power logistics	3.98	74.5	2.9	2.06	35.4	-9.6
Environment & sustainability	2.63	40.6	-5.4	2.75	58.3	6.0
E-commerce	4.13	78.1	-2.4	2.44	47.9	5.1
Sharing economy	3.25	56.3	-6.4	2.38	45.8	8.8
Public planning	3.44	60.9	-5.1	2.18	39.2	6.6
Industry plans	3.31	57.8	-4.5	2.25	41.7	6.7
Globalization trends	3.38	59.4	-0.1	2.75	58.3	11.2
Desire for speed	3.50	62.5	-6.2	1.81	27.1	-1.0
Omni-channel logistics	4.00	75.0	4.4	1.69	22.9	-0.4
CNG and EV for urban freight	4.06	76.6	0.4	1.88	29.2	-10.0
IoT and Big Data	3.68	66.9	0.4	1.88	29.2	-4.7
Unmanned Aerial Vehicle	2.75	43.8	1.7	2.88	62.5	6.9
Automated vehicles	4.19	79.7	3.1	2.06	35.4	-11.1
Average	**3.56**	**64.0**	**-1.3**	**2.2**	**41.0**	**1.1**

Source: elaboration by Steer Davies Gleave

The values reported in the two columns 'Δ from whole sample' in the previous table are plotted in the following scatter diagram. The following Figure, therefore, displays the specific feeling of the research sector with respect to the drivers' impact and time horizon, when compared to the average results observed over the whole survey's sample.

Figure 11: Research – Drivers' impact and time horizon, Δ from whole sample



Source: elaboration by Steer Davies Gleave

The specific perception of the likely impact of the selected drivers on urban logistics as expressed by the research's group shows large differences from the average over the x-axis ('Time horizon'). This denotes a more diverse range of opinions on the time horizon in which the drivers will have influence. Deviations recorded over the y-axis ('Impact') are less significant.

Overall, nearly all drivers belonging to the core areas 'Consumption' and 'Land use and planning' are located in the lower-right quadrant of the scatter plot (less significant). On the contrary, nearly all drivers belonging to the area 'Technologies and equipment' are located in the upper-left quadrant of the scatter plot (more significant).

The following differences in the research group's perception when compared with the assessment which results from the whole sample, can be underlined:

- Of the four drivers in the 'Consumption' group, three ('E-commerce', 'Environment & sustainability', and 'Sharing economy') are perceived as being able of having a lower impact on urban logistics, and of deploying such effect farther in time; on the contrary, 'Grey power logistics' is perceived as being able of having a higher impact on urban logistics, and of deploying such effect closer in time.
- The two drivers in the 'Land and road use' group, are perceived as capable of having a lower impact on urban logistics, and of deploying such effect farther in time.

- Within the 'Distribution and supply chain management' group, one driver ('Omni-channel logistics') is perceived as capable of having a higher impact on urban logistics; 'Omni-channel logistics' is perceived as capable of deploy its effect on urban logistics farther in time.
- Of the four drivers in the 'Technologies and equipment' group, three ('IoT and Big Data', 'CNG and EV for urban freight', and 'Automated vehicles') are perceived as capable of deploying their effects on urban logistics closer in time; also, the impact of 'Automated vehicles' is perceived as higher than what results from the whole sample; on the contrary, 'Unmanned Aerial Vehicles' is perceived as being able of deploying its effects on urban logistics farther in time.

3.4. Other

Table 10 reports the coordinates of the 'Other' group's bubbles (please see Figure 8), in terms of values for 'impact' and 'time horizon', on the scales from 1 to 5, and from 1 to 4 respectively, as well as on the scale from 0 to 100.

For each driver, Table 10 reports also the deviation ('Δ') of the two research's bubbles' coordinates from the average values observed over the whole survey's sample (represented in Figure 8 by the arrows' length).

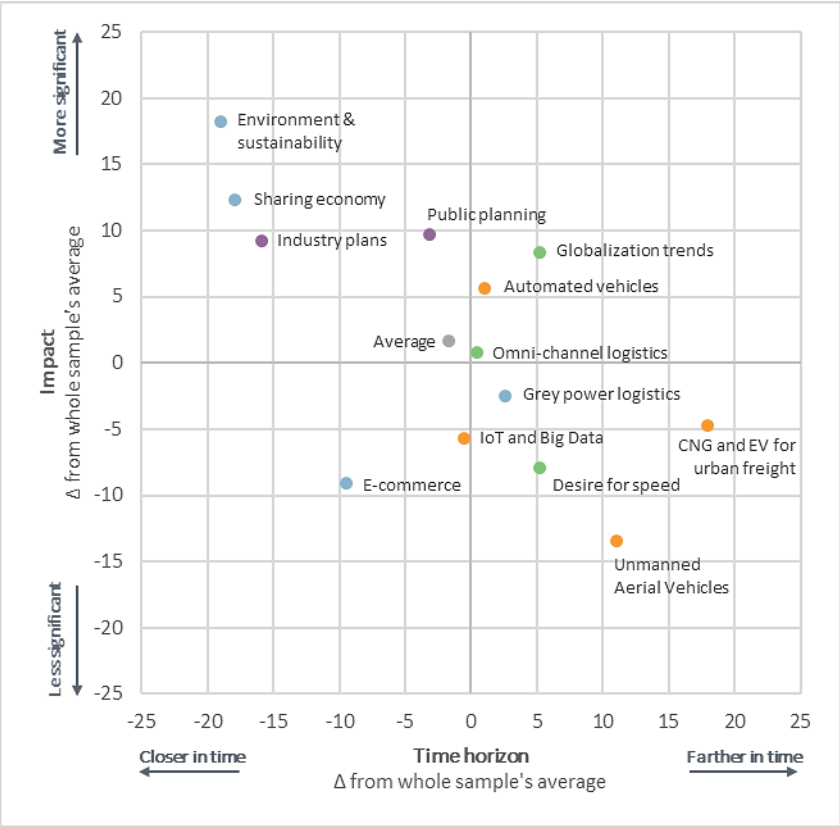
Table 10: Drivers' impact and time horizon, answers received from respondents in the 'Others' group vs. whole sample's average

	Impact			Time horizon		
	Scale: 1 to 5	Scale: 0 to 100		Scale: 1 to 4	Scale: 0 to 100	
	Others	Others	Δ from whole sample	Research	Research	Δ from whole sample
Grey power logistics	3,76	69,0	-2,5	2,43	47,6	2,6
Environment & sustainability	3,57	64,3	18,3	2,00	33,3	-19,0
E-commerce	3,86	71,4	-9,1	2,00	33,3	-9,5
Sharing economy	4,00	75,0	12,3	1,57	19,0	-18,0
Public planning	4,03	75,7	9,7	1,89	29,5	-3,1
Industry plans	3,86	71,4	9,1	1,57	19,0	-15,9
Globalization trends	3,71	67,9	8,3	2,57	52,4	5,3
Desire for speed	3,43	60,7	-7,9	2,00	33,3	5,3
Omni-channel logistics	3,86	71,4	0,8	1,71	23,8	0,5
CNG and EV for urban freight	3,86	71,4	-4,8	2,71	57,1	18,0
IoT and Big Data	3,43	60,7	-5,7	2,00	33,3	-0,5
Unmanned Aerial Vehicle	2,14	28,6	-13,5	3,00	66,7	11,1
Automated vehicles	4,29	82,1	5,6	2,43	47,6	1,1
Average	**3,68**	**66,9**	**1.6**	**2,1**	**38,2**	**-1.7**

Source: elaboration by Steer Davies Gleave

The values reported in the two columns 'Δ from whole sample' in the previous table are plotted in the following scatter diagram. The following Figure, therefore, displays the specific feeling of the 'Other' group with respect to the drivers' impact and time horizon, when compared to the average results observed over the whole survey's sample.

Figure 12: Others – Drivers' impact and time horizon, Δ from whole sample



Source: elaboration by Steer Davies Gleave

Due to the scarce number of responses in the 'Other' group, and to the heterogeneity in the composition of respondents, deviations of the drivers' coordinates on both axes result to be higher than in the previous cases.

Therefore, we do not believe it significant to analyse such deviations.

D. Focus on the specific factors and trends

1. Introduction

This Chapter include the analysis of the Expert Survey's results, with a focus on description of responses received for each of the specific factors and trends identified.

2. Analysis of each of the thirteen trends and factors identified

In the following paragraphs, the responses received with respect to each of the thirteen drivers are being analysed.

For each driver:

- We quote the question asked to the expert in the Survey;
- We analyse the responses received, providing a breakdown by answer for each of the two dimensions considered ('Impact' and 'Time horizon);
- We provide an interpretation of such results; and
- We analyse possible additional results.

DRIVER 1 – GREY POWER LOGISTICS

The following box quotes the text of the question relating to the driver 'Grey power logistics'.

> Within the next decades, population ageing will become one key driver of demographic trends in Europe: the old-age dependency ratio (≥65 years / 15-64 years) will increase from the current figure of about 30% to about 50% in the longer term1.
>
> In the meantime, the first wave of digital natives will enter the aged population segment.
>
> Grey power logistics2, that is the logistics for an aging society, is likely to drive consuming and logistics.
>
> How do you assess the future impact of population aging on the following areas?
>
> - Development of e-commerce (1 to 5)
> - Development of convenience stores (e.g. mini-marts - "corner stores" in urban areas) (1 to 5)
> - Development of medical, pharma, home care logistics networks (1 to 5)
>
> In which time frame do you think that population ageing will become a driver of logistics? [before 2020; before 2030; after 2030]
>
> [1] Eurostat. *People in the EU - population projections.* Data extracted in June 2015.
>
> [2] Trend identified in: DHL. Logistics trend radar. Version 2016

The following paragraphs describe the responses received from the experts.

Impact

Figure 13 shows the percentage of responses by answer (1 to 5), with respect to the average of the 3 questions relating to the impact of 'Grey power logistics'.

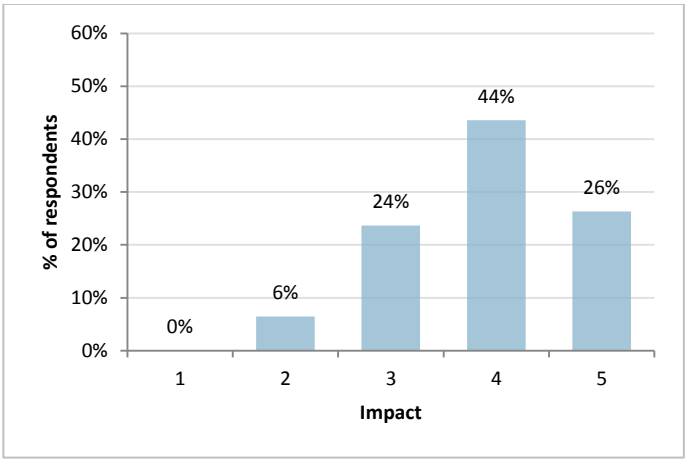
The mode is '4' (44% of responses), followed by '5' (26%), '3' (24%). The answer '2' received a minor share of responses (6%), while '1' received no responses.

Responses are skewed toward the right side of the distribution.

The overall assessment of the experts' panel is that population aging will have a high impact on urban logistics.

The expert panel excludes that population aging will have a low impact on urban logistics.

Figure 13: Grey power logistics, impact - Percentage of respondents by answer (average of three questions)



Source: elaboration by Steer Davies Gleave

Time horizon

Figure below shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'Grey power logistics' will deploy its effects on urban logistics.

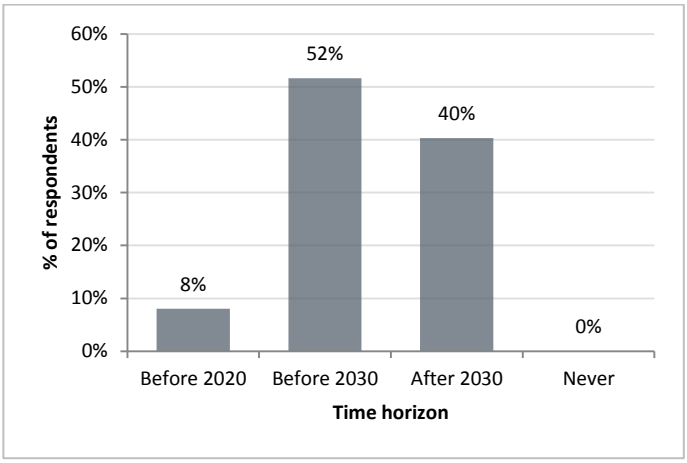
The mode is 'Before 2030' (52% of responses), followed by 'After 2030' (40%). 'Before 2020' received a minor share of responses (8%), while 'Never' received no responses.

Responses are concentrated in the central part of the distribution.

The overall assessment of the expert panel is that population aging will deploy its effects on urban logistics in the medium run, more probably before than after 2030.

The expert panel basically excludes that population ageing will impact on urban logistics in the short term or that it will never do it.

Figure 14: Grey power logistics, time horizon - Percentage of respondents by answer

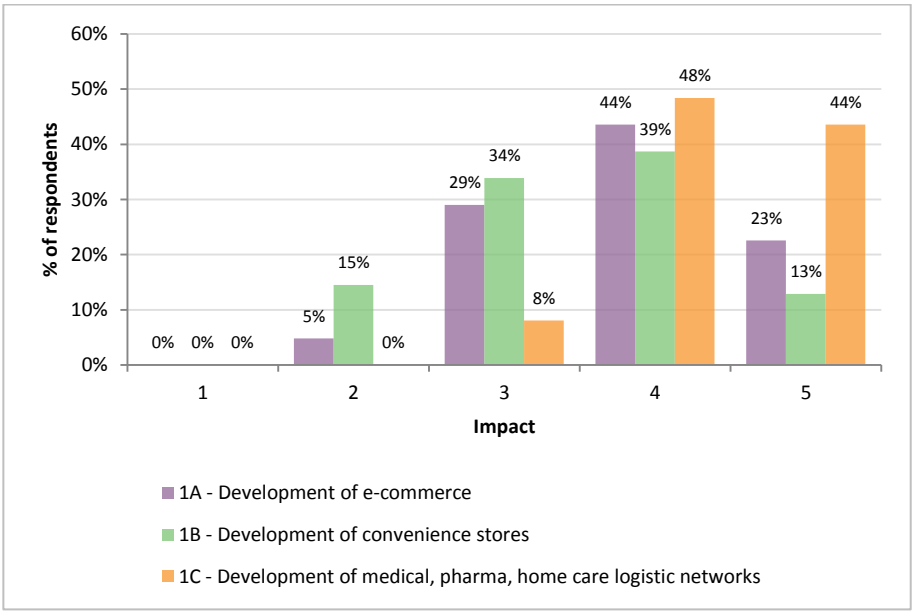


Source: elaboration by Steer Davies Gleave

Additional findings

The following Figure shows the answer received in each of the 3 questions relating to the impact of 'Grey power logistics' on urban logistics.

Figure 15: Grey power logistics, impact - Percentage of respondents by answer (breakdown by question)



Source: elaboration by Steer Davies Gleave

We underline that the expert panel's assessment of the impact of population ageing on the 3 considered areas of urban logistics varies as follows:

- The experts' assessment is that population aging will have a very high impact on the development of medical, pharma, home care logistics networks.
- The experts' assessment is that population aging will have a high impact on the development of e-commerce;

- The experts' assessment is that population aging will have a medium-high impact on the development of convenience stores.

The experts' assessment is that population aging will have a very high impact on the development of medical, pharma, home care logistics networks.

The following Table reports the average of the experts' responses, with respect to the three areas considered.

Table 11: Average of experts' responses, by area

	Impact
Development of e-commerce	3.81
Development of convenience stores	3.46
Development of medical, pharma, home care logistics networks	4.32
Average	**3.86**

Source: elaboration by Steer Davies Gleave

DRIVER 2 – ENVIRONMENT & SUSTAINABILITY

The following box quotes the text of the question relating to the driver 'Environment & sustainability'.

> In recent years, consumers have raised their awareness on the environmental sustainability of the products they buy. Nevertheless, products quality and price are still core drivers of consumers' behaviours.
>
> **To what extent consumers' behaviours will be driven by the environmental sustainability of a product, including the sustainability of its delivery mode? (1 to 5)**
>
> **In which time frame do you think the environmental sustainability of a product will become a key driver of consumers' behaviours? [before 2020; before 2030; after 2030; never]**

The following paragraphs describe the responses received from the experts.

Impact

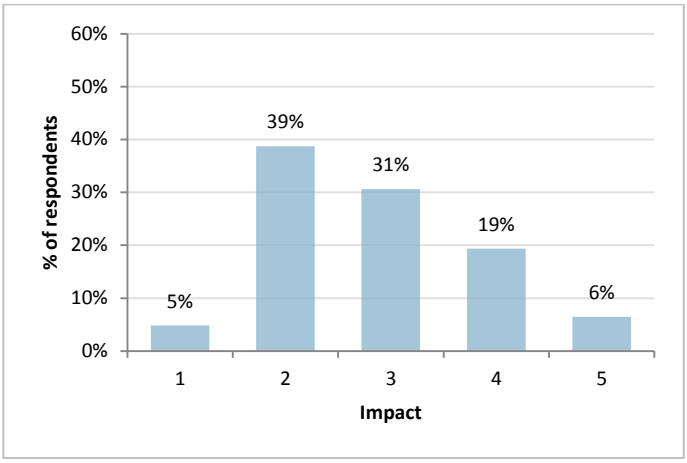
The next Figure shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'Environment & sustainability'.

The mode is '2' (39% of responses), followed by '3' (31%), and '4' (19%). The answers '5' and '1' received a minor share of responses (6% and 5% respectively).

Responses are concentrated in the central part of the distribution, with a preference toward the answer '2' (meaning 'low').

The overall assessment of the expert panel is that consumers' preferences for the environmental sustainability of a product will have a medium-low impact on urban logistics.

Figure 16: Environment & sustainability, impact – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Time horizon

Figure 17 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'Environment & sustainability' will deploy its effects on urban logistics.

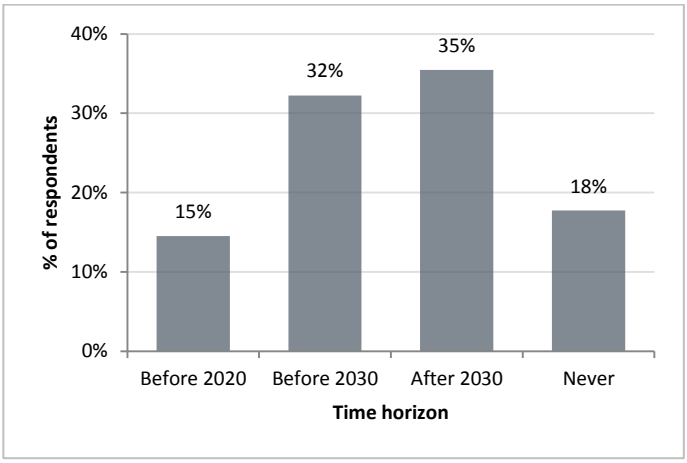
The mode is 'After 2030' (35% of responses), closely followed by 'Before 2030' (32%). 'Never' and 'Before 2020' received a lower share of responses (18% and 15% respectively).

Responses are relatively concentrated in the central part of the distribution; however the answers at the two edges of the distribution also received significant shares of the total answers.

Consumers' preferences for the environmental sustainability of a product will deploy their effects on urban logistics in the medium-long run, more probably after than before 2030.

However, we underline a certain level of uncertainty over this assessment.

Figure 17: Environment & sustainability, time horizon - Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

DRIVER 3 – E-COMMERCE

The following box quotes the text of the question relating to the driver 'E-commerce'.

The Ecommerce Foundation reports that business-to-consumer (B2C) e-commerce sales worldwide reached $1.9 trillion in 2014, representing a doubling in sales compared to 2011[1]. E-commerce is expected to continue growing. Several studies expect that home delivery generates more freight traffic, but cuts private mobility to shops.[2]

Will e-commerce be a core factor influencing urban freight? (1 to 5)

How do you expect e-commerce to impact on the total urban traffic as a consequence of the trade-off described above? (1 to 5, 3 means no impacts on traffic, 1 high decrease and 5 high increase)

In which time frame do you expect e-commerce to be the main sales channel? [before 2020; before 2030; after 2030; never]

[1] SCL Report Series. City Logistics: Challenges and Opportunities. 2015

[2] Johan Vissera, Toshinori Nemotob, Michael Brownec. Home Delivery and the Impacts on Urban Freight Transport: A Review. ScienceDirect. 2014

The following paragraphs describe the responses received from the experts.

Impact

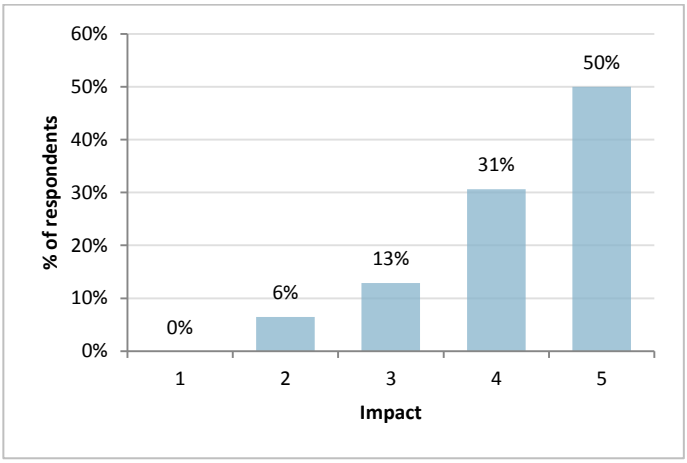
Figure 18 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'E-commerce'.

The mode is '5' (50% of responses), followed by '4' (31%), '3' (13%). The answer '2' received a minor share of responses (6%), while '1' received no responses.

Responses are significantly skewed toward the right side of the distribution.

The overall assessment of the expert panel is that the development of e-commerce will have a very high impact on urban logistics.

Figure 18: E-commerce, impact - Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Time horizon

Figure 19 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'E-commerce' will deploy its effects on urban logistics.

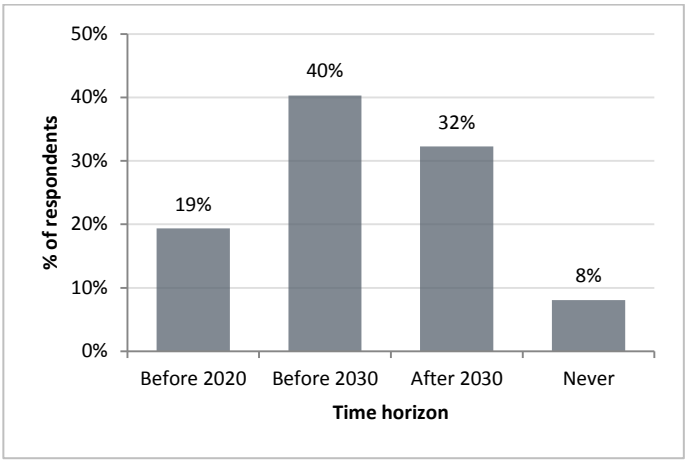
The mode is 'Before 2030' (40% of responses), followed by 'After 2030' (32%), and 'Before 2020' (19%). 'Never' received a minor share of responses (8%).

Responses are relatively concentrated in the central part of the distribution; however 'Before 2020' also received significant shares of the total answers.

The overall assessment of the expert panel is that the development of e-commerce will become the main sale channel in the medium run, more probably before than after 2030.

Experts exclude that it will never do so.

Figure 19: E-commerce, time horizon – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

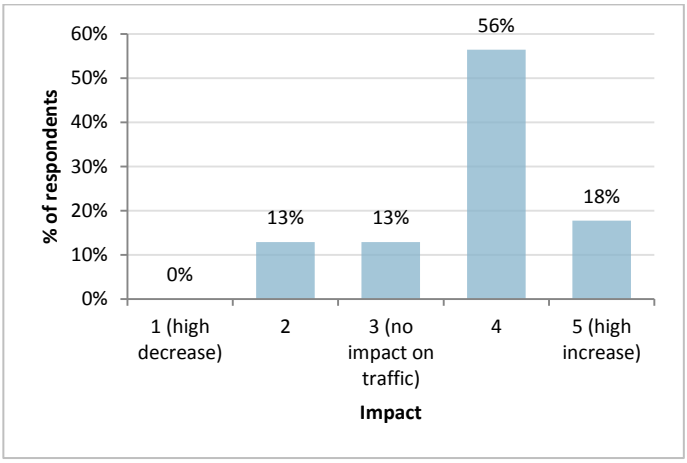
Additional findings

The following figure shows the percentage of responses by answer, with respect to the question relating to the likely impact of e-commerce on the total urban traffic as a consequence of the trade-off between more freight traffic, and less private trips to shops.

Responses are concentrated in the answer '4' (meaning 'increase in traffic'), with minor shares on '5' (high increase in traffic'), '2' ('less traffic'), and '3' ('no impact on traffic').

The prevailing assessment of the expert panel is that the development of e-commerce will lead to an increase in traffic in urban areas.

Figure 20: Impact of e-commerce on the level of traffic in urban areas - Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

DRIVER 4 – SHARING ECONOMY

The following box quotes the text of the question relating to the driver 'Sharing economy'.

According to the Canadian Institute of Traffic and Transportation, a number of technology-based start-ups have recently entered the logistics industry claiming they will be the next "Uber of trucking". They claim to change the current state of the logistics industry by replacing the need for 3rd Party Logistics Providers[1].

According to a study by Scott Walsen[2], the number of trips by taxis in New York fell by 8% between 2012 and 2014 after Uber's entry. According to Transport for London, the number of licensed private hire operators in London has declined by 11% since Uber launched in the city in 2012[3].

To what extent could these new start-ups (the "Uber of trucking") impact on urban transport and logistics providers with the same magnitude as Uber did on the taxi industry? (1 to 5)

In which time frame will these initiatives be a consolidated practice in urban freight? [before 2020; before 2030; after 2030; never]

[1] Canadian Institute of Traffic and Transportation.
[2] Scott Wallsten. *The Competitive effect of the Sharing Economy: How is Uber Changing Taxis?*. Technology Policy Institute. 2015
[3] For further information, please see: Georgios Petropoulos. *Uber and the economic impact of sharing economy platforms*. Bruegel. 2016.

The following paragraphs describe the responses received from the experts.

Impact

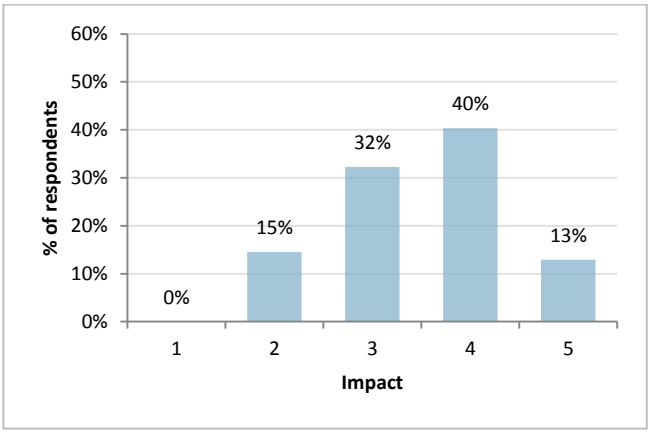
Figure 21 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'Sharing economy'.

The mode is '4' (40% of responses), followed by '3' (32%). The answers '2' and '5' received a lower share of responses (15% and 13% respectively), while '1' received no responses.

Most of responses are divided between '4' and '3', with two tails on '2' and '5'.

Emerging experiences in freight sharing economy (e.g. new start-ups applying the Uber's business model to urban logistics) will have a medium-high impact on urban logistics, being likely to erode the market share of incumbent urban transport and logistics providers.

Figure 21: Sharing economy, impact – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Time horizon

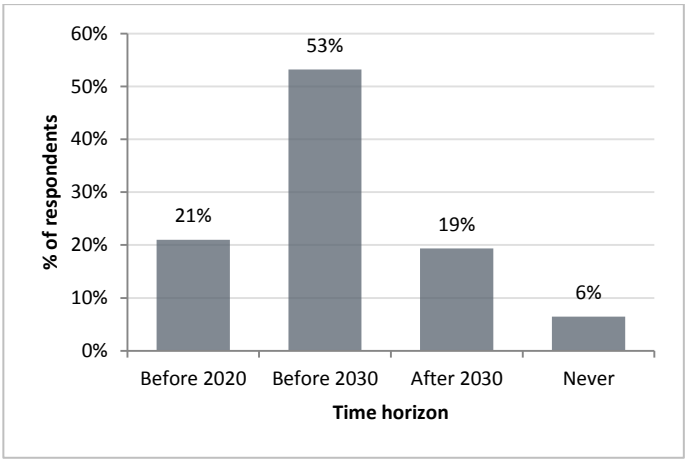
Figure 22 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'Sharing economy' will deploy its effects on urban logistics.

The mode is 'Before 2030' (53% of responses). 'Before 2020' and 'After 2030' received a lower share of responses (21% and 19% respectively). 'Never' received 6% of responses.

Responses are concentrated in the answer 'Before 2030'.

The expert's prevailing assessment is that business experiences in the area of sharing economy will become a consolidated practice in urban freight in the decade between 2020 and 2030.

Figure 22: Sharing economy, time horizon – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

DRIVER 5 – PUBLIC PLANNING

The following box quotes the text of the question relating to the driver 'Public planning'.

Urban space is an increasingly scarce resource. Different users compete for limited street space. A recent study by the US Regional Plan Association in cooperation with the Volvo Research and Educational Foundations indicates that freight vehicles generally have lower priority in road space allocation1. At the same time logistics companies' location have sprawled in metropolitan areas increasing the impacts of freight traffics to/from the urban centre.

Though city logistics actions can be multiple and complementary, we are interested in having your opinion on which of the following practices you expect to become common and in which time frame (1 to 5, 5 means extremely common practice).

- Road Usage Charging for freight vehicles in the metropolitan area with revenues earmarked for transport investments (1 to 5) [before 2020; before 2030; after 2030; never]
- Public regulations for dedicated logistics facilities or space in real estate urban projects (1 to 5) [before 2020; before 2030; after 2030; never]
- Planning of logistics facilities in urban areas accessible by rail or river (1 to 5) [before 2020; before 2030; after 2030; never]
- Applying "complete streets" principles that include freight needs ("complete streets" meaning planning and designing streets to be safe, convenient and comfortable for each user) (1 to 5) [before 2020; before 2030; after 2030; never]
- Shifting deliveries to off peak times [before 2020; before 2030; after 2030; never]

[1] Edited Henrik Nolmark (Volvo Research and Educational Foundations), Michael Browne (University of Gothenburg), Genevieve Giulano (METRANS Transportation Center, University of Southern California), José Holguin-Veras (Rensselaer Polytechnic Institute). Why Goods Movement Matters, Strategies for Moving Goods in Metropolitan Areas. 2016.

The following paragraphs describe the responses received from the experts.

Impact

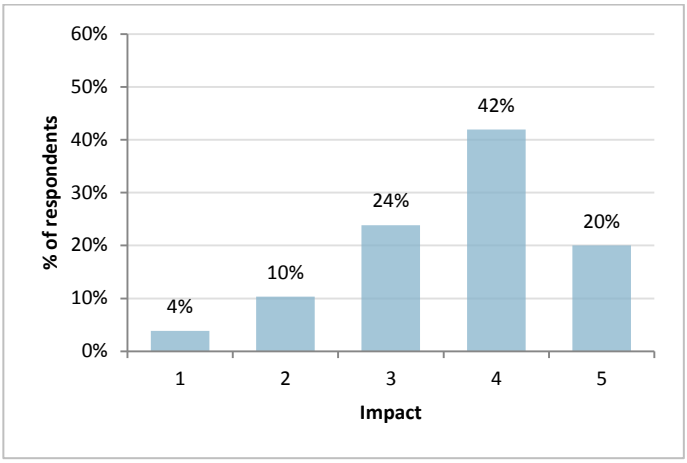
Figure 23 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'Public planning'.

The mode is '4' (42% of responses), followed by '3' (24%), and '5' (20%). The answers '2' and '1' received a minor share of responses (10% and 4% respectively).

Responses are skewed toward the right side of the distribution.

The overall assessment of the expert panel is that the considered public planning practices to manage urban logistic development will become common, and therefore will have a high impact on urban logistics.

Figure 23: Public planning, impact - Percentage of respondents by answer (average of five questions)



Source: elaboration by Steer Davies Gleave

Time horizon

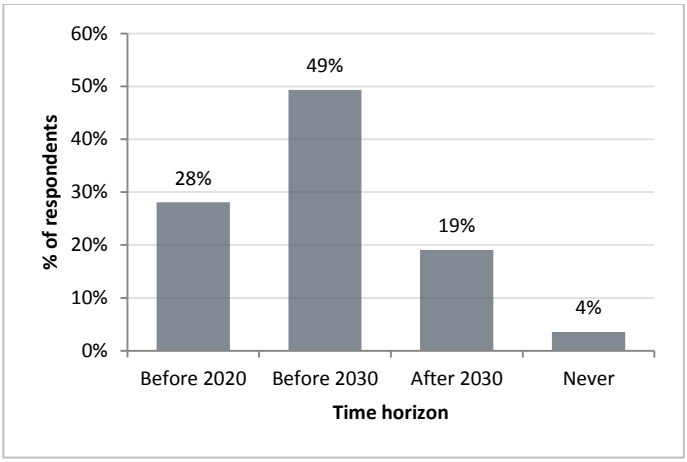
Figure 24 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'Public planning' will deploy its effects on urban logistics.

The mode is 'Before 2030' (49% of responses). 'Before 2020' and 'After 2030' received a lower share of responses (28% and 19% respectively). 'Never' received 4% of responses.

Responses are concentrated in the answer 'Before 2030', but 'Before 2020' was also chosen by a significant part of the panel.

The expert's prevailing assessment is that public planning practices in the field of urban logistics will become common before 2030.

Figure 24: Public planning, time horizon - Percentage of respondents by answer (average of five questions)



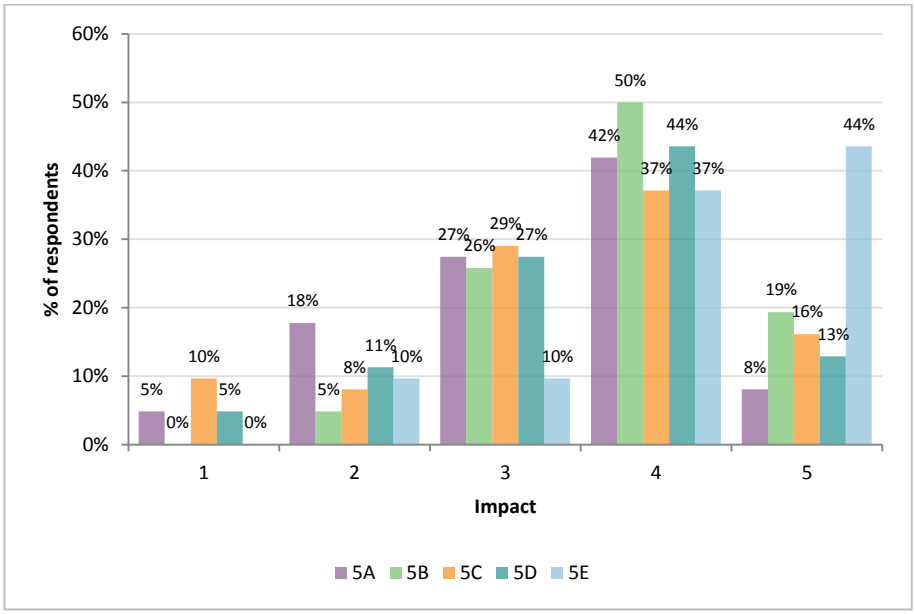
Source: elaboration by Steer Davies Gleave

Additional findings

The following Figures show the answers received with respect to the 5 urban planning practices considered:

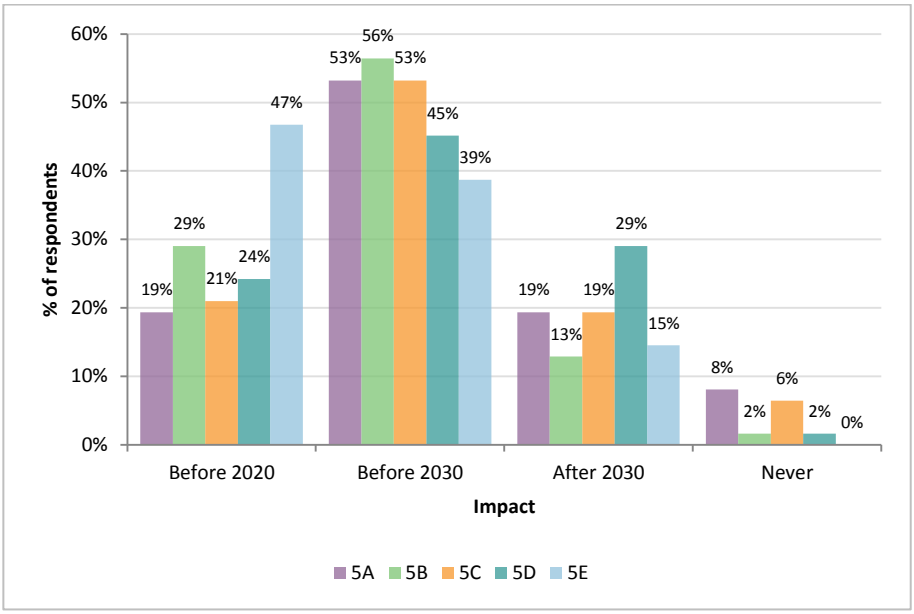
a. Road Usage Charging for freight vehicles in the metropolitan area with revenues earmarked for transport investments;
b. Public regulations for dedicated logistics facilities or space in real estate urban projects;
c. Planning of logistics facilities in urban areas accessible by rail or river;
d. Applying "complete streets" principles that include freight needs;
e. Shifting deliveries to off peak times;

Figure 25: Public planning, impact - Percentage of respondents by answer (breakdown by question)



Source: elaboration by Steer Davies Gleave

Figure 26: Public planning, time horizon - Percentage of respondents by answer (breakdown by question)



Source: elaboration by Steer Davies Gleave

We underline that two practices deviate to a significant extent from the average:

- Practice A (Road Usage Charging) – the skewness of the experts' responses, with respect to the likelihood of such practice to become common in city logistics, is relatively less pronounced than the average, meaning a lower impact than the average;
- Practice E (Shifting deliveries to off peak times) – the experts' responses, with respect to the likelihood of such practice to become common in city logistics, are concentrated in the right side of the distribution, meaning a higher impact than the average; moreover, the skewness of the 'Time horizon' distribution is more skewed than the average toward the left side, meaning a higher likelihood of such practice to become common closer in time.

The following Table reports the average of the experts' responses, with respect to the five public planning practices considered.

Table 12: Average of experts' responses, by area

	Impact	Time horizon
Road Usage Charging for freight vehicles in metropolitan areas	3.30	2.16
Public regulations for dedicated logistics facilities/space in real estate urban projects	3.84	1.87
Planning of logistics facilities in urban areas accessible by rail or river	3.40	2.13
Applying "complete streets" principles that include freight needs	3.51	2.06
Shifting deliveries to off peak times	4.16	1.67
Average	**3.64**	**1.98**

Source: elaboration by Steer Davies Gleave

We can conclude that off peak deliveries are expected to significantly diffuse and that public regulations and planning of logistics facilities are going to be shorter term actions.

DRIVER 6 – INDUSTRY PLANS

The following box quotes the text of the question relating to the driver 'Industry plans'.

Colliers International Group Inc.[1] has identified three types of Distribution Centres which will take the dominant form in years to come:

1. mega-sized Regional-National Distribution Centres located along major road infrastructures;
2. mid-sized, cross-docked city Distribution Centres around the main arterial routes of major cities and conurbations;
3. small, flexible urban warehouses-access centres located in urban communities.

To what extent do you expect type (iii) to significantly diffuse as means to exploit proximity to clients and related optimization of routes and delivery time? (1 to 5)

In which time frame do you think that type (iii) will be a widespread practice? [before 2020; before 2030; after 2030; never]

[1] Colliers International Group Inc.. From First Mile to Last Mile - Global Industrial & Logistics Trends. October 2015

The following paragraphs describe the responses received from the experts.

Impact

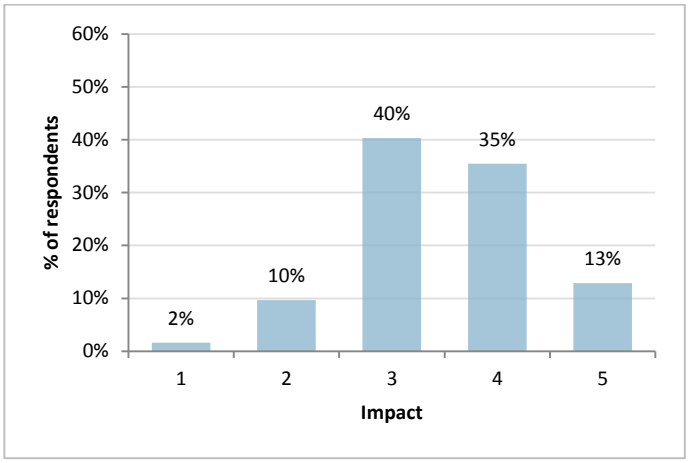
Figure 27 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'Industry plans'.

The mode is '3' (40% of responses), closely followed by '4' (35%). The answers '5' and '2' received a lower share of responses (13% and 10% respectively), while '1' received a negligible share (2%).

Most of responses are divided between '4' and '3'.

The overall assessment of the expert panel is that industry plans will have a medium-high impact on urban logistics.

Figure 27: Industry plans, impact – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Time horizon

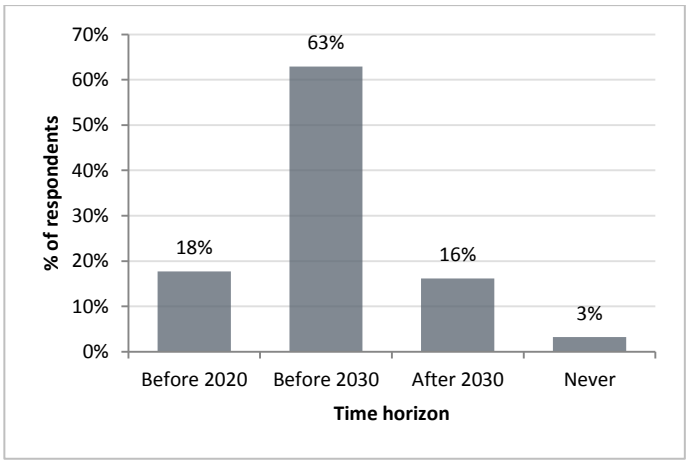
Figure 28 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'Industry plans' will deploy its effects on urban logistics.

The mode is 'Before 2030' (63% of responses). 'Before 2020' and 'After 2030' received a lower share of responses (18% and 16% respectively), while 'Never' received a negligible share (3%).

Responses are concentrated in the answer 'Before 2030'.

The expert's prevailing assessment is that flexible urban warehouses-access centres located in urban communities will become a widespread practice in the decade between 2020 and 2030.

Figure 28: Industry plans, time horizon – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

DRIVER 7 – GLOBALIZATION TRENDS

The following box quotes the text of the question relating to the driver 'Globalization trends'.

> Globalization has increased freight flows because production has been distributed across multiple locations around the world, driven by production cost factors. While this overall trend is continuing, a number of companies have started considering investments in the opposite direction. For example, Adidas is developing a worldwide network of high-tech low-distance manufacturing facilities or 'speed factories'1, which are located within regional sales markets, ensuring proximity to clients and significantly reducing freight costs.
>
> **To what extent do you expect such practices to consolidate? (1 to 5)**
>
> **In which time frame? [before 2020; before 2030; after 2030; never]**
>
> [1]http://www.adidas-group.com/en/media/news-archive/press-releases/2016/adidas-expands-production-capabilities-speedfactory-germany/

The following paragraphs describe the responses received from the experts.

Impact

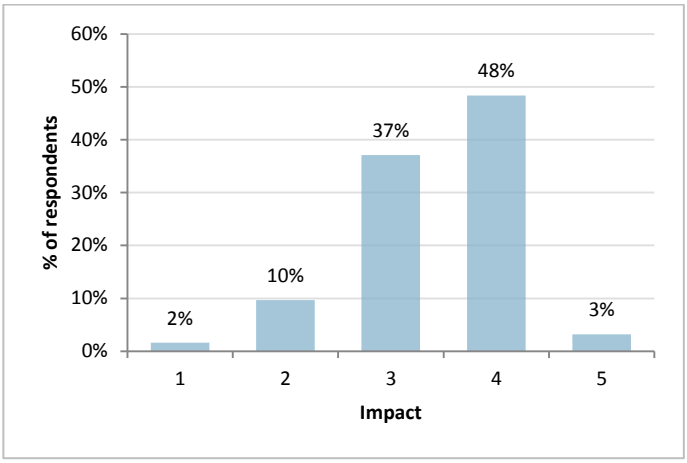
Figure 29 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'Globalization trends'.

The mode is '4' (48% of responses), followed by '3' (37%). The answer '2' received a minor share of responses (10%), while '5' and '1' received negligible shares (3% and 2% respectively).

Most of responses are divided between '4' and '3'.

The overall assessment of the expert panel is that relocation choices opposing established globalization trends will have a medium-high impact on urban logistics.

Figure 29: Globalization trends, impact - Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Time horizon

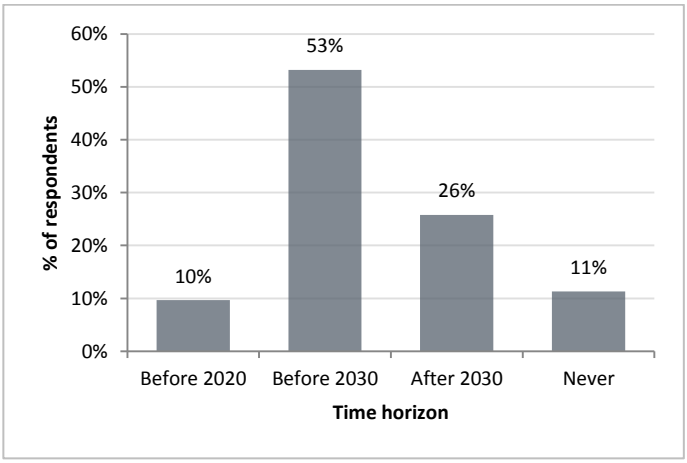
Figure 30 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'Globalization trends' will deploy its effects on urban logistics.

The mode is 'Before 2030' (53% of responses). 'After 2030', 'Never', and 'Before 2020' received lower shares of responses (respectively, 26%, 11%, and 10%).

Responses are concentrated in the answer 'Before 2030', but 'After 2030' was also chosen by a significant part of the panel.

The expert's prevailing assessment is that that relocation trends will become common in the medium run, probably before rather than after 2030.

Figure 30: Globalization trends, time horizon - Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

DRIVER 8 – DESIRE FOR SPEED

The following box quotes the text of the question relating to the driver 'Desire for speed'.

> In recent years, many e-tailers have started to offer their customers a same-day delivery option, sometimes up to 1-hour delivery (e.g. Amazon Primenow in selected US cities).
>
> **To what extent do you think that the "desire for speed1" will increase freight transport impacts in urban areas? (1 to 5)**
>
> **In which time frame will these types of deliveries become a practice on all main commodities? [before 2020; before 2030; after 2030; never]**
>
> [1] Factor identified in DHL. Logistics trend radar. Version 2016

The following paragraphs describe the responses received from the experts.

Impact

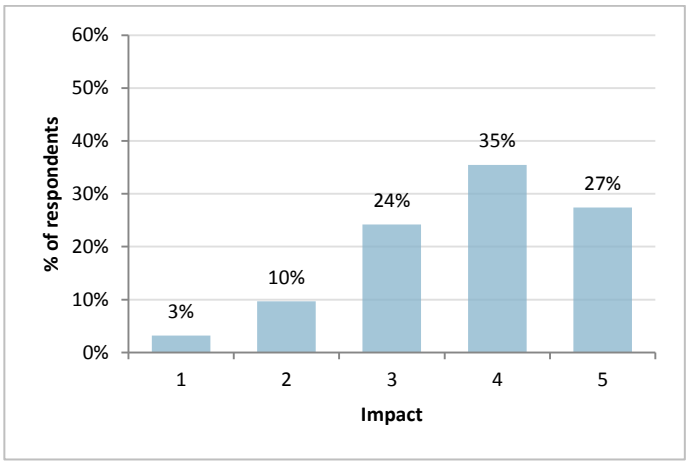
Figure 31 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'Desire for speed'.

The mode is '4' (35% of responses), followed by '5' (27%), and '3' (24%). The answer '2' received a minor share of responses (10%), while '1' received a negligible share (3%).

Responses are skewed toward the right side of the distribution.

The overall assessment of the expert panel is that the 'desire for speed' by consumers will have a high impact on urban logistics.

Figure 31: Desire for speed, impact – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Time horizon

Figure 32 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'Desire for speed' will deploy its effects on urban logistics.

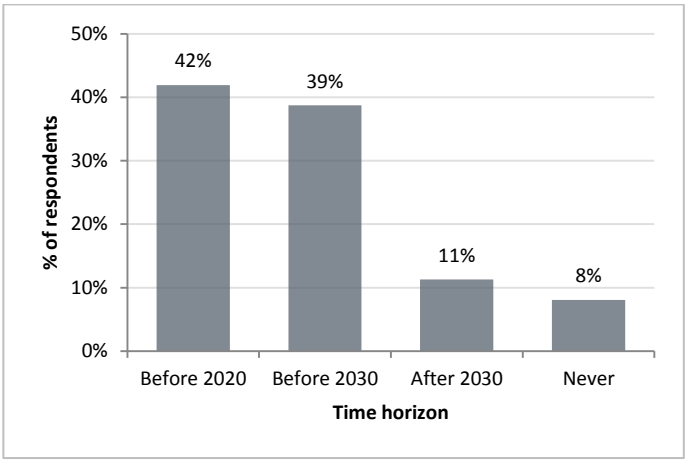
The mode is 'Before 2020' (42% of responses), closely followed by 'Before 2030' (39%). 'After 2030' and 'Never' received lower shares (11% and 8% respectively).

Responses are concentrated in the left part of the distribution.

'Desire for speed' will deploy its effects on urban logistics in the short-medium run, most probably at the turn or in the early years of the next decade.

The expert panel exclude that 'desire for speed' will impact on urban logistics in the long term period.

Figure 32: Desire for speed, time horizon – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

DRIVER 9 – OMNI-CHANNELS LOGISTICS

The following box quotes the text of the question relating to the driver 'Omni-channels logistics'.

> Omni-channel retailing foresees the integration of several on-line and off-line retail channels in which consumers can buy, pick up or receive goods and manage payments. Many retailers, as for example Walmart in the US, are adopting omni-channel retailing. This brings challenges to logistics activities in terms of stock management, number of deliveries and visibility in the supply chain among different retail channels.
>
> **To what extent do you think that this trend will grow? (1 to 5)**
>
> **In which time frame? [before 2020; before 2030; after 2030; never]**

The following paragraphs describe the responses received from the experts.

Impact

Figure 33 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'Omni-channels logistics'.

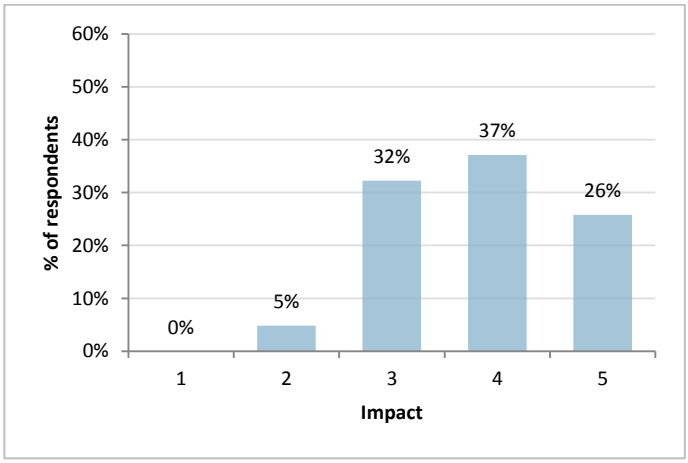
The mode is '4' (37% of responses), followed by '3' (32%), and '5' (26%). The answer '2' received a minor share of responses (5%), while '1' received no responses.

Responses are concentrated in the right side of the distribution.

Omni-channels logistics is highly likely to grow as a trend influencing urban logistics.

Experts exclude that such trend will have a low impact.

Figure 33: Omni-channels logistics, impact - Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Time horizon

Figure 34 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'Omni-channels logistics' will deploy its effects on urban logistics.

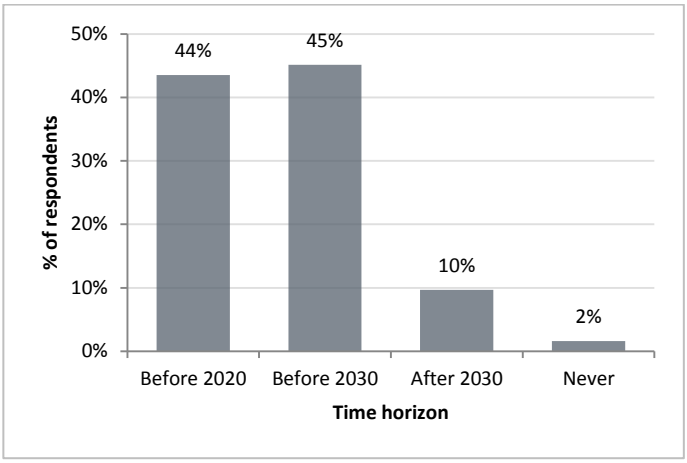
The mode is 'Before 2030' (45% of responses), closely followed by 'Before 2020' (44%). 'After 2030' received a minor share of responses (10%), while 'Never' received a negligible share (2%).

Responses are concentrated in the left part of the distribution.

Omni-channels logistics will deploy its effects on urban logistics in the short-medium run, most probably at the turn or in the early years of the next decade.

The expert panel exclude that such trend will have impacts on urban logistics in the long term period.

Figure 34: Omni-channels logistics, time horizon – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

DRIVER 10 – CNG AND EV FOR URBAN FREIGHT

The following box quotes the text of the question relating to the driver 'CNG and EV for urban freight'.

> CNG (Compressed Natural Gas) public charging stations and EV (Electric Vehicles) rapid charging stations in Europe respectively equal to about 3.000 (source NGVA) and more than 1.600 (source OCM), with uneven distribution among Member States for both types of fuel infrastructures. The total number of petrol stations in Europe is approximately 114.000 (source FuelsEurope). Many factors (e.g. technology, policy, infrastructure, …) are affecting the uptake of alternative fuel vehicles.
>
> **To what extent do you expect that alternative fuel freight vehicles will be a mainstream practice in urban areas? (1 to 5)**
>
> **In which time frame? [before 2020; before 2030; after 2030; never]**

The following paragraphs describe the responses received from the experts.

Impact

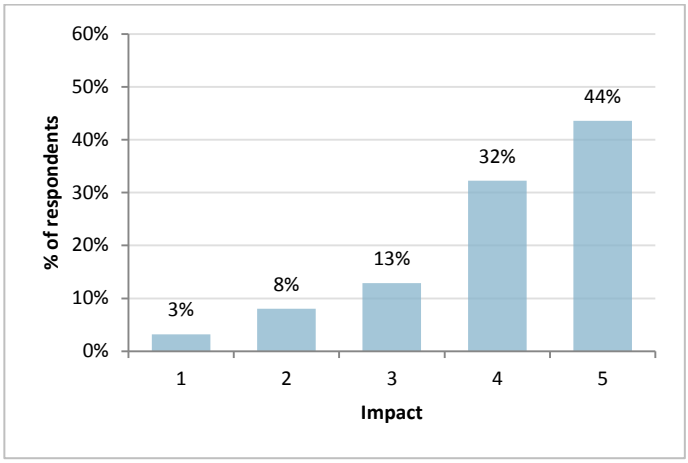
Figure 35 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'CNG and EV for urban freight'.

The mode is '5' (44% of responses), followed by '4' (32%). The answers '3' and '2' received lower shares of responses (13% and 8% respectively), while '1' received a negligible share (3%).

Responses are significantly skewed toward the right side of the distribution.

The overall assessment of the expert panel is that the development of CNG and EV for urban freight will have a very high impact on urban logistics.

Figure 35: CNG and EV for urban freight, impact – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Time horizon

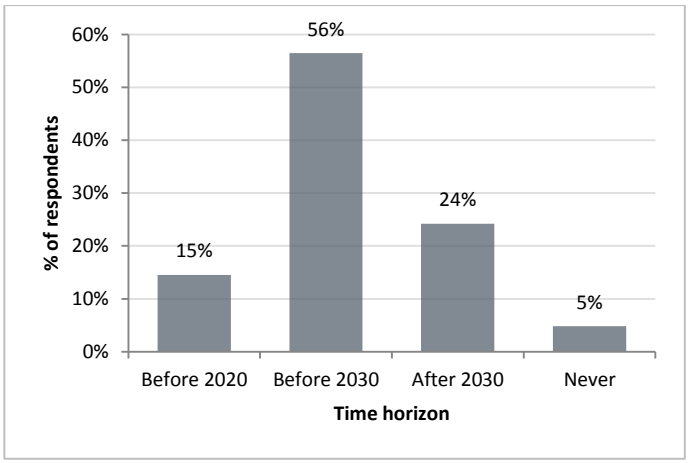
Figure 36 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'CNG and EV for urban freight' will deploy its effects on urban logistics.

The mode is 'Before 2030' (56% of responses). 'After 2030' and 'Before 2020' received lower shares of responses (24% and 15% respectively), while 'Never' received 5% of responses.

Responses are concentrated in the answer 'Before 2030'.

The expert's prevailing assessment is that the development of CNG and EV for urban freight will become a mainstream practice in urban areas in the decade between 2020 and 2030.

Figure 36: CNG and EV for urban freight, time horizon – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

DRIVER 11 – INTERNET OF THINGS AND BIG DATA

The following box quotes the text of the question relating to the driver 'Internet of Things and Big Data'.

> The volume, velocity, and variety of data arriving in real-time is quickly increasing in recent years. Internet of Things (IoT) represents the next step towards the digitisation of the society and economy, where objects and people are interconnected through communication networks and report about their status and/or the surrounding environment[1]. Quickly transforming these data into decisions may increasingly become a reality and a key technological enabler to improve city logistics operations and logistics providers' business strategies.
>
> **To what extent do you expect that IoT will change logistics in cities in terms of:**
>
> - **Freight traffic reduction (1 to 5)**
> - **Transport safety (1 to 5)**
> - **Better utilization of urban space (1 to 5)**
> - **Better logistics operations planning (1 to 5)**
> - **Improved public planning in transport (1 to 5)**
>
> **In which time frame do you expect Internet of Things to diffuse in city logistics? [before 2020; before 2030; after 2030; never]**

The following paragraphs describe the responses received from the experts.

Impact

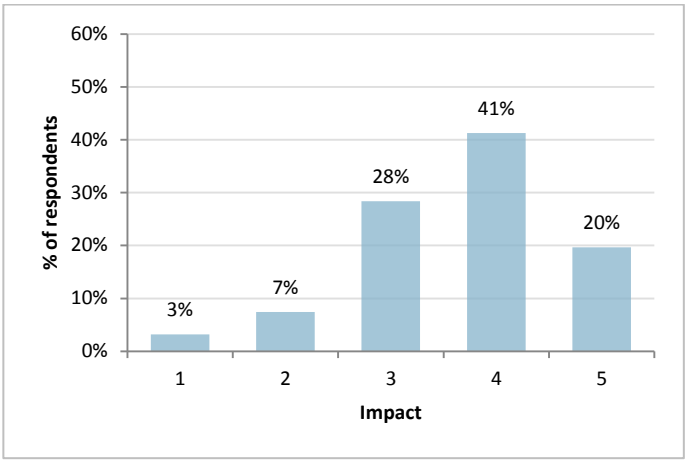
Figure 37 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'Internet of Things and Big Data'.

The mode is '4' (41% of responses), followed by '3' (28%), and '5' (20%). The answer '2' received a minor share of responses (7%), while '1' received a negligible share (3%).

Responses are concentrated in the right side of the distribution.

The overall assessment of the expert panel is that the development of Internet of Things and Big Data will have a high impact on urban logistics.

Figure 37: Internet of Things and Big Data, impact - Percentage of respondents by answer (average of five questions)



Source: elaboration by Steer Davies Gleave

Time horizon

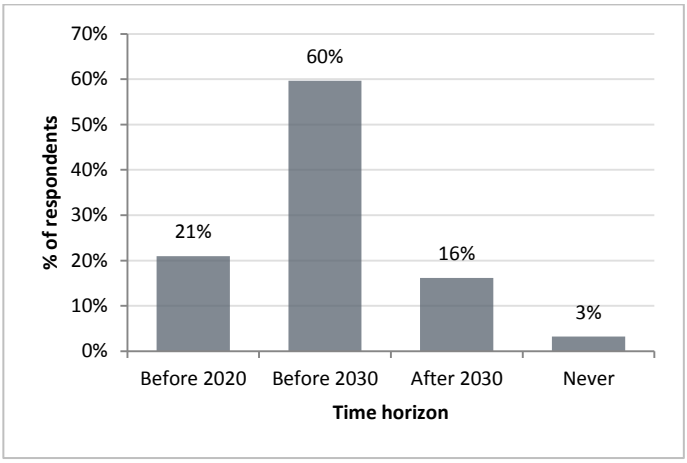
Figure 38 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which 'Internet of Things and Big Data' will deploy its effects on urban logistics.

The mode is 'Before 2030' (60% of responses). 'Before 2020' and 'After 2030' received lower shares of responses (21% and 16% respectively), while 'Never' received 3% of responses.

Responses are concentrated in the answer 'Before 2030'.

We can conclude that the expert's prevailing assessment is that Internet of Things to diffuse in city logistics in the decade between 2020 and 2030.

Figure 38: Internet of Things and Big Data, time horizon - Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Additional findings

The following Figures show the answers received with respect to the 5 considered areas of impact of Internet of Things on city logistics:

a. Freight traffic reduction;

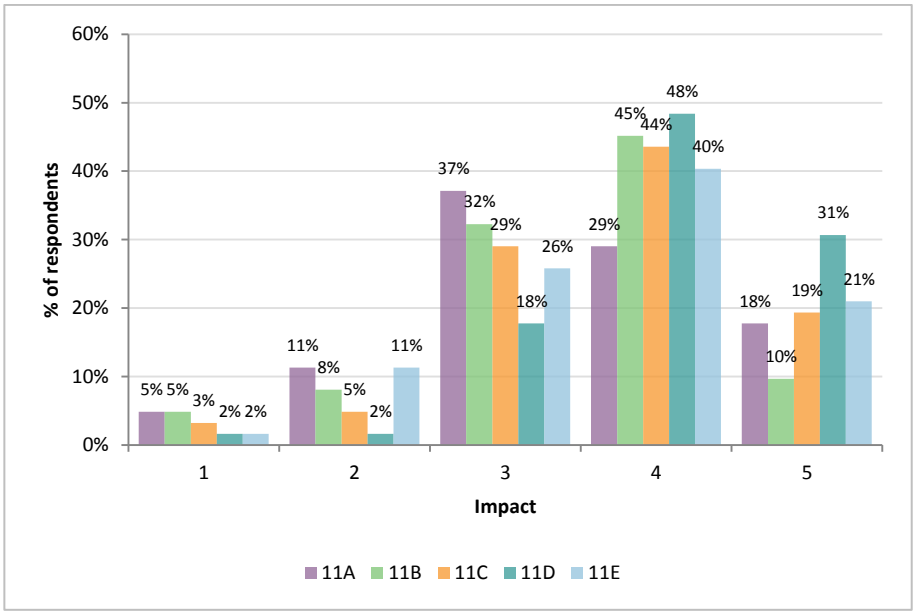
b. Transport safety;

c. Better utilization of urban space;

d. Better logistics operations planning;

e. Improved public planning in transport.

Figure 39: Internet of Things and Big Data, impact - Percentage of respondents by answer (breakdown by question)



Source: elaboration by Steer Davies Gleave

The skewness towards the right side of the distribution is relatively less pronounced with respect to the impact of Internet of Things on areas A ('Freight traffic reduction') and B ('Transport safety') - meaning a lower impact than the average - while it is relatively more pronounced with respect to the impact of Internet of Things on area D ('Better logistics operations planning') - meaning a higher impact than the average.

Impacts look stronger with reference to better logistics operations planning.

The following Table reports the average of the experts' responses, with respect to the five public planning practices considered.

Table 13: Average of experts' responses, by area

	Impact
Freight traffic reduction	3.41
Transport safety	3.46
Better utilization of urban space	3.70
Better logistics operations planning	4.05
Improved public planning in transport	3.67
Average	**3.66**

Source: elaboration by Steer Davies Gleave

DRIVER 12 – UNMANNED AERIAL VEHICLES (UAVS)

The following box quotes the text of the question relating to the driver 'Unmanned Aerial Vehicles'.

> Amazon CEO Jeff Bezos announced that his company is currently testing Unmanned Aerial Vehicles (UAVs) in Canada, the United Kingdom, and the Netherlands. Bezos envisions UAVs delivering parcels from distribution centres directly to customers via Amazons Prime Air.
>
> **To what extent do you expect that UAVs will become a practice in the parcel sector, also considering safety and regulatory issues? (1 to 5)**
>
> **In which time frame do you think that cities should develop a policy framework to take into consideration UAV deliveries? [before 2020; before 2030; after 2030; never]**

The following paragraphs describe the responses received from the experts.

Impact

Figure 40 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'Unmanned Aerial Vehicles'.

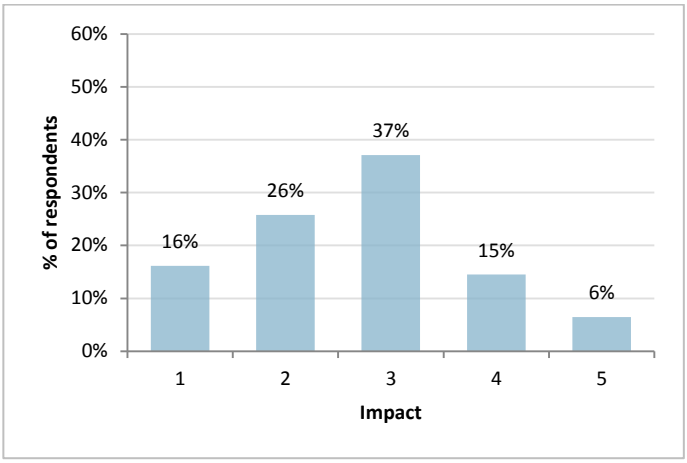
The mode is '3' (37% of responses), followed by '2' (26%), '1' (16%), and '4' (15%). The answer '5' received a minor share of responses (6%).

Responses are distributed around the centre, with a relatively larger weight on the left side of the distribution.

The overall assessment of the expert panel is that the development of Unmanned Aerial Vehicles will have a medium-low impact on urban logistics.

Experts exclude that such trend will have a high impact. This may be due to the fact that the topic is still a frontier technology.

Figure 40: Unmanned Aerial Vehicles (UAVs), impact - Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Time horizon

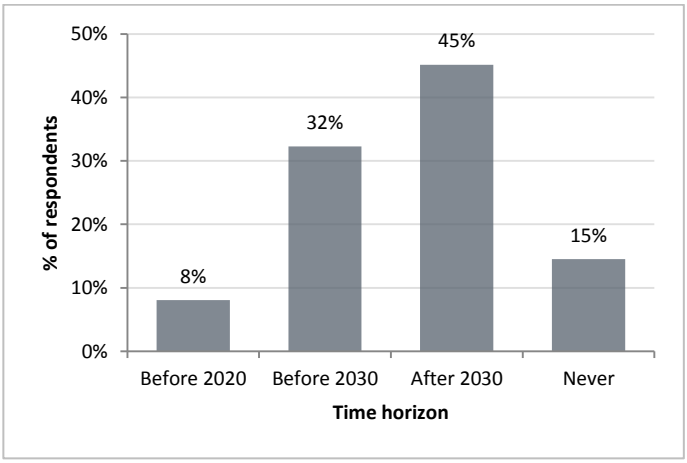
Figure 41 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which the driver 'Unmanned Aerial Vehicles' will deploy its effects on urban logistics.

The mode is 'After 2030' (60% of responses), followed by 'Before 2030' (32%). 'Never' received 15% of responses, while 'Before 2020' received 8% of responses.

Responses are relatively concentrated in the central part of the distribution, with a relative skewness towards the right side.

The overall assessment of the expert panel is that cities should develop a policy framework to take into consideration UAV deliveries in the medium-long run.

Figure 41: Unmanned Aerial Vehicles (UAVs), time horizon - Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

DRIVER 13 – AUTOMATED VEHICLES

The following box quotes the text of the question relating to the driver 'Unmanned Aerial Vehicles'.

Fully automated vehicles capable of driving themselves from origin to destination (without needing a driver) are expected to be feasible on a large scale not earlier than in 20 years. Urban environment systems are expected to follow a pathway where application of highly automated vehicles will initially be limited to specific environments (e.g. airports, campuses, exhibition centres, etc.) and then gradually open up to less protected circumstances[1].

In which time frame do you expect the diffusion of pilot applications of automated freight vehicles at urban level? [before 2020; before 2030; after 2030; never]

Which level of impact do you expect on authorities' regulatory and planning practices? (1 to 5)

[1] Steer Davies Gleave. Research for the European Parliament TRAN Committee – Self-piloted cars: The future of road transport?. 2016

The following paragraphs describe the responses received from the experts.

Impact

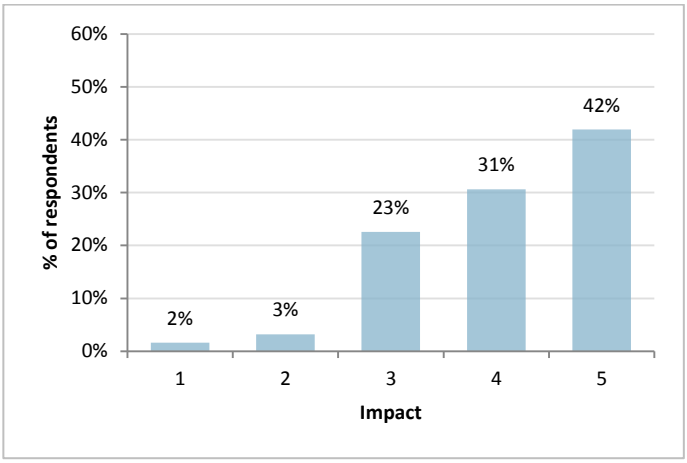
Figure 42 shows the percentage of responses by answer (1 to 5), with respect to the question relating to the impact of 'Automated vehicles'.

The mode is '5' (42% of responses), followed by '4' (31%), and '3' (23%). The answers '2' and '1' received negligible shares of responses (3% and 2% respectively).

Responses are concentrated in the right part of the distribution, with a skewness toward the answer '5' (meaning 'very high').

We can conclude that the overall assessment of the expert panel is that the development of automated vehicles will have a very high impact on urban logistics.

Figure 42: Automated vehicles, impact – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

Time horizon

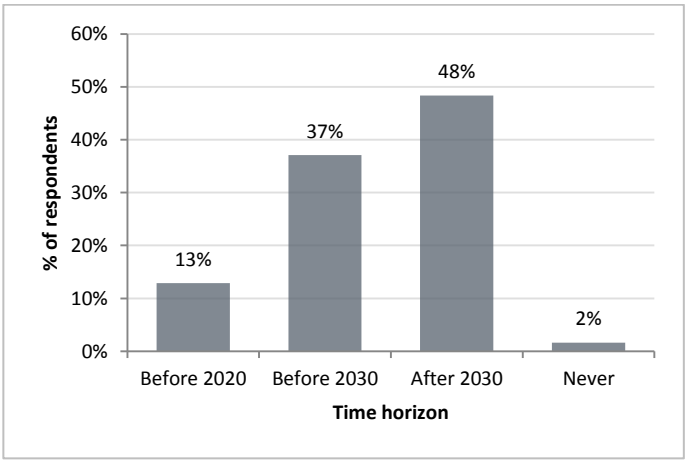
Figure 43 shows the percentage of responses by answer, with respect to the question relating to the likely time horizon in which the driver 'Automated vehicles' will deploy its effects on urban logistics.

The mode is 'After 2030' (48% of responses), followed by 'Before 2030' (37%). 'Before 2020' received 13% of responses, while 'Never' received a negligible share of responses (2%).

Responses are relatively concentrated in the central part of the distribution, with a relative skewness towards the right side.

The overall assessment of the expert panel is that applications of automated freight vehicles at urban level will diffuse in the medium-long run.

Figure 43: Automated vehicles, time horizon – Percentage of respondents by answer



Source: elaboration by Steer Davies Gleave

3. Other key elements impacting on logistics in functional urban areas

Other key elements impacting on logistics in functional urban areas are discussed in the following.

3.1. Trends in the economic geography of cities

A clear macro trend in the evolution of economic geography of EU cities and functional areas can be probably identified in the development of the service industry.

That aside, it is not possible to identify a unique trend in the development of the economic geography of cities – on the contrary, development scenarios are diversified. This is one of the major conclusion of the Oxford Economics' Report "Future trends and market opportunities in the world's largest 750 cities – How the global urban landscape will look in 2030".

According to Oxford Economics, the diversity of economic performance among the world's largest 750 cities is large. Among other factors, the study underlines the differences among cities in terms of their resource endowments, institutional infrastructure and the skill levels of their citizens, as well as in the resulting variation in forecast growth rates. Among other factors having an impact on urban performance, the study lists:

- sector structure;
- agglomeration benefits;
- infrastructure quality;
- central government's tolerance of diverse performance;
- land supply and city governance.

One major conclusion is that the resulting divergence in urban economic performance within countries will eventually determine commercial opportunities, as well as investment and location decisions, making it not possible to identify generalized trends in the development of the economic geography of cities.

4. Main outcomes of the experts' workshop

According to the methodological steps described in Section 2 of this report, an on line workshop was organised with a restricted number of experts in order to comment on the results of the survey.

We report hereafter the main questions asked and the experts' overall feedback. The feedback is not associated to the point of view of the single experts.

First of all experts were asked to give a feedback on the survey overall results, in terms of level of impact of the different drivers and of time horizon in which drivers will have impact.

The main experts' comments were:

- E-commerce already has a high impact on urban freight transport, while the survey answers indicate that it is going to have an impact on a longer time horizon (in the medium run, and even earlier that the driver "Internet of Things").
- It is reasonable that Cluster A (including the drivers "Omni-channel logistics" and "Desire for Speed") will have a medium-high impact on a relatively close time horizon.

- It is also reasonable that Cluster D (including the drivers "Environment and sustainability" and "Unmanned Aerial Vehicles") will have a low impact on a relatively far time horizon.

Then, experts were asked to comment on the differences in the answers of each category of respondents (in particular "Business", "Research" and "Authorities) versus the average of answers of all categories.

With reference to the "Business" category, the main experts' comments were:

- The fact that "Business" experts think that the drivers will have an overall higher impact on a short time horizon looks plausible; it pinpoints a higher level of attention of the business sector to the impacts generated by the selected drivers.
- It is surprising that the "Business" experts evaluate that the driver "CNV and EV for urban freight" will have a stronger impact on a shorter time horizon compared to the other respondents' categories.

With reference to the "Authority" category, the main experts' comments were:

- There is not a common understanding between the "Authority" experts' opinions and the "business" and "research" experts concerning the time horizon and the level of impact of the drivers, considering that they think that drivers will have a less significant impact on a longer time horizon. This is in particular surprising with reference to the driver "CNV and EV for urban freight", considering that policies in the clean fuels sector have an important role to stimulate the market uptake of EV and CNG vehicles.

With reference to the "Research" category, the main experts' comments were:

- "Research" experts probably over-estimate the time horizon in which "automated vehicles" will generate impacts.
- It is plausible that "Research" experts consider the technology and equipment drivers to have a higher impact on a shorter time horizon.

Finally, experts were asked to make short statements concerning:

- their views on how they expect European Functional Urban Areas to evolve;
- which further specific trends in the transport and logistics industry will impact on urban freight; and
- factors that policy makers should take into consideration.

The main experts' statements are reported hereafter:

- The evolution of urban economic geography will not be the same in all European cities. We may expect that warehousing activities will position closer to the distribution areas and final customers (increase of proximity storage practices). This will also impact on the logistics real estate trends, which will behave responding to logistics supply needs.
- There will be a "metropolisation" trend and a clustering of economic activities in big cities. Consumers and professional services will have an increasing share in urban economies.
- Home deliveries and e-commerce will further develop with a consequent increase of freight traffics and storage capacities in residential and areas.
- Lean logistics will play an important role in the future and the transport industry will have to provide related solutions.
- Concerning technologies and in particular Internet of Things and Bid Data, while we may expect that they will not become a practice in the short term, Apps diffusion will significantly grow.

- There is a need for public policies which promote clean fuelled vehicles and it can be expected that electric vehicles will significantly increase their market share.
- There is a need for public policies targeted at the optimisation of urban freight and at the reduction of its environmental impacts.

E. Conclusions

These conclusions have the aim of summarizing the main results of the Delphi Analysis, as well as providing recommendations to the policy makers involved in the SULPiTER project.

The expert panel's assessment on the overall significance of the thirteen considered trends and factor is positive; the scores received by all drivers being turned towards the top of the 1-5 range.

With respect to the time horizon, the overall assessment of the expert panel points towards the medium range of the spectrum (e.g. 'Before 2030') rather than the short range (i.e. 'Before 2020') or the longer range (i.e. 'After 2030' and 'Never').

We propose a clustering of the 13 urban logistics drivers as reported in the following Table.

Table 14: Clustering of drivers

Cluster	Drivers	Impact	Time horizon
Cluster A	Omni-channel logistics Desire for speed	Medium-high	Relatively close
Cluster B	Public planning Industry plans Internet of Things and Big Data Sharing economy	Medium	Medium
Cluster C	E-commerce CNG and EV for urban freight Automated vehicles Grey power logistics	High	Relatively far
Cluster D	Environment & sustainability Unmanned Aerial Vehicles	Low	Far
No cluster	Globalization trends	Medium-low	Relatively far

Source: elaboration by Steer Davies Gleave

The main results of the Expert Survey, listed by cluster, are described below. Clusters with shorter time impacts are described at first.

- **Cluster A**: two drivers will have a medium-high impact on urban logistics, and will deploy such impact over a relatively close time horizon (most probably at the turn or in the early years of the next decade):
  - Omni-channel logistics (i.e. the integration of several on-line and off-line retail channels in which consumers can buy, pick up or receive goods and manage payments) is likely to grow as a trend influencing urban logistics;
  - "Desire for speed" by consumers (i.e. preferences for 1-day / 1-hour deliveries) is likely to increase freight transport impacts in urban areas and become a practice on all main commodities.
- **Cluster B**: four drivers will have a medium impact on urban logistics, and will deploy such impact in the medium run (most probably in the decade between 2020 and 2030):
  - Public planning practices to manage urban logistic development (in particular, policies to shift deliveries to off peak times) are likely to become more common in the future;

- Industry plans focused on the development of networks of small and flexible urban warehouses / access centres, are likely to diffuse as means to exploit proximity to clients and optimize routes and delivery times;
- Internet of Things is likely to become a key driver of urban logistics – in particular, Internet of Things' impacts look stronger with reference to better logistics operations planning;
- Emerging experiences in freight sharing economy (e.g. new start-ups applying the Uber's business model to urban logistics) are likely to erode part of the market share of incumbent urban transport and logistics providers.

- **Cluster C**: four drivers will have a high impact on urban logistics, and will deploy such impact over a relatively far time horizon (around 2030, probably earlier):
  - E-commerce is highly likely to become a core driver of urban freight, and is likely to lead to an increase in traffic in urban areas;
  - CNG and EV for urban freight are highly likely to become a mainstream practice in urban areas;
  - The diffusion of pilot applications of automated vehicles is likely to have a high impact on authorities' regulatory and planning practices;
  - Population aging will have a high impact on urban logistics and, in particular, on the development of medical, pharma, home care logistics networks.
- **Cluster D**: two drivers will have a low impact on urban logistics, and will deploy such impact over in the long run (around 2030, probably after):
  - Consumers' preferences for the environmental sustainability of a product and its delivery mode play a minor role in driving urban logistics trends;
  - Experts express a degree of scepticism about the possibility of Unmanned Aerial Vehicles to become a practice in the parcel sector.
- Relocation choices opposing established globalization trends will have a medium-high impact on urban logistics; relocation choices will become common in the medium-long term period (around 2030, probably after).

Based on the answers received with respect to a number of drivers (e.g. Grey power logistics, E-commerce, Industry plans), we can conclude that logistics operations will have an increasing significance for cities and FUAs and that they will increase their impacts on cities.

Another overall result is that consumers' behaviour and choices (not only related to e-commerce but also to the increased 'desire for speed' and variety of sales channels) are more likely to result in an increase, rather than a reduction, of transport services and traffic in urban areas.

When considering the answers received by groups of respondents (business sector, authorities, research, others) it does emerge how the authorities have an overall perception of the selected urban logistics' drivers as likely to have a less significant impact on urban logistics, and to deploy such impact farther in time, than the business sector and the research group.

Therefore, public authorities should take into consideration the different perception of other stakeholders when shaping urban logistics public policies. This should be taken into consideration when developing the participatory processes with stakeholders in the definition of the their logistics plans.

The survey aimed identifying the likely time horizon of each driver, taking into consideration even long-term horizons. A city logistic plan has a time horizon of approximately 10 years, and SULPiTER's cities' logistic plans will be developed by 2019.

Many drivers commented by the experts will have a significant influence on urban logistics by 2030 (e.g. e-commerce, consequences of population aging, new business models belonging to sharing economy, applications of the Internet of Things, diffusion of CNG and EV for urban freight and pilot applications of automated vehicles), and some even by 2020 (e.g. omni-channel logistics, and consumers' desire for speed).

Therefore, such trends and factors must be taken into account by public planners since now. Otherwise, at the turn of the next decade, a just-approved logistics plan would miss key behaviours and elements already in place or developing as soon as the plan is ready to be implemented.

APPENDIX A - List of respondents

The following table reports a list of the experts and institutions / organizations which have provided their answer to the Expert Survey. Respondents are sorted in alphabetical order by the name of their organization.

We note that:

- 40 respondents agreed that both their name and surname, and the name of their institution / organization are published in this Report;
- 8 respondents agreed that the name of their institution / organization is published in this Report, but not their name and surname;
- 3 respondents agreed that their name and surname is published in this Report, but not the name of their institution / organization; these answers are considered as personal answers.
- 12 respondents asked that neither their name and surname, nor the name of their institution / organization, are published in this Report.

Table A. 1: Expert Survey - List of respondents

Institution - Organisation	Name and surname
ALICE (Alliance for Logistics Innovation for Collaboration in Europe)	Fernando Liesa
ALICE (Alliance for Logistics Innovation for Collaboration in Europe)	Sergio Barbarino
Asociación Plan Estratégico, Ciudad de Burgos	
Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management	Martin Eder
Barcelona Metropolitan Area	Guillem Alsina
Barcelona Metropolitan Area	Daniel Illa
Brussels Mobility	Christophe De Voghel
Budapest University of Technology and Economics	
Chamber of Commerce and Industry, Lyon Metropole	Janique Thia Toong
City of Graz	Gerhard Ablasser
City of Krakow / Urban Infrastructure Department	Tomasz Zwolinski
City of Malmö	Max Hanander
City of Prague	Jaroslav Mach
City of Stockholm	
Club Sustainable Development of Civil Society (CSDCS)	Lucia Ilieva
Denso Automotive Deutschland GmbH	Andres Caldevilla
Erasmus University, Rotterdam	Giuliano Mingardo
ERTICO - ITS Europe	
Fundación Valenciaport	Salvador Furio
Global Road Safety Partnership (GRSP), Hungary	
IFSTTAR	Laetitia Dablanc
Indian Institute of Technology, Madras	Gitakrishnan Ramadurai
Kaunas City Municipality	James Mcgeever
Maritime University of Szczecin, Faculty of Economics and Engineering in Transport	Stanisław Iwan

Institution - Organisation	Name and surname
MemEx	Giorgio Ambrosino
Metropolitan Transport Authority of Tarragona	Daniel Miravet Arnau
Municipality of Piraeus	Maria Poulou
Municipality of Porto	Eurico Ferreira
Municipality of Serres, Greece	Foteini Mikiki
NewRail - Centre for Railway Research at Newcastle University	Thomas Zunder
Optilog d.o.o.	
Posta Slovenije d.o.o.	Martin Krizanec
PosteItaliane, Foundation proPosta	Dario Biggi
PTV	Marcel Huschebeck
Region Hannover	Tanja Goebler
Regione Liguria	Arcangelo Merella
SCHIG mbH	Sebastnik Rudolf
Slovenian Logistics Association (SLA)	Robert Biček
Smart Freight Centre	Suzanne Greene
Smart Freight Centre	Sophie Punte
Transport and Telecommunication Institute (TSI), Latvia	
Transport research centre (CDV), Czech Republic	David Barta
Trieste Port Authority	
University of Ljubljana	Patricija Bajec
University of Melbourne	Russell Thompson
University of Rijeka	Dragan Cisic
University of Westminster	Jacques Leonardi
	Andrea Campagna
	Maria Elena Perretti
	Ian Wainwright

Source: elaboration by Steer Davies Gleave

APPENDIX B - Expert Survey

The text of the online questionnaire is provided in the following.

Steer Davies Gleave has been commissioned this Expert Survey by the Institute for Transport and Logistics in Emilia-Romagna region (Italy). The Survey is funded by the European Commission within the SULPiTER project (Interreg Central Europe Programme – European Regional Development Fund). The SULPiTER project focuses on freight transport and logistics planning in functional urban areas. For more information, please visit the project's website: http://www.interreg-central.eu/Content.Node/SULPiTER.html

This Survey aims to receive experts' views on trends and factors impacting on urban freight transport and support authorities in developing Sustainable Urban Logistics Plans.

You have been selected as one of the main experts with competencies in technical areas concerning urban freight transport and we would be pleased to receive your contribution to this Survey.

Your answers will not be public and only aggregated results will be published. Respondents will receive the Survey results. If you wish, your name and/or the name of your institution - organisation will be mentioned in the Survey report.

The Survey will take approximately 15 minutes. We would kindly ask you to fill in the Survey by 28th October 2016.

To access the Survey, please click on the following link:

https://ec.europa.eu/eusurvey/runner/SULPiTERsurvey2016

We thank you in advance for your cooperation and support in shaping better freight systems in Europe.

Steer Davies Gleave

Expert Name: xxxxxx

Expert Surname: xxxxxx

Institution - Organisation: xxxxxx

Do you agree to mention your name and surname in the survey report? Y/N

Do you agree to mention your institution - organisation in the survey report? Y/N

B.1 Consumption

DEMOGRAPHIC TRENDS

1. Grey power logistics

Within the next decades, population ageing will become one key driver of demographic trends in Europe: the old-age dependency ratio (≥65 years / 15-64 years) will increase from the current figure of about 30% to about 50% in the longer term[4].

In the meantime, the first wave of digital natives will enter the aged population segment.

Grey power logistics[5], that is the logistics for an aging society, is likely to drive consuming and logistics.

- **How do you assess the future impact of population aging on the following areas?**
  - **Development of e-commerce (1 to 5)**
  - **Development of convenience stores (e.g. mini-marts - "corner stores" in urban areas) (1 to 5)**
  - **Development of medical, pharma, home care logistics networks (1 to 5)**
- **In which time frame do you think that population ageing will become a driver of logistics? [before 2020; before 2030; after 2030]**
- **Eventual comments [open]**

[4] Eurostat. *People in the EU - population projections.* Data extracted in June 2015.

[5] Trend identified in: DHL. Logistics trend radar. Version 2016

2. Environment & sustainability

In recent years consumers have raised their awareness on the environmental sustainability of the products they buy. Nevertheless products quality and price are still core drivers of consumers' behaviours.

- **To what extent consumers' behaviours will be driven by the environmental sustainability of a product, including the sustainability of its delivery mode? (1 to 5)**
- **In which time frame do you think the environmental sustainability of a product will become a key driver of consumers' behaviours? [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

3. E-commerce

The Ecommerce Foundation reports that business-to-consumer (B2C) e-commerce sales worldwide reached $1.9 trillion in 2014, representing a doubling in sales compared to 20116. E-commerce is expected to continue growing. Several studies expect that home delivery generates more freight traffic, but cuts private mobility to shops.[7]

- **Will e-commerce be a core factor influencing urban freight? (1 to 5)**
- **How do you expect e-commerce to impact on the total urban traffic as a consequence of the trade-off described above? (1 to 5, 3 means no impacts on traffic, 1 high decrease and 5 high increase)**
- **In which time frame do you expect e-commerce to be the main sales channel? [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

4. Sharing economy

According to the Canadian Institute of Traffic and Transportation, a number of technology-based start-ups have recently entered the logistics industry claiming they will be the next "Uber of trucking". They claim to change the current state of the logistics industry by replacing the need for 3rd Party Logistics Providers[8].

According to a study by Scott Walsen[9], the number of trips by taxis in New York fell by 8% between 2012 and 2014 after Uber's entry. According to Transport for London, the number of licensed private hire operators in London has declined by 11% since Uber launched in the city in 2012[10].

[6] SCL Report Series. *City Logistics: Challenges and Opportunities*. 2015

[7] Johan Vissera, Toshinori Nemotob, Michael Brownec. *Home Delivery and the Impacts on Urban Freight Transport: A Review*. ScienceDirect. 2014

[8] Canadian Institute of Traffic and Transportation.

[9] Scott Wallsten. *The Competitive effect of the Sharing Economy: How is Uber Changing Taxis?*. Technology Policy Institute. 2015

[10] For further information, please see: Georgios Petropoulos. *Uber and the economic impact of sharing economy platforms*. Bruegel. 2016

- **To what extent could these new start-ups (the "Uber of trucking") impact on urban transport and logistics providers with the same magnitude as Uber did on the taxi industry? (1 to 5)**
- **In which time frame will these initiatives be a consolidated practice in urban freight? [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

LAND AND ROAD USE

5. Public planning

Urban space is an increasingly scarce resource. Different users compete for limited street space. A recent study by the US Regional Plan Association in cooperation with the Volvo Research and Educational Foundations indicates that freight vehicles generally have lower priority in road space allocation[11]. At the same time logistics companies' location have sprawled in metropolitan areas increasing the impacts of freight traffics to/from the urban centre.

- **Though city logistics actions can be multiple and complementary, we are interested in having your opinion on which of the following practices you expect to become common and in which time frame (1 to 5, 5 means extremely common practice).**
  - **Road Usage Charging for freight vehicles in the metropolitan area with revenues earmarked for transport investments (1 to 5) [before 2020; before 2030; after 2030; never]**
  - **Public regulations for dedicated logistics facilities or space in real estate urban projects (1 to 5) [before 2020; before 2030; after 2030; never]**
  - **Planning of logistics facilities in urban areas accessible by rail or river (1 to 5) [before 2020; before 2030; after 2030; never]**
  - **Applying "complete streets" principles that include freight needs ("complete streets" meaning planning and designing streets to be safe, convenient and comfortable for each user) (1 to 5) [before 2020; before 2030; after 2030; never]**
  - **Shifting deliveries to off peak times [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

6. Industry plans

Colliers International Group Inc.[12] has identified three types of Distribution Centres which will take the dominant form in years to come:

i. mega-sized Regional-National Distribution Centres located along major road infrastructures;
ii. mid-sized, cross-docked city Distribution Centres around the main arterial routes of major cities and conurbations;
iii. small, flexible urban warehouses-access centres located in urban communities.

[11] Edited Henrik Nolmark (Volvo Research and Educational Foundations), Michael Browne (University of Gothenburg), Genevieve Giulano (METRANS Transportation Center, University of Southern California), José Holguin-Veras (Rensselaer Polytechnic Institute). Why Goods Movement Matters, Strategies for Moving Goods in Metropolitan Areas. 2016

[12] Colliers International Group Inc.. From First Mile to Last Mile - Global Industrial & Logistics Trends. October 2015

- **To what extent do you expect type (iii) to significantly diffuse as means to exploit proximity to clients and related optimization of routes and delivery time? (1 to 5)**
- **In which time frame do you think that type (iii) will be a widespread practice? [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

B.2 Distribution and supply chain management

TRENDS IN WORLD PRODUCTION AND TRADE

7. Globalization trends

Globalization has increased freight flows because production has been distributed across multiple locations around the world, driven by production cost factors. While this overall trend is continuing, a number of companies have started considering investments in the opposite direction. For example, Adidas is developing a worldwide network of high-tech low-distance manufacturing facilities or 'speed factories'[13], which are located within regional sales markets, ensuring proximity to clients and significantly reducing freight costs.

- **To what extent do you expect such practices to consolidate? (1 to 5)**
- **In which time frame? [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

NEW BUSINESS MODELS AND TRENDS IN SUPPY CHAIN MANAGEMENT

8. Desire for speed[14]

In recent years, many e-tailers have started to offer their customers a same-day delivery option, sometimes up to 1-hour delivery (e.g. Amazon Primenow in selected US cities).

- **To what extent do you think that the "desire for speed" will increase freight transport impacts in urban areas? (1 to 5)**
- **In which time frame will these types of deliveries become a practice on all main commodities? [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

[13] http://www.adidas-group.com/en/media/news-archive/press-releases/2016/adidas-expands-production-capabilities-speedfactory-germany/

[14] Factor identified in DHL. Logistics trend radar. Version 2016

9. Omni-channel logistics

Omni-channel retailing foresees the integration of several on-line and off-line retail channels in which consumers can buy, pick up or receive goods and manage payments. Many retailers, as for example Walmart in the US, are adopting omni-channel retailing. This brings challenges to logistics activities in terms of stock management, number of deliveries and visibility in the supply chain among different retail channels.

- **To what extent do you think that this trend will grow? (1 to 5)**
- **In which time frame? [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

B.3 Technologies and equipment

CLEAN FUELS

10. CNG and EV for urban freight

CNG (Compressed Natural Gas) public charging stations and EV (Electric Vehicles) rapid charging stations in Europe respectively equal to about 3.000 (source NGVA) and more than 1.600 (source OCM), with uneven distribution among Member States for both types of fuel infrastructures. The total number of petrol stations in Europe is approximately 114.000 (source FuelsEurope). Many factors (e.g. technology, policy, infrastructure, …) are affecting the uptake of alternative fuel vehicles.

- **To what extent do you expect that alternative fuel freight vehicles will be a mainstream practice in urban areas? (1 to 5)**
- **In which time frame? [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

11. Internet of Things and Big Data

The volume, velocity, and variety of data arriving in real-time is quickly increasing in recent years. Internet of Things (IoT) represents the next step towards the digitisation of the society and economy, where objects and people are interconnected through communication networks and report about their status and/or the surrounding environment[15]. Quickly transforming these data into decisions may increasingly become a reality and a key technological enabler to improve city logistics operations and logistics providers' business strategies.

- **To what extent do you expect that IoT will change logistics in cities in terms of:**
  - **Freight traffic reduction (1 to 5)**
  - **Transport safety (1 to 5)**

[15] https://ec.europa.eu/digital-single-market/en/internet-things

- **Better utilization of urban space (1 to 5)**
- **Better logistics operations planning (1 to 5)**
- **Improved public planning in transport (1 to 5)**

- **In which time frame do you expect Internet of Things to diffuse in city logistics? [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

"FRONTIER" TECHNOLOGIES

12. Unmanned Aerial Vehicle (UAV)

Amazon CEO Jeff Bezos announced that his company is currently testing Unmanned Aerial Vehicles (UAVs) in Canada, the United Kingdom, and the Netherlands. Bezos envisions UAVs delivering parcels from distribution centres directly to customers via Amazons Prime Air.

- **To what extent do you expect that UAVs will become a practice in the parcel sector, also considering safety and regulatory issues? (1 to 5)**
- **In which time frame do you think that cities should develop a policy framework to take into consideration UAV deliveries? [before 2020; before 2030; after 2030; never]**
- **Eventual comments [open]**

13. Automated vehicles

Fully automated vehicles capable of driving themselves from origin to destination (without needing a driver) are expected to be feasible on a large scale not earlier than in 20 years. Urban environment systems are expected to follow a pathway where application of highly automated vehicles will initially be limited to specific environments (e.g. airports, campuses, exhibition centres, etc.) and then gradually open up to less protected circumstances[16].

- **In which time frame do you expect the diffusion of pilot applications of automated freight vehicles at urban level? [before 2020; before 2030; after 2030; never]**
- **Which level of impact do you expect on authorities' regulatory and planning practices? (1 to 5)**
- **Eventual comments [open]**

If you wish, you can insert here any other factors or trends that you consider important

[16] Steer Davies Gleave. Research for the European Parliament TRAN Committee – Self-piloted cars: The future of road transport?. 2016