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# Societal trends influencing mobility and logistics in Europe: a comprehensive analysis

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## Abstract

The objective of this paper is to establish a comprehensive view of societal trends that have an impact on mobility and logistics in the future. We have reviewed scientific literature, the output of European research projects and reports from consultancies. The result of this investigation provides a broad and comprehensive set of factors that influence, and will influence in the future, mobility and logistics. The set is composed of 29 trends organised under 9 larger categories covering economic issues, societal issues, urbanisation, the environment, the digital society, new business models, safety, security and the legislative framework.

This work has been strongly inspired by the ideas of the liquid modernity developed by Bauman. This broad and complete view on societal trends has proved to be very supportive of the present analysis. It allows describing linkages between social and economic trends, and between society and technology, especially information and communication technology. Building the analysis on liquid modernity provides coherence and exhaustiveness in covering the topic. The added value of this contribution is its systematic approach and that evidence is provided for each identified trend.

## 1 Introduction

Understanding current and future mobility and logistics is a key element in order to shape transport policies and orientate future research. Therefore, establishing a comprehensive view of societal trends that have an impact on

mobility and logistics, represents a significant step. In the context of the European research project Mobility4EU<sup>1</sup>, such an analysis was carried out (L'Hostis et al. 2016). The aim here is to present societal factors, in the broad sense, that influence mobility and logistics. Studying mobility of people and logistics together remains a challenging task. The “last mile” of logistics is very often a matter of individual mobility, which shows how interrelated the two topics can be. Mobility of persons is the most prominent topic in the study of societal trends, but logistics issues can nevertheless be found in several places in our contribution.

There is a broad consensus within scientific literature and in policies that mobility is of crucial importance for society. According to a study by the International Transport Forum in 2011 (Wilson 2011; ‘ITF Transport Outlook 2017’ 2017), by 2050 passenger mobility will increase by a staggering 200-300 % and freight activity by as much as 150-250 %.

Mobility is increasingly becoming so important that several authors proposed to replace the study of society by the study of mobility (Urry 2007). We chose not to separate society from mobility and transport, but rather to take an integrated approach.

A societal trend is described as an emerging pattern, movement, and evolution in society that leads to change, and potentially has implications for mobility and transport (e.g. ageing, social networks). Societal trends impact transport infrastructure and demand, thus they can be considered key elements for transport related change.

The analysis had to find a compromise between the need to identify and hence separate, and the need to highlight interactions between individual trends and groups of trends. In this perspective trends have been organised in groups of individual trends.

In this work, it has proven difficult to dissociate clearly societal trends from political trends. For example, it is difficult to identify if environmental issues have been led by changes within patterns of behaviour in citizens or if it has been led by legislation. Likewise, it is difficult to dissociate societal trends from technological trends as expressed in the concept of *digital society*. Consequently, our analysis of societal trends that impact transport uses five domains of investigation: this analysis covers societal, political, technological, environmental, legal and economic trends.

Another difficulty of the present approach has been to produce a coherent set of trends, shaped around a general view of present and future social behaviour. In order to avoid bias, we chose not to rely only on the sociologists of mobility such as Kaufmann (Kaufmann 2002), Urry (Urry 2007) or Kellerman (Kellerman 2012), who tend to consider mobility (and immobility) as central societal values. Instead, we refer to a more general view on society, as contained in the idea of

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<sup>1</sup> The Mobility4EU project aims at producing a roadmap for mobility and logistics in 2030 starting from societal needs. The overall objective consists in linking present and future societal trends and needs to existing and emerging transport and mobility solutions. <http://www.mobility4eu.eu>

*liquid modernity* introduced by the sociologist Z. Bauman (Bauman 2000). This proposal formulates many ideas described in the *post-modern* concept. This new phase of modernity can be seen as being characterised by five trends:

- a continuing movement of individualism;
- the development of fluidity, which can be seen positively with the ideas of change and innovation, but which also has a darker side with respect to the ideas of rupture and precariousness;
- the principle of an acceleration of the pace of existence, especially as it is felt through the experience of individuals;
- the emergence of social networks that gain more significance, as compared to the more stable and strong (Granovetter 1983) social ties of the family, or of the workplace;
- the introduction of the technologies of information and communication in almost all aspects of social life.

One of the merits of this approach is to establish links between domains. Liquid modernity links social dynamics with technology, with social and economic dynamics. In addition, if Bauman (Bauman 2000) intends to describe society and not mobility itself, building an analysis of mobility out of these elements is very straightforward. Liquid modernity provides a strong support to the list of trends exposed here especially through the linkages it creates between societal trends and between societal and technology trends.

Liquid modernity ideas provide direct insights for understanding persons' mobility, and also gives indications of how freight transport is and should be organised in the future. Needs are more individualised, personalised and hence logistic flow tends to be individual based. Fluidity and the feeling of acceleration converts into the need for immediacy as is reflected in the development of so-called "instant delivery" (Dablanc et al. 2017). These aspects are devised in the relevant trends.

The emergence of a consensus among social scientists can be observed (Clegg and Baumeler 2010) on the idea of a shift of society towards *liquid modernity* introduced by (Bauman 2000). In consequence, this view provides a sound basis for the analysis of societal trends having an impact on mobility and logistics.

As compared to other similar scientific exercises, this approach is broader and emphasises new trends. Several researchers have focused on trends in favour of sustainable transport (Rudinger, Donaghy, and Poppelreuter 2004; Boschmann and Kwan 2008), while others have studied trends from travel surveys in a single country (Frändberg and Vilhelmson 2011). As compared to other similar exercises in European research, our approach is rooted in the study of societal trends as opposed to a more classic transport demand analysis, found in for example TransForum (Anderton et al. 2015), TRANSvisions (Petersen et al. 2009), FUTRE (Bernardino, Vieira, and Garcia 2013), RACE2050 (Sena e Silva et al. 2013), EUTransportGHG (Sessa and Enei 2009), ORIGAMI (Lemmerer and Pfaffenbichler 2012) and VOYAGER (Brög, Barta, and Erl 2005). These approaches tend to separate trends along classic transport modes and transport markets, without extending into the study of societal trends. As opposed to these

approaches, firstly we analysed societal dynamics in a broad sense, and secondly identified trends that have an interaction with mobility and logistics. In this work, societal trends are starting points instead of more traditionally starting with the identification of transport solutions or markets. This approach complements previous research. In addition, as opposed to more thematic approaches to studying societal trends, for instance CITYLAB on freight (Dablanc et al. 2016) or TransForum on several targeted transport sectors (Anderton et al. 2015), our analysis intends to cover all transport modes, all geographical scales and freight as well as passenger transport.

## **2 Method**

The objective of this chapter is to establish a comprehensive view of societal trends that impact mobility and logistics. In this aim, a literature review has been conducted, encompassing published scientific sources, research reports and statistics sources.

In order to set up a comprehensive view, a list of trends has been created. A set of rules has been defined for the identification of these trends in relation to mobility and logistics. Firstly, a trend is coherent, not equivocal. A trend can carry a paradox, like the trend about the acceleration of liquid modernity, and a trend can also move in a single direction.

Secondly, a trend is not redundant. Bearing in mind the complex nature of societal issues, the task of building a set with little overlap has proved challenging.

Thirdly, the set of trends should not omit factors or tendencies in society in the broad sense that may exert an influence on mobility and logistics.

And finally, a trend must be described and supported by evidence found in the literature. Statistics, surveys, and figures are provided for each trend. These analytical elements determine the direction of the influence exerted on mobility and logistics. In cases where an idea was formulated without evidence, it was not considered as a trend.

## **3 Societal, political, technological, environmental, legal and economic trends interacting with mobility and logistics**

We are developing an analysis of this system of trends in the present with a temporal horizon of 2030. Consequently, the description of trends aims at capturing the present situation and the dynamics of these trends in the future.

The result of this process is the following list. This list can be seen as the shortest possible set of trends that allows describing present and emerging societal factors, in a broad sense, that have an impact on mobility, both for freight and passengers' mobility.

The list is composed of 29 trends organised under 9 larger categories. These larger categories cover economic issues, societal issues, urbanisation, the environment, digital society, new business models, safety, security and finally, the legislative framework. Table 1 lists the categories and the trends, and indicates the type of each trend: social, political, economic, technological and legal.

**Table 1: The 29 societal trends having an impact on mobility and logistics and their categories**

Categories	Trends	Type of trend
3.1 Economic trends	Share of the European economy in world GDP declines	Economic
	Restructuring working arrangements	Economic, Social
3.2 Societal trends	Increasing life expectancy of the population	Social
	Migration trend generating long distance flows	Social
	Trend towards inclusion of vulnerable to exclusion groups	Political
	Less car usage by younger generations	Social
	Move towards more active and healthy lifestyles	Social
	Acceleration and flexibility of liquid modern society	Social
	Personalisation of liquid modern society	Social
	European integration facilitating flows	Political
3.3 Urbanisation	Rising and expanding urbanisation	Economic, Social
	The emergence of Smart cities	Technological
3.4 Environmental protection	Stricter regulations for environmental protection	Social, Political
	Limited resources require more resource efficiency and circular economy in transport	Economic, Social
	Move away from fossil fuels towards energy efficiency and renewable energies	Political, Economic, Technological
	Impact of climate change on transport	Environmental
3.5 Digital society and the Internet of things	Rise of the Internet of Things and big data	Technological
	More automation	Technological
	Expectation of customers and digitisation of mobility	Social
	New uses of travel-time	Social
3.6 Novel Business models in transport	New models challenging the individual vehicle ownership model	Economic, Social
	New players and new business models	Economic
	Emerging co-development and co-creation of new systems by users and economic actors	Economic
3.7 Safety in transport	The persisting issue of transport safety	Social, Political
	The emerging safety issue in complex networks with new vehicles	Social, Legal
3.8 Security in transport	Growing concern over security threats	Social

3.9 Legislative framework	Diversifying approaches of governance	Political, Legal
	Legislative models adapts to new transport solutions and businesses	Legal
	Trend toward harmonisation in legislative frameworks	Legal

Considering that trends can be of several types, it can be observed that 16 trends are social, 8 trends are economic, 6 trends are political, 4 are technological, 4 are legal, and only one is environmental. If, as expected, more than half of the trends refer directly to social issues, the other aspects play a significant role in the description of trends.

The next section describes the trend categories in detail.<sup>2</sup>

### 3.1 Economic trends

Economic climate and economic conditions play a major role in shaping the demand for mobility. In the economic domain two trends have been identified. Firstly, it is foreseen that the adaptation of Europe's economy in the global context will have a relative decline of GDP (Bassanini and Reviglio 2011). European GDP and population should grow but much slower than the rest of the world on average. The direct consequence of global growth will be an increase in flows, particularly freight, but also the possibility of a re-industrialisation of Europe, which could lead to significantly modified freight flows ('ITF Transport Outlook 2017' 2017). At the individual level, economic growth usually converts into more mobility, as illustrated by the growth of tourism.

The second trend within this category refers to the restructuring of working arrangements. Telework and part-time work are the two major foreseeable tendencies already at work and that should grow in the future (Isusi and Corral 2004; Jagger et al. 2014). They have direct and indirect effects on mobility. Although there is a decreasing quantity of home-to-work flows, they could take longer due to the urban sprawl made easier by telework and less peak hour traffic, as there may be more trips for other purposes (Jackson and Victor 2011; Bernardino, Vieira, and Garcia 2013). A likely consequence of the last effect has been identified as a demand for more flexible tickets for public transport.

### 3.2 Societal trends

The second category of trend refers to societal dynamics that interact with mobility and freight demand. Most of these trends are mainly societal dynamics such as; "Increasing life expectancy of the population" or "Migration trend generating long distance flows", but some of them are also supported by "Move towards more active and healthy lifestyles" or driven by "Trend towards inclusion of vulnerable to exclusion groups" and "European integration facilitating flows".

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<sup>2</sup> For a detailed description of trends see (L'Hostis et al. 2016).

“Increasing life expectancy of the population” is an essential dynamic of European societies (Eurostat 2015; World Health Organization and The World Bank 2011). The interaction with mobility and logistics are complex though: the population of car drivers is likely to grow, and less active mobility is expected from the “oldest old”, but maybe more active mobility will come from those who will stay or move back to denser urban areas; a need for proximity in goods and service deliveries for the urban elders contrasts with specific and costly mobility demand in ageing rural areas (Anderton et al. 2015; Velaga, Beecroft, and Nelson 2012).

“Migration trend generating long distance flows” (European Commission 2011) introduces or develops specific patterns of mobility demand: the foreseen increasing migration in Europe will generate longer distance flows of persons and goods with the countries of origin of migrants (‘Asylum Statistics - Statistics Explained’ 2016; Vasileva 2009).

There is a consensus on the fact that policies support a “Trend towards inclusion of vulnerable to exclusion groups” (Martens 2012). This trend has a direct impact on transport policy in terms of accessibility for all. In addition to known vulnerable groups, the digitisation of mobility carries the risk of creating new exclusion, for instance among those who do not own a smartphone (Pauzié 2013; Velaga, Beecroft, and Nelson 2012).

Forming part of the explanation of the *peak car* phenomenon, the tendency of “Less car usage by younger generations“ has been observed recently since the mid-2000 (Davis, Dutzik, and Baxandall 2012; Goodwin 2012; Newman, Kenworthy, and Glazebrook 2013; Metz 2013). Connecting to the social network, whatever the means, physically based or telecommunication based, seems to have replaced the car ownership dream observed in previous generations (Deloitte, Corwin, et al. 2015; McKinsey et al. 2012).

Another consequence of the societal awareness for environmental issues is the “Move towards more active and healthy lifestyles“. This trend is fuelled by individual awareness and by policies aimed at influencing individual behaviour. Health is likely to become a major concern in the future with direct implications for the policies aimed at orientating mobility behaviour (Krzyzanowski, Kuna-Dibbert, and Schneider 2005).

There is an emerging consensus among social scientists around the idea of *liquid modernity* introduced by Z. Bauman (Bauman 2000). In order to characterise the interactions of liquid modernity with mobility and logistics two trends have been established: “Acceleration and flexibility of liquid modern society“ and “Personalisation of liquid modern society“. The first trend refers to the ideas of acceleration and flexibility and provides an explanation to the increase of leisure time and its associated mobility patterns (Harvey 1990; Levine 1998; Rosa 2003). It also entails that transport users need less time for planning their trips, and have access to immediate and seamless information. The second trend of liquid modernity highlights the personalisation aspect. The individualisation process, illustrated among other indicators by the decreasing size of households (Euromonitor 2013; Capros et al. 2013), favours individual transport modes of



cars but also bike and walking, and also favours models of the type “one-stop-shop” for mobility services.

Essentially driven by policies and political choices “European integration facilitating flows“ is still, despite the recent reverse movement by the United Kingdom, an ongoing process. Its impacts on mobility are straightforward through the increase in tourism and freight flows in Europe (Kester 2014).

### **3.3 Urbanisation**

Urbanisation is the major trend of human settlement. Despite an already high level of urbanisation in Europe, it is foreseen that urbanisation is set to increase from 73 % in 2014 to 84 % in 2050 (United Nations 2014).

Cities and city-regions, which are densifying and spatially extending, are increasingly the dominant forms of settlement (Fujita, Krugman, and Venables 2001). These trends lead to more intense and longer urban flows, both for passengers and goods (Sena e Silva et al. 2013).

The emerging model of the *smart city* aims at articulating human and social development with information and communication technologies in cities (European Investment Bank Institute EIB 2013). Equipping cities with ICT infrastructure is being led by the introduction of new technologies of mobility (mainly electric vehicles, car sharing, car-pooling) and should lead to new social interactions and to new uses of city spaces, and hence should have significant impact on mobility behaviour and freight demand.

### **3.4 Environmental protection**

In the domain of environmental protection, four trends can be identified. The first three are led or encouraged by policies, while the last one refers to the management of the consequences of climate change.

Rising awareness for environmental issues leads to the adoption of “Stricter regulations for environmental protection”. Transport has a large impact on the environment, and is confronted with the strategic policy goals of decarbonisation (Pachauri and Meyer 2014; Anderton et al. 2015).

The economy is adapting in the context of increasingly limited resources available (“Limited resources require more resource efficiency and circular economy in transport”). A “sustainable consumption” culture emerges among citizens and firms tend to conform to social and environmental rules and approaches: corporate responsibility, circular economy, life cycle assessment (Petersen et al. 2009). All these elements will require the reconsideration of the organisation of logistics, as for instance in the case of local food consumption that need short supply chains (Blanke and Burdick 2005; Coley, Howard, and Winter 2009; Meisterling, Samaras, and Schweizer 2009; Kulak et al. 2015; Dablanc et al. 2016).

In the domain of energy, policy goals support a movement to “Move away from fossil fuels towards energy efficiency and renewable energies” (European Commission 2011; Harrison 2013). The current dependence of transport on fossil fuels is expected to be replaced by more electricity and biofuels (Pachauri and Meyer 2014).

Finally, regarding environmental trends, the “Impact of climate change on transport” is direct and significant. Extreme weather events cause damages to transport systems of road, rail and aviation (Doll, Klug, and Enei 2014). Global warming could have one positive effect though, to open the North-West passage for freight between Europe and Asia (Anderton et al. 2015).

### **3.5 Digital society and the Internet of things**

In this section on digital society, two types of trends are covered. Regarding the digital world, technology, as an enabler, exerts a real influence and drives individual and social uses. Two technological trends of “Internet of things and big data”, and “automation” form the supply side. But at the same time, technology is sometimes used for a slightly different purpose than what was foreseen by the designers. In this sense, individuals and social groups can be seen as actors of digital society, and able to fuel trends that are not driven by technology. This is the demand side of digital society.

The technological trends of “Rise of the Internet of Things and big data” is impacting many aspects of the production of goods and services, and particularly in the transport domains. Vehicles, transport infrastructures, ICT devices, parcels will all be able to communicate in real-time. Dealing with the masses of data produced require new methods, the so called big data approaches, but promise to improve many transport issues like transport operations planning, traffic management, or safety (Löffler and Tschiesner 2016; Jeske, Grüner, and Weiss 2013; Zakir, Seymour, and Berg 2015).

The trend of “More automation“ is driven by the development of artificial intelligence, sensors and information and communication technologies (Frisoni et al. 2016). This technological development has ambitious road safety promises, but also raises difficulties expressed in another trend (“The emerging safety issue in complex networks with new vehicles”). Automation is also developing in the air and rail transport domains (Verstraeten and Kirwan 2014).

Regarding the demand side of the digital society, the first trend refers to the “Expectation of customers and digitisation of mobility”. Travellers in the digital world expect to be able to connect their mobile devices, and expect to receive accurate and real-time information about their trips (Pauzié 2013). All these expectations are challenging for transport providers (Deloitte, Goodall, et al. 2015). Quite ambivalently, travellers also want more data privacy (Pauzié 2013)

Mostly driven by the development of the digital society, “New uses of travel-time” can be observed (Jain and Lyons 2008; Lyons et al. 2013). Usually seen as a burden, travel time can become a positive moment for users. This trend is able to

influence the transport mode choice in favour of public transport (Russell 2012), until automation is introduced.

### **3.6 Novel Business models in transport**

The transport sector witnesses the emergence of new players and new business models interacting with – if not fuelled by – new behaviour. New business models are closely related to the previously mentioned trend of “Rise of the Internet of Things and big data”. The main issue is the currently dominating individual vehicle ownership model, described in the first trend “New models challenging the individual vehicle ownership model” (Shaheen, Mallery, and Kingsley 2012; Hardesty 2014; Cirstea 2015). The second trend covers the other cases where new players and new business models emerge, in batteries, in data, in freight “New players and new business models” (Forbes 2015; Leminen et al. 2015; Rantasila et al. 2014; Casey and Valovirta 2016). The last trend highlights the emergence of the co-development model and its implications for mobility: “Emerging co-development and co-creation of new systems by users and economic actors”(Chang and Yen 2012; Finnish Prime Minister’s Office 2015; Kostianen, Aapaoja, and Hautala 2016)

### **3.7 Safety in transport**

Despite significant improvement of the levels of safety, especially in the road transport domain, and encouraging perspectives linked to automation, transport safety will most probably remain a pressing issue in the future (‘European Commission Press Release - 2015 Road Safety Statistics: What Is behind the Figures?’ 2015).

Considering the long-term promise of the decrease in road casualty through the introduction of automated cars, a new safety issue emerges with the coexistence of automatic and non-automatic vehicles, creating complex networks and environments (Lazakis 2014). Safety will become a far more complex issue than today with new insurance and liability issues (Smith and Svensson 2015).

### **3.8 Security in transport**

Terrorism is a growing concern in our societies and for governments (Zellner 2014). Attacks often target transportation infrastructure, and hence the interaction between this trend and mobility and freight is straightforward (Jenkins 2007). More security is expected which raises the security and accessibility tension: the provision of more security in transport by introducing controls and barriers reduces accessibility.

### **3.9 Legislative framework**

The legislative dimension converts societal demand, through the production of laws and rules by public authorities and jurisprudence. This legislative dimension is an expression of the broader policy process and institutional environment that directly affects the transport sector. Nevertheless, beyond the mere role of translation of societal demand, the legislative dimension can be considered as a dynamic on its own, and hence can be considered as a societal trend in the broad sense. Three legislative trends exert influence in the domains of mobility and logistics.

We observe in the legislative domain a trend of “Diversifying approaches of governance“ (European Environment Agency 2015). More actors are invited to contribute to the governance of transport and mobility. In particular, with the association of citizens in decision processes, more transparency is required in governance models (Albrechts 2010). The innovation at play in the domain of legislation and governance, leads to a diversification of governance models.

Secondly, with the trend “Legislative models adapting to new transport solutions and businesses“ an interaction occurs between new business models and the legislative framework. The legislative framework has to adapt to new solutions (Azevedo and Maciejewski 2015), but newcomers must also make sure their business can sustain in a given and changing legislative framework.

The “Trend toward harmonisation in legislative frameworks” of the legislative framework in Europe has direct implications for transport, in the aims of interoperability of transport systems (‘Road Transport: Harmonisation of Legislation | EU Fact Sheets | European Parliament’ 2016). This trend refers also to the fact that legislative adaptations to new models and solutions in a given European country will inspire other countries’ reactions.

## **4 Interrelations between trends**

In this section we present the main interrelations between these trends. Even though this work mostly identified and isolate individual factors interacting with mobility and logistics in an unequivocal sense, the intrinsically interdependent nature of our material cannot be ignored.

The main interactions between trends form three groups. A small group links societal dynamics to policies aimed at correcting or accompanying them. A large group includes all the links between societal trends and digital technologies. Finally, a few remaining interrelations are identified beyond these two categories.

The first group of interrelations links policies, expressing the will of policy makers, and societal trends as actual transformations in the social field. Several emerging trends in transport demand are pushed by policies, but can also be seen as reflecting societal demand. This is the case in the environmental protection domain where a sustainable consumption culture interacts with extensive sets of policies dedicated to environment protection. Hence, the present analysis mixes societal trends, like ageing, and political responses to identified issues like policies aiming at inclusion of vulnerable groups.

The second group of interrelations links society and digital technologies.

The *liquid modern* society described by Bauman (Bauman 2000), is intimately shaped by digital technologies of information and communication. There is hence clearly a strong link between the two trends of liquid modernity and the four trends of the digital society. The current and future digital society would not exist without the technology developments in communication and information, but, on the other hand, the use by individuals and social groups is not always envisaged by the creators of services, yet contribute significantly to shaping the digital society. In this sense, digital society is shaped by technology and by societal factors. As is well known in the domain of transport infrastructure, a new supply generates a demand that was not expressed before: this is the so called induced demand. Digital society is rooted in the societal trends of liquid modernity, and also influences the transport demand. The expectation of the customer having a specific dynamic in the digital world. And the digital society does not limit to transport user requirement, but has deep interactions with mobility in general, including avoiding mobility.

The observed reduction in car use by younger generations has been seen by several analysts as linked to a change in values. The possession of a car tends to be replaced by the idea of connecting to the social network; this points to the use of ICT and hence to several trends identified in the digital society section.

A trend towards the inclusion of vulnerable groups can be identified. But in the emerging digital society new forms of exclusion arise; these forms are particularly of concern in the transport and mobility sectors. Here a clear issue lies at the intersection of public policies aiming at inclusion and the development of new transport services making use of ICT.

We have identified a trend of new uses of travel time, mainly by means of ICT that currently favours public transport. But, in the future car automation is likely to erase this comparative advantage. A complex interaction of trends exists here, with evolving developments over time.

Beyond the two categories of interrelations, three other linkages can be identified.

Complex interactions link automation and transport safety. Automation comes with the promise of significant improvement of the levels of safety in transport, but it also introduces new kinds of safety problems; an illustration is the self-driven Tesla car casualty accident in 2016 and the many similar events since then. This represents a new type of accident raising significant liability and insurance issues most likely to impact the legislative and regulatory frameworks.

The responses to the security threat perception, as noted, carries the risk of introducing more controls that may be detrimental to the ease of access and use of collective transport systems. The trend of a security versus accessibility tension is clearly contrary to the fluidity, acceleration and flexibility features of the *liquid modern* society.

Liquid modernity is both a consequence, or a symptom, and a source for the observed restructuring working arrangements. Indeed, the observation of acceleration is paradoxically based on the growing mobility for non-work purposes, and hence directly related to the idea of growing part-time work described in the restructuring arrangement trend. This forms an example of the links between economy and society.

This review of linkages was necessary to reveal the complexity of the system of trends. This review also contributes to validating the list of trends, by distinguishing many factors for the understanding of the present and future dynamics between society and transport.

## 5 Conclusion

This paper focuses on the identification and description of societal trends shaping the demand of mobility and logistics. The work has led to the identification of a list of 29 societal trends covering societal trends, political, economic, technological and legal trends. The result of this investigation forms a broad and comprehensive set of factors that influence, and will influence future, mobility and logistics. This approach has been organised so that, even if trends are linked one to another, as can be seen in the last section, no duplication can be found in the set of trends. This set borrows characteristics of a system in the sense that individual sub-parts, once assembled, form a coherent set.

This work has been strongly inspired by the ideas of the liquid modernity developed by Bauman. Liquid modernity highlights key societal trends of individualism, of the fluidity of society, of the feeling of acceleration of the pace of life, of the growing importance of social networks, and of the role of information and communication technologies. This broad and complete view on societal trends has proved to be very supportive of the present analysis. It allows to describe linkages between social and economic trends, and between society and technology, especially information and communication technology. Basing the analysis on liquid modernity provides coherence and exhaustiveness in covering the topic.

The added value of this contribution is its systematic approach and that evidence is provided for each identified trend. The proposal forms a broad and comprehensive view of societal trends that play, and will play, a role in shaping the demand for mobility and logistics in Europe at the horizon 2030. The trends identified in this paper form the bases of the scenario building in the Mobility4EU

project which is the subject of the paper “Building scenarios for the future of transport in Europe: The Mobility4EU approach” in **Chapter X**.

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## **9 Keywords**

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