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THE FREE MOVEMENT OF DATA AS AN ENABLER OF THE FUNCTIONING OF AUTONOMOUS AND CONNECTED CARS IN THE EUROPEAN UNION

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ABSTRACT

Today's world is a technological one where data has become an important asset and enabler. The importance of personal data and data protection thereof has been rather well established while the value of non-personal data is less well-known. When we talk about innovation in the transportation industry, the importance of machine-generated data has become prevalent. For instance, in the case of connected cars which operate based on communication with each other and with the infrastructure, data is generated and used extensively, especially non-personal, hence the movement of data becomes crucial. In spite of talking about the internal market together with four fundamental freedoms and from 2014 also about the Digital Single Market, the European Union, unfortunately, still does not have a free movement of data as such. The aim of the thesis is to conclude whether the free movement of data is an enabler for the functioning of connected cars and whether the European Union has taken enough steps to facilitate the development of connected cars.

The thesis uses a qualitative research method and examines mainly academic articles. The paper evaluates the following hypothesis: Without a proper legal regulatory framework enabling the free movement of data, the European Union fails to introduce connected cars and loses its competitiveness in the innovative transportation industry. The outcome of the thesis shows that the newly adopted Regulation on the free flow of non-personal data is beneficial for connected cars. However, it is not enough to fully facilitate the functioning of connected cars, thus a sector-specific legislative framework for automated and connected technologies, including data movement between the cars, the possibility for data portability, data accessibility for third parties and the re-use data, should be adopted.

KEYWORDS: autonomous cars, connected cars, the free movement of data, non-personal data, the European Union.

INTRODUCTION

The current technological world where road vehicles are becoming increasingly more modernised strives towards cars that are capable of driving themselves, hence being autonomous. Moreover, digitalisation affects the road transportation and due to the latest developments, cars can benefit immensely from the internet connection which leads to connected cars that use connectivity with other cars and the infrastructure as a basis for functioning. Therefore, with the latest technological developments and the increase of data production and usage, "cars become mobile devices while drivers are becoming connected drivers"[1]. However, in order to function, the cars are equipped with different technologies and systems which produce and use a lot of non-personal data since it is important for these cars to know about the traffic and road conditions, about the intended actions of other cars and receive data from the road infrastructure such as the traffic lights in order to drive safely and function properly on the public roads. Moreover, the data should be accessible for third parties such as service providers, insurance, public authorities. Therefore, all this non-personal data should be able to move freely between the cars, the infrastructure and cars, and manufacturers and cars.

Autonomous cars are rather beneficial for drivers, passengers and the transportation industry due to increasing road safety, improving driving convenience, enhancing mobility and boosting innovation and therefore, could potentially make their way into the market if laws and regulations facilitate the functioning of autonomous and connected cars. Hence, the European Union's actions can influence innovation, especially in road transportation and have an impact on when and whether connected cars can enter the roads. However, there is no legal framework governing and allowing autonomous and connected cars on the roads,[2] moreover, there are certain aspects regarding the data movement and data accessibility that restrict the functioning of such cars.[3] Even

[1] Golestan, K. *et al.* (2016). Situation Awareness Within the Context of Connected Cars: A Comprehensive Review and Recent Trends. – *Information Fusion*, Vol. 29, p 69.
[2] de Bruin, R. (2016). Autonomous Intelligent Cars on the European Intersection of Liability and Privacy: Special Issue on Regulating New and Emerging Technologies. – *European Journal of Risk Regulation*, Vol. 7, No. 3, p 486.
[3] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. "Building a European data economy". COM(2017) 9 final, p 4.

though the European Union has already enabled the free movement of personal data, the focus has to be on the free movement of non-personal data, machine-generated data, which is important for the proper functioning of connected cars.

One of the objectives of the current European Commission is the development of the Digital Single Market which consists of three pillars, the third one concerning the digital economy and promoting the free movement of data. The focus has been placed on the facilitation of the free movement of non-personal data and as a result, a Regulation[4] ensuring the free flow of such data became applicable in May 2019. The Regulation lays down rules concerning data localisation requirements and data portability, hence focusing on two aspects that are also important in the context of connected cars. Therefore, a step towards the free movement of non-personal data has been taken, however, the author argues that it may not be enough to facilitate the deployment of connected cars. Furthermore, a problematic aspect is the concept of non-personal data since the only definition is provided in the aforementioned Regulation stating that non-personal data is everything other than personal data which is a rather vague definition.

Consequently, the topic of the thesis is relevant since creating a legal framework that enables the functioning of connected cars is an actual topic. As there are already cars on the market equipped with systems that enable automated driving while fully autonomous cars are a considerable and beneficial future technology, the topic is significantly important and thus requires a proper legal framework.[5] Moreover, the free movement of data is also a topical issue nowadays, especially in the light of the development of the Digital Single Market and the adoption of the Regulation on the free flow of non-personal data. Since data movement is necessary for the functioning of connected cars, the topic presents an actual issue that should be analysed.

The focus of the thesis is on connected cars and the regulation of the free movement of data not on proposing changes in the traffic regulations in order to allow autonomous and connected cars on the roads. Moreover, even though high-speed 5G technologies are definitely required for connected cars, the thesis does not focus on analysing the development and necessity of these technologies. Therefore, the aim of the thesis is to examine the concept of the free movement of data and analyse why it is necessary for the functioning of autonomous and connected cars by

[4] Regulation (EU) 2018/1807 of the European Parliament and of the Council of 14 November 2018 on a framework for the free flow of non-personal data in the European Union, OJ L 303, 28.11.2018.
[5] Turk, K., Pild, M. (2017). *Analüüs SAE tase 4 ja 5 sõidukite kasutusele võtmiseks*. Accessible: https://triniti.ee/wp-content/uploads/sites/2/2017/10/L%C3%95PPRAPORT_Anal%C3%BC%C3%BCs-SAE-tase-4-ja-5-s%C3%B5idukite-kasutusele-v%C3%B5tmiseks_Riigikantselei_okt-2017.pdf, 10 April 2019, p 6.

analysing two aspects of the free movement of data, data localisation requirements and data portability since these concern mainly non-personal data. Moreover, the importance and issues of data ownership and data accessibility are also analysed since the lack of proper regulation of these questions may hinder the deployment of connected cars.

The author proposes that the free movement of data is relevant from the standpoint of the European Union since it has to be regulated on a cross-border basis not internally in the Member States in order to provide a market for connected cars in the EU. Therefore, the focus is placed on examining what has been done to facilitate the free movement of data, especially concerning non-personal data, in order to come to a conclusion whether it is enough to enable connected cars on to public roads or something else should be done to regulate data movement regarding connected cars. Thus, the aim of the author is to assess the hypothesis based on the research questions and conclude whether providing an enabling legal framework for the free movement of data is an enabler of the functioning of connected cars and whether it should be facilitated further.

The hypothesis of the thesis is the following: **Without a proper legal regulatory framework enabling the free movement of data, the European Union fails to introduce connected cars and loses its competitiveness in the innovative transportation industry.** The author assesses the hypothesis based on three research questions. **What is the free movement of data in the European Union and why is it necessary for the functioning of autonomous and connected cars? What has been done in the European Union to support the free movement of data, especially regarding non-personal data? What is the impact of the Regulation on the free flow of non-personal data on autonomous and connected cars? Is the Regulation enough to enable the functioning of connected cars, if not, what steps need to be taken to ensure it?**

In order to answer the research questions and evaluate the hypothesis, the author uses a qualitative research methodology. The thesis is based on a theoretical and analytical framework analysing and comparing relevant scientific articles and examining European Union legislation. The main sources of the thesis are peer-reviewed articles about the free movement of data in the European Union including data localisation and data portability aspects, and about autonomous and connected cars including the need of data for these types of cars. Moreover, relevant legislation including the Regulation on the free flow of non-personal data and the General Data Protection

Regulation (GDPR)[6] are scrutinised in order to provide a thorough insight of the legislative measures concerning the topic. Additionally, the thesis analyses cases from the European Court of Justice and the European Commission's recommendations.

The first chapter is dedicated to the relationship between the data and connected cars. Firstly, the concept of autonomous and connected cars is introduced by analysing the importance of connectivity in the functioning of connected cars and the benefits of these cars. Secondly, the relationship between the data and connected cars is analysed by thoroughly explaining the necessity of the free movement of data for the proper operation of such cars. The second chapter includes the introduction to the free movement of data in the European Union and concentrates mostly on the principles forming the movement. The focus is placed on two aspects, the removal of unjustified data localisation restrictions and the facilitation of data portability which are explained and their importance in enabling the free movement of non-personal data is examined. Additionally, it focuses on the re-use of and access to data and its relevance for connected cars. The third chapter introduces the Regulation on the free flow of non-personal data through analysing the content of the Regulation and its impact on the functioning of connected cars by concluding whether the Regulation facilitates connected cars or other steps have to be taken. The fourth and last chapter suggests further steps regarding the necessary actions by the European Union that would enable connected cars to operate on public roads. The author aims to propose what should be changed in the legal system and whether it should be done on the EU level or in the Member States.

[6] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), OJ L 119, 4.5.2016.

1. THE RELATION BETWEEN DATA AND CONNECTED CARS

1.1. The essence and functioning of autonomous and connected cars

It has been stated that "the car of the future will be autonomous, connected, and full of innovative information technology features. We may drive it or let it drive us. We know it will be a computer system on wheels"[7]. Indeed, due to the development of technology, the way society functions has changed drastically, for example, smartphones and online social networks have had a huge impact on people's lives and similar changes are taking place in the transportation sector where cars are becoming more autonomous and transform the way people travel.[8] The road transport is changing and the goal is to develop cars that are able to drive themselves without needing a human driver. Moreover, due to the advancements in connectivity, the transportation world could possibly be changed by introducing connected cars that communicate with each other and with the infrastructure while still being able to drive independently.[9] Autonomous cars have been an intensively researched topic for decades, however, recently the efforts to promote and develop this type of technology have increased.[10] These types of cars have actually quite a long history since already in the 1920s attempts were made towards autonomous cars by advancing automated systems and in the later years test versions of autonomous cars were developed.[11] Nowadays actual prototypes have been developed and the well-known Google's self-driving cars have already done their test drives on actual roads.[12]

[7] Determann, L., Perens, B. (2017). Open Cars. – *Berkeley Technology Law Journa*l, Vol. 32, No. 2, p 917.
[8] Jones, A. (2016). Autonomous Cars: Navigating the Patchwork of Data Privacy Laws That Could Impact the Industry. – *Catholic University Journal of Law and Technology*, Vol. 25, No. 1, p 180.
[9] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions. On the road to automated mobility: An EU strategy for mobility of the future. COM(2018) 283 final, p 4.
[10] Bagloee, S. A. *et al.* (2016). Autonomous Vehicles: Challenges, Opportunities, and Future Implications for Transportation Policies. – *Journal of Modern Transportation*, Vol. 24, No. 4, p 284, 295.
[11] *Ibid.*, p 287.
[12] *Autonomous Driving - Technical, Legal and Social Aspects.* (2016). /Eds. M. Maurer, J. C. Gerdes, B. Lenz, H. Winner. Ladenburg: Springer-Verlag Berlin Heidelberg, p 150-151.

Autonomous cars, also called driverless or self-driving cars, are capable of sensing the road environment and hence make controlled movements without any human intervention.[13] The main characteristic of an autonomous car is that the system of the car is capable of making decisions about the activities of the car such as steering, braking, speed, lane choice and avoiding obstacles independently.[14] Usually, cars are divided into different categories based on their level of automation. On the lowest level, known as level 0, are non-automated cars where the driver controls the vehicle completely and at all times, however, these cars can include certain driver assistance systems such as sensors, cameras and GPS while more advanced cars are already on a certain level automation-assisted and still require a driver to control the car, but allow the technology to take over control in difficult driving or accident situations (levels 1 and 2).[15]

One step higher from automation-assisted cars is monitored assistance which shares the driving with the driver, however, the driver must still be present and control the vehicle since the technology can control the car only when conditions permit such as in cases where the driver chooses to use the automatic parking or lane keeping systems (level 3 and 4).[16] Estonian law, for example, allows level 2 automated cars which means that driver assistance technology can take over some driving tasks such as parking and lane keeping, but the driver is required to manage the overall driving.[17] The last level is full automation which includes technologies that enable the car to perform all driving tasks independently and automatically, hence a driver is no longer needed (level 5).[18] These cars are called fully autonomous which are the final goal of road transportation.

Non-automated cars are fully allowed by the law. For example, the Estonian Traffic Act[19] lays down that a driver[20] is a person who drives a vehicle or an off-road vehicle, therefore stating that a vehicle must have a driver. The Act also mentions that the driver is prohibited to engage in activities that may impede the ability to drive or comprehension of the traffic environment while driving such as holding a telephone in hand and using a telephone with hands.[21] Therefore, these provisions indicate that every car must have a driver and moreover, the driver must be present and

[13] Tettamanti, T. *et al.* (2016). Impacts of Autonomous Cars from a Traffic Engineering Perspective. – *Periodica Polytechnica: Transportation Engineering*, Vol. 44, No. 4, p 245.
[14] Surden, H., Williams, M. A. (2016). Technological Opacity, Predictability, and Self-Driving Cars. – *Cardozo Law Review*, Vol. 38, No. 1, p 132-133.
[15] Wood, S. P. *et al.* (2012). The Potential Regulatory Challenges of Increasingly Autonomous Motor Vehicles. – *Santa Clara Law Review*, Vol. 52, No. 4, p 1429-1430.
[16] *Ibid.*, p 1431.
[17] Turk, *supra nota* 5, p 10.
[18] Wood, *supra nota* 15, p 1432.
[19] Liiklusseadus. RT I, 06.07.2018, 14.
[20] *Ibid*., § 2(19).
[21] *Ibid*., § 33(11)(1).

alert at all times and not use anything that would impede the ability to drive. Autonomous cars, however, do not require a driver and should allow the person in the car to use a telephone and engage in activities other than driving. Therefore, according to the Traffic Act, autonomous cars are not allowed on public roads. However, the Traffic Act regulates self-driving delivery robots and defines these as partially or fully automated or remotely controlled vehicles which move on wheels or another chassis that is in contact with the ground, which use sensors, cameras or other equipment for obtaining information on the surrounding environment and, based on the obtained information, are able to move partially or fully without being controlled by a driver.[22] This definition states that a vehicle may use its sensors and cameras to obtain information from the environment and based on this move even fully independently. Therefore, some form of self-driving vehicles are allowed and regulated in Estonia, however, this is far from autonomous cars. The Act allows these types of robots that can move only six kilometres per hour[23], and for moving can use a sidewalk, footpath and the part of a cycle and pedestrian track designated for pedestrians[24].

From the international perspective, road traffic and traffic rules are firstly regulated by the Geneva Convention on Road Traffic from 1949 and the Vienna Convention on Road Traffic which was concluded in 1968. Although many of the EU Member States have not ratified the Geneva Convention, it is relevant from the point of view of vehicle regulation and lays down international rules for vehicles. Under the Geneva Convention, every vehicle has to have a driver who must be able to control the vehicle at all times.[25] Though, the definition of a driver in the Geneva Convention includes a notion that the driver is any person who is in actual physical control of the vehicle.[26] Therefore, the Geneva Convention may not explicitly and categorically prohibit automated driving since the term „driver" may be flexible enough and even though the Convention requires vehicles to be controlled, such requirements may be satisfied if the person is able to intervene in the operation of the vehicle.[27] Moreover, the term „control" in this provision may be relative and leave room for interpretation which can mean that it is enough if a person is able to intervene in the operation of the car.[28] Consequently, automation-assisted cars that allow the car

[22] *Ibid*., § 2(68[1]).
[23] *Ibid*., § 15(12[1]).
[24] *Ibid*., § 151[3](1).
[25] United Nations, Geneva Convention on Road Traffic, Treaty Series Vol.125, No. 1671, 19. 9.1949, Geneva, art 8, p 1 and 5.
[26] *Ibid*., art 4, p 1.
[27] Smith, B. W. (2014). Automated Vehicles are Probably Legal in the United States. – *Texas A&M Law Review*, Vol. 1, No. 3, p 435.
[28] *Ibid*., p 424.

to take over driving but still require a driver to be present could potentially meet the criteria set out in Article 8 of the Geneva Convention.

The Vienna Convention, on the other hand, is more restrictive and excludes the deployment of autonomous cars since it does not allow vehicles without a driver and leaves no room for interpretation.[29] According to the Convention, every vehicle must have a driver and the driver shall be able to control his vehicle at all times.[30] It defines a driver as any person who drives a motor vehicle or other vehicle.[31] Hence, the definition is different from the Geneva Convention and omits the possibility of a driver to simply be in control of the vehicle since the driver must drive the vehicle. Therefore, under this Convention only non-automated cars are allowed on roads and autonomous cars are not permitted. Unfortunately, most of the EU Member States have ratified this Convention and therefore must comply with the provisions. Consequently, under international and Estonian law, only non-automated cars which have a driver are allowed and therefore there are no laws that would actually enable autonomous cars to operate on the roads. Moreover, cars which have driver assistance systems such as lane keeping assistance that simplify the driver's driving tasks but still require a driver are also allowed on the roads by the laws, hence these types of cars do not bring along any issues and they are already operating on the roads for years.

There is currently no EU legislation on traffic rules and therefore the Member States have to implement international instruments such as the Geneva Convention and the Vienna Convention on the national level.[32] However, the problem is that every Member State regulates vehicles differently. Germany, for example, has regulated fully automated vehicles in their legislation while some countries such as Estonia permit automated cars that in some situations share driving with the driver.[33] This leads to the fragmentation of the internal market since, for example, in one Member State it would be permitted to drive with such an autonomous car and when entering another Member State, these types of cars are not allowed. Therefore, the internal market is disturbed and there is no consistency.

[29] *Ibid*., p 430.
[30] United Nations, Vienna Convention on Road Traffic, Treaty Series Vol. 1042, No.15705, 8.11.1968, Vienna, art 8, p 1 and 5.
[31] *Ibid*., art 1, p v.
[32] Communication from the Commission (2018), *supra nota* 9, p 9.
[33] Turk, *supra nota* 5, p 10, 86.

Conventional cars nowadays are being equipped with technologies such as lane keeping assistance, emergency braking, parking assistance that assist in driving, however, higher levels of automation are becoming more available which leads to the introduction of autonomous cars.[34] These cars deploy different types of sensors, cameras and GPS technology in order to detect objects and their surroundings.[35] Thus, the data gathered would enable the car to make decisions about its actions such as the speed, lane changing and braking.[36] Currently, many car manufacturers aim to facilitate and introduce these types of cars. Google, for example, has been developing prototypes of autonomous and also connected cars and testing these cars on the roads for the past several years.[37] In addition to Google, conventional car companies such as Audi and Toyota are also developing autonomous car prototypes and integrating automated systems into currently available cars.[38] Estonia, for example, also presented its TalTech Iseauto, a start-project for the future autonomous vehicle, in February 2019 and further aims to create a new car to improve the ability to drive with other cars, road participants and people in the city, however, innovations on the software are necessary.[39] Therefore, the development of autonomous cars is seemingly occurring and in order to facilitate the advancement further, it is necessary to adopt measures and policies for the functioning of autonomous cars.

1.1.1 Communication as the basis for the functioning of connected cars

As mentioned, then autonomous cars are able to drive independently, however, the enablers of their functioning are technological systems and sensors which should collect data about the road environment, other vehicles and road participants. Therefore, connectivity is a crucial factor for the deployment of autonomous cars which highlights the importance of connected cars. Autonomous vehicles receive information through their sensors and cameras, consequently using this data to function.[40] Connected cars, on the other hand, have the ability to communicate with each other and with the infrastructure in order to use the information gathered.[41] Therefore,

[34] de Bruin, *supra nota* 2, p 485.
[35] Crane, D. A. *et al.* (2017). A Survey of Legal Issues Arising From the Deployment of Autonomous and Connected Vehicles. – *Michigan Telecommunications and Technology Law Review,* Vol. 23, No. 2, p 199.
[36] Bagloee, *supra nota* 10, p 287.
[37] Maurer, *supra nota* 12, p 150-151.
[38] Lee, C. (2017). Grabbing the Wheel Early: Moving Forward on Cybersecurity and Privacy Protections for Driverless Cars. – *Federal Communications Law Journal*, Vol. 69, No. 1, p 27.
[39] Tõniste, R. (2019). *TalTech presented the Iseauto in Brussels to the European Commission and potential partners from industry and universities.* Accessible: https://www.ttu.ee/taltech-will-present-the-iseauto-in-brussels-to-the-european-commission-and-potential-co-operation-partners-from-industry-and-universities, 27 February 2019.
[40] Glancy, D. J. (2015). Autonomous and Automated and Connected Cars - Oh My: First Generation Autonomous Cars in the Legal Ecosystem. – *Minnesota Journal of Law, Science and Technology*, Vol. 16, No. 2, p 642.
[41] Crane, *supra nota* 35, 199.

autonomous and connected cars are interrelated. The path follows from automated technologies to fully autonomous cars and ends with connected car technologies such as vehicle-to-vehicle and vehicle-to-infrastructure communications.[42]

Connected car technologies include two different systems, firstly a vehicle-to-vehicle communication and secondly a vehicle-to-infrastructure communication. Operation based on vehicle-to-infrastructure communication exchanges information between the car and the road infrastructure such as street signs, roadside sensors and traffic lights in order to enable efficient traffic management and vehicle-to-vehicle communication transmits necessary data between the cars to avoid accidents and facilitate smooth traffic flow.[43] Communication between the cars includes the exchange of data such as vehicle's speed, heading, braking, number of passengers.[44] Communicating with the infrastructure means that the car receives and transmits information about traffic dangers, road and weather conditions, emergencies and obstacles on the road.[45] For example, a driverless bus was operating in Tallinn in 2017 and it was made based on communication with the infrastructure as the traffic light sensors were able to recognise the approach of the driverless bus and give way to it.[46] Hence, this bus demonstrates the way connectivity could function in reality and illustrates how communication between cars and the infrastructure could be developed. However, proper connectivity and communication are largely dependent on appropriate and coherent legislation enabling the free movement of non-personal data including data portability and access to data.

Additionally, connectivity allows the vehicle manufacturer to receive vehicle data from the car.[47] These networks are intended to collect information about the functioning of the car and its parts which could be valuable for different sectors and enhance the operation of connected vehicles.[48] The data can be used to provide services such as repair, maintenance and to deliver advertisements including finding a parking space, hotels, restaurants and notifying the need to refuel.[49] Moreover, the data can be useful for the government to monitor traffic patterns, violations of traffic rules and

[42] Crane, *supra nota* 35, p 197.
[43] Coppola, R., Morisio, M. (2016). Connected Car: Technologies, Issues, Future Trends. – *ACM Computing Surveys*, Vol. 49, No. 3, p 11.
[44] Crane, *supra nota* 35, p 200.
[45] Spencer, D. (2018). The Road to the Future: Regulatory Regime for the Rise of the Robot Cars. – *William Mary Environmental Law and Policy Review*, Vol. 42, No. 2, p 658.
[46] EU2017.ee. (2017). *Driverless buses will enter into service tomorrow in Tallinn.* Accessible: https://www.eu2017.ee/node/3682.html, 22 February 2019.
[47] Glancy (2015), *supra nota* 40, p 646.
[48] *Ibid*., p 647.
[49] Amon, B. (2017). Invading the Driver's Seat: Preventing Overbearing Targeted Advertising in Connected Vehicles. – *Hofstra Law Review*, Vol. 46, No. 1, p 330.

for car manufacturers in order to monitor and enhance product safety, develop new features, improve their products and learn about competitors' products.[50] Additionally, there are other sectors that will benefit from the data such as car insurance in order to determine liability and also different service providers in order to provide services such as repair and maintenance.[51] Moreover, accessibility to data is important for the emergency services sector.[52] However, this implies that the data must move freely and there is a possibility to actually access the data.

Unfortunately, manufacturers are reluctant to share this information since they consider it to be valuable information and third parties have difficulties in accessing the data. [53] Therefore, sharing, accessing and using the data would be highly beneficial in the case of connected cars which, however, requires for accessibility and data movement alongside with the manufacturers' obligation to share information. Data portability, as provided in the GDPR, could be used as a way to ensure accessibility and guarantee the manufacturer's obligation to share relevant data or, alternatively, a completely new framework on access to data could be developed. In this case, data portability could be similar to the one in the GDPR which offers individuals the possibility to receive their data from one controller and transmit it to another controller.[54] Hence, third parties could have the right to receive relevant data and manufacturers could have the possibility to transmit this data to third parties.

1.1.2 The benefits of autonomous and connected cars

There are already billions of cars on the road and the number is growing constantly, therefore road safety has become one of the biggest concerns and challenges in the transportation industry, hence, alternatives in the industry are welcomed and needed which means that autonomous cars have the potential to be the next useful and beneficial technological development on the roads.[55] Today's society is rather digitalised where technological advancements are used daily and people, for example, have a habit of handling their phones and other technological devices also when driving. Even though using a phone when performing driving responsibilities is prohibited in many countries, including in Estonia as seen from the Traffic Act[56], people are unfortunately doing the

[50] Determann, *supra nota* 7, p 945-946.
[51] *Ibid.*, p 946.
[52] Nkenyereye, L., Jang, J. W. (2016). Integration of Big Data for Connected Cars Applications Based on Tethered Connectivity. – *Procedia Computer Science*, Vol. 98, p 559.
[53] Glancy (2015), *supra nota* 40, p 647.
[54] Regulation (EU) 2016/679, *supra nota* 6, art 20, p 1.
[55] Golestan, *supra nota* 1, p 68.
[56] Liiklusseadus, *supra nota* 19, § 33(11)(1).

opposite and therefore, accidents happen due to texting, calling and using the phone while driving. Autonomous cars, however, not only enable drivers to use their phones but also allow them to read a book or use a computer which consequently increases safety.[57] Therefore, the most important benefit of autonomous cars is increased safety since not requiring a driver eliminates accidents and dangerous situations caused by human drivers. The European Commission has issued a report on car safety in the EU according to which 75% are accidents are caused by human error including excessive speed, distraction and drink-driving.[58]

Due to being equipped with technological systems, autonomous cars are better at maintaining a steady speed, being aware of other drivers and pedestrians, and making rapid adjustments and driving decisions.[59] The cars have the ability to sense any road problem, coordinate manoeuvres and then take actions to prevent potential accidents and enable smooth and safe traffic flow.[60] Since autonomous cars operate solely on technology and they do not need time to adapt, they react more quickly than human drivers and therefore potentially could prevent accidents and dangerous traffic situations.[61] Connected cars will have benefits over human drivers due to sharing data with each other and making available real-time data including maps of the road and traffic conditions, possible car crashes and safety concerns, hence being aware of dangerous situations.[62] Therefore, the advancement of autonomous cars is incredibly beneficial which renders the development of connected cars necessary and requires a framework for these cars and the free movement of data.

In addition to enhancing safety, autonomous cars offer several social benefits such as increased mobility and driving satisfaction. These cars enable elderly and disabled people who cannot drive themselves, to participate in the traffic and therefore, provide an opportunity for mobility to all sectors of the society.[63] Moreover, since drivers do not need to control the car and constantly pay attention to traffic, they have freedom for entertainment, possibilities to relax or sleep during the drive. [64] Autonomous cars will have many potential uses in addition to personal cars including

[57] Surden, *supra nota* 14, p 136.
[58] Report from the Commission to the European Parliament and the Council COM(2016) 787 final. *Saving Lives: Boosting Car Safety in the EU*. Accessible: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016DC0787&from=EN, 7 May 2019, p 4.
[59] Collingwood, L. (2017). Privacy Implications and Liability Issues of Autonomous Vehicles. – *Information & Communications Technology Law*, Vol. 26, No. 1, p 34.
[60] Communication from the Commission (2018), *supra nota* 9, p 4.
[61] Maurer, *supra nota* 12, p 134.
[62] Glancy (2015), *supra nota* 40, p 623.
[63] Tettamanti, *supra nota* 13, p 249.
[64] Lohmann, M. F. (2016). Special Issue on the Man and the Machine: Liability Issues Concerning Self-Driving Vehicles. – *European Journal of Risk Regulation*, Vol. 7, No. 2, p 335.

online ride-service cars such as taxis and commercial delivery service cars.[65] Connected cars, additionally, offer the benefit of real-time information such as maps about available parking spots, the best routes to take, nearby places and advertisement.[66] Therefore, in order to fully benefit from connected cars, third parties who offer these services and advertisement need to access the vehicle data, moreover, the data needs to flow freely between the car and third parties. This means that manufacturers who will firstly receive the data generated by the car need to allow access to the data and enable portability between the car and third parties. However, first and foremost, legislation enabling data portability and regulating access to vehicle data has to be adopted in the EU.

1.2 The importance of the free movement of data for autonomous and connected cars

Connected cars need to avoid obstacles during driving and be aware of the road conditions, therefore it is necessary to share and receive data and thus, data movement needs to be facilitated.[67] Data concerning the road infrastructure, traffic conditions, car data such as speed, intended actions can be considered as non-personal data which highlights the importance of the free movement of non-personal data for the functioning of connected cars. It is crucial to make the car's behaviour predictable in the traffic.[68] Therefore, it is important to collect relevant data about the road environment and other traffic participants since the ability to communicate is the fundamental necessity for the deployment of autonomous and connected cars into the transport system.[69] However, road conditions change rather quickly and therefore connected cars face a challenge to manage in every situation which in turn means that mapmakers need to be able to detect traffic situations and update their maps as close to real time as possible, hence the maps need to include all relevant information about accidents, alternative traffic roads and lane closures.[70] Therefore, another reason for the data movement is to ensure that the cars are aware of the newest information about the road conditions which means that data needs to flow freely and rather quickly. Additionally, connected cars must be able to communicate with nearby people in order to detect

[65] Glancy (2015), *supra nota* 40, p 623.
[66] Coppola, *supra nota* 43, p 8.
[67] Surden, *supra nota* 14, p 144.
[68] *Ibid*., p 129.
[69] Communication from the Commission (2018), *supra nota* 9, p 11.
[70] Miller, G. (2014). *Autonomous Cars Will Require a Totally New Kind of Map*. Accessible: https://www.wired.com/2014/12/nokia-here-autonomous-car-maps/, 3 January 2019.

and avoid pedestrians and other road participants.[71] Therefore, it is important to make these cars predictable and ensure that the connected car has detected the obstacle and operates accordingly. Consequently, enabling the free movement of non-personal data is crucial, moreover, access to data has to be provided for third parties.

Furthermore, cars are produced by various companies which have different software and sensors compelling these cars to react differently in particular situations while driving thus leading to unpredictability regarding the actions of connected cars and therefore, communication is important since predictability could be increased by standardising certain car behaviours by sharing relevant information.[72] Hence, manufacturers could be under the obligation to provide and share data. Even though there is the Directive on the re-use of public sector information (PSI Directive)[73] which provides for sharing and re-using public sector data, there are no legal frameworks for private sector data. Therefore, due to the data produced in connected cars, there is a need for legislation for the private sector that would require them to share relevant data. Moreover, the data could be used to assess errors and reasons behind accidents.[74] Therefore, sharing data and access to data should be facilitated by the obligation of the private sector to share data which could be based on the PSI Directive or other measures that regulate the access to vehicle data and the manufacturers' requirement to share relevant data.

Although data movement is crucial and definitely needed, there is a lack of a proper framework for it, especially in the area of autonomous and connected cars. Even though the EU enables the free movement of personal data, connected cars produce a lot of non-personal data which is important for the functioning of these cars and should be regulated. Moreover, manufacturers have a crucial role in the development and functioning of connected cars, therefore they could be obliged to share relevant information which, however, also requires the free movement of data and could be assigned more specifically to data portability enabling to transfer and share data and to data accessibility. The same data portability could benefit service providers and other third parties such as the insurance, ambulance, advertisement and public authorities since they could be able to access and receive the data. Conclusively, since manufacturers are considered as the first receivers of the data[75], they could be obliged to provide access for third parties and data portability could be

[71] Surden, *supra nota* 14, p 167.
[72] *Ibid*., p 176.
[73] Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information, OJ L 345, 31.12.2003.
[74] de Bruin, *supra nota* 2, p 495.
[75] Communication from the Commission (2018), *supra nota* 9, p 12.

the tool how data would move from one party to another. Since cars are usually produced by different manufacturers, they need to provide access to vehicle data in their cars in order for the cars to be able to communicate with each other and transmit necessary data while data portability could be used for the data movement between cars.

2. THE IMPORTANCE OF THE FREE MOVEMENT OF DATA IN THE EUROPEAN UNION

2.1 Principle fifth freedom in the European Union – the free movement of data

Technology has become quite sophisticated and complex due to hardware and software incorporated in them.[76] This makes the technological developments more convenient, comfortable, beneficial and innovative. However, all these advancements are based on digital data, hence producing and processing vast amounts of information, hence, data movement, access to and the re-use of data are crucial.[77] Due to increased cross-border mobility and globalization, people move around alongside with goods and services, therefore, all the data generated flows also. Moreover, data has become an asset in the technological world and is considered as an important enabler in newly emerging technologies such as cloud computing but also has enormous potential in other fields such as intelligent transport systems.[78]

In today's digital society where the usage of the Internet has increased, cross-border data flow has become inevitable.[79] The reason why data is important lies in the digital data-based products and services that can change fields such as intelligent transport systems and smart cities, however, the problem is that the European Union lacks a legal framework for data which results from barriers to the free movement of data and several legal uncertainties concerning data.[80] Therefore, the EU is aiming to create uniformity in data movement in order to enable the best exploitation of the digital data potential and benefit the economy and society.[81] Hence, one of the objectives is to

[76] Lohmann, *supra nota* 64, p 335.
[77] *Building a European data economy.* European Commission. Accessible: https://ec.europa.eu/digital-single-market/en/policies/building-european-data-economy, 9 January 2019.
[78] Communication from the Commission (2017), *supra nota* 3, p 2.
[79] Bu-Pasha, S. (2017). Cross-Border Issues Under EU Data Protection Law With Regards to Personal Data Protection. – *Information & Communications Technology Law*, Vol. 26, No. 3, p 214.
[80] *Building the European Data Economy – Questions and answers*. European Commission. Accessible: http://europa.eu/rapid/press-release_MEMO-17-6_en.htm, 10 January 2019.
[81] European Commission, *supra nota* 77.

establish the principle of the free movement of data in the European Union.[82] The efforts concern especially the free flow of non-personal data which is crucial for the proper functioning of the internal market and the digital economy.[83]

The EU is constantly striving towards improving the Union and becoming more competitive and innovative. The EU is aiming to strengthen competitiveness and technological leadership in sectors such as transportation and facilitate innovation by striving towards the development of high value, innovative transport technologies.[84] Since automated technologies alongside with connected cars are becoming more and more ambitious and significant, the desire of the EU is to be the leading power in the usage of such technologies.[85] The ambition of the EU is to become a world leader in the deployment of connected and automated mobility.[86] However, due to difficulties in regulating such technologies and the lack of legal frameworks, the EU confronts losing its competitive edge and fall behind on adopting connected cars. For example, the USA is considered currently the frontrunner in the deployment of connected cars since the regulatory approach is less restrictive, hence allowing more freedom for connected and automated technologies than the EU; and therefore, due to current legislative and regulatory impediments for these vehicles, the EU could significantly fall behind the USA.[87]

The European Union's internal market includes the free movement of goods, persons, services and capital. The foundation for the internal market has been established in Article 26(2) of the Treaty on the Functioning of the European Union (TFEU) which states that the internal market is an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured. Therefore, the basis for these fundamental freedoms is one of the European Union's founding treaties which consequently means that only a treaty can give effect to freedom in the European Union. The single market was created before the advancement of technology and before the rapid growth of the Internet where information and communication technologies became an important aspect of the economic world.[88] Since the technological world is constantly developing,

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[82] Tobias, J. (2015-2016). What You Need to Know about the Digital Single Market. – *Managing Intellectual Property*, Vol. 255, p 35.
[83] *Free flow of non-personal data*. European Commission. Accessible: https://ec.europa.eu/digital-single-market/en/free-flow-non-personal-data, 30 January 2019.
[84] Maurer, *supra nota* 12, p 153.
[85] Communication from the Commission (2018), *supra nota* 9, p 1.
[86] *Ibid*., p 2.
[87] Plucinska, J., Posaner, J. (2016). *Self-driving cars hit European speed bump*. Accessible: https://www.politico.eu/article/uber-volvo-self-driving-cars-eu-regulations/, 12 April 2019.
[88] Communication from the Commission. Europe 2020 - A strategy for smart, sustainable and inclusive growth. COM(2010) 2020 final, p 20.

data is becoming an asset and therefore it is important for the protection of fundamental freedoms to facilitate the free movement of data.[89] Therefore, Article 26(2) of the TFEU which defines the internal market could be possibly adapted to include also the digital single market that would reflect the European Union in the digital age.[90] However, in order for the free movement of data to become the fifth freedom in the EU, it is required to amend the foundational treaties which can only occur based on consensus. The situation in the Union is currently rather sensitive for attempting to revise the treaties and therefore if the EU decides to amend them in the future, the author proposes to consider establishing and including the free movement of data as a fundamental freedom.

Personal data movement has already been enabled in the European Union. The basis for the free movement of personal data is in Article 16(2) of the TFEU and the rules for such movement are laid down in the GDPR[91] which prohibits restrictions on the free movement of personal data. However, nowadays there are a lot of data not associated with a specific person and therefore, is not considered as personal data, for example, the statistics of public transport and data generated by the sensors in a car.[92] Certainly, the free movement of personal data and the protection of such data will be an important pillar of the principle new freedom, however, there are a lot of non-personal data that does not require protection but calls for clear regulatory rules, for example, for access to data and for sharing data regarding especially autonomous and connected cars.[93]

Unfortunately, the free movement of data as such is not yet ensured in the European Union and faces many challenges. The main obstacles include unjustified data localisation restrictions by the Member States and legal uncertainty about the applicable legislation to cross-border data storage and processing.[94] It is important to deal with these issues in order to facilitate the free movement of data, especially non-personal data including two important pillars. The first pillar is the removal of unjustified data localisation requirements to non-personal data, known as the free flow of data, and the second one is enabling access and portability of both personal data and non-personal data.[95]

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[89] Communication from the Commission (2017), *supra nota* 3, p 5.
[90] Tobias, *supra nota* 82, p 36.
[91] Regulation (EU) 2016/679, *supra nota* 6.
[92] Hankewitz, S. (2017). *Estonia and the road to the free movement of data in Europe*. Accessible: http://estonianworld.com/technology/road-free-movement-data-europe/, 3 January 2019.
[93] Kala, K. (2017). *Free movement of data as the 5th fundamental freedom of the European Union*. Accessible: https://e-estonia.com/free-movement-of-data-as-the-5th-fundamental-freedom-of-the-european-union/?fbclid=IwAR0IQvv_ez02CoklbDpSlYhfPMECodt2CPQCBMfdv4z1qUNXaJD-xp6OF4I, 16 January 2019.
[94] European Commission, *supra nota* 83.
[95] Ministry of Economic Affairs and Communications. (2017). *Estonian Vision Paper on the Free Movement of Data - the Fifth Freedom of the European Union*. Accessible: https://www.eu2017.ee/sites/default/files/inline-files/EU2017_FMD_visionpaper.pdf, 8 January 2019, p 4.

Access to data and data portability are crucial for the deployment of connected cars and hence need to be properly regulated and facilitated. The removal of unjustified data localisation requirements is important for connected cars likewise, however, more from the cross-border aspect where data and cars move between the Member States. There are already some legislative measures that support the free flow of data in some sectors such as the Services Directive for the free movement of services, the GDPR and the PSI Directive, however, there are no specific regulations, except for the Regulation on the free flow of non-personal data that would regulate the non-personal data and therefore, in order to fully enable the free movement of data, this type of data requires special attention.[96]

2.2 The principles of the free movement of data and their importance for connected cars

2.2.1 Removal of unjustified data location restrictions for non-personal data

As mentioned then the free movement of data includes three pillars from which one is the facilitation of the free flow of data. Technological advancements, innovation and cross-border services are, however, restricted by barriers to the free movement of data in the European Union such as unjustified data localisation requirements.[97] These requirements can potentially harm the digital economy of the EU.[98] Since the EU law already prohibits restrictions on the free movement of personal data, the focus is currently on non-personal data and one option to deal with data localisation is to establish the free flow of data as a basic principle in the European Union law.[99]

Data localisation requirements pose a barrier to the global flow of data since they restrict where and how this data can be stored, processed and transferred.[100] Unjustified restrictions on the free movement of data are requirements imposed by public authorities on the location of data storage or processing and require that important data cannot be transferred outside the country.[101]

[96] European Parliament. (2018). *Briefing - Free flow of non-personal data in the European Union.* Accessible: http://www.europarl.europa.eu/RegData/etudes/BRIE/2017/614628/EPRS_BRI(2017)614628_EN.pdf, 3 February 2019, p 3.
[97] Communication from the Commission (2017), *supra nota* 3, p 5.
[98] Fraser, E. (2016). Data Localisation and the Balkanisation of the Internet. – *SCRIPTed: Journal of Law, Technology and Society*, Vol. 13, No. 3, p 373.
[99] *Digital Single Market conference on the free movement of data - Closing speech by Vice-President Andrus Ansip in charge of the Digital Single Market* (2017). European Commisison. Accessible: http://europa.eu/rapid/press-release_SPEECH-17-2024_en.htm, 2 January 2019.
[100] Fraser, *supra nota* 98, p 359.
[101] Communication from the Commission (2017), *supra nota* 3, p 6.

Countries justify these requirements for various reasons, mainly in order to protect people from possible foreign surveillance and guarantee their privacy and to promote domestic economic development.[102] Moreover, the restrictive rules are set forward due to the lack of legal certainty about applicable rules and practices regarding data movement in the other Member States and in situations that are not covered by the GDPR, hence especially concerning non-personal data.[103] In the context of non-personal data, these localisation requirements may be established promote domestic economic development and grant a competitive advantage to local companies, however, they restrict cross-border data movement which hinders cross-border business and impairs the internal market.[104]

Connected cars communicate with each other and with the infrastructure, hence receive and share data necessary for functioning and therefore, data should be able to move from one car to another. Moreover, the author is on the opinion that the cross-border aspect becomes clear when a car moves to another Member State and thus the data gathered by cars in this State should be transferred to the newly entered car. Additionally, the new car entering the Member State produces a lot of data which all become available to related parties in the other Member State together with previous data. The data can be used by manufacturers too, for example, to examine how the cars function in overall and benefit from the data movement to produce better and safer cars. However, data localisation requirements have the potential to impede the development of the digital economy and effective use of data due to having an effect on, for example, connected cars since the cross-border flow of information and access to data are important enablers in this area.[105] Moreover, these localisation restrictions affect the freedom to provide services and the free movement of people and goods, therefore, cross-border data movement is necessary to enable the goods, services and people to move within the EU.[106] Fortunately, the European Union has enabled the free movement of personal data and recently also the free flow of non-personal data by adopting a Regulation[107] which removes these unjustified data localisation requirements and facilitates cross-border data movement.

[102] Chander, A., Le, U. P. (2015). Data Nationalism. – *Emory Law Journal,* Vol. 64, No. 3, p 682.
[103] European Commission (2017), *supra nota* 99.
[104] Ministry of Economic Affairs and Communications, *supra nota* 95, p 8.
[105] Ursic, H., Custers, B. (2016). Legal Barriers and Enablers to Big Data Reuse. – *European Data Protection Law Review,* Vol. 2, No. 2, p 216.
[106] Communication from the Commission (2017), *supra nota* 3, p 3.
[107] Regulation (EU) 2018/1807, *supra nota* 4.

2.2.2 Facilitation of data portability regarding non-personal data

The European Union has adopted recently a Regulation, the GDPR, concerning the protection of personal data and the free movement of such data and includes a completely new right, data portability, which enables individuals to freely transmit their personal data.[108] The Regulation grants individuals three different rights regarding data portability. Firstly, the right to receive the personal data[109], secondly the right to transmit the data to another controller[110], and also the right to have the data transmitted from one controller to another[111]. The aim of this is to protect privacy and personal data while granting individuals' the right to control their data.[112] However, even though data portability grants individuals the right to control their data and enjoy the wealth of it in the data economy, data portability can be extended to businesses and companies as well.[113] The possibility of data portability would allow businesses to easily transmit their data from one system to another.[114] Furthermore, data portability could be adapted to connected cars and include the right for service providers to receive non-personal data and the possibility to transmit data for manufacturers.

As mentioned, the third pillar of the free movement of data concerns data portability, especially regarding non-personal data. Currently, the GDPR introduces the right to data portability of personal data, however, for non-personal data, there is no legal obligation to guarantee even a minimum level of data portability which means that portability is offered only through contractual means and the rights are negotiated on a case-by-case basis.[115] Therefore, it is important to broaden the scope of data portability to non-personal data and ensure that companies would not be excluded from data in which creation they have been part of.[116] However, this pillar is the most controversial since it dictates how companies should communicate their data to other companies, individuals and the government and therefore, legal rules have to be critically assessed in order to create a business environment that would not force companies out of the European Union and would not have a chilling effect on innovation regarding new technologies depending on data such as

[108] Scudiero, L. (2017). Bringing Your Data Everywhere: Legal Reading of the Right to Portability. – *European Data Protection Law Review*, Vol. 3, No. 1, p 119.
[109] Regulation (EU) 2016/679, *supra nota* 6, art 20, p 1.
[110] *Ibid*.
[111] *Ibid*., art 20, p 2.
[112] Ursic, H. (2018). Unfolding the New-Born Right to Data Portability: Four Gateways to Data Subject Control. – *SCRIPTed: Journal of Law, Technology and Society*, Vol. 15, No. 1, p 42.
[113] De Hert, P. *et al.* (2018). The right to data portability in the GDPR: Towards user-centric interoperability of digital services. – *Computer Law & Security Review*, Vol. 34, No. 2, p 194.
[114] Communication from the Commission (2017), *supra nota* 3, p 15.
[115] European Commission, *supra nota* 77.
[116] Ministry of Economic Affairs and Communications, *supra nota* 95, p 35.

connected cars.[117] Otherwise, companies manufacturing connected cars would possibly be deterred from developing such cars if they would need to share their business and other relevant information. Too much and too strong regulation can inhibit technological developments and innovation while an insufficient and weak regulation could have the same effect.[118] Therefore, data portability could be developed based on the right provided by the GDPR, however, not being obligatory for companies but rather a possibility through uniformly established standard contract terms.

There are many entities who will be interested in connected car data such as vehicle developers and transportation researchers, marketing and advertising actors, service providers and law enforcement who find the data highly valuable.[119] In the context of connected cars, data portability would be beneficial since it could be connected to the manufacturers' requirement to share information and transmit relevant data which would increase the ability to develop better cars, manage traffic, provide services and possibly update road maps. Moreover, data portability is relevant since it will enable third parties such as the insurance, ambulance and public authorities to receive data from connected cars.[120] Since non-personal data is not protected by law and does not need the car owner's consent for access, third parties will be able to access and receive such data.[121] Hence, in the case of non-personal data, portability could be conceived as a tool for manufacturers to control and share relevant and necessary data concerning connected cars. Moreover, since non-personal data requires no protection as such and consent from the owner, data portability could be extended to data movement between connected cars which would enable one car to port data such as speed, car condition, number of passengers, the car's actions and intentions, data gathered about the road environment to another car. Nevertheless, in this case, relevant legal frameworks are necessary to enable data portability between different cars since vehicle data moves also among different manufacturers who have to provide access to their cars and data produced.

[117] *Ibid*., p 22.
[118] de Bruin, *supra nota* 2, 488.
[119] Glancy, D. J. (2012). Privacy in Autonomous Vehicles. – *Santa Clara Law Review*, Vol. 52, No. 4, p 1199.
[120] Störing, M. (2017). *What EU legislation says about car data*. Accessible: http://www.osborneclarke.com/wp-content/uploads/2017/08/OSB100213_FIA-Car-Data-Report_v1.pdf, 24 January 2019, p 12.
[121] De Hert, *supra nota* 113, p 198.

2.3 The re-use of public sector information – example for sharing private sector information

As data movement is already enabled to a certain extent and the reuse of data is considered to be a part of the free movement of data, the PSI Directive, for example, regulates the sharing and the re-use of public sector data, however, does not include the private sector.[122] Even though the European Commission has issued Guidance[123] on sharing private sector data, there is no legal framework and obligation for private entities to share and re-use data, not to mention non-personal data.[124] Therefore, as the public sector is already required to disclose data that can be used by third parties including the private sector, it is necessary to facilitate and promote the access to and use of data that are owned by private companies.[125] Since the public sector is one of the most data-intensive sectors, it is important to allow access to public data in order to contribute to the growth of the digital economy and the development of artificial intelligence, therefore, the European Union facilitates the access to and the re-use of public data through the PSI Directive which was revised at the beginning of 2019 and will be renamed as the Open Data and Public Sector Information Directive.[126]

Data that has been generated in the transport sector is really beneficial for re-use, however, entities operating in this sector are not included in the Directive.[127] Therefore, the European Union could possibly regulate the re-use and sharing of private sector information by making it obligatory or advisable for private entities. Hence, the new PSI Directive could be an example for the re-use and sharing of private sector information since it would greatly benefit connected cars by requiring manufacturers to share relevant information concerning the functioning of connected cars. Moreover, the requirement could be combined with data portability which would facilitate the exchange of information. For example, they would have to share relevant software codes and through sharing information, standardise the way dangerous and complex situations in the traffic

[122] Ursic (2016), *supra nota* 105, p 210.
[123] Commission Staff Working Document SWD(2018) 125 final. *Guidance on sharing private sector data in the European data economy accompanying the document Communication Towards a common European data space*. Accessible: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018SC0125&from=EN, 12 April 2019.
[124] Ursic (2016), *supra nota* 105, p 211.
[125] Kala, *supra nota* 93.
[126] European Commission, *supra nota* 77.
[127] *Proposal for a revision of the Public Sector Information (PSI) Directive*. European Commission. Accessible: https://ec.europa.eu/digital-single-market/en/proposal-revision-public-sector-information-psi-directive, 19 February 2019.

are resolved.[128] However, even though non-personal data does not need protection as such, it is a valuable asset to companies and other entities which indicates that it should be protected to some extent as a product of technological development.[129] Therefore, legal rules for the re-use of and access to data must preserve the companies' right to be competitive and protect trade secrets and other commercially sensitive information.[130]

There are different options for private sector data sharing. The most liberal approach is an open data one where the data are made available with very few restrictions and against no or very limited remuneration which is the most suitable when the person sharing data has a strong interest in the re-use of data, for example, in the case of service providers that would like to reach the customers.[131] In the case of connected cars, these could be the repair, maintenance, entertainment, insurance and emergency service providers. Another option for data sharing and allowing re-use is bilateral contracts through an intermediary where data is traded against remuneration which would be beneficial for companies that do not know the data re-users and grant access to data only for monetary purposes, however, model contract terms are advisable in order to facilitate the conclusion of data usage agreements.[132] The most restrictive one is a closed platform where access to data re-use is provided by one party or an intermediary only against monetary remuneration or added-value services provided within the platform.[133] It means that the service provider or a new market participant who needs to access and re-use the data can only do so if he provides the services within the environment that the data were collected, hence provides services to that specific manufacturer. However, it creates competition issues and car users may not receive the best services while the service providers cannot independently and freely offer their services.

Non-personal data generated by connected cars could be reusable in order to provide new services, develop improved cars and organise, control traffic. Therefore, the new PSI Directive may be seen as an example for private sector information by adopting measures for the re-use of and access to private sector data. However, the author considers that since the private sector is independent and not owned by the state, harsh legislative measures could be more detrimental rather than beneficial regarding innovation and companies' incentives to operate in the EU. Therefore, it is important to

[128] Pearah, P. J. (2017). Opening the Door to Self-Driving Cars: How Will This Change the Rules of the Road. – *Journal of High Technology Law*, Vol. 18, No. 1, p 41.
[129] Communication from the Commission (2017), *supra nota* 3, p 4-6.
[130] Commission Staff Working Document (2018), *supra nota* 123, p 4, 6.
[131] *Ibid.*, p 5.
[132] *Ibid*.
[133] *Ibid.*, p 5.

find the balance between enabling the re-use of and access to data and respecting the independent nature of the private sector. A proposal would be to regulate the re-use by a legislative instrument which composes of liberal rules such as the re-use and access based on bilateral contracts for remuneration that include established model contract terms granting the right to re-use and access relevant data but the nature of the contract is based on negotiated terms. This solution would enable the best use of the potential of non-personal data while respecting the freedom of the private sector.

2.4 Issues of data ownership and data access regarding connected cars

In the context of connected cars, the ownership of data is an actual issue since the cars produce an enormous amount of data which poses a question who owns this data and consequently has the right to access and use the data.[134] Unfortunately, the concept of ownership is not defined by EU law and national legal systems also define ownership differently.[135] In the case of business-to-business, the main legal rules regulating the sharing of data are intellectual property law such as trade secrets and contract law respecting the freedom of contract.[136] Contract law respects the principle of contractual freedom, hence the parties are free to decide on the contract terms themselves. Therefore, a company having control over the data such as the manufacturer has ultimately the right to decide on the access to the data and conclude contracts. Moreover, contract law is different in the Member States since there is no harmonisation on the EU level which leads to various approaches towards contractual relations. Consequently, there are currently no policy frameworks that would regulate non-personal machine-generated data and lay down conditions for their economic usage and tradeability.[137]

Data generated by connected cars are beneficial for service providers, however, they need access, in some cases real-time access, to the vehicle data for being able to provide such services, therefore, data should be available to interested parties and manufacturers would need to enable data accessibility. Moreover, the data is beneficial for public authorities to evaluate and improve traffic safety and regulation or conduct law enforcement.[138] However, car data are usually transmitted directly to the servers of the manufacturers who obtain exclusive control of it with the

[134] Janeček, V. (2018). Ownership of Personal Data in the Internet of Things. – *Computer Law & Security Review*, Vol. 34, No. 5, p 1042.
[135] *Ibid*., p 1041.
[136] Ministry of Economic Affairs and Communications, *supra nota* 95, p 24-25.
[137] Communication from the Commission (2017), *supra nota* 3, p 10.
[138] Kerber, W. (2018). Data Governance in Connected Cars: The problem of Access to In-Vehicle Data. – J*ournal of Intellectual Property, Information Technology and Electronic Commerce Law*, Vol. 9, No. 3, p 312.

opportunity to benefit from the economic value of the data which creates a problem for car users and other interested parties since they cannot access the data without the consent of the manufacturer.[139] Therefore, it is questionable whether exclusive ownership is an economically efficient solution, especially in the context of connected cars where the vehicle data may be used to provide services or to create new services and it needs immediate access.[140] Manufacturers' exclusive control of data creates competitive concerns since they are able to sell the access to the vehicle data to certain service providers and thus, car users can only choose between the service providers having contracts with a certain manufacturer.[141] This leads to a situation where the market is not free for service providers but controlled by the manufacturers which may decrease innovation and service providers incentives to offer services for connected cars.

Therefore, in order to make the most of the possibilities the data offers, different market players need to have access to the data.[142] Hence, the European Union should improve access to machine-generated data through sharing and re-use which should make data a source of innovation and creation of services.[143] Since exclusive ownership is not an option for the functioning of connected cars, the EU should opt for regulating the access to data rather than the ownership. Ultimately, the EU needs to consider whether to take an instructive non-legislative approach or a legislative approach to access to vehicle data. Moreover, there are two distinct options, either regulate the issue through existing legislation or create new laws.

Non-legislative approaches could possibly include guidance on sharing data which would entail recommendations on how non-personal car data rights should be handled in contracts.[144] The guidance could additionally include possible incentives for businesses to share data such as access to data under remuneration.[145] Another non-legislative option would be to create model contract terms which would lay down provisions for data usage licences to facilitate sharing of non-personal data and therefore, voluntary deployment of these contract terms would create more fair

[139] *Ibid*., p 317.
[140] *Ibid*., p 316.
[141] *Ibid*., p 317.
[142] Communication from the Commission (2017), *supra nota* 3, p 9.
[143] *Ibid*., p 11.
[144] Commission Staff Working Document SWD(2017) 2 final *on the free flow of data and emerging issues of the European data economy accompanying the document Communication Building a European data economy.* Accessible: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017SC0002&from=EN, 9 April 2019, p 30.
[145] Ministry of Economic Affairs and Communications, *supra nota* 95, p 35.

and balanced terms for smaller businesses while still upholding contractual freedom, hence all interested parties would have fair opportunities to use the data.[146]

A legislative approach offers a stronger and a more regulated, coherent basis. Firstly, default contract rules for data licences could be laid down in legislation.[147] The European Union has adopted a Directive on the Unfair Contract Terms which applies in consumer protection.[148] However, some Member States have accustomed the Directive also to business relations.[149] Therefore, the EU should explore and discuss whether the Directive could be a potential and proper tool for regulating contractual terms in a business context concerning the access to data.[150] These default contract rules could be based on the Unfair Contract Terms Directive and the aim would be to regulate the contractual relations when it comes to granting access to data, moreover, contractual clauses that deviate excessively from the default rules are considered to be invalid.[151] In overall, this approach would decrease legal barriers for businesses and increase the fairness and equality between companies while still allowing a large degree of contractual freedom.[152] Since some deviation from the contract rules is allowed, it protects the principle of contractual freedom, but the established default rules provide fairness in contractual relations to smaller businesses and to service providers. Moreover, the Services Directive[153] could be a potential tool in the context of connected cars and the accessibility to data if amended and adjusted to include access to data by service providers. Currently, the Directive lays down provision facilitating the exercise of the freedom of establishment for service providers and the free movement of services.[154] Consequently, it could include relevant provisions about the accessibility of data by service providers in order to provide their services and maintain the freedom to provide services.

A legislative approach could be provided also for access to data for public interest purposes which entails a legislation granting the possibility for the government to request private actors to enable data accessibility.[155] Access for public authorities could be granted for data that is of general interest and would be relevant for the public sector, for example, data collected by connected cars

[146] Commission Staff Working Document (2017), *supra nota* 144, p 31.
[147] *Ibid*.
[148] Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts, OJ L 95, 21.4.1993, art 1, p 1.
[149] Commission Staff Working Document (2017), *supra nota* 144, p 32.
[150] Ministry of Economic Affairs and Communications, *supra nota* 95, p 26.
[151] Communication from the Commission (2017), *supra nota* 3, p 12.
[152] *Ibid*.
[153] Directive 2006/123/EC of the European Parliament and of the Council of 12 December 2006 on services in the internal market, OJ L 376, 27.12.2006.
[154] *Ibid*., art 1, p 1.
[155] Commission Staff Working Document (2017), *supra nota* 144, p 32.

which could be beneficial for the management of traffic.[156] Therefore, a concept of public interest data could be introduced and developed at the EU level that would lay down a certain class of data to which public sector bodies will have access.[157] Additionally, the right of public authorities to have access to vehicle data could be extended through existing legislation.[158] The aim of the Intelligent Transport Systems Directive is to facilitate the coordinated and coherent deployment and use of intelligent transport systems in the European Union.[159] The Directive states that it is necessary to develop specifications for actions in priority areas such as the optimal use of the road, traffic and travel data, and Intelligent Transport Systems road safety and security.[160] One of the specifications required under this Directive could potentially include the requirement to enable access to data generated by vehicles, especially connected cars for public authorities in order to, for example, improve road safety and manage traffic.[161]

Some Member States are currently seeking ways to regulate the access to machine-generated data by themselves, however, this uncoordinated approach may lead to fragmentation between the Member States and hence become detrimental to the development of the EU data economy.[162] Therefore, it is important to regulate the issue on the EU level since these matters concern the EU data economy and the internal market. Even though there is no specific EU legislation that regulates the question of ownership and data accessibility, there are various legislations such as the Services Directive, Unfair Contract Terms Directive and Intelligent Transport Systems Directive that could have an impact on data and through which the EU could potentially regulate these matters. Therefore, existing contract law legislation and EU directives could be a sufficient solution if voluntary agreements covering certain sectors such as transportation are designed.[163]

Otherwise, a viable solution could be to regulate the issue through a new legislative framework concerning specifically access to non-personal data or, in the context of connected cars, through new sector-specific rules on connected and automated technologies. Non-legislative measures such as guidelines may not be enough to actually guarantee the access to data and provide incentives for manufacturers' to share their data while legislative measures may be too strict and

[156] Communication from the Commission (2017), *supra nota* 3, p 12.
[157] Commission Staff Working Document (2017), *supra nota* 144, p 32.
[158] Communication from the Commission (2018), *supra nota* 9, p 13.
[159] Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport, OJ L 207, 6.8.2010, art 1, p 1.
[160] *Ibid*., art 1, p 2.
[161] Communication from the Commission (2018), *supra nota* 9, p 13.
[162] Communication from the Commission (2017), *supra nota* 3, p 11.
[163] *Ibid*., p 10.

overregulate a rather novel topic, therefore, there should be a balanced framework to regulate the access to non-personal regarding connected cars. The author is on the opinion that the EU should avoid the exclusive data ownership by the manufacturers and rather opt for the openness of the data for every interested party who requires the data such as the service providers, manufacturers, the public sector and the owners. Access to data, in essence, could be laid down as a legislative principle and a right for interested parties. However, the actual functioning of data accessibility should be regulated not too strictly by making it obligatory for manufacturers to share their data. However, since manufacturers are the ones who first receive the data through their networks and have privileged access to data, the openness of data should be provided by the manufacturers.[164]

[164] Communication from the Commission (2018), *supra nota* 9, p 12.

3. THE RELEVANCE AND ISSUES OF THE REGULATION ON THE FREE FLOW OF NON-PERSONAL DATA FOR CONNECTED CARS

3.1 Different options to regulate the free flow of non-personal data – the purpose of the adopted Regulation

As discussed, the free movement of data is essential for the functioning of autonomous and connected cars, moreover, it facilitates all other digital developments. Even though the free movement of personal data has been granted by the TFEU and the GDPR, non-personal data faces challenges and currently lacks a legal framework which facilitates the movement of such data. In order to deal with this issue, the EU adopted a proposal[165] for the Regulation on the free flow of non-personal data which entered into force at the end of 2018. Different options were considered to tackle the issues of data localisation requirements and the uncertainty about applicable laws, the first one being a non-legislative initiative which provides guidelines on enhancing the enforcement of existing EU legislation while the second option considered establishing a principle-based legislative initiative and a cooperation framework which would create the principle of free flow of data and prohibit unjustified data localisation requirements.[166] The third option was a detailed legislative initiative that would establish fully harmonised rules on unjustified data location requirements and, for example, make it compulsory for service providers to facilitate data portability.[167]

The author considers that since the free movement of data, especially non-personal data is a rather new and recent topic, a softer approach could be more beneficial. It is still in its experimental phase, therefore applying strict rules and overregulating a growing data-related field would be

[165] Regulation (EU) 2018/1807, *supra nota* 4.
[166] Commission Staff Working Document SWD(2017) 305 final. *Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on a framework for the free flow of non-personal data in the European Union*. Accessible: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017SC0305&from=EN, 8 February 2019, p 2.
[167] *Ibid.*, p 3.

perhaps more detrimental to the movement that needs time and patience to evolve.[168] Guidelines facilitate the development of the free movement of non-personal data and do not regulate the matter too strictly, hence not hindering the future of it. If strict rules and prohibitions are laid down, it can impede, for example, innovation and strive companies out of the EU due to too strict laws.[169] Continuous innovation is, however, necessary for the EU in order to maintain its competitiveness.[170] A principle of the free flow of data would be the fundamental basis for the development of the overall free movement and would slowly and steadily form it into what it should be. Since the free flow of data is a rather recent topic, it needs a softer regulation and time rather than harsh and restrictive rules from the beginning. The EU opted for the second choice and the Commission proposed a legislative initiative to facilitate the free movement of data by prohibiting requirements on data localisation. The form of regulation was proposed due to the ability to ensure uniform rules for the free flow of non-personal data within the European Union which is important in order to remove existing restrictions and avoid any future ones.[171]

The aim of the Regulation is to achieve a more integrated EU market for data storage and processing by ensuring and facilitating the free movement of data in the European Union through removing obstacles to the free flow of non-personal data and promoting data portability.[172] The Regulation consists only of ten articles seeking to ensure the free flow of non-personal data by laying down rules relating to data localisation requirements and data porting for professional users.[173] Since the GDPR provides full protection for personal data, restrictions for such data movement and portability for data protection reasons have already been restricted and eliminated.[174] Therefore, the new legislation aims to ensure consistency with existing EU legal rules by providing rules for the free flow of non-personal data, hence alongside with the GDPR ensure a comprehensive and coherent approach to the free flow and portability of data in the European Union.[175]

[168] Ministry of Economic Affairs and Communications, *supra nota* 95, p 3.
[169] *Ibid*., p 22.
[170] Communication from the Commission (2018), *supra nota* 9, p 5.
[171] Commission Staff Working Document (2017), *supra nota* 166, p 5.
[172] Broy, D. (2017). The European Commission's Proposal for Framework for the Free Flow of Non-Personal Data in the EU. – *European Data Protection Law Review*, Vol. 3, No. 3, p 382.
[173] Regulation (EU) 2018/1807, *supra nota* 4, art 1.
[174] Regulation (EU) 2016/679, *supra nota* 6, art 1, p 3.
[175] Proposal for a regulation of the European Parliament and of the Council on a framework for the free flow of non-personal data in the European Union. COM(2017) 495 final, p 3.

3.2 The content and importance of the Regulation on the free flow of non-personal data for connected cars

3.2.1 Restrictions on data localisation requirements

One aim of the Regulation is to remove unjustified national rules that restrict the choice of companies where to store or process their data which is implemented in Article 4 of the Regulation and has become the principle of the free flow of non-personal data.[176] A data localisation requirement is any obligation, prohibition, condition, limit or other requirement provided for in the laws, regulations or administrative provisions of the Member States which imposes the location of data storage or processing of data in the territory of a specific Member State or hinders the storage or processing of data in any other Member State.[177] Therefore, due to the Regulation, the location of data for storage or other processing in the EU cannot be restricted to the territory of a specific Member State, and storage or other processing in any other Member State cannot be prohibited or restricted unless restricting is done on the grounds of public security.[178]

Even though the Regulation establishes the principle of the free flow of non-personal data in the European Union, the question remains whether this enables connected cars to function properly on public roads. Although, by analysing the functioning of connected cars, the principle granted under this Regulation is relevant and could possibly have an impact on these cars regarding data localisation. Firstly, the removal of unjustified requirements on data localisation creates a suitable environment for connected cars since it means that a Member State cannot require companies and other entities to store their data in that Member State which allows every company or other organisation to choose where they wish to store and process their non-personal data. Secondly, as mentioned then connected cars need to share and receive data when moving to another Member State and the removal of data localisation requirements enables the data already gathered by the car to move alongside the car, hence allows the processing of data to occur in another Member State. Moreover, data that is necessary for manufacturers' moves and is available to other parties in the other Member State.

Regarding the free movement of services, for example, removal of localisation could potentially mean that maintenance and advertisement providers could access the data in the connected car that travelled to another Member State and offer their services. Moreover, removal of these

[176] Broy, *supra nota* 172, p 382.
[177] Regulation (EU) 2018/1807, *supra nota* 4, art 3, p 5.
[178] *Ibid*., art 4, p 1.

requirements facilitates the free movement of goods and people since the cars can move across the EU and the functioning of the internal market is not disturbed by restrictions to cross-border data movement. However, even though the removal of data localisation requirements facilitates the cross-border data movement and the ability of connected cars to move between the Member States, it does not explicitly regulate the data movement between the cars themselves. Therefore, there is a lack of specific regulation for data movement between the cars and between the cars and the infrastructure which the European Union should consider laying down and including guidelines on enabling such data movement.

3.2.2 Enabling data portability for professional users

Additionally, the new Regulation aims to regulate data portability issues regarding non-personal data. Therefore, the Commission has been given the role of encouraging and facilitating the development of self-regulatory codes of conduct at the EU level in order to define guidelines on best practices.[179] These guidelines should facilitate the switch of providers and porting data outside the users' own technological infrastructure by providing users with detailed, clear and transparent information before a contract for data storage and processing is concluded.[180] Hence, service providers and professional users should develop and enforce codes of conduct including all relevant information about data portability and its condition before they conclude a contract. Therefore, the Regulation offers a more self-regulatory approach rather than a strict obligation. However, the Commission may take a more regulated approach if these codes of conduct are not put in place and effectively implemented.[181]

Even though the European Union took a legislative approach towards the data portability of non-personal data, it is still rather soft. The GDPR created the right to data portability while the Regulation on the free flow of non-personal data simply takes a self-regulatory approach and offers codes of conduct to simplify the porting of data. Therefore, the Regulation proposes to different companies, professionals and service providers to have a contract and handle data portability based on contractual obligations while the GDPR creates a legal right and offers stronger protection for it. Moreover, the approach by the Regulation is rather soft since it encourages and advises to develop the codes of conduct, however, does not make it mandatory as such. Although, the author argues that a soft approach may be more reasonable since the Regulation does not concern personal

[179] *Ibid*., recital 30.
[180] *Ibid*., art 6, p 1.
[181] *Ibid*., recital 21.

data and individuals but only non-personal data and professional users, hence it is not necessary to create a right to data portability but rather facilitate the chance to port data outside own IT systems and grant the possibility if a company wishes to do so. From the point of view of the service providers, soft approach is also more beneficial since it does not impose strict legal obligations to data portability, hence it would not hinder the entry to the EU market for these providers and restrict incentives to innovation.[182] A soft legislative approach is potentially more beneficial in the context of non-personal since it does not need strong protection and therefore, innovation may be boosted this way.

Consequently, if data portability would be strictly regulated in the context of connected cars, it could possibly have a detrimental effect on companies and their incentives to innovate and develop. Manufacturers who develop connected cars invest in the development and also into the data production which is important for innovative processes and could be re-used and accessed in order to facilitate innovation and product improvement.[183] Therefore, if these manufacturers would be under strict obligations, they could be discouraged from investing and developing further. Innovation and competition depend on having access to relevant data, however, bigger manufacturers may be unwilling to give out their data in order to maintain their competitiveness.[184]

If data portability would be facilitated in the context of connected cars as the obligation of manufacturers to share data, the question remains whether soft regulation is enough to urge companies and manufacturers to allow access to data and share relevant data. Clear rules are needed since too soft regulation does not grant manufacturers a sufficient incentive to share data and opt for data portability.[185] Although there is an interest in facilitating accessibility and the re-use of data to enable innovation and the deployment of connected cars, the extent of rules and legislative measures has to be considered.[186] In order to boost innovation and support connected cars while protecting competition and companies' incentives to develop, the EU should consider carefully whether it is better to adopt soft legislative measures that allow data accessibility but under certain circumstances.

[182] Ministry of Economic Affairs and Communications, *supra nota* 95, p 33.
[183] Graef, I., Husovec, M. (2017). *Response to the Public Consultation on "Building a European Data Economy".* Accessible: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2958287, 18 April 2019, p 2.
[184] *Ibid*.
[185] Ministry of Economic Affairs and Communications, *supra nota* 95, p 22.
[186] Graef (2017), *supra nota* 183, p 2.

Data portability provided in the Regulation means that companies and manufacturers can easily transmit their non-personal data concerning the functioning and condition of a connected car to wherever they wish. Therefore, the data can move from one platform to another and from one country to another. Hence, companies are able to share information with others who use the same service provider. Moreover, this data portability could be used as a mean to oblige manufacturers to share relevant information, although, the EU should explicitly regulate the manufacturers' requirement to share data such as the PSI Directive does for the public sector. However, the data portability under the Regulation does not engage in regulating the data movement from one car to another. Therefore, in the context of connected cars, data portability could mean the transfer of data from one car to another, from the infrastructure to cars and vice versa.

Consequently, the author considers that data portability contained in the Regulation on the free flow of non-personal data could potentially be beneficial for connected cars and have an impact on the functioning of them, especially regarding the possibility of manufacturers to port their data outside the Member State and switch platforms all around the EU. Manufacturers and companies could have access to the data generated by the cars and they would have the possibility to share and transmit the data. However, data portability should be updated to fit into the context of connected cars. Moreover, it only covers the service provider change and hence porting the data from one provider to another. To adapt data portability to connected cars, manufacturers and relevant third parties should be able to access the data, hence manufacturers could be under the obligation to share the data and moreover, data porting from one car to another should be regulated. Therefore, data portability could be interrelated with data accessibility which, however, requires firstly to regulate the access to data and then integrate data portability within the framework.

One possible solution could be to develop further rights to data portability regarding non-personal data based on the right provided in the GDPR which could apply particularly in business-to-business situations.[187] Contracts between the manufacturers and service providers could be based on standard contract terms. However, it has to be analysed and discussed whether data portability should be granted under freedom of contract as a companies' choice or as a legal requirement for companies since an obligation could potentially be detrimental for innovation.[188] Therefore, the author proposes that data portability could be an overall framework that would enable companies and service providers to access data held by other parties. Accordingly, it could also regulate

[187] Communication from the Commission (2017), *supra nota* 3, p 16-17.
[188] Ministry of Economic Affairs and Communications, *supra nota* 95, p 35.

connected cars, especially regarding data accessibility and manufacturers' responsibility to share relevant data. However, it should be decided whether the same data portability would regulate data movement between the cars which, in this case, should most likely be sector-specific, hence apply only to automated and connected technologies.

Conclusively, the Regulation encourages companies to develop the codes of conduct but does not make it obligatory for manufacturers to share data which is necessary for connected cars. Therefore, there are no specific conditions under which data can move between the manufacturers and between cars. Even though there are no data localisation restrictions anymore which facilitates cross-border movement, connected cars need rules on conditions for data movement between themselves and the manufacturer. Data portability could potentially concern the exchange of data between the cars and the surrounding environment, hence allows cars to port their own non-personal data. However, since a connected car has to be in contact with the system of another car, it still requires the consent of the owner or the manufacturer. Therefore, the Regulation does have a beneficial impact on connected cars but still does not regulate the issues sufficiently and efficiently. Moreover, there are still issues with data ownership and as long as these rules are not laid down, manufacturers can prohibit third parties from accessing the non-personal data since they consider themselves to be the owners of the data. Therefore, there is a strong need for clear rules on data movement, data portability, data ownership and data sharing. Consequently, even though the Regulation supports the functioning of connected cars, legal frameworks for these cars are still needed and the EU should regulate and facilitate data producing, data sharing and data flows.

3.3 The ambiguity regarding the concept and definition of non-personal data

The Regulation on the free flow of non-personal data applies to the storage or other processing of electronic data other than personal data.[189] According to the Regulation, data is other than personal data as referred to in Article 4(1) of GDPR.[190] Accordingly, the Regulation presumes that the concept of personal data is well defined and formulated, however, the distinction between personal and non-personal data is difficult to determine in the reality and the concept of personal data itself

[189] Regulation (EU) 2018/1807, *supra nota* 4, art 2, p 1.
[190] *Ibid*., art 3, p 1.

is wide and not concretely established.[191] Since the Regulation does not define non-personal data as such, it is necessary to examine what constitutes personal data in order to determine what non-personal data consequently embodies. Non-personal data is usually considered as raw machine-generated data which is produced by computer processes, applications or services, or by sensors processing information received from equipment, software or machinery, however, even machine-generated data can be considered personal if it enables to identify the person.[192]

Unfortunately, neither the proposal for the Regulation nor the Regulation itself explicitly define non-personal data and provide examples, therefore, it is rather complicated to regulate such data with a separate legal framework when personal data is not well defined and cannot be clearly distinguished from non-personal data.[193] The free movement of data includes personal and non-personal data and it is important to distinguish between these since they are regulated by different legal instruments, moreover, connected cars produce and collect both types of data. For example, technical data can be personal if the company or the manufacturer controlling the data has means to link the information to the person and hence is able to identify that person.[194] Conclusively, the concept of personal data is important for non-personal data since the broad approach and definition of personal data leaves room for interpretation. Since even non-personal data can be considered as personal, the concept of non-personal data is vague and should be established more concretely.

The only definition of personal data can be found in the GDPR and is defined as any information relating to an identified or identifiable natural person while an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.[195] The definition of personal data is further clarified by the Article 29 Working Party in their opinion[196] on the concept of personal data and by the case law of the European Court of Justice. However, the concept of personal data is rather broad and seems to apply to a growing range of situations.[197] Therefore, the problem is that personal data has not been defined properly

[191] Graef, I. *et al.* (2018). *Feedback to the Commission's Proposal on a Framework for the Free Flow of Non-Personal Data*. Accessible: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3106791, 13 January 2019, p 1.
[192] Communication from the Commission (2017), *supra nota* 3, p 9.
[193] Graef (2018), *supra nota* 191, p 3.
[194] *Ibid*., p 9, 12.
[195] Regulation (EU) 2016/679, *supra nota* 6, art 4, p 1.
[196] *Guidelines on the Right to Data Portability WP 242 rev.01.* (2017). Article 29 Data Protection Working Party. Accessible: https://ec.europa.eu/newsroom/article29/item-detail.cfm?item_id=611233, 18 January 2019.
[197] Purtova, N. (2018). The Law of Everything. Broad Concept of Personal Data and Future of EU Data Protection Law. – *Law, Innovation and Technology*, Vol. 10, No. 1, p 41.

which leads to the question of what actually constitutes personal and non-personal data produced by connected cars.

Most of the cases regarding personal data mention whether the type of data involved in the case constitutes personal data without any discussion on the elements that such data entails.[198] A person's fingerprints have been considered as personal data as they objectively contain unique information about the individual which allows precise identification of the person.[199] Moreover, a person's daily work periods, rest periods and corresponding breaks constitute personal data because they represent information relating to an identified or identifiable natural person, hence enabling identification of the person.[200] Even though not being exclusively about the person, tax data are considered to be personal data since they are information relating to an identified or identifiable natural person.[201]

As seen from Article 4(1) of the GDPR, the definition of personal data composes of elements such as information, relating to and an identified or identifiable person.[202] The notion of "any information" is seemingly rather wide. Indeed, the concept of "any information" indicates itself that the Regulation aims to create a broad interpretation of personal data.[203] The Court has confirmed this by stating that the meaning of "any information" reflects the aim of the EU to assign a wide scope to the concept and therefore the concept includes all kinds of information, in addition to objective also subjective in the form of opinions and assessments.[204] However, unfortunately, it means that the concept can be interpreted broadly since everything is or at least contains information.[205]

Generally, information is considered to relate to a person if it is about that person.[206] However, the data that relates to a person is much broader than data about the person.[207] Early cases have adopted quite a narrow approach by stating that even though something may contain personal information,

[198] Purtova, *supra nota* 197, p 61.
[199] Court decision, 17.10.2013, Schwarz, C-291/12, EU:C:2013:670, point 27.
[200] Court decision, 30.5.2013, Worten, C-342/12, EU:C:2013:355, point 19.
[201] Court decision, 1.10.2015, Bara and Others, C-201/14, EU:C:2015:638, point 29.
[202] Purtova, *supra nota* 197, p 45-46.
[203] *Opinion 4/2007 on the concept of personal data WP 136.* (2007). Article 29 Data Protection Working Party. Accessible:https://ec.europa.eu/justice/article-29/documentation/opinion-recommendation/files/2007/wp136_en.pdf, 21 January 2019, p 6.
[204] Court decision, 20.12.2017, Nowak, C-434/16, EU:C:2017:994, point 34.
[205] Purtova, *supra nota* 197, p 50.
[206] Article 29 Data Protection Working Party, *supra nota* 203, p 9.
[207] Graef (2018), *supra nota* 191, p 2.

it does not itself constitute personal data. [208] However, later cases have shown that the Court has adopted a wider approach to the concept of "relate to" by stating that information which can be linked to a person constitutes personal data.[209] Therefore, there has to be a relevant connection between the information and the person in order to be able to identify the person. Consequently, in the case of connected cars, the data relates to a person if the data generated by the car can be linked to the person and hence used to identify the person.

Lastly, data is considered to be personal if it allows identification of the person either directly or indirectly, the former meaning that the person is identified immediately while the latter indicates that the person can be identified when the information is combined with some other type of information.[210] Therefore, it is not necessary that the information alone allows the person to be identified in order to qualify as personal data.[211] However, the person is identifiable only if the service provider has legal means and additional information which enable to identify the person.[212] Therefore, if there is a possibility to combine a certain piece of data with additional information, it constitutes a means to identify the person concerned and the data is considered as personal data.[213]

The question of personal data is important in the context of connected cars since there is no definition or explanation on what constitutes non-personal data neither in the Regulation nor in any of other EU laws, however, such data is crucial for the functioning of connected cars. Even though the EU aims to enable the free movement of non-personal data, it is problematic if there is no relevant concept on such data as it leaves the Member States uncertain how to operate when no guidelines on non-personal data are given. It may possibly not be enough to state that non-personal data is other than personal data.[214] The thesis focuses on purely non-personal data that are important for the proper functioning of connected cars such as sensor produced data about the weather, road conditions and infrastructure, and car's technical condition. However, as seen, then non-personal data can be considered as personal if it enables to identify the person and therefore, the notion of non-personal data is even more ambiguous. Consequently, non-personal in the context of connected cars should be purely machine-generated data such as data collected through

[208] Court decision, 17.7.2014, YS and Others, C-141/12, EU:C:2014:2081, point 38, 39.
[209] Court decision, *supra nota* 204, point 35.
[210] Article 29 Data Protection Working Party, *supra nota* 203, p 13.
[211] Court decision, 19.10.2016, Breyer, C-582/14, EU:C:2016:779, point 41.
[212] *Ibid*., point 49.
[213] *Ibid*., point 45.
[214] Graef (2018), *supra nota* 191, p 3.

sensors about the environment, infrastructure and temperature which does not enable to identify the person since it is not linked to the person. Even though the Regulation is important in the context of connected cars, this industry calls for better legislation and legal framework concerning the data movement and the concept of non-personal data.

Therefore, the author proposes that the EU should consider defining non-personal data in the context of connected cars. Even though non-personal data is regarded as machine-generated data including sensor produced data, it is important to fully distinguish between personal and non-personal data in connected cars since even machine-generated data that allows to identify the person may qualify as personal data. Therefore, there could potentially be relevant definition regarding non-personal data produced by connected cars or any other automated vehicle. The definition of non-personal data as machine-generated data could be a viable solution, however, it should have specific conditions what constitutes non-personal data. Moreover, the definition should be sector-specific, hence, in the context of connected cars, the definition of non-personal data should include machine-generated car or technical car data. Consequently, since non-personal data in the context of connected cars is rather specific and vehicle orientated, the definition of non-personal data should be distinctive to the transportation industry. Possible legislation could include the biggest and most important transportation industries such as connected cars and other automated vehicles and definitions of non-personal for these vehicles.

4. PROPOSALS FOR FACILITATING THE FREE MOVEMENT OF DATA FOR THE PROPER FUNCTIONING OF CONNECTED CARS IN THE EU

Since the European Union composes of 28 Member States, a coherent and comprehensive approach towards certain matters is required. The free movement of data is important for the EU data economy and the internal market. Moreover, if connected cars are allowed on public roads, they have to be able to drive in every Member State. Therefore, issues concerning the free movement of data and connected cars should be regulated on the EU level. Harmonisation is necessary since if every Member State decides to regulate the issues of data movement themselves, the EU will become fragmented and there will be no coherent approach towards the regulation of connected cars. The deepening of the internal market and facilitating the free movement of non-personal data cannot be achieved by the Member States at a national level due to being an issue of cross-border data movement.[215] Therefore, the regulation of the free movement of such data has to be done on the supranational level since a different approach by the Member States would lead to the fragmentation of the internal market. Moreover, connected cars have to be regulated on the EU level also in order to ensure the same treatment of these cars, otherwise connected cars are allowed in one Member State but not in the other which would be harmful to the internal market and the deployment of connected cars within the EU.

The free movement of data, especially non-personal data should be firstly regulated on a non-legislative basis in order to move forward slowly and not making any rapid changes, otherwise, innovation and ultimately the deployment of connected cars may suffer. It would be beneficial to begin with guidelines, frameworks, principles since milder regulation is advisable for connected cars. These cars are considered as future technology.[216] Therefore, harsh regulation would be detrimental to newly developed and still developing technology. Moreover, the regulations and laws developed now are mostly future looking, meaning that they are developed now but are meant

[215] Commission Staff Working Document (2017), *supra nota* 166, p 4.
[216] Holder, C. *et al.* (2016). Robotics and Law: Key Legal and Regulatory Implications of the Robotics Age (Part I of II). – *Computer Law & Security Review*, Vol. 32, No. 3, p 384.

to regulate technologies still being developed.[217] Therefore, if strict laws and legislative measures are developed from the beginning, it will be difficult to amend these rules since the technology changes so quickly but laws are rather slow in catching up, moreover the creation of proper legislation requires time.[218] Hence, flexible measures need to be developed that would be able to adapt and flow with technological developments.

The free movement of data includes the free flow of data, data portability and data accessibility. In the context of connected cars, all these categories are important. In order to enable the functioning of connected cars, the free movement of data, especially non-personal, needs to be facilitated. Therefore, it is important to

1) establish clear rules, concrete definitions and rights for data movement, data portability and data access;
2) find a balance between the independent nature of companies and the availability of and access to data;
3) establish a balance between strong legislative measures and too weak rules in order to ensure consistency and functioning of the free movement of non-personal data that would at the same time respect and facilitate innovation;
4) avoid establishing the concept of ownership, rather consider developing the principle of data openness for interested parties;
5) enable access to data for the public sector based on principles of public interest data and data of general interest.

Conclusively, the author proposes the following options:

Option 1 – an overall framework for the free movement of non-personal data that should be able to apply to connected cars. In order to achieve this, the following steps should be established:

1. Extend data portability to businesses and companies based on the right in the GDPR alongside with broadening the data portability of non-personal data to include the possibility to access the relevant data and transmit it between different parties. Moreover, non-personal data should be available to everyone who has been a part of the creation of the data (such as manufacturers, owners) and everyone who requires the data (such as service providers, public sector, insurance).

[217] Turk, *supra nota* 5, p 6.
[218] Holder, *supra nota* 216, p 384.

2. Develop rules on the re-use of private sector non-personal data that are balanced between the necessity to use the data and the independent nature of the companies in order to facilitate the potential use of data and not hinder innovation and technological development.

3. Develop a legislative framework composing of rules on the re-use of and access to data which are based on bilateral contracts including EU established model contract terms. Therefore, it is necessary to adopt measures for the re-use of and access to private sector data.

4. The concept of non-personal data in the overall framework of the free movement of data should be universal, defined as machine-generated data which means that the definition of non-personal data is developed further for every sector. Since non-personal data can have different concepts and include different types of data, machine-generated data can be sector-specific and adapted accordingly.

Option 2 – specific framework concerning the free movement of non-personal data for autonomous and connected technologies. In order to achieve this, the following steps should be established:

1. In order to establish a framework for the free movement of non-personal data, the right of data portability should be extended to businesses, especially manufacturers and developers of automated and connected technologies. Developing data portability could be based on the right provided by the GDPR so that manufacturers have the right to port their data to each other and to interested parties on a cross-border basis, and to the public sector while car owners would have the right to receive data and share it to service providers. Moreover, data portability could be the enabler of receiving and accessing data from the car. Therefore, data portability could be as a mean to guarantee and enable access to data for third parties such as the service providers.

2. In the context of automated and connected technologies, data portability should be extended also specifically to the technology so that data movement between the devices is enabled. Therefore, the concept of sector-specific data portability of non-personal data for automated and connected technologies could be established.

3. Develop a framework for access to non-personal data based on sector-specific rules regarding automated and connected technologies. Hence, the EU should consider establishing data accessibility as a legislative principle and a right for interested parties not as an obligation of the manufacturers. Access to data is granted based on contracts that are developed through standard contract terms by the EU in order to ensure the openness of data and equal treatment of all parties while protecting companies' competitiveness and self-sufficiency.

4. Adopt relevant measures for the re-use of and access to private sector data, hence opening private sector non-personal data up for re-use. In the context of automated and connected technologies, the reusability of data would apply to service providers, new product developers, the public sector and other interested parties.

5. Consider defining non-personal data on the EU level as machine-generated data. The definition should have specific conditions when the data is considered fully non-personal. Moreover, the definition could be sector-specific regarding transportation industry or more specifically automated and connected technologies.

Consequently, a new framework on the free movement of non-personal data regarding automated and connected technologies may be the best solution since a comprehensive EU approach towards connected and automated mobility would set out clear rules and ensure that the EU legal and policy frameworks support the deployment of connected mobility, hence connected cars.[219] However, the framework should lay down what is considered to be automated and connected technologies. It would be too narrow and overlapping to create frameworks for different automated technologies independently since not only cars can be autonomous and connected, therefore it would be beneficial and reasonable to regulate the whole industry, moreover, it may allow more interpretation and freedom for these technologies.[220]

Option 3 – amend existing laws to include non-personal data movement, access and portability which could potentially be enough to fit into the context of connected cars and regulate them. In order to achieve this, the following steps should be established:

1. Amend the relevant legislation such as the Services Directive, Unfair Contract Terms Directive and Intelligent Transport Systems Directive to include non-personal data. Services Directive should include access to data, especially non-personal, in order to provide services and enable the free movement of services. The Unfair Contract Terms Directive could be extended to business relations and therefore, include contract terms that apply in the accessibility of data in a business-to-business context. The Intelligent Transport Systems Directive could be amended to include the right of public authorities to access private data in order to deploy and use intelligent transport systems in the European Union.

[219] Communication from the Commission (2018), *supra nota* 9, p 2.
[220] Turk, *supra nota* 5, p 7, 84-85.

2. The Regulation on the free flow of non-personal data should be amended to include data portability between private entities and the accessibility of non-personal data held by one entity. Moreover, the Regulation should include the possibility of data movement between technological devices in order to enable connected cars to exchange relevant non-personal data.

Even though there are many possible directives and regulations that may be adapted to connected cars, a simple framework for the free movement of data including data accessibility, sharing and the re-use of data, data movement and portability could be the most beneficial and avoid a situation where legislation regulating connected cars is fragmented and various elements can be found in different laws. Consequently, it may not be enough to amend existing legislation to adapt them to connected technologies since it can possibly leave too much room for interpretation and not regulate the issues as thoroughly as required. Concrete legislation on these technologies would enable the best use of the potential of non-personal data and facilitate the deployment of connected cars.[221]

Therefore, the author considers that the best option of the proposals put forward is a sector-specific legislative framework providing the principle of the free movement of non-personal data for automated and connected technologies. The framework should be comprehensive and include all relevant aspects concerning the possibility of data portability for manufacturers, third parties and connected cars, the right to data accessibility for third parties, the re-use of data for the public sector and third parties and an appropriate concept of non-personal data regarding automated and connected technologies.

[221] European Commission, *supra nota* 83.

CONCLUSION

The aim of the thesis was to explore the free movement of data concept in the European Union, specifically regarding non-personal data and in particular two aspects, data localisation requirements and data portability. Moreover, the thesis examined the importance of data accessibility and the re-use of data for connected cars. The main purpose of the paper was to analyse whether and why the free movement of data is relevant for the functioning of autonomous and connected cars, especially non-personal data and what has been done in the European Union to facilitate it. As an outcome, the thesis verifies whether the free movement of data acts as an enabler for the functioning of autonomous and connected cars and what further measures have to be adopted to ensure the free movement of data.

The author firstly introduced the concept of autonomous cars and its further advancement, connected cars. While autonomous cars are capable of driving independently, connected cars are based on connectivity and are intended to communicate with each other and with the infrastructure through exchanging non-personal data such as the vehicle's speed, heading, weather conditions and obstacles in order to operate on the roads. Additionally, connectivity enables manufacturers to use the non-personal data for diagnostics and product improvement, and accessibility to data enables third parties such as the service providers, the product developers, advertisement and public authorities to use the data for necessary purposes such as offering services, developing new technologies and evaluating traffic safety and managing traffic. Therefore, data produced by the connected car has to move and be accessible which showcases the importance of focusing on the free movement of non-personal data. The removal of unjustified data localisation requirements and enabling access and portability of non-personal data are relevant aspects in the context of connected cars since they permit data movement, data exchange and accessibility of data.

The thesis concluded that the removal of data localisation requirements is important for connected cars since it means manufacturers and other relevant companies can store and process non-personal data anywhere in the European Union and they can share the data with third parties in the different Member States. Additionally, when connected cars move between the Member States, data

produced and collected by the car can also move freely and the processing of data can occur in that Member State. Moreover, the removal of these requirements enables the freedom to provide services and the free movement of goods and people. The second important aspect, data portability, is granted for personal and non-personal data, however, regarding the latter, it allows portability for professional users who wish to change their service providers. Consequently, the Regulation is beneficial for the functioning of connected cars since manufacturers could simply change the location of their data which facilitates the cross-border data movement, however, it is not enough to fully support connected cars. Even though the Regulation on the free flow of non-personal data enables the cross-border movement of connected cars and non-personal data and data portability, there are no frameworks that would regulate the free movement of data between the cars and the surrounding environment since they also process the data. As data portability is important for connected cars since it enables manufacturers to share their data, allows access to data for third parties and facilitates data movement between connected cars and the infrastructure, it is necessary to adopt a legal framework regulating such matters by enabling this type of portability.

The thesis explored a third rather important aspect for the functioning of connected cars. Sharing and the re-use of public data is ensured in the European Union and although non-personal data produced by connected cars could be reused in order to provide services, develop enhanced cars and manage traffic, there is no legislation for the re-use of private sector information, only guidelines by the Commission. Consequently, the European Union should regulate the re-use and sharing of private sector information by laying down a framework for private sector data. Additionally, data accessibility is an important aspect of the free movement of data and the deployment of connected cars, therefore, non-personal car data has to be accessible for third parties. In order to protect companies' competitiveness, independence and contractual freedom, the EU should regulate the access to data through legislative guidelines and standard contract terms to, on one hand, ensure necessary access to data and, on the other hand, not deter companies from innovating and developing technological products in the EU.

A problematic aspect is also the concept of non-personal data since there is no definition or explanation what constitutes non-personal data other than the aforementioned Regulation which defines it as data other than personal data as referred to in the General Data Protection Regulation. Therefore, due to the lack of a proper understanding of non-personal data, vehicle data can be considered as personal if the manufacturer controlling the data has additional information concerning the person which enables to identify the person. Hence, a vague notion of non-personal

data may allow too much interpretation and thus it is important to establish precisely the definition of such data.

The author assessed the following hypothesis: **Without a proper legal regulatory framework enabling the free movement of data, the European Union fails to introduce connected cars and loses its competitiveness in the innovative transportation industry.** As a result of the thesis, the hypothesis was confirmed since autonomous and connected cars are considered to be the future technology and the EU is aiming to be innovative in order to become the leader in automated mobility. However, there are no legal frameworks that would enable the free movement of non-personal data which consequently means that there cannot be a proper framework for autonomous and connected cars. Therefore, without a proper legal regulatory framework, the EU cannot deploy connected cars and consequently may lose its competitiveness. The free movement of data consists of personal data and non-personal data, the former is actually enabled already by the European Union. Even though the thesis did not focus on the importance of personal data regarding connected cars, it is an inevitably important factor for the functioning of connected cars and as the thesis concluded, non-personal data is also crucial for connected cars. Consequently, they together form the free movement of data which in overall is an important enabler of the functioning of autonomous and connected cars.

Although, the framework for the free movement of data has to be developed, facilitated and regulated on the EU level since data movement is crucial for the EU data economy and the internal market. In order to provide a comprehensive framework that would enable the free movement of data in every Member State, it is important for the EU to take a supranational approach. Moreover, connected cars should be able to drive in every Member State and therefore the free movement of data should be regulated on the EU level to ensure a common approach to the regulation and the functioning of connected cars in every Member State and avoid fragmentation of the internal market. However, the European Union has to consider whether to adopt strict regulations or more flexible and softer rules since the former may have a chilling effect on innovation and decrease companies' incentives to develop technological devices in the EU while the latter may simply not be enough to regulate connected cars comprehensively and thoroughly.

The author has concluded that there are three different options to tackle the issue of the free movement of data. Firstly, an overall framework for the free movement of non-personal data which has to apply to connected cars. Secondly a sector-specific approach to the free movement of non-personal data concentrating on automated and connected technologies and regulating the free

movement of non-personal data from the point of view of these technologies. Thirdly, a possibility to regulate the matter through existing legislation such as the Services Directive for the free movement of services which could include access to data, Unfair Contract Terms which could be adapted to business relations and include contract terms for data accessibility, the Intelligent Transport Systems Directive which could include the right of public authorities to access private data and the Regulation on the free flow of non-personal data for data localisation and data portability. However, an overall framework may be too vague and not regulate connected cars comprehensively and coherently enough while amending the existing legislation may leave too much room for interpretation and also not regulate the issues as thoroughly as necessary.

As the hypothesis proves, there is a need for a proper legal regulatory framework enabling the free movement of non-personal data in order to stay competitive and introduce connected cars on the roads, hence the author proposes to adopt a sector-specific legal framework enabling the free movement of non-personal data regarding automated and connected technologies, including the following steps. Firstly, establishing an overall sector-specific data portability by extending data portability to businesses, especially manufacturers and developers of automated and connected technologies in order to provide a possibility to port and share data to all interested parties, and to data movement between cars and the infrastructure in order to enable the communication between the cars and the infrastructure. Secondly, including in this framework accessibility to non-personal data which could be a granted under a legislative principle and a right for interested parties to gain access through contracts developed based on standard contract terms established by the EU. Thirdly, incorporating means for the re-use of private sector data into data accessibility, for example, for the public sector concerning data of public interest. Lastly, since there is no concept of non-personal data, it is necessary to establish what constitutes non-personal data in the context of automated and connected technologies, therefore, non-personal data could be defined as machine-generated data which is further specified for the transportation industry.

The author sees potential for further research possibilities. From the point of view of connected cars, further research could include the examination of other issues regarding these cars such as legal frameworks for liability questions. From the point of view of the current thesis, future research could analyse the impact of different legal proposals and solutions regarding the free movement of non-personal data to the actual functioning of connected cars. Moreover, the topic could be developed further by assessing the compatibility of EU laws with other countries' laws in order to enable connected cars to drive outside the EU.

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