

# INEQUALITIES IN THE LABOUR MARKET AND IN THE EDUCATION SYSTEM IN THE CONTEXT OF CURRENT SOCIAL CHANGES FOR A SELECTED SECTOR IN THE SLOVAK REPUBLIC

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## Nerovnosti na trhu práce a vo vzdelávacom systéme v kontexte súčasných sociálnych zmien vo vybranom sektore v Slovenskej republike

***Abstract:** The presented paper analyzes the sector of transport, logistics, and postal services in the Slovak Republic in terms of inequalities in the labour market. In the first part, the author deals with the impact of innovation on human resources in the sector (describes the most important innovations for the sector in the coming years and gives an example of the impact of these innovations on human resources) and then points to labour market disparities due to staff shortages and high outflows. graduates to other sectors. For the purposes of the paper, the author's analyzes were evaluated in cooperation with an expert team, which is created within the national project Sector-Driven Innovation. The author of the paper is directly involved in the implementation of project activities and participates in the research of changes in the labour market caused by incoming innovations. These results are analyzed in combination with the national project Labour Market Forecasts II, the data of which point to disparities in the labour market in this sector. Through cooperation with representatives of the most important sectoral companies operating in the Slovak Republic, it is possible to indicate the highly real impact of innovations on the labour market over the next 10 years. Such findings are one of the most important sources for changes in the education system, which on the one hand prepares the future workforce for this sector and for relevant institutions providing lifelong learning to people who might otherwise be at risk of future changes.*

**Keywords:** Forecasting, Innovation, Labour market, Education

**JEL Classification:** J01, O33

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## 1 Introduction

It is one of the largest consumers of energy and has a significant impact on the environment. At the same time, however, it is one of the key necessities of the socio-economic development of society. We are talking about the transport sector, which is essential for ensuring the mobility of the population and the supply of goods and services. In addition, the sector is important for enabling economic growth and providing a significant share of jobs in the labour market. The transport, logistics and postal services sector represents 6.75% of total employment in the national economy of the Slovak Republic, making it one of the medium-sized sectors. In numerical terms, this share represents more than 137,000 employees (Trexima Bratislava, 2019). Despite the strong representation of education in the group of departments 37 (Transport, Post, Telecommunications), this sector is unable to capture even half of its graduates and thus ensure their application in practice. Therefore, not only in the Slovak Republic, but also in the European area, there is a public debate about the future of work and the education and training of students. The whole world is currently facing unprecedented challenges – pandemic, economic, social and environmental. Closely related to this are changes in the labour market due to migration, digitalisation and the unfavourable demographic situation. Although the author Rievajová (2009) claims that the aging of the population is not a big threat (because it will create a complex of new jobs), we must pay great importance to this area in Slovakia. The analysis of the impacts of a phenomenon such as Industry 4.0 must be carried out comprehensively. Previous statements by experts from international institutions often very generally characterize the impact of new innovative trends on employment. An example is the OECD (2018) study, which states that up to 70 percent of jobs in Slovakia are threatened by robotics and production automation. This statement is based on the results of a survey focused on the skills of employees in Slovakia. But can this survey capture all the sectors truthfully enough? How will the nature of the work of employees in the surveyed sector change by ten years? Are there almost 100,000 employees at risk in this sector? If we are to work with such information, it is necessary to examine in detail the impact of innovative changes in the sector and to determine the real impact of these changes in the conditions of companies operating in the Slovak Republic. Innovative changes bring with them a significant change in the workload of the work. (EC 2010 Europe 2020, A Strategy for smart, sustainable and inclusive growth) If their significant impact is confirmed, another question

needs to be answered – how should future high school and university graduates focusing on the transport, logistics and postal services sector prepare for the performance of their future jobs? What trends do schools need to incorporate into their curricula in order to prepare their students to work with innovation? Is the sector only threatened by innovative changes in the future, or will it have to deal with a shortage of future employees? The author will try to answer these questions in the presented study, which draws mainly from two national projects implemented in the conditions of the Slovak Republic. The author is a direct member of a working group representing the sector, within which, together with members, they have long been dealing with issues of changes in the labour market. In examining the impact of innovative changes on job performance, the author evaluates real information from representatives of the most important companies operating in the sector, such as Slovenská pošta, a.s., Železničná spoločnosť Slovensko, a.s., Národná diaľničná spoločnosť, a.s., Združenie prevádzkovateľov MHD, etc. They are members of the Sector Council within the national project Sector-Driven Innovation, the main goal of which is to identify requirements for job performance, analysis of changes in the workload of human work and transfer of findings to the education system<sup>2</sup>. This paper highlights the impending impact of innovative and technological changes in transport and other related services.

In the second part of the paper, the author deals with the employment of graduates of the relevant fields of study. It is important to note that disparities on the labour market are an increasing problem in the Slovak Republic. In practice, this means that a graduate of a study field focused on transport will work outside his field and work e.g. as an employee in a car factory. Such disparities ultimately point to the problems of the education system, as well as to the lack of employment policies that would ensure the transition of graduates to employment in the sector.

The education system in the Slovak Republic should be considered the engine of the development of the knowledge society. In the short term, we will witness the most turbulent period on the labour market in the Slovak Republic. However, the impact of the pandemic will be short-term and, in the long term, the economy will be coping with negative effects. We must be prepared to take

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<sup>2</sup> Representatives of major companies in the sector are members of the Sector Council for Transport, Logistics, and Postal Services. The author of the paper is the secretary and coordinator of this working group. The complete list of members of the Sector Council is available on the following website: [https://sustavapovolani.sk/sektorova\\_rada-20](https://sustavapovolani.sk/sektorova_rada-20)

this opportunity to attach great importance to the transfer of knowledge gained in the education system into practice. It is one of the key tools for securing an emerging economy in the long term.

## 2 Methodology

The presented paper and its results are based on a long-term research by the author, who within the Sectoral Council for Transport, Logistics, Postal Services<sup>3</sup> examines the impact of innovations in the sector on human resources. The aim of the research is to fulfill the goal of the national project Sector-Driven Innovations – to transfer all findings to the educational process and to prepare better prepared graduates in the future. The author collaborates on the creation of a unique database of innovations and then, together with experts in the Sector Council, transfers these findings to the competence model of selected sectoral jobs (identification of new professional knowledge and skills for employment). The contribution of the author is in the identification of changes through interviews and several personal or online meetings with representatives of the most important companies in the sector. During these interviews and meetings, more than seventy specific innovations in the sector were identified, which can have a significant impact on employment in the Slovak Republic. The main contribution of the paper is the presentation of the results of the professional work of the Sector Council for Transport, Logistics, and Postal Services. Ensuring the transfer of these requirements is guaranteed by the social partners in the Slovak Republic, who are part of the project.

The National Project Forecasts of Labour Market Development in the Slovak Republic II under the authority of the Ministry of Labour, Social Affairs and Family of the Slovak Republic in accordance with the National Reform Program of the Slovak Republic 2019 implements short-term and medium-term labour market forecasts in close cooperation with employers from all sectors of the national economy and declining job opportunities, quantification of short-term and medium-term mismatch in the labour market and the

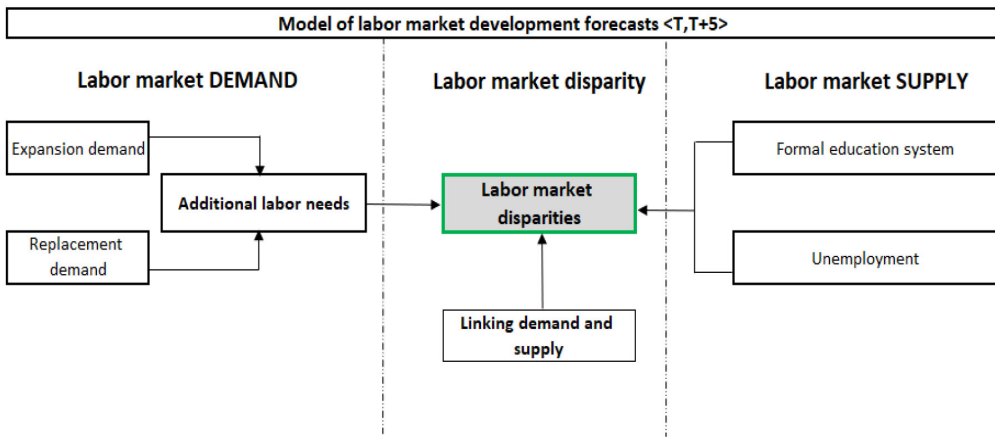
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<sup>3</sup> The starting point for the creation of the presented paper is the National Project of Sector-Driven Innovation. The urgency of solving the problem of low flexibility of the education system, the absence of an objective and comprehensive description of labour market requirements applicable to the formation of appropriate educational programs has resulted in the implementation of this national project. In Act no. 5/2004 Coll. on employment services and on the amendment of certain laws as amended, this system of the national project is defined as the basic system framework for the creation of a systemic solution for the transfer of labour market needs to the system of lifelong learning.

resulting recommendations for the labour market in the Slovak Republic and its individual regions.<sup>4</sup>

Combining the findings of both above national projects creates a comprehensive picture of the sector in terms of the education system and the labour market. Labour market forecasts in comparison with the preparation of graduates in each sector can accurately assess the state in which the sector is now and in which it will be in the short term five years. This important information must clearly be the most important basis for changes in the education system.

### Scheme 1: Methodology for forecasting labour market developments



**Source:** Nation-wide project “Prognózy vývoja na trhu práce v SR II.”, Trexima Bratislava, author’s processing

The additional labour force needs consist of two basic parts:

#### *Labour market needs due to replacement demand*

- Stochastic models
- An estimate of the probability of leaving the labour market in individual occupations, sectors, regions by sex and age

#### *Labour market needs due to economic development (expansion demand)*

- International input-output model

<sup>4</sup> European Commission, January 14<sup>th</sup>, 2020. A strong social Europe for just transitions - requiring national and regional authorities in each Member State to EU Member States for the purposes of credible characteristics of the expected needs and requirements of the labour market to work intensively with those who, on the basis of their own economic activity, can credibly anticipate future developments, especially with representatives of employers, employees, as well as with employment service workers and their partners in the field education and training for the labour market.

- Econometric models (development since 2001)
- Field surveys on expected developments in companies; for self-employed persons; investments; for students
- Official macroeconomic forecasts of the Ministry of Finance of the Slovak Republic
- Soft data from sector experts

### **3 Impact of Innovation on Human Resources in the Sector until 2030**

#### **3.1 Monitored development of changes in the number of employees**

Trexima Bratislava is a statistical research company that has been conducting statistical surveys in the field of the labour market for almost thirty years and is a relevant national and international partner for many public and private institutions. From the available data of the company in question, it is possible to analyze unique information, e.g. on the number of persons employed in specific positions, broken down by age, sex, education, region, etc. In the case of long-term collection of this data, it is possible to analyze and interpret changes in the labour market in any existing sector of the national economy. For the purposes of the paper, the author used available data on the development of employees in the sector for the years 2012 to 2019. Data for the transport, logistics and postal services sectors were analyzed.

In the monitored period, the most significant decrease in the number of employees in the following job positions was identified: Technician, controller in railway transport – in the given job the number of employees decreased by approximately 0.9 thousand persons for the last seven years, which represents a decrease of 57%. Other significant decreases were recorded in jobs such as Forklift Operator (decrease of approximately 500 employees), Technician, Railway Infrastructure Controller (decrease of approximately 400 employees), Railway Administrative Worker (decrease of approximately 400 employees) and Postal Delivery and Worker courier and postal services not elsewhere classified (decrease by about 300 employees).

On the contrary, the highest increase in the number of employees in the transport, logistics, postal services sector recorded low-skilled jobs such as Warehouse Worker Warehouse Worker) – an increase of more than nineteen

thousand employees; Driver of a truck (increase by approximately four thousand employees), or Administrative worker in logistics (increase in the number of employees by more than two thousand).

Already these initially identified changes in human resources may indicate innovative trends that are slowly but surely entering our labour market. It does not matter whether we analyze robotization as one of the most significant innovations in these years, or automation, which brings with it significant changes in the nature of work. In the following part, the real findings of the author focused on specific innovation trends in the monitored sector will be presented.

### 3.2 Key innovation trends for the future of the industry

The authors Blomström, Kokko and Sjöholm in their study (2002) point to these findings, which are one of the starting points for analysing innovation trends: *“Depending on the economy’s starting point, technical progress and growth can be based on creation of entirely new knowledge, adaptation and transfer of existing foreign technology, or a mix of the two.”*

To identify innovative trends in the sector and analyze their impact on human resources, the author draws on research conducted within the Sector Council. In the past period, members have defined twelve categories of the most significant innovation trends that will have a significant impact on employment in the sector. Their list is as follows<sup>5</sup>:

- 3D technologies and materials
- AI (artificial intelligence)
- Alternative fuels and drives
- Automation
- Big Data
- Digitization
- Digital security
- Drones
- Internet of Things (IoT)
- Robotization
- Development of information technologies
- Smart technology.

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<sup>5</sup> Findings of the author within the Sector Council for Transport, Logistics, Postal Services.

It is also possible to add specific wording of innovations to individual categories and examine their impact on selected jobs. It is important to note that specific jobs may not disappear due to innovation. Employment as such will in most cases continue to be part of the labour market in the sector, but we can expect a change in the professional skills and expertise for which current and future employees must be prepared. (EC 2010, An Agenda for new skills and jobs: A European contribution towards full employment) In examining each of the above topics, we have been able to identify dozens of specific innovations and determine their impact on selected jobs. One of the most widespread innovations is the topic of artificial intelligence, for which the authors identified a specific example of innovation and its impact on human resources:

*“Autopilots in traction rail vehicles”* – in the future, the automated system will take control of the vehicle throughout the journey or only for a certain stage of the journey, (with or without human supervision). In addition to autonomous operation, autopilots in traction units will evaluate a number of other safety, economic and environmental objectives while driving. The safe and reliable operation of such systems requires a series of sensors that measure the vehicle’s surroundings (position, obstacles), a reliable and secure connection between other vehicles and the appropriate infrastructure.

Among the professional knowledge that future graduates of relevant fields of study will have to learn are, for example:

- automated system of control over means of transport during their performance on the road by the driver or without him,
- automated system of predictive maintenance of vehicles,
- communication software configuration procedures,
- procedures for using intelligent transport systems,
- procedures for using network technologies,
- ways to automate activities related to the operation of vehicles and related infrastructure,
- ways of setting up and using automated systems,
- ways to use the 5G network,
- artificial intelligence systems in the operation of vehicles,
- ways to automate customer communication activities,
- the methods of setting up and carrying out autonomous operational and control centres,



- methods of automated system of control over means of transport during their performance on the road without driver,
- ways of application, management and control of transport systems through artificial intelligence,
- ways of using digital services for passengers.

As mentioned in the introduction to the paper, it is expected that in the next 20 years, it will be possible to replace approximately 69 % of the work processes currently performed by employees. If we reflect this on the current number of employees in the sector, up to 147.2 thousand employees could be substituted. Of this, the majority will consist of employees in job positions 4321001 Warehouse Worker (Warehouseman), 8332001 Truck Driver and 8344000 Forklift Operator.

To ensure consistency between supply and demand for jobs, it is crucial that employers' requirements for filling vacancies by qualified employees, including graduates, are systematically transferred to education and training for the labour market, with regular monitoring and evaluation of graduates' employment results in the labour market (AZZZ SR, 2020). The importance of the preparation of future graduates in the context of innovations and requirements is also confirmed by the author Van den Berg (2001) *“it is the quality of the labour force, its accumulated experience and human capital, its education system, and so on, that determines an economy's ability to create new ideas and adapt old ones”*.

## **4 Labour Market in the Transport Sector Now and in the Future**

Studies of the national project Forecasts of Labour Market Development in the Slovak Republic II (2018) shows that most employees in the transport, logistics and postal services sector had the department of education graduated 2466 Mechanic repairman in 2019<sup>6</sup>. In the school year 2018/2019, 224 full-time students studied in this field. In the Slovak Republic, a total of 205 – 305 full-time graduates from this field of education will enter the labour market in the period 2020 – 2025, while approximately 19 % of graduates work in the transport, logistics and postal services sector. Most graduates of this field of education will enter the labour market in 2020. Approximately 8 % of employees in this sector have a degree in education 2466 Mechanic repairman.

<sup>6</sup>Unified numeric code of a specific department.

The second key department of education in terms of the number of employees is department 7902 Grammar School. In the school year 2018/2019, 70 427 full-time students studied in this field. In the period 2020 – 2025, a total of 33 879 – 35 879 full-time graduates from this field of education will enter the labour market, while approximately 8 % of them are expected to work in the transport, logistics, postal services sector. Most graduates will enter the labour market in 2025. Approximately 4 % of employees in this sector have a degree in education 7902 Gymnasium.

**Table 1:** Number of graduates entering the labour market from key fields of education in the sector in the period 2019 – 2024 in the Slovak Republic

Code and name of the field of education	ISCED <sup>7</sup> level of education	Number of students in the field in 2018/2019	Number of graduates entering the labour market in years 2020 – 2025	Proportion of graduates working in the sector in 2019 out of the total number of graduates in the department	Proportion of employees with a completed department of education out of the total number of employees in the sector <sup>8</sup> in 2019
2466 Mechanic	355	224	205 – 305	19.30 %	7.60 %
7902 Grammar school	344	70 427	33 879 – 35 879	8.20 %	4.40 %
6317 Business Academy	354	10 632	5 546 – 6 546	6.70 %	3.60 %
2683 Electrical Engineer	352	966	1 174 – 1 374	12.50 %	2.20 %
2672 Electronics Mechanic	354	0	0	9.40 %	2.10 %
2414 Engi- neering	354	553	1 389 – 1 589	10.90 %	1.80 %
2413 Mechanic of machines and equipment	354	1 185	1 389 – 1 589	10.70 %	1.80 %

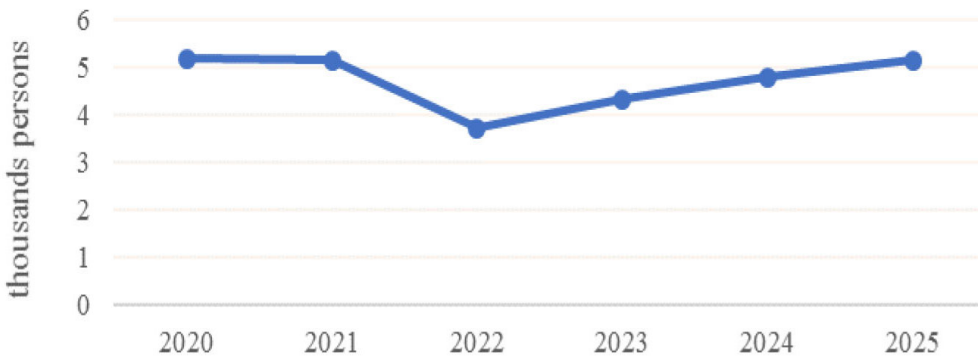
**Source:** Nation-wide project “Prognózy vývoja na trhu práce v SR II.”, Trexima Bratislava, author’s processing

<sup>7</sup> ISCED is the reference international classification for organizing education programs and related qualifications by levels and fields.

<sup>8</sup> Sector of transport, logistics and postal services

The total additional need in the transport, logistics, and postal services sector will be at the level of approximately 28 thousand people by 2025, of which most in 2020 and at least in 2022. When analyzing the additional labour force needs, it is important to know how additional job opportunities arise in the labour market. The largest number of vacancies due to the exit of the labour market (especially into old-age pensions) will have to be filled in 2025. The highest expansion demand is expected in 2020.

**Graph 1:** Development of the total additional labour force needs in the sector of transport, logistics, and postal services in the period 2020 – 2025



**Source:** Nation-wide project “Prognózy vývoja na trhu práce v SR II.”, Trexima Bratislava, author’s processing

The additional labour force demand is the sum of the expansion demand for labour and the replacement demand of labour. The additional need for employees in the future represents a requirement to supplement the workforce with jobs that will not be possible to fill from currently employed persons.

**Table 2:** Total additional manpower needs and replacement demand according to occupation SK ISCO-08 with the highest additional manpower need in the sector transport, logistics, and postal services

Employment SK ISCO-08 <sup>9</sup>	Additional labour force needs in the Slovak Republic in the period 2020 – 2025	The share of replacement demand in the Slovak Republic in the period 2020 – 2025	Additional labour force needs in the sector in the period 2020 – 2025
8332001 Lorry drivers	11 718 – 13 718	44 %	7 233 – 8 233
8331001 Bus drivers	2 699 – 2 899	73 %	2 582 – 2 782
8332005 Truck drivers	1 742 – 1 942	44 %	1 503 – 1 703
4321001 Warehouse worker (warehouseman)	7 333 – 8 333	40 %	1 300 – 1 500
8311001 Driver in railway transport	911 – 1011	73 %	859 – 959

**Source:** Nation-wide project “Prognózy vývoja na trhu práce v SR II.”, Trexima Bratislava, author’s processing

#### 4.1 Where are graduates of departments focused on transport, logistics, and postal services employed?

Disparities on the labour market can also be monitored in detail in the transport, logistics and postal services sectors. Of the total number of graduates in the corresponding fields of education, only about 28 % are employed in this sector. The remaining graduates find their employment in other sectors, which can be explained, for example, by better salary conditions. However, the employment of graduates outside this sector causes a significant shortage of the necessary qualified workforce, which has long been reflected in selected positions.

**Table 3:** Proportion of graduates working in the sector out of the total number of graduates in selected fields

Code, name of department, level of education	Sector name	Proportion of graduates working in the sector out of the total number of graduates in the field
3744 Road transport – complete	Business, marketing, gastronomy and tourism	36 %
	Automotive and mechanical engineering	16 %

<sup>9</sup> SK ISCO-08 represents the national classification of occupations based on the international classification ISCO-08.

secondary vocational education	<b>Transport, logistics, postal services</b>	<b>12 %</b>
	Construction, geodesy and cartography	11 %
	Public services and administration	10 %
3702 Transport services – 2nd. university degree	Information technology and telecommunications	20 %
	Automotive and mechanical engineering	16 %
	<b>Transport, logistics, postal services</b>	<b>13 %</b>
	Public services and administration	9 %
	Business, marketing, gastronomy and tourism	9 %
3704 Postal services – 2nd. university degree	Business, marketing, gastronomy and tourism	60 %
	Automotive and mechanical engineering	8 %
	<b>Transport, logistics, postal services</b>	<b>7 %</b>
	Construction, geodesy and cartography	7 %
	Science, research, education, training and sport	4 %
3730 Railway transport – 2nd. university degree	<b>Transport, logistics, postal services</b>	<b>43 %</b>
	Public services and administration	15 %
	Automotive and mechanical engineering	10 %
	Science, research, education, training and sport	6 %
	Business, marketing, gastronomy and tourism	6 %

**Source:** Nation-wide project “Prognózy vývoja na trhu práce v SR II.”, Trexima Bratislava, author's processing

## 4.2 Analysis of endangered occupation in the sector

In order to demonstrate the impact of the introduction of new technologies and innovations directly in transport, in the example below we will evaluate the potential threat to the selected job position. For the purposes of this evaluation, we have chosen the job Treasurer and ticket seller in public passenger transport, which has the national job classification SK ISCO-08 number 5230004. The above technological changes in the field of digitization will most likely have a strong impact on the threat of low-skilled positions, such as the position of treasurer and ticket vendor in public passenger transport. One of the highest impacts of digitization and automation in this job position may be the replacement of the human workforce by robots and machines that will be able to provide full customer service.

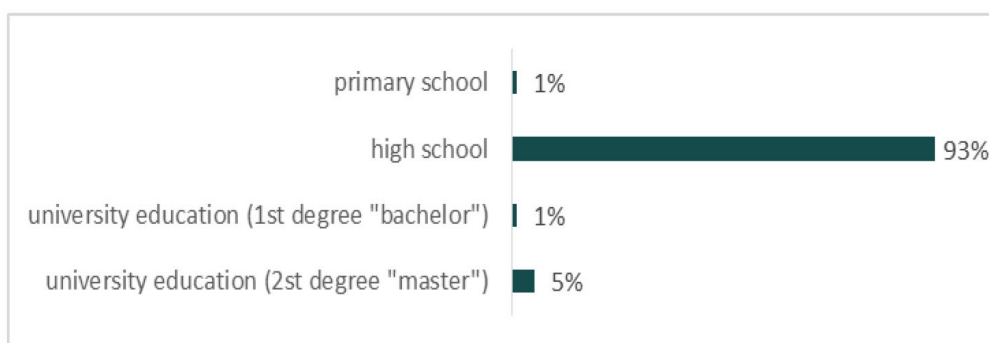
For the purposes of evaluating the selected job, we chose three main elements of the structure:

- level of education of employees working in the position in question
- age structure of persons working in the position in question
- place of performance of the job position broken down by region.

The total number of working employees (data as of 4Q 2019) for the position of Treasurer and ticket seller in public passenger transport is 934. The average monthly gross salary for these employees is at the level of EUR 996. The average age of employees in this position is 48 years.

The educational level of employees in this position has the following structure and representation:

**Graph 2:** Development of the total additional labour force needs in the sector of transport, logistics, and postal services in the period 2020 – 2025



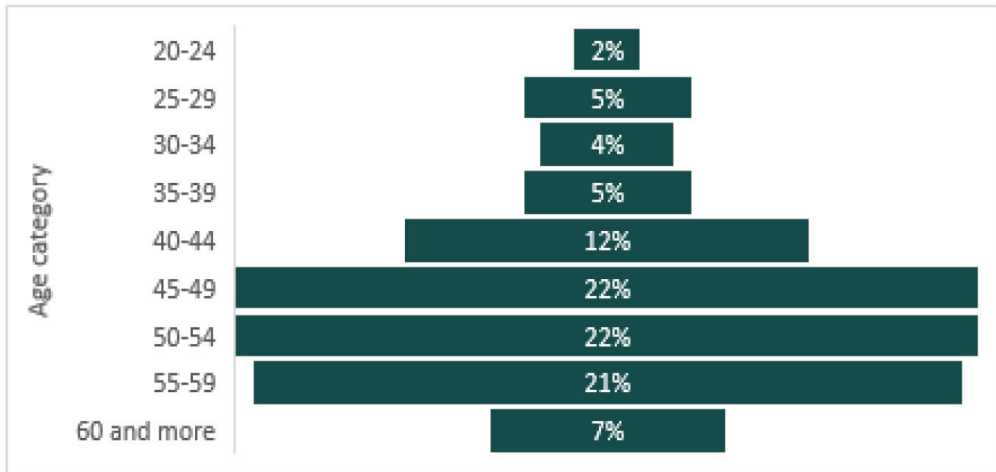
**Source:** Statistical survey on labour costs (ISCP (MPSVR SR) I-04), Trexima Bratislava, Period: 4Q 2019

The highest number of employees is a cashier and a ticket seller in public passenger transport in the Žilina and Bratislava regions (total approximately 32 %). On the other side, the lowest number of people employed in this position is in the Trnava region.

The impact of new technologies will have a significant impact on human labour. Apprehension for the loss of millions of jobs worldwide could materialize in the coming years. Those employees who are unable to adapt to the changes in time will be most affected by these changes. Age plays an important role in this area.

More than 70% of all employees in the position of Treasurer and Ticket Seller in public passenger transport are over 45 years old. In the case of the impact of automation on reducing the number of jobs in this job, it is also necessary to consider a large group of workers who will retire within a few years. However, it remains to resolve the use of a younger workforce, which will have to find a new job or additional training to meet the new requirements.

**Graph 3:** Age structure of employees in the position of Cashier and Ticket Seller in public passenger transport



**Source:** Statistical survey on labour costs (ISCP (MPSVR SR) 1-04), Trexima Bratislava, Period: 4Q 2019

Members of the Sector council for transport, logistics, and postal services (2019) claim that similar effects of automation are also expected in logistics, where an increase is expected, especially in road transport, through safety systems to new means of transport. The deployment of intelligent transport systems, traffic education and training, will be crucial to achieving the vision of a "fatal accident". In this area, especially in cities, the application of Smart City solutions can significantly help. In the future, it is also necessary to count on autonomous trucks. Logistics 4.0 will also significantly affect road freight transport technology. The expected impact on human resources will be captured in particular in the area of job creation for engineers focused on intelligent transport systems and Smart City.

### 4.3 Selection of employers' recommendations for a better connection between the labour market and the education system

This section presents the proposals of employers based on the defined strategy of human resources development, which should ensure significantly higher cooperation between employers and schools.

- Support for the development of innovative skills of secondary school teachers in accordance with the requirements of the labour market.

- Checking the content of accredited and retraining courses in the field of transport, in accordance with current innovation and technological trends in the sector.
- Elaboration of extended content of the state educational program for the group of departments 37 – Transport, post, telecommunications in the following areas:
  - *Management and coordination of information systems*
  - *Data analysis and processing*
  - *Data diagnosis and evaluation*
  - *Virtual / augmented reality*
  - *Artificial intelligence*
  - *Electronisation, automation, new technologies*
  - *Efficient organization of the transport process*
- Support for the experimental verification of new teaching and study fields created based on the needs of employers.
- Ensuring more intensive cooperation between the college / university and partners from practice in the field of commissioning joint semester or final theses focused on the application of theoretical knowledge acquired during the study in practice.

## 5 Conclusions and Policy Implications

The aim of the paper was to analyze current and upcoming innovation trends in a selected sector in terms of their impact on human resources in the Slovak Republic and to point out the threat of disparities in the labour market. International studies describing the significant impact of automation in our country and their impact on 70% of employees in the coming years fail to comprehensively capture the conditions in which innovations are located. Sector councils, as associations of the most important employers, have the opportunity to bring closer the level of use of innovations in their companies and thus predict changes in specific positions. Most jobs have a high chance of retention by 2030 – only the nature and nature of the work will change, which will require mastering new knowledge and skills. For this reason, it can be argued that 70% of jobs will not be jeopardized by the dismissal of such a volume of employees – but they will be forced to undergo continuous training and the responsibility of secondary and higher education institutions will be responsible for training future employees based on employers' requirements.



The creation of a database of innovations and the specification of the required knowledge and skills must be incorporated into the education system by relevant institutions, such as the State Institute of Vocational Education, the University of Žilina in Žilina, Secondary Vocational Schools teaching group no. 37 etc. The second part of the paper confirmed the medium-term threat to the sector due to a shortage of skilled labour, which will cause significant differences in the labour market in the future. Graduates from sectoral areas of education will in many cases find employment outside their field. The reasons may be higher salaries in the competitive industry, lack of internships during studies, which would ensure an easier transition to practice to employers, reluctance to work in uninteresting positions and others.

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