

ANALYSIS OF MOBILITY WORKFORCE IN THE REGION

ANALÝZA MOBILITY PRACOVNÍ SÍLY V REGIONU

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Abstract

The aim of this paper is to present the methodology and outcomes of the case studies for the company MUBEA. It was one of a series of practical cooperation of the local company with College of Logistics. Currently the main topic of the project was region's labor force and mobility. The contribution specifies the goals, the methodology itself and the fulfillment of these goals which is presented on map outputs. In the conclusion of the paper, further steps of cooperation in this area of interest are outlined.

Abstrakt

Cílem tohoto příspěvku je seznámit čtenáře s metodikou a výstupy případové studie pro firmu MUBEA. Jednalo se o další z celé řady praktických spoluprací místního podniku s Vysokou školou logistiky. Tentokrát bylo hlavním tématem projektu pracovní síla regionu a její mobilita. V příspěvku jsou zmíněny stanovené cíle, vlastní metodika a plnění těchto cílů, které je prezentováno na mapových výstupech. V závěru příspěvku jsou nastíněny další kroky spolupráce v této oblasti zájmu.

Key words

Mobility, labor, logistics, commuting, commuting costs

Klíčová slova

Mobilita, pracovní síla, logistika, dojížděka zaměstnanců, náklady dojížděky

INTRODUCTION

Low labor mobility reduces the efficiency of the labor market and hampers economic

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growth. Growth in labor mobility is, in addition to ensuring an appropriate education and qualifications structure of the labor market, considered to be an important condition for ensuring the needs of businesses in increasing their performance and competitiveness. At the current stage of re-launching the growth of industrial production and the related need to attract new workers, the urgency to seek concrete ways to address the discrepancy between localization of potential labor resources and localization of businesses is growing.

MUBEA supplies its products to automobile manufacturers around the world (Audi, BMW, Chrysler, Daimler, Ferrari, etc.). It develops its products in close cooperation with its customers. The MUBEA is exceptional in lightweight design, friction reduction and reduced built-in space, including gearbox springs, engine springs, axle springs, stabilizers, carbon fiber reinforced products or car interior components. [3].

It follows from the above that the success of a company depends on the performance of its employees. MUBEA is constantly investing in the education of its employees at all levels of development, production and management [3]. The company itself has created more than 5,000 new jobs throughout the world over the last six years. The exception is therefore not looking for new employees to the branch in Prostějov.

OBJECTIVES OF THE CASE STUDY

MUBEA's management has addressed the College of Logistics with a request for cooperation in the field of labor mobility analysis in Prostějov and the surrounding area. As MUBEA plans to expand its production, it also needs to provide adequate workforce at all levels, especially looking for new employees in the workers' professions.

The purpose of the case study was to assess the resources and geographic distribution of the potential working (especially labor) power in the region. Design accessibility by mass passenger transport in the nearby and further distant surroundings of Prostějov. And formulate measures and conditions that will lead to the use of the labor force for active employment in areas with limited mobility.

METHODOLOGY OF THE CASE STUDY

Since the previous survey on a similar topic was unknown, the methodology had to be based on basic, often general, source data. From the point of view of MUBEA, it was mainly the organization of shifts and qualitative and quantitative criteria for the selection of new workers. From the point of view of labor resources, there was the data on the number and structure of the inhabitants in the area of interest (Czech Statistical Office) and the unemployment rate in the area of interest (individual labor offices). Population availability was assessed on the basis of information collected from the public internet timetable IDOS.

It was necessary to supplement the mass transport of an individual car. According to studies [Professions], 73% of employees are willing to commute 30 minutes by car to work or 60 minutes by mass passenger transport at an adequate level of salary, position or transport allowance. On the basis of real time accessibility of a maximum of 30 minutes by car, the boundaries were defined and the municipalities of the area concerned were allocated.

The selection was made using the ArcGIS program and the communications layer from the ArcČR database where each average road speed and motorway were assigned an average speed value, e.g. for highways and speedways 110 km/h, roads of I class 70 km/hour. Based on the length, the time was assigned to individual sections of the communication. Gradual loading of the time values up to 30 minutes created a time model of commuting by car to Prostějov. The total number of the surveyed municipalities (cadastral territories) has stabilized to 348. The results of the analysis are clearly illustrated in Figure 1. In terms of mass transport, there was a decision after the discussion with the case study commissioner on the maximum commute of 120 minutes and three transfers, the approach must have been at least 20 minutes before commencement of the shift, and the maximum wait for the jump after the shift was 50 minutes.

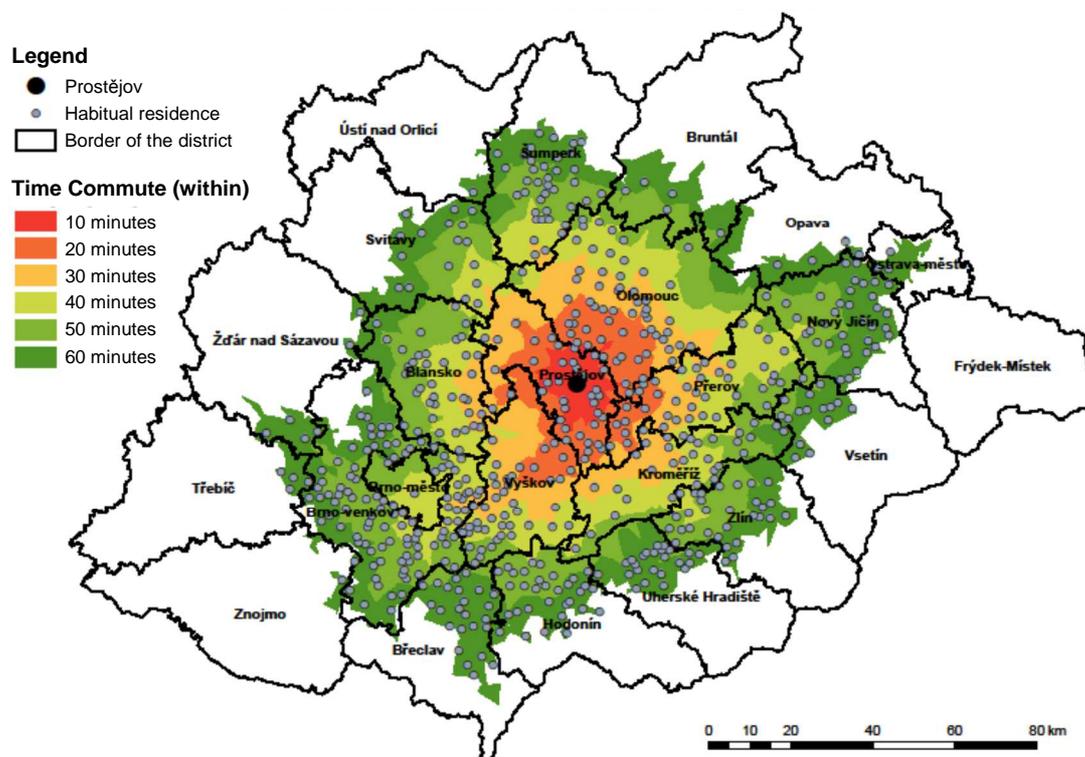


Fig. 1 Municipalities of the area of interest
Source: own processing, map background [1]

The potential source of new employees was adjusted by the combination and comparison of the economically active population, registered at labor offices, who are immediately available for employment, trained in the technical field or who have completed a secondary school with a GCSE. Data were provided by the Labor Offices in Přerov, Prostějov, Šumperk, Olomouc, Jeseník, Zlín and Blansko districts as of April 30, 2015. The data comes from GIS2 statistics, the structure according to education includes the UCVE, UCVH, UCVJ and UCVL groups according to statistics and Categorization of the Ministry of Education of Youth and Physical Education and the Ministry of Labor and Social Affairs.

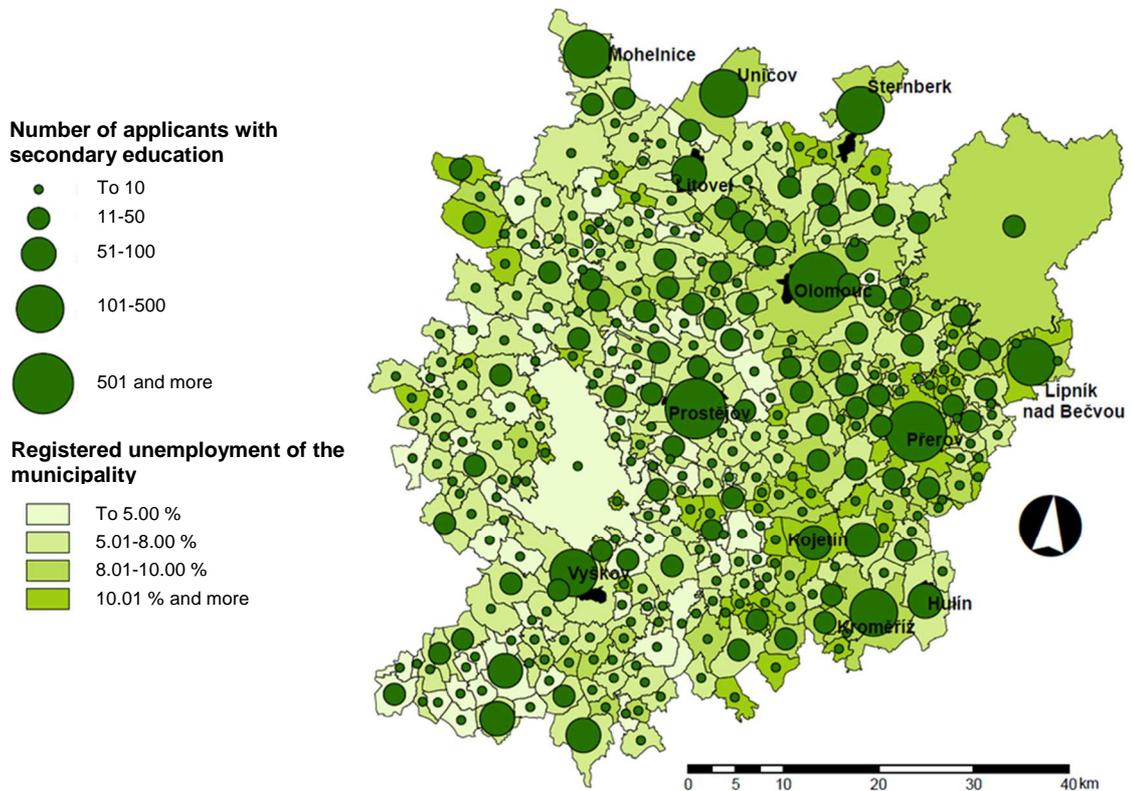


Fig. 2 Number of job seekers (unemployed) with the required education
 Source: own processing, [4], map background [1]

Another monitored aspect of municipalities in the area of interest was accessibility. Of all 348 villages surveyed, using a passenger car can be transported to Prostějov within 30 minutes. Using search engines for all types of public transport - bus, train - verified accessibility of monitored municipalities for individual shifts. The exchanges were given by the company's requirements.

Under the specified conditions, see above, a database of all municipalities was created for each shift, indicating whether or not shift and shift is possible. From these databases, map outputs of commuting to individual shifts (0 - unavailability, 1 - availability in one direction, 2 - availability in both directions) were created. For three-shift and continuous operation, a composite commute analysis was created from individual shift outputs. For every municipality there is a number of all commuter commutes, graphical depiction of the number of inhabitants of individual municipalities with secondary education. For all three shifts in the three-shift operation, it is possible to identify a maximum of 6 routes (from/to the shift), for eight consecutive operations (day, night and weekday and holiday, again from/to the shift).

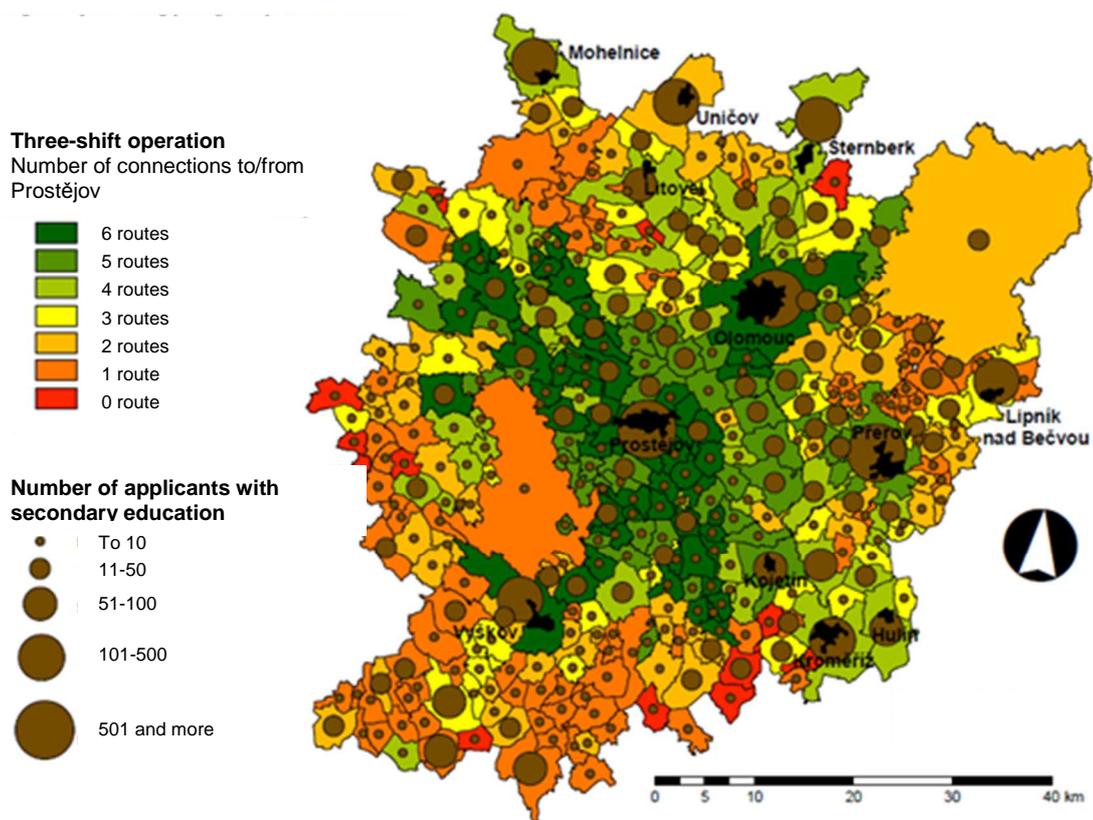


Fig. 3 The number of journeys on all shifts within a three-shift operation, complete with the number of unemployed with secondary education
Source: own processing, [2, 4], map background [1]

THE CASE STUDY OUTPUTS

From the obtained data we conclude, there is a frequent discrepancy between settlements with available staff and transport services. The transport availability statistics shown in Tab. 1 shows that only 38 % of job-seekers with secondary education from the area of interest are guaranteed access to all exchanges. An increase in the number of connections by 1-2 would make the commuter available for some 38 % of the applicants. On the contrary, in a number of municipalities the service is suitable for the enterprise.

Tab. 1 Number of available job seekers and their availability

	Available job seekers aged 15-64	Applicants with secondary education
Total in the area of interest	30638	7347
With great availability for 3 shifts (6/6)	10499	2780
With good availability for 3 shifts (4-5/6)	11595	2660
With bad availability for 3 shifts (2-3/6)	5500	1264
With no availability for 3 shifts (1-0/6)	3044	643

Source: own processing, [2, 4]

With using of the obtained outputs, municipalities were identified to consider increasing the number of connections to improve the availability of potential staff for MUBEA. The selection of municipalities is shown in Figure 4 using the hatched area. These are **Konicko, Nezamyslice, Přerov - Olomouc and Kojetín - Přerov**. Thus, areas are with high unemployment, poor accessibility and a potential source of new employees.

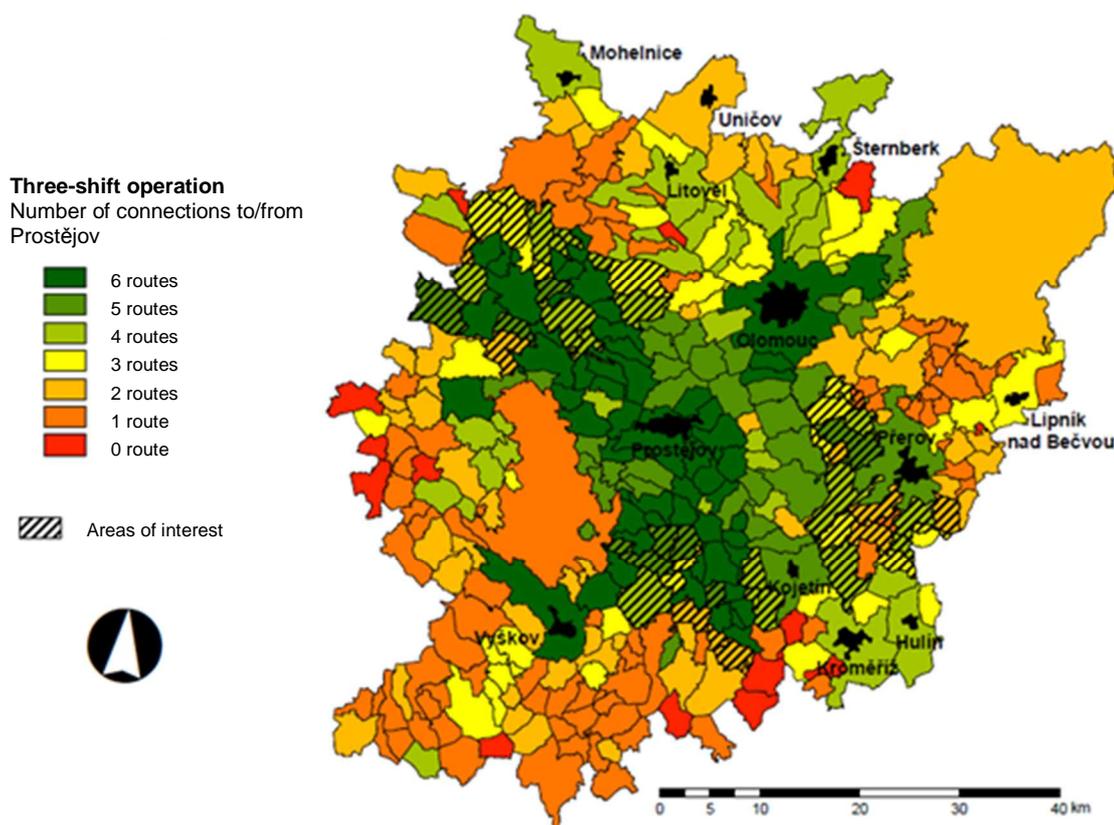


Fig. 4 Selection of municipalities to complement the number of connections for three-shift operation

Source: own processing, [2], map background [1]

Not only commuting, but also commuting costs are factors that affect jobseekers when deciding on an employer. Local communities with a high number of job seekers were selected. For these villages, the cost of transport to Prostějov was calculated for each individual ride. The basis for determining the cost of transport from selected locations for bus and rail was the transport tariffs according to the rates of the carriers, when using a passenger car, a refund scale using a passenger car for business purposes. So far, no consideration has been given to the situation where an employee would use his own vehicle without the need to reimburse travel expenses.

As an example of the proposed changes, the municipality of Majetín, with a potential for secondary school graduates of 11 employees and 20 commuters (without rebates), could be worth CZK 1880 per month. The completion of the four connections for the Kojetín - Prostějov connection would make access to all exchanges available for a total of 72 job seekers with the required education, the commuting time would be 39 minutes in one direction, and the monthly commuting costs for 20 shifts would be CZK 1120 without discounts.

The following table shows the comparison of individual car traffic with mass bus and rail transport in the areas of interest.

Tab. 2 Comparison of modes of transport in selected areas of interest area

	Individual car transport			Bus transport			Rail transport		
	Distance[km]	Transportation time [min]	Transportation costs [CZK]	Distance[km]	Transportation time [min]	Transportation costs [CZK]	Distance[km]	Transportation time [min]	Transportation costs [CZK]
Olomouc - Přerov	19,7	22,3	72,8	34,2	63,2	34,3	37,8	37	53,5
Vyškov - Kojetín	20,3	25,8	75,2	26,1	46,4	30,1	26,4	32,8	46,8
Kojetín - Přerov	27	34,9	100	40,2	74,6	44,3	40,2	61,2	64,5
Konice - Litovel	26,2	38,3	96,9	30,8	61,6	32,1	27,6	50,8	46,2

Source: own processing, [2]

The advantages and disadvantages of four variants of the general solutions also presented to MUBEA and are listed in the following table.

Tab. 3 Comparison of selected mobility solutions for employees

Variant	Advantages	Disadvantages
V1: external transporters	Costs for the company (subject to statutory conditions)	Selection procedure ⇒ costs increase
V2: internal transport	The vehicle can be used as an advertisement carrier	Managed by the company: leasing, operation (fuel, driver, traffic, insurance, etc.) ⇒ costs increase
V3: additional cost of transport from public sources	Only for selected areas with commute over 10 km, validity 6 months, up to 2.50 CZK/km, only one way (there, not back))	The issue of sustainability
V4: additional cost paid by the company	E.g. 1000, - CZK costs the company 1340, - the worker gets about 740, -	The need to determine the amount of the supplement and the number of workers covered by the measure ⇒ costs increase

Source: own processing

CONCLUSION

The current distribution of job opportunities is uneven and it corresponds to a substantial extent to the distribution of unemployment. The current transport infrastructure respects the needs of the necessary public transport services, but not the employment needs, especially of the non-stop operating companies. The remote availability of potential workers from the seat of a potential employer thus encounters an obstacle that can be solved both in the employer's interest and in society's interest.

Part of the project was in the original version also drafting proposals for eventual changes in timetables or introducing staff transport. This can only be done if workers are recruited in defined areas. Only then it is possible to enter into negotiations with carriers, or process costing own transport. The effectiveness of these measures depends strongly on the number of persons transported. It would be better to set up the right marketing strategy in each region and work with local government and local authorities.

Map outputs (Fig. 1-4) are not completely according to cartographic markings. They were created at the request of the contracting authority.

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