

# **CHANGES IN EMPLOYEE COMMUTING: A COMPARATIVE ANALYSIS OF EMPLOYEE COMMUTING TO MAJOR SLOVENIAN EMPLOYMENT CENTERS FROM 2000 TO 2009**

## **SPREMEMBE V MOBILNOSTI ZAPOSLENIH: PRIMERJALNA ANALIZA MOBILNOSTI DELAVCEV V NAJVEČJA ZAPOSLOTVENA SREDIŠČA SLOVENIJE MED LETOMA 2000 IN 2009**

David Bole



ALEŠ SMREKAR

The completion of freeways has contributed to greater daily mobility of employees.  
Dokončanje avtocest je največ pripomoglo k večji dnevni mobilnosti zaposlenih.

# Changes in Employee Commuting: A Comparative Analysis of Employee Commuting to Major Slovenian Employment Centers from 2000 to 2009

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**ABSTRACT:** This paper discusses changes in employee commuting in the ten largest Slovenian employment centers from 2000 to 2009. Based on analysis of the SRDAP database, changes are presented in employee commuter routes between source and target municipalities. The results show a significant increase in both the scope of employee commuting and number of routes. Reasons for these changes are explained by the construction of freeway infrastructure, which has made it possible to travel faster from one municipality to another and to commute to employment centers. The scope and direction of commuting also depend on changes in the socioeconomic structure of the urban system, especially suburbanization, the economic crisis affecting local employment centers, and changing job locations within the regions themselves.

**KEYWORDS:** geography, regional development, transport geography, mobility, commuting, jobs, Slovenia

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# 1 Introduction

Human social and economic activities have always been connected with movement. The division of labor entails spatial separation of places of residence and work, resulting in commuting and traffic flows, and strongly affecting the landscape's geography. The first major commuting flows in the developed world developed at the end of the nineteenth century, when trains and, later on, also other means of public transport were introduced; today commuters predominantly use cars (Dessemontet, Kaufmann and Jemelin 2010).

The scope and manner of employee commuting is influenced by a number of factors, among which transport infrastructure proves to be more important. Transport infrastructure adapted to the use of cars will certainly enable easier employee mobility and daily commuting to employment centers. The construction of freeways in Slovenia in the past two decades has therefore been thoroughly changing employee mobility flows, thus also indirectly affecting Slovenia's regional structure. Kozina (2010a) reports moderate degrees of correlation between the freeway access of settlements and their access to regional centers because the Spearman correlation coefficient ranges between 0.45 and 0.72. Public transport is similar: if public transport infrastructure is good, this can also be manifested in more employee commuting; for example, on the Litija–Ljubljana route, which has a good train connection (Gabrovec and Bole 2009).

Another factor influencing the scope of employee commuting is the socioeconomic structure of the settlement system. Some studies (e.g., Bole 2008) have showed that commuting is more common in two types of areas. The first type includes areas with clearly negative economic indicators that tend to lose jobs. Employees are thus forced to look for work in more distant employment centers and commute there. The second type includes clearly suburbanized and growing settlements near large cities that do not offer a sufficiently diverse range of jobs for the growing local population, which is why people commute to a nearby regional employment center.

These are the main factors influencing the scope and manner of employee commuting to employment centers. There are certainly a number of other factors and many of them are completely personal or psychological in nature. People decide to commute to distant employment centers based on personal preferences and choices, the typical lifestyle, estimated travel costs, time, and so on. Schafer (1998) established that the average household is willing to pay 10% to 15% of its entire monthly income and spend 1.1 hrs per person per day for transport. More recent studies on commuters in Belgium, France, and the United Kingdom show that the average daily commuting time increased to 1.25 hrs (Hubert and Toint 2007). Their assumptions form the basis for the spatial-economic models used for studying commuting and the attractiveness of employment centers (Verhetsel, Thomas and Beelen 2010).

Employee commuting is thus an extremely complex phenomenon, but also a very »geographical« one. It can be used to determine changes in regional development, processes within a region, and the structure of the urban system (Bole 2004). This paper presents changes in employee commuting in the last decade in terms of numbers and space. It verifies whether the construction of the Slovenian freeway network as an important factor enabling daily commuting has also caused larger commuter flows into employment centers. It determines whether the employment attractiveness of individual major employment centers is changing, and points out possible reasons for these changes. The paper focuses on changes in the scope of employee commuting – that is, the number of employees and changes in the spatial dimension of commuting.

## 2 Methodological explanations

The purpose of this paper is to present changes in the attractiveness of employment centers from 2000 to 2009. The main database used is the Statistical Register of the Active Working Population (SRDAP), which provides information on employees' place of residence and place of work. The database covers employed and self-employed people over the age of fifteen in Slovenia, excluding farmers. There are certain problems with the SRDAP that must be taken into account when interpreting the data and that distort the correctness of the data to some extent. The first and greatest problem is incorrect information on the place of work (Ravbar 2007; Bole 2008; Gabrovec and Bole 2009). This problem was solved by simply excluding routes with suspiciously large numbers of commuters between two extremely distant municipalities (e.g. Lendava–Ljubljana) from the map. In reality, it turns out that these municipalities are either those

on the border or those with major military barracks (e.g. Ilirska Bistrica). However, the problem is not merely incorrect information on places of work, but also incorrect places of residence because part of the population actually does not live in the town listed as their official permanent place of residence. According to some estimates, approximately 10% of the Slovenian population is listed under an incorrect place of residence (Gabrovec and Bole 2010).

The second problem is the changed methodology of collecting SRDAP data. A major change occurred in 2008, when permanent place of residence was taken into account with Slovenian citizens and temporary residence with foreigners (for details on migrants in Slovenia see Pajnik, Bajt and Herič 2010). Since 2009, temporary place of residence has also been taken into account with citizens, which makes more sense from the perspective of studying actual commuting for work. From our point of view, this problem is less important because we assume that the error is evenly distributed across the entire country. Nonetheless, this change must be considered when interpreting the results.

The third problem is that the SRDAP database does not contain information on actual travel by employed persons. In the past decades, the nature of the work process has changed thoroughly and it is no longer necessary for employees to commute to their place of work. There are several occupations in which part of the work process can also take place at home, which is why employees commute to their place of work as needed – that is, a few times a week or even less. This is especially typical of the service sector, and less of traditional industries.

We selected 192 municipalities, as they existed in 2000, for the spatial unit. Eighteen new municipalities were established by 2009, but we ascribed these to the »old« municipalities from 2000 to ensure methodological consistency. Between 2000 and 2009 some minor changes also occurred with the municipal borders due to adding/excluding settlements to/from municipalities, but they do not have a significant impact on the results.

An explanation regarding the selection of employment centers is also important. Slovenia's ten largest employment centers were selected because this allowed us to include nearly all regional centers. The only exception is Slovenj Gradec, whose number of jobs is too small (8,300 in 2009); it is even smaller than that of Domžale, Krško, and Slovenska Bistrica. In order to include Slovenj Gradec, the other centers would have had to be included as well, which would have considerably limited the clarity of the cartographic presentation. The strength of employment centers or the scope of commuting for work was presented by connecting the source and target municipality with a straight line (route). A similar method has already been used both in Slovenia (Gabrovec and Bole 2009) and abroad (Dessemontet, Kaufmann and Jemelin 2010). For clarity, only routes that include fifty employed commuters or more were presented on the maps.

### 3 Analysis

In 2000, the SRDAP database included a total of 756,426 jobs, and in 2009 it included 805,615. The ten largest employment centers provide approximately half of all jobs in Slovenia. Figure 1 presents the changes in the number of jobs, in which Ljubljana stands out not only because of the large number of jobs there, but also the highest growth rate. Negative trends in the number of jobs are the strongest in the Municipality of Murska Sobota, but minor decreases are also recorded in the municipalities of Kranj, Velenje, and Nova Gorica.

#### 3.1 Employment center attractiveness in 2000 and 2009

The 2000 commuter routes reflected an extensive spatial range of Ljubljana, and partly also Maribor and Celje. There were important connections between the employment centers that are close to one another, especially on the Kranj–Ljubljana, Celje–Ljubljana, Ptuj–Maribor, and Velenje–Celje routes.

Despite the possible errors, the spatial areas covered by individual employment centers in Slovenia, and thus also regional ones, are clearly visible. The map of individual routes shows similar conditions as established in past studies on daily commuting (e.g., Bole 2004). Especially in the Ljubljana Basin, the high employee commuting rates resulted from the high rate of urbanization and metropolitanization (Ravbar 1997, 86), and the favorable freeway and railroad connections. Similar conditions could be found on the Drava Plain, where, in addition to Maribor, Ptuj was also an important secondary employment center.

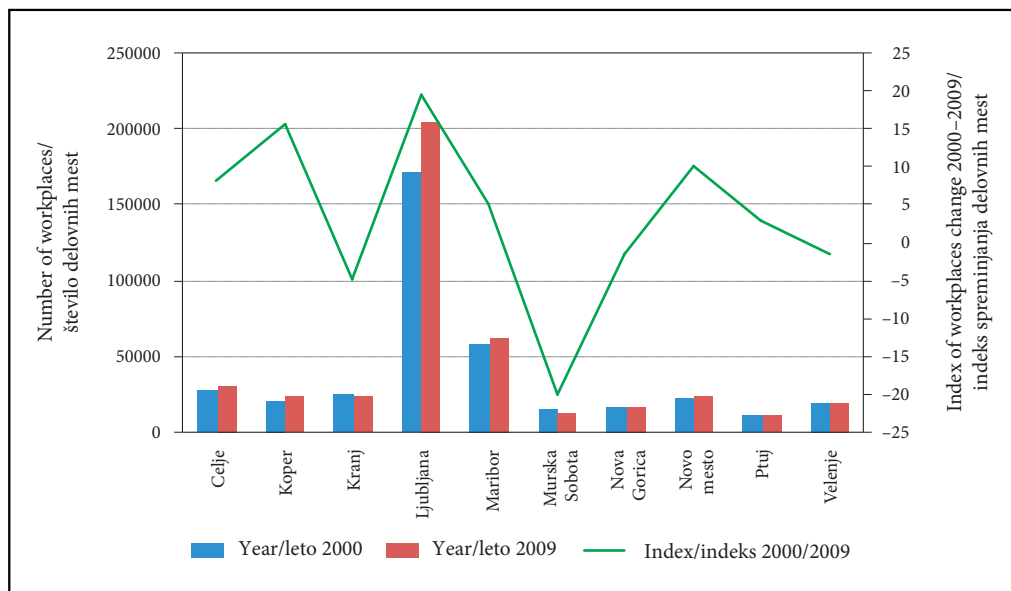


Figure 1: Changes in the number of jobs in Slovenia's ten largest employment centers (source: SRDAP 2010).

Figure 3 shows considerable changes, especially the increased attractiveness of practically all major employment centers. However, the numbers themselves reveal many details: not only did the spatial »range« of individual employment centers increase, but commuting between the employment centers themselves increased as well; for example, on the Koper–Ljubljana, Celje–Ljubljana, and Novo mesto–Ljubljana routes. The most obvious reason for this is the construction of transport infrastructure or the completion of freeway sections between these centers. It is also interesting that Ljubljana not only became a target municipality, but also a source municipality for employees: the number of employees on the Ljubljana–Celje and Ljubljana–Koper routes increased from 200 in 2000 to approximately 400 in 2009.

The Ljubljana and Maribor employment centers stand out in terms of changes in the spatial range. In both cases, the routes not only moved to newly built freeway sections, but also to areas in which there were no considerable improvements in road connections. With regard to Ljubljana's attractiveness, there was a high increase especially in the municipalities south of the city (Cerkljica, Postojna, Ribnica, and Kočevje); in Maribor, the increase was evident north of the city (Šentilj and Kungota).

### 3.2 Changes in employment center attractiveness between 2000 and 2009

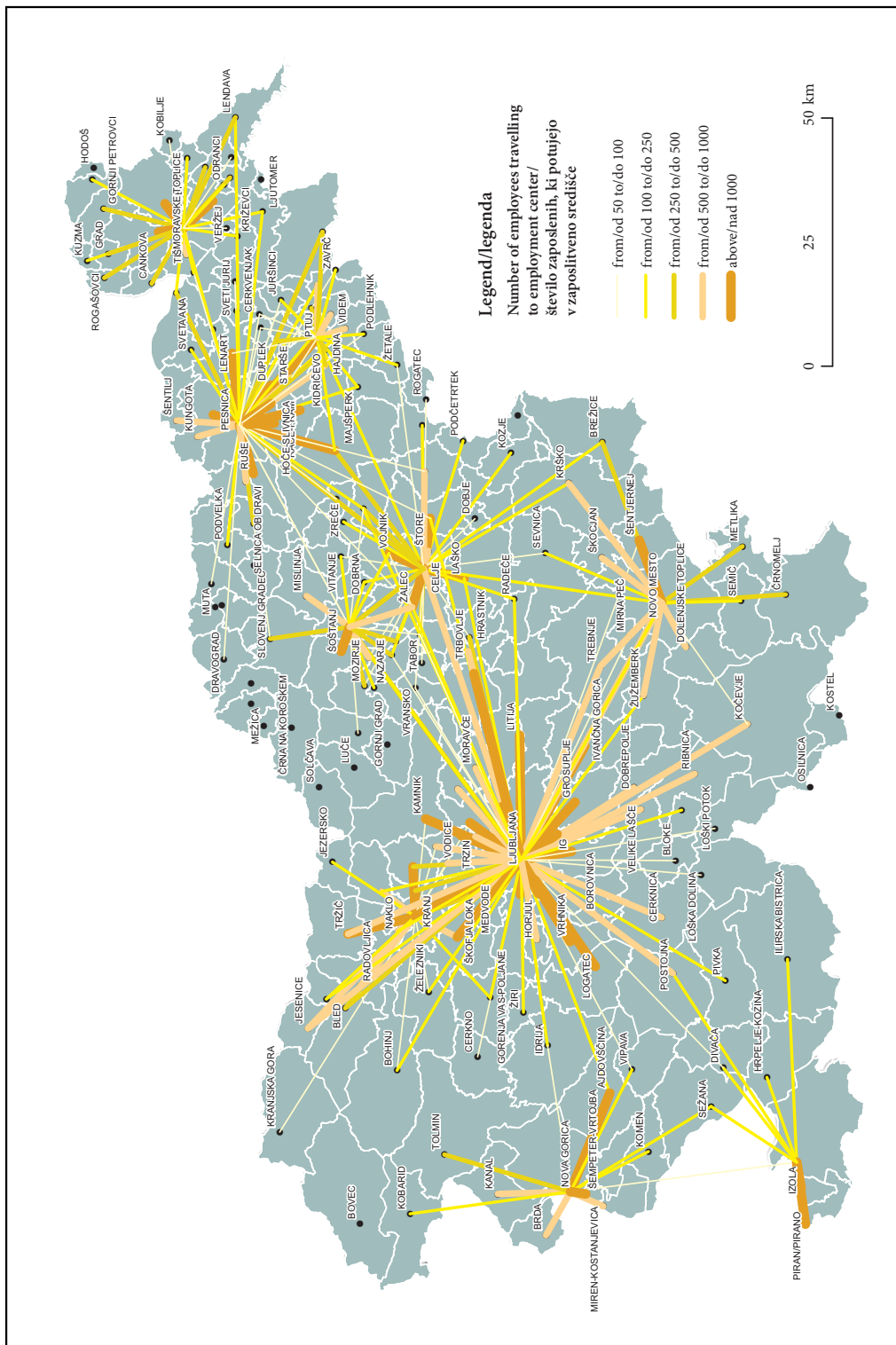
Figure 4 compares the scope of commuting between the ten largest employment centers and other municipalities. An increased range and scope of commuting to Ljubljana, Maribor, Koper, and Celje can be highlighted. The number of employees traveling to Ljubljana increased from nearly all directions: both from the suburbanized municipalities nearby (Grosuplje, Kamnik, Vrhnika, etc.) and more distant municipalities outside the Ljubljana region (Postojna, Koper, Novo mesto, Celje, etc.). In Maribor, the increase in the number of employees was smaller: only commuting from Slovenska Bistrica increased by more than 500 employees. Among the employment centers with a decreased scope of employee commuting, Murska Sobota stands out the most: the number of commuters decreased from the majority of directions. The

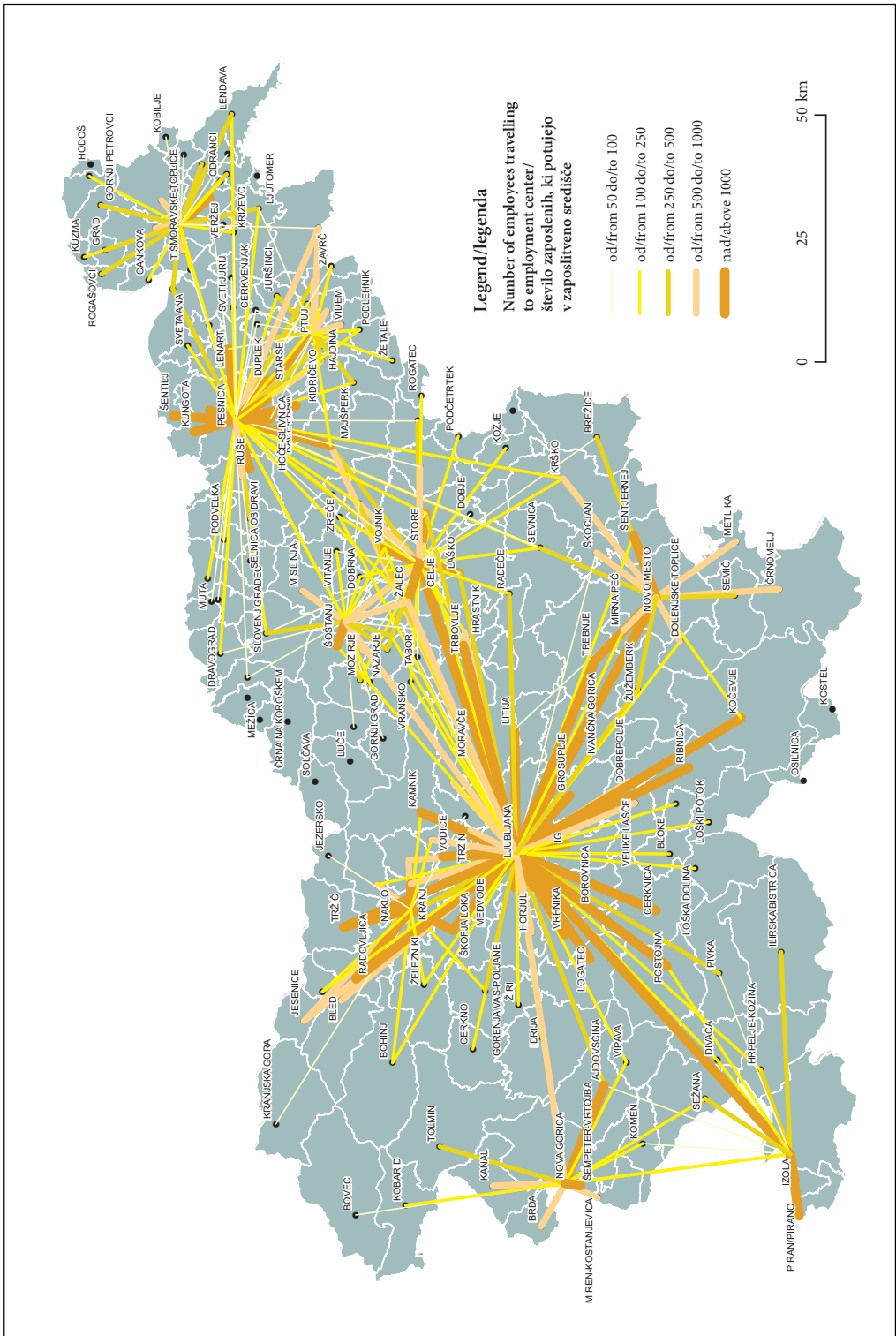
Figure 2: Attractiveness of the ten largest employment centers in 2000 (source: SRDAP 2010). ► p. 94

Figure 3: Attractiveness of the ten largest employment centers in 2009 (source: SRDAP 2010). ► p. 95

Figure 4: Changes in employment center attractiveness in absolute numbers. ► p. 96

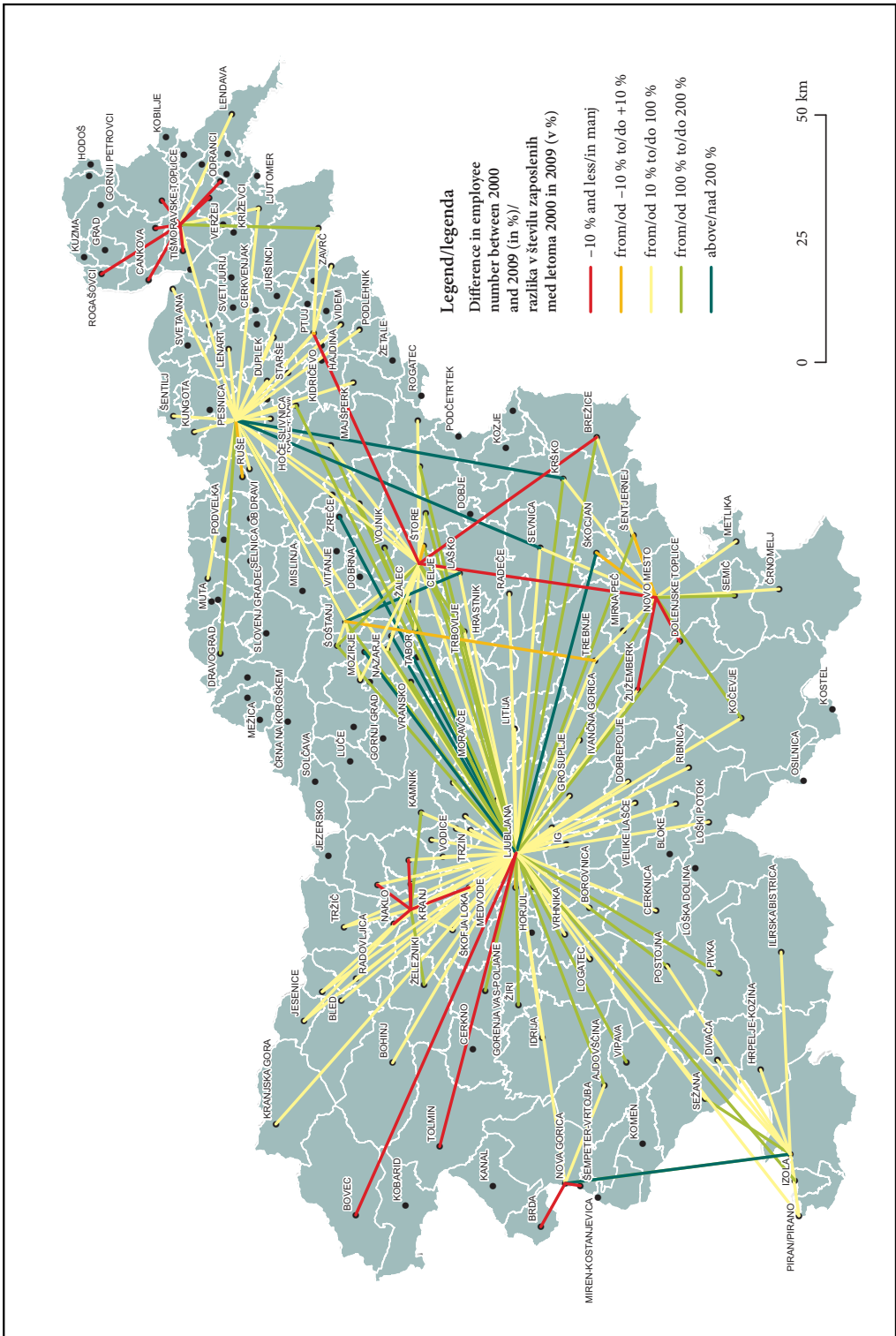
Figure 5: Changes in employment center attractiveness in relative numbers. ► p. 97











attractiveness of Novo mesto and Kranj also decreased on certain routes nearby: the decrease from the direction of Dolenjske Toplice and Žužemberk to Novo mesto is interesting as is the one from Cerklje na Gorenjskem to Kranj. Historically, these were the routes connecting the factories in the two employment centers in particular. Perhaps the commuter flows changed due to the restructuring of the economy from production to service because commuting to service centers increased, whereas commuting to industrial centers decreased.

Figure 5 shows changes in attractiveness according to relative values (shares). It shows even more clearly the routes on which the greatest changes in employee commuting occurred in the period studied. The largest growth shares can be seen on the Ljubljana–Celje route, on which the scope of employee commuting more than doubled in 2009 compared to 2000. In addition, employee flows from the Littoral region and the Sava Valley–Lower Carniola direction to Ljubljana increased by more than 100%. Important freeway sections were completed on all of these routes, providing better road connections with Ljubljana. Certain changes also occurred in other employment centers, but they were not as notable compared to Ljubljana.

## 4 Discussion: characteristics of and reasons for changes in employment center attractiveness

### 4.1 Improved objective and subjective transport accessibility

The analysis of SRDAP data shows changes in workforce commuting. Assuming that the degree of error in the SRDAP database due to incorrect information on the place of work and residence remained the same between the two reference years, the map showing changes in workforce commuting is a relevant source based on which these changes can be detected. Some basic characteristics can be determined from the analysis of the direction and scope of employee commuting in both reference years described above. The first characteristic, which also confirms the thesis presented in the introduction, is that freeway construction clearly leads to a larger scope of employee commuting. The maps show the axes along which the number of commuters increased significantly in both absolute and relative values. They primarily include the following:

Koper–Ljubljana, where the freeway section to Koper was completed, reducing the driving time by approximately 15 minutes, which in the psychological sense is apparently enough to reduce the »resistance« against deciding to drive to work.

The 2005 construction of the Trojane freeway tunnels obviously increased employee commuting between the Celje and Ljubljana regions. In 2009, 200 more employees from Slovenske Konjice (which is 1 hour and 7 minutes from Ljubljana according to online information) worked in Ljubljana than in 2000. Employee flows to Ljubljana from municipalities in the Celje region (e.g., Prebold, Polzela, Žalec, and Celje) also increased significantly.

The A2 freeway towards Obrežje in Lower Carniola was also nearly fully opened during that same period, so that it is now possible to reach Krško in 1 hour and 10 minutes from Ljubljana. The maps show that the absolute number of employees from the municipalities of Krško and Trebnje working in Ljubljana increased significantly; an increase in relative numbers could also be seen for some other smaller municipalities (e.g., Škocjan and Šentjernej).

At the same time, it is apparent that in other employment centers the increase was smaller than in Ljubljana. As some previous studies suggested (Gulič and Plevnik 2000), the improvement and completion of the freeway network largely strengthened the central role of Ljubljana. There were fewer changes in commuting to other regional centers. Novo mesto may have gained 671 employees from three municipalities in the Sava Valley (i.e., Sevnica, Krško, and Brežice) thanks to the 2008 construction of the freeway section at Otočec. In the future, the recently completed freeway sections could increase the scope of employee routes especially in the Vipava Valley (towards Ljubljana and perhaps Koper), the Drava Plain and Haloze (towards Maribor), and Prekmurje (towards Maribor and perhaps Murska Sobota). However, the subjective perception of accessibility also plays an important role in addition to objective time accessibility. Even though the construction of a specific freeway section only brings an employment center closer by a few minutes, in people's eyes its accessibility obviously improves to a considerably greater extent. The introduction of freeway toll stickers also increased the use of freeways and contributed its share to people's perception of improved time accessibility of employment centers.

## 4.2 Socioeconomic changes in municipalities

The second characteristic is not connected with the construction of or significant improvements to the road network. Some routes reflect a great increase in the number of employees even without improved road infrastructure. These are routes between the municipalities to the south of Ljubljana (e.g., Kočevje, Ribnica, Postojna, and Pivka), around Maribor (e.g., Šentilj and Hoče), and in other individual locations (e.g., Šentjur pri Celju–Celje or Črnomelj–Novo mesto). This increase can be attributed to basic socioeconomic changes within the urban system (Bole 2008). With some routes, it is possible to talk about the spread of suburbanization effects and consequent increased commuting between satellite towns and the central place of work; for instance, the Hoče–Maribor route. In other cases, commuting to more distant employment centers increases due to an economic crisis in the source municipalities. From 2000 to 2009, the Municipality of Šentilj lost nearly a third of all jobs and at the same time increased commuting to nearby Maribor by more than 300 employees. The same is true for employment centers that are losing employed commuters; the crisis and layoffs in the food and textile industries in Murska Sobota most likely contributed to the decreased commuting of employees from the surrounding rural municipalities.

## 4.3 Hierarchical changes between regions

The third characteristic is connected with the increasingly obvious connections between regions. Regional centers do not necessarily have a uniform collection area, and they increasingly interconnect with one another. During the period studied, connections between regional centers increased significantly. Important employee flows move beyond the »regional« borders and form a uniform urban network. Similar conclusions were also made by other authors, such as Dessementet, Kaufmann, and Jemelin (2010), who established that in Switzerland commuting patterns not only change within the regions, but increasingly more between regions; in other words, the hierarchy is changing between individual urban regions.

## 4.4 Hierarchical changes within regions

Changes in commuting within regions are also important. During the period studied, the number of people working and living within the same employment center (i.e., the ones that live and work in the same municipality) decreased in all employment centers except Koper. This decrease can be the result of reduced workforce in employment centers due to demographic reasons (i.e., ageing of the population or population decline). Based on urban geography studies, it can also be assumed that the negative difference also results from the fact that residents of regional centers increasingly commute to work to the secondary employment centers within and outside the regions. Employee flows are thus becoming increasingly dispersed because increasingly more employees commute from regional centers to small employment centers nearby and the various business districts that are emerging near towns. A similar process was already described for the Ljubljana (Bole 2008) and Maribor regions (Drozg 2006); this is resulting in a more polycentric structure of regions or »regional towns,« where the hierarchic organization of settlements within a region changes and »balances out.«

## 5 Conclusion

Despite many limitations resulting from the quality of data, some important conclusions can be made. We can confirm the thesis that improved road connections contribute to a larger scope of employee commuting. Better accessibility of an employment center thus affects the general development of a region (Kozina 2010b). However, at the same time serious second thoughts arise with increased daily commuter flows. The first has to do with the fact that only Ljubljana is significantly expanding its spatial range, whereas other regional centers are expanding theirs to a considerably lesser extent. Thanks to its location at the intersection of the two major Slovenian freeway axes, Ljubljana is expanding its range especially towards Celje, the Sava Valley, Novo mesto, and Koper. The range of other regional centers, which is directly connected with the construction of the freeway network, is less obvious and so it can be concluded that the present concept of freeway infrastructure construction is increasing notable concentration in only one

urban center. From the viewpoint of balanced regional development, it would make sense to strengthen interregional connections, which would also connect other regional centers (e.g., a third development axis, the main road from Ljubljana to the Soča Valley). From the viewpoint of sustainable development, it would also make sense to take into account that improved accessibility is not merely based on the infrastructure that makes it possible to use cars, but also on competitive state-of-the-art public transport.

The second concern has to do with general regional and local development. Employee commuting is increasing not only along new freeways, but also in areas where the road infrastructure has not significantly improved. This includes municipalities with a notably negative economic development, which are losing their own jobs, and where people commute to other, larger employment centers (e.g., Šentilj and Kočevje). This phenomenon leads to an impoverished economic and sociocultural role of local employment centers and increases the external transport costs due to greater traffic loads. These daily commuters often demand that the local and national authorities improve the transport infrastructure, which, however, is rarely economically feasible. Such pressure from commuters has been reported in the Kočevje area and Idrija (Bole, Gabrovec and Kozina 2010), and conditions are also similar in discussions supporting the expansion of the Ljubljana loop.

However, there are also other concerns. The increasing commuting of employees, which leads to a »commuter culture,« can affect employee productivity. A study of more than 41,000 Germans commuting to work daily yielded interesting results (Ommeren and Gutiérrez-i-Puigarnau 2011). On average, employees that have longer daily commutes tend to be absent from work more frequently due to health problems and other concerns. On average, absence from work would be 15 to 20% lower if all employees had minimal daily commutes.

In any case, daily employee commuting is an interesting geographical phenomenon. Changes in employee commuting indicate changes in regional structure and infrastructure, and completely personal, psychological motives. However, at the same time daily employee commuting has important reciprocal effects on the environment, especially from the viewpoint of the pollution of landscape elements and economic costs. The latter results not only in using and building transport infrastructure, but also in polluting and destroying valuable farmland, residential areas, and ecosystems. Therefore, studying daily commuting is an important part of geographical research, as well as regional and spatial planning.

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# **Spremembe v mobilnosti zaposlenih: primerjalna analiza mobilnosti delavcev v največja zaposlitvena središča Slovenije med letoma 2000 in 2009**

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**KLJUČNE BESEDE:** regionalni razvoj, prometna geografija, mobilnost, dnevna mobilnost, dnevne migracije, delovna mesta, Slovenija

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## 1 Uvod

Človeške družbene in gospodarske aktivnosti so že od nekdaj pogojene z gibanjem. Delitev dela pomeni prostorsko ločenost lokacije bivanja in lokacije dela in vodi v vsakodnevno mobilnost, povzroča prometne tokove in močno vpliva na geografijo pokrajine. O prvih večjih tokovih dnevne mobilnosti v razvitem svetu lahko govorimo od konca 19. stoletja naprej zaradi uporabe vlaka, kasneje drugih javnih prevoznih sredstev in danes vse bolj zaradi razširjene uporabe osebnih prevoznih sredstev (Dessemontet, Kaufmann in Jemelin 2010).

Na obseg in način mobilnosti delavcev vplivajo številni dejavniki, med katerimi je prometna infrastruktura pomembnejša. Prometna infrastruktura, ki je prilagojena uporabi osebnega avtomobila bo zagotovo omogočala lažjo mobilnost delavcev in vsakodnevno vožnjo z avtomobilom v zaposlitvena središča. Zato gradnja avtocest v zadnjih dveh desetletjih temeljito spreminja tokove mobilnosti delavcev in s tem posredno vpliva tudi na regionalno strukturo Slovenije. Kozina (2010a) navaja zmerne stopnje korelacije med dostopom naselij do avtocestnega priključka in dostopom do regionalnih središč, saj se Spearmanov koeficient korelacije giblje med 0,45 in 0,72. Podobno velja tudi za javni promet: če je infrastruktura javnega prometa dobra, se to lahko izkazuje tudi v večji mobilnosti delavcev, kot je primer relaciji kjer je dobra povezava z vlakom, na primer relaciji Litija – Ljubljana (Gabrovec in Bole 2009).

Naslednji dejavnik, ki vpliva na obseg mobilnosti delavcev je družbenoekonomska zgradba naselbinskega sistema. Določene raziskave (Bole 2008) so pokazale, da je dnevna mobilnost izrazitejša v dveh vrstah območij: prva vrsta so območja, ki imajo izrazito negativne gospodarske kazalnike in praviloma izgubljajo delovna mesta. Delavci so zato primorani iskati službo in se voziti v bolj oddaljena zaposlitvena središča. Druga vrsta pa so izrazito suburbanizirana in rastoča naselja v bližini večjih mest, ki ne nudijo dovolj raznovrstne ponudbe delovnih mest za rastoče lokalno prebivalstvo, zato se le ti dnevno vozijo v bližnje regionalno zaposlitveno središče.

Omenili smo le pglavne dejavnike, ki vplivajo na obseg in način mobilnosti delavcev v zaposlitvena središča. Zagotovo obstajajo številni drugi dejavniki, mnogi med njimi so povsem osebne ali psihološke narave. Ljudje se za vožnjo v oddaljena zaposlitvena središča odločajo na podlagi osebnih preferenc in odločitev, značilnega načina življenja, na podlagi ocenjenih potovalnih stroškov, časa in podobno. Schaffer (1998) je ugotovil, da je povprečno gospodinjstvo pripravljeno plačati med 10 in 15 % celotnega mesečnega prihodka in čez dan porabiti 1,1 uro na osebo za transport. Novejše raziskave vozačev v Belgiji, Franciji in Združenem Kraljestvu kažejo, da se je povprečni dnevni čas potovanja zvišal na 1,25 ure (Hubert in Toint 2007). Na njihovih predvidevanjih slonijo prostorsko-ekonomski modeli s katerimi se raziskuje dnevno mobilnost in privlačnost zaposlitvenih središč (Verhetsel, Thomas in Beelen 2010).

Mobilnost delavcev je zato izjemno kompleksen a zelo geografski pojav. Z njim lahko ugotavljamo spremembe v regionalnem razvoju in procesih znotraj regije ter zgradbo urbanega sistema (Bole 2004). V tem prispevku želimo prikazati spremembe v številskem in prostorskem obsegu mobilnosti delavcev v zadnjem desetletju. Želimo preveriti ali je izgradnja avtocestnega omrežja, kot pomembnega dejavnika, ki omogoča dnevno mobilnost, povzročila tudi večje tokove mobilnosti v zaposlitvena središča. Želimo ugotoviti ali se zaposlitvena privlačnost posameznih večjih zaposlitvenih središč spreminja in nakazati morebitne razloge za te spremembe. Osredotočili se bomo na spreminjanje obsega mobilnosti delavcev, torej njihovega števila ter njihovih spremembah prostorskega obsega.

## 2 Metodološka pojasnila

Namen prispevka je prikazati spremembe v privlačnosti zaposlitvenih središč med letoma 2000 in 2009. Glavna baza podatkov je Statistični register delovno aktivnega prebivalstva (SRDAP), kjer je na voljo kraj bivanja in kraj dela zaposlenega. Baza prikazuje zaposlene in samozaposlene osebe v delovnem razmerju, stare nad 15 let, na območju republike Slovenije, izvzeti so kmetje. Pri SRDAP bazi obstajajo določeni problemi, ki jih je treba upoštevati pri interpretaciji in do določene mere izkrivljajo pravilnost podatkov. Prvi in največji problem je napačno naveden kraj dela (Ravbar 2007; Bole 2008; Gabrovec in Bole 2009). Ta problem smo rešili tako, da tistih relacij kjer je prihajalo do sumljivo velikega števila dnevnik vozačev med zelo oddaljenima občinama (na primer Lendava–Ljubljana) nismo prikazali na karti. V realnosti so to občine, ki so bodisi mejne ali pa imajo večje vojašnice (na primer Ilirska Bistrica). Problem pa ni le

v napačno navedenem kraju dela, ampak tudi v napačno navedenem kraju bivanja, saj del prebivalcev dejansko ne prebiva v kraju kjer imajo navedeno uradno stalno prebivališče. Po nekaterih ocenah ima okoli desetina prebivalcev Slovenije napačno zaveden kraj bivanja (Gabrovec in Bole 2010).

Drugi problem je spremenjena metodologija zbiranja podatkov SRDAP. Večja sprememba se je zgodila leta 2008, ko se je pri državljanih Slovenije upoštevalo stalno prebivališče, za tujce pa začasno (o migrantih na trgu dela v Sloveniji glej Pajnik, Bajt in Herič 2010). Od leta 2009 se tudi pri državljanih Republike Slovenije upošteva začasno prebivališče, kar je z vidika raziskovanja dejanske delovne mobilnosti pravilneje. Ta problem je z našega vidika manj pomemben, saj predvidevamo, da je napaka enakomerno razporejena po celotni državi. Kljub vsemu moramo to spremembo upoštevati pri tolmačenju rezultatov.

Tretji problem je, da SRDAP baza ne vsebuje podatka o dejanskih potovanjih zaposlenih oseb. Narava delovnega procesa se je v zadnjih desetletjih temeljito spremenila in vsakodnevno potovanje delavcev na kraj dela ni več nujnost. Obstaja vse več poklicev, kjer se del delovnega procesa lahko odvija tudi na domu, zato delavci potujejo na kraj dela po potrebi, nekajkrat tedensko ali celo manj. To se pojavlja zlasti v storitvenih panogah, manj pa v klasičnih industrijskih panogah.

Za prostorsko enoto smo izbrali 192 občin, kot so obstajale leta 2000. Do leta 2009 je nastalo še 18 novih občin, ki smo jih zaradi metodološke doslednosti pripisali starim občinam iz leta 2000. Med letoma 2000 in 2009 so se zgodile tudi manjše spremembe občinskih meja, kot so pripojitve/izločitve naselij v/iz občin, ki pa zaradi manjšega obsega na rezultate bistveno ne vplivajo.

Pomembno je tudi pojasnilo glede izbora zaposlitvenih središč. Izbrali smo deset največjih zaposlitvenih središč v Sloveniji, saj tako zaobjamemo skoraj vsa regionalna središča. Izjema je le Slovenj Gradec, ki ima premajhno število delovnih mest (8.300 leta 2009) in je celo manjše od Domžal, Krškega in Slovenske Bistrice. Če bi želeli vključiti še Slovenj Gradec bi morali vključiti tudi ostala omenjena zaposlitvena središča, kar bi precej omejilo razumljivost kartografskega prikaza. Moč zaposlitvenih središč oziroma obseg delovne mobilnosti smo prikazali tako, da smo povezali izvorno in ciljno občino z ravno linijo (relacijo). Podobna metoda je bila že uporabljena tako v Sloveniji (Gabrovec in Bole 2009) kot v tujini (Dessemontet, Kaufmann in Jemelin 2010). Na kartah smo zaradi preglednosti prikazali le relacije, ki imajo 50 zaposlenih vozačev ali več.

## 3 Analiza

V podatkovni bazi SRDAP je bilo leta 2000 skupno 756.426 delovnih mest, leta 2009 pa 805.615. Deset največjih zaposlitvenih središč ima skupaj približno polovico vseh delovnih mest v Sloveniji. Na sliki 1 je predstavljeno gibanje števila delovnih mest, kjer vidno izstopa Ljubljana, ne le zaradi zelo velikega števila delovnih mest, temveč tudi zaradi najvišje stopnje rasti. Negativno gibanje števila delovnih mest opazimo najbolj izrazito v občini Murska Sobota, manjši upad pa je zabeležen tudi v občinah Kranj, Velenje in Nova Gorica.

Slika 1: Gibanje števila delovnih mest v desetih največjih zaposlitvenih središčih Slovenije (vir: SRDAP 2010). Glej angleški del prispevka.

### 3.1 Privlačnost zaposlitvenih središč leta 2000 in 2009

Relacije delovne mobilnosti leta 2000 so izkazovale velik prostorski domet zlasti Ljubljane, deloma tudi Maribora in Celja. Obstajale so pomembne povezave med samimi zaposlitvenimi središči, ki so si prostorsko bližje, zlasti na relacijah Kranj–Ljubljana, Celje–Ljubljana, Ptuj–Maribor in Velenje–Celje.

Kljub možnosti napak so dobro vidna prostorska zaledja, ki jih imajo posamezna zaposlitvena in s tem tudi regijska središča v Sloveniji. Zemljevid posameznih relacij nam prikaže podobne razmere kot v drugih raziskavah dnevne delovne mobilnosti v preteklosti (na primer Bole 2004). Visoka stopnja prostorske mobilnosti zaposlenih je bila zlasti v Ljubljanski kotlini zaradi visoke stopnje urbanizacije oziroma metropolitanezacije (Ravbar 1997, 86) in ugodnih prometnih povezav z avtocesto in železnico). Podobno je bilo tudi na Dravskem polju, kjer je bilo poleg Maribora pomembno sekundarno zaposlitveno središče tudi Ptuj.

Slika 2: Privlačnost deset največjih zaposlitvenih središč leta 2000 (vir podatkov: SRDAP 2010). Glej angleški del prispevka.



Slika 3 prikazuje precej spremenjeno podobo, zlasti povečano privlačnost praktično vseh večjih zaposlitvenih središč. V pogled v same številke pa razkrije marsikatero podrobnost: ni se povečal le prostorski domet posameznih zaposlitvenih središč v okoliške občine, temveč se je močno povečala tudi mobilnost med samimi zaposlitvenimi središči. Takšne so relacije Koper–Ljubljana, Celje–Ljubljana in Novo mesto–Ljubljana. Najbolj očitni razlog je izgradnja prometne infrastrukture oziroma dokončanje avtocestnih odsekov med omenjenimi središči. Zanimivo je tudi, da je Ljubljana poleg ciljne postala tudi izvorna občina delavcev: število delavcev na relaciji Ljubljana–Celje in Ljubljana–Koper se je med letoma 2000 in 2009 povečalo iz 200 na okoli 400.

Glede spremenjenega dometa izstopata zaposlitveni središči Ljubljana in Maribor. Obseg relacij se v obeh primerih ni pomikal le ob novo izgrajenih odsekih avtocest, temveč tudi na območja kjer se cestne povezave niso bistveno izboljšale. V primeru privlačnosti Ljubljane je opazen močen porast zlasti v občinah južno (Cerknica, Postojna, Ribnica, Kočevje), v Mariboru pa severno od mesta (Šentilj, Kungota).

Slika 3: Privlačnost deset največjih zaposlitvenih središč leta 2009 (vir podatkov: SRDAP 2010).  
Glej angleški del prispevka.

### 3.2 Spremembe privlačnosti zaposlitvenih središč med letoma 2000 in 2009

Primerjava obsega mobilnosti med desetimi največjimi zaposlitvenimi središči in ostalimi občinami je vidna na Sliki 4. Izpostavimo lahko povečan domet in obseg mobilnosti v Ljubljano, Maribor, Koper in Celje. Število delavcev v Ljubljano se je povečalo skoraj iz vseh smeri: tako iz suburbaniziranih občin v bližini (Grosuplje, Kamnik, Vrhnika ...) kot iz bolj oddaljenih občin izven ljubljanske regije (Postojna, Koper, Novo mesto, Celje ...). Manjši je bil porast obsega delavcev v Maribor: za več kot 500 delavcev se je povečala le mobilnost iz Slovenske Bistrice. Med zaposlitvenimi središči z zmanjšanim obsegom delovne mobilnosti najbolj izstopa Murska Sobota, ki beleži upad zaposlenih vozačev iz večine smeri. Tudi privlačnost Novega mesta in Kranja se na nekaterih bližnjih relacijah zmanjšuje: zanimiv je upad iz smeri Dolenjskih Toplic in Žužemberka v Novo mesto in Cerklj na Gorenjskem v Kranj. Gre za relacije, ki imajo dolgo zgodovino izvora delavcev zlasti za industrijske obrate v omenjenih dveh zaposlitvenih središčih. Morda gre za preusmeritev tokov dnevne delovne mobilnosti hkrati s prestrukturiranjem gospodarstva iz proizvodnega v storitveni sektor, saj se je ob zmanjšanju mobilnosti v industrijska, povečala mobilnost v storitvena središča.

Slika 4: Sprememba privlačnosti zaposlitvenih središč v absolutnih vrednostih.  
Glej angleški del prispevka.

Slika 5 prikazuje spremembe v privlačnosti glede na relativne vrednosti (delež). Ta slika nam še jasneje prikazuje relacije, kjer je v omenjenem obdobju prišlo do največjih sprememb v mobilnosti zaposlenih. Največji deleži rasti so vidni na osi Ljubljana–Celje, kjer se je obseg mobilnosti zaposlenih v letu 2009 glede na leto 2000 več kot podvojil. Za več kot 100 % so se povečali tudi tokovi zaposlenih iz primorske in posavsko–dolenjske smeri proti Ljubljani. Na vseh omenjenih smereh so bili dokončani pomembni avtocestni odseki, ki so omogočili boljšo dostopnost Ljubljane. Tudi v ostalih zaposlitvenih središčih so se zgodile določene spremembe, ki pa so v primerjavi z Ljubljano manj izrazite.

Slika 5: Sprememba privlačnosti zaposlitvenih središč v relativnih vrednostih.  
Glej angleški del prispevka.

## 4 Razprava: značilnosti in vzroki sprememb v privlačnosti zaposlitvenih središč

### 4.1 Izboljšanje objektivne in subjektivne prometne dostopnosti

Iz analize SRDAP podatkov so vidne spremembe v mobilnosti delovne sile. Če predvidevamo, da je raven napake v bazi SRDAP zaradi napačno navedenega kraja dela in bivanja med obema referenčnima letoma ostala enaka, potem je karta sprememb mobilnosti delovne sile relevanten vir, na podlagi katerega lahko

te spremembe zaznavamo. Iz omenjene analize smeri in obsega prostorske mobilnosti zaposlenih v obeh primerjalnih letih lahko ugotovimo nekatere temeljne značilnosti. Prva značilnost in hkrati tudi potrditev teze iz uvoda tega prispevka je, da izgradnja avtocest očitno vpliva na večji obseg mobilnosti zaposlenih. Iz kart so vidne osi, kjer se je število zaposlenih vozačev močno povečalo tako v absolutnih kot relativnih vrednostih. Zlasti gre za naslednje osi:

Koper–Ljubljana, kjer je bil dokončan avtocestni odsek do mesta Koper, ki je skrajšal čas vožnje za okoli 15 minut, kar pa v psihološkem smislu očitno dovolj zmanjša upor, ki je potreben za odločitev o vožnji na delo.

Z izgradnjo trojanskih avtocestnih predorov (leta 2005) se je očitno povečala mobilnost zaposlenih med celjsko in ljubljansko regijo. Iz Slovenskih Konjic (po spletnih brskalnikih sodeč oddaljene od Ljubljane 1 uro in 7 minut) je bilo leta 2009 v Ljubljani 200 zaposlenih več kot leta 2000. Zelo močno so se povečali tudi tokovi zaposlenih iz občin na celjskem proti Ljubljani: Prebold, Polzela, Žalec, Celje.

V istem obdobju se je skoraj v celoti odprla tudi dolenska avtocesta A2 proti Obrežju in Krško je sedaj dostopno v 1 uri in 10 minutah. Z zemljevidov vidimo, da se je v absolutnih vrednostih močno povečalo število zaposlenih v Ljubljani iz občin Krško in Trebnje, v relativnih pa tudi manjšim občinam (Škocjan, Šentjernej).

Hkrati opazimo, da je bilo povečanje v ostalih zaposlitvenih središčih precej manj izrazito kot na primeru Ljubljane. Izboljšava oziroma dokončanje avtocestnega omrežja je najbolj okrepilo osrednjo vlogo Ljubljane, kot so to napovedovale nekatere pretekle študije (Gulič in Plevnik 2000). Mobilnost v ostala regionalna središča so se spreminjala manj. Novo mesto je morda zaradi dokončanja avtocestnega odseka leta 2008 pri Otočcu pridobilo 671 delavcev iz treh posavskih občin (Sevnica, Krško, Brežice). Nedavni dokončani odseki avtocest bi lahko v prihodnosti povečali obseg relacij zaposlenih zlasti v Vipavski dolini (v smeri Ljubljane, morda Kopra) in na Dravskem polju in Halozah (v smeri Maribora) ter Prekmurja (v smeri Maribora, morda Murske Sobotne). Veliko vlogo pa nima zgolj objektivna časovna dostopnost, ampak tudi subjektivno dožemanje dostopnosti. Četudi izgradnja določenega odseka avtoceste približa zaposlitveno središče le za nekaj minut, je dožemanje izboljšanje dostopnosti očitno precej večje. Tudi uveljavitev vinjetnega sistema cestninjenja je povečala uporabo avtocest in prispevala svoj delež k dožemanju boljše časovne dostopnosti zaposlitvenih središč.

## 4.2 Družbenoekonomske spremembe v občinah

Druga značilnost ni povezana z izgradnjo ali bistveno izboljšavo cestnega omrežja. Nekatere relacije izkazujejo veliko porast števila zaposlenih, a brez izboljšanja cestne infrastrukture. Gre za relacije med občinami južno od Ljubljane (Kočevje, Ribnica, Postojna in Pivka), v okolici Maribora (Šentilj, Hoče) in posamičnih drugih lokacijah (Šentjur pri Celju–Celje ali Črnomelj–Novo mesto). Ta porast lahko pripišemo temeljnemu družbenoekonomskemu spremembam znotraj urbanega sistema (Bole 2008). V primeru nekaterih relacij lahko govorimo o širjenju suburbanizacijskih vplivov in posledično večji mobilnosti med satelitskimi kraji in središčnim krajem dela – takšna je na primer relacija Hoče–Maribor. V drugih primerih pa se mobilnost v bolj oddaljena zaposlitvena središča povečuje zaradi ekonomske krize izvornih občin. Občina Šentilj je v razdobju 2000–2009 izgubila skoraj tretjino vseh delovnih mest in hkrati povečala mobilnost zaposlenih v bližnji Maribor za več kot 300. Isto velja tudi za zaposlitvena središča, ki izgubljajo obseg zaposlenih vozačev – kriza in odpušcanje delavcev v živilski in tekstilni industriji Murske Sobotne je najverjetneje vplivala na zmanjšanje mobilnosti delavcev iz okoliških podeželskih občin.

## 4.3 Spremembe hierarhije med regijami

Tretja značilnost je povezana z vse bolj očitnimi povezavami med regijami. Regijska središča nimajo nujno enotnega zaledja, temveč se vse bolj prepletajo in medsebojno povezujejo. V obravnavanem časovnem razdobju so se močno povečale povezave med samimi regijskimi središči. Pomembni tokovi zaposlenih se gibljejo izven regionalnih meja in oblikujejo enotno urbano omrežje. Podobno so ugotovili tudi drugi avtorji, na primer v Švici, kjer so ugotovili, da se ne spreminjajo samo vzorci mobilnosti znotraj regij, temveč vse bolj med regijami samimi (Dessemontet, Kaufmann in Jemelin 2010) oziroma spreminja se hierarhičnost med posameznimi mestnimi regijami.

#### 4.4 Spremembe hierarhije znotraj regij

Pomembne so tudi spremembe mobilnosti znotraj regij. V obravnavanem obdobju se je namreč v vseh zaposlitvenih središčih (razen Kopra) zmanjšalo število tistih, ki delajo in bivajo znotraj istega zaposlitvenega središča (torej tistih, ki delajo in bivajo v isti občini). Ta upad je lahko posledica zmanjšanja števila delovne sile v zaposlitvenih središčih zaradi demografskih vzrokov (staranje prebivalstva, manjšanje števila prebivalstva). Na podlagi urbanogeografskih raziskav pa lahko predvidevamo tudi, da je negativna razlika tudi posledica dejstva, da se prebivalci regijskih središč vse bolj vozijo na delo v sekundarna zaposlitvena središča znotraj in izven regij. Tokovi zaposlenih postajajo tako vse bolj razpršeni, saj se vse več zaposlenih iz regijskega središča vozi v manjša okoliška zaposlitvena središča v razne obrtne in podjetniške cone, ki nastajajo v obmestnem prostoru. Podoben proces je bil opisan že na primeru ljubljanske (Bole 2008) in mariborske regije (Drozg 2006), vodi pa v nastanek bolj policentrične zgradbe regij oziroma regijskega mesta, kjer se hierarhična organiziranost naselij v regiji spreminja in uravnoteži.

### 5 Sklep

Kljub številnim omejitvam, ki izhajajo iz kakovosti podatkov, lahko izluščimo nekatere pomembne sklepe. Pritrdimo lahko tezi, da izboljšanje cestne povezave vpliva na večji obseg mobilnosti zaposlenih. Boljša dostopnost zaposlitvenega središča torej vpliva na obči razvoj regije (Kozina 2010b). A hkrati se postavljajo resni pomisleki ob povečanih tokovnih dnevne mobilnosti zaposlenih. Prvi pomislek je, da najbolj izrazito svoj prostorski domet širi le Ljubljana, ostala regionalna središča precej manj. Zaradi lokacije Ljubljane ob križišču avtocestnih osi, se je povečal domet zlasti proti Celju, Posavju, Novemu mestu in Kopru. Domet ostalih regionalnih središč, neposredno povezan z izgradnjo avtocestnega omrežja je manj očiten in zato sklepamo, da današnji koncept izgradnje avtocestne infrastrukture povečuje izrazito zgoščevanje le v enem urbanem središču. Z vidika uravnoveženega regionalnega razvoja bi bilo smiselno krepiti medregionalne povezave, ki bi približala ostala regionalna središča (na primer 3. razvojna os, Keltika). Z vidika trajnostnega razvoja pa bi bilo smiselno razmišljati tudi o tem, da izboljšana dostopnost ne temelji zgolj na infrastrukturi, ki omogoča osebni prevoz, ampak na konkurenčnem in sodobnem javnem prevozu.

Drugi pomislek zadeva splošni regionalni in lokalni razvoj. Mobilnost zaposlenih se ne povečuje zgolj ob novih avtocestah, ampak tudi tam, kjer se cestna infrastruktura ni bistveno izboljšala. Gre za občine z izrazito negativnim gospodarskim razvojem, izgubljanjem lastnih delavnih mest in posledično s pojavom dnevne mobilnosti v druga, večja zaposlitvena središča (Šentilj, Kočevje). Ta pojav vodi v osiromašenje gospodarske in kulturno-družbene vloge lokalnih zaposlitvenih središč in povečuje eksterne stroške prometa, ki nastanejo zaradi večjih prometnih obremenitev. Nemalokrat ti dnevni vozači pritiskajo na lokalne in državne oblasti z namenom, da se izboljša prometna infrastruktura, kar pa je iz ekonomskega vidika redko upravičeno. Takšni so primer pritiska dnevnih vozačev na Kočevskem in v Idriji (Bole, Gabrovec in Kozina 2010), razmere pa so podobne tudi v razpravah za dodatno gradnjo oziroma razširitev ljubljanskega avtocestnega obroča.

Obstajajo tudi drugi pomisleki. Vse večja prostorska mobilnost zaposlenih, ki vodi v kulturo vozaštva ima lahko posledice na produktivnost delavcev. Študija več kot 41.000 nemških dnevnih delovnih vozačev je pokazala zanimivi rezultate (Ommeren in Gutiérrez-i-Puigarnau 2011). Zaposleni, ki se dnevno vozijo dlje, so v povprečju več odsotni z delovnega mesta zaradi zdravstvenih in drugih razlogov. V povprečju bi bila odsotnost z delovnega mesta manjša za 15–20 %, če bi imeli vsi zaposleni minimalno razdaljo za vožnjo na delo.

Dnevna mobilnost zaposlenih je vsekakor zanimiv geografski pojav. Spremembe v mobilnosti delavcev nakazujejo na spremembe regionalne strukture, infrastrukturne spremembe in na povsem osebne, psihološke vzgibe. A hkrati ima dnevna mobilnost zaposlenih pomembne povratne posledice na prostor, zlasti z vidika onesnaženosti pokrajinskih prvin in gospodarskih stroškov. Slednji ne izhajajo le iz upora - be ter gradnje prometne infrastrukture, ampak tudi z vidika onesnaženja, uničenja kakovostnih kmetijskih, bivalnih ali ekosistemskih površin. Zato je preučevanje dnevne mobilnosti pomemben del geografskega raziskovanja, širše pa tudi regionalne in prostorskega načrtovanja.

## **6 Zahvala**

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## **7 Literatura**

Glej angleški del prispevka.