

Stratification of postal areas

Matej Pechota¹, Lucia Možuchová¹

¹Department of Communications, Faculty of Operation and Economics of Transport and Communications, University of Žilina, Slovakia

Abstract The postal network consists of sending points, delivery points or shipment between these points. Its separation within the selected country is important. The stratification of postal areas has an impact for example on the length of the transit time, the number of posts to be operated and the associated operating costs. Stratification of postal areas is affecting several areas. In this article, we will focus on stratifying postal areas depend from the transit time. The article proves importance of the stratification because it is one piece of real mail studies.

Keywords postal area, stratification, transit time, EN 13850, real mail studies

JEL L87, L86

1. Introduction

Every of the postal operator has to separate country area into the postal areas. Number of the postal areas depends on amount of sent items in the area, number of citizens and there are rules as well. We would like to present in this article, aspects that are useful for the next stage in stratification of the postal areas. Throughout this article there will be theoretical bases about the general definition of postal services, stratification based on the European standard EN 1380. More important is the methodology which we applied to program features for dynamic map of postal areas which is separated based on the rules and standard. We applied mathematics method to calculate part of amount of the sent letter mails in each postal area. Thanks to the stratification of the postal area can be improved the methodical of transit time and change will be shown real time because of the program. According to these results we can decide how to improve methodical transit time and postal services as well.

2. Theoretical bases

To get closer to the main topic of this article we will describe postal services as well as definition of the stratification of postal areas.

The post - is a fixed establishment designed for the selection and distribution of postal items and the sale of postal censuses. The "mail" label can only be used to indicate the access points of the public postal network and the public postal network contact points. This is without prejudice to the right to use the word "mail" in combination with other words as part of the business name of the postal undertaking or as part of the postal service's postal service name provided

the distinguishing feature of the sign under the first sentence is ensured. [7]

2.1. Postal services

Postal services are provided by postal operators in each country. We are going to focus on national postal operators which should provide special postal services. This postal service can be called "universal service" and it means that:

"It is an offer of postal services which serves the minimal needs of all postal service users in Slovakia and to ensure accessibility to access points of the public postal network and the contact points of the public postal network under the same conditions within a specified quality at a fair price. Every working day with at least one recess and daily delivery." [1]

Postal services topic is too big for this article; hence we should concentrate on two main services which is provided by the national postal operator. These are: [2]

Letter mail

Letter mail is the most popular service provided by postal operators in the selected area. Letter mail is a letter service communication or small article sent by this operator. You can send it within the domestic area or abroad. Letter mail has got some specifications which are different in every country. You can use it for sending letters, letters for the blind, direct mail (within Slovak Republic). Communications can be sent on any kind of physical media (paper, card, CD, DVD). There could be different quality standards of transit times, size and weight, but in Slovakia the specifications for letter mail are the following:

- **Letters within the Slovak Republic:**
 - 1st Class Letter - D+1 (delivery on the next working day after the day of posting),

- 2nd Class Letter - D+2 (delivery on the second working day after the day of posting)
- Letter for blind - D+4 (delivery on the fourth working day after the day of posting),
- Direct mail - D+4 (delivery on the fourth working day after the day of posting),
- **Letters abroad**
 - assumed transit times of letters addressed abroad depend on the respective country of destination, for an expedite transit time, choose the "1st Class" Letter option [2]

Letter mail is a paid service, but every country has got different control devices which control if the price is regular for that market. There are many things which are important to set up for the right price for this service. Analysis of these topics is too large, and it is not the main area to be characterised. There is one thing which is set up for letter mail and that is the method of payment. Here are some possible methods of payment for letter mail:

- cash,
- postage stamps,
- bank transfer,
- postage credit,
- franking machine.

There are also some special services which can be added to it. It is for example: Reply service, Withdrawal of an Item from the Post at posting, Withdrawal of an Item from the Post at delivery, return to Sender immediately, do not redirect, return to Sender after ... days, do not return these special services are provided for letter mail send in domestic service. For those letter mails, which are sent abroad there are these possibilities: Reply service (up to 50 g to all countries, above 50 g to shortlisted countries), Withdrawal of an Item from the Post at posting, do not redirect, Poste restante. [2]

2.2. Geographical stratification

The relationship between the point of delivery and the point of delivery characterizes each shipment geographically. Both points together represent a delivery area, a delivery area, a certain distance, and the complexity of geographical postal logistics between them. Stratification according to the geographic features of shipments must reflect possible logistical differences in the distribution of shipments between different delivery, delivery and distribution distances. Geographic stratification is therefore based on the postal logistics structure. When submitting and delivering, the area must be partitioned into at least three mutually exclusive postal areas. Postal areas are derived from the logistics structure of postal operators. It must ensure a complete geographic coverage of the study. [4]

The geographical breakdown of groups must be done by random selection. The entire geographic area defined in the study area is appropriate. Sender and recipient groups must be scattered in a geographic raster to recruit group members

based on postal zones operated by operators. Spread of the group must ensure that all postal areas defining geographic stratification are covered.

Postal areas must be separated into the two main groups. There are cities and local areas. City area is area where the number of citizens is 50 000 or more. City area must be independently.

Local area is area where number of citizens is less than 50 000. Local areas may be merged.

Postal areas may be merged in way where the transport of the postal items will not be worse. [3]

3. Methodology

Stratification of the postal areas is currently already done. We comprised current stratification due to standard and rules. Based on right methodology we could program dynamic map of postal areas.

3.1. Comparison

There are too many definitions of comparison. It depends on what field you would like to compare. But basically, comparison means to find some differences between something. We can compare economics, trends, marketing campaign etc. In this case I am going to compare amount of sent items. It is comparison of statistics information. In many cases, a researcher is interesting in gathering information about two populations to compare them. As in statistical inference for one population parameter, confidence intervals and tests of significance are useful statistical tools for the difference between two population parameters. In this case parameters are amount of sent items in next chapter I will compare data from five years. Comparison consists of three main steps for example:

- a) Collecting data
- b) Ensure consistency of information
- c) Select on effect to compare

Comparison can do only when data are consistence and it is possible to compare it. You cannot compare incomparably. [5,6]

3.2. Merging and partitioning areas

Merging is process where the two or more areas are getting into one group. It means they form one area.

Postal area should be merge when the amount of sent or delivered items are too less. In this case postal area needs to be merge to another postal area where the amount of sent or delivered items are too less as well.

Less amount of sent or delivered items are less than 10 % per main processing centre.

Partitioning is process where in the area exist city area or where the amount of sent or delivered items are more than 10 %.

Postal city area must be separately from the other postal areas because of the real mail studies. [3,7]

4. Results

Due to analysis of the Slovak postal stratification we found out way how to upgrade postal areas. The postal areas are stratified at the level of district processing centers. District processing centers are postal areas, which also results in areas where the share of the total volume of leaf items is very small. This small share of the total volume of letter shipments is the reason for the merging of postal areas. Other reasons for merging postal areas include:

- insufficient distribution of urban and rural areas due to the absence of a study of actual flows;
- selected areas district processing centers have a very low share of shipments;
- from the point of view of the size of the country in which the measurement is applied is the number of postal areas - 43 for comparison. The Czech Post divides the territories into 53 postal areas (the size of the Czech Republic is 1.6 times larger than that of the Slovak Republic).

Based on the requirements of EN 13850 and the above, we have designed postal areas that comply with EN 13850 and stratification of postal areas is directly proportional to the size of the Slovak Republic. For the design of postal areas, we have defined urban and rural areas where:

- The urban area is where the population is equal to or greater than 50,000.
- The countryside is where the population is less than 50,000.

According to the data from the Statistical Office of the Slovak Republic, we found the following:

- There are 10 sites in the Slovak Republic that meet the requirement of EN 13850 to be categorized into urban areas: Bratislava, Trnava, Trenčín, Nitra, Žilina, Martin, Banská Bystrica, Poprad, Prešov and Košice,
- There are 26 District Processing Centers with a very low proportion of shipments that we propose to merge,
- Urban areas should be removed from the postal areas to be independent of actual flows.

Under the terms of the standard and the information we have acquired, we propose to merge postal areas with a low share of mail so that the logistics processes of the postal network are not compromised. At the same time, we propose to divide the postal areas where the postal city area is located, ie. the urban postal area must be a separate study of actual flows. To better visualize the merging or distribution of postal areas, an example of the postal areas served by the main processing center in Žilina.

Table 1. Current postal areas

Current areas	Number of citizens local area	Number of citizens city area	Rate of letter mails %
OSS Liptovský Mikuláš	72452		8,27
OSS Ružomberok	56942		8,93
OSS Martin	57414	55332	10,85
OSS Púchov	44434		3,38
OSS Považská Bystrica	62810		10,61
OSS Trenčín	154929	55593	15,23
OSS Žilina	139579	81041	22,05
OSS Čadca	90739		8,17
OSS Dolný Kubín	137279		12,5

In the above-mentioned district processing centers with the relevant inhabitants in the area and percentage of the consignments within the main processing center Žilina. According to the rules of urban and rural postal areas, which we defined at the beginning of this subchapter, we proposed the merger and division of postal areas. After merging and splitting the postal areas within the main processing center in Žilina, the following were:

Table 2. Suggested postal areas

Postal area	Old stratification	District
mMT	OSS Martin	Martin city
mZA	OSS Žilina	Žilina city
mTR	OSS Trenčín	Trenčín city
DK, LM, RK	OSS Dolný Kubín OSS Liptovský Mikuláš OSS Ružomberok	Dolný Kubín Liptovský Mikuláš Ružomberok Námestovo Tvrdošín
vZA, CA, vMT	OSS Žilina OSS Čadca OSS Martin	Žilina local Čadca Martin local Bytča Kysucké Nové Mesto Turčianske Teplice
vTR, PB, PU	OSS Trenčín OSS Považská Bystrica OSS Púchov	Trenčín local Púchov Považská Bystrica Ilava Bánovce nad Bebravou

The previous table lists the postal areas we have designed. Compared to the original postal areas where the postal areas are not divided into urban and rural areas and the percentage of postal areas is low, there are a total of 9 postal areas. [8,9]

The proposal created by us has divided the postal areas into the urban and rural postal areas and we have also secured

an increase in shipments in the postal sector. Our proposal therefore counts with 3 urban postal areas and 3 rural postal areas, a total of 6 postal areas served by the main processing center in Žilina. The difference is in the number of postal areas, the volume of postal items in the postal area, a qualitative increase in measurement of 2nd class letter shipment. The postal area map is used to view the changes.

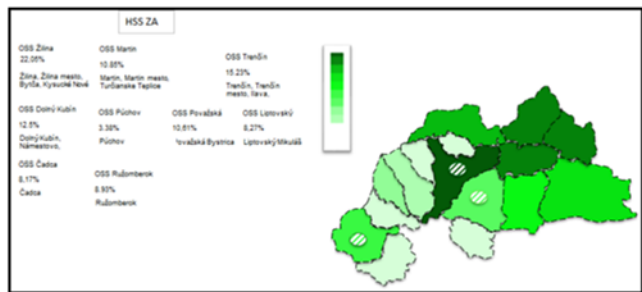


Figure 1. Map of the current postal areas

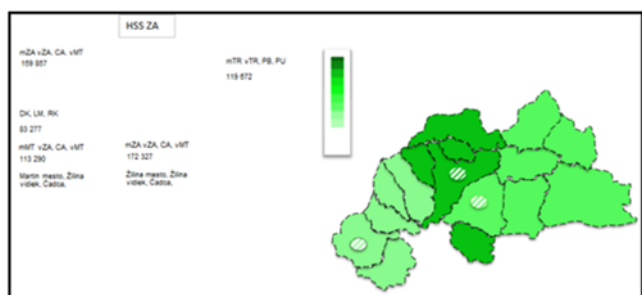


Figure 2. Map of the suggested postal areas

Design of suggested postal area based on the European standard EN 13850 and the other rules can be applied to all postal areas on the Slovak postal market.

5. Conclusions

Postal stratification is important because of transit time, quality of the postal services and customer satisfaction as well. Stratification of the postal areas is just one part of real mail studies. Nowadays number of postal areas on the Slovak

postal market are not stratified due to rules and standards. There are missing city areas, and local areas with a rate of sent of delivered items more than 10 per main processing centre. Based on this information we stratified postal areas in the main processing centre of Žilina. We suggest to stratify postal areas into the three city areas and three local areas due to rules and standards. This process can be applied on all Slovak postal market.

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