

Abstract

A census of population, households and apartments is the biggest statistical research, the aim of which is to gather basic information on the number, territorial layout, and composition of population according to its demographic, economic, educational, migrational and other features.

For the purposes of the Zagreb City Office for Strategic Planning and Development, the Faculty of Geodesy at University of Zagreb developed in July 2010 the project "GIS database of census districts according to the 2001 population census". The primary sources of data were boundaries of the city of Zagreb spatial units and data of the 2001 population census. The project linked for the first time the statistical with geometrical data in a single database.

Considering the possibilities of data analysis, seen through visualization of different queries, the undoubted conclusion is that thus formatted statistical data linked to spatial data in a GIS environment offer a wide, practically unlimited, range of applications. Some of the possible database applications are strategic and spatial planning, urbanism, public utility actions, projects of social standard improvement, geomarketing, etc. A single and adjustable database model enables its easy maintenance and updating, which will be especially important after the new statistical censuses of 2011.

Database modelling

Entry data to the project were:

1. Registry of business units – boundaries of city neighbourhoods (mdb)
2. Data of the population census (2001) according to census districts (xls)

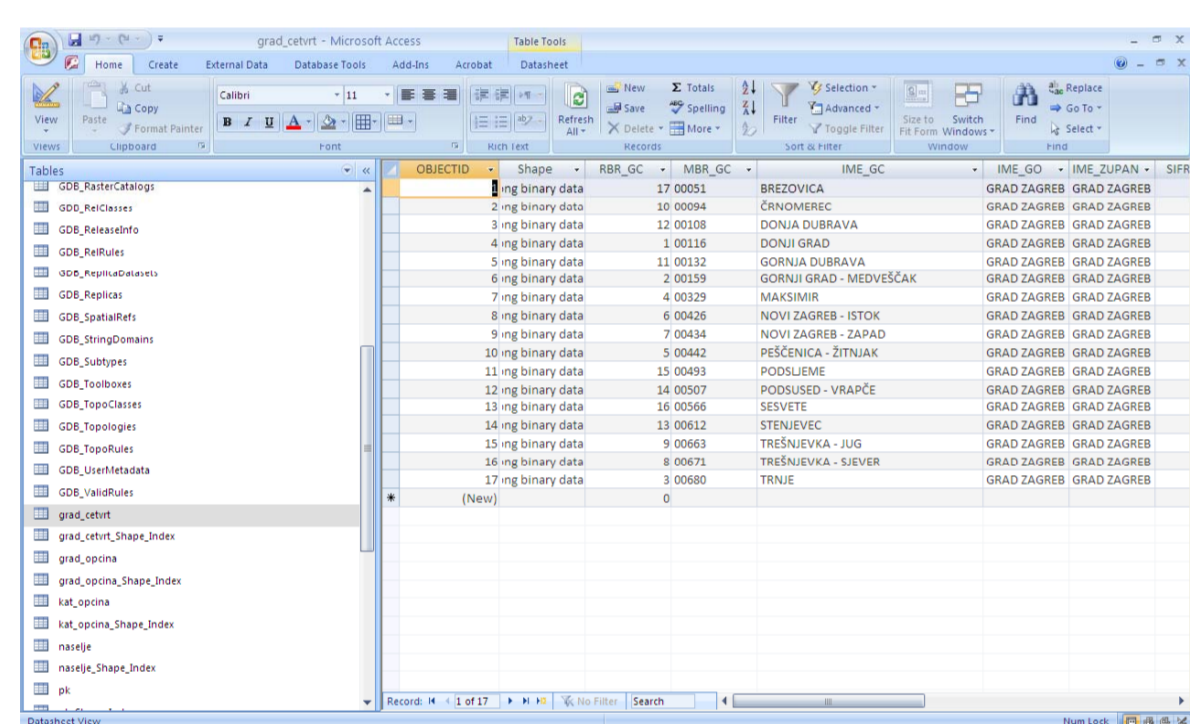
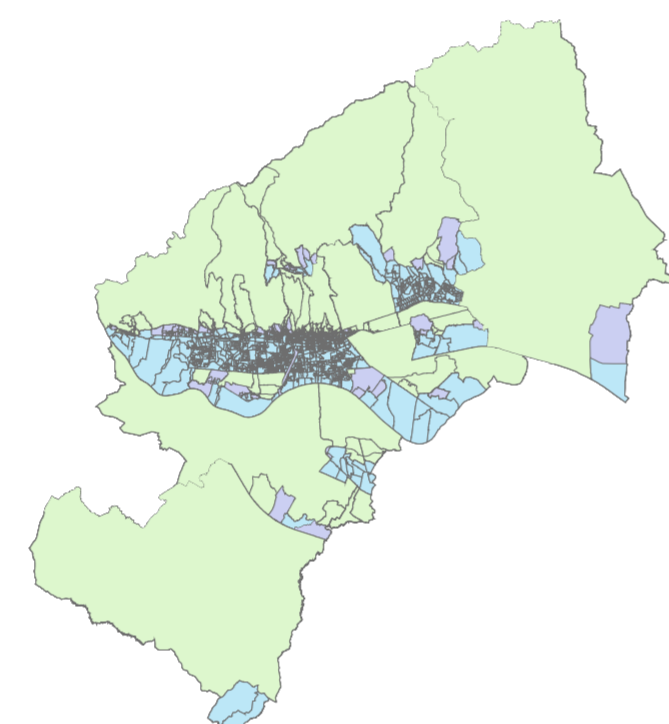


Table city-neighbourhood from the RBU

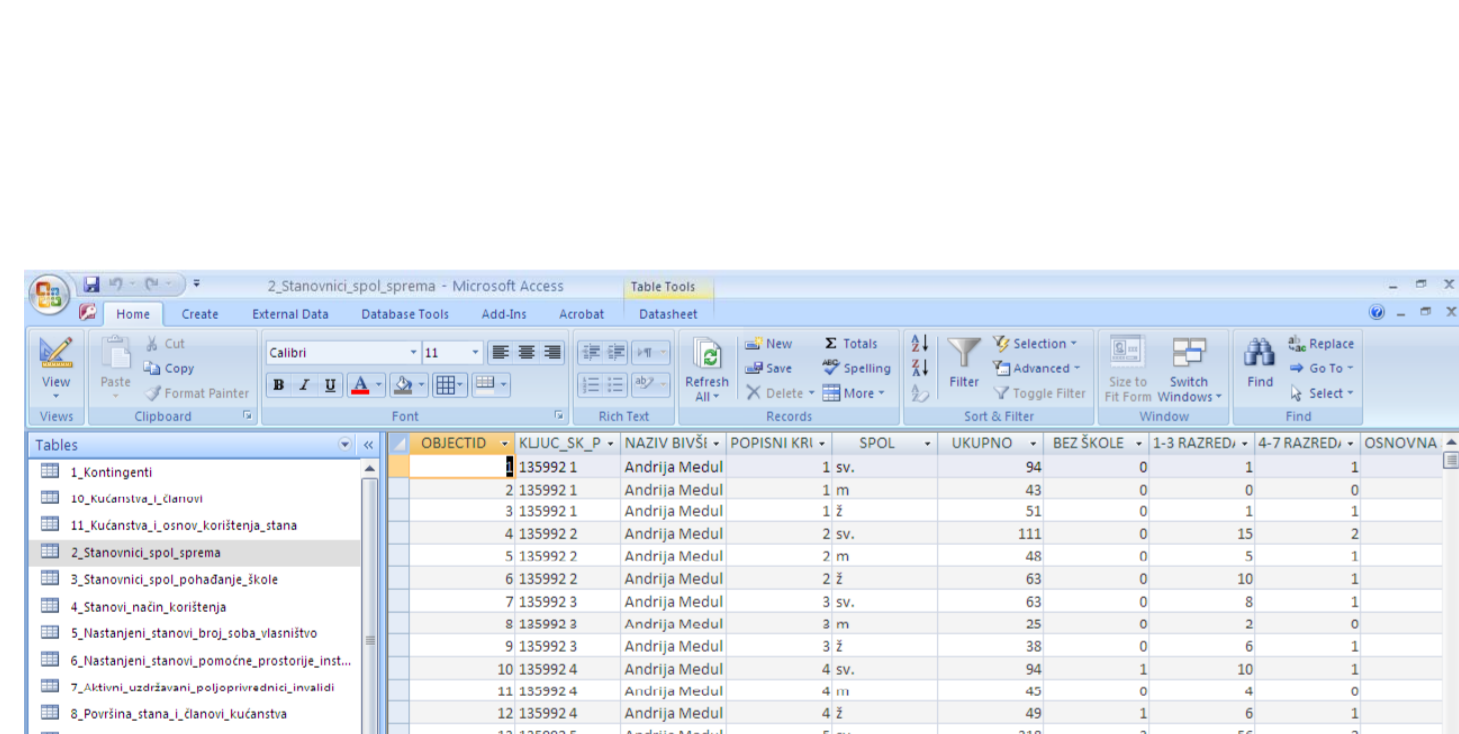


RBU census districts



Taken statistical data

After arrangement, the entry data were put into an Access relational database, and were linked to the georeferenced data of census and statistical districts.



Statistical data in the base

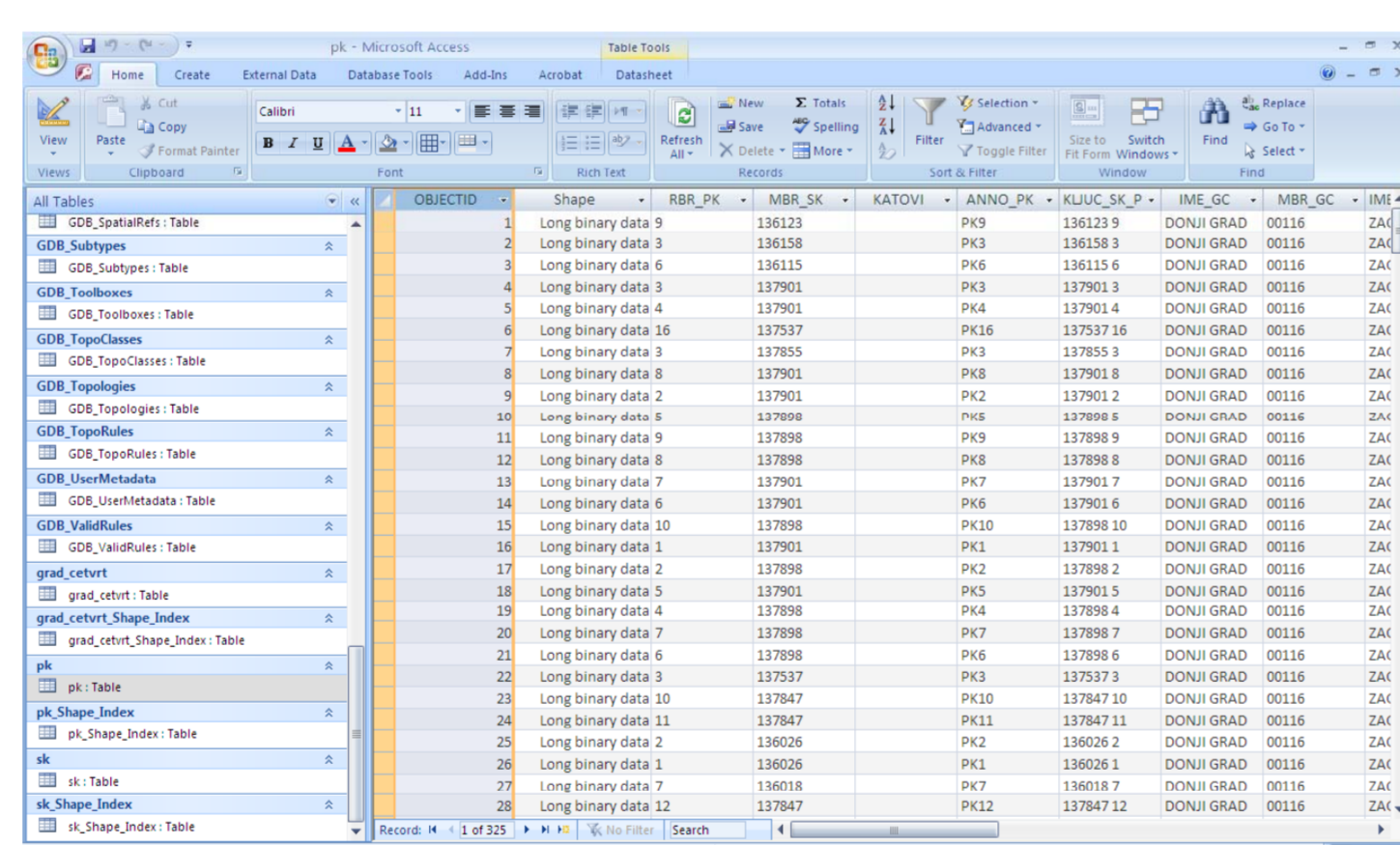
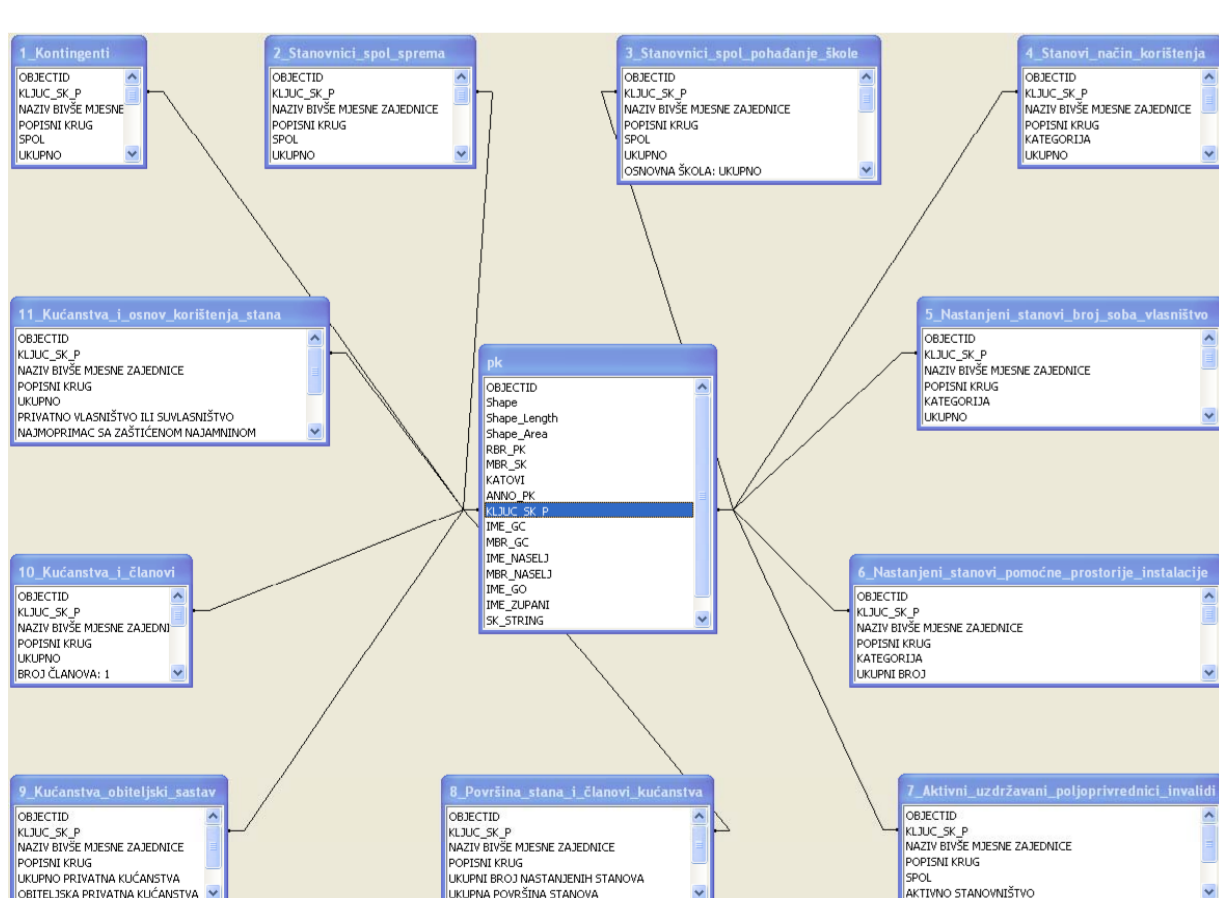
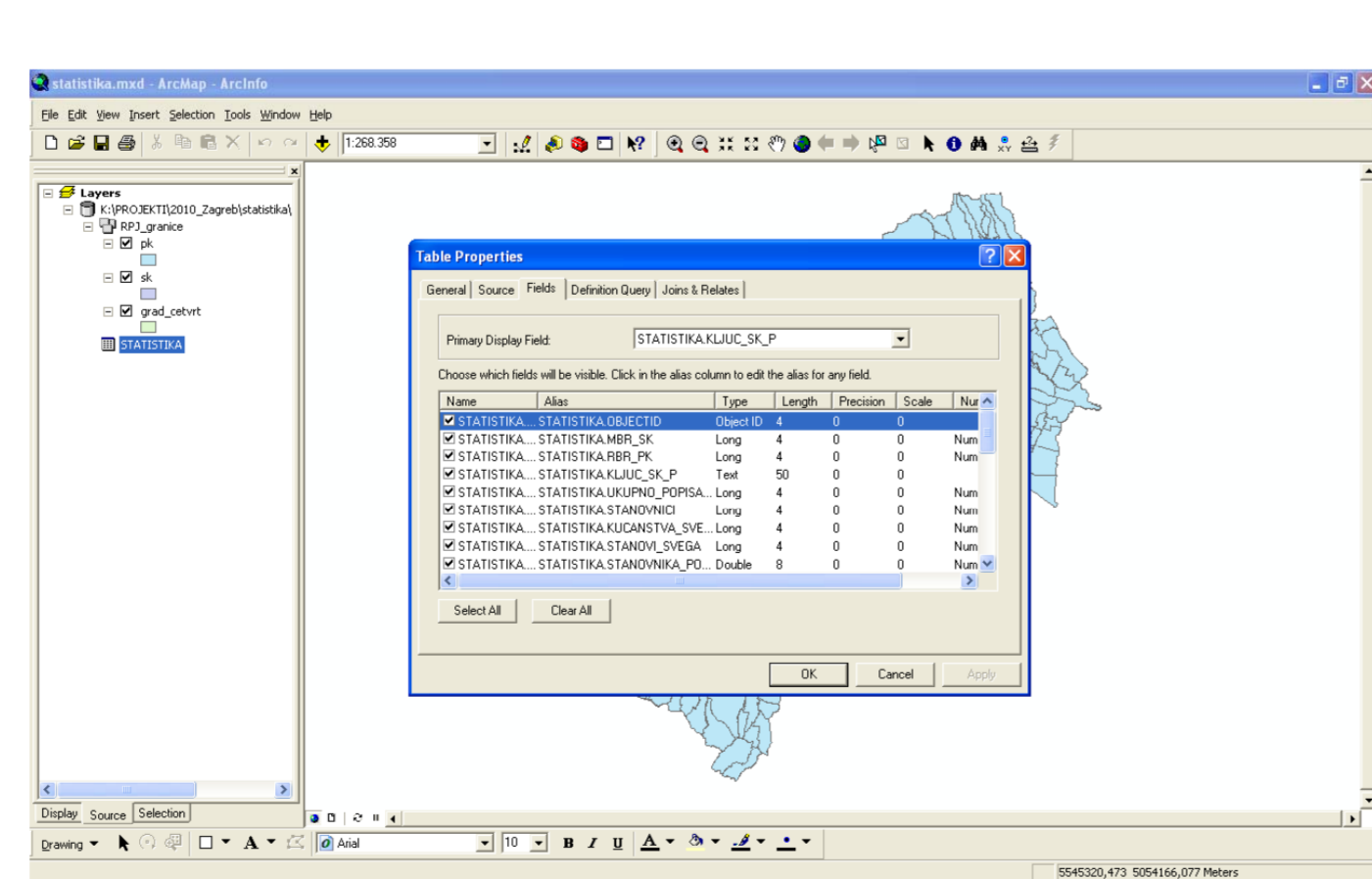


Table cd (geometry of census districts)

Linking of the attributed statistical data to geometry in the cd table was done through a single identifier KLJUC_SK_P, which is a combination of the registry number of statistical district and the ordinal number of census district.



Links between tables in the model

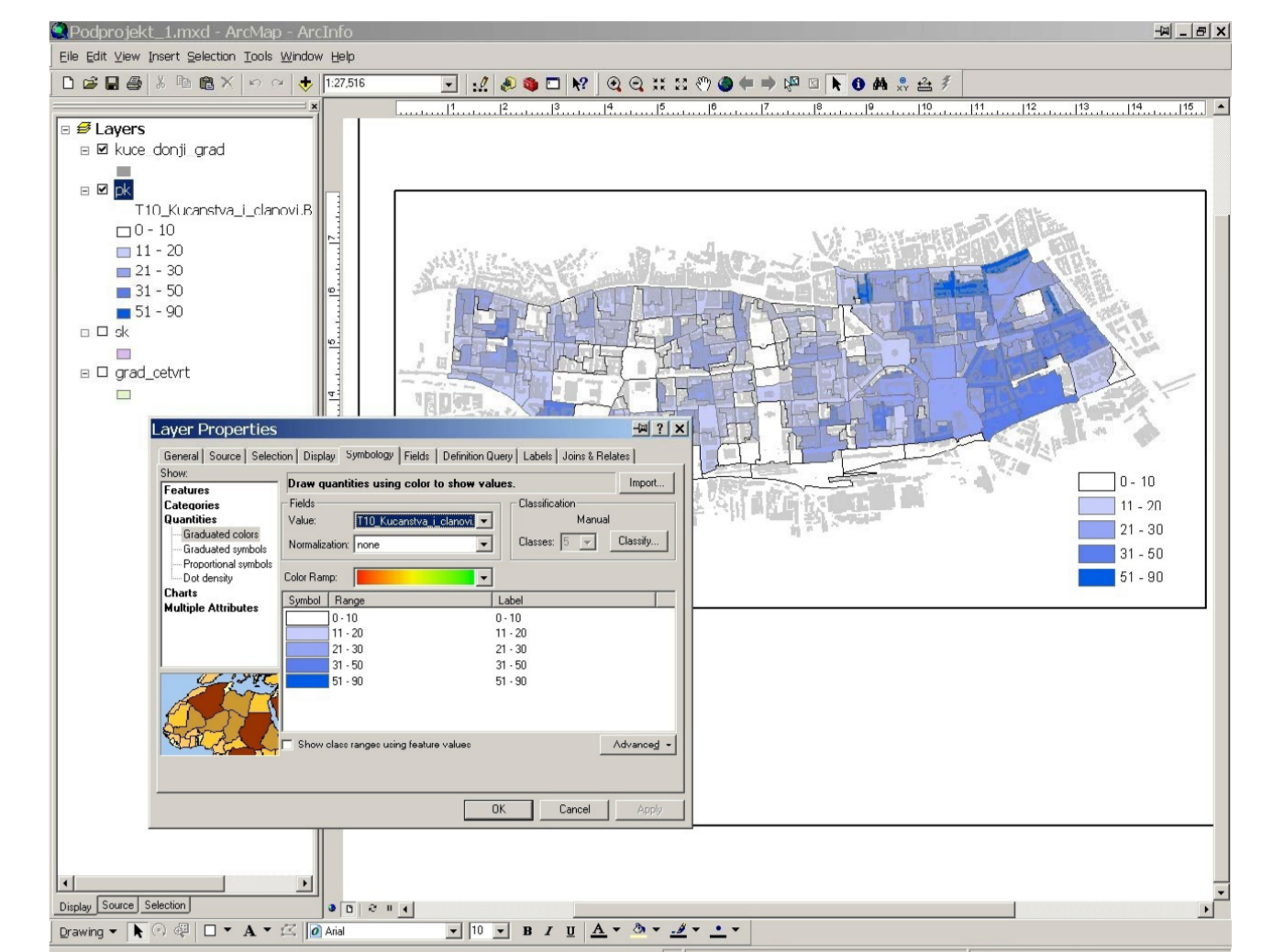


Linking statistical data and geometry in ArcGIS

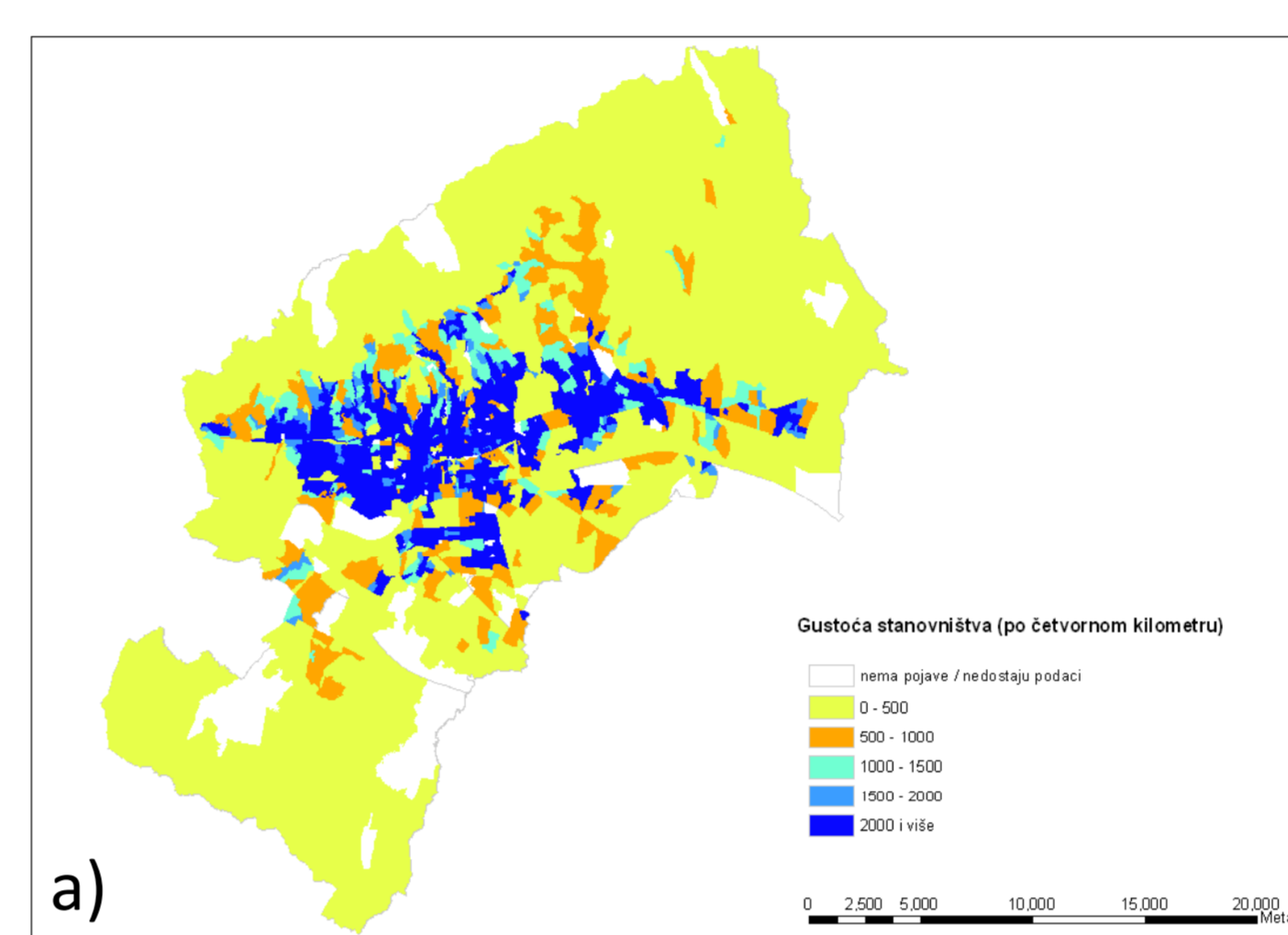
GIS analyses and visualization of data

The main purpose of the created GIS database of census districts is spatial analysis through various spatial analyses and queries as a support to the process of space planning and protection in an area.

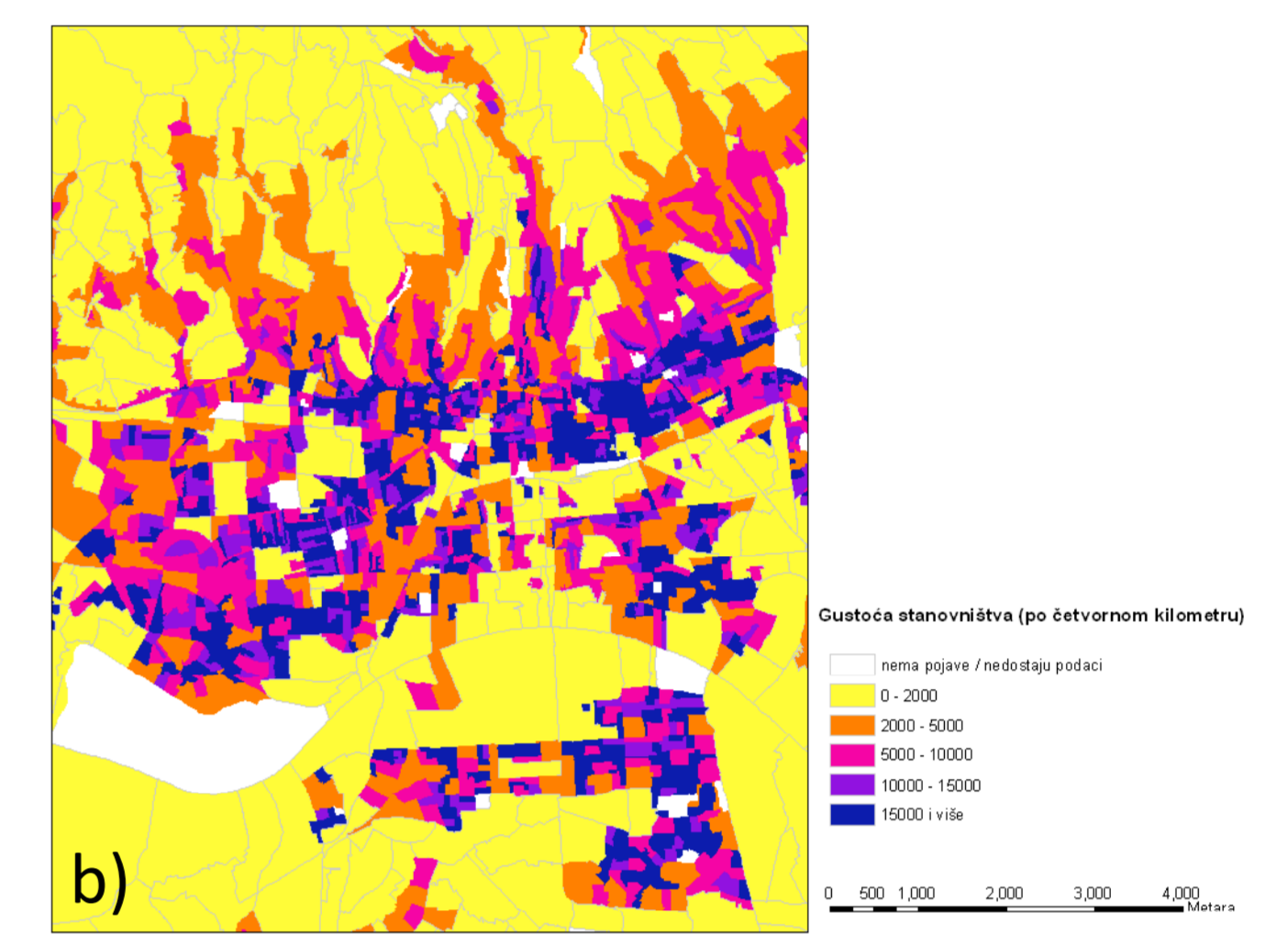
ArcGIS enables making different types of queries. What follows are different examples of the possibilities of using such a GIS system to visualize results.



Making queries in ArcGIS

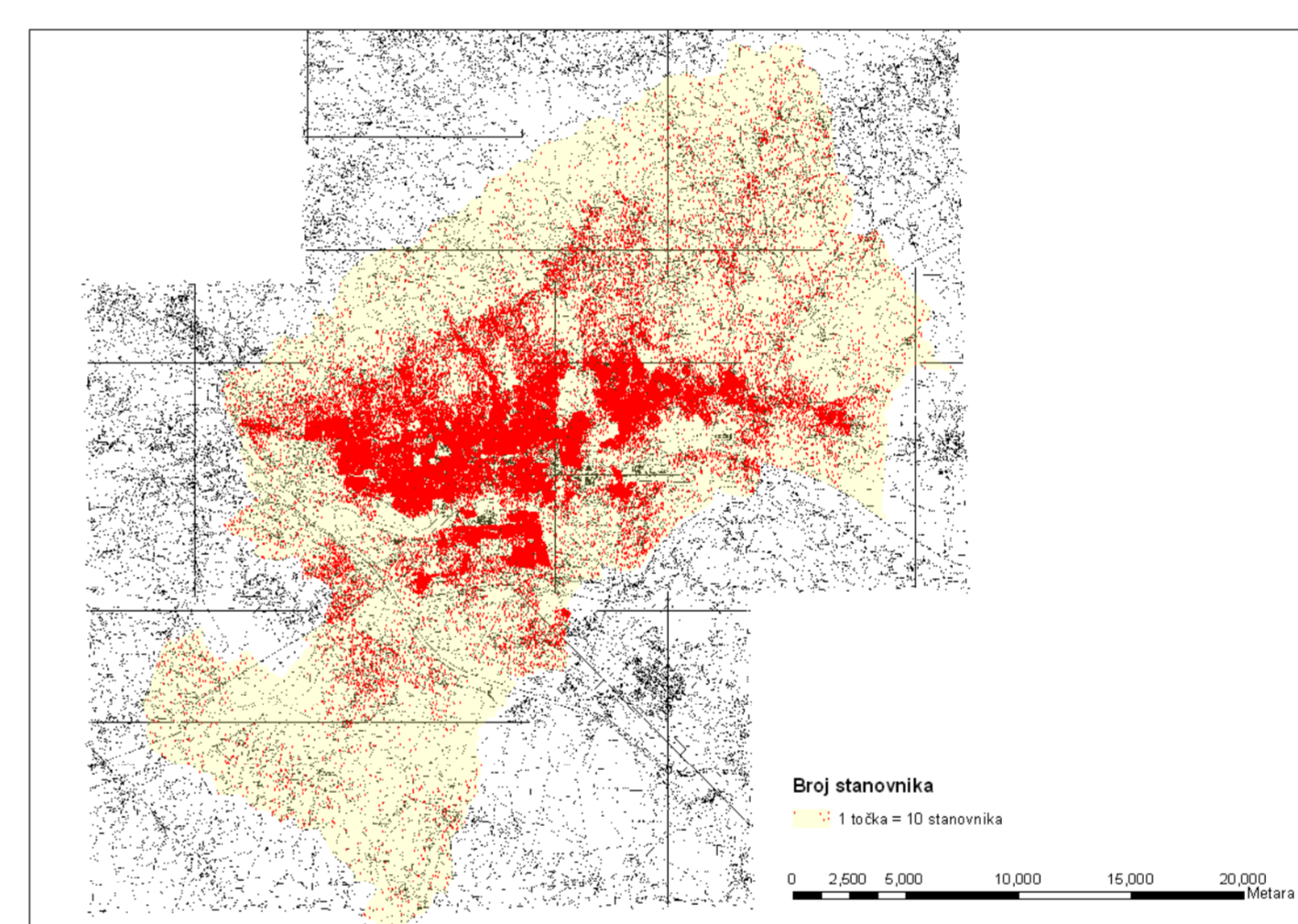


a)

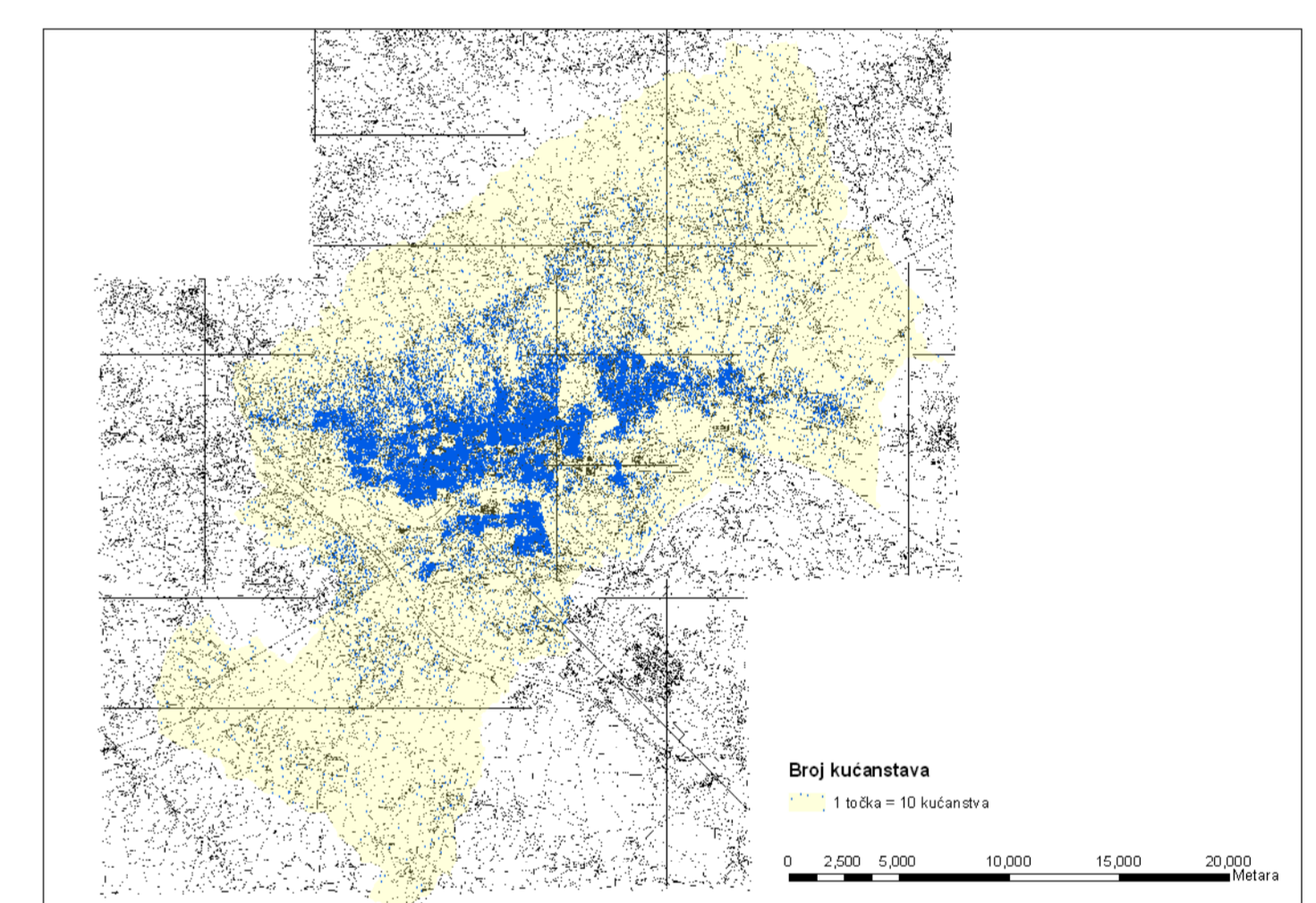


b)

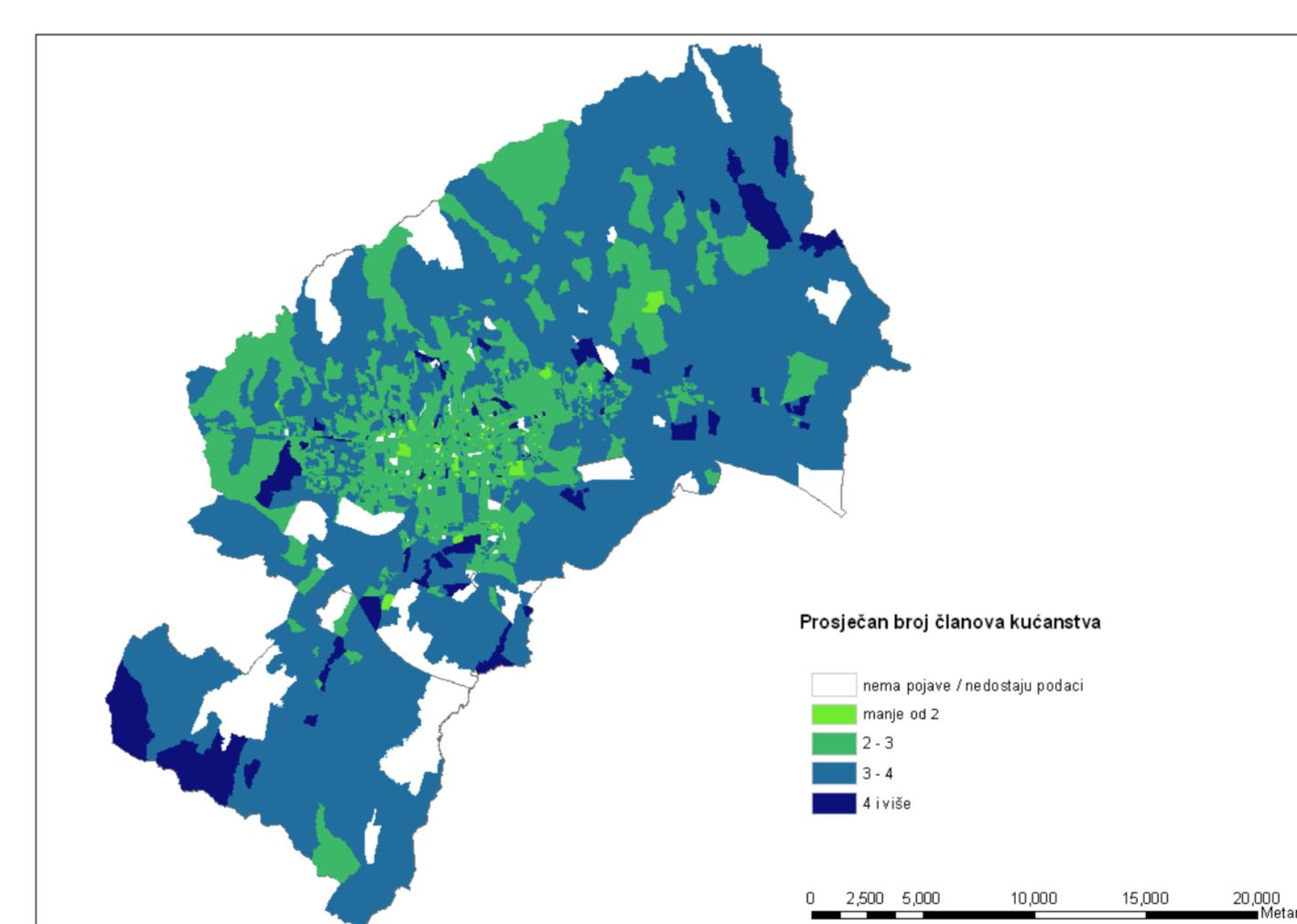
Density of population in a wider (a) and narrower (b) City of Zagreb area



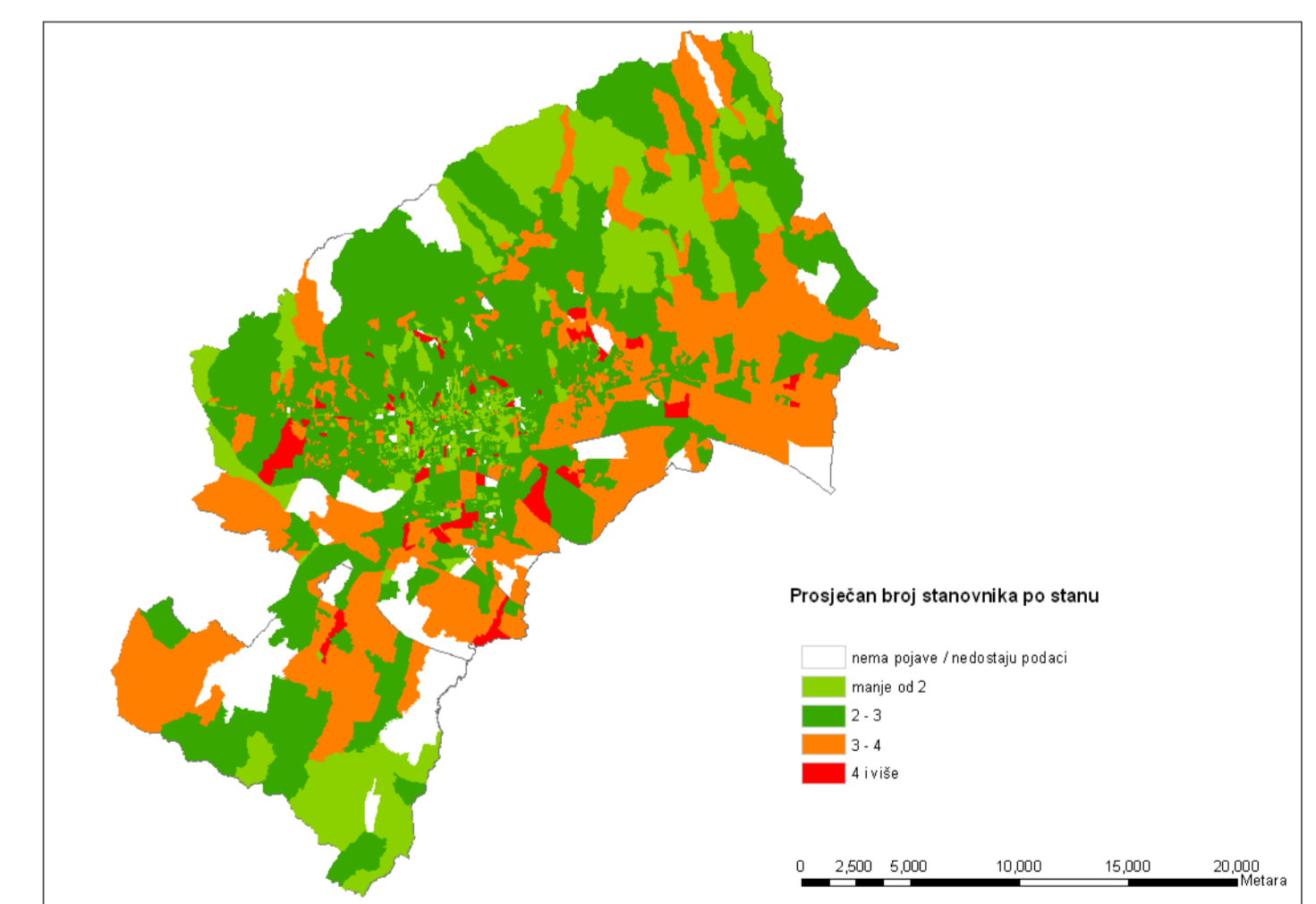
Distribution of population in the City area



Number of households



Average number of household members



Average number of inhabitants per apartment

Conclusion

Result of the project is a GIS database of the census of population, households and apartments according to the 2001 census districts.

Analysis of data shown through visualization of different queries leads to the conclusion that thus formatted statistical data linked to spatial data in a GIS environment offer almost unlimited possibilities.

Those are primarily strategic and spatial planning, urbanism, public utility actions, projects of social standard improvement, marketing, etc.

A single and adjustable database model enables easy maintenance and updating. After the accomplished analyses of the 2011 census and adding those to the 2001 data, it will be possible to follow the current urban trends in the City of Zagreb.

