



# MIESTO DEMOGRAFINIO EKONOMINIO MODELIO KŪRIMAS KLAIPĖDOS MIESTO PAVYZDŽIU



## CREATING THE URBAN DEMOGRAPHIC ECONOMIC MODEL: AN EXAMPLE OF KLAIPĖDA CITY

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This study aims to create the future model of Klaipėda city and predict the development of the city by the year 2020, monitoring and evaluating the changes of the city and its suburban areas.



**New residential buildings in Klemiškė II rural area of Klaipėda district .**

Photo by D. Verkulevičiūtė-Kriukienė

## **Work tasks:**

1. To determine the most probable scenarios for the development of Klaipeda city, using morphological analysis and the Delphi method.
2. By combining digitization of satellite pictures, georeferenced databases and orthographic and georeferenced databases, to identify changes of Klaipeda city suburban areas in 2005-2013.
3. To estimate territorial variations of Klaipėda city and settlements of suburban areas of by the year 2020.

# Morphological analysis.

- **1. Selection of indicators** (*in analysing of Klaipėda city strategic plans*). Seven urban scenarios for further development have been identified.
- **2. Synthesis of criteria and indicators.**
- **3. The assessment stage.** Clustering groups are analyzed and conclusions are formed.

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		Klaipeda's city developme							Klaipeda's city business							Klaipeda's city comm			Klaipeda's city infrastruc				Klaipeda's city gover												
		Marine city development	Pessimistic city development	Optimistic city development	Innovative city development	Tourism attractive city development	City expansion to suburbs	Environmentally friendly city development	Adapted to geographical situation	Marinistic	Small business	Innovative business	Economical potential	Interesting to foreign and local investors	Knowledge-based economy development	Participating in city social and political life	Active in city social and political life	Consumerist	Increasing depopulation	Working in communities	Seeking for their rights	Not suitable for the tourism	Developing transnational communication	Not suitable to people with disability	Steady port development	Growing suburbs	Good connection in city and with suburbs	Weak social infrastructure	Developing institutions	Bureaucratic	Weak cooperation with business	Orientated to EU structural funds	Marine city development	Education and culture development	
Klaipeda's city infrastructure	Not suitable for the tourism	K	-	X	K	X	K	X	X	K	K	K	X	X	K	X	K	K	X	X															
	Developing transnational communication	-	X	-	K	-	K	K	-	-	K	K	-	-	K	K	K	-	X	K	X														
	Not suitable to people with disability	K	-	X	-	K	-	X	K	K	K	K	K	K	X	-	K	K	-	-															
	Steady port development	-	K	-	-	-	K	K	-	-	K	K	-	K	K	K	-	K	K	K	K														

*Synthesis fragment of morphological analysis.*

# Selection of criteria for creation Klaipėda city future model, using morphological analyse

Klaipėda's city development scenarios/ <i>Klaipėdos miesto vystymosi scenarijai</i>	Klaipėda's city business and economic situation/ <i>Klaipėdos miesto verslo ir ekonominė situacija</i>	Klaipėda's city infrastructure/ <i>Klaipėdos miesto infrastruktūra</i>	Klaipėda's city government/ <i>Klaipėdos miesto valdžia</i>	Klaipėda's city geographical and enviromental situation/ <i>Klaipėdos miesto geografinė ir aplinkos situacija</i>	Klaipėda's city tourism/ <i>Klaipėdos miesto turizmas</i>	Klaipėda's city educational profile/ <i>Klaipėdos miesto švietimo situacija</i>
Marine city development/ <i>Jūrinio miesto vystimas</i>	Adopted to geographical situation/ <i>Prisitaikęs prie geografinės padėties</i>	Not suitable for the tourism/ <i>Nepritaikytas turizmui</i>	Developing institutions/ <i>Besivystančios institucijos</i>	Marine city/ <i>Jūrinis miestas</i>	Undeveloped/ <i>Neišsivystęs</i>	Innovative/ <i>Inovatyvus</i>
Pessimistic city development/ <i>Pesimistinis miesto vystymosi modelis</i>	Marinistic/ <i>Jūrinis</i>	Developing transnational communication/ <i>Tarptautinių komunikacijų vystymas</i>	Bureaucratic/ <i>Biurokratinis</i>	Good economic-geographical situation/ <i>Gera ekonominė-geografinė situacija</i>	Low income/ <i>Mažos pajamos</i>	Scientific/ <i>Mokslinis</i>
Optimistic city development/ <i>Optimistinio miesto vystymas</i>	Small business/ <i>Smulkus verslas</i>	Not suitable to people with disability/ <i>Nepritaikytas žmonėms su negalia</i>	Week cooperation with business/ <i>Menkas bendradarbiavimas su verslu</i>	Nonfreezing sea port/ <i>Neužšąlantis uostas</i>	Marginal development/ <i>Nežymus vystymasis</i>	Research orientated/ <i>Orientuotas į tyrimus</i>
Innovative city development/ <i>Inovatyvaus miesto vystymas</i>	Innovative business/ <i>Inovatyvus verslas</i>	Steady port development/ <i>Stabilus uosto vystymasis</i>	Orientated to EU structural funds/ <i>Orientuotas į ES struktūrinius fondus</i>	Green spaces/ <i>Žaliosios erdvės</i>	Seasonal/ <i>Sezoniškas</i>	Soft studies/ <i>Populiarūs mokslai</i>
Tourism attractive city development/ <i>Turizmui patrauklaus miesto vystymas</i>	Economical potencial/ <i>Ekonominis potencialas</i>	Growing suburbs/ <i>Augantis priemiestis</i>	Marine city development/ <i>Jūrinio miesto vystymas</i>	Going better ecological enviroment/ <i>Gerėjanti ekologinė situacija</i>	Not attractive/ <i>Nepatrauklus</i>	Business orientated studies/ <i>Į verslą orientuotos studijos</i>
City expansion to suburbs/ <i>Miesto plėtra į priemiesčių link</i>	Interesting to foreign and local investors/ <i>Dominantis vietinius ir užsienio investuotojus</i>	Good connection in city and with suburbs/ <i>Geras susisiekimasis mieste ir priemiestyje</i>	Education and culture development/ <i>Mokslo ir kultūros vystymas</i>		Resort attractiveness increase/ <i>Kurosto patrauklumo didėjimas</i>	Developing life-long learning study programs/ <i>Antrosios kartos studijų programų vystymas</i>
Enviromentaly friendly city development/ <i>Ekologiško miesto vystymas</i>	Knowlege-based economy development/ <i>Mokslu paremtos ekonomikos vystymas</i>	Week social infrastructure/ <i>Silpna socialinė infrastruktūra</i>	Improvement of living conditions/ <i>Gyvenimo sąlygų gerėjimas</i>		Water tourism development/ <i>Vandens turizmo vystymas</i>	Decreasing scholars number/ <i>Mokinių skaičiaus mažėjimas</i>
			Social security consolidation/ <i>Socialinės apsaugos stiprinimas</i>			

Sources: Klaipėdos miesto plėtros strateginis planas 2001-2011 metams; Klaipėdos miesto plėtros strateginis planas 2007-2013 metams; Klaipėdos miesto plėtros strateginis planas 2014-2020 metams.

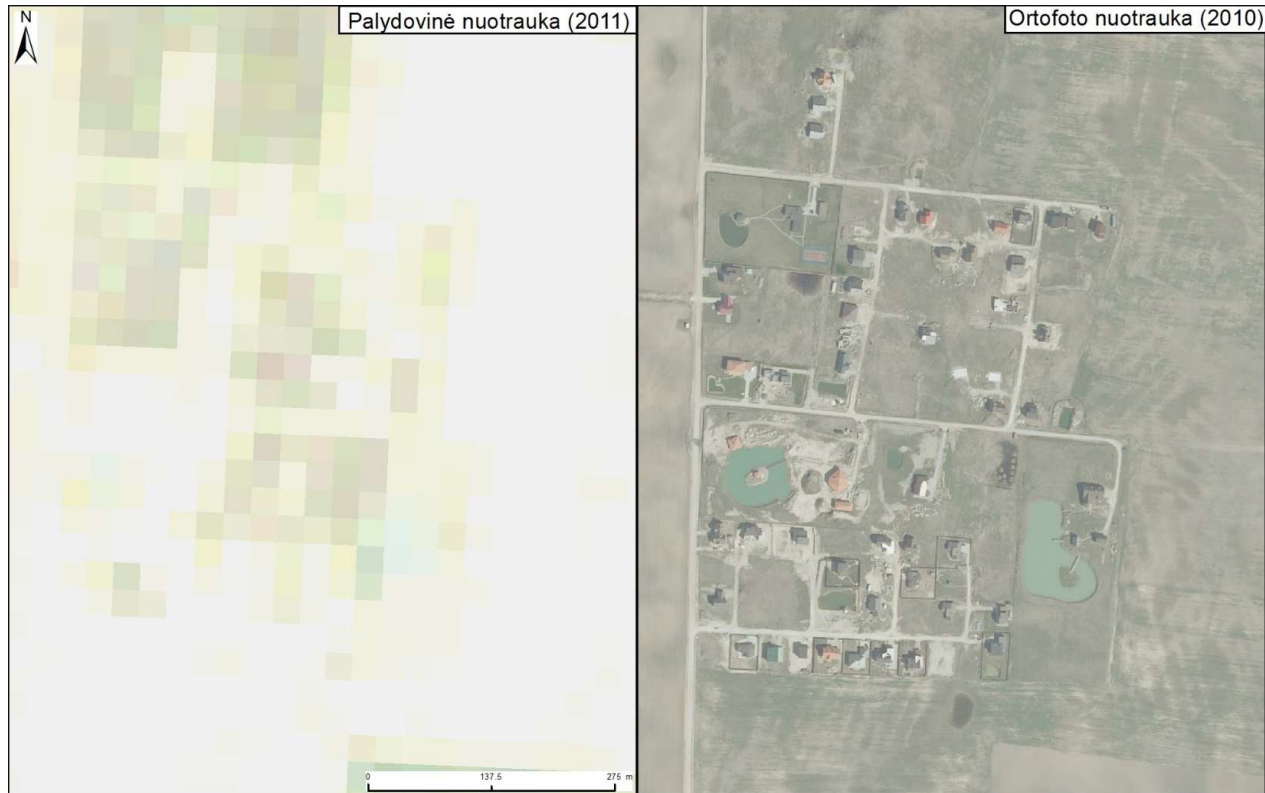
In the final stage the four possible scenarios for the development of Klaipėda city has been selected:

- marine city;
- innovative city;
- attractive for tourism city;
- development of suburban areas.

### Delphi analysis

This method is based on expert opinion. The survey carried out in two stages.

To monitor territorial disparities of settlements within the period, the comparison of satellite pictures, GIS 2005 and 2013 databases and orthographic photos were selected.



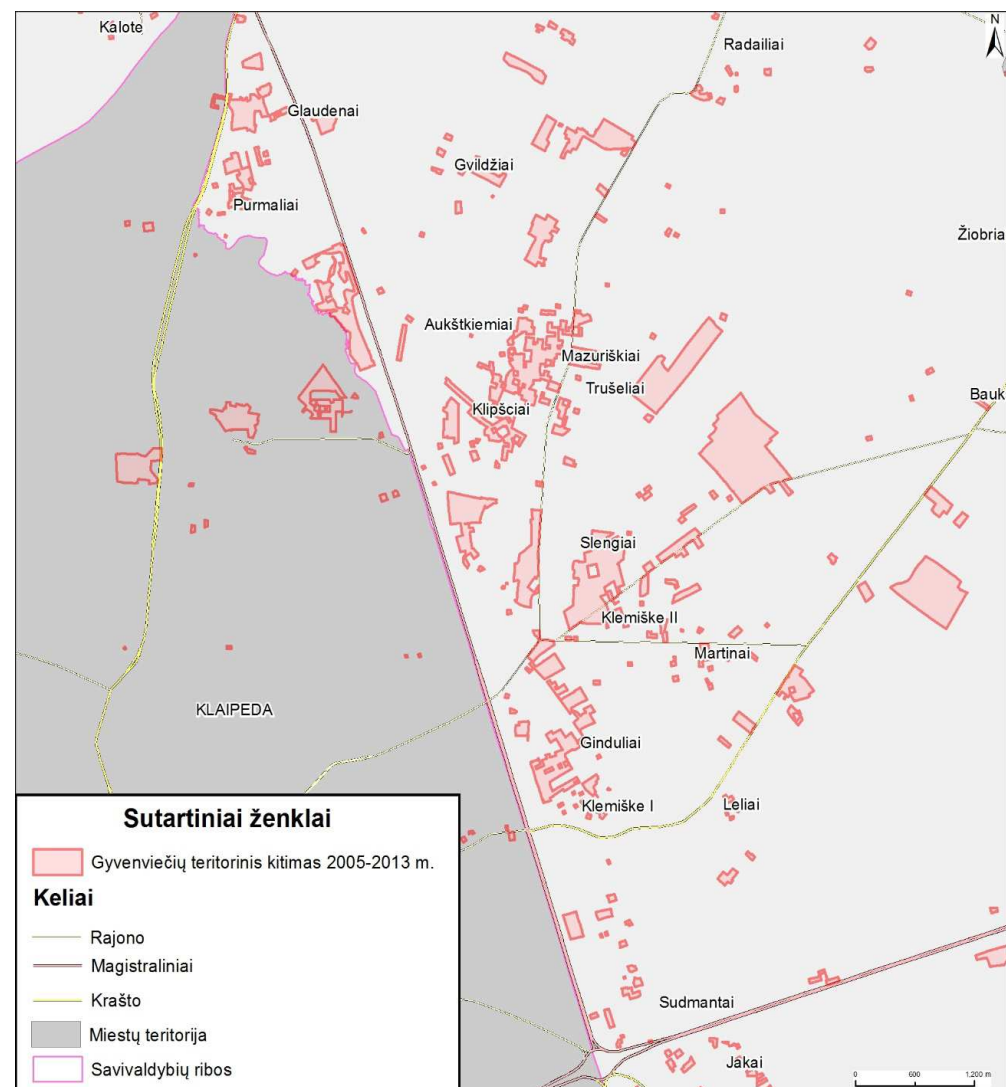
***Differences between satellite (LANDSAT 5) (2011) and orthophoto (ORT10LT) (2010) images.***

Sources: USGS duomenų bazė, 2013; Lietuvos Respublikos teritorijos M 1:10 000 skaitmeninis ortografinis žemėlapis ORT10LT. Nacionalinė žemės tarnyba prie Žemės ūkio ministerijos, 2013.



It is necessary to combine the GIS database GDB10LT layers of settlements with orthographic photos data. Combining these two methods and the following geometrical adjustments it possible to get the most accurate results, which was the subject of the research.

Klaipėda city is expanding to the east and slightly to north-south direction on a specific geographic location.

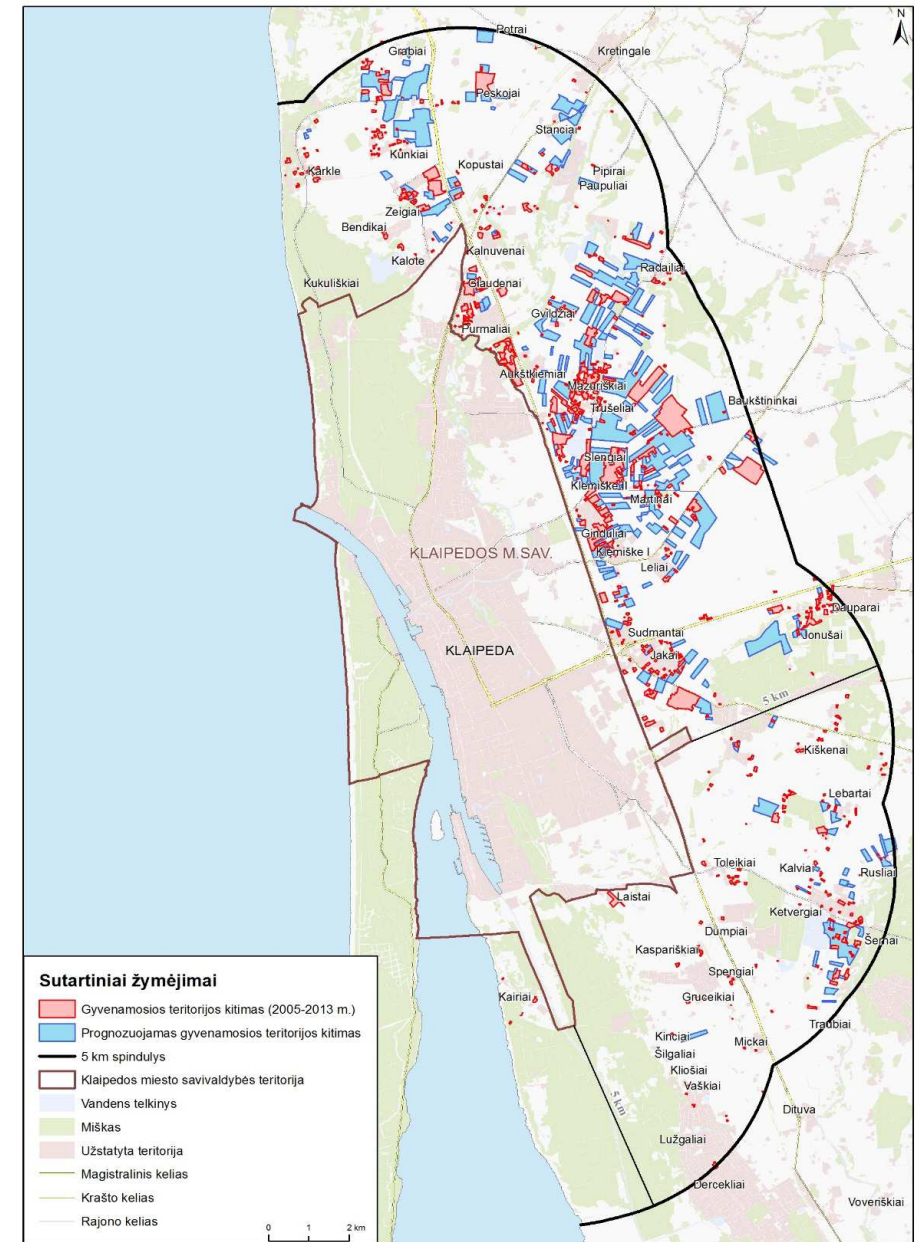


*The territorial change of settlements of Klaipėda district during the year 2005-2013, in ha.*

In order to predict the further territorial expansion of settlements, the prognostic maps of spatial changes of settlements by the year 2020 were created.

*Prognosis of settlements size change 5 km radius from Klaipėda city center till the year 2020.*

Sources: Lietuvos Respublikos teritorijos M 1:10 000 skaitmeninis ortografinis žemėlapis ORT10LT. Nacionalinė žemės tarnyba prie Žemės ūkio ministerijos; Lietuvos Respublikos teritorijos M 1:10 000 georeferencinio pagrindo duomenų bazė GDB10LT. Nacionalinė žemės tarnyba prie Žemės ūkio ministerijos. VĮ Registrų centras. Registruotos žemės sklypų ribos, 2013. Created by ArcMap 10.1 software.



## *Conclusions*

- Morphological and Delphi analysis allows to create scenarios of the city development in the future.
- The most reliable method for harmonization orthographic photos and georeferenced databases to monitor the territorial changes of the settlements were established.
- By 2020, the size of the residential area of 5 km radius of the city Klaipėda will increase. The growth trend of residential areas to the east and north from Klaipėda city was found.



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Thank You.