

TP Lab Web Service
Spatial information GIS webservice

User manual

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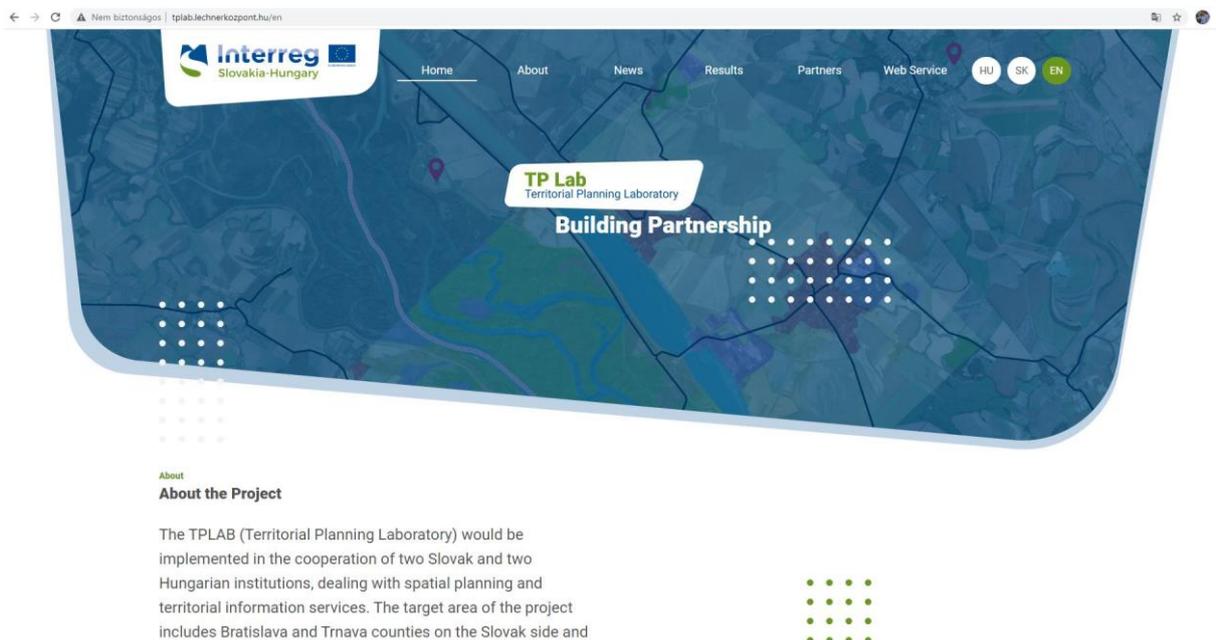
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1. Introduction

One of the main objectives of the **TPLAB (Territorial Planning Laboratory) Project** is to create a **common information platform** with the use of recent data about the area of interest consisting of three counties (Győr-Moson-Sopron County, Bratislavský kraj, and Trnavský kraj). The produced geodatabase and other map information is available on a public service platform for the interested **professional organizations, universities, decision makers, NGOs**, and other actors. The available application may be useful in the planning and decision-making work as it provides the current data on **social, economic, and environmental processes** and their **spatial projection**. Furthermore, the scientific actors (students or scientists) may be interested about the webservice's analytic, query and other information platforms.

2. The access of the application

The GIS webservice is embedded and directly available on the **official TPLAB website** (tplab.lechnerkozpont.hu). The service is public – visiting or using are not bound to authentication (login).

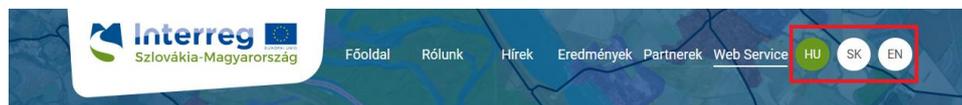


If you click on the "Web Service" menu, the interface of the web map application will open.



2.1 Language

The TPLAB website and the map application are available in three languages – **English, Slovakian, and Hungarian**. You can choose the language in the upper right corner of the website (HU – Hungarian / SK – Slovakian / EN – English)



2.2 Full screen view of the webservice

While using the embedded webservice some elements - mainly panels, caused by their dynamic resizing - may be distorted to some degree. In order to avoid this, full-screen view is recommended. This may be done by clicking the "**Full screen view**" button on the left side under the embedded webservice window.



3. Main contents of the webservice

3.1 Features of the dashboards

The dashboard technology allowed us make a map analysis platform, which is **user friendly, data driven, information centric** and **visually easy to interpret**. Some elements of the interface could be rearranged, regroup and dynamized linked to the map events. For this reason, the user could share complex information on a map or create visualisation of attribute data. Main elements of the dashboard:

- **Indicators**
- **Charts (column and circle)**
- **Lists and textual contents**
- **Embedded contents**
- **Analysis tools**

3.2 Features of thematic interfaces

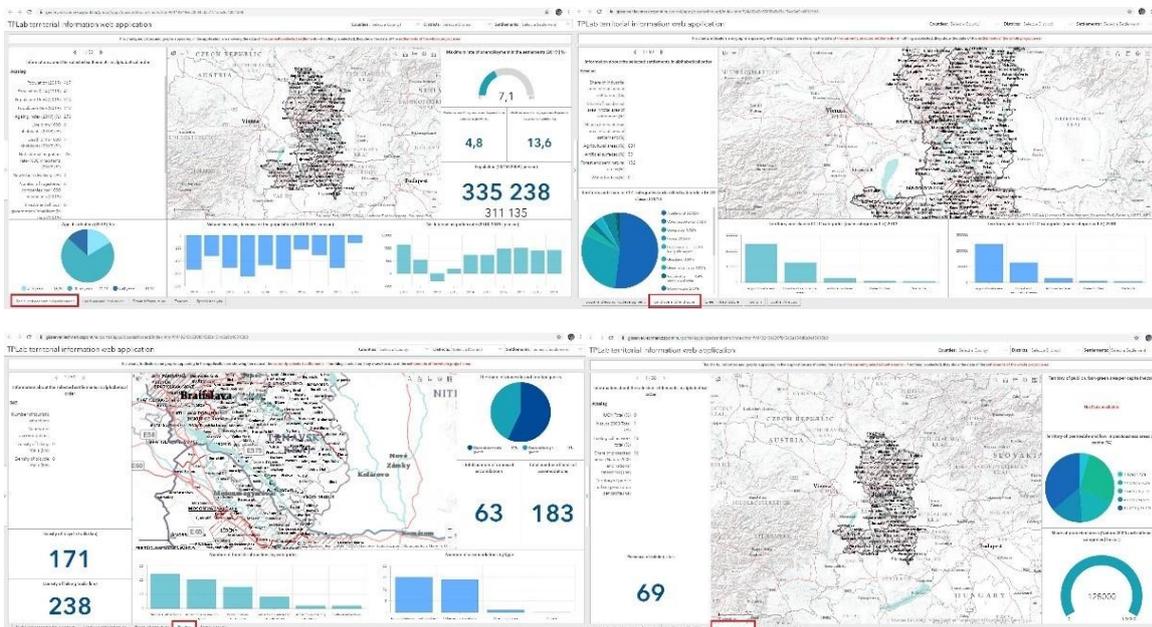
The main aim of the thematic interfaces (tabs) is to *present to the user a visually appealing content of the most important social, economic, and environmental information and their spatial projection*. Choose one of the four tabs in the application's footer (when the application starts, the first to appear is the "Social and economic development" tab).

- Social and economic development
- Land use and land cover
- Green infrastructure
- Tourism



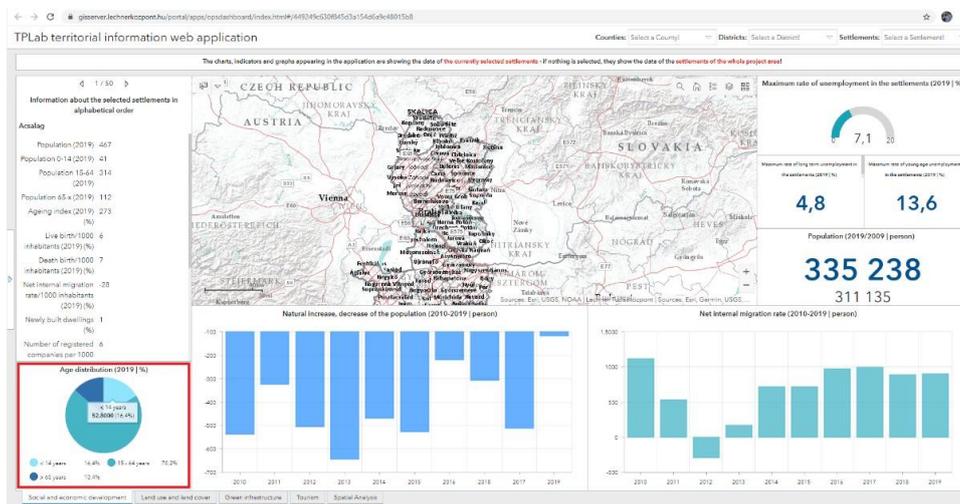
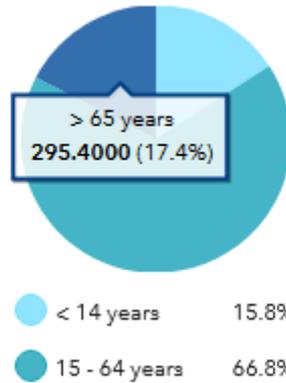
Megtekintés teljes képernyőben

The user can see on the four interfaces (tabs) the indicator's data and map layers of the given themes. On these thematic interfaces the maps are synchronized, i.e. the map extent is the same on each map. For example if you move the map or zoom in or out, the visible area will be changed on the "Social and economic development", "Land use and land cover", "Green infrastructure" and "Tourism" dashboard as well.



Hovering the mouse cursor over the graphic elements of charts enables you to view the values of the elements.

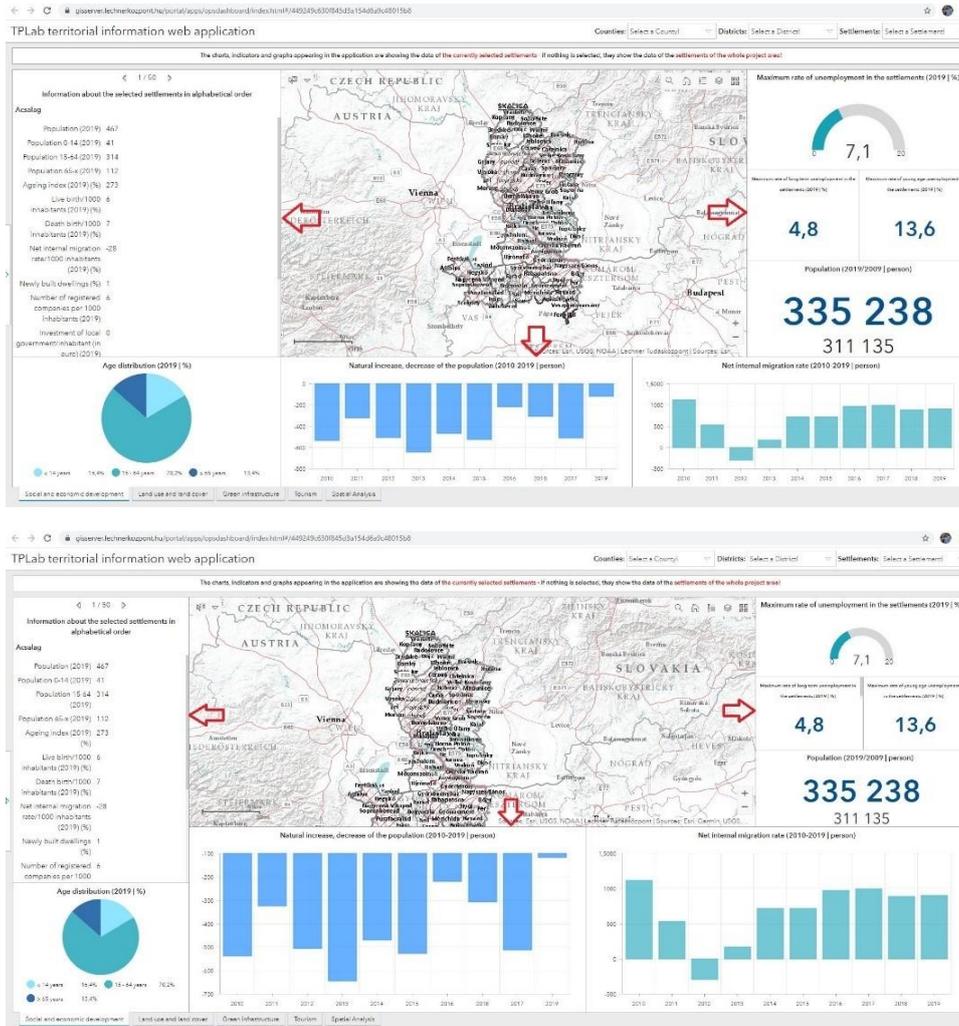
Age distribution (2019 | %)



3.2.1 Resize the panels

The **panels could be resized by the user** on the thematic interfaces. Hovering the mouse over the thin strip of the panel's boundary will thicken the grey line (and the cursor changes to a double arrow), and thus they may be moved away to increase or decrease the size of panel. If one panel is sharing border with another one, moving the boundary will cause the resizing of the other panel as well.

In case the size of the display causes bad distribution of some elements or data or some subtitle or label can't appear (or just partially), you are recommended to resize the panels.



3.3. Features of the Spatial analysis interface

The last menu of the footer is the **"Spatial analysis"** interface, that aims to create **complex queries and comparative analysis** of the whole data. Like the thematic interfaces the Spatial analysis interface includes – for some functions – some panels and a map window. The user may **create individual queries** for the developed indicators in addition to the predefined filters. All of the thematic layers are part of the map window again, however in this case different spatial patterns and processes may be analysed. The platform pays special attention to the **complex indicators**, the **potential development areas** and **conflict zones**.

3.3.1 Resize the panels

The **panels can be resized by the user** like on previous thematic interfaces. If the mouse is hovered over the strip of the panel's side, the grey strip's colour will become darker (and the cursor will change to a double arrow), and the panel's side may be moved to increase or decrease the size of panel. If one panel is sharing border with another one, moving the boundary will cause the resizing of the other panel as well.

In case the size of the display causes bad distribution of some elements or data or some subtitle or label can't appear (or just partially), you are recommended to resize the panels.

The panels could appear in full view on the Spatial analysis tab (interface). If you click the square in the panel's upper right corner, the panel will appear in full. In this case only the panel's content is visible, other elements are covered. If you click the strip in the upper right corner, the panel will return to its original size. The same process may be done with the map window as well.

4. Parts of the thematic interfaces

4.1. Queries on the thematic interfaces

4.1.1. Process of the territorial unit choosing

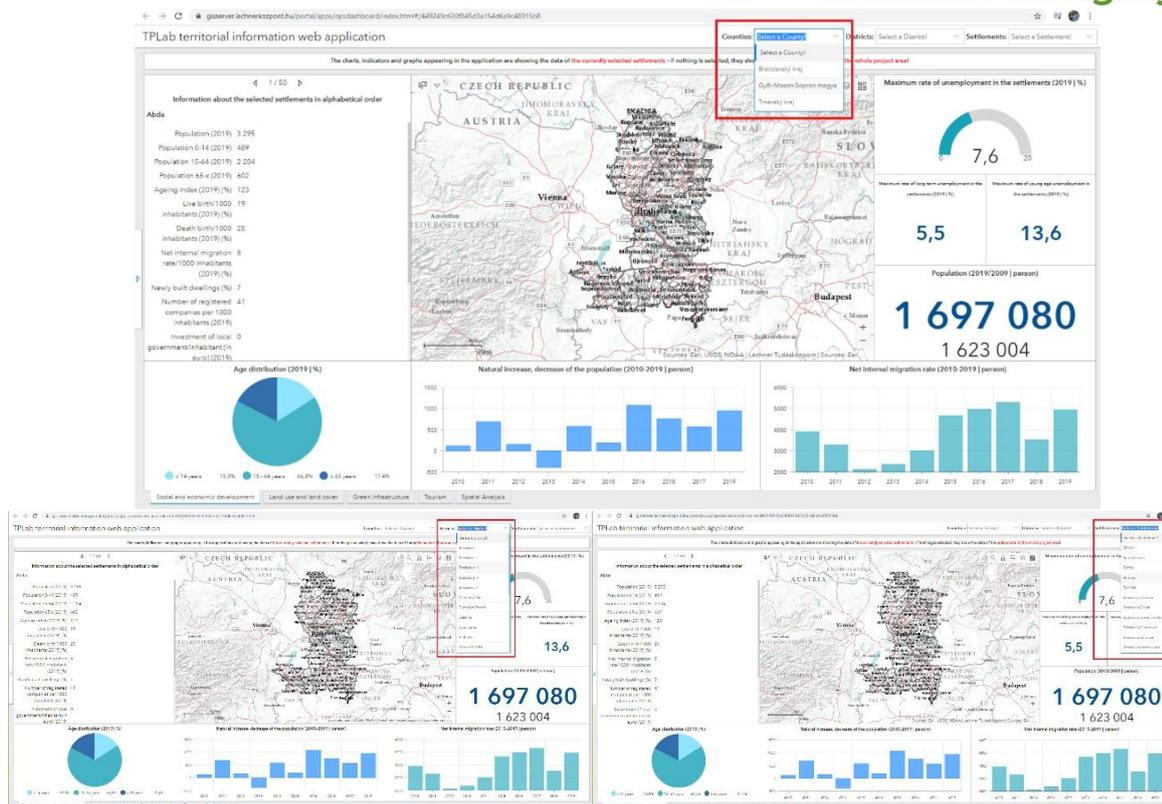
The thematic interfaces enable **data filtering for a particular county, district, or settlement**. By default (when the application is loaded and no filter is set) data of the whole project area appear on the panels, aggregated to the three counties of the project. The data of the settlements of the project area in alphabetical order can be seen on the left-side information panel. You can move between the settlements using the arrows (← →) located at the top of this window.

The drop-down menu items in the header allow for territorial filtering according to the administrative levels.

TPLab territorial information web application

Counties: Districts: Settlements:

- You may choose one county from the counties of the project by clicking on the arrow in the text box ("**Select a County!**") near the "**Counties**" subtitle. Only the territorial units belonging to the county will be visible on map (this only applies to the territorial administrative layers; the filtering does not apply to other thematic layers!)
 - o All panels including their textual or graphical elements (indicators, charts or figures) will show the data of the chosen unit
 - o *For example, if we choose Győr-Moson-Sopron County from the list, several data for this county will appear automatically*

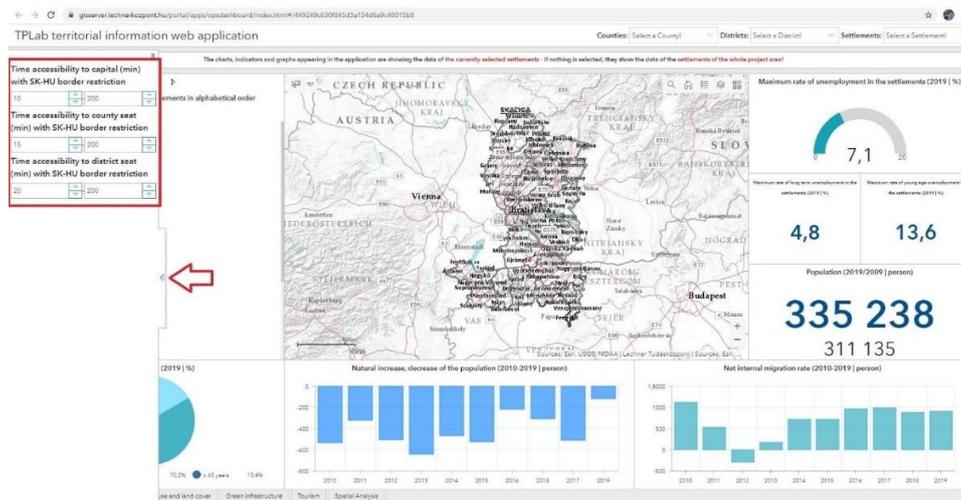


- You may choose one district from the districts of the project by clicking on the arrow in the text box ("**Select a District!**") near the "**Districts**" subtitle. If a county has been filtered already, only the boundaries belonging to this county will be visible
- While choosing a district, only the territorial units belonging to the district will be visible (this only applies to the territorial administrative layers, the filtering does not apply to the other thematic layers!)
 - All panels incl. their textual or graphical elements (indicators, charts, figures) will show the data for the chosen unit
 - *For example, if you choose Dunajská Streda district from the list, several data for this district will appear automatically*
- You may choose one settlement from the settlements of the project by clicking on the arrow in the text box ("**Select a Settlement!**") near the "**Settlements**" subtitle. If a county or district has been filtered already, only the boundaries belonging to the county or district will be visible
- While choosing a settlement, only the boundary of the settlement will be visible (this only applies to the territorial administrative layers, the filtering does not apply to the other thematic layers!)
 - All panels incl. their textual or graphical elements (indicators, charts, figures) will show only the data for the chosen unit
 - *For example, if you choose Bratislava-Devín settlement from the list, several data for this settlement will appear automatically*

4.1.2. Filtering based on accessibility

On the left side of the thematic interfaces is an openable panel which appears for a short time, while the application is being loaded – thereby also drawing attention to its fixed position. By default it stays hidden.

If you hover the mouse cursor over the small panel's tab, its background colour will become blue → in this case the panel may be opened with a click. To close it, click the panel's tab again.



In this menu there are three filter parameters:

- **Time accessibility to capital** with Slovakia-Hungary border restriction (measured in minutes)
- **Time accessibility to county seat** with Slovakia-Hungary border restriction (measured in minutes)
- **Time accessibility to district seat** with Slovakia-Hungary border restriction (measured in minutes)

By default, there is a **0-200 minute value**, that may be modified by the user. The **minimum value** may be modified in the left box (minimum accessibility in minutes), while the **maximum value** may be modified in the right box (maximum accessibility in minutes). User may write the values or may choose the values using the arrows at the edge of the box.

For example, setting values of 10 to 40 in case of the accessibility of the county seat, only those settlements will appear on the map, from where the county seat is accessible using the road by more than 10 minutes and less than 40 minutes.

- After writing the values in the box, you must click outside to get the result. In this case only the filtered settlements will appear on the map and other graphical elements (charts, indicators) (this only applies to the territorial administrative layers; it does not apply to other thematic layers!)
- You have to reset the values to delete the filtering

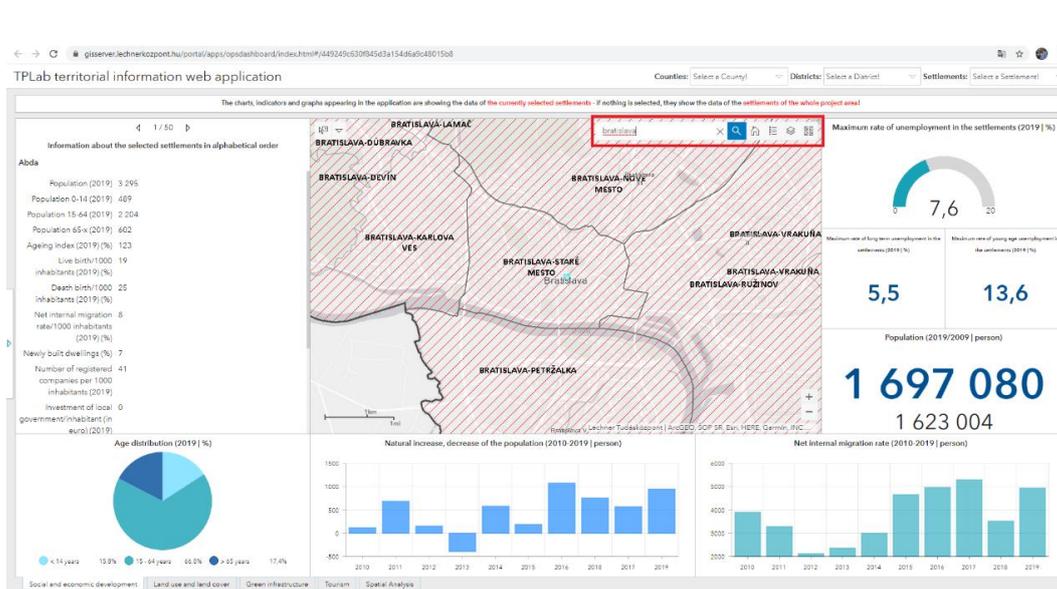
- The three filter value ranges set in the boxes are all active at the same time, as well as in the first three thematic tabs (interfaces)

4.2 Map functionality

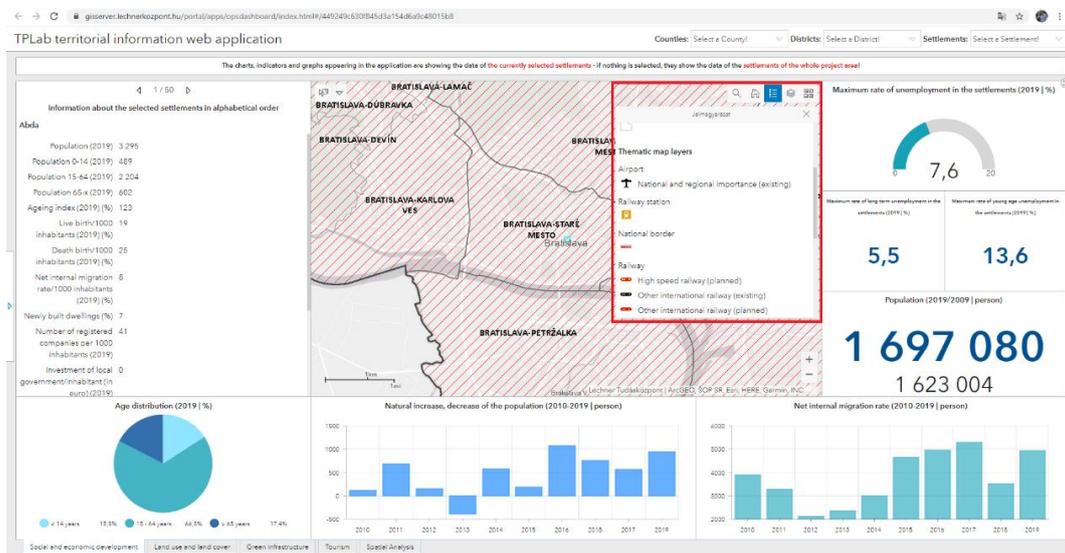
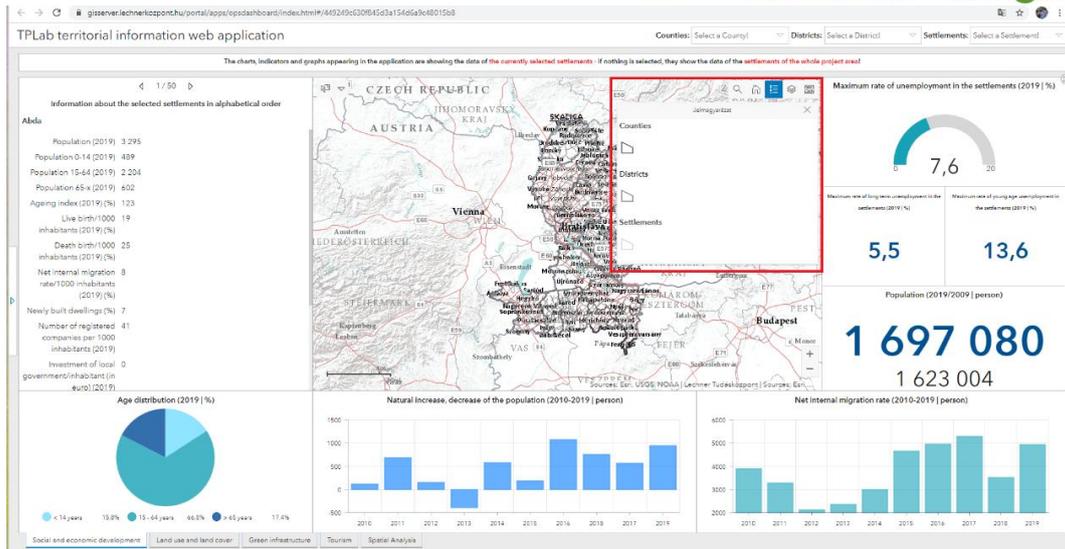
4.2.1. Basic web map features

In order to facilitate spatial orientation and map search the following additional functions are available on the maps of the thematic interfaces:

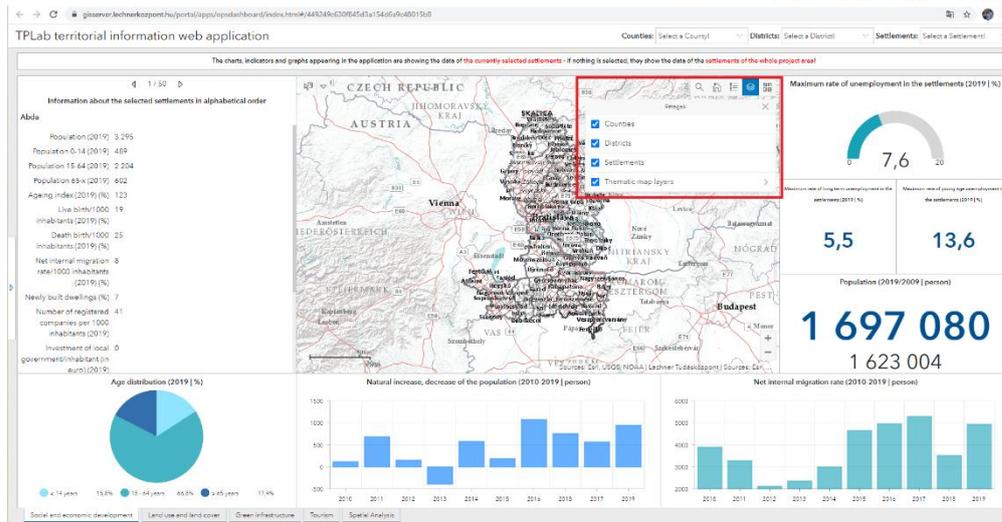
- **Search:** Clicking on the  icon opens a text input field where the name of a settlement or an address can be entered. After pressing "Enter", the map zooms in to the centre of the given city or the specified address. By pressing "X" in the input field, the searched value can be deleted and a new search can be started as desired



- **Full extent:** Clicking the  icon the map will zoom to the initial extent. The maps of the four thematic interfaces are connected, so they all follow the changes in the map extent.
- **Legend:** Clicking on the  icon opens a window with the names of the map layers and the associated symbol. This greatly helps in the visual identification and comparison of each layer. The layers can be point, line or surface (polygon).

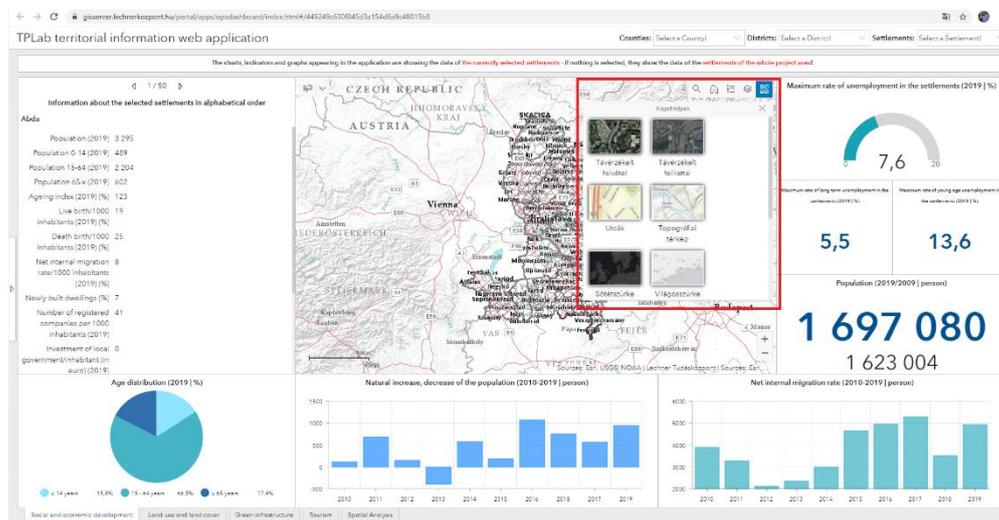


- **Layer Manager:** Clicking on the  icon opens a window listing the map layers (and layer groups). The visibility of the layers can be adjusted turning the checkbox in front of the layers on and off. It is worth noting that the layer order displayed here is the same as the layer order in the map window.



- **Basemaps:** Clicking on the  icon opens a window showing different base map options. Basemaps help with map navigation and the geographical identification of individual elements, as well as an understanding of spatial relationships. It is recommended to use different base maps for different purposes.

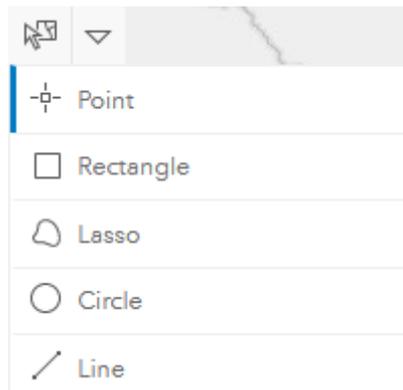
Clicking on the selected base map icon changes the base map in the map window. Only one base map can be active at a time.



4.2.2. Queries on the thematic map interfaces

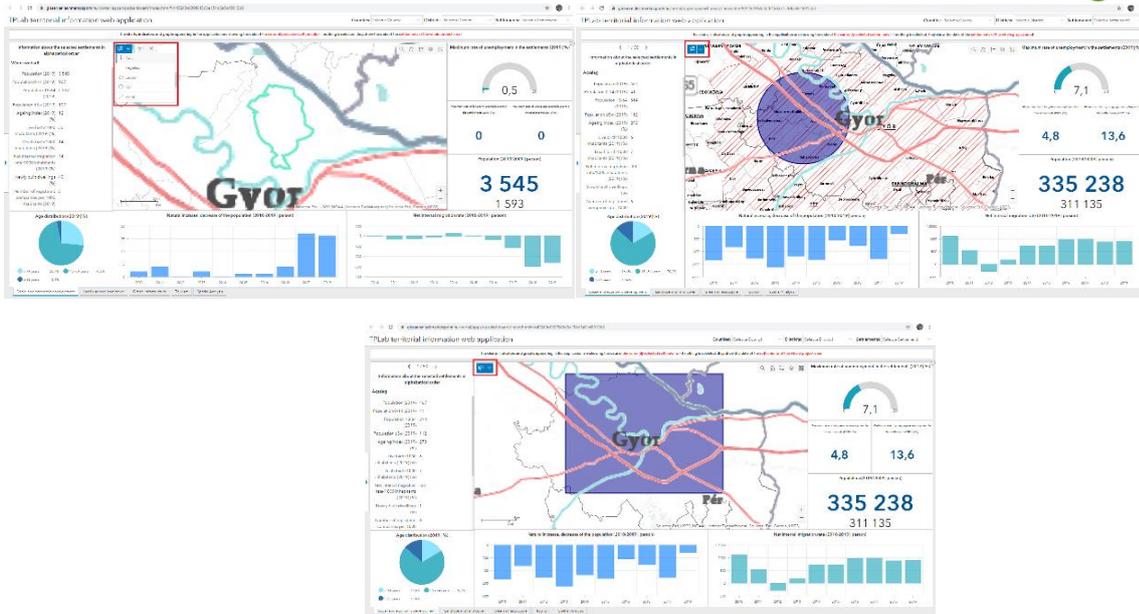
Map queries (selection of areas) can be performed not only by applying filters in the header, but also by selecting features in the map window. The selection menu is located in the upper left corner of the maps on the thematic interfaces.

Clicking the down arrow next to the selection button displays the geometry types that can be used for selection:



- **Point**
- **Rectangle**
- **Lasso**
- **Circle**
- **Line**

Selecting one of the options, the background of the menu darkens (changes to dark blue), meaning the function is active (if it has a light background, the function is switched off, in which case you cannot click on the map). Depending on the selected geometric type, one or even more territorial units (settlements) can then be delimited on the map surface by drawing or marking.



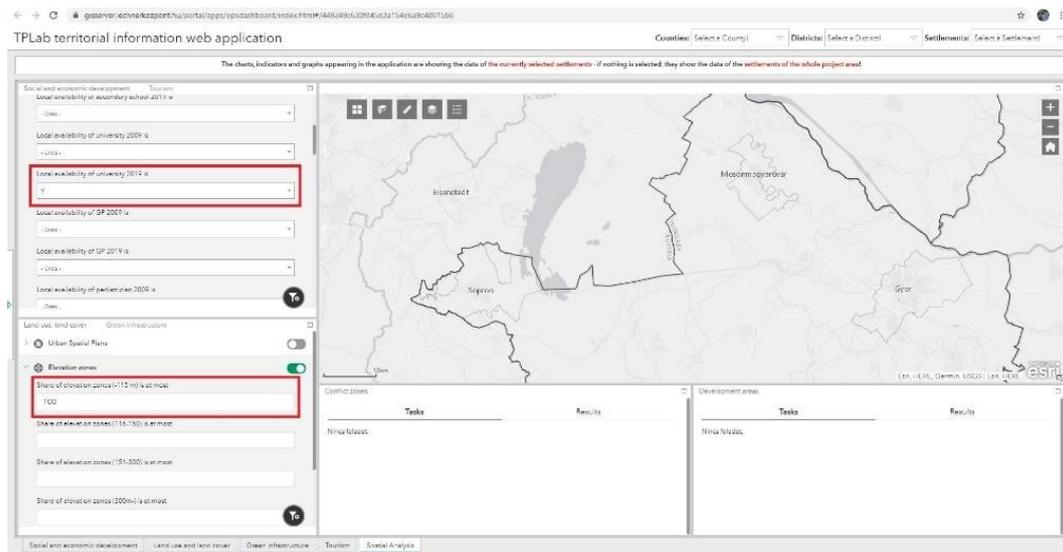
After making the selection, a small pop-up window will display the individual territorial levels (county, district, settlement) and the number of territorial units excised from each level. Then clicking on the area level for which you are interested in --> the map zooms in on the selected units and shows the selection area with a flashing boundary line. When the selection is made, the graphic elements (charts and indicators) show the data for the selected area.

To clear the selection, press the "X" button next to the menu to reset the map.

5. The Spatial Analysis interface

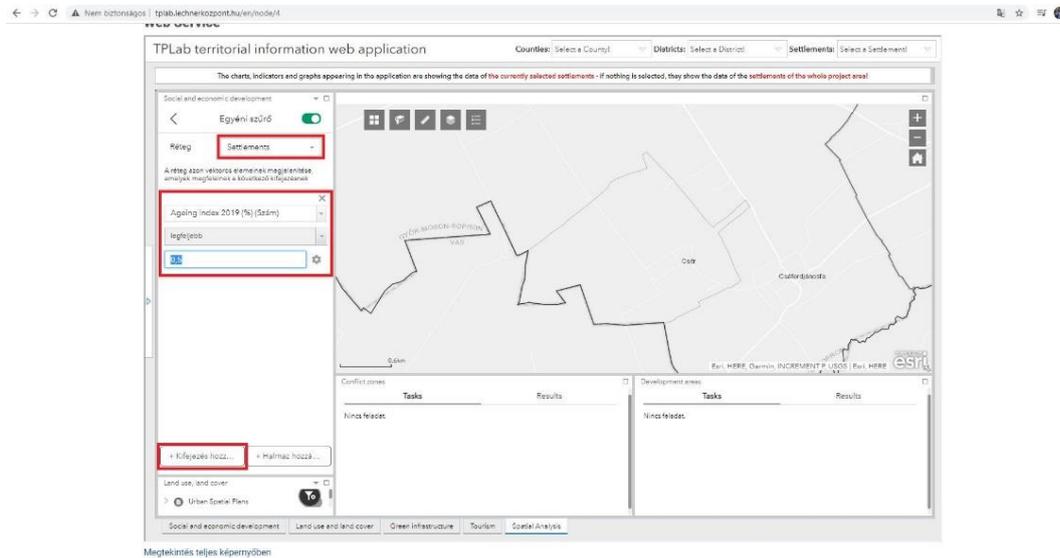
5.1 Filters and queries in the Spatial Analysis interface

The panels of the Spatial analysis interface on the left side allow **predefined queries** related to the four main topics to be performed. In the top left panel, you can switch between the indicators for two of the topics by clicking on **“Social and Economic Development”** or **“Tourism”**. The main indicators or indicators groups - with icons and the name - are arranged below each other.



- Clicking on the  arrow in front of the icons displays the indicators that can be filtered
- Click on the text box to select a value from the drop-down list – or enter a number, depending on the field type
- In addition to the name of the indicator, the filter condition is always displayed (for example, **“Agricultural enterprises 2009 (%) is greater than - 15%”** or **“Local availability of secondary school 2019 is - Yes or No”**)
- If filter criteria are set for multiple indicators at the same time, they will be applied together
- To activate the filter, toggle the switch behind the indicator name! To deactivate the filter, click on it again
- When filters are applied, only area units (settlements) that meet the filter criteria appear on the map
- For good visibility and identification of the results, it is recommended to temporarily switch off all other layers!

In addition to the predefined filters, you can click on the  icon to compile custom filter criteria and more complex filters.



- Under "Layer", you must first select the layer on which you want to filter

- By clicking on the "Add expression" button, the filter criteria can be added

- The field to be filtered must be entered first
- Depending on the field type, a filtering expression can be selected
- Then the value of the condition can be entered

- To activate the filter, toggle the switch behind the indicator name! To deactivate the filter, click on it again

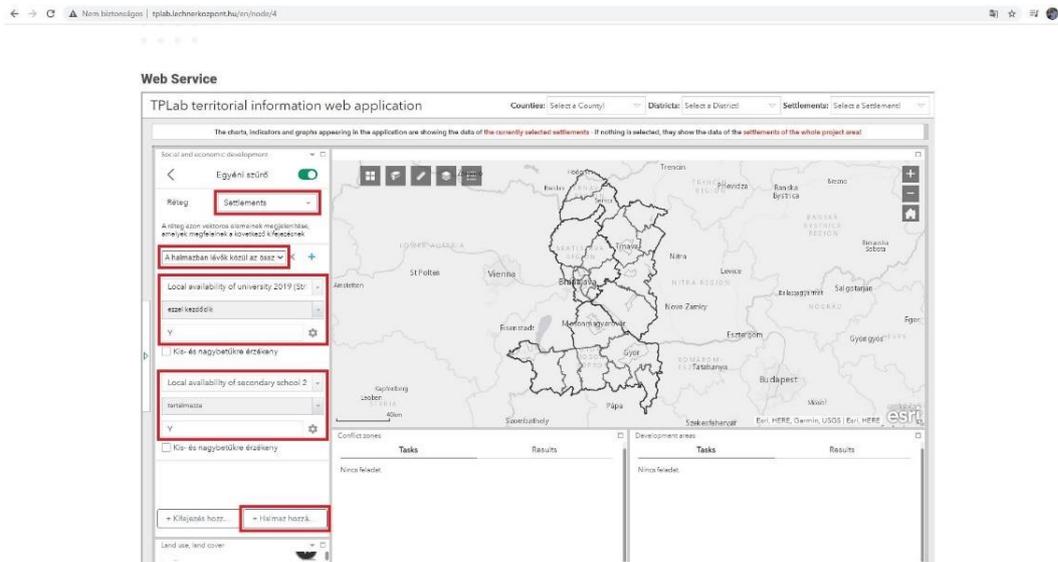
- When filters are applied, only area units (settlements) that meet the filter criteria appear on the map

- For better visibility and identification of the results, it is recommended to temporarily switch off all other layers!

After selecting the layer you want to filter, you can also specify more than one condition at a time by clicking the "Add set" button.

- The field to be filtered must be entered first
- Depending on the field type, a filtering expression can be selected

- Then the value of the condition can be entered

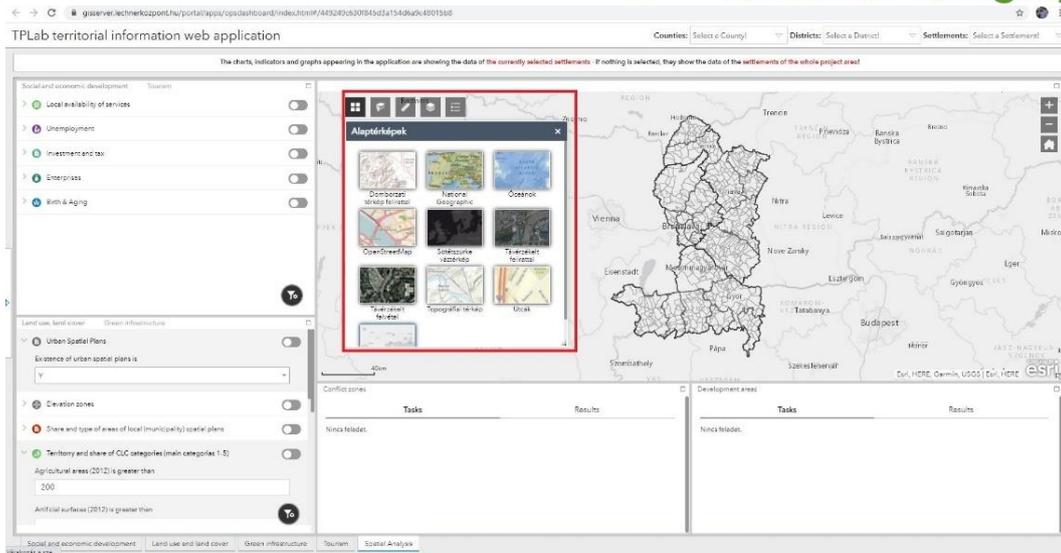


- these steps must be repeated at least twice, but by clicking the + button any number of additional conditions for filtering can be added
- you can also set whether each condition has to take effect at once, or if at least one of the conditions applies. The matching elements will appear on the map!
- To activate the filter, toggle the switch behind the indicator name! To deactivate the filter, click on it again
- When filters are applied, only area units (settlements) that meet the filter criteria appear on the map
- For better visibility and identification of the results, it is recommended to temporarily switch off all other layers!

5.2 Map functionality

- **Basemaps:** Clicking on the  icon opens a window showing different base map options. Basemaps help with map navigation and the geographical identification of individual elements, as well as an understanding of spatial relationships. It is recommended to use different base maps for different purposes.

Clicking on the selected base map icon changes the base map on the map window. Only one base map can be active at a time.

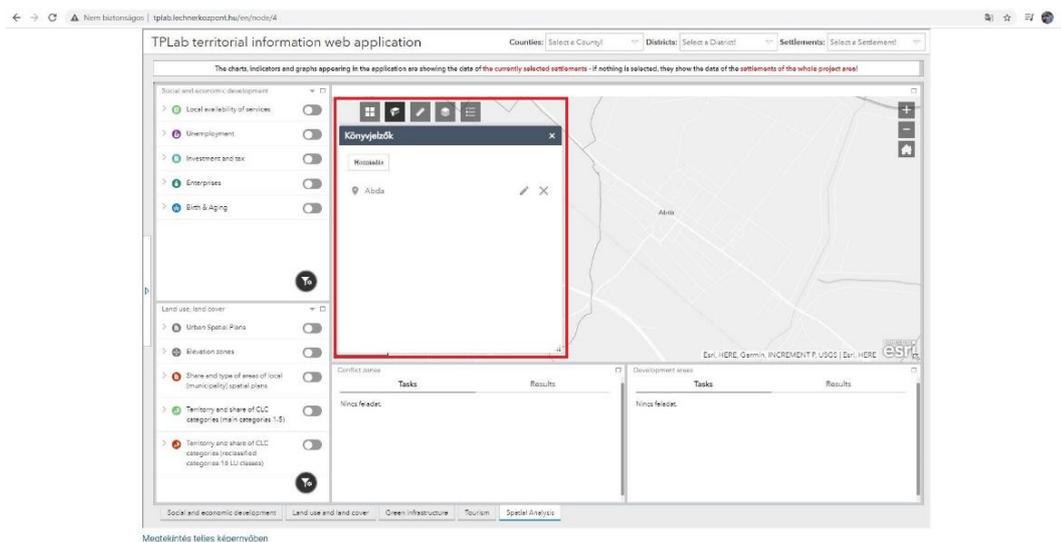


- **Bookmarks:** Bookmarks are used to save any map views, so you can quickly and easily zoom to certain areas for later work. To use bookmarks, click the  icon. A pop-up window shows the bookmarks that have already been added and named.

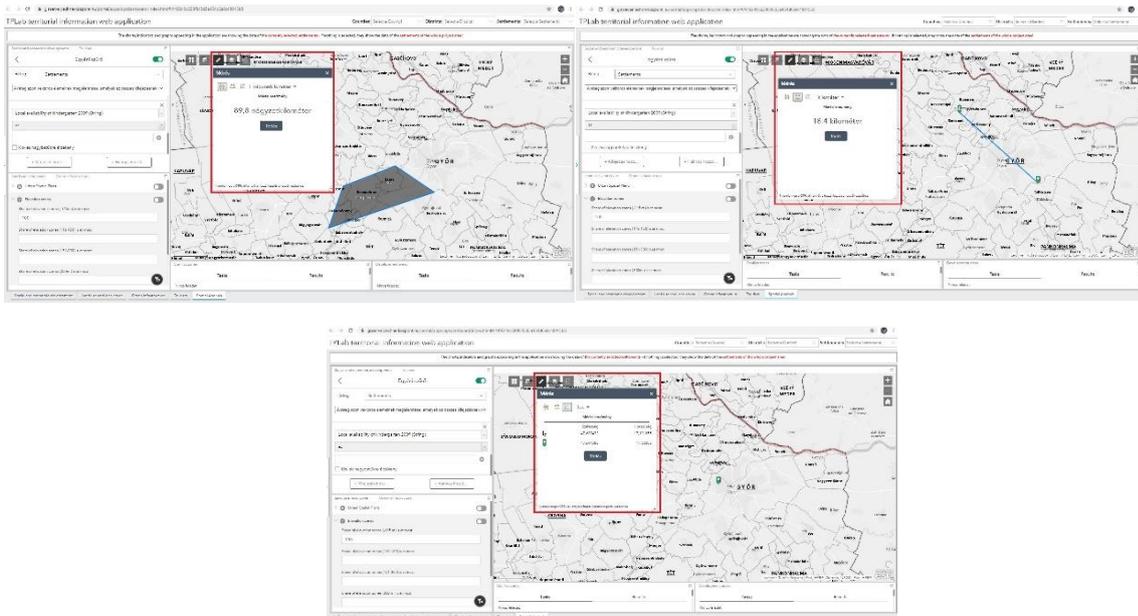
- o Click the “Add” button and enter a name to add a new bookmark. When you click the add button, the current map view will be saved

- o Click the pencil icon to edit the name of a bookmark already added

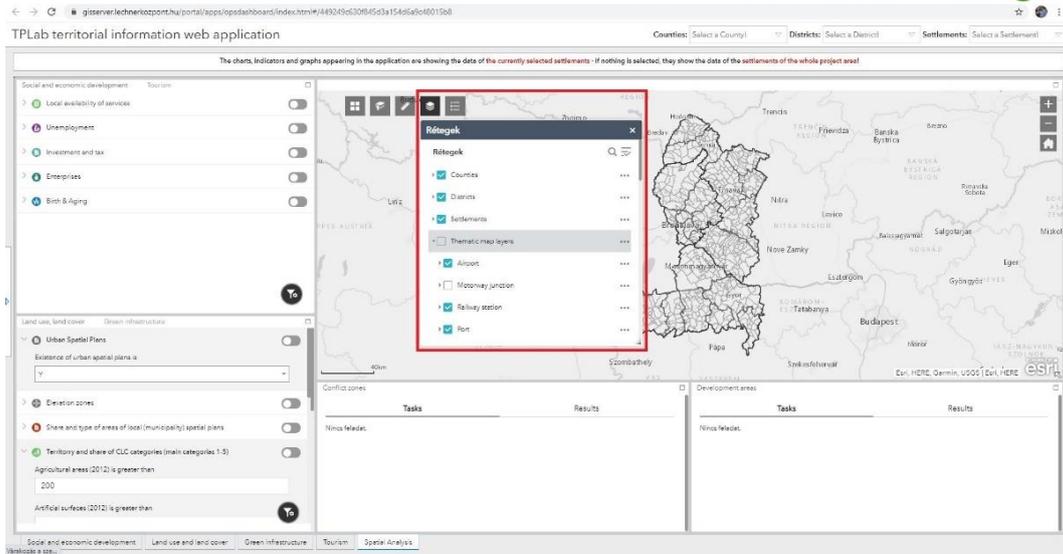
- o Click on the "X" icon to delete the existing bookmark



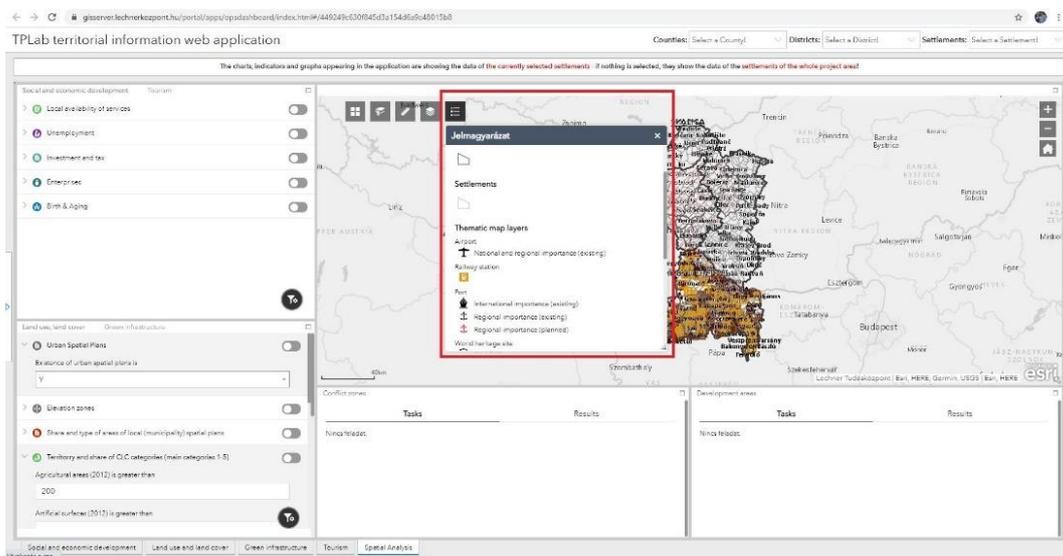
- **Measurement:** By clicking on the  icon, it is possible to measure the map areas and distances and to determine the coordinates of any point. From the drop-down menu, select the measurement unit you want to use, and then click on the map to start drawing the geometry. You can finish drawing (measuring) with a double click. The geometry drawn on the map and the measurement result can be deleted with the "Clear" button - and a new measurement can be started.



- **Layer Manager:** Clicking on the  icon opens a window listing the map layers (and layer groups). The visibility of the layers can be adjusted turning the checkbox in front of the layers on and off. It is worth noting that the layer order displayed here is the same as the layer order in the map window.
- The layer manager's top right hamburger menu contains settings for all layers: switching all layers on and off at the same time and opening and collapsing all layers at the same time
- Clicking the magnifying glass icon displays a text box. The terms entered here can be used to search in the layer tree.



- **Legend:** Clicking on the  icon opens a window with the names of the map layers and the associated symbols. This greatly helps in the visual identification and comparison of each layer. In terms of geometry, layers can be point, line or polygon.



- **Zoom in:** Click the  icon to move to the next zoom level on the map - zoom inwards.
- **Zoom out:** Click on the  icon on the map to return to the previous zoom level - zoom out.
- **Full extent:** Clicking the  icon the map will zoom to the initial extent.