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Geodata-driven urban planning

Tbilisi Sea Masterplan

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Key facts & figures about potential of data

Did you know…

Every year data volumes explode by **40%**

Big Data investments accounted for nearly **$40 billion** in 2015 alone

Over **80%** of data in enterprise consists of **unstructured data**

Due to the lack of **analytical skills** companies analyse only **12%** of data

Poor data can cost businesses **20%-35%** of their operating revenue

Why spatial data can change approach to urban planning?

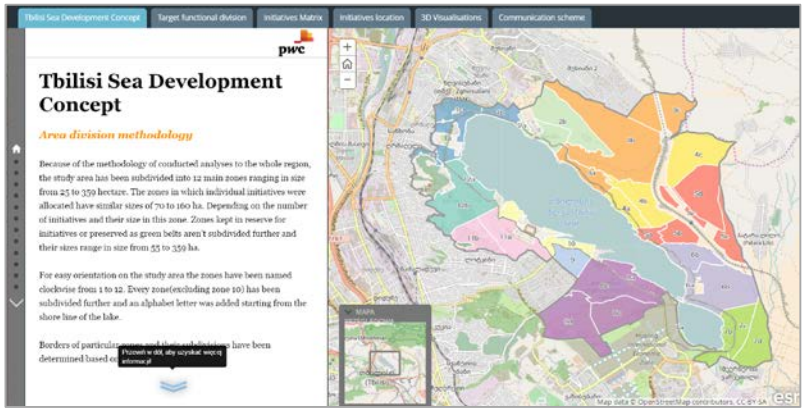
Case Study: Tbilisi Sea Masterplan

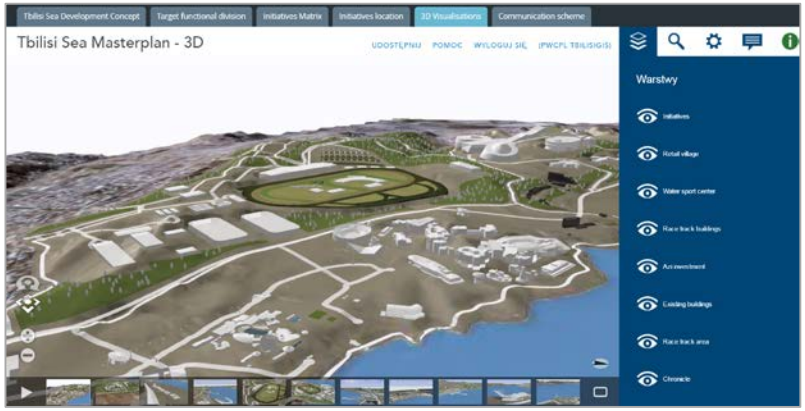
1

Project back-ground

Executive summary – the Master Plan shows tremendous potential for the citizens and visitors to Tbilisi

- Together with Chapman Taylor we have designed a detailed functional Masterplan of the Tbilisi Sea area
- Main assumptions included preservation of natural environment and addressing citizens needs
- The process involved many interested parties including City Hall departments, LUP team, GWP and local investors
- Together we created an advanced application to bring the Masterplan to life
- The Masterplan shows:
  - A clear role for government investment in required and enabling infrastructure
  - investment opportunities ranging from recreation and light retail to hospitality, accessing both local and international capital
- The Masterplan can be successfully implemented if:
  - It gets full support from the authorities
  - Legal obstacles are addressed
  - Will be delivered in a structured and comprehensive way, from planning to execution





The goal of the project was to create a vision for the masterplan

Tbilisi Sea Masterplan project engagement goals and main assumptions

- Vision for the future, benefiting the City and it's inhabitants
- Drive economic and touristic development in Tbilisi Sea area
- Attracting private investors, local and international
- Answer the development needs of the City considering the Tbilisi Land Use Plan and prevent urban sprawl
- Introducing sustainability standards, maintaining the natural character of Tbilisi Sea area
- Identify areas and projects requiring Government investment

Case Study: Tbilisi Sea Masterplan

2

Our approach

Our methodology was based on geospatial tools, urban design and financial modeling, we have also performed a comprehensive market research and benchmark screening

Tbilisi Sea project methodology

After Phase 1 we have prepared initial outline of initiatives location and GIS model for the site

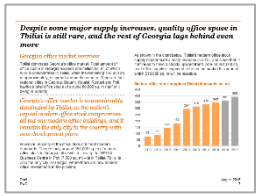
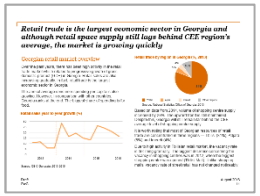
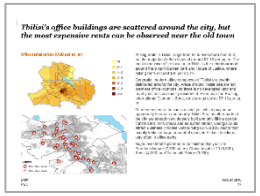
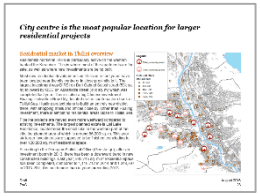
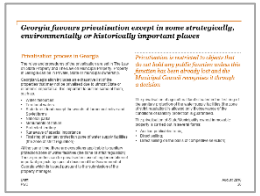
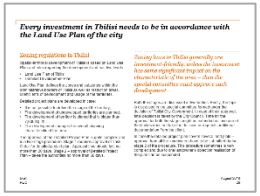
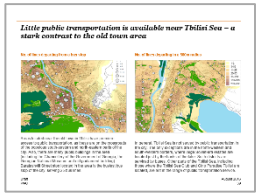
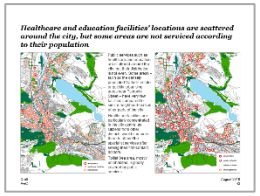
Final master plan report includes NPV and IRR indexes for the whole project as well as execution schedule (phasing), CAPEX summary and impact on undergoing projects

Site visits → **GIS city model** → **Initiatives matrix** → **GIS Tbilisi Sea model** → **Financial model** → **Final masterplan**

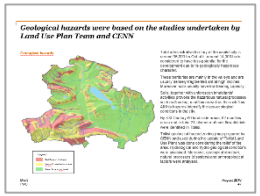
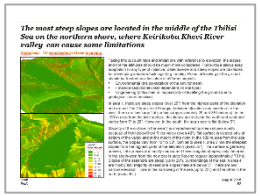
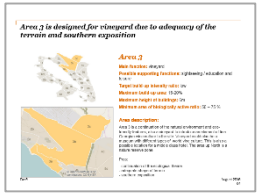
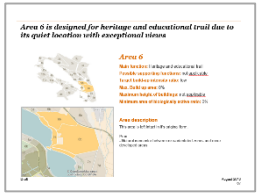
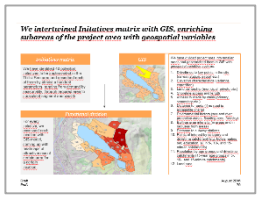
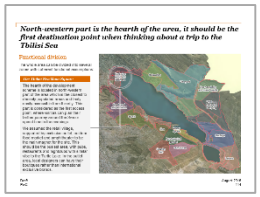
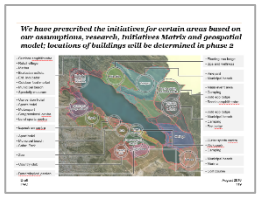
Initial stage of the project included designing the geospatial model of Tbilisi covering different Real Estate market segments and long list of initiatives (initiatives matrix)

Each initiative introduced comes with separate financial model indicating it's profitability and CAPEX

We have completed Phase 1 of the project, during which we have designed a functional division of the area and identified all potential initiatives

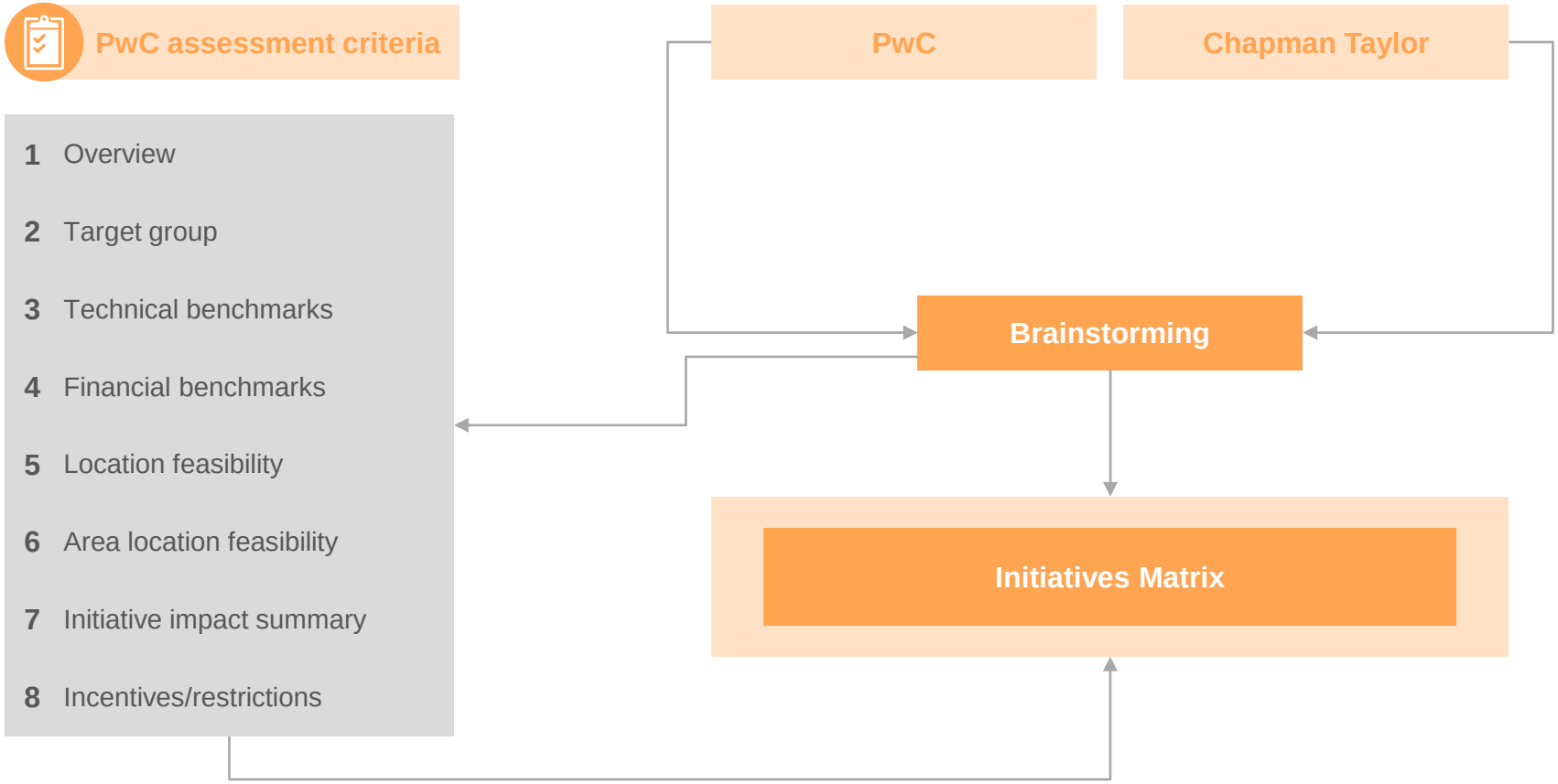
Step taken	Excercises overview	Visualisation
1 **High overview of real estate market in Georgia**	We have conducted market research on the Georgian real estate market by four selected categories: office, retail, residential and hospitality, we compared Georgian conditions to other countries in Europe and in the region	 
2 **High-level real estate market overview in Tbilisi**	We have assessed real estate market in Tbilisi in the four selected categories (retail, office, residential and hospitality) using GIS analysis and modeling, we identified key players and developments in analyzed segments	 
3 **Local regulations analysis**	We reviewed local regulations regarding construction and environmental protection including privatization process overview, zoning regulations and utility connection regulations	 
4 **Geospatial model of Tbilisi**	We have made a geospatial model of the city's demographics, public transportation and points of interest, which led us to conclude on which functions would fit the Tbilisi Sea	 

The key output of our analyses is the target functional division of the area and list of potential initiatives to be presented to investors as business opportunities

Step taken	Excercises overview	Visualisation
5 Analysis of technical conditions of the area	We have assessed technical conditions in regard of geology, hydrology and technogenic conditions, we have analyzed the elevation model and key geological and hydrological hazards for potential developments	 
6 Area division	We have divided the project area and assigned functions to each of newly-made subareas, the division was conducted based on existing development and infrastructure as well as cadastral division and natural conditions	 
7 Initiatives proposition	We have developed an initiative matrix and checked each subarea for its attractiveness for initiatives, we have indicated optimal locations within the area for certain initiative	 
8 Target functional division	We concluded our analyses and came up with functional division of the area, we have created the target vision of the Tbilisi Sea which would be attractive for tourists, Tbilisi citizens and investors	 

We have evaluated each initiative potential for every project area based on geospatial variables and Initiatives Matrix criteria

Initiatives Matrix composition overview

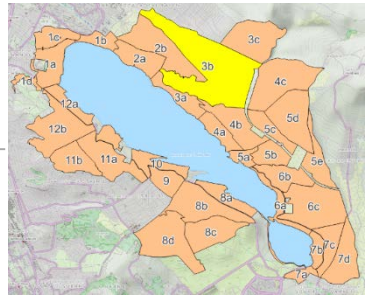


We intertwined Initatives matrix with GIS, enriching subareas of the project area with geospatial variables

Initiatives matrix

We have identified 40 potential initiatives to be implemented in the Tbilisi Sea area and described each of them by almost a hundred parameters, ranging from demand by seasonality, through required area to core client segment and wealth.

GIS

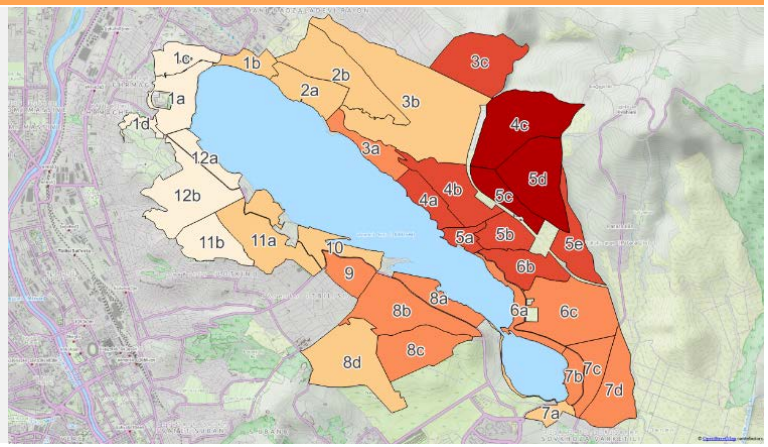


We have divided project area into smaller areas and geoenriched them in GIS with geospatial variables such as:

1. Drivetimes to key points in the city (railway station, airport etc.)
2. Elevation characteristics (variance, exposition)
3. Land ownership (municipal, private etc.)
4. Shoreline access and length
5. Access to roads by class (primary, secondary etc.)
6. Distance to roads (if no road is accessible onsite)
7. Environmental factors (sea and river protection zones, flooding area, forestry)
8. Built-up area intensity (in areas and in radiuses from areas)
9. Distance to subway stations
10. Points of interest by category and drivetime catchment (e.g. hotels, eating out, education, all in 5-, 10-, and 15-minute catchments)
11. Population by age groups and drivetime catchments (15-year age groups in 5-, 10-, and 15-minute catchments)
12. Land area

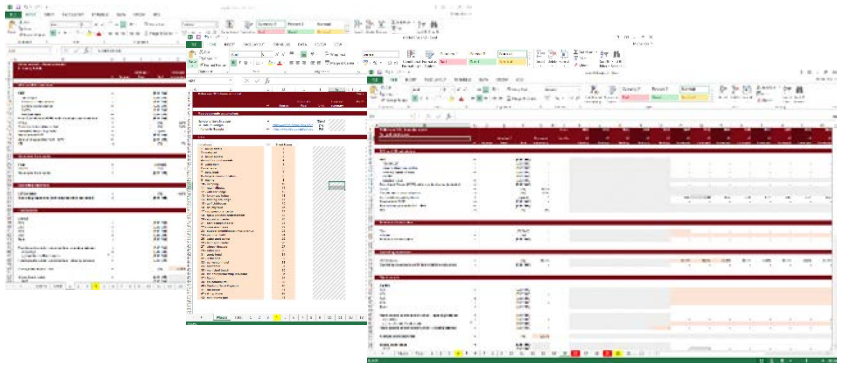
Functional division

For every initiative, we assessed each location with GIS model, coming up with heatmaps of attractiveness of certain area for a certain location.



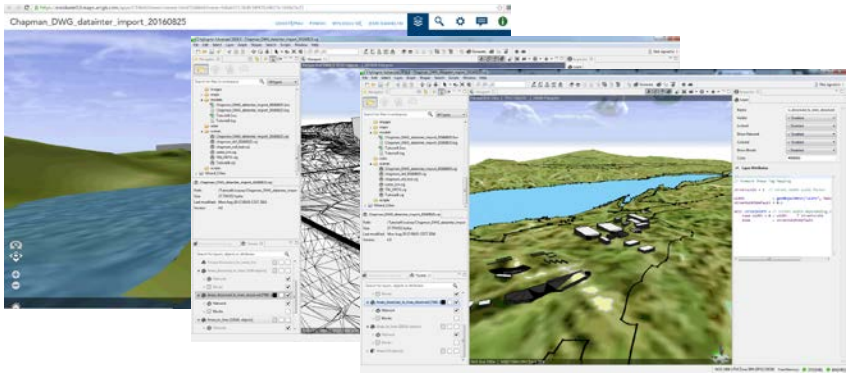
In Phase 2 of the project we were focusing on financial modeling to determine the most profitable initiatives and 3D visualizations of the Master Plan

Financial model



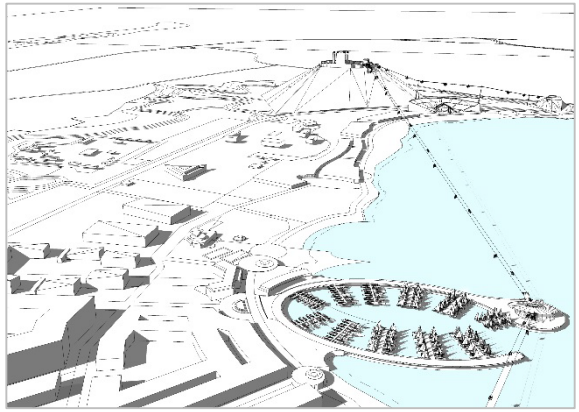
- We developed a comprehensive financial model that included over 40 separate calculation sheets for each initiative to determine their profitability
- The CAPEX side of the assumptions was covered by our local subcontractor, that is responsible for assessing the costs of development of buildings as well as infrastructure
- We have researched financial statements of companies which are running business operations similar to our initiatives and used them as financial ratio benchmarks
- We have researched the income models for each initiative to calculate cash flows, income assumptions are being adjusted to Georgian market characteristics

Visualizations



- We were working closely with Chapman Taylor to create vivid conceptual visualizations of the Tbilisi Sea area
- Our key task was to create the 3D model, which could be interactively presented to the audience
- Apart from that we have provided the CH with maps of each investment area, where outlines of buildings, infrastructure and road network will be presented

We have created a full scale 3D model of the area, outlining considered inititatives and their locations, the results were then delivered in a form of an online app



Want to know more? Contact us!

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