OUT Project

short overview

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Architecture

Frontend

jQuery.js
Leaflet.js (Map, Tiles, Basic
Geo Data Visualization
tools)
D3.js (graphs, plots)

Deploy

Docker
docker-compose
Django through Gunicorn + nginx
Cloud

Backend

Django, classic MVC set up with
custom extra python packages
for the views to handle specific
tasks.

Plan to add Golang server for
the most intensively loaded
modules

DB (RDBMS)

Sqlite3 + Sqlite Studio

Plan to add Neo4j to
migrate geospatial data
there in order to increase
speed of graph algorithms

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Basic Scenarios and Functions

USERS'

- Paving the Way by Car and as a Hiker
- Time handling and Way Rebuild
- Camps and Stops
- Share way and store its configuration as a link
- Station - Funiculars
- Zones
- Reserves
- Search
- Costs: Reserves and Funiculars
- Notes
- Altitudes
- Gallery of Places and Building way along places
- Day partition

ADMINS AND OPERATORS'

- Admins console, separated by authentication process
- Full control and CRUD operations over geo-data

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Paving the way by Car and as a Hiker

- A-star algorithm is under the hood of pathfinding mechanisms for "car" and "hiker" mode. However, competitive functions are applied for the "hiker" mode in order to have ability to move away from trails that is real life scenario

- Cancel Last Move Option

- Delete All Way Option

- Direction's considered for "cars" mode

- Altitude calculation for "hiker mode"

- Nodes and lines structure is created by processing OSM data, downloaded via Overpass API

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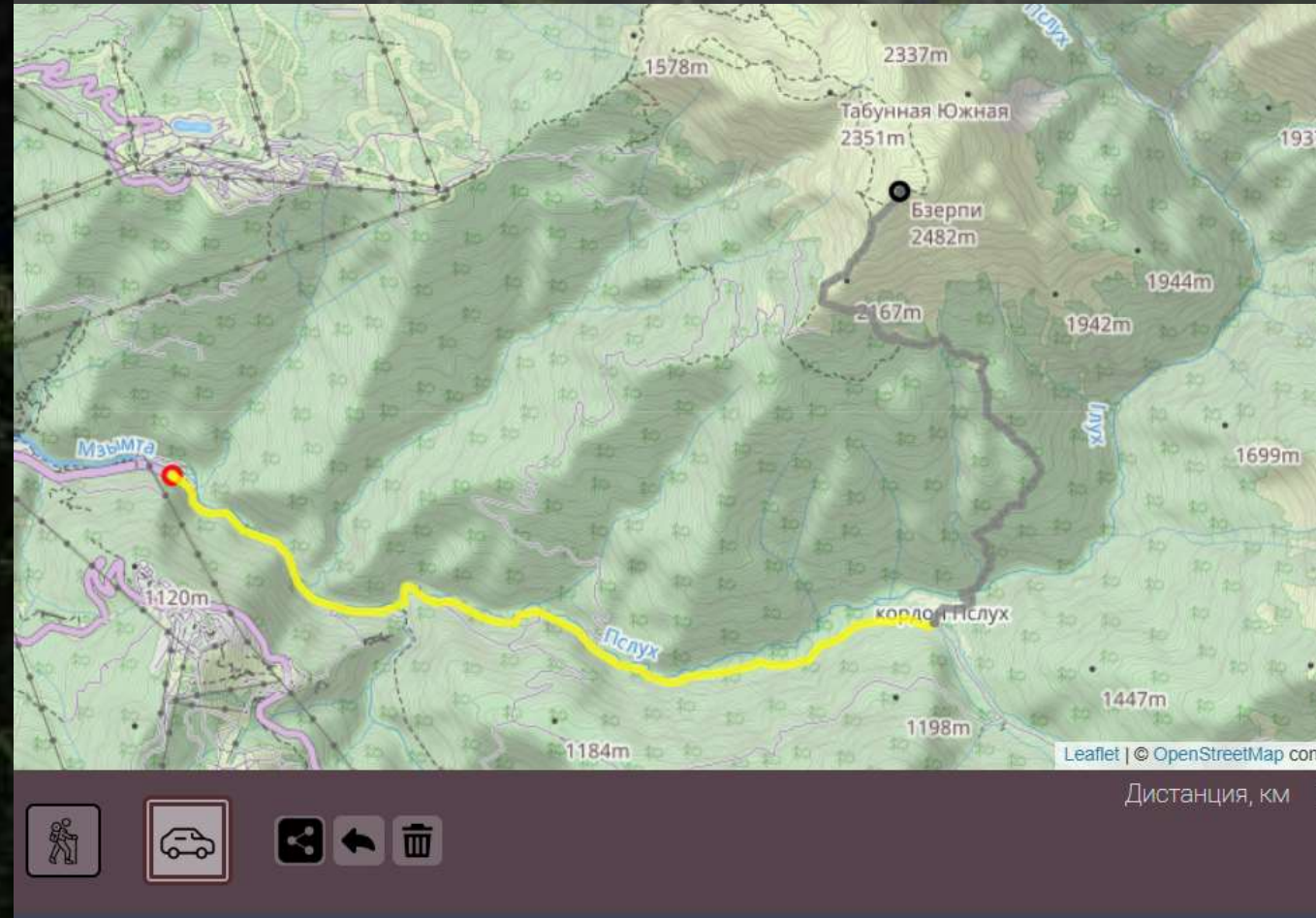
Time handling and Way Rebuild

- User's time converted into the time of the Region

- Default start time is current time in the Region

- If user changes the start time, all way reassembles along points defined by user

- Маршрут -

19 сен 25' || 11:09 || GMT+3

Выберите дату и время начала маршрута (местное, GMT+3)

| 19.09.2025 📅 | 09:09 🕐 | Сохранить |

Camps and Stops

- Options to add overnight camps and casual stops to your way

Share way and store its configuration

- Option to share way in its current state via your own notes. It will be stored within 3 months since last request and can be retrieved anytime.

- Way configuration is compressed for storage and decompressed for usage in order not to keep it as set of coordinates
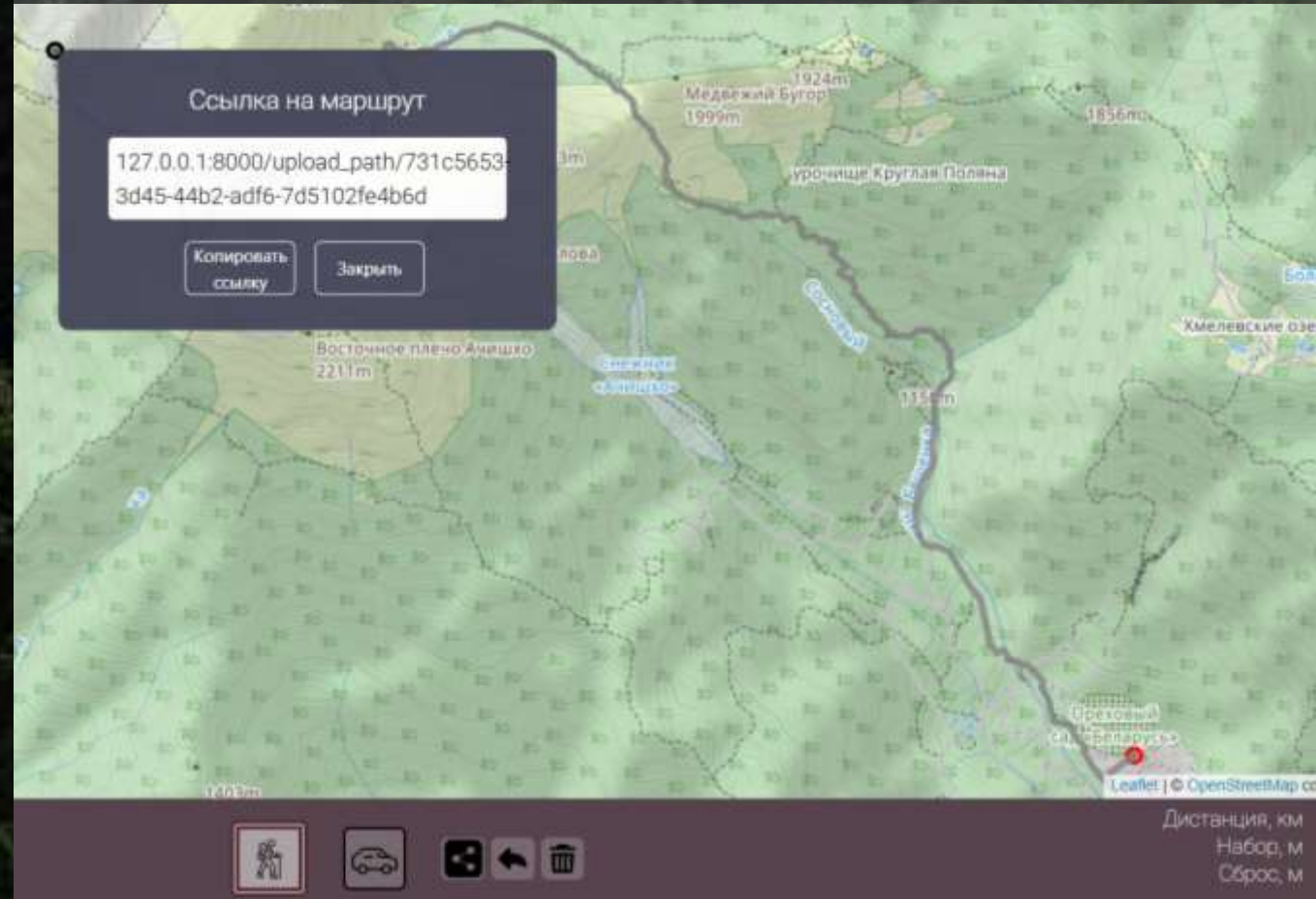
Stations: Funiculars

- Inside the nodes-line structure certain nodes are marked as a Funicular station. This is an entry point into Funicular network.

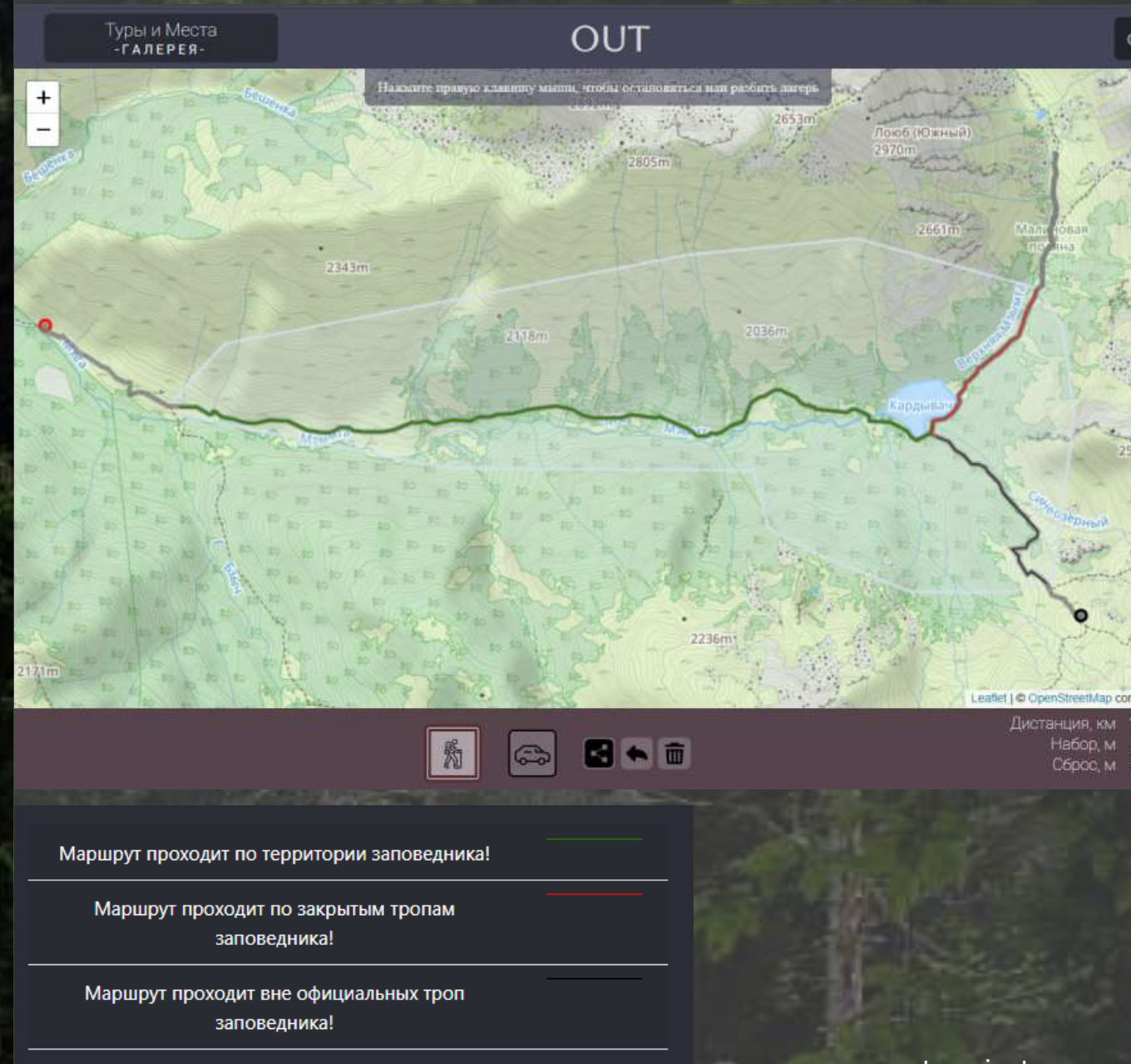- According to the data from Resorts funiculars are also considered within assembling the Way.

Zones

- Feature, which let you know if your path is inside special zone like territories nearby border of states, private and e.t.c.
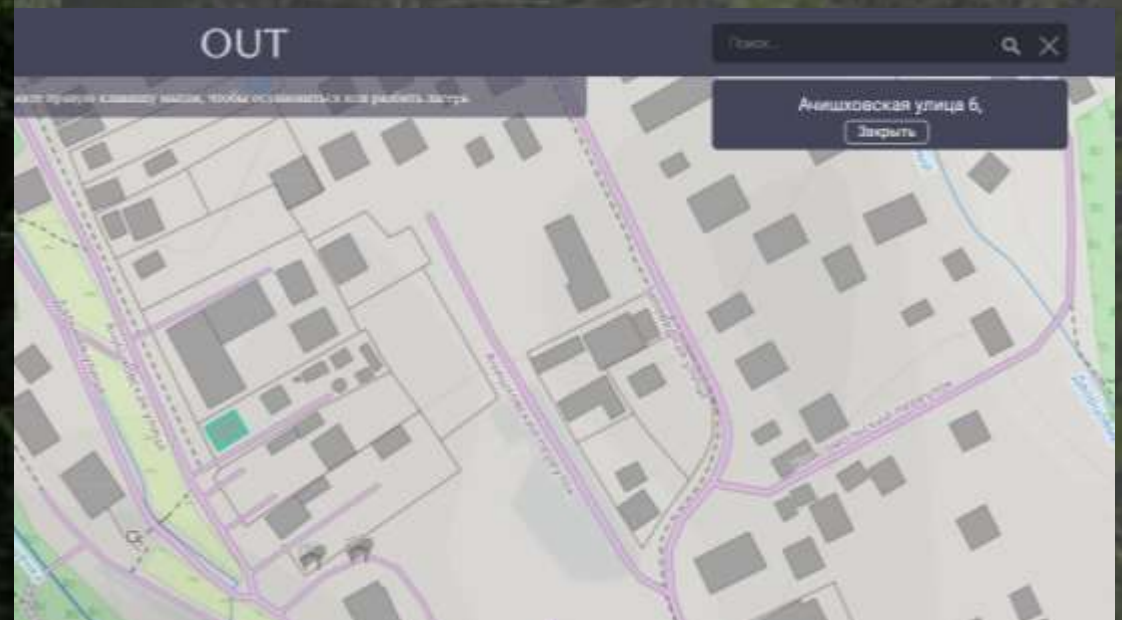

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Reserves

- Feature for description of National Reserves or similar territories there are only limited number routes, where ordinary tourist can pass.

- There are three categories of path within the borders of the reserve: open, closed, forbidden.

- Distance-aside parameters are set for open trail – what distance off the track is considered crucial

- Parameters of the trails inside are changing permanently.

Туры и Места -ГАЛЕРЕЯ-

OUT

Маршрут проходит по территории заповедника!

Маршрут проходит по закрытым тропам заповедника!

Маршрут проходит вне официальных троп заповедника!

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Search

- Feature to search the Places on the map.

- Feature to search certain address (OSM data)

Costs: Reserves and Funiculars

- For now, there are two origins of Costs: Funiculars' tickets and Tickets to the National Reserves

- Reserves' cost comes from the number of within the Reserve and Path parameters

- Funiculars: special algorithm chooses the best set of ticket for your set of funicular routes

| Себестоимость - 300 ₽ | Профиль высот | Заметки ко дню маршрута |

Пропуск в заповедник на группу | ₽ |	300
Подъемник | ₽ |	0

Notes

- Feature to let you add notes up to the Way or each day of the Way

- Notes are not deleted implicitly: if you delete whole Way, they are saved and associated with certain date

Altitudes

- As Django application starts working, geotiffs with altitude transforms into Numpy array in order to be into RAM

- Most of the data about vertical data is stored inside Lines priorly.

- Profiles, daily and overall, are created on request from the client side

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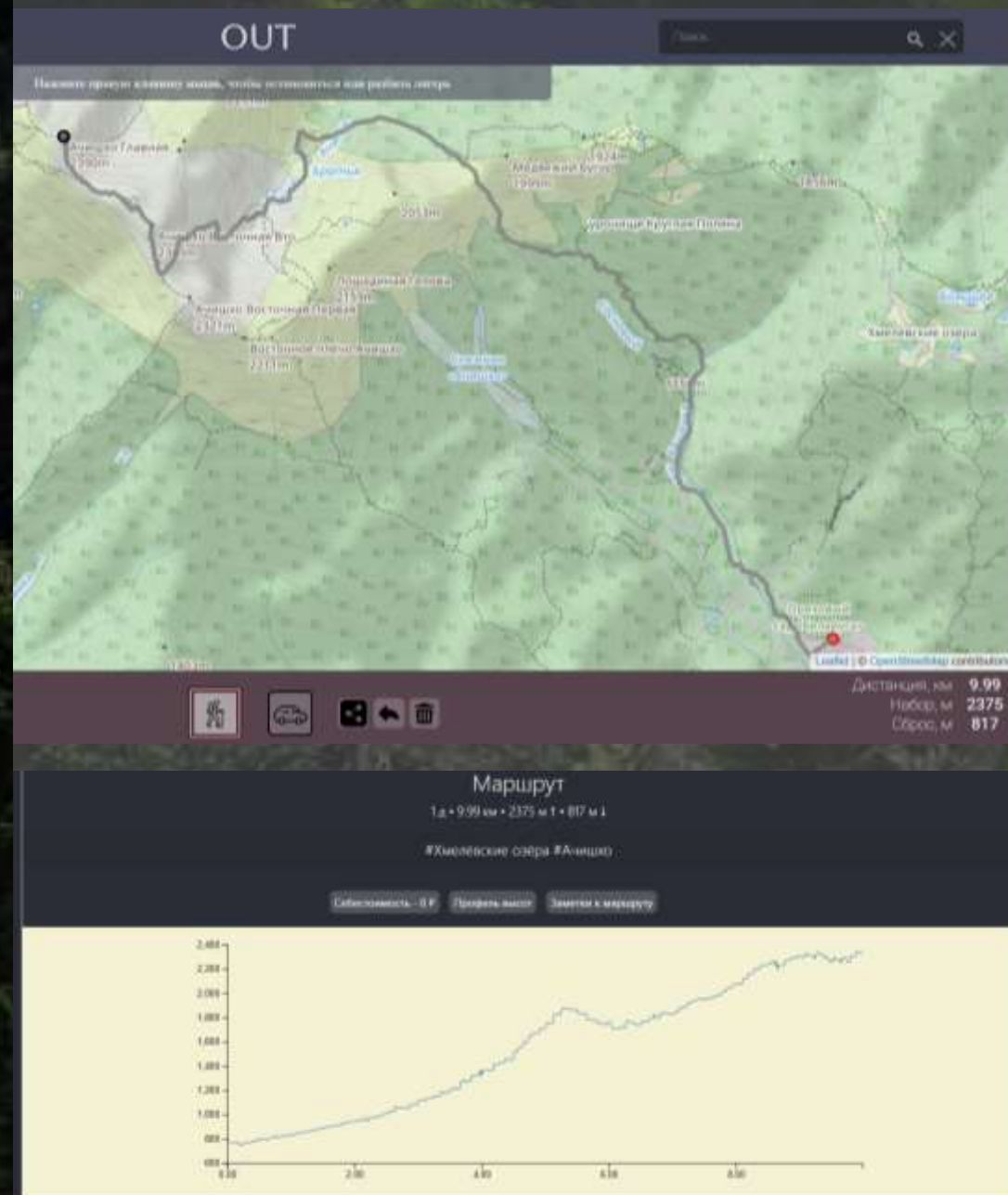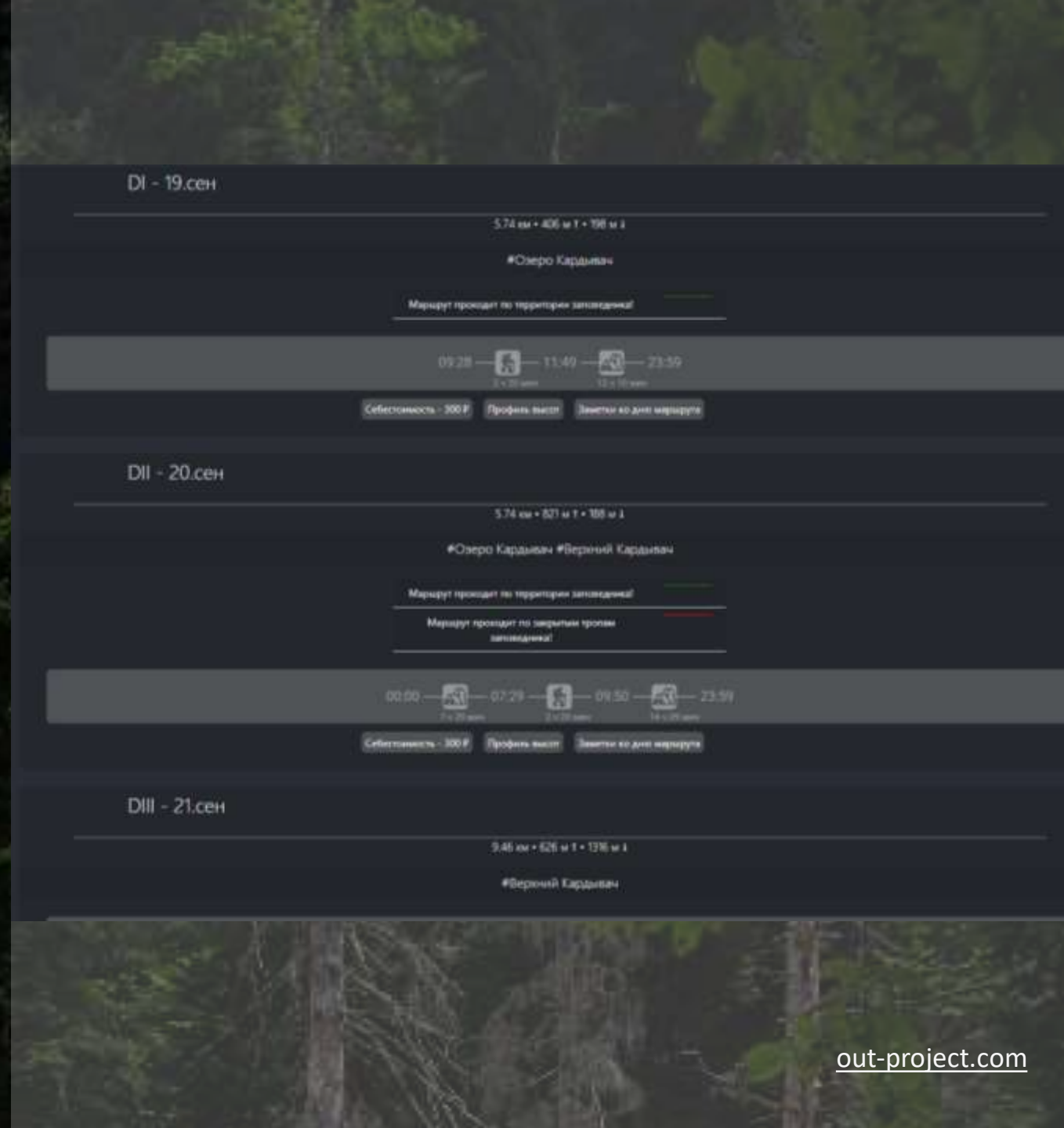
Gallery of Places

- Feature to look up media associated with Place, search Places, add it to your Way explicitly

- As the Way being built algorithm automatically checks if there are any Places inside

Day Partition

- Set of similar function processing the part of the Way to separated different cases to each day

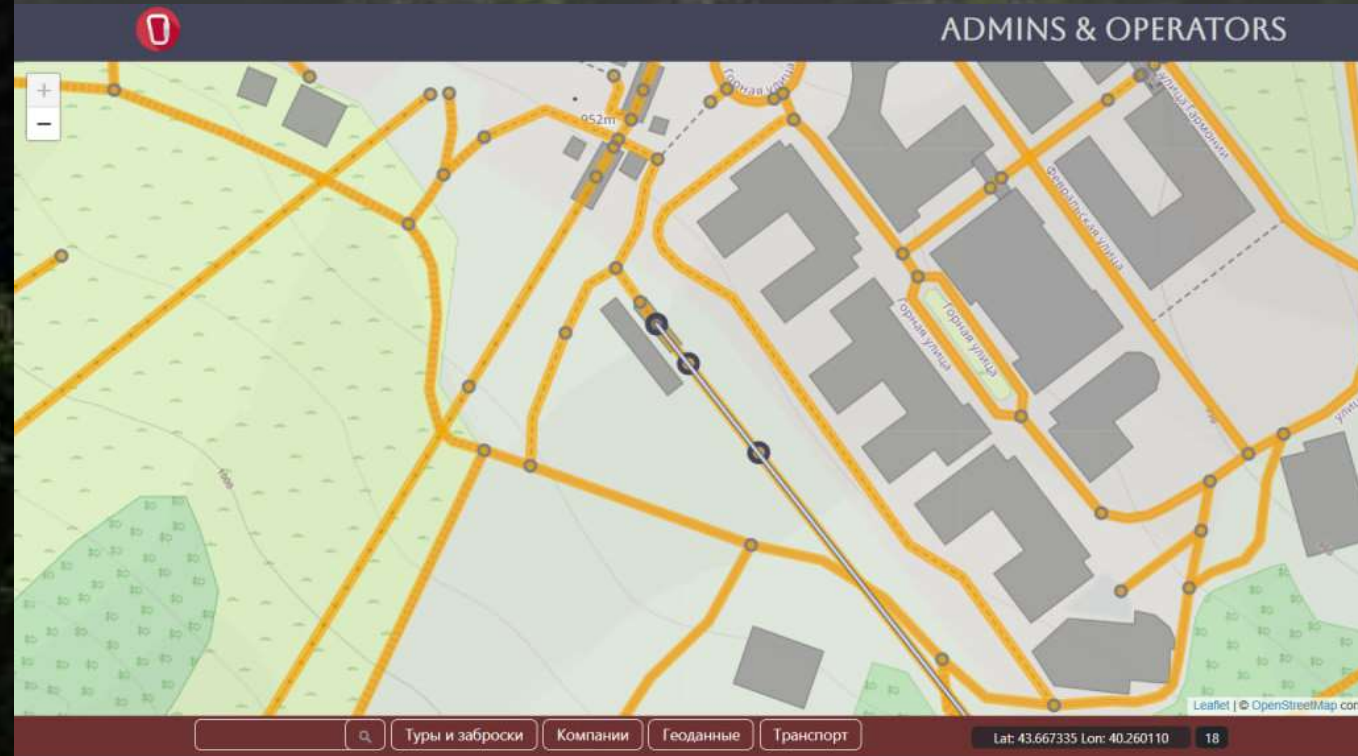- Feature to create thread of the Way within one day

Admin Console

- Separated by authentication part of the service.

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Full control and CRUD operations over geo-data

- GUI to control over all geospatial data, support for any CRUD operation with a purpose to save consistency of the Nodes-Lines structure.

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To be continued. . .