Climathon Bratislava 2020

Challenges:

1. How to motivate the citizens to get involved in the transformation of Bratislava into a city resilient to climate change?

Learn more about this Challenge

Challenge Vision: *The key objective in this challenge is finding new solutions for coping with climate change-augmented impacts. It addresses the mitigation of the heat islands, pollution reduction, protection from events such as flash floods, and enhancing readiness as well as resilience to climate change.*

2. How to increase the usage of public transport and green mobility alternatives?

Learn more about this Challenge

Challenge Vision*: This challenge envisions the necessity to rethink the public use of the transportation city capacities, an increase in the quality of life of the city dwellers, the reduction of noise from transportation, etc. Novel innovative solutions are sought to strengthen the interest in public transportation and its alternative ways.*

Timeline

Available data

Openportal dataset overview facebook video
[https://www.facebook.com/hubhubbratislava/videos/1045807899224386]

Open data portal - https://opendata.bratislava.sk/
Mapy bratislava - https://mapy.bratislava.sk/

Štatistický úrad, sociálna poisťovňa

More data sources should be available later…

Datasets about transport will be presented 4.11.2020 ….

Bus and trams data - delay ..

Data – Trams examples

Date	TIME	VEHICLE_ NUMBER	LINE	DIRECTIO N	SERIAL_ NUMBER	LON	LAT	DELAY	STOP_ NUMBE R	STOP_ NAME	DOORS
08.01. 2019	04:35: 37	7401	6	2	13	17,163982	48,180603	Unnamed: 12	46402	Vozovňa Jurajov dvor	1
08.01. 2019	05:41: 33	7401	4	4	1	17,11552	48,147428	-00:03:32	20902	Mariánska	1
08.01. 2019	05:41: 37	7401	4	4	1	17,11552	48,147428	-00:03:37	20902	Mariánska	0

Data source ??

Spectral composites from satellites

Tree points map

Data source technologies

Azure + Databricks

CatNet Swiss Natural Catastrophe assessment toolMore infoM

Data – Technology tools available

- Azure + Databricks (including 100$+ Azure passes for teams)
- CatNet – SR Natural Catastrophe assessment tool - first time available f externals

Next Steps

1. V1 data overview available today (on SLACK)
2. Access to DataBricks and Tutorials mid-next week (on SLACK)
3. More info at workshops on Friday, Nov 13 - 19.00 and 19.45

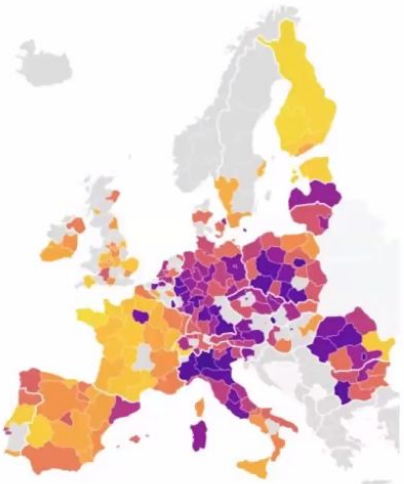
More information later…. **Lukas Csoka**

Live introduction & Climathon Kick-off

4.11. - 18:00

Challenge 1

- Fifth highest costs per capita when it comes to air pollution 2 168 EUR annually
- Identify city vulnerabilities and how to mitigate them
- How can we involve residents in responsible behaviour and making their neighbourhoods more resilient
- How can we better plan the city



Challenge 2

How to increase the usage of public transport and green mobility alternatives?

- Drop in public transport usage by 90% during Spring, increase in cycling
- Increasing number of cars registered in Bratislava, over 300 000 cars

Desired solution

- Data management tools
- Residents engagement
- Data collection tools
- Gamification and positive vibes

- At the end of the weekend, you will submit:
  1. PPT Presentation (3min presentation + 3 min Q/A from the jury)
  2. Tool: demo, code, visualisations, etc.

Evaluation criteria

1. Implementation: Is the technology and data scalable and helps collect data on an ongoing basis?
2. Usefulness: Is it desired by residents?
3. Innovativeness: Is there competition on the market? Does it replicate what already exists?
4. Strategic alignment: Does it fulfill the sustainability goals of the city?

The Jury

DIRECTOR OF THE METROPOLITAN INSTITUTE OF BRATISLAVA
Ján Mazúr

CHIEF INNOVATION OFFICER
Petra Dzurovčínová, Bratislava

HEAD DSA, DATA SCIENCE BRATISLAVA
Uwe Nagel, Swiss Re

IT STUDENT COACH AT SWISS RE
Matej Gálik, Swiss Re

Data available

- Bus & Trams data
- Vending ticket machines
- Trees as points
- Small polluters
- Sidewalks
- Spectral composite
- And a lot more...

Notes from introduction speeches

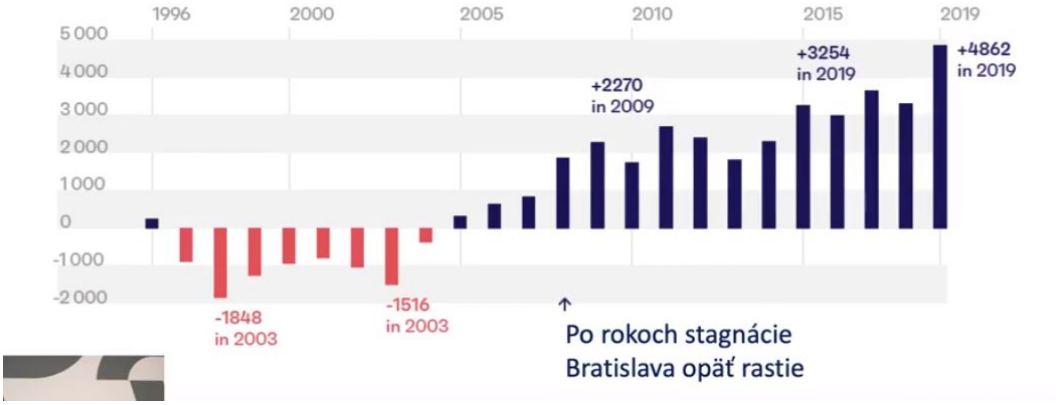
Who are people from Bratislava ?

- concept of categorization

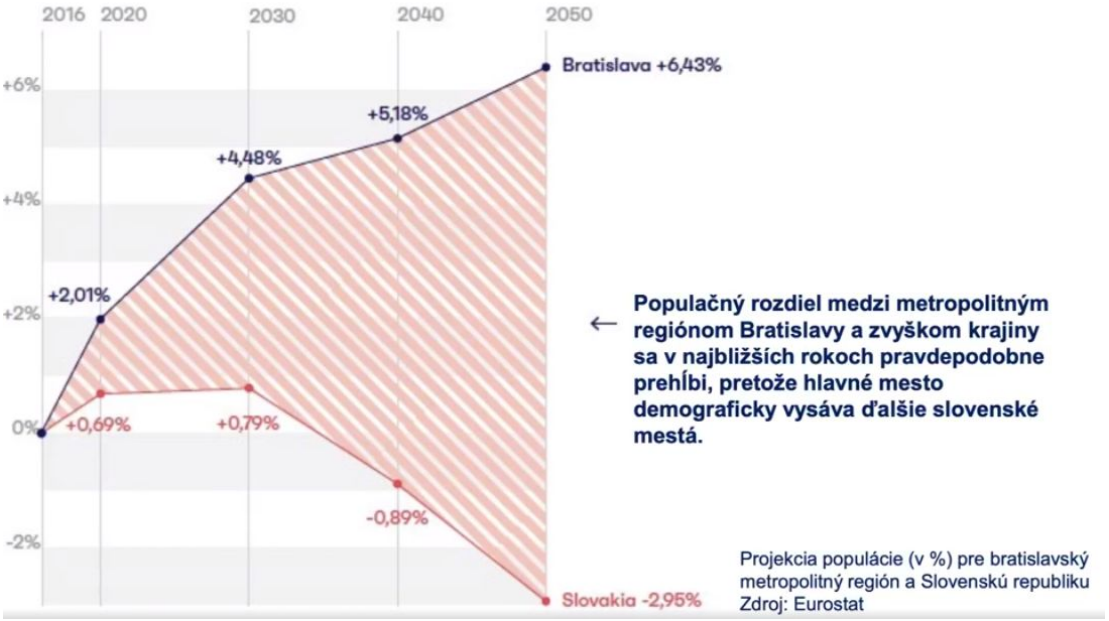
Rastie počet obyvateľov s trvalým bydliskom

Bratislava opäť rastie

Bratislavská populácia. Celkové nárasty počas rokov



Projekcia populácie (v %) pre bratislavský metropolitný región a Slovenskú republiku

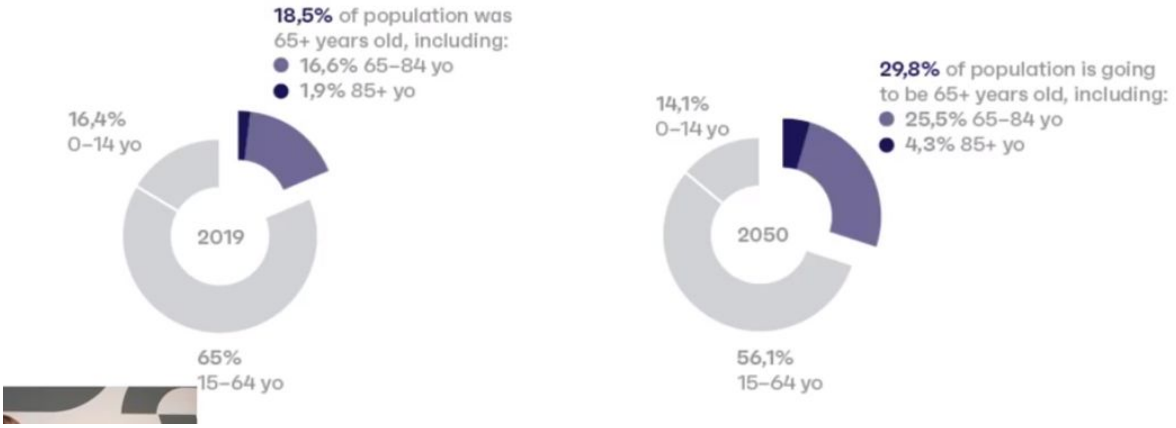


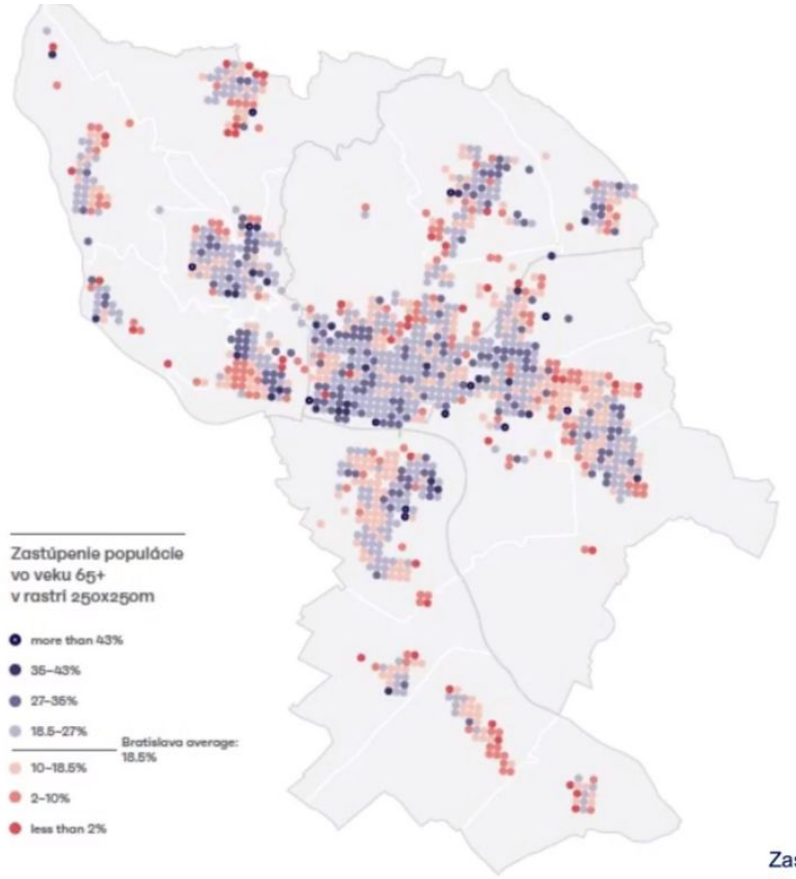
Populačný rozdiel medzi metropolitným regiónom Bratislavy a zvyškom krajiny sa v najbližších rokoch pravdepodobne prehĺbi, pretože hlavné mesto demograficky vysáva ďalšie slovenské mestá.

Projekcia populácie (v %) pre bratislavský metropolitný región a Slovenskú republiku
Zdroj: Eurostat

Bratislava bude starnúť...

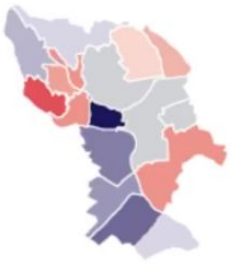
Tento negatívny demografický trend sa bude postupne prehlbovať





Zastúpenie populácie vo veku 65+ v rastri 250x250m
Zdroj: Štatistický úrad SR

V ostatných desiatich rokoch si Staré Mesto v porovnaní s ostatnými mestskými časťami vedie stále lepšie.



change between 2004–2007 and 2014–2017	municipal district	median occupation income in 2004–2007		in 2014–2017
	average median	529 €	→	747 €
+16 pp	Staré Mesto	617 €	→	990 €
+9 pp	Rusovce	462 €	→	719 €
+7 pp	Petržalka	493 €	→	751 €
+5 pp	Jarovce	502 €	→	751 €
+3 pp	Devínska Nová Ves	519 €	→	758 €
+2 pp	Záhorská Bystrica	555 €	→	795 €
+1 pp	Čunovo	576 €	→	820 €
no change	Nové Mesto	532 €	→	752 €
no change	Vrakuňa	487 €	→	687 €
no change	Ružinov	524 €	→	738 €
-2 pp	Rača	506 €	→	703 €
-4 pp	Vajnory	515 €	→	695 €
-5 pp	Dúbravka	526 €	→	707 €
-6 pp	Karlova Ves	559 €	→	747 €
-6 pp	Podunajské Biskupice	458€	→	603 €
-6 pp	Lamač	603 €	→	807 €
-15 pp	Devín	561 €	→	677 €

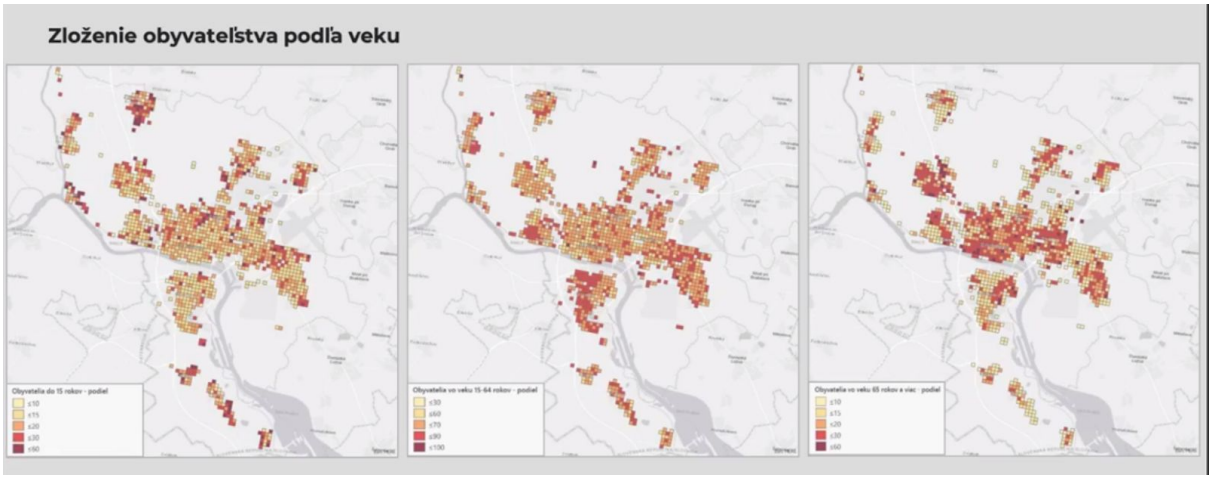
Zmena mediánu príjmu mestských častí (ako percentuálneho podielu priemerného mediánu vo všetkých mestských častiach).

Zmena mediánu príjmu mestských častí (ako percentuálneho podielu priemerného mediánu vo všetkých mestských častiach).
Zdroj: Sociálna poisťovňa, vlastné spracovanie

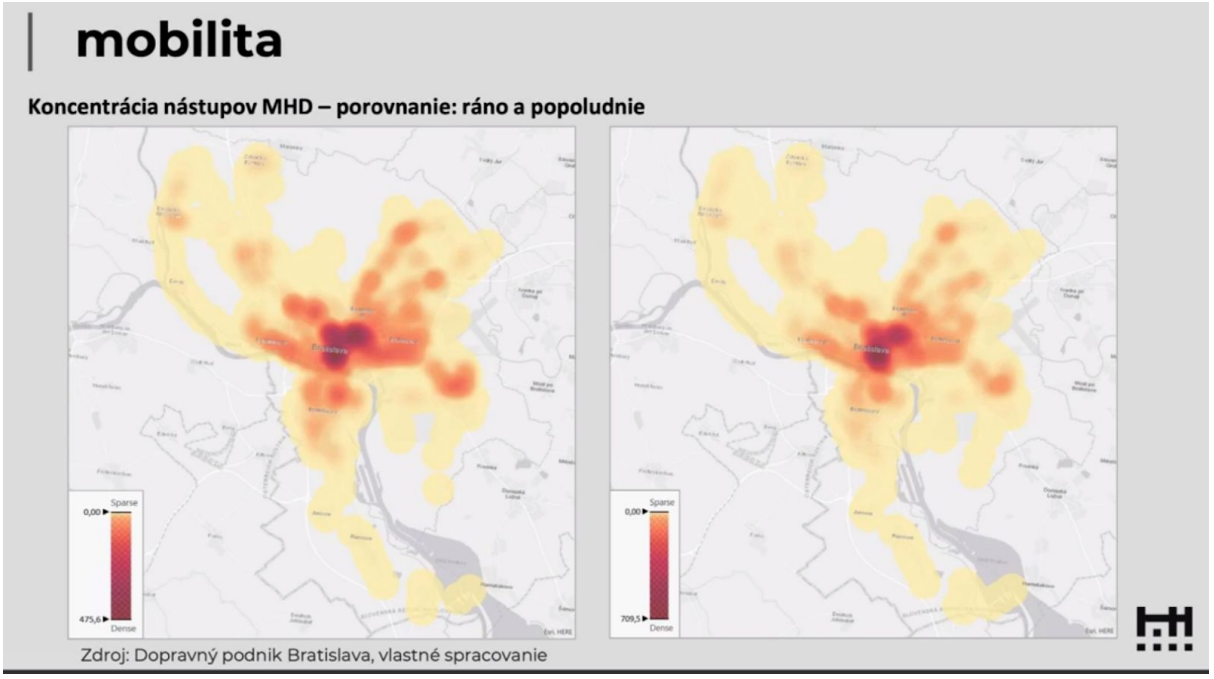
Chudobou najohrozenejšou skupinou sú starší ľudia. I tu pohlavie robí rozdiel. Zatiaľ čo muži vo veku 65+ majú o cca 12 % nižšie príjmy ako priemerne ekonomicky aktívny Bratislavčan, ženy majú nižšie príjmy až o 20 %.

Ženy vo veku 85+ zaostávajú dokonca o 30 % oproti ekonomicky aktívnym Bratislavčanom.

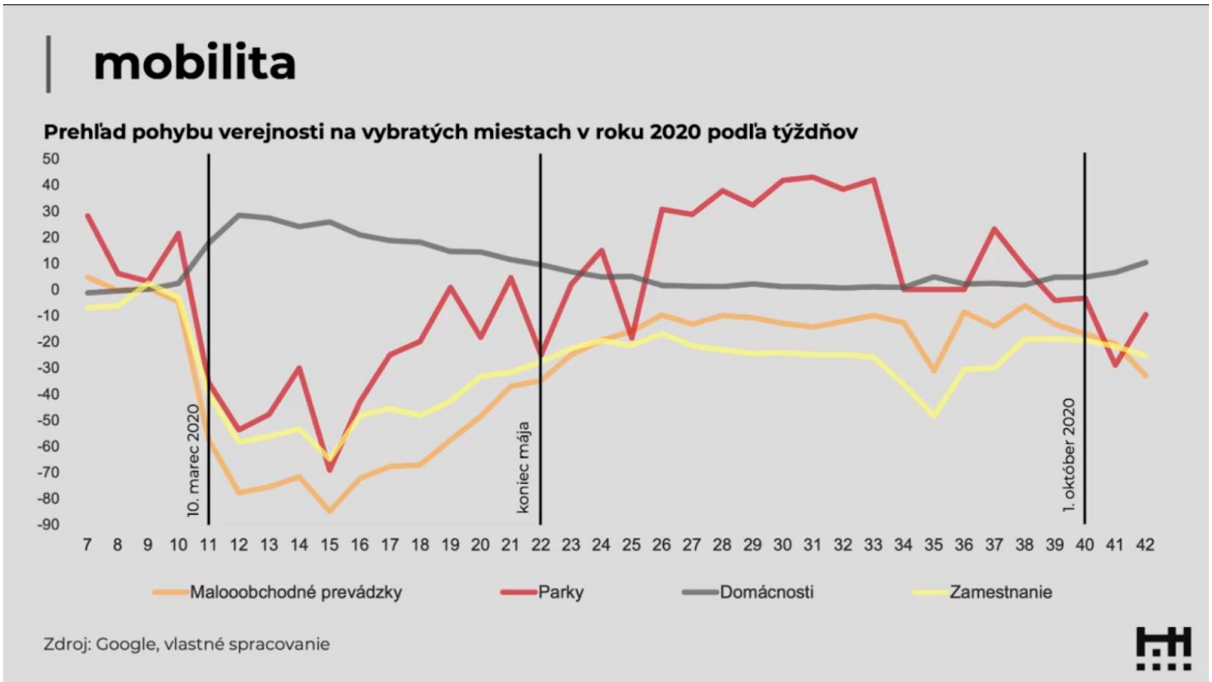
Idea: Inšpirácia zo zahraničia - komunitne domy pre staršie ženy + komunitne zahrady ??



The most economically active people are located in Petrzalka.
The most oldest and economically inactive are located in Stare mesto.



We will have tram transport data. (Sensor in doors exit count)



Ideas

Idea - Transport and covid-19 impacts ??

Ked pojdes elektrickou, kolko by si usetrila casu (v porovnani s autom)

Idea - Waste from food delivery and covid-19 impacts??

Kampan pre obyvatelov -> aby vyuzivali eko obaly
Pomoc pre restauracie -? aby im mesto pomohlo s dodavkou lacnejsich ekoobalov (nakup vacsieho mnozstva)

Idea - Automation of community gardens

Podpora lokalnych farmarov

Idea - Internet of things ??

Idea - Expensive housing in Bratislava

Idea - Heat in center

Idea - Satellite imagery to map green environment

Based on text from official website,:
We need their help to map trees, greenery, benches and amenities so that we can collaboratively enhance the most deprived neighborhoods.

and

To give an example of a great starting point, it would be extremely useful to create a map of what is already available to our citizens (parks, benches, playgrounds) and what is still sought or would be welcomed

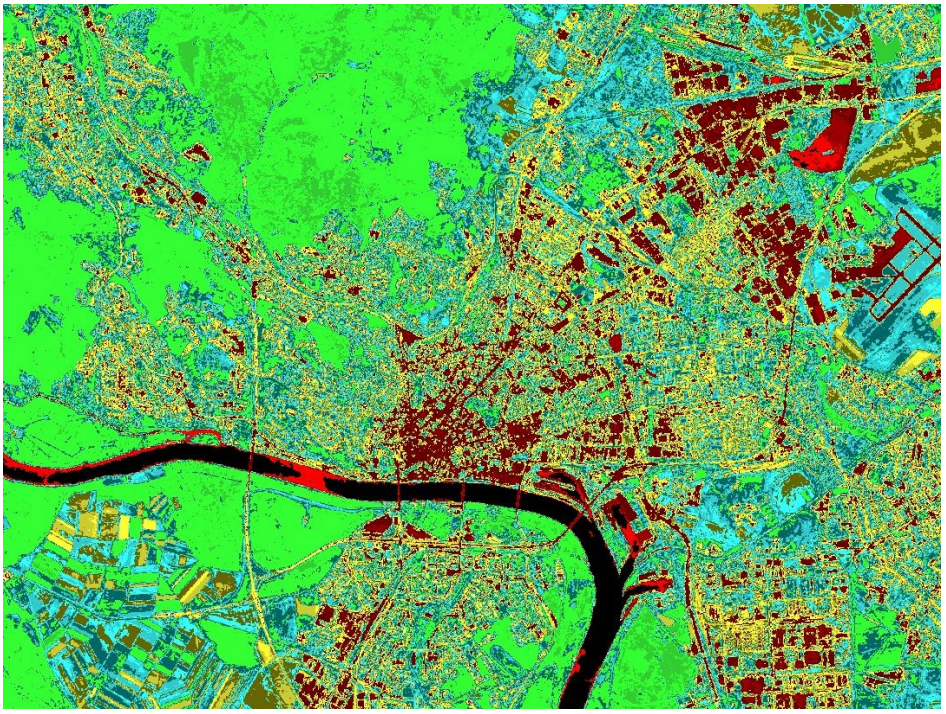
We are able to use open source Copernicus Sentinel 2 data from official service. Demo implementation and MVP should be implemented with Python API.

For a better idea see this online playground, since we are able to download and process the same data periodically in 3-5 day, also in 5 years from the past.

Video: Iceberg movement time series

Bratislava TRUE COLOR

Bratislava VEGETATION INDEX



We should be able to do some integration (summarization) of all green environments. And do some environment/urbanisation predictions.
Also, we should be able to compare Bratislava with other European cities and based on satellite data provide proposals for improvements.

Advantages:

- Nice demo and presentation with satellite images
- Suitable and scalable for all cities not only for Bratislava
- Oliver has some experiences with sentinel 2 and image processing

Disadvantages:

- Sentinel 2 spatial resolution is very low - 10 meters per pixel
- Maybe not so suitable for this hackathon

Available technologies

- Smartphones GPS
- Virtual machine 1CPU 1G RAM
- 270 E google cloud platform /

Notes

Dotaznik kto a prečo preferuje auto pred MHD

- uvitali by se cestovny poukaz ako pracovný benefit?
- keby ste mali na výber vybrali by ste si donášku jedla v eko obale?
- využíval by si komunitnu zahradu ?

Zľava na cestovani/rezimka ako pracovný benefit

Mestska sprava výroby eko obalov na jedlo

Ake dotacie su k dispozicii na eko riesenie a na podporu lokalnych pestovatelov

Platforma na zjednodušenie spravy a prefinancovania a rozdelenia verejných fondov

Stretnutia GreenModel :)

05.11. 2020 (Oliver, Janci, Simka, Mary, Danci)

1. Aplikacia na trackovanie najazdenych km MHD -> usetreny cas, uhlikova stopa, odmeny

2. PokemonGO style -> augmented reality v busi, aby sme sa vyhli neprijemnostiam
3. Trackovanie inventaru ala ‘Odkaz starostovi’
4. Screening -> Vodnozadrzne opatrenia, plus kombinacia s komunitnymi zahradkami

Domaca uloha: Pozriet data, zamysliet sa nad napadmi, pozriet sa na “konkurenciu” (ako sa ostatne krajiny snazia vysporiadat s klimatickymi zmenami)

09.11. 2020 (Oliver, Janci, Simka, Mary&Danci, Filip&Lucka,)

8.11.2020

Bike self repair hotspot

- Hotspoty v meste, s dostupným náradím na opravu opravu bicyklu (kľúče, lepky, pumpa)
- Appka s mapou dostupných hotspotov + navody/tutorialy
- par hotspotov uz existuje. Su lacne. Rychle riesenie

Public + green transport benefits (doplnenie k uz navrhnutej teme)

- Apka zaznamenava kolko cestujete s MHD alebo green mobilitou
- Uzivatel aplikácia získava kredity/body
- Mesto poskytne zlavy/vstupy na ktore ma dosah (eventy, plavaren, muzeum)
- Apka by musela aktivne zistovat ci cestujete MHD alebo nie, overenie? QR?
- Implementácia:
    - Potrebne overenie ci uzivatel naozaj pouziva mhd/green mobilitu

Bike ride planner

- Existuju sice mapy oficiálnych cyklotrás, ale na každodenné cestovanie bicyklom nestačí
- Existujú v Bratislave cesty, ktoré sú pre cyklistov bezpečné a vhodné a tie ktoré niesu (šírka cesty, premávka)
- Aplikácia by navrhla optimálne, bezpečnú trasu na bike, korcule, kolobezka

Bike friendly tag

- Oficiálny certifikát pre organizácie, budovy, verejné priestory, obchody, zamestnávateľov, že sú bike friendly
- Podmienky:
    - miesto na parkovanie
    - možnosť umyť sa
- Moznost nabijat kolobezku, ebike

11.9.

Donate system

- na stromy
- na parky
- tlak na mesto, na podporu a urychlenie vystavby
- na cyklotrasu

Video tutorial
Cyklokoalícia kontaktovat,

Dotaznik

1. Aký dopravný prostriedok používate pri dochádzaní do školy/zamestnania?
2. Prečo?
    a. Rýchle
    b. Dostupné
    c. Lacné
    d. Ekologické
    e. Iné
3. Jazdíte na bicykli vo voľnom čase?
4. Kolko hodin tyzdenne stravite na bicykli? Koľko km cca najazdíte?
5. Kde zvyknete bicyklovať? (skor v meste alebo v prirode)
6. Mate vlastny bicykel?
7. Vyuzivate moznost pozicania bicykla (slovnaft bajk, rekola, ..) ?
8. Co vám v Bratislave z pohľadu cyklistu najviac chýba?
9. Čo máte na Bratislave z pohľadu cyklistu najradšej?
10. Používate aplikáciu na plánovanie trasy? Využívate aj jej iné funkcie? Ak áno, akú / aké?
    (Ak 10 = nie)

10b. Prečo?

11. Čo by ste v takej aplikacii ešte uvitali?
    a. Mapa
    b. Zaujimave miesta
    c. Navrhy zaujimavych cyklovyletov
    d. Zbieranie bodov podla prejdených kilometrov a nasledne zľavy na mestske podujatia
    e. Informacie o vasej uhlikovej stope
    f. Moznost posielať podnety mestu na poskodene trasy alebo nove napady
    g. Plánovanie trasy s použitím prenajatého bicykla (slovnaft bajk, rekola, ..)
    h. Moznost “adoptovat” si cast cyklotrasy a prispiet na jej obnovy/postavenie
    i. Iné:

12. Ak mate deti, bicyklujete sa s nimi ?
    (Ak 12 = nie)
13. Prečo?

14. Pokazil sa Vám niekedy bicykel počas jazdy?
15. Uvitali by ste specialne miesta v bratislave, kde by ste mohli najst naradie na zakladne opravy bicykla ?
16. Čo by sa malo zmeniť aby ľudia v Bratislave viac využívali bicykel ?

Data access

Azure account - https://portal.azure.com/
mail: greenmodel@outlook.com
pass: Climathon2020
promo code: QXK0YC0EVSF7DYINL4

Tomas Peciar
Cyklokoalicia vrstva cyklotrias 2018
https://www.openstreetmap.org/#map=12/48.1404/17.0398&layers=C

https://overpass-turbo.eu/
https://www.openstreetmap.org/

0918488624

Technical Specification

Introduction

The goal of the project for Climathon 2020

Increase the awareness about cycleways in Bratislava and make bike planning easier for users of the application by providing a safe and optimal cycleway from point A to point B by bicycle. The algorithm tries to avoid proposing risky areas with a higher frequency of vehicles or with a lack of infrastructure.
The goal was derived and supported by the questionnaire of which results can be found here:
https://docs.google.com/forms/d/1Nkl0KPwjOdSNNmYNJhU_9Ng7GqjiH8TfcvWAVKgMDGw/edit#responses
The answers are still coming up.

Target Group

We focus on people:

- Who don't know cycleways in Bratislava - we provide them cycle map
- Who are afraid of transport by bicycle - we provide them planner of safe cycleways
- People that use cars for transport in the city but there is a potential to use a bicycle instead

Description of the application GreenBA

Within the project for Climathon Bratislava 2020, we decided to technically describe and visually design the application for planning bike routes in Bratislava for everybody who would

like to use a bicycle (electric bicycle) instead of a car. We also want to design other features that help the users during biking in Bratislava, which we want to introduce to you in more detail below.

HomePage

Home page contains the most basic but also most important functionality of the app: map. You can do the following actions here:

- Search for a bike-friendly route from one point on the map to another (you can pick these points on the map or search for an address). Multiple routes are found and they are ordered by total duration and also by how secure the route is. Secure route means that it mostly uses official cycleways, it doesn't use roadways that are meant for cars and also at night, a secure path is illuminated. User can turn on and off all of these secure path parameters in the settings.
- When searching for a route, user can set in settings to use a rented bike and the app will first look for closest renting places for bikes, such as rekola or slovnaft bajk, and then find the best cycle-route within these renting points.
- Users can explore Bratislava and all of the cycleways it has. Those are highlighted by different colours and strokes. Cycle-highways are bold and non-cycleways are dashed. Users can also choose options to show planned cycleways.
- User can also view on the map following cycle-friendly features:
    - Places, where user can safely leave his bicycle for a short period of time
    - Cycling training fields
    - Bicycle-friendly restaurants and bars
    - Renting points (slovnaft bajk, rekola)
    - Potholes or damaged cycleways
    - Repair point, places where user can find tools for basic bike repairs
    - Report issues on the cycleway (pothole, damages, obstacles,...)
- At the bottom, there is a navigation menu, from which the user can go to his profile and also there is an option in this menu to report damaged roads (potholes, fallen trees, cars parked on sideways, …).

Features

Vouchers

This section enables the user to check his actual "GreenCoins" that were obtained depending on the distance travelled by bicycle and have a look at the vouchers that are provided by the sponsors.
The aim is to have sponsors like companies, cafes, restaurants, shops and other organizations that would get a "bike-friendly" sticker from us.

The condition that has to be met to get the sticker is to have at least one of the following requirements met:

- Bicycle storage
- Shower with dressing room

- Possibilities of charging an electric bicycle

For sponsors, it is a PR activity or so-called social enterprise concept. These organisations could have higher attendance as the application will notify the user about the bike-friendly organisation nearby.
Users would be more motivated to use bicycle transport in the town as it would be more convenient for them.

Report a Complaint

This section enables the user to report a complaint with respect to cycleways in the city. The typical complaint can be a pothole on the road.
The user can fill 3 types of information:

- Location - either automatically obtained from the app or type the exact address where the issue was found
- Description - space for the specification of the complaint
- Photo documentation (optional) - possibility to upload a photo of the issue.

The complaint is then sent to the admin of the app. We recommend using the same admin that takes care of complaints via “Odkaz pre starostu”.

Profil

The users can find complex statistics (time saved / carbon footprint / earned points) about his rides for the specific time period (day/week/month/year) in their profile processed in simple dashboards. Settings could also be changed in this section.

Final Screen

After the end of each trip, users should be informed about the results. The first reason for that is the users have instant information about how they helped the environment, thanks to the decision to choose a more ecological type of transportation.
Generally, apps that contain reward systems and instantly show your results are popular among users. But it is necessary to keep a balance between spamming users and show them useful information and notifications. For that reason, we decided to include the most relevant data collected during their trip session only to a simple overview screen, which pop-up for users after the end of the trip session. You could find the preliminary design of this user screen in our final presentation. Content of overview screen:

Carbon footprint - Part of the summary trip screen will be the information about the carbon footprint. Users will get this information after each ride, but also their results will be saved into their global stats. For the computing of carbon footprint, we collected information from more relevant sources and concluded that we should use the research result of a study of the European Environment Agency. They determined that the average new car made in 2017 creates a 119 g/km carbon footprint. They used data from 9 manufacturers. Usually, they dealt with cars whose weight was not greater than 1600 kilograms. So it is not necessary to ask the user for information about his vehicle.

Session trip summary - At the top of the screen, you could find fundamental and relevant information about user trip summary like time spent on a bike, distance, and description of the starting point and endpoint.
Our app gathers data about:

- Time spent on the bike
- The distance on the bicycle from google maps through API modules

We plan to offer the user two options to collect data about his trip starting point and endpoint:

- Users can add this information to the app manually through a route planner.
- The second option is through modality differentiation functionality, which automatically observes the user's change of speed and starts to record the trip session. After a decrease in movement speed, it will automatically evaluate the trip. We need to have their approval for location tracking. The collected data are anonymised and do not use any persistent identification.

The results of the session trip summary can be shareable through social networks, which could secure the improvement of the user base and motivate other people to think about their impact on the environment based on information about saved carbon footprint.

Saved time - In case the user adds start and endpoint in the application, we could automatically gain information through Google maps API about the time estimation of an ordinary car to go through the same trip. So after the end of the session trip, the app compares the difference between time lengths and shows the user result in a summary screen. If users don't want to use the application option, we could use the monitoring of the beginning point and endpoint thanks to modality movement functionality and find out the total time of the trip. Estimated time of session trip for an ordinary car can be gained by the following method: After the end of the bike trip, we send information about the startpoint, endpoint, and start time and through google API, we receive information about time estimation for a car trip. After synchronization, it is enough to compare results to see the saved time.

Google Distance Matrix API
https://developers.google.com/maps/documentation/distance-matrix/overview

Reward point (Green coins) stats - More information in section vouchers.

Road quality - Evaluation of the bike road. User can express his experience from the bike route. User can enter a range of stars from 1 to 5. If he enters 1 or 2 stars there will pop outbox where he can put a detailed description of the issue. This data can be provided to the city and be the base for improvement.

Data sources and specifications

Cycleways - official and recommended

Our app will use the cycleways from the following data sources:
Bratislava cycleways: https://www.openstreetmap.org/#map=12/48.1474/17.0947&layers=C

Additional source: https://www.cyclosm.org/#map=12/48.1270/17.1258/cyclosm
Cyklokoalicia: https://cyklokoalicia.sk/
The data source for export: https://overpass-turbo.eu/, https://www.openstreetmap.org/

The exporting script, which downloaded cycleways data for use in Google map base:

```
[out:json];

(
  // get cycle route relations
  relation[route=bicycle]({{bbox}});
  // get cycleways
  way[highway=cycleway]({{bbox}});
  way[highway=path][bicycle=designated]({{bbox}});
);

out body;
>;
out skel qt;
```

Our final exported cycleways layer that would be added on the Google Maps layer: https://www.google.com/maps/d/edit?mid=1R1JOOI7aNccqrpv0NY2bzHvGahBXNBVu&usp=sharing

Bike relevant points on the map

Most of these data are officially available but from the different sources. We are connecting all relevant bike and green mobility hotspots to the one multilayer map.

Source: Cyklokalicia https://cyklokoalicia.sk/

- Potholes or damaged cycleways, places, where you can safely leave your bicycle for a short period of time

Source: Slovnaft bajk stations - Open Data portal Bratislava (Slovnaft bajk)

- Renting points (slovnaft bajk, rekola)

Sources: Slovnaft bajk stations - Open Data portal Bratislava (Slovnaft bajk)
Cyklokalicia https://cyklokoalicia.sk/

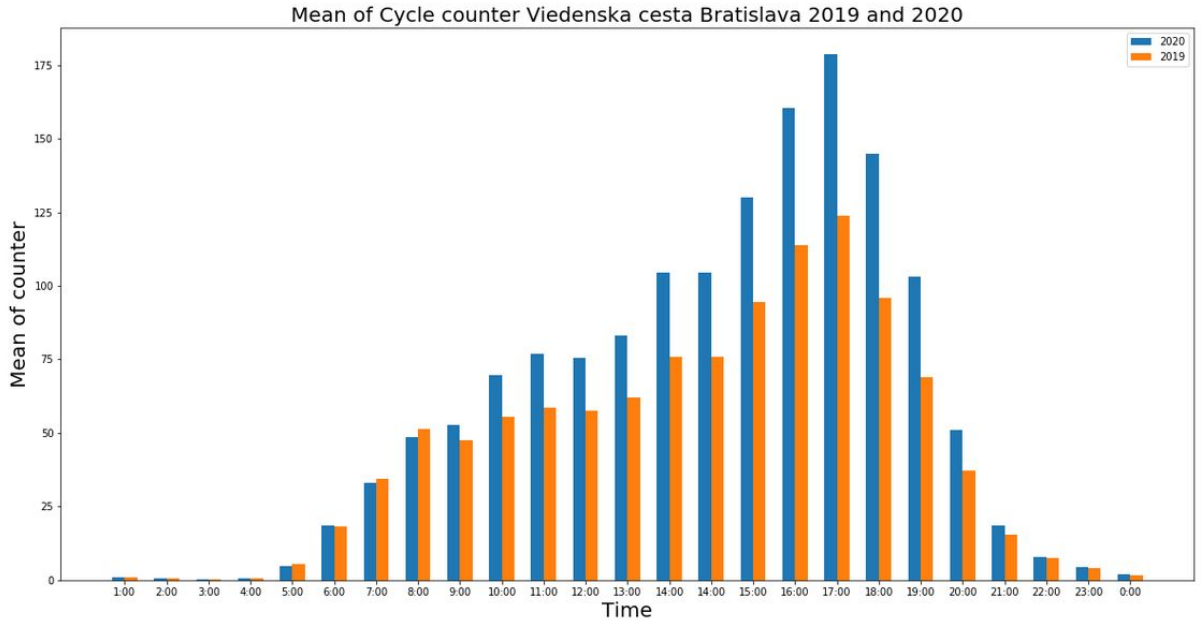
- Bicycle-friendly restaurants and bars
- Repair point places where you can find tools for basic bike repairs

These points will be added continuously as our solution gets a larger impact. The city could be responsible for updating information about new cycleways. (Agreement in progress with Tomas Peciar).

Data statistics impacts

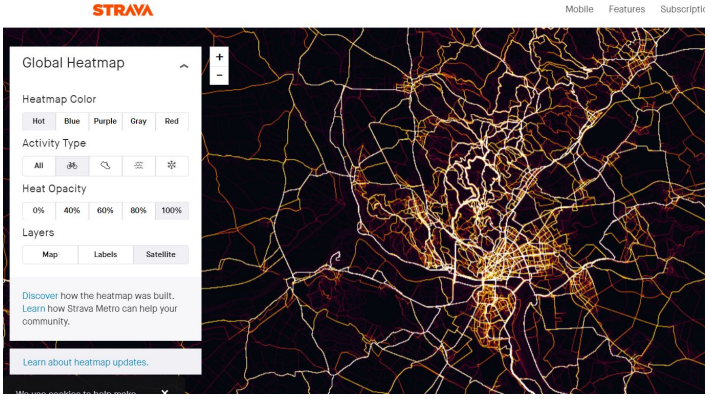
We looked at the basic statistics of how many cyclists are on the roads with respect to time in a day. The graph says that most cyclists are on road from 3 pm to 7 pm. This encouraged us to think about what else can be done for cyclists in Bratislava. As we had some responses about insufficient street lighting on the roads in our questionnaire, this could be a

suggestion for improvement in the street lighting. Graph below indicates that it is necessary to cover cycleways by more light.



Recommended cycleway

We are going to actively collect feedback on specific routes in Bratislava, later we are going to evaluate routes by experienced cyclists and city coordinators. The official cycleways could be evaluated as the best, then any other road will be evaluated by the sufficient width and traffic volume. Another approach is to use third party data, for example, the most usable cycleways, like these:
https://www.strava.com/heatmap#11.95/17.05674/48.17150/hot/ride



Backend implementation

User activity monitoring and prediction

We need to actively detect user activity type based on mobile device sensors (GPS, accelerometers, gyroscopes). We are going to use third party solutions for the best accuracy of prediction.
Android sdk: https://developer.android.com/guide/topics/location/transitions
iOS sdk: https://developer.apple.com/documentation/coremotion/cmmotionactivity
These software development kits are able to detect the start, pause or stop of the activity and also the type of the activity: IN_VEHICLE, ON_BICYCLE, RUNNING, STILL, WALKING

Optimal route planner

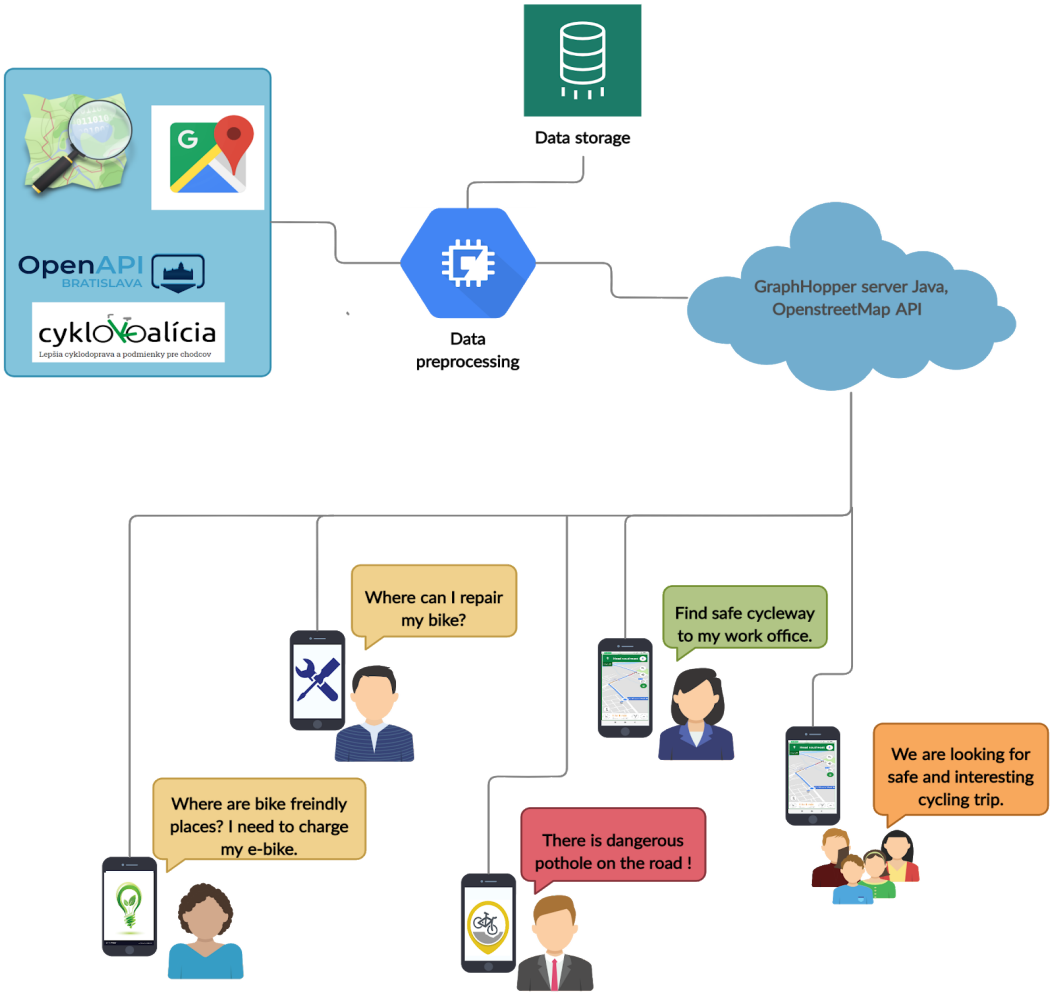
This feature is the backbone of the whole application. As the most important parameter of our path-searching algorithm is not total time spent, but the combination of time and safety, we need to look for weighted path-searching. As there is no easy way to import weighted data to Google Directions API, we have to go for a more complex solution. As a base map provider, we will use OpenStreetMap and as a tool that finds an optimal route for users, we will use graphHoper. Data set for graphHoper will be constructed from multiple exports from openStreetMap. Each route type export (roadway, cycleway, sidewalk, …) will be done separately and then to each point of export is added weight by route type. GraphHoper will then find the best route, even if it is a combination of multiple route types.
Also, when the user finishes his journey, the app asks him to rate the route and by this rating are adjusted all points that route consists of.

GraphHoper Routing API
https://docs.graphhopper.com/#tag/Routing-API

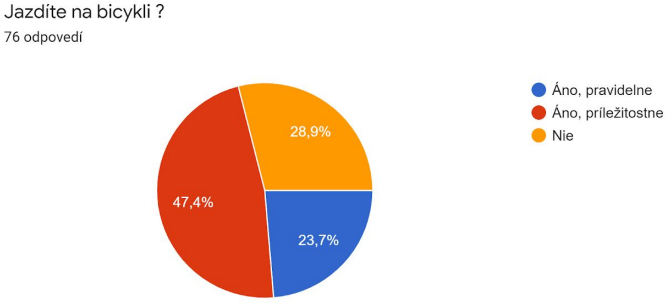
Eco statistics

Based on road length and transportation type

Implementation Structure



Appendices



User Research - Mary

We wanted to gain deeper knowledge about how cyclists feel in the city of Bratislava. We tried to map their behaviour and find out the reasons why people don't use a bicycle as a way of transport. We conducted research on 76 respondents almost equally divided between

men and women. We got the responses from our target group, since the majority (61%) were in the age group 18-25. The rest (36%)
60% respondentov, ktorí nebicyklujú uviedli, že sa necítia bezpečne.
85,2% sa necíti v Bratislave na bicykli bezpečne