

Final presentation of the Earth Miles project

created by Skipit ApS
under ESA NAVISP EL2-145

6th of September 2024

SKIPIT

 **esa**

Earth Miles.

Agenda

1. Introduction to presenters
2. Appreciation
3. Why Earth Miles
4. Going beyond ticketing with ESA
5. Project breakdown
6. Next steps
7. Conclusion

Introductions to presenters



Simone Leomanni: CTO, co-founder and full stack developer



Maria Dilling Elken: COO, Co-founder and Head of Partnerships



Conor Clancy: CEO, Co-founder and creator of Skipit and Earth Miles

A BIG THANK YOU!

A big thank you to all those at ESA for supporting us in building Earth Miles. We are truly grateful for the opportunity and the help we have received.

A few personal thank yous to:

Andrea
Paolo
Dan
Petra



INTRODUCING SKIPIT AND EARTH MILES



Earth Miles.



SKIPIT

An app that makes it easier to pay for public transport in cities across Europe.

Earth Miles.

A loyalty program for Skipit users, rewarding the usage of sustainable transportation

SKIPIT

Earth Miles.

e esa

WHY EARTH MILES?

Why Earth Miles? 1/3

We are not alone

There is at least **200** private companies across Europe offering journey planning and ticketing for mobility.

Why Earth Miles? 2/3

In Copenhagen 75% of people are satisfied with public transport. There are more bikes than people. But still...

Drivers spend 140,000 hours a week stuck in traffic in Copenhagen.

1,021,820 ton

Amount of CO2
emissions in
Copenhagen/year

550

People die
prematurely/year

3€ Billion

Economic loss

Why Earth Miles? 3/3

There is a €19 billion market rewarding unsustainable transport through airplane loyalty programmes. Such as Lufthansa Miles and More or SAS Eurobonus...



... but there is no comparable solution for sustainable transport

GOING BEYOND TICKETING WITH ESA



Earth Miles.



NAVISP Earth Miles project with ESA

In 2023 we started building the world's first loyalty program for sustainable transport. Leveraging GNSS, PNT and Sat Nav data to help us build a secure and robust solution.

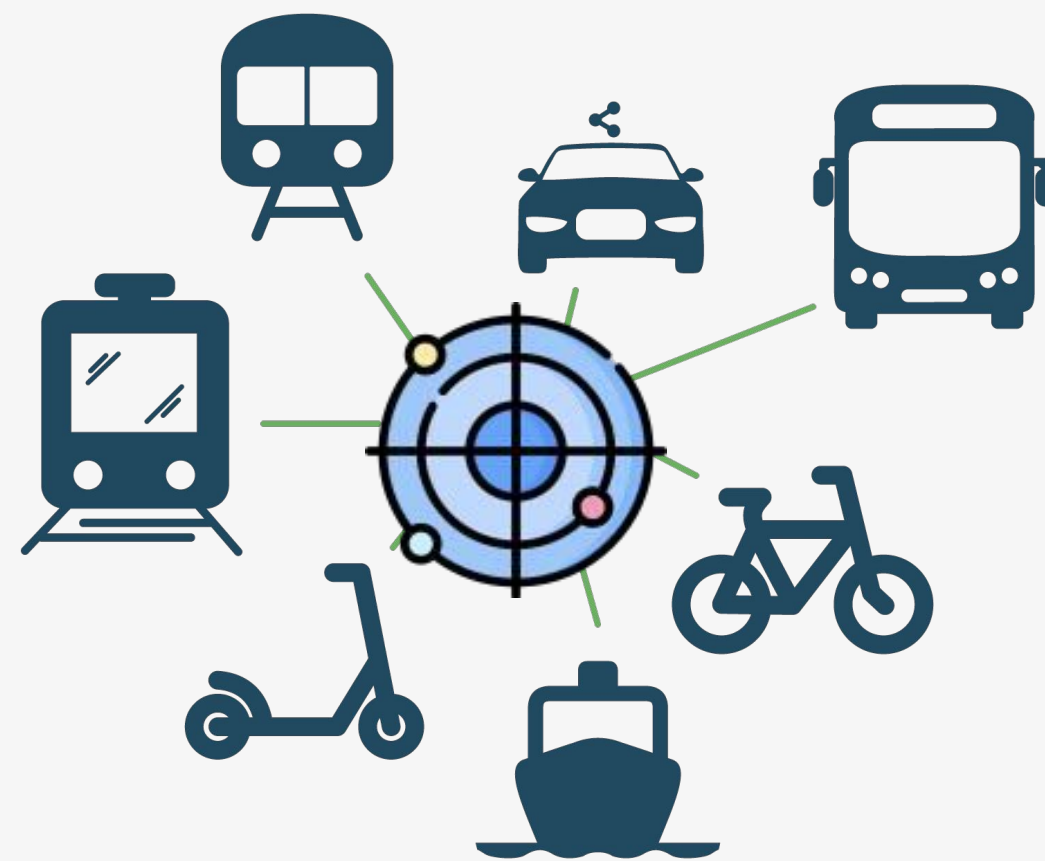


European Space Agency

Earth Miles.

The role of GNSS and PNT data 1/4

Positioning is used to be able to identify the closest mobility option to the user



The role of GNSS and PNT data 2/4

Ensuring the user can only redeem the discount once physically at the location



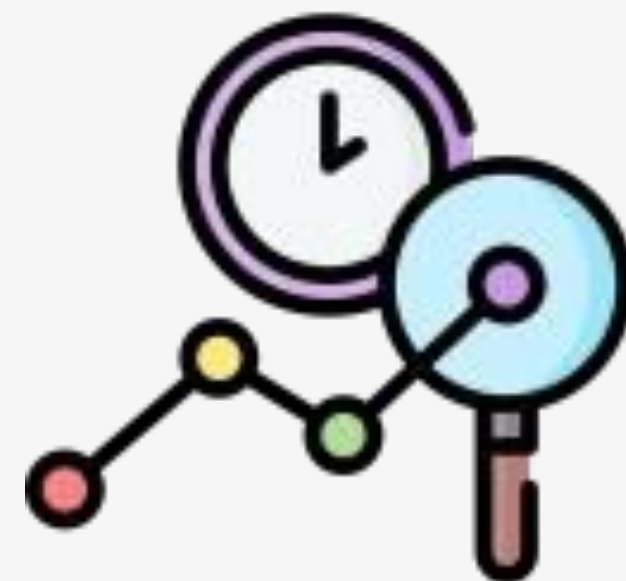
The role of GNSS and PNT data 3/4

We cross check the route taken and ensure the right points are therefore earned up. Furthermore leveraging navigation we provide live information on sustainable journey planning based on API's and live data from the public transport authority. Suggesting the best route and feedback for the user.



The role of GNSS and PNT data 4/4

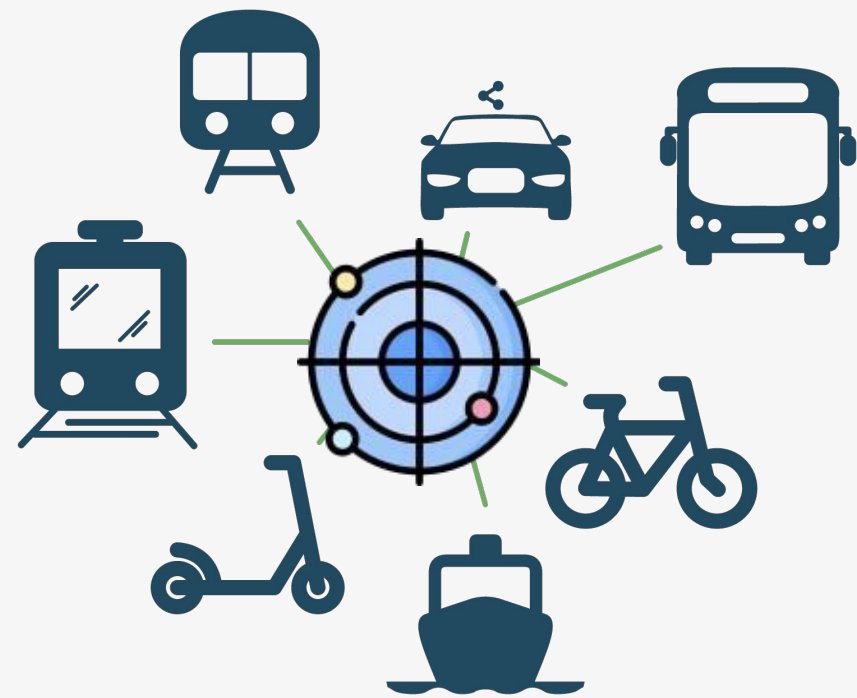
The use of Timing allows us to track the users in real time to ensure honest use of the scheme, such as cross checking mode of transport taken, depending on velocity and arrival times



Earth Miles.



A robust and user friendly solution to help reward sustainable transport usage



GETTING STARTED



Earth Miles.



Project breakdown

The project had 4 key work packages

WP1 - Building MVP

WP2 - Piloting and testing

WP3 - Stabilising

WP4 - Scaling

WP1 - BUILDING MVP

WP1 - Building MVP

WP10 - Developing and prototyping

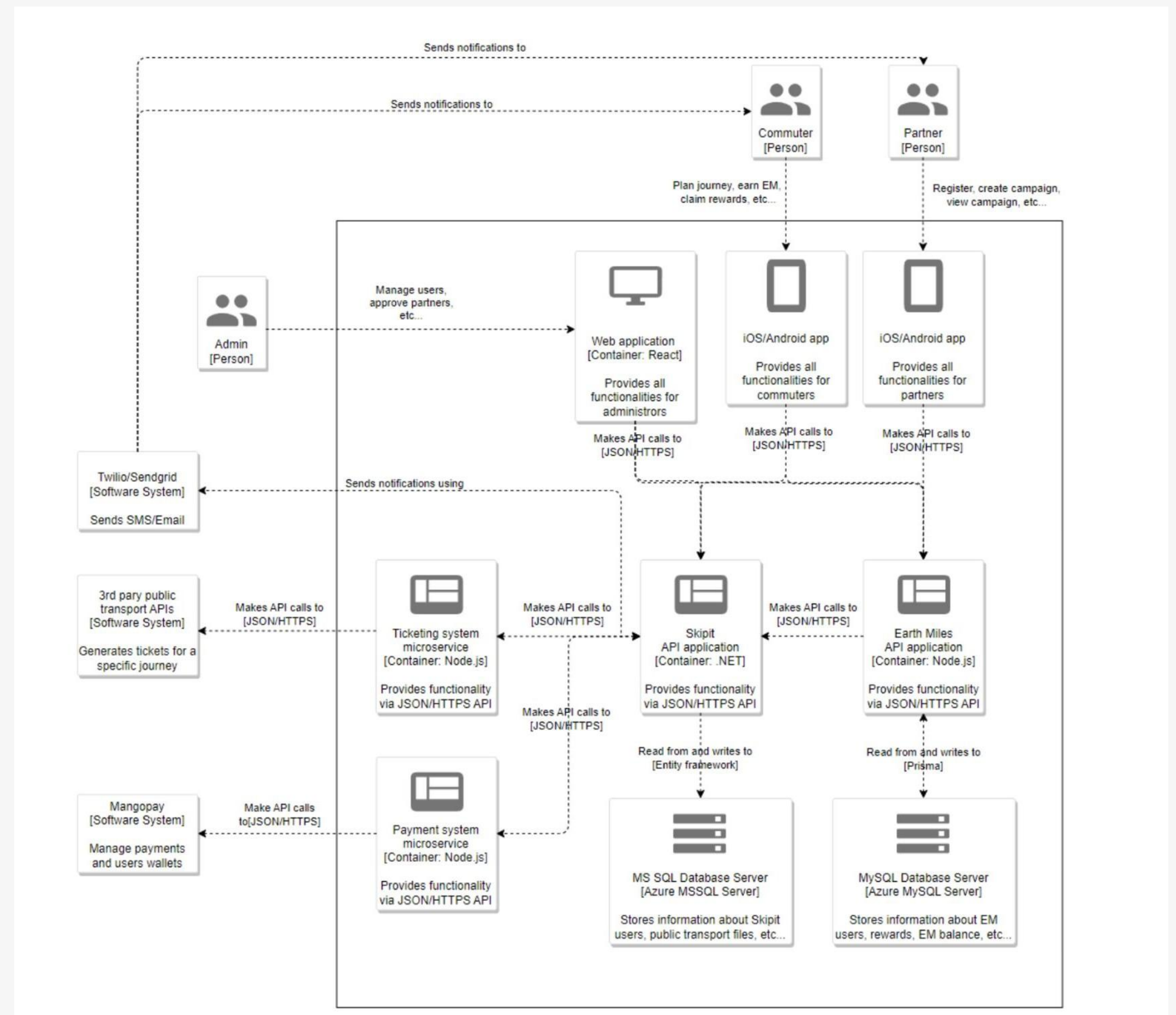
WP11 - UX and UI

WP12 - Programming of MVP

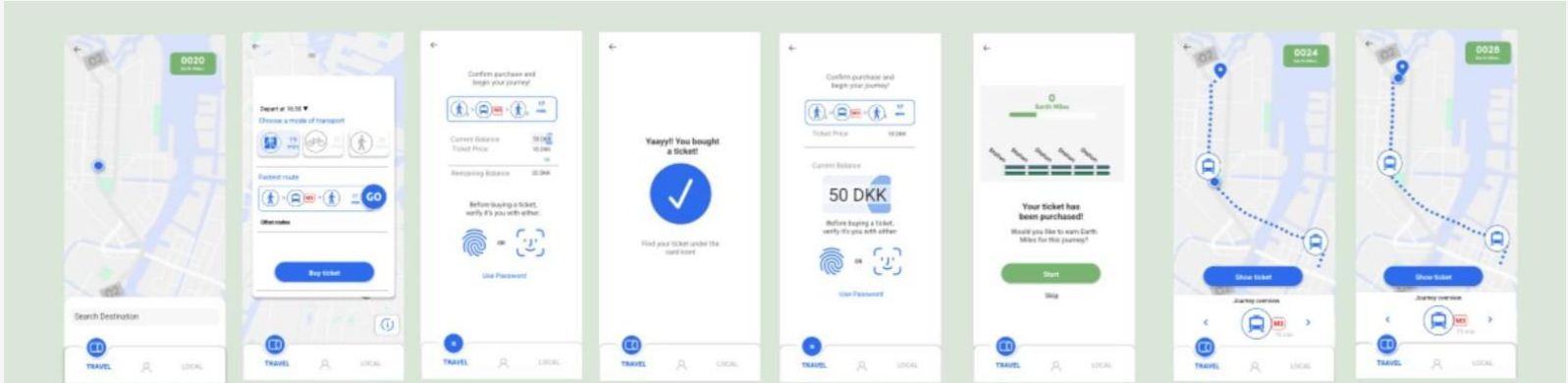
WP13 - Internal testing and adjusting

Highlights

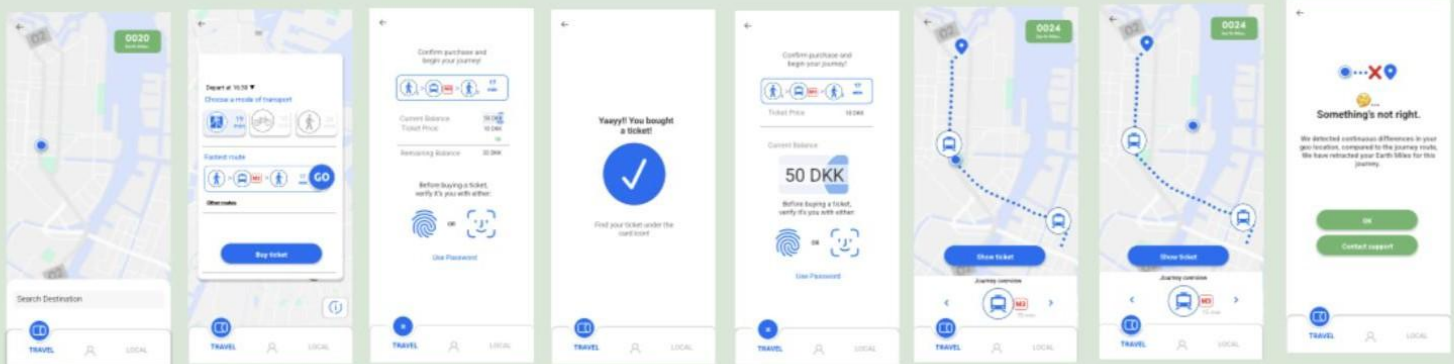
Definition of the architecture for developing and integrating Earth Miles within Skipit application.



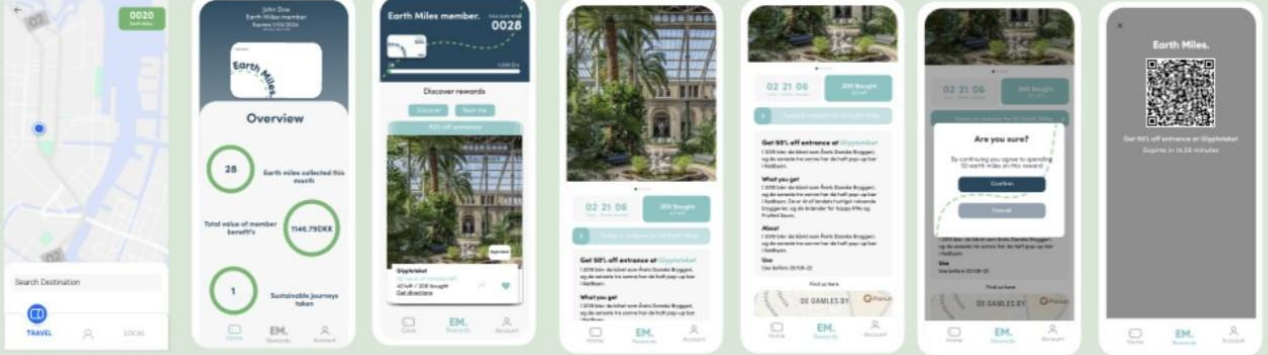
Highlights



Error response examples



Redeeming reward on Earth Miles from Skipit



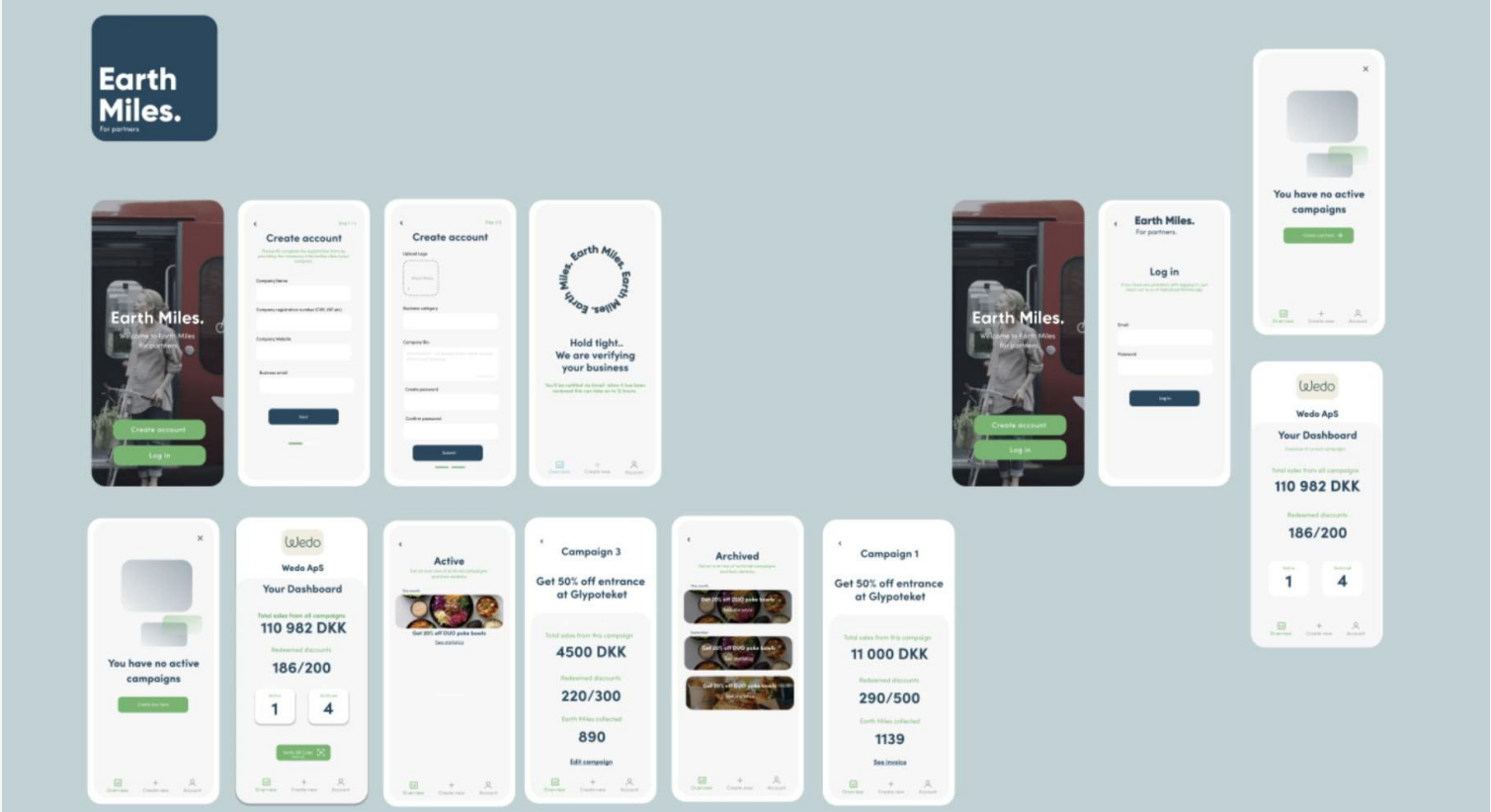
Earth Miles Logo

Use and location

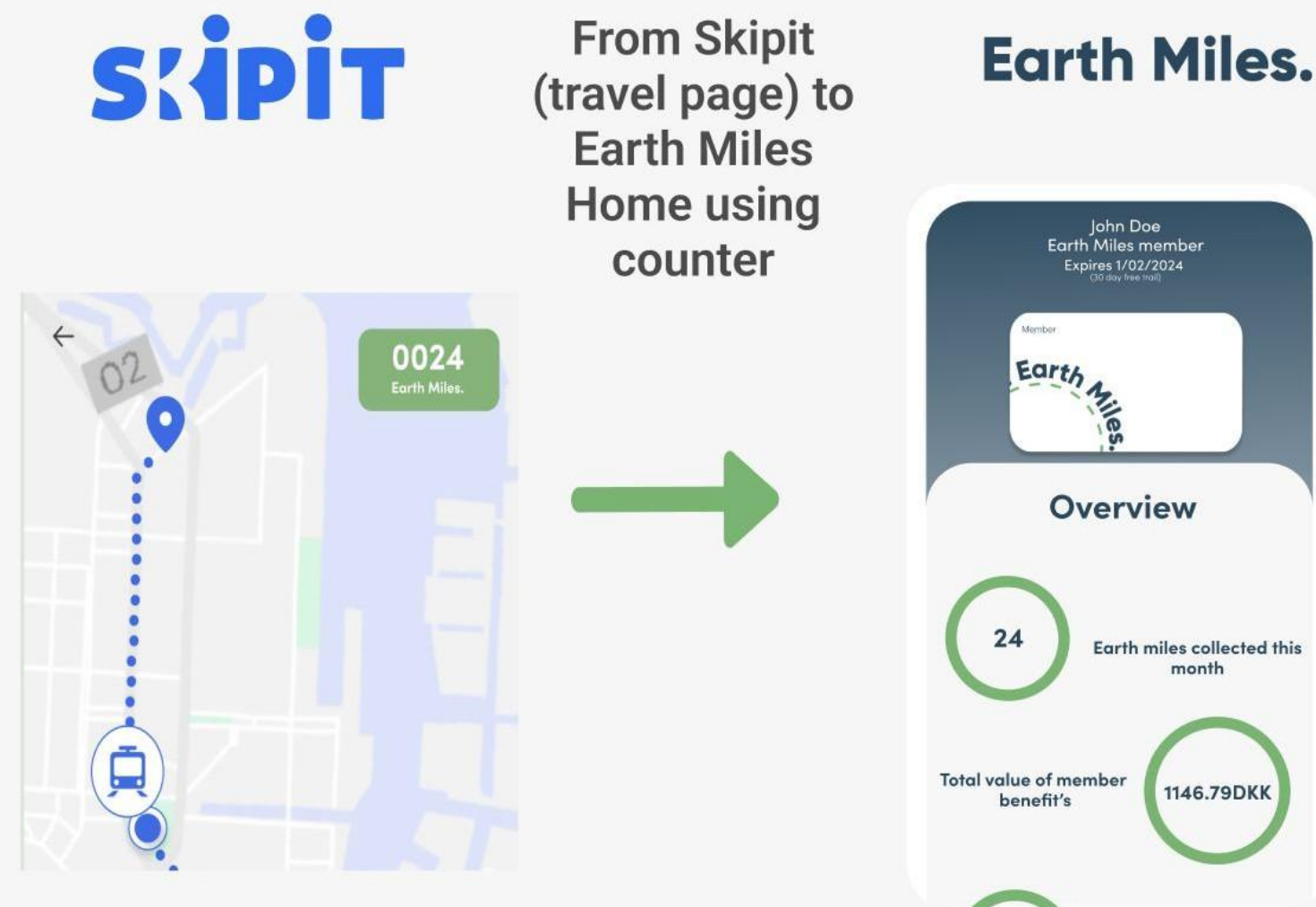
The logo is simple and modern in its expression. It has slightly curved shapes which makes it fun and playful. The colour of the logo is a dark blue that signified trust, and can be used on multiple lighter backgrounds. The Logo is made from Gilroy Extra bold.



Earth Miles.
Earth Miles.



Learnings



After some initial testing, we found having rewards in the app became very messy, it was decided early on to create a deep link in the Skipit app and have Earth Miles as a separate app.



Iterative development, combined with continuous feedback loops from internal testing, has been key to refining the MVP and addressing issues before broader deployment.

WP2 - PILOTING AND TESTING

WP2 - Piloting and testing

WP20 - Testing web platform

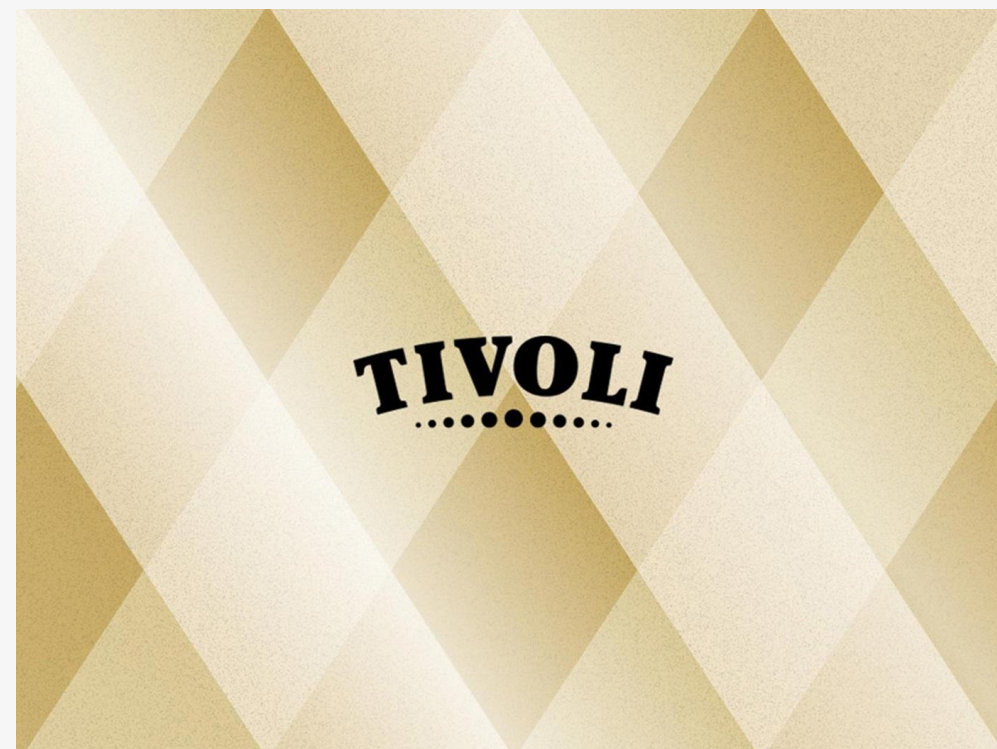
WP21 - Testing with initial users

WP22 - Strategising new partners

WP23 - Bugfixing and final release of MVP

Highlights

Some of Denmark's biggest companies wanted to be a part of it.



GOBOAT

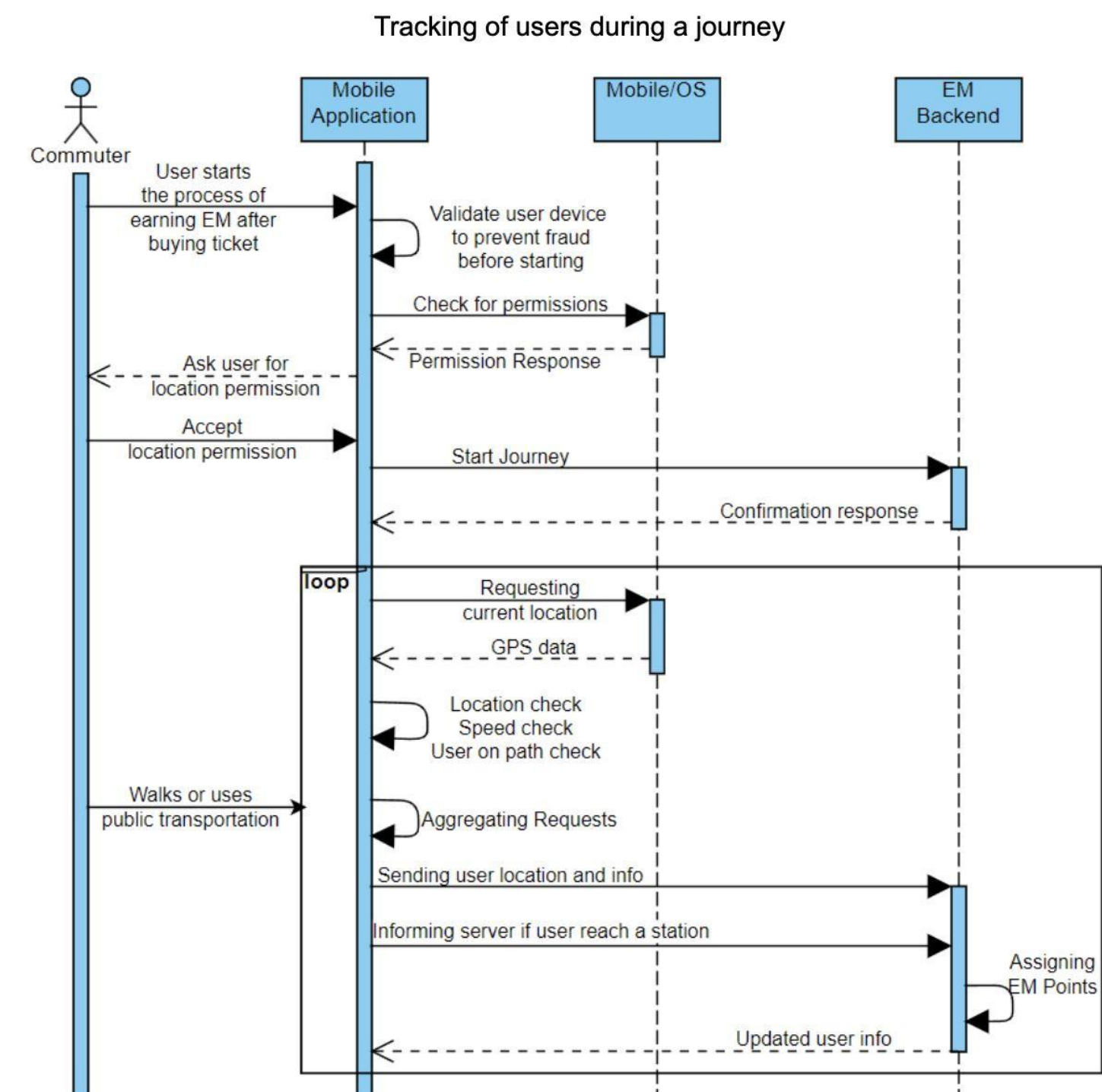
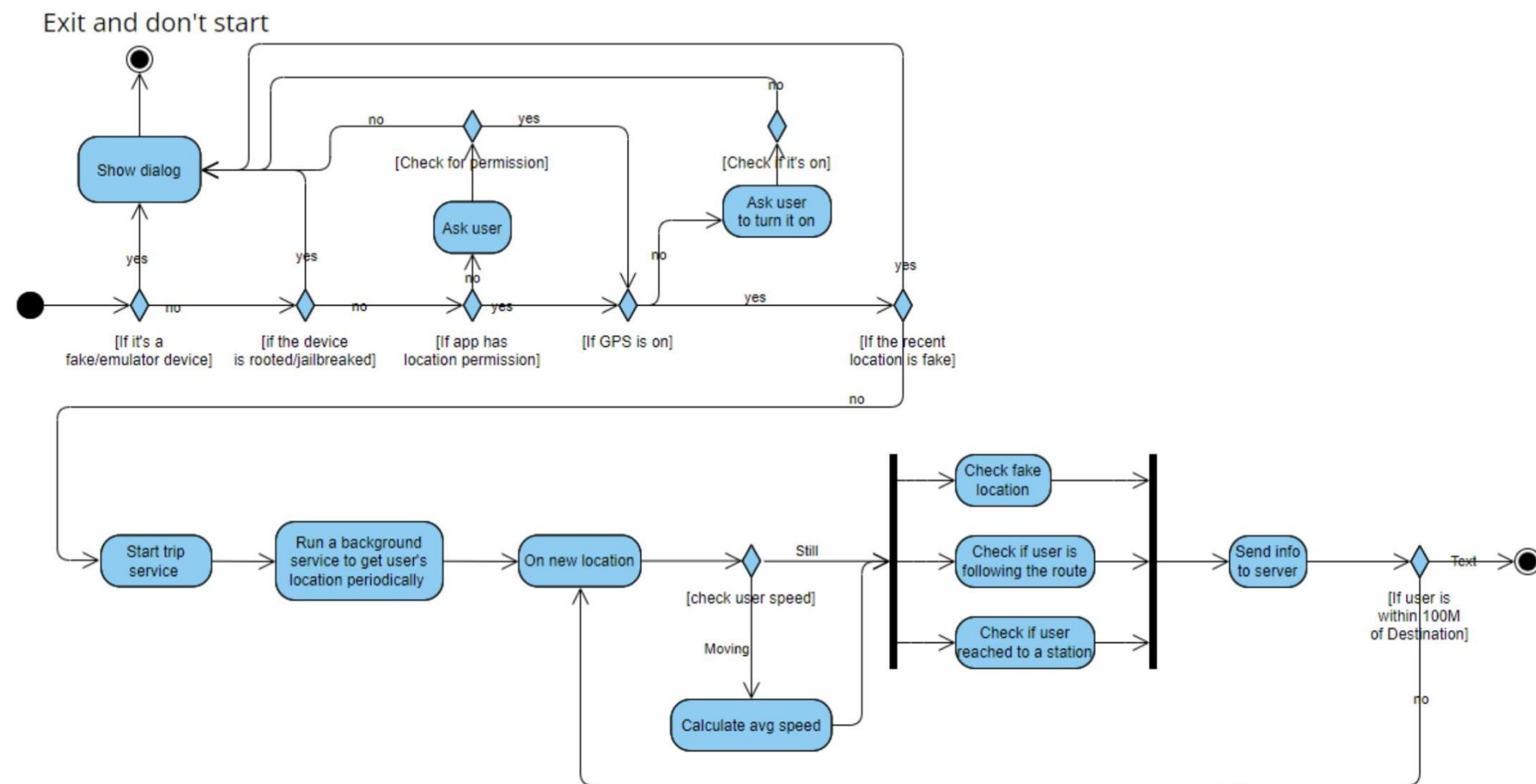


Earth Miles.



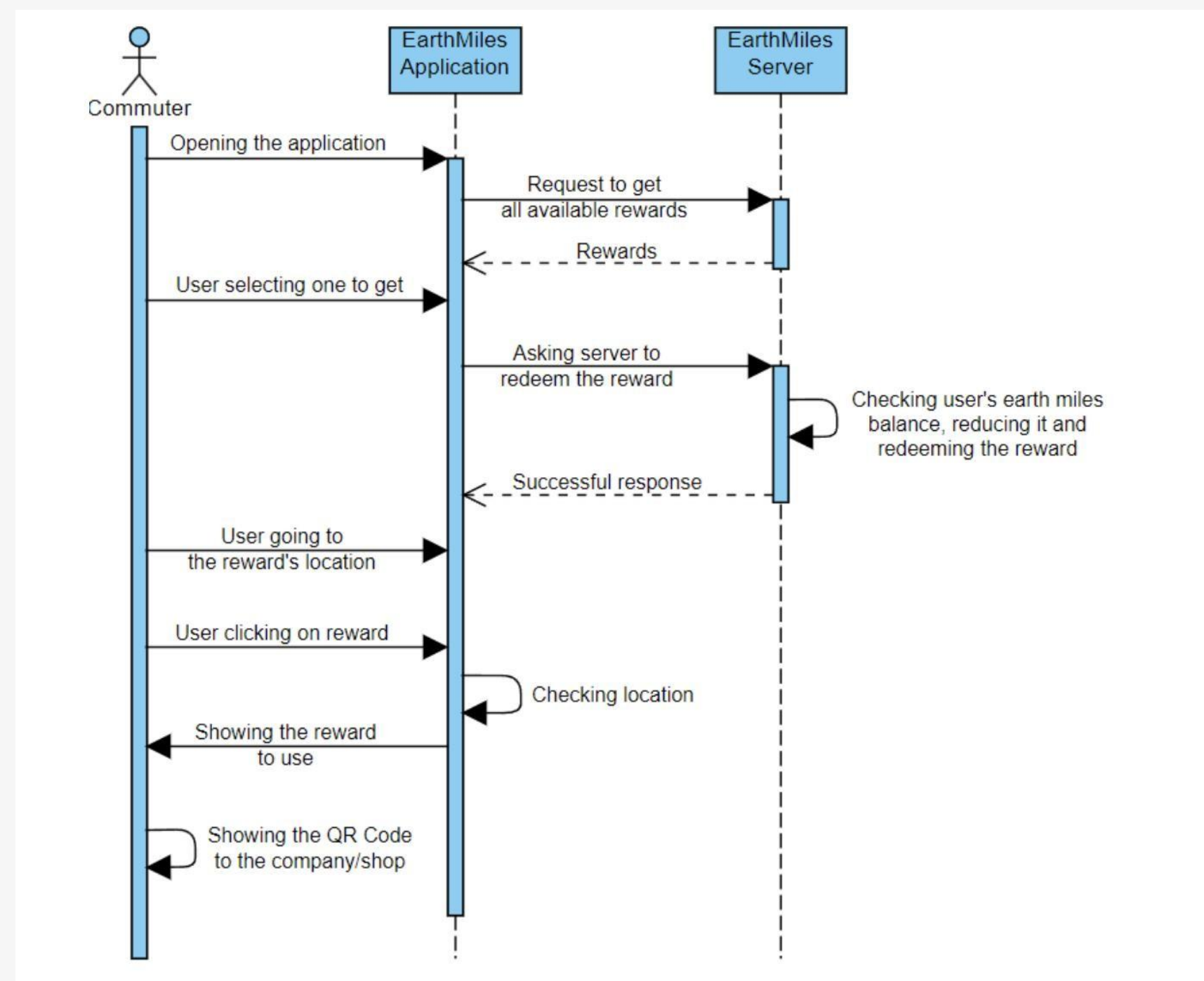
Highlights

Prevention of GPS alteration and tracking of user during journey

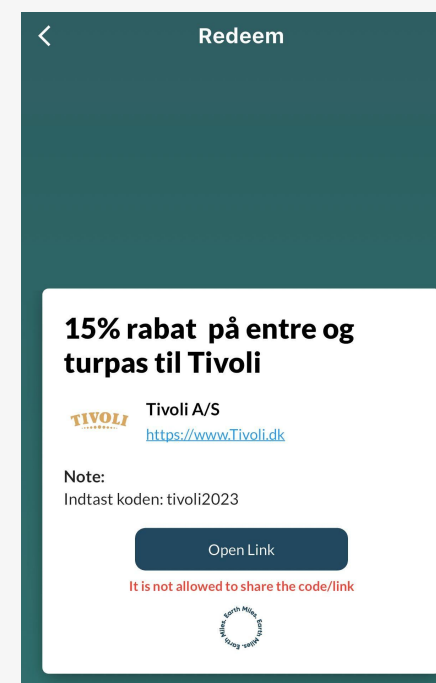


Highlights

Claiming of a reward based on user positioning.
Calculation and earning mechanism of Earth Miles



Learnings



The initial feedback was overall positive however the three main concerns were: 1) Ensuring the discounts would work
2) A link to the environmental impact
3) The need to have another journey planning app.

We needed to also include other redemption methods as despite the enthusiasm from partners to join a QR code would not be possible to implement.

In the future, it will be possible to integrate additional controls to prevent GPS alteration, for example by using acceleration and/or velocity from mobile inertial movement sensors and comparing with the speed provided by the GNSS.

WP3 - STABILISING

WP3 - Stabilising

WP30 - Stabilising web and mobile

WP31 - Duplicate microservices

WP32 - Blueprint creation

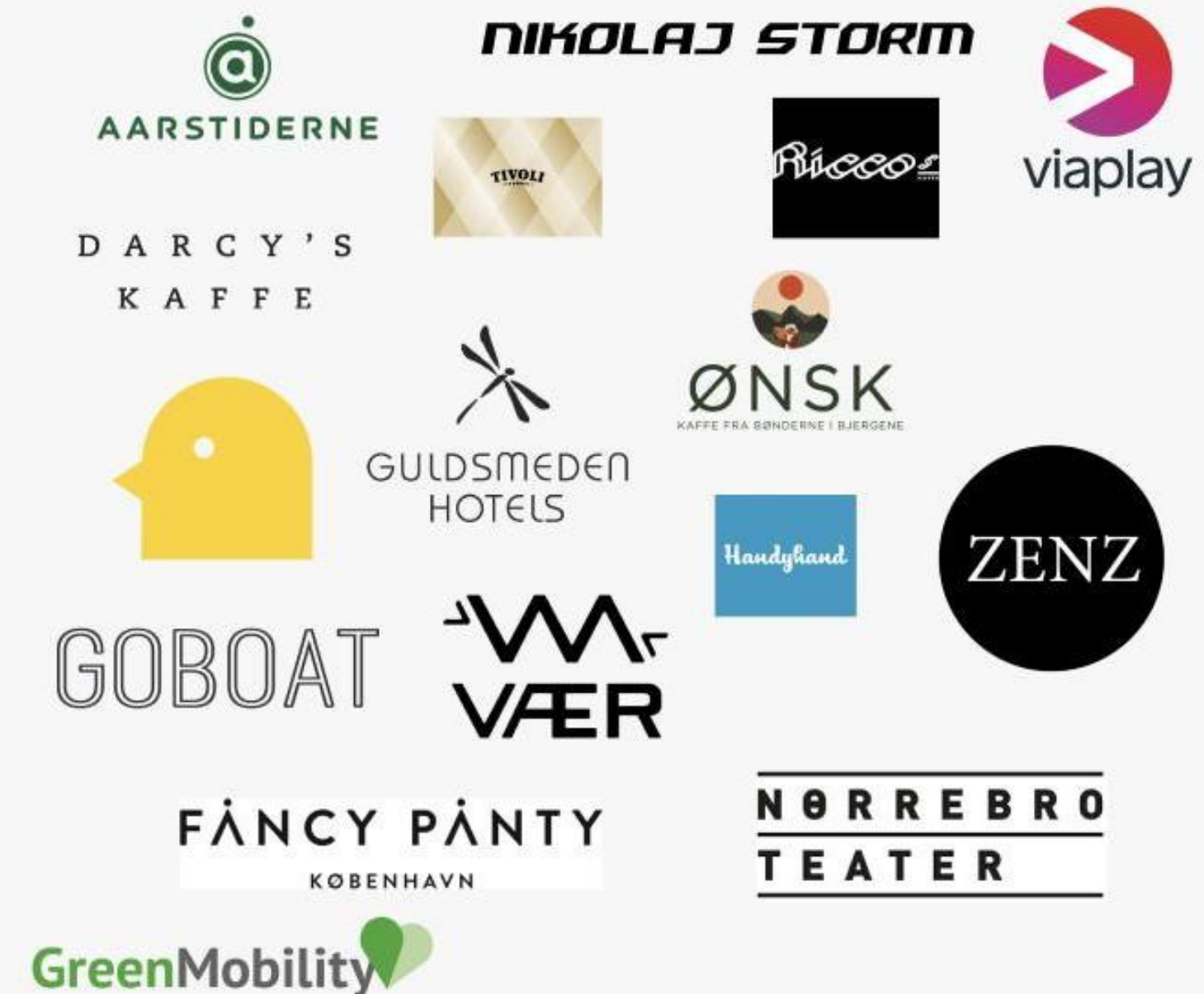
WP33 - Testing and bugfixing

Highlights

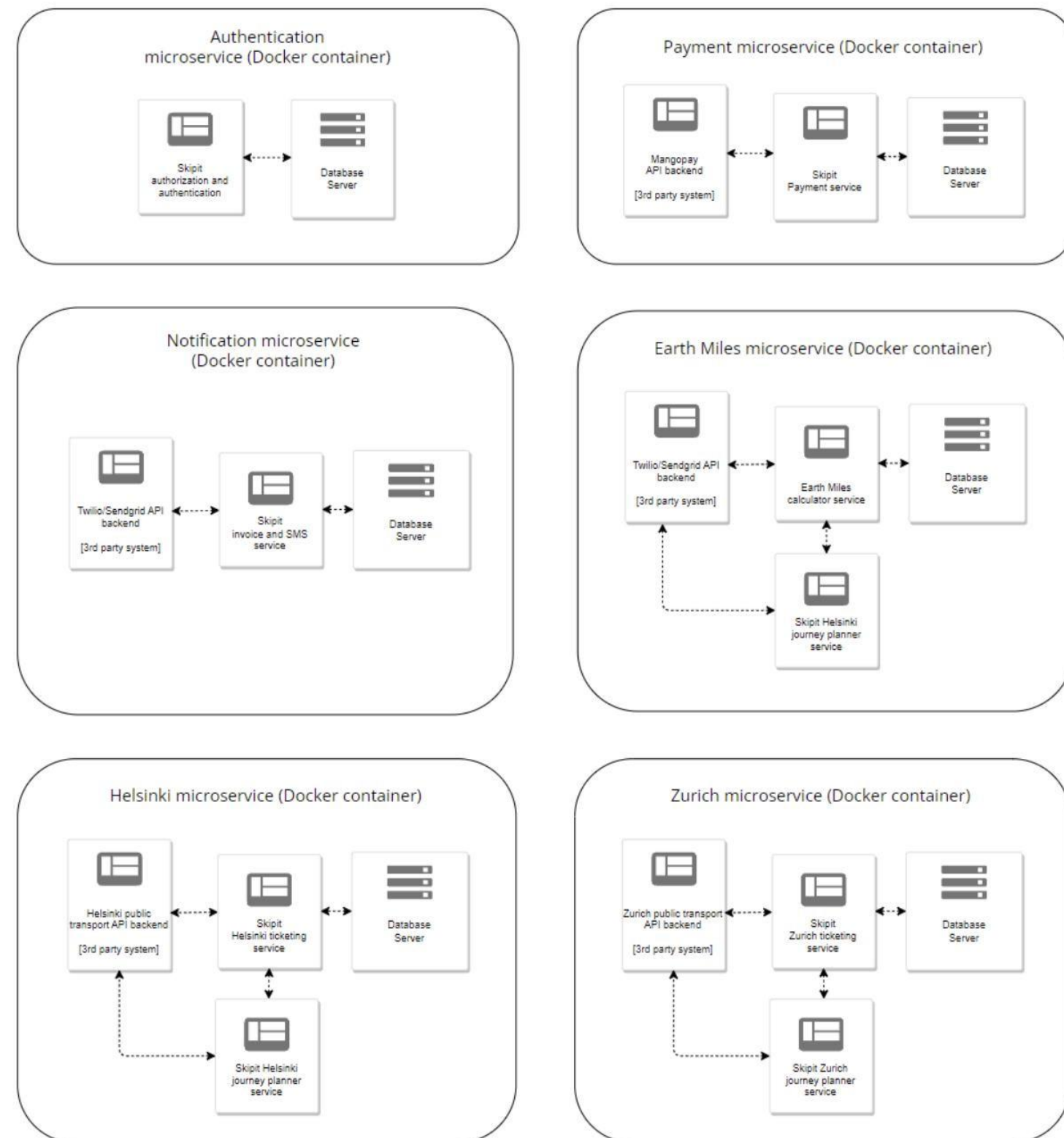
1.200 users in 4 months



30 new partners in the app



Highlights



Backend structure and dependencies after decomposition into Dockerized microservices and adding of Earth Miles microservice

Highlights

Example of the use of GNSS to track user and ensure quality

First part of the Journey

Search

Standard Satellite Streets Outdoors Light Dark OSM mapbox Tømmerup CPH - Copenhagen Airport

```
</>JSON Table ? Help
```

```
1 {
2   "type": "FeatureCollection",
3   "metadata": {
4     "startStation": "Tømmerup Stationsvej (Amager Landevej)",
5     "endStation": "Korsvejens Skole (Amager Landevej)"
6   },
7   "features": [
8     {
9       "type": "Feature",
10      "geometry": {
11        "type": "Point",
```

Second part of the Journey

Search

Standard Satellite Streets Outdoors Light Dark OSM mapbox Kastrup

```
</>JSON Table ? Help
```

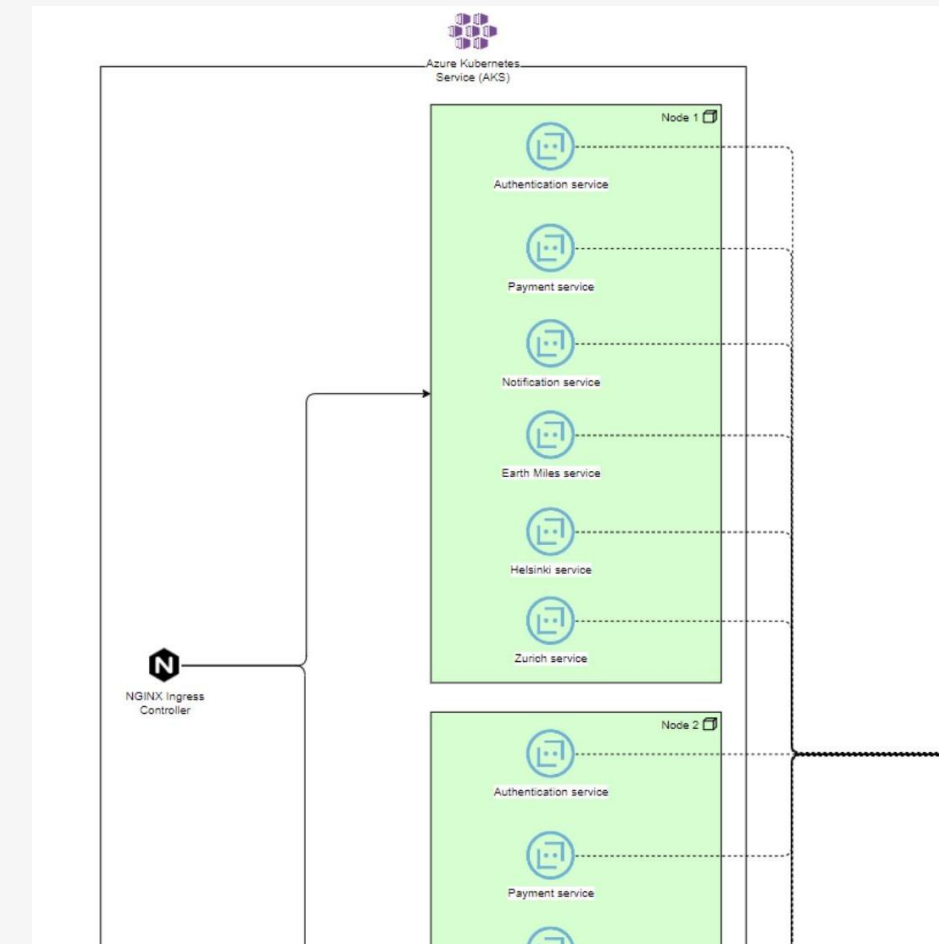
```
1 {
2   "type": "FeatureCollection",
3   "metadata": {
4     "startStation": "Korsvejens Skole (Amager Landevej)",
5     "endStation": "Nørreport"
6   },
7   "features": [
8     {
9       "type": "Feature",
10      "geometry": {
11        "type": "Point",
```

Learnings



Our initial business model of taking a small fee every redemption was not proven as lucrative as first thought. It is a viable business model, but not a stand alone one.

The new Docker and Kubernetes-based architecture provides a scalable framework for developing, deploying, and expanding the Earth Miles system across new cities. This approach ensures the system can handle increased loads, maintain high availability, and efficiently adapt to the demands of urban mobility solutions.



WP4 - SCALING

WP4 - Scaling

WP40 - Designing campaigns

WP41 - Creating campaigns

WP42 - Securing partners in new cities

WP43 - Implementing Earth Miles in new cities

WP44 - Testing and bugfixing

Highlights

79%

In new campaigns
and partners

191%

Increase in users

x3

Increase in
redemptions

2

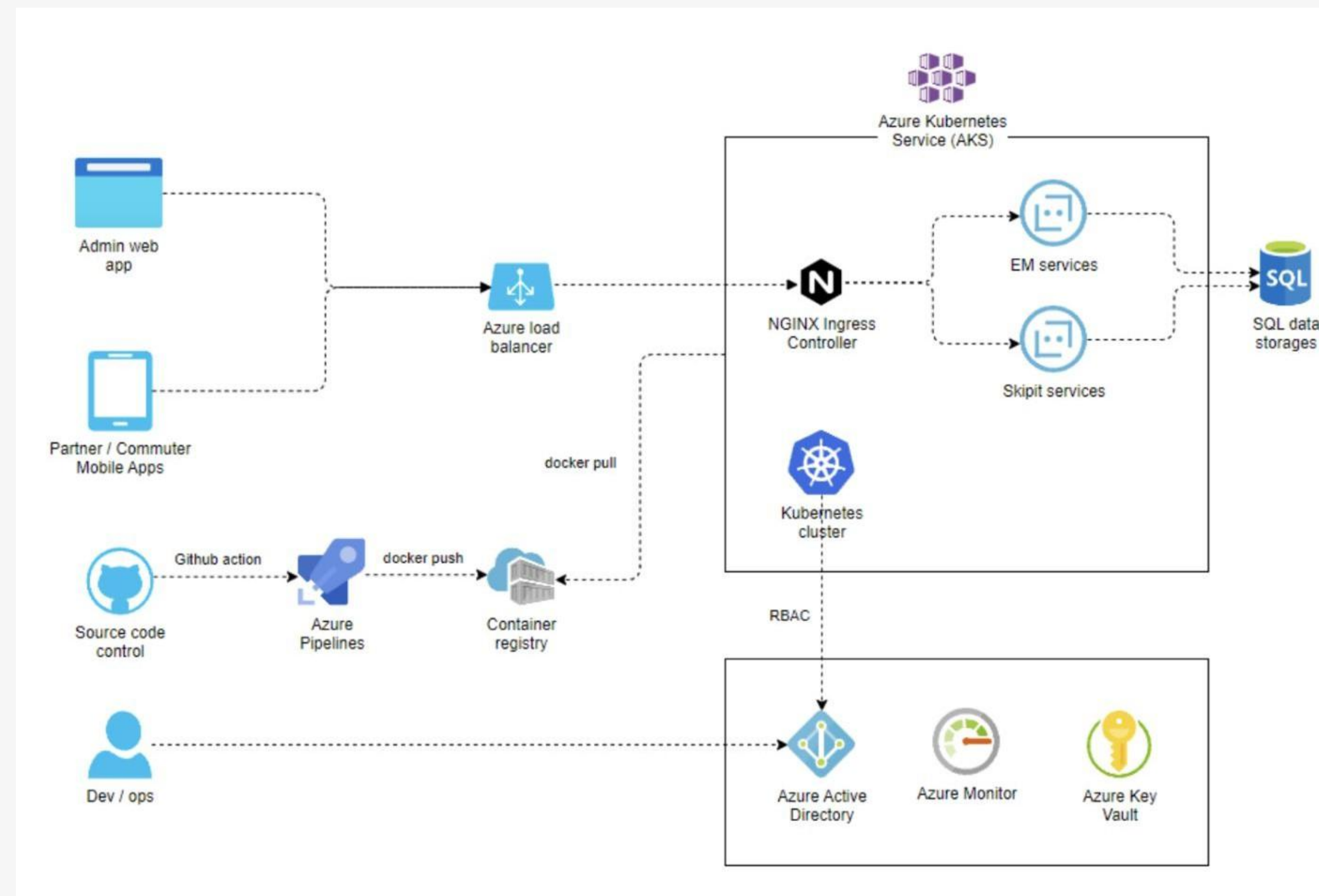
new cities in Denmark

300K+

engagement on SoMe
campaigns

Highlights

Final architecture leveraging Microsoft Azure Services



Learnings



Sustainability type rewards
are not the first choice



Exposing our APIs for integration
with existing transport platforms
or by marketing it as an
employee engagement tool to
influence commuting behavior.

WHERE DO WE GO FROM HERE?

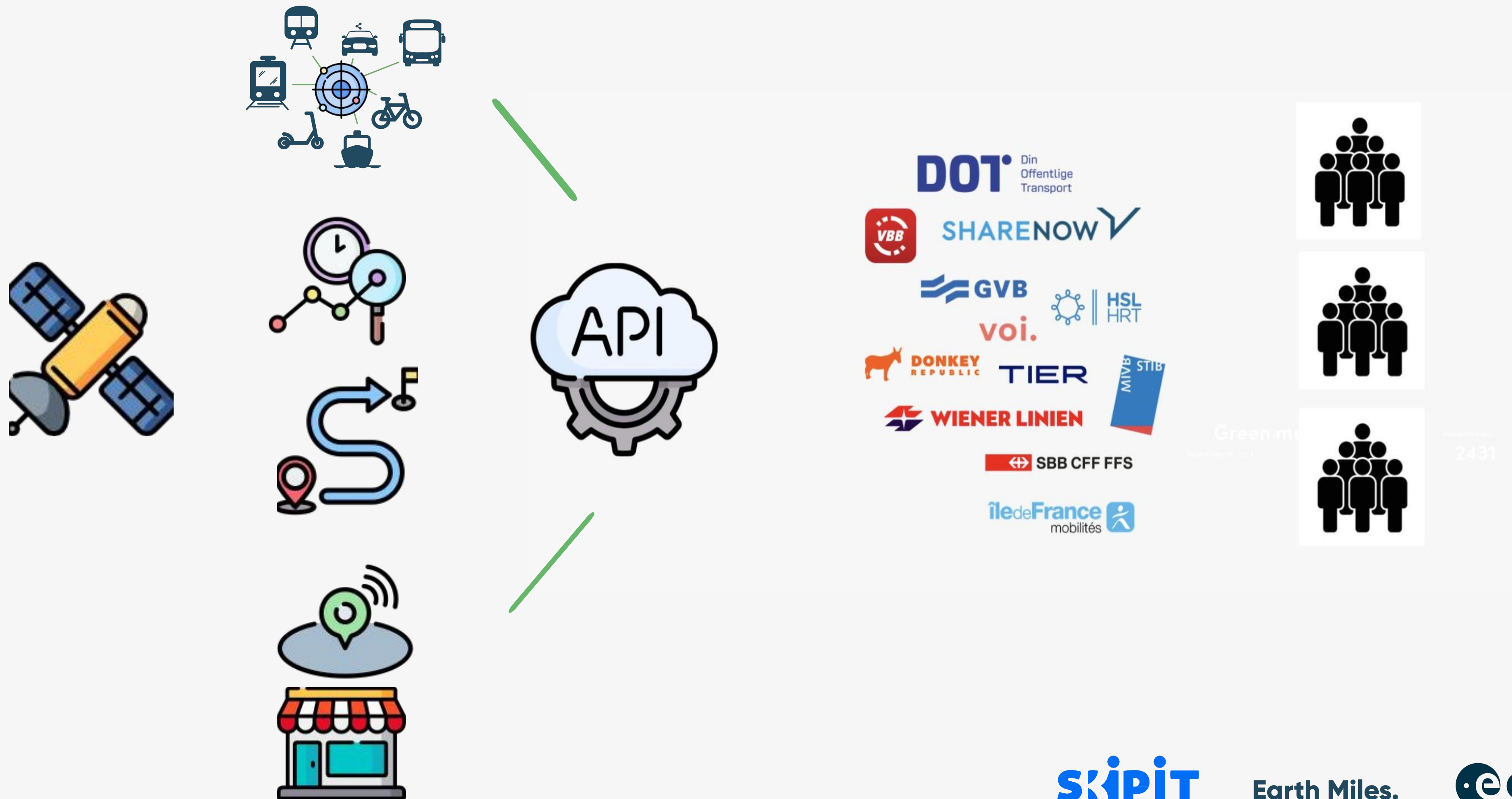
Where do we go from here?

We have built a good foundation will continue to work hard to grow our users base and reward partners across Denmark and beyond!



Where do we go from here?

Sustainable transport loyalty API



Where do we go from here?

CSRD reporting - Employee commuting behaviour.



Conclusion

Once again we would like to express our thank you to ESA for the support in building Earth Mile. We are very excited about what the future holds.

We look forward to continue leveraging GNSS and other forms of space data to help build a more sustainable future.

THANK YOU!
OPEN FOR QUESTIONS



Earth Miles.

