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D4.5

A smartphone app (Android) for personalized driving behavioural feedback

Safe tolerance zone calculation and interventions for driver-vehicle-environment interactions under challenging conditions

iDREAMS

Project identification

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Table of contents

List of Figures

1 Introduction

One of the main objectives of WP4 is: The technical implementation of driver assistance interventions (i.e. in real-time while driving) and post-trip (i.e. providing feedback about the safety performance of the driver and using goal setting and social gamification schemes for long-term sustainable behavioural change) for different risk-related scenarios.

The i-DREAMS platform adopts two strategies for post-trip interventions, i.e. on the one hand a strategy targeted at providing personalized feedback about driver/operator behavioural aspects of the past trip with a direct link to safety (overall safety score, speeding, mobile phone usage, etc.) and ecological driving, and on the other hand, a strategy called feed and feed forward targeted at setting safety behavioural goals and supported by social gamification schemes. Two user-friendly technologies are developed for this, i.e. a smartphone app and a web-based platform.

A smart-phone app for feedback has been developed on Android where the driver receives feedback about important safety driver behaviour variables once a trip has been completed. The smartphone app communicates through a REST API with the i-DREAMS post-trip intervention backend where the processing of scores into gamification elements takes place. Based on the safety driver performance of the individual, new goals are communicated to the driver and tips, tricks and rewards can be provided to achieve those goals. The driver is able to see also her/his safety and ecological driver performance in relation to her/his fellow drivers. The Android smartphone app, its realization and functionalities, are the subject of this deliverable.

This text accompanies the software deliverable D4.5: A smartphone app (Android) for personalized driving behavioural feedback. Section 2 describes the i-Dreams framework components and data flow, and situates the smartphone app in this framework. Section 3 presents the approach that was taken in developing the app, and the technologies that were leveraged. In section 4 we give a high-level overview of the smartphone app and its different functionalities and screens. This text has an appendix powerpoint presentation which shows the screens and functionalities of the app in detail. The code artefacts of the app are available on a Gitlab repository, to which access can be provided on request.

2 I-DREAMS platform: components and data flow

The I-DREAMS architecture consists of several input, output and processing (server) components, as shown in **Error! Reference source not found.**. Different components communicate with each other through a REST API interface.

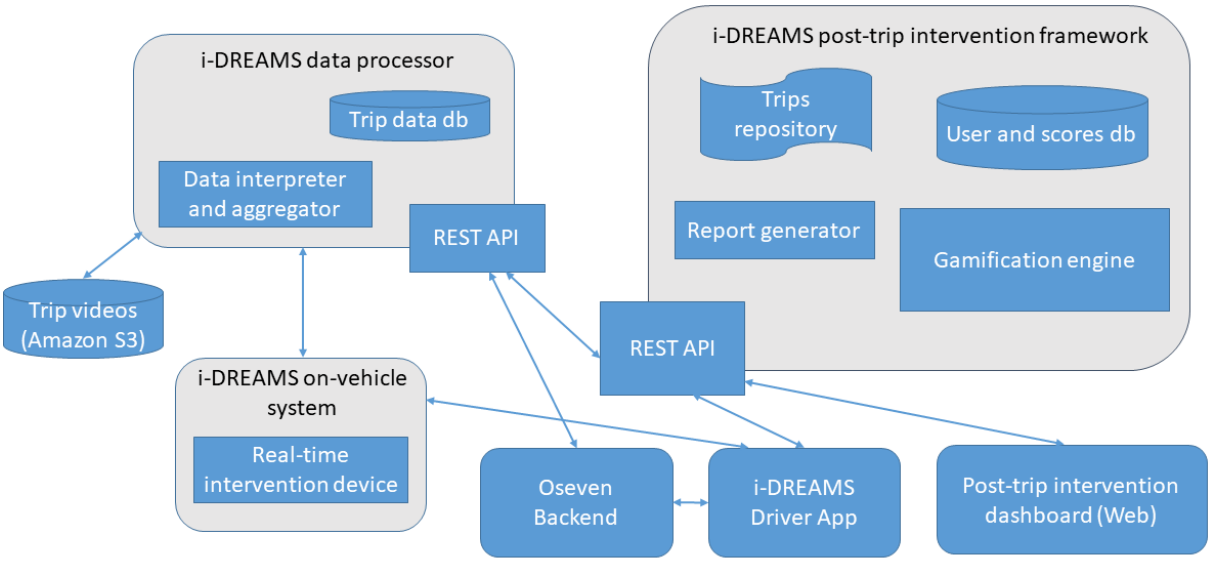


Figure 1 I-DREAMS components and data flow

The i-DREAMS platform consists of the following input components:

- **I-DREAMS on-vehicle system**: collects real-time data relevant for real-time interventions and stores a part of this data (on the Cardio Gateway) to be sent through to the i-DREAMS data processor.
- **I-DREAMS driver app**: integrates the O7SDK that collects data from smartphone sensors (e.g. GPS, accelerometer, gyroscope) during a trip, that is used for real-time and post-trip interventions and sends it to the OSeven backend for processing after the end of a trip.
- **OSeven backend**: processes the data collected from the i-DREAMS app (O7SDK) together with map related data and calculates driving metrics and scores, which are finally made available to the i-DREAMS data processor. It also provides a service to derive speed limits and speeding events to the post-trip intervention framework.

The i-DREAMS platform consists of the following output components:

- **I-DREAMS real-time intervention device**: visually shows real-time interventions to the driver.
- **I-DREAMS driver app**: shows scores and other gamification elements to the driver (post-trip intervention).
- **I-DREAMS post-trip intervention dashboard (Web)**: allows the company coach and manager to analyse behaviour evolution of the drivers. The I-DREAMS controller also uses the dashboard to configure gamification functionality for each project.

The i-DREAMS platform consists of the following processing/backend components:

- **I-DREAMS data processor**: receives data from the I-DREAMS on-vehicle system and the I-DREAMS driver app, processes and stores it. It exposes an API to the I-DREAMS post-intervention framework which can get the necessary data from it. Each time new

trip data is available, the post-trip intervention backend gets notified and can synchronize this trip data.

- **I-DREAMS post intervention framework**: contains trip information and a database with scores for all relevant performance objectives, which it generates from the data obtained from the I-DREAMS data processor. The driver app and the web dashboard use its API for their operations.

The I-DREAMS post-trip intervention framework provides the driver with scores on the following performance objectives, which are grouped into safety promoting goals:

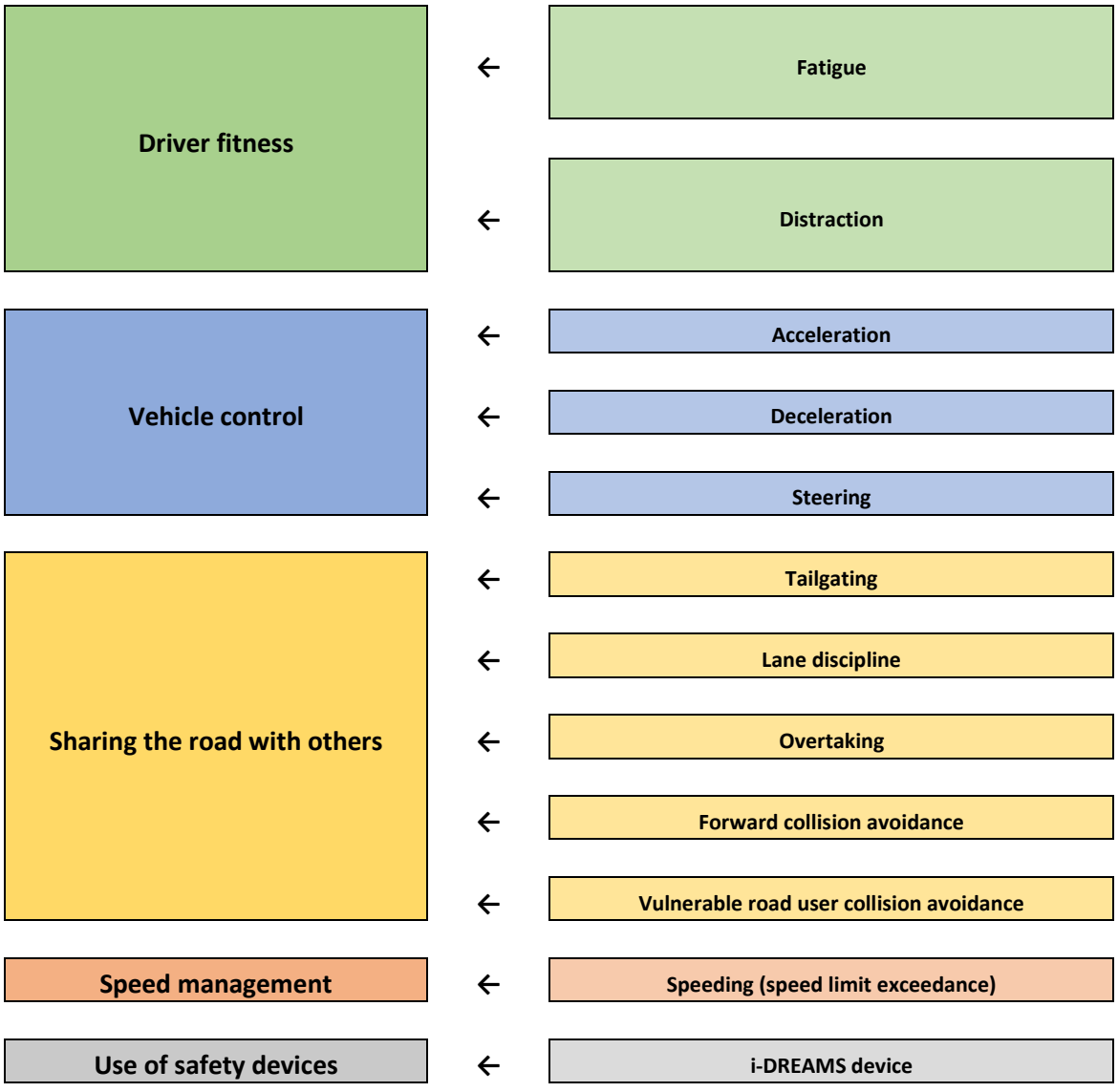


Figure 2 Safety promoting goals and performance objectives

The post-trip intervention framework needs to calculate the scores for these performance objectives. It obtains data from the I-DREAMS data processor, which has cleaned, interpreted and aggregated the data it had received from the different input components. The post-trip intervention framework receives general trip data (start and end time, location trace, fuel consumption, distance) and pre-processed data. The former will be stored in the trips

repository, and the latter is fed into the scores generator, which will generate scores for the different performance objectives and store them in the scores database.

Scores data is the starting point for the gamification engine. These scores are shown to the user and are the basic metric by which a user can track his progress for a given performance objective. The scores also drive forward the other gamification elements:

- A leaderboard which ranks drivers according to their score.
- Goals taken up by drivers trying to achieve a minimal score within a given time or distance.
- Badges earned when achieving goals for specific performance objectives.
- Credits associated with achieving a good score.

Supporting information like advantages and disadvantages of certain behaviour, and tips to achieve a specific goal, are also managed by the gamification engine.

All together, the post-trip intervention framework and its gamification engine manage the gamification experience for the user and provide all necessary information to the i-DREAMS app by its REST API.

3 i-DREAMS app: technical overview

The i-DREAMS app uses Kotlin for implementation, and a RESTful API for communication with the backend. The development approach and architecture focused on the following non-functional requirements:

- Use of mainstream technologies: Kotlin and REST are popular, extensive and well-supported technologies for app development. Kotlin libraries (for a full overview, see section 3.2) like moxy for realizing the MVP (model-view-presenter) design pattern or dagger for dependency injection are well-established.
- Content genericity and adaptability: Gamification features are highly configurable. The driving behaviour parameters (safety promoting goals and performance objectives) could be changed or extended in the future. The app dynamically decides which content to load based on the set of behaviour parameters that are active for the user.
- Use of open data: for showing map tiles, we used OpenStreetmap, which is non-proprietary data.
- Flexible, iterative, traceable development: agile Scrum development, using a development tool stack that is standard in industry (see section 3.1).

3.1 Development methodology and tools

The i-DREAMS app was realized using an agile (Scrum) development methodology, in which functionalities are described in stories, that are selected and grouped in sprints of 2 weeks. Each sprint represents an iteration in the development process. In this way, development was efficient, flexible and traceable. The following tools supported this process:

- Jira: management of Scrum boards which contain the stories and sprints.
- Confluence: documentation of implementation decisions, API and stories.
- Gitlab: code repository tool.
- Slack: for daily and efficient communication between team members.
- GitFlow: as a basic branching approach for git.
- CI/CD: continuous integration of code via GitFlow, and Docker-based deployment in a development, test and production environment.
- Android Studio: for code implementation.

3.2 Technologies and libraries

The i-DREAMS app was developed in the programming language Kotlin, which is a state-of-the-art language (bundled in Android Studio) and is by now used by the majority of Android app developers. Kotlin improves efficiency and has some modern features (like null reference checking) that Java does not have.

For communication with the backend, a REST API is provided (documented in Confluence), with calls that are tailored to the functionalities needed in the app, improving communication efficiency and processing needs on the client (smartphone).

The following libraries were used in the app:

```
    // Android Support
    'androidx.appcompat:appcompat:1.3.0-alpha02'
    'androidx.constraintlayout:constraintlayout:2.0.1'
    "androidx.preference:preference-ktx:1.1.1"

    // Kotlin
    "org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"

    // Anko
    "org.jetbrains.anko:anko-commons:$ankoVersion"
    "org.jetbrains.anko:anko-design:$ankoVersion"
    "org.jetbrains.anko:anko-design-listeners:$ankoVersion"
    "org.jetbrains.anko:anko-appcompat-v7-commons:$ankoVersion"
    "org.jetbrains.anko:anko-appcompat-v7-listeners:$ankoVersion"
    "org.jetbrains.anko:anko-sdk21:$ankoVersion"
    "org.jetbrains.anko:anko-sdk21-listeners:$ankoVersion"

    // Dependency Injection
    kapt "com.google.dagger:dagger-compiler:$daggerVersion"
    kapt "com.google.dagger:dagger-android-processor:$daggerVersion"
    "com.google.dagger:dagger-android:$daggerVersion"
    "com.google.dagger:dagger-android-support:$daggerVersion"

    // RxJava + RxKotlin
    "io.reactivex.rxjava2:rxandroid:$rxandroidVersion"
    "io.reactivex.rxjava2:rxjava:$rxjavaVersion"
    "io.reactivex.rxjava2:rxkotlin:$rxkotlinVersion"
    "com.jakewharton.rxrelay2:rxrelay:$rxrelayVersion"

    // Network
    "com.squareup.okhttp3:okhttp:$okhttpVersion"
    "com.squareup.okhttp3:logging-interceptor:$okhttpVersion"
    "com.squareup.retrofit2:retrofit:$retrofitVersion"
    "com.squareup.retrofit2:converter-gson:$retrofitVersion"
    "com.squareup.retrofit2:adapter-rxjava2:$retrofitVersion"
    "com.google.code.gson:gson:$gsonVersion"

    // MVP
    "com.github.moxy-community:moxy:$moxyVersion"
    kapt "com.github.moxy-community:moxy-compiler:$moxyVersion"
    "com.github.moxy-community:moxy-ktx:$moxyVersion"
    "com.github.moxy-community:moxy-android:$moxyVersion"
    "com.github.moxy-community:moxy-androidx:$moxyVersion"

    // Navigation
    "ru.terrakok.cicerone:cicerone:$ciceroneVersion"

    // Crashlytics
    'com.google.firebase:firebase-analytics:17.6.0'
    'com.google.firebase:firebase-crashlytics:17.2.2'

    // Testing
    'junit:junit:4.12'
    'androidx.test.ext:junit:1.1.1'
    'androidx.test.espresso:espresso-core:3.1.0'

        // CircleImageView
    'de.hdodenhof:circleimageview:2.1.0'

    //Bottom navigation bar
    'com.aurelhubert:ahbottomnavigation:2.1.0'
```

```
//Expandable RecyclerView
'com.thoughtbot:expandablerecyclerview:1.3'

// BinaryPrefs
'com.github.iamironz:binaryprefs:1.0.0-BETA-2'

// Pie Chart
'com.github.PhilJay:MPAndroidChart:v3.0.3'

// Glide
'com.github.bumptech.glide:glide:4.11.0'
'com.github.bumptech.glide:okhttp3-integration:4.11.0'
kapt 'com.github.bumptech.glide:compiler:4.11.0'

// Image viewer
'com.github.piasy:BigImageViewer:1.5.6'

// EasyImage
'com.github.jkwiecien:EasyImage:3.0.3'

// Permissions wrapper
'com.tbruyelle.rxpermissions2:rxpermissions:0.9.4@aar'

// Localization
'com.akexorcist:localization:1.2.6'

// Material Components
'com.google.android.material:material:1.2.1'

// OSM
'org.osmdroid:osmdroid-android:6.1.6'
'com.github.MKergall:osmbonuspack:6.6.0'
```

3.3 Android SDK for i-DREAMS app

The O7SDK has been developed and it is continuously optimized, also in the framework of i-Dreams, in order to achieve the optimum balance of recording accuracy and battery consumption. Therefore, the data recording does not run 24/7 in the background, but it is regularly activated by the Android operating system and collects data for a few seconds to determine if the user is in a vehicle and is actually in driving status. This process is called "Driving Detection". If the O7SDK verifies that (a) the user is in driving status and (b) the logged in user matches with the user that is logged in to the I-DREAMS on-vehicle system, the trip recording starts. Otherwise, the data collection procedure stops, and the SDK is in a paused state until the next time it is activated by the system. Trip recording starts automatically within the first minutes of driving and will end 5 minutes after the end of driving.

Indicatively some of the recorded data from the smartphone sensors or the operating system of the smartphone device are: date/time/timestamp of the recorded data, GPS data, accelerometer data, gyroscope data, activity data (e.g. walking, stopping, driving), smartphone device data and push notification token data.

A variety of APIs is used to read the data of the sensors that have been recorded and temporarily stored in the smartphone database before they are transferred to the O7PLATFORM. When the device is found on a network that meets the user's data upload requirements (Wi-Fi or 3G/4G), the application starts sending the data in parts (in packets), from the device, to the upload area operated by OSeven at the computer center within the

European Union, owned by the cloud service technology provider (Amazon). Any packet successfully uploaded is permanently deleted from the device.

Optimizations in the SDK will continue to be implemented to ensure the maximum accuracy in trips recording and the minimum battery consumption for the users. These are very significant factors in all telematics and driving behaviour analysis smartphone applications.

Real time mobile use detection (laboratory version)

A team of data scientists has developed an algorithm for laboratory use for the real-time detection of mobile use (RTMU). This algorithm has been developed in Python to evaluate its accuracy and minimize the false positive events. The algorithm utilizes values from several smartphone sensors e.g. gyroscope, accelerometer and GPS without using any data that could be considered as a risk for the users' privacy, therefore it is fully GDPR compliant. For the validation of the algorithm, data from hundreds of thousands of recorded trips (with the old and new O7SDK developed especially for the needs of i-Dreams) have been used to calibrate the algorithm's thresholds and maximize accuracy. After that, the algorithm was handed over to the Android Developers for implementing the algorithm and all required tests into the O7SDK.

Real time mobile use detection (production version)

Following the Python implementation, the Android team executed the porting of the RTMU algorithm to a native Android library so that it can be integrated with the O7SDK of the i-Dreams project. The library is designed to be battery friendly and thread safe. The algorithm collects values from the smartphone sensors in high frequency to accommodate the real-time detection of mobile use. The detection algorithm does not rely on any specific permission that could jeopardise the user's privacy (access to the call registry, access to messages etc.). The algorithm analyses high frequency data from the device sensors looking for patterns that are encountered when a user interacts with her/his smartphone e.g., to answer a call, text a message or browse the internet. The algorithm has been tested against the original algorithm that has been developed in Python and in actual driving experiments.

Several iterations of optimization and finetuning of the algorithm have been carried out, between Python and Android implementations to ensure full alignment of the results and optimum accuracy based on the actual driving experiments.

i-Dreams app and the i-DREAMS on-vehicle system communication module

This is a native Android module implemented in Kotlin. Its purpose is to facilitate the communication between the driver's app and the on-vehicle system using the Bluetooth Low Energy (BLE) protocol. More precisely, the module covers two functionalities: (a) It checks to see if the currently logged in app user matches with the currently logged in user of the on-vehicle system. If this is true it allows trip recording, otherwise it prohibits it. This functionality is required so that the app records only the trips where the app owner is driving a car that is participating in the experiment. All other cases were the app owner is a passenger or is driving a car that is not participating in the experiment will not be recorded; (b) It forwards to the on-vehicle system in real-time events of mobile use detection raised by the RTMU library. After that, the i-DREAMS on-vehicle system is responsible for presenting a visual and audible alert to the user via the i-DREAMS real-time intervention device. The component is written in Kotlin to take advantage of the language's many strengths such as coroutines and channels.

Android device configuration module

The Android device configuration module plays a very critical role in the user adoption of the app, as it ensures the smooth recording of trips, which is one of the most significant factors in a telematics and driving behaviour analysis application. Due to the need for recording trips in the background without any user involvement, users need to perform several configurations on their device for the app to record successfully which many vary among manufacturers and

OS levels. To that end, a Device Setup app screen where users can see with one look if all necessary Android permissions have been granted. Each time this page loads a background check is performed for any missing permissions and the results are presented to the user in the form of a clear check list with indicators on any action that is pending from the user's side (e.g. turn on the GPS). Moreover, the Device Setup screen contains a link to a Knowledge Base (KB) web page with necessary proprietary device settings that may be needed to be performed by the user on top of the official Android permissions. The KB contains posts with instructions for configuring properly the most popular Android devices (e.g. Samsung, Huawei, Xiaomi, OnePlus, etc.) in Europe. The KB content is maintained and extended as new device or operating system versions releases occur.

Open Street Maps infrastructure

The required infrastructure to utilize map data from Open Street Maps has been developed in the O7PLATFORM, such as speed limits, addresses for trip start / end, to provide a reliable tool for the visualization of the trip and also to have access in a high volume of location-based information that may be useful in a driving behaviour analysis application as i-Dreams. This is a very important component in the i-Dreams project, as the costs of the commercial map providers (e.g. Google Maps, Here Maps) are very high and they would impose a significant risk in the commercialization of the i-Dreams product.

Route identification algorithms are applied to compute the actual vehicle route given a collection of "noisy" GPS coordinates, and then the maximum speed limits of the identified road segments are retrieved by looking these up in the OSM database or in case these are not available by computing these from the type of road and country of origin.

Speed limits API

The B2B interface of OSeven has been extended to provide a new secure web service endpoint to request road segment speed limits given a list of geographical coordinates representing a vehicle's route.

4 i-DREAMS app: structure and functionalities

The i-DREAMS app contains the following functionalities, of which the flow is shown in Figure 3 I-DREAMS app functionalities:

- *Scores*: an overview of the scores for each safety promoting goal and performance objective that is activated for a driver.
- *Trips*: a list of trips performed by the driver
    - Trip scores: an overview of the scores for each safety promoting goal and performance objective for a selected trip of the driver.
    - Trip on map: a GPS trace representation of a selected trip on a map, together with the events corresponding to performance objectives that happened on that trip.
- *Forum*: messages that are send to the driver or group of drivers.
- *Settings*: Privacy policy, terms and conditions, … .
- *Pros-cons*: a list of advantages and disadvantages of certain driving behaviour related to specific performance objectives.
- *Tips*: a list of coping tips to improve driving behaviour related to specific performance objectives.
- *Goals and badges*:
    - Completed goals: a list of goals for specific performance objectives that were successfully reached by the driver.
    - Open goals: a list of goals for specific performance objectives that were taken up by the driver and on which the driver is currently working.
    - New goals: a list of goals for specific performance objectives that are new and which the driver can take up.
- *Leaderboard*: a score-based ranking of drivers in a group.
- *Survey*: the drivers can improve their knowledge about chosen safety promoting goals by filling in questionnaires.
- *Shop*: the driver can use earned credits to buy items in the shop.

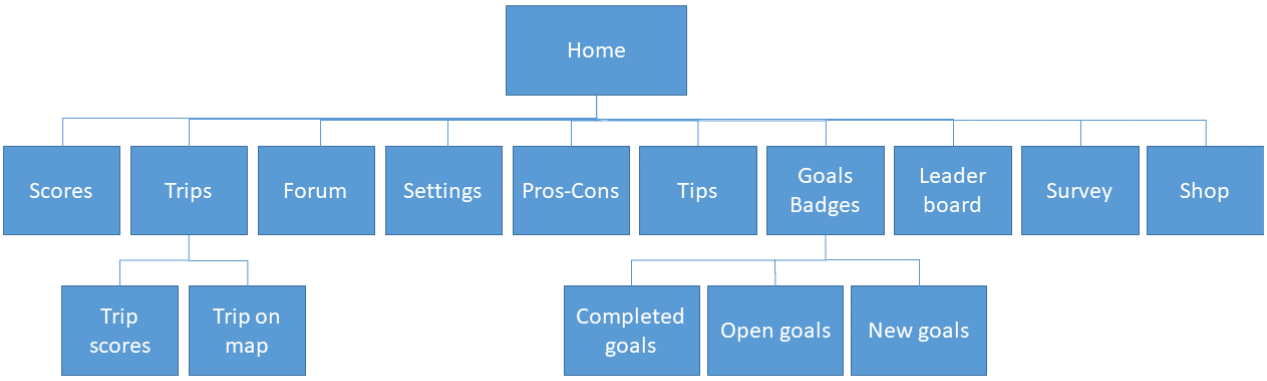


Figure 3 I-DREAMS app functionalities

In the remainder of this section, the most important screens of the app are shown and explained. For a full overview of functionalities and screens, we refer to the appendix of this deliverable. The following sections and the appendix are intended to give an overview of the

functionalities realized in the i-DREAMS Android app software deliverable. As such it is not the scope of this deliverable to provide a manual or instructions on how to use the software in practice.

4.1 I-DREAMS app: home screen and scores

The home screen allows the driver to access all activated gamification functionalities. The menu items in the bottom menu bar (Figure 3) are always activated: home, trips, scores, forum/messages, and settings, and this menu bar is visible in every screen of the app, allowing the driver to quickly navigate to each of these functionalities. The yellow-black tiles in the home screen are only enabled when their corresponding gamification features are activated for the psychological profile of the driver. For example, a driver that is in precontemplation phase will only see pros & cons and coping tips enabled, but the leaderboard and other tiles will be greyed out.

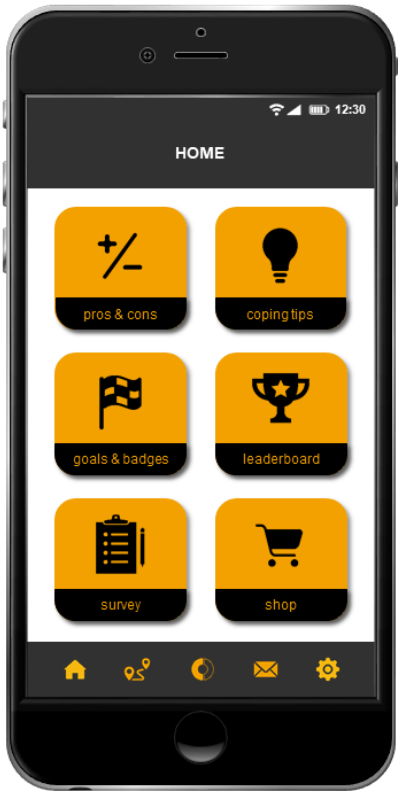


Figure 4 I-DREAMS app home screen

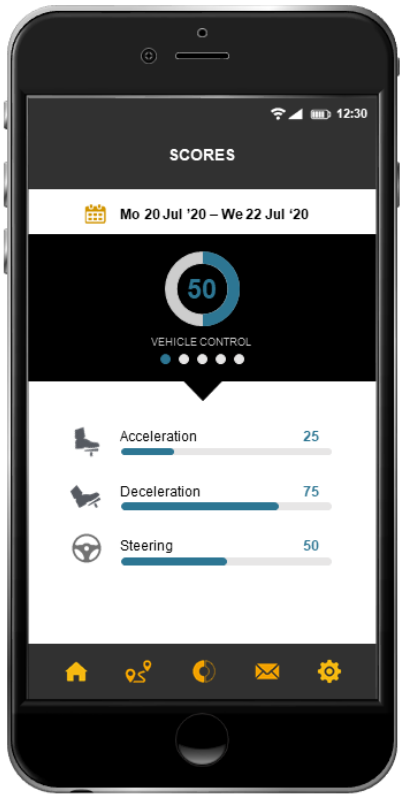


Figure 5 I-DREAMS app: scores

The scores screen (Figure 4) shows the scores of the safety promoting goals and their performance objectives for the driver. These scores are aggregated according to the time interval the driver can choose on top of the screen.

4.2 I-DREAMS app: trips

By navigating to the trips screen, the user sees a list of the trips that were performed for the chosen date interval (yesterday is the default choice). Clicking on a trip shows basic information about the trip (date, time, duration, distance), and the scores the driver obtained in the selected trip for the safety promoting goals and their performance objectives. A trip can also be visualized on a map, showing the GPS trace and the events that happened during the trip. By clicking on an event, more information about the event is shown, including a video if available.

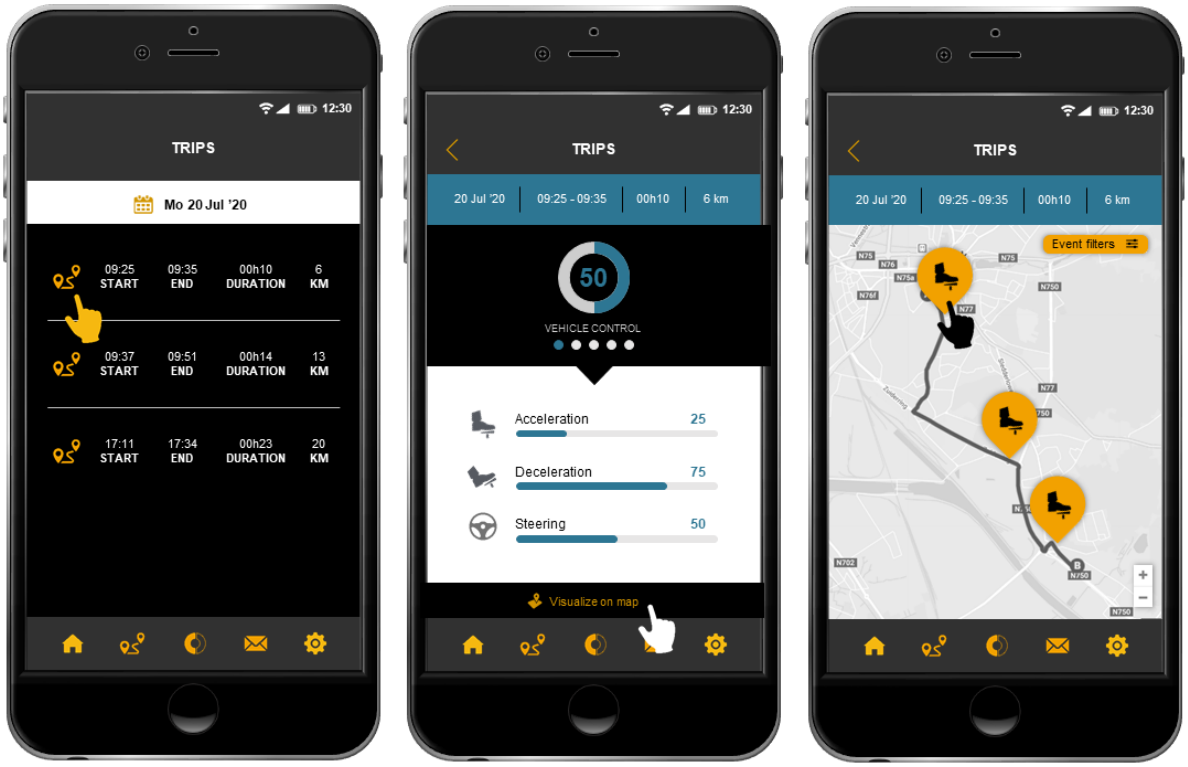


Figure 6 I-DREAMS app: trips

4.3 I-DREAMS app: tips and pros & cons

Coping tips and pros & cons are information elements that help the drivers in improving their driving behaviour. A driver can navigate through these items that are grouped according to safety promoting goals and are tagged with the performance objective they belong to. The information items consist of a textual description and an optional picture or video. The driver can like or dislike a tip, pro or con, and provide feedback to the project leader about the content of the item.

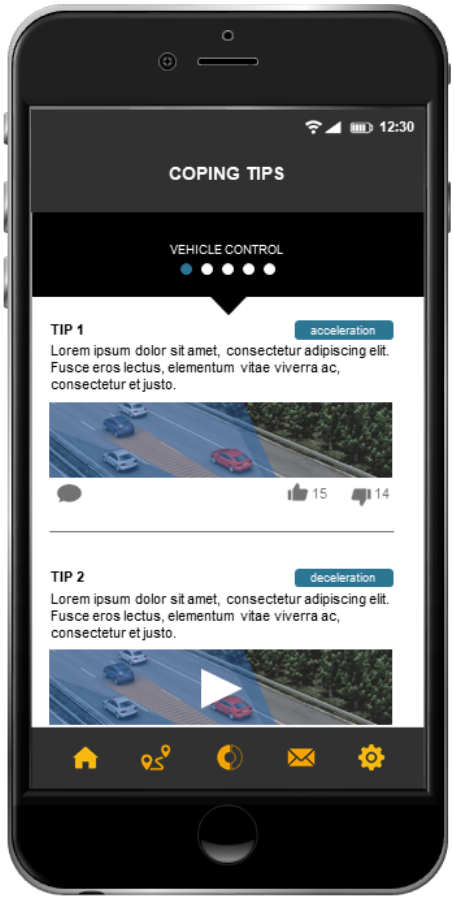


Figure 7 I-DREAMS app: coping tips

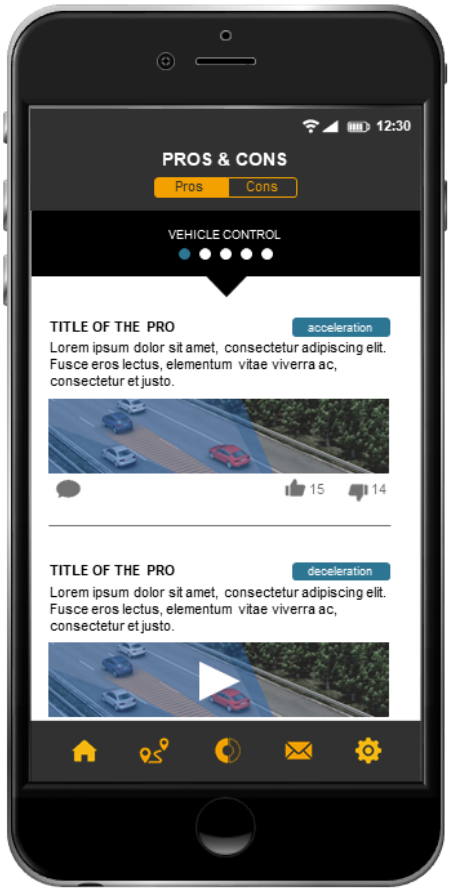


Figure 8 I-DREAMS app: pros & cons

4.4 I-DREAMS app: leaderboard

The leaderboard shows a ranking of the drivers who are part of a group in a project, based on the aggregated safety score they obtained. Also an indication of change in ranking is given.

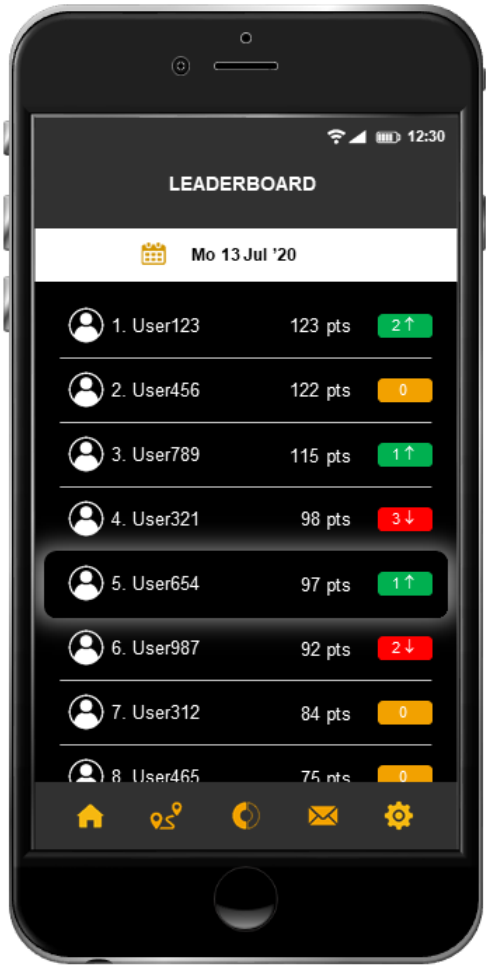


Figure 9 I-DREAMS app: leaderboard

4.5 I-DREAMS app: goals and badges

The driver can list the goals that were completed, are open, or are new in the goals and badges screen. Goals are grouped according to safety promoting goals and require the driver to obtain a minimal score for a specified distance on the safety promoting goal. The driver can check the progress made on open goals and take up new goals. If a driver succeeds in a set of goals for a safety promoting goal, he receives a badge. There are four categories of badges in increasing order of difficulty: bronze, silver, gold and platinum.

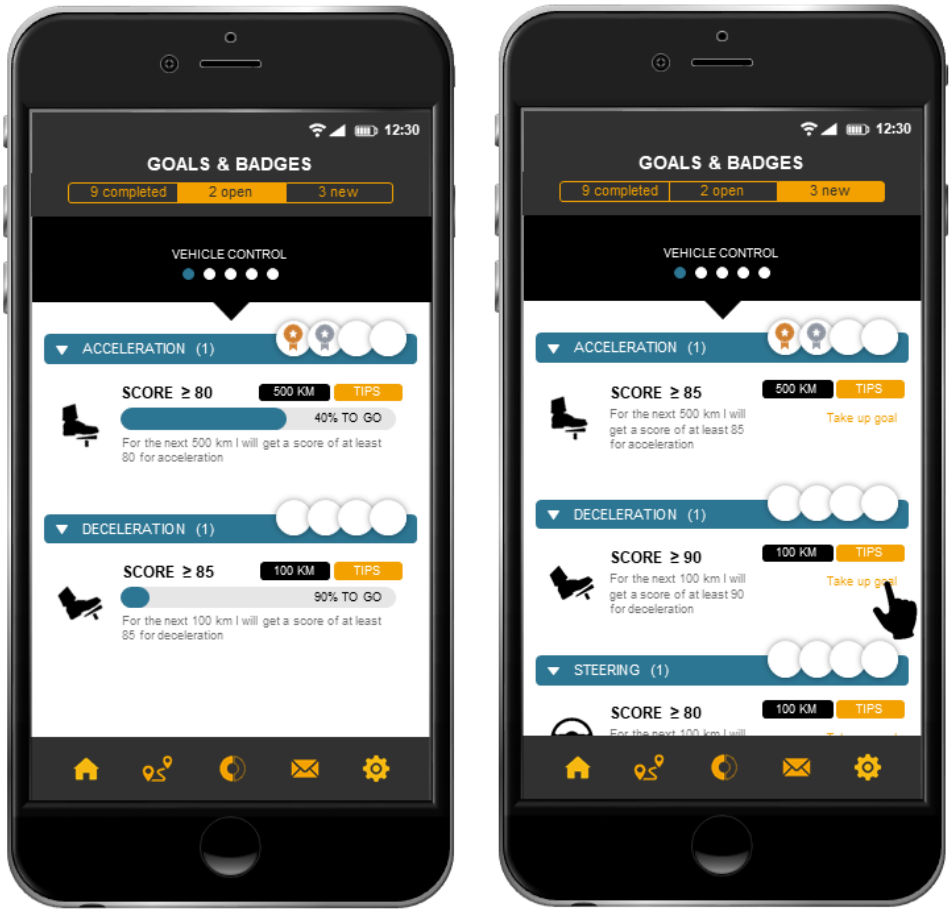


Figure 10 I-DREAMS app: goals and badges

4.6 I-DREAMS app: shop and survey

The drivers can exchange obtained credits for items in the shop (Figure 10), and fill in surveys to extend their knowledge concerning safety promoting goals.

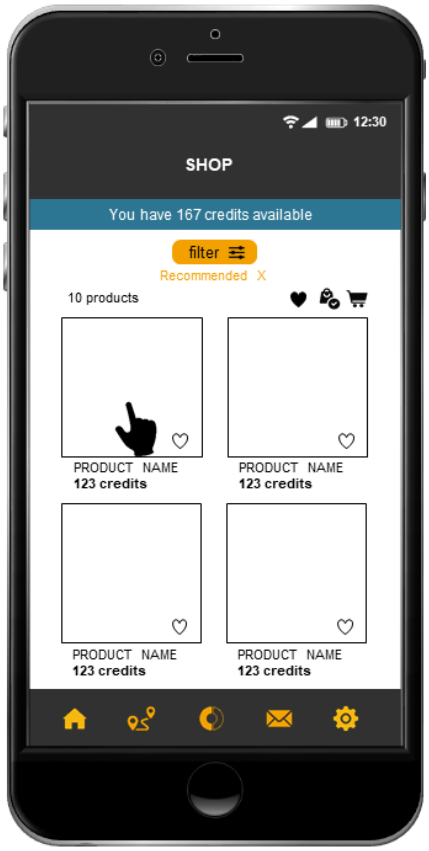


Figure 11 I-DREAMS app: shop

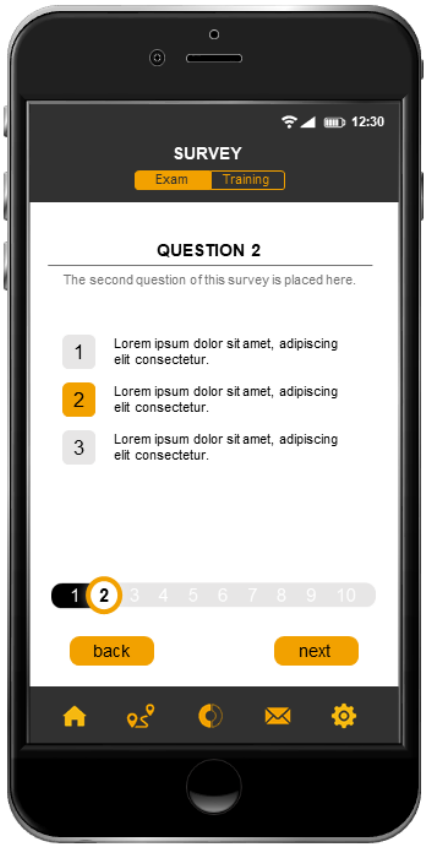


Figure 12 I-DREAMS app: survey

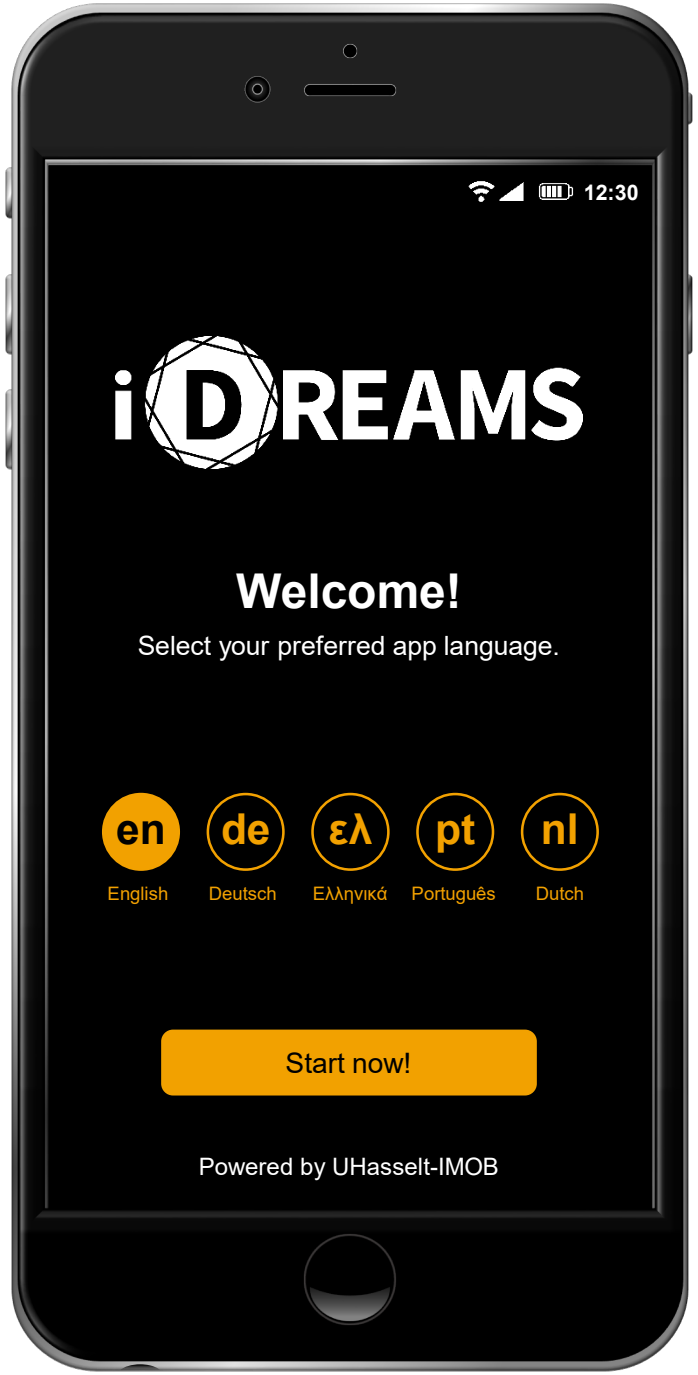
4.7 I-DREAMS app: Forum and messages

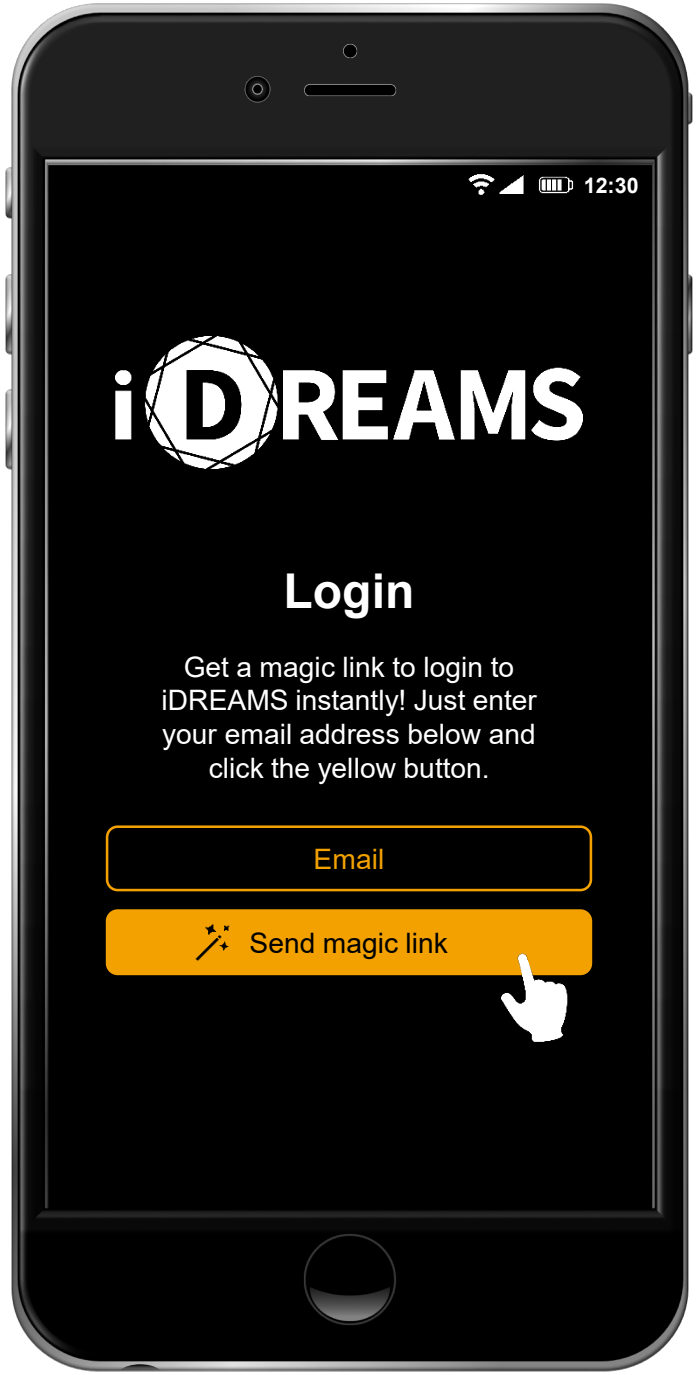
The forum allows the project leader to communicate with drivers. Messages can be responded to and liked (Figure 13 I-DREAMS app: Forum/messages).

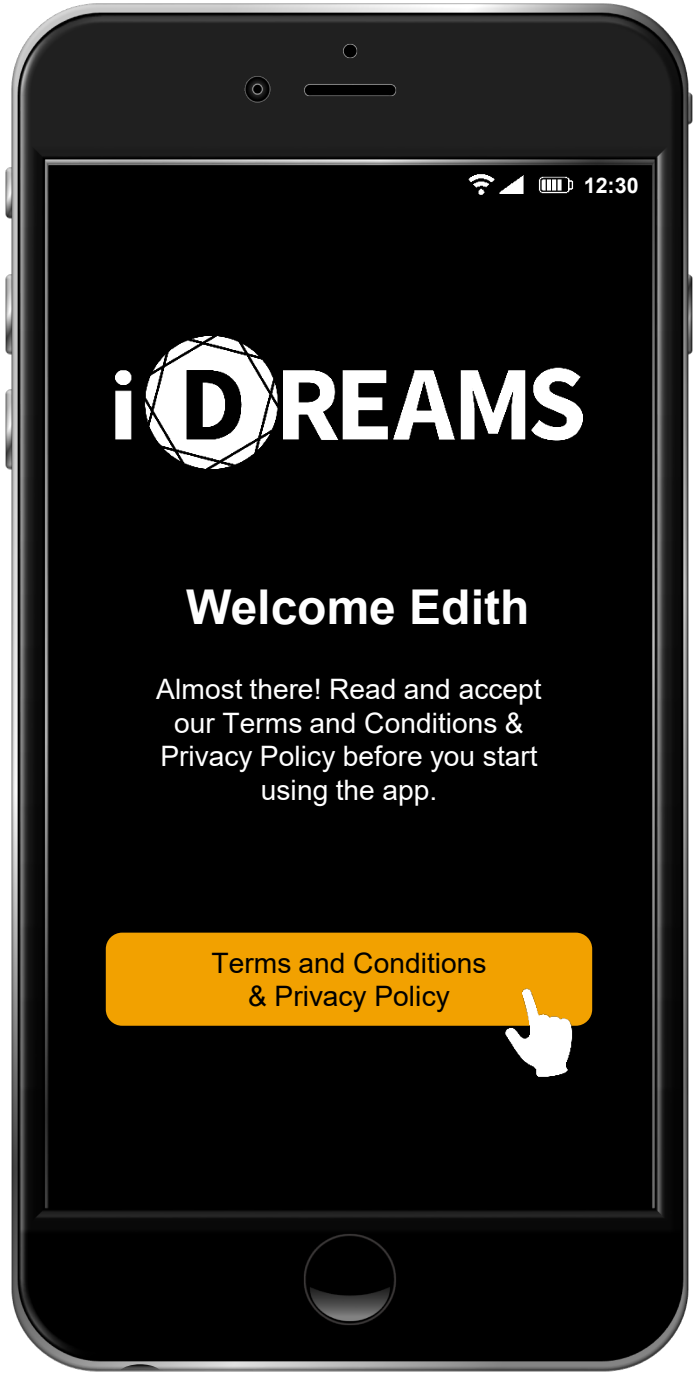
Figure 13 I-DREAMS app: Forum/messages

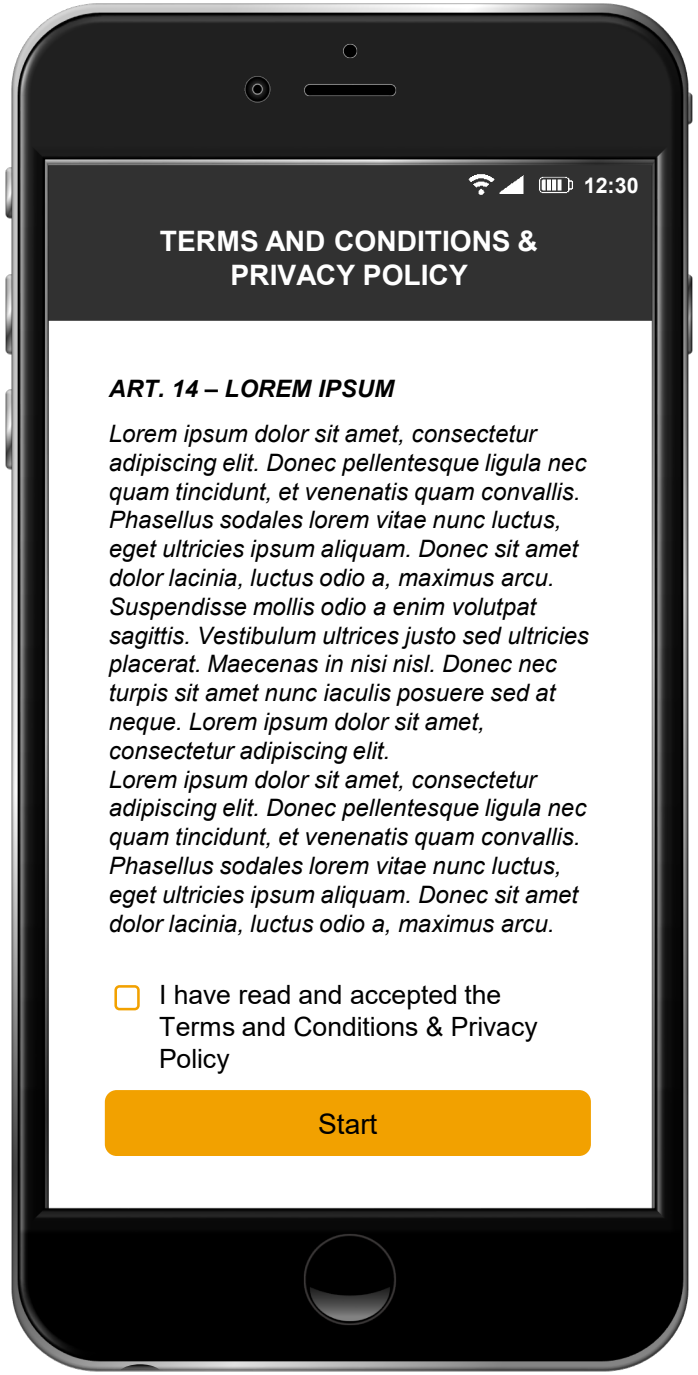
5 Summary

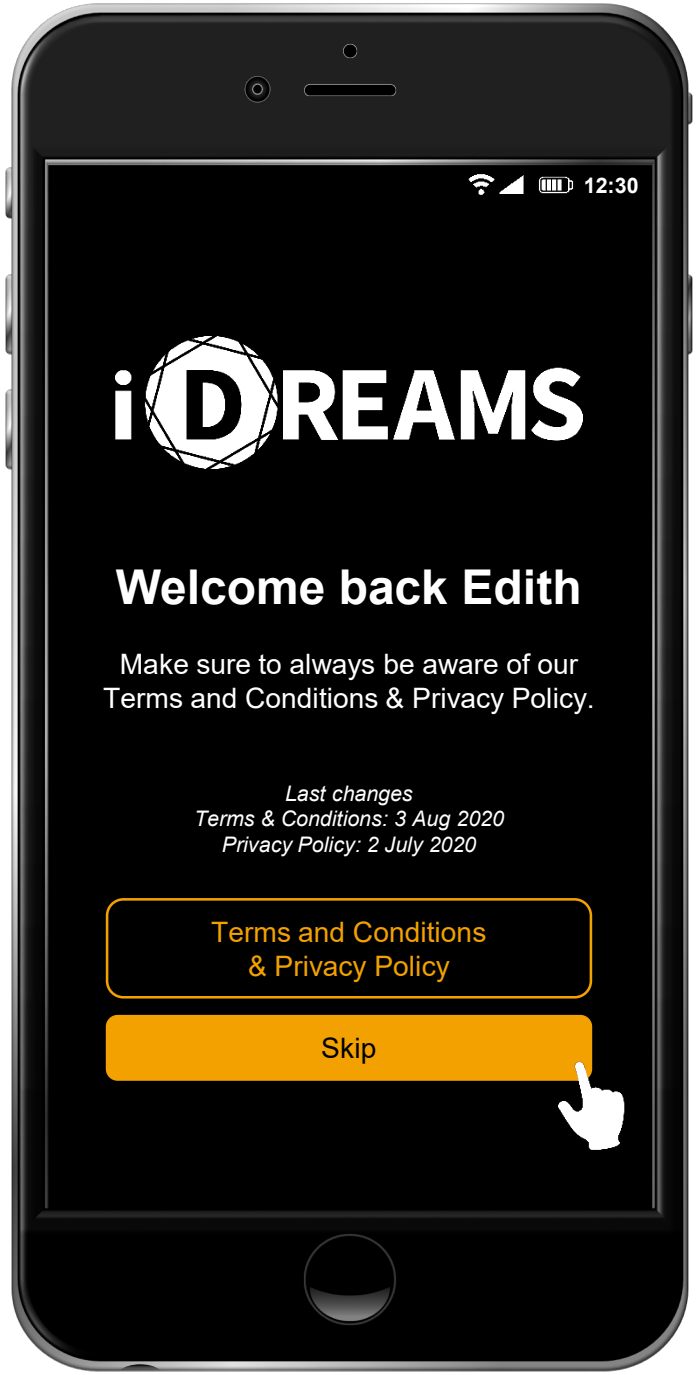
This text provided an overview of the place of the i-DREAMS Android smartphone app in the overall i-DREAMS software framework, the approach and technological decisions that were taken, and the main functionalities that were realized in this app. In providing a qualitative, state-of-the-art, flexible and dynamic app, we realize the two strategies for post-trip interventions fundamental to the i-DREAMS approach, i.e. on the one hand a strategy targeted at providing personalized feedback about driver/operator behavioural aspects of the past trip with a direct link to safety (overall safety score, speeding, mobile phone usage, etc.) driving, and on the other hand, a strategy called feed and feed forward targeted at setting safety behavioural goals and supported by social gamification schemes.

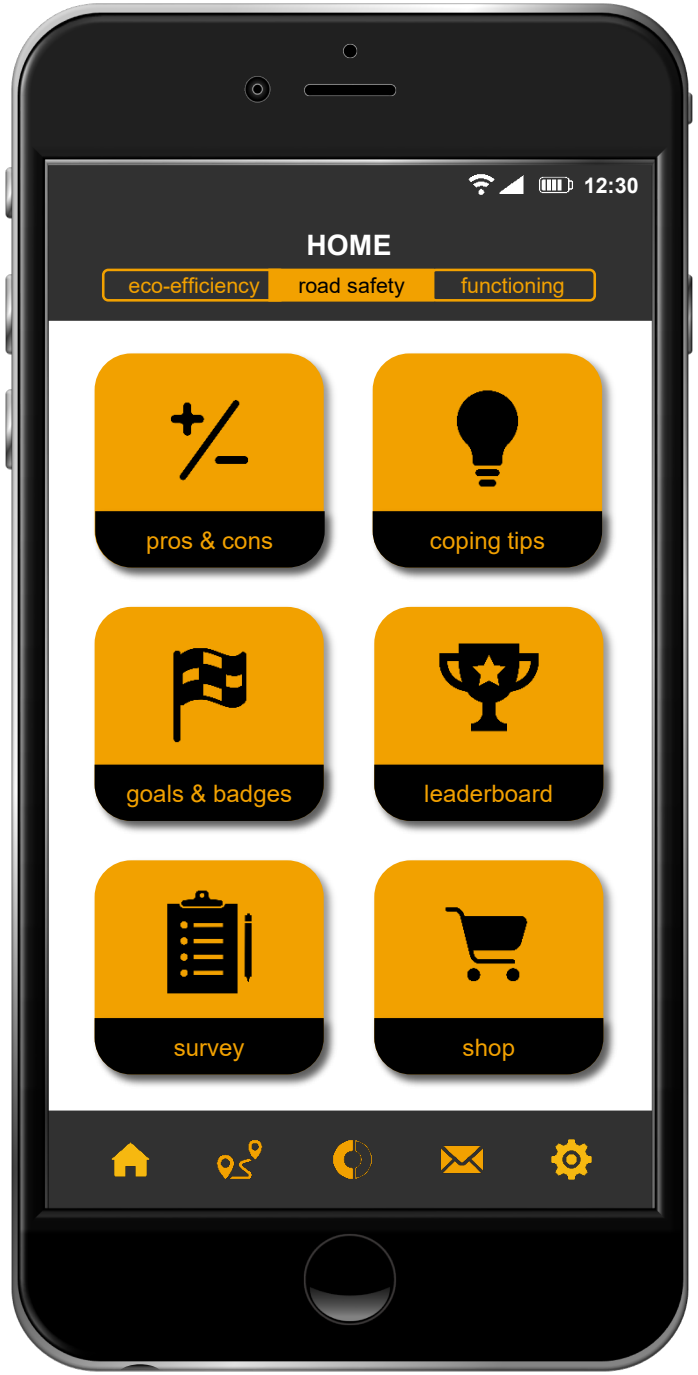

12:30
iDREAMS
Welcome!
Select your preferred app language.
en
English
de
Deutsch
ελ
Ελληνικά
pt
Português
nl
Dutch
Start now!
Powered by UHasselt-IMOB

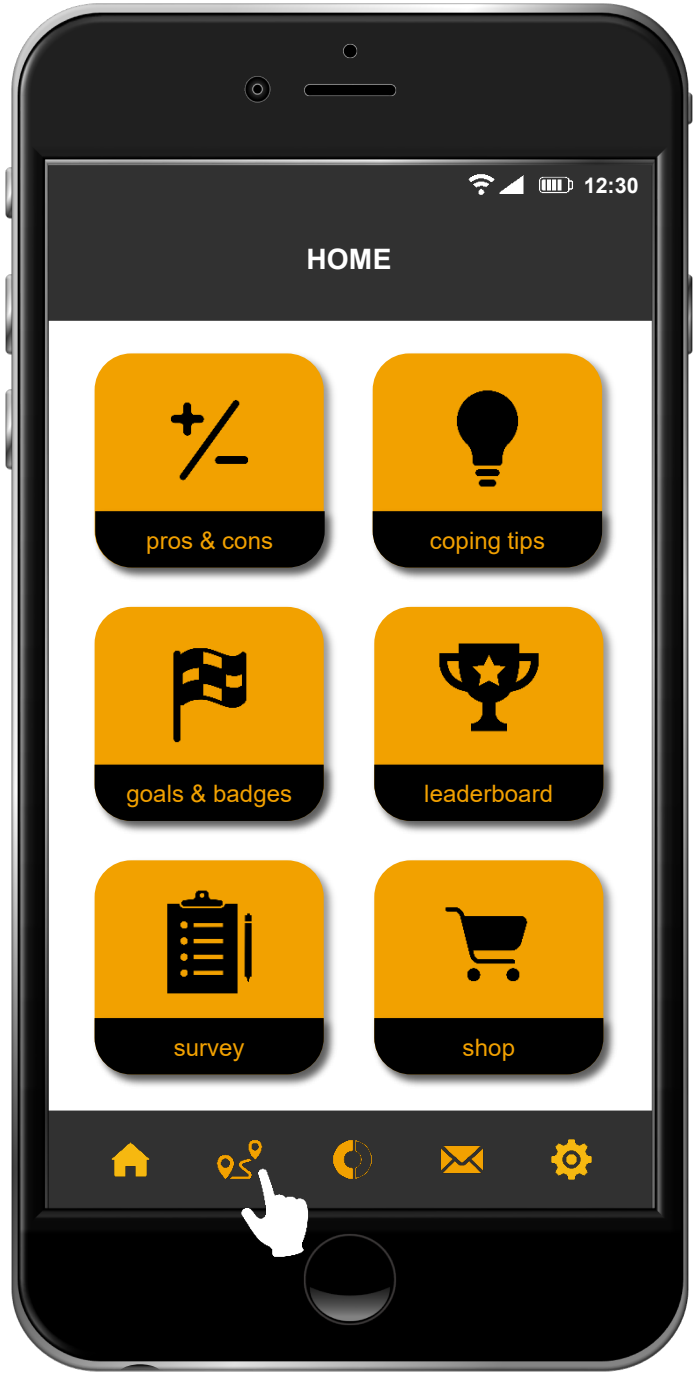

12:30
iDREAMS
Login
Get a magic link to login to iDREAMS instantly! Just enter your email address below and click the yellow button.
Email
Send magic link


12:30
iDREAMS
Welcome Edith
Almost there! Read and accept our Terms and Conditions & Privacy Policy before you start using the app.
Terms and Conditions & Privacy Policy

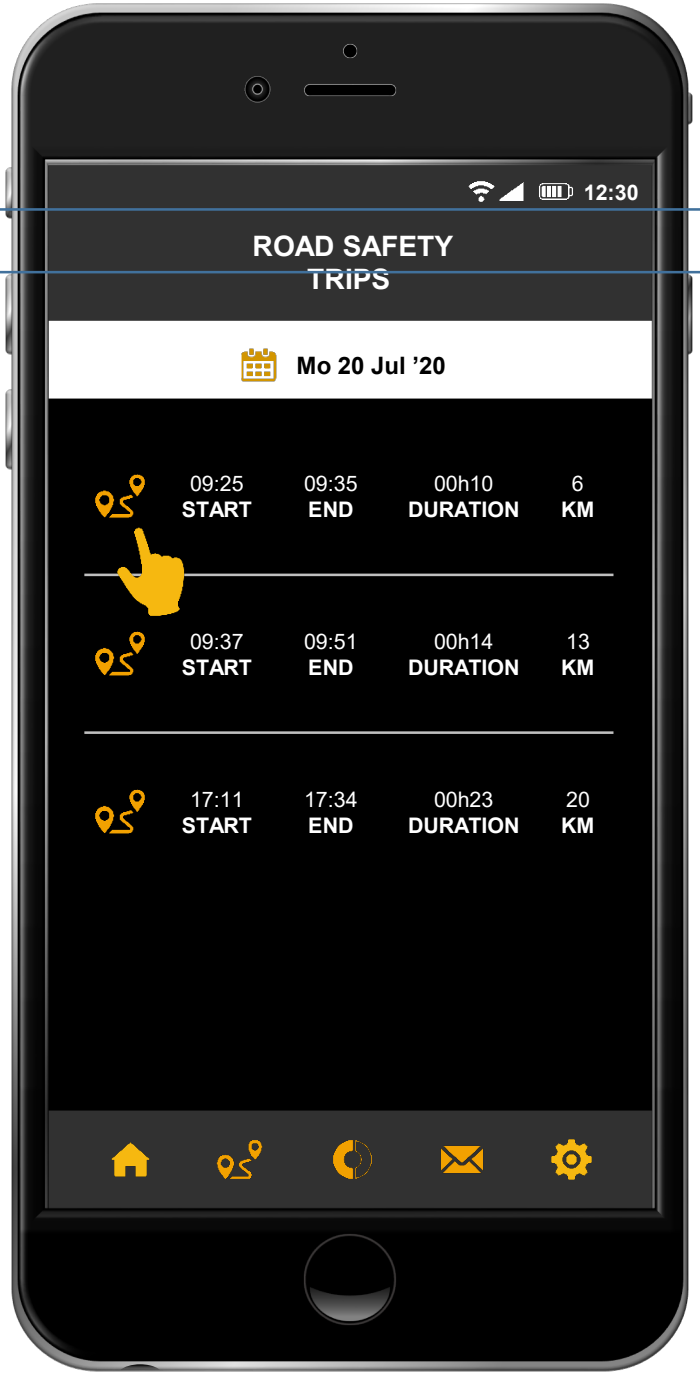

12:30
TERMS AND CONDITIONS &
PRIVACY POLICY
ART. 14 – LOREM IPSUM
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec pellentesque ligula nec quam tincidunt, et venenatis quam convallis. Phasellus sodales lorem vitae nunc luctus, eget ultricies ipsum aliquam. Donec sit amet dolor lacinia, luctus odio a, maximus arcu. Suspendisse mollis odio a enim volutpat sagittis. Vestibulum ultrices justo sed ultricies placerat. Maecenas in nisi nisl. Donec nec turpis sit amet nunc iaculis posuere sed at neque. Lorem ipsum dolor sit amet, consectetur adipiscing elit.
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec pellentesque ligula nec quam tincidunt, et venenatis quam convallis. Phasellus sodales lorem vitae nunc luctus, eget ultricies ipsum aliquam. Donec sit amet dolor lacinia, luctus odio a, maximus arcu.
I have read and accepted the Terms and Conditions & Privacy Policy
Start

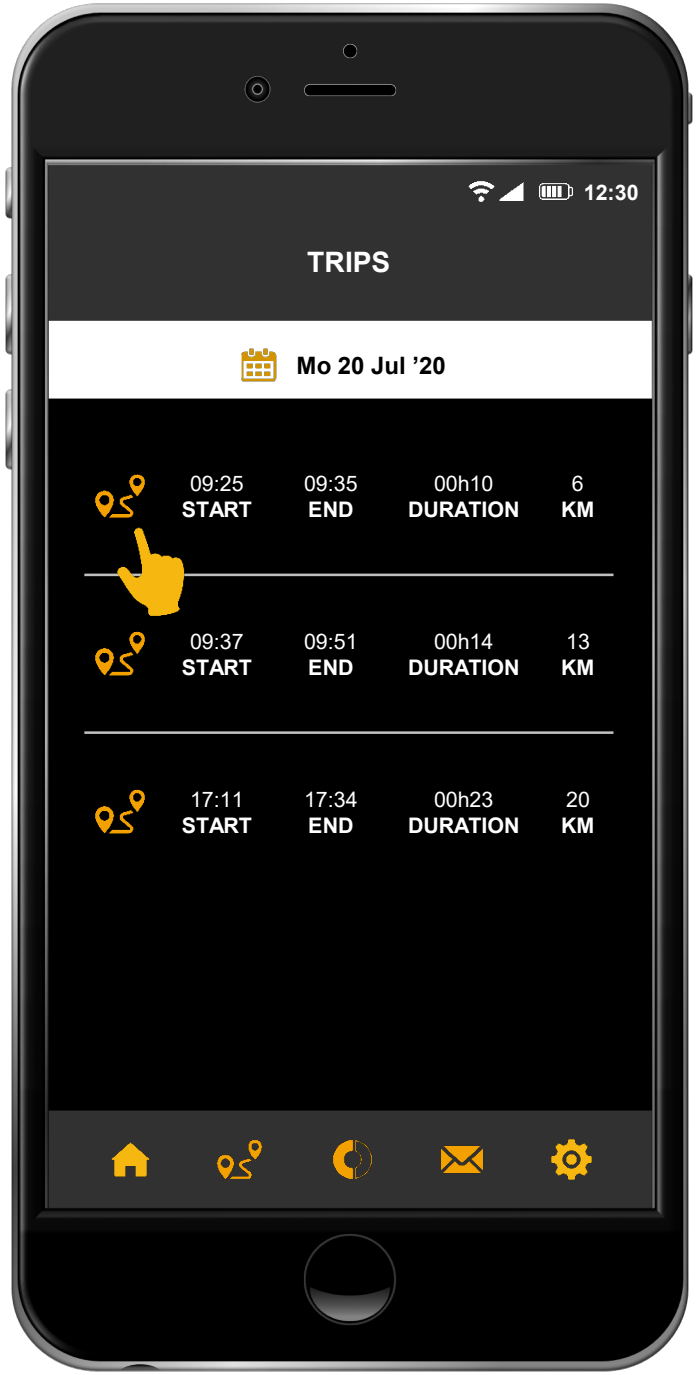

12:30
iDREAMS
Welcome back Edith
Make sure to always be aware of our
Terms and Conditions & Privacy Policy.
Last changes
Terms & Conditions: 3 Aug 2020
Privacy Policy: 2 July 2020
Terms and Conditions
& Privacy Policy
Skip

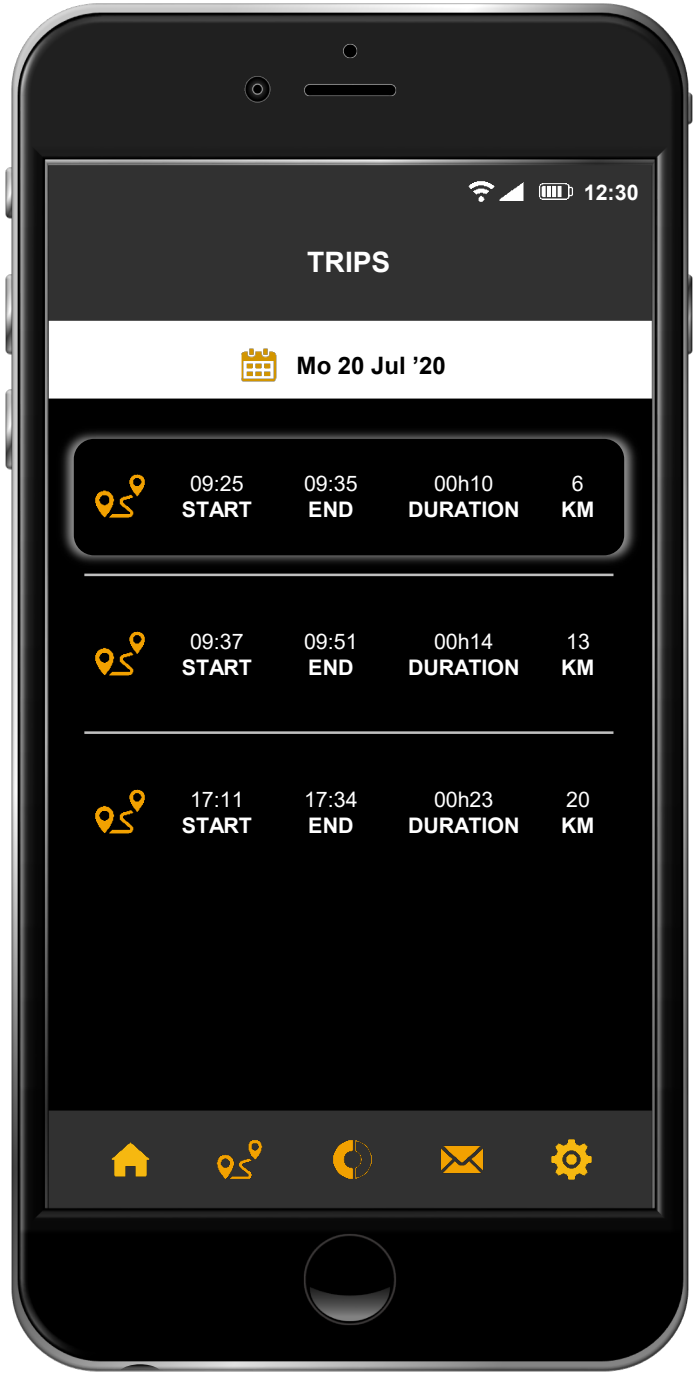

12:30
HOME
eco-efficiency
road safety
functioning
pros & cons
coping tips
goals & badges
leaderboard
survey
shop

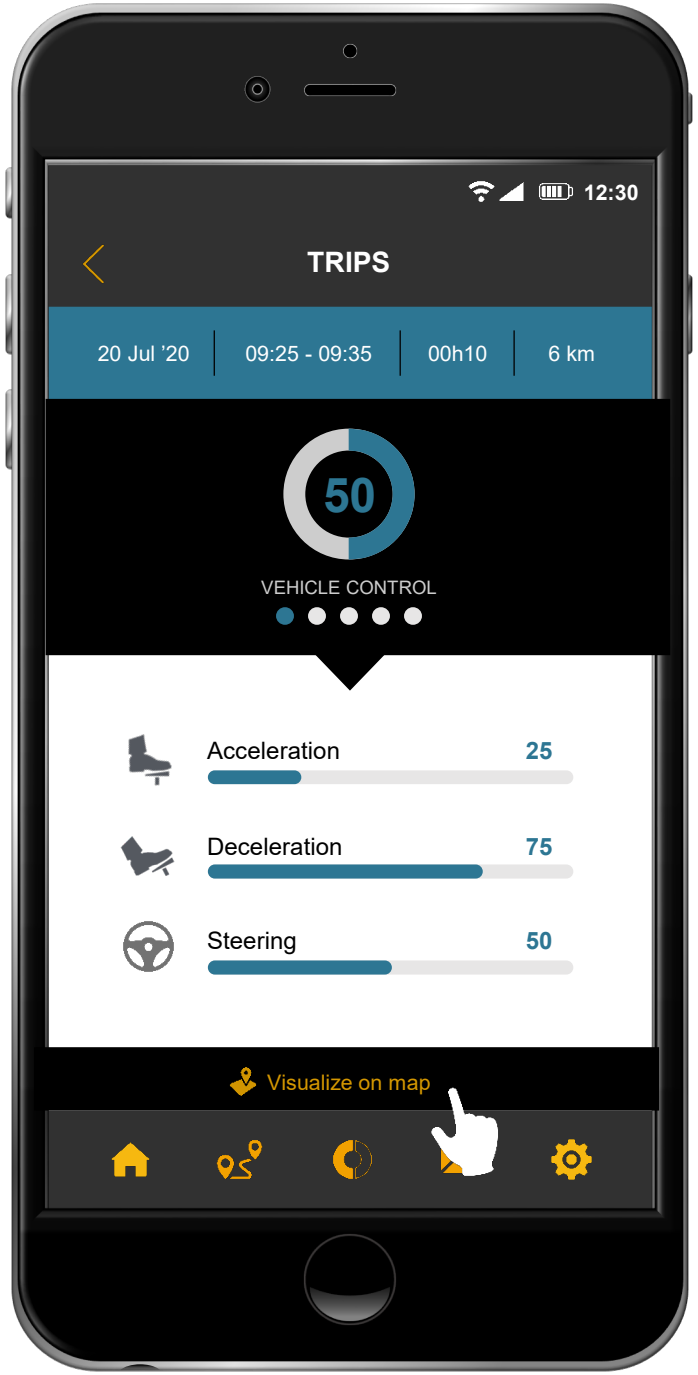

12:30
HOME
pros & cons
coping tips
goals & badges
leaderboard
survey
shop

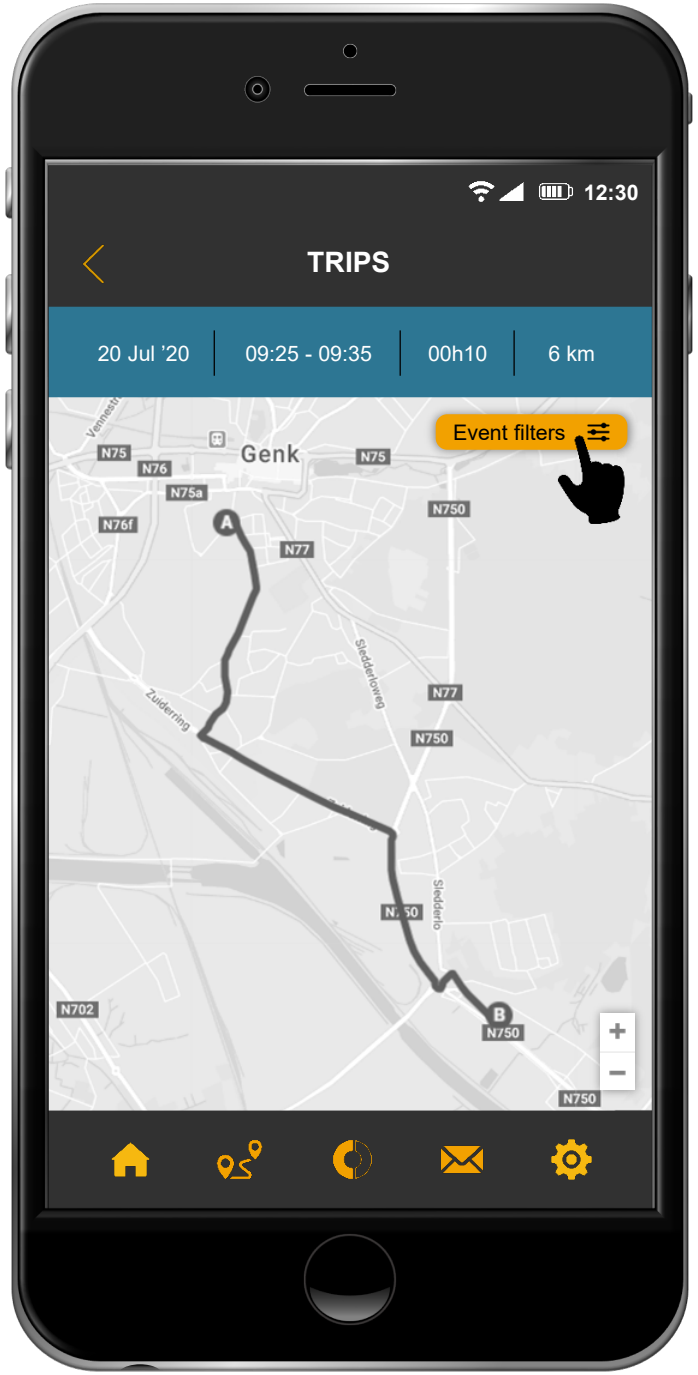
Always mentioned in case we work with multiple domains

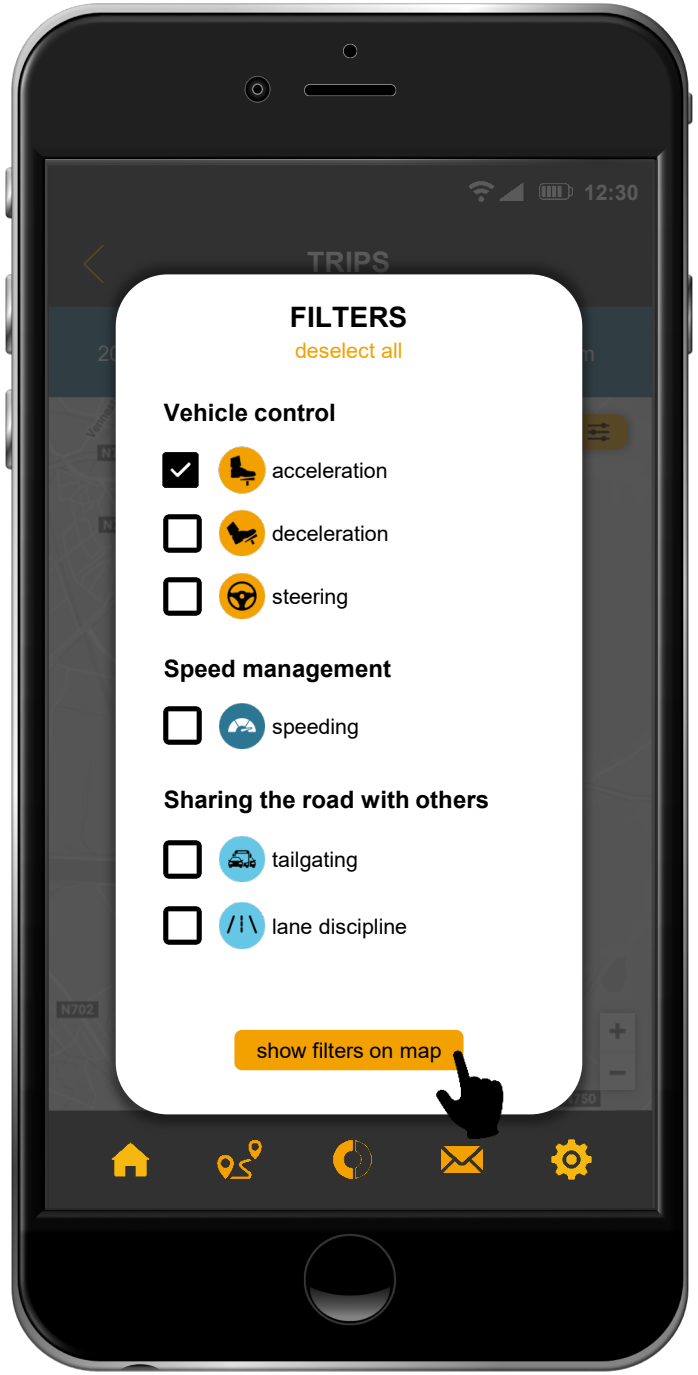


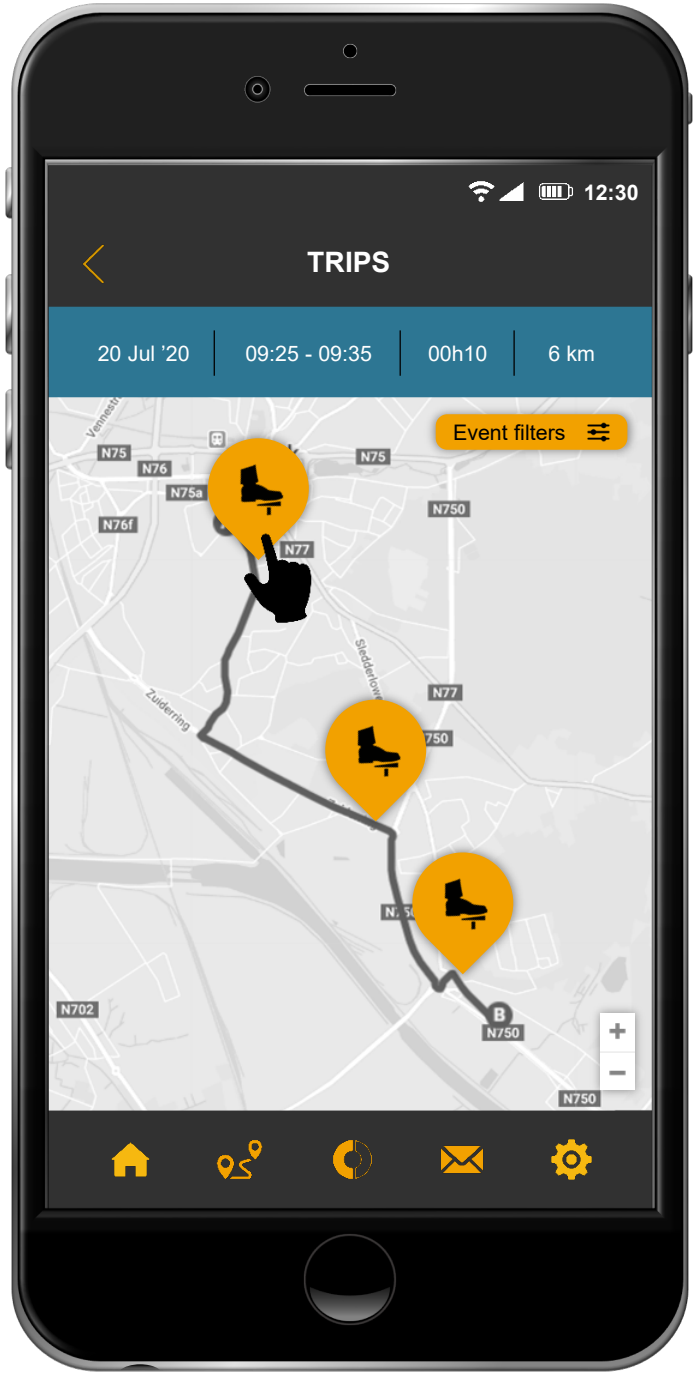

12:30
TRIPS
Mo 20 Jul '20
09:25 START
09:35 END
00h10 DURATION
6 KM
09:37 START
09:51 END
00h14 DURATION
13 KM
17:11 START
17:34 END
00h23 DURATION
20 KM

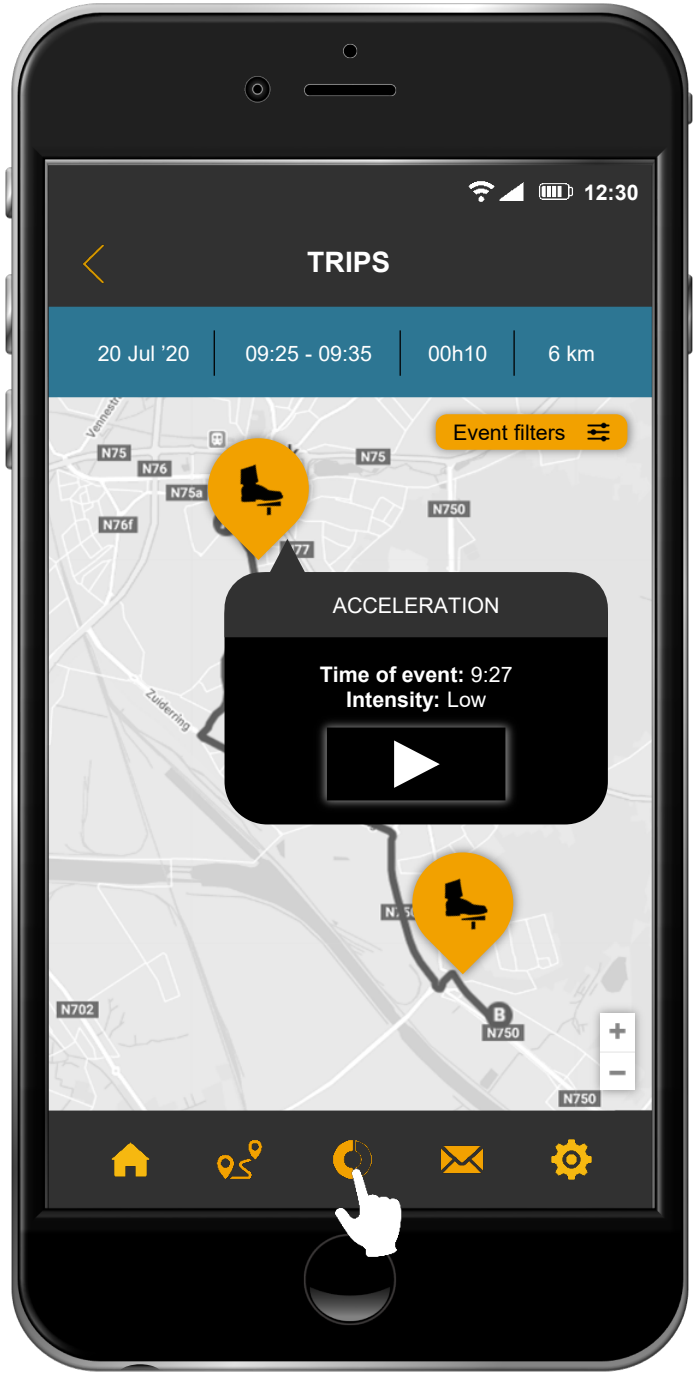

12:30
TRIPS
Mo 20 Jul '20
09:25 START
09:35 END
00h10 DURATION
6 KM
09:37 START
09:51 END
00h14 DURATION
13 KM
17:11 START
17:34 END
00h23 DURATION
20 KM

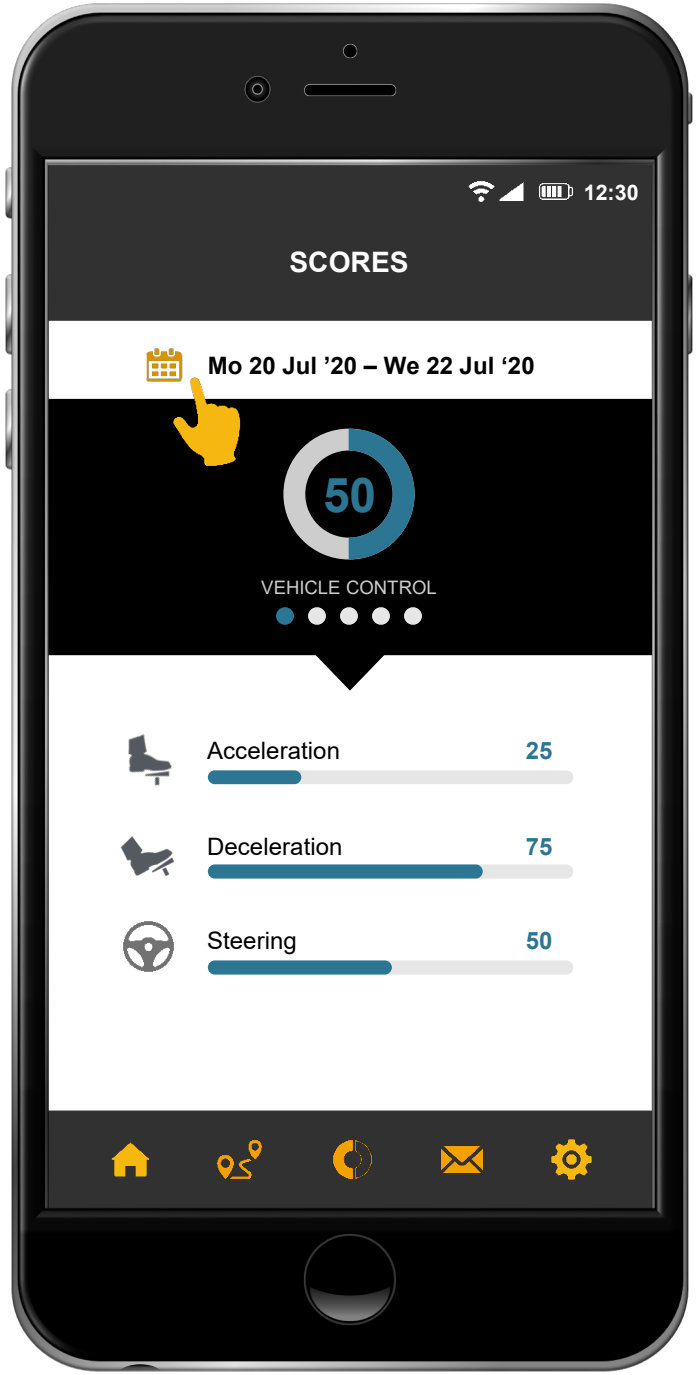

12:30
TRIPS
20 Jul '20
09:25 - 09:35
00h10
6 km
50
VEHICLE CONTROL
Acceleration
25
Deceleration
75
Steering
50
Visualize on map

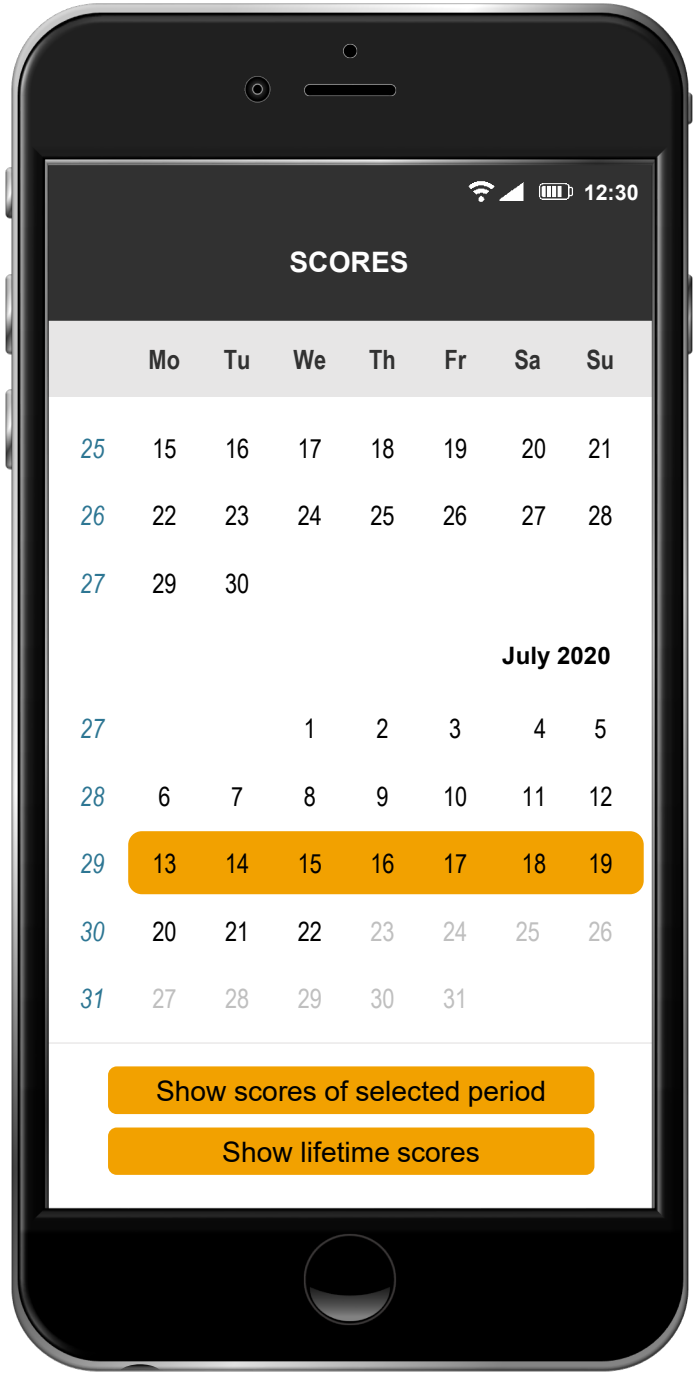

12:30
TRIPS
20 Jul '20
09:25 - 09:35
00h10
6 km
Event filters
Genk
N75
N76
N75a
N76f
N77
N750
A
B
N702

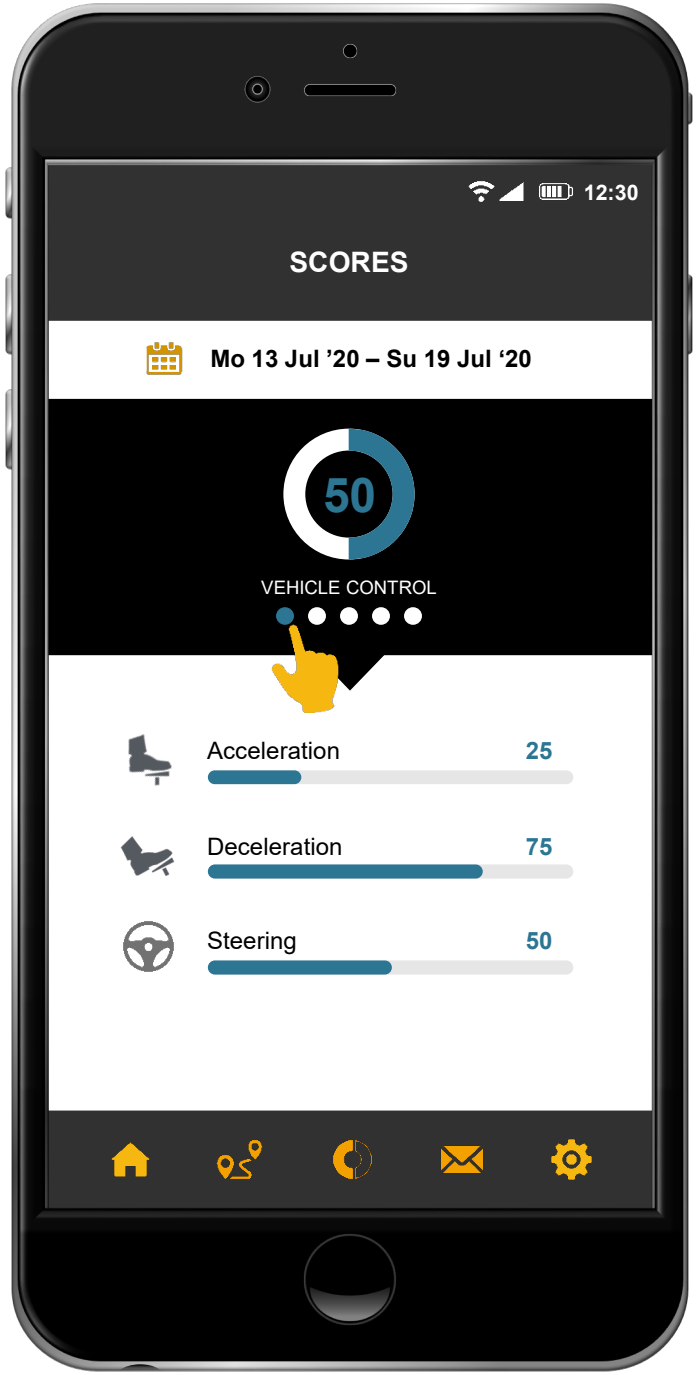

12:30
TRIPS
FILTERS
deselect all
Vehicle control
acceleration
deceleration
steering
Speed management
speeding
Sharing the road with others
tailgating
lane discipline
show filters on map

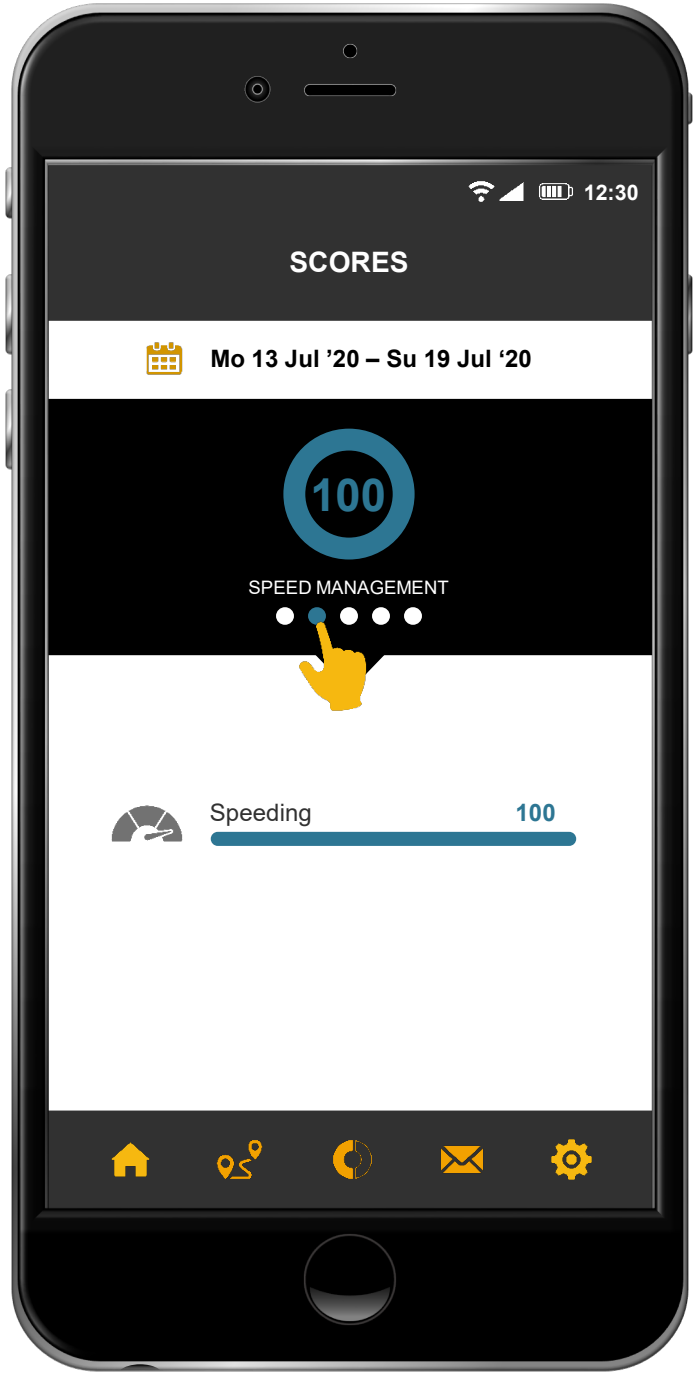

12:30
TRIPS
20 Jul '20
09:25 - 09:35
00h10
6 km
Event filters
N75
N76
N75a
N76f
N77
N750
N702

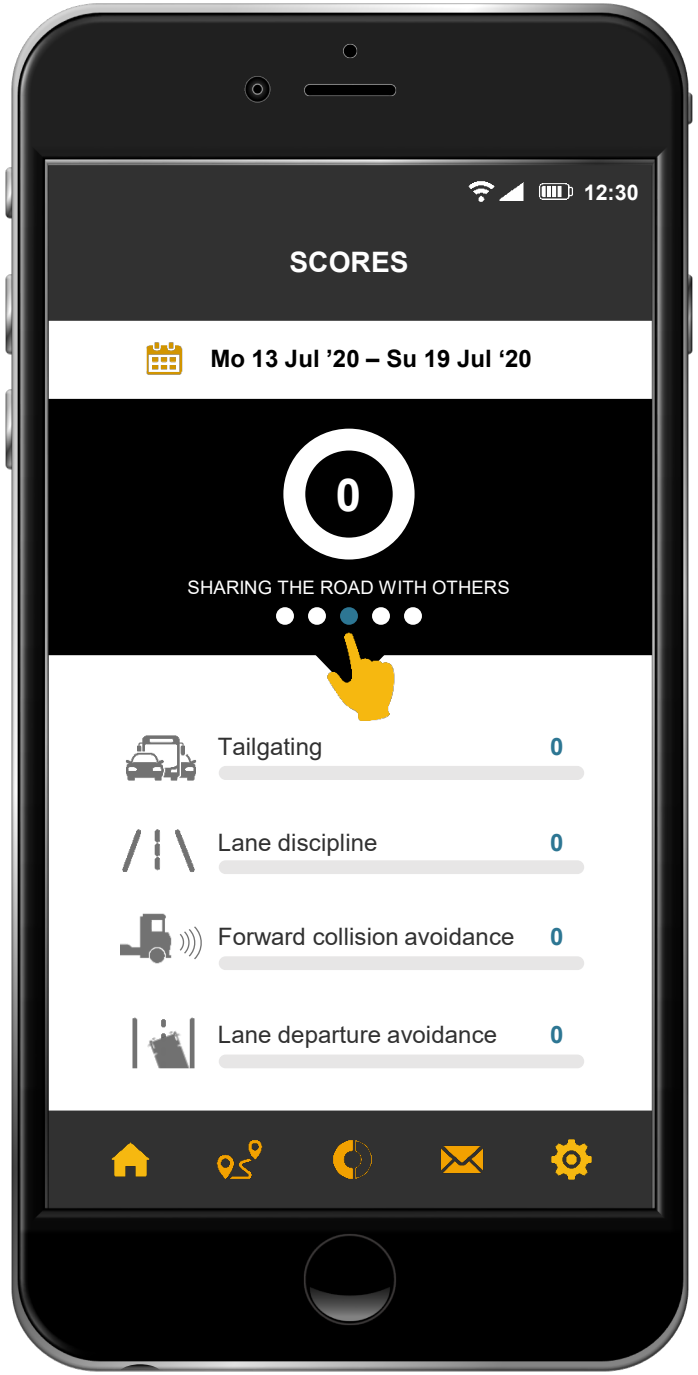

12:30
TRIPS
20 Jul '20
09:25 - 09:35
00h10
6 km
Event filters
ACCELERATION
Time of event: 9:27
Intensity: Low
N75
N76
N75a
N76f
N750
N702


12:30
SCORES
Mo 20 Jul '20 – We 22 Jul '20
50
VEHICLE CONTROL
Acceleration
25
Deceleration
75
Steering
50

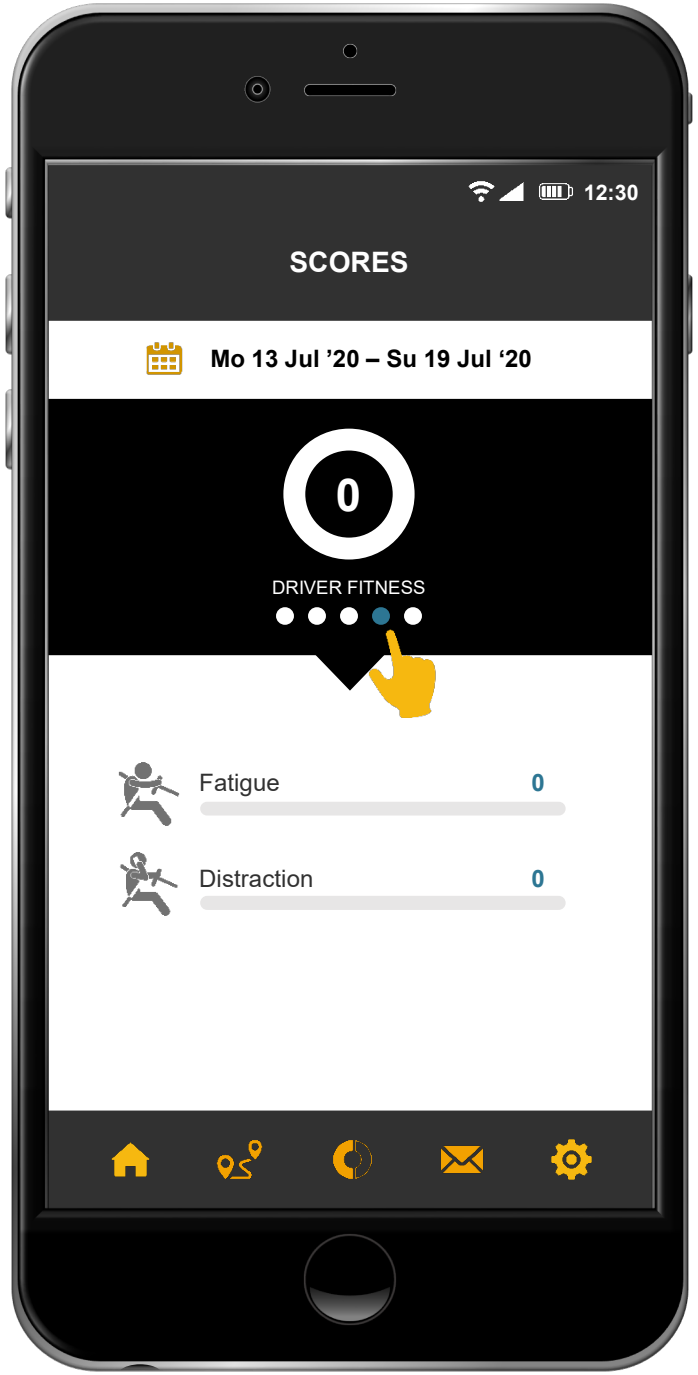

12:30
SCORES
Mo Tu We Th Fr Sa Su
25 15 16 17 18 19 20 21
26 22 23 24 25 26 27 28
27 29 30
July 2020
27 1 2 3 4 5
28 6 7 8 9 10 11 12
29 13 14 15 16 17 18 19
30 20 21 22 23 24 25 26
31 27 28 29 30 31
Show scores of selected period
Show lifetime scores

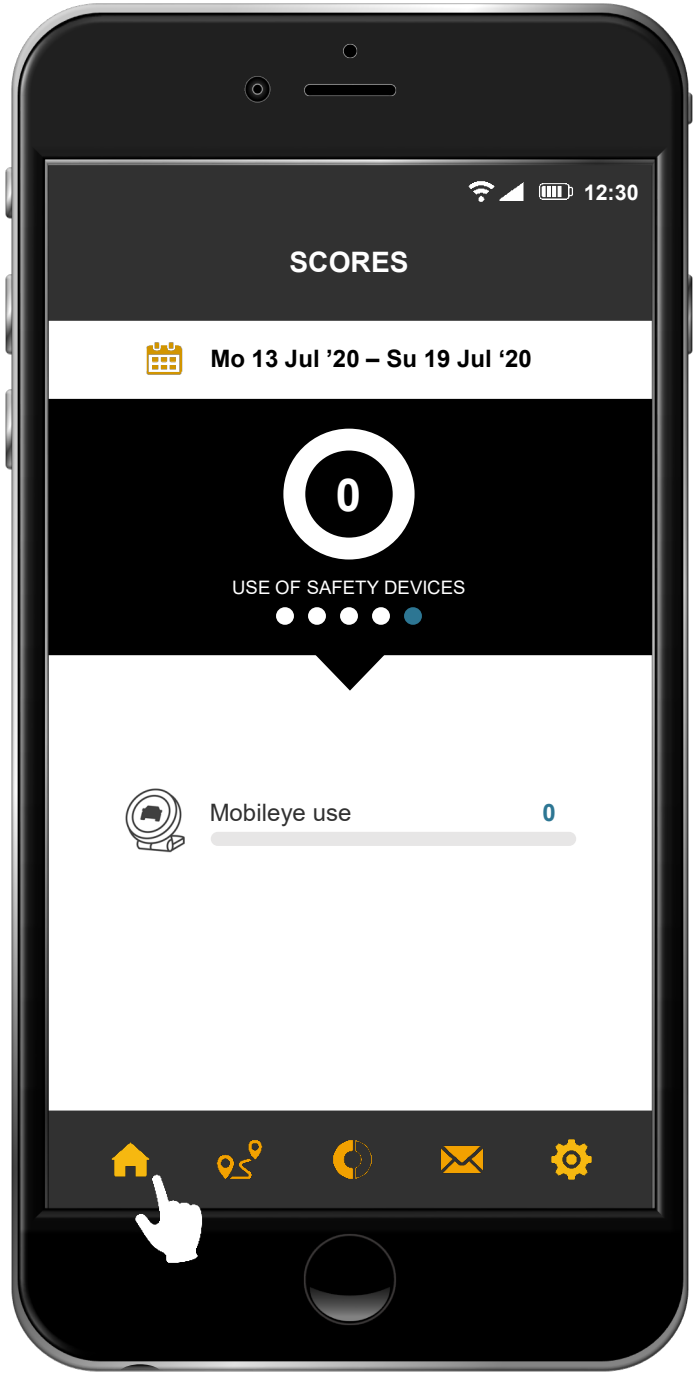

12:30
SCORES
Mo 13 Jul '20 – Su 19 Jul '20
50
VEHICLE CONTROL
Acceleration
25
Deceleration
75
Steering
50

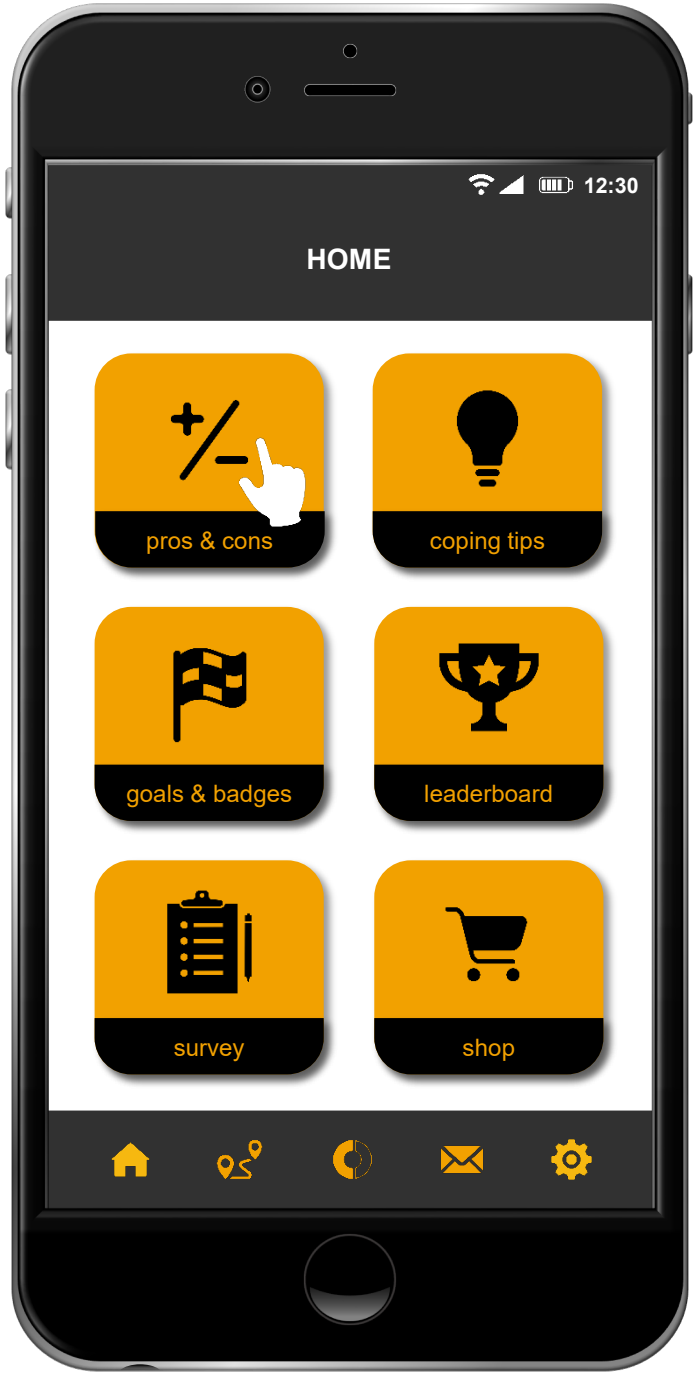

12:30
SCORES
Mo 13 Jul '20 – Su 19 Jul '20
100
SPEED MANAGEMENT
Speeding
100



Vulnerable road user avoidance 0


12:30
SCORES
Mo 13 Jul '20 – Su 19 Jul '20
0
DRIVER FITNESS
Fatigue
0
Distraction
0


12:30
SCORES
Mo 13 Jul '20 – Su 19 Jul '20
0
USE OF SAFETY DEVICES
Mobileye use
0


12:30
HOME
pros & cons
coping tips
goals & badges
leaderboard
survey
shop

12:30

PROS & CONS

Pros | Cons

VEHICLE CONTROL

TITLE OF THE PRO

acceleration

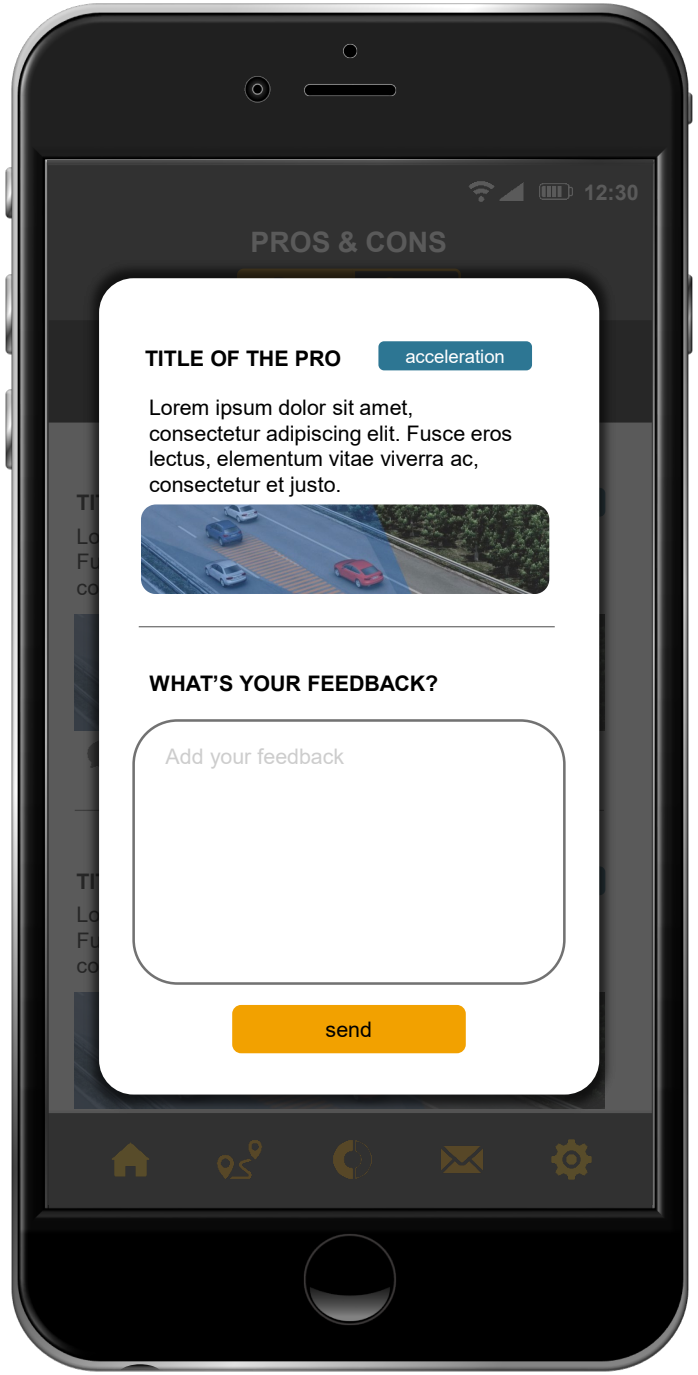
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce eros lectus, elementum vitae viverra ac, consectetur et justo.

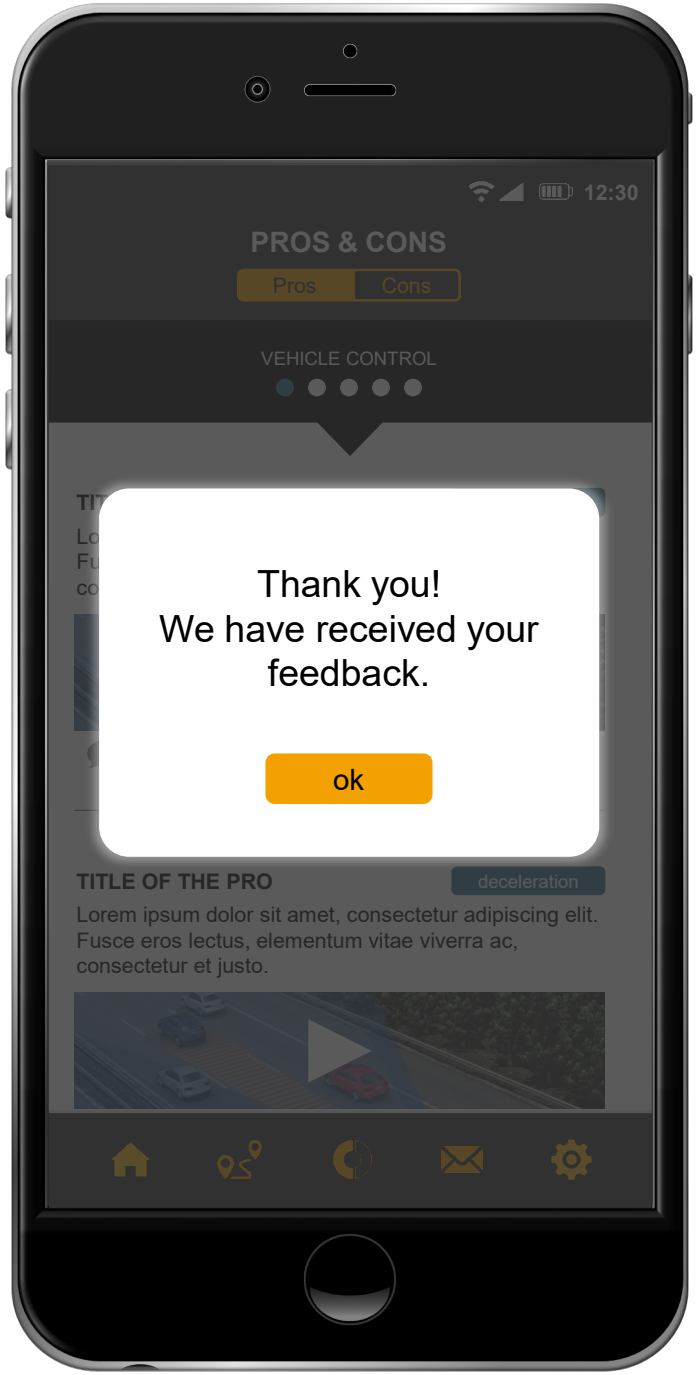
15 14

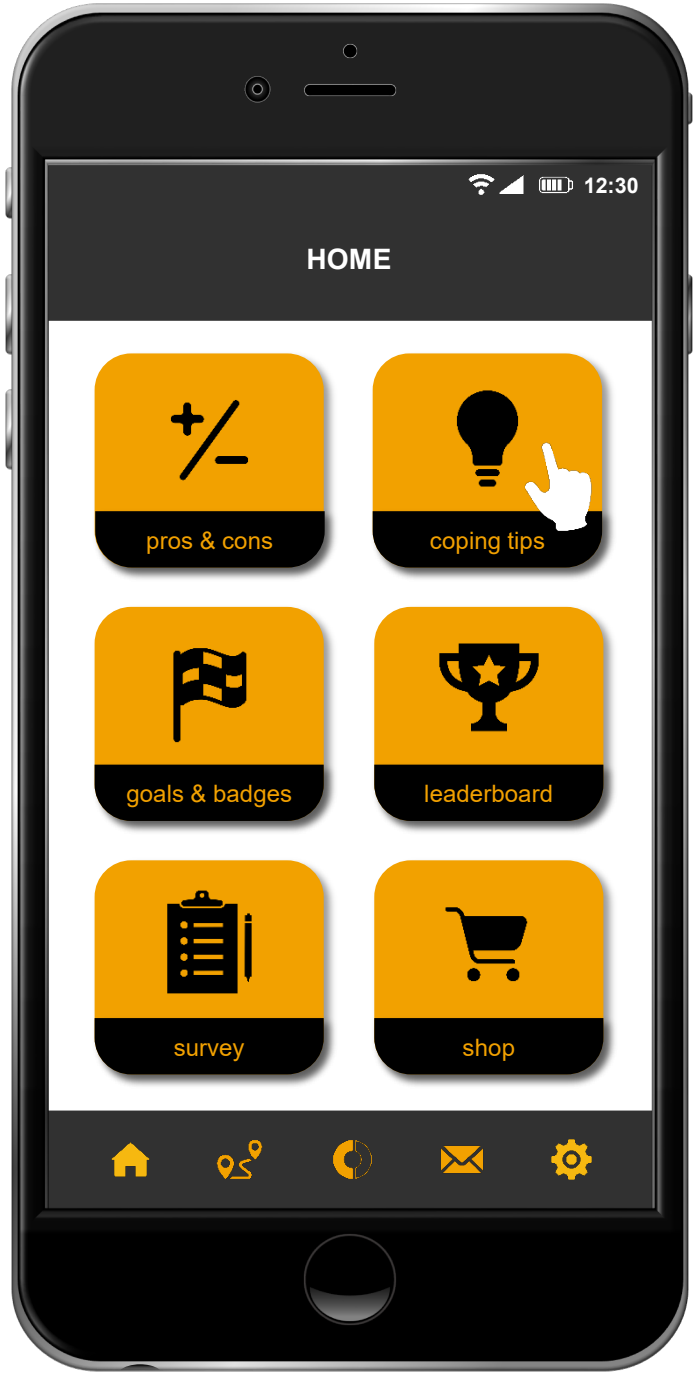
TITLE OF THE PRO

deceleration

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce eros lectus, elementum vitae viverra ac, consectetur et justo.


12:30
PROS & CONS
TITLE OF THE PRO
acceleration
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce eros lectus, elementum vitae viverra ac, consectetur et justo.
WHAT'S YOUR FEEDBACK?
Add your feedback
send


12:30
PROS & CONS
Pros
Cons
VEHICLE CONTROL
Thank you!
We have received your feedback.
ok
TITLE OF THE PRO
deceleration
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce eros lectus, elementum vitae viverra ac, consectetur et justo.


12:30
HOME
pros & cons
coping tips
goals & badges
leaderboard
survey
shop

12:30

COPING TIPS

VEHICLE CONTROL

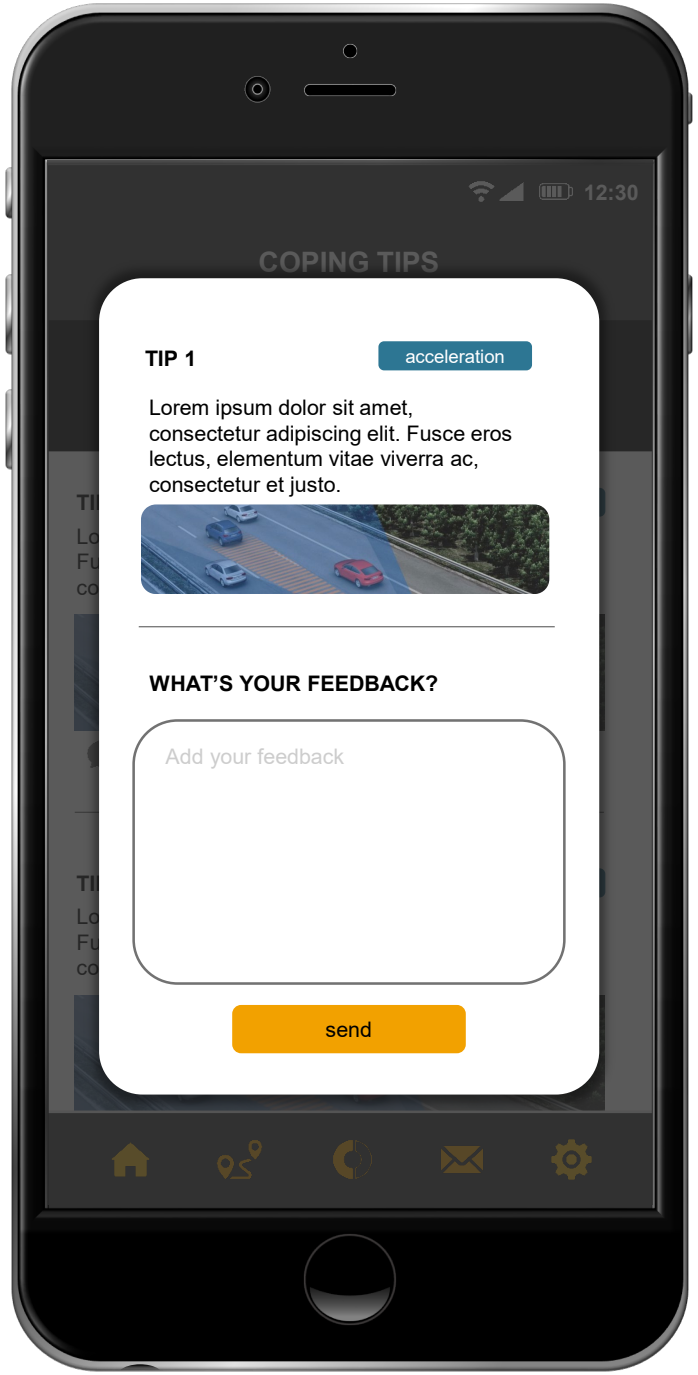
TIP 1 acceleration

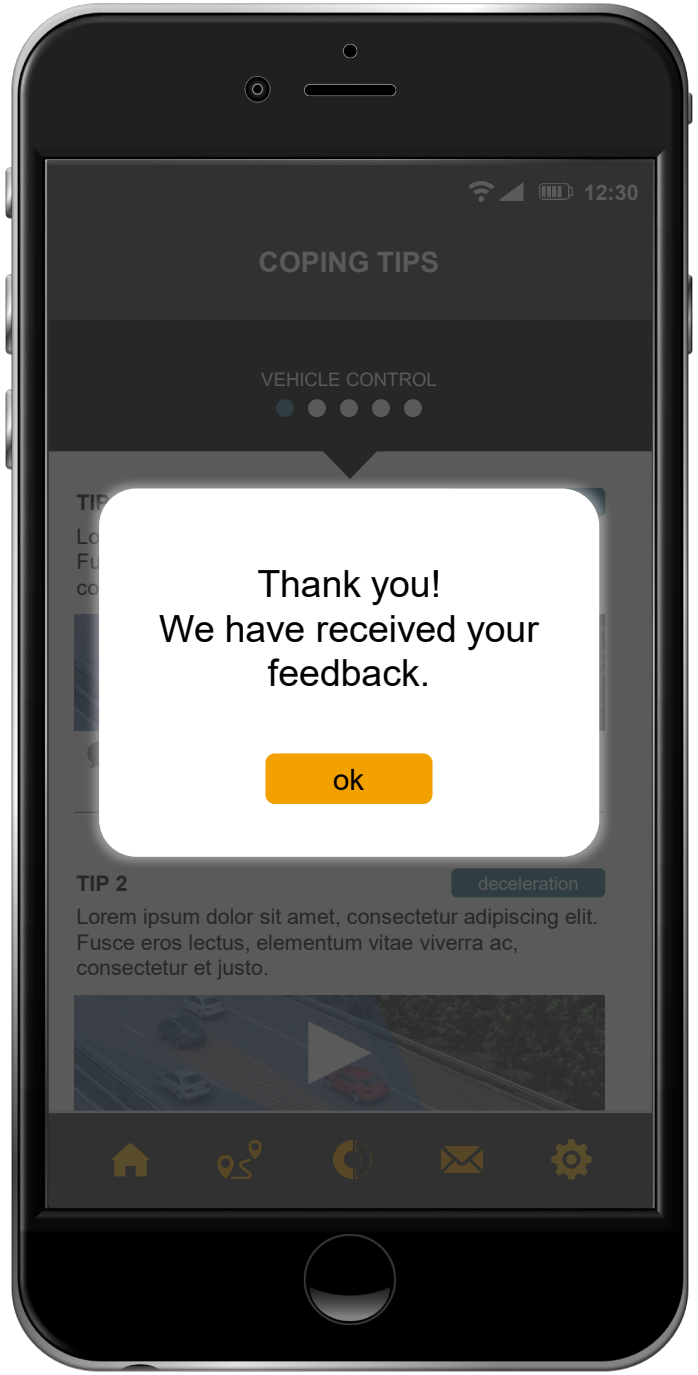
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce eros lectus, elementum vitae viverra ac, consectetur et justo.

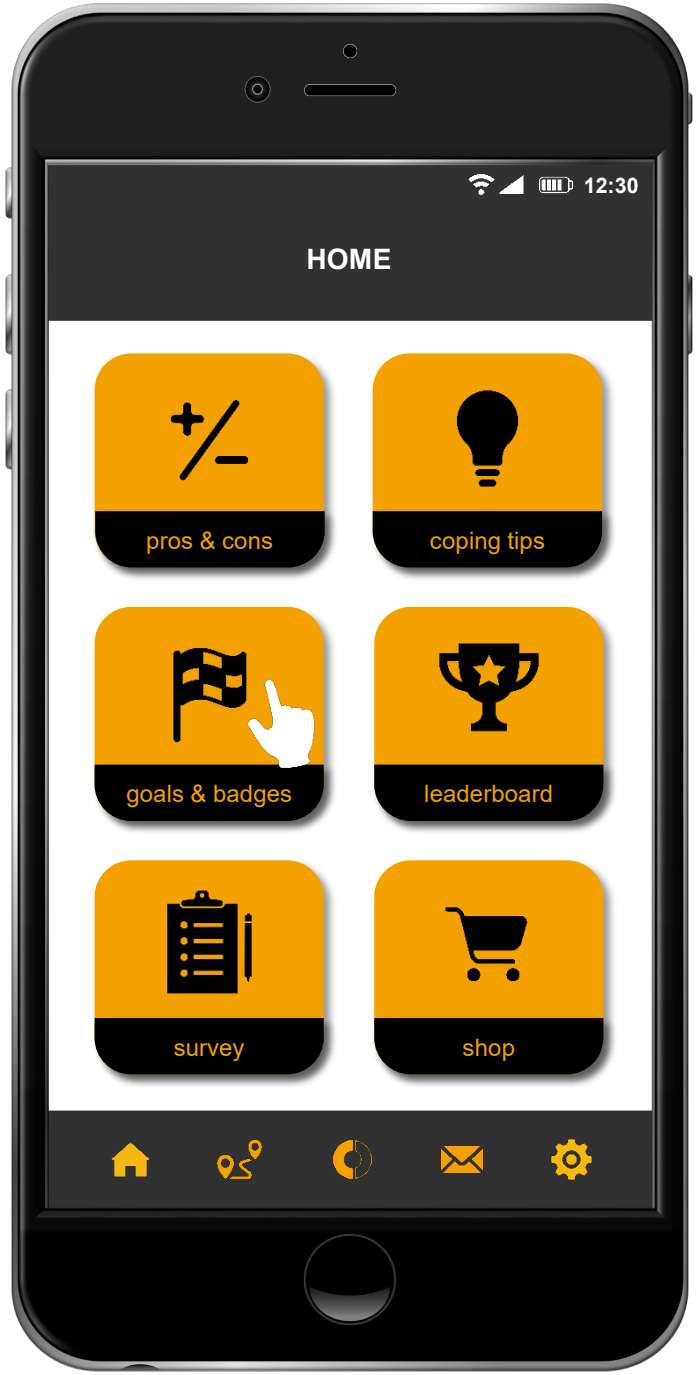
15 14

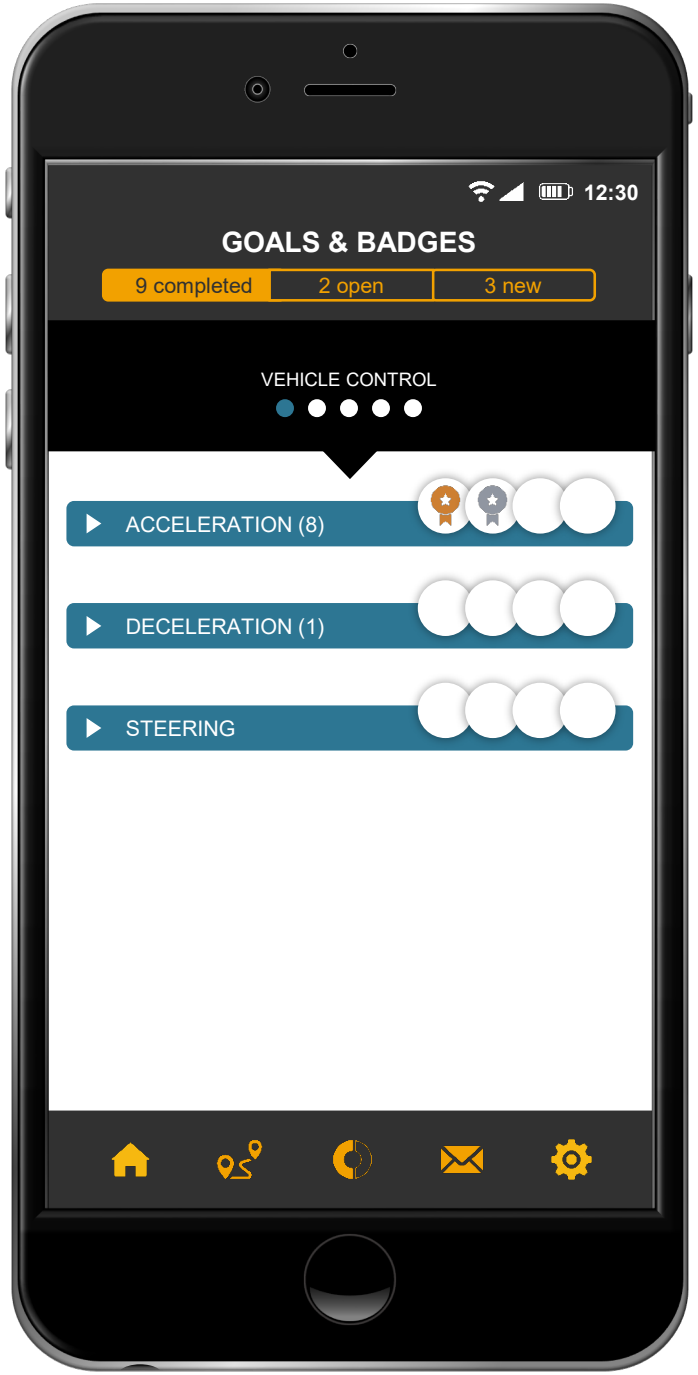
TIP 2 deceleration

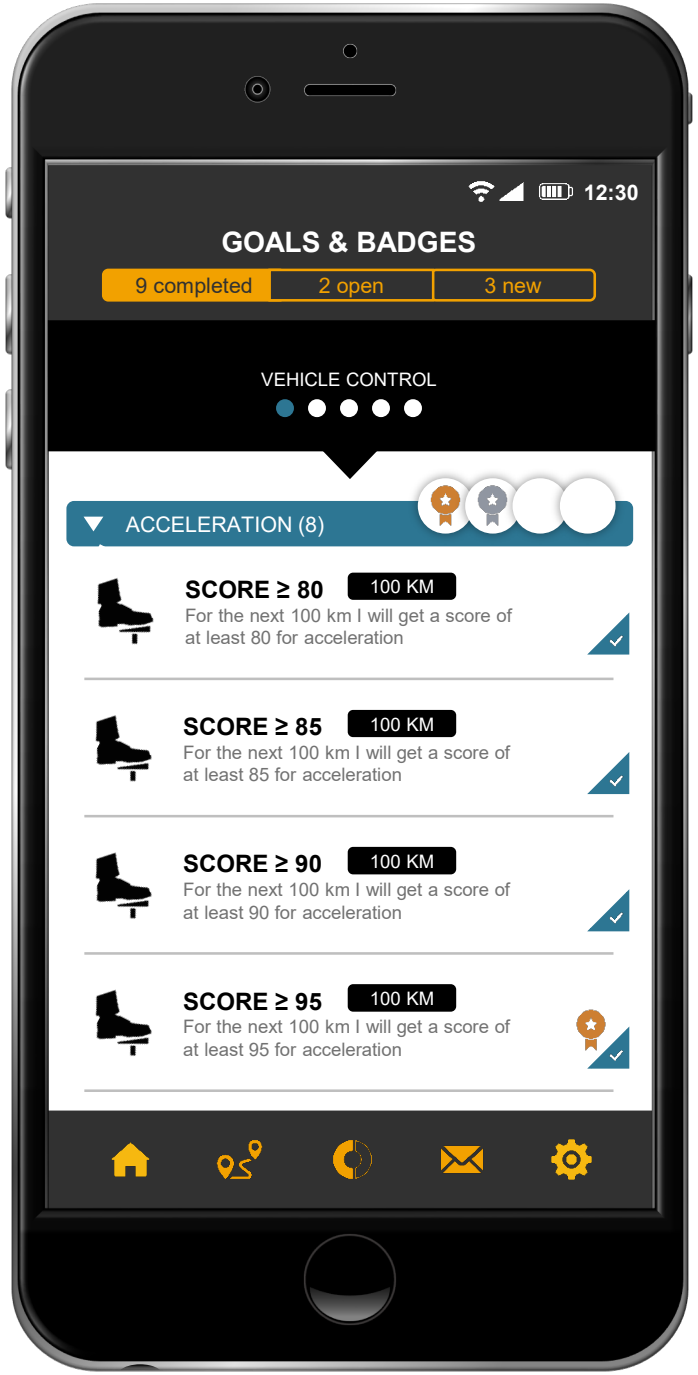
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce eros lectus, elementum vitae viverra ac, consectetur et justo.


12:30
COPING TIPS
TIP 1
acceleration
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce eros lectus, elementum vitae viverra ac, consectetur et justo.
WHAT'S YOUR FEEDBACK?
Add your feedback
send


12:30
COPING TIPS
VEHICLE CONTROL
Thank you!
We have received your feedback.
ok
TIP 2
deceleration
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Fusce eros lectus, elementum vitae viverra ac, consectetur et justo.


12:30
HOME
pros & cons
coping tips
goals & badges
leaderboard
survey
shop


12:30
GOALS & BADGES
9 completed
2 open
3 new
VEHICLE CONTROL
ACCELERATION (8)
DECELERATION (1)
STEERING



SCORE ≥ 80 250 KM
For the next 250 km I will get a score of at least 80 for acceleration

SCORE ≥ 85 250 KM
For the next 250 km I will get a score of at least 85 for acceleration

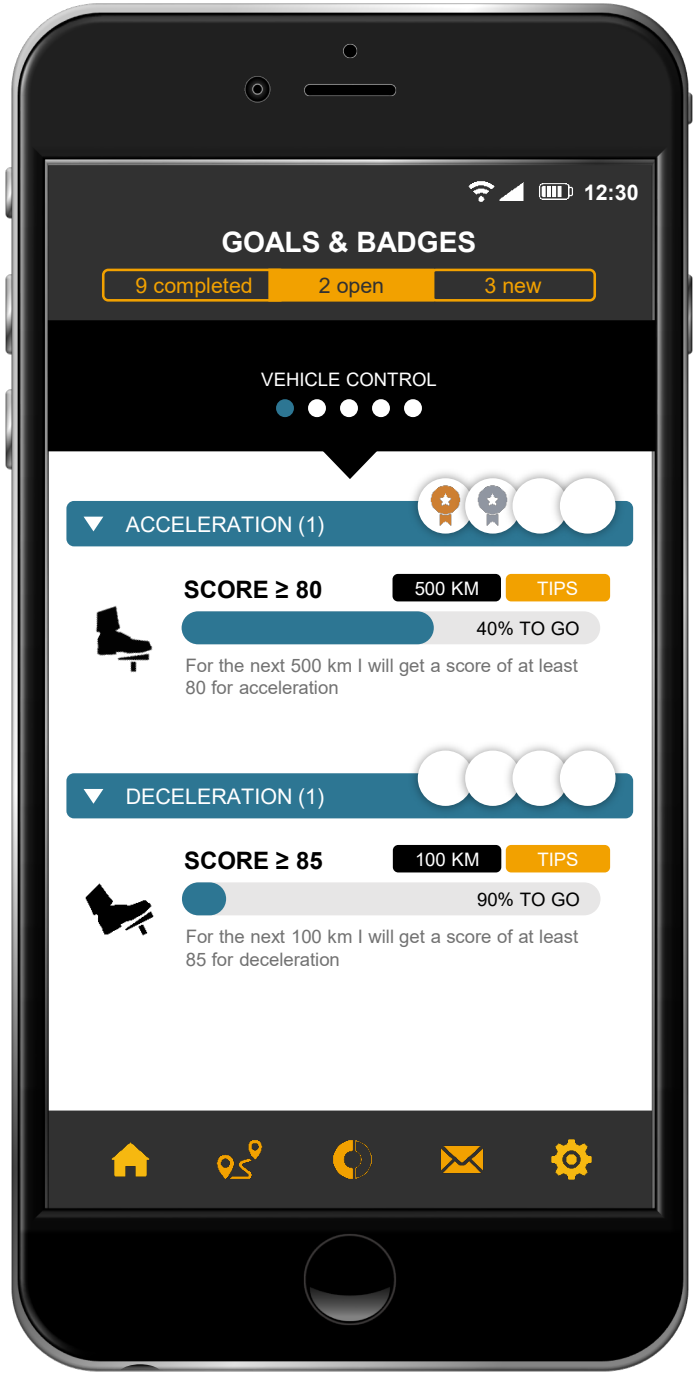
SCORE ≥ 90 250 KM
For the next 250 km I will get a score of at least 90 for acceleration

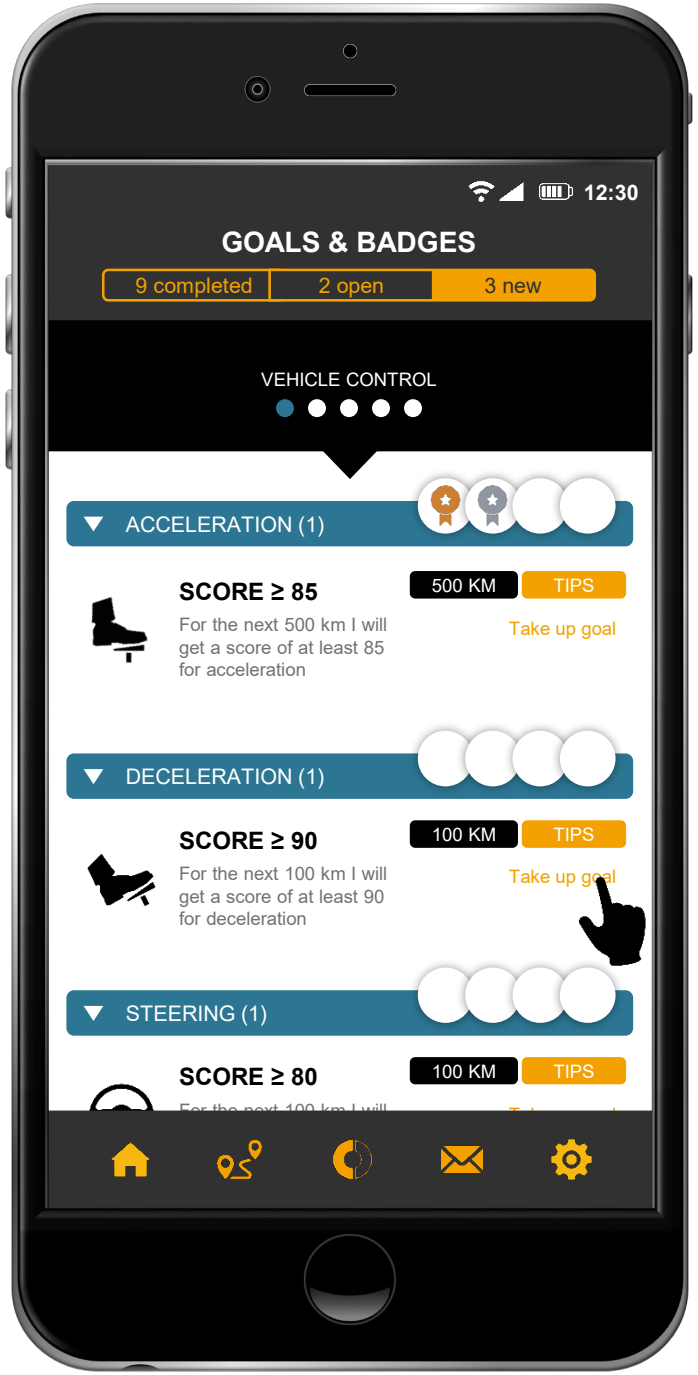
SCORE ≥ 95 250 KM
For the next 250 km I will get a score of at least 95 for acceleration

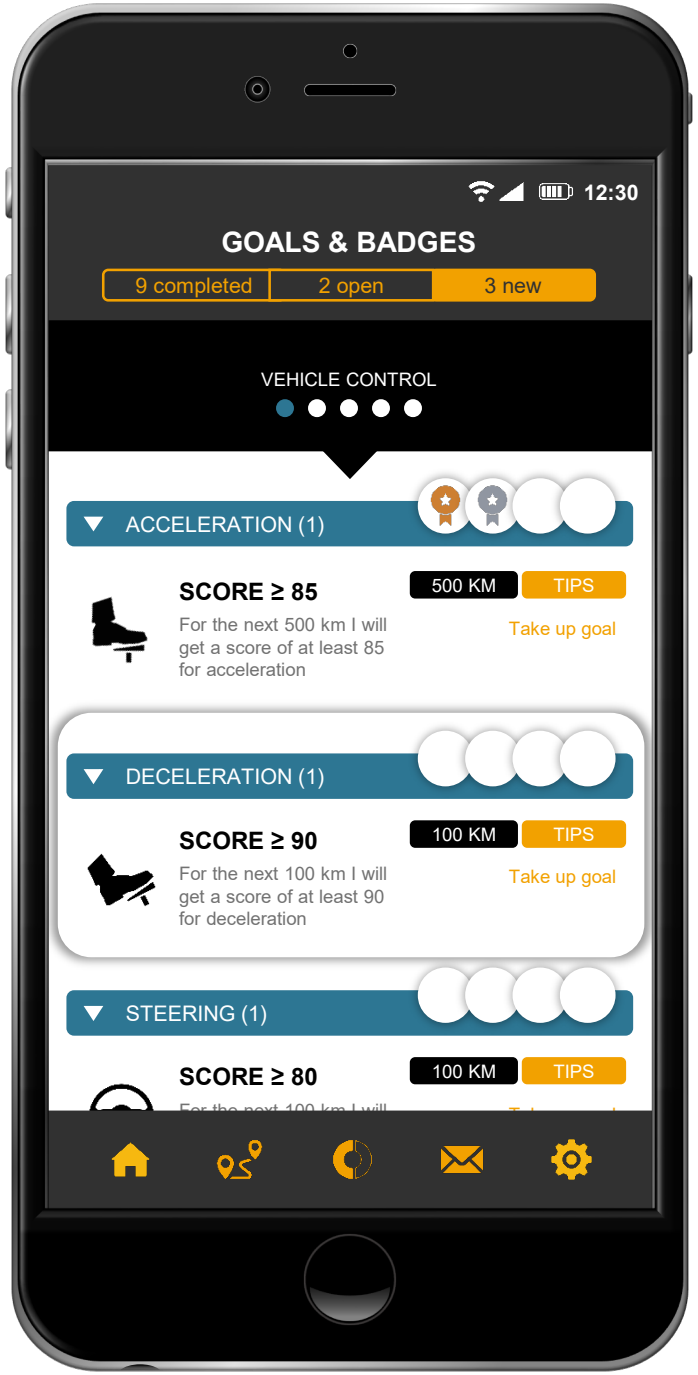
DECELERATION (1)

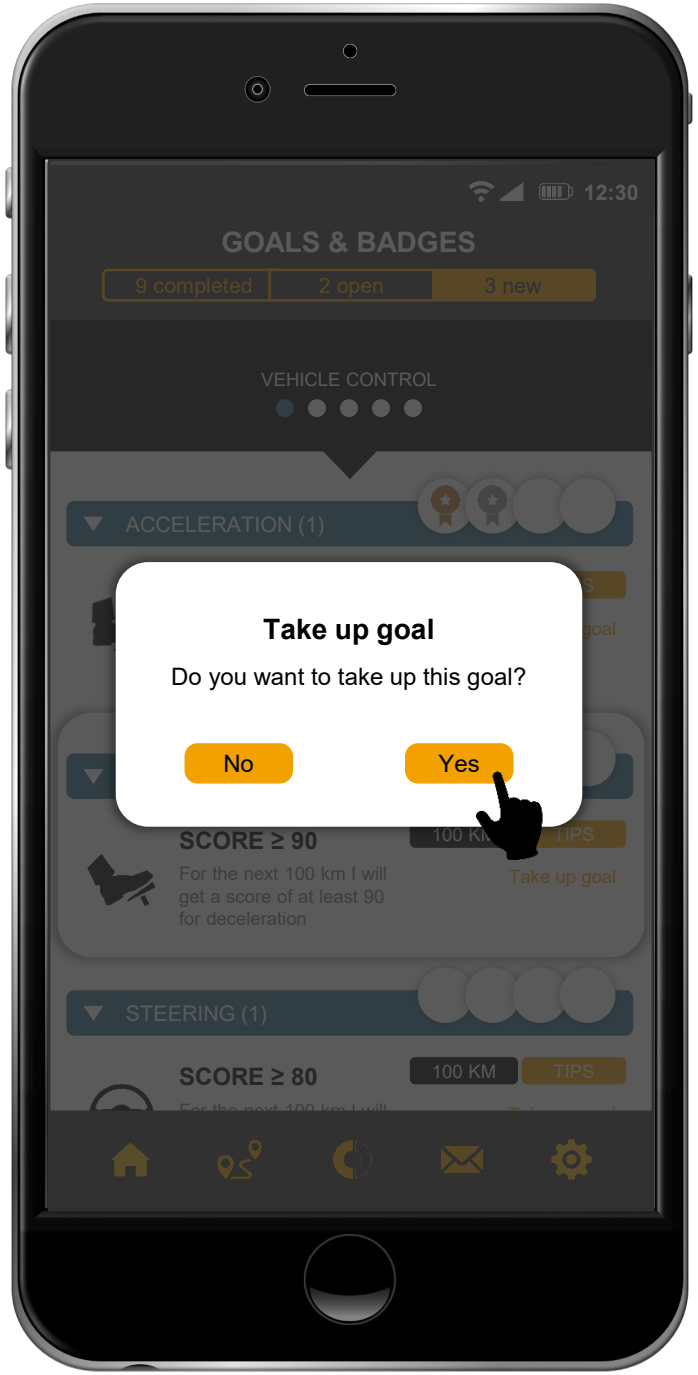
SCORE ≥ 80 100 KM
For the next 100 km I will get a score of at least 80 for deceleration

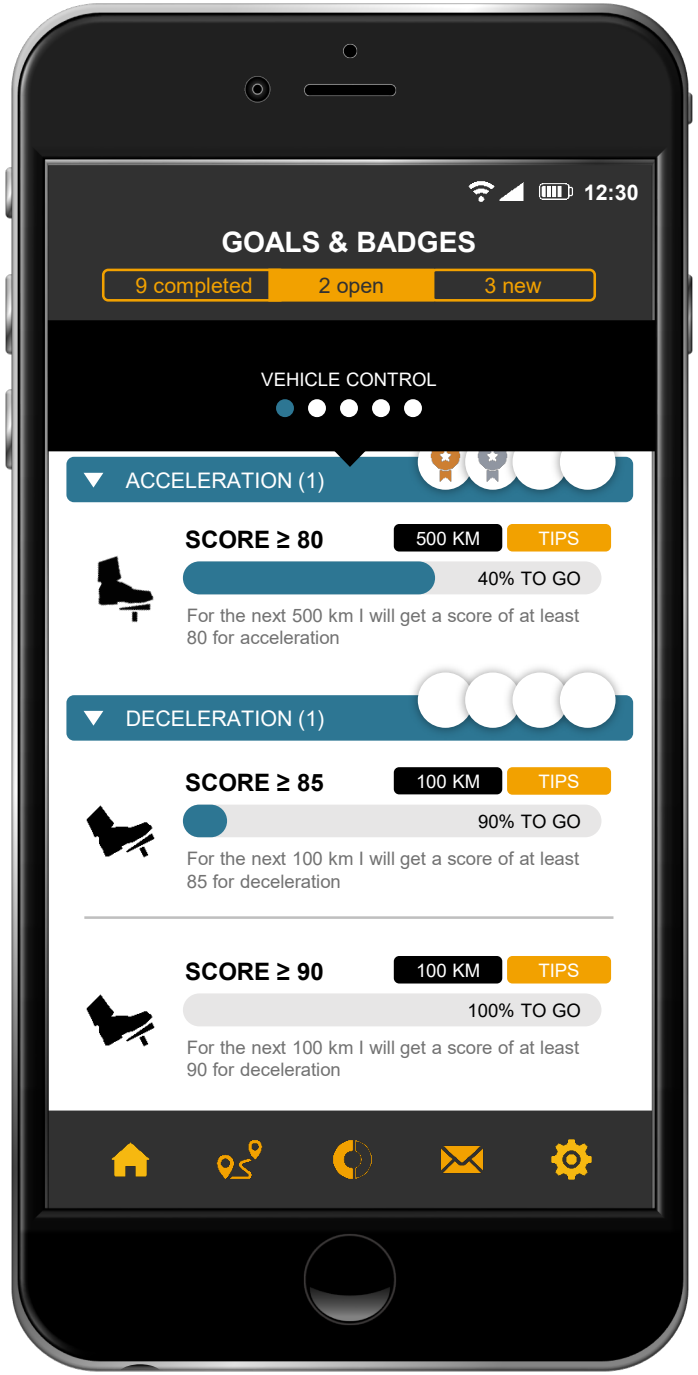
STEERING


12:30
GOALS & BADGES
9 completed
2 open
3 new
VEHICLE CONTROL
ACCELERATION (1)
SCORE ≥ 80
500 KM
TIPS
40% TO GO
For the next 500 km I will get a score of at least 80 for acceleration
DECELERATION (1)
SCORE ≥ 85
100 KM
TIPS
90% TO GO
For the next 100 km I will get a score of at least 85 for deceleration

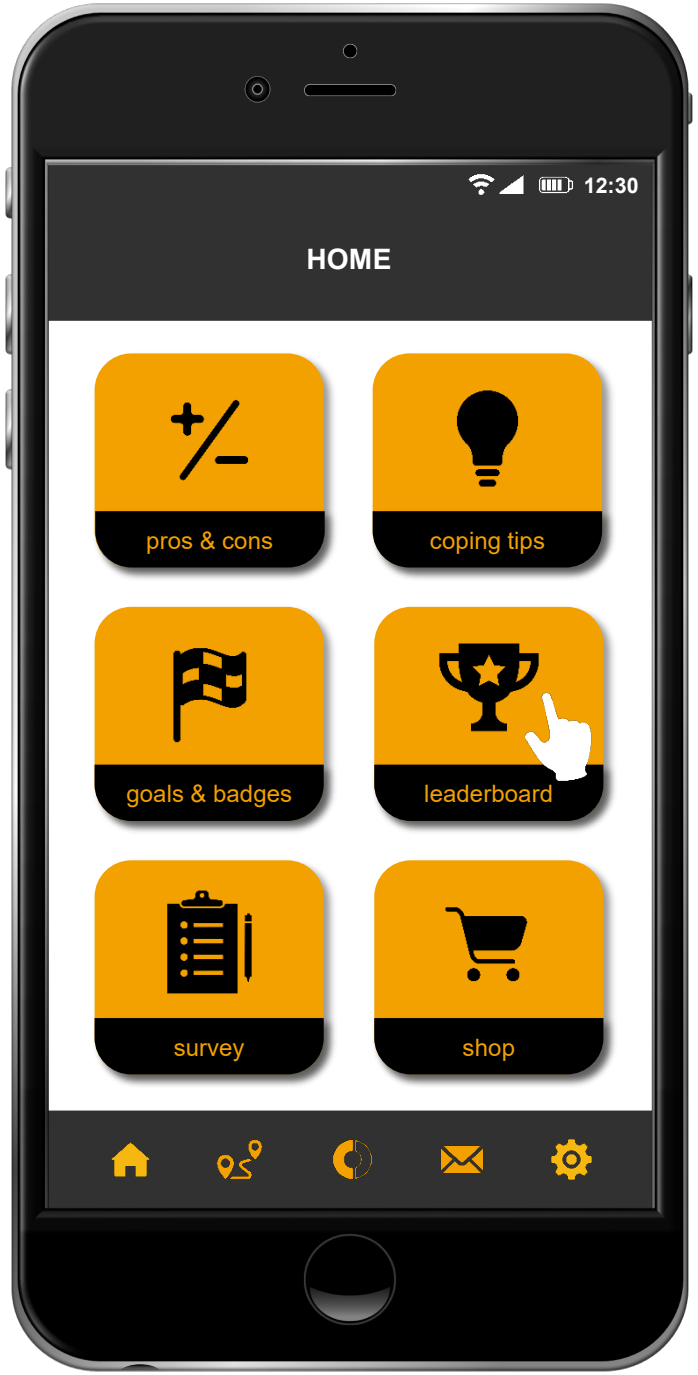

12:30
GOALS & BADGES
9 completed
2 open
3 new
VEHICLE CONTROL
ACCELERATION (1)
SCORE ≥ 85
For the next 500 km I will get a score of at least 85 for acceleration
500 KM
TIPS
Take up goal
DECELERATION (1)
SCORE ≥ 90
For the next 100 km I will get a score of at least 90 for deceleration
100 KM
TIPS
Take up goal
STEERING (1)
SCORE ≥ 80
100 KM
TIPS

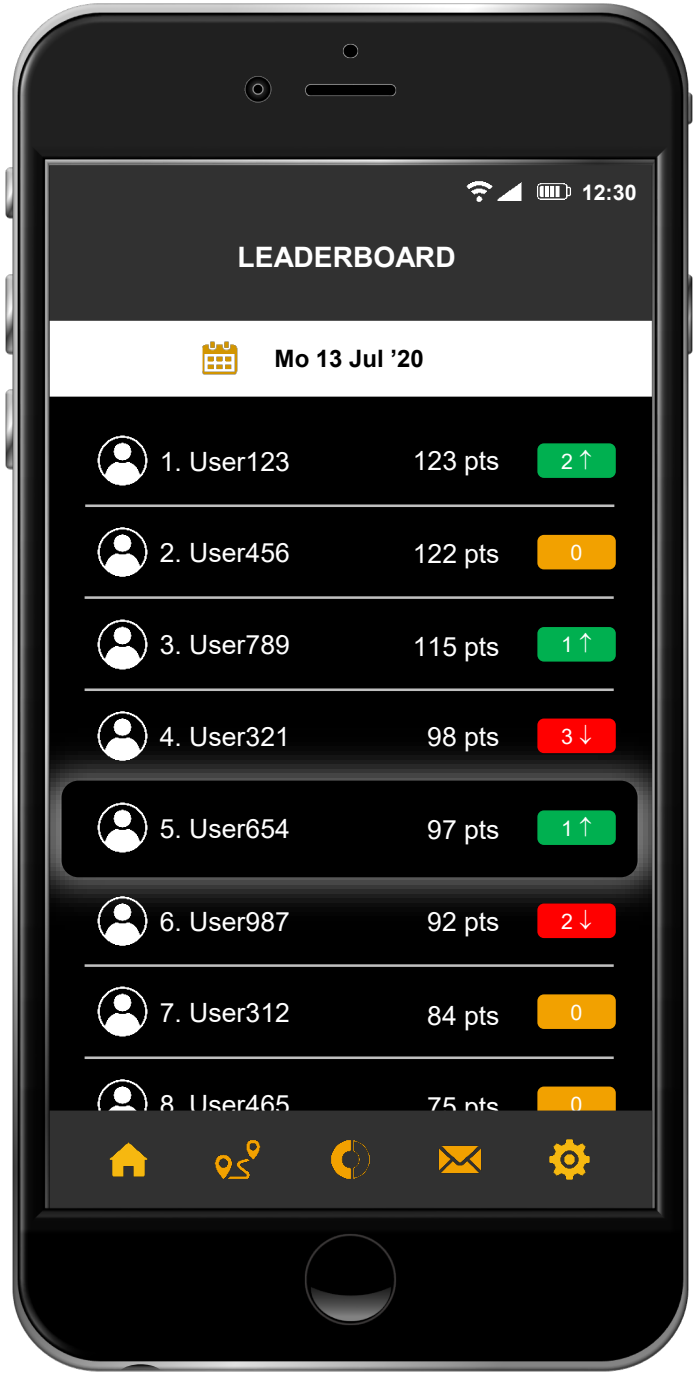

12:30
GOALS & BADGES
9 completed
2 open
3 new
VEHICLE CONTROL
ACCELERATION (1)
SCORE ≥ 85
For the next 500 km I will get a score of at least 85 for acceleration
500 KM
TIPS
Take up goal
DECELERATION (1)
SCORE ≥ 90
For the next 100 km I will get a score of at least 90 for deceleration
100 KM
TIPS
Take up goal
STEERING (1)
SCORE ≥ 80
100 KM
TIPS

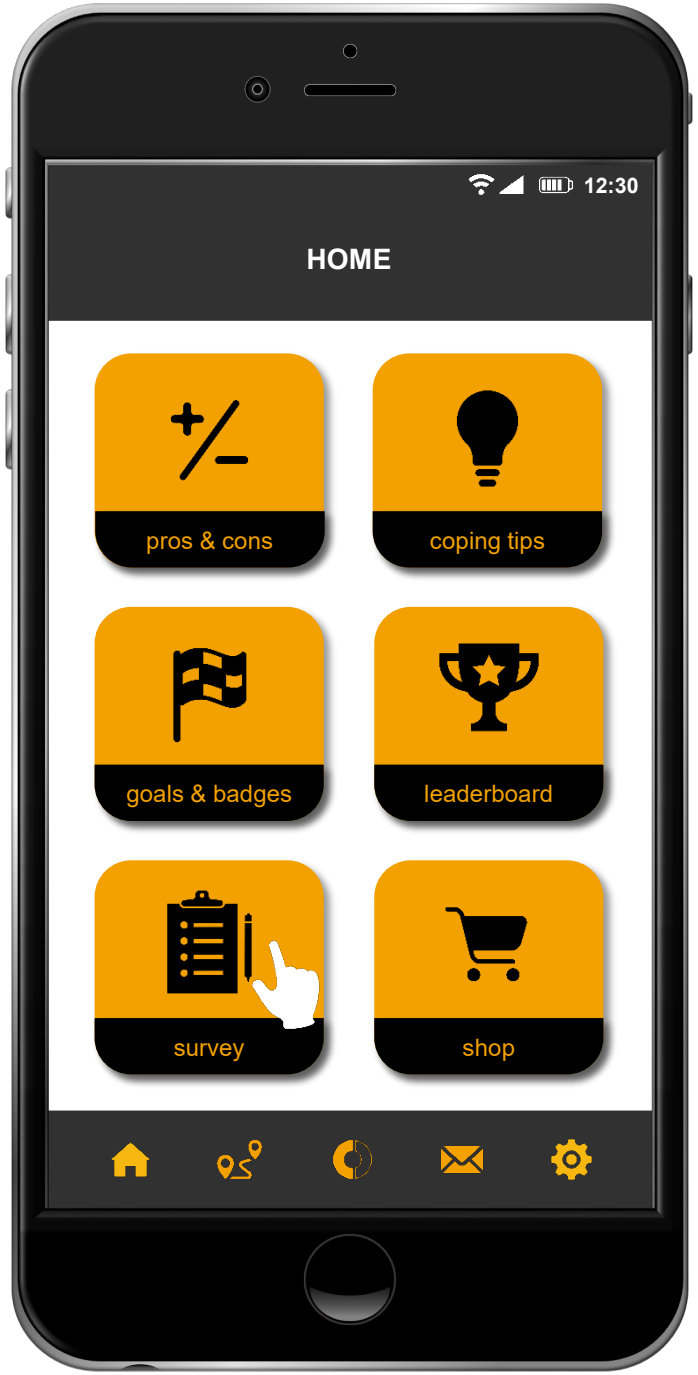

12:30
GOALS & BADGES
9 completed
2 open
3 new
VEHICLE CONTROL
ACCELERATION (1)
Take up goal
Do you want to take up this goal?
No
Yes
SCORE ≥ 90
For the next 100 km I will get a score of at least 90 for deceleration
100 KM
TIPS
Take up goal
STEERING (1)
SCORE ≥ 80
100 KM
TIPS

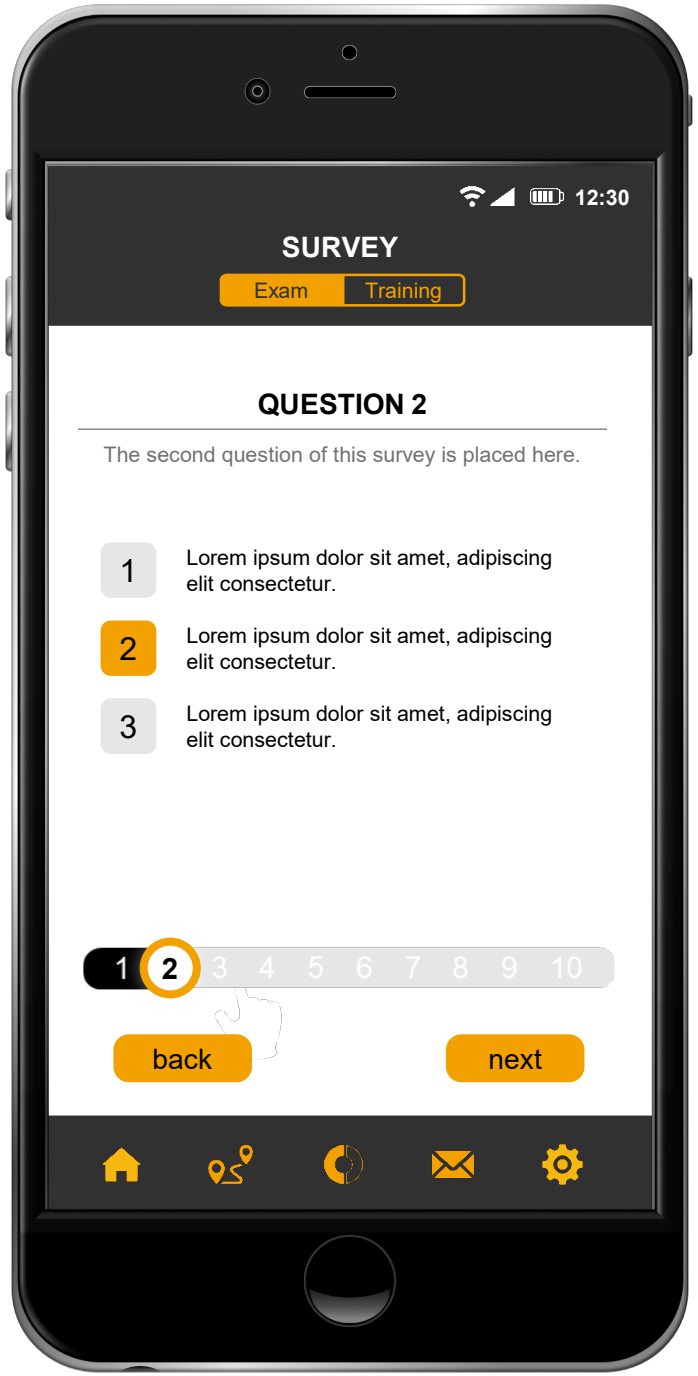


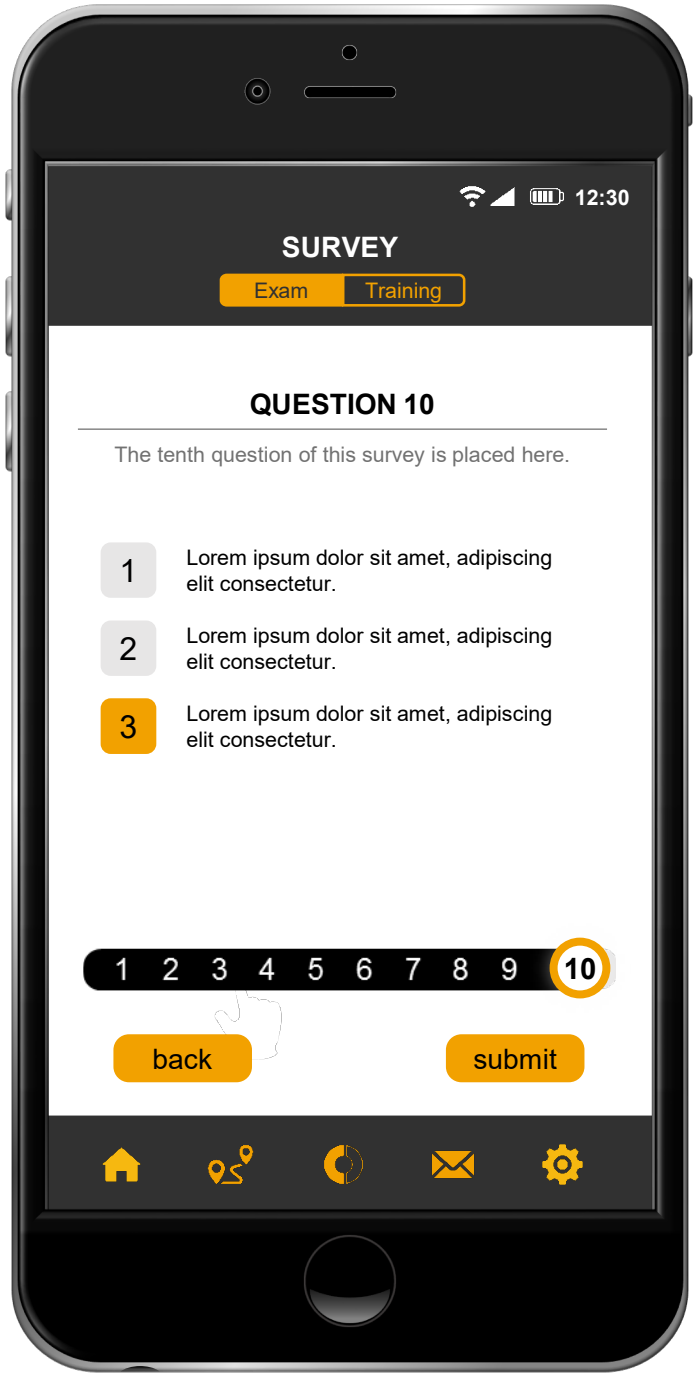
New goal is added

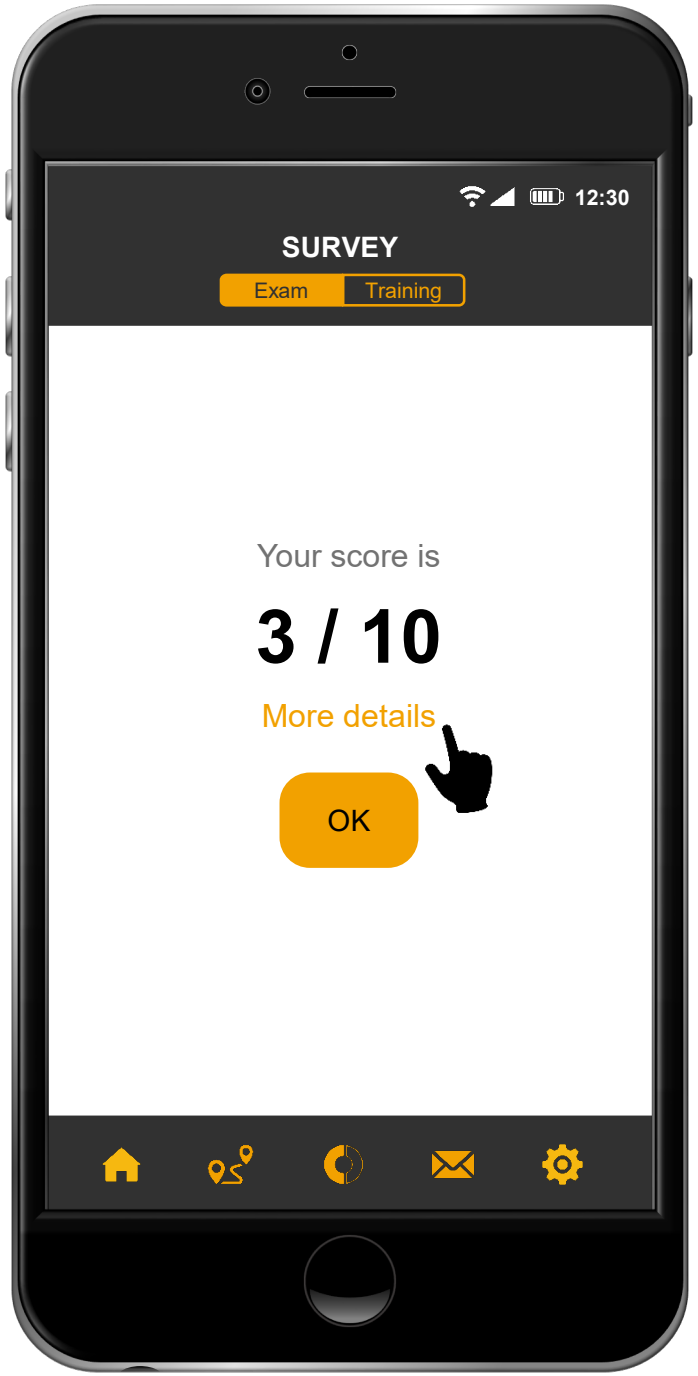

12:30
HOME
pros & cons
coping tips
goals & badges
leaderboard
survey
shop

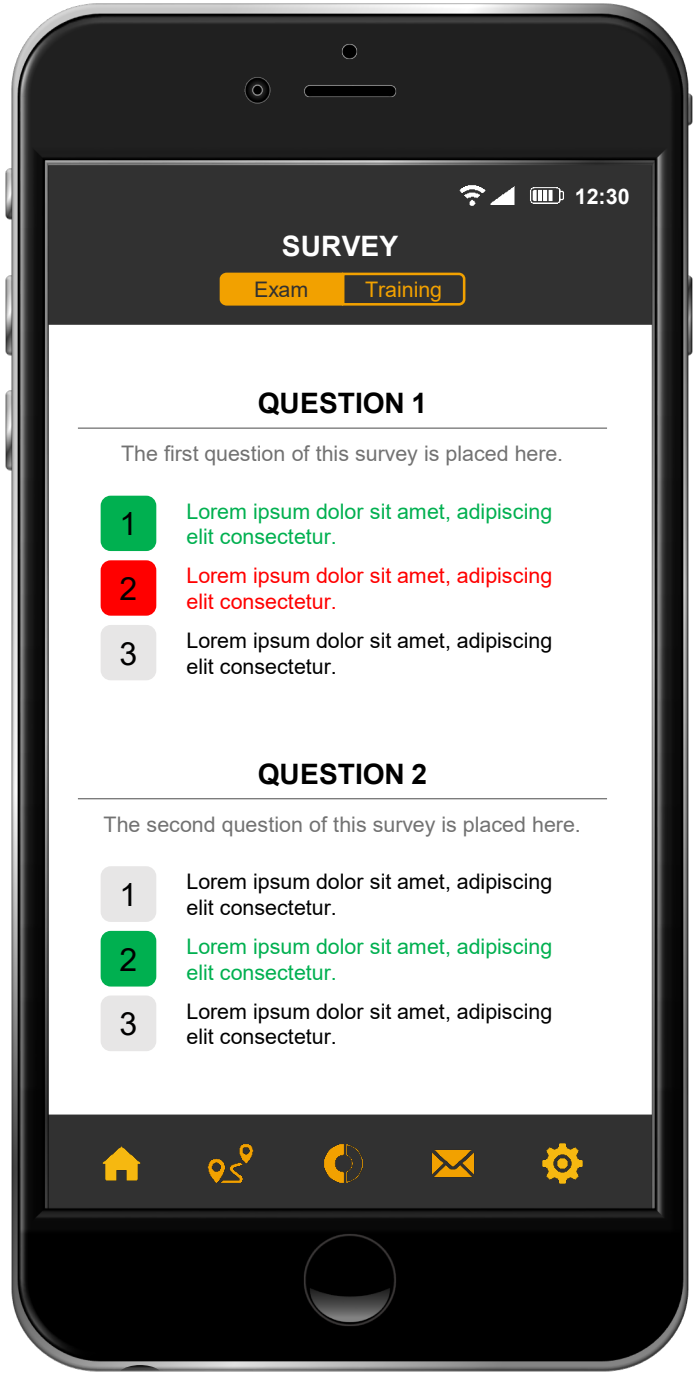

12:30
LEADERBOARD
Mo 13 Jul '20
1. User123 123 pts 2↑
2. User456 122 pts 0
3. User789 115 pts 1↑
4. User321 98 pts 3↓
5. User654 97 pts 1↑
6. User987 92 pts 2↓
7. User312 84 pts 0
8. User465 75 pts 0

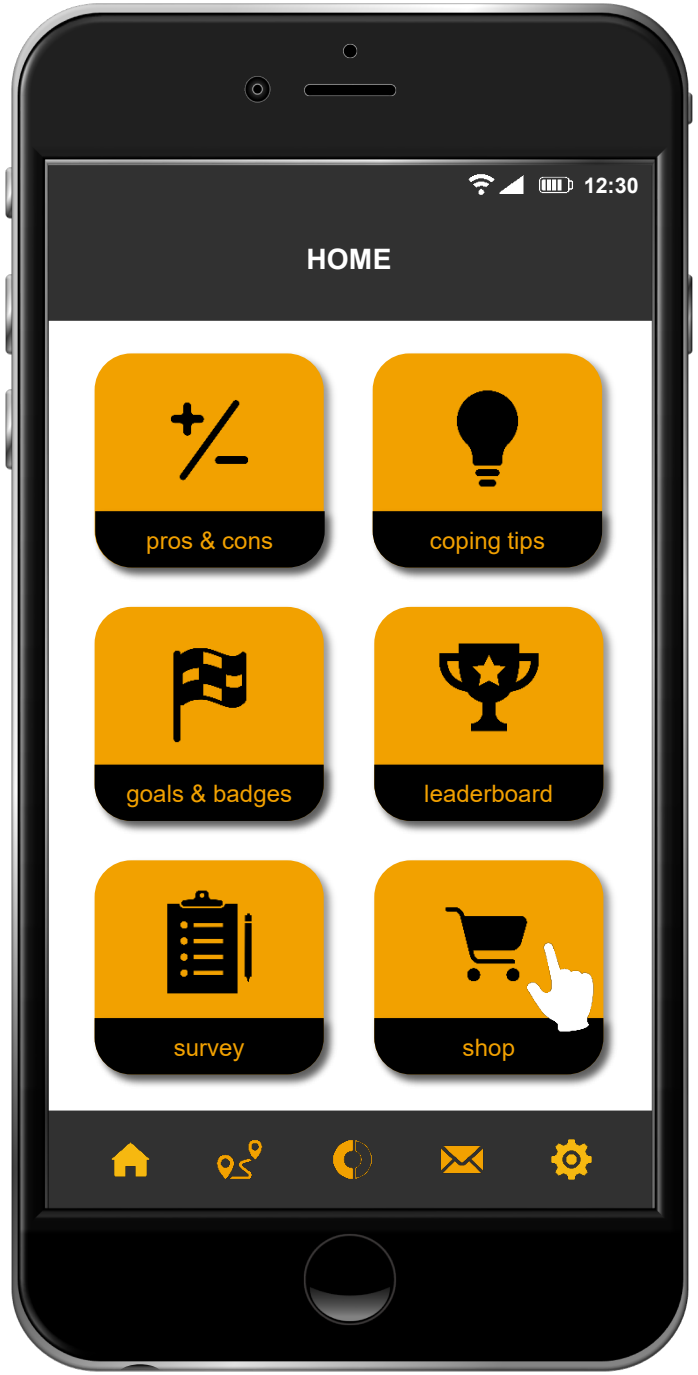

12:30
HOME
pros & cons
coping tips
goals & badges
leaderboard
survey
shop

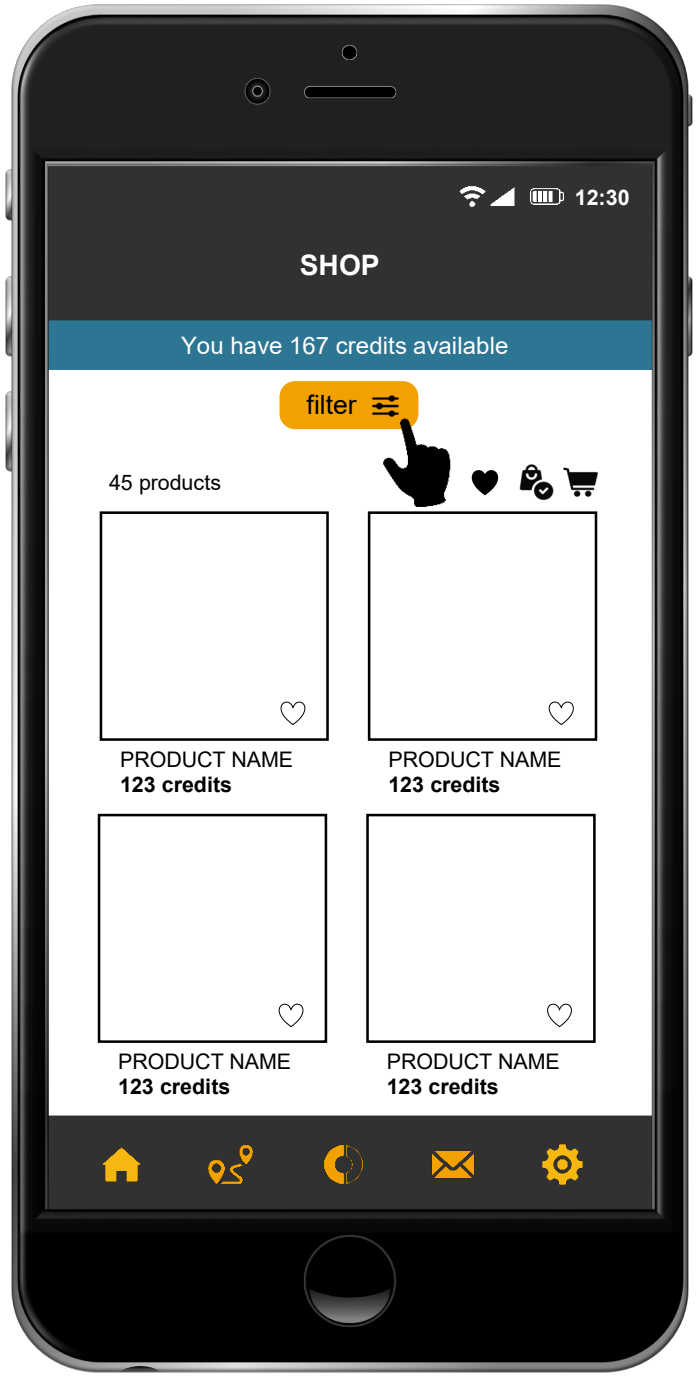

12:30
SURVEY
Exam
Training
QUESTION 2
The second question of this survey is placed here.
1
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
2
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
3
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
1 2 3 4 5 6 7 8 9 10
back
next

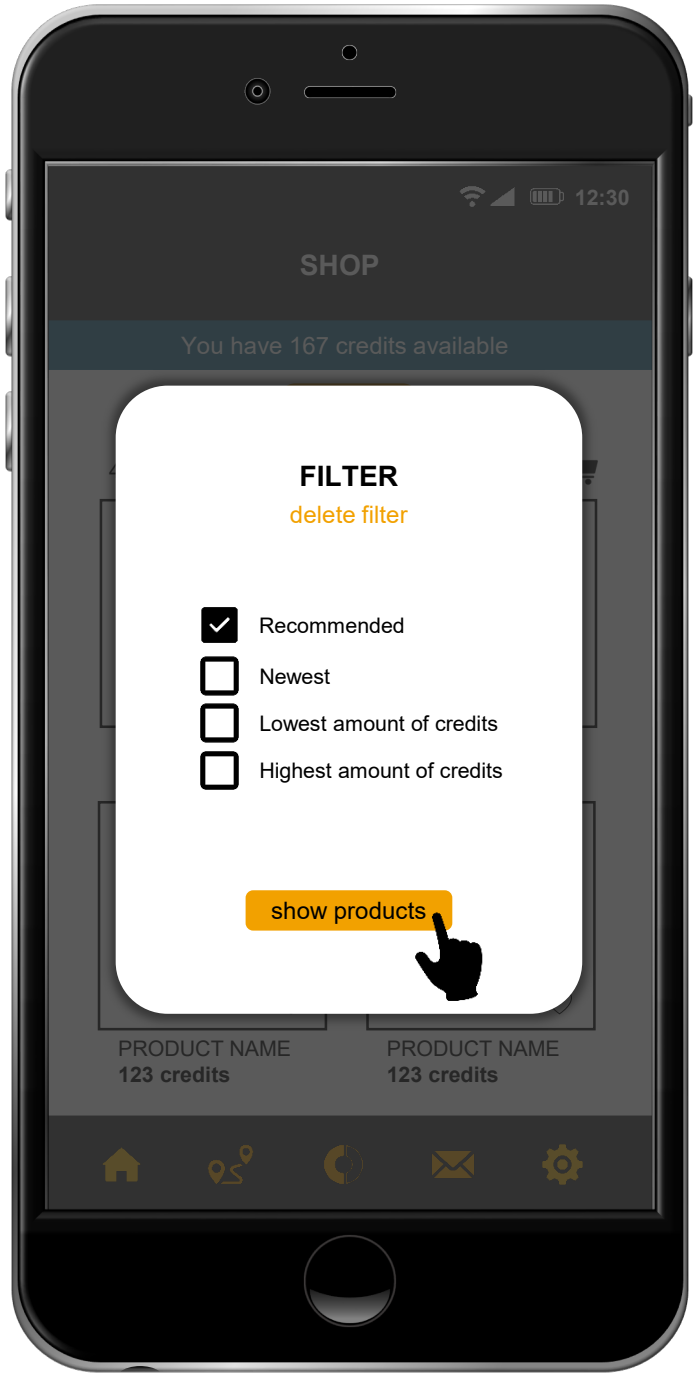

12:30
SURVEY
Exam
Training
QUESTION 10
The tenth question of this survey is placed here.
1
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
2
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
3
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
1 2 3 4 5 6 7 8 9 10
back
submit

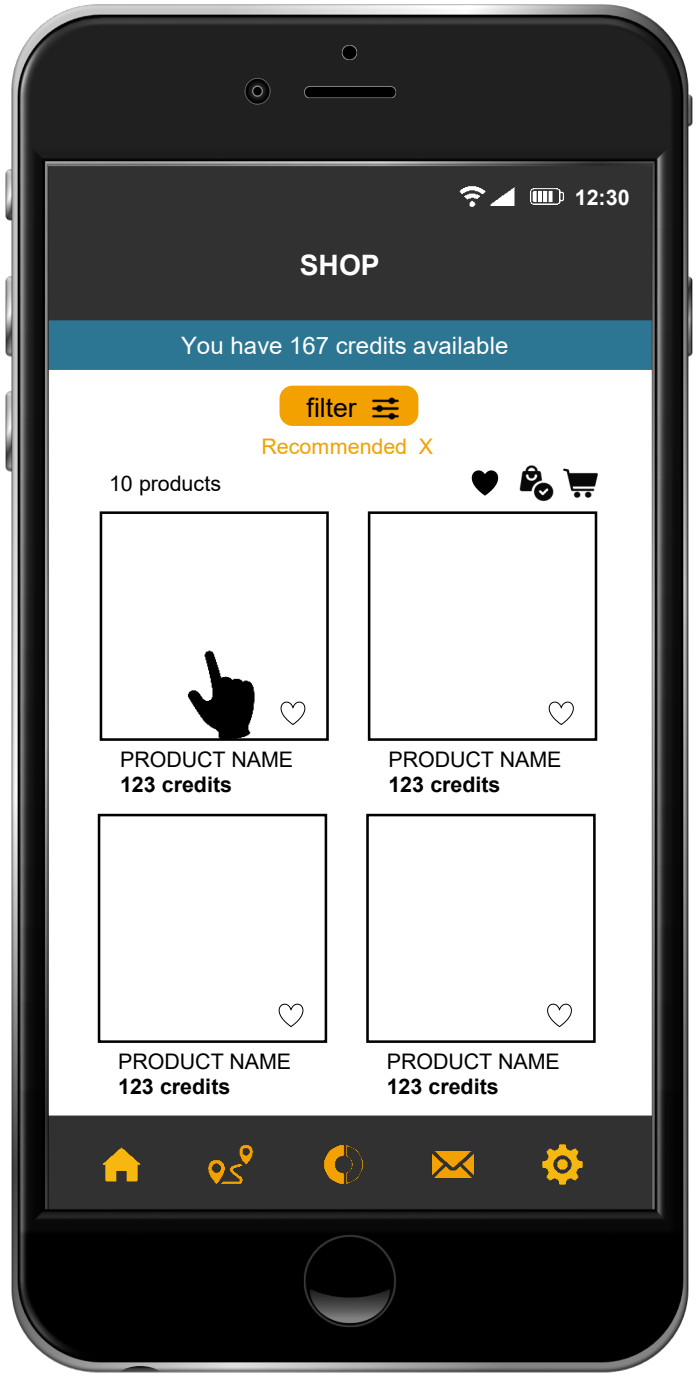

12:30
SURVEY
Exam
Training
Your score is
3 / 10
More details
OK


12:30
SURVEY
Exam
Training
QUESTION 1
The first question of this survey is placed here.
1
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
2
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
3
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
QUESTION 2
The second question of this survey is placed here.
1
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
2
Lorem ipsum dolor sit amet, adipiscing elit consectetur.
3
Lorem ipsum dolor sit amet, adipiscing elit consectetur.

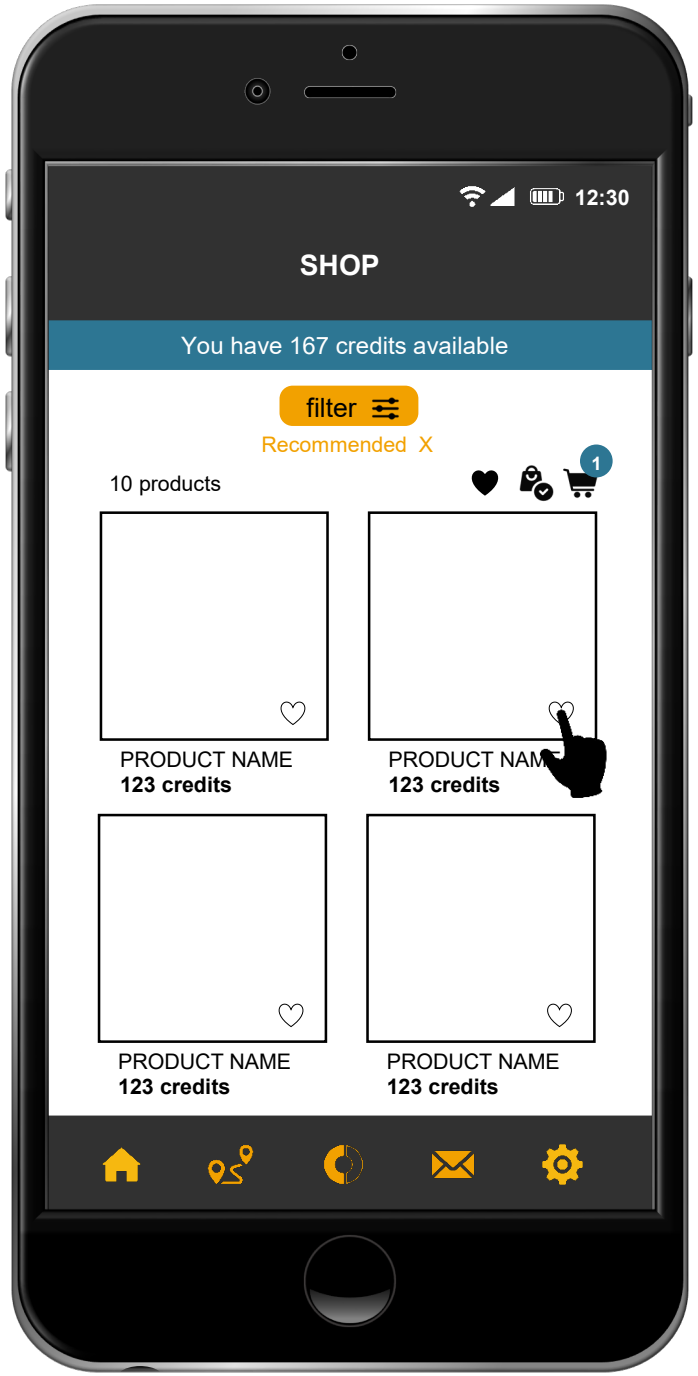

12:30
HOME
pros & cons
coping tips
goals & badges
leaderboard
survey
shop

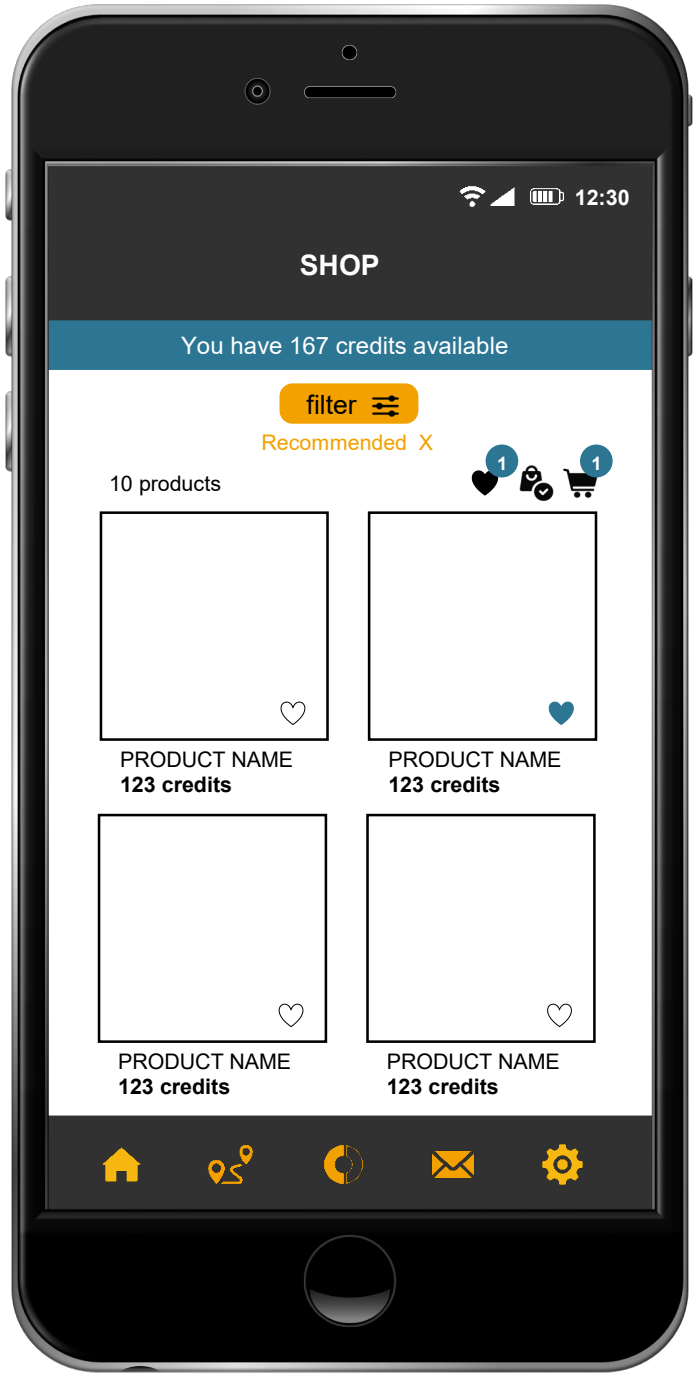

12:30
SHOP
You have 167 credits available
filter
45 products
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits

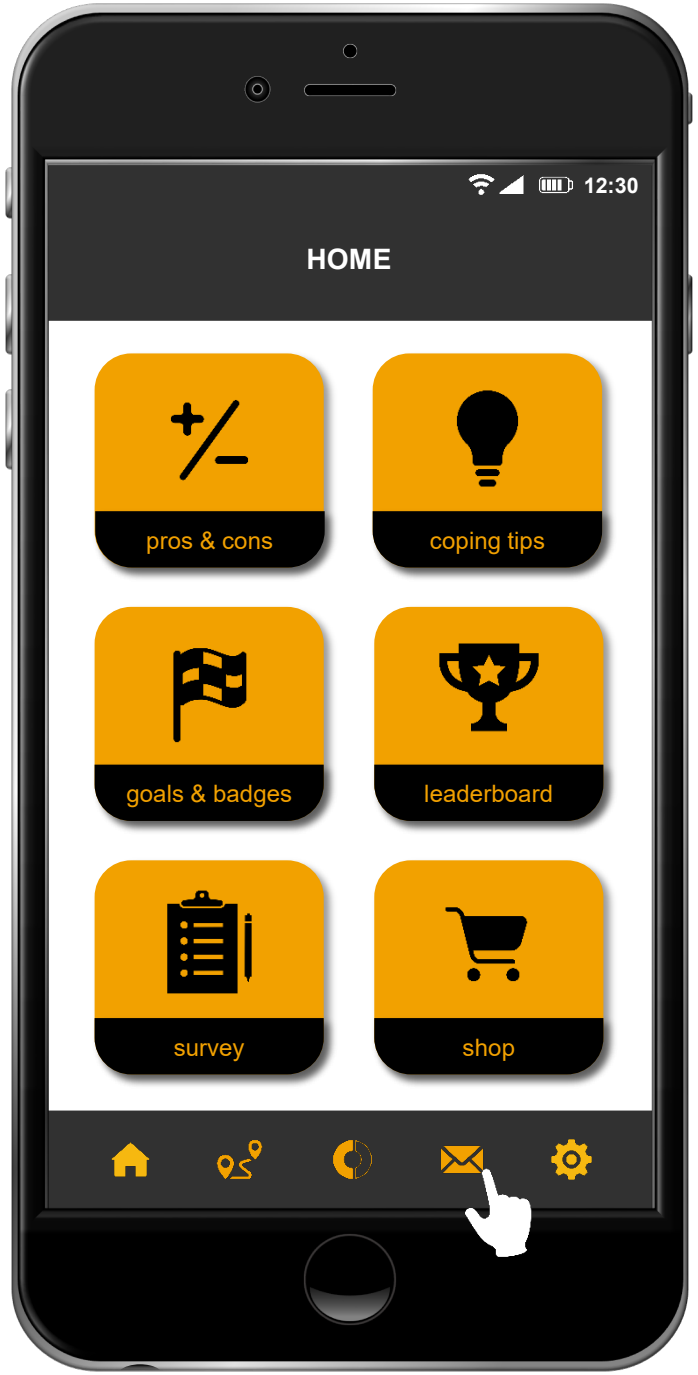

12:30
SHOP
You have 167 credits available
FILTER
delete filter
Recommended
Newest
Lowest amount of credits
Highest amount of credits
show products
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits


12:30
SHOP
You have 167 credits available
filter
Recommended X
10 products
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits


12:30
SHOP
PRODUCT NAME
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam sagittis luctus varius. Ut velit arcu, ultricies at molestie nec, ultricies eget urna.
123 credits
Add to shopping cart

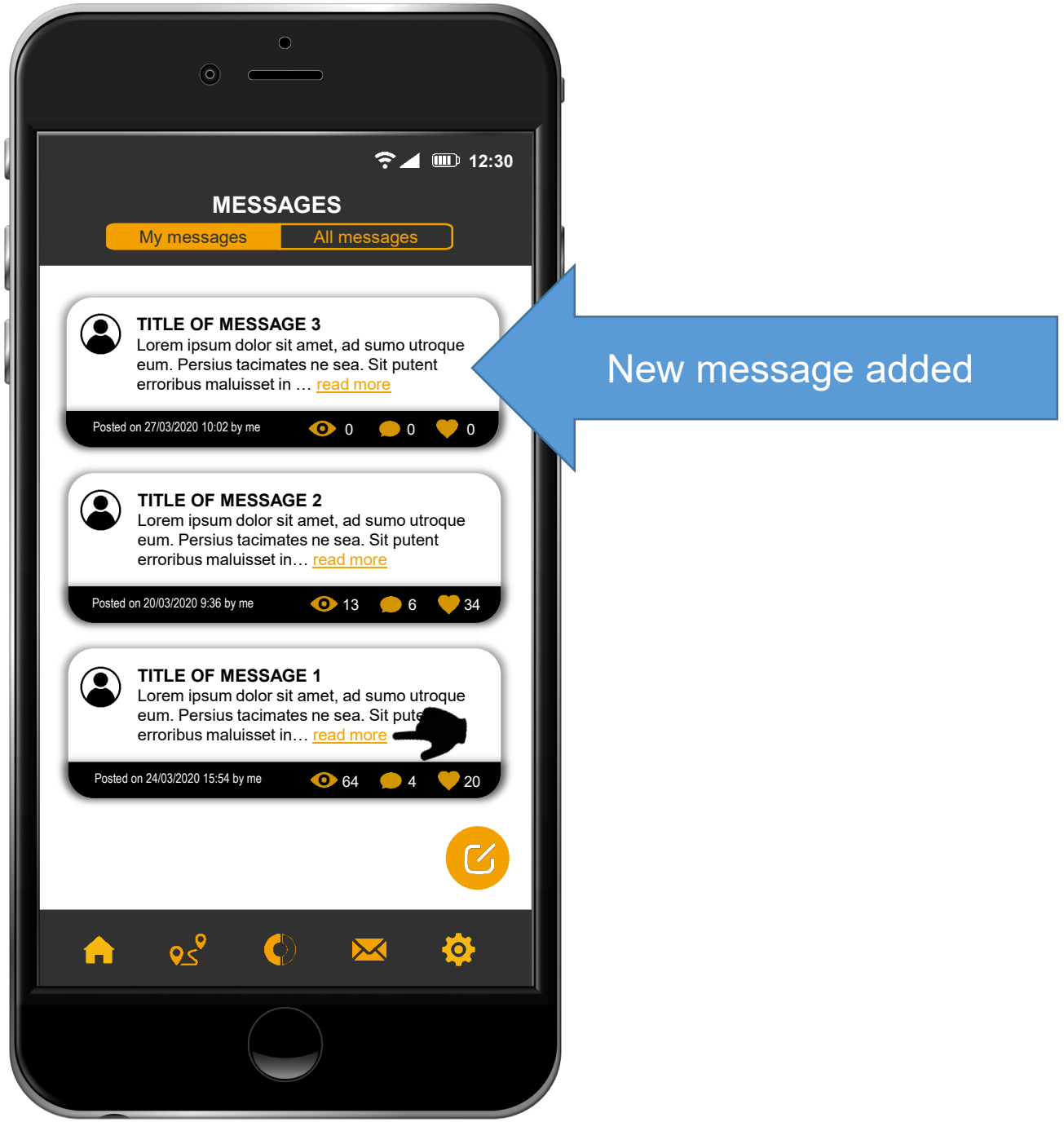

12:30
SHOP
You have 167 credits available
filter
Recommended X
10 products
1
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits

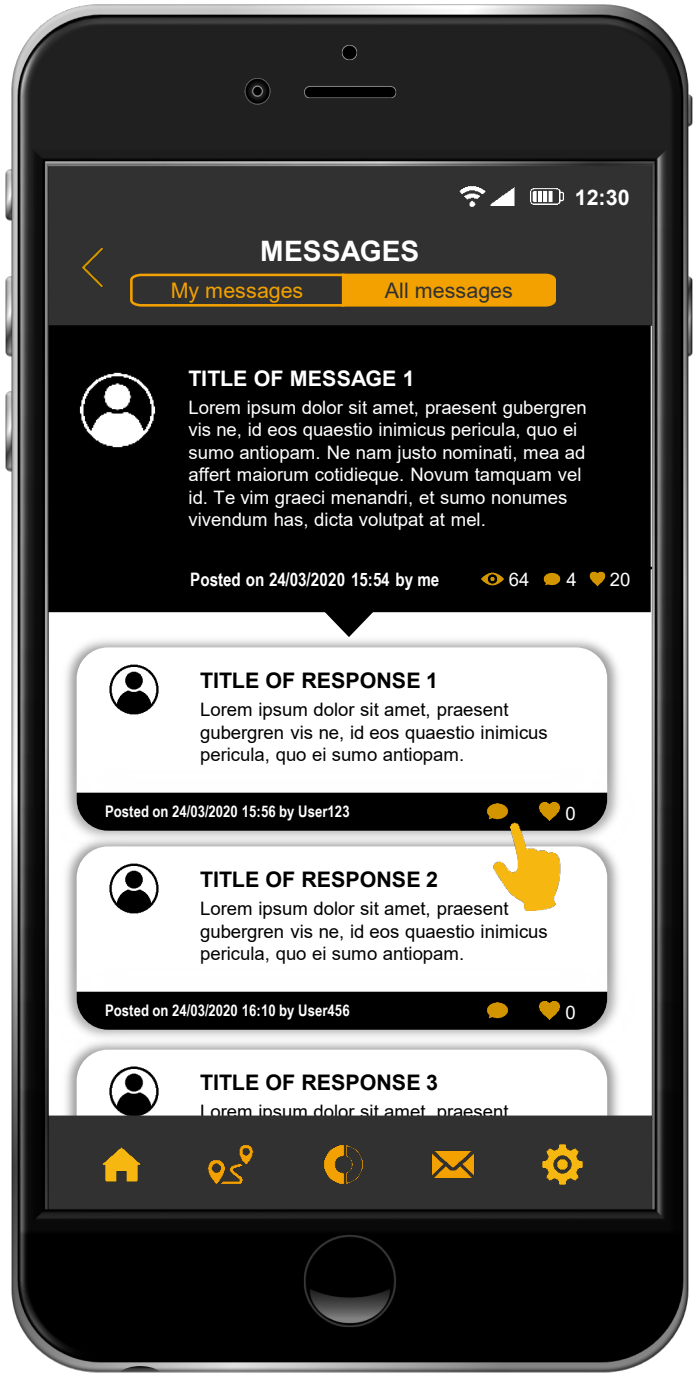

12:30
SHOP
You have 167 credits available
filter
Recommended X
10 products
1
1
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits
PRODUCT NAME
123 credits

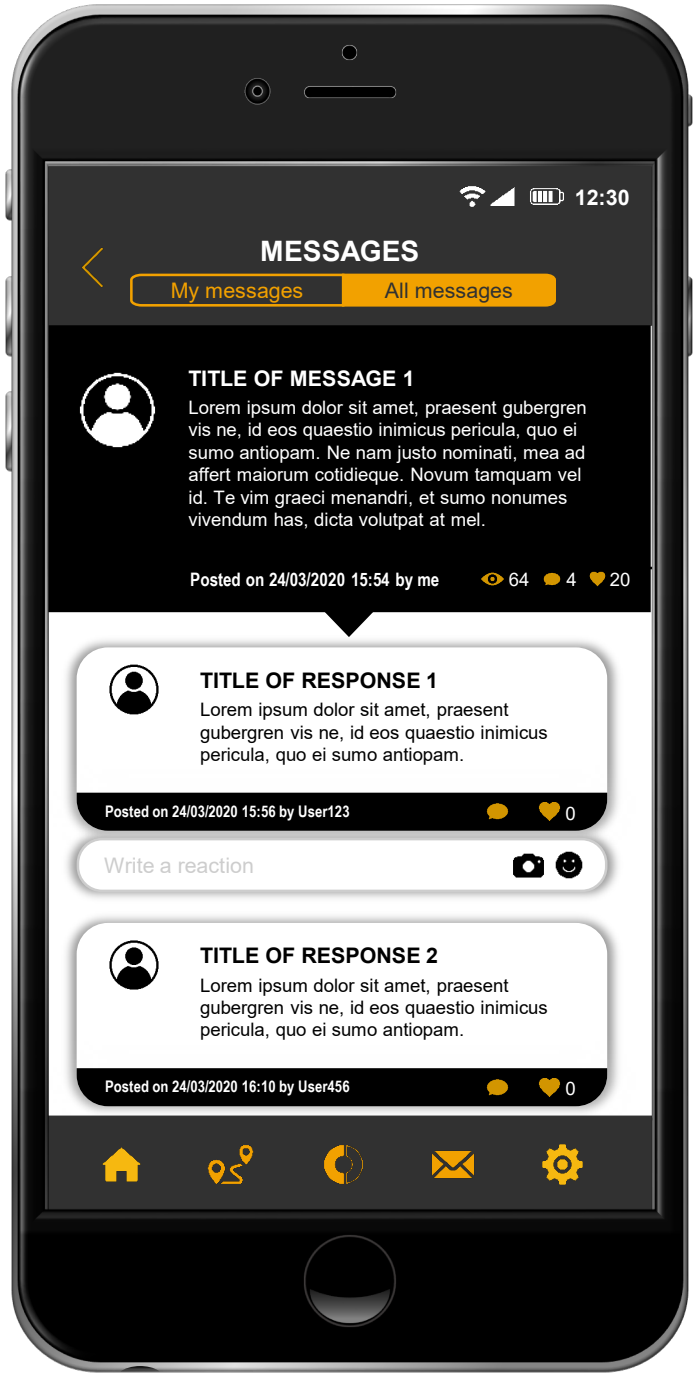

12:30
HOME
pros & cons
coping tips
goals & badges
leaderboard
survey
shop

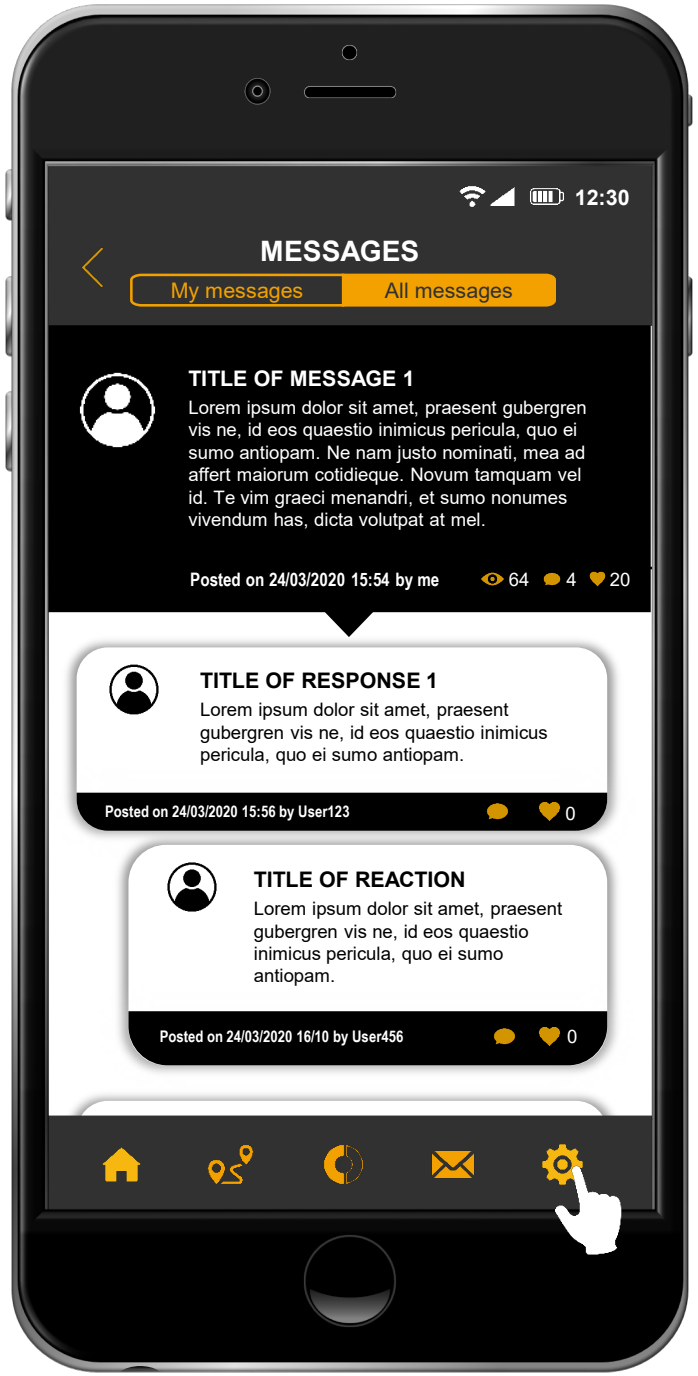

12:30
MESSAGES
My messages
All messages
TITLE OF MESSAGE 2
Lorem ipsum dolor sit amet, ad sumo utroque eum. Persius tacimates ne sea. Sit putent erroribus maluisset in… read more
Posted on 24/03/2020 15:54 by me
64
4
20
TITLE OF MESSAGE 1
Lorem ipsum dolor sit amet, ad sumo utroque eum. Persius tacimates ne sea. Sit putent erroribus maluisset in… read more
Posted on 20/03/2020 9:36 by me
13
6
34

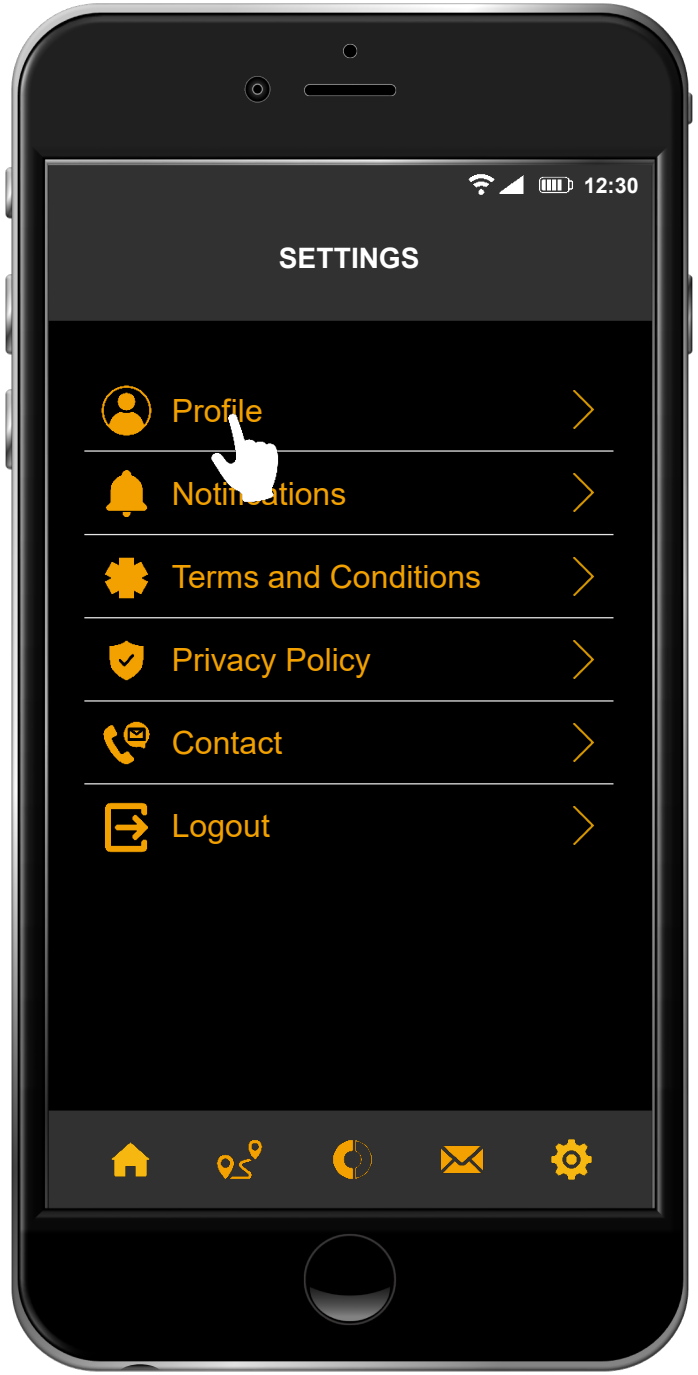

12:30
MESSAGES
My messages
All messages
Write your message!
TO: project leader
Subject
Message text
Upload image
Upload video
Post message

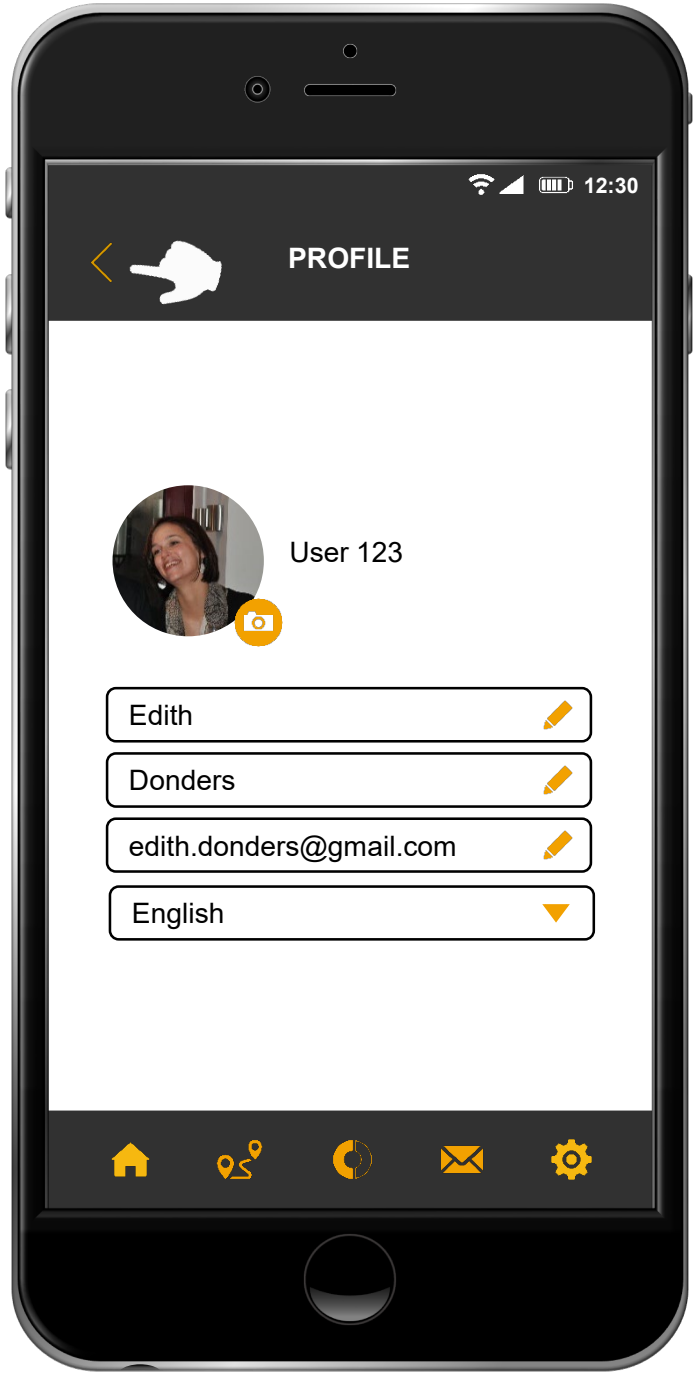

12:30
MESSAGES
My messages
All messages
TITLE OF MESSAGE 3
Lorem ipsum dolor sit amet, ad sumo utroque eum. Persius tacimates ne sea. Sit putent erroribus maluisset in … read more
Posted on 27/03/2020 10:02 by me
0
0
0
TITLE OF MESSAGE 2
Lorem ipsum dolor sit amet, ad sumo utroque eum. Persius tacimates ne sea. Sit putent erroribus maluisset in… read more
Posted on 20/03/2020 9:36 by me
13
6
34
TITLE OF MESSAGE 1
Lorem ipsum dolor sit amet, ad sumo utroque eum. Persius tacimates ne sea. Sit pute
erroribus maluisset in… read more
Posted on 24/03/2020 15:54 by me
64
4
20
New message added


12:30
MESSAGES
My messages
All messages
TITLE OF MESSAGE 1
Lorem ipsum dolor sit amet, praesent gubergren vis ne, id eos quaestio inimicus pericula, quo ei sumo antiopam. Ne nam justo nominati, mea ad affert maiorum cotidieque. Novum tamquam vel id. Te vim graeci menandri, et sumo nonumes vivendum has, dicta volutpat at mel.
Posted on 24/03/2020 15:54 by me
64
4
20
TITLE OF RESPONSE 1
Lorem ipsum dolor sit amet, praesent gubergren vis ne, id eos quaestio inimicus pericula, quo ei sumo antiopam.
Posted on 24/03/2020 15:56 by User123
0
TITLE OF RESPONSE 2
Lorem ipsum dolor sit amet, praesent gubergren vis ne, id eos quaestio inimicus pericula, quo ei sumo antiopam.
Posted on 24/03/2020 16:10 by User456
0
TITLE OF RESPONSE 3


12:30
MESSAGES
My messages
All messages
TITLE OF MESSAGE 1
Lorem ipsum dolor sit amet, praesent gubergren vis ne, id eos quaestio inimicus pericula, quo ei sumo antiopam. Ne nam justo nominati, mea ad affert maiorum cotidieque. Novum tamquam vel id. Te vim graeci menandri, et sumo nonumes vivendum has, dicta volutpat at mel.
Posted on 24/03/2020 15:54 by me
64
4
20
TITLE OF RESPONSE 1
Lorem ipsum dolor sit amet, praesent gubergren vis ne, id eos quaestio inimicus pericula, quo ei sumo antiopam.
Posted on 24/03/2020 15:56 by User123
0
Write a reaction
TITLE OF RESPONSE 2
Lorem ipsum dolor sit amet, praesent gubergren vis ne, id eos quaestio inimicus pericula, quo ei sumo antiopam.
Posted on 24/03/2020 16:10 by User456
0


12:30
MESSAGES
My messages
All messages
TITLE OF MESSAGE 1
Lorem ipsum dolor sit amet, praesent gubergren vis ne, id eos quaestio inimicus pericula, quo ei sumo antiopam. Ne nam justo nominati, mea ad affert maiorum cotidieque. Novum tamquam vel id. Te vim graeci menandri, et sumo nonumes vivendum has, dicta volutpat at mel.
Posted on 24/03/2020 15:54 by me
64
4
20
TITLE OF RESPONSE 1
Lorem ipsum dolor sit amet, praesent gubergren vis ne, id eos quaestio inimicus pericula, quo ei sumo antiopam.
Posted on 24/03/2020 15:56 by User123
0
TITLE OF REACTION
Lorem ipsum dolor sit amet, praesent gubergren vis ne, id eos quaestio inimicus pericula, quo ei sumo antiopam.
Posted on 24/03/2020 16/10 by User456
0


12:30
SETTINGS
Profile
Notifications
Terms and Conditions
Privacy Policy
Contact
Logout

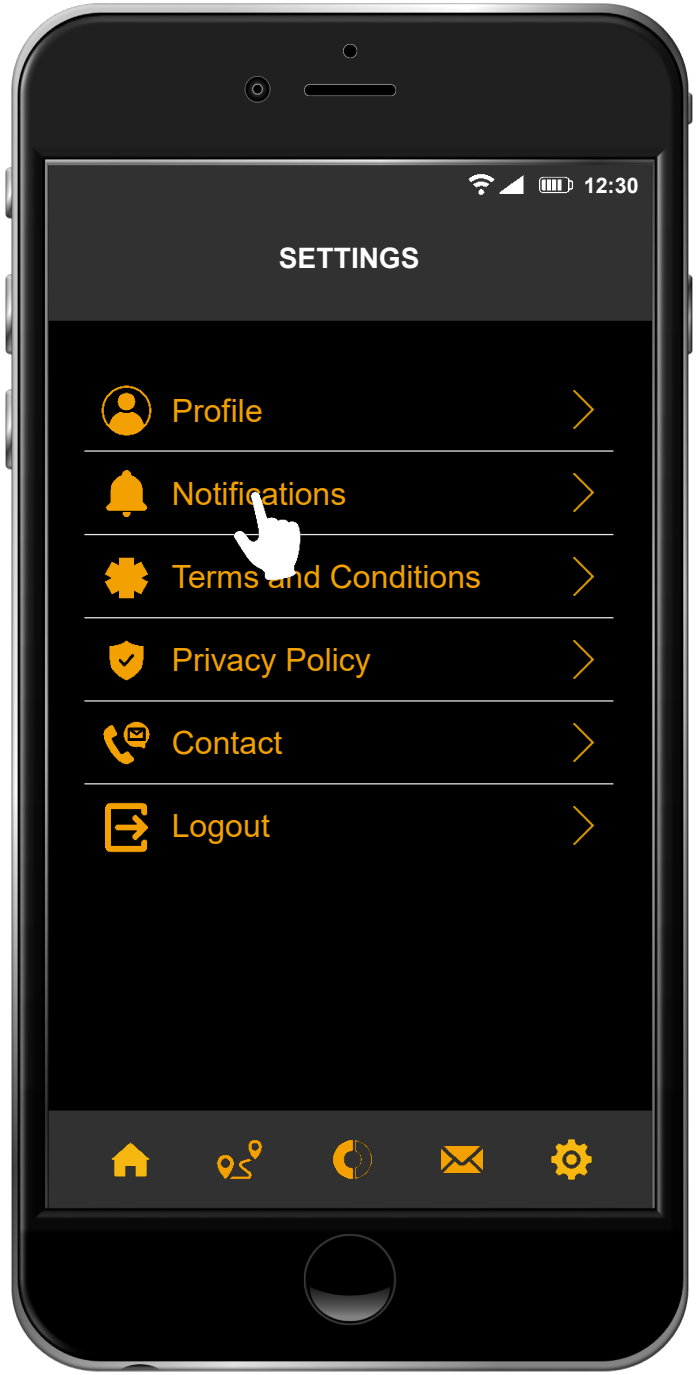


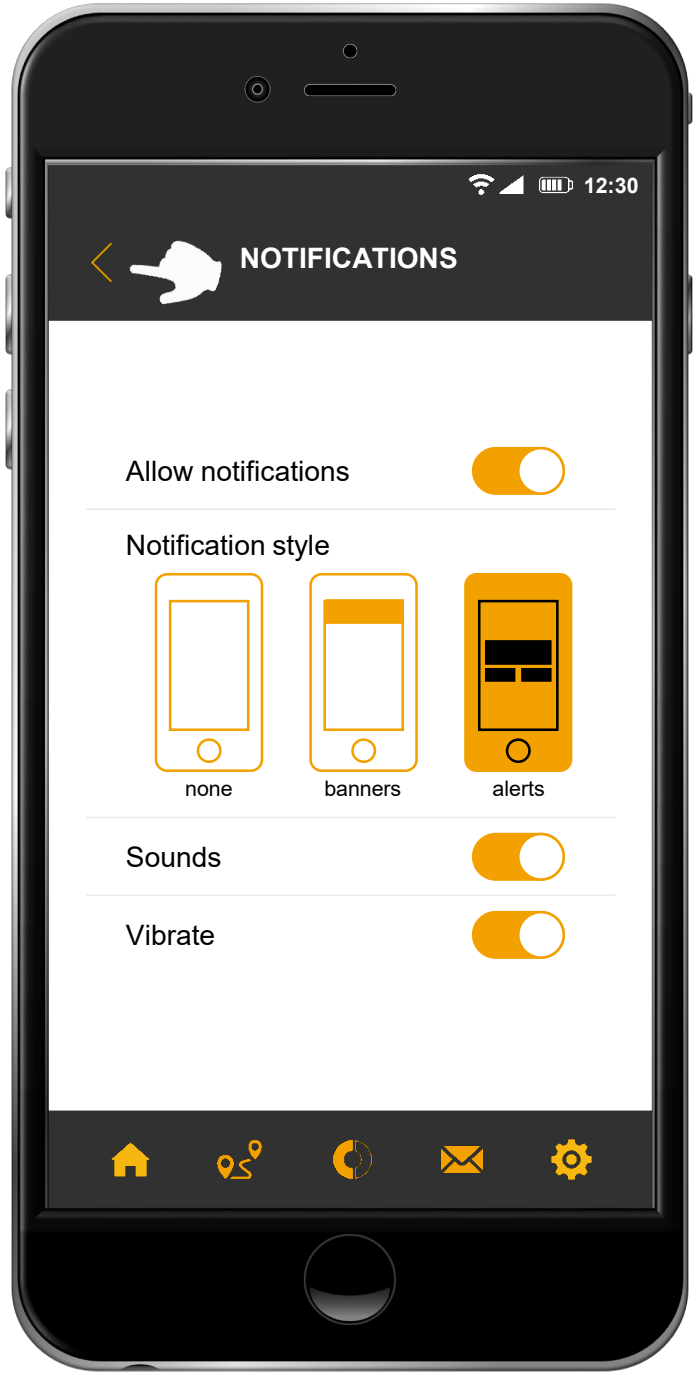
Deutsch

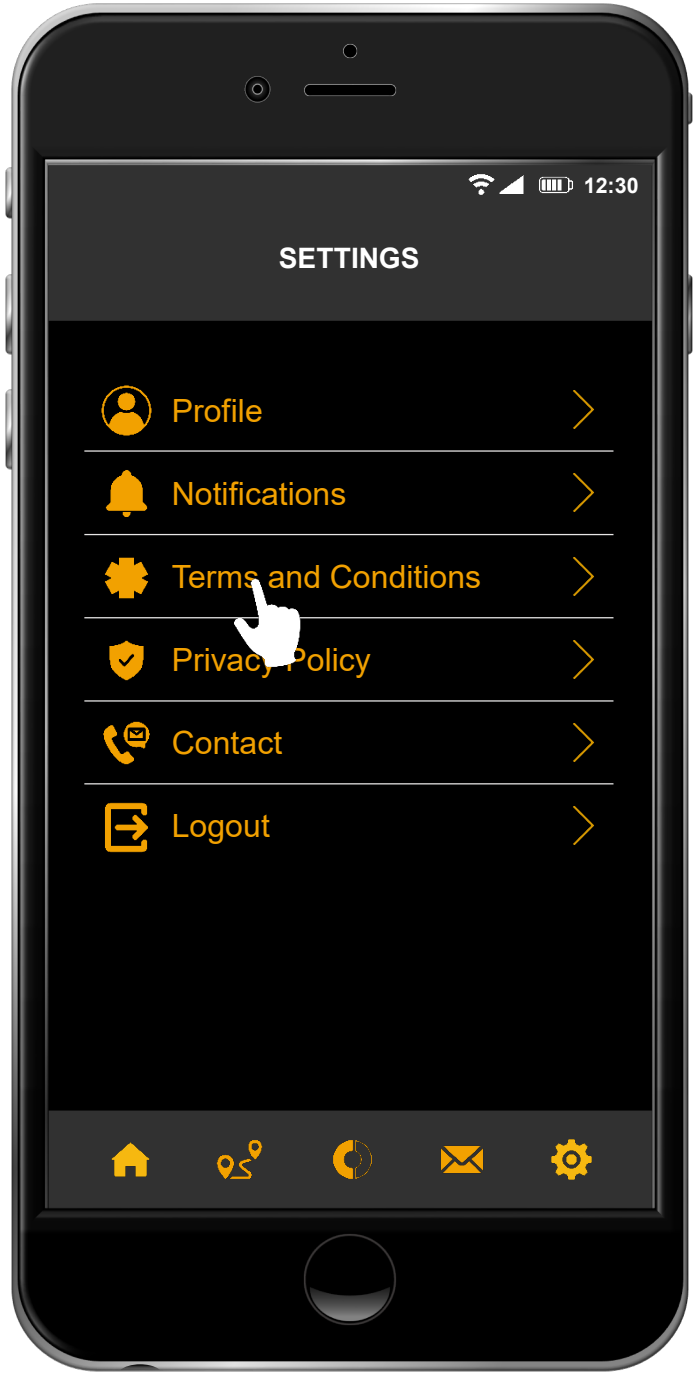
Ελληνικά

Português

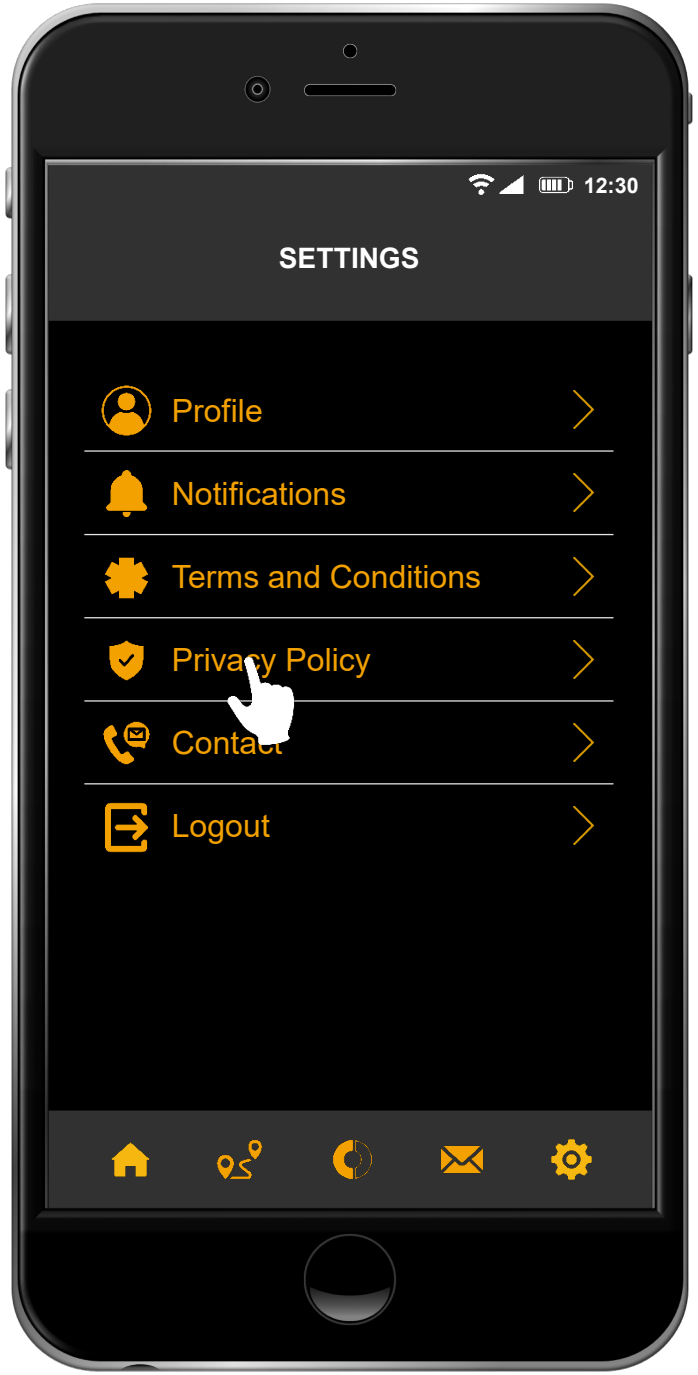
Dutch


12:30
SETTINGS
Profile
Notifications
Terms and Conditions
Privacy Policy
Contact
Logout

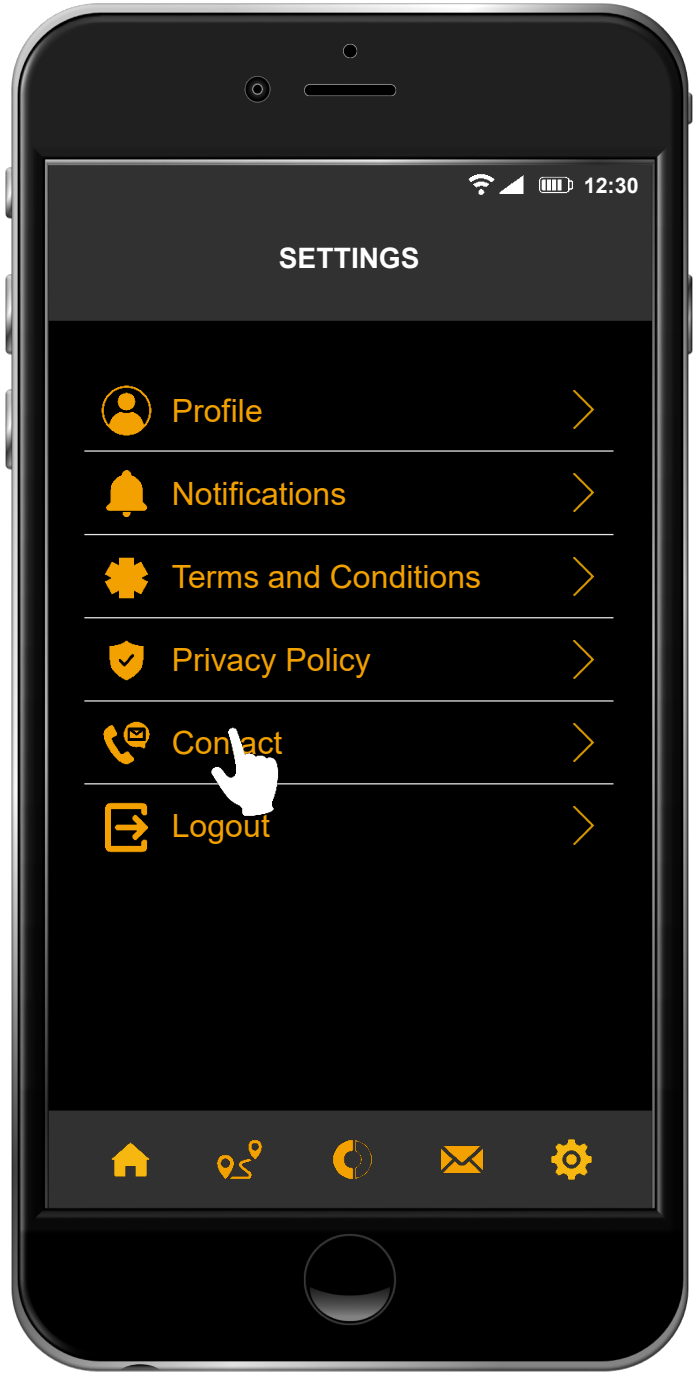

12:30
NOTIFICATIONS
Allow notifications
Notification style
none
banners
alerts
Sounds
Vibrate

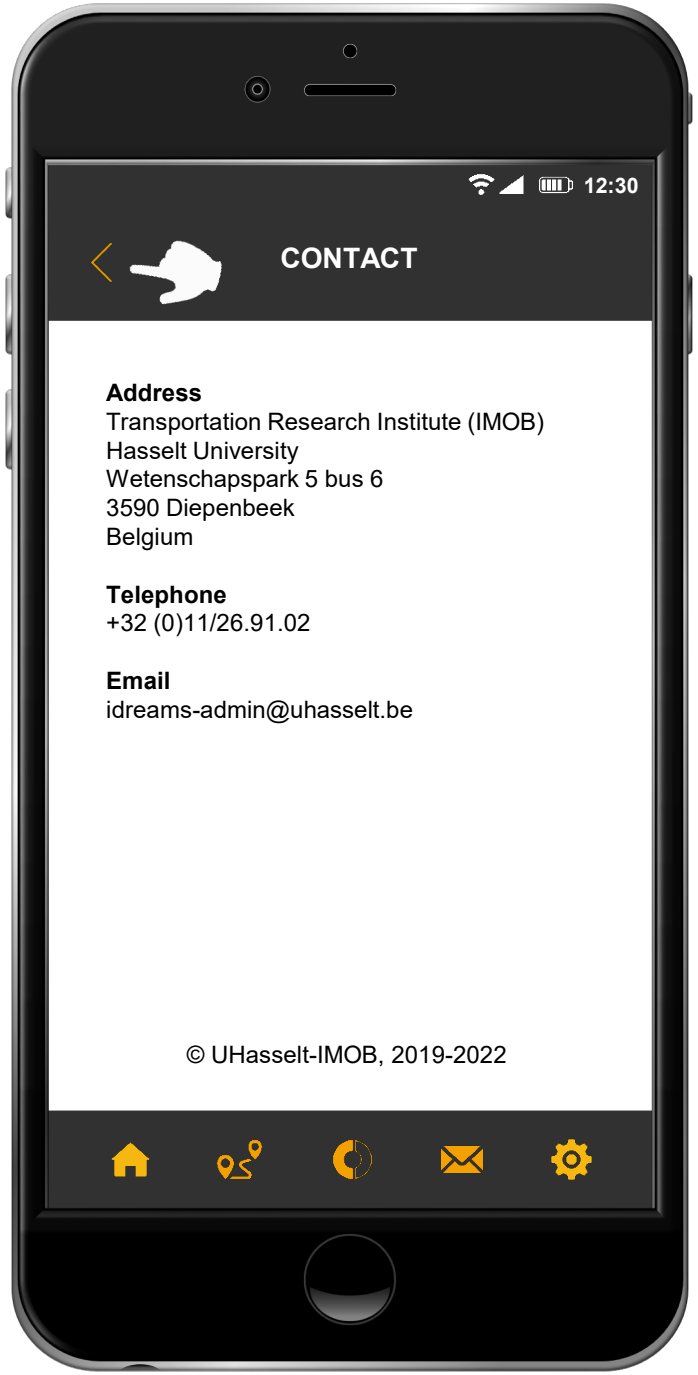

12:30
SETTINGS
Profile
Notifications
Terms and Conditions
Privacy Policy
Contact
Logout

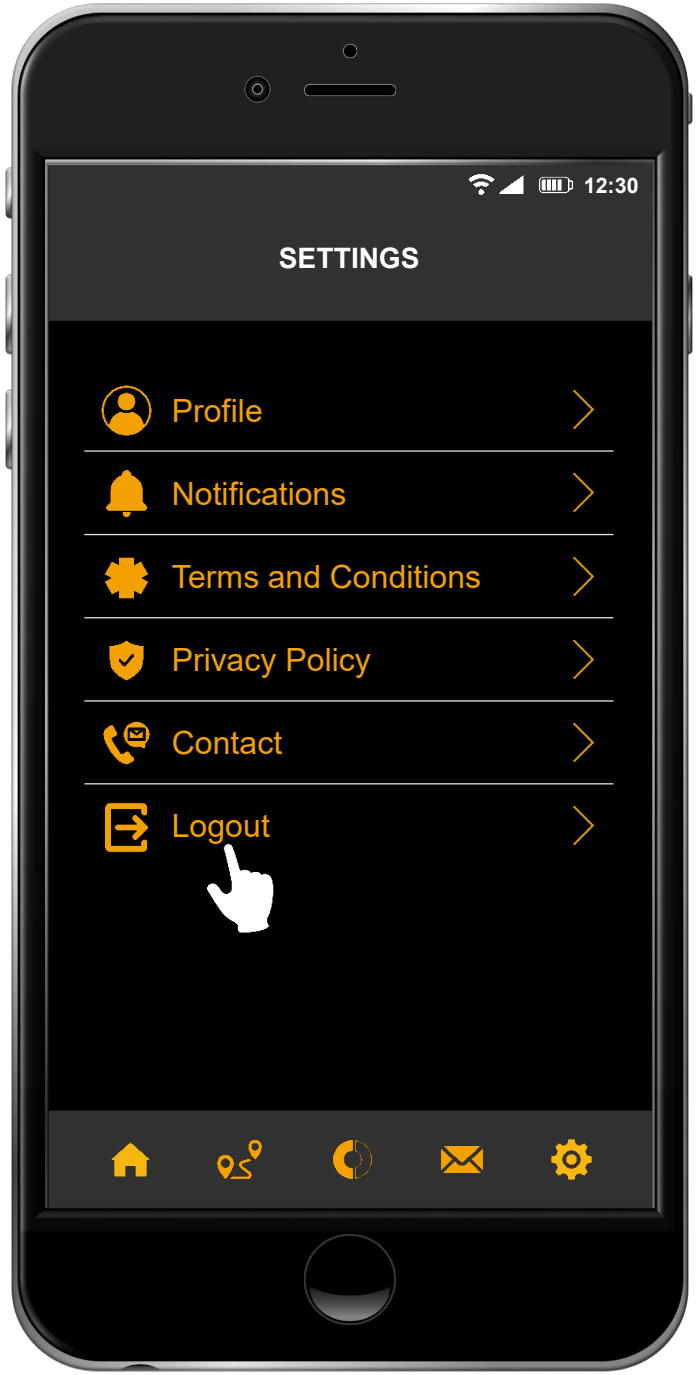

12:30
ERMS & CONDITIONS
ART. 1 – LOREM IPSUM
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec pellentesque ligula nec quam tincidunt, et venenatis quam convallis. Phasellus sodales lorem vitae nunc luctus, eget ultricies ipsum aliquam. Donec sit amet dolor lacinia, luctus odio a, maximus arcu. Suspendisse mollis odio a enim volutpat sagittis. Vestibulum ultrices justo sed ultricies placerat. Maecenas in nisi nisl. Donec nec turpis sit amet nunc iaculis posuere sed at neque. Lorem ipsum dolor sit amet, consectetur adipiscing elit.
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec pellentesque ligula nec quam tincidunt, et venenatis quam convallis. Phasellus sodales lorem vitae nunc luctus, eget ultricies ipsum aliquam. Donec sit amet dolor lacinia, luctus odio a, maximus arcu.
ART. 2 – LOREM IPSUM
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec pellentesque ligula nec quam tincidunt, et venenatis quam convallis.

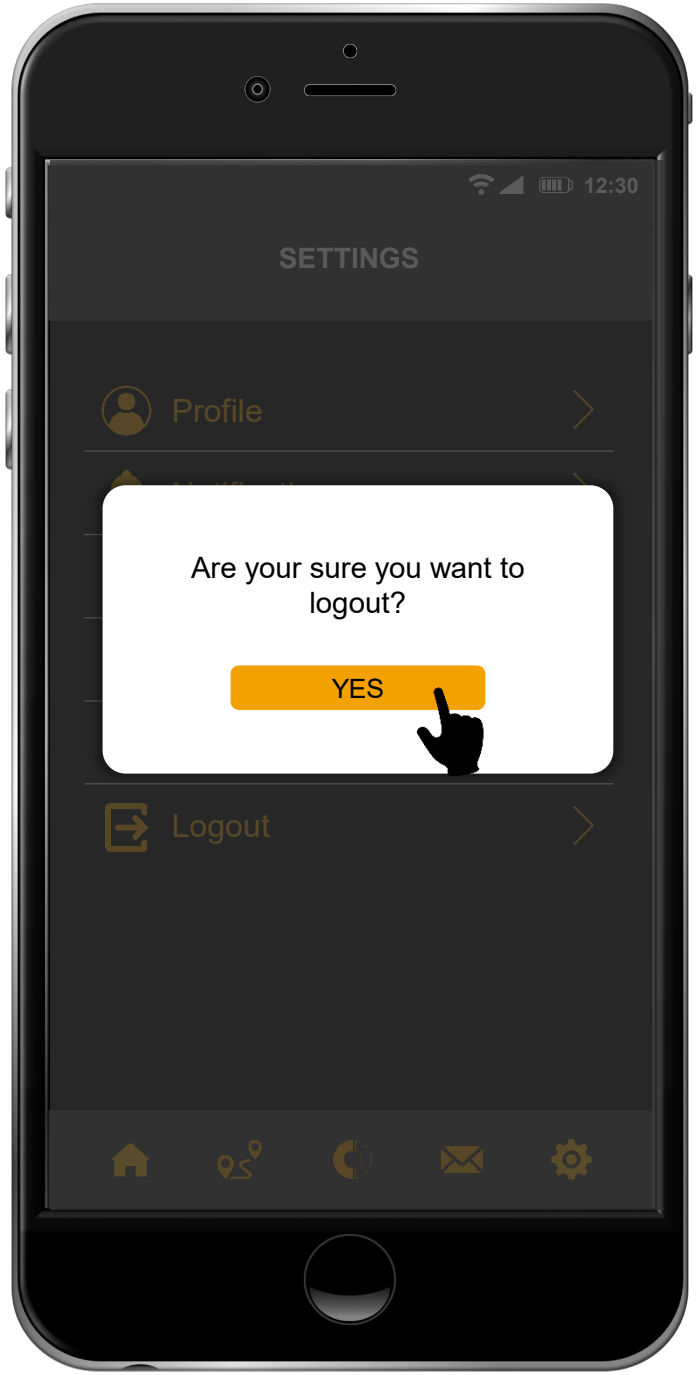

12:30
SETTINGS
Profile
Notifications
Terms and Conditions
Privacy Policy
Contact
Logout

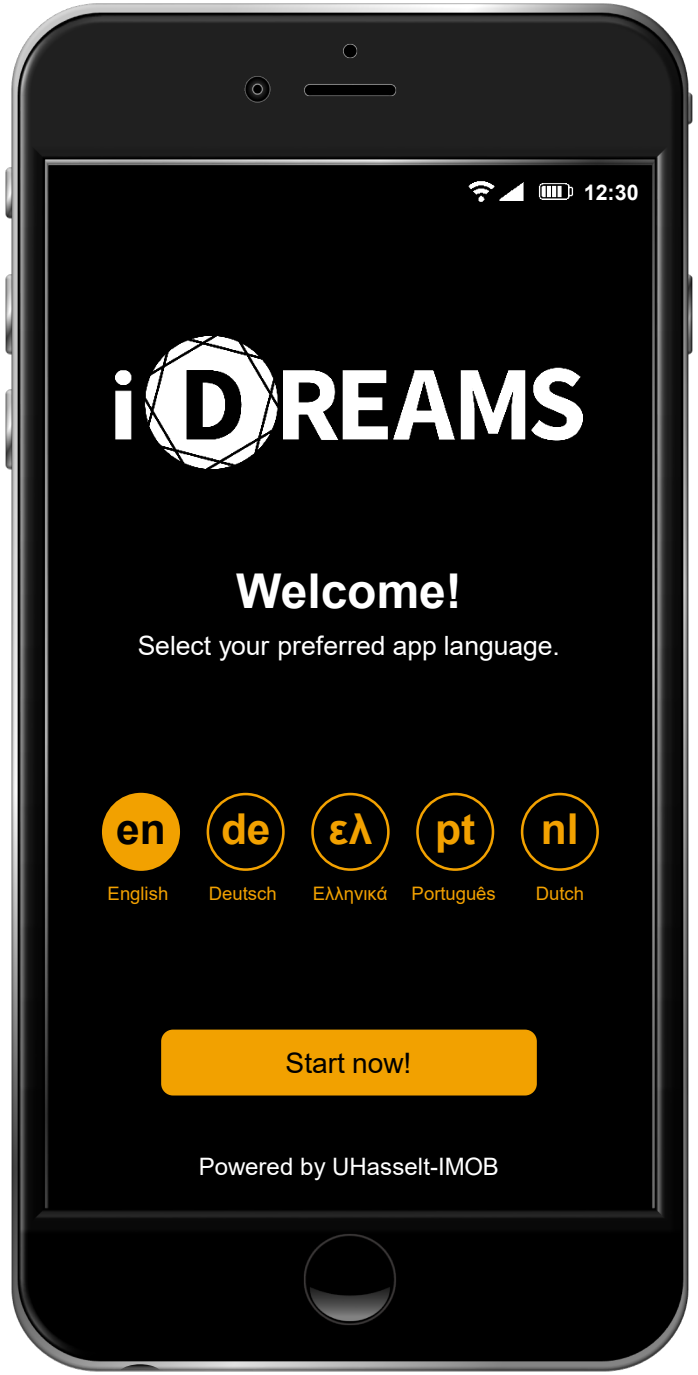

12:30
PRIVACY POLICY
ART. 1 – LOREM IPSUM
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec pellentesque ligula nec quam tincidunt, et venenatis quam convallis. Phasellus sodales lorem vitae nunc luctus, eget ultricies ipsum aliquam. Donec sit amet dolor lacinia, luctus odio a, maximus arcu. Suspendisse mollis odio a enim volutpat sagittis. Vestibulum ultrices justo sed ultricies placerat. Maecenas in nisi nisl. Donec nec turpis sit amet nunc iaculis posuere sed at neque. Lorem ipsum dolor sit amet, consectetur adipiscing elit.
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec pellentesque ligula nec quam tincidunt, et venenatis quam convallis. Phasellus sodales lorem vitae nunc luctus, eget ultricies ipsum aliquam. Donec sit amet dolor lacinia, luctus odio a, maximus arcu.
ART. 2 – LOREM IPSUM
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec pellentesque ligula nec quam tincidunt, et venenatis quam convallis.


12:30
SETTINGS
Profile
Notifications
Terms and Conditions
Privacy Policy
Contact
Logout

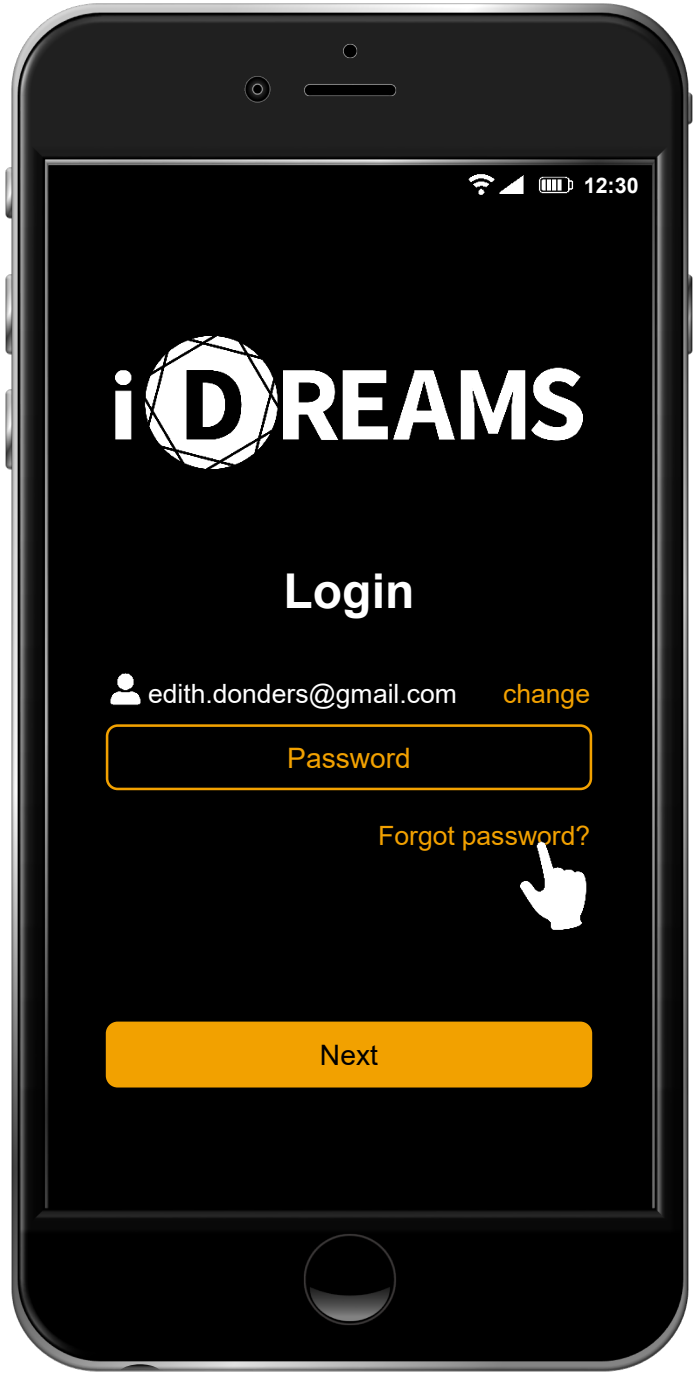

12:30
CONTACT
Address
Transportation Research Institute (IMOB)
Hasselt University
Wetenschapspark 5 bus 6
3590 Diepenbeek
Belgium
Telephone
+32 (0)11/26.91.02
Email
idreams-admin@uhasselt.be
© UHasselt-IMOB, 2019-2022

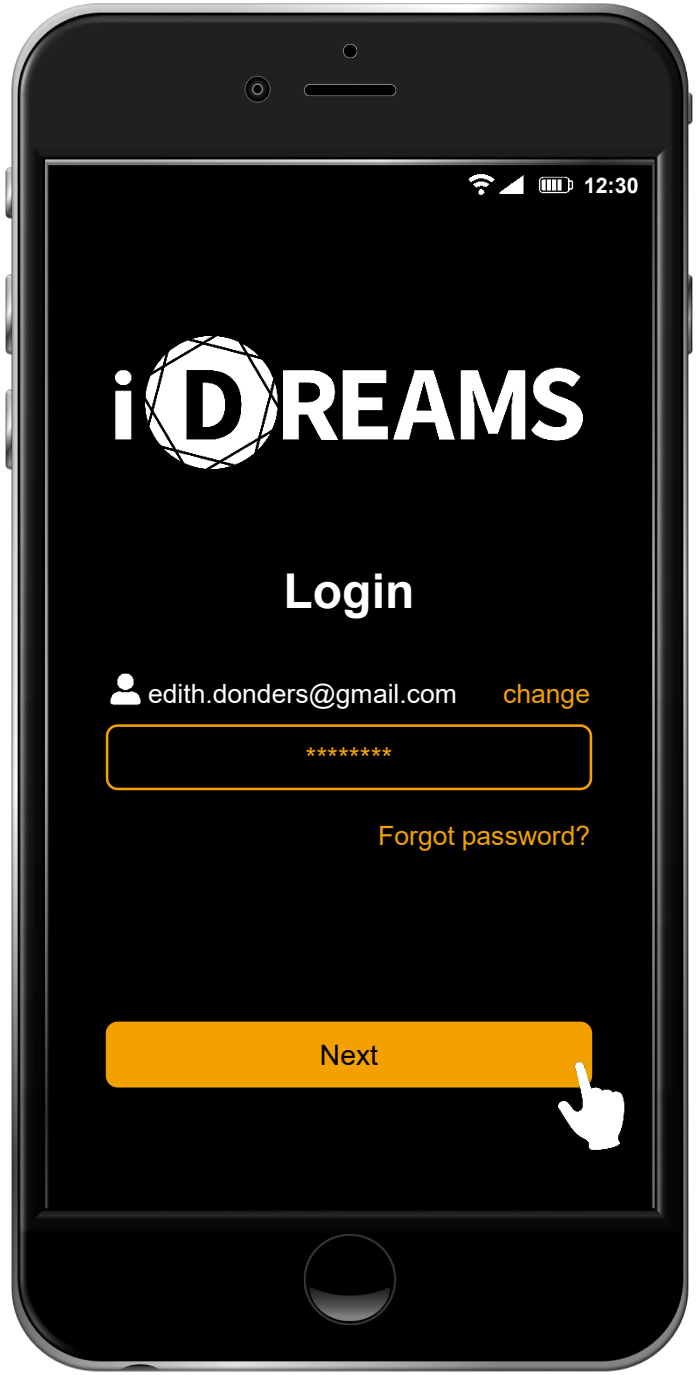

12:30
SETTINGS
Profile
Notifications
Terms and Conditions
Privacy Policy
Contact
Logout

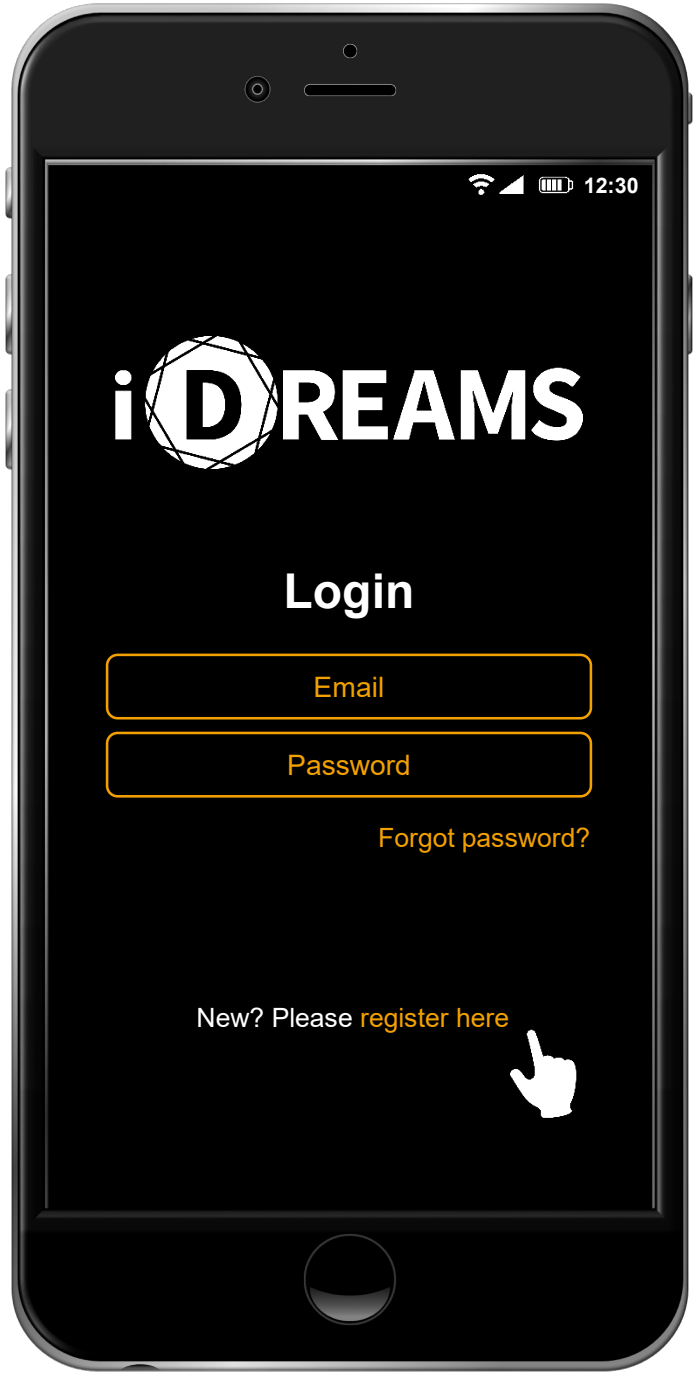

12:30
SETTINGS
Profile
Are your sure you want to logout?
YES
Logout

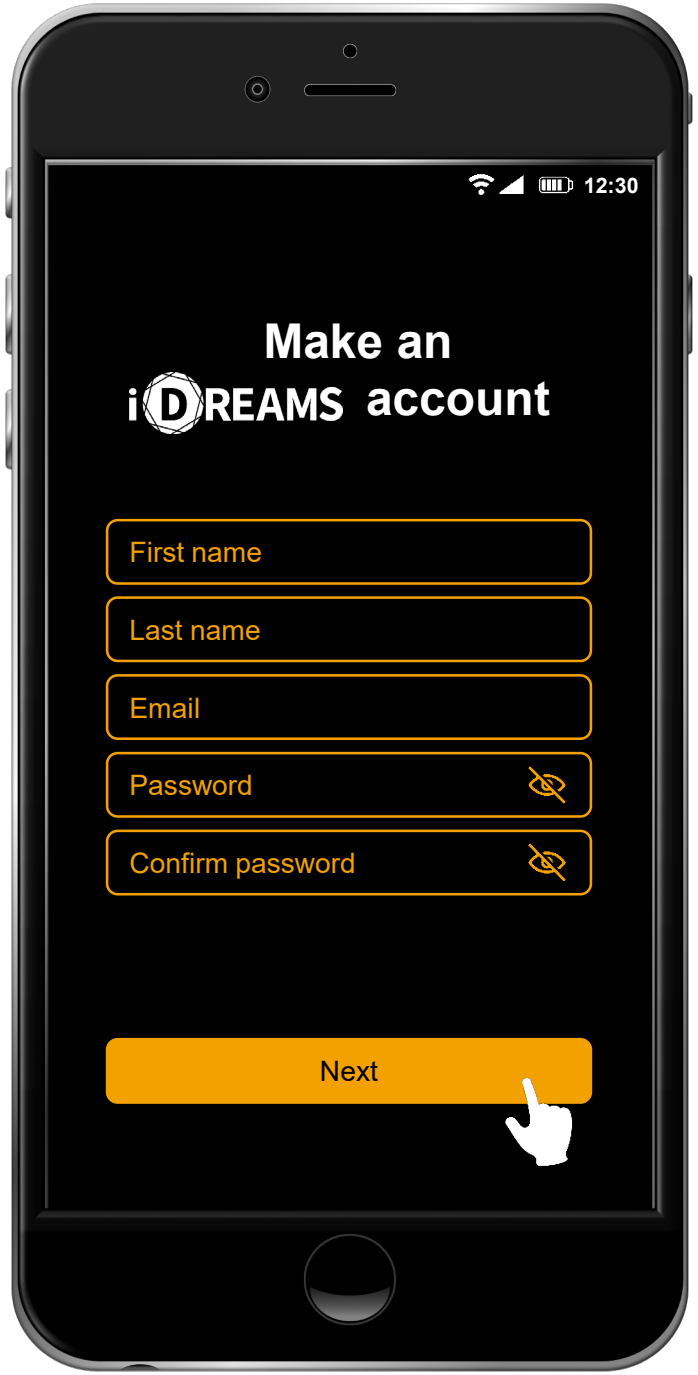

12:30
iDREAMS
Welcome!
Select your preferred app language.
en
English
de
Deutsch
ελ
Ελληνικά
pt
Português
nl
Dutch
Start now!
Powered by UHasselt-IMOB

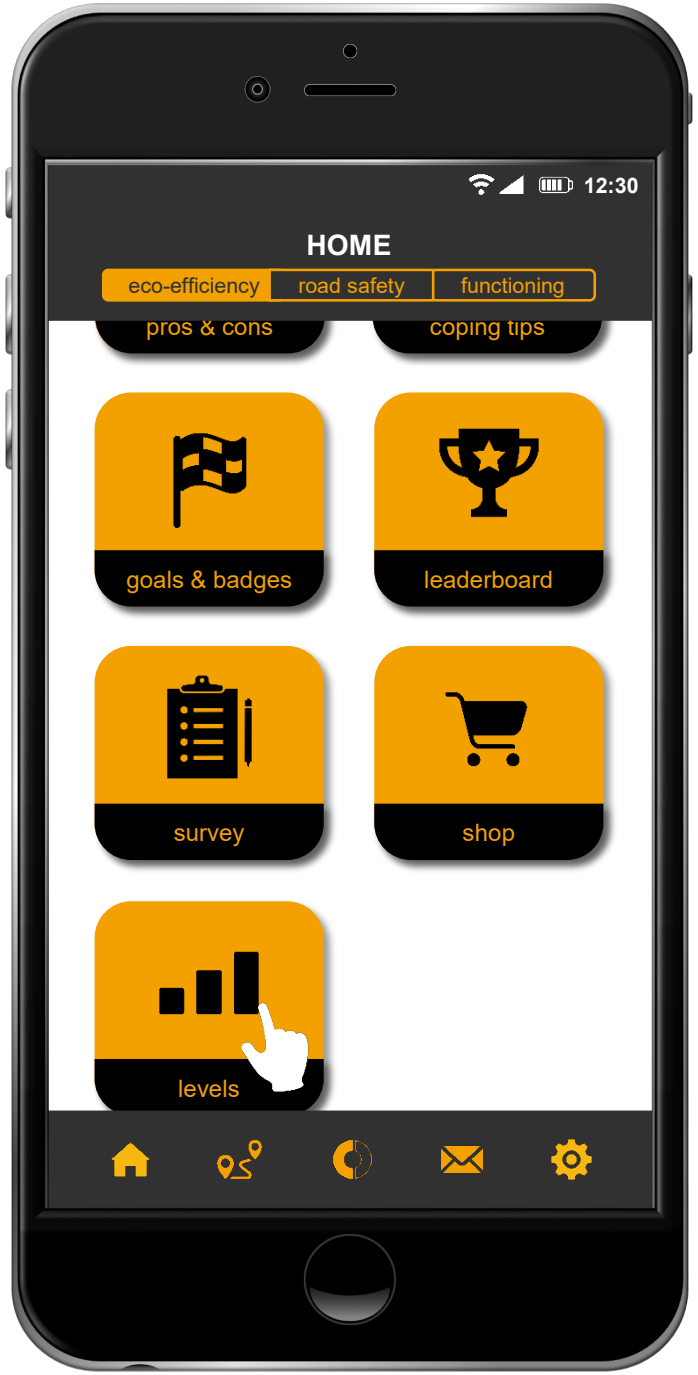
Outside i-DREAMS scope

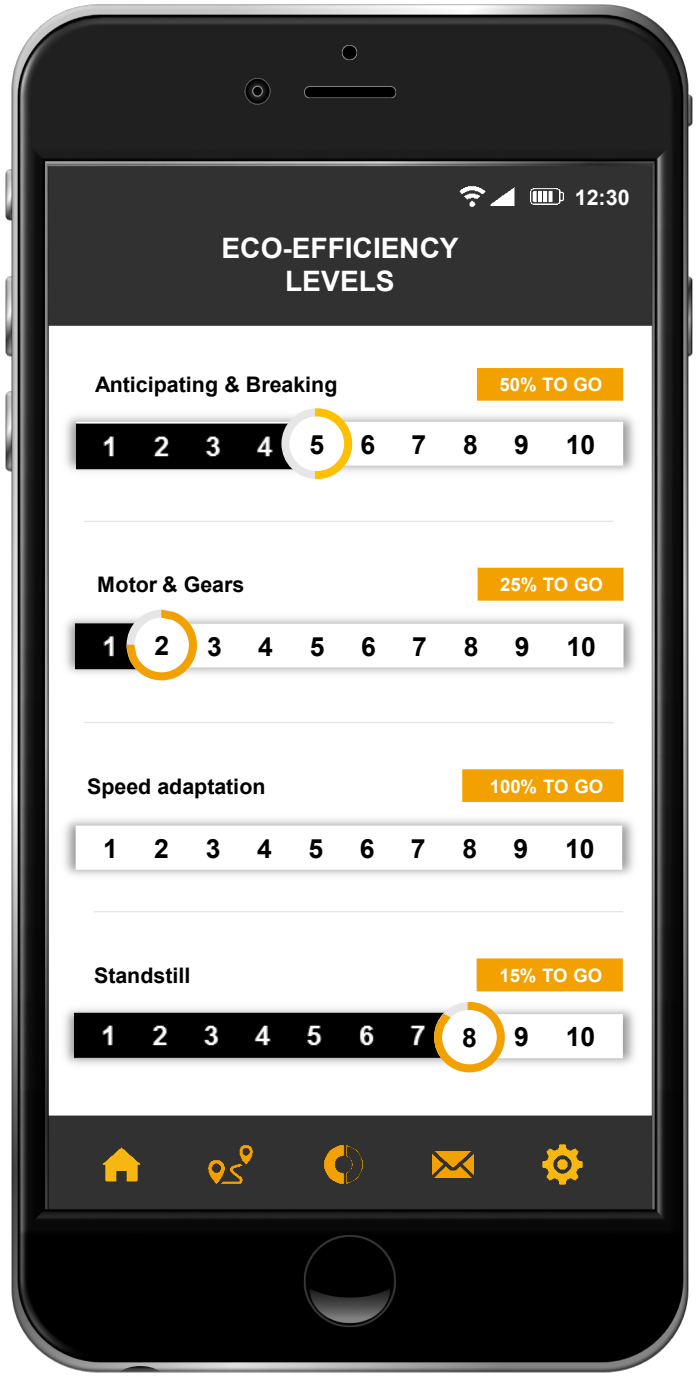

12:30
iDREAMS
Login
edith.donders@gmail.com
change
Password
Forgot password?
Next


12:30
iDREAMS
Login
edith.donders@gmail.com
change
****
Forgot password?
Next


12:30
iDREAMS
Login
Email
Password
Forgot password?
New? Please register here


12:30
Make an
iDREAMS account
First name
Last name
Email
Password
Confirm password
Next


12:30
HOME
eco-efficiency
road safety
functioning
pros & cons
coping tips
goals & badges
leaderboard
survey
shop
levels


12:30
ECO-EFFICIENCY LEVELS
Anticipating & Breaking
50% TO GO
1 2 3 4 5 6 7 8 9 10
Motor & Gears
25% TO GO
1 2 3 4 5 6 7 8 9 10
Speed adaptation
100% TO GO
1 2 3 4 5 6 7 8 9 10
Standstill
15% TO GO
1 2 3 4 5 6 7 8 9 10