*[Edit: Matteo, 18/10/19]: Revised some goals and domain assumptions, willing to delete some due to integrated notes. Please take a look to them too. Some more could be added, need a discussion.*

1. Introduction
   1. Purpose

SafeStreets is a mobile application that relies on the help of lawful citizens to make life in the streets less stressful and more organized, as traffic violations are a problem people are forced to face daily, whether they proactively take part in the traffic itself or not. The purpose of this document is to describe in depth SafeStreets in terms of functional and nonfunctional requirements, so as to help the customer and the developer be on the same page by identifying the former’s needs, and documenting these in a way that makes analysis, communication, and implementation sustainable for both parties.

* 1. Scope

The given problem is to create a software system that meets the stakeholders’ needs, which translate with the intent of making traffic regulation more efficient and organized by providing people with the ability to report and notify violations, e.g. vehicles parked in the middle of bike lanes, or in spots reserved to people with disabilities, to the designated authorities.

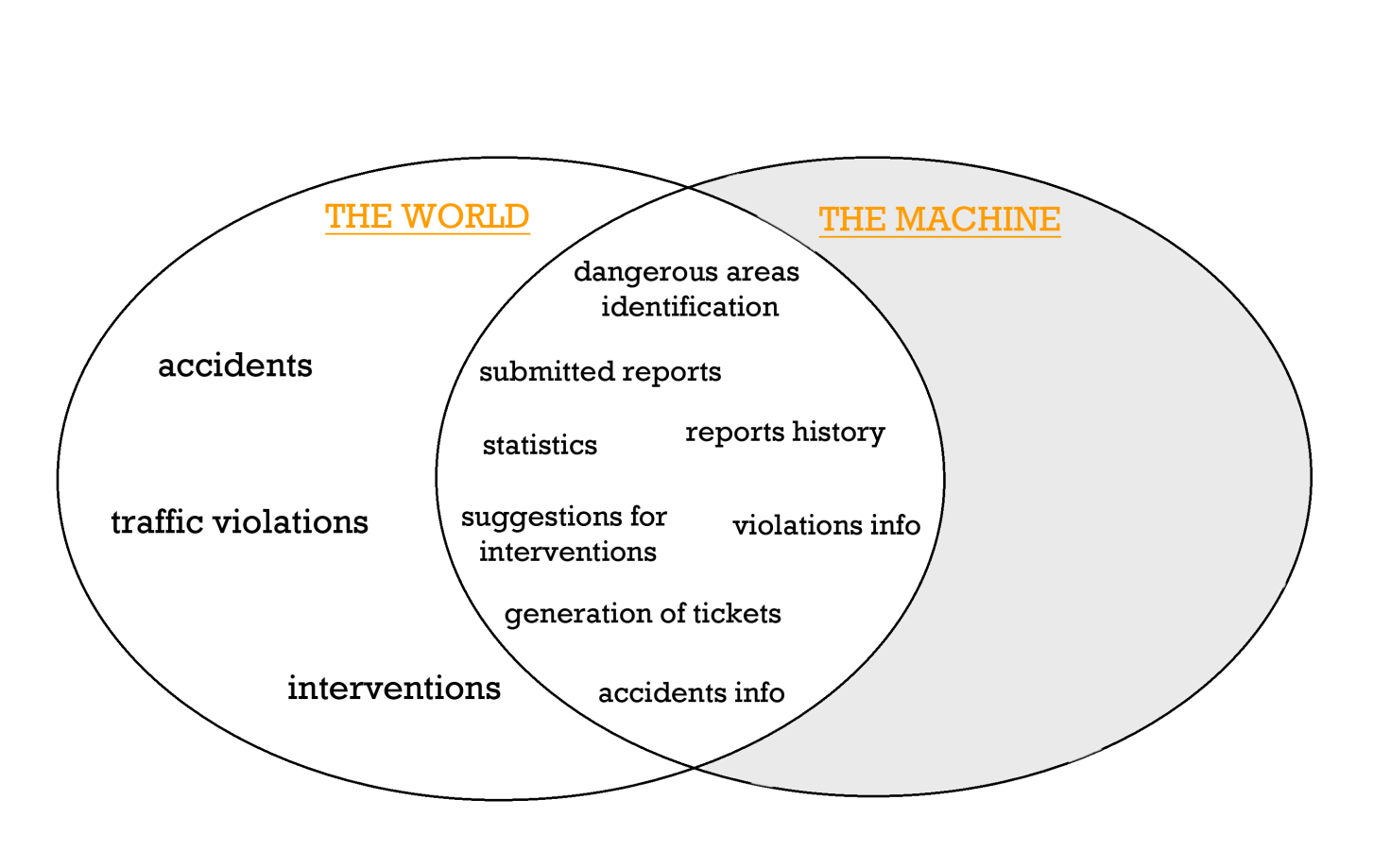
In particular, citizens [of age] should be able to register as users by providing meaningful credentials, so as to avoid wasteful data such as fake accounts, and a way to verify them, e.g. ID or driver license. Once successfully logged in, users should be able to send pictures as proof of vehicles parked illegally and attach additional information to provide authorities with a starting point for the reviewing process, such as the date, the time, the type of violation which is to be reported and the place in which it has occurred, which can be retrieved through the geographical position of the user itself. This means the device which the user is working with should at least be equipped with a camera and a GPS system.

SafeStreets stores the information provided by its users in the database and employs it by running an algorithm on the picture to recognize the license plate number. Such process could be made quicker by the input of the user itself, who is provided with the option of inserting the license plate information as plain text while filling out their submission. If that were the case, the system should use such information as a starting point for the recognition process, though the algorithm should be run nonetheless as a way of double-checking the information. The stored data can then be elaborated by both end users and the designated authorities to highlight the zones which are found to be subject to the highest amount of violations.

Furthermore, SafeStreets wants to exploit its own data by combining it with information about accidents and analyzing it in order to identify zones or streets whose safety could be improved by making interventions, possibly suggesting viable solutions as well. This functionality is developed in collaboration with a third party, i.e. the municipality, meaning its usefulness will depend on the possibility of the municipality itself to share its data and match it with the interface SafeStreets developed for the functionality.

Lastly, SafeStreets strives to assist the local police in generating traffic tickets, and possibly build various statistics of interest. To ensure the effectiveness of this service, it is necessary that the exchange of sensible data which must occur between SafeStreets and the municipality cannot be tampered with in any way, e.g. modifying the picture of the violation at hand. To avoid this scenario, the application should only accept as reliable information pictures that have been taken within the boundaries of SafeStreets itself, meaning the application should be equipped with an internal camera system.

In the following diagram, we define the boundaries of the application by identifying and distinguishing between World and Machine phenomena, with particular attention to the shared ones.

*Figure 1. World and Machine phenomena.*

Goals

~~[G1] Allow a visitor to become a registered User by providing his own credentials;~~

[G2] Allow an User to report traffic violations by providing a picture of involved vehicles with readable license plate, the location and the type of violation;

[G3] The system must recognize if the license plate is visible from the picture and if not, it must ask to retake the picture; *(a requirement)*

[G4] Allow an User to view an history of his past reports;

[G5] Allow Users and Authorities to mine information to highlight areas with most violations;

[G6] If the municipality offers the possibility, users can notify accidents occurred on the municipality’s territory; *(infos about accidents are directly collected by authorities)*

[G7] Allow User to receive a notice which inform them if their notification has been approved or rejected. *(notification not necessary, all signalizations are accepted → see D3-D7)*

[G8] Share the received reports with Authorities, if requested;

[G9] Municipality can accept or refuse an user request; *(which requests?)*

[G10] Municipality can generate traffic tickets; *(not concerning the system)*

[G11] Municipality can consult statistics built by Safestreets. *(redundant with G4)*

[G12] Link issued traffic tickets to relative Users signalizations and build statistics on the Users with most verified signalizations; *(Two different goals?)*

[G13] Allow a System Manager to cross information coming from Users and Authorities to identify and signalize unsafe areas;

[G14] Allow a System Manager to suggest possible solutions for the areas in which most violations occur;

Domain assumptions

[D1] Each User is unique;

[D2] An User notification is evaluated by an Authority within a week;

[D3] An User sends information about a violation when he notes it;

[D4] Information about date and time of the violation corresponds to the date and time when the signalization is sent;

[D5] Information about position of the violation is collected through GPS;

[D6] Picture of violations are taken at the moment and are not inserted in a second time or from already saved pictures;

[D7] Violations can only be reported through the mobile application;

[D8] An user notify accidents which are really occurred; *(accidents not reported by users)*

[D9] An User reports a certain violation once;

[D10] Reporting about a violations already evaluated are rejected; *(more signalizations about a violation can be useful → of course not generating multiple tickets is authorities' duty)*

[D11] Authorities have tools for assessing if a reporting is a violation or not;

[D12] Authorities generate traffic tickets only for actual violations;

[D13] Authorities are able to find the owner of the vehicle by the license plate, which is unique to each car vehicle;

Actors:

The actors implicated in our system are:

* Guest: he is a person who is not registered in the system and he is only able to sign up to the application;
* User: he is a person who has already signed up. Once logged in, he can access to his page and to the application functionalities;
* Local Police: the Local Police evaluates users’ reporting and can generate tickets;

Definitions, acronyms, abbreviations

Definitions:

User: a user, as already explained, is a person who is logged in the application and can notify violations;

Reporting: it is a notification sent by the user to indicate violations;

Authorities: as authorities is intended people who receive complaints and have the power to punish the offenders with traffic tickets;

Traffic tickets: they are sanctions which force an offender to pay an amount of money;

Information: it is about a violation, it specifies the date, the place and the type of the violation

(da completare mano a mano)

Acronyms:

(Per ora non utilizzati)

Abbreviations:

[Gn]: n-th goal;

[Dn]: n-th domain property

(da completare)