**Purpose**

This document is aimed to provide system for an authorities or Traffic Police and they want to develop software-based services in which people are allowed to notify authorities when traffic violations occur. Atually the app will give every citizen of the country an opportunity to become a virtual traffic police officer. SafeStreets is expected to be an answer for various limitations faced by the police in controlling traffic violations.

The SafeStreets software tools would provide a service in which it can report traffic violations and send the data from the mobile phone. This document will try to find the requirements for setting up such a system.

This document will also provide an analysis about a service tool called Advanced functions 2

, a service which can takes the information about the violations coming from SafeStreets, and generates traffic tickets from it.

Also this document will provide an overview of safestreetit will describe the system and its requirements.

**Scope**

**Description of the given problem**

SafeStreets is an application that intends to bringing public participation into reducing traffic offences, in particular parking violations. The application allows users to send pictures of violations, including their date, time, and position to police. There are 2 possiblie servic basic servic and advanced servic.for the basic servic SafeStreets stores the information provided by users, completing it with suitable meta- data. In particular, when it saves the report of vilation the user recognize the number of vehicle and stores the retrieved information with the violation, including also the type of the violation which select by users and the name of the street where the violation occurred and also can be retrieved from the geographical position of the violation. In addition, the application allows both end users and authorities to mine the information that has been received, for example by highlighting the streets (or the areas) with the highest frequency of violations, or the vehicles that commit the most violations. Of course, different levels of visibility could be offered to different roles.

**Advanced functions 2**: In addition, the municipality (and, in particular, the local police) could offer a service that takes the information about the violations coming from SafeStreets, and generates traffic tickets from it. In this case, mechanisms should be put in place to ensure that the chain of custody of the information coming from the users is never broken, and the information is never altered (e.g., if a manipulation occurs at any point of the image showing the violation, for example to alter the license plate, the application should discard the information). In addition, the information about issued tickets can be used by SafeStreets to build statistics, for example about the most egregious offenders, or the effectiveness of the SafeStreets initiative (e.g., by looking for trends in the issuing of tickets).

Using the app, now public can report visible traffic violations such as .. .. using cellphone while driving, obstructing free flow of traffic, buses carrying passengers on foot board and jumping signal by sending the photo of the violation to the police.

Shortage of manpower was one of the hurdles faced by the police in controlling traffic violations. The app can be downloaded to smart phones with Android platform using their Google account.

**1.2.2. Current System**

There are two applicatios which their names are TrafficEye, PublicEye that people can report road crashes & traffic violations without disclosing the sender identity.

**World and machine phenomena:**

the occurrences of Violation

the report of Violation by public

takeing photo and write details of Violation scene

upload the photo

the update of a database entry

the creation of a new object of class traffic Violation

access to Gallery of smartphone

upload the photo from the gallery

access to the camera of smartphone

### Goals

[G1] Allow a Visitor to become registered User after providing personal information in sign up form.

[G2] Allow user to capture the violation

[G2.1] Giving Access to use camera of his/her intelligence mobile phone or gadget.

[G2.2] Providing a form for some additional information, such as the license plate number (the application will be designed so that it can identify the license plate by image-processing algorithms, however, for confirming and special situations, it would be better to has this item which user can write license plate number in form), type of violation, type of vehicle, details about location and vehicle’s position, and other description.

[G2.3] Give access user to location (it is possible by employing Google Map service to find the location of user and violation on the map and sending it to authorities).

[G3] Allow user to get useful information about general information and news about streets situation.

[G3.1] Highlighting and warning most accident potential areas.

[G3.2] Familiarizing users with regions are prone to occur diverse violations.

[G3.3] Notifying users with current status of area (it can be implemented like news page, a page which local police can announce citizen about new changed occasions and rules in the region)

[G4] Give access the local police details of violation

[G4.1] the image must be clear and without noises (image analysis mechanisms can be implements to make image clear).

[G4.2] the image must focus on area that violation exactly happen and ignoring the rest (distinguishing concept of violation by image processing motor)

[G4.3] first need editor options must be provided for police officer (such as zoom in and zoom out, increasing brightness and contrast).

[G4.4] information of violation which is exploited from image processing and user interface should be represented in a table.

[G5] Give access to local police a panel for general announcements.

[G5.1] A section for representing the result of data mining processes on stored statistics and dividing and labeling city areas to Green: approximately without violations, Yellow: low present of violations, Red: high present of violations.

[G5.1.1] An option for categorizing type of violations such as: speeding, reckless driving, driving while intoxicated, failure to stop at a red light or traffic sign, parking violations, issues with paperwork and so on.

[G5.2] A section for publishing news. For example, new rules and new changes about traffic regulations.

[G6] Guiding Local Police for future determinations.

[G6.1] Complete access to (recent and old) reported information in statistic and searching way.

[G6.2] Access to mined information achieved by data mining algorithms.

[G6.3] ability to edit information of reports by authorities.

On several occasions, they proved to be too weak to confirm a case of violation   
Many complaints get rejected as the photographs are not clear to show the violations. 

\_The system must be able to detect the user location according to the user’s GPS.

– The system must allow user to report new violation immidately after submited one before.

– The system must reject the violation report if the photo is in poor quality.

– The system must reject the violation report if the place is not exact.

– The system must reject the violation report if user alter the report after submitting.

The system must be able to check the position of the client.

The system must not accept requests of user to change report after submit it.

The system must transfer the report to the appropriate traffic polic.

– The system must be able to determine the zone where the client is located according to the client’s GPS position.

– The system must be able to show zone with hight rate of violation based on type.

– The system must be able to show car number with high rate of parking violation.

## **Definitions, acronyms and abbreviations**

### **Acronyms**

• RASD: Requirement Analysis and Specification Document.

API: Application Programming Interface

### **Abbreviations**

• [Dn]: n-domain assumption.

• [Gn]: n-goal.   
• [Rn]: n-functional requirement.

**Definitions**

• User: he is a user of the app. when he requests to sing up to app he should insert the following information: Name, Family,Telephone number.

• Traffic Violation: Traffic violations occur when drivers violate laws that regulate vehicle operation on streets.

Type of violation:it can be these 5 type of parking violation: Double parking,

Double parking: is a traffic offence categorized under parking violations. It occurs when a car parks parallel to another vehicle parked against a curb.

Handicap parking: is a traffic offence categorized under parking violations. It occurs when a car parks on that spots are set aside for people with disability.

Residential parking: is a traffic offence categorized under parking violations. It occurs when a car parks where parking zones are controlled or designated for use by residents living nearby.

Sidewalk parking: is a traffic offence categorized under parking violations. It occurs when a car parks in sidewalks are meant for use by pedestrians.

Special parking: is a traffic offence categorized under parking violations. It occurs when a car parks a place that are designated for specific vehicles.

• Report Traffic Violation: …

• Zone: it is a zone of approximately area of the city is split into these

zones..

• System: it is the new system we will create with the database .

• API: application programming interface; it is a common way to communicate with another system.

## **References**

• Specification Document: “Assignments AA 2016-2017.pdf”.

• GPS Performances

• IEEE Std 830-1993 - IEEE Guide to Software Requirements Specifications.

## **Overview**

## This RASD is composed by six parts and an appendix:

## 1. In the first part an introduction to the problem is given listing all the identified goals and providing some base information in order to better understand the other sections of the document.

## 2. The second part consists of an overall description of the system in which its boundaries are identified, and the actors involved in the system’s usage lifecycle are listed. The boundaries are given providing all the necessary assumptions: both the ones required in order to better understand the customer’s specifications given and the ones that will hold into the system and now on considered as true.

## 3. The third part is composed by the specific requirements identified, both functional and non-functional.

## 4. In the fourth part a list of eight scenarios is provided; each of them describes a particular situation with the system might have to cope with.

## 5. The fifth part is entirely composed by the UML diagrams that model the system in details.

## 6. Sixth part is embodied with the Alloy model of the system and includes all the relevant details; a proof of consistency and an example of the generated world are also provided.

## 7. The last part is accessory and contains a list of the tools used to redact this document and its contents, and a detailed report of the hours spent to do so.

**User characteristics**

**Actors**

* *Visitor:* a person using PowerEnJoy (through the mobile app or the website) without being registered. The only thing he/she can do is proceeding with registration.
* *Registered User / User:* a person passed through a successful registration process and now able to use all the safestreet services. He/she can login to the system and, after that, use all the platform's functionalities.
* *Trrafic police:* an employee of local trrafic police able to maintain and update the system. Registration for this kind of users is not possible and they have to be added directly during system's installation process.
* *Car:* a car involved in a violation report .

**Constraints**

**Regulatory policies**  
The system will ask for users' payment informations and obviously, in addition to store them safely.  
Moreover, the system will have to ask for users' permission in order to retrieve and use their positions (at least in a first implementation) storing them.

The system will have to ask for users' permission in order to access to camera and use their it (at least in a first implementation) storing them .

The system will have to ask for users' permission in order to access gallery and use their photo (at least in a first implementation) storing them.

Telephone numbers won't be used for commercial uses.

**Hardware limitations • Mobile App**

- iOSorAndroidsmartphone - 2G/3G/4G connection  
- GPS

• Web App  
- Modern browser able to retrieve user's location

**Interfaces to other applications**

…?

**Functional requirements:**

**Assumptions, dependencies and constraints.**

**Domain assumptions**

* Credentials that a visitor has to provide to become a registered user are: name, surname, telephone number and username.
* In order to access to the system, he has to provide the username and password associated to him/her.
* Every special parking area is a No parking area.
* A No parking area is a special parking area that no one can park a car there.
* A restricteced parking area is a special parking area that people with disabiliteis one can park a car there.
* As soon as the system send violation report the user can create another violation report again.
* fining a car to the system consists in adding its license plate, owner and model, and in polic system to communicate with the safestreet.
* The username must be unique.
* Smartphone of user is equipped with cammera.
* When the system shows a report of violation in a certain position it means that it's actually there.
* The registration number of the vehicle involved in the violation must be legible in the photo.
* The app has a provision to take photos of the violation
* The violation can be captured on the phone camera or the photo can be uploaded from the gallery.
* The plate number,type, time and place of violation will be sent to the police
* when the location setting (GPS) in the device is on active mode.
* Once a traffic violation is successfully submitted, an electronic fine-ticket will be generated by the traffic police .
* Using the registration number of the vehicle, the police collect the details of the vehicle owner to issue the fine.
* For every report violation, details about the violation are correctly entered.
* For every report, photo about the violation are clearly captured.
* Accurate violation scene locations are known by GPS
* All the GPS always give the right position.

User is registered and logged in on the application to interact with the system.

**Dependencies:**  
[D1]: The safestreet will depend on Google Map API’s to define the place of violation.

[D2]: The app is dependent on the camera, on the smartphone and the smartphone, to be able to roll out their services. For that reason, it is important to have a close relationship with them.

**Constraints:**  
[C1]: Users should capture photo with high quality and in right angel.

2.2 Product functions:

Considering all of the presented goals of the SafeStreet system, most of the functions of the system can be divided into 2 services. In the next section, they are listed and more accurately defined, on the basis of the goals mentioned earlier.

BASIC:

In this service, the user will be able to register themselves. Once they have registered, the users  
will be able to log-in on the SafeStreet application which will provide the user on their smart-  
phone a ability to report a traffic violation, also user can see the area where is place with most parking violation, also traffic polic can acsess to the places with hight rate of violation and also filiter the by car that has large number of violation.

ADVANCED2: