Use case descriptions

1. Registration Process – User (Citizen)

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| Actor | Visitors |
| Goal | G1 |
| Input condition | There are no entry conditions. |
| Event flow | 1. The Visitor, after downloaded the mobile application, comes to the view of the mobile app and clicks on the Sign In button to start Registration Process 2. The Visitor from a first panel choose button labelled “Citizens” 3. The Visitor fills all personal mandatory fields (name, surname, address, gender, birth date, e-mail, phone number and fiscal code). 4. The Visitor clicks the Confirmation button. 5. The system saves and check correctness of provided data. 6. The system asks for the user a favourite communication method (SMS or e-mail) 7. The system sends, accordingly to the user’s choice, a confirmation link. 8. The Visitor clicks on the confirmation link to correctly enable his account. |
| Output condition | The Visitor successfully ends the registration process, becoming a User. Since now, he/she can log into the application with his/her e-mail and password. |
| Exception | 1. The Visitor does not specify at least one mandatory field. 2. The Visitor inserts invalid information in at least one field (data-type not respected, no match between personal information and provided fiscal code, invalid e-mail provided). 3. The Visitor specifies an email which has already been associated with an existing account. 4. The Visitor specifies a fiscal code which has already been associated with an existing User. 5. All exceptions are handled notifying the issue to the Visitor and taking back to the Event Flow to the point 3. |

2. Registration Process – Authorities

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| Actor | Visitors |
| Goal | G2 |
| Input condition | There are no entry conditions. |
| Event flow | 1. The Visitor, after downloaded the mobile application, comes to the view of the mobile app and clicks on the Sign In button to start Registration Process 2. The Visitor from a first panel choose button labelled “Authority District” 3. The Visitor fills mandatory fields: formal force name (Polizia, Carabinieri, Local Police District), reference address for that station, city name and an institutional mail address. 4. The Visitor upload a list of its employee (for which is needed to specify name, surname, institutional e-mail and a unique code) that match required file extension. 5. The Visitor clicks the Confirmation button. 6. The system saves and check correctness of provided data. 7. The system, in an automatic way, create an account for each Authority Member belonging to that District. 8. The system sends a mail containing a confirmation link and a randomly generated password. 9. The Visitor clicks on the confirmation link to correctly enable his account. |
| Output condition | The Visitor successfully ends the registration process, becoming an Authority. Since now, an employee assigned to this role for that District, can log into the application using institutional district’s e-mail and password. |
| Exception | 1. The Visitor does not specify at least one mandatory field. 2. The Visitor inserts invalid information in at least one field. 3. The Visitor specifies a triple (formal name, address, city) which has already been associated with an existing District. 4. The Visitor specifies an e-mail address already associated to an existing District. 5. The Visitor do not upload any attachment related to employees list. 6. The Visitor upload a file with not allowed extension. 7. Exceptions 1-4 are handled notifying the issue to the Visitor and taking back to the Event Flow to the point 3. 8. Exceptions 5-6 are handled notifying the issue to the Visitor and taking back to the Event Flow to the point 4. |

3. Activating Account Process – Authority Members

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| Actor | Authority Members |
| Goal | G3 |
| Input condition | There are no entry conditions. |
| Event flow | 1. The Visitor, after downloaded the mobile application, comes to the view of the mobile app and clicks on the Sign In button to start Registration Process 2. The Visitor from a first panel choose button labelled “Authority Member” 3. The Visitor after specifying information about District of belonging, insert the unique code provided to him/her. 4. The system retrieves personal data associated to that code and show them to the Visitor. 5. The Visitor check data correctness (in case something is wrong modifies identified fields) and then clicks the Confirmation button. 6. The system sends a mail containing a confirmation link and a randomly generated password. 7. The Visitor clicks on the confirmation link to correctly enable his account. |
| Output condition | The Visitor successfully ends the activating account process, becoming an Authority Member. Since now, he/she can log into the application with his/her institutional e-mail and password. |
| Exception | 1. The Visitor inserts a wrong unique code, or one not associated to specified District of belonging 2. The Visitor whose choose to modify some field inserts invalid information in at least one of them (data type not respected, invalid e-mail provided). 3. Exception 1 is handled notifying the issue to the Visitor and taking back to the Event Flow to the point 3. 4. Exception 2 is handled notifying the issue to the Visitor and taking back to the Event Flow to the point 5. |

4. Login Process – All

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| Actor | Users, Authorities and Authority Members |
| Goal | G1, G2, G3 |
| Input condition | The Customer in play has correctly performed the Sign In process, accordingly to the rules specified for its role in the application. |
| Event flow | 1. The Customer comes to the view of the mobile app and clicks on the Log In button. 2. The Customer insert its credential: (institutional) e-mail and password. 3. The system check correctness of inserted data. 4. The system allows to the Customer to access to its personal profile. |
| Output condition | The Customer successfully log into the application and can now perform all possible action accordingly to the role of the Customer in the application. |
| Exception | 1. The Customer does not specify at least one mandatory field. 2. The Customer inserts invalid information in at least one field. 3. All Exception are handled notifying the issue to the Customer and taking back to the Event Flow to the point 2. |

5. Notify Authority – User

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| Actor | User |
| Goal | G4 |
| Input condition | User has correctly performed the login operation. |
| Event flow | 1. The User comes to the view of the mobile app and clicks on specific panel to start upload a violation’s report. 2. Only first time, the User allows to SafeStreets usage of camera and GPS sensor. 3. The User fills a form about the occurred traffic violations. Required fields are type and image of violation, where violation occur and to which Authority notify the violation. 4. The User can optionally type additional notes to improve accuracy of report. 5. The User clicks the Confirmation button. 6. The system saves and check correctness of provided data, recognizing possible altered information contained in the traffic violation’s report. 7. The system runs the Reading Plate algorithm and adds as metadata, the result of this elaboration. 8. The system performs some elaboration through designed algorithm in order to extract essential information from the report. 9. The system makes result of that elaboration part of the statistics. 10. The system displays an image that let the User know process is correctly ended. |
| Output condition | The User successfully notified Authorities for the violation. Since now, he/she can follow the progress of this and also past notifications handling into the specific section of SafeStreets’ application. |
| Exception | 1. The User does not specify at least one mandatory field. 2. The User inserts invalid information in at least one field. 3. The User do not allow requested authorization. 4. The system, after run Reading Plate algorithm, cannot find a clear match with provided image. 5. The system recognizes in the user report an attempt to data alteration. 6. All exceptions are handled notifying the issue to the User and taking back to the Event Flow to the point 3. |

6. Authority Member handle violation report

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| Actor | Authority Member |
| Goal | G5 |
| Input condition | * Authority Member has correctly performed the login operation. * Authority Member has set as “Available” his/her availability status. * Authority Member, whose is send the request of intervention, belongs to the specified by User Authority to notify, and is the closest, available member for handling the violation. |
| Event flow | 1. The Authority Member is notified by SafeStreets about the violation. 2. The Authority Member start handling the request and goes to the place where violation occurs. 3. The system updates the history of that notification as “Taken in charge”. 4. The system automatically set as “Unavailable” Authority Member status. 5. The Authority Member once there, verifies the truthfulness of the violation and apply proper sanctions accordingly with laws in force for that specific town. 6. The Authority Member fills on the application a police report. 7. The system performs some elaboration through designed algorithm in order to extract essential information from the report. 8. The system makes result of that elaboration part of the statistics. 9. The system updates the history of that notification as “Handled”. 10. The system attaches to User’s notification history the police report filled by Authority Member that has handled the request of intervention. 11. The system set again as “Available” Authority Member status. |
| Output condition | The Authority Member correctly handled the notified violation. Since now, he/she can check his/her own police report related to that violation into the specific section of SafeStreets’ application. |
| Exception | 1. The Authority Member once on the place of traffic offence isn’t able to verify the truthfulness of the violation. 2. The Authority Member don’t see notification of SafeStreets application. 3. Exception 1 is handled by the system, updating the history of that notification as “No violation observed”, aborting the Event Flow from point 7 on. 4. Exception 2 is handled by the system, notifying again the Authority Member and taking back to the Event Flow to the point 2 |

7. User requests to visualize Statistics

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| Actor | User |
| Goal | G6 |
| Input condition | User has correctly performed the login operation. |
| Event flow | 1. The User comes to the view of the mobile app and clicks on specific panel to visualize Statistics. 2. The system retrieves from storage Statistics, accordingly with level of visibility of this Customer and with his/her town of belonging. 3. The User visualize requested Statistics. 4. The User can add some filters to the search (at this time those include a more restrictive search on a specific Area, lists the Top 10 unsafe area of the city). 5. The system retrieves updated Statistics that respects the constraints expressed. 6. The User visualize requested, updated Statistics.   < |
| Output condition | The User is able to visualize Statistics about unsafe area of its town. |
| Exception | 1. The User, whose choose to express a filter, do not specify at least one mandatory field. 2. The User, whose choose to express a filter, inserts invalid information in at least one field. 3. The system in retrieving Statistics for the filters added by the User doesn’t find any match in the storage. 4. All exceptions are handled notifying the issue to the User and taking back to the Event Flow to the point 1. |

8. Authority Members requests to visualize Statistics

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| Actor | Authority Members |
| Goal | G7 |
| Input condition | Authority Members has correctly performed the login operation. |
| Event flow | 1. The Authority Members comes to the view of the mobile app and clicks on specific panel to visualize Statistics. 2. The system retrieves from storage Statistics, accordingly with level of visibility of this Customer and with his/her town of belonging. 3. The Authority Members visualize requested Statistics. 4. The Authority Members can add some filters to the search (at this time those include a more restrictive search on a specific Area, lists the Top 10 unsafe area of the city, the unruliest vehicle drivers). 5. The system retrieves updated Statistics that respects the constraints expressed. 6. The Authority Members visualize requested, updated Statistics. |
| Output condition | The Authority Members is able to visualize Statistics about unsafe area of its town. |
| Exception | 1. The Authority Members, whose choose to express a filter, do not specify at least one mandatory field. 2. The Authority Members, whose choose to express a filter, inserts invalid information in at least one field. 3. The system in retrieving Statistics for the filters added by the Authority Members doesn’t find any match in the storage. 4. All exceptions are handled notifying the issue to the Authority Members and taking back to the Event Flow to the point 1. |

9. User requests to visualize progress of an his/her Past Notification

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| Actor | User |
| Goal | G4 |
| Input condition | User has correctly performed the login operation. |
| Event flow | 1. The User comes to the view of the mobile app and clicks on specific panel about his/her past Notification. 2. The system retrieves from storage Notification which sender is the User whose is performing the request. 3. The User visualize his/her past Notification list. 4. The User tap on an element of the list for which want to see more details. 5. The system retrieves from storage all details and attachment for that Notification. 6. The User visualize details about that Notification and if already handled can read the police report attached. |
| Output condition | The User is able to visualize progress of an his/her Past Notification. |
| Exception | 1. The User hasn’t already performed any notification to the Authorities. 2. Exception 1 is handled showing an empty list and aborting the Event Flow form the point 3 on. |

10. Authority Members requests to visualize his/her Past handled Notification

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| Actor | Authority Members |
| Goal | G5 |
| Input condition | Authority Members has correctly performed the login operation. |
| Event flow | 1. The Authority Members comes to the view of the mobile app and clicks on specific panel about Notification that he/she has handled. 2. The system retrieves from storage those Notifications. 3. The Authority Members visualize his/her past Notification list. 4. The Authority Members tap on an element of the list for which want to see more details. 5. The system retrieves from storage all details and attachment for that Notification. 6. The Authority Member visualizes details about that Notification and can read police report he/she wrote. |
| Output condition | The Authority Member is able to visualize his/her Past handled Notification. |
| Exception | 1. The Authority Member hasn’t already handled any notification. 2. Exception 1 is handled showing an empty list and aborting the Event Flow form the point 3 on. |

11. SafeStreets suggest same possible intervention to Municipality

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| Actor | Municipality |
| Goal | G8 |
| Input condition | Municipality offers a (well-integrated with SafeStreets) service on which retrieve information about the accidents that occur on the territory. |
| Event flow | 1. The system retrieves information from Municipality’s service. 2. The system commutes those information in data, compatible with its own produced statistics. 3. The system makes a cross between its and municipality’s data. 4. The system analyses the result, and, for each critical zone, selects from a default set of suggestion the most relevant ones. 5. SafeStreets sends those suggestion to the Municipality (through institutional e-mail provided by that during Registration Process). |
| Output condition | Municipality receives suggestions made by the System. |
| Exception | 1. The system does not find any statistics about a zone. 2. The system isn’t able to cross information producing a feasible suggestion on intervention. 3. Exception 1 at this time cannot be handled by the system, so for that zone the Event Flow is aborted from the point 4 on. 4. Exception 2 is handled by the system, sending a notification to System Manager asking to add other pre-set suggestion. |

12. SafeStreets sends to Authority (local Police) certified violations for which is possible to generate traffic tickets

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| Actor | Authority (local Police) |
| Goal | G9 |
| Input condition | Authority has correctly performed the Sign In process, accordingly to the rules specified for its role in the application.  Authority Member, which has *ForceName = “Local Police”*, has certified that a notification sent by a user is effectively a violation. |
| Event flow | 1. The system receives the intention expressed by AM to proceed to the creation of a ticket. 2. The system, taken the plate read in previous phases of the violation handling process, run *findOwnerPlate* external algorithm. 3. *findOwnerPlate* returns the data of the person whose committed the infraction. 4. The system updates the statistics regarding traffic tickets. 5. The system attaches all needed information and send a notification to let the Authority (which has the AM whose certified the violation in its employee list) compile the ticket. 6. Authority receives the notification and is ready to handle the ticket generation process. |
| Output condition | The Authority correctly receives SafeStreets notification and has all information in order to start ticket generation process. |
| Exception | 1. *findOwnerPlate* is unable to find a match with the plate provided but the system is unable to perform any action to avoid this. 2. The Authority don’t see notification of SafeStreets application. 3. Exception 1 is handled by the system, sending a form filled without offender’s data. Could be the case of a compromised plate. 4. Exception 2 is handled by the system, notifying again the Authority and taking back to the Event Flow to the point 5 |

13. Authority (local Police) requests to visualize Statistics about Traffic Tickets

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| Actor | Authority (local Police) |
| Goal | G10 |
| Input condition | Authority has correctly performed the login operation. |
| Event flow | 1. Authority accesses to traffic tickets statistic by mean of main page. 2. The system provides traffic tickets statistic related to the belonging zone of authority member. |
| Output condition | Local police authority visualizes statistics about traffic tickets in its area. |
| Exception | 1. No traffic tickets generated in the zone of action of the Authority. 2. Exception 1 is handled by the system, notifying that no traffic tickets are occurred. |