

Functional Requirements Document

Road Crash Case Information System

Prepared by: Tinatini Papashvili | Date: 23.04.2026
Version 1.0

Note: Due to privacy and security reasons, this project has been modified and sensitive information is not displayed.

Table of Contents

Table of Contents	2
1. Introduction	3
1.1 Business Problem	3
1.2 Project Goal	3
1.3 Scope	3
1.4 Document Structure	3
2. Functional Modules.....	4
2.1 Crash Card Registration (Actions A-E)	4
2.2 Card List and Search (Actions F-I)	4
2.3 System Administration	4
3. Functional Requirements Table	5
4. Input Data Summary	7
4. Roles	7
5. Reference Catalogs	7

1. Introduction

This document defines the functional requirements for the Road Crash Case Information System (CrashForm), a module to be added to the Ministry of Internal Affairs electronic violation registration system. The system will enable patrol police inspectors to capture crash data digitally via tablet computers, with automatic GPS location recording and integration with the e-Flow document management system.

1.1 Business Problem

Crash data is currently collected manually and is not always complete, standardized, or geographically accurate. The most critical issue is the absence of reliable exact crash location data. This makes it difficult to identify black spots, perform trend analysis, and determine probable root causes of crashes.

1.2 Project Goal

The goal is to create a structured digital form for recording crash information immediately after the incident, enabling analytical reporting across multiple parameters for data-driven road safety decision-making.

1.3 Scope

- Crash card registration on patrol vehicle on-board computers.
- Automatic capture of exact crash location through GPS coordinates.
- Structured capture of crash, vehicle, participant, road, and environment data.
- Review, verification, search, print, export, and reporting functions.
- Administration of users, roles, and reference data.
- Provision of crash data to external analytical systems through a web service or API.

1.4 Document Structure

The document describes the processes for the following activities: recording a road traffic accident in the accident card (Actions A–E), the accident card list and search (Actions F–I), the card information web service, and system administration (user and reference catalog management).

2. Functional Modules

2.1 Crash Card Registration (Actions A-E)

The patrol inspector completes the digital crash card on the tablet computer at the scene. The card consists of five sections: crash location with GPS (Action A), involved vehicles (Action B), involved persons (Action C), environment and road conditions (Action D), and additional comments (Action E).

Important: the system must store the change history of accident cards in the database. Cards completed by registrars must be verified by managers. When completing a card, the accident type must be a mandatory field (criminal case or administrative collision).

2.2 Card List and Search (Actions F-I)

The system provides a web-based list of all crash cards with quick search (key fields) and advanced search (all parameters) capabilities. Results can be exported to Excel. Access is restricted to MIA internal network and pre-approved IP addresses.

2.3 System Administration

User management will be carried out in the E-Flow electronic document management system. There are four user roles: Registrar, Manager, Analyst, and Administrator. The Administrator manages 25 reference catalogs to support standardized data entry.

3. Functional Requirements Table

The following table lists the core functional requirements for the CrashForm system. Each requirement is mapped to its corresponding functional module and assigned a priority level.

ID	Requirement	Description	Module	Priority
FR-001	Digital Crash Card Registration	The system shall allow patrol inspectors to create a new crash card (სსმ ბარათი) on a tablet computer. Upon first save, the system shall automatically assign a unique sequential ID number. The inspector's name shall be auto-populated from the logged-in user profile.	Action A	Critical
FR-002	Automatic GPS Coordinate Capture	The system shall automatically capture GPS coordinates (N, E) from the tablet's GPS module at the crash scene. Coordinates shall be stored as decimal numbers and linked to the crash record. Manual coordinate entry shall also be supported as a fallback.	Action A	Critical
FR-003	Crash Location Form	The system shall provide a structured form for crash location data including: road/location name (text), distance from origin (numeric), GPS coordinates (auto/manual), municipality/district (from reference catalog), crash date and time, crash type (criminal case / administrative collision), crash subtype (multi-select from catalog), and contributing factors (multi-select from catalog).	Action A	Critical
FR-004	Vehicle Registration	The system shall allow adding, editing, and deleting involved vehicles. Each vehicle record includes: sequential number (auto), vehicle type (from catalog, with free-text option for 'Other'), vehicle defects (multi-select), movement direction (multi-select, with free-text for 'Other'), vehicle ID (type + number), and manufacturer/model (from catalog).	Action B	High
FR-005	Involved Persons Registration	The system shall allow adding, editing, and deleting involved persons. Each person record includes: sequential number (auto), traffic participant category (from catalog), linked vehicle number, sex (default: male), age, body injury (from catalog), seatbelt usage, helmet usage, alcohol intoxication status, drug suspicion (yes/no), traffic rule violation (multi-select from catalog), pedestrian movement (from catalog), and comments (free text).	Action C	High
FR-006	Environment and Road Conditions	The system shall capture road environment and conditions including: road characteristics, surface type, surface condition, lighting, traffic signals, junction type, climate conditions, time of day, and location type. All fields use predefined reference catalog selections.	Action D	High

FR-007	Crash Sketch Upload	The system shall support uploading, viewing, downloading, and deleting crash scene sketch images. After the shift, the office clerk (feldeger) shall be able to locate the crash card by its number and attach the scanned sketch file.	Action A/E	High
FR-008	Card Status Management	Each crash card shall have a status field: 'რეგისტრირებულია' (Registered) or 'დამოწმებულია' (Verified). Only verified cards shall be included in analytical reports. Managers must verify cards after reviewing data completeness and attaching crash sketches.	Action A	High
FR-009	Change History Audit Trail	The system shall log all changes to crash cards, recording the edit date, time, user identity, and modified fields. The full change history must be queryable.	System Req.	High
FR-010	Card Search Functionality	The system shall provide quick search (text-based with AND logic across key fields) and advanced search (with filtering on all crash card fields including vehicle, person, environment parameters). Search results shall be displayed as a sortable list.	Action F	High
FR-011	Export to Excel	Search results shall be exportable to Microsoft Excel format (.xlsx) with all visible columns preserved.	Action G	Medium
FR-012	Analytical Reports	The system shall generate predefined reports: crash distribution by contributing factors, by crash type, by location and injury severity, by age group/sex/injury, by vehicle type, by lighting conditions, by time of day, by day of week, and by vehicle ownership. Reports shall be accessible via the web interface.	Action I	High
FR-013	Role-Based Access Control	The system shall enforce four user roles: Registrator (create/delete cards), Manager (edit/verify/print cards + analytics), Analyst (search/export/view analytics), Administrator (manage users, roles, and reference catalogs). Web access restricted to MIA internal network and pre-approved IP addresses.	Administration	Critical
FR-014	Reference Catalog Management	The system shall provide an administration interface for managing all 25 reference catalogs (municipality, crash type, vehicle type, injury severity, road conditions, etc.). Administrators can add, edit, and deactivate catalog values.	Administration	Medium
FR-015	Web Service API	The system shall expose a web service for sharing crash card data with external analytical systems (e.g., Roads Department). API specification documentation shall be prepared separately.	Web Service	Medium

4. Input Data Summary

The crash card captures data across four major categories, each containing multiple structured fields sourced primarily from predefined reference catalogs:

Category	Key Fields	Data Type
Crash Location	Road name, distance from origin, GPS (N/E), municipality, date/time, crash type, subtype, contributing factors, sketch image	Text, Numeric, GPS coordinates, Catalog selections, Image upload
Involved Vehicles	Vehicle type, defects, movement direction, vehicle ID (type + number), manufacturer/model	Catalog selections (multi-select), Text for 'Other', ID fields
Persons	Category, vehicle link, sex, age, injury, seatbelt, helmet, alcohol, drugs, violations, pedestrian movement, comments	Catalog selections, Boolean, Numeric, Free text
Environment/Road	Road characteristics, surface type/condition, lighting, signals, junction type, climate, time of day, location type	Catalog selections (all fields)

4. Roles

Role	Primary Responsibilities
Patrol Inspector / Registrar	Create crash records and enter structured crash data at the scene or immediately after the incident.
Manager	Search, review, edit, attach supporting files, and verify crash records.
Analyst	Search, filter, export, and analyze verified crash records.
Administrator	Maintain users, roles, and reference data values used by the system.

5. Reference Catalogs

The system requires 25 reference catalogs for standardized data entry:

Municipality/District, Accident Type, Probable Contributing Factors of the Accident, Vehicle Type, Vehicle Damage, Vehicle Direction of Movement, Make/Model, Road User Category, Bodily Injury, Seat Belt, Helmet, Determination of Alcohol Intoxication, Traffic Rule Violation by the Road User, Pedestrian Movement, Road Characteristics, Road Surface Condition, Road Surface Type, Lighting, Traffic Signal, Intersection Type, Climatic Conditions, Weather Severity Level, Time of Day, Location, Comments and notes.