**Actors:**

- **Vehicle**: Captures real-time driving data (speed, location, acceleration) and detects accidents.
- **ECALL System**: Manages accident detection, emergency call initiation, and data transmission.
- **Notification Service**: Sends alerts via SMS/email to emergency services.

**Description:**

This use case describes how the ECALL System detects an accident, initiates an emergency call, and notifies emergency responders with vehicle data.

1. **Accident Detection** (ECALL-01)
    - The system continuously monitors the vehicle's speed and acceleration.
    - If the speed drops drastically (e.g., from 80 km/h to 0 in 2 seconds), an accident is detected.
2. **Emergency Call Initiation** (ECALL-02)
    - Once an accident is detected, the ECALL System triggers an emergency call.
3. **Vehicle Data Transmission** (ECALL-03)
    - The system sends critical accident data (vehicle ID, speed, location, acceleration, timestamp) to the Notification Service.
4. **Notification Handling** (ECALL-04)
    - The Notification Service processes the data and notifies emergency services via SMS and/or email.
5. **Error Handling** (ECALL-07)
    - If invalid input is detected (e.g., negative speed), an error is logged, and the system prompts for correct data.
    - If network transmission fails, the system retries until successful.
6. **Accident Data Logging** (ECALL-08)
    - The accident event is logged in JSON/CSV format for future review.
7. **Historical Data Analysis** (ECALL-09)
    - The system allows reloading past accident logs for investigation.
8. **User Input via Terminal** (ECALL-10)
    - Users manually input speed, location, and acceleration to test the system.
9. **Automated Accident Simulation (Optional - ECALL-11)**
    - The system allows users to input a sequence of values for speed and acceleration over time.
    - If an accident condition is met, the ECALL feature is activated automatically.
10. **Networking Support (Optional - ECALL-12)**
    - If enabled, the system sends accident data to a remote server.
11. **Observer Pattern for Notifications (Optional - ECALL-13)**

- The system uses an observer pattern to notify multiple services when an accident occurs.