

UC3: “Environmental-related re-routing”

- *Context of use.* The system identifies an imminent reason for re-routing, based on real-time info (accident, road works, denial of passage from infrastructure, etc.) and provides the driver with the most optimum re-routing solution with regard to safety together with estimated time of arrival at destination. In case the initial routing has not been planned by the system (and therefore the vehicle, load and route data including destination, etc. are not stored), then the system, before starting the estimation for the safest route planning, it makes a request to the driver (or the company), in order to receive the needed info (or through TMC-UC9). As soon as driver (company) consent about re-routing is provided, all involved actors in the logistics chain are notified on new expected time of arrival at destinations (UC6).
- *Primary actor.* System (which however may use as an input a relevant notification by the infrastructure or the Police).
- *Input (trigger).* The system, taking into consideration real-time data related to weather conditions, traffic flow, road works, accidents, other data coming from the infrastructure regarding change in potential for passage, etc., identifies need for re-routing.
- *Output.* The system, taking also in consideration the vehicle, load and route data (stored or acquired upon request by the company or the driver), processes with the alternative “safest” re-routing planning and provides it to the driver, together with notification about estimated time of arrival.
- *Main success scenario(s).*
 - ⇒ **Step 1:** The system identifies need for re-routing (*it may also send the key info to the driver to justify re-routing-UC9*).
 - ⇒ **Step 2:** The system plans the new “safest” route alternative and provides it to the user, together with any confirmation of passage booking through “special infrastructures” and a notification on estimated time of arrival in declared destination, within a time horizon of 5 minutes from the time of re-routing identification and asks for driver receipt of route guidance and approval of alternative route.
 - ⇒ **Step 3:** The user confirms the approval of the system given alternative and initiates re-routing according to the system guidance.
 - ⇒ **Step 4 (UC6):** *As soon as the driver confirms re-routing proposal acceptance, all involved actors in the logistics chain (mainly customers and company) are notified about new expected time of arrival at declared destination(s).*
- *Connected UCs and extensions.* During the re-routing procedure and in case special infrastructures are interfered (i.e. tunnels, etc.) and if the time interval is sufficient, the system asks for booking of passage from the new infrastructure (or the same at a different time) and provides confirmation of receipt to the driver (see UC1). Another possible extension of the UC is the fact that the driver or the company is not satisfied with the estimated time of arrival, if the safest route, as estimated by the system, is followed, and makes another request for re-routing according to another criterion such as “shortest route”, etc. (see UC2); thus the system proceeds with the re-estimation and performs the route planning according to the new defined criteria. Another case is that the user (driver/company) does not approve the first alternative given by the system for any reason. Then the user sends denial notification and the system provides the user with the second “safest” alternative and so on. In any case of re-routing, the system notifies all actors of the logistic chain, mainly the customers and the company, for re-

routing and estimated time of arrival in claimed destinations (see UC6). Finally, key info communication is related to UC9.

○ *Indicative scenarios of use.*

⇒ “An unexpected road work has occurred during the initial route of the vehicle X¹ and has interrupted completely the traffic flow-need for re-routing”.

⇒ “A considerable traffic congestion is noticed in the initial route of vehicle X and the estimated delay in time of arrival will be about 2 hours-need for re-routing”.

⇒ “The tunnel Y has denied booked passage to the vehicle due to accident occurring-need for re-routing”.

After the first re-routing...

⇒ “I need another alternative/route”.

⇒ “I have to be at destination Y with a delay of 1 hour at most”-“UC2”.

¹ X refers to the ID of the vehicle and the load.