Although security measures in transportation systems are becoming larger, the progressive increase in the number of vehicles traveling through the cities and highways around the world certainly increases the probability of an accident. In such situations, the response time of emergency services is crucial, as it is shown that the shorter the time is between an accident and hospital care of the injured, the greater are their chances of survival.

Vehicular networks allow communication among vehicles and the communication between vehicles and infrastructure, leading to a plethora of new applications and services in the vehicular environment. Focusing on applications related to road safety, vehicles could inform other vehicles and emergency services in case of accident.

When an accident occurs, it is necessary to develop an effective plan of action, which allows a fast rescue of the injured. Arrival time of emergency services to the area where the accident took place can be the difference between the injured survive or die. In this Thesis a system able to reduce the time of the emergency services arrival to the accident scene by redistributing traffic is proposed. The system combines traffic density information with road map topology complexity in order to reduce the emergency services arrival time. Results show that our system is able to reduce the arrival time up to 47.9 %.

On the other hand, one of the most important issues is to know what information related to the accident must be sent. Nowadays, vehicles have a variety of sensors that allow obtaining information about themselves (speed, location, states of security systems, number of passengers, etc.), and about their surroundings (weather information, road conditions, lightness, etc.). In this Thesis we propose an ontology to structure and encode this information, with the aim of allowing the interaction and communication among vehicles of different manufacturers, and between them and central systems.

Finally, in order to make that information generated by crashed vehicles to properly arrive to the emergency services, we propose to use the infrastructure to provide coverage to all vehicles in the scenario. Specifically, in this work we propose a road-side-units deployment scheme that allows automatically obtaining the smallest number of them and their optimal position, thereby reducing costs without losing services.