

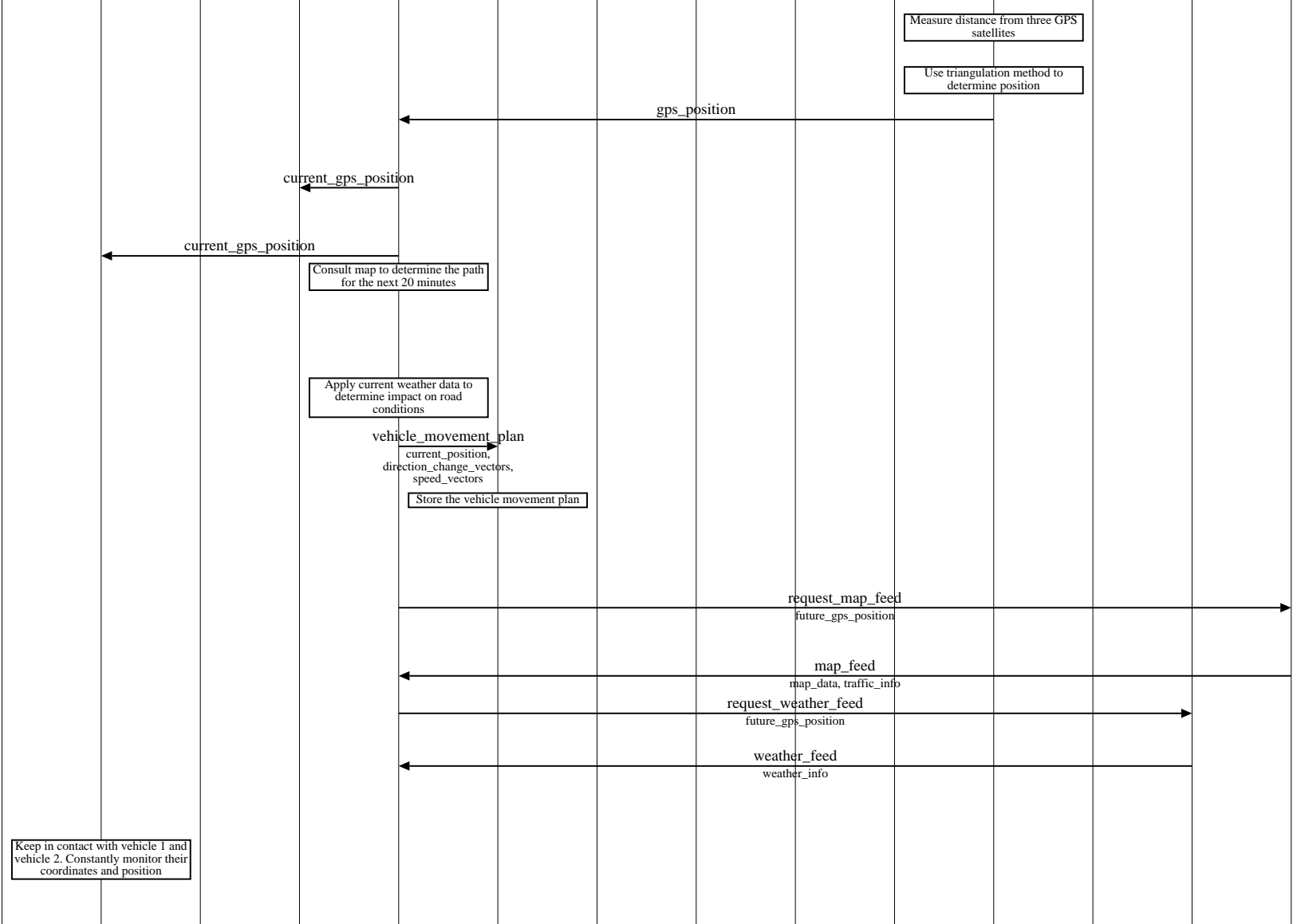
AutoDrive Use Cases (Regular driving)														
my highway lane											other highway lane	internet		EventHelix.com/EventStudio 2.0
vehicle 1	my vehicle										vehicle 2	weather web service	map web service	
IVS subsystem 1	inter vehicle signaling subsystem	radar	obstruction detection subsystem	position mapping subsystem	automatic driving subsystem	steering	brakes	accelerator	dashboard	gps receiver	IVS subsystem 2	weather web service	map web service	05-Jul-03 16:25 (Page 1)

**LEG: Preconditions: Regular driving**

My vehicle is driving behind vehicle 1. Vehicle 2 is present in the other lane. The highway is about to curve by 60 degrees over a one mile stretch

**LEG: GPS Position Handling (Detailed)**

GPS position tracking and periodic weather, map and traffic updates



GPS receiver measures distance from at least three GPS satellites  
 Current position is determined by using triangulation.  
 Current GPS position is reported to the position mapping subsystem. This process is repeated periodically  
 The GPS position is then sent to all the modules that need to know the position of the vehicle

The maps are consulted and speed and direction change vectors are prepared. This information is required for automatic driving. Traffic on the route is also considered while calculating the routes  
 Calculated speed and direction vectors may be modified based on current weather conditions

The vehicle movement plan is saved by the automatic driving subsystem. This information will be used to direct movement of brakes, accelerator and steering

Request map feed from the mapping webservice. This information is obtained for future mapping requirements  
 Map feed with current traffic conditions is obtained

Now look ahead and check the weather conditions at future locations

Weather information is obtained. This will be used in computing the route and speed

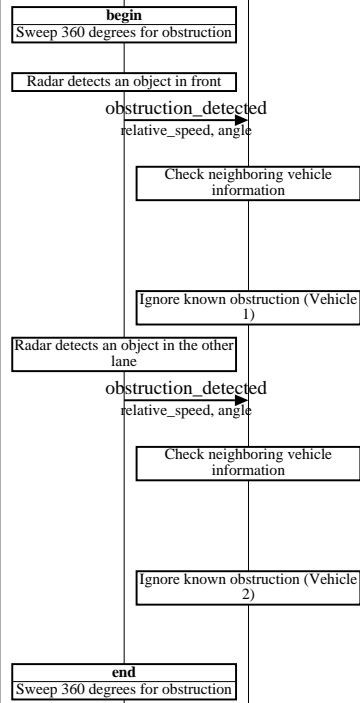
**LEG: Inter Vehicle Signaling (Summary)**

Keep track of neighboring vehicles. This involves monitoring their speed, size and direction of movement

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**LEG: Radar Feed Handling (Detailed)**

Obstruction detection subsystem filters the radar feed for known objects



The radar begins a 360 sweep around the car to locate any obstructions around the car

Radar reports the obstruction to the obstruction detection subsystem

The obstruction location is checked against known locations for other vehicles by checking the GPS position reported by neighboring IVS vehicles.

Since this is a known object, no further action is required

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The obstruction location is checked against known locations for other vehicles by checking the GPS position reported by neighboring IVS vehicles

Since this is a known object, no further action is required

**LEG: No other obstruction found**

**LEG: Automatic Driving (Details)**

Check if vehicle's speed needs to change

**LEG: Recommended speed is greater than current speed**

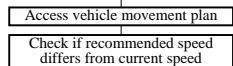
Vehicle movement plan recommends a higher speed, so speed up the vehicle by using the accelerator (gas)

Check if vehicle's direction needs to change

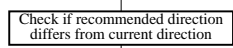
**LEG: Recommended direction is different from current direction**

Move the steering to change direction

**LEG: Postconditions: Regular driving**



apply\_acceleration



move\_steering

Vehicle has negotiated the 60 degree direction change by automatically steering the vehicle