

## Project #1 Term3

### Self-Driving Car Engineer Nanodegree Program

#### Path Planning

In this project, our goal is to design a path planner that is able to create smooth, safe paths for the car to follow along a 3 lane highway with traffic. Designed path planner will be able to keep inside its lane, avoid hitting other cars, and pass slower moving traffic all by using localization, sensor fusion, and map data.

#### Rubric Points:

- The code compiles correctly.
- The car is able to drive at least 4.32 miles without incident.
- The car drives according to the speed limit.
- Max Acceleration and Jerk are not Exceeded.
- Car does not have collisions.
- The car stays in its lane, except for the time between changing lanes.
- The car is able to change lanes
- There is a reflection on how to generate paths.

#### Designing Steps:

We considered following steps to build our path planner:

- Iterate over sensor fusion data to detect car's lane, is it in front of us or not and is it close to us or not. We also extract its position and velocity. (line 281 – 305)
- Decision making: slow down/ keep fast/ change lane to left/ change lane to right? (line 307-329)
- Do action (calculate desired lane and speed) based on maked decision. (line 331-356)
- Generate path using spline function ( 50 points ). (line 359-459)
- Send generated (x,y) to simulator. (line 461-476)