# Highway Driving Reflection

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The code model of this project is composed of two main components: a behavior planner and a trajectory generator.

1. Behavior planner

The BehaviorPlanner class is responsible for generating the high level behavior maneuver of the next step of the ego vehicle. It uses a Finite State Machine to determine the next step based on the current state and current surrounding traffic. There are five states in total: Keep Lane, Prepare Lane Change Left, Prepare Lane Change Right, Lane Change Left, Lane Change Right. The state machine transition model is described as follow:
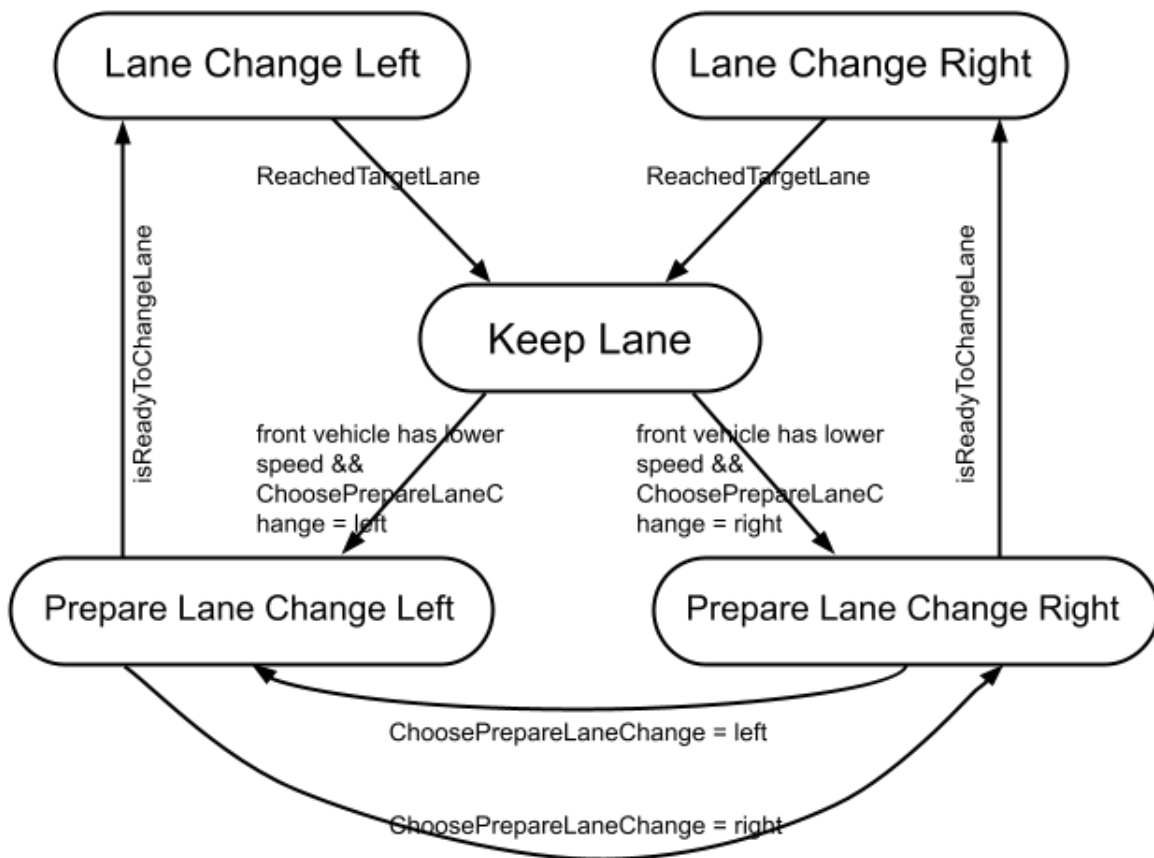
2. Trajectory generator

The TrajectoryGenerator class is responsible for generating the detailed path given a high level behavior maneuver. The input of each GenerateTrajectory method is the vehicle's starting state, the target lane, and the target speed.

The spline library is used to generate continuous trajectory. Five points are taken as the reference points of the spline. First two reference points come from the last two points of the previous path. Three new reference points are taken from the target lane with 30 meters space apart. The new path is append to the left trajectory points of the previous path.