Basic Movement Test

Goal of the test
Evaluate the movement of the car on a portion of the track This includes straight line movement, left turns and right turns. The test is divided into two portions, one which emphasizes left hand turns, and one which emphasizes right hand turns.

Testing Area

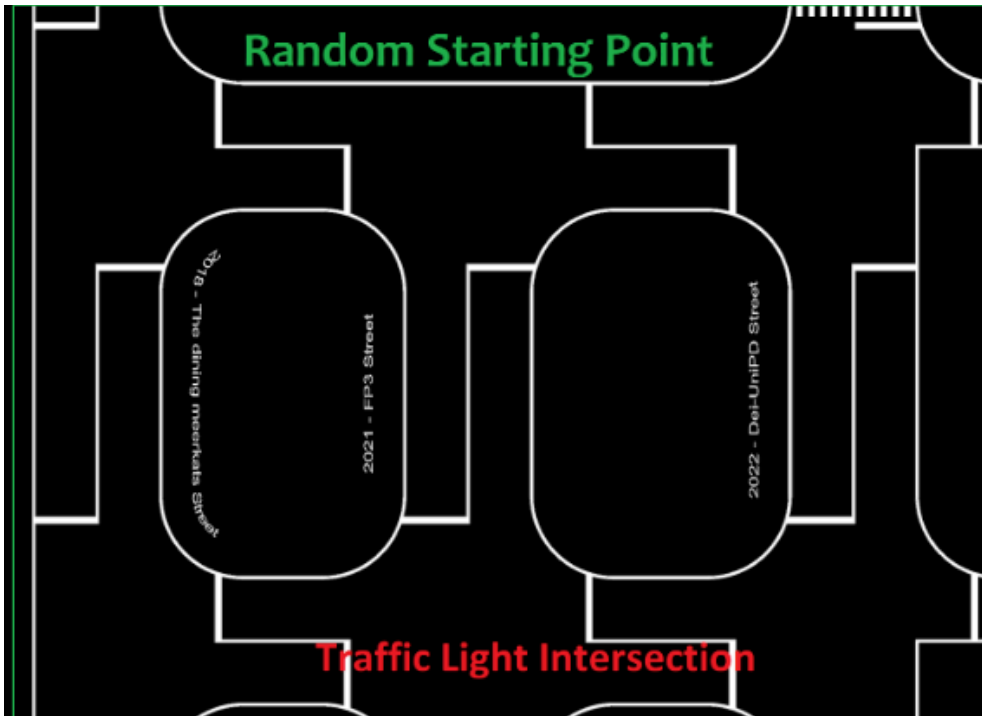

Figure 1 : Intersections to be used in the test

The testing area used will be the above intersections. These have been chosen because they offer the opportunity to easily test out the three basic movements of the car.

Projected Trajectory

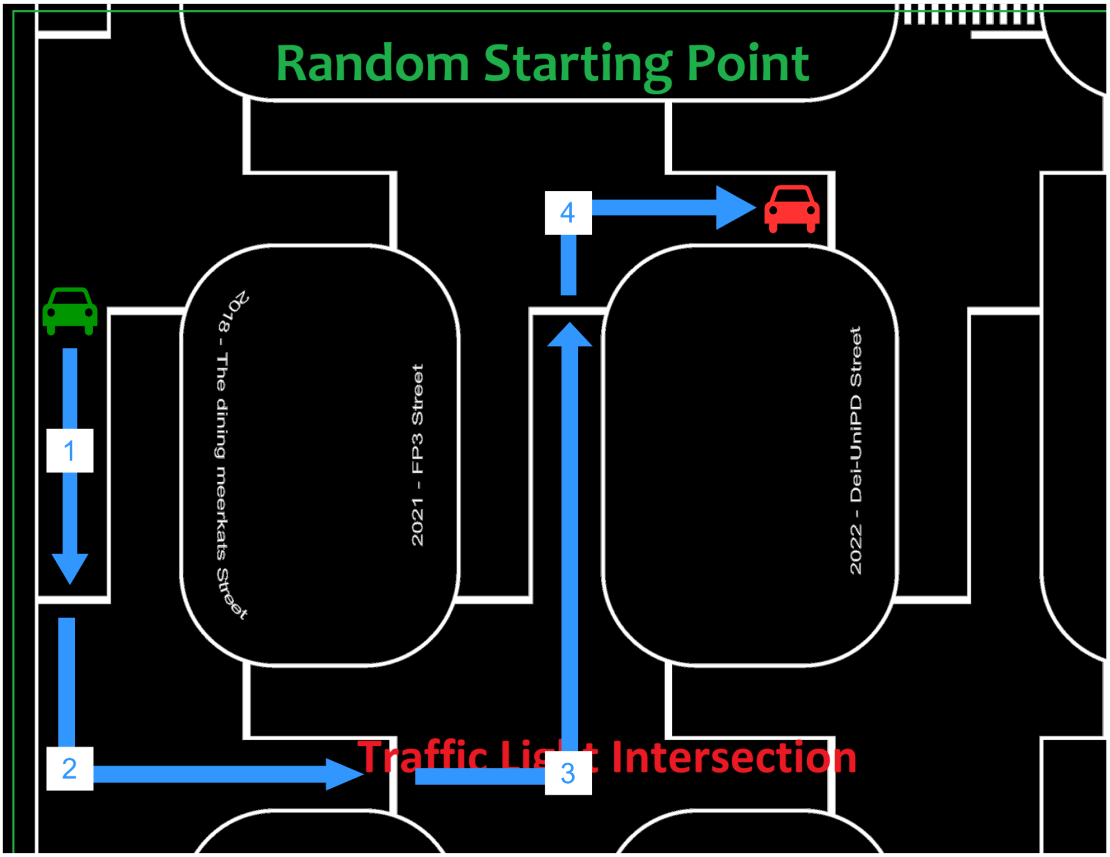

Figure 2 : Proposed trajectory of the car, Left Hand Emphasis

Figure 2 shows the proposed trajectory of the car for testing out left turns. The car will begin by maintaining a straight line movement (1). When it reaches the appropriate point, it will initiate a left hand turn and merge into the correct lane (2). Then, it will perform another left hand turn once it reaches the intersection (3). Finally, it will perform a right hand turn after reaching the third intersection (4).

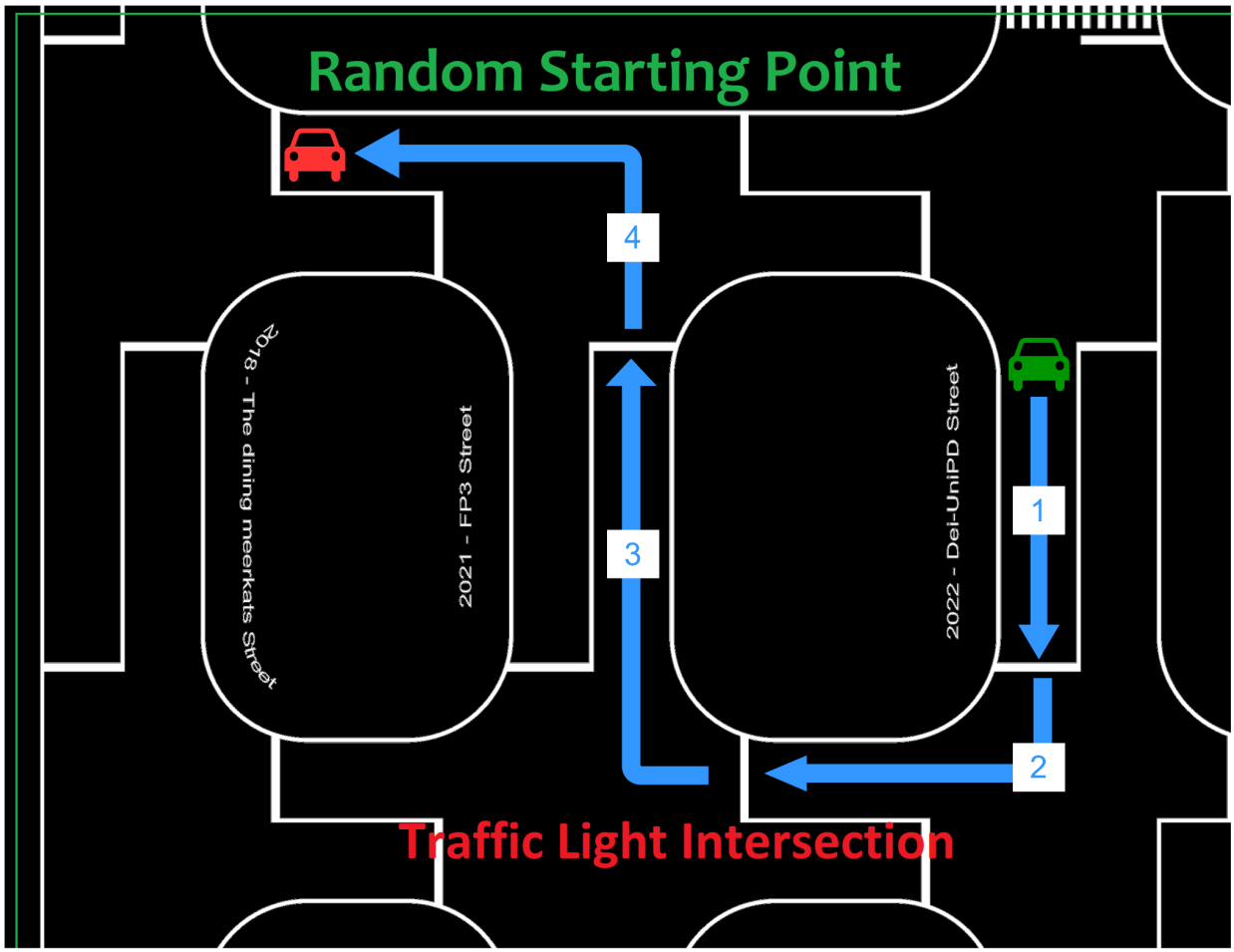

Figure 3 : Proposed trajectory of the car, Right Hand Emphasis

Figure 3 shows the proposed trajectory of the car for testing out right turns. The car will begin by maintaining a straight line movement (1). When it reaches the appropriate point, it will initiate a right hand turn and merge into the correct lane (2). Then, it will perform another right hand turn once it reaches the intersection (3). Finally, it will perform a left hand turn after reaching the third intersection (4).

Required Props

For the purpose of this test, which strictly evaluates movement from odometry and path following, no props will be used. The only required material is the track and the car.
i.e.

- Track
- Car

Required Running Scripts

This test will require the control algorithm to run with the car. Since no sign detection is being used, the camera may or may not be necessary depending on the use of lane detection. The dashboard will be required to plan the trajectory.

i.e.

- Controller
- Dashboard

Estimated Time for Completion

The time for each portion of the test is around 20 minutes. Therefore, the total basic movement test should last around 45 minutes.
i.e. 45 minutes

Evaluation Criteria

- Ability to maintain straight line trajectory
- Ability to start turn at the appropriate moment
- Ability to enter lane correctly after first turn
- Ability to start the second and subsequent turns at the appropriate point
- Does drift accumulate after having made multiple turns?
- Does the speed influence the trajectory?
- Is there a significant difference between left hand and right hand turns?