Handling An Intersection Scenario Without Dynamic Objects

Course 4, Module 5, Lesson 2

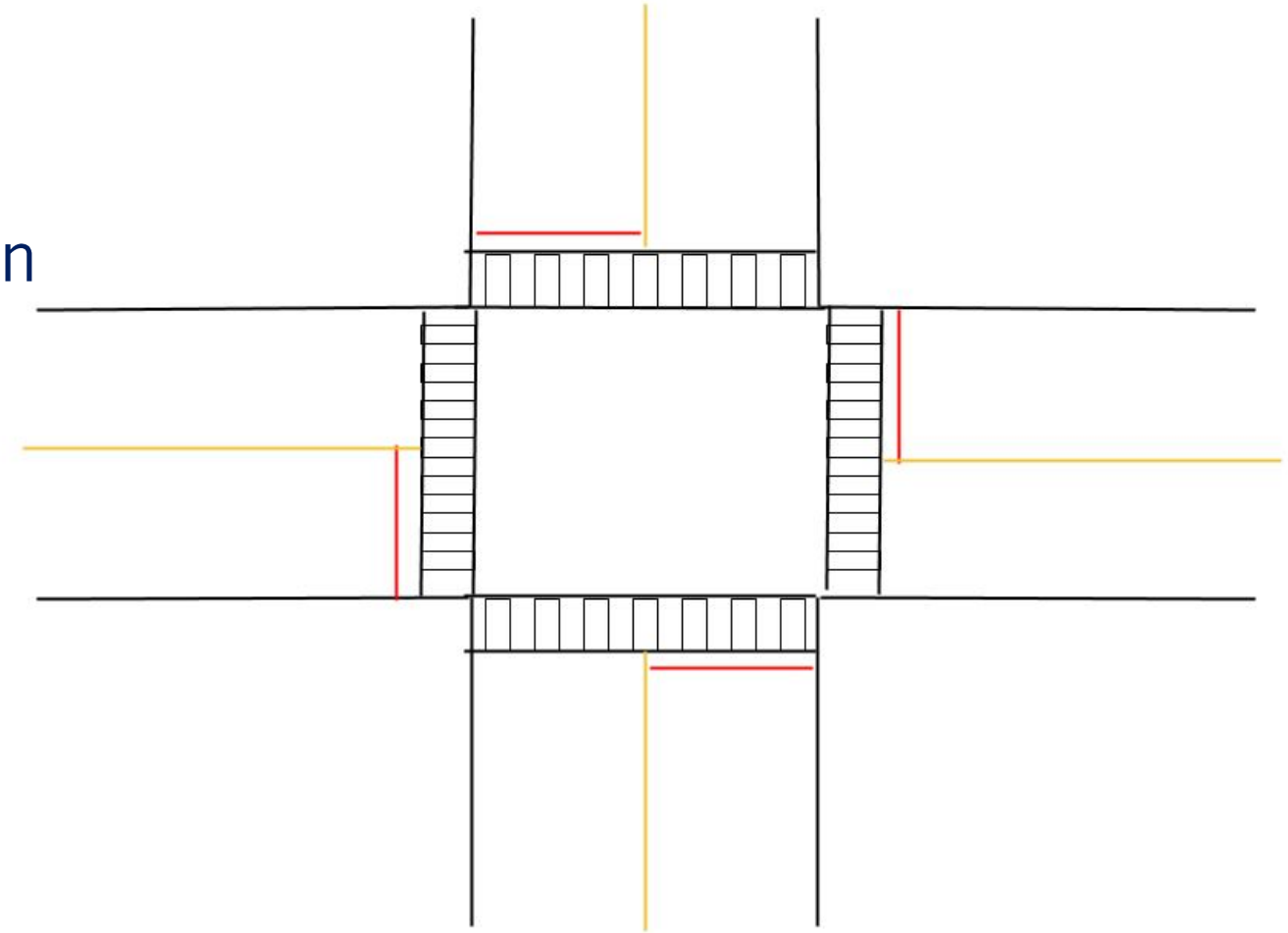
UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

Learning Objectives

- Identify the intersection scenario that will be handled
- Discuss the discretization of the environment that will be used
- Review the states required to complete the scenario
- Create the state transitions and state outputs required to safely and effectively complete the scenario
- Highlighting testing procedures to confirm a correct and accurate system

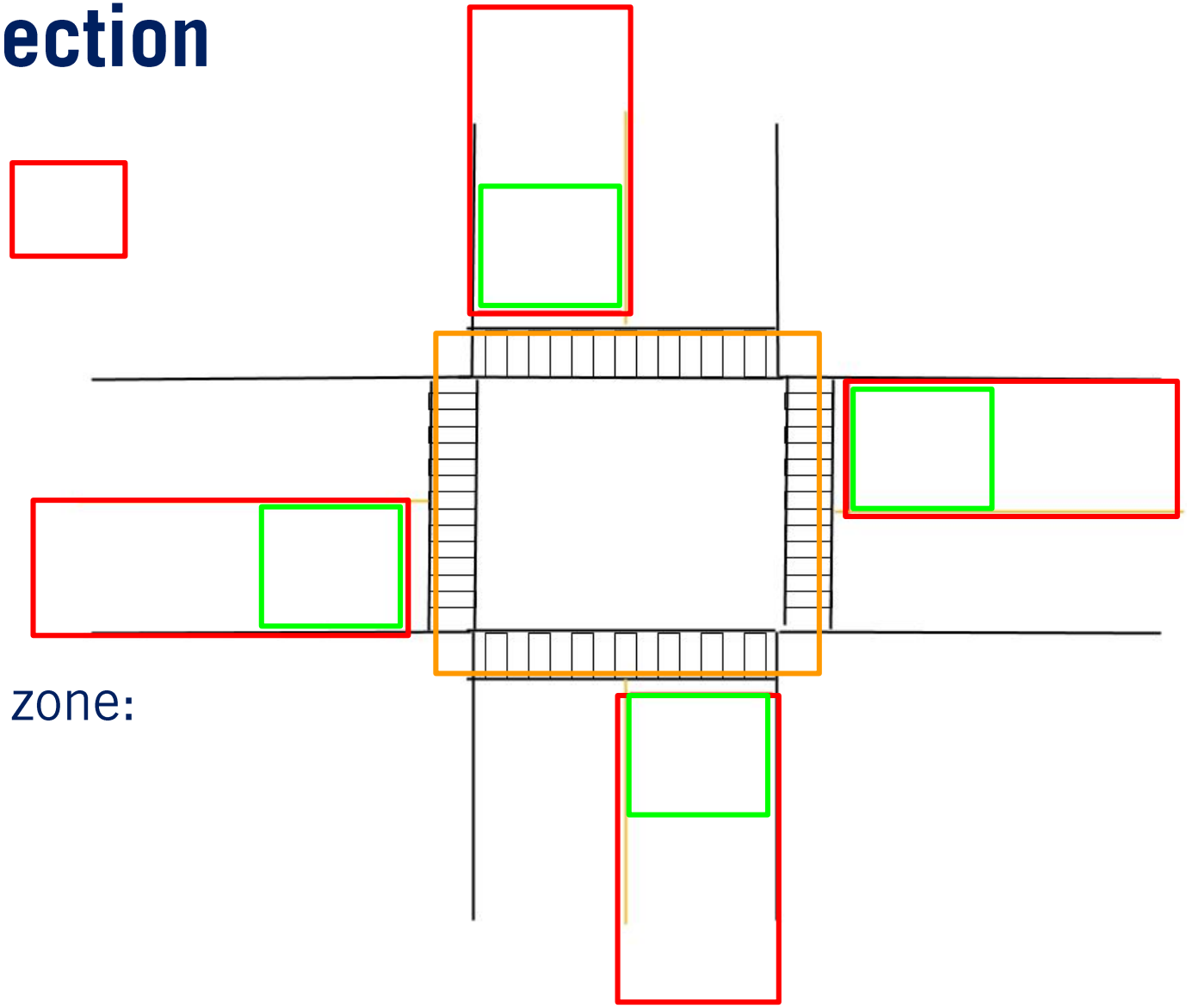
Scenario Evaluation

- 4 way Intersection
- Two lane
- Stop Sign for every direction
- Be able to travel:
  - Through the intersection
  - Left at the intersection
  - Right at the intersection
- No other dynamic vehicles



Discretizing the Intersection

- Approaching an intersection
- At an intersection
- On an intersection

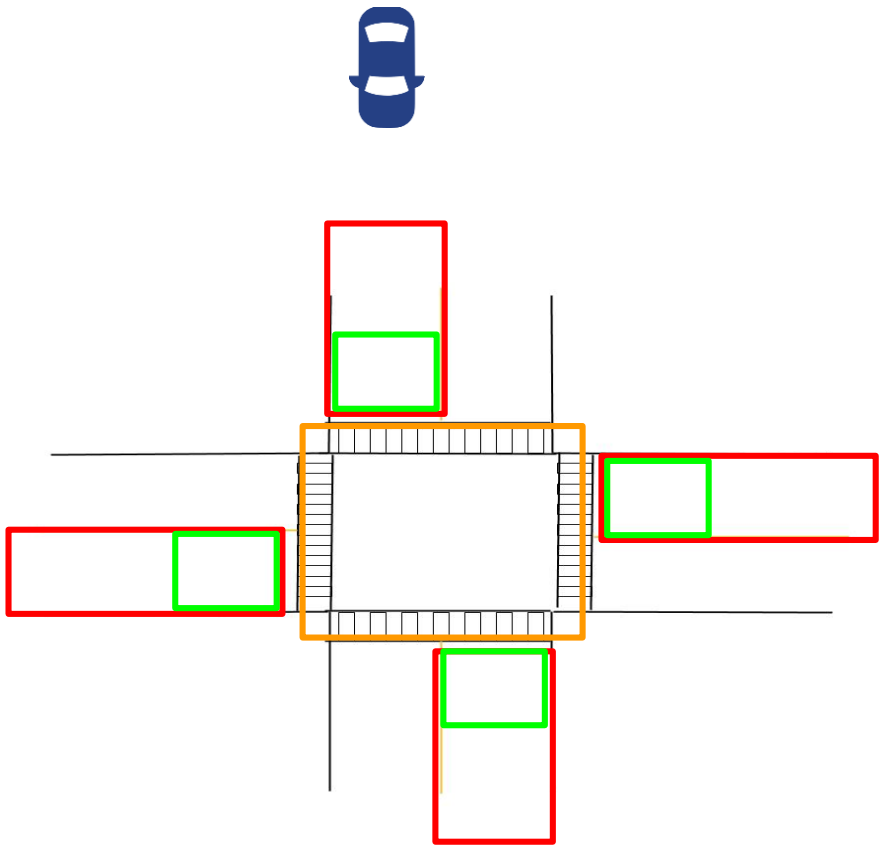


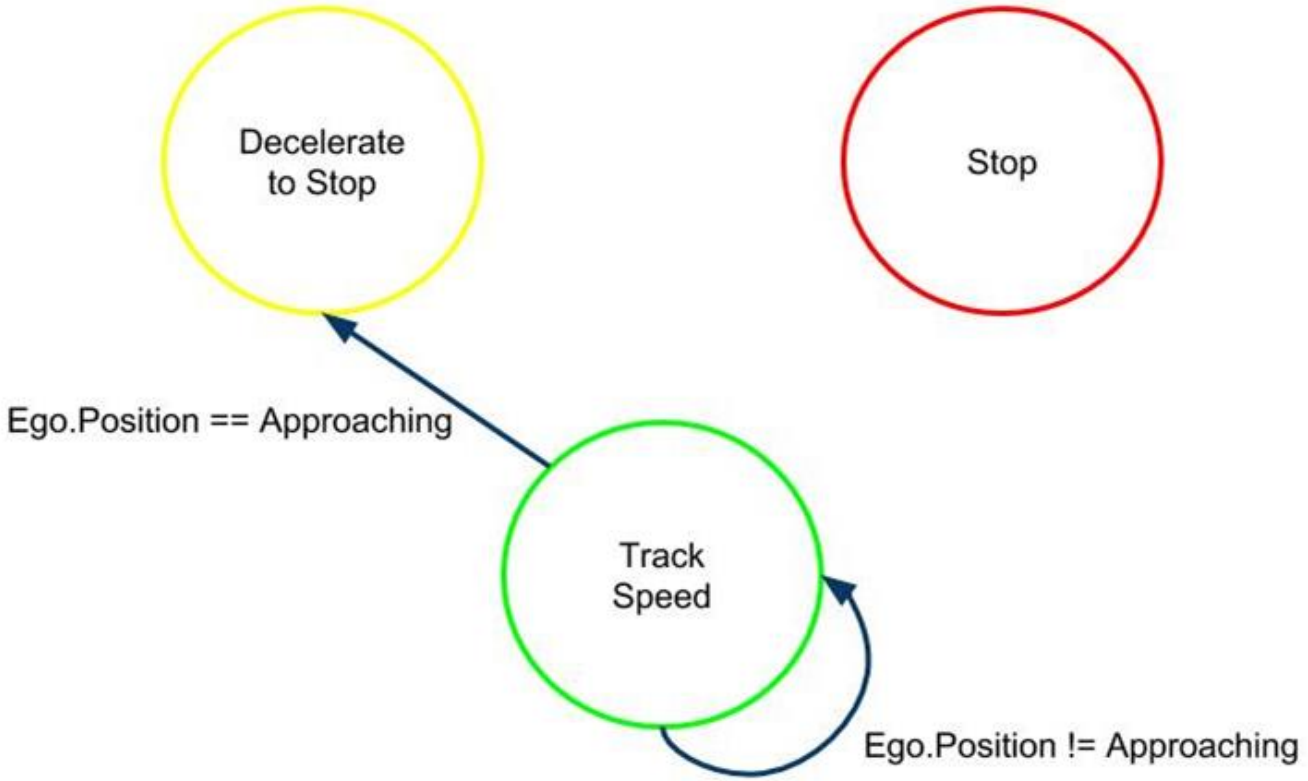
- Determining the size of each zone:
  - Ego vehicle velocity
  - Size of the intersection

State Machine States

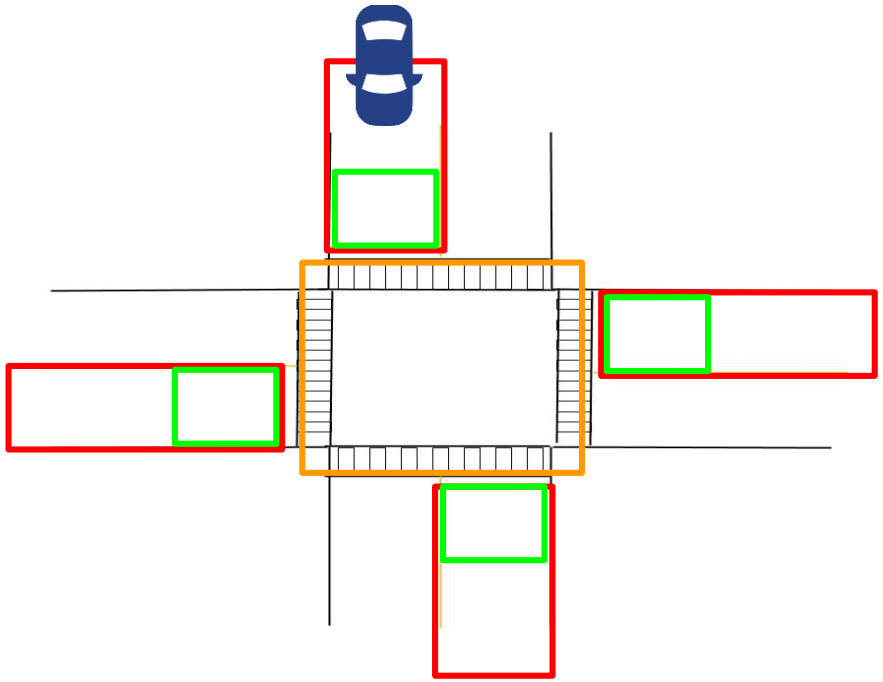
- **Track Speed** – Follow the current speed limit
- **Decelerate to Stop** – Stop to a particular point
- **Stop** – Stay stopped at the current location

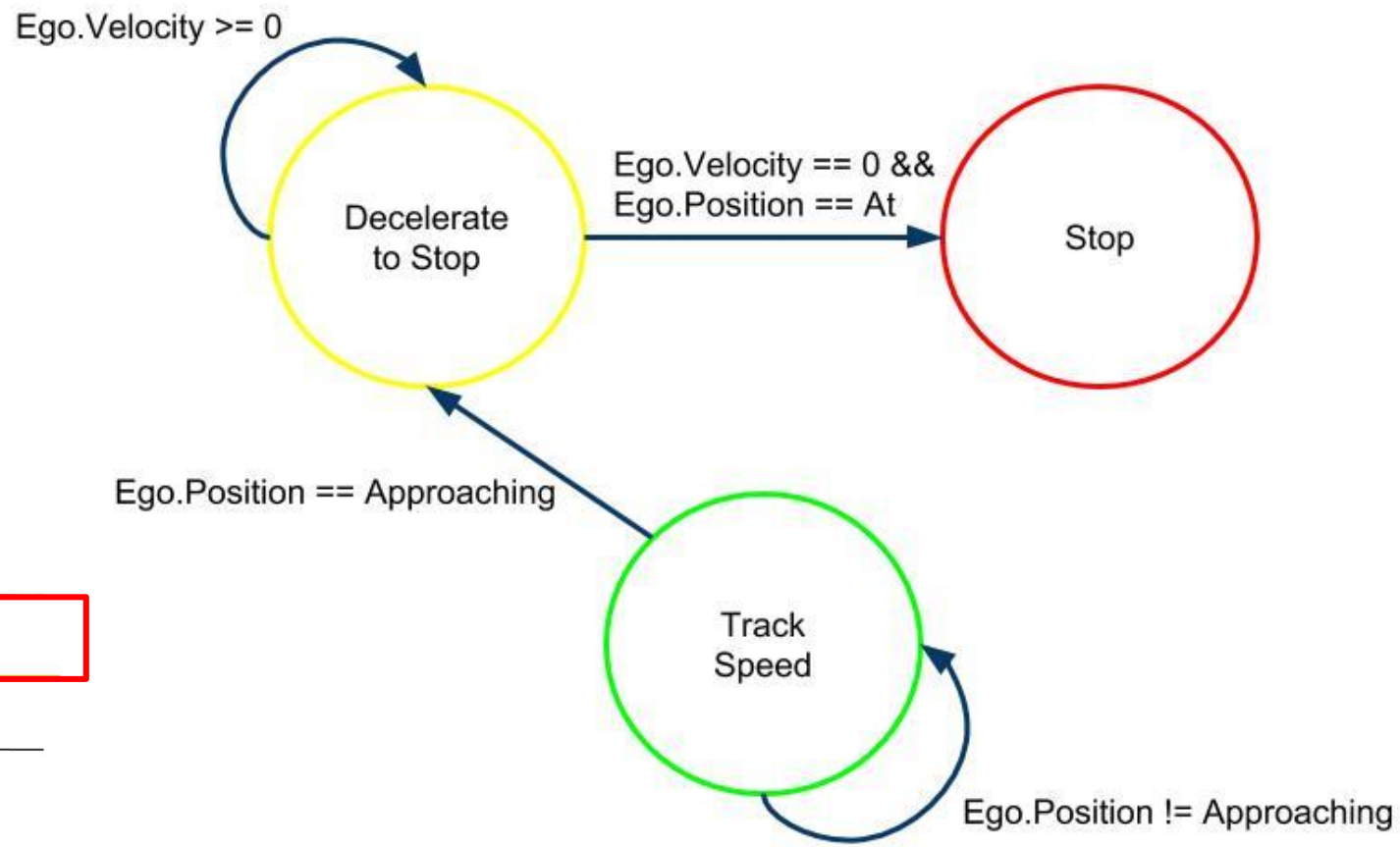
State Machine Transitions





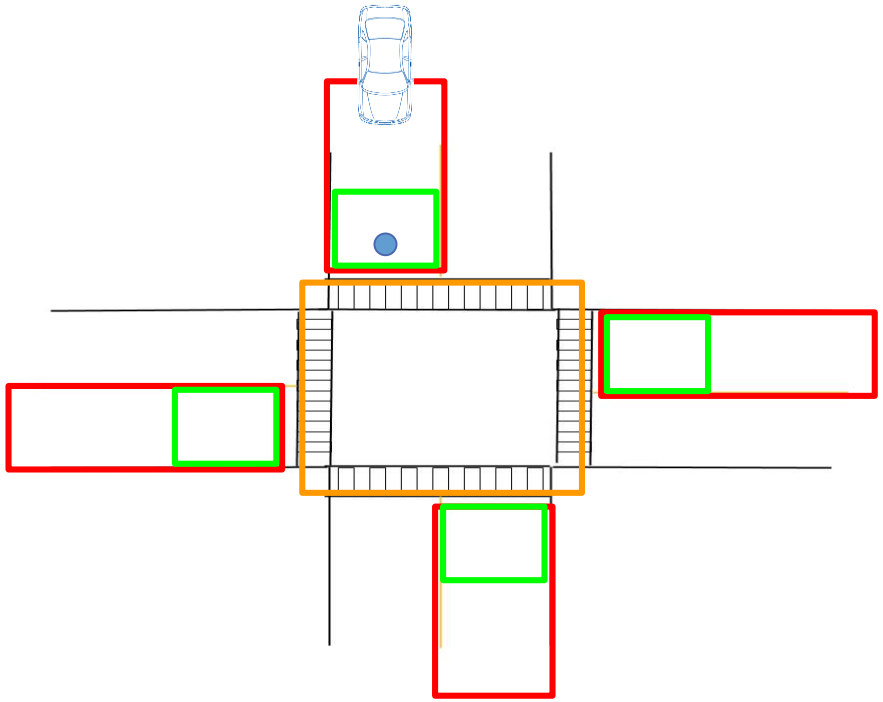
State Machine Transitions

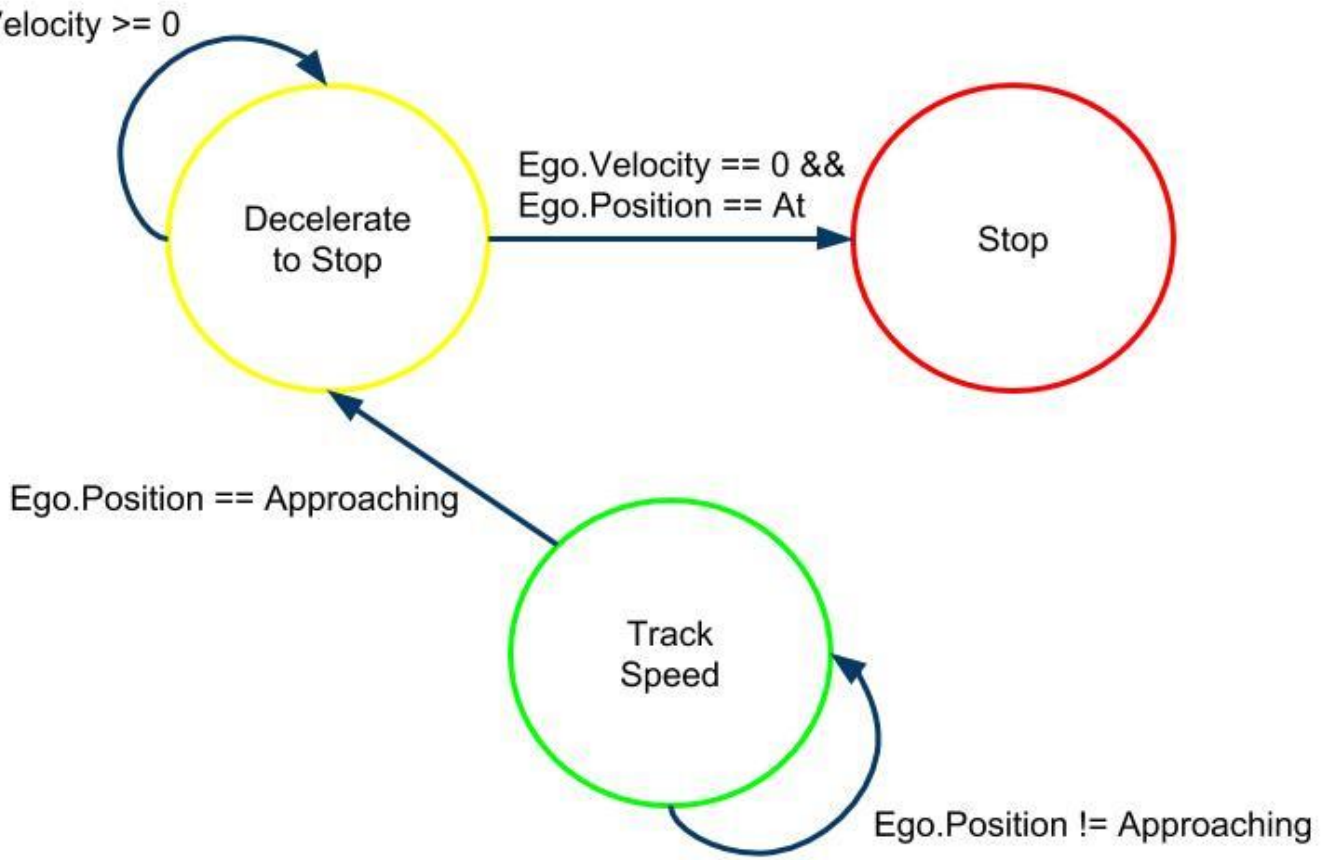




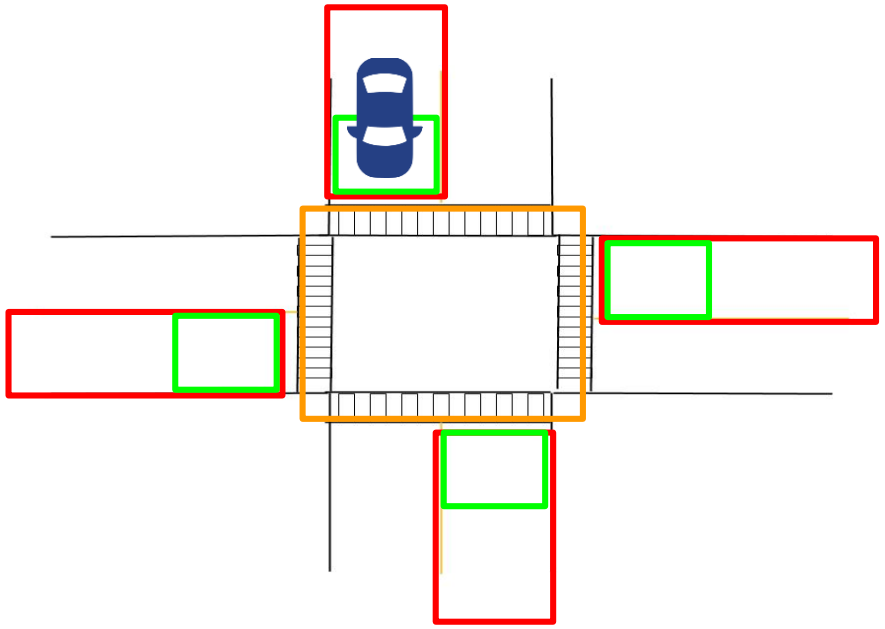
Selecting a Decelerate to Stop Location

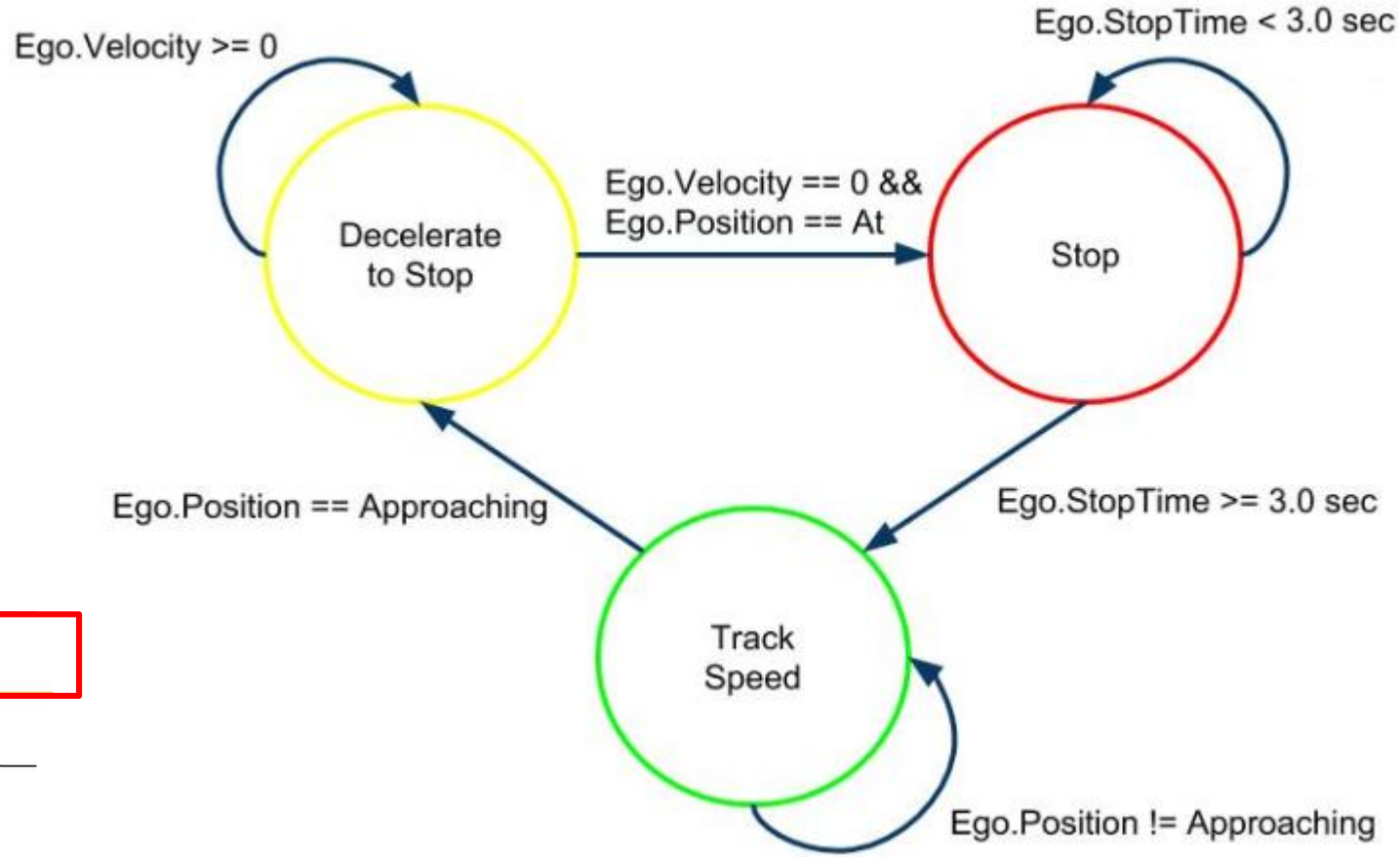
- Simple in this scenario
- Before the reaching the on location



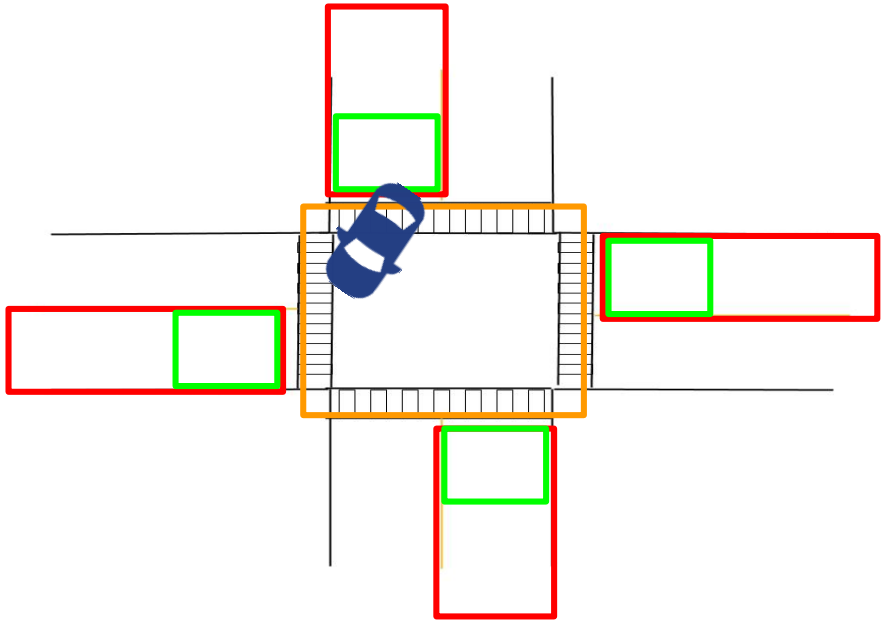


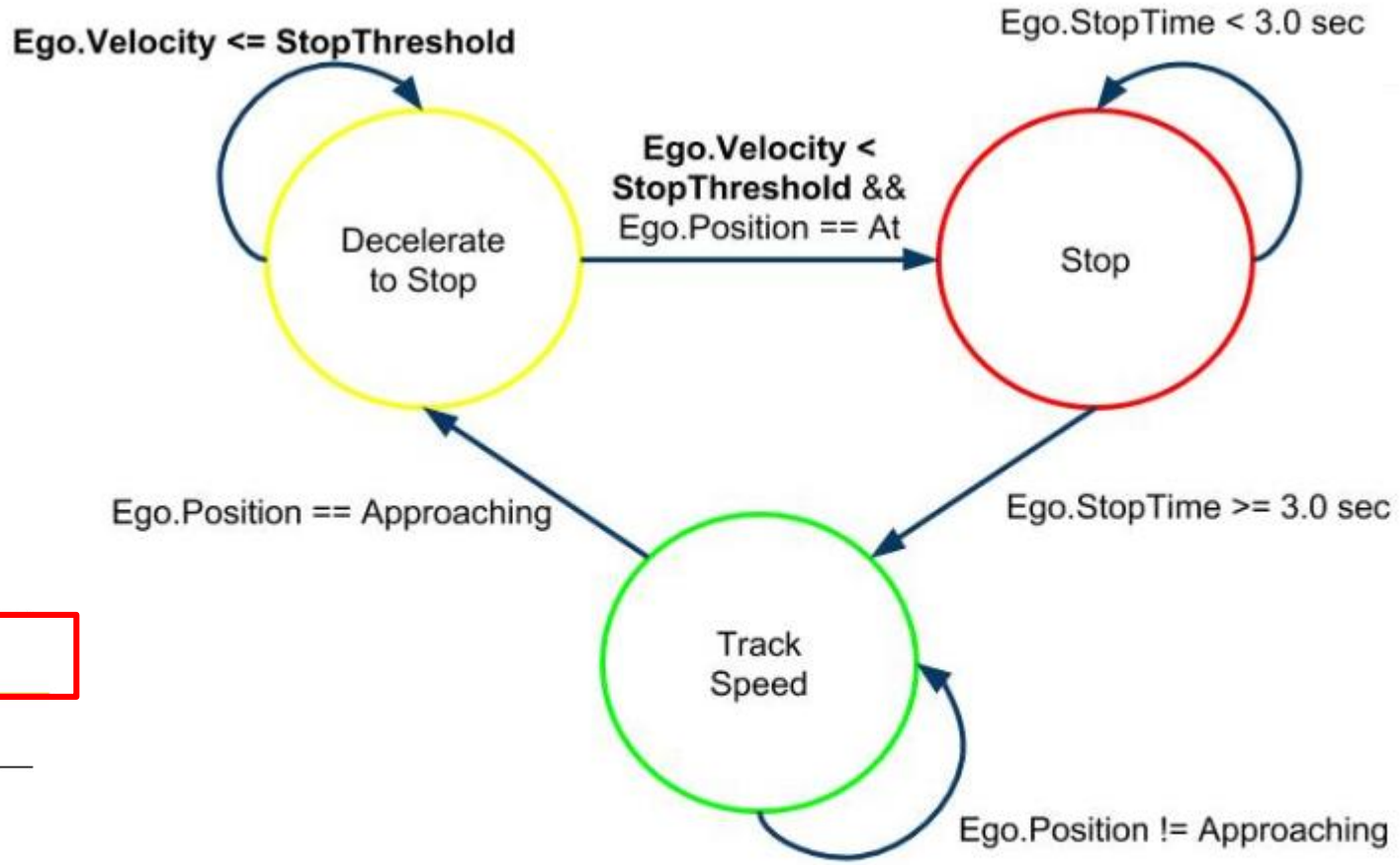
State Machine Transitions





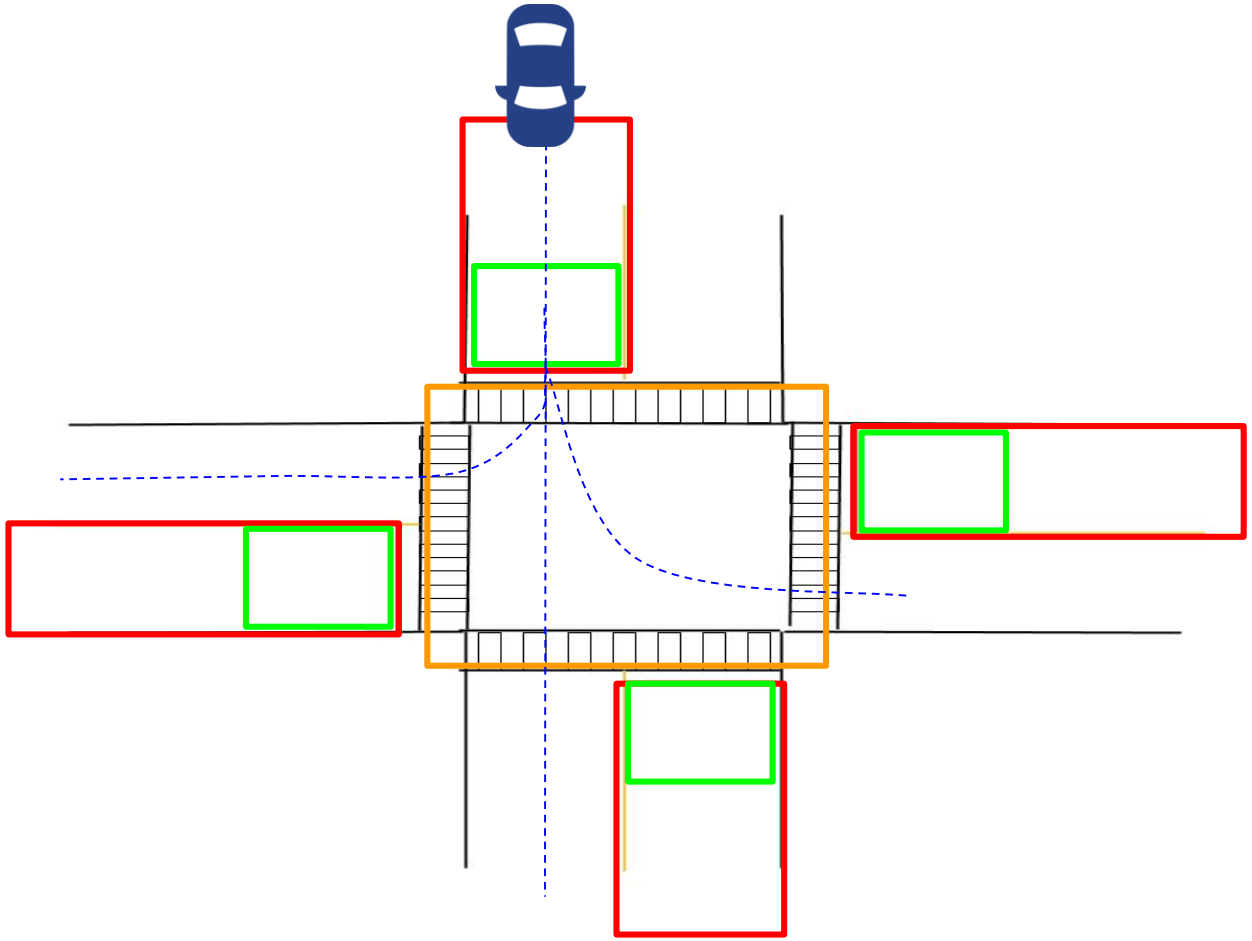
Dealing With Environmental Noise





Behavior Planning Testing

- Code based tests
- Simulation tests
- Private track tests
- Limited scoped close supervision road tests



Summary

- The intersection scenario that was handled by the behavior planner state machine
- Identified the discretization of the environment that will be used
- Review the states required to complete the listed scenario
- Create the state transitions and state outputs required to safely and effectively complete the scenario
- Highlighting testing procedures to confirm a correct and accurate system

- **Next**: Handling an intersection scenario with dynamic objects