

# Handling An Intersection Scenario Without Dynamic Objects

Course 4, Module 5, Lesson 2



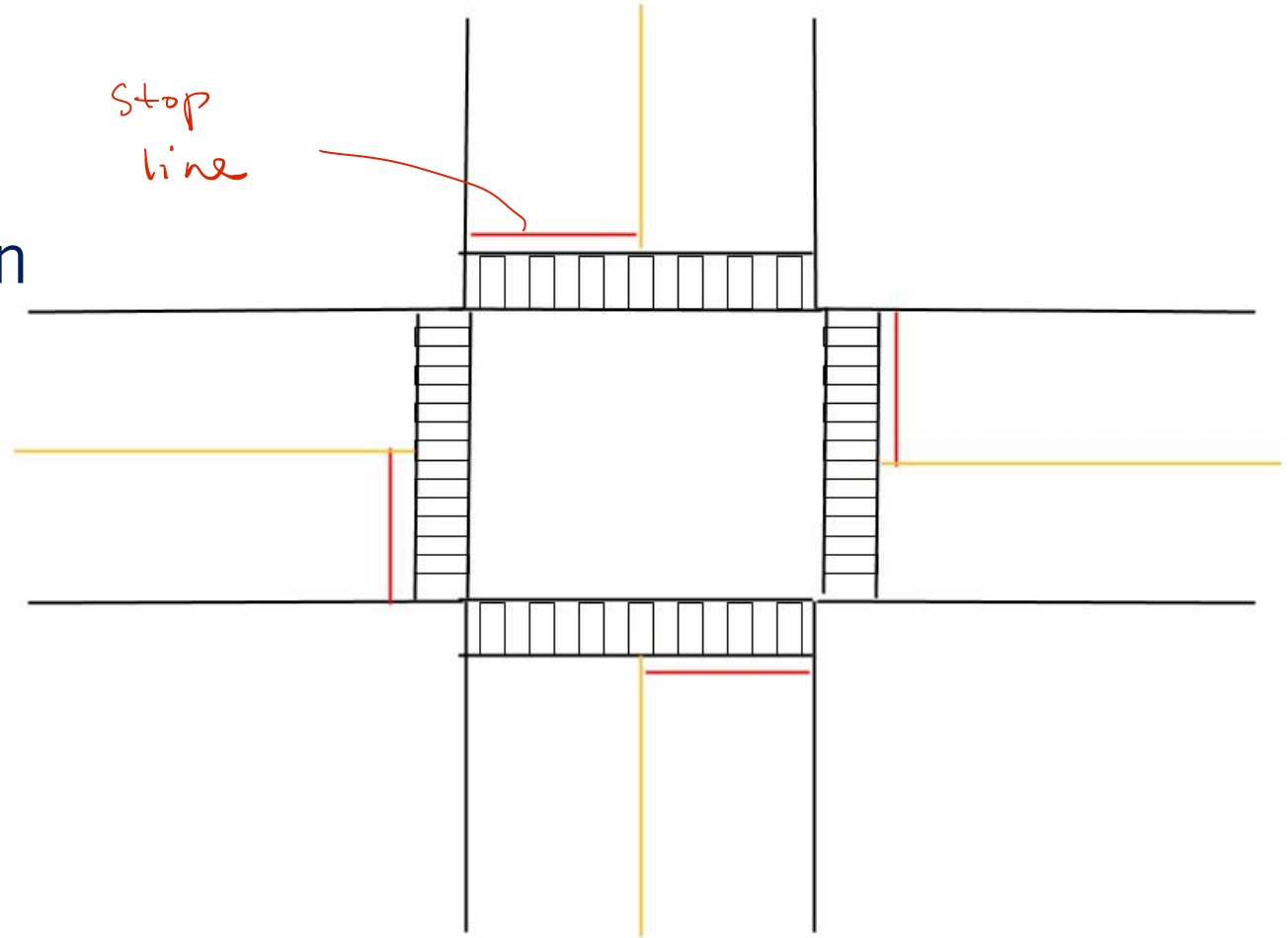
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# Learning Objectives

- 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



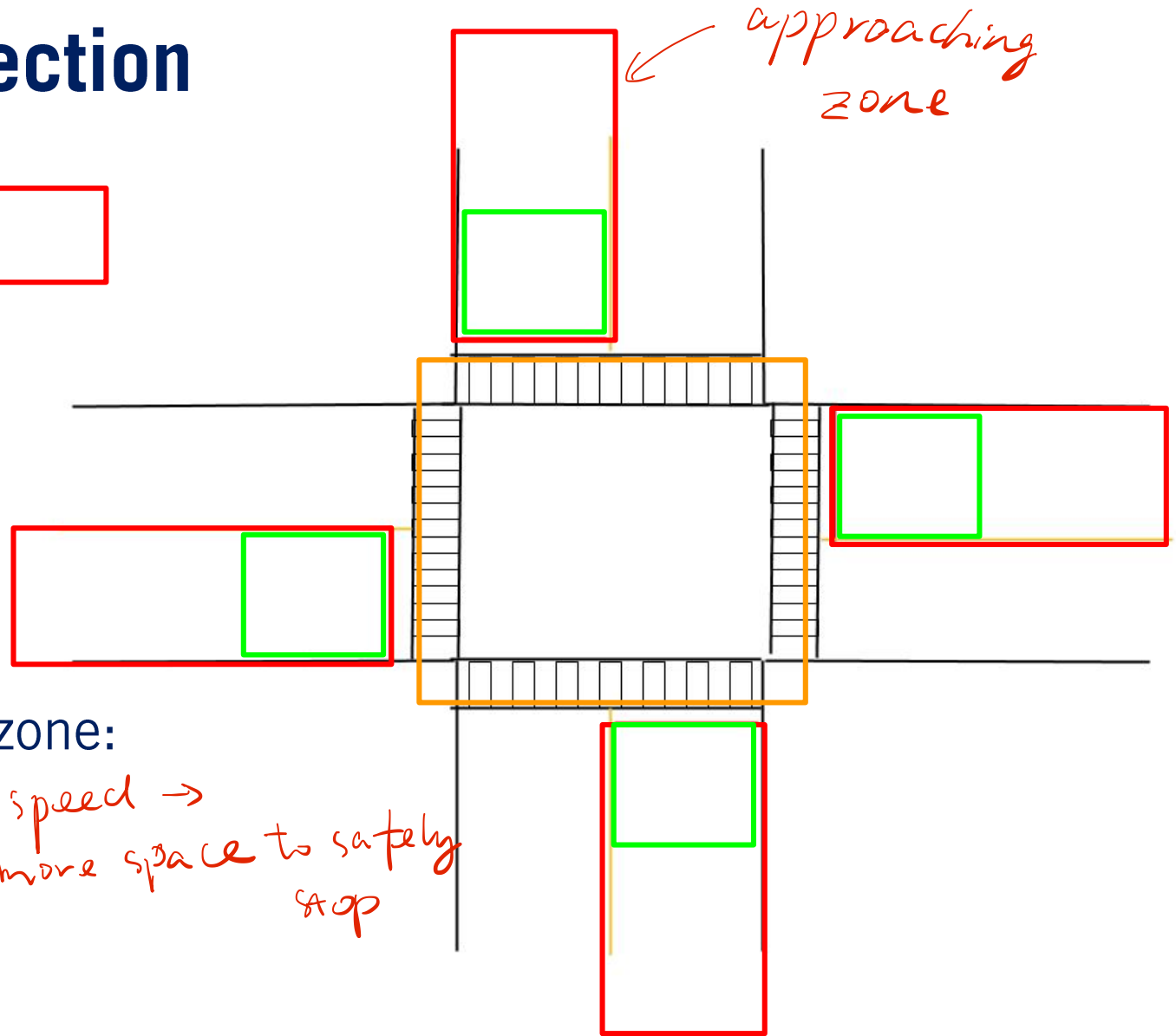
- On an intersection



- Determining the size of each zone:

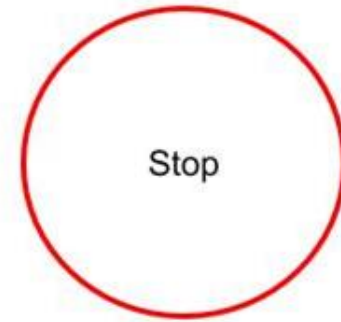
- Ego vehicle velocity
- Size of the intersection

*higher speed →  
more space to safely  
stop*

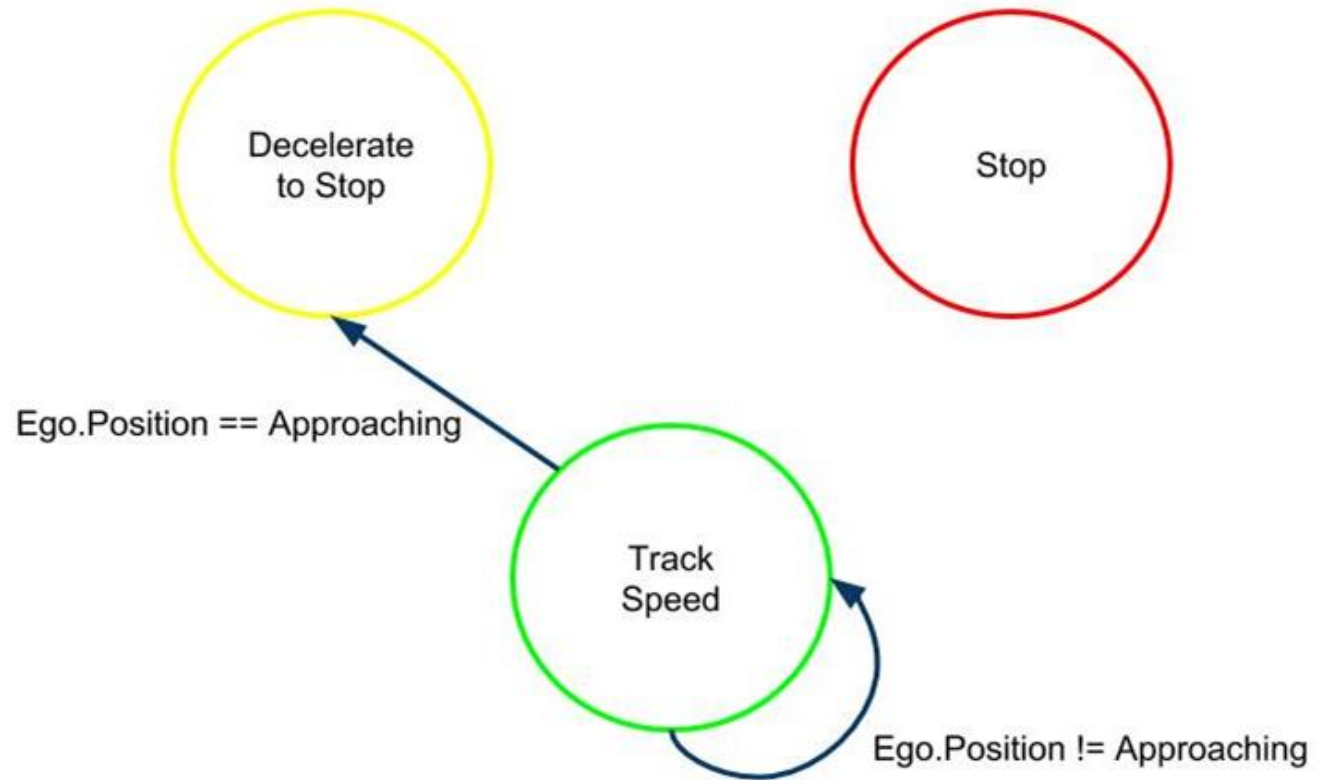
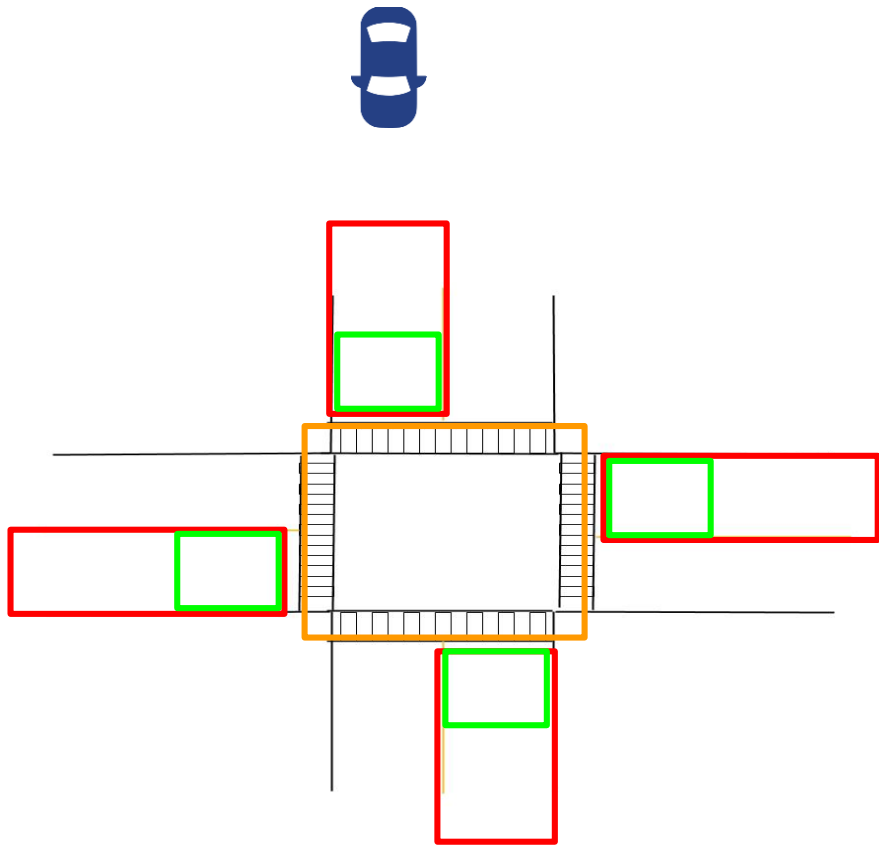


# State Machine States

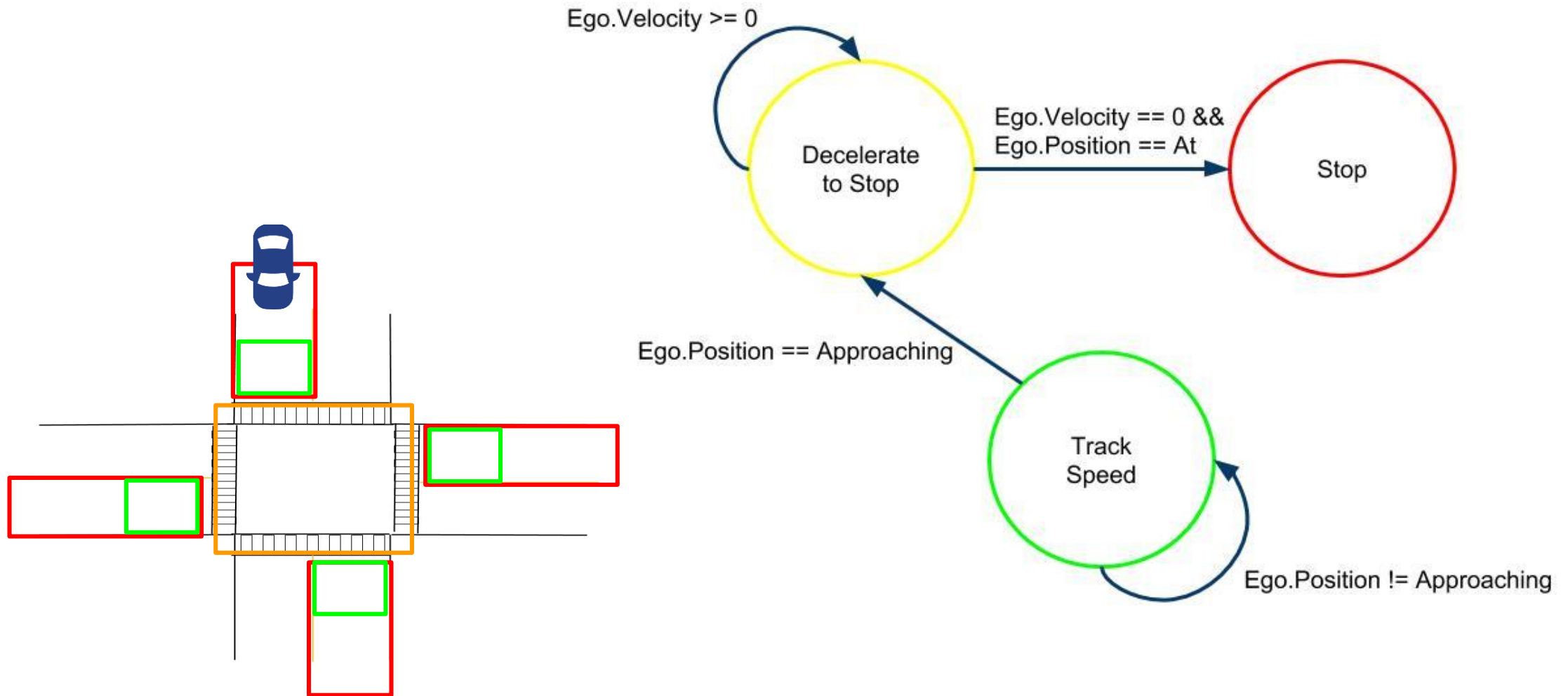
- **Track Speed** – Follow the current speed limit
- **Decelerate to Stop** – Stop to a particular point
- **Stop** – Stay stopped at the current location



# State Machine Transitions

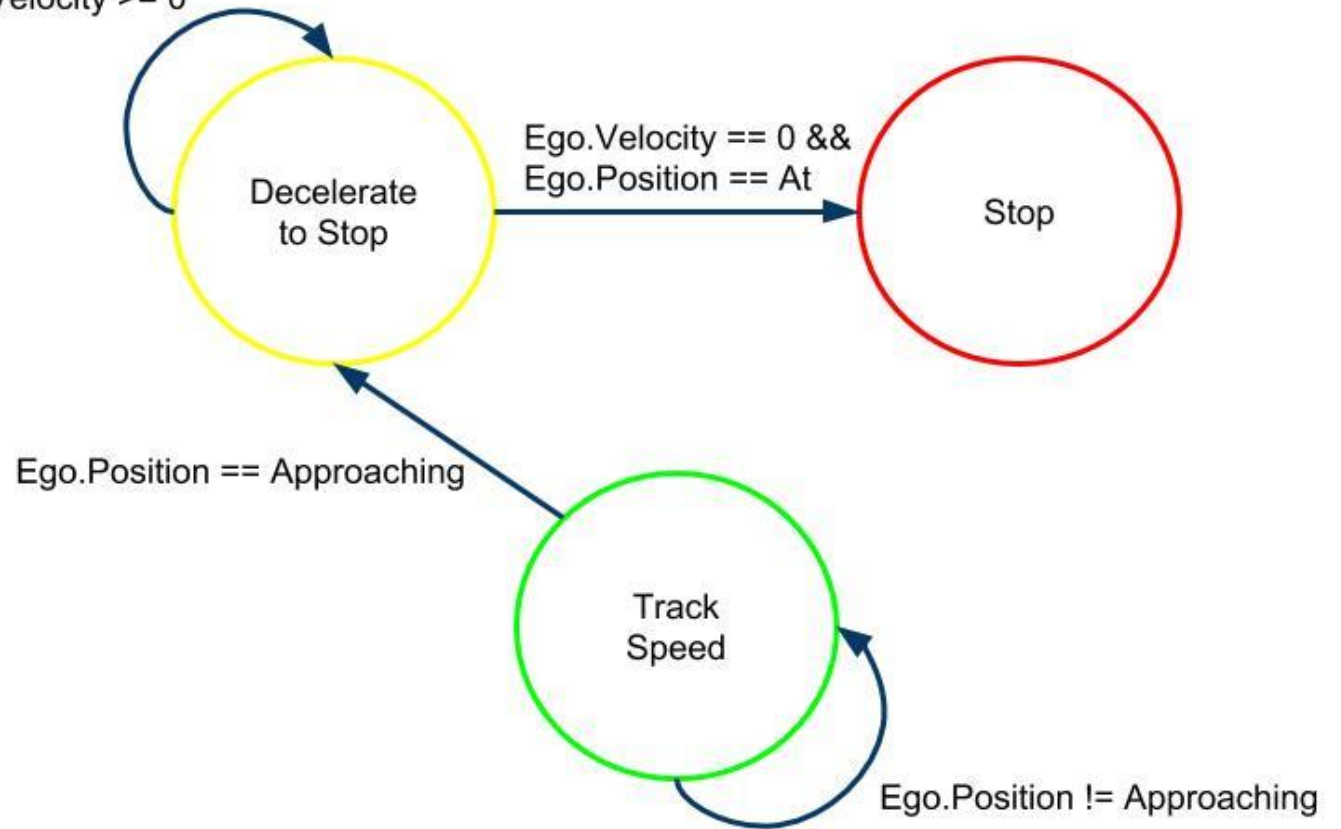
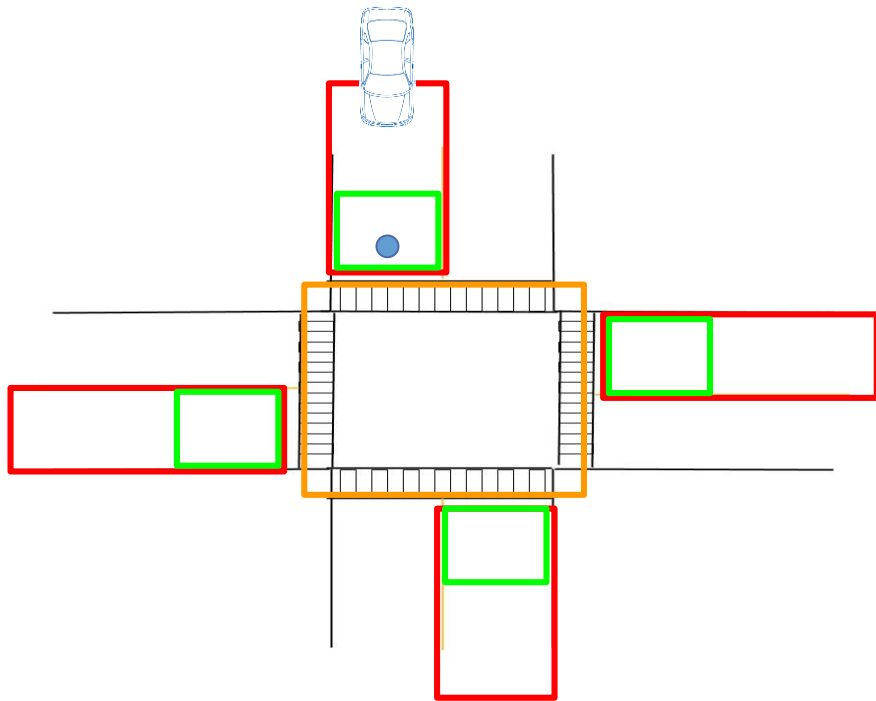


# State Machine Transitions



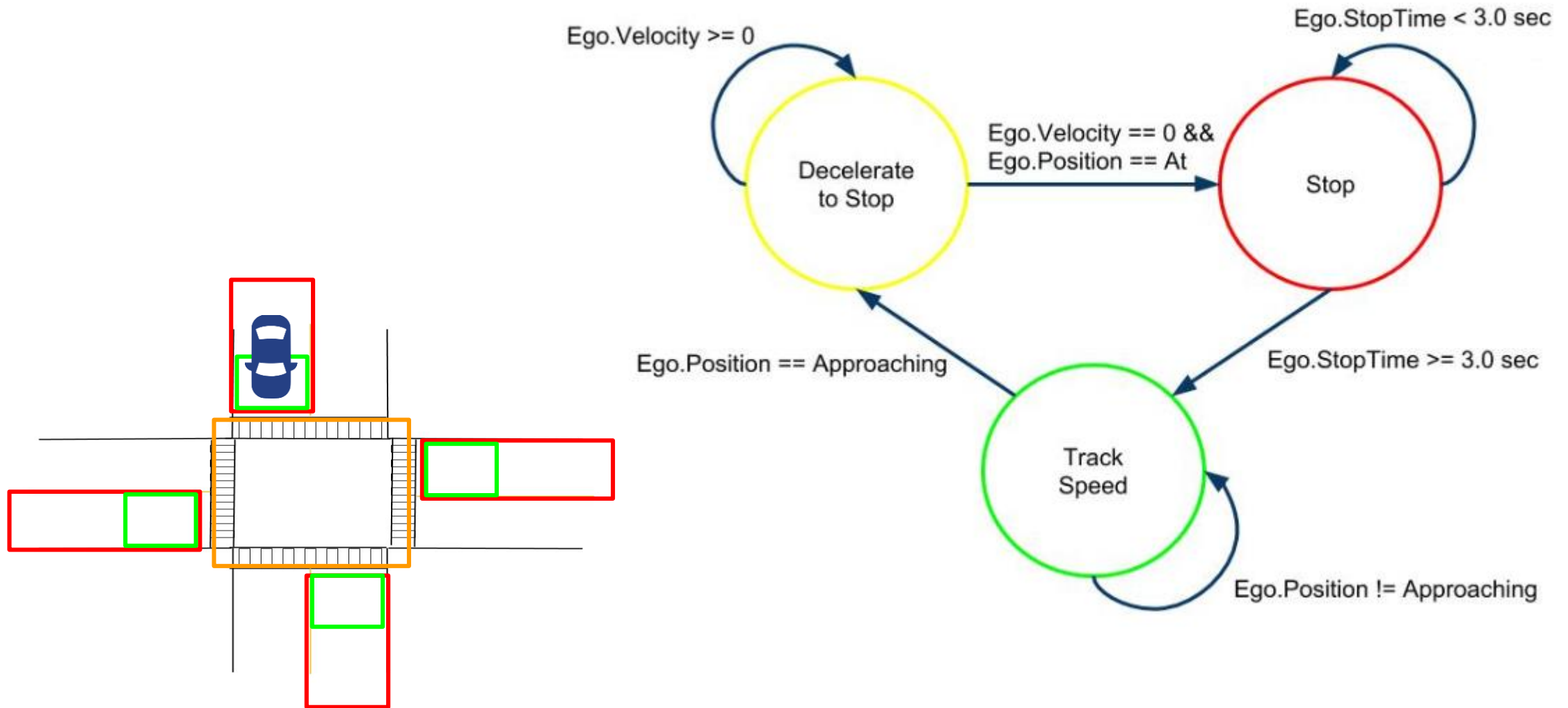
# Selecting a Decelerate to Stop Location

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

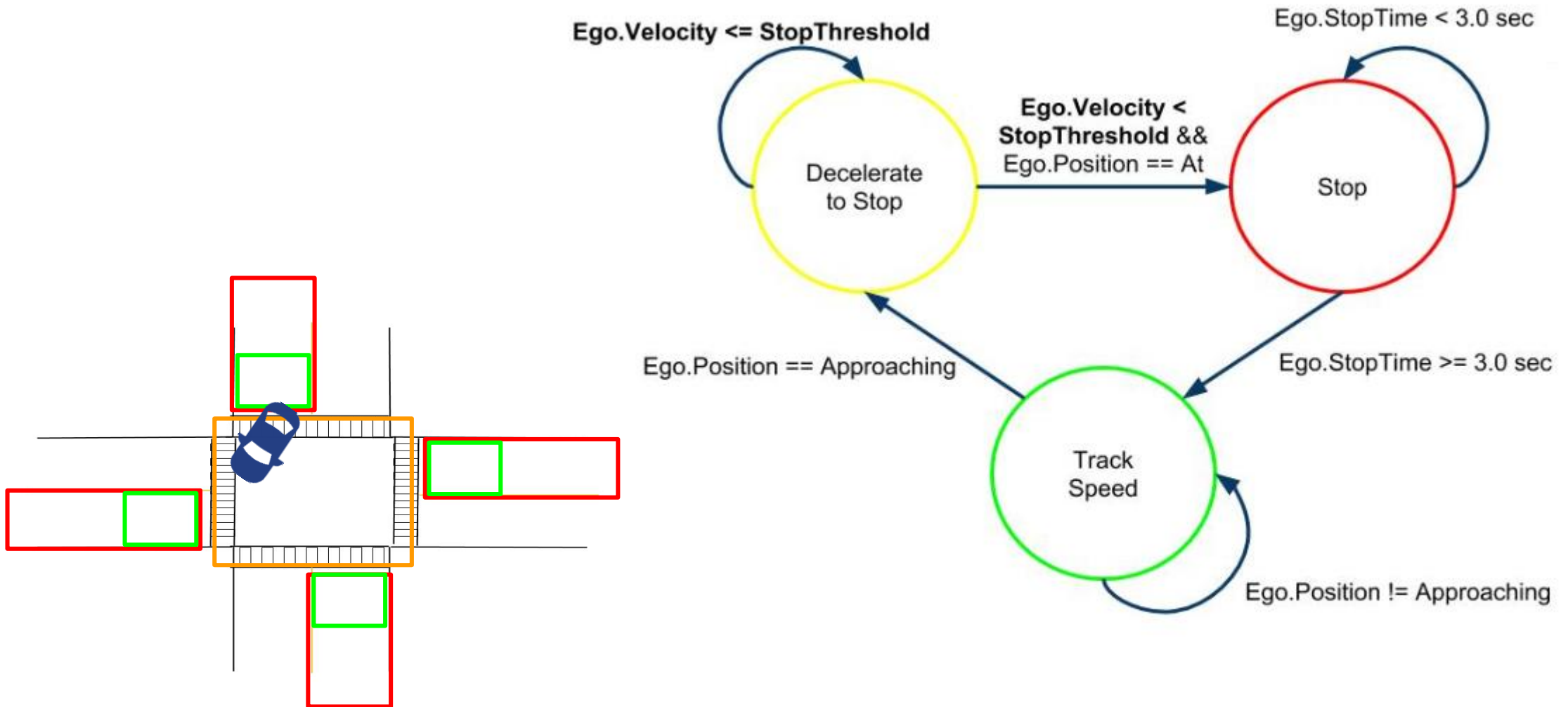




# State Machine Transitions

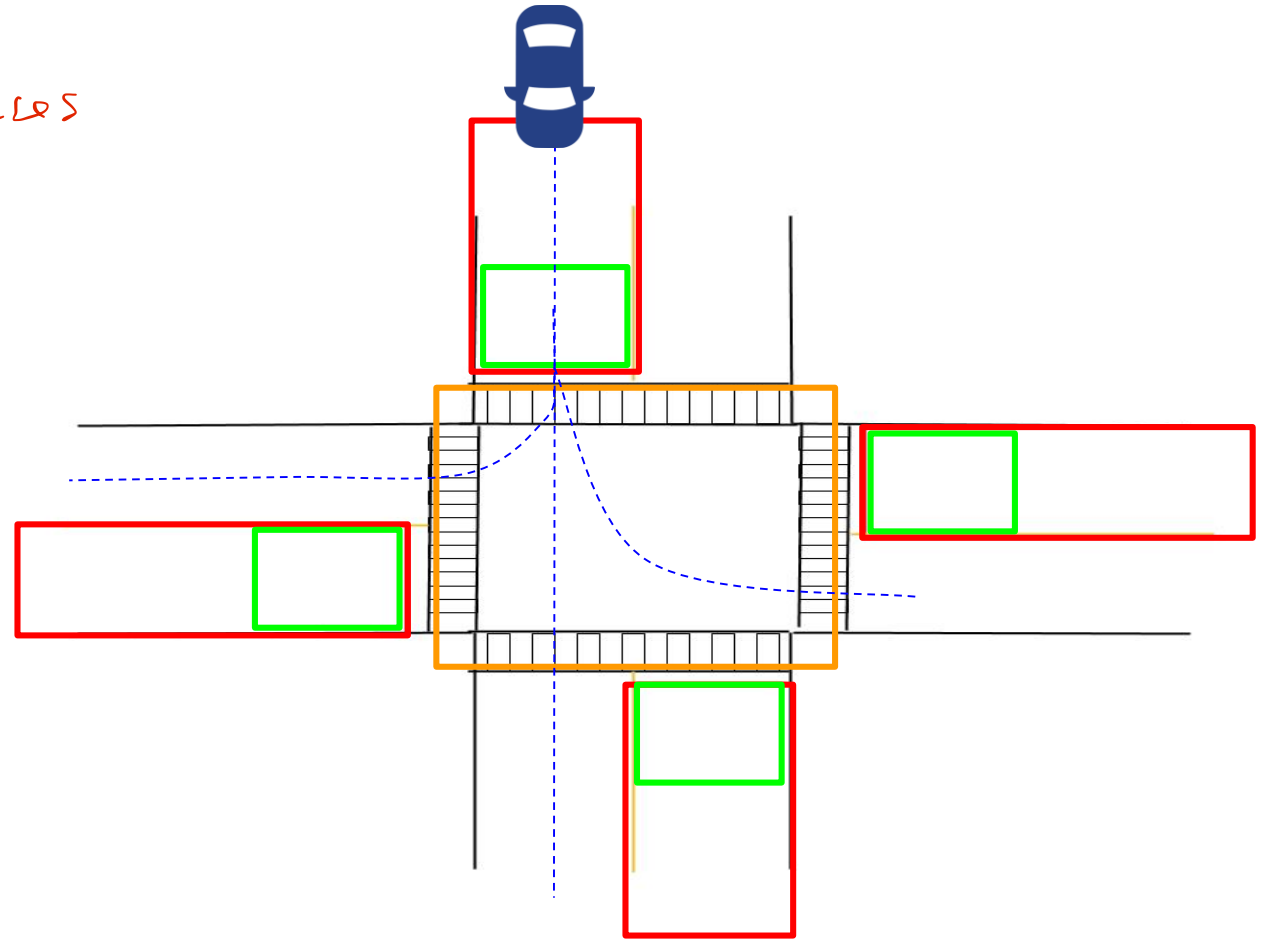


# Dealing With Environmental Noise



# Behavior Planning Testing

- Code based tests
- Simulation tests *find edge cases*
- 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
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- **Next:** Handling an intersection scenario with dynamic objects