Dealing With Multiple Scenarios

Course 4, Module 5, Lesson 4

UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

Learning Objectives

- Develop a larger overarching state machine which includes multiple scenarios
- Develop a method to switch between driving scenarios

Scenario Done So Far

- 4 way intersection
- Every direction has a stop sign
- Be able to travel:
  - Through the intersection
  - Left at the intersection
  - Right at the intersection

- Only vehicles as dynamic objects
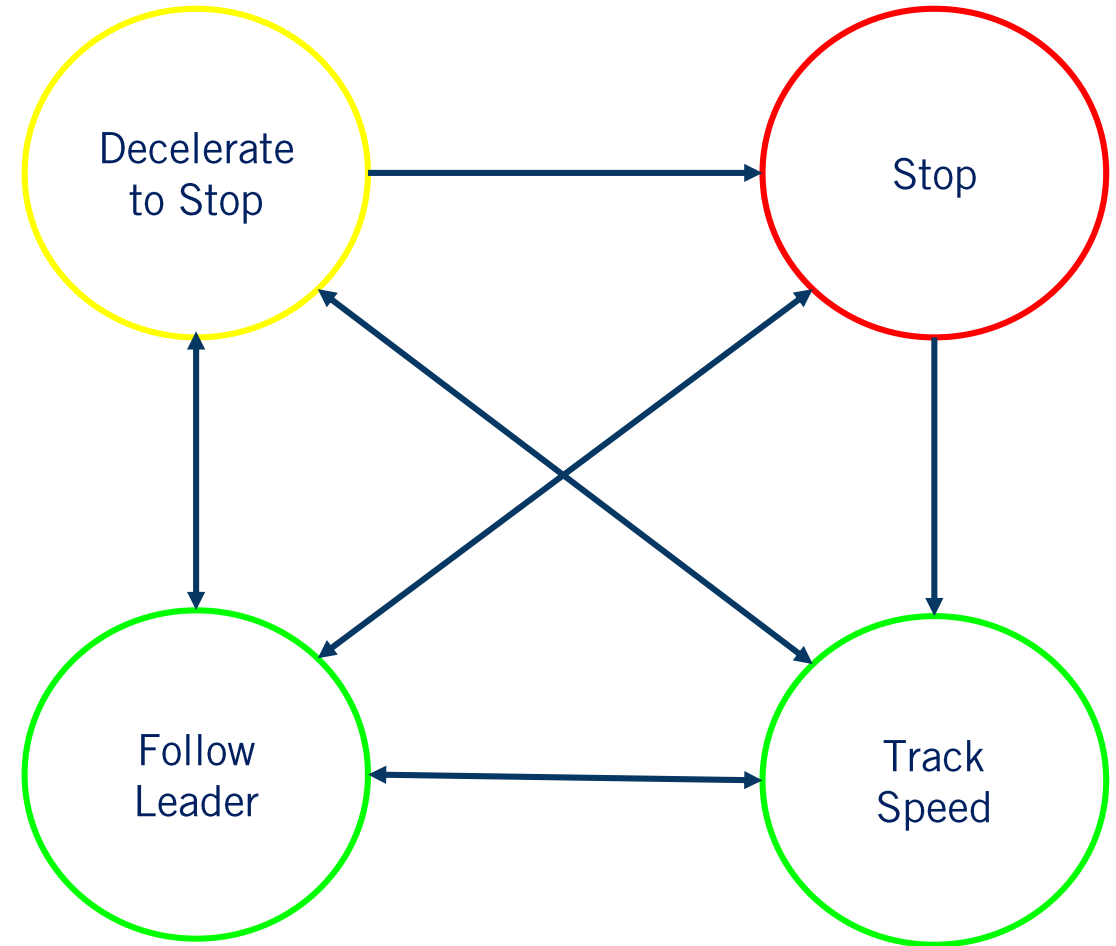 - 1, 2, 3 or 4 other vehicles
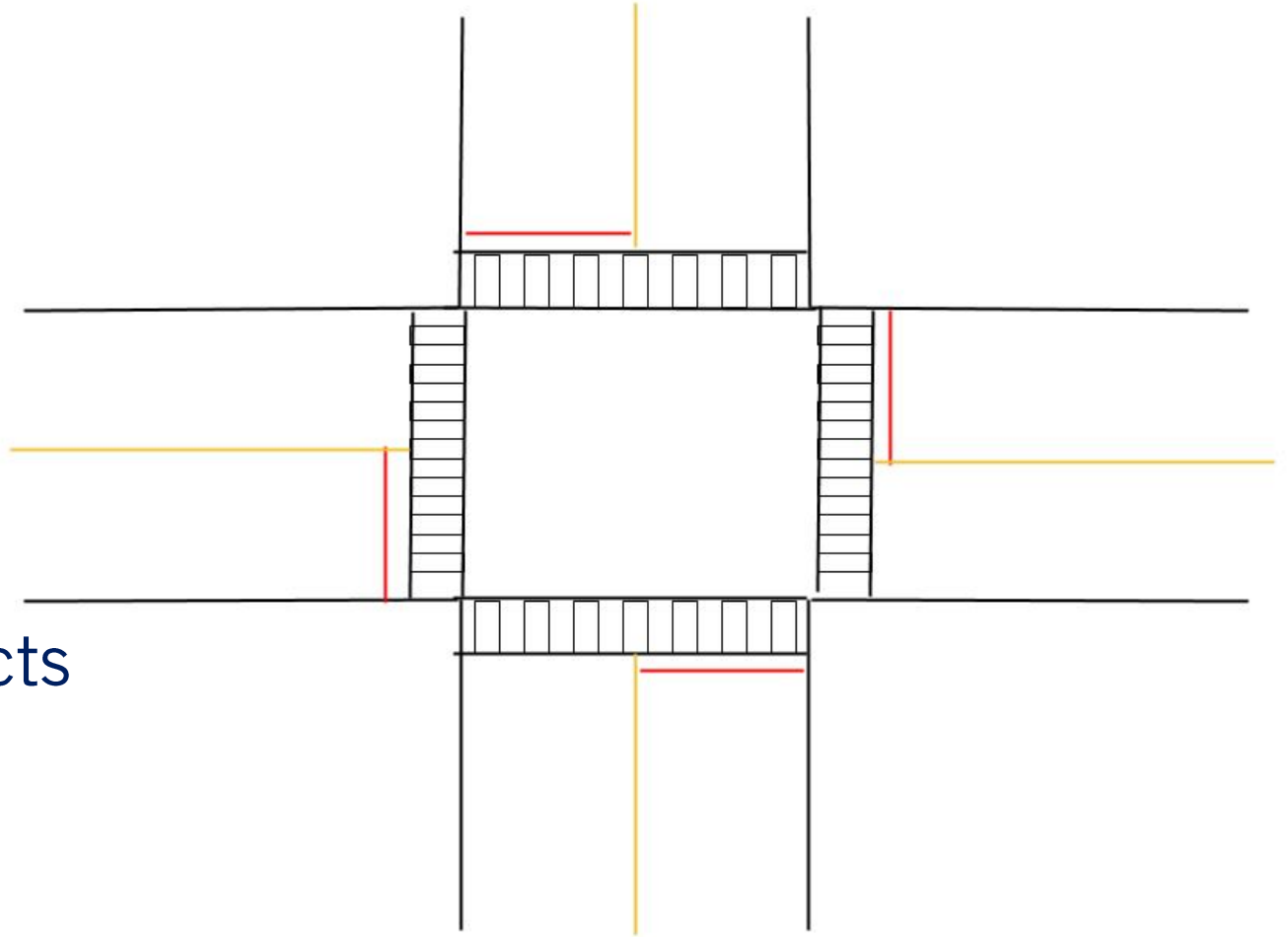
Multiple Scenarios
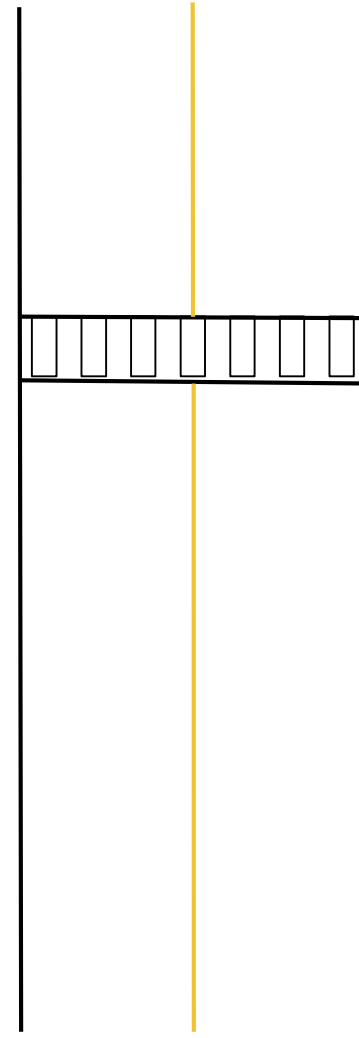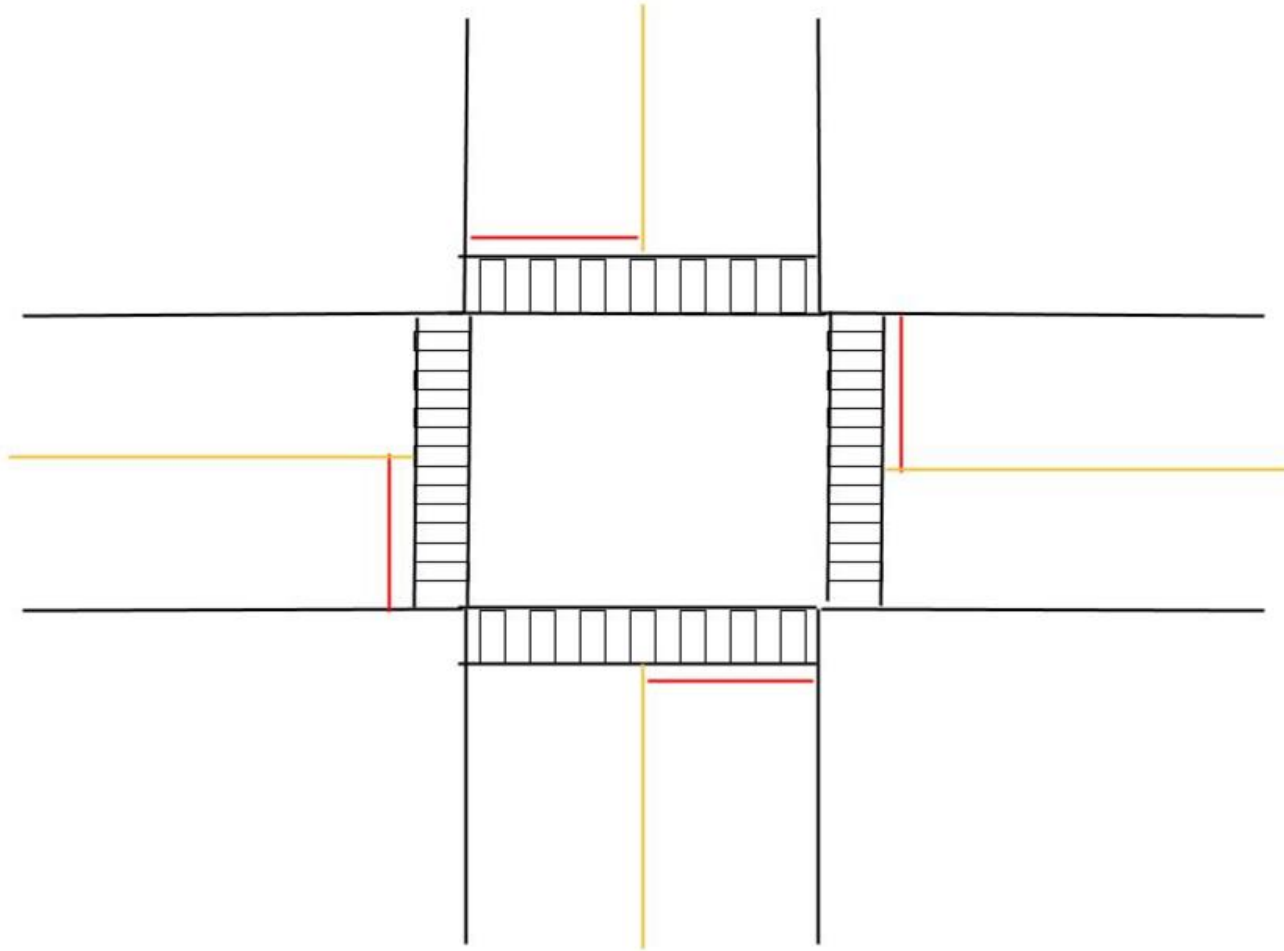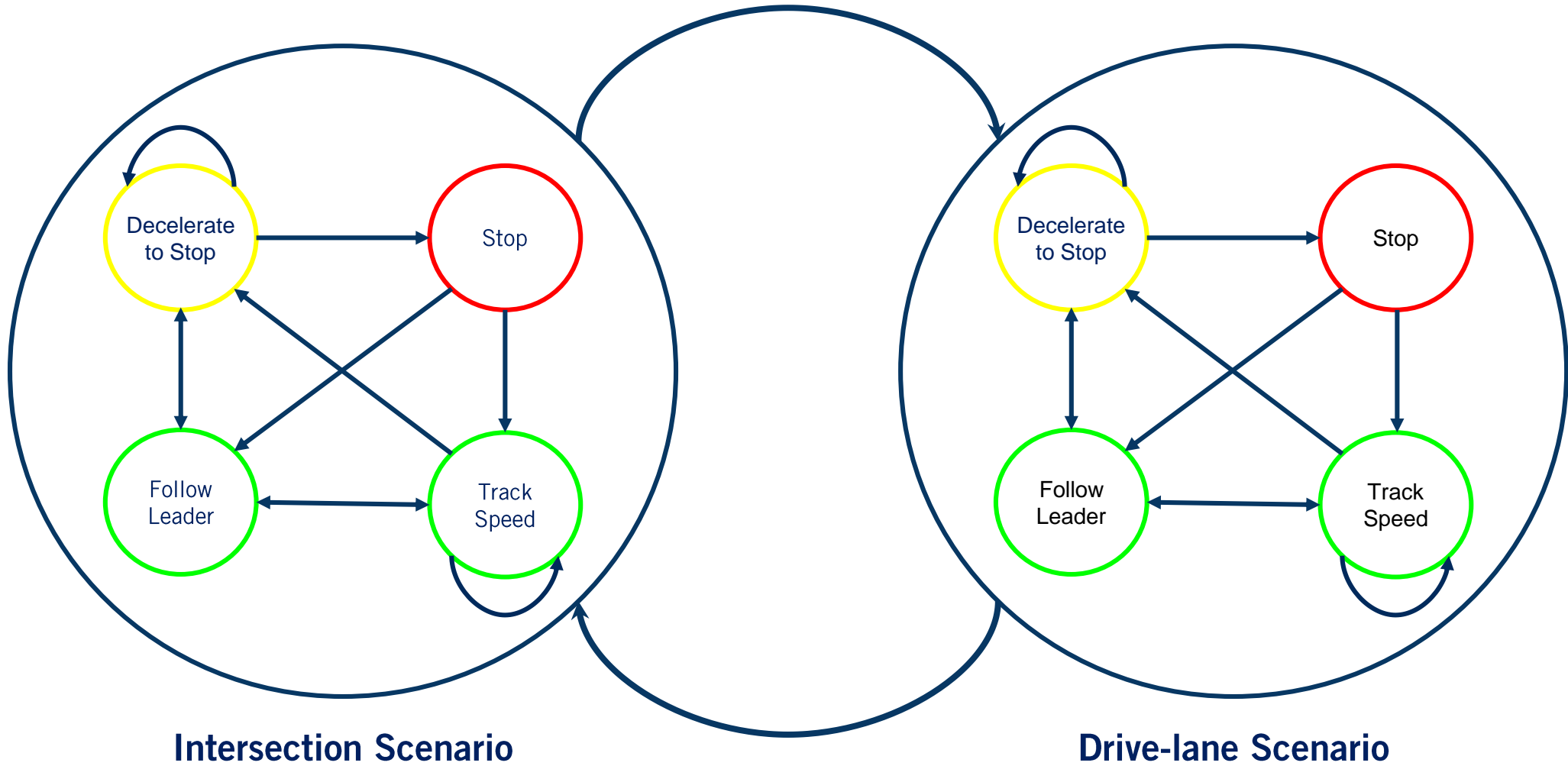
Single State Machine

- Single state machine method
  - Add transitions
  - Add additional transition conditions

- Issues with single state machine method:
  - Rule explosion
  - Increase in computational time
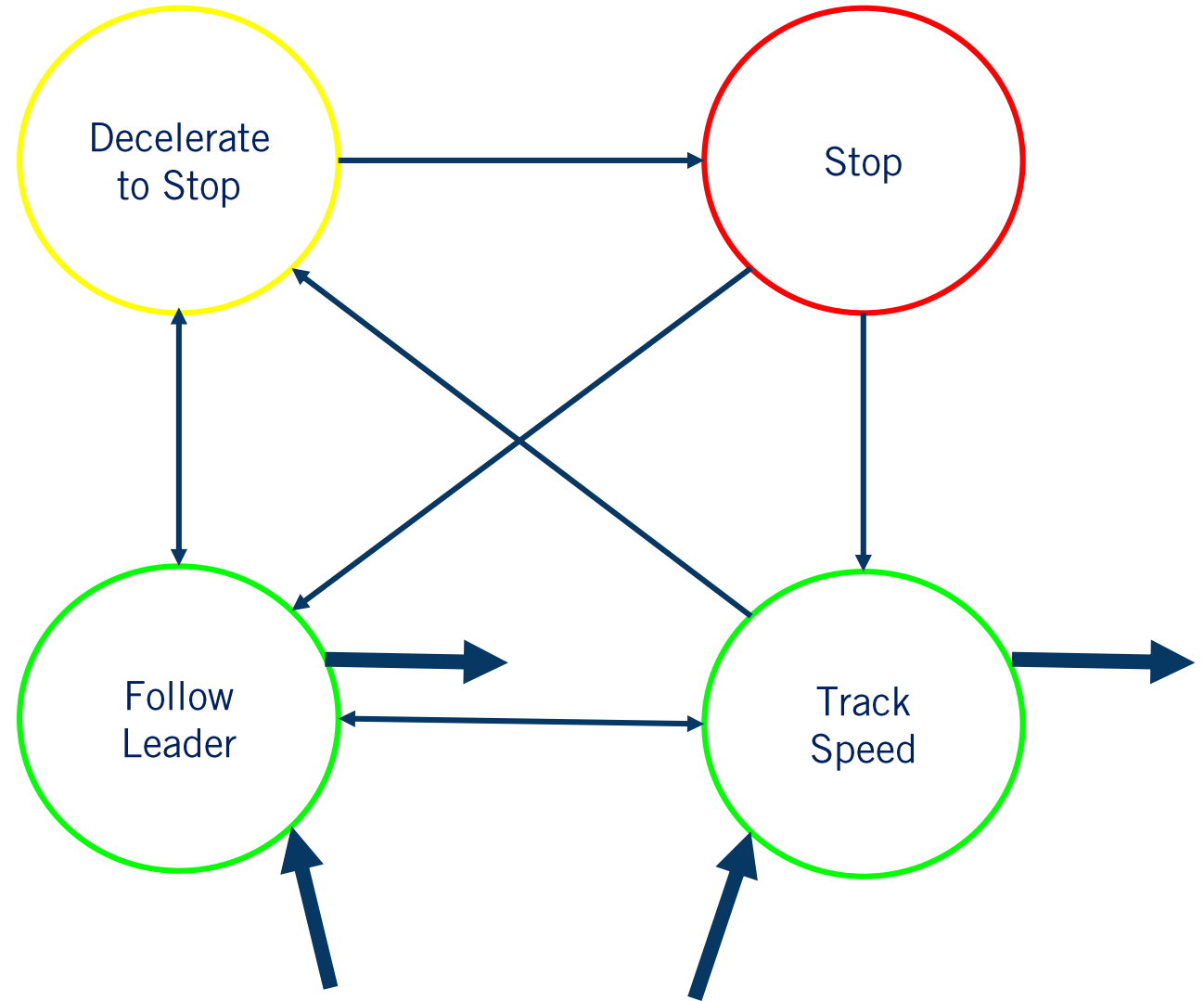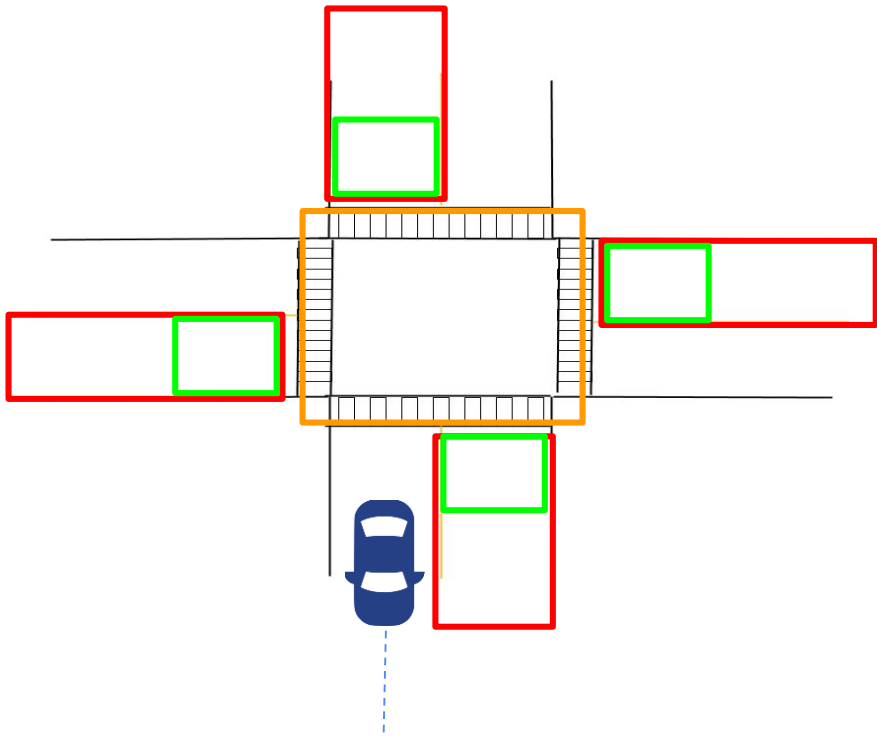 - Complicated to create and maintain

Multiple State Machine

Intersection Scenario

Drive-lane Scenario

Hierarchical State Machine
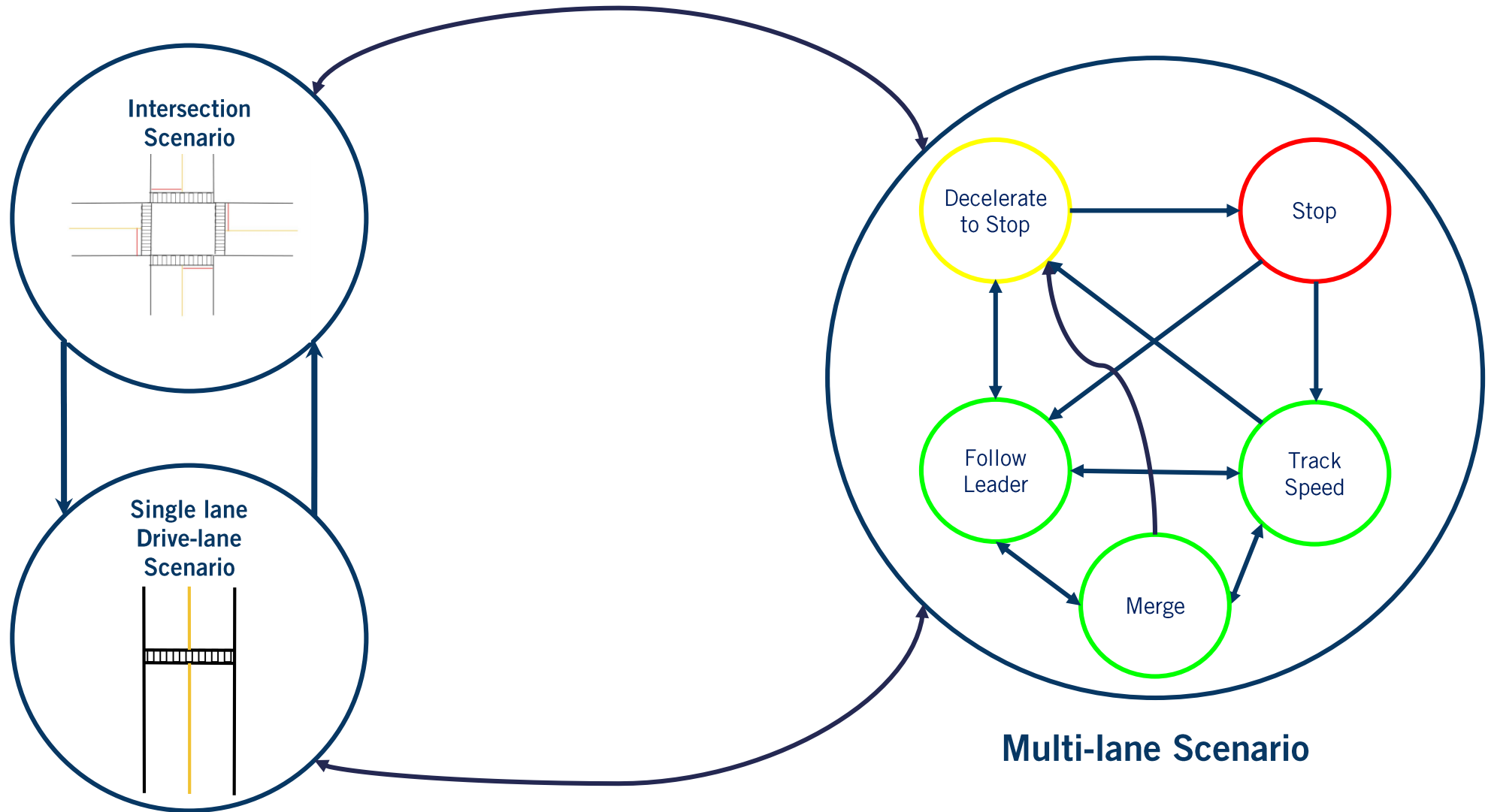

Intersection Scenario

Drive-lane Scenario
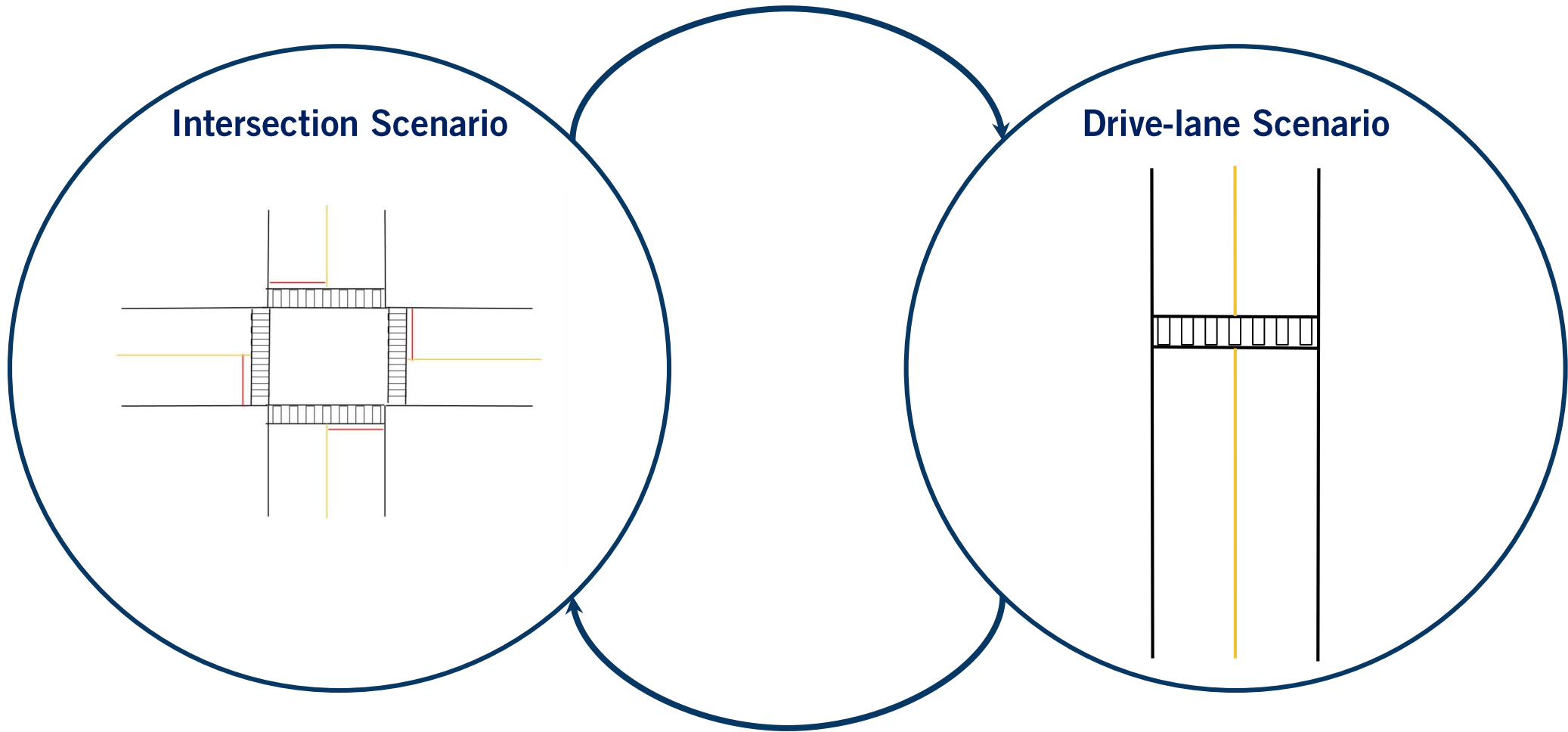
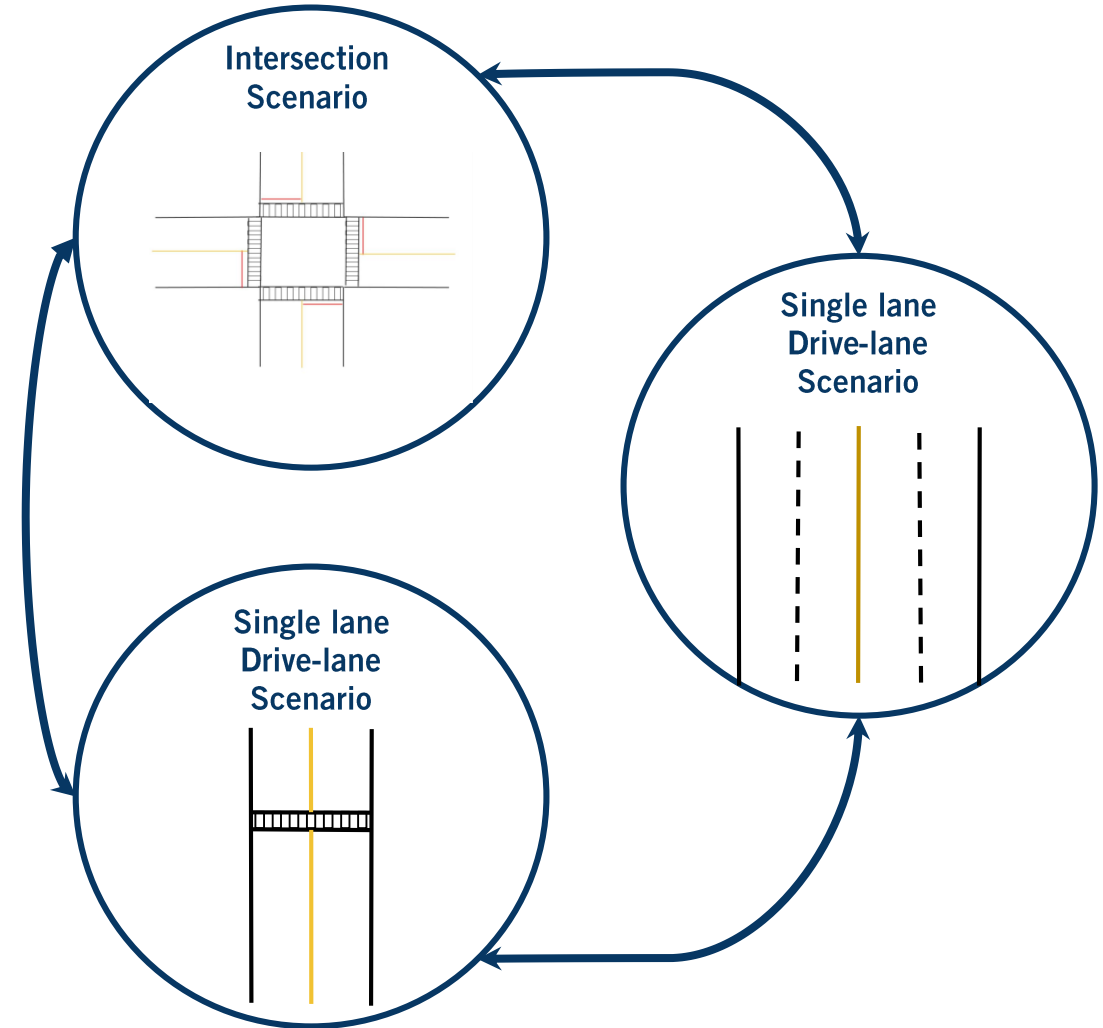# Entry and Exit Transitions - Intersection

Hierarchical State Machine

Hierarchical State Machine - Advantages and Disadvantages

- Advantages:
  - Decrease in computational time
  - Simpler to create and maintain
- Disadvantages:
  - Rule Explosion
  - Repetition of many rules in the low level state machines

Summary

- Developing a larger overarching state machine which includes multiple scenarios
- Develop a method to switch between driving scenarios

- **Next**: Advanced methods for behaviour planning