

# 1 Introduction

## 2 Assumptions

## 3 Model 1: T

### 3.1 Simulation and discussion

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We simulate a toll plaza with 8 tollbooths and 3 lanes of travel.

Common vehicles are usually  $4-4.5m$  long and  $1.65-1.85m$  wide, so a vehicle will take up 2 cells. According to the *Green Book, 1994*, an appropriate design of a toll plaza would be a trapezoid with a 168-meter-long recovery zone and a 612-meter-long departure zone. The width of a tollbooth along with a toll island is usually  $5.5m$ , while that of each lane is  $3.5-4m$ . We set the length of each cell equal to  $2m$ :  $l_{car} = 4m$ . So the parameters are as follows:

$$l_{veh} = 2w_{veh} = 1WB = W_bB = 3 \times 8 = 24WL = W_lL = 2 \times 3 = 6L_r = 84L_d = 306$$

Figure 1 shows the relationship between current throughput and traffic flow density with different  $p_v$ .

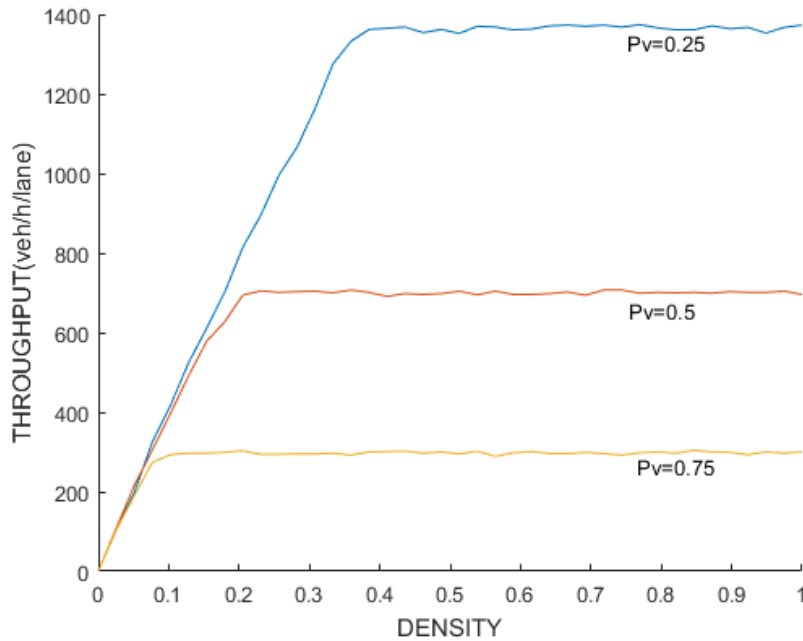


Figure 1: The relationship between throughput and density with different  $p_v$