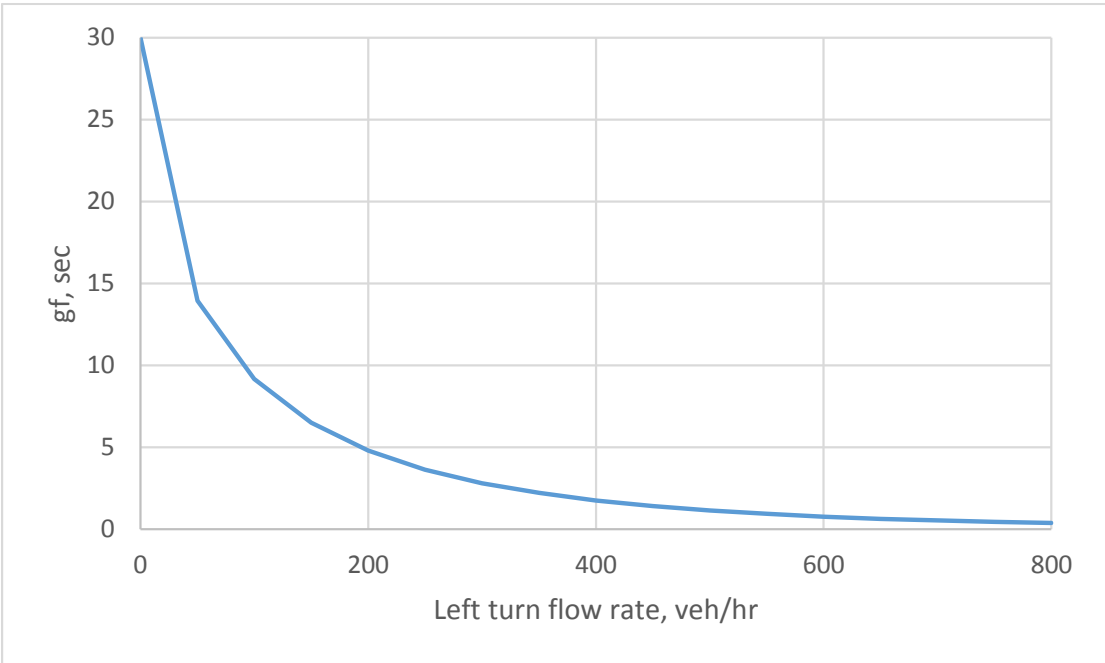
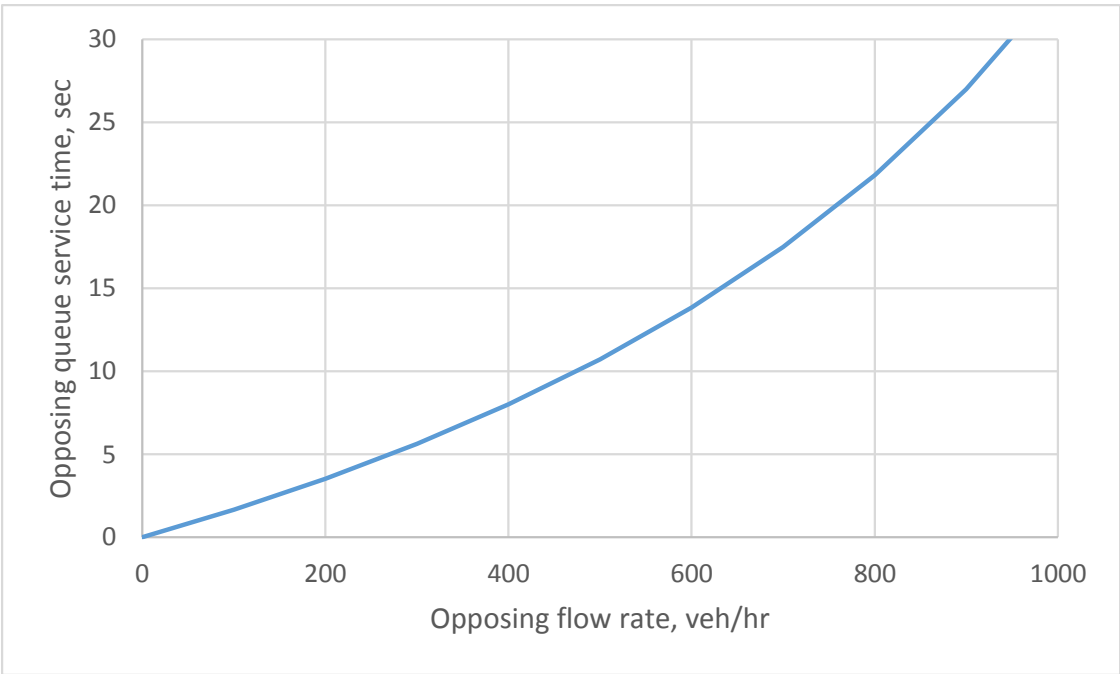


# CE 572 – Spring 2015

Intersection Traffic Operations

Class 17

27 February 2015



Briefly discuss why the assumption of uniform arrivals and the predicted arrival pattern using the platoon dispersion model will produce different estimates of delay at a signalized intersection. Give an example sketch that illustrates this difference based on your reading.

## Assignment 25 - Predicting delay when arrivals are non-uniform

The purpose of this assignment is to study how arrival patterns affect the delay at a signalized intersection. Your work for each task should be clearly documented and the spreadsheet should be clearly organized so that it can be easily followed. Use VBA functions as needed. Assume the following input data:

*For both intersections:*

- $C = 60$  sec
- $g/C = 0.5$
- $s = 1900$  veh/hr

*For upstream intersection:*

- Arrival flow = 800 veh/hr

*For downstream intersection:*

- Offset = 0 sec

*Other data:*

- Distance = 1000 ft
- Speed = 25 mi/hr

### Tasks

Task 1. Calculate the departure flow profile for the upstream intersection and the arrival flow profile for the downstream intersection showing 1 sec time steps over a four cycle period.

Task 2. Prepare plots of both flow profiles that you calculated in task 1. The plots should also show the four green and red time intervals over time.

Task 3. For each time step, beginning with the start of the second red interval and continuing for one complete cycle, calculate the queue length. Based on these data, prepare a queue accumulation polygon for this cycle.

Task 4. For this same cycle, calculate the total and average delays.

Task 5. For this same cycle, and for a range of offsets from 0 to 60 sec in intervals of 5 sec, show how average delay varies as a function of the offset.

Task 6. Are your results from task 5 consistent with the queue accumulation polygon for three offset values (that you select).

Task 7. How do your predictions of average delay for varying offsets compare with your calculated average delay assuming uniform arrivals?