

## CE 774 - Traffic Management and Design (2022)

### Assignment - 2

**Instructions:** (i) Start each question on a new page, (ii) All questions and answers should be written by hand, (iii) Scan the assignment in the same order and submit as a single pdf file, (iv) through the google form that will be shared by the TA.

1. Refer to the example problem 1 in HCM 2000 chapter 16 (page 16-38). Detailed calculation of NB is already given. Similarly, show the detailed calculation of WB and NB. Show details related to 'Volume Adjustment and Saturation Flow Rate Worksheet' and 'Capacity and Los Worksheet'. (It is NOT necessary to show the supplemental worksheet for values of Left-turn adjustment factor, Left-turn and right-turn pedestrian/bicycle adjustment factor. Instead, just adopt the final values from that sheets).
2. Refer to the example problem 2 in HCM 2000 chapter 23 (page 23-20). Solve the same problem, but (i) instead of the flow of 4000, you generate randomly any flow value greater than 6000 but less than 7000, and (ii) instead of the PHF=0.85, generate randomly a PHF greater than 0.87 but less than 0.95. Show clearly the changes in the input data and detailed steps of calculation.
3. Refer to the example problem 1 in HCM 2000 chapter 24 (page 24-23). Solve the same problem, but assume (i) a PHF value generated randomly between 0.85 and 0.95 (except 0.91), (ii) FFS either 90, 100, or 120, and (iii) a percentage of heavy vehicle value generated randomly greater than 6.0% and less than 9.5%. Show clearly the changes in the input data and detailed steps of calculation.
4. Refer to the example problem 1 in HCM 2000 chapter 25 (page 25-24). Solve the same problem, but (i) increase the ramp volume by randomly between 5 to 10 %, (ii) decrease the freeway volume by randomly between 4 to 8 %, (iii) FFS either 90, 110, or 120. Show clearly the changes in the input data and detailed steps of calculation.