CE 572 – Spring 2015

Intersection Traffic Operations

Class 15

23 February 2015

Assignment 19…part 2

- Group work
- Review your results for A19 together
- Consider following situation: if permitted LTs were used how would this change the steps that you would use? What additional data would you need to determine the critical movements?

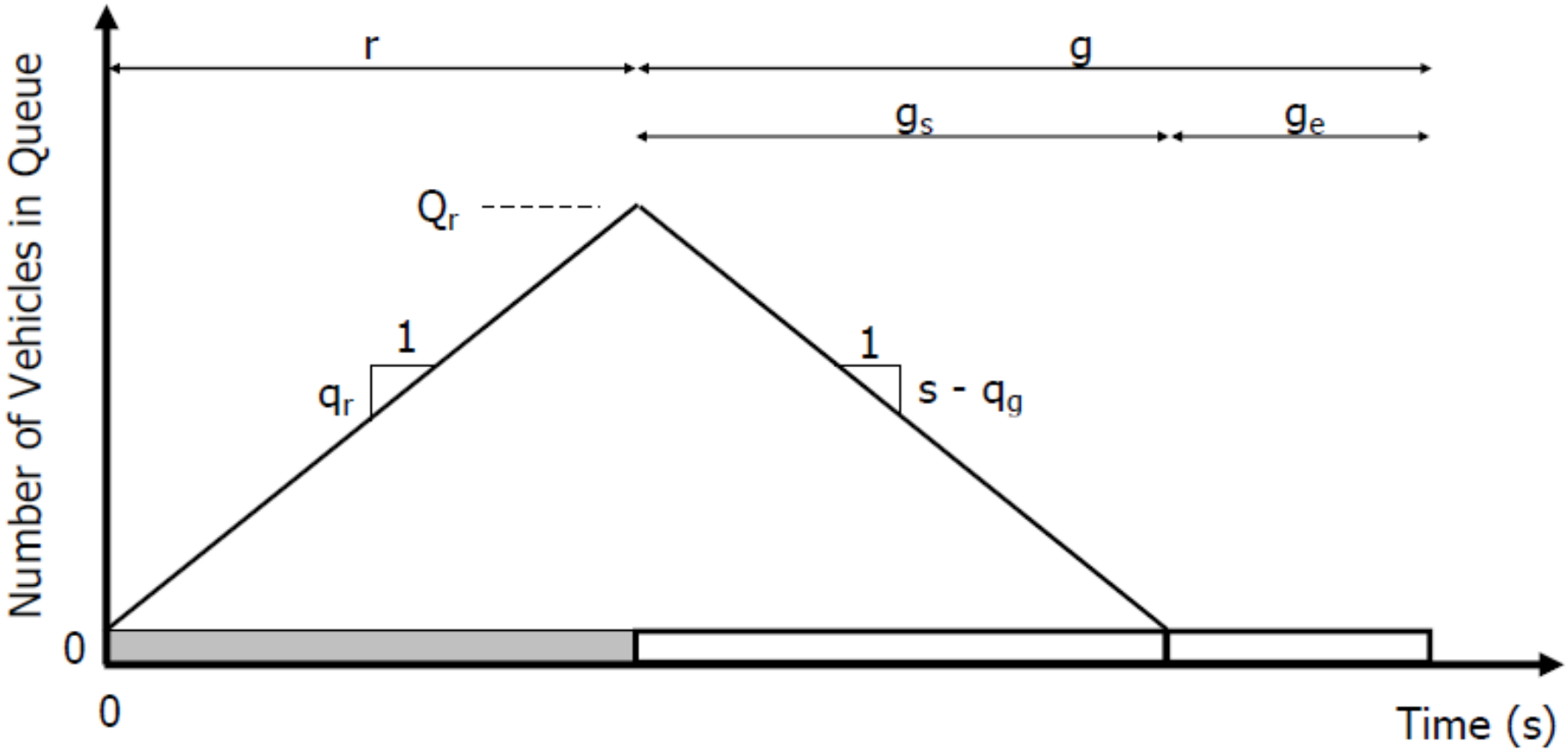

Exhibit 31-15
Queue Accumulation Polygon for
Protected Movements

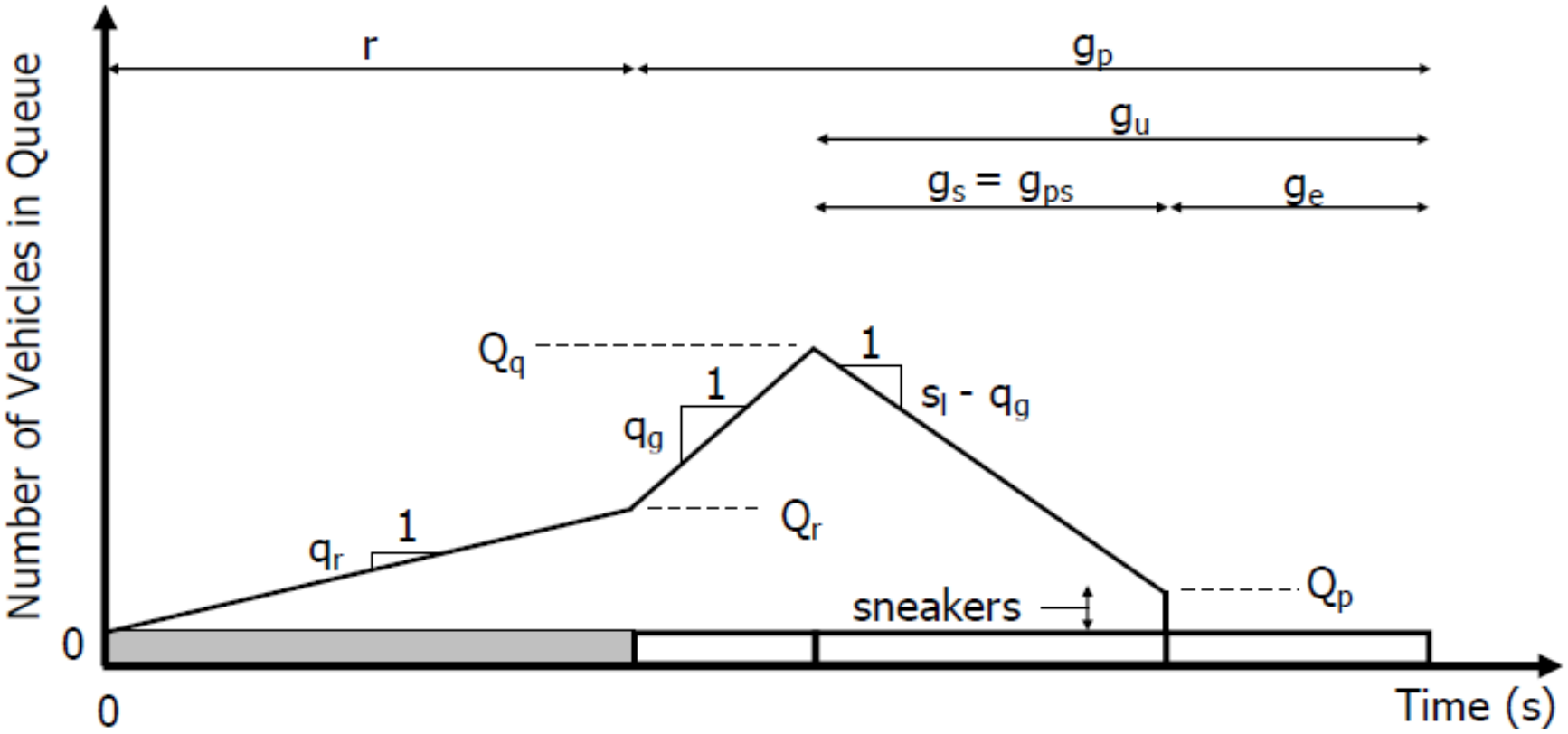

Exhibit 31-17
QAP for Permitted Left-Turn Operation in an Exclusive Lane

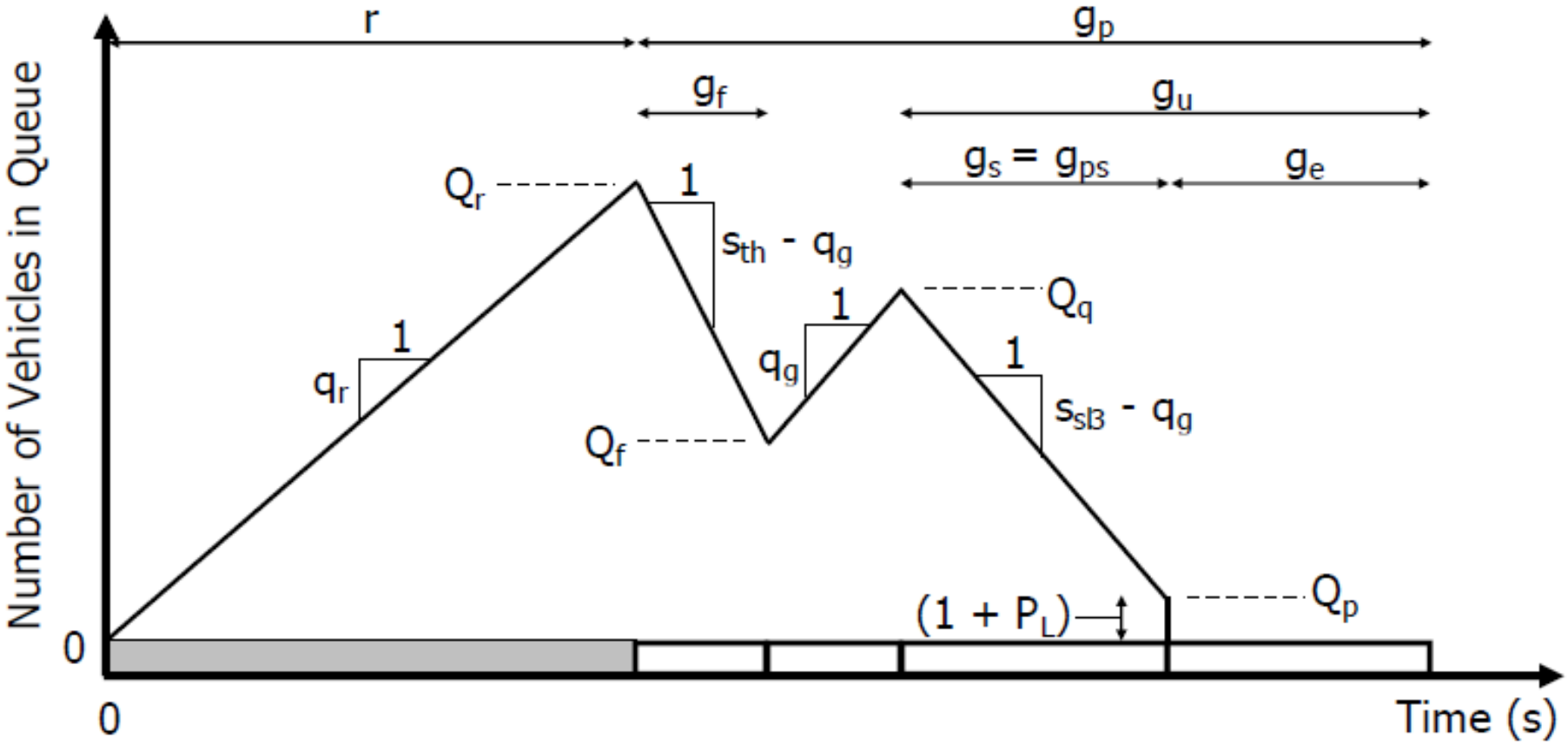

Exhibit 31-18
QAP for Permitted Left-Turn Operation in a Shared Lane

Assignment 21 - Delay during oversaturated conditions

An approach to a pretimed signalized intersection has a saturation flow rate of 1700 vehicles per hour of green. The cycle length is 60 seconds and the effective red is 40 seconds. During three consecutive cycles 15, 8, and 4 vehicles arrive. The arrival pattern should be assumed to be uniform during each cycle.

(1) Prepare a flow profile diagram, a cumulative vehicle diagram, and a queue accumulation polygon for these conditions.
(2) Determine the total vehicle delay and the average delay per vehicle for each cycle, and for all three cycles.
(3) For the queue present at the beginning of each of the three green intervals, how long would it take for each queue to clear?
(4) Is there sufficient capacity on capacity on this approach to serve the demand?

Assignment 22 - Reading

The purpose of this reading assignment is to prepare you to study the method used to calculate saturation flow rates for permitted LT from both exclusive LT lanes and shared LT/TH lanes. The HCM methods for these cases are complex and will require some work on your part to master. I would suggest that you carefully study the QAPs for both of these cases. Here are the relevant sections from Chapter 31 of the HCM 2010 that you need to read before our next class:

- QAP concepts (Introduction, Concepts): pp 31.48-31.49
- Step 1. Determine permitted LT green time: pp 31.51-31.53
- Step 2. Determine time before first LT vehicle arrives: pp 31.53-31.54
- Step 3. Determine permitted LT saturation flow rate: pp 31.54.31.55
- QAPs for permitted LTs from exclusive lane and from shared lane: Exhibit 31.17 (p 31.61) and Exhibit 31.18 (p 31.62)