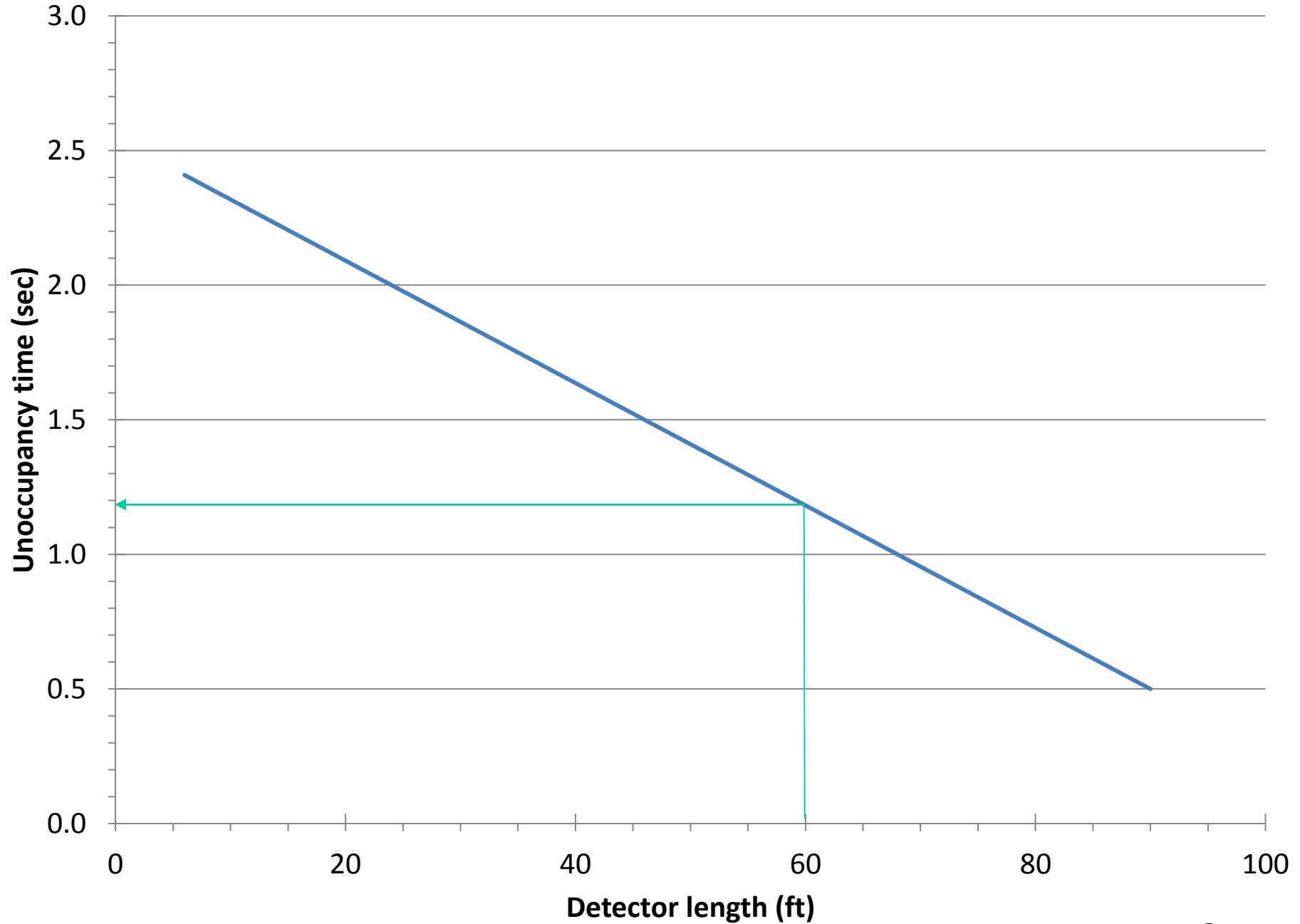


CE 474 – Class 16

September 30, 2015

For next time...

- Preview A36.
 - Read “Information” section
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ACTIVITY
32

Relating the Length of the Detection Zone to the Duration of the Green Indication



ACTIVITY
33

Determining the Length of the Minimum Green Time



ACTIVITY
34

Understanding the Variation of Vehicle Headways in a Departing Queue



ACTIVITY
35

Relating Headway to Unoccupancy Time and Vehicle Extension Time



→**Deliverable:** One Excel spreadsheet with deliverables for each of the four activities on separate tabs as identified in each of the activities.

- Due Thursday, 8:00 am to BBLearn.
- Submit for team of 2.

ACTIVITY
32

Relating the Length of the Detection Zone to the Duration of the Green Indication



ACTIVITY
33

Determining the Length of the Minimum Green Time



ACTIVITY
34

Understanding the Variation of Vehicle Headways in a Departing Queue



ACTIVITY
35

Relating Headway to Unoccupancy Time and Vehicle Extension Time



For each activity:

- Download the video
- Watch the video; collect and record data
- Answer the Critical Thinking Questions
 - A32: Q4
 - A33: Q1
 - A34: Q1, Q2
 - A35: Q1

A32

- MinG=0s
- VET/PT=0s
- MaxG=50s
- Det zones=22 ft/66 ft
- Video=30s

A33

- VET/PT=2.2s for $\phi 4$
- MinG=5s/10s
- Video=1:30

Data to record	Case 1	Case 2
Start of green		
Back of vehicle leaves zone		
Start of yellow/end of green		
Difference between "start of yellow/end of green" and "back of vehicle leaves zone"		

Vehicle #	Start of green	Vehicle begins to move	Vehicle enters detection zone
	89.5		
1			
2			
3			
4			

A34

- Video=1:00

Vehicle number	Start of green	Time front of vehicle reaches stop bar	Headway
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

A35

- Video=1:00

Vehicle Number	Start of green	Start of yellow	Front of vehicle enters zone	Rear of vehicle exits zone	Headway	Unoccupancy time
1			14.0		1.2	
2					2.4	
3					1.7	
4					1.9	
5					1.8	
6					1.8	
7					1.7	
8					1.9	
9					1.4	
10					1.7	

Event/Variable	L=22'	L=66'
Beginning of green for SB approach (movement 4).	49.9	49.9
Detection zone for SB approach becomes empty.	54.0	61.0
Beginning of the yellow interval.	54.2	61.2
Number of vehicles served during green indication.	3	7
Duration of green	4.3	11.3

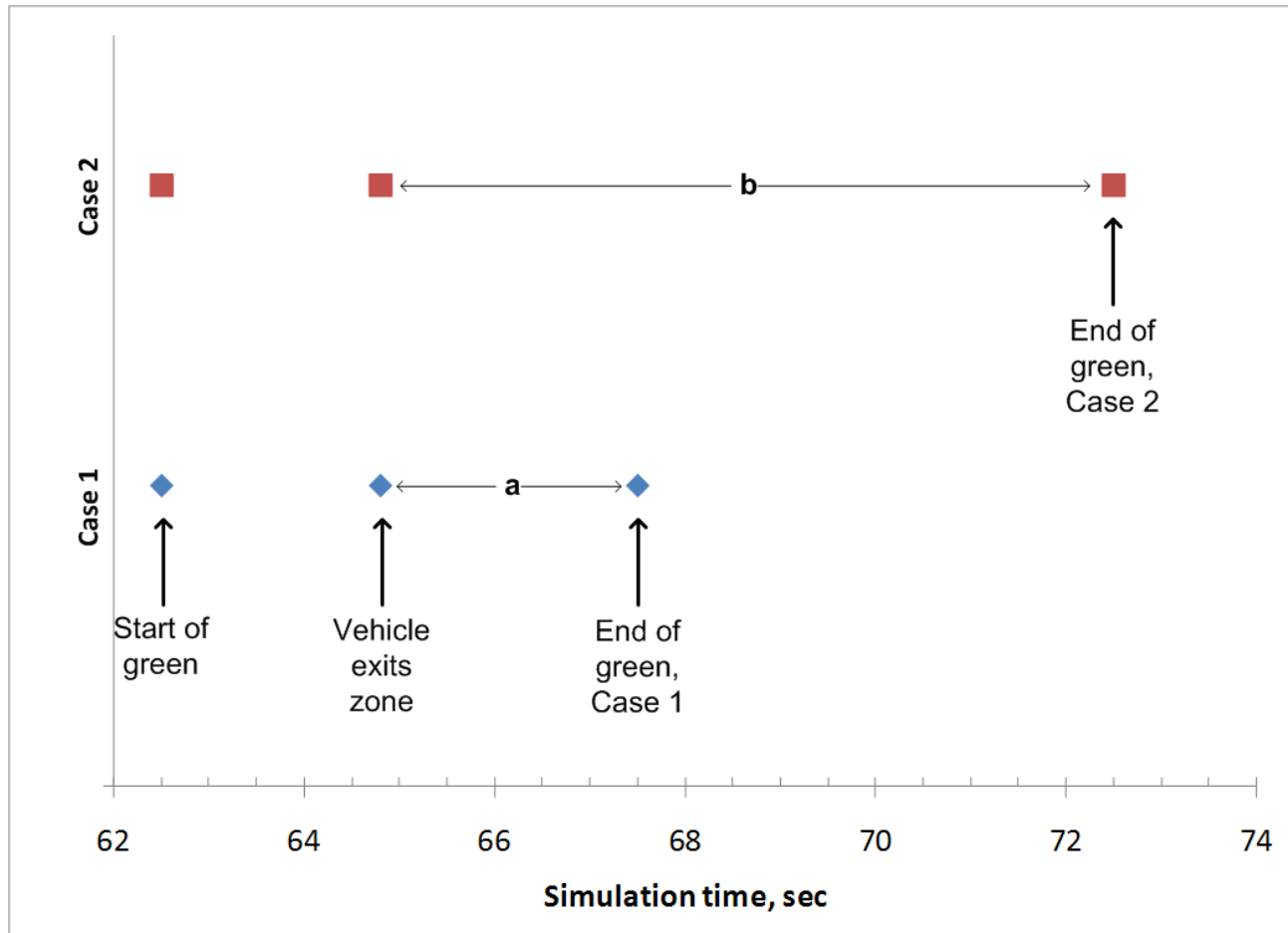


- When is Minimum Green time too long?

Data to record	Case 1	Case 2
Start of green	62.5	62.5
Back of vehicle leaves zone	64.8	64.8
Start of yellow/end of green	67.5	72.5
Difference between "start of yellow/end of green" and "back of vehicle leaves zone"	2.7	7.7



- When is Minimum Green time too long?



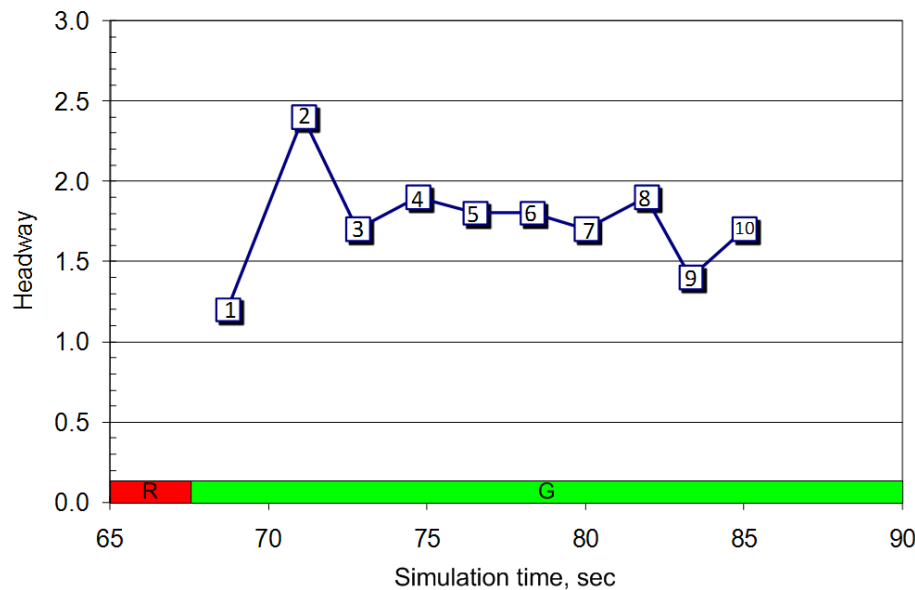


- How much variation is there in headways between vehicles in departing queue?

Vehicle number	Start of green	Time front of vehicle reaches stop bar	Headway
	67.5		
1		68.7	1.2
2		71.1	2.4
3		72.8	1.7
4		74.7	1.9
5		76.5	1.8
6		78.3	1.8
7		80.0	1.7
8		81.9	1.9
9		83.3	1.4
10		85.0	1.7



- Based on headways that you observed in departing queue, what is your recommendation for desired maximum headway?





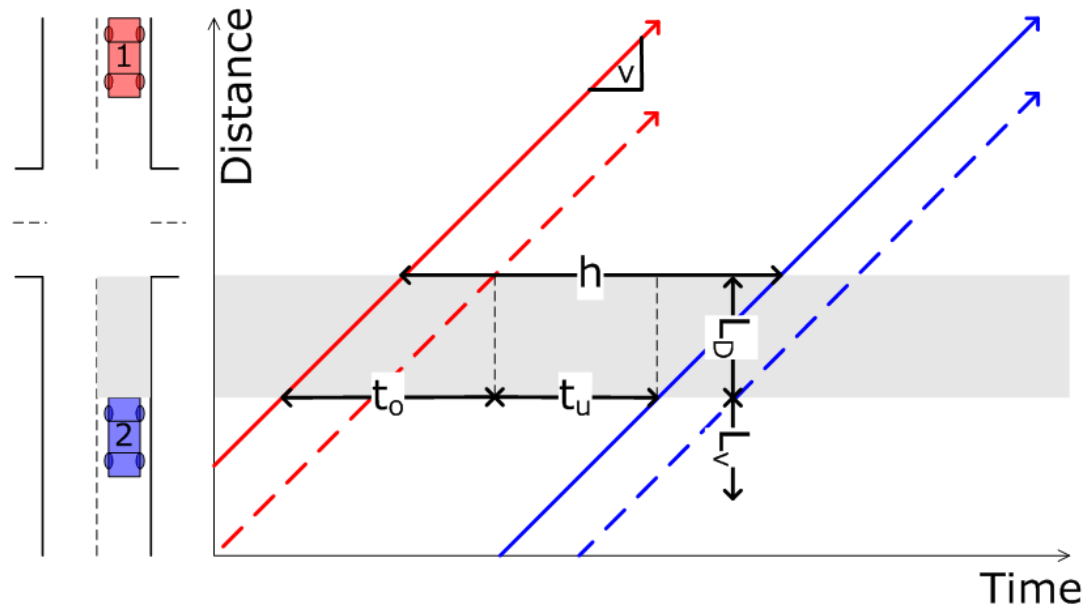
- Learning outcomes
- Overview
- Questions to consider
- Steps

ACTIVITY
35

Relating Headway to Unoccupancy Time and Vehicle Extension Time



Vehicle Number	Start of green	Start of yellow	Front of vehicle enters zone	Rear of vehicle exits zone	Headway	Unoccupancy time
	67.5					
1			14.0	69.8	1.2	
2			69.1	71.6	2.4	0
3			71.9	73.2	1.7	0.3
4			73.9	75.0	1.9	0.7
5			75.9	76.9	1.8	0.9
6			77.7	78.6	1.8	0.8
7			79.4	80.3	1.7	0.8
8			81.3	82.3	1.9	1.0
9			82.7	83.7	1.4	0.4
10			84.4	85.4	1.7	0.7
		90.3				



——→ Trajectory of front of vehicle
 - - - → Trajectory of rear of vehicle

t_u = unoccupancy time	L_V = Vehicle Length
t_o = occupancy time	h = headway
L_D = detection zone length	V = vehicle speed

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