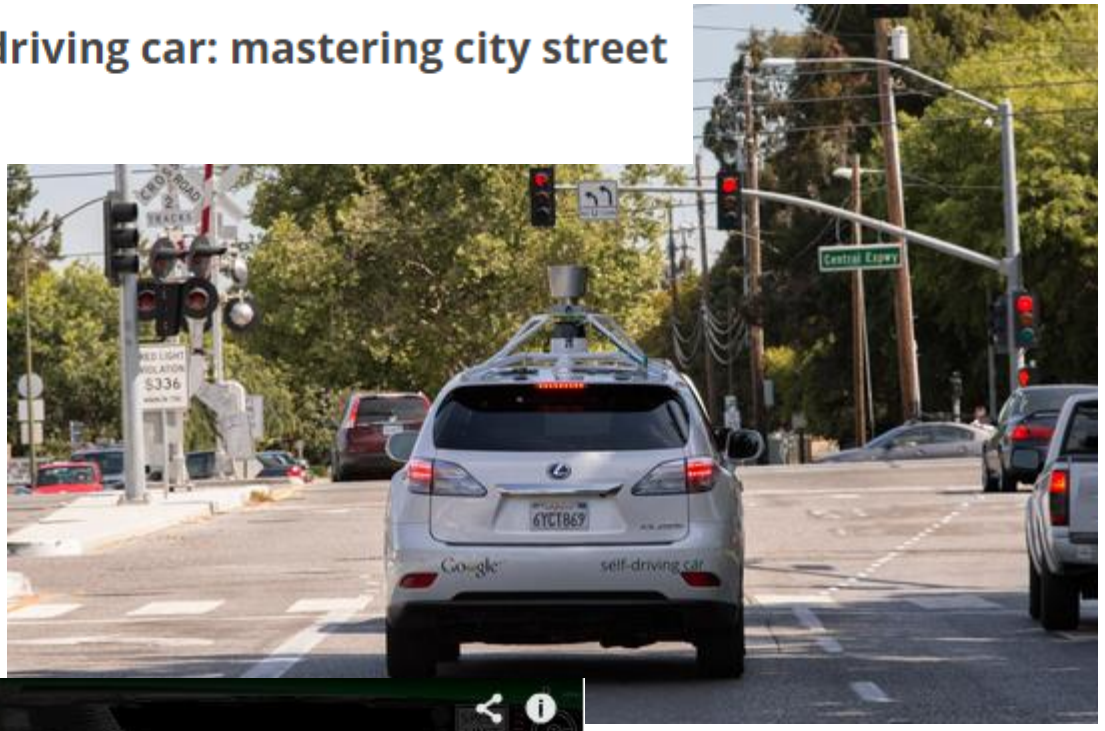
CE 474

Class 34

11 November 2015

The latest chapter for the self-driving car: mastering city street driving



12	**Class 33 (11.09)** Progression and coordination Do: AC03	**Class 34 (11.11)** Progression and coordination Continue: AC03 (due 11.12)	**Class 35 (11.12)** Build VISSIM network for system Review: AC02 Do: AC04 (due 11.16) Network 1 Network 2
13	**Class 36 (11.16)** Split times Critical movement analysis Do: AC05 (due	**Class 37 (11.18)** Continue: AC05 (due 11.19)	**Class 38 (11.19)** Do: AC06 (due 11.30)
14	**Class 39 (11.30)** Cycle length analysis Do: AC07 (due 12.07)	**Class 40 (12.02)** Exam #2	**Class 41 (12.03)** Offset analysis Do: AC08 (due 12.07)
15	**Class 42 (12.07)** Analyze data and prepare design	**Class 43 (12.09)** Analyze data and prepare design	**Class 44 (12.10)** Design project #2 presentation

AC03: Progression

AC04: Base network

AC05: Critical movement analysis

AC06: Split analysis

AC07/AC08: Cycle and offset analysis

Synthesis and summary

Activity	Work Tasks
AC02	**Field work** • Learn about parameters to describe quality of progression
AC01 AC03	**Spreadsheet tool** • Learn about options for coordination • Experiment with offsets and cycle length
AC04 AC05 AC06 AC07 AC08	**VISSIM microsimulation model** • Optimize phase splits, cycle length, and offsets • Predict travel times and delay

AC03 – Due 11.12

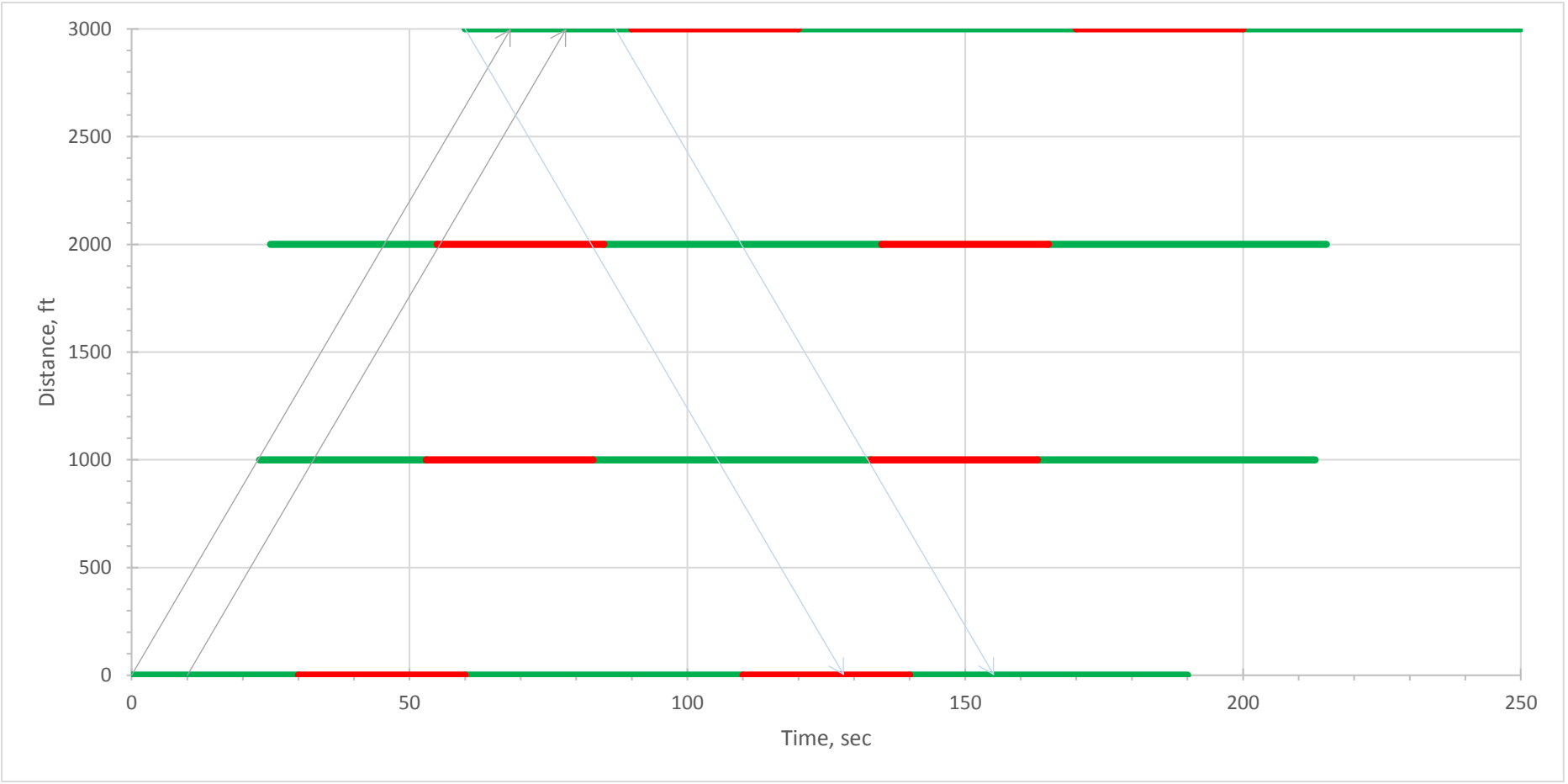
Tasks

2. Find the optimal offsets for the following cases based on the travel times between intersections, using the base conditions of a 100 sec cycle length and even green splits.
    a. The up direction only
    b. The down direction only
3. Using the same base conditions as in task 2, experiment with different offset combinations to find the best progression in both directions. Document your two "best" solutions.
4. Change the cycle length to 60 secs and maintain even green splits. Find the two offset combinations that yield the "best" two-way progression.
5. Prepare one slide in PowerPoint that shows your recommended signal timing for two-way operation using a cycle length of 100 sec.

AC03 – Due 11.12

Critical Thinking Questions

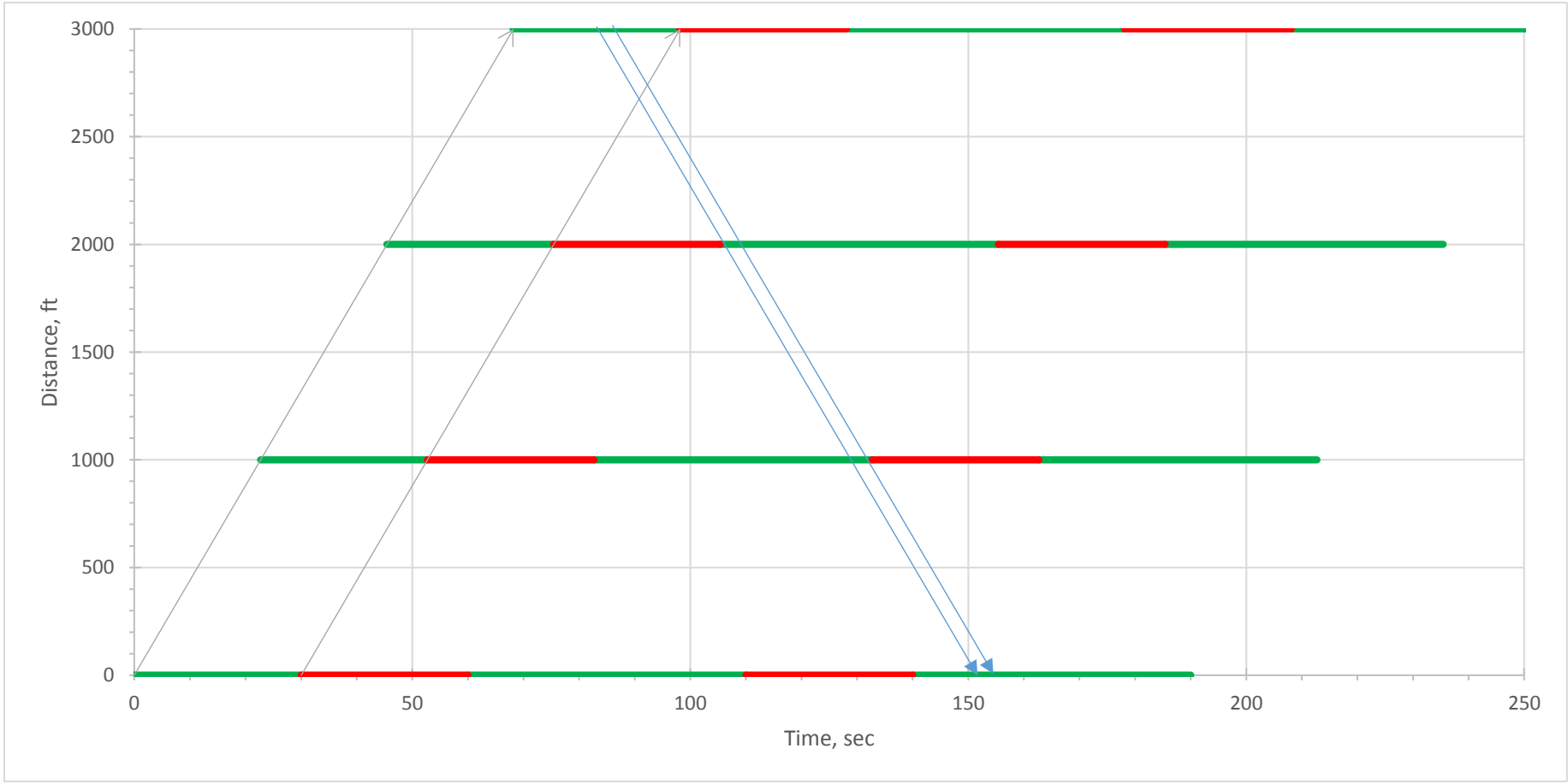
1. Describe the results of the signal coordination analysis from task 2 where you considered only one-way progression.
2. Describe the results of the signal coordination analysis from task 3, where you considered two-way progression. Is progression possible in both directions? Why or why not?
3. Considering the results from task 3, what opportunities and limitations for progression do you envision for your design project?
4. Discuss what goal you might set for your design project based on your answer to question 3.
5. How will a queue that is still clearing at the downstream intersection affect the offset to achieve progression for an arriving platoon?
6. Does the change in cycle length from 100 sec to 60 sec affect your progression results? What is the change in the bandwidth when this cycle length change is made?



Quality of progression
- Up = Good
- Down = Average to poor

Bandwidth
- Up = 10 sec
- Down = 27 sec (partial)

What are your goals?
What can you accomplish?



Quality of progression
- Up = Excellent
- Down = Poor

Bandwidth
- Up = 40 sec
- Down = 5 sec

What are your goals?
What can you accomplish?