



# UCI EAST PELTASON INTERSECTION STUDY

Institute of Transportation Engineers  
University of California, Irvine

# Overview

- Coordination with UCI Transportation
- Data Collection
- Existing network Constraints and Parameters
- Signal Timing & Phasing Analysis
- Coordination analysis
- Recommendations and Implementation

# UCI Traffic Problems

- Long queues in peak hours
- Two-lane roads in high volume areas
- High pedestrian movements
- Frequent need for Traffic Directors



# UCI Parking and Transportation



- Discussed problems at UCI
- Decided on analyzing intersections:
  - East Peltason & Campus (City)
  - East Peltason & Pereira
  - East Peltason & Anteater
  - East Peltason & Los Trancos (Stop)
  - East Peltason & Bison



# Goals

- Obtain accurate data
- Analyze signal timing and phasing with Synchro & SimTraffic V7
- Explore coordination alternatives
  - Decrease overall delay
  - Minimize Stops
  - Minimize emissions



# Data Collection

- Jamar counters
- AM hours 7:30am-8:30am
- PM hours 5:00pm-6:00pm
- Data collected
  - Turning Volumes
  - Pedestrian Counts
  - Pedestrian Calls



# Existing conditions Analysis

- Data obtained using Synchro & SimTraffic

	Synchro	SimTraffic	
	LOS	Delay/Veh (s)	Stops/Veh
<b>Bison / E. Peltason</b>	<b>F</b>	<b>73.7</b>	<b>1.27</b>
<b>Los Trancos / E . Peltason</b>	<b>F</b>	<b>27.5</b>	<b>1.16</b>
<b>Anteater / E. Peltason</b>	<b>C</b>	<b>16.4</b>	<b>0.65</b>
<b>Pereira / E. Peltason</b>	<b>C</b>	<b>31</b>	<b>0.73</b>

# Constraints and Parameters

- No geometry improvements
- Campus/ E. Peltason controlled by the City of Irvine
- Existing Timing Parameters
- Flashing Don't Walk time for Pedestrian Clearance
  - Measured Cross walk Lengths
  - Assume pedestrian speed of 4 ft/s

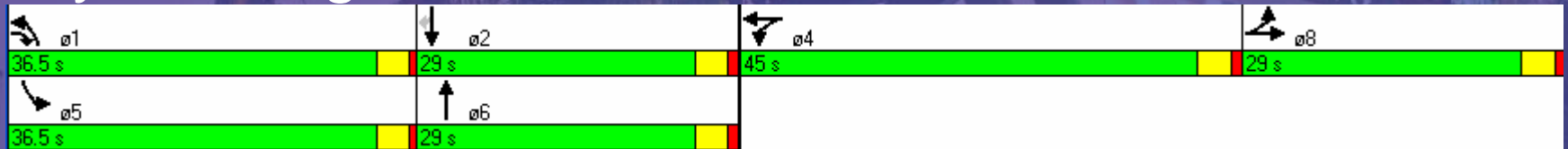


# Signal Timing & Phasing

Intersection splits are optimized using Synchro

Existing Timing

Cycle Length: 140s

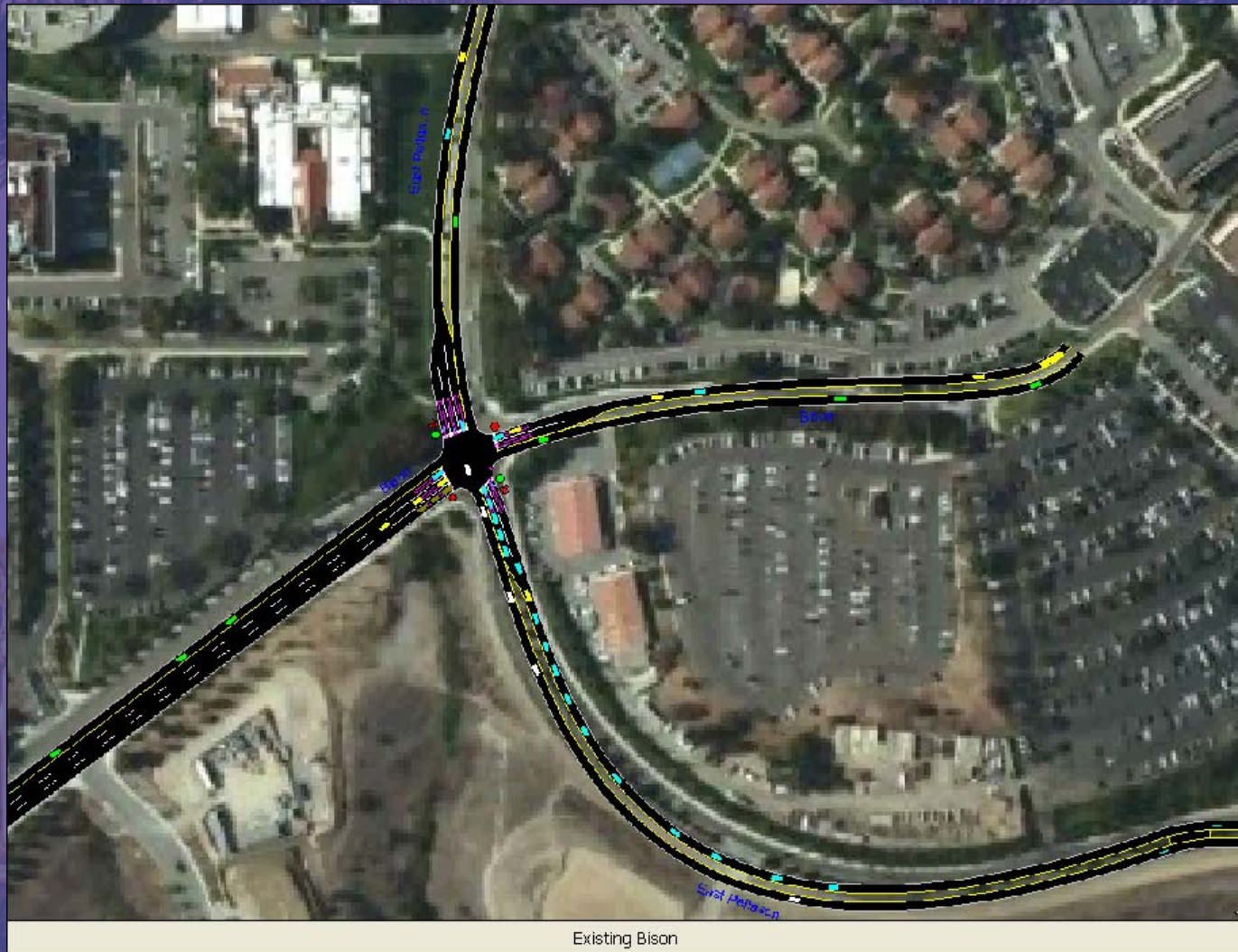


Optimized Timing

Cycle Length: 150s

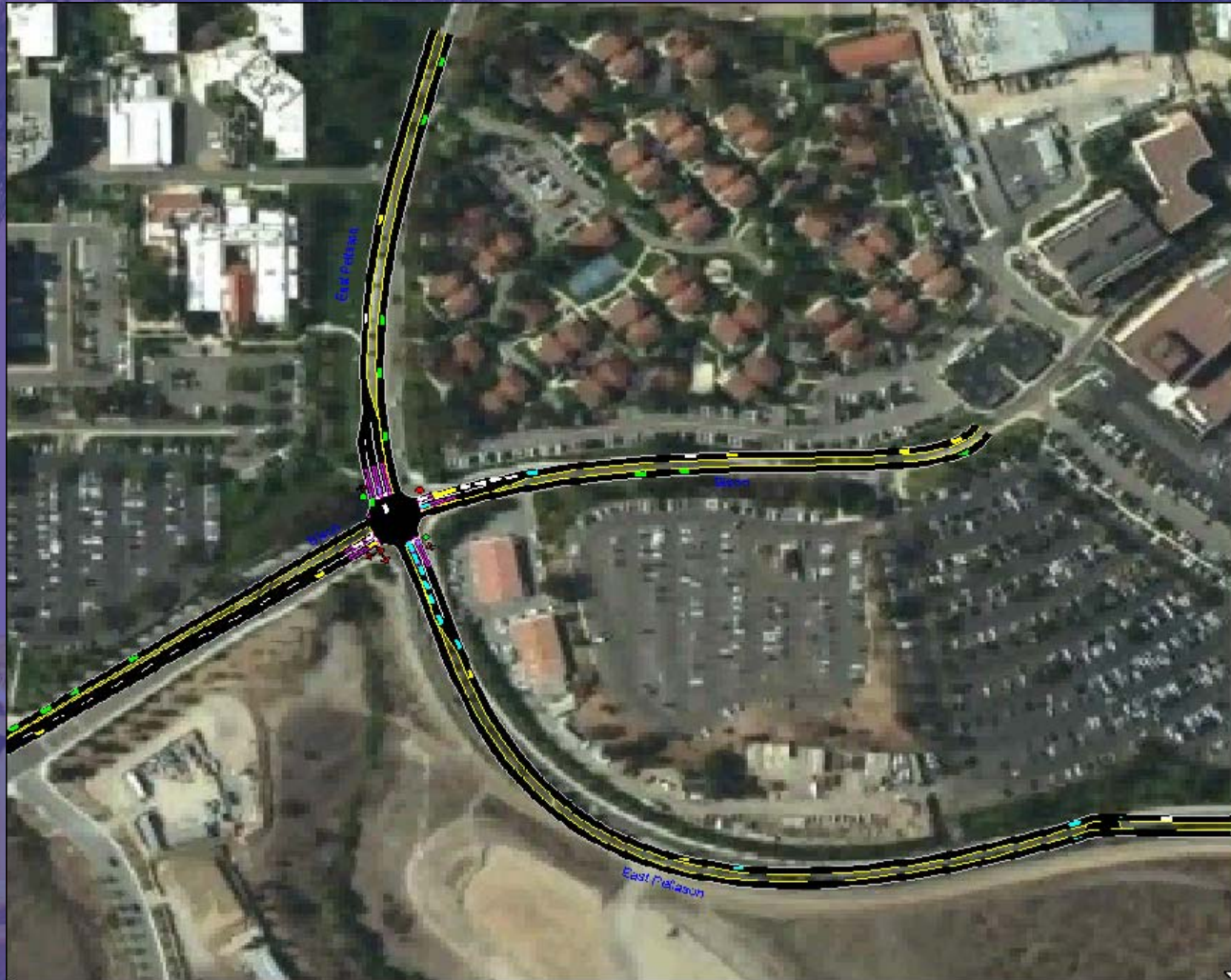


# Existing Bison Intersection



Existing Bison

# Coordinated Bison Intersection



Coordinated Bison

# Signal Timing and Phasing

- Phasing alternatives analyzed
- Maximum split check to ensure volumes are being served.

$$t_{split} = \left( \frac{V}{\#Lanes} \right) \div \left( \frac{PHF}{C} \right) * h_{avg} + \sum t_{loss}$$

Existing Anteater and East Peltason Cycle Length: 140s



Optimized Anteater and East Peltason Cycle Length: 85s



# Coordination Approach

- Los Trancos is still unsignalized
- Intersections to coordinate are
  - East Peltason & Campus
  - East Peltason & Pereira
  - East Peltason & Anteater



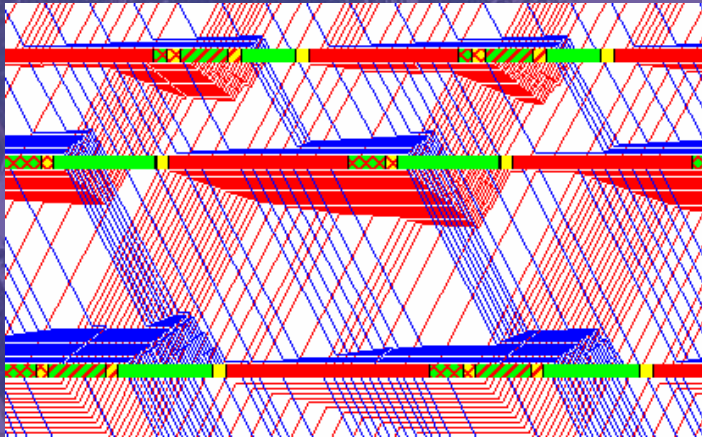
# Signal Coordination

## Existing

Campus

Pereira

Anteater



## Coordinated Intersections

Pereira/E Peltason

Anteater/E Peltason

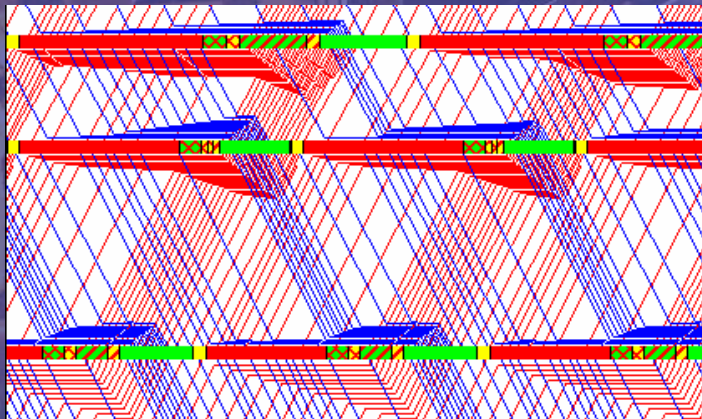
- Cycle Length = 85
- Reference phase 2 and 6  
End of yellow

## Campus not Coordinated

Campus

Pereira

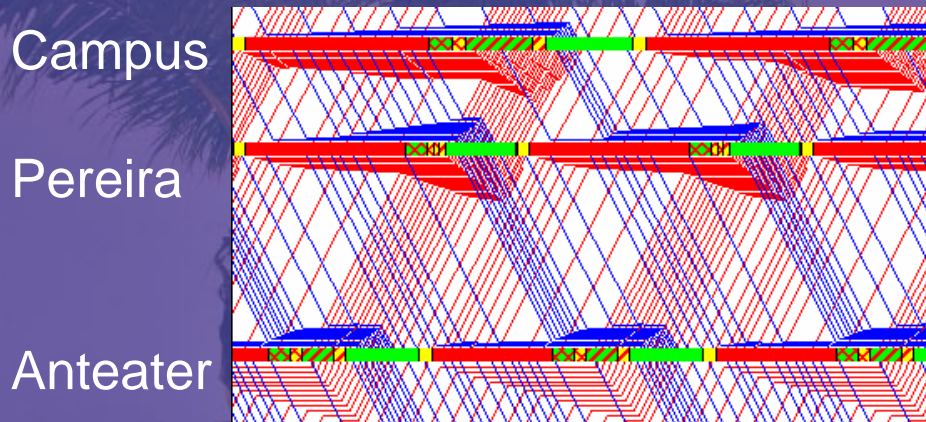
Anteater



\*Campus should be coordinated

# Signal Coordination

Campus not coordinated



Campus/E Peltason

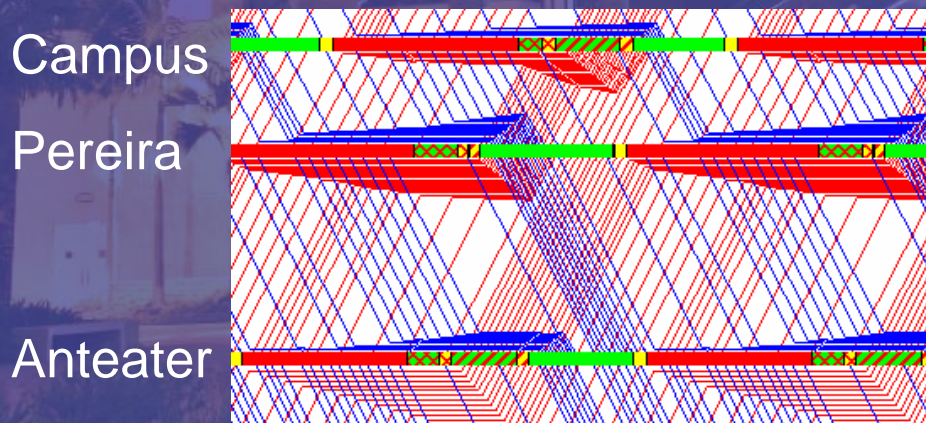
- Cycle Length = 120

Pereira/E Peltason

Anteater/E Peltason

- Cycle Length = 85

Campus coordinated



Campus/E Peltason

Pereira/E Peltason

Anteater/E Peltason

- Cycle Length = 120

- Better for Ped Clearance

# Summary of Results

Measures of Effectiveness	SimTraffic	
	Total Delay (hour)	Total Stops
Existing	15	1370
Coordinated	13.7	1308
Coordinated with Campus	12.7	1164

Level of Service	Existing	Optimized
Bison / E. Peltason	F	E
Anteater / E. Peltason	C	C
Pereira / E. Peltason	C	C

# Recommendations and Implementation

- Coordination with UCI Parking and Transportation to test Timing sheets
- Longer Flashing Don't Walks for Pedestrians
- After study is conducted by ITE students