



Presented to:

Carbon Canyon Road (SR 142)

Phase 2 Study – Draft Traffic Study

January 9, 2019

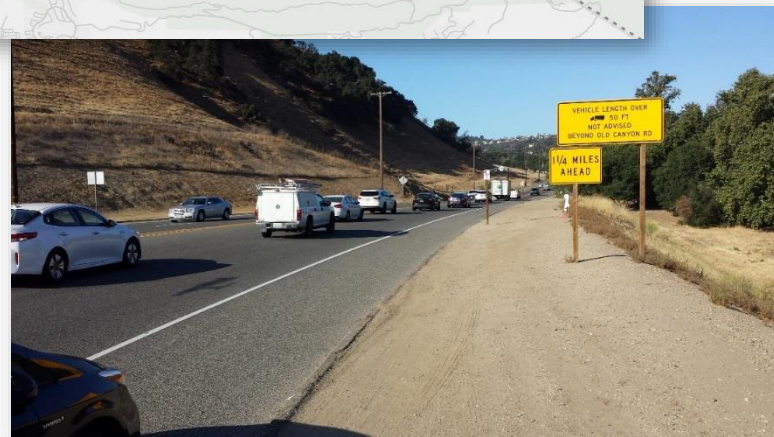
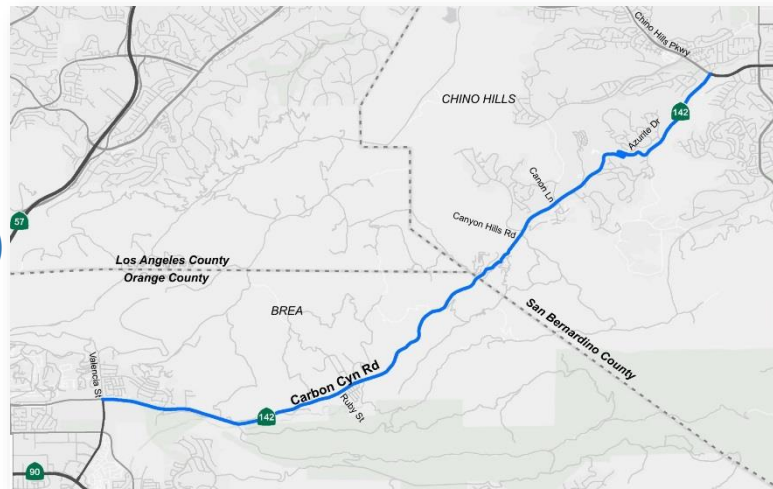


Study Area



Carbon Canyon Rd (SR-142) Corridor

- **8.4 miles (3.8 in Chino Hills, 4.6 in Brea)**
 - 13 intersections (1 traffic signal) in Chino Hills
 - 8 intersections (4 traffic signals) in Brea
- **2 lane undivided roadway (except Brea segment)**
- **Speed limit varies from 35 to 50 mph**
- **Advisory signs (trucks over 50' length)**



Data Collected



Daily and Peak Hour volumes

- 1,300-1,400 peak hour volumes (Southwest in AM, Northeast in PM)
- 17,000 Daily volume

Trucks

- 1% of daily volume (majority 2-axle trucks)

Video Camera footage (S-curve)

Traffic Operations Analysis



Intersection Level of Service (LOS) per the Highway Capacity Manual (HCM)

Level of Service	Description	Signalized Intersection Delay (seconds per vehicle)	Unsignalized Intersection Delay (seconds per vehicle)
A	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation.	≤ 10	≤ 10
B	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	>10 and ≤ 20	>10 and ≤ 15
C	Good operation. Occasionally drivers may have to wait more than 60 seconds, and back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>20 and ≤ 35	>15 and ≤ 25
D	Fair operation. Vehicles are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues.	>35 and ≤ 55	>25 and ≤ 35
E	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.	>55 and ≤ 80	>35 and ≤ 50
F	Forced flow. Represents jammed conditions. Backups from locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	> 80	> 50

Traffic Operations Analysis



Intersection Level of Service (average vehicle delay)

Intersection		Jurisdiction	Traffic Control Type	AM Peak Hour		PM Peak Hour	
				Delay (s)	LOS	Delay (s)	LOS
1	Carbon Cyn Rd/Chino Hills Pkwy	Chino Hills	Signalized	31.3	C	31.3	C
2	Carbon Cyn Rd/Azurite Dr	Chino Hills	Stop-controlled	26.5	D	14.7	B
3	Carbon Cyn Rd/Canon Ln	Chino Hills	Stop-controlled	53.8	F	41.2	E
4	Carbon Cyn Rd/Canyon Hills Rd	Chino Hills	Stop-controlled	51.4	F	28.2	D
5	Carbon Cyn Rd/Rosemary Ln	Chino Hills	Stop-controlled	36.6	E	25.3	D
6	Carbon Cyn Rd/Olinda Pl	Brea	Signalized	70.6	E	4.5	A
7	Carbon Cyn Rd/Ruby St	Brea	Signalized	15.2	B	36.8	D
8	Carbon Cyn Rd/Brea Hills Ave	Brea	Stop-controlled	29.3	D	12.1	B
9	Carbon Cyn Rd/Santa Fe Rd	Brea	Signalized	20.4	C	26.7	C
10	Carbon Cyn Rd/Valencia Ave	Brea	Signalized	60.4	E	39.4	D

Notes: HCM 2000 Operations Methodology. LOS = Level of Service, Delay = Average Vehicle Delay (Seconds)

Delay shown at stop-controlled intersections reflects delay at worst-case stop-controlled approach

Potential Safety Improvements (Short-range)

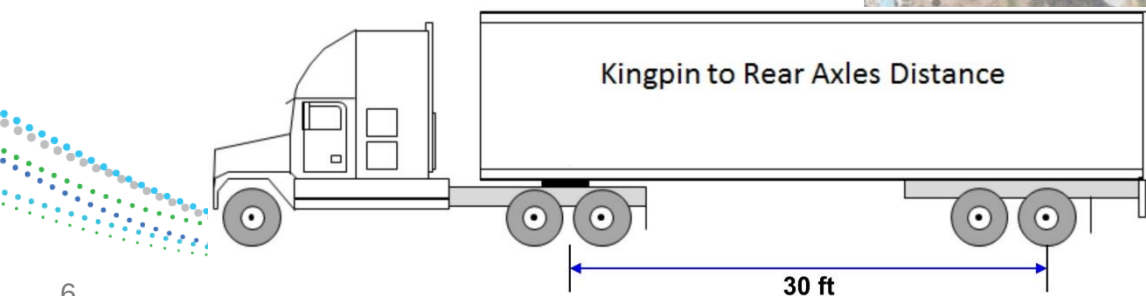


Heavy Truck Restriction

Video Camera Data Collected (July):

- 7 consecutive days
- 2 camera locations (upper and lower curves)

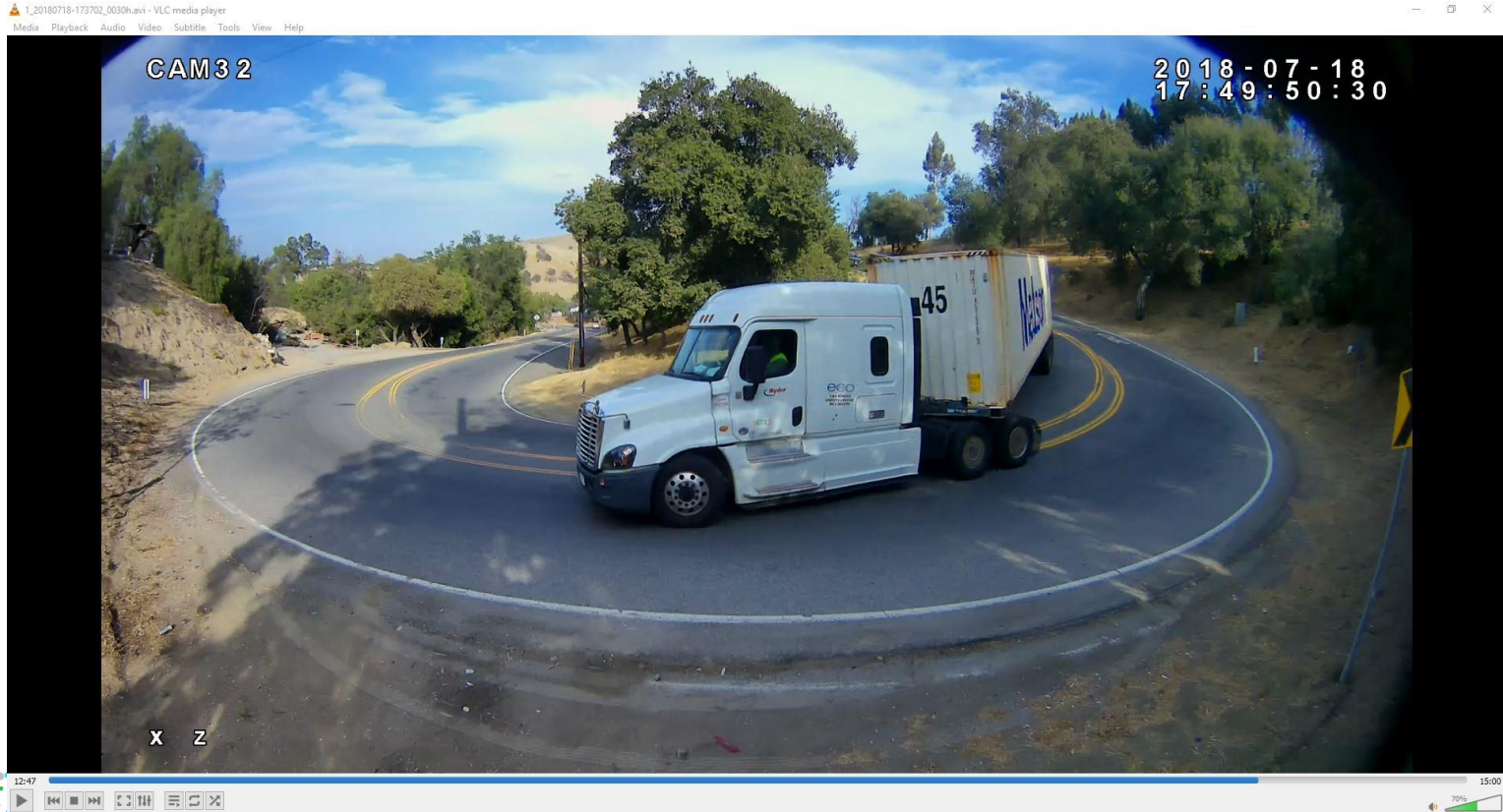
Recommend Maximum Kingpin-to-Rear Axle (KPRA) of 30'



Switchback Video Observations (lower camera)



Switchback Video Observations (lower camera)



Switchback Video Observations (lower camera)



Switchback Video Observations (lower camera)



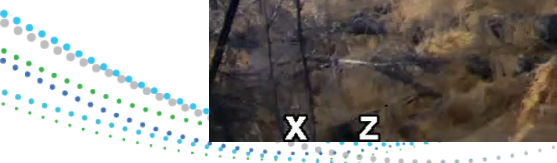
Switchback Video Observations (lower camera)



Switchback Video Observations (lower camera)



CITY OF CHINO HILLS
INCORPORATED 1981



Switchback Video Observations (upper camera)



Potential Safety Improvements (Short-range)

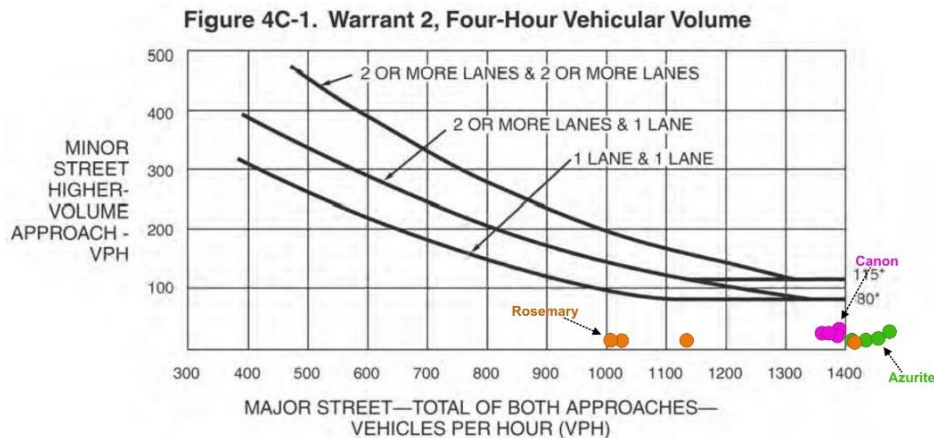
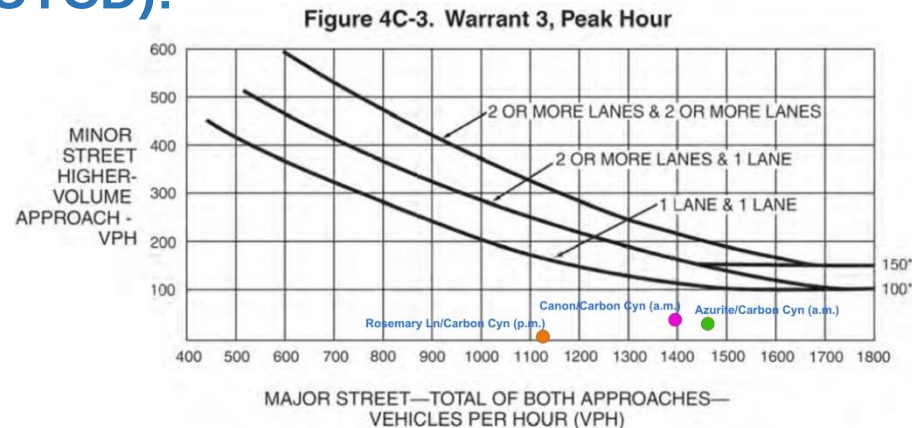


Traffic Signal installation evaluated (MUTCD):

- Canyon Hills (Caltrans review)
- Azurite Dr
- Canon Ln
- Rosemary Ln

Potential Benefits:

- Provide traffic metering to allow gaps
- Reduce side street delay
- Helps eliminate sight distance issues (left-turns)

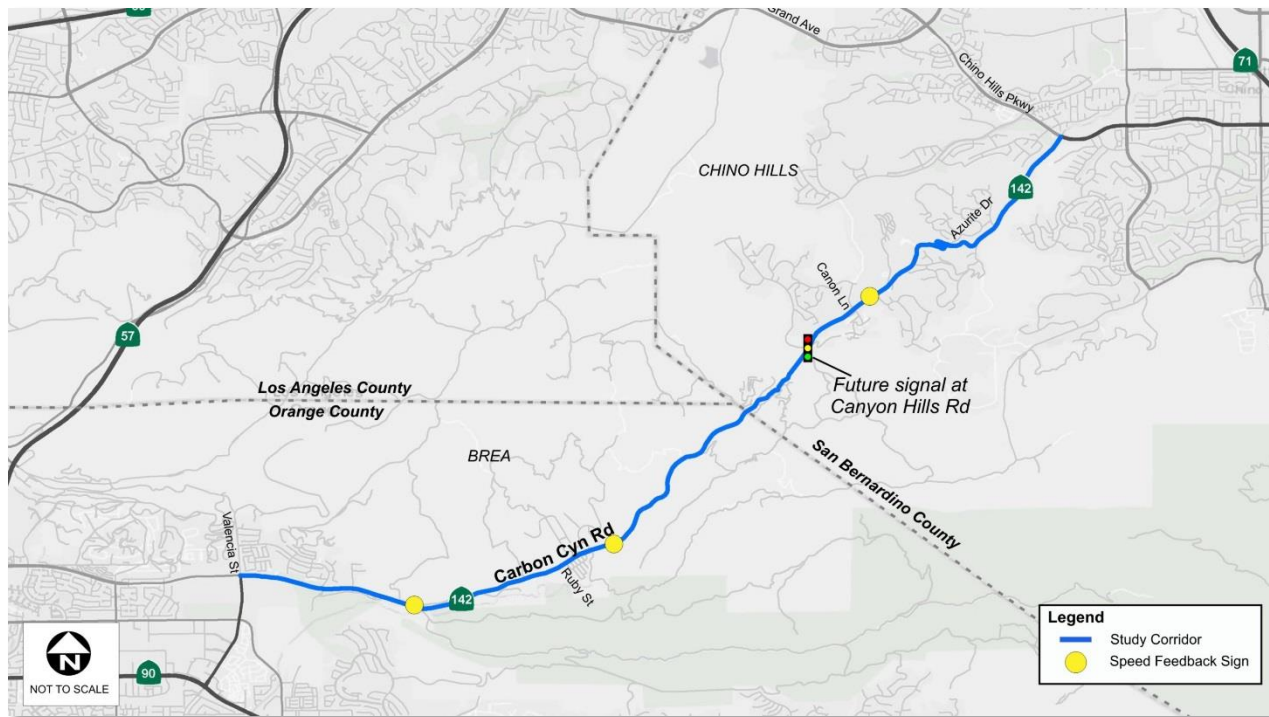


Potential Safety Improvements (Short-range)



Speed Feedback signs:

- Canon Ln
- Brea locations (downhill)



Potential Safety Improvements (Short-range)



Refuge/Acceleration Lane (T-intersections):

- Carriage Hills Ln
- Valley Springs

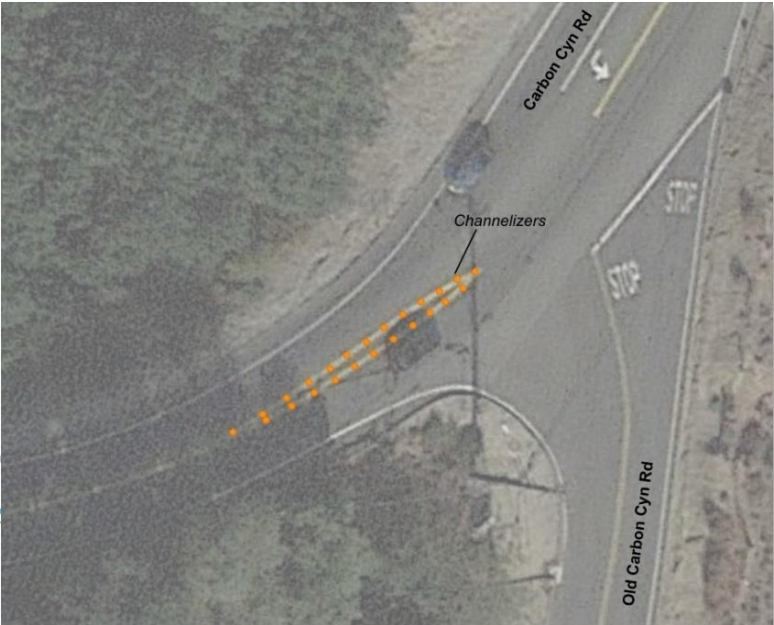


Potential Safety Improvements (Short-range)



Channelizers (traffic calming):

- Canon Ln
- Old Carbon Cyn Rd
- Brea locations



Potential Safety Improvements (Short-range)



Bus Stop Improvements:

- Valley Springs Rd
- Canon Ln
- Canyon Hills
- Rosemary Ln
- Oak Way Ln

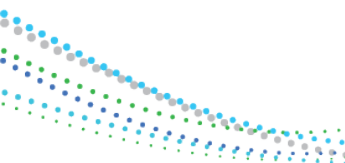
Flashing yellow lights and/or
paved waiting areas, curb,
sidewalks, bus turnouts



Potential Safety Improvements (Long-range)



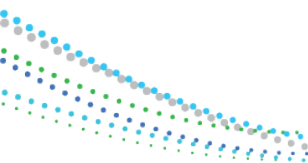
Chino Hills Pkwy/Carbon Cyn Rd (NB free-right turn)



Potential Safety Improvements (Long-range)



Extend Carbon Cyn to 2 lane segment south of Chino Hills Pkwy



Cost Estimates (Long-Range vs Short-range)



Short-range improvements:

- Speed Feedback (\$7-10k each)
- Traffic Signal at Canyon Hills (\$300-350k)
- Channelizers (\$5-7k each)
- Left-turn refuge (\$10-15k each)

Long-range improvements:

- Extend Southbound Carbon Cyn 2-lane segment (\$750k-1.5 million)
- Widen in Brea westbound/southbound (\$3-5 million)
- Sidewalk both sides (\$20-30 million)
- Pedestrian Bridge with ADA ramp (\$1.5-2 million)



Thank You

Questions?