

# A Quantification of Greenhouse Gas Emissions from Increased Travel to the Tahoe Reno Industrial Center

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Desert Research Institute

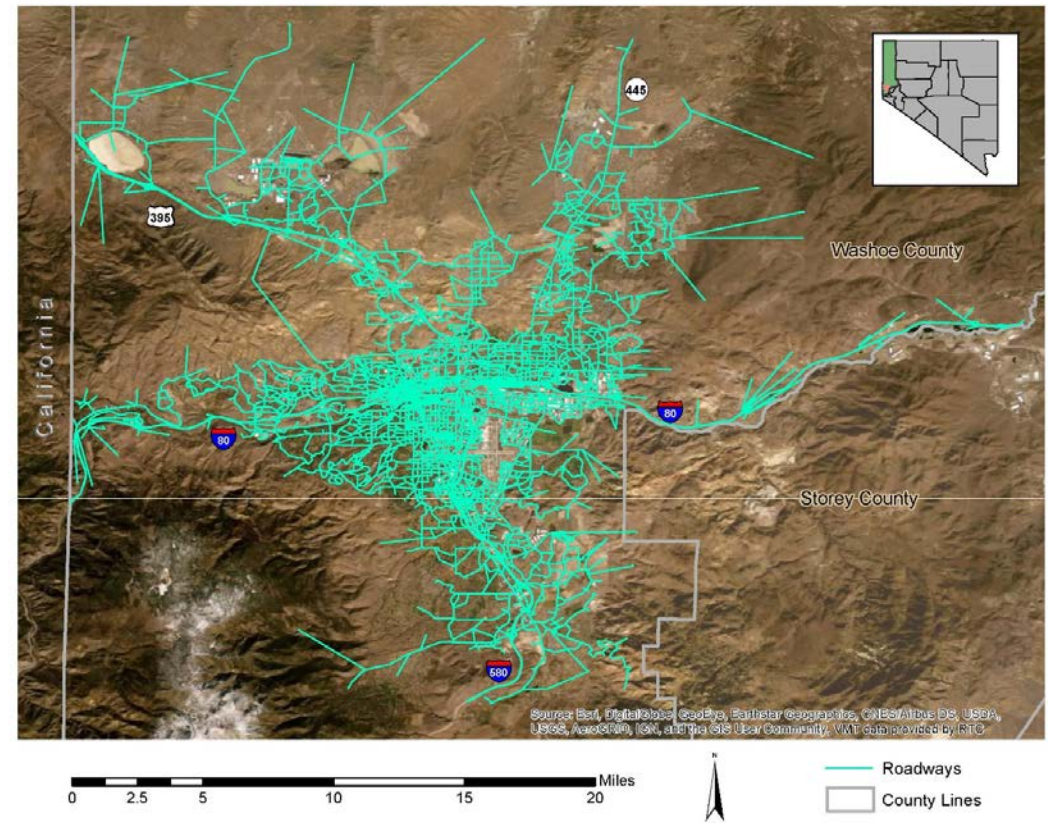
March, 2020

# Purpose

- Understand existing pollutant and energy consumption in the Sparks metro area
- Evaluate the effect of increased growth and additional highways on emissions and energy consumption

# Regional Inventory

- Used EPA model MOVES
  - MOVES is a commonly-used platform that implements the EPA's Office of Transportation and Air Quality emission and emission factor estimation tools for mobile sources.

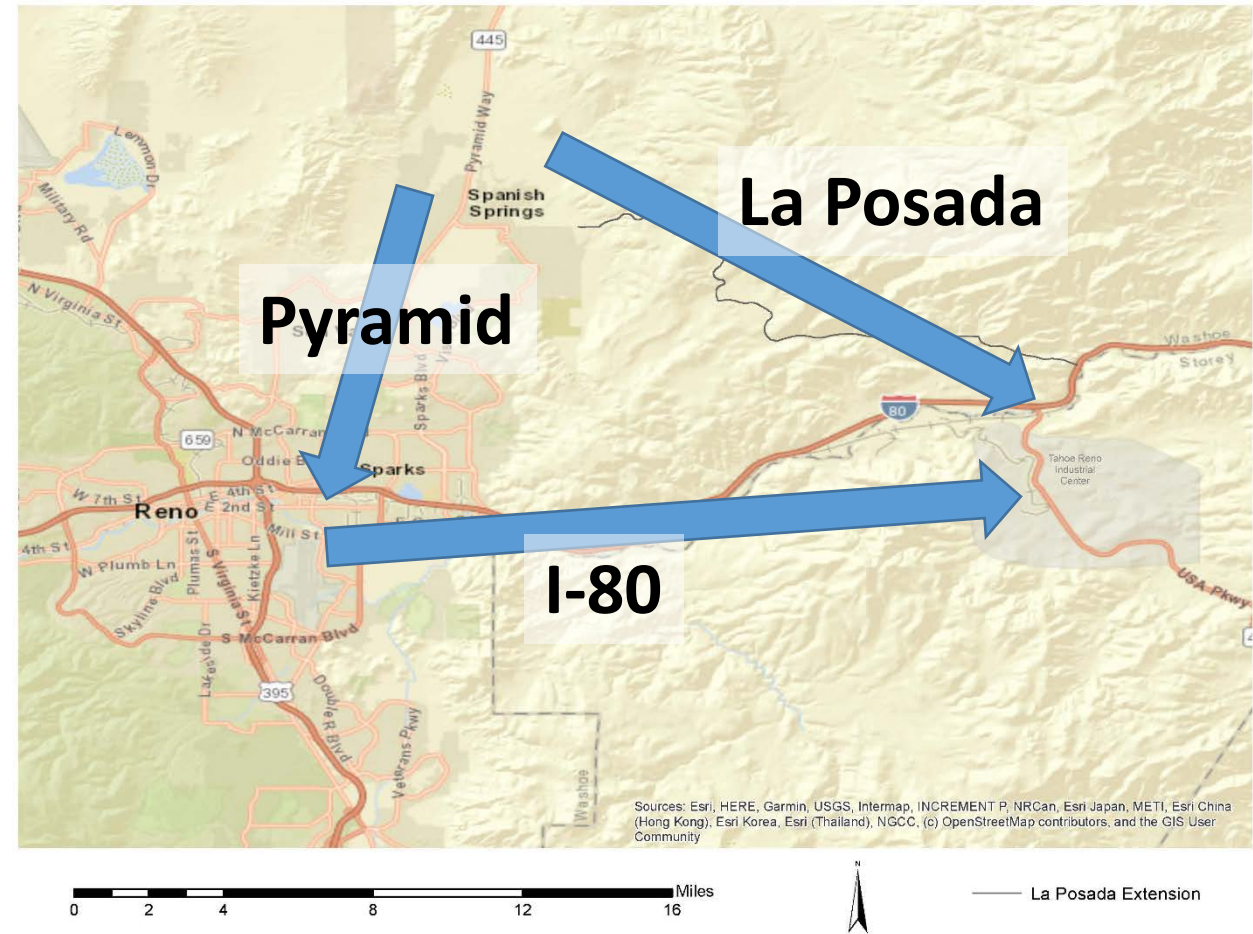


# Regional Inventory Results

Year	HC (tons/d)	CO (tons/d)	CO2 Atm. (tons/d)	CO2 Eq. (tons/d)	PM2.5 (tons/d)	CH4 (tons/d)	TEC (tons/d)	NOx (tons/d)
2015	1.18	29	3,771	3,773	0.29	0.06	4,4758	9.16
2017	1.17	36	4,664	4,666	0.15	0.08	5,5404	8.49

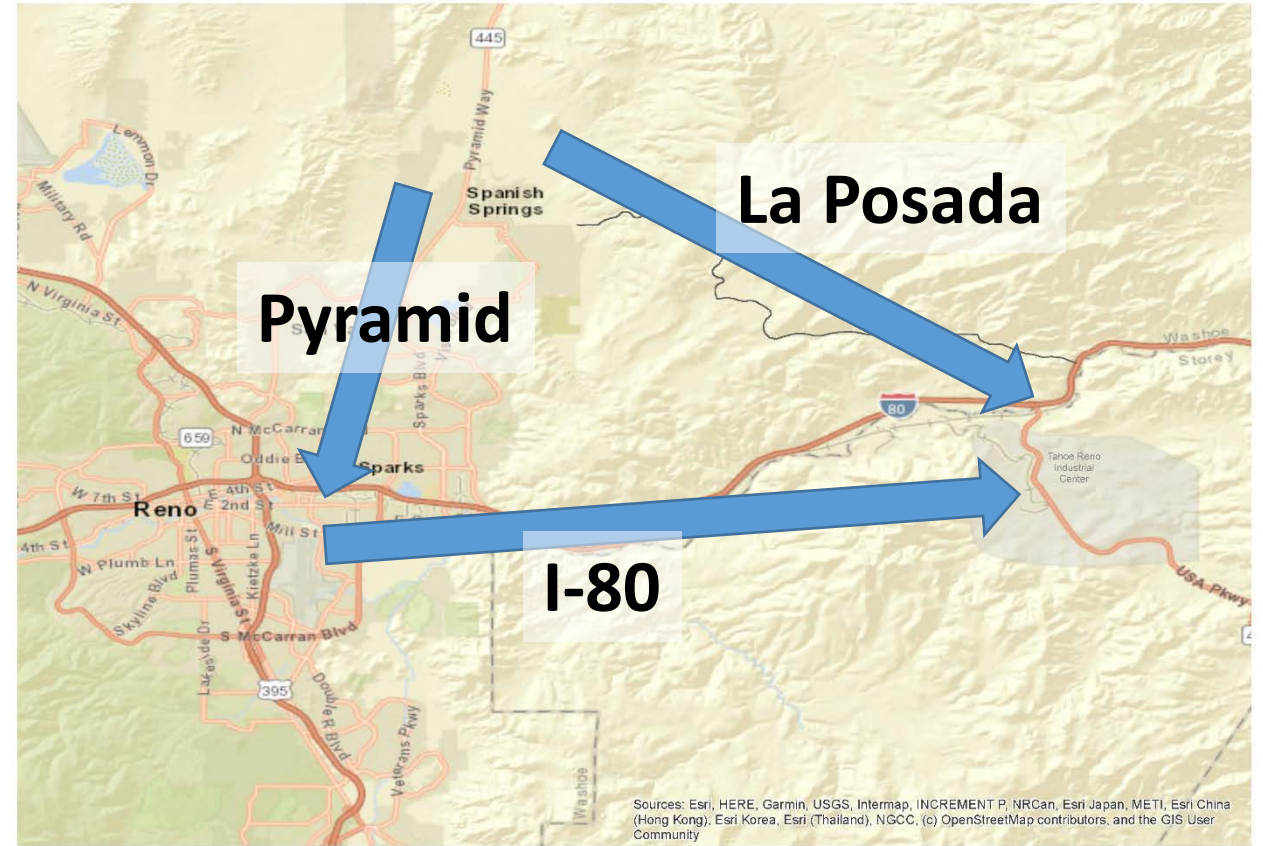
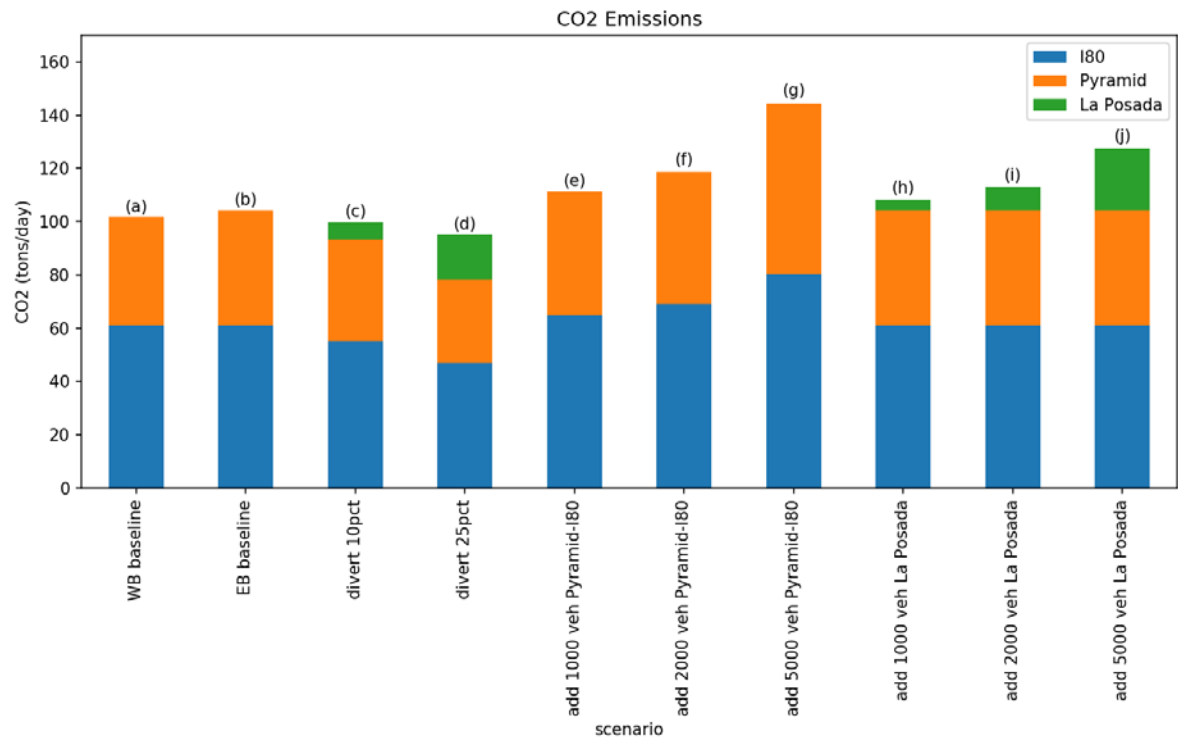
# Corridor-specific Inventory

- Developed a pollutant inventory for three corridors
  - Pyramid Way
  - Interstate 80
  - Proposed new highway (La Posada Extension)
- Used traffic simulation tools (SUMO) to estimate emissions from observed traffic patterns and vehicle distributions



# Corridor-specific Inventory

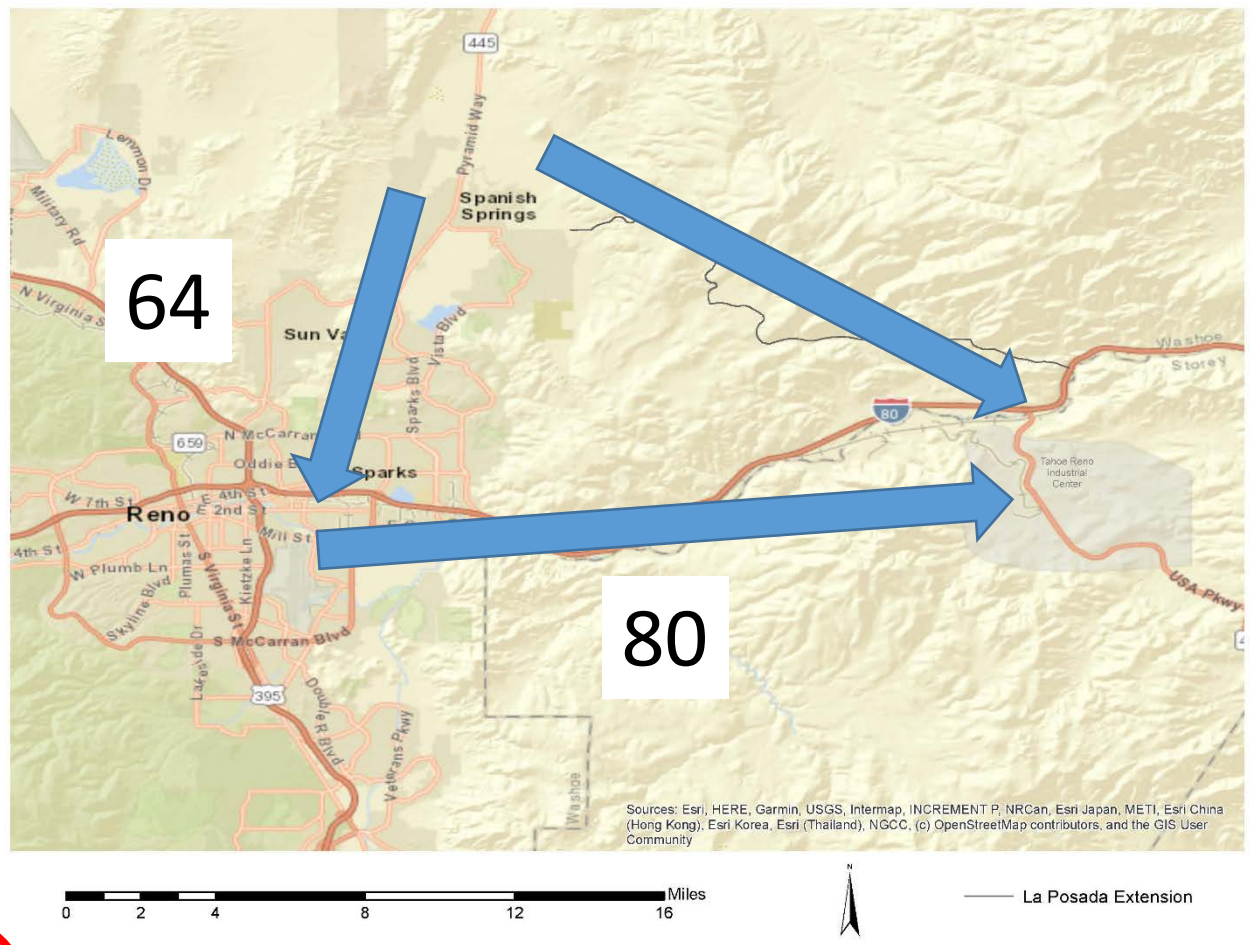
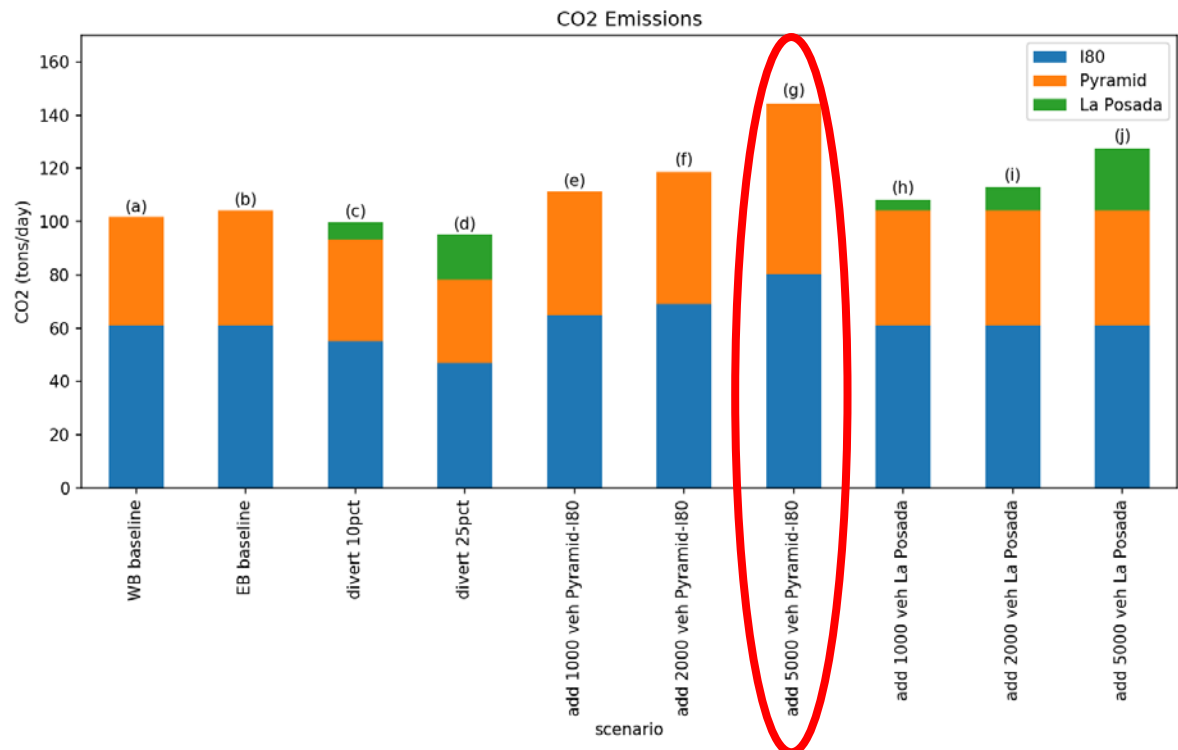
- Evaluated current traffic on Pyramid Way and Interstate 80
- Evaluated effect of diverting or increasing traffic to La Posada
  
- 10 simulations
- 4 categories
  - Baseline
  - Divert traffic from Pyramid to La Posada
  - Increase traffic on Pyramid and I-80
  - Increase traffic on La Posada



— La Posada Extension

	(a) WB baseline	(b) EB baseline	(c) divert 10pct	(d) divert 25pct	(e) add 1000 veh Pyramid-I80	(f) add 2000 veh Pyramid-I80	(g) add 5000 veh Pyramid-I80	(h) add 1000 veh La Posada	(i) add 2000 veh La Posada	(j) add 5000 veh La Posada
I80	61	61	55	47	65	69	80	61	61	61
Pyramid	41	43	38	31	46	50	64	43	43	43
La Posada	0	0	6	17	0	0	0	4	9	23

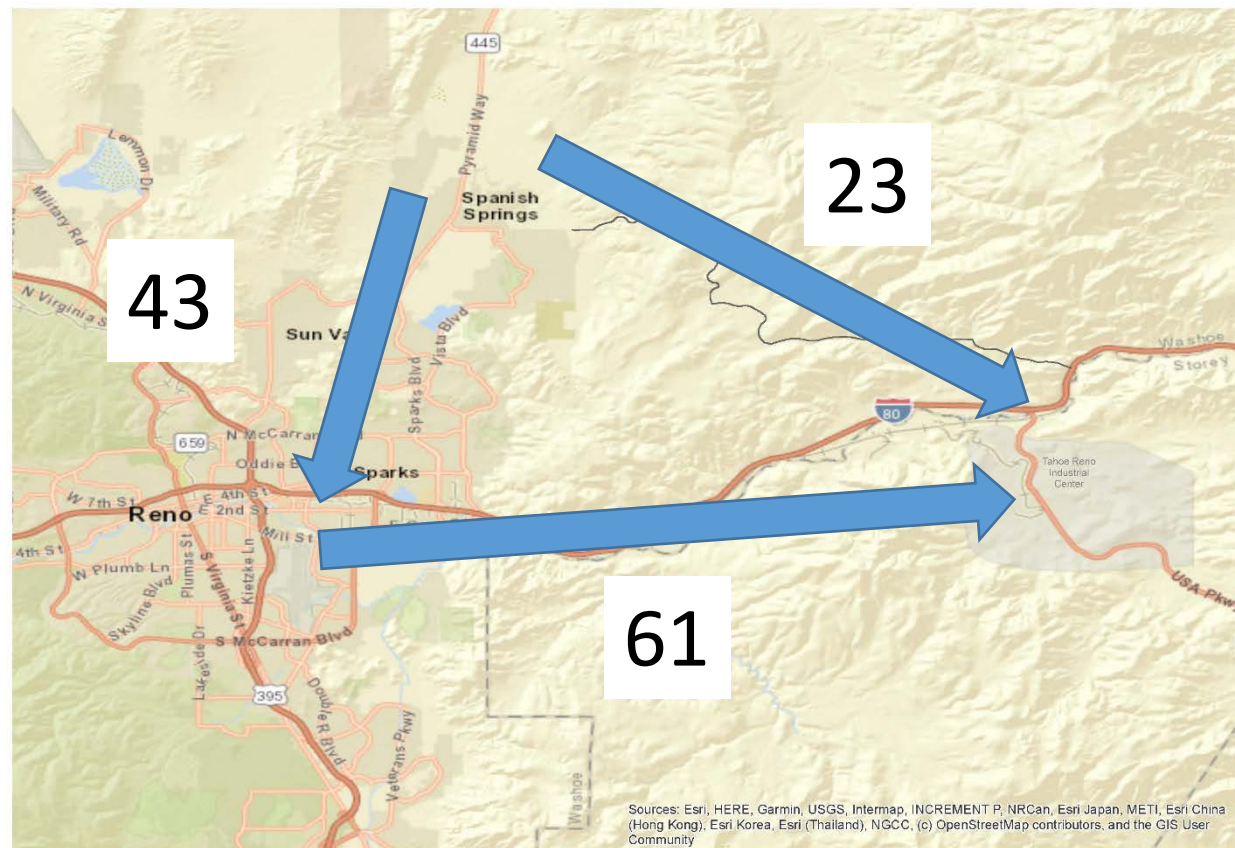
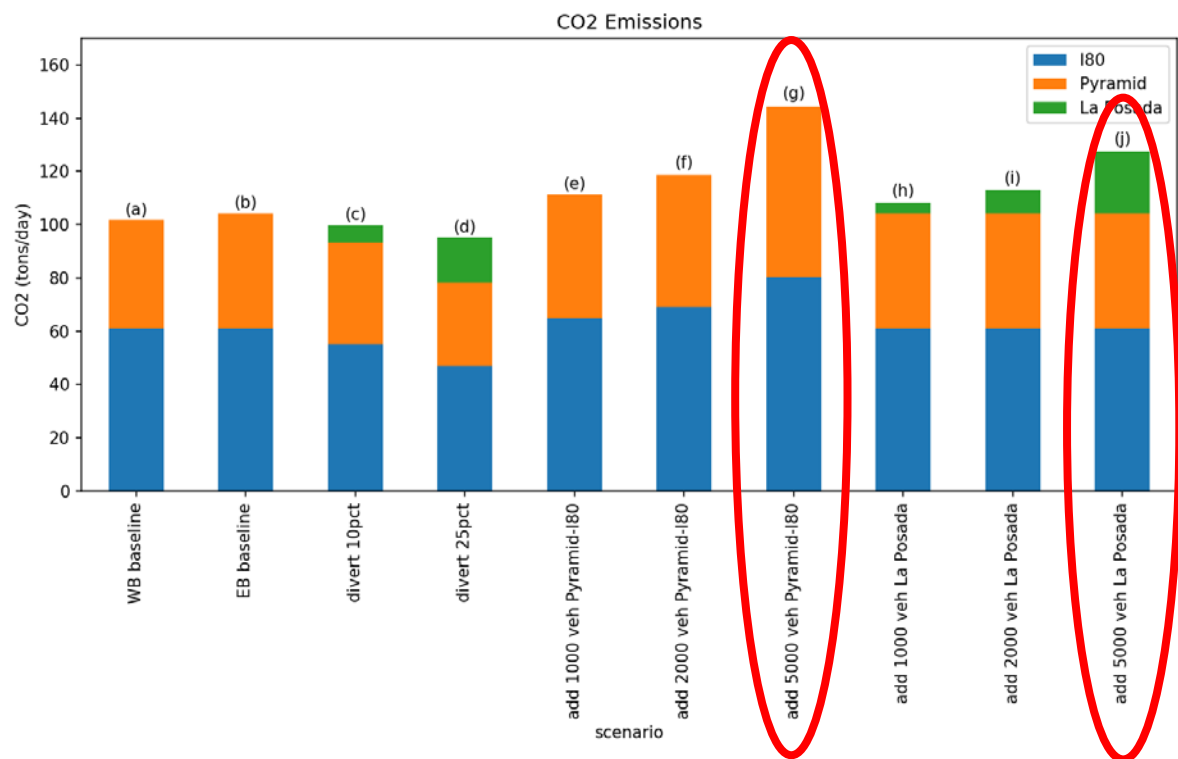
Baseline: 104  
 Add 5000 veh to Pyramid/I80: 144



	(a) WB baseline	(b) EB baseline	(c) divert 10pct	(d) divert 25pct	(e) add 1000 veh Pyramid-I80	(f) add 2000 veh Pyramid-I80	(g) add 5000 veh Pyramid-I80	(h) add 1000 veh La Posada	(i) add 2000 veh La Posada	(j) add 5000 veh La Posada
I80	61	61	55	47	65	69	80	61	61	61
Pyramid	41	43	38	31	46	50	64	43	43	43
La Posada	0	0	6	17	0	0	0	4	9	23



Baseline: 104  
 Add 5000 veh to Pyramid/I80: 144  
 Add 5000 veh to La Posada: 127



— La Posada Extension

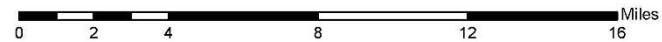
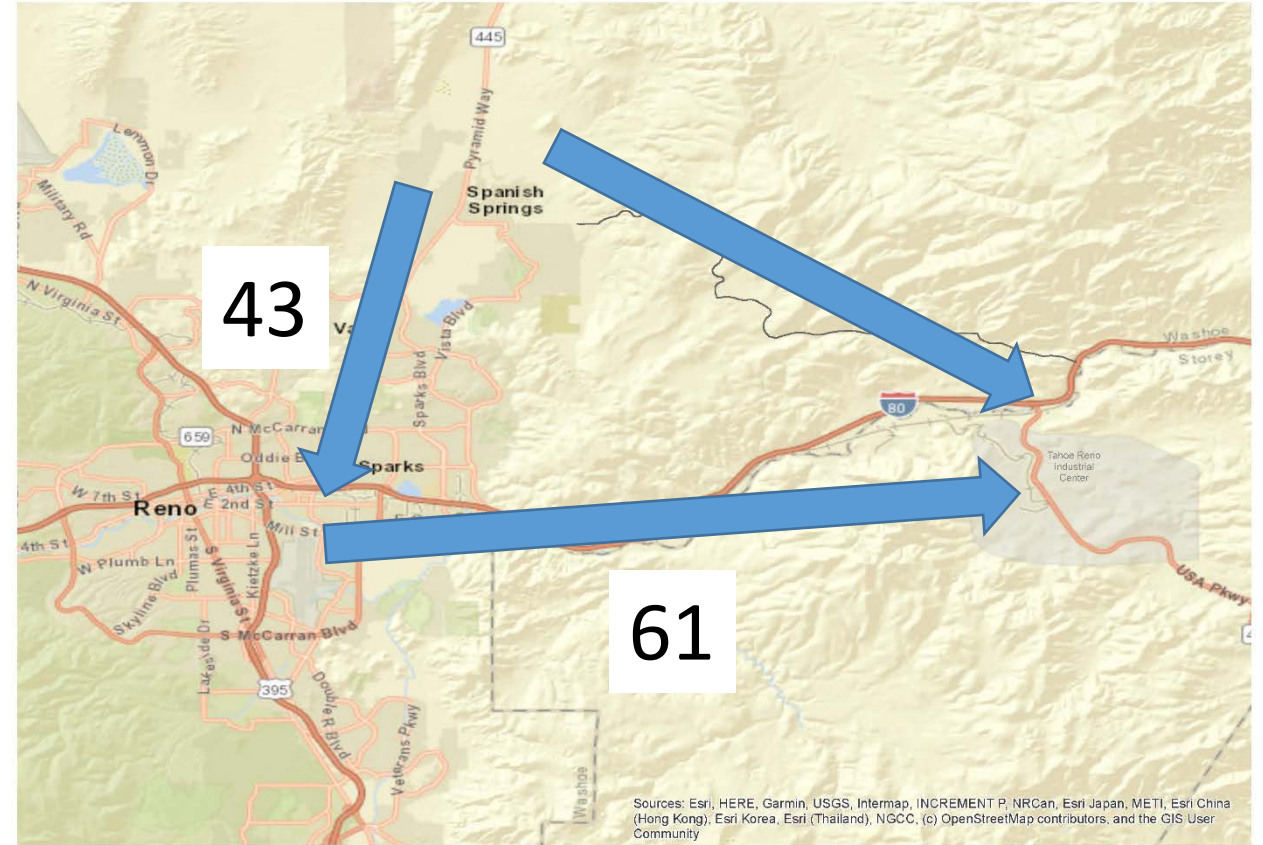
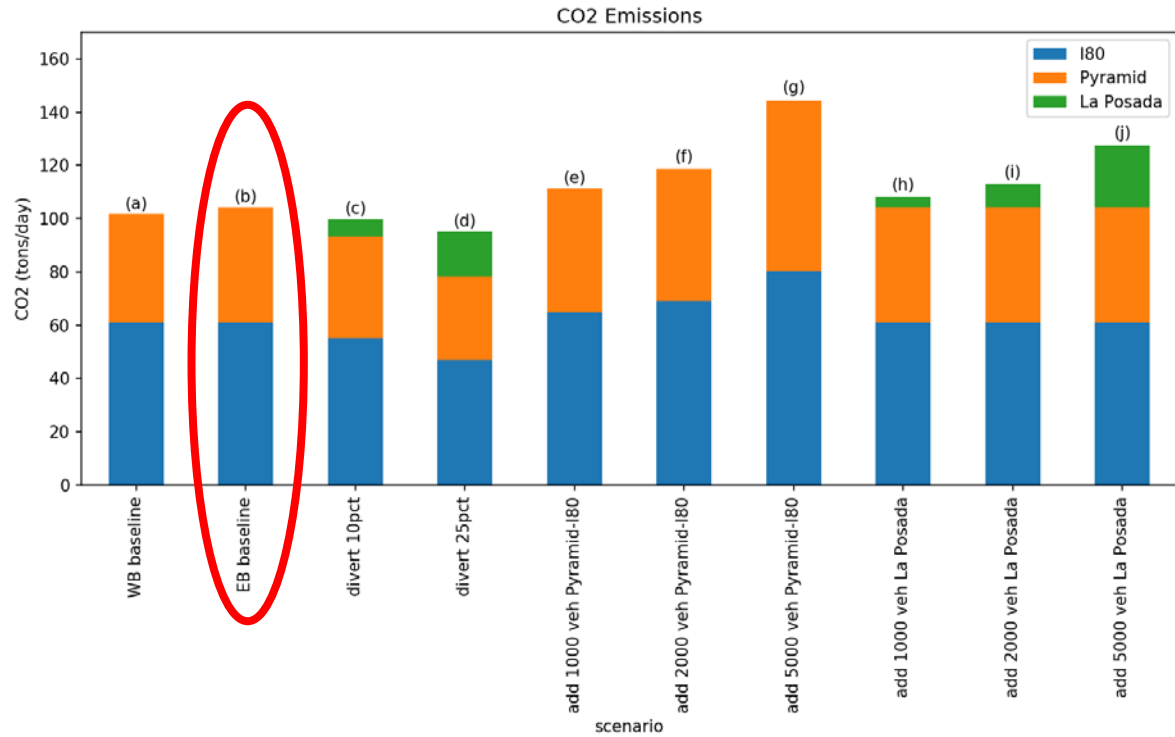
	(a) WB baseline	(b) EB baseline	(c) divert 10pct	(d) divert 25pct	(e) add 1000 veh Pyramid-I80	(f) add 2000 veh Pyramid-I80	(g) add 5000 veh Pyramid-I80	(h) add 1000 veh La Posada	(i) add 2000 veh La Posada	(j) add 5000 veh La Posada
I80	61	61	55	47	65	69	80	61	61	61
Pyramid	41	43	38	31	46	50	64	43	43	43
La Posada	0	0	6	17	0	0	0	4	9	23

# Discussion

- Emissions from Pyramid Way are significant
  - Due to congestion, which causes stop-and-go traffic
  - Diverting traffic away from Pyramid Way can reduce total emissions
- La Posada extension, as an alternative to Pyramid-I80, is a more-efficient path from Sparks to TRIC because:
  - Free-flowing traffic emits less GHG than stop-and-go
  - Shorter distance

Extra slides

# Total CO2 Baseline: 104

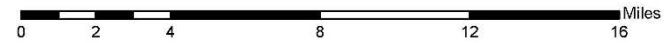
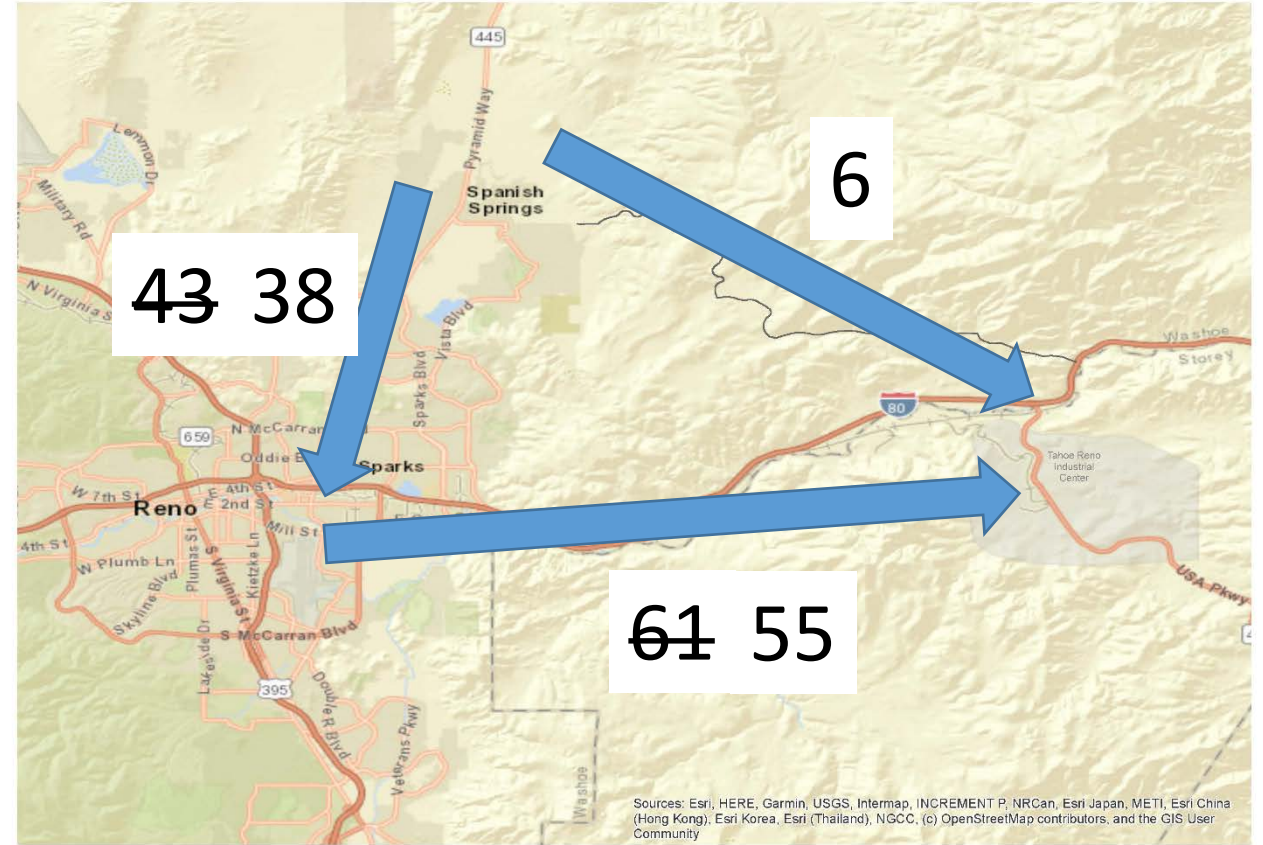
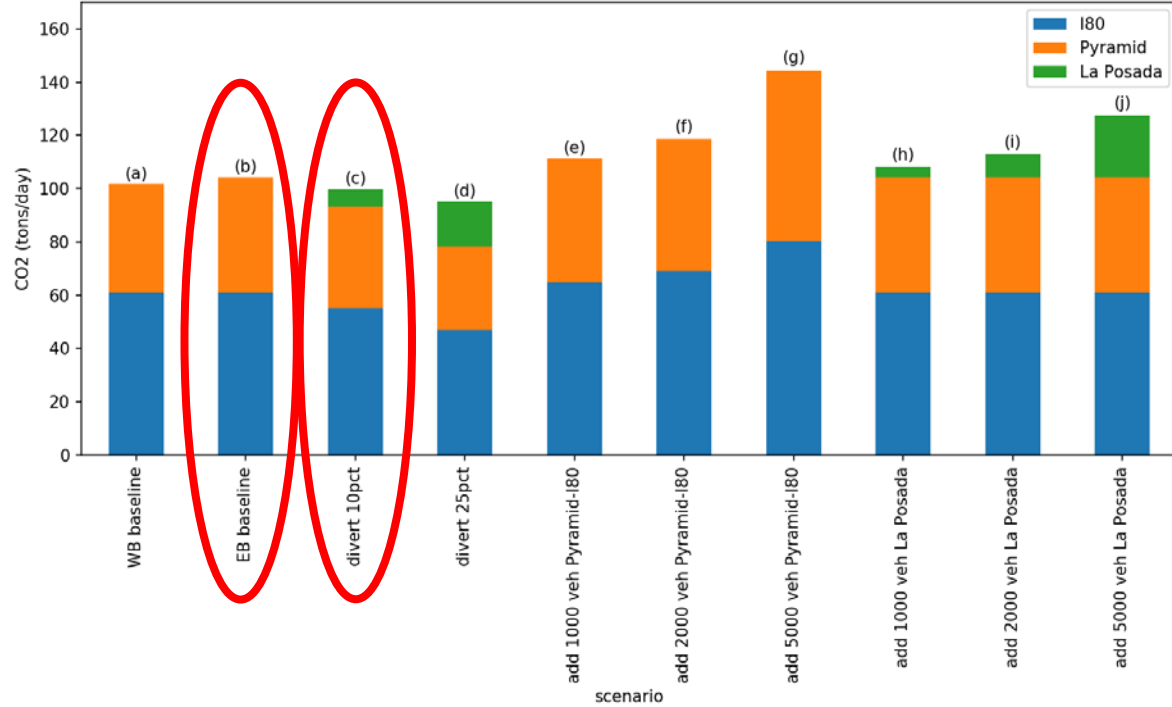


— La Posada Extension

	(a) WB baseline	(b) EB baseline	(c) divert 10pct	(d) divert 25pct	(e) add 1000 veh Pyramid-I80	(f) add 2000 veh Pyramid-I80	(g) add 5000 veh Pyramid-I80	(h) add 1000 veh La Posada	(i) add 2000 veh La Posada	(j) add 5000 veh La Posada
I80	61	61	55	47	65	69	80	61	61	61
Pyramid	41	43	38	31	46	50	64	43	43	43
La Posada	0	0	6	17	0	0	0	4	9	23

Baseline: 104  
Divert 10% to La Posada: 99

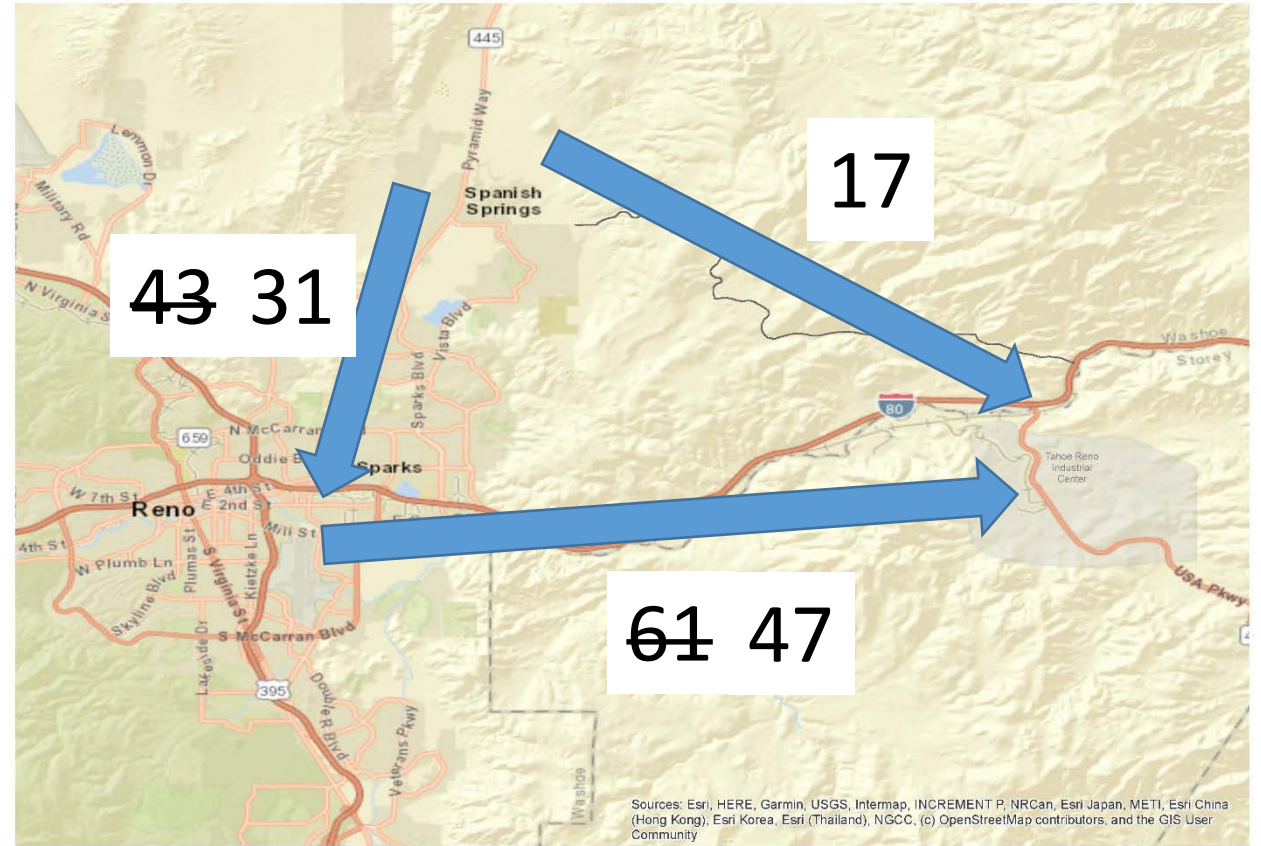
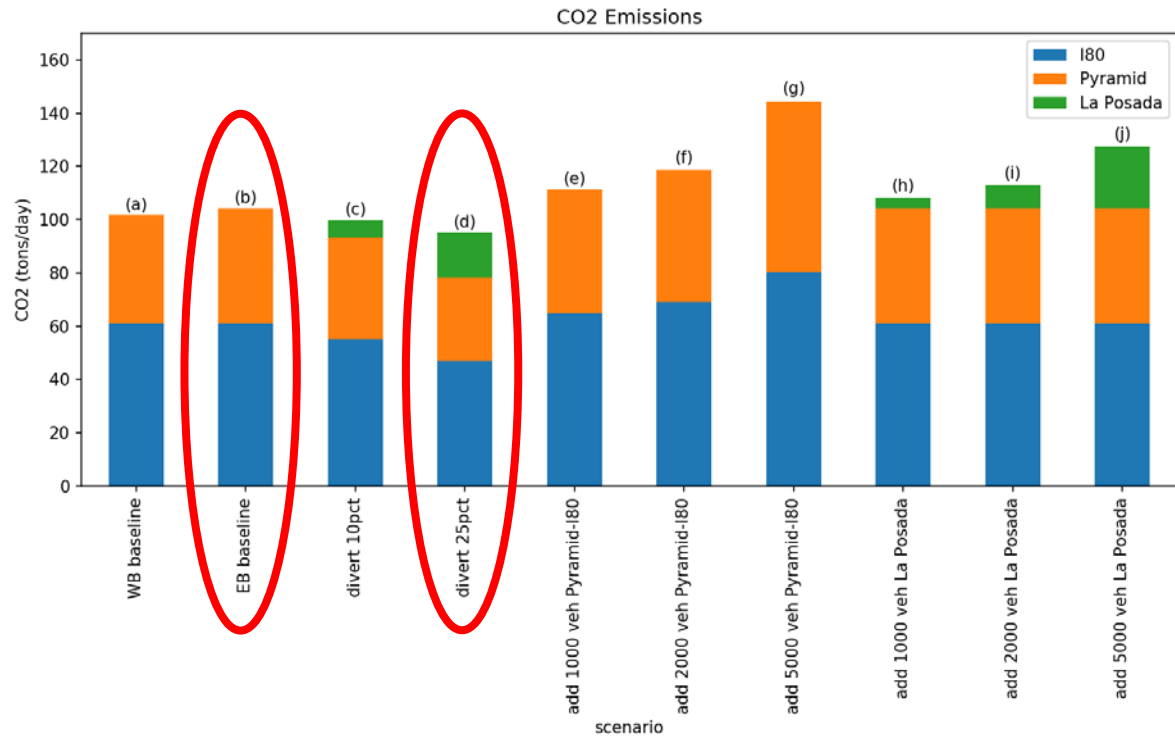
CO2 Emissions



— La Posada Extension

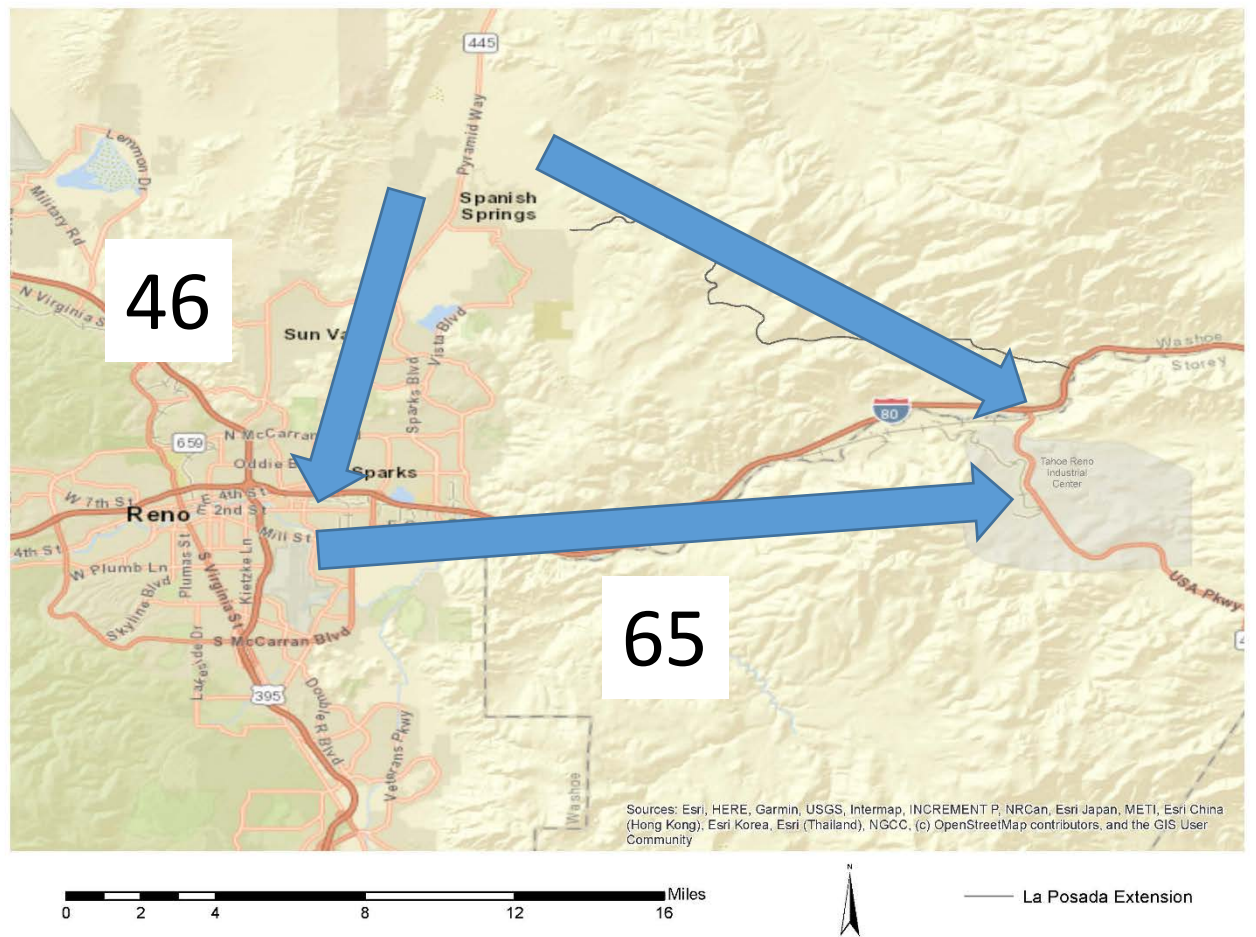
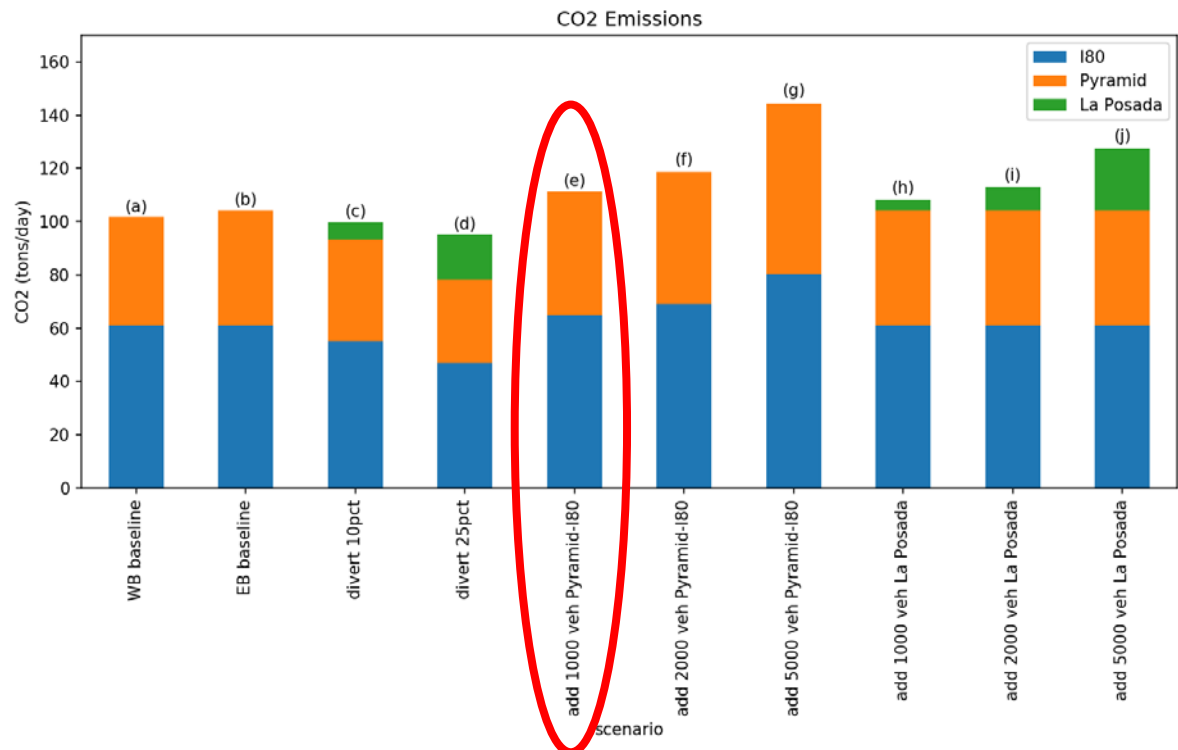
	(a) WB baseline	(b) EB baseline	(c) divert 10pct	(d) divert 25pct	(e) add 1000 veh Pyramid-I80	(f) add 2000 veh Pyramid-I80	(g) add 5000 veh Pyramid-I80	(h) add 1000 veh La Posada	(i) add 2000 veh La Posada	(j) add 5000 veh La Posada
I80	61	61	55	47	65	69	80	61	61	61
Pyramid	41	43	38	31	46	50	64	43	43	43
La Posada	0	0	6	17	0	0	0	4	9	23

Baseline: 104  
Divert 25% to La Posada: 95



	(a) WB baseline	(b) EB baseline	(c) divert 10pct	(d) divert 25pct	(e) add 1000 veh Pyramid-180	(f) add 2000 veh Pyramid-180	(g) add 5000 veh Pyramid-180	(h) add 1000 veh La Posada	(i) add 2000 veh La Posada	(j) add 5000 veh La Posada
I80	61	61	55	47	65	69	80	61	61	61
Pyramid	41	43	38	31	46	50	64	43	43	43
La Posada	0	0	6	17	0	0	0	4	9	23

Baseline: 104  
 Add 1000 veh to Pyramid/I80: 111

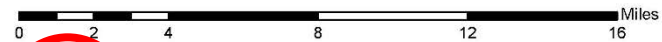
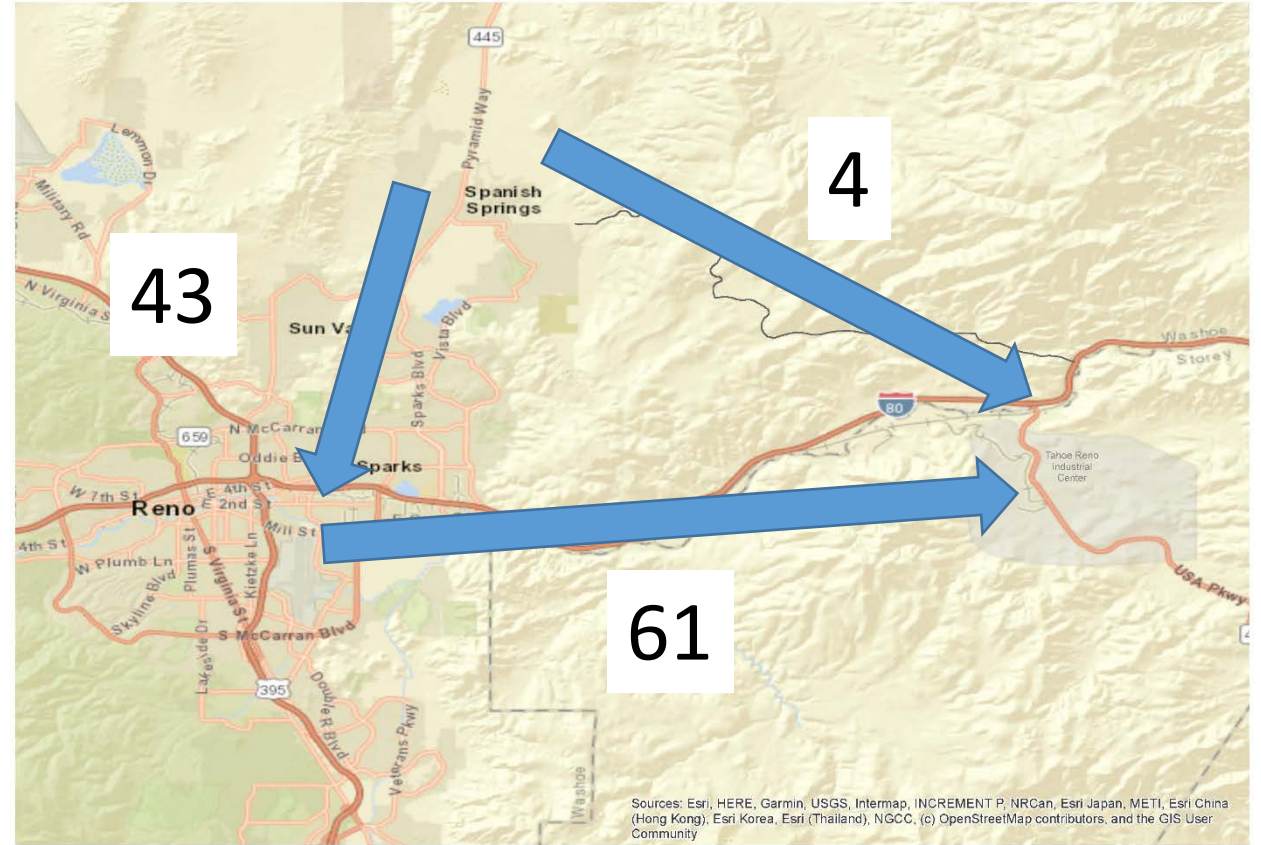
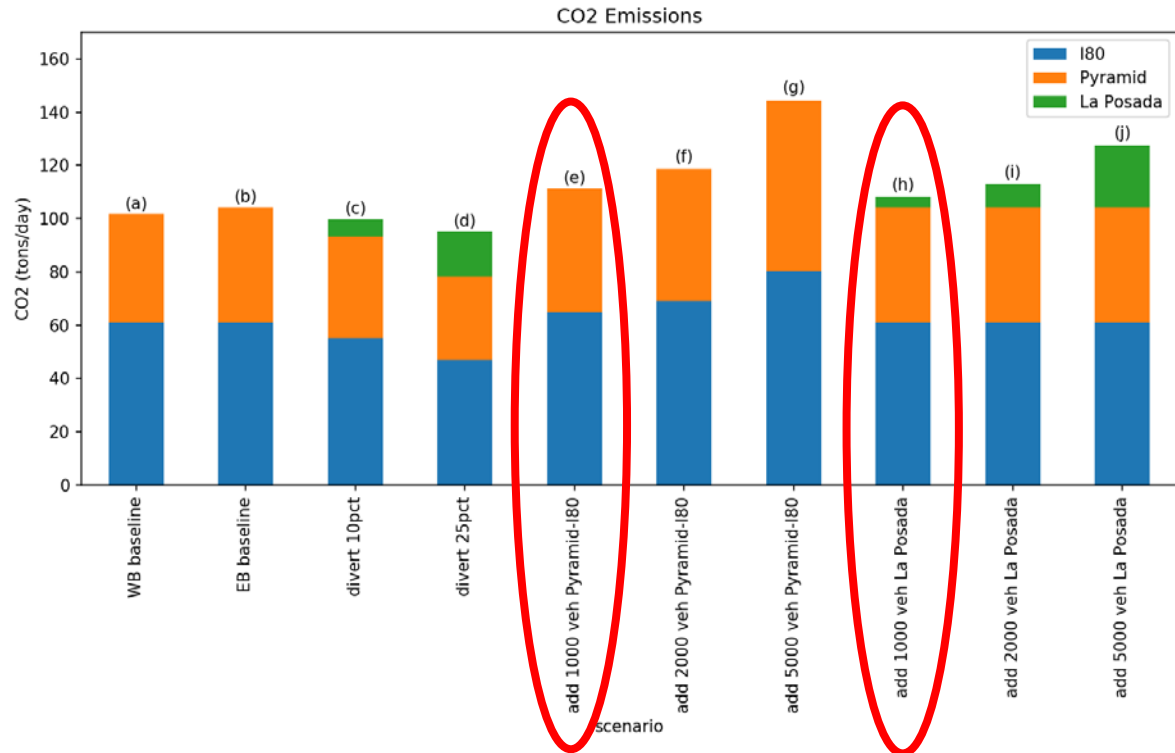


	(a) WB baseline	(b) EB baseline	(c) divert 10pct	(d) divert 25pct	(e) add 1000 veh Pyramid-I80	(f) add 2000 veh Pyramid-I80	(g) add 5000 veh Pyramid-I80	(h) add 1000 veh La Posada	(i) add 2000 veh La Posada	(j) add 5000 veh La Posada
I80	61	61	55	47	65	69	80	61	61	61
Pyramid	41	43	38	31	46	50	64	43	43	43
La Posada	0	0	6	17	0	0	0	4	9	23

Baseline: 104

Add 1000 veh to Pyramid/I80: 111

Add 1000 veh to La Posada: 107

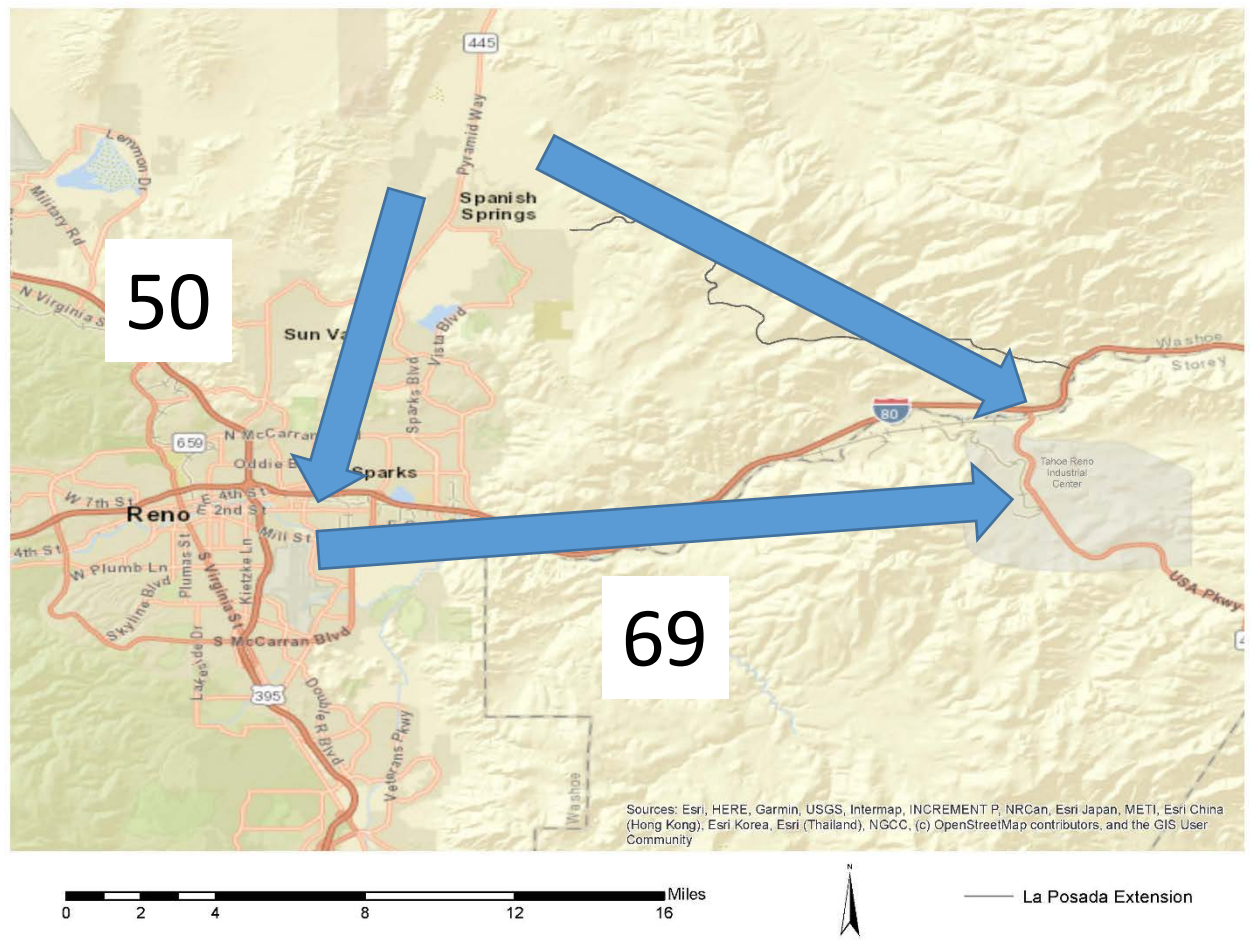
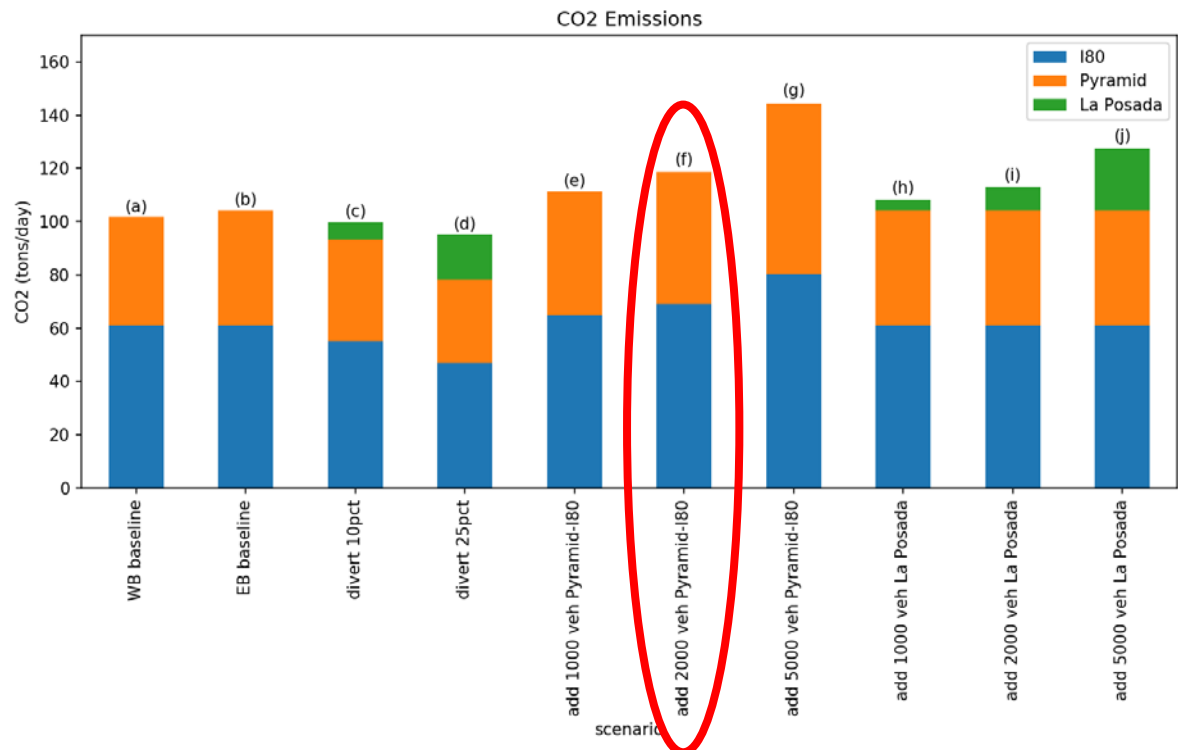


— La Posada Extension

	(a) WB baseline	(b) EB baseline	(c) divert 10pct	(d) divert 25pct	(e) add 1000 veh Pyramid-I80	(f) add 2000 veh Pyramid-I80	(g) add 5000 veh Pyramid-I80	(h) add 1000 veh La Posada	(i) add 2000 veh La Posada	(j) add 5000 veh La Posada
I80	61	61	55	47	65	69	80	61	61	61
Pyramid	41	43	38	31	46	50	64	43	43	43
La Posada	0	0	6	17	0	0	0	4	9	23

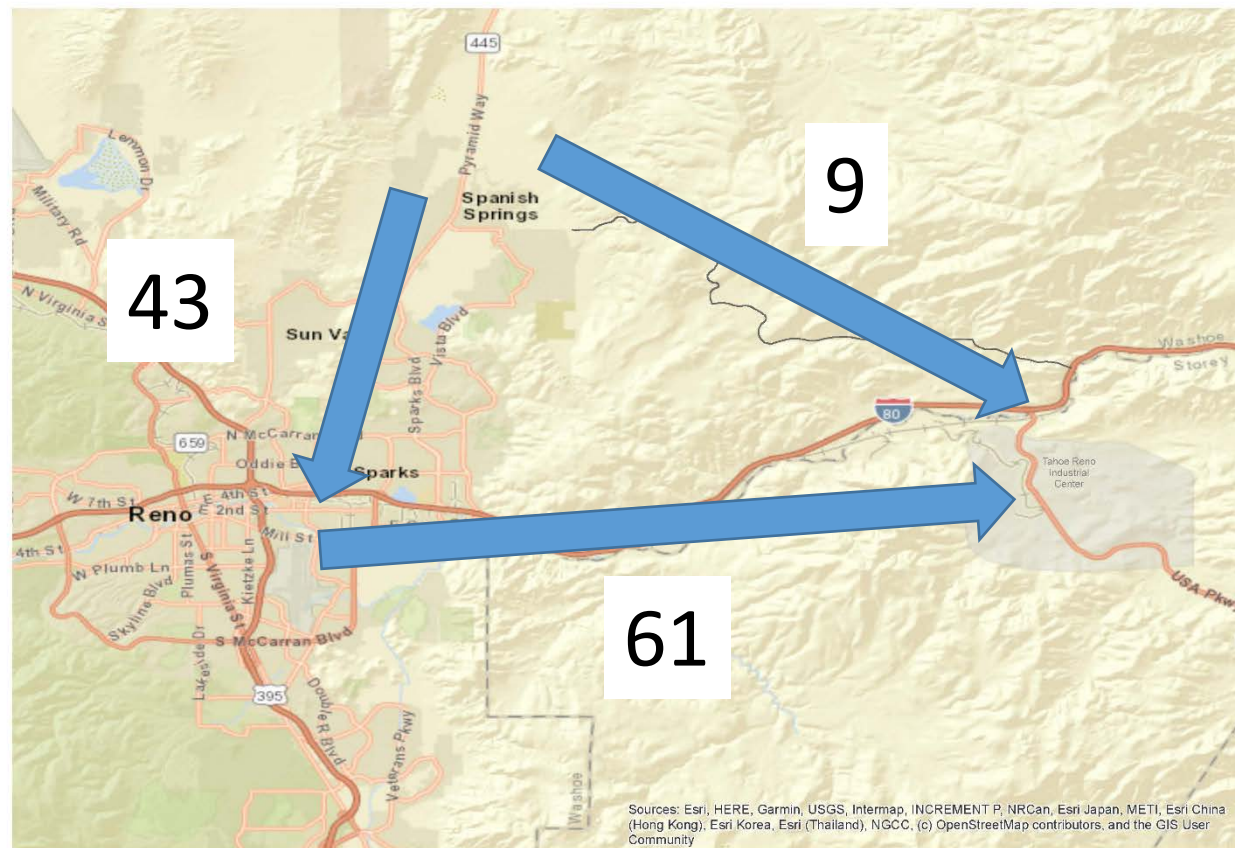
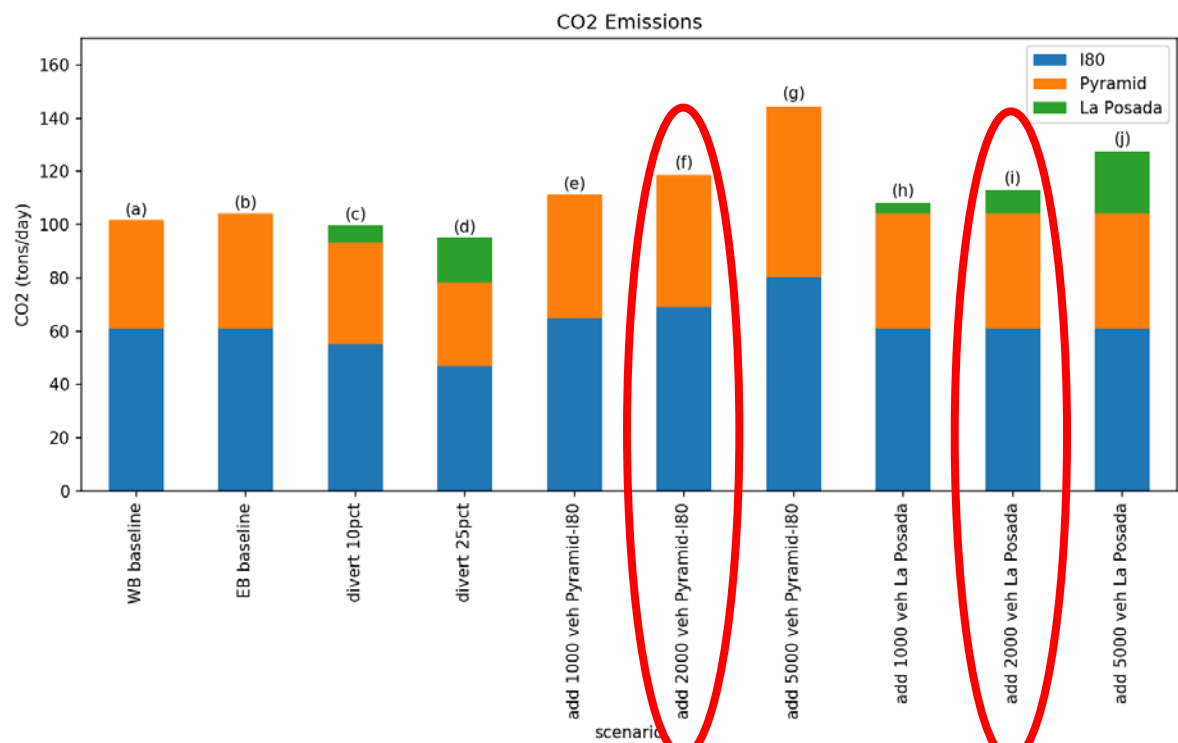


Baseline: 104  
 Add 2000 veh to Pyramid/I80: 119



	(a) WB baseline	(b) EB baseline	(c) divert 10pct	(d) divert 25pct	(e) add 1000 veh Pyramid-I80	(f) add 2000 veh Pyramid-I80	(g) add 5000 veh Pyramid-I80	(h) add 1000 veh La Posada	(i) add 2000 veh La Posada	(j) add 5000 veh La Posada
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La Posada	0	0	6	17	0	0	0	4	9	23

Baseline: 104  
 Add 2000 veh to Pyramid/I80: 119  
 Add 2000 veh to La Posada: 113



— La Posada Extension

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La Posada	0	0	6	17	0	0	0	4	9	23