Traffic Impact Study for the Pacific Trade Center in the City of El Monte

William Chenoweth, Civil Engineering
Mentor: Dr. Wen Cheng
Kellogg Honors College Capstone Project

BACKGROUND

- The 27-acre site, formerly a glass manufacturing facility, is located in the Northwest El Monte Redevelopment Area
- It is bounded by residential, industrial, and commercial use buildings
- It is near Valley Boulevard, a major commuter route for east-west traffic near Los Angeles

SCOPE

- Analyze traffic conditions for original, design year without project, and design year with project scenarios
- Mitigate congestion by adjusting roadway geometry and traffic control devices in order to accommodate future growth and improve user mobility within the given project area

STUDY & DESIGN METHODOLOGY

- Evaluation Guide: *Highway Capacity Manual (HCM) 2010*
- Traffic modeling software: *Synchro 8*
- Left Turn Protection Evaluation: *Traffic Engineering Handbook*
- Traffic Control Signal Needs Study: *Manual on Uniform Traffic Control Devices (MUTCD) 2009, Chapter 4C*
- Signal Phasing Convention: *National Electrical Manufacturers Association (NEMA)*
- Tested the following signal controls for each intersection:
    - Unsignalized   Roundabout   Pretimed   Actuated or Semi-Actuated (uncoordinated)
- Tested the following turn types for each movement:
    - Permitted   Protected   Protected/Permitted (Lead-Lag, Lead-Lead, Lag-Lag)

GIVEN

- Traffic Volumes Report (original and design-year)
- Basic Roadway Geometry (original and design-year with project)
- Roadway Descriptions & Project Site Access Requirements

LOCATION MAP

VOLUMES REPORT

GEOMETRY & DELAY

Existing and Design-Year Without-Project Geometry

Design-Year With-Project Geometry
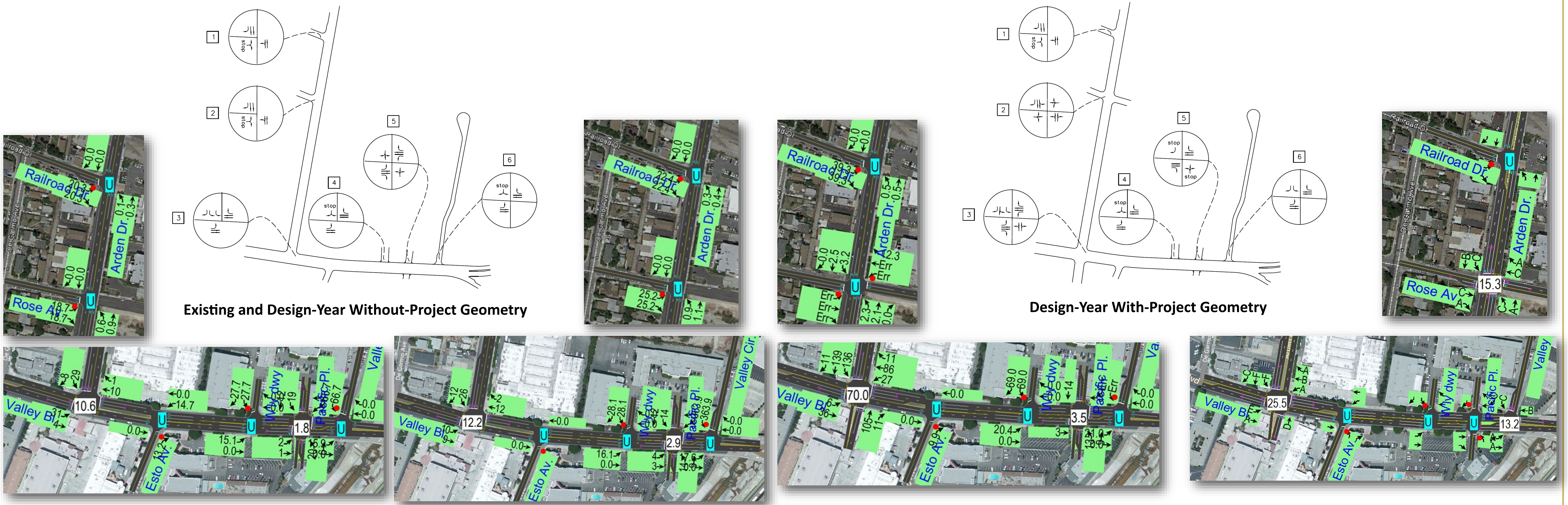
CHANGES & MITIGATION

ORIGINAL	DESIGN YEAR WITHOUT PROJECT	DESIGN YEAR WITH PROJECT	DESIGN YEAR W/PROJECT MITIGATED

Arden Drive — 4-lane undivided, 35 mph, on-street parking

Arden Drive/Rose Avenue — Three Legs, stop-controlled

Arden Drive/Valley Boulevard — 3-legs

Pacific Place/Valley Boulevard — **Signal**-controlled

Easterly Driveway/Valley — Stop-Controlled

Arden Drive — 4-lane undivided **WITH ADDED TURN POCKETS**, 35 mph, on-street parking **ELIMINATED**

Arden Drive/Rose Avenue — **FOUR** Legs, **SIGNAL**-controlled

Arden Drive/Valley Boulevard — **FOUR** legs

Pacific Place/Valley Boulevard — **Stop**-controlled

Easterly Dwy/Valley — Renamed **Street A**, **Signal**-controlled with one **Left-Turn lane** and one **Right-Turn lane**

INTERSECTION IMPACT SUMMARY			Original				Design Year Without Project				Design Year With Project				Design Year With Project - Mitigated		
Intersection	Major St.	Minor St.	Legs	Control Type	Avg Delay [s/veh]	LOS	Legs	Control Type	Avg Delay [s/veh]	LOS	Legs	Control Type	Avg Delay [s/veh]	LOS	Legs	Control Type	Avg Delay [s/veh]	LOS
1	Arden Dr.	Railroad Dr.	3	1-Way Stop	0.5	A	3	1-Way Stop	0.7	A	3	1-Way Stop	1.1	A	3	1-Way Stop	1.0	A
2	Arden Dr.	Rose Av.	3	All-Way Stop	2.2	A	3	All-Way Stop	3.4	A	4	2-Way Stop	Error	F	4	Signal	13.1	C
3	Valley Bl.	Arden Dr.	3	Signal	10.6	B	3	Signal	12.2	B	4	Signal	69.1	E	4	Signal	27.4	C
4	Valley Bl.	Westerly Dwy	3	1-Way Stop	0.1	A	3	1-Way Stop	0.1	A	3	1-Way Stop	1.6	A	3	1-Way Stop	1.0	A
5	Valley Bl.	Pacific Pl.	4	Signal	9.0	A	4	Signal	2.9	A	4	Signal	3.5	A	4	1-Way Stop	0.3	A
6	Valley Bl.	Easterly Dwy	3	1-Way Stop	0.7	A	3	1-Way Stop	5.9	A	3	1-Way Stop	395	B	3	Signal	11.9	B