

# LOCAL TRANSPORTATION ASSESSMENT

## LOS ANGELES

201 S. Figueroa St, Suite 240  
Los Angeles, CA 90012  
213.337.3680  
Fax :213.337.3679

## ONTARIO

4141 E. Inland Empire Blvd, Suite 250  
Ontario, CA 91764  
909.481.5750  
Fax :909.481.5757

## SAN DIEGO

600 B St, Suite 1600  
San Diego, CA 92101  
619.400.0600  
Fax:619.400.0599

## SANTA CLARITA

25152 Springfield Ct, Suite 350  
Santa Clarita, CA 91355  
661.284.7400  
Fax 661.284.7401

## TEMECULA

41951 Remington Ave, Suite 220  
Temecula, CA 92590  
951.294.9300  
Fax: 951.294-9301

## TUSTIN

17782 17th St, Suite 200  
Tustin, CA 92780  
714.665.4500  
Fax: 714.665.4501

## APPLE VALLEY

18484 Outer Highway 18 North,  
Suite 225  
Apple Valley, CA 92307  
760.524.9100  
Fax 760.524.9101

[www.deainc](http://www.deainc)

## LANCASTER PROMENADE

## LANCASTER, CALIFORNIA

*Prepared by:*



DAVID EVANS  
AND ASSOCIATES INC.

**March 1, 2021**

APPROVED  
CITY OF LANCASTER  
TRAFFIC ENGINEER

SIGNATURE  3/10/2021  
MATTHEW SIMONS, TE, PTP DATE



March 1, 2021

Job No. INVC0000-0001

**Russ Khouri**

Investment Concepts Inc.  
1667 East Lincoln Avenue  
Orange, CA 92865

**RE: Local Transportation Assessment – Lancaster Promenade – Lancaster, CA**

Dear Mr. Khouri,

**David Evans and Associates, Inc.** is pleased to submit this Local Transportation Assessment for your proposed project consisting of Multi-Family Housing with 392 dwelling units and approximately 12,750 square feet of commercial buildings. The proposed project is located on the west side of 20<sup>th</sup> Street West south of Avenue I and north of Lancaster Blvd on an approximate 26.3-acre site in the City of Lancaster.

The report examines the changes in intersection operation specifically for the project and presents recommended traffic improvements. The report also evaluates the impacts of overall growth within the area to assure that changes in intersection operation due to cumulative development can be addressed. The report has been prepared in coordination with the City of Lancaster consistent with the City of Lancaster Department of Development Services Local Transportation Assessment Guidelines dated November 20, 2020.

We are pleased to have been of assistance to you in processing and obtaining approval for the project. If you have any questions or comments, please feel free to contact me at 909-912-7304.

Sincerely,

DAVID EVANS AND ASSOCIATES, INC.

A handwritten signature in blue ink, appearing to read 'Jim Daisa', is written over the company name.

James M. Daisa, PE  
Senior Project Manager



## TABLE OF CONTENTS

1	EXECUTIVE SUMMARY .....	4
	Intersection Assessment .....	4
	Summary of Cumulative Project Conditions .....	4
	Vehicle Miles Traveled (VMT) Assessment .....	5
	Proposed and Project Specific Improvements .....	5
	Phase 1 .....	5
	Phase 2 .....	5
	Phase 3 .....	7
2	INTRODUCTION TO TECHNICAL ANALYSIS .....	8
3	EXISTING CONDITIONS .....	11
	Existing Street Network and Study Intersections .....	11
	Existing Traffic Volumes .....	12
	Capacity Analysis Methodologies and City of Lancaster Intersection Criteria .....	12
	Existing Traffic Analysis .....	14
4	EXISTING PLUS PROJECT CONDITIONS .....	16
	Project Trip Generation .....	16
	Project Trip Distribution and Assignment .....	16
	Existing Plus Project Conditions .....	22
5	BACKGROUND (CUMULATIVE) TRAFFIC CONDITIONS .....	26
	Other Area Projects .....	26
	Background (Cumulative) Traffic Analysis .....	26
6	PROJECT TRAFFIC CONDITIONS .....	31
	Project Conditions Traffic Analysis .....	31

## LIST OF FIGURES

Figure ES-1: Site Plan .....	6
Figure 1: Vicinity Map .....	9
Figure 2: Site Plan .....	10
Figure 3: Existing Traffic Volumes .....	13
Figure 4: Existing Condition Intersection Geometrics .....	15
Figure 5: Residential Project Trip Distribution .....	17
Figure 6: Commercial Project Trip Distribution .....	18
Figure 7: Residential Project Trips .....	19
Figure 8: Commercial Project Trips .....	20
Figure 9: Total Project Trips .....	21
Figure 10: Existing plus Project Traffic Volumes .....	23



Figure 11: Existing plus Project Intersection Geometrics.....	24
Figure 12: Other Area Project Trips.....	27
Figure 13: Background (Cumulative) Traffic Volumes .....	28
Figure 14: Background Geometrics.....	30
Figure 15: Project Condition Traffic Volumes .....	32
Figure 16: Project Geometrics.....	34

## LIST OF TABLES

Table 1: Intersection Capacity Analysis – Cumulative Project Conditions.....	4
Table 2: Intersection Capacity Analysis – Project Driveway Approach Comparison .....	5
Table 3: HCM 6 – LOS Criteria for Signalized Intersections .....	12
Table 4: City of Lancaster Criteria for Signalized Intersections.....	12
Table 5: HCM 6 – LOS Criteria for Two Way Stop Controlled (TWSC) Intersections.....	14
Table 6: City of Lancaster Criteria for unsignalized (side-street stop) Intersections.....	14
Table 7: Intersection Capacity Analysis – Existing Conditions.....	14
Table 8: Estimated Project Trip Generation.....	16
Table 9: Intersection Capacity Analysis – Existing Plus Project Conditions .....	25
Table 10: Estimated Trip Generation of Other Area Projects.....	26
Table 11: Intersection Capacity Analysis – Background (Cumulative) Conditions .....	29
Table 12: Intersection Capacity Analysis – Project Conditions .....	31
Table 13: Intersection Capacity Analysis – Project Driveway Approach Comparison .....	33

## APPENDICES

Appendix A : Other Area Projects
Appendix B: Intersection Capacity Analysis Calculations
Appendix C: Traffic Signal Warrant Analysis
Appendix D: Justification for VMT Analysis Waiver

## 1 EXECUTIVE SUMMARY

### Intersection Assessment

In summary, the proposed project, comprised of 392 multi-family dwelling units, and 12,750 square feet of commercial buildings, will contribute to the cumulative increase in traffic along with future ambient growth and other development in the area but does not cause or contribute to level of service (LOS) deficiencies requiring modifications to lane configurations or traffic control at any public street intersection.

### Summary of Cumulative Project Conditions

Cumulative project conditions represent estimated project traffic in addition to background (cumulative) growth in traffic from ambient growth and planned and/or approved but not yet built development in the vicinity of the project. This includes the 20<sup>th</sup> Street West Apartments (SPR 20-4 – 162 multi-family units) located on the east side of 20<sup>th</sup> Street W and sharing a common driveway intersection (designated as 20th Street West and Project Driveway “B”/ Aligned Project Driveway). See **Figure ES-1** in Chapter 2 for site plan and driveway designations. The intersection capacity analysis of cumulative project conditions is summarized in **Table 1**.

Table 1: Intersection Capacity Analysis – Cumulative Project Conditions

Intersection	Intersection Control Type	Background Cumulative Condition				Project Condition				Difference		LOS Deficiency	
		AM		PM		AM		PM		AM	PM	AM	PM
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	Delay		
1 20th Street West and Avenue I	Signal	29.9	C	38.9	D	38.2	D	42.2	D	8.3	3.3	No	No
2 20th Street West and Project Driveway “A”	SSSC/ Driveway	N/A	N/A	N/A	N/A	10.7	B	12.9	B	N/A	N/A	No	No
3 20th Street West and Project Driveway “B” / Aligned Project Driveway	SSSC/ Driveway	14.9	B	22.4	C	17.6	C	76.5	F	2.7	54.1	No	No
4 20th Street West and Linda Avenue/ Project Driveway “C”	SSSC	14.1	B	19.6	C	23.3	C	60.5	F	9.2	40.9	No	No
5 20th Street West and Louise Avenue/ Project Driveway “D”	SSSC	14.6	B	20.4	C	16.1	C	26.2	D	1.5	5.8	No	No
6 20th Street West and Lancaster Blvd	Signal	17.9	B	20.6	C	19.1	B	23.0	C	1.2	2.4	No	No
SSSC Side Street Stop Controlled Intersection Delay – seconds per vehicle LOS – Level of Service Difference in delay between Project Conditions and Background Cumulative Conditions LOS Deficiency as outlined in <b>Table 4</b> and <b>Table 6</b> .													

Source: David Evans and Associates, Inc.

Two driveway intersections (20th Street West and Project Driveway “B”/ Aligned Project Driveway and 20th Street West and Linda Avenue/ Project Driveway “C”) operate at LOS F for the worst movement which is the left turn out from the proposed project’s driveways. Other movements at these intersections operate without delay or at LOS D or better.

Neither of the above driveway intersections meet the City’s criteria for level of service deficiencies nor do they meet warrants for the installation of all way stop control or a traffic signal based on the California Manual of Uniform Traffic Control Devices (MUTCD) 2014 Edition peak hour traffic signal warrant.

In response to comments from the City of Lancaster, **Table 2** compares the analysis of the 20th Street West / Project Driveway “B” and 20th Street West / Linda Avenue / Project Driveway “C” with its proposed single-lane and an alternative two-lane driveway approach. The delay provided in both scenarios is representative of the critical delay from the project driveways.

The two-lane driveway alternative provides an exclusive left-turn lane and shared thru-right lane. Although the critical delay increases for each condition, the two-lane driveway allows right turning vehicles to bypass queued left turning vehicles resulting in an improvement for the right turning vehicles using each driveway.

Table 2: Intersection Capacity Analysis – Project Driveway Approach Comparison

Intersection	Intersection Control Type	Single-Lane Project Driveway				Two-Lane Project Driveway			
		AM		PM		AM		PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
3   20th Street West and Project Driveway "B" / Aligned Project Driveway	SSSC/ Driveway	17.6	C	76.5	F	17.3	C	76.9	F
4   20th Street West and Linda Avenue/ Project Driveway "C"	SSSC	23.3	C	60.5	F	17.7	C	77.1	F
SSSC Side Street Stop Controlled Intersection									
Delay – seconds per vehicle									
LOS – Level of Service									

Source: David Evans and Associates, Inc.

### Vehicle Miles Traveled (VMT) Assessment

A VMT analysis screening assessment pursuant to the City of Lancaster's Local Transportation Assessment Guidelines (November 2020) indicates that the Lancaster Promenade development project does not require a VMT analysis because it is located in a Traffic Analysis Zone (TAZ) that is already 15% below the AVPA Baseline VMT. Justification for VMT analysis waiver is provided in **Appendix D**.

### Proposed and Project Specific Improvements

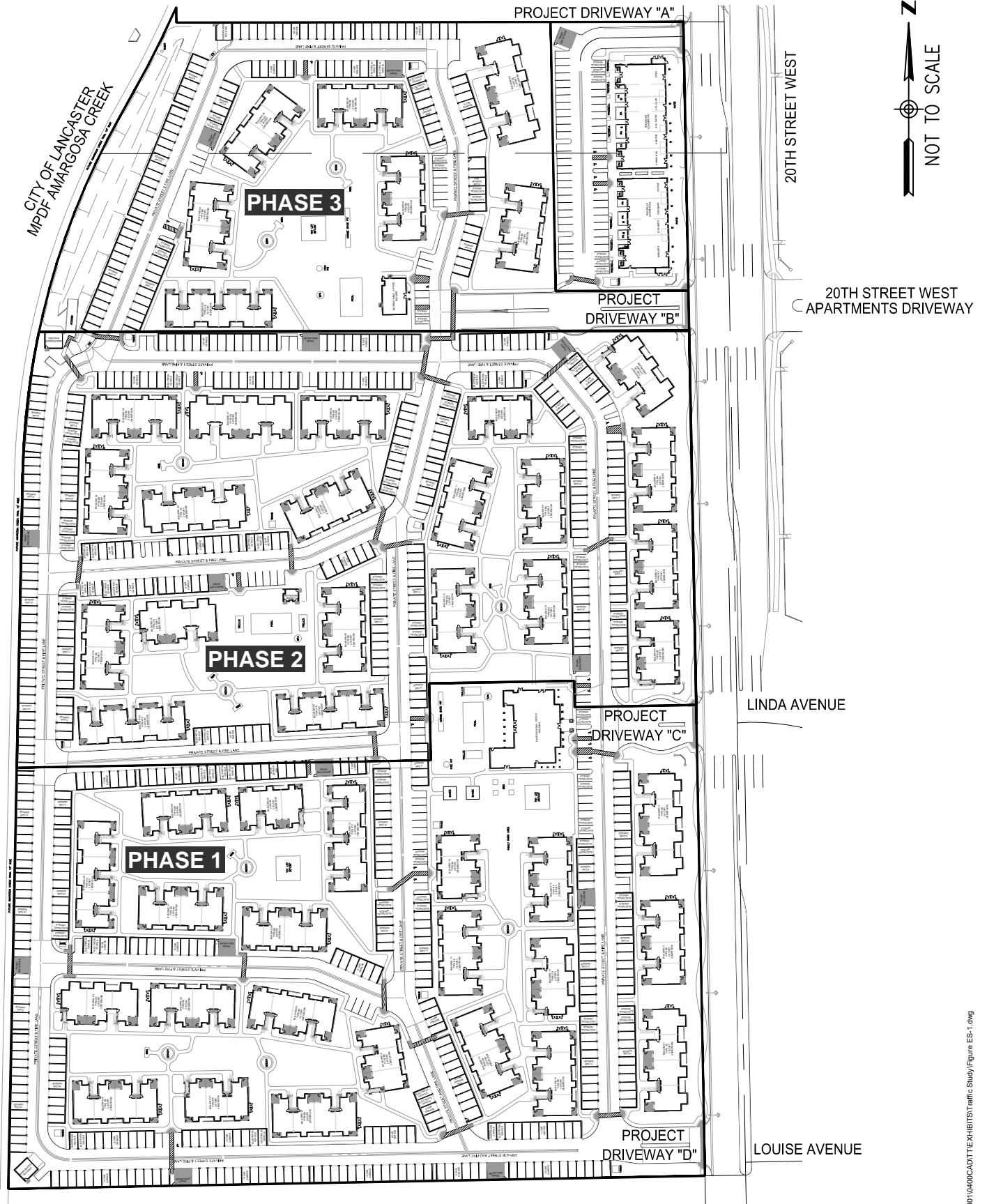
Although this local transportation assessment analyzed the project as a single-phase of development, the project is proposed to be constructed in three phases. The driveway access improvements would be constructed in each applicable phase of the development. The project specific improvements to 20<sup>th</sup> Street West and driveway intersections by phase are as follows:

#### Phase 1

1. Construct frontage improvements (curb, gutter, meandering sidewalk/landscaping, pavement, and raised median) along the Phase1 frontage of 20th Street West to its ultimate ½ width extending from Louise Avenue to Linda Avenue. The median should provide a northbound left-turn bay into the future Driveway "C". This improvement includes the appropriate southbound transition between the ultimate improved section and the existing unimproved pavement of 20<sup>th</sup> Street West.
2. Construct a right in/right out only driveway on the west leg of 20th Street West / Louise Avenue / Driveway "D", enforcing the turn restrictions through construction of the raised median on 20th Street West.
3. Construct the full access two-lane west leg (Driveway "C") at the intersection of 20th Street West / Linda Avenue, providing an exclusive left-turn lane and a shared through-right lane.

#### Phase 2

1. Construct frontage improvements (curb, gutter, meandering sidewalk/landscaping, pavement, and raised median) along the Phase 2 frontage of 20th Street West to its ultimate ½ width extending from Linda Avenue to future Driveway "B". The median should provide a southbound left-turn bay into Linda Avenue. This improvement includes the appropriate southbound transition between the ultimate improved section and the existing unimproved pavement.



### **Phase 3**

1. Construct frontage improvements (curb, gutter, meandering sidewalk/landscaping, pavement, raised median, and one half of the raised median and turn lanes along the project's frontage shared by the 20<sup>th</sup> Street West Apartments) along the Phase 3 frontage of 20<sup>th</sup> Street West to its ultimate ½ width extending from Driveway "B" to the northern end of the project's property at Driveway "A". The median should include a northbound left-turn-in only bay for left turn access into Driveway "B" and a southbound left-turn bay into the 20<sup>th</sup> Street West Apartment property to the east side of 20<sup>th</sup> Street West.
2. Construct the full access two-lane west leg (Driveway "B") at the intersection with 20<sup>th</sup> Street West, providing an exclusive left-turn lane and a shared through-right lane.
3. Construct the 20<sup>th</sup> Street West / Project Driveway "A" intersection restricted to right-turn-in / right-turn-out through construction of the raised median described above.

## 2 INTRODUCTION TO TECHNICAL ANALYSIS

This report identifies the changes in intersection operation specifically for the project and presents recommended traffic improvements for access and local traffic circulation for the proposed Lancaster Promenade.

The proposed project is located on the west side of 20<sup>th</sup> Street West south of Avenue I and north of Lancaster Blvd in the City of Lancaster, California. The project consists of an Apartment Complex containing 392 dwelling units, and approximately 12,750 square feet of commercial buildings on a 26.3-acre site. **Figure 1** identifies the project location.

The project is bounded to the north by a hotel and gas station/convenience market, to the west by SR-14, to the east by 20<sup>th</sup> Street West, and to the south by multi-family residential. **Figure 2** illustrates the proposed project site plan. As illustrated, access to the site is from four driveways on 20<sup>th</sup> Street West.

The intent of this Local Transportation Assessment report is to identify changes in intersection operation caused by, or contributed to, by the proposed project under the following study scenarios:

- Existing Conditions
- Existing plus Project Conditions
- Background Cumulative Conditions
- Project Conditions

The **Existing Conditions** analysis is based on traffic counts collected in April 2018 and reflects conservative traffic conditions “Pre-Covid” and prior to the road diet completed along 20<sup>th</sup> Street west.

The **Existing plus Project Conditions** analysis addresses intersection level of service deficiencies if the project were completed today. This analysis identifies intersection level of service deficiencies solely caused by the proposed project when compared to existing conditions.

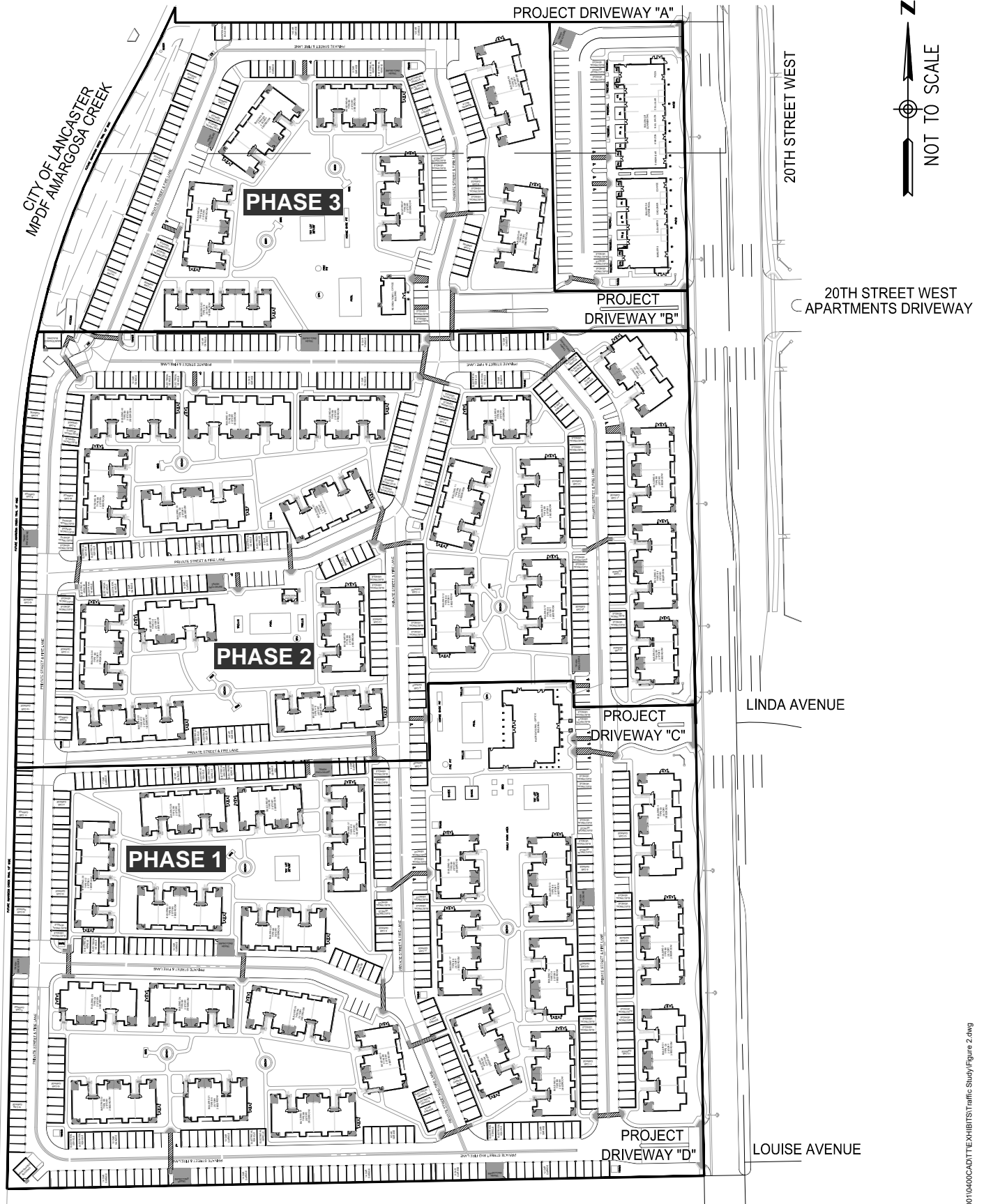
The **Background (Cumulative) Conditions** analysis addresses intersection level of service deficiencies due to ambient growth in traffic up to the project opening year of 2022 within the study area and traffic generated by other nearby development. Ambient growth is estimated at two percent of the existing traffic volumes annually. A list of other nearby development was provided by the City of Lancaster Staff and included in the **Appendix A** of this report.

The **Project Condition** analyzes the effects of project traffic added to the Background (Cumulative) Condition. This analysis identifies changes in intersection operation that the proposed project contributes to, along with other cumulative development, and may be required to fund its fair share of the necessary improvements.





**FIGURE 1: VICINITY MAP  
LANCASTER PROMENADE  
LANCASTER, CALIFORNIA**



**FIGURE 2: SITE PLAN**  
**LANCASTER PROMENADE**  
**LANCASTER, CALIFORNIA**



### 3 EXISTING CONDITIONS

Currently the project site is comprised of a vacant and undeveloped land. It is bounded to the north by a hotel and gas station/convenience market, to the south by multi-family residential developments, to the east by 20<sup>th</sup> Street West, and to the west by SR-14.

#### Existing Street Network and Study Intersections

The following roadways provide regional and local access to the project site:

**20<sup>th</sup> Street West** provides direct access to the project site through four driveways. The roadway traverses north to south and is primarily a two-lane (one lane and bike lanes in each direction) roadway with left turn pockets at key intersections. 20<sup>th</sup> Street West is identified as a major arterial in the City of Lancaster's General Plan.

**Lancaster Boulevard** is an east-west street with two travel lanes (one lane and bike lanes in each direction) with left-turn bays at key intersections. This street is classified as a secondary arterial in the City of Lancaster's General Plan.

**Avenue I** is an east-west street with six travel lanes (three lanes in each direction) with turn bays at key intersection and a raised curbed median. The roadway is a major arterial on the City of Lancaster Existing Roadway Network.

The report will analyze six existing and/or future intersections on 20<sup>th</sup> Street West. Two of the intersections are existing but are modified under project conditions to add project driveways as fourth legs. Two future intersections occur only under project conditions with construction of a project driveway. The six study intersections are:

1. 20<sup>th</sup> Street West and Avenue I (existing intersection)
2. 20<sup>th</sup> Street West / Project Driveway "A" (future driveway)
3. 20<sup>th</sup> Street West / Project Driveway "B" (future driveway)
4. 20<sup>th</sup> Street West / Linda Avenue / Project Driveway "C" (existing and future Driveway)
5. 20<sup>th</sup> Street West and Louise Avenue / Project Driveway "D" (existing and future driveway)
6. 20<sup>th</sup> Street West and Lancaster Blvd (existing intersection)

The existing intersections of 20<sup>th</sup> Street West / Avenue I and 20<sup>th</sup> Street West / Lancaster Blvd are signalized. The existing intersections of 20<sup>th</sup> Street West / Linda Avenue and 20<sup>th</sup> Street West / Louise Avenue (prior to the addition of driveways under project conditions) are both stop-controlled (with Linda and Louise being stop controlled).

The future intersections of 20<sup>th</sup> Street West / Project Driveway "A" and 20<sup>th</sup> Street West / Project Driveway "B" are proposed to be side-street stop-controlled as described in the section on Existing Plus Project conditions.

## Existing Traffic Volumes

Due to the impact of COVID-19 on travel, it was agreed that April 2018 Traffic Counts, provided in **Appendix B**, would be used. The April 2018 are conservative traffic volumes at the study intersections as the result of a recent road diet along 20<sup>th</sup> Street West extending from Avenue I to Lancaster Blvd. The road diet consisted of a removal of a northbound through lane, southbound through lane, and two-way-left turn lane and the addition of buffered bike lanes, completed after the 2018 counts were conducted.

**Figure 3** provides the existing intersection traffic volumes. Newport Traffic Studies (NTS) conducted AM (7:00-9:00 AM) and PM (4:00-6:00 PM) peak period turning movement counts in April 2018. **Appendix B** presents the existing turning movement volumes.

## Capacity Analysis Methodologies and City of Lancaster Intersection Criteria

Intersection capacity analyses were conducted using Synchro software (1), which implements the methods of the Highway Capacity Manual, 6<sup>th</sup> Edition (HCM 6) (2) used in this report. The intersection capacity analyses utilize existing intersection geometrics and existing and forecasted traffic volumes in analyzing AM and PM peak hour intersection operating conditions. The traffic analysis methodology concepts presented in Chapters 19 and 20 of the Highway Capacity Manual (HCM 6) were utilized to calculate intersection Level of Service (LOS) based on the average control delay (in seconds per vehicle) of vehicles utilizing intersections.

The analysis determines a LOS that quantitatively describes the operating characteristics of signalized intersections. **Table 3** provides LOS thresholds for signalized intersections as provided in the HCM 6 Chapter 19.

Table 3: HCM 6 – LOS Criteria for Signalized Intersections

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio <sup>a</sup>	
	≤1.0	>1.0
≤ 10	A	F
> 10 - 20	B	F
> 20 - 35	C	F
> 35 - 55	D	F
> 55 - 80	E	F
> 80	F	F

Note: <sup>a</sup> For approach-based and intersection-wide assessments, LOS is defined solely by control delay.  
Source: Highway Capacity Manual 6<sup>th</sup> Edition, Exhibit 19-8.

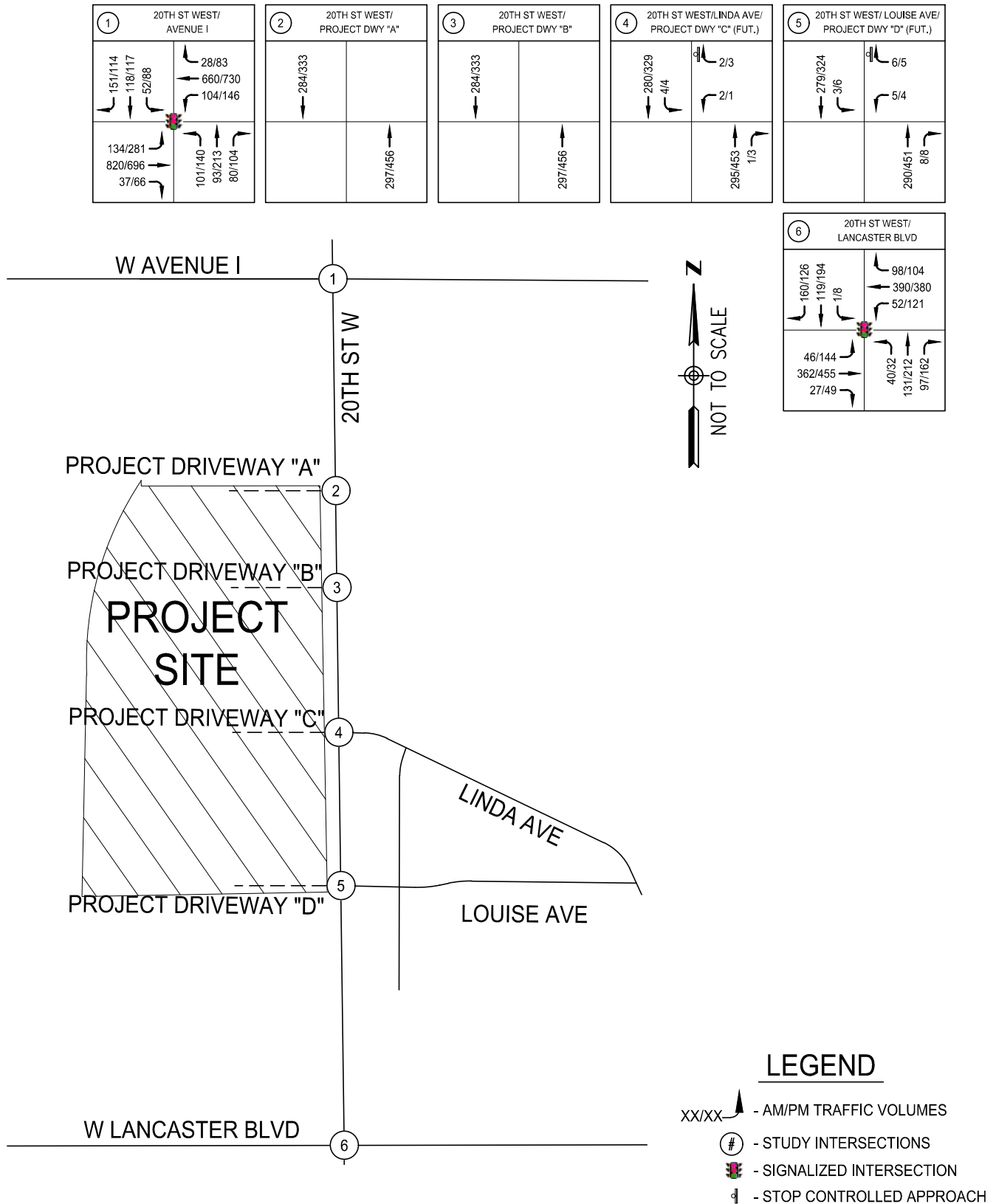
When comparing existing or future baseline conditions to “plus project” conditions, delay changes for signalized intersections that exceed the City’s level of service deficiency criteria, presented below in **Table 4**, should be identified.

Table 4: City of Lancaster Criteria for Signalized Intersections

LOS without Project	LOS with Project	Average Total Delay (seconds per Vehicle)	Project-Related Increase in Seconds of Average Total Delay
A, B, C, or D	E or F	-	Any increase in delay
E or F	E or F	> 55.0	Equal to or greater than 5.0 seconds

1 Trafficware Ltd, Version 10.

2 Transportation Research Board, Washington D.C., 2010.



**FIGURE 3: EXISTING TRAFFIC VOLUMES  
LANCASTER PROMENADE  
LANCASTER, CALIFORNIA**

**Table 5** provides the Two Way Stop Controlled (TWSC) intersection HCM 6 LOS thresholds.

Table 5: HCM 6 – LOS Criteria for Two Way Stop Controlled (TWSC) Intersections

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio	
	v/c ≤1.0	v/c >1.0
0 - 10	A	F
> 10 -15	B	F
> 15 - 25	C	F
> 25 - 35	D	F
> 35 - 50	E	F
> 50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.  
Source: Highway Capacity Manual 6<sup>th</sup> Edition, Exhibit 20-2.

When comparing existing or future baseline conditions to “plus project” conditions, delay changes for side- street stop intersections that exceed the criteria, provided below in **Table 6**, should be identified.

In addition to the delay thresholds, the peak hour traffic signal warrant and/or all-way stop warrant should also be met as part of the performance criteria. Adding these warrants to the criteria will ensure that minor street approaches with low traffic volumes are not identified as potentially needing improvements.

Table 6: City of Lancaster Criteria for unsignalized (side-street stop) Intersections

LOS with Project	Average Total Delay (seconds per Vehicle)	Project-Related Increase in LOS or Seconds of Average Total Delay
E	> 35.0 to 50.0	LOS D or better to LOS E or worse, and meets the peak hour warrant for a traffic signal
F	> 50.0	LOS E to LOS F, or > 10 seconds of delay for worst-case approach if already at LOS F; and meets the peak hour warrant for a traffic signal

## Existing Traffic Analysis

The existing intersection capacity analysis uses existing intersection geometrics and existing AM and PM peak hour traffic counts to determine level of service. **Table 7** and **Appendix B** provide the results of the analysis. **Figure 4** illustrates the existing intersection geometrics utilized in the capacity analysis.

Table 7: Intersection Capacity Analysis – Existing Conditions

Intersection		Intersection Control Type	AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
1	20 <sup>th</sup> Street West and Avenue I	Signal	25.9	C	33.9	C
2	20 <sup>th</sup> Street West and Project Driveway “A”	SSSC/Driveway	N/A	N/A	N/A	N/A
3	20 <sup>th</sup> Street West and Project Driveway “B”/Aligned Project Driveway	SSSC/Driveway	N/A	N/A	N/A	N/A
4	20 <sup>th</sup> Street West and Linda Avenue	SSSC	10.9	B	12.3	B
5	20 <sup>th</sup> Street West and Louise Avenue	SSSC	10.9	B	12.7	B
6	20 <sup>th</sup> Street West and Lancaster Blvd	Signal	15.7	B	16.9	B

SSSC – Side Street Stop Controlled Intersection  
Delay – seconds per vehicle  
LOS – Level of Service

Source: David Evans and Associates, Inc.

As shown in **Table 7** under Existing Conditions, all the study intersections operate at LOS B or C.

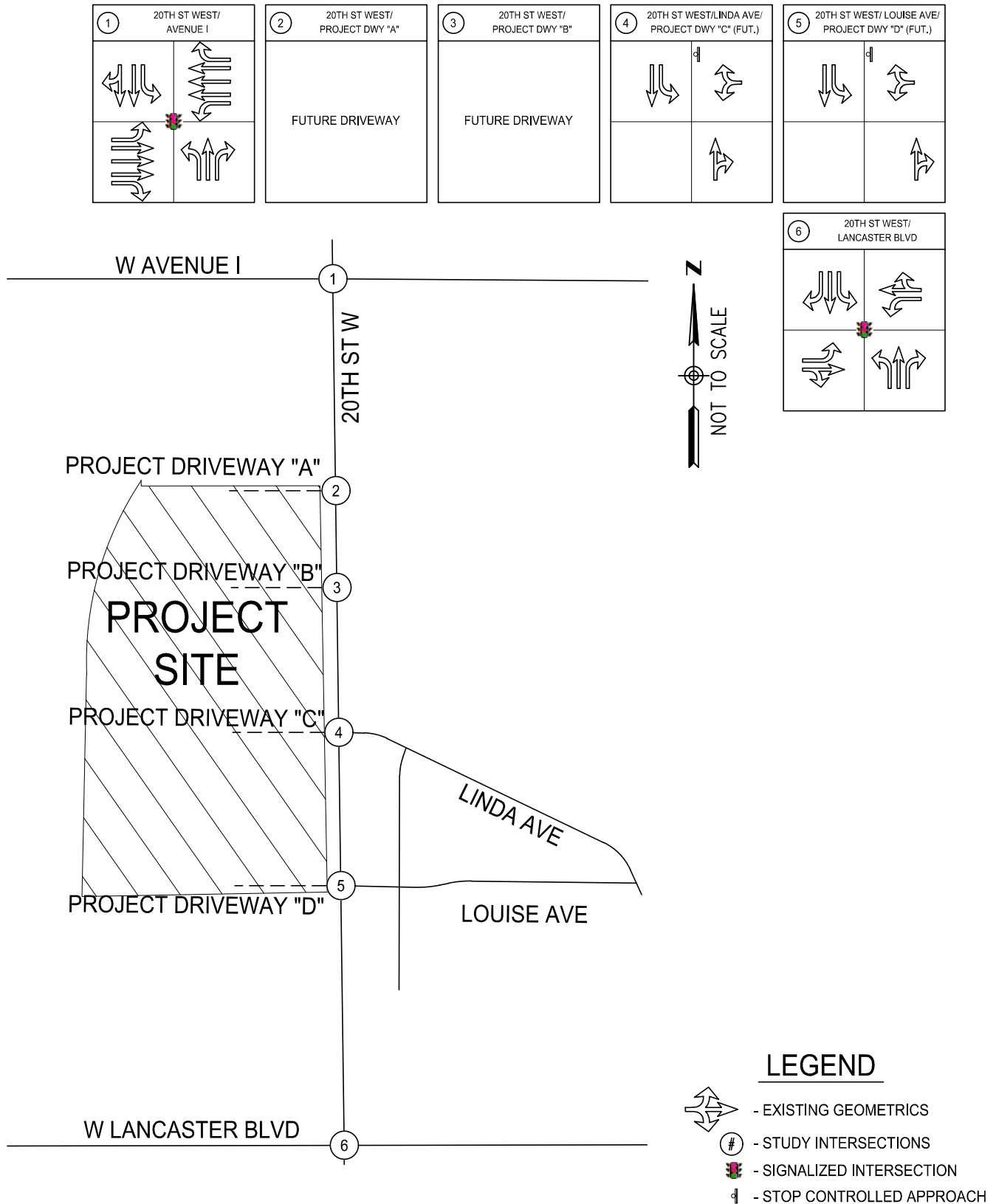


FIGURE 4: EXISTING CONDITION  
INTERSECTION GEOMETRICS  
LANCASTER PROMENADE  
LANCASTER, CALIFORNIA

#### 4 EXISTING PLUS PROJECT CONDITIONS

The Existing Plus Project Conditions scenario provides a baseline comparison of the project's impacts if it were built today. This section describes the estimated trip generation of the project and the Existing Plus Project intersection capacity analysis.

##### Project Trip Generation

To identify potential changes in intersection operation, trip generation rates are applied to the proposed land uses to estimate project vehicle trips. Trip generation rates for Multifamily Housing (ITE Land Use Category 220) and Fast Casual Restaurant (ITE Land Use Category 930) are from the Institute of Transportation Engineers (ITE) Trip Generation manual, 10<sup>th</sup> Edition. **Table 8** summarizes the estimated trip generation for the project site during the AM (7-9 AM) peak and PM (4-6 PM) peak periods.

Table 8: Estimated Project Trip Generation

Location	Land Use	Size	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
1	Multifamily Housing (Low-Rise) Land Use Category (ITE 220)								
	Rates (Per Dwelling Units)	392	7.32	0.10	0.36	0.46	0.35	0.21	0.56
	Trips		2,870	40	141	181	139	82	221
2	Fast Casual Restaurant Land Use Category (ITE 930)								
	Rates (Trips per 1,000 Sq. Feet Gross Floor Area)	5,925	315.17	1.39	0.68	2.07	7.77	6.36	14.13
	Trips		1,868	9	5	14	47	38	85
	Internal Trip Reduction (10%)		187	1	1	2	5	4	9
	Adjusted Trips		1,681	8	4	12	42	34	76
3	Fast Casual Restaurant Land Use Category (ITE 930)								
	Rates (Trips per 1,000 Sq. Feet Gross Floor Area)	6,825	315.17	1.39	0.68	2.07	7.77	6.36	14.13
	Trips		2,152	10	5	15	54	44	98
	Internal Trip Reduction (10%)		216	1	1	2	6	5	11
	Adjusted Trips		1,936	9	4	13	48	39	87
Subtotal Trips			6,890	59	151	210	240	164	404
Internal Trip Reduction (10%)			403	2	2	4	11	9	20
Total Adjusted Trips			6,487	57	149	206	229	155	384

Source: "Trip Generation Manual, Institute of Transportation Engineers", 10<sup>th</sup> Edition

As presented in **Table 8**, the project would generate 6,487 daily project trips, 206 trips during the AM peak, and 384 primary trips during the PM peak hours.

##### Project Trip Distribution and Assignment

The project trips are distributed by direction and assigned to the local network of streets. **Figure 5** illustrates the distribution of the residential project trips. **Figure 6** illustrates the distribution of the commercial project trips. **Figure 7**, **Figure 8**, and **Figure 9** illustrate the of the residential, commercial, and total project trips, respectively.

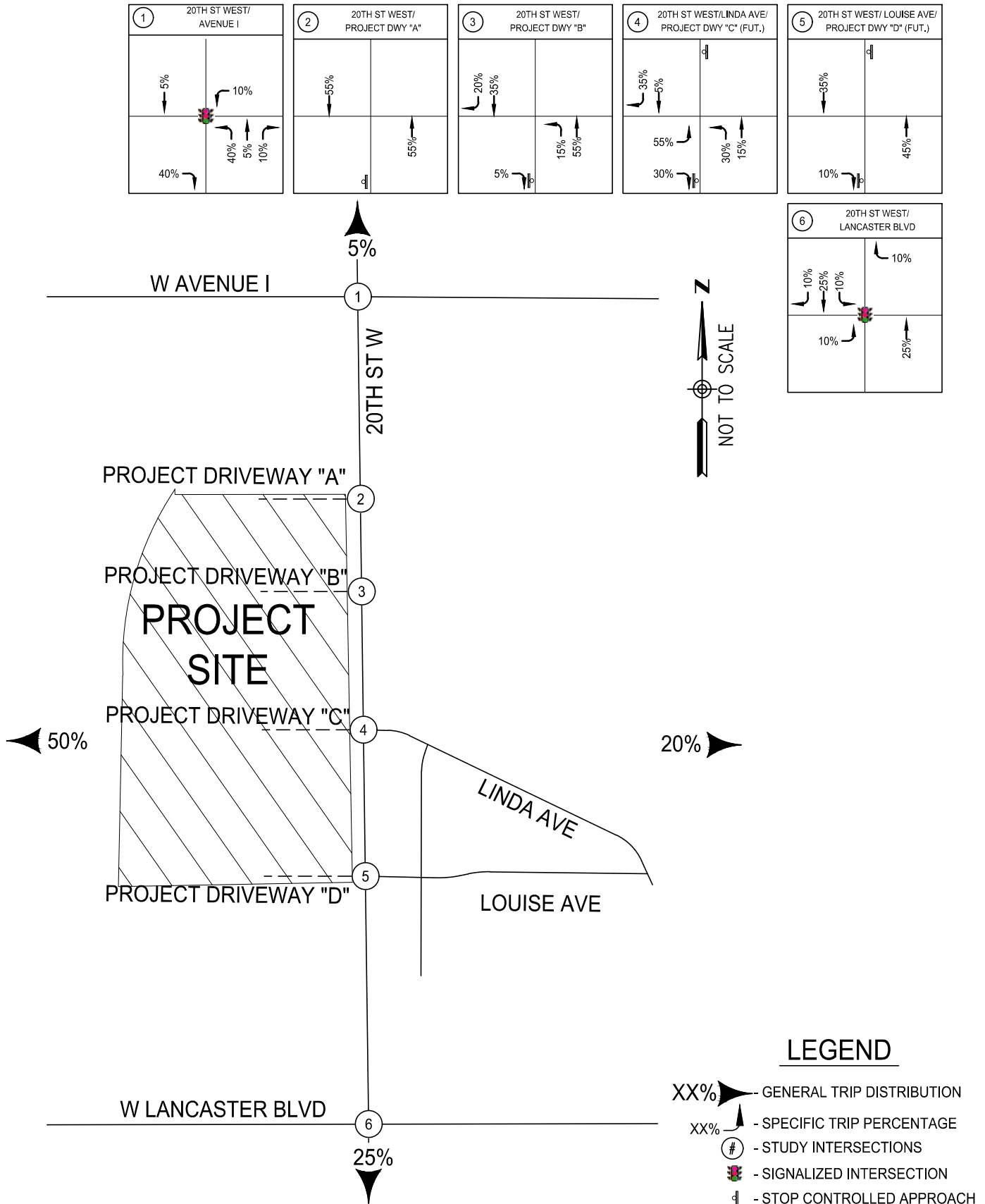
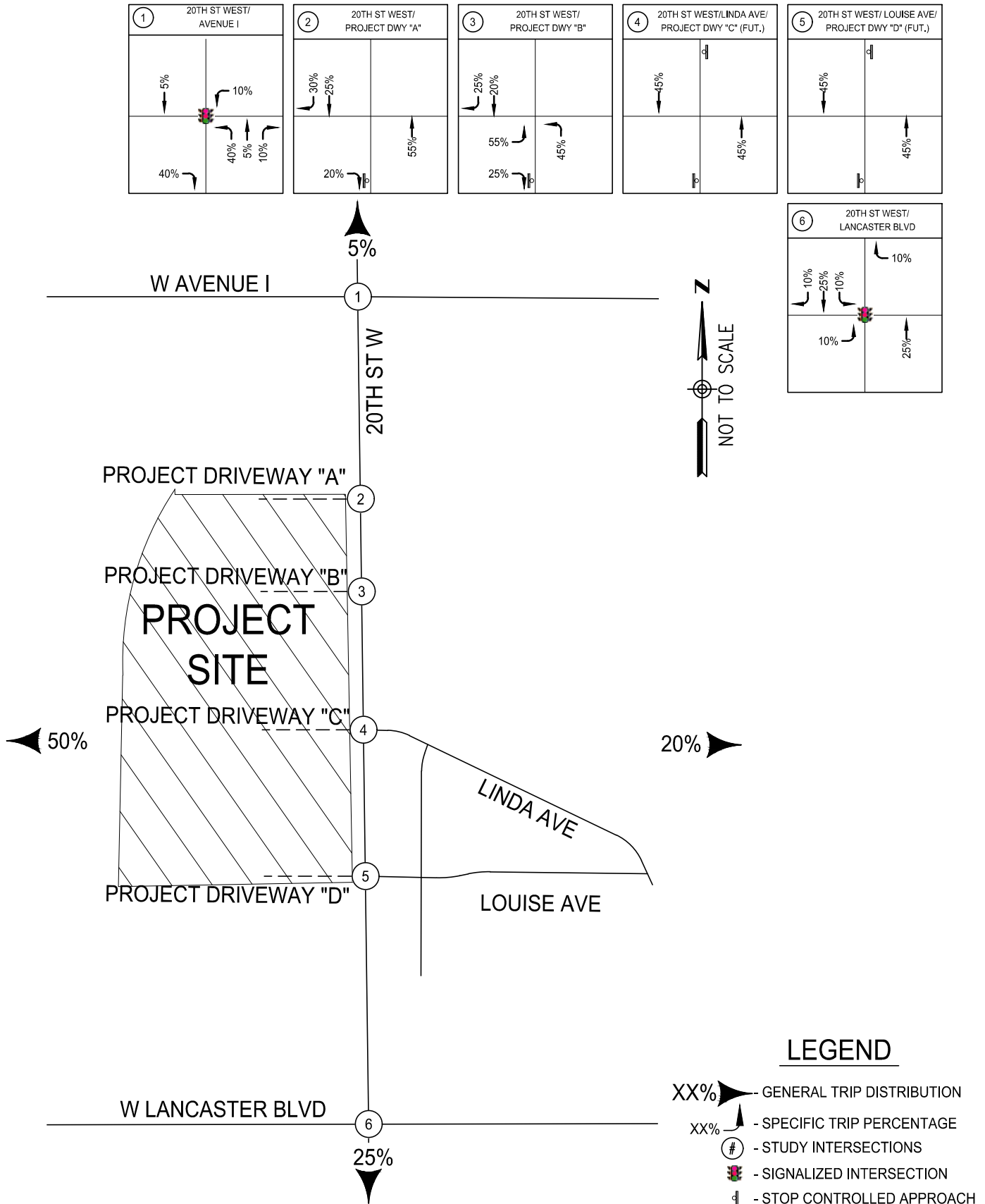
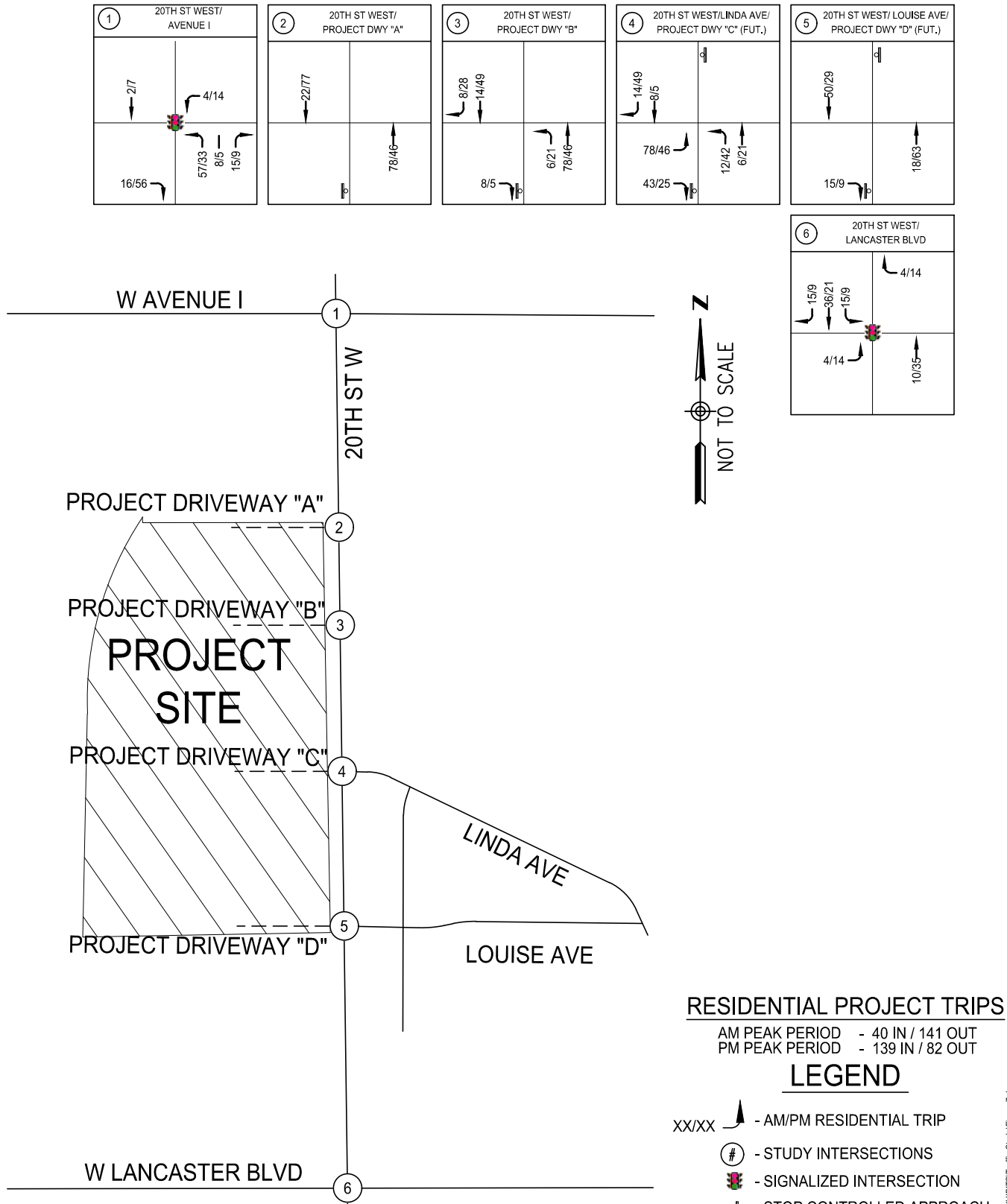


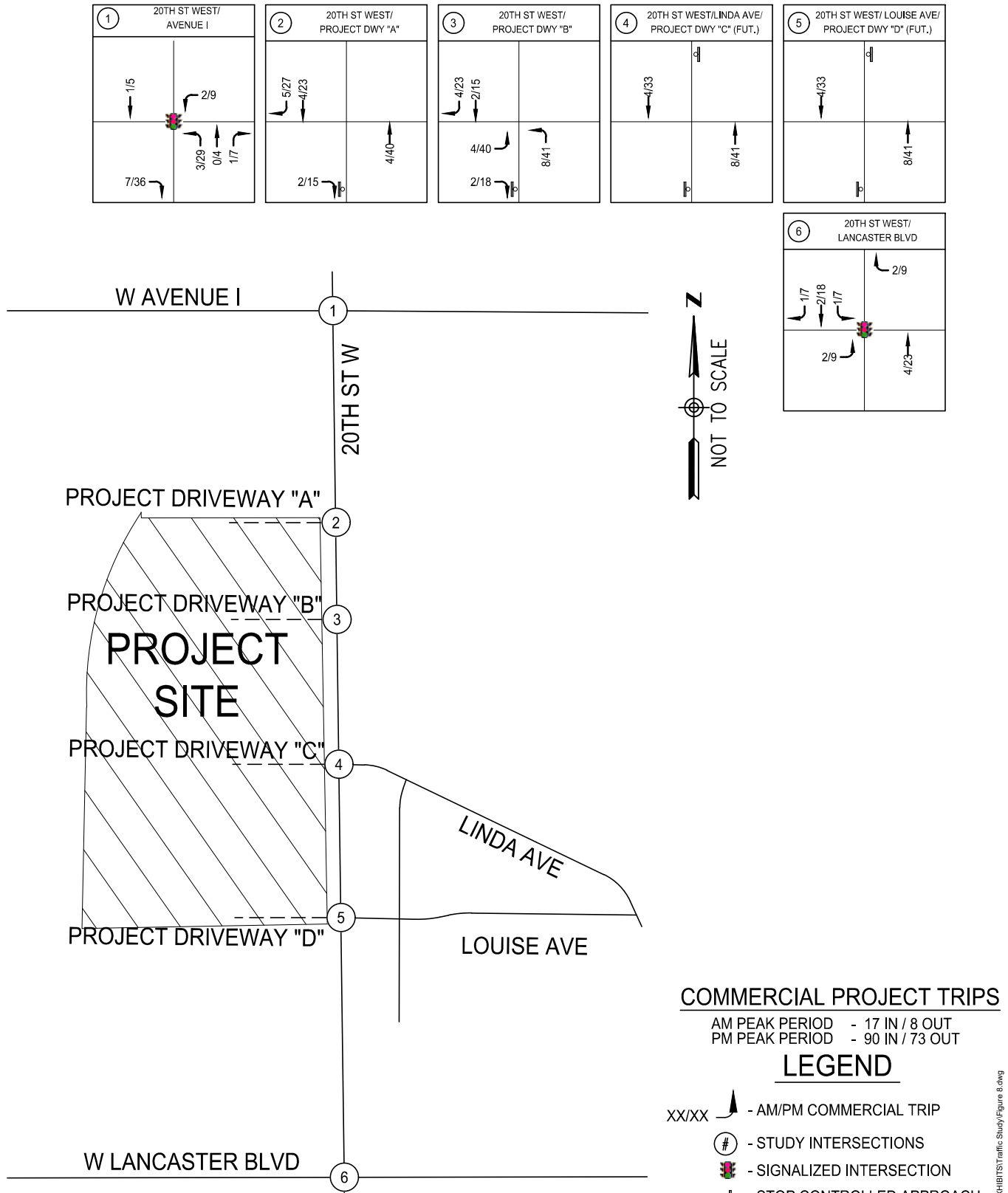
FIGURE 5: RESIDENTIAL PROJECT TRIP DISTRIBUTION  
LANCASTER PROMENADE  
LANCASTER, CALIFORNIA

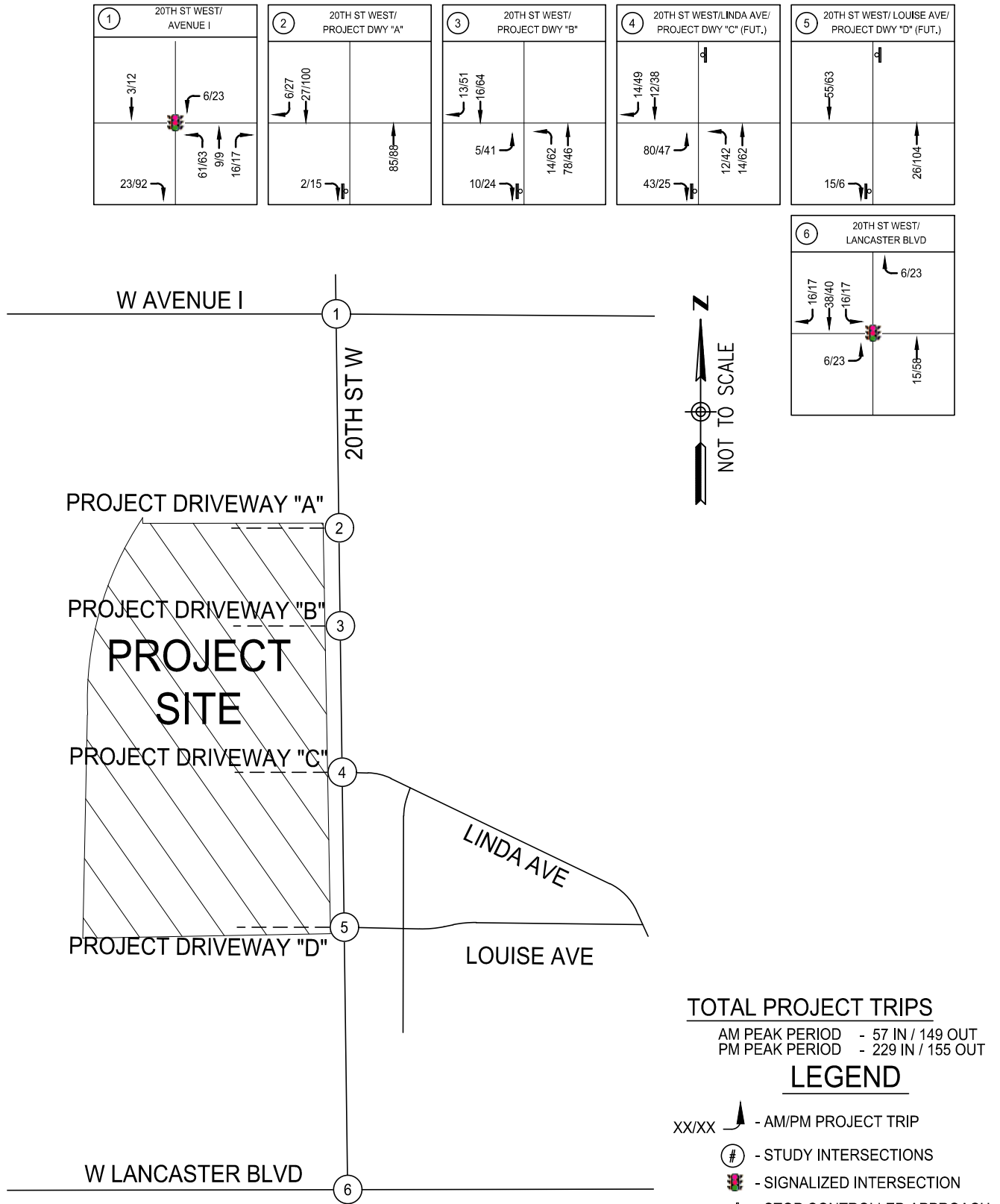


**FIGURE 6: COMMERCIAL PROJECT TRIP DISTRIBUTION  
LANCASTER PROMENADE  
LANCASTER, CALIFORNIA**









## Existing Plus Project Conditions

Access to the project is from four driveways on 20<sup>th</sup> Street West at the eastern edge of the site. Two of the driveways align with the existing local streets of Linda Avenue (Project Driveway “C”) and Louise Avenue (Project Driveway “D”). While the Project Driveway “A” and Project Driveway “B” form a T-intersection with 20<sup>th</sup> Street West, respectively.

The intersection capacity analysis of Existing Plus Project conditions utilized existing and proposed intersection geometrics and the AM and PM peak hour traffic volumes shown in **Figure 10**.

### Proposed Intersection Geometrics at Project Driveways

The Existing Plus Project conditions analysis assumed the following lane configurations at the four project driveways:

- **Project Driveway “A” / West 20<sup>th</sup> Street West:** The driveway will be restricted to right turn in / right turn out, as shown in **Figure 11**. The restrictions would require construction of a raised center median on 20<sup>th</sup> Street West consistent with the City’s definition of major arterials.
- **Project Driveway “B” / West 20<sup>th</sup> Street West:** This access point is initially analyzed as a side-street-stop-controlled intersection allowing full movements to/from Project Driveway “B”, as shown in **Figure 11**.
- **Project Driveway “C” / West 20<sup>th</sup> Street West / Linda Avenue:** This access point is initially analyzed as a stop-controlled intersection allowing full movements to/from Linda Avenue and Project Driveway “C”, as shown in **Figure 11**.
- **Project Driveway “D” / West 20<sup>th</sup> Street West / Louise Avenue:** The driveway will be restricted to right turn in / right turn out only, as shown in **Figure 11**. The restrictions would require construction of a raised center median on 20<sup>th</sup> Street West consistent with the City’s definition of major arterials.

### Existing Plus Project Traffic Analysis

As presented in **Table 9**, under Existing Plus Project conditions, the study intersections are anticipated to operate acceptably at LOS D or better.

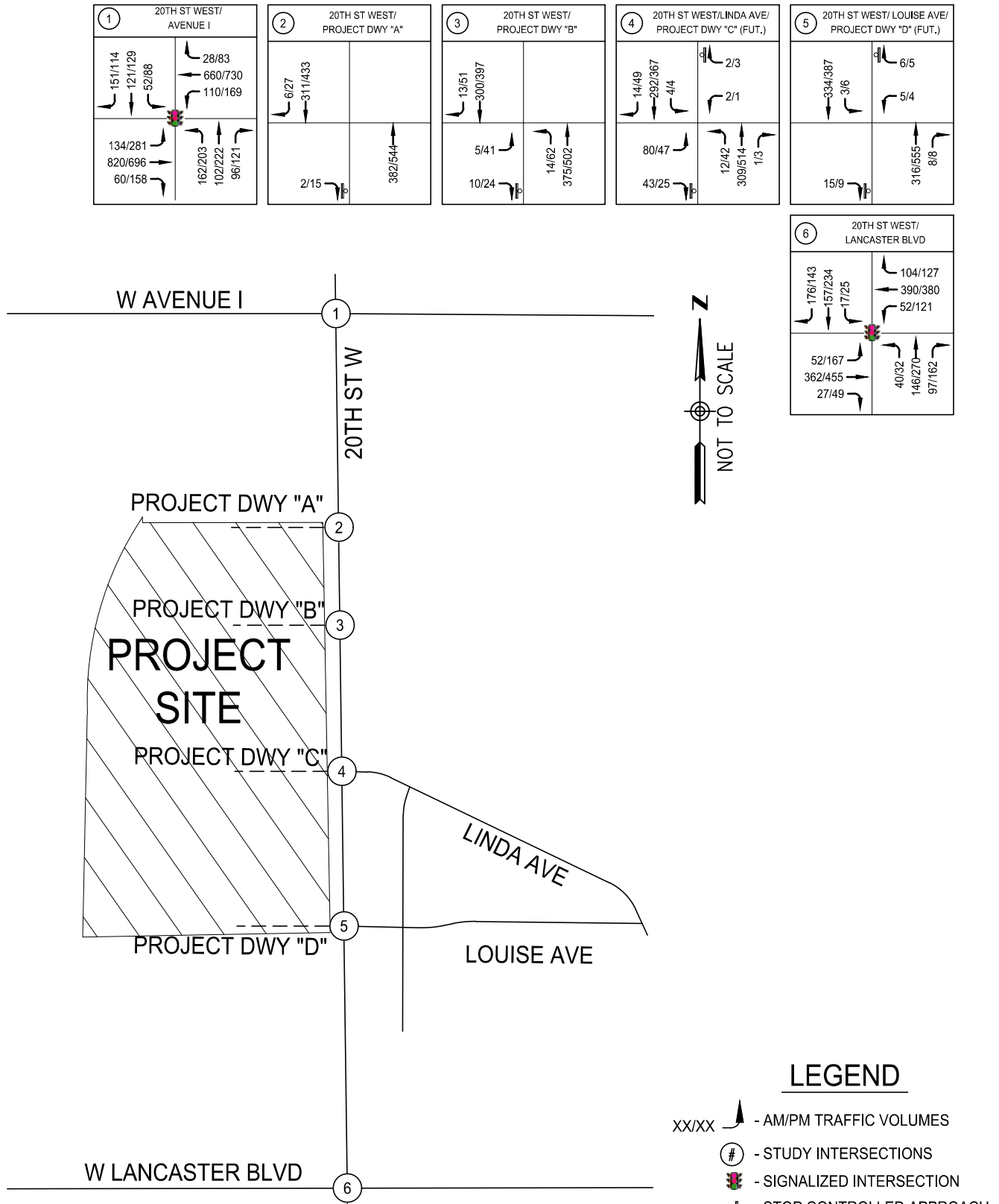
## Existing Plus Project Conditions Improvements

The proposed improvements for the intersection of 20<sup>th</sup> Street West and Driveway “A” include installing a raised median and providing a single right turn only lane on the west leg.

The proposed improvements for the intersection of 20<sup>th</sup> Street West and Driveway “B” include constructing a raised median with a northbound left-turn bay and providing a single shared left-right lane on the west leg.

The proposed improvements for the intersection of 20<sup>th</sup> Street West and Linda Avenue/ Driveway “C” include constructing a raised median with a northbound left-turn bay and southbound left-turn bay, and providing a single shared left-through-right lane on the west leg.

The proposed improvements for the intersection of 20<sup>th</sup> Street West and Louise Avenue/Driveway “D” include installing a raised median with a southbound left-turn bay and providing a single right turn only lane on the west leg.



**FIGURE 10: EXISTING + PROJECT TRAFFIC VOLUMES  
LANCASTER PROMENADE  
LANCASTER, CALIFORNIA**

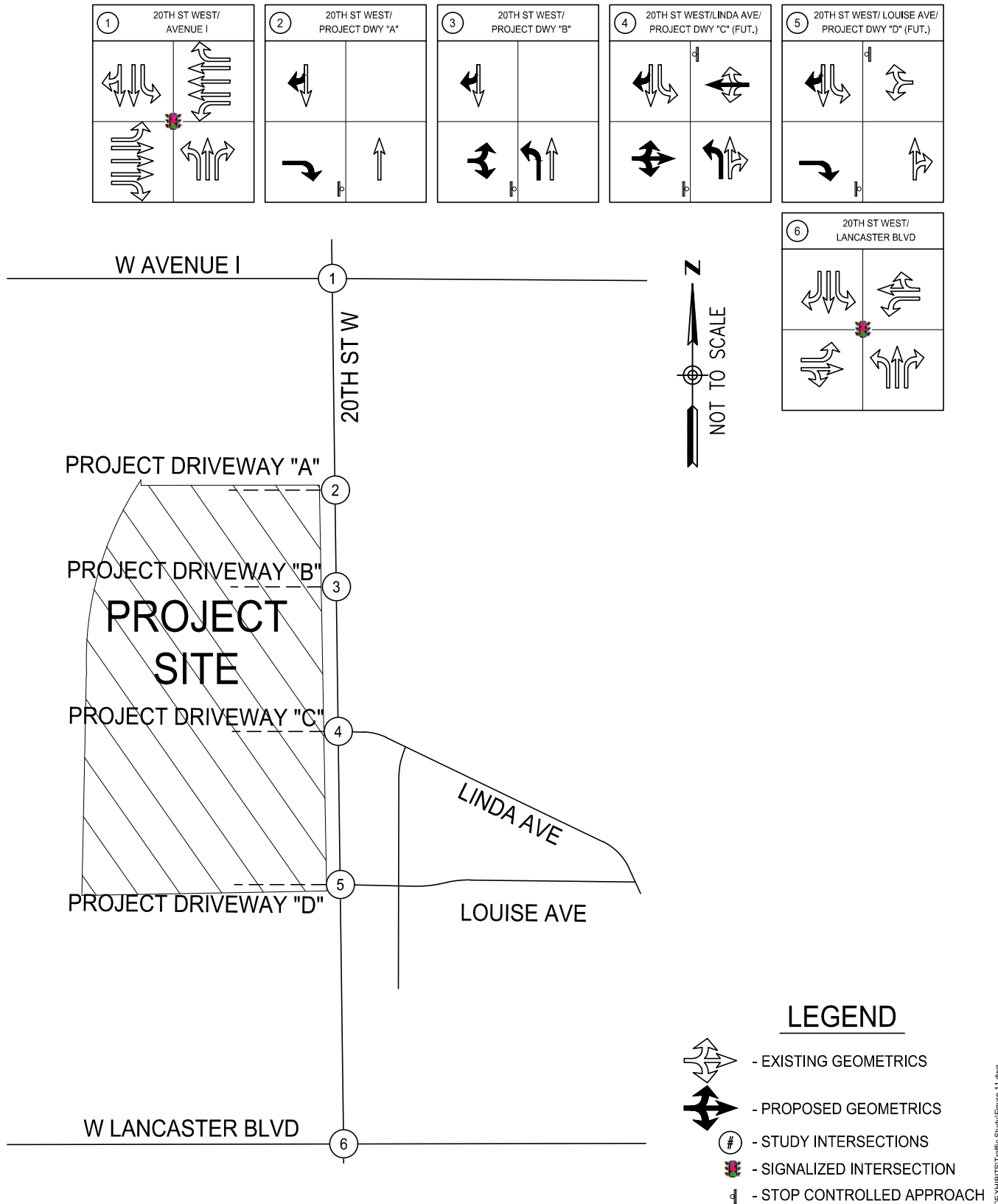


Table 9: Intersection Capacity Analysis – Existing Plus Project Conditions

Intersection		Intersection Control Type	Existing Condition				Existing + Project Condition				Difference		LOS Deficiency	
			AM		PM		AM		PM		AM	PM	AM	PM
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	Delay		
1	20th Street West and Avenue I	Signal	25.9	C	33.9	C	31.2	C	40.2	D	5.3	6.3	No	No
2	20th Street West and Project Driveway "A"	SSSC/ Driveway	N/A	N/A	N/A	N/A	10.2	B	11.8	B	N/A	N/A	No	No
3	20th Street West and Project Driveway "B"	SSSC/ Driveway	N/A	N/A	N/A	N/A	11.9	B	27.9	D	N/A	N/A	No	No
4	20th Street West and Linda Avenue/ Project Driveway "C"	SSSC	10.9	B	12.3	B	17.5	C	34.6	D	6.6	22.3	No	No
5	20th Street West and Louise Avenue/ Project Driveway "D"	SSSC	10.9	B	12.7	B	13.4	B	19.2	C	2.5	6.5	No	No
6	20th Street West and Lancaster Blvd	Signal	15.7	B	16.9	B	16.8	B	18.7	B	1.1	1.8	No	No
SSSC Side Street Stop Controlled Intersection Delay – seconds per vehicle LOS – Level of Service Difference in delay between Existing + Project Conditions and Existing Conditions. LOS Deficiency as outlined in <b>Table 4</b> and <b>Table 6</b> .														

Source: David Evans and Associates, Inc.

The California Manual of Uniform Traffic Control Devices (MUTCD) 2014 Edition Traffic Signal Warrant were evaluated for the intersection of 20th Street West and Project Driveway "B." The intersection does not meet the warrants under the Existing plus Project Condition. The Traffic Signal Warrant Analysis Worksheets are provided in **Appendix C** of this report.

The California Manual of Uniform Traffic Control Devices (MUTCD) 2014 Edition Traffic Signal Warrant were evaluated for the intersection of 20th Street West and Linda Avenue/ Project Driveway "C." The intersection does not meet the warrants under the Existing plus Project Condition. The Traffic Signal Warrant Analysis Worksheets are provided in **Appendix C** of this report.

**Table 9** and **Appendix B** provide the results of the analysis. Under Existing + Project Conditions, all the study intersections operate at LOS D or better.

## 5 BACKGROUND (CUMULATIVE) TRAFFIC CONDITIONS

The Background (Cumulative) Conditions scenario evaluates impacts due to ambient growth and other area project trips in traffic within the study area up to the First Phase Project Opening Year of 2022. Typically, ambient growth in traffic ranges from 1% to 2% annually—the ambient growth in traffic in this report uses a 2% annual rate of growth applied to existing traffic volumes.

### Other Area Projects

Other area development includes approved development that were recently constructed (but not yet occupied) or expected to be constructed by the year the first phase of the project completion in 2022. The City of Lancaster identified the four developments shown in **Table 10**; which summarizes the daily, AM, and PM peak hour trip generation of these cumulative developments.

Table 10: Estimated Trip Generation of Other Area Projects

Use		Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
1	Gas Station/Mini Mart (CUP 17-19)	644	21	19	40	27	26	53
2	Multi-Family Housing (SPR 20-4)	1,186	17	58	75	57	34	91
3	Professional Offices (SPR 19-06)	418	26	7	33	12	30	42
4	Lancaster Health District Project (Net Project Trips)	40,043	1,902	1,168	3,070	1,459	2,099	3,558

Source: City of Lancaster

**Figure 12** presents the total other area development trips at the study intersections. **Appendix A** contains the trip generation and distribution worksheets for the other area development.

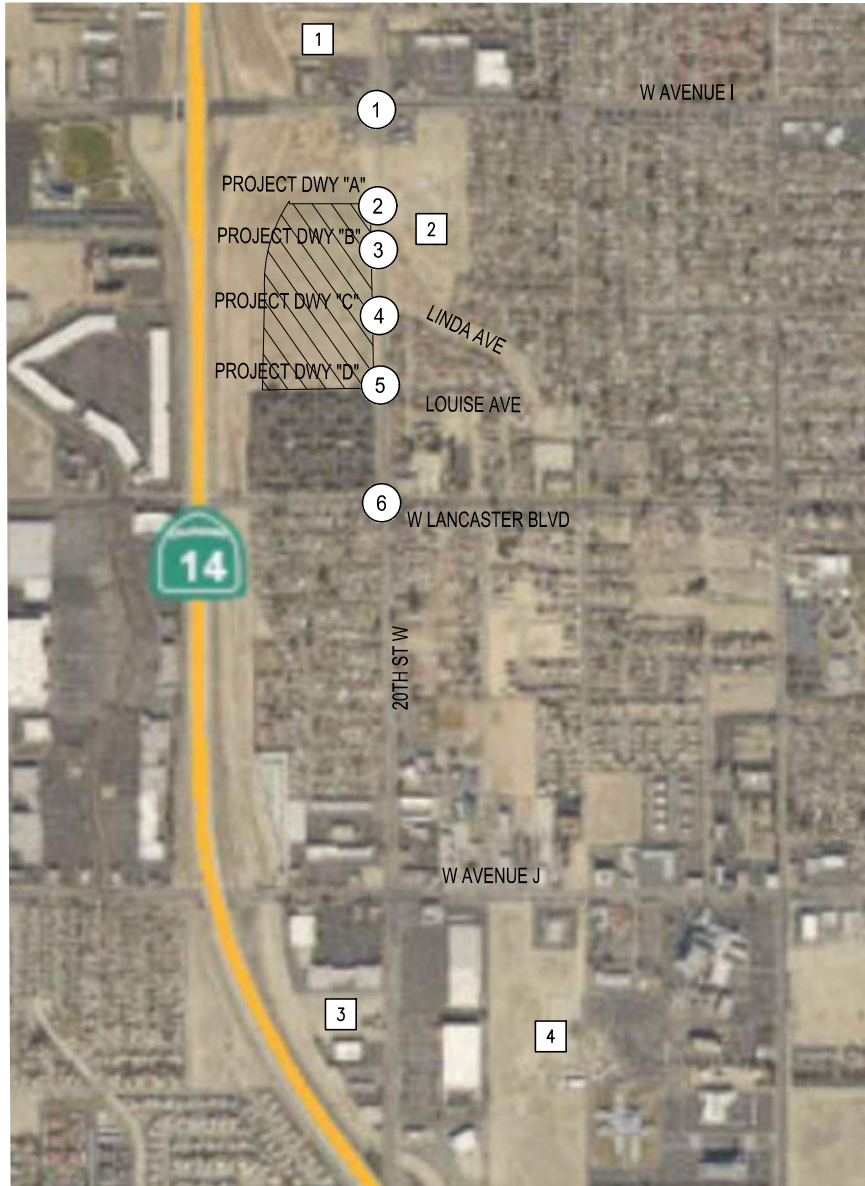
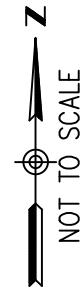
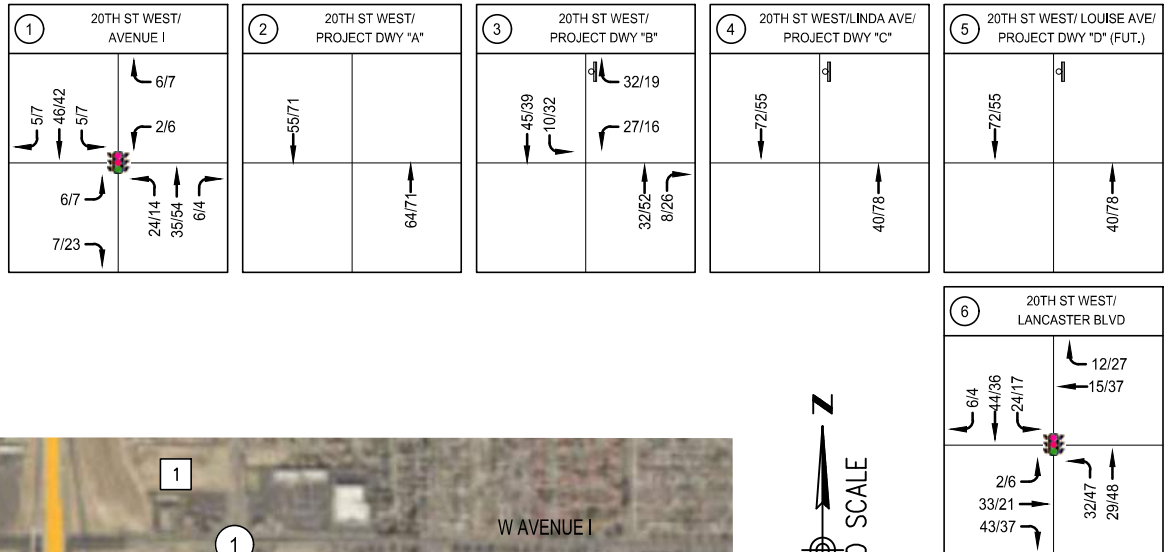
### Background (Cumulative) Traffic Analysis

The Background (Cumulative) Conditions intersection capacity analysis utilized existing intersection geometrics and the projected AM and PM peak hour traffic shown in **Figure 13**. **Table 11** and **Appendix B** provides the results of the analysis.

The California Manual of Uniform Traffic Control Devices (MUTCD) 2014 Edition Traffic Signal Warrant were evaluated for the intersection of 20th Street West and Project Driveway “B.” The intersection does not meet the warrants under the Background Conditions. The Traffic Signal Warrant Analysis Worksheets are provided in **Appendix C** of this report.

The California Manual of Uniform Traffic Control Devices (MUTCD) 2014 Edition Traffic Signal Warrant were evaluated for the intersection of 20th Street West and Linda Avenue/ Project Driveway “C.” The intersection does not meet the warrants under the Background Conditions. The Traffic Signal Warrant Analysis Worksheets are provided in **Appendix C** of this report.



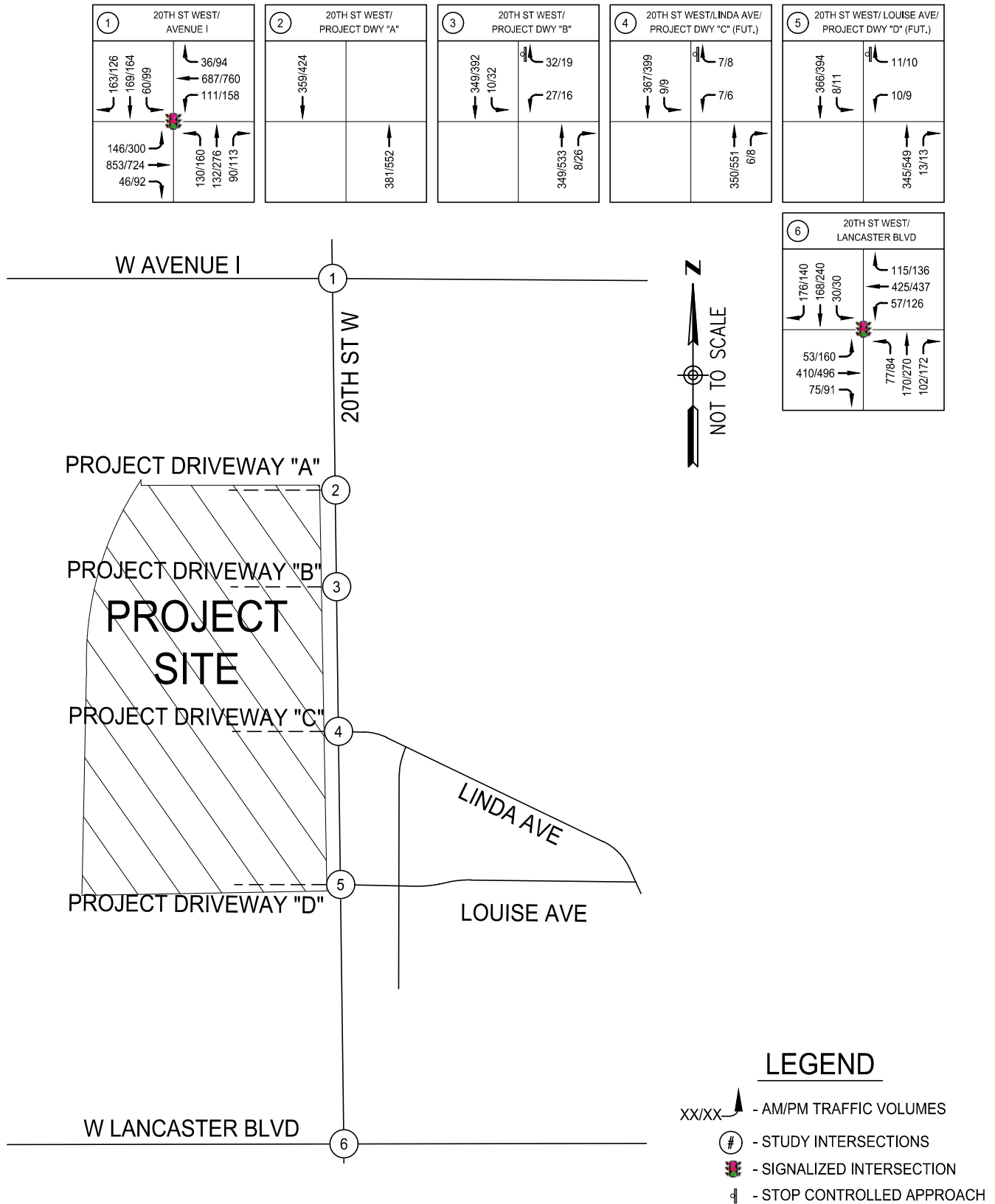


### OTHER AREA PROJECT TRIPS

AM PEAK PERIOD - 1,966 IN / 1,252 OUT  
PM PEAK PERIOD - 1,555 IN / 2,189 OUT

### LEGEND

- XX/XX - AM/PM OTHER AREA PROJECT TRIP
- ① - STUDY INTERSECTIONS
- SIGNALIZED INTERSECTION
- STOP CONTROLLED APPROACH
- ② - OTHER AREA PROJECTS



**FIGURE 13: BACKGROUND (CUMULATIVE)  
TRAFFIC VOLUMES  
LANCASTER PROMENADE  
LANCASTER, CALIFORNIA**

The Multi-Family Housing (SPR 20-4) main project entrance aligns with the Proposed Lancaster Promenade Project Driveway “B”. Under Background Conditions, the intersection of 20th Street West and Project Driveway “B”/Driveway is evaluated as Side-Street-Stop-Control on the east leg. The background geometrics are illustrated in **Figure 14**.

Table 11: Intersection Capacity Analysis – Background (Cumulative) Conditions

Intersection		Intersection Control Type	AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
1	20th Street West and Avenue I	Signal	29.9	C	38.9	D
2	20th Street West and Project Driveway “A”	SSSC/ Driveway	N/A	N/A	N/A	N/A
3	20th Street West and Project Driveway “B”/ Aligned Project Driveway	SSSC/ Driveway	14.9	B	22.4	C
4	20th Street West and Linda Avenue/ Project Driveway “C”	SSSC	14.1	B	19.6	C
5	20th Street West and Louise Avenue/ Project Driveway “D”	SSSC	14.6	B	20.4	C
6	20th Street West and Lancaster Blvd	Signal	17.9	B	20.6	C
SSSC Side Street Stop Controlled Intersection Delay – seconds per vehicle LOS – Level of Service						

Source: David Evans and Associates, Inc.

As presented in **Table 11**, under Background (Cumulative) traffic conditions the study intersections would operate acceptably with existing and anticipated background geometrics.

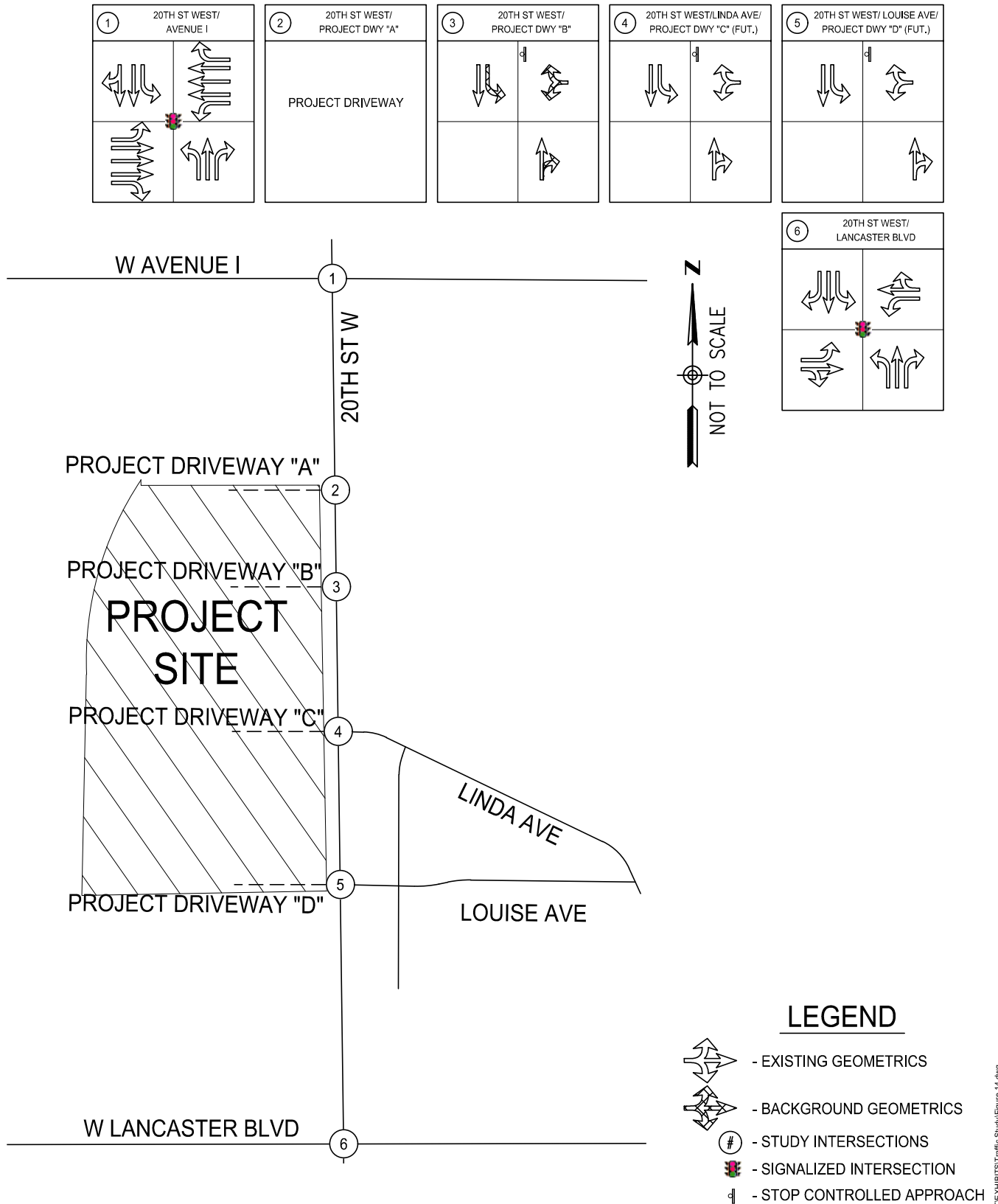


FIGURE 14: BACKGROUND CONDITION  
INTERSECTION GEOMETRICS  
LANCASTER PROMENADE  
LANCASTER, CALIFORNIA

## 6 PROJECT TRAFFIC CONDITIONS

The first phase of the proposed project is planned to open in the year 2022. Under Project Conditions, the estimated project trips were added to the Background (Cumulative) Condition traffic volumes resulting in the traffic volumes illustrated in **Figure 15**.

### Project Conditions Traffic Analysis

The intersection capacity analysis of Project Conditions utilized existing and proposed intersection geometrics and the projected AM and PM peak hour traffic volumes. **Table 12** and **Appendix B** provide the results of the analysis.

The California Manual of Uniform Traffic Control Devices (MUTCD) 2014 Edition Traffic Signal Warrant were evaluated for the intersection of 20th Street West and Project Driveway "B." The intersection does not meet the warrants under the Project Conditions. The Traffic Signal Warrant Analysis Worksheets are provided in **Appendix C** of this report.

The California Manual of Uniform Traffic Control Devices (MUTCD) 2014 Edition Traffic Signal Warrant were evaluated for the intersection of 20th Street West and Linda Avenue/ Project Driveway "C." The intersection does not meet the warrants under the Project Conditions. The Traffic Signal Warrant Analysis Worksheets are provided in **Appendix C** of this report.

Table 12: Intersection Capacity Analysis – Project Conditions

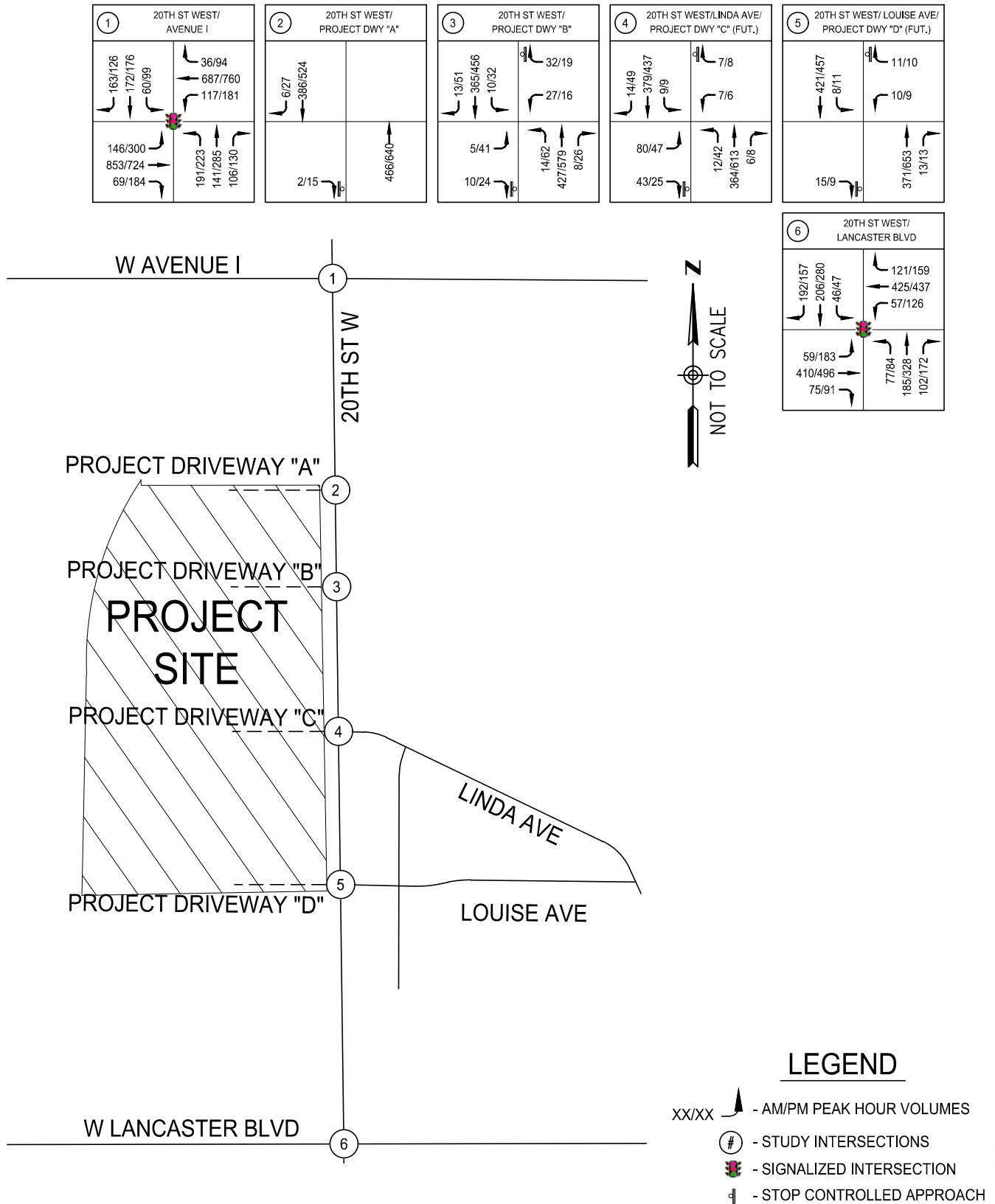
	Intersection	Intersection Control Type	Background Cumulative Condition				Project Condition				Difference		LOS Deficiency	
			AM		PM		AM		PM		AM	PM	AM	PM
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	Delay		
1	20th Street West and Avenue I	Signal	29.9	C	38.9	D	38.2	D	42.2	D	8.3	3.3	No	No
2	20th Street West and Project Driveway "A"	SSSC/ Driveway	N/A	N/A	N/A	N/A	10.7	B	12.9	B	N/A	N/A	No	No
3	20th Street West and Project Driveway "B"	SSSC/ Driveway	14.9	B	22.4	C	17.6	C	76.5	F	2.7	54.1	No	No
4	20th Street West and Linda Avenue/ Project Driveway "C"	SSSC	14.1	B	19.6	C	23.3	C	60.5	F	9.2	40.9	No	No
5	20th Street West and Louise Avenue/ Project Driveway "D"	SSSC	14.6	B	20.4	C	16.1	C	26.2	D	1.5	5.8	No	No
6	20th Street West and Lancaster Blvd	Signal	17.9	B	20.6	C	19.1	B	23.0	C	1.2	2.4	No	No
SSSC Side Street Stop Controlled Intersection Delay – seconds per vehicle LOS – Level of Service Difference in delay between Project Conditions and Background Cumulative Conditions LOS Deficiency as outlined in <b>Table 4</b> and <b>Table 6</b> .														

Source: David Evans and Associates, Inc.

As presented in **Table 12**, under project traffic conditions, the study intersections would operate acceptably with the existing and proposed geometrics at the Project Driveways "A" and "D".

The intersections of 20th Street West / Linda Avenue / Project Driveway "C" and 20th Street West / Project Driveway "B" with side-street-stop-control would operate at LOS F in the PM peak hours. The LOS F is incurred by the combined eastbound left-thru-right lane from the project driveways.

The 20th Street West / Project Driveway "B" and 20th Street West / Linda Avenue / Project Driveway "C" are proposed as a two-lane approach.



**FIGURE 15: PROJECT TRAFFIC VOLUMES  
LANCASTER PROMENADE  
LANCASTER, CALIFORNIA**

**Table 13: Intersection Capacity Analysis – Project Driveway Approach Comparison**

Intersection	Intersection Control Type	Single-Lane Project Driveway				Two-Lane Project Driveway			
		AM		PM		AM		PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
3	20th Street West and Project Driveway "B" / Aligned Project Driveway	17.6	C	76.5	F	17.3	C	76.9	F
4	20th Street West and Linda Avenue/ Project Driveway "C"	23.3	C	60.5	F	17.7	C	77.1	F
SSSC Side Street Stop Controlled Intersection									
Delay – seconds per vehicle									
LOS – Level of Service									

Source: David Evans and Associates, Inc.

In response to comments from the City of Lancaster, **Table 13** compares the analysis of the 20th Street West / Project Driveway "B" and 20th Street West / Linda Avenue / Project Driveway "C" with its proposed single-lane and an alternative two-lane driveway approach. The delay provided in both scenarios is representative of the critical delay from the project driveways.

The two-lane driveway alternative provides an exclusive left-turn lane and shared thru-right lane. Although the critical delay increases for each condition, the two-lane driveway allows right turning vehicles to bypass queued left turning vehicles resulting in an improvement for the right turning vehicles using each driveway.

The project geometrics are illustrated in **Figure 16**.

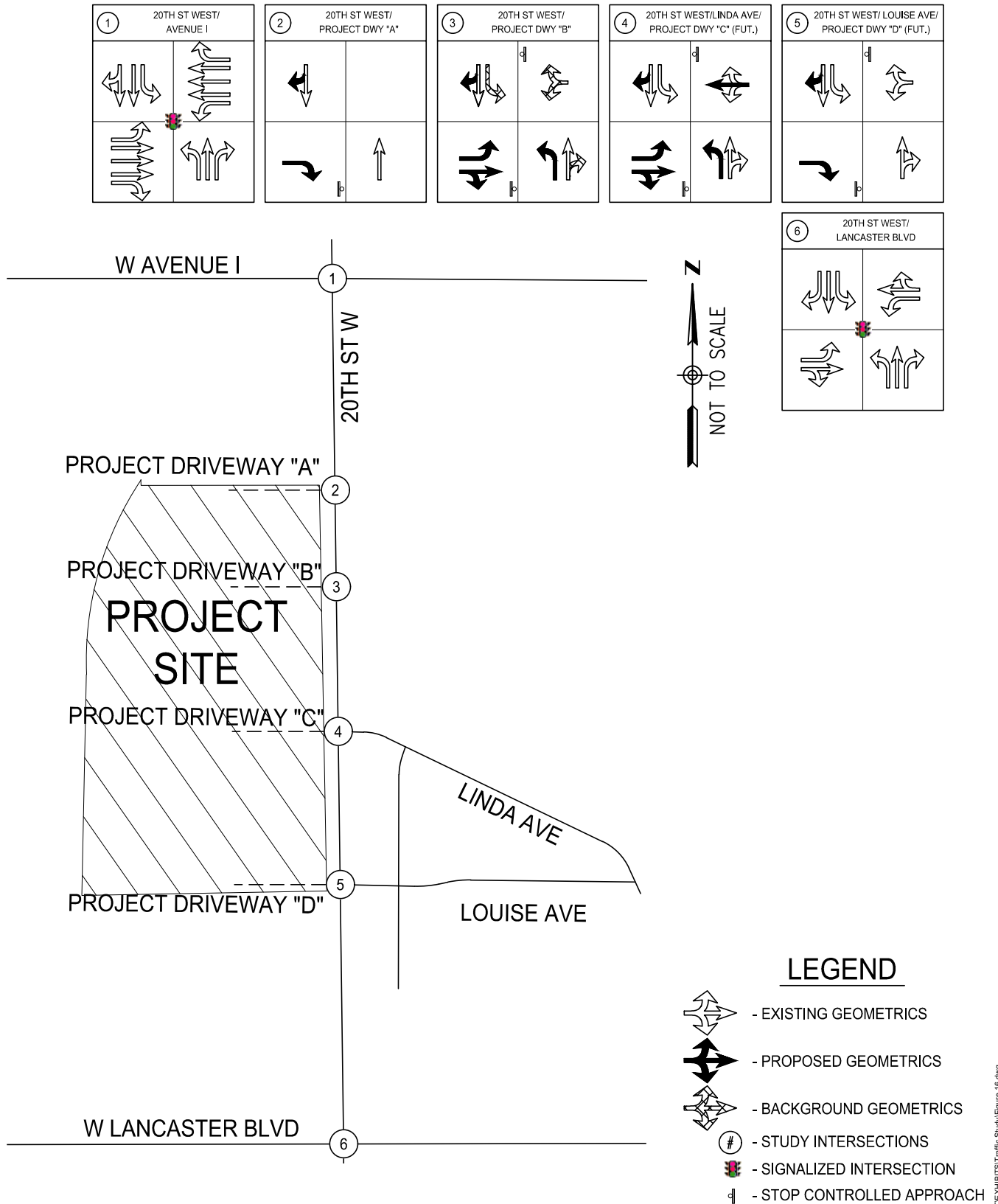


FIGURE 16: PROJECT CONDITION  
INTERSECTION GEOMETRICS  
LANCASTER PROMENADE  
LANCASTER, CALIFORNIA



## **APPENDICES**

Appendix A: Other Area Projects

Appendix B: Intersection Capacity Analysis Calculations

Appendix C: Traffic Signal Warrant Analysis

Appendix D: Justification for VMT Analysis Waiver