

TRAFFIC IMPACT ANALYSIS REPORT
WHITEWOOD MULTI-FAMILY DEVELOPMENT
Murrieta, California
November 4, 2021
(Revision of August 16, 2021 Report)

Prepared for:
KNE Real Estate
217 Medano Street
Rancho Mission Viejo, CA 92694

LLG Ref. 2-21-4392-1



Prepared by:
Justin Tucker, P.E.
Transportation Engineer II

Under the Supervision of:
Daniel A. Kloos, P.E.
Associate Principal

**Linscott, Law &
Greenspan, Engineers**
1580 Corporate Drive
Suite 122
Costa Mesa, CA 92626
714.641.1587 T
714.641.0139 F
www.llgengineers.com

TABLE OF CONTENTS

SECTION	PAGE
Executive Summary	vi
1.0 Introduction.....	1
1.1 Study Area	2
2.0 Project Description and Location.....	3
2.1 Site Access	3
3.0 Existing Conditions.....	4
3.1 Existing Street Network	4
3.2 Existing Public Transit	5
3.3 Pedestrian/Bicycle Trails.....	5
3.4 Existing Traffic Volumes	5
3.5 Existing Intersection Conditions	6
3.5.1 Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections).....	6
3.5.2 Highway Capacity Manual (HCM) Method of Analysis (Unsignalized Intersections)	7
3.5.2.1 Two-Way Stop-Controlled Intersections	7
3.5.2.2 All-Way Stop-Controlled Intersections	7
3.5.3 Volume to Capacity (V/C) Ratio Method of Analysis (Roadway Segments)	7
3.6 Level of Service Criteria	8
4.0 Traffic Forecasting Methodology	13
5.0 Project Traffic Characteristics	14
5.1 Project Traffic Generation.....	14
5.2 Project Traffic Distribution and Assignment	14
5.3 Existing Plus Project Traffic Conditions.....	15
6.0 Future Traffic Conditions	17
6.1 Ambient Traffic Growth.....	17
6.2 Cumulative Project Traffic Characteristics	17
6.3 Year 2023 Traffic Volumes.....	17
7.0 Traffic Impact Analysis Methodology	20
7.1 Impact Criteria and Thresholds	20
7.2 Traffic Impact Analysis Scenarios	21

TABLE OF CONTENTS (CONTINUED)

SECTION	PAGE
8.0 Existing Plus Project Analysis	22
8.1 Intersections.....	22
8.1.1 Existing Traffic Conditions.....	22
8.1.2 Existing Plus Project Traffic Conditions	22
8.2 Roadway Segments	22
8.2.1 Existing Traffic Conditions.....	23
8.2.2 Existing Plus Project Traffic Conditions	23
9.0 Year 2023 Plus Project Analysis.....	26
9.1 Intersections.....	26
9.1.1 Year 2023 Cumulative Traffic Conditions	26
9.1.2 Year 2023 Cumulative Plus Project Traffic Conditions	26
9.2 Roadway Segments	27
9.2.1 Year 2023 Cumulative Traffic Conditions	27
9.2.2 Year 2023 Cumulative Plus Project Traffic Conditions	27
10.0 Caltrans Facilities Analysis.....	30
10.1 Ramp Intersection Capacity Analysis	30
11.0 Site Access and Internal Circulation Evaluation	31
11.1 Level of Service Analysis For Project Access Locations.....	31
11.2 Internal Circulation Evaluation	31
12.0 Area-Wide Traffic Improvements.....	33
12.1 Existing Plus Project Recommended Improvements	33
12.2 Year 2023 Plus Project Recommended Improvements	33
13.0 Project-Related Fair Share Contribution.....	34
13.1 Year 2023 Project-Related Fair Share Contribution	34
14.0 Multimodal Circulation.....	36

APPENDICES

APPENDIX

- A. Approved Traffic Study Scope of Work
- B. Existing Public Transit Routes
- C. Existing Traffic Count Data
- D. Existing Plus Project Level of Service Calculation Worksheets
- E. Year 2023 Cumulative Plus Project Level of Service Calculation Worksheets
- F. Project Driveway Level of Service Calculation Worksheets

LIST OF FIGURES

SECTION-FIGURE#	FOLLOWING PAGE
1-1 Vicinity Map	2
2-1 Existing Site Aerial	3
2-2 Proposed Site Plan	3
3-1 Existing Roadway Conditions and Intersection Controls.....	4
3-2 Existing AM Peak Hour Traffic Volumes.....	6
3-3 Existing PM Peak Hour and Daily Traffic Volumes.....	6
5-1 Project Trip Distribution Pattern (North Units).....	16
5-2 Project Trip Distribution Pattern (South Units).....	16
5-3 AM Peak Hour Project Traffic Volumes.....	16
5-4 PM Peak Hour and Daily Project Traffic Volumes.....	16
5-5 Existing Plus Project AM Peak Hour Traffic Volumes	16
5-6 Existing Plus Project PM Peak Hour and Daily Traffic Volumes	16
6-1 Location of Cumulative Projects	19
6-2 AM Peak Hour Cumulative Projects Traffic Volumes	19
6-3 PM Peak Hour and Daily Cumulative Projects Traffic Volumes	19
6-4 Year 2023 Cumulative AM Peak Hour Traffic Volumes	19
6-5 Year 2023 Cumulative PM Peak Hour and Daily Traffic Volumes	19
6-6 Year 2023 Cumulative Plus Project AM Peak Hour Traffic Volumes.....	19
6-7 Year 2023 Cumulative Plus Project PM Peak Hour and Daily Traffic Volumes	19
12-1 Year 2023 Cumulative Plus Project Conditions Recommended Improvements	33

LIST OF TABLES

SECTION-TABLE#	PAGE
3-1 Level of Service Criteria For Signalized Intersections (HCM)	9
3-2 Level of Service Criteria For Unsignalized Intersections (HCM)	10
3-3 Daily Roadway Segment Capacities	11
3-4 Level of Service Criteria For Roadway Segments (V/C Methodology).....	12
5-1 Project Traffic Generation Rates and Forecast.....	16
6-1 Location and Description of Cumulative Projects.....	18
6-2 Cumulative Projects Traffic Generation Forecast	19
8-1 Existing Plus Project Peak Hour Intersection Capacity Analysis Summary	24
8-2 Existing Plus Project Daily Roadway Segment Analysis Summary	25
9-1 Year 2023 Cumulative Plus Project Peak Hour Intersection Capacity Analysis Summary	28
9-2 Year 2023 Cumulative Plus Project Daily Roadway Segment Analysis Summary	29
11-1 Project Driveway Peak Hour Levels of Service Summary	32
13-1 Year 2023 Project Fair Share Contribution	35

EXECUTIVE SUMMARY

- **Project Description** – The Project site is located on the southeast corner of the intersection of Whitewood Road and Linnel Lane/Lee Lane in the City of Murrieta, California. The proposed Project will consist of a 324-unit multi-family apartment complex. Of this total, 116 units are located on the north side of the project site (i.e. north units) and 208 units are located on the south side of the project site (i.e. south units). The Project is expected to be completed and fully occupied by the Year 2023.

Vehicular access to the 116 north units will be provided via one (1) full access unsignalized driveway located along Lee Lane (i.e. Project Driveway No. 1) and via one (1) right-turn in/right-turn out only unsignalized driveway located along Whitewood Road (i.e. Project Driveway No. 2). Vehicular access to the 208 south units will be provided via one (1) right-turn in/right-turn out only unsignalized driveway located along Whitewood Road (i.e. Project Driveway No. 3) and via one (1) full access unsignalized driveway located along Greenburg Place (i.e. Project Driveway No. 4).

- **Study Scope** – The seven (7) key study intersections, four (4) Project driveways, and two (2) key roadway segments selected for evaluation were determined based on coordination with City of Murrieta Traffic Engineering staff. The intersections and roadway segments listed below provide local access to the study area and define the extent of the boundaries for this traffic impact investigation.

<u>Key Study Intersections</u>
1. Whitewood Road at Baxter Road
2. Whitewood Road at Linnel Lane/Lee Lane
3. Whitewood Road at Mendham Street/Greenberg Place
4. I-215 SB Ramps at Clinton Keith Road
5. I-215 NB Ramps at Clinton Keith Road
6. Warm Springs Parkway/Bronco Court at Clinton Keith Road
7. Whitewood Road at Clinton Keith Road
8. Project Driveway No. 1 at Lee Lane (Future)
9. Whitewood Road at Project Driveway No. 2 (Future)
10. Whitewood Road at Project Driveway No. 3 (Future)
11. Project Driveway No. 4 at Greenburg Place (Future)
<u>Key Roadway Segments</u>
A. Whitewood Road between Linnel Lane/Lee Lane and Greenburg Place
B. Clinton Keith Road between I-215 NB Ramps and Warm Springs Parkway/Bronco Court

- **Project Trip Generation** – The proposed Project is forecast to generate approximately 2,372 daily trips, with 149 trips (34 inbound, 115 outbound) produced in the AM peak hour and 181 trips (114 inbound, 67 outbound) produced in the PM peak hour on a “typical” weekday.

- **Cumulative Projects Trip Generation** – The twelve (12) cumulative projects are forecast to generate a total of 42,844 daily trips, with 1,835 trips (1,064 inbound and 771 outbound) forecast during the AM peak hour and 3,715 trips (1,777 inbound and 1,938 outbound) forecast during the PM peak hour.
- **Existing Traffic Conditions** – One (1) of the seven (7) key study intersections currently operates at an unacceptable level of service during the PM peak hour. The intersection of Whitewood Road at Mendham Street/Greenberg Place currently operates at unacceptable LOS F during the PM peak hour. The remaining six (6) key study intersections currently operate at acceptable LOS D or better during the AM and PM peak hours.

The two (2) key roadway segments currently operate at acceptable LOS B or better on a daily basis.

- **Existing Plus Project Traffic Conditions** – The proposed Project will not significantly impact any of the seven (7) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Whitewood Road at Mendham Street/Greenberg Place is forecast to operate at unacceptable LOS F during the PM peak hour, this intersection is not impacted per the significant impact criteria specified in this report, as the peak hour traffic signal warrant is not satisfied. The remaining six (6) key study intersections currently operate and are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of Project generated traffic to existing traffic.

The traffic associated with the proposed Project will not significantly impact the two (2) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. The two (2) key roadway segments currently operate and are forecast to continue to operate at an acceptable service level on a daily basis with the addition of Project generated traffic to existing traffic.

- **Year 2023 Cumulative Traffic Conditions** – The addition of ambient traffic growth and cumulative project traffic will adversely impact two (2) of the seven (7) key study intersections. The remaining five (5) key study intersections are forecast to continue to operate at acceptable levels of service during the AM and PM peak hours with the addition of ambient traffic growth and cumulative project traffic. The locations forecast to operate at an adverse LOS are as follows:

<u>Key Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>HCM</u>	<u>LOS</u>	<u>HCM</u>	<u>LOS</u>
3. Whitewood Road at Mendham Street/Greenberg Place	---	---	107.1 s/v	F
7. Whitewood Road at Clinton Keith Road	62.8 s/v	E	89.0 s/v	F

With the addition of ambient traffic growth and cumulative project traffic, one (1) of the two (2) key roadway segments is forecast to operate at an adverse level of service. The one (1) location that is forecast in the Year 2023 to operate at an adverse LOS is as follows:

<u>Key Roadway Segment</u>	<u>V/C</u>	<u>LOS</u>
B. Clinton Keith Rd between I-215 NB Ramps and Warm Springs Pkwy/Bronco Ct	0.983	E

The remaining one (1) key roadway segment is forecast to continue to operate at an acceptable level of service on a daily basis with the addition of ambient traffic growth and cumulative projects traffic.

- ***Year 2023 Cumulative Plus Project Traffic Conditions*** – The traffic associated with the proposed Project will cumulatively impact one (1) of the seven (7) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Whitewood Road at Mendham Street/Greenberg Place is forecast to operate at unacceptable LOS F during the PM peak hour, this intersection is not impacted per the significant impact criteria specified in this report, as the peak hour traffic signal warrant is not satisfied. The remaining five (5) key study intersections are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of Project generated traffic in the Year 2023. The location cumulatively impacted by the proposed Project in the Year 2023 is as follows:

<u>Key Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>HCM</u>	<u>LOS</u>	<u>HCM</u>	<u>LOS</u>
7. Whitewood Road at Clinton Keith Road	71.7 s/v	E	101.6 s/v	F

As shown in column (5), the implementation of improvements at the impacted key study intersection of Whitewood Road at Clinton Keith Road completely offsets the impact of project traffic.

The traffic associated with the proposed Project ***will not*** significantly impact the two (2) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segment B is forecast to operate on a daily basis at unacceptable LOS F with the addition of Project traffic, the proposed Project is expected to add less than 0.050 to the V/C ratio. The remaining one (1) key roadway segment is forecast to continue to operate at an acceptable service level on a daily basis with the addition of project generated traffic in the Year 2023 traffic condition.

- ***Caltrans Facilities Analysis*** – The two (2) state-controlled key study intersections are forecast to operate at acceptable LOS D or better during AM and PM peak hours under Existing Plus Project Traffic Conditions and Year 2023 Cumulative Plus Project Traffic Conditions. As such, the proposed Project will not impact the two (2) state-controlled key study intersections.
- ***Site Access and Internal Circulation Evaluation*** – The four (4) Project Driveways are forecast to operate at acceptable LOS C or better during the AM and PM peak hours for near-term (Year 2023) cumulative traffic conditions. As such, project access will be adequate. Motorists entering and exiting the Project site will be able to do so comfortably, safely, and without undue congestion.

Based on our review of the proposed site plan, the on-site circulation layout of the proposed Project on an overall basis is adequate. Curb return radii have been confirmed and are generally adequate for passenger cars, emergency vehicles, and trash/delivery (FedEx, UPS) trucks.

- ***Existing Plus Project Recommended Improvements*** – The proposed Project will not significantly impact any of the seven (7) key study intersections or two (2) key roadway segments under the “Existing Plus Project” traffic scenario. Given that there are no significant project impacts, no improvements are required under this traffic scenario.
- ***Year 2023 Cumulative Plus Project Recommended Improvements*** – The following improvements listed below have been identified to improve the “Year 2023 Cumulative Plus Project” impact at the one (1) cumulatively impacted key study intersection:
 - Intersection No. 7 – Whitewood Road at Clinton Keith Road: Widen and/or restripe the northbound approach along Whitewood Road to provide a second exclusive northbound left-turn lane. Widen and/or restripe the southbound approach along Whitewood Road to provide a second exclusive southbound left-turn lane. Modify the existing traffic signal, as necessary.

The results of the “Year 2023 Plus Project” daily roadway segment analysis indicates that the proposed Project will not significantly impact any of the two (2) key roadway segments. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

- ***Year 2023 Project-Related Fair Share Contribution*** – The Project’s traffic percentage at the one (1) cumulatively impacted key study intersection is 16.8% for intersection #7 (Whitewood Road at Clinton Keith Road).
- ***Multimodal Circulation*** – Refer to Section 14.0 of the report for specific details on Multimodal Circulation.

TRAFFIC IMPACT ANALYSIS REPORT
WHITEWOOD MULTI-FAMILY DEVELOPMENT
Murrieta, California
November 4, 2021
(Revision of August 16, 2021 Report)

1.0 INTRODUCTION

This traffic impact analysis addresses the potential traffic impacts and circulation needs associated with the proposed Whitewood Multi-Family Development (hereinafter referred to as Project). The Project site is located on the southeast corner of the intersection of Whitewood Road and Linnel Lane/Lee Lane in the City of Murrieta, California. The proposed Project will consist of a 324-unit multi-family apartment complex. Of this total, 116 units are located on the north side of the project site and 208 units are located on the south side of the project site.

This traffic report documents the findings and recommendations of a traffic impact analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the potential impacts associated with the proposed Project. The traffic analysis evaluates the existing operating conditions at seven (7) key study intersections and two (2) key roadway segments within the project vicinity, estimates the trip generation potential of the proposed Project, and forecasts future opening year (Year 2023) operating conditions without and with the proposed Project. Where necessary, intersection and/or roadway segment improvement measures are identified.

This traffic report satisfies the *City of Murrieta Traffic Impact Analysis Preparation Guidelines*, dated May 2020. The Scope of Work for this traffic study, which is included in **Appendix A**, was developed in conjunction with City of Murrieta Traffic Engineering staff.

The Project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing traffic information has been collected at seven (7) key study intersections and two (2) key roadway segments on a “typical” weekday for use in the preparation of intersection and roadway segment level of service calculations. Information concerning cumulative projects (planned and/or approved) in the vicinity of the proposed Project has been researched at the City of Murrieta and the County of Riverside. Based on our research, there are eleven (11) cumulative projects located in the City of Murrieta and one (1) cumulative project in the County of Riverside. The twelve (12) cumulative projects were considered in the cumulative traffic analysis for this project.

This traffic report analyzes existing and future daily, AM peak hour and PM peak hour traffic conditions for an opening year (Year 2023) traffic setting upon completion of the proposed Project. Peak hour traffic forecasts for the Year 2023 horizon year have been projected by increasing existing traffic volumes by an annual growth rate of 2.0% per year and adding traffic volumes generated by twelve (12) cumulative projects.

1.1 Study Area

The seven (7) key study intersections, four (4) Project driveways, and two (2) key roadway segments selected for evaluation were determined based on coordination with City of Murrieta Traffic Engineering staff. The intersections and roadway segments listed below provide local access to the study area and define the extent of the boundaries for this traffic impact investigation. It should be noted that the four (4) Project driveways are evaluated later in this report (i.e. Section 11.0).

<u>Key Study Intersections</u>
1. Whitewood Road at Baxter Road
2. Whitewood Road at Linnel Lane/Lee Lane
3. Whitewood Road at Mendham Street/Greenberg Place
4. I-215 SB Ramps at Clinton Keith Road
5. I-215 NB Ramps at Clinton Keith Road
6. Warm Springs Parkway/Bronco Court at Clinton Keith Road
7. Whitewood Road at Clinton Keith Road
8. Project Driveway No. 1 at Lee Lane (Future)
9. Whitewood Road at Project Driveway No. 2 (Future)
10. Whitewood Road at Project Driveway No. 3 (Future)
11. Project Driveway No. 4 at Greenberg Place (Future)
<u>Key Roadway Segments</u>
A. Whitewood Road between Linnel Lane/Lee Lane and Greenburg Place
B. Clinton Keith Road between I-215 NB Ramps and Warm Springs Parkway/Bronco Court

Figure 1-1 presents a Vicinity Map, which illustrates the general location of the proposed Project and depicts the study locations and surrounding street system. The Level of Service (LOS) investigations at these key locations were used to evaluate the potential traffic-related impacts associated with area growth, cumulative projects and the proposed Project. When necessary, this report recommends intersection improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service and/or off-set the impact of the project.

Included in this Traffic Impact Analysis are:

- Existing traffic counts,
- Estimated project traffic generation/distribution/assignment,
- Estimated cumulative project traffic generation/distribution/assignment,
- Daily, AM and PM peak hour capacity analyses for existing conditions,
- Daily, AM and PM peak hour capacity analyses for existing plus project conditions,
- Daily, AM and PM peak hour capacity analyses for future (Year 2023) conditions without and with project traffic,
- Caltrans Analysis,
- Site Access and Internal Evaluation,
- Recommended Improvements,
- Project-Related Fair Share Contribution, and
- Multimodal Circulation.

2.0 PROJECT DESCRIPTION AND LOCATION

The Project site is located on the southeast corner of the intersection of Whitewood Road and Linnel Lane/Lee Lane in the City of Murrieta, California. **Figure 2-1** presents an existing aerial photograph of the Project site, which is currently vacant.

The proposed Project will consist of a 324-unit multi-family apartment complex. Of this total, 116 units are located on the north side of the project site (i.e. north units) and 208 units are located on the south side of the project site (i.e. south units). The Project is expected to be completed and fully occupied by the Year 2023. **Figure 2-2** illustrates the proposed site plan for the proposed Project.

2.1 Site Access

As shown in *Figure 2-2*, vehicular access to the 116 north units will be provided via one (1) full access unsignalized driveway located along Lee Lane (i.e. Project Driveway No. 1) and via one (1) right-turn in/right-turn out only unsignalized driveway located along Whitewood Road (i.e. Project Driveway No. 2). Vehicular access to the 208 south units will be provided via one (1) right-turn in/right-turn out only unsignalized driveway located along Whitewood Road (i.e. Project Driveway No. 3) and via one (1) full access unsignalized driveway located along Greenburg Place (i.e. Project Driveway No. 4).



n:\4300\2214392 - whitewood multi-family development, murrieta\dwg\4392 f2-1.dwg LDP 09:50:40 05-12-2021 agular



NO SCALE

SOURCE: GOOGLE

KEY


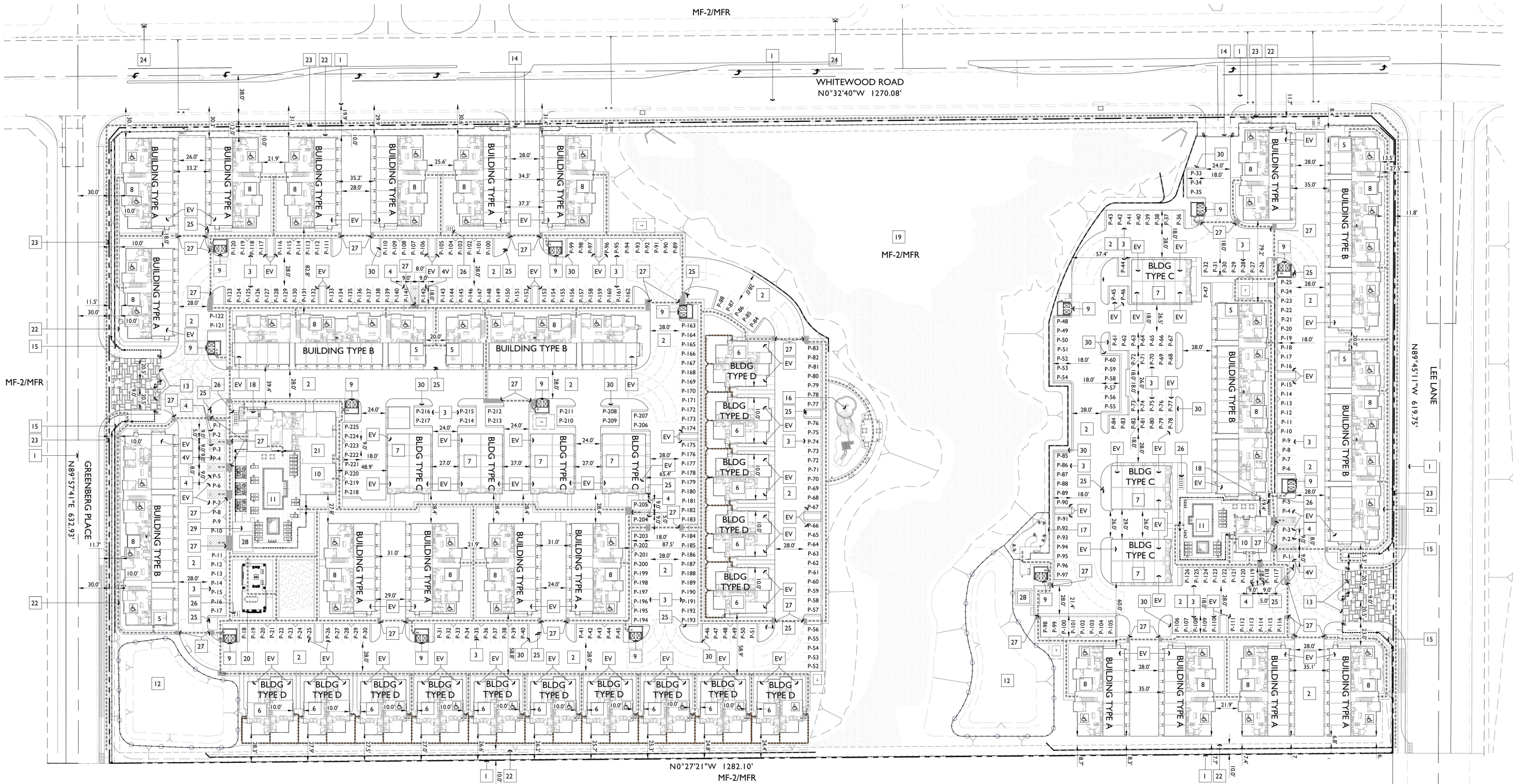
 = PROJECT SITE

FIGURE 2-1

EXISTING SITE AERIAL

WHITEWOOD MULTI-FAMILY DEVELOPMENT, MURRIETA



n:\4300\2214392 - whitewood multi-family development, murrieta\dwg\4392 f2-2.dwg LDP 17:04:34 11-03-2021 tucker

3.0 EXISTING CONDITIONS

3.1 Existing Street Network

The I-215 Freeway provides regional access to the Project site. The principal local network of streets serving the Project site includes Whitewood Road and Clinton Keith Road. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

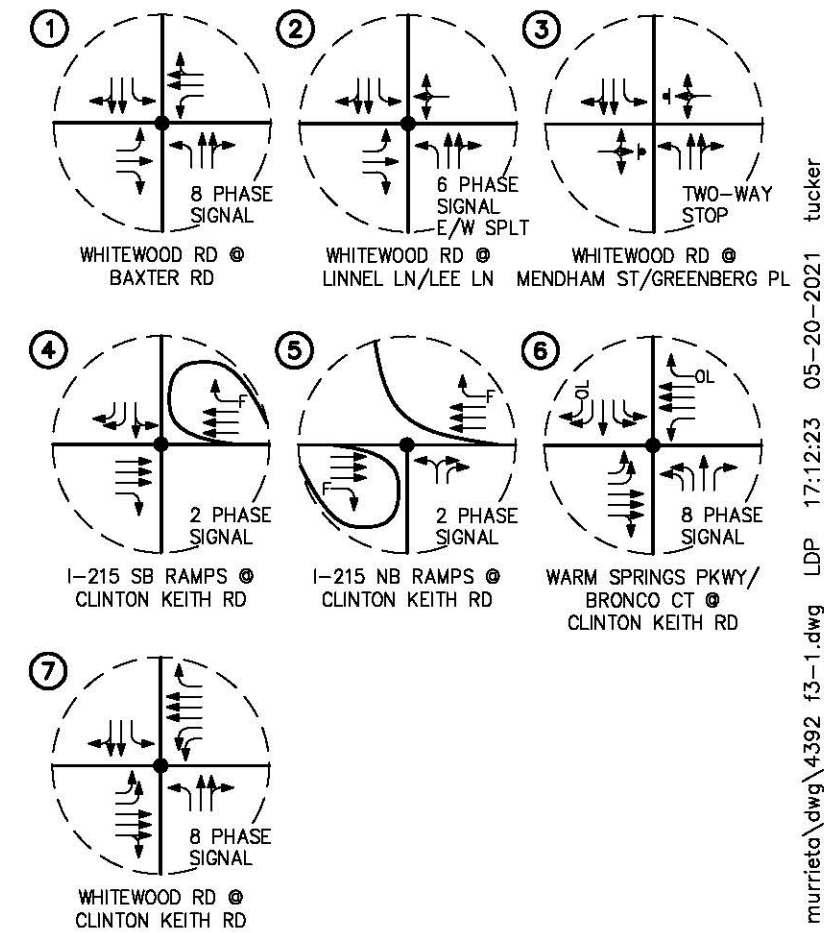
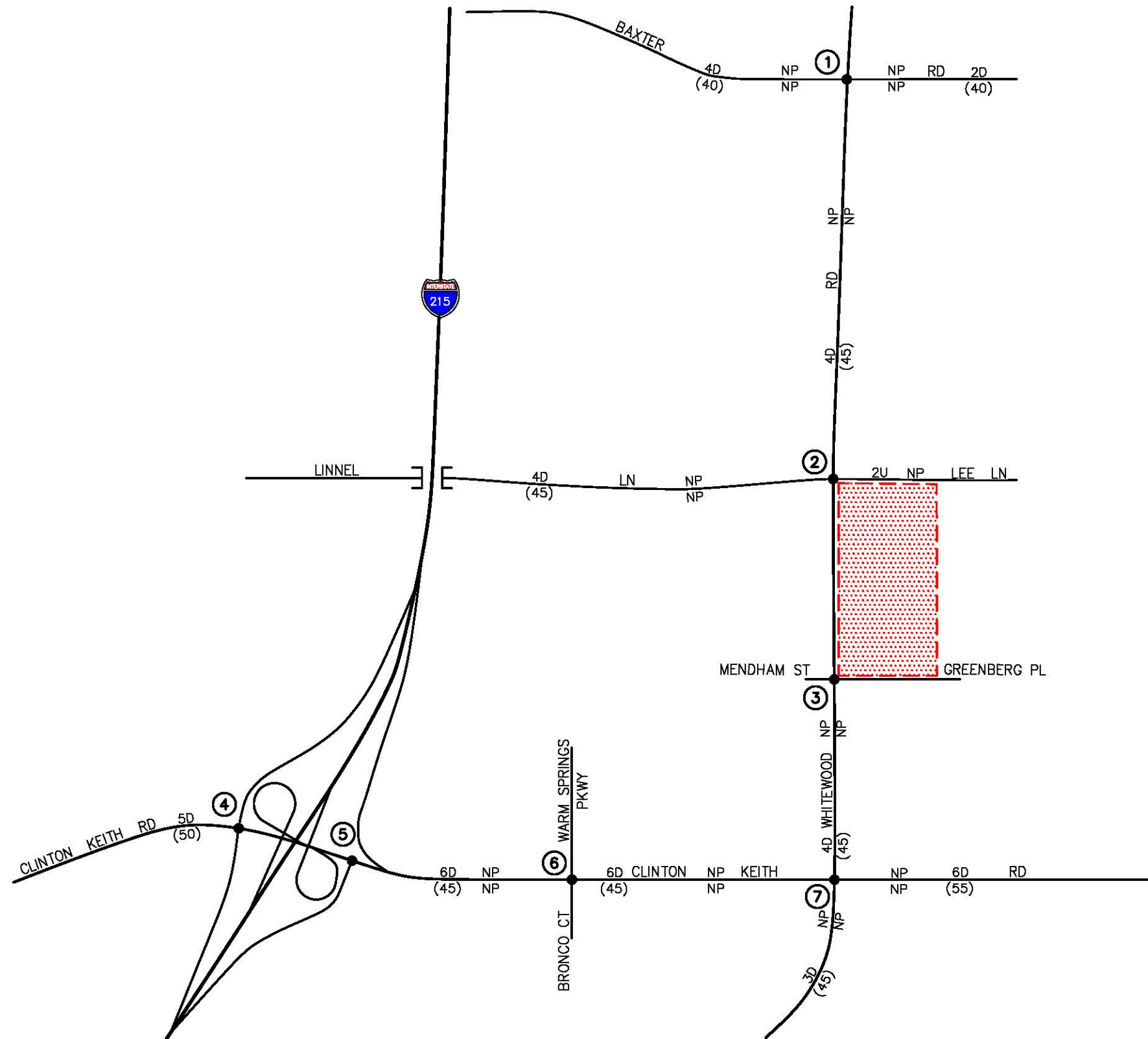
Whitewood Road is generally a four-lane roadway with two-way-left-turn lanes in the vicinity of the Project between Clinton Keith Road and Linnel Lane/Lee Lane, oriented in the north-south direction. Whitewood Road borders the Project site to the west with an ultimate classification as a four-lane major roadway. The posted speed limit on Whitewood Road is 45 miles per hour (mph). On-street parking is generally not permitted on both sides of the roadway in the vicinity of the Project. Traffic signals control the study intersections of Whitewood Road at Baxter Road, Linnel Lane/Lee Lane and Clinton Keith Road. The Mendham Street/Greenberg Place eastbound and westbound approaches to Whitewood Road are stop-controlled.

Clinton Keith Road is generally a six-lane, divided roadway in the vicinity of the Project, oriented in the east-west direction. Clinton Keith Road has an ultimate classification as a six-lane urban arterial between the I-215 and Winchester Road. The posted speed limit on Clinton Keith Road is 50 mph west of the I-215 SB Ramps, 45 mph between the I-215 NB Ramps and Whitewood Road and 55 mph east of Whitewood Road. On-street parking is generally not permitted on both sides of the roadway in the vicinity of the Project. Traffic signals control the study intersections of Clinton Keith Road at the I-215 SB Ramps, the I-215 NB Ramps, Warm Springs Parkway/Bronco Court and Whitewood Road.

Linnel Lane/Lee Lane is generally a four-lane, divided roadway west of Whitewood Road to the I-215, and a two-lane, undivided roadway east of Whitewood Road, oriented in the east-west direction. Linnel Lane/Lee Lane borders the Project site to the north with an ultimate classification as a four-lane secondary roadway. The posted speed limit on Linnel Lane is 45 mph. On-street parking is not permitted on both sides of the roadway in the vicinity of the Project. A traffic signal controls the study intersection of Linnel Lane/Lee Lane at Whitewood Road.

Greenberg Place is a two-lane, undivided roadway east of Whitewood Road, oriented in the east-west direction. Greenberg Place borders the Project site to the south and is located opposite of Mendham Street. Greenberg Place currently does not provide any outlet and does not have an ultimate classification assigned. The Mendham Street/Greenberg Place eastbound and westbound approaches to Whitewood Road are stop-controlled.

Figure 3-1 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area study intersections.



n:\4300\2214392 - whitewood multi-family development, murrieta\dwg\4392 f3-1.dwg LDP 17:12:23 05-20-2021 tucker

KEY

- ① = STUDY INTERSECTION
- = APPROACH LANE ASSIGNMENT
- = TRAFFIC SIGNAL, ▼ = STOP SIGN
- P = PARKING, NP = NO PARKING
- U = UNDIVIDED, D = DIVIDED
- 2 = NUMBER OF TRAVEL LANES
- (XX) = POSTED SPEED LIMIT (MPH)
- F = FREE-RIGHT
- OL = OVERLAP
- [Red Hatched Box] = PROJECT SITE

FIGURE 3-1

EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

WHITEWOOD MULTI-FAMILY DEVELOPMENT, MURRIETA

3.2 Existing Public Transit

The Riverside Transit Agency (RTA) operates within the study area. A description of the transit services within the Project vicinity are as follows:

Riverside Transit Agency (RTA)

City Route 61:

- Route 61 provides service from Perris to Temecula; via Promenade Mall, Hancock & Los Alamos, McElwain at Super Target, Mt. San Jacinto College Menifee, Cherry Hills & Bradley, Encanto & McCall, and Perris Station Transit Center.
- The route traverses the cities of Perris, Menifee, Murrieta, and Temecula.
- During the weekday AM and PM peak hours, Route 61 has approximate headways of 80 minutes in the northbound and southbound directions.

Appendix B contains the most current public transit route schedules and maps for the aforementioned bus route. It should be noted that the bus stops nearest to the Project site are located along Clinton Keith Road, just east of Bronco Way on the south side of the roadway and just west of Bronco Way on the north side of the roadway.

3.3 Pedestrian/Bicycle Trails

Whitewood Road, between Keller Road and Clinton Keith Road, is currently a Class II: Striped Bike Lane (On-Road), providing an exclusive roadway space for cyclists, demarcated through pavement marking and signage. Linnel Lane, west of Whitewood Road, does not currently have any designated bicycle facilities implemented.

Pedestrian connection to the surrounding residential developments is provided via existing public sidewalks along the west side of Whitewood Road in the vicinity of the Project. The intersection of Whitewood Road at Linnel Lane/Lee Lane currently provides crosswalks along the western, southern, and eastern legs which provides pedestrians safe and convenient access from the Project site across Whitewood Road and/or Linnel Lane/Lee Lane. It should be noted that future sidewalks along the Project frontage on Whitewood Road, Lee Lane and Greenberg Place will be installed in conjunction with the Project.

3.4 Existing Traffic Volumes

Due to the COVID-19 Coronavirus Pandemic, historical counts were researched for the seven (7) key study intersections and two (2) roadway segments evaluated in this report but were only available for key study intersections #1, #2, #4, #5, and #7, as well as the two (2) roadway segments. Specifically, the historical traffic counts for intersection #1 were conducted by Counts Unlimited on December 12, 2018 and the historical traffic counts for intersection #2, #4, #5, and #7 were conducted by Counts Unlimited on February 26, 2019. The historical traffic counts for roadway segments A and B were conducted by Counts Unlimited on October 23, 2018 (Roadway Segment B was also conducted by Counts Unlimited on December 6, 2018 and the larger volume was used to provide for a conservative analysis).

Due to the absence of available historical traffic count data for intersections #3 and #6, traffic counts at these two (2) locations were conducted by Counts Unlimited on April 27, 2021. Given that these traffic counts were conducted during the COVID-19 Coronavirus Pandemic, the traffic counts were grown by a derived factor to establish Year 2021 existing baseline traffic conditions. Intersections #3 and #6 were grown by a factor of 1.1779 during the weekday AM peak hour and by a factor of 1.0 during the weekday PM peak hour (i.e. calculated growth factors for intersection #7 based on the COVID-19 Year 2021 counts compared to the Year 2019 historical data, which was grown at 2% per year to Year 2021). It should be noted that the actual growth factor for the PM peak hour calculated to be 0.9905, but to provide for a conservative analysis, a factor of 1.0 was used. The traffic counts for intersections #1, #2, #4, #5, and #7 were factored up by the City-approved growth factor of 2.0% per year to reflect current Year 2021 existing baseline traffic conditions (i.e. 6% total growth for intersection #1 and 4% total growth for intersections #2, #4, #5, and #7). It should be noted that the traffic volumes for the seven (7) key study intersections were conservatively adjusted upward, as needed, to ensure appropriate conservation of flow between intersections.

In addition to the historical (Year 2018) traffic count data, new traffic counts at the two (2) roadway segments were conducted by Counts Unlimited on April 27, 2021. The historical (Year 2018) traffic counts for roadway segments A and B were factored up by the City-approved growth factor of 2.0% per year to reflect current Year 2021 existing baseline traffic conditions (i.e. 6% total growth) and then compared to the April 27, 2021 counts (the larger volume was used to provide for a conservative analysis).

Figures 3-2 and **3-3** illustrate the existing AM and PM peak hour traffic volumes at the seven (7) key study intersections evaluated in this report, respectively. **Figure 3-3** also presents the existing average daily traffic volumes for the two (2) key roadway segments.

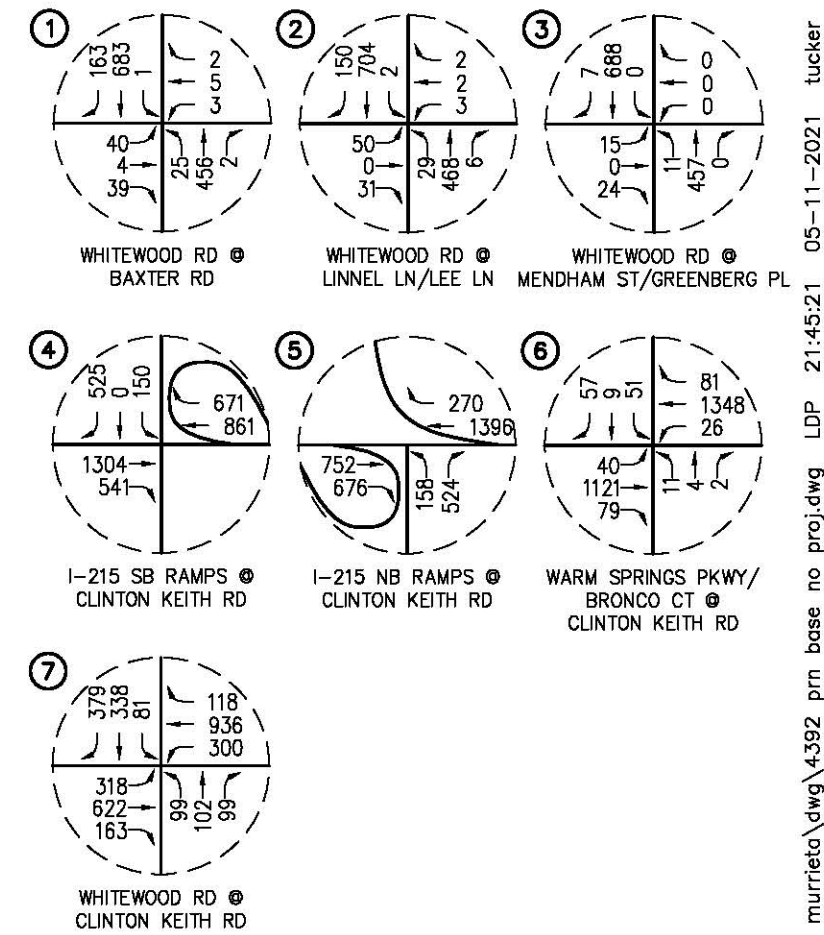
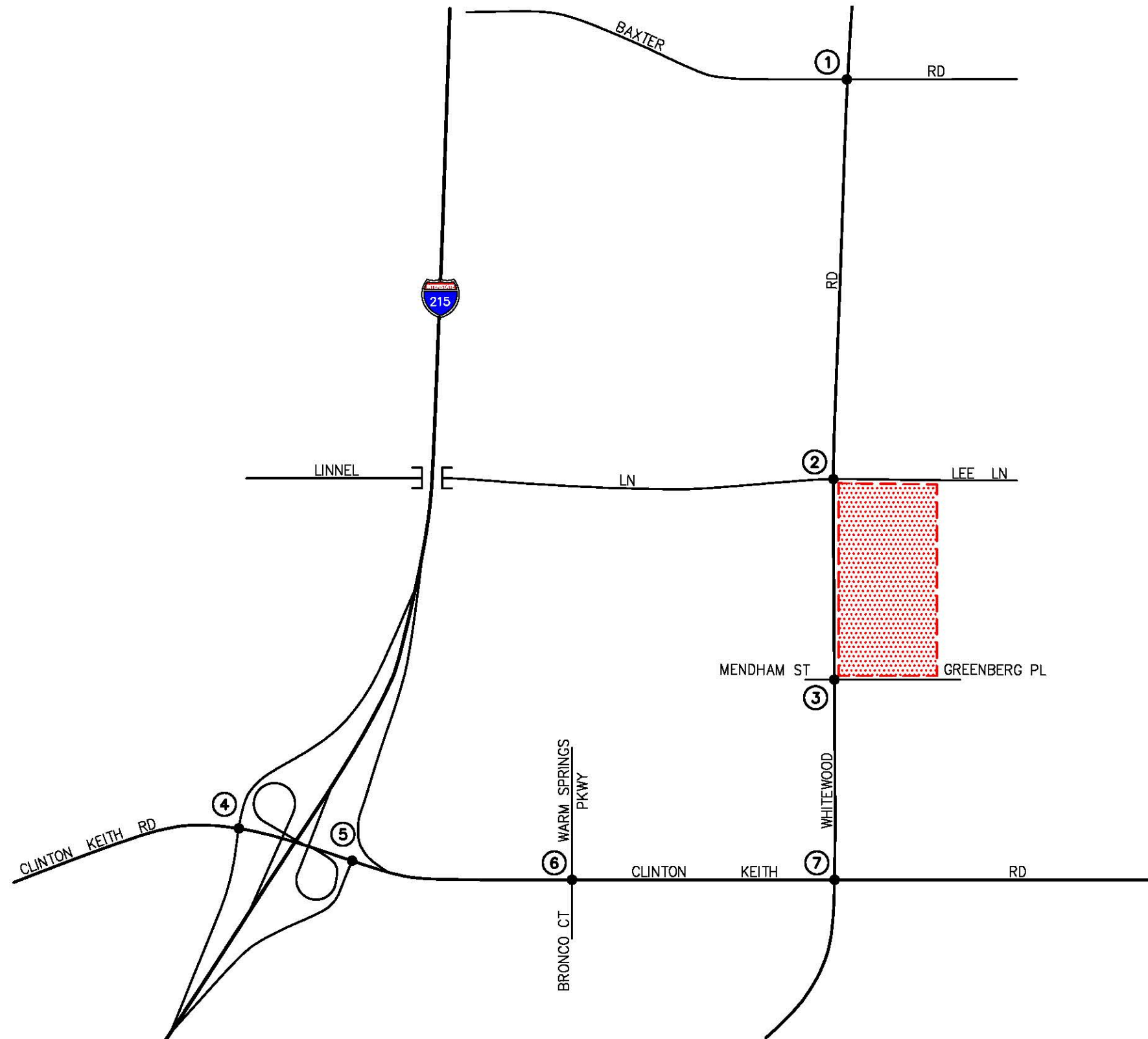
Appendix C contains the detailed peak hour traffic count sheets for the key intersections evaluated in this report, the historical data, the growth factor calculation worksheet, as well as the intersection volumes adjustment worksheets.

3.5 Existing Intersection Conditions

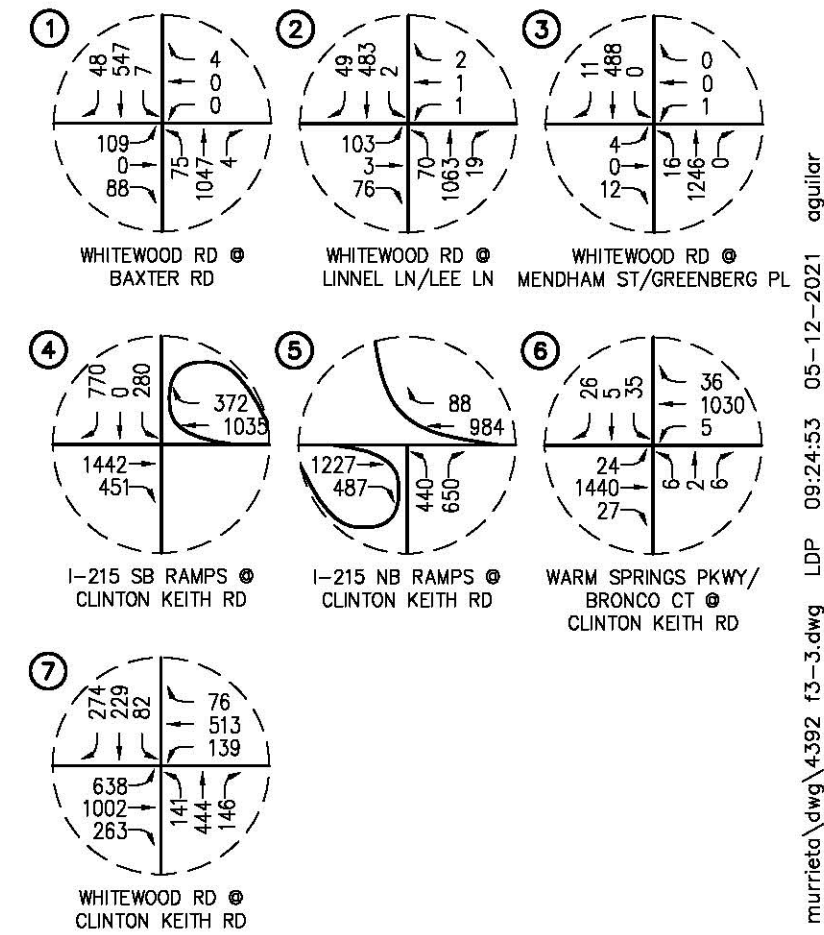
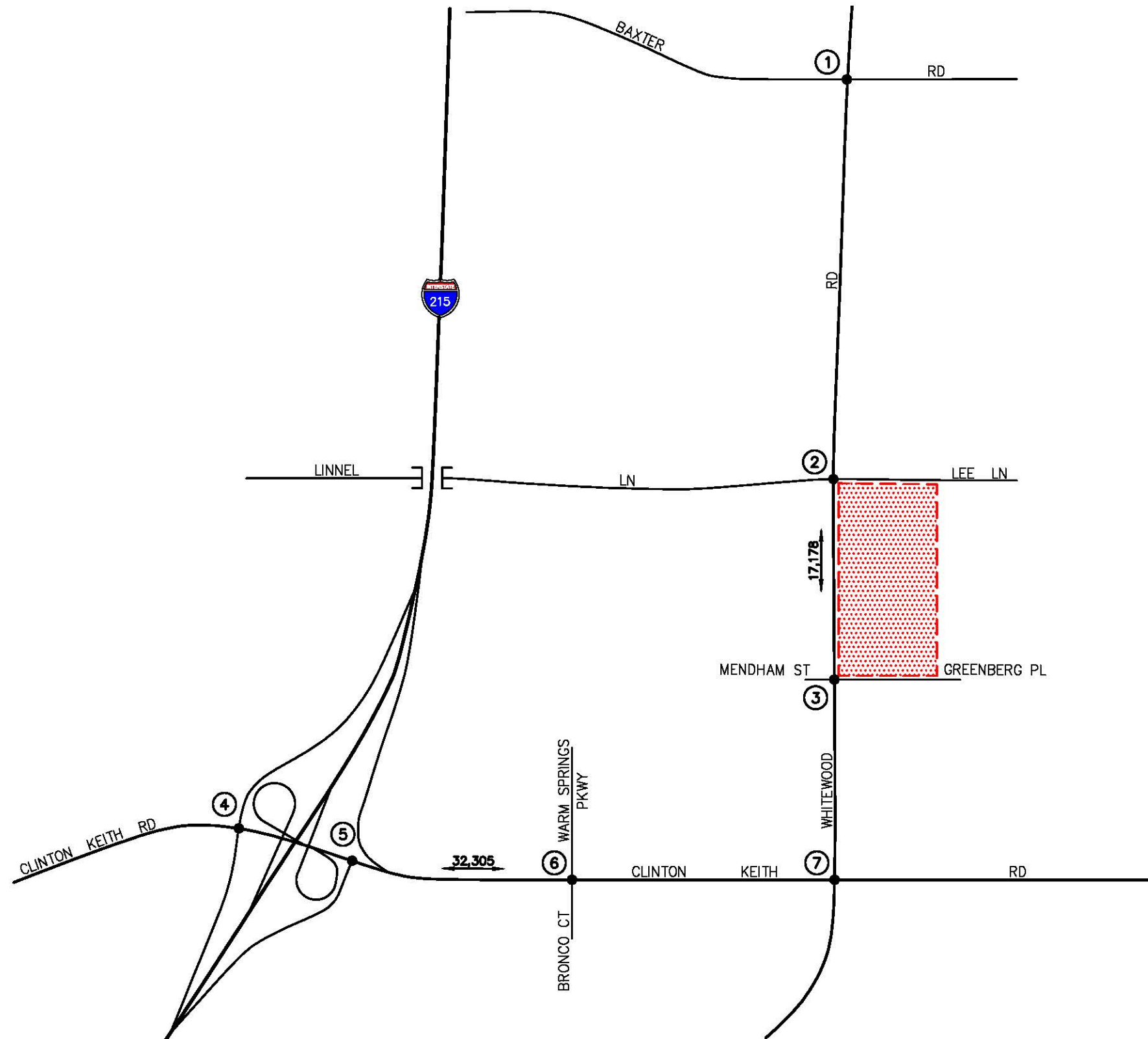
In conformance with *City of Murrieta Traffic Impact Analysis Preparation Guidelines*, existing AM peak hour and PM peak hour operating conditions were evaluated using the methodology outlined in the *Highway Capacity Manual 6th Edition (HCM 6)* for signalized and unsignalized intersections. Daily operating conditions for the key study roadway segments were analyzed using the *Volume to Capacity (V/C) ratio*.

3.5.1 *Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)*

Based on the HCM operations method of analysis, level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometries, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during ideal



n:\4300\2214392 - whitewood multi-family development, murrieta\dwg\4392 prn base no proj.dwg LDP 21:45:21 05-11-2021 tucker



conditions: in the absence of traffic control, in the absence of geometric delay, in the absence of any incidents, and when there are no other vehicles on the road.

In Chapter 19 of the HCM, only the portion of total delay attributed to the control facility is quantified. This delay is called *control delay*. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In contrast, in previous versions of the HCM (1994 and earlier), delay included only stopped delay. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle. The six qualitative categories of Level of Service that have been defined along with the corresponding HCM control delay value range for signalized intersections are shown in **Table 3-1**.

3.5.2 Highway Capacity Manual (HCM) Method of Analysis (Unsignalized Intersections)

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. LOS criteria for unsignalized intersections differ from LOS criteria for signalized intersections as signalized intersections are designed for heavier traffic and therefore a greater delay.

3.5.2.1 Two-Way Stop-Controlled Intersections

Two-way stop-controlled intersections are comprised of a major street, which is uncontrolled, and a minor street, which is controlled by stop signs. Level of service for a two-way stop-controlled intersection is determined by the computed or measured control delay. The control delay by movement, by approach, and for the intersection as a whole is estimated by the computed capacity for each movement. LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. The worst side street approach delay is reported. LOS is not defined for the intersection as a whole or for major-street approaches, as it is assumed that major-street through vehicles experience zero delay. The HCM control delay value range for two-way stop-controlled intersections is shown in **Table 3-2**.

3.5.2.2 All-Way Stop-Controlled Intersections

All-way stop-controlled intersections require every vehicle to stop at the intersection before proceeding. Because each driver must stop, the decision to proceed into the intersection is a function of traffic conditions on the other approaches. The time between subsequent vehicle departures depends on the degree of conflict that results between the vehicles and vehicles on the other approaches. This methodology determines the control delay for each lane on the approach, computes a weighted average for the whole approach, and computes a weighted average for the intersection as a whole. Level of service (LOS) at the approach and intersection levels is based solely on control delay. The HCM control delay value range for all-way stop-controlled intersections is shown in **Table 3-2**.

3.5.3 Volume to Capacity (V/C) Ratio Method of Analysis (Roadway Segments)

In conformance with *City of Murrieta Traffic Impact Analysis Preparation Guidelines*, daily operating conditions for the key study roadway segments have been investigated according to the Volume to Capacity (V/C) ratio of each roadway segment. The V/C relationship is used to estimate

the LOS of the roadway segment with the volume based on the 24-hour traffic volumes and the capacity based on the City's classification of each roadway. The daily roadway link capacity of each street classification according to the *Murrieta General Plan 2035; Chapter 5 – Circulation Element; Table 5-2 - Daily Roadway Capacity Values* are presented in **Table 3-3**. The six qualitative categories of Level of Service have been defined along with the corresponding Volume to Capacity (V/C) value range and are shown in **Table 3-4**.

3.6 Level of Service Criteria

According to City of Murrieta guidelines, LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak commute hours on all intersections and LOS C is the minimum acceptable condition that should be maintained on a daily basis on all roadway segments.

TABLE 3-1
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM)¹

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	> 10.0 and ≤ 20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	> 20.0 and ≤ 35.0	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35.0 and ≤ 55.0	Long traffic delays At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55.0 and ≤ 80.0	Very long traffic delays This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths and high v/c ratios. Individual cycle failures are frequent occurrences.
F	≥ 80.0	Severe congestion This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

¹ Source: *Highway Capacity Manual 6th Edition*, Chapter 19 (Signalized Intersections).

TABLE 3-2
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM) ²

Level of Service (LOS)	Highway Capacity Manual (HCM) Delay Value (sec/veh)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

² Source: *Highway Capacity Manual 6th Edition*, Chapters 20 (Two-Way Stop-Controller Intersections) and 21 (All-Way Stop-Controlled Intersections).

TABLE 3-3
DAILY ROADWAY SEGMENT CAPACITIES³

Roadway Classification	Number of Lanes	Maximum Two-Way Volume (ADT)		
		LOS C	LOS D	LOS E
Urban Arterial	6-lanes	43,100	48,500	53,900
Arterial	6-lanes	43,100	48,500	53,900
Arterial	4-lanes	28,700	32,300	35,900
Major	4-lanes	27,300	30,700	34,100
Secondary	4-lanes	20,700	23,300	25,900
Collector	2-lanes	10,400	11,700	13,000

³ Source: *Murrieta General Plan 2035; Chapter 5 – Circulation Element; Table 5-2 - Daily Roadway Capacity Values.*

TABLE 3-4
LEVEL OF SERVICE CRITERIA FOR ROADWAY SEGMENTS (V/C METHODOLOGY)⁴

Level of Service (LOS)	Volume to Capacity Ratio (V/C)	Level of Service Description
A	≤ 0.600	EXCELLENT. Describes primarily free flow operations at average travel speeds, usually about 90% of the free flow speed for the arterial class. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.
B	0.601 – 0.700	VERY GOOD. Represents reasonably unimpeded operations at average travel speeds, usually about 70% of the free flow speed for the arterial class. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.
C	0.701 – 0.800	GOOD. Represents stable conditions; however, ability to maneuver and change lanes in mid-block location may be more restricted than in LOS B, and longer queues and/or adverse signal coordination may contribute to lower average travel speeds of about 50% of the average free flow speed for the arterial class. Motorists will experience appreciable tension while driving.
D	0.801 – 0.900	FAIR. Borders on a range in which small increases in flow may cause substantial increases in approach delay and, hence, decreases in arterial speed. This may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these. Average travel speeds are about 40% of free flow speed.
E	0.901 – 1.000	POOR. Characterized by significant approach delays and average travel speeds of one-third the free flow speed or lower. Such operations are caused by some combination of adverse progression, high signal density, extensive queuing at critical intersections, and inappropriate signal timing.
F	> 1.000	FAILURE. Characterizes arterial flow at extremely low speeds below one-third to one-quarter of the free flow speed. Intersection congestion is likely at critical signalized locations, with resultant high approach delays. Adverse progression is frequently a contributor to this condition.

⁴ Source: *Transportation Research Board Circular 212 – Interim Materials on Highway Capacity.*

4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the proposed Project, a multi-step process has been utilized. The first step is traffic generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is traffic distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/expected future travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

5.0 PROJECT TRAFFIC CHARACTERISTICS

5.1 Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 10th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2017].

Table 5-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project and presents the forecast daily and peak hour project traffic volumes for a “typical” weekday. As shown in the upper portion of *Table 5-1*, the trip generation potential of the proposed Project is estimated using ITE Land Use 220: Multifamily Housing Low-Rise trip rates. Review of the last row of *Table 5-1* indicates that the proposed Project is forecast to generate approximately 2,372 daily trips, with 149 trips (34 inbound, 115 outbound) produced in the AM peak hour and 181 trips (114 inbound, 67 outbound) produced in the PM peak hour on a “typical” weekday. The potential traffic impacts of the aforementioned Project trips are evaluated in the traffic impact analysis section of this report.

It should be noted that the trip generation methodology and forecasts were approved by City of Murrieta staff prior to proceeding with further analysis.

5.2 Project Traffic Distribution and Assignment

Figures 5-1 and **5-2** illustrate the general, directional traffic distribution patterns for the residential north units and the residential south units, respectively. Project traffic volumes both entering and exiting the project site have been distributed and assigned to the adjacent street system based on the following considerations:

- directional flows on the freeways in the immediate vicinity of the project site (i.e. I-215 Freeway),
- the site's proximity to major traffic carriers (i.e. Clinton Keith Road, Whitewood Road, etc.),
- expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals, and
- ingress/egress availability at the project site.

The anticipated AM and PM peak hour project traffic volumes associated with the proposed Project are presented in **Figures 5-3** and **5-4**, respectively. *Figure 5-4* also presents the daily project traffic volumes for the proposed Project. The traffic volume assignments presented in **Figures 5-3** and **5-4** reflect the traffic distribution characteristics shown in **Figures 5-1** and **5-2**, and the traffic generation forecast presented in *Table 5-1*.

It should be noted that the trip distribution patterns were approved by City of Murrieta staff prior to proceeding with further analysis.

5.3 Existing Plus Project Traffic Conditions

The existing plus project traffic conditions have been generated based upon existing conditions and the estimated project traffic. These forecast traffic conditions have been prepared pursuant to the City's requirement, which requires that the potential impacts of a Project be evaluated upon the circulation system as it currently exists. This traffic volume scenario and the related intersection capacity analyses will identify the roadway improvements necessary to offset the direct traffic impacts of the Project, if any.

Figures 5-5 and **5-6** present projected AM and PM peak hour traffic volumes at the seven (7) key study intersections with the addition of the trips generated by the proposed Project to existing traffic volumes, respectively. *Figure 5-6* also presents the existing plus project daily traffic volumes.

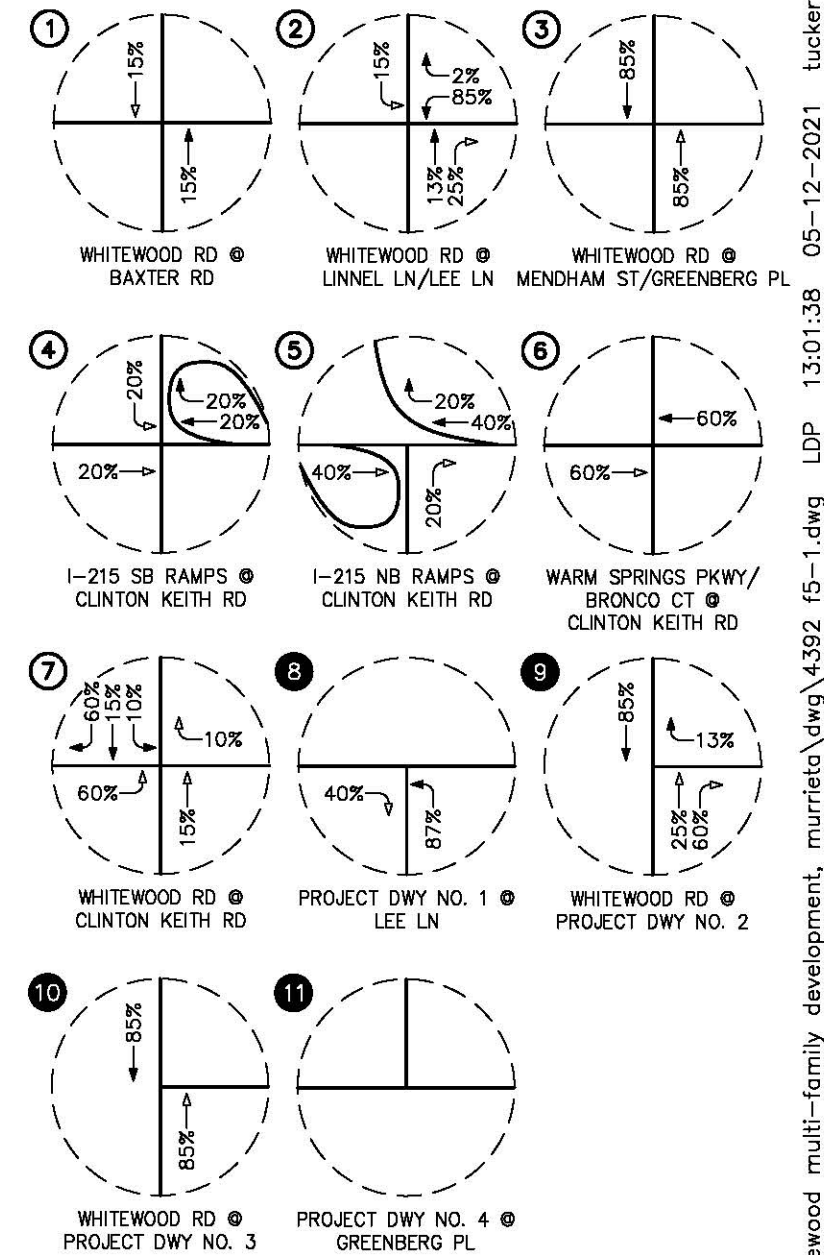
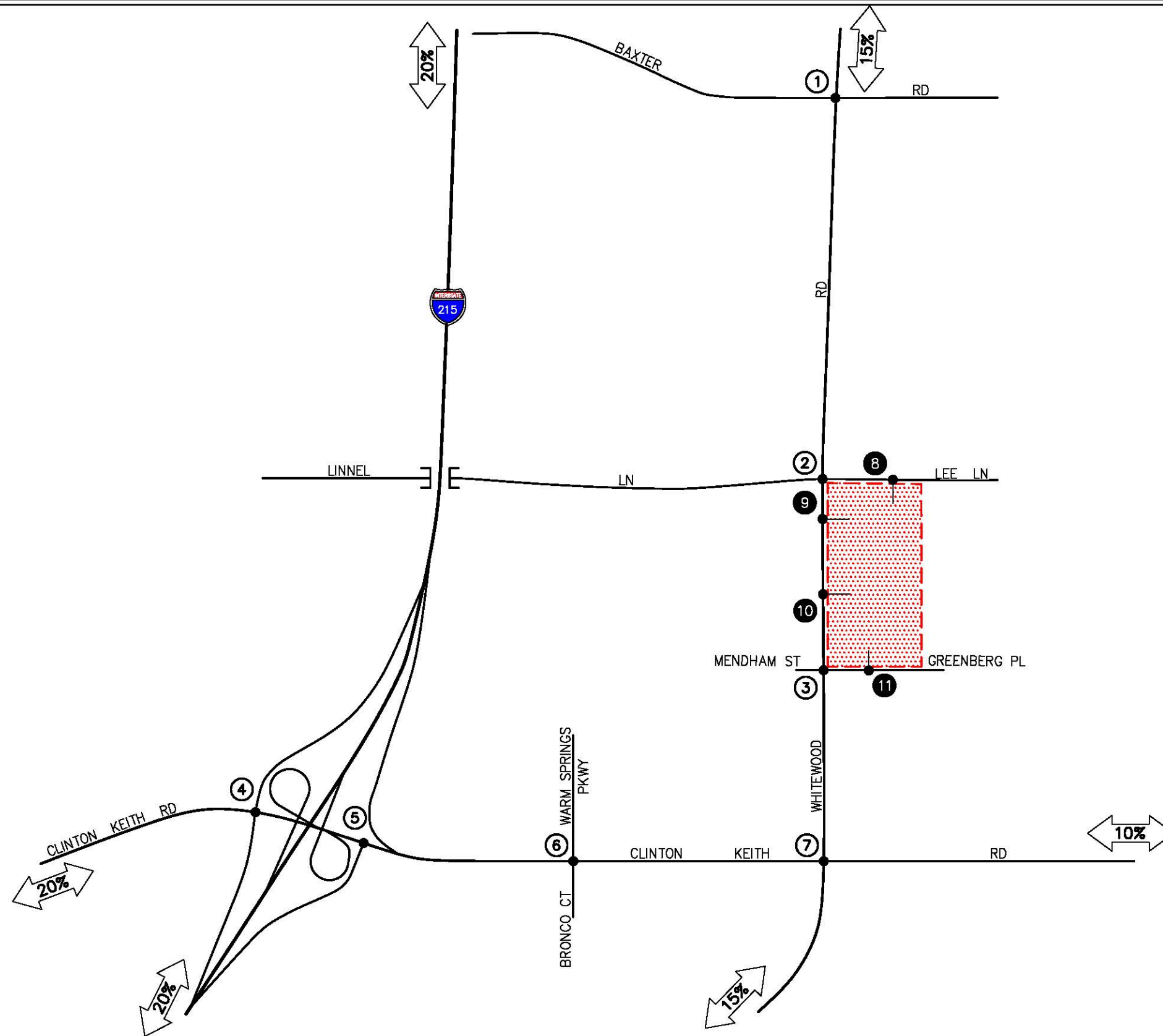
TABLE 5-1
PROJECT TRAFFIC GENERATION RATES AND FORECAST⁵

ITE Land Use Code / Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
<u>Generation Rates:</u>							
▪ 220: Multifamily Housing (Low-Rise) (TE/DU)	7.32	23%	77%	0.46	63%	37%	0.56
<u>Proposed Project Generation Forecasts:</u>							
▪ Multifamily Housing – North Units (116 DU)	849	12	41	53	41	24	65
▪ Multifamily Housing – South Units (208 DU)	1,523	22	74	96	73	43	116
Total Proposed Project Trip Generation Forecast	2,372	34	115	149	114	67	181

Notes:

- TE/DU = Trip end per dwelling unit

⁵ Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).

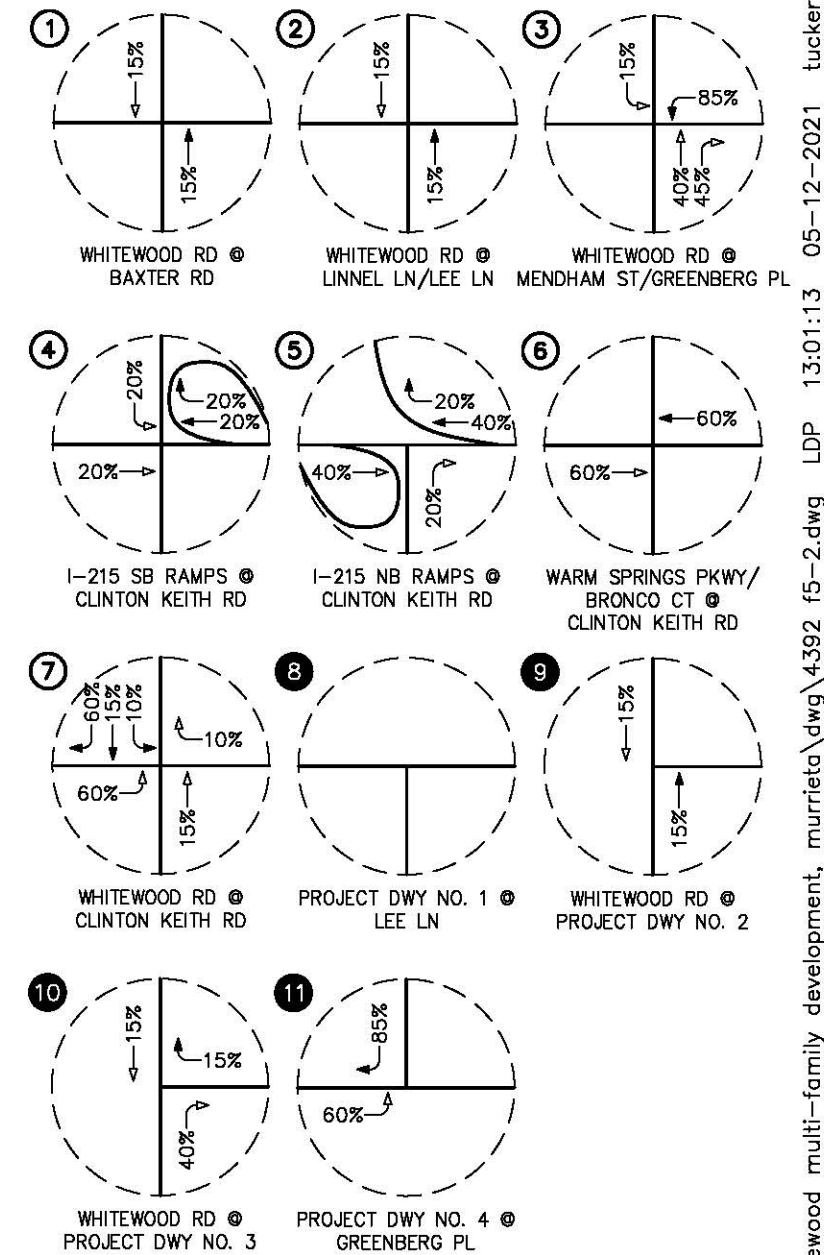
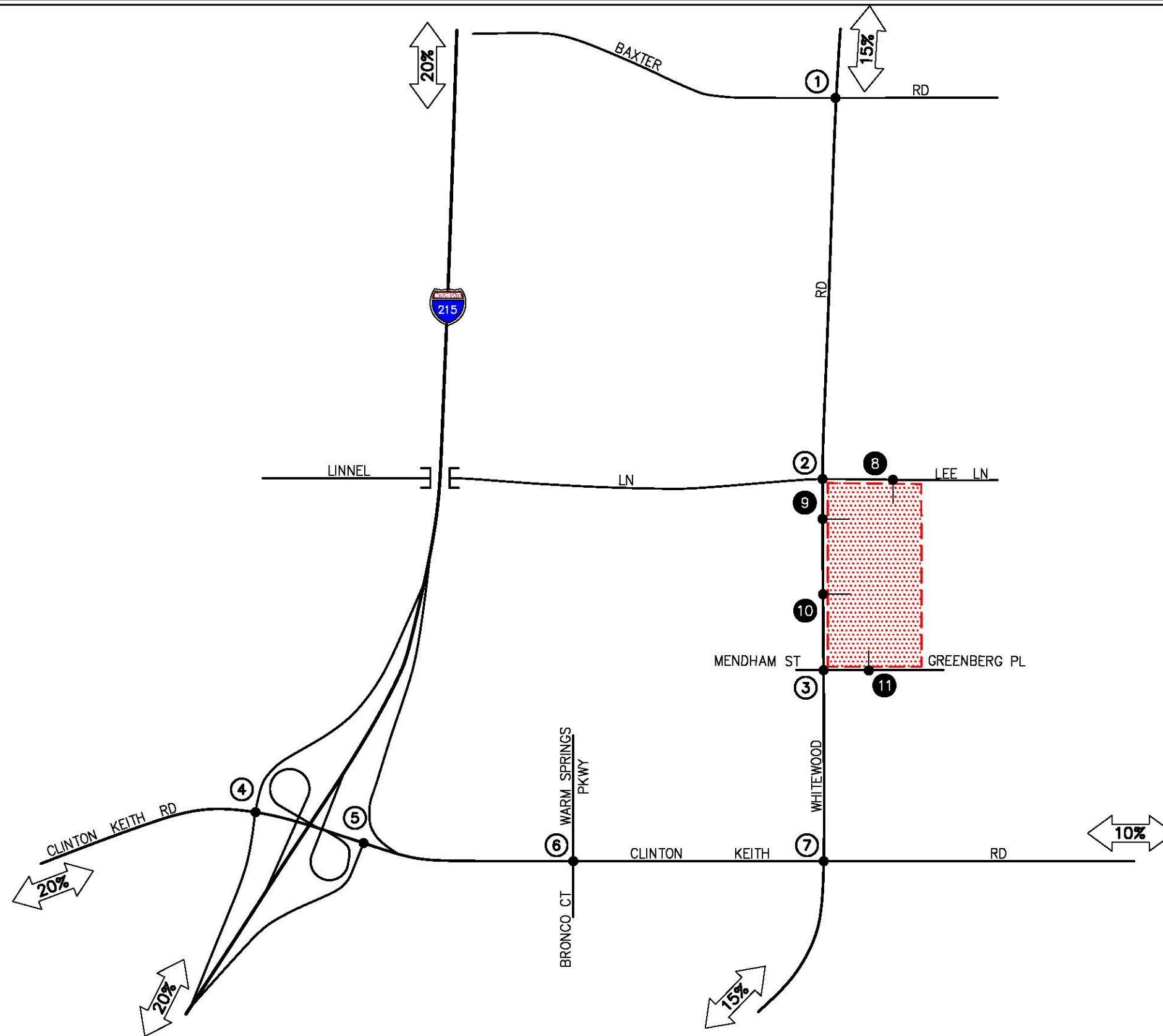


KEY

- ④ = STUDY INTERSECTION
- ← = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE
- [Red Hatching] = PROJECT SITE

FIGURE 5-1

PROJECT TRIP DISTRIBUTION PATTERN (NORTH UNITS)
WHITEWOOD MULTI-FAMILY DEVELOPMENT, MURRIETA

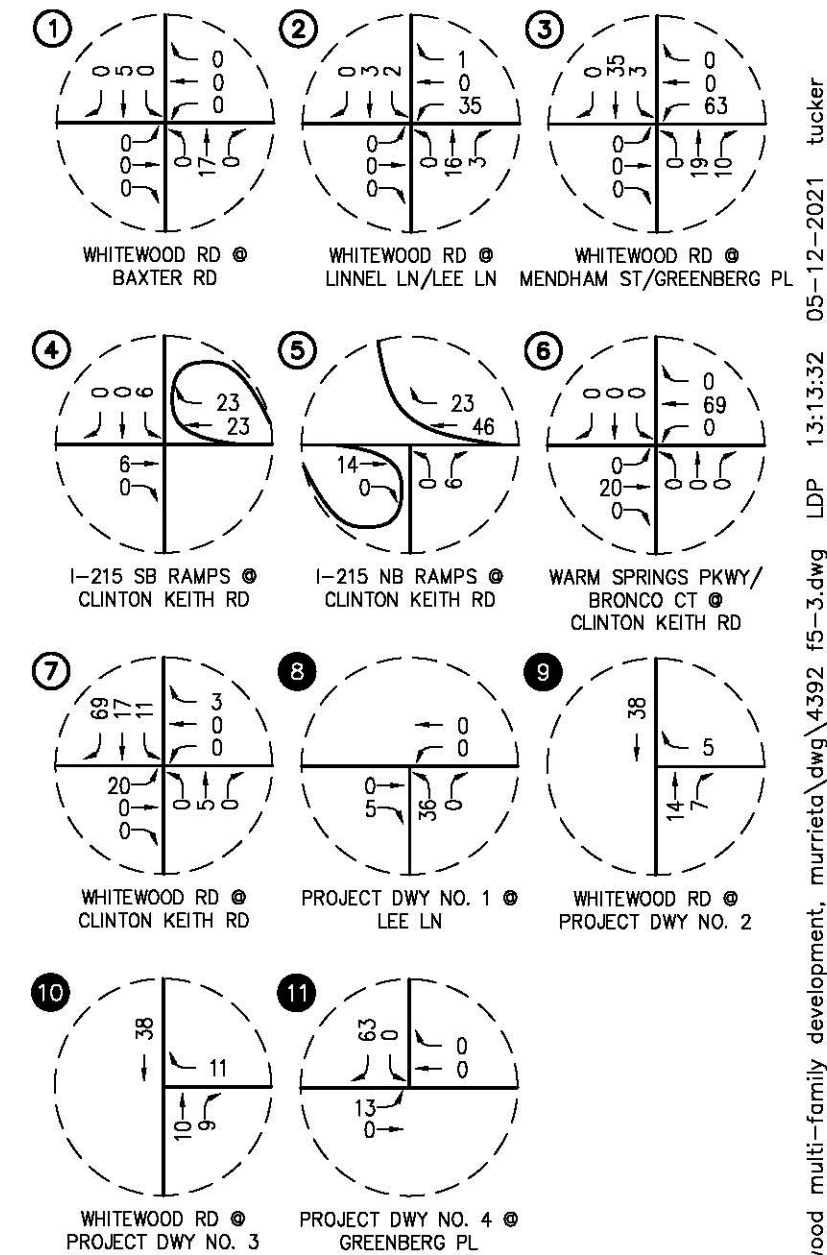
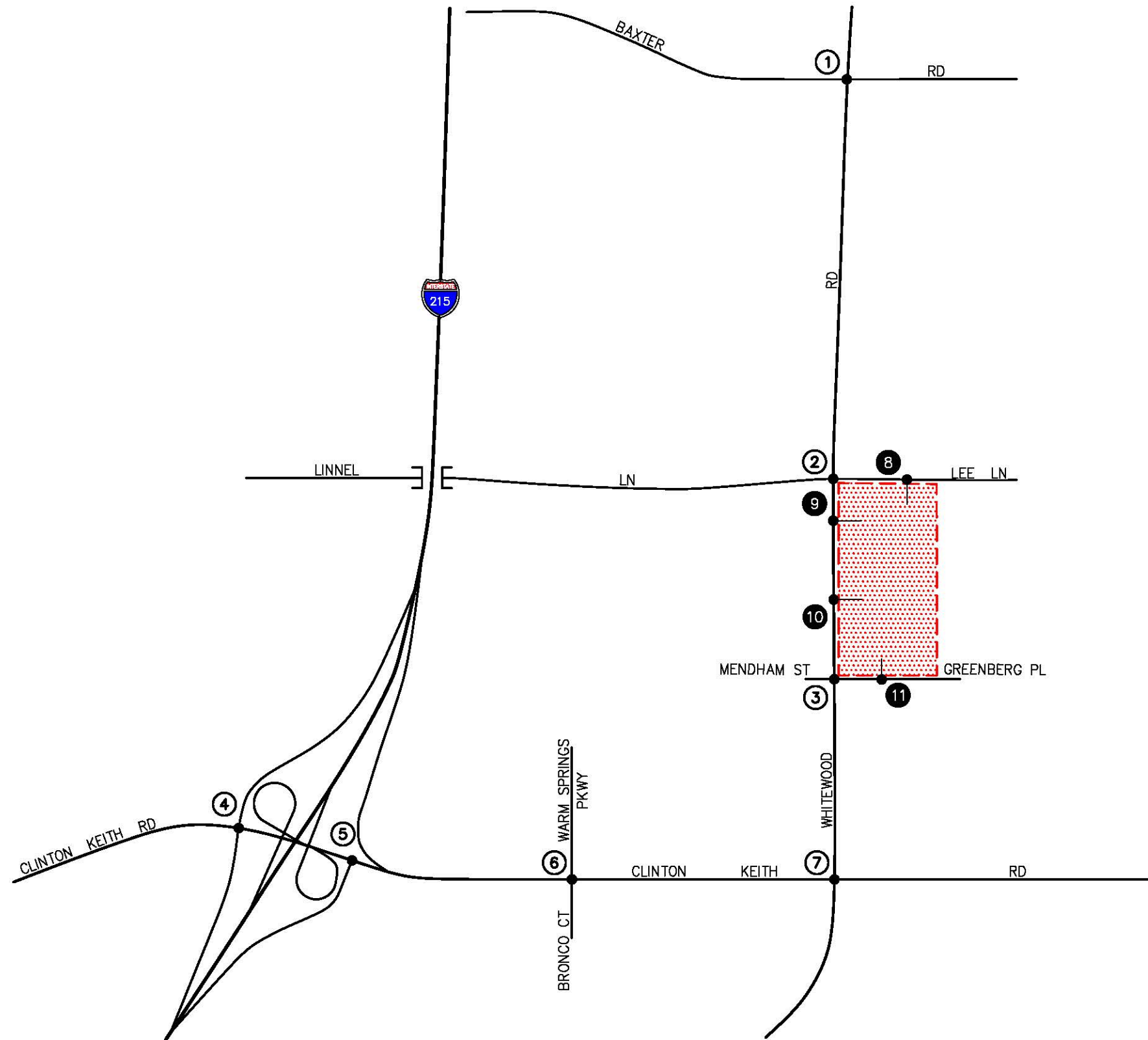


KEY

- ④ = STUDY INTERSECTION
- ← = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE
- [Red Hatching] = PROJECT SITE

FIGURE 5-2

PROJECT TRIP DISTRIBUTION PATTERN (SOUTH UNITS)
WHITEWOOD MULTI-FAMILY DEVELOPMENT, MURRIETA



KEY

① = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 5-3

AM PEAK HOUR PROJECT TRAFFIC VOLUMES
 WHITEWOOD MULTI-FAMILY DEVELOPMENT, MURRIETA

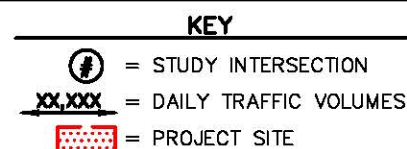
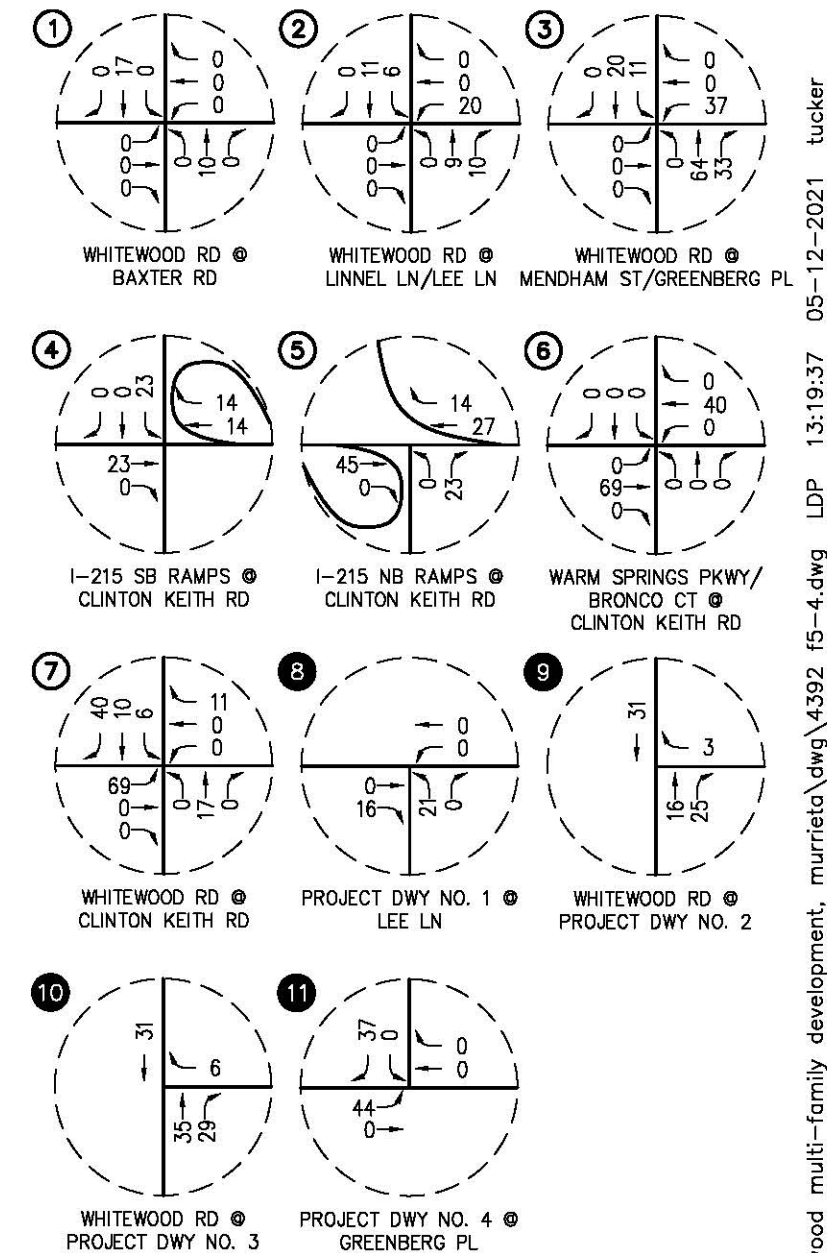
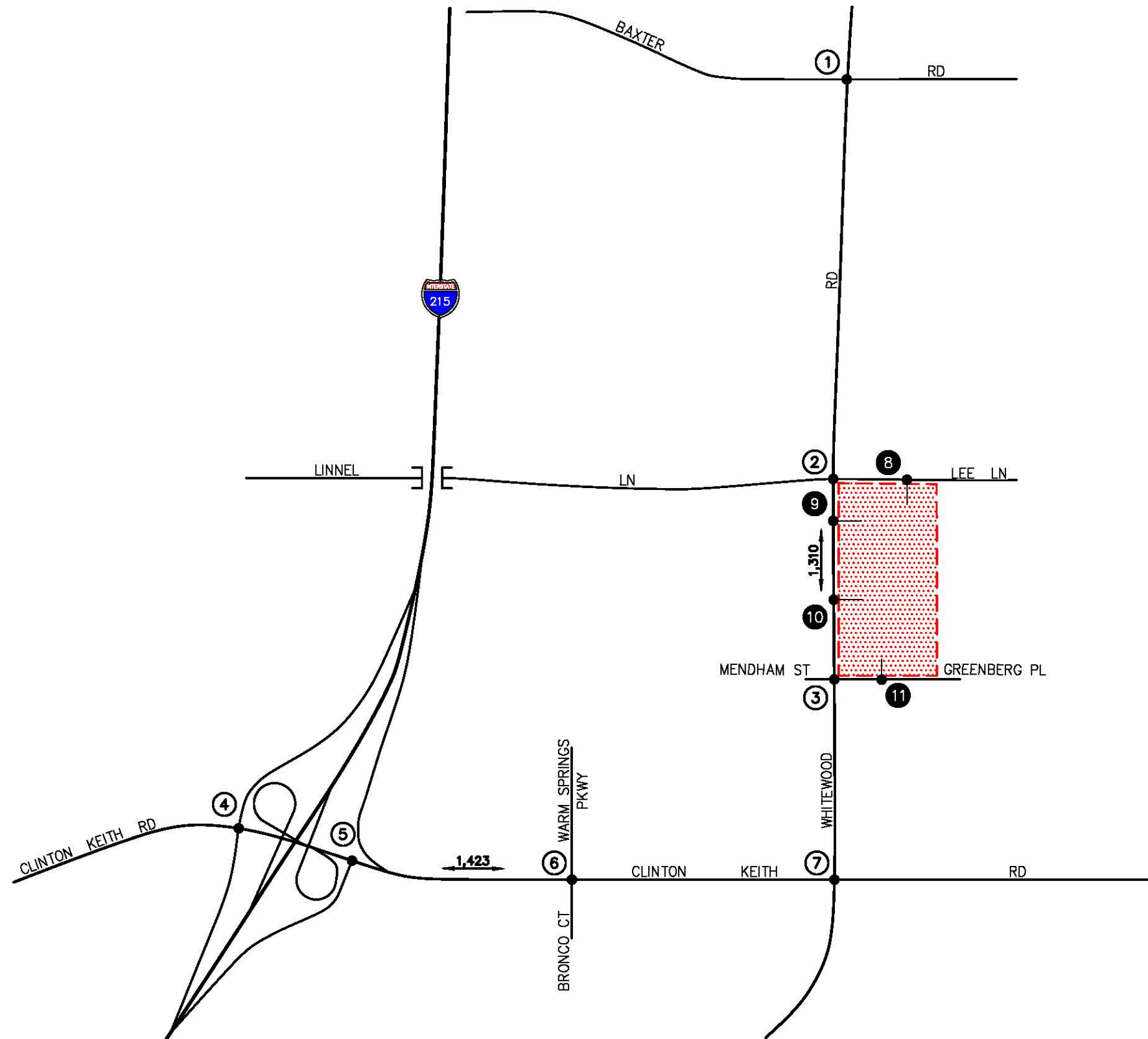
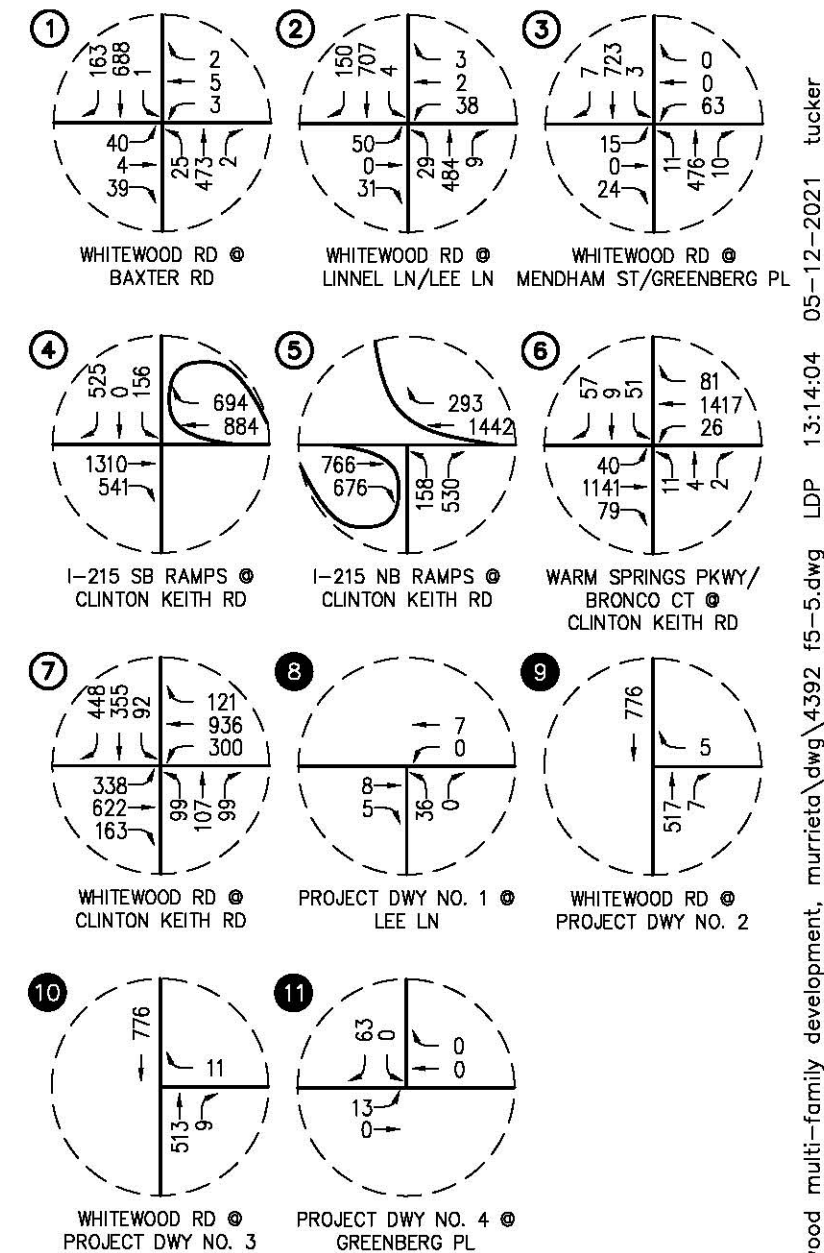
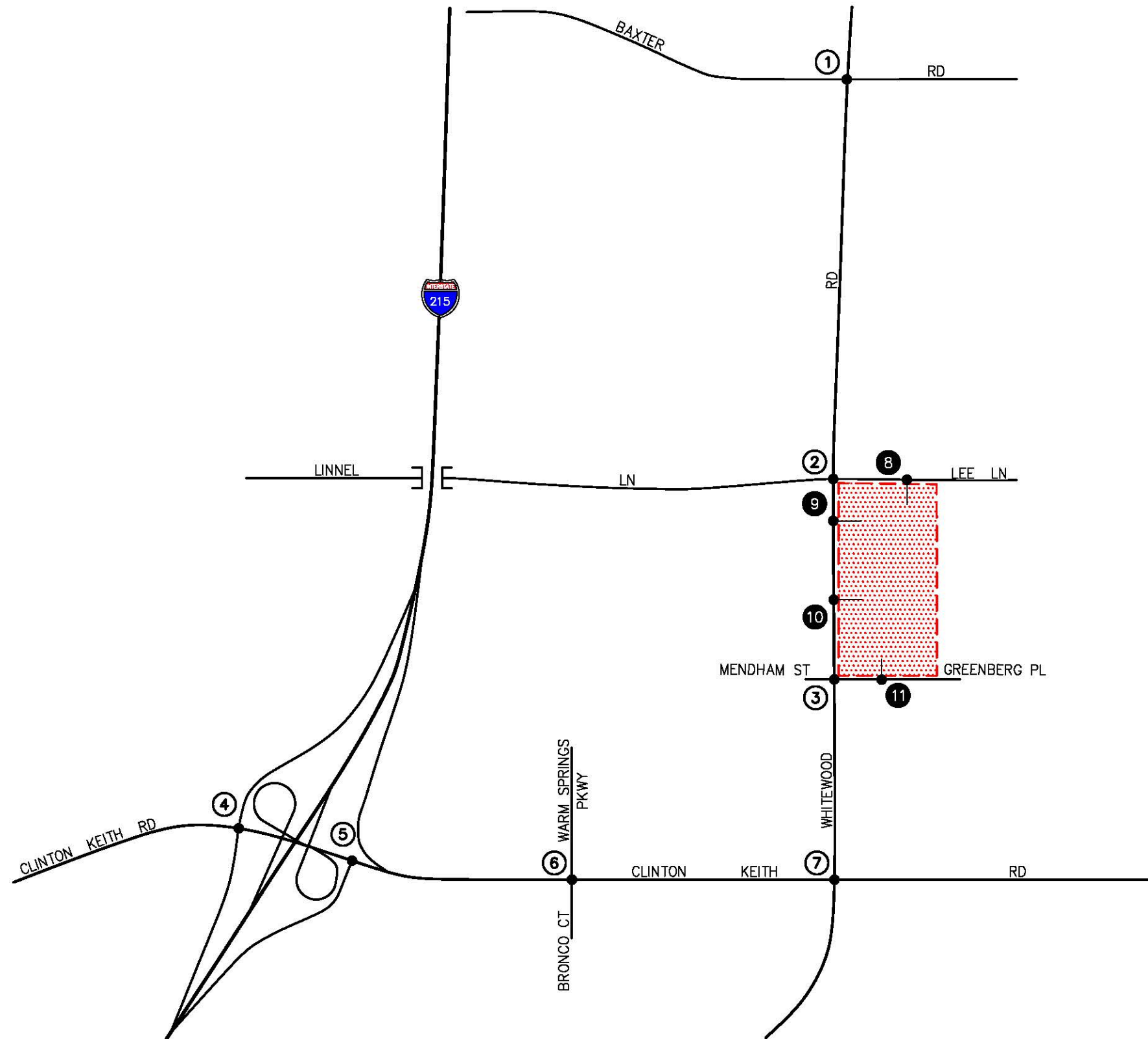


FIGURE 5-4

PM PEAK HOUR PROJECT AND DAILY TRAFFIC VOLUMES

WHITEWOOD MULTI-FAMILY DEVELOPMENT, MURRIETA



n:\4300\2214392 - whitewood multi-family development, murrieta\dwg\4392 f5-5.dwg LDP 13:14:04 05-12-2021 tucker

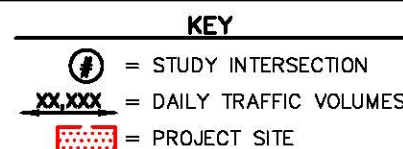
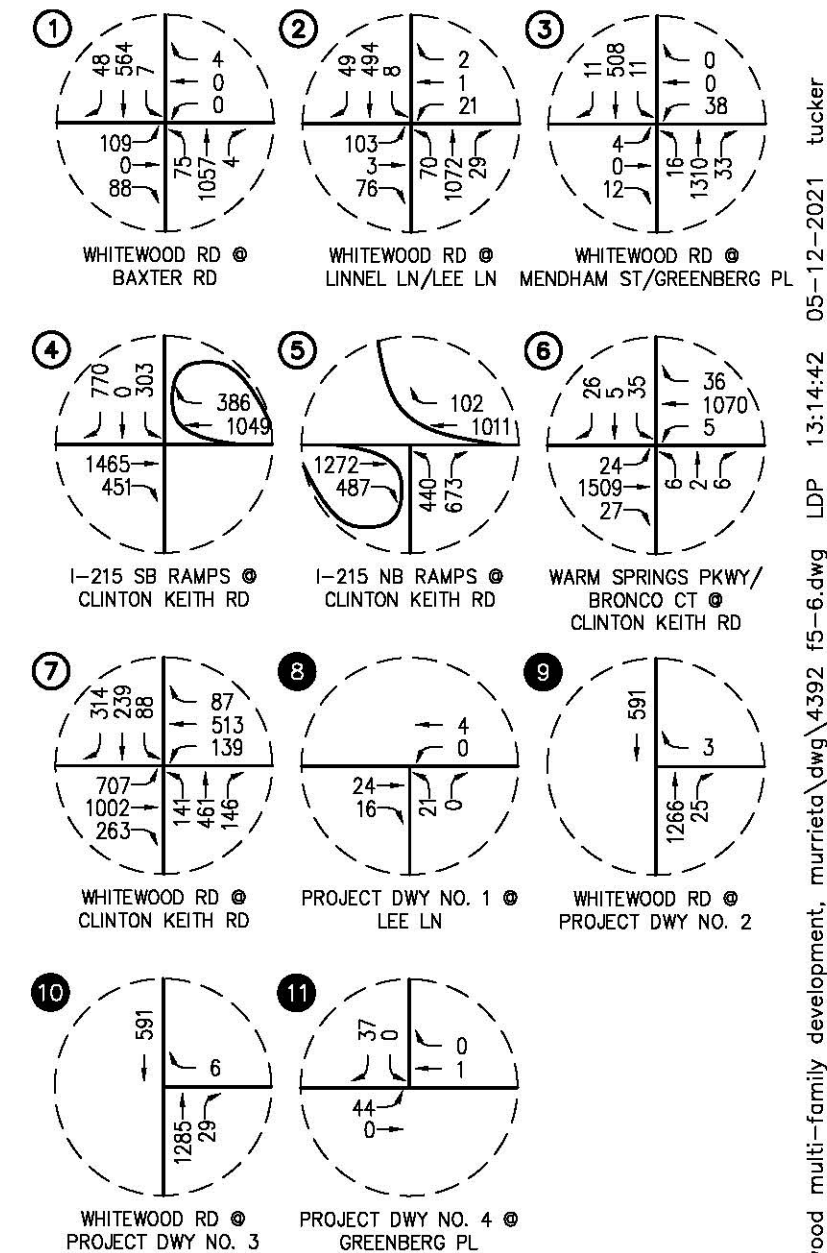
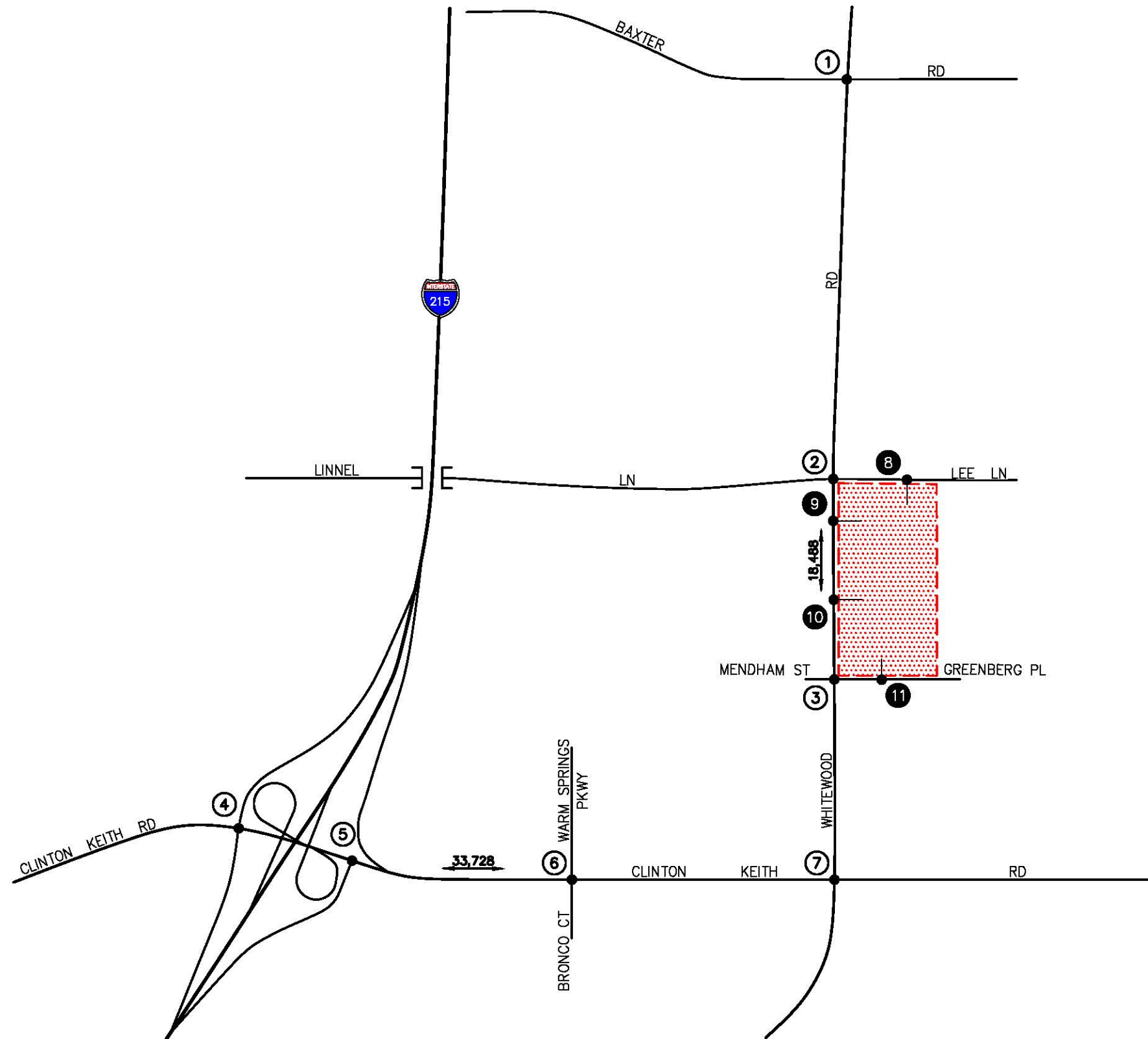


FIGURE 5-6

EXISTING PLUS PROJECT PM PEAK HOUR AND DAILY TRAFFIC VOLUMES

WHITEWOOD MULTI-FAMILY DEVELOPMENT, MURRIETA

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Ambient Traffic Growth

Horizon year, background traffic growth estimates have been calculated using an ambient traffic growth factor. The ambient traffic growth factor is intended to include unknown and future cumulative projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The future growth in traffic volumes has been calculated at two percent (2.0%) per year. Applied to the Year 2021 existing traffic volumes, this factor results in a 4.0% growth in existing volumes to the near-term horizon year 2023.

6.2 Cumulative Project Traffic Characteristics

In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed Project, the status of other known development projects (cumulative projects) in the vicinity of the proposed Project has been researched at the City of Murrieta and the County of Riverside. With this information, the potential impact of the proposed Project can be evaluated within the context of the cumulative impact of all ongoing development.

Based on our research, there are eleven (11) cumulative projects located in the City of Murrieta and one (1) cumulative project located in the County of Riverside within the vicinity of the subject site that have either been built, but not yet fully occupied, or are being processed for approval. These twelve (12) cumulative projects were considered in the cumulative traffic analysis for this project.

Table 6-1 provides a brief description for each of the twelve (12) cumulative projects. **Figure 6-1** graphically illustrates the location of the cumulative projects. These cumulative projects are expected to generate vehicular traffic, which may affect the operating conditions of the key study intersections and/or roadway segments.

Table 6-2 presents the trip generation for the twelve (12) cumulative projects. As shown in **Table 6-2**, the twelve (12) cumulative projects are forecast to generate a total of 42,844 daily trips, with 1,835 trips (1,064 inbound and 771 outbound) forecast during the AM peak hour and 3,715 trips (1,777 inbound and 1,938 outbound) forecast during the PM peak hour.

6.3 Year 2023 Traffic Volumes

The AM and PM peak hour traffic volumes associated with the twelve (12) cumulative projects are presented in **Figures 6-2** and **6-3**, respectively. **Figure 6-3** also presents the daily cumulative project traffic volumes.

Figures 6-4 and **6-5** present the AM and PM peak hour cumulative traffic volumes (existing traffic + ambient growth traffic + cumulative project traffic) at the key study intersections for the Year 2023, respectively. **Figure 6-5** also presents the Year 2023 daily cumulative traffic volumes.

Figures 6-6 and **6-7** illustrate the Year 2023 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project, respectively. **Figure 6-7** also presents the Year 2023 daily cumulative plus project traffic volumes.

TABLE 6-1
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS⁶

No.	Description	Location/Address	Size
<u>City of Murrieta</u>			
1.	Meadowlark (TTM-37493 & DP-2018-1624)	NWC of Whitewood Rd & Greenberg Pl	83 DU Condominiums
2.	Murrieta-Whitewood Skilled Nursing Facility (DP-2015-708 & CUP-2015-709)	NEC of Whitewood Rd & Lee Ln	59-Bed Skilled Nursing Facility
3.	McElwain and Linnel (DP-2019-1887 & TPM-2019-1886)	NEC of McElwain Rd & Linnel Ln	120-Room Hotel 15,295 SF Conference/Event Building
4.	The Orchard at Stonecreek (DP-03-161)	NEC of McElwain Rd & Clinton Keith Rd	460,000 SF Shopping Center (186,000 SF Remaining)
5.	Murrieta Senior Living (DP-2017-1333 & CUP-2017-1334)	NWC of Greer Rd & Clinton Keith Rd	87 DU Assisted Living 22 DU Memory Care
6.	Express Carwash and Learning Center (CUP-2020-2179)	NWC of McElwain Rd & Clinton Keith Rd	10,000 SF Daycare Center 4,100 SF Car Wash
7.	76 Gas Station Clinton Keith (DP-2019-1846, CUP-2019-1847 & MCUP-2019-1856)	SWC of McElwain Rd & Clinton Keith Rd	12 VFP Gas Station 3,734 SF Convenience Store 1,295 SF Automated Car Wash
8.	Costco (DP-2018-1652, TPM 37511, CUP-2018-1654)	NEC of I-215 & Clinton Keith Rd	153,362 SF Retail and Car Wash 79,900 SF Shopping Center 32 VFP Gas Station
9.	The Vineyard Shopping Center (DP-2012-3260, SC-2019-1894 & CUP-2019-1918)	NEC of I-215 & Clinton Keith Rd	78,489 SF Retail Center 91-Room Hotel
10.	Vineyard Northwest (Curci Property) (DP-2018-1691 & TPM 37547)	NEC of I-215 & Clinton Keith Rd	11,650 SF Retail 3,000 SF High-Turnover Restaurant 5,000 SF Fast-Food w/Drive Through 5,000 SF Bank 5,000 SF Tire Store 4,000 SF Auto Repair
11.	Makena Hills (EA-2017-1315)	SEC of Antelope Road & Baxter Road	116,200 SF Medical Office 9,300 SF Restaurant 206-Room Hotel
<u>County of Riverside</u>			
12.	TR37294	SWC of Briggs Rd & Clinton Keith Rd	48 DU Single-Family

⁶ Source: City of Murrieta and County of Riverside staff.

TABLE 6-2
CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST⁷

No.	Cumulative Project Description	Daily Two-Way	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
1.	Meadowlark (TTM-37493 & DP-2018-1624)	608	9	29	38	29	17	46
2.	Murrieta-Whitewood Skilled Nursing Facility (DP-2015-708 & CUP-2015-709)	244	7	4	11	9	8	17
3.	McElwain and Linnel (DP-2019-1887 & TPM-2019-1886) ⁸	1,003	34	23	57	37	35	72
4.	The Orchard at Stonecreek (DP-03-161)	6,320	98	59	157	224	244	468
5.	Murrieta Senior Living (DP-2017-1333 & CUP-2017-1334)	407	12	5	17	15	14	29
6.	Express Carwash and Learning Center (CUP-2020-2179)	1,058	58	52	110	81	88	169
7.	76 Gas Station Clinton Keith (DP-2019-1846, CUP-2019-1847 & MCUP-2019-1856) ⁹	2,075	126	126	252	104	104	208
8.	Costco (DP-2018-1652, TPM 37511, CUP-2018- 1654) ¹⁰	12,780	90	44	134	536	590	1,126
9.	The Vineyard Shopping Center (DP-2012-3260, SC-2019-1894 & CUP-2019-1918) ¹¹	6,254	111	70	181	258	273	531
10.	Vineyard Northwest (Curci Property) (DP-2018-1691 & TPM 37547) ¹²	4,433	171	140	311	198	197	395
11.	Makena Hills (EA-2017-1315) ¹³	7,209	339	192	531	256	350	606
12.	TR37294	453	9	27	36	30	18	48
Total Cumulative Projects Trip Generation Forecast		42,844	1,064	771	1,835	1,777	1,938	3,715

⁷ Unless otherwise noted, Source: *Trip Generation, 10th Editions*, Institute of Transportation Engineers (ITE) [Washington, D.C. (2017)].

⁸ Source: *McElwain and Linnel Traffic Impact Analysis*, prepared by Trames Solutions, Inc., dated July 11, 2019.

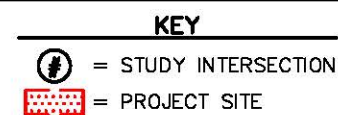
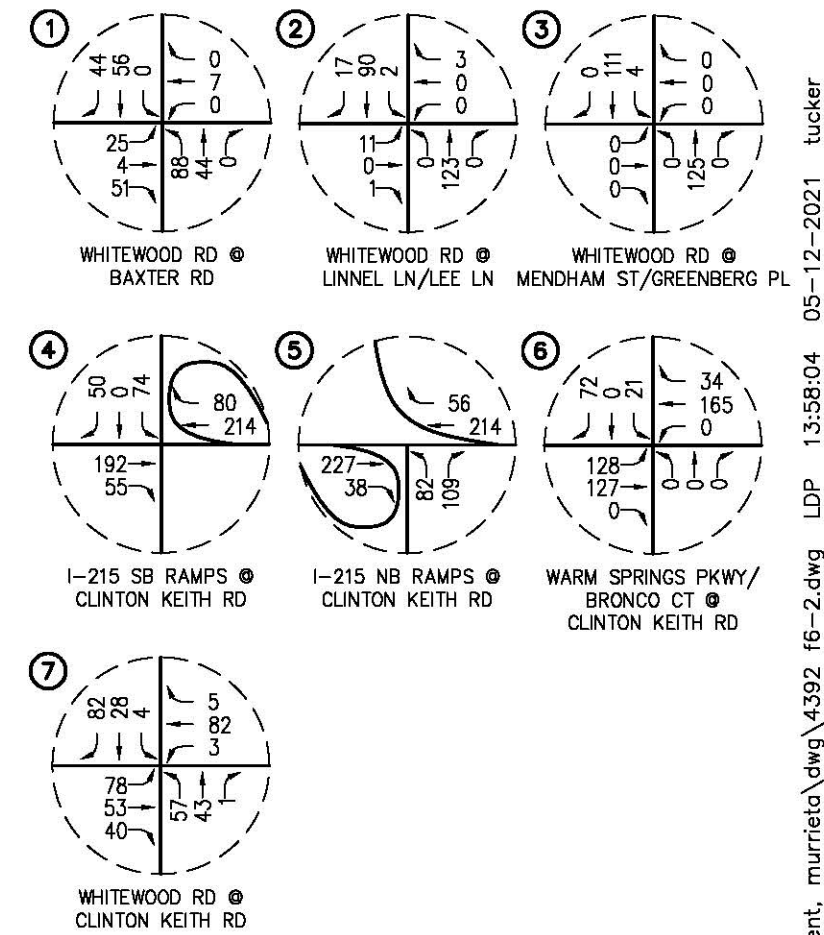
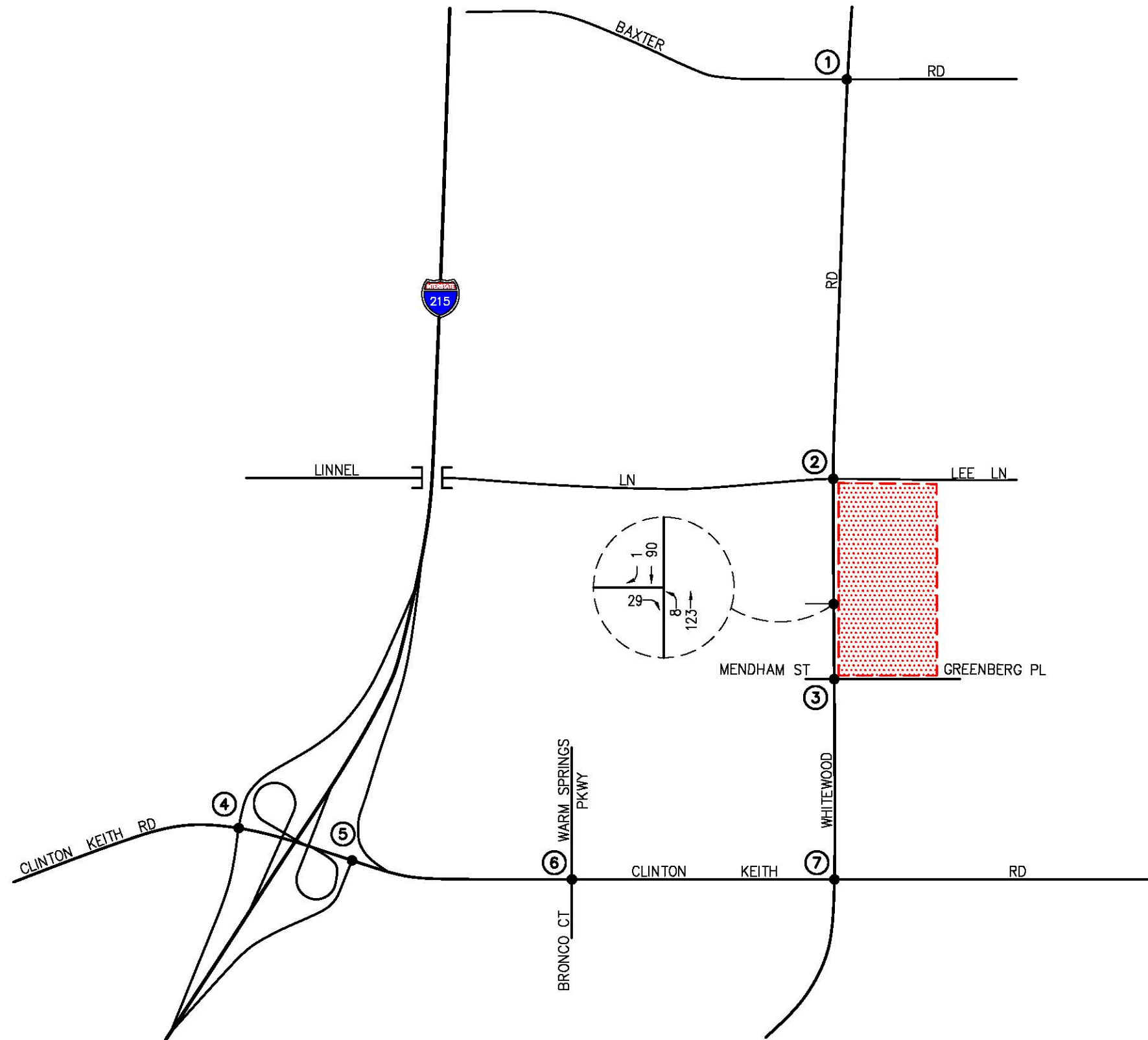
⁹ Source: *Clinton Keith Service Station Project Traffic Impact Analysis*, prepared by Integrated Engineering Group, dated April 2021.

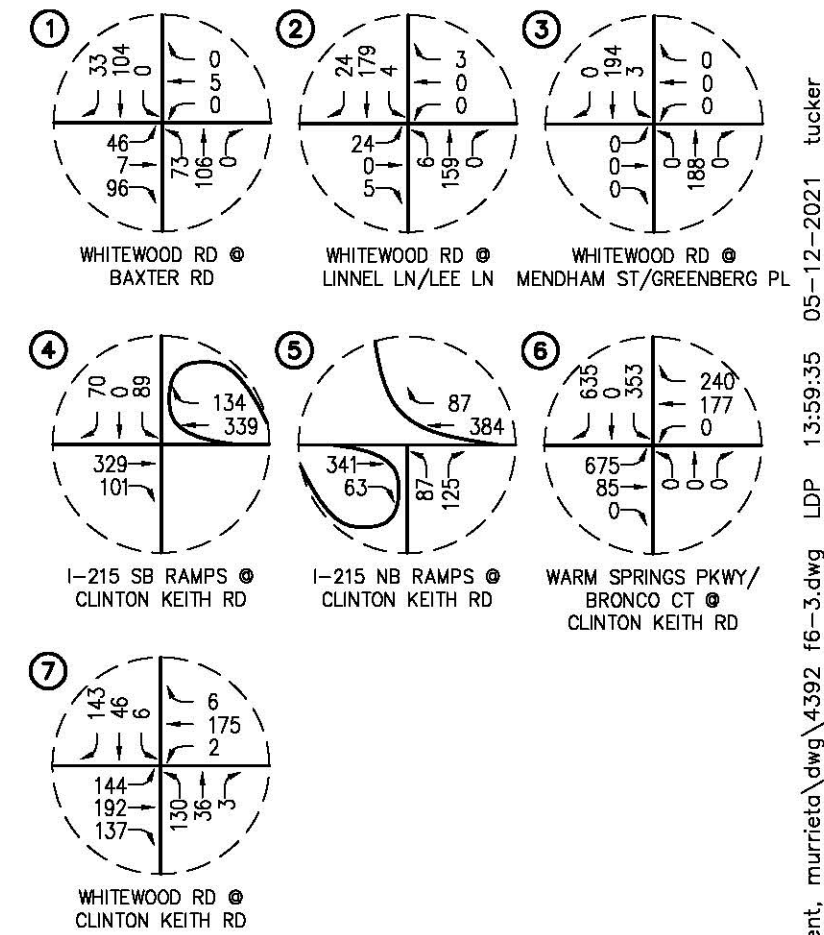
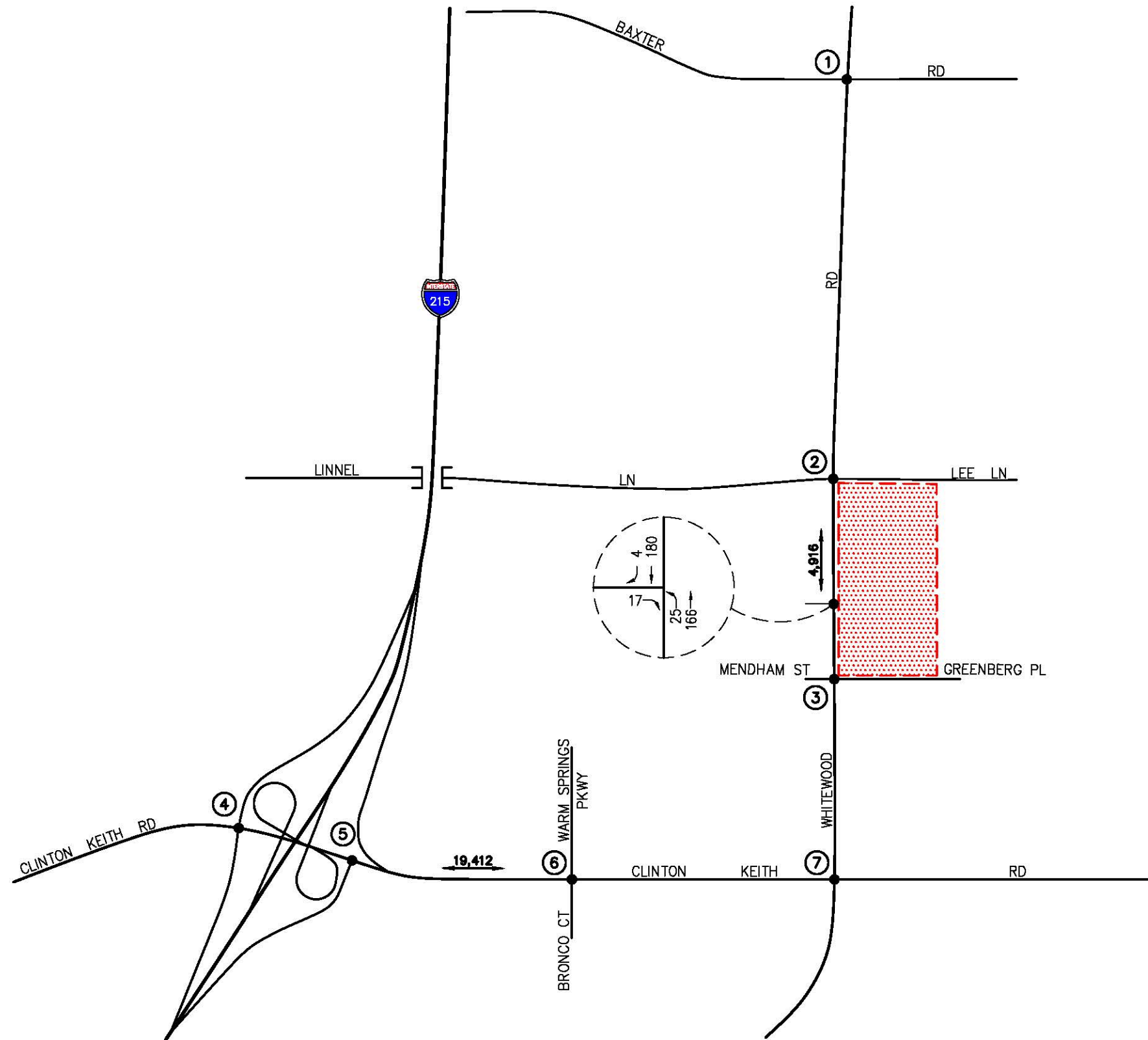
¹⁰ Source: *Transportation Impact Analysis Murrieta Costco and Vineyard II*, prepared by Kittleson & Associates, dated March 2020.

¹¹ Source: *The Vineyard Shopping Center Traffic Impact Analysis*, prepared by Trames Solutions, Inc., dated April 8, 2013.

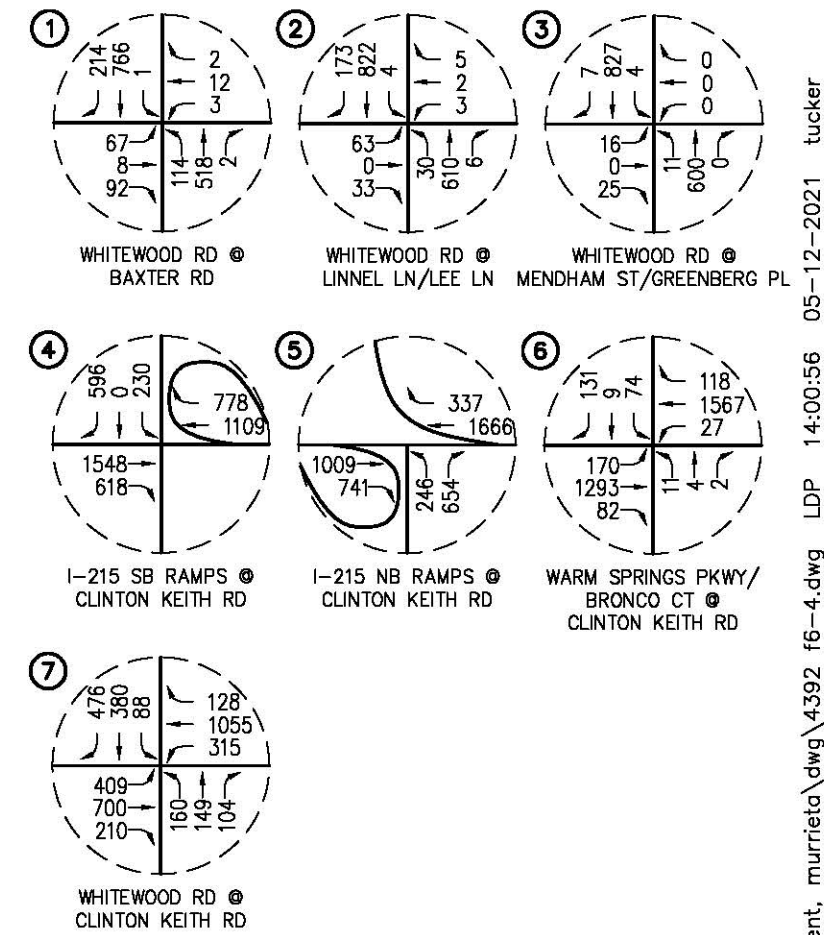
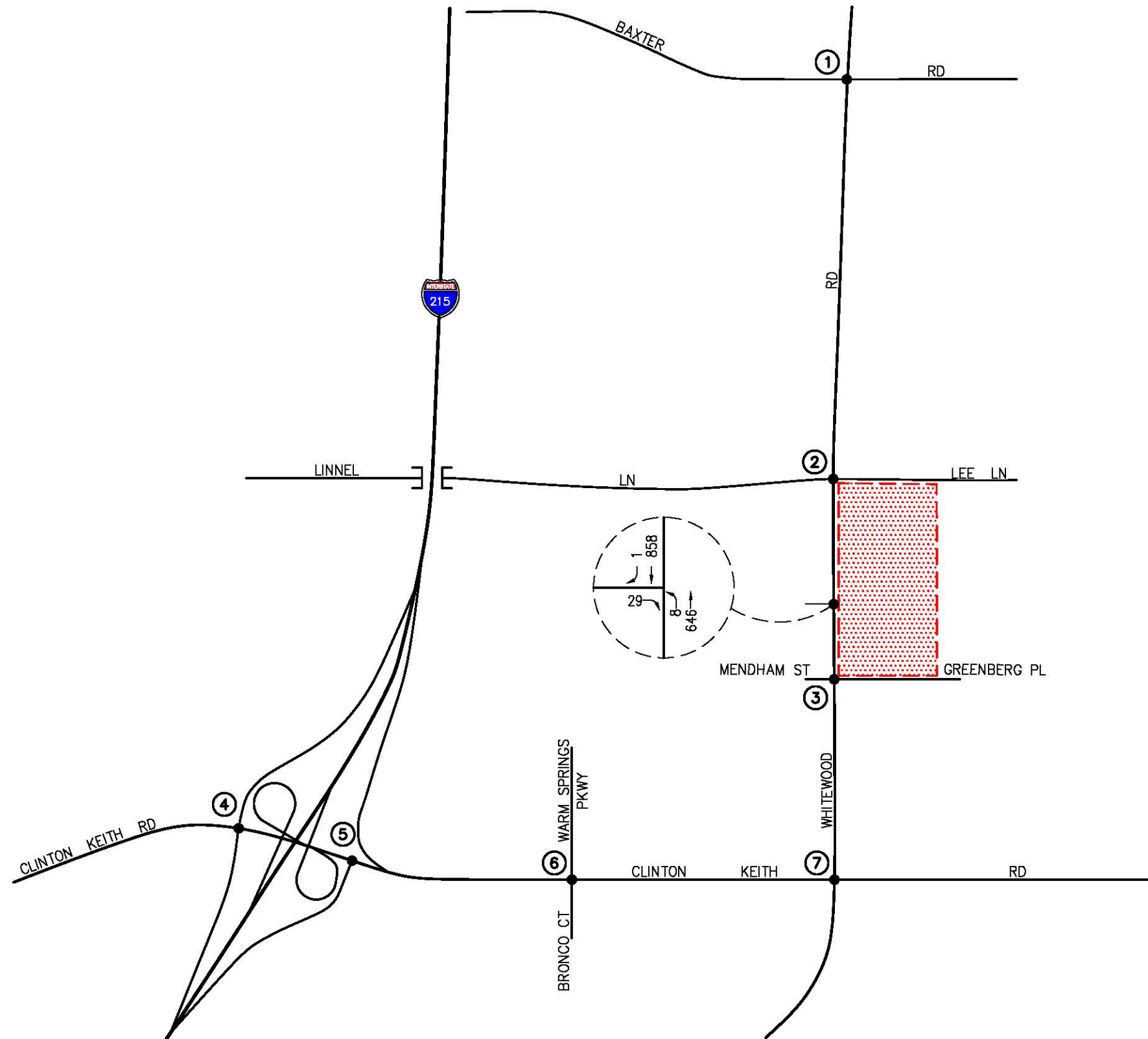
¹² Source: *Curci Property Traffic Impact Analysis*, prepared by Trames Solutions, Inc., dated March 10, 2020.

¹³ Source: *Makena Hills Traffic Impact Analysis*, prepared by LLG Engineers, dated October 5, 2017.





n:\4300\2214392 - whitewood multi-family development, murrieta\dwg\4392 f6-3.dwg LDP 13:59:35 05-12-2021 tucker



n:\4300\2214392 - whitewood multi-family development, murrieta\dwg\4392 f6-4.dwg LDP 14:00:56 05-12-2021 tucker

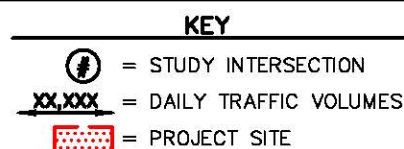
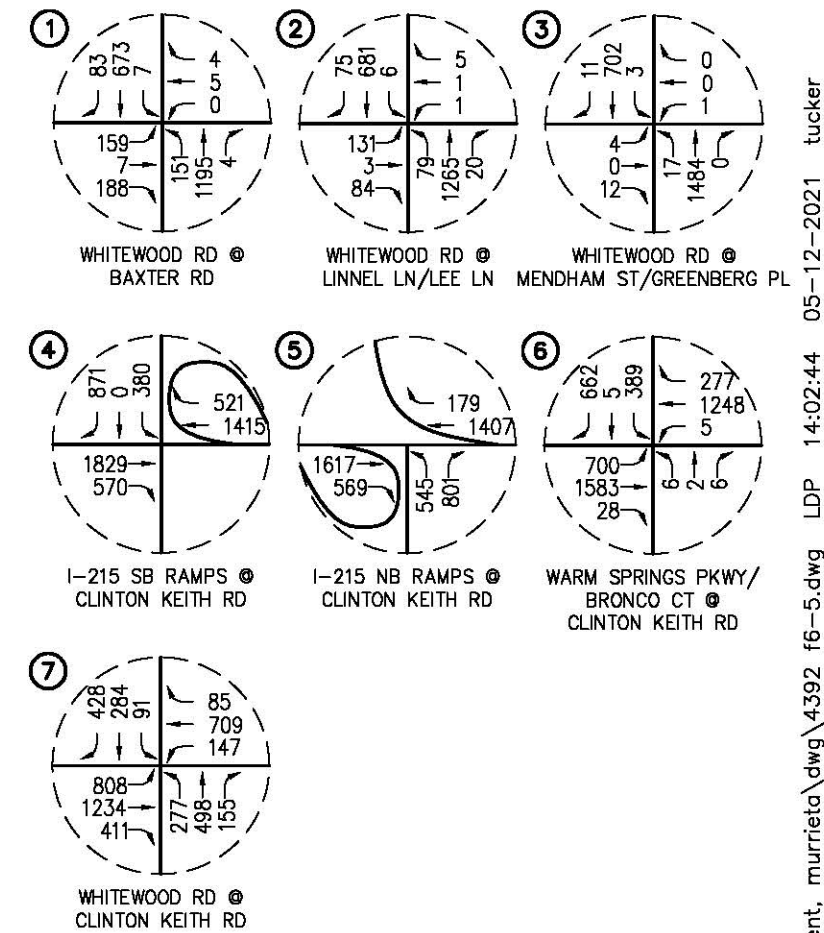
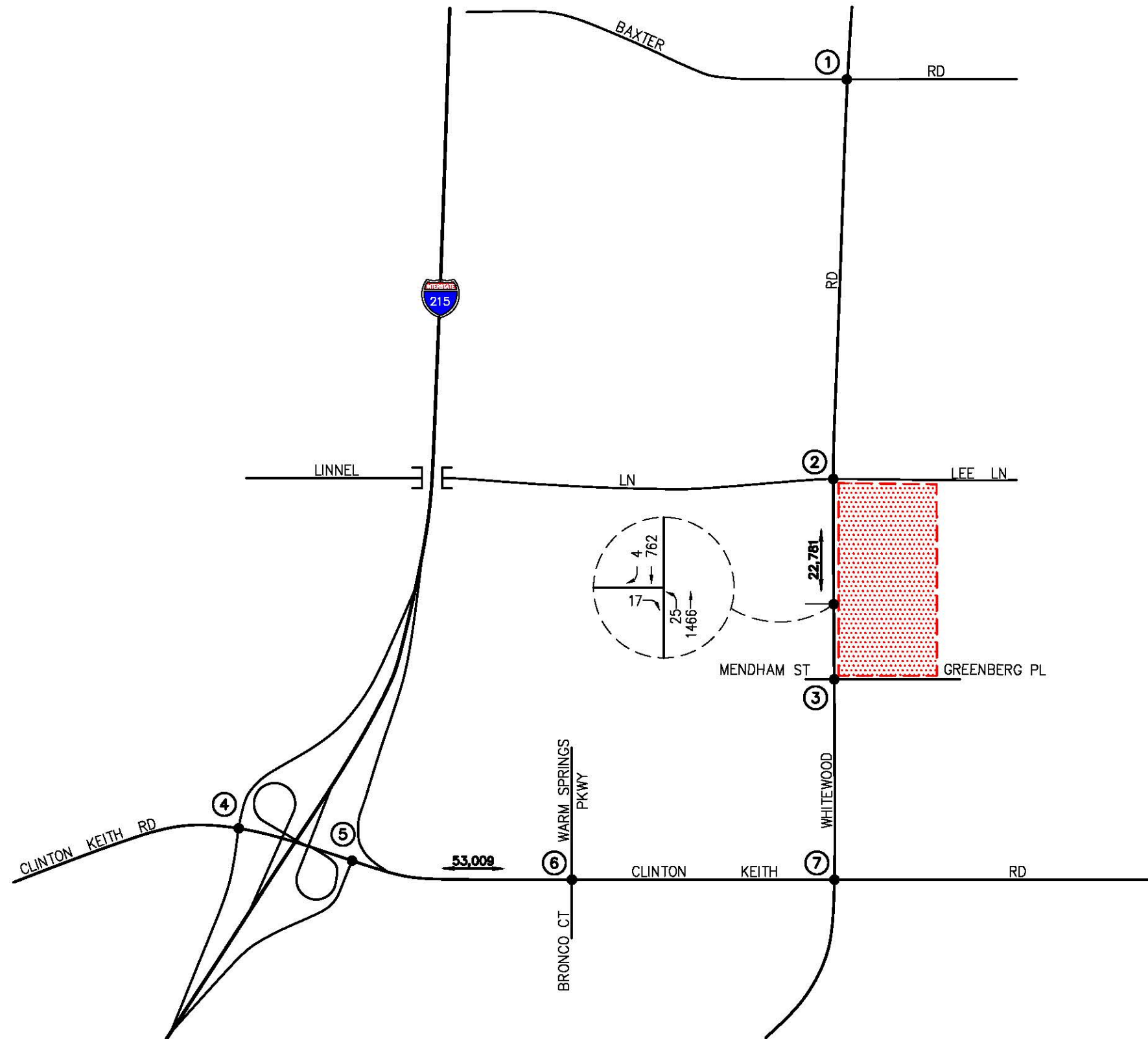
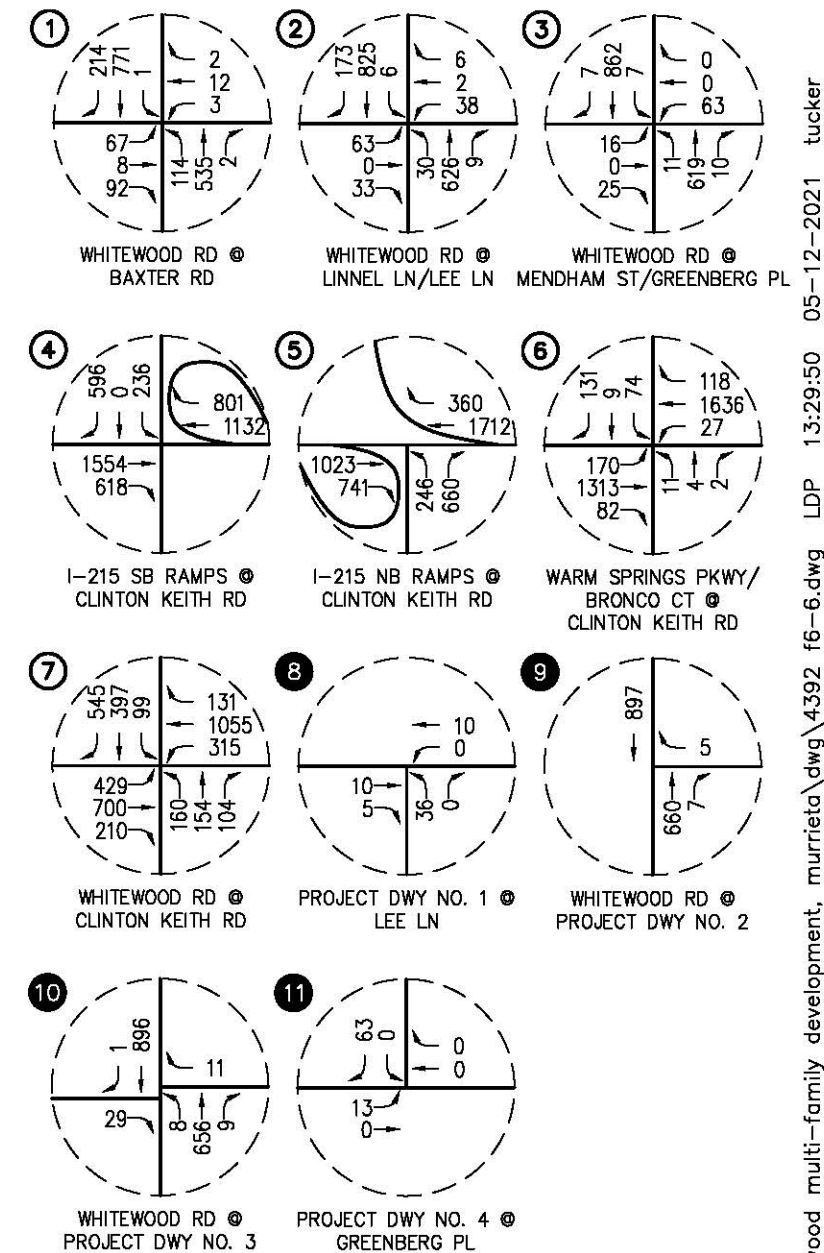
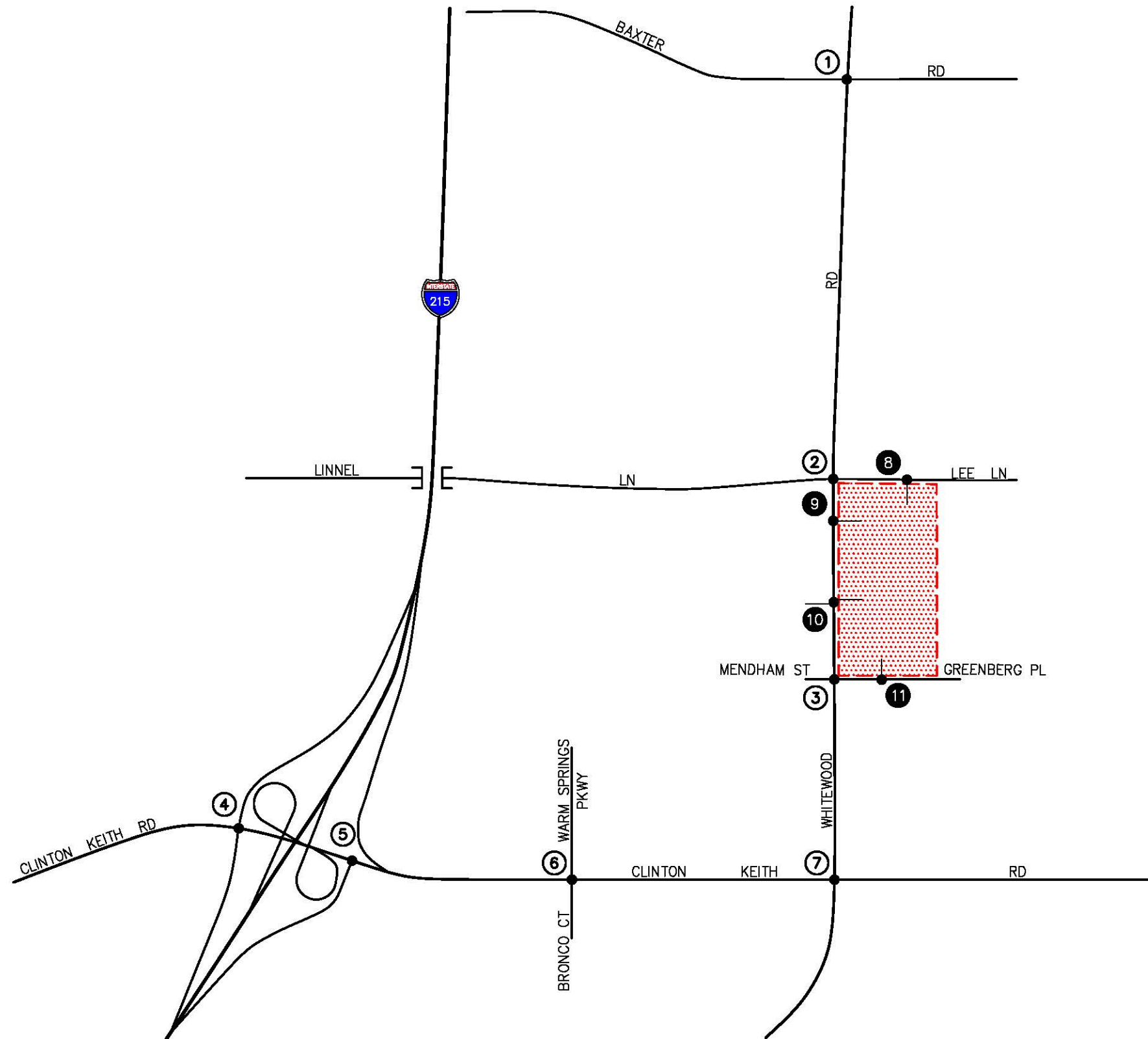
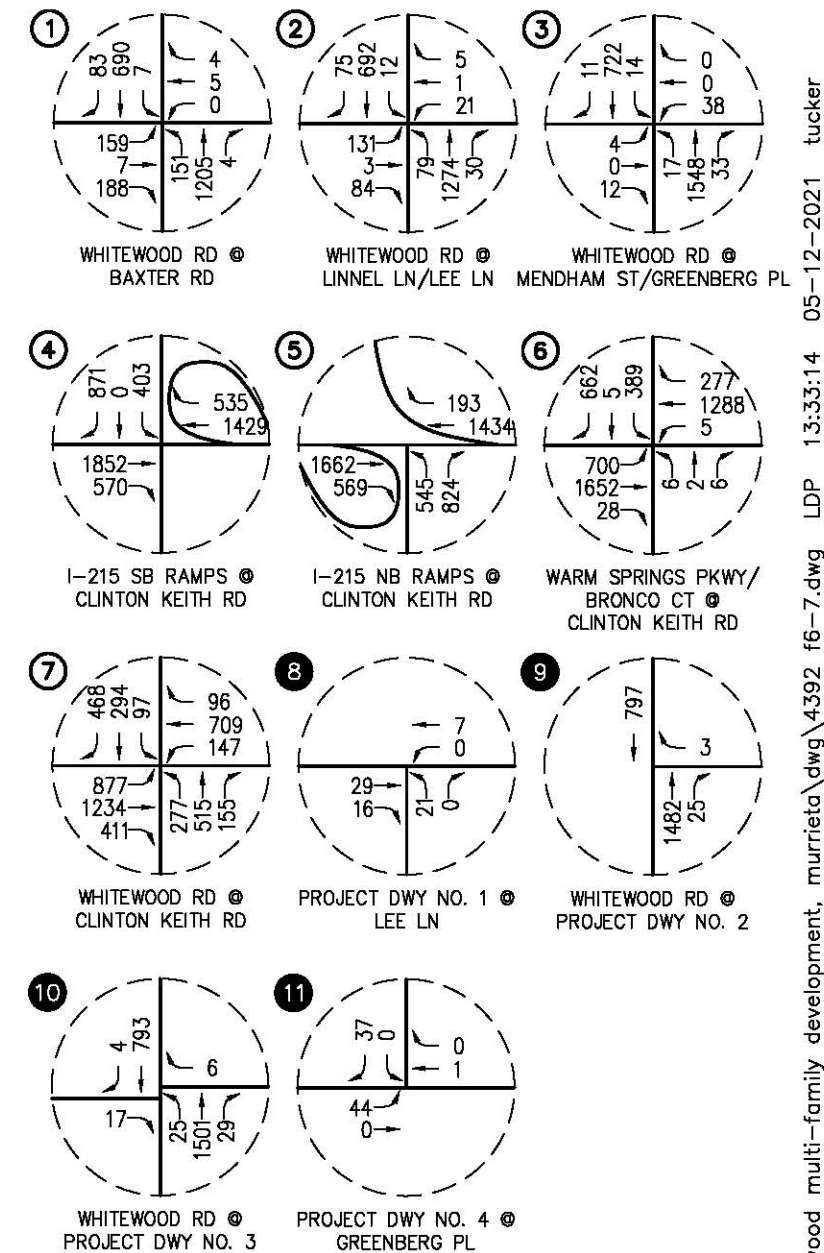
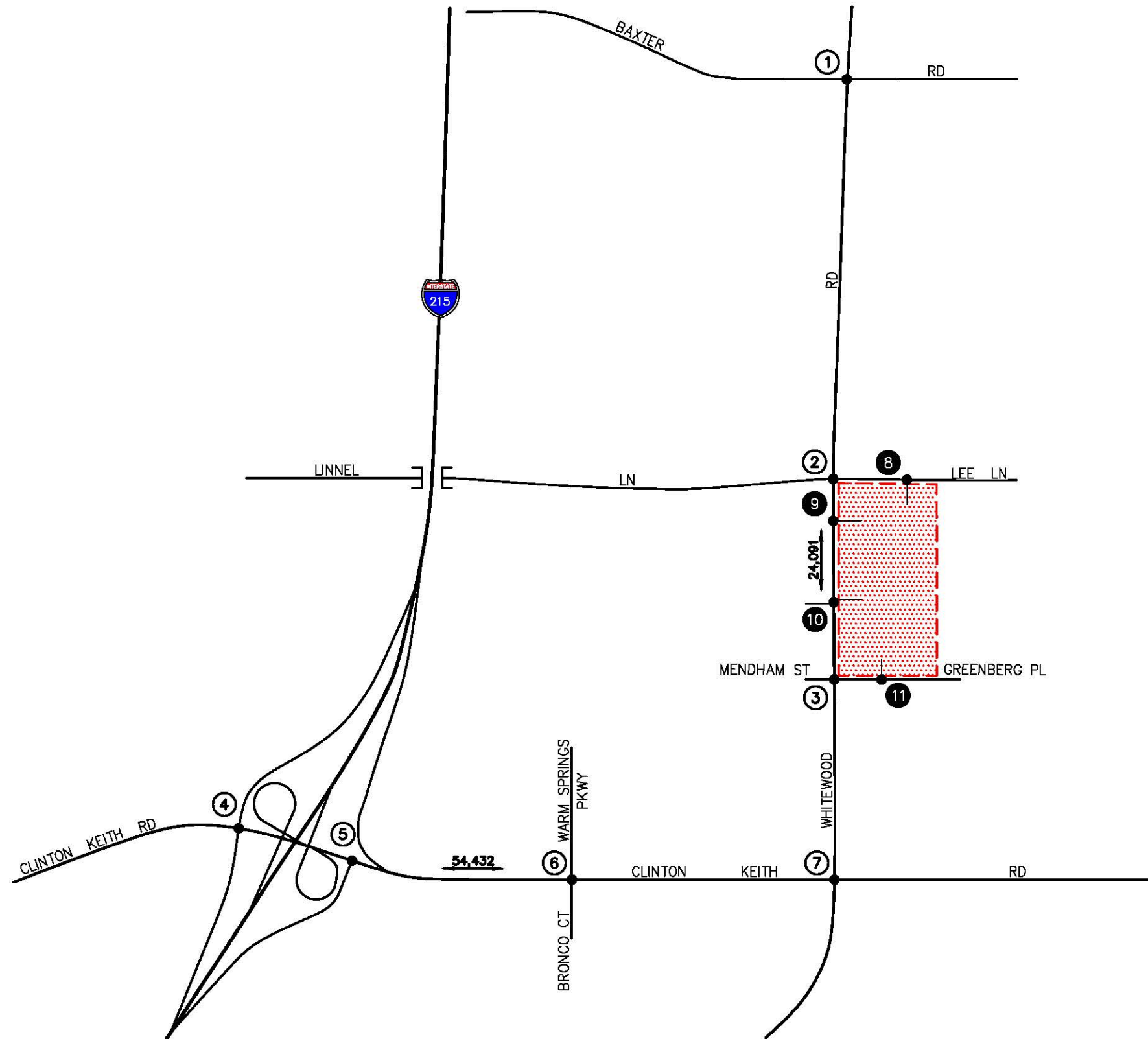


FIGURE 6-5

YEAR 2023 CUMULATIVE PM PEAK HOUR AND DAILY TRAFFIC VOLUMES
WHITEWOOD MULTI-FAMILY DEVELOPMENT, MURRIETA



n:\4300\2214392 - whitewood multi-family development, murrieta\dwg\4392 f6-6.dwg LDP 13:29:50 05-12-2021 tucker



7.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

The relative impact of the proposed Project during the AM peak hour/PM peak hour and on a daily basis was evaluated based on analysis of future operating conditions at the seven (7) key study intersections and two (2) key roadway segments, without, then with the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and service level characteristics at each study intersection and roadway segment. The significance of the potential impacts of the Project at each key intersection and key roadway segment was then evaluated using the following traffic impact criteria.

7.1 Impact Criteria and Thresholds

According to the *City of Murrieta Traffic Impact Analysis Preparation Guidelines*, dated May 2020, impacts to local and regional transportation systems are considered significant if:

Signalized Intersections:

- Any signalized study intersection operating at an acceptable LOS D or better without project traffic in which the addition of project traffic causes the intersection to degrade to a LOS E or F shall identify improvements to improve operations to LOS D or better.
- Any signalized study intersection that is operating at LOS E or F without project traffic where the project increases delay by 5.0 or more seconds shall identify improvements to offset the increase in delay.

Unsignalized Intersections:

- An operational improvement would be required if the study determines that either section a) or both sections b) and c) occur:
 - a) The addition of project related traffic causes the intersection to degrade from an acceptable LOS D or better to LOS E or F.
 - OR
 - b) The project adds 5.0 seconds or more of delay to an intersection that is already projected to operate without project traffic at a LOS E or F,
 - AND
 - c) The intersection meets the peak hour traffic signal warrant after the addition of project traffic.
- If the conditions above are satisfied, improvements should be identified that achieve the following:
 - LOS D or better for case a) above or to pre-project LOS and delay for case b) above.

Roadway Segments:

- Any study roadway segment operating at a LOS C or better without project traffic in which the addition of project traffic causes the segment to degrade to an LOS E or F should identify improvements to achieve LOS C.
- As an exception, LOS “D” may be allowed in the North Murrieta Business Corridor, Clinton Keith/Mitchell, Golden Triangle North (Central Murrieta), South Murrieta Business Corridor, or other Focus Areas, or other employment centers.
- Any roadway segment that operates unacceptably in the no project scenario where the project adds traffic in excess of 5% of the roadway capacity (e.g. a volume-to-capacity ratio increase of 0.05) should identify improvements to add capacity to the segment.

7.2 Traffic Impact Analysis Scenarios

The following scenarios are those for which volume/capacity calculations have been performed at the seven (7) key study intersections and two (2) key roadway segments for existing plus project and near-term (Year 2023) traffic conditions:

- (a) Existing Traffic Conditions;
- (b) Existing Plus Project Traffic Conditions;
- (c) Scenario (b) with Improvements, if necessary;
- (d) Near-Term (Year 2023) Cumulative Traffic Conditions,
- (e) Near-Term (Year 2023) Cumulative plus Project Traffic Conditions; and
- (f) Scenario (e) with Improvements, if necessary.

8.0 EXISTING PLUS PROJECT ANALYSIS

The following summarizes the “Existing Plus Project” level of service results for the seven (7) key study intersections and two (2) key roadway segments.

8.1 Intersections

Table 8-1 summarizes the peak hour level of service results at the seven (7) key study intersections for existing plus project traffic conditions. The first column (1) of HCM/LOS values in *Table 8-1* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing plus project traffic conditions. The third column (3) shows the increase in delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fourth column (4) indicates the anticipated level of service with recommended improvements.

8.1.1 Existing Traffic Conditions

Review of column (1) of *Table 8-1* indicates that one (1) of the seven (7) key study intersections currently operates at an unacceptable level of service during the PM peak hour. The intersection of Whitewood Road at Mendham Street/Greenberg Place currently operates at unacceptable LOS F during the PM peak hour. The remaining six (6) key study intersections currently operate at acceptable LOS D or better during the AM and PM peak hours.

8.1.2 Existing Plus Project Traffic Conditions

Review of columns (2) and (3) of *Table 8-1* indicates that traffic associated with the proposed Project ***will not*** significantly impact any of the seven (7) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Whitewood Road at Mendham Street/Greenberg Place is forecast to operate at unacceptable LOS F during the PM peak hour, this intersection is not impacted per the significant impact criteria specified in this report, as the peak hour traffic signal warrant is not satisfied. The remaining six (6) key study intersections currently operate and are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of Project generated traffic to existing traffic.

Appendix D presents the existing and the existing plus project HCM/LOS calculations for the seven (7) key study intersections for the AM peak hour and PM peak hour. *Appendix D* also includes the existing plus project traffic signal warrant worksheets for the intersection of Whitewood Road at Mendham Street/Greenberg Place.

8.2 Roadway Segments

Table 8-2 summarizes the roadway segment level of service results at the two (2) key roadway segments for existing plus project traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS “E” capacity. The fourth column (4) presents a summary of existing daily traffic

conditions. The fifth column (5) lists existing plus project daily traffic conditions. Column (6) shows the increase in V/C ratio value due to the added daily project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

8.2.1 *Existing Traffic Conditions*

Review of column (4) of *Table 8-2* indicates that the two (2) key roadway segments currently operate at acceptable LOS B or better on a daily basis.

8.2.2 *Existing Plus Project Traffic Conditions*

Review of columns (5) and (6) of *Table 8-2* indicates that traffic associated with the proposed Project ***will not*** significantly impact the two (2) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. The two (2) key roadway segments currently operate and are forecast to continue to operate at an acceptable service level on a daily basis with the addition of Project generated traffic to existing traffic.

TABLE 8-1
EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) Significant Impact		(4) Existing Plus Project With Improvements	
		HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
1. Whitewood Road at Baxter Road (S)	AM	10.2 s/v	B	10.3 s/v	B	0.1 s/v	No	--	--
	PM	14.8 s/v	B	14.8 s/v	B	0.0 s/v	No	--	--
2. Whitewood Road at Linnel Lane/Lee Lane (S)	AM	10.9 s/v	B	13.2 s/v	B	2.3 s/v	No	--	--
	PM	14.8 s/v	B	16.6 s/v	B	1.8 s/v	No	--	--
3. Whitewood Road at Mendham St/Greenberg Pl (U)	AM	14.9 s/v	B	23.0 s/v	C	8.1 s/v	No	--	--
	PM	57.4 s/v	F	164.3 s/v	F	106.9 s/v	No [a]	--	--
4. I-215 SB Ramps at Clinton Keith Road (S)	AM	16.7 s/v	B	16.7 s/v	B	0.0 s/v	No	--	--
	PM	20.6 s/v	C	20.8 s/v	C	0.2 s/v	No	--	--
5. I-215 NB Ramps at Clinton Keith Road (S)	AM	20.8 s/v	C	20.9 s/v	C	0.1 s/v	No	--	--
	PM	26.2 s/v	C	26.6 s/v	C	0.4 s/v	No	--	--
6. Warm Springs Parkway/Bronco Court at Clinton Keith Road (S)	AM	11.1 s/v	B	11.1 s/v	B	0.0 s/v	No	--	--
	PM	7.6 s/v	A	7.6 s/v	A	0.0 s/v	No	--	--
7. Whitewood Road at Clinton Keith Road (S)	AM	47.7 s/v	D	52.1 s/v	D	4.4 s/v	No	--	--
	PM	42.8 s/v	D	54.0 s/v	D	11.2 s/v	No	--	--

Notes:

- s/v = seconds per vehicle (delay)
- LOS = Level of Service, please refer to *Tables 3-1 and 3-2* for the LOS definitions
- **Bold HCM/LOS values** indicate adverse service levels based on the LOS standards mentioned in this report
- S = Signalized intersection; U = Unsignalized intersection
- [a] = Although this intersection is forecast to operate at an unacceptable LOS, this intersection is not impacted per the significant impact criteria specified in this report, as the peak hour traffic signal warrant is not satisfied (refer to Section 7.1)

TABLE 8-2
EXISTING PLUS PROJECT DAILY ROADWAY SEGMENT ANALYSIS SUMMARY

Key Roadway Segment	(1)	(2)	(3)	(4)			(5)			(6)	
	No. of Lanes	Arterial Classification	LOS E Capacity (VPD) ¹⁴	Existing Traffic Conditions			Existing Plus Project Traffic Conditions			Significant Impact	
				Daily Volume	V/C Ratio	LOS	Daily Volume	V/C Ratio	LOS	V/C Inc.	Yes/No
A. <u>Whitewood Road between Linnel Lane/Lee Lane and Greenberg Place</u>	4D	Major	34,100	17,178	0.504	A	18,488	0.542	A	0.038	No
B. <u>Clinton Keith Road between I-215 NB Ramps and Warm Springs Parkway/Bronco Court</u>	6D	Urban Arterial	53,900	32,305	0.599	A	33,728	0.626	B	0.027	No

Notes:

- VPD = Vehicles Per Day
- V/C = Volume to Capacity Ratio
- LOS = Level of Service, please refer to *Table 3-4* for the LOS definitions
- D = Divided; U = Undivided
- **Bold “V/C”/LOS values** indicate adverse service levels based on the LOS standards mentioned in this report

¹⁴ Source: *Murrieta General Plan 2035; Chapter 5 – Circulation Element; Table 5-2 - Daily Roadway Capacity Values.*

9.0 YEAR 2023 PLUS PROJECT ANALYSIS

The following summarizes the “Year 2023 Plus Project” level of service results for the seven (7) key study intersections and two (2) key roadway segments.

9.1 Intersections

Table 9-1 summarizes the peak hour level of service results at the seven (7) key study intersections for Year 2023 traffic conditions. The first column (1) of HCM/LOS values in *Table 9-1* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 8-1*). The second column (2) lists projected cumulative traffic conditions (existing plus ambient traffic plus cumulative project traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2023 near-term traffic conditions with the addition of Project traffic. The fourth column (4) shows the increase in delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fifth column (5) indicates the anticipated level of service with recommended improvements.

9.1.1 Year 2023 Cumulative Traffic Conditions

An analysis of future (Year 2023) cumulative traffic conditions indicates that the addition of ambient traffic growth and cumulative project traffic will adversely impact two (2) of the seven (7) key study intersections. The remaining five (5) key study intersections are forecast to continue to operate at acceptable levels of service during the AM and PM peak hours with the addition of ambient traffic growth and cumulative project traffic. The locations forecast to operate at an adverse LOS are as follows:

<u>Key Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>HCM</u>	<u>LOS</u>	<u>HCM</u>	<u>LOS</u>
3. Whitewood Road at Mendham Street/Greenberg Place	---	---	107.1 s/v	F
7. Whitewood Road at Clinton Keith Road	62.8 s/v	E	89.0 s/v	F

9.1.2 Year 2023 Cumulative Plus Project Traffic Conditions

Review of columns (3) and (4) of *Table 9-1* indicates that traffic associated with the proposed Project will cumulatively impact one (1) of the seven (7) key study intersections, when compared to the LOS standards and significant impact criteria specified in this report. Although the intersection of Whitewood Road at Mendham Street/Greenberg Place is forecast to operate at unacceptable LOS F during the PM peak hour, this intersection is not impacted per the significant impact criteria specified in this report, as the peak hour traffic signal warrant is not satisfied. The remaining five (5) key study intersections are forecast to continue to operate at an acceptable LOS D or better during the AM and PM peak hours with the addition of Project generated traffic in the Year 2023. The location cumulatively impacted by the proposed Project in the Year 2023 is as follows:

<u>Key Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>HCM</u>	<u>LOS</u>	<u>HCM</u>	<u>LOS</u>
7. Whitewood Road at Clinton Keith Road	71.7 s/v	E	101.6 s/v	F

As shown in column (5), the implementation of improvements at the impacted key study intersection of Whitewood Road at Clinton Keith Road completely offsets the impact of project traffic.

Appendix E presents the Year 2023 cumulative and Year 2023 cumulative plus project HCM/LOS calculations for the seven (7) key study intersections. *Appendix E* also includes the Year 2023 plus project traffic signal warrant worksheets for the intersection of Whitewood Road at Mendham Street/Greenberg Place.

9.2 Roadway Segments

Table 9-2 summarizes the roadway segment level of service results at the two (2) key roadway segments for Year 2023 traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the LOS “E” capacity. The fourth column (4) presents a summary of existing daily traffic conditions. The fifth column (5) lists Year 2023 cumulative daily traffic conditions. The sixth column (6) lists Year 2023 plus project daily traffic conditions. Column (7) shows the increase in V/C ratio value due to the added daily project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

9.2.1 Year 2023 Cumulative Traffic Conditions

An analysis of future (Year 2023) cumulative traffic conditions indicates that with the addition of ambient traffic growth and cumulative project traffic, one (1) of the two (2) key roadway segments is forecast to operate at an adverse level of service. The one (1) location that is forecast in the Year 2023 to operate at an adverse LOS is as follows:

<u>Key Roadway Segment</u>	<u>V/C</u>	<u>LOS</u>
B. Clinton Keith Rd between I-215 NB Ramps and Warm Springs Pkwy/Bronco Ct	0.983	E

The remaining one (1) key roadway segment is forecast to continue to operate at an acceptable level of service on a daily basis with the addition of ambient traffic growth and cumulative projects traffic.

9.2.2 Year 2023 Cumulative Plus Project Traffic Conditions

Review of columns (6) and (7) of *Table 9-2* indicates that traffic associated with the proposed Project ***will not*** significantly impact the two (2) key roadway segments when compared to the LOS standards and significant impact criteria specified in this report. Although Roadway Segment B is forecast to operate on a daily basis at unacceptable LOS F with the addition of Project traffic, the proposed Project is expected to add less than 0.050 to the V/C ratio. The remaining one (1) key roadway segment is forecast to continue to operate at an acceptable service level on a daily basis with the addition of project generated traffic in the Year 2023 traffic condition.

TABLE 9-1
YEAR 2023 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2023 Cumulative Traffic Conditions		(3) Year 2023 Cumulative Plus Project Traffic Conditions		(4) Significant Impact		(5) Year 2023 Cumulative Plus Project With Improvements	
		HCM	LOS	HCM	LOS	HCM	LOS	Increase	Yes/No	HCM	LOS
1. Whitewood Road at Baxter Road (S)	AM	10.2 s/v	B	17.4 s/v	B	17.6 s/v	B	0.2 s/v	No	--	--
	PM	14.8 s/v	B	22.3 s/v	C	22.3 s/v	C	0.0 s/v	No	--	--
2. Whitewood Road at Linnel Lane/Lee Lane (S)	AM	10.9 s/v	B	11.8 s/v	B	14.0 s/v	B	2.2 s/v	No	--	--
	PM	14.8 s/v	B	16.3 s/v	B	18.1 s/v	B	1.8 s/v	No	--	--
3. Whitewood Road at Mendham St/Greenberg Pl (U)	AM	14.9 s/v	B	18.5 s/v	C	34.8 s/v	D	16.3 s/v	No	--	--
	PM	57.4 s/v	F	107.1 s/v	F	513.8 s/v	F	406.7 s/v	No [a]	--	--
4. I-215 SB Ramps at Clinton Keith Road (S)	AM	16.7 s/v	B	19.3 s/v	B	19.3 s/v	B	0.0 s/v	No	--	--
	PM	20.6 s/v	C	25.3 s/v	C	25.5 s/v	C	0.2 s/v	No	--	--
5. I-215 NB Ramps at Clinton Keith Road (S)	AM	20.8 s/v	C	27.1 s/v	C	27.3 s/v	C	0.2 s/v	No	--	--
	PM	26.2 s/v	C	35.5 s/v	D	36.4 s/v	D	0.9 s/v	No	--	--
6. Warm Springs Pkwy/Bronco Ct at Clinton Keith Road (S)	AM	11.1 s/v	B	15.4 s/v	B	15.4 s/v	B	0.0 s/v	No	--	--
	PM	7.6 s/v	A	52.3 s/v	D	52.5 s/v	D	0.2 s/v	No	--	--
7. Whitewood Road at Clinton Keith Road (S)	AM	47.7 s/v	D	62.8 s/v	E	71.7 s/v	E	8.9 s/v	Yes	62.6 s/v	E
	PM	42.8 s/v	D	89.0 s/v	F	101.6 s/v	F	12.6 s/v	Yes	80.8 s/v	F

Notes:

- s/v = seconds per vehicle (delay)
- LOS = Level of Service, please refer to *Tables 3-1 and 3-2* for the LOS definitions
- **Bold HCM/LOS values** indicate adverse service levels based on the LOS standards mentioned in this report
- S = Signalized intersection; U = Unsignalized intersection
- [a] = Although this intersection is forecast to operate at an unacceptable LOS, this intersection is not impacted per the significant impact criteria specified in this report, as the peak hour traffic signal warrant is not satisfied (refer to Section 7.1)

TABLE 9-2
YEAR 2023 CUMULATIVE PLUS PROJECT DAILY ROADWAY SEGMENT ANALYSIS SUMMARY

Key Roadway Segment	(1)	(2)	(3)	(4)			(5)			(6)			(7)	
	No. of Lanes	Arterial Classification	LOS E Capacity (VPD) ¹⁵	Existing Traffic Conditions			Year 2023 Cumulative Traffic Conditions			Year 2023 Cumulative Plus Project Traffic Conditions			Significant Impact	
				Daily Volume	V/C Ratio	LOS	Daily Volume	V/C Ratio	LOS	Daily Volume	V/C Ratio	LOS	V/C Inc.	Yes/No
A. <u>Whitewood Road</u> between Linnel Lane/Lee Lane and Greenberg Place	4D	Major	34,100	17,178	0.504	A	22,781	0.668	B	24,091	0.706	C	0.038	No
B. <u>Clinton Keith Road</u> between I-215 NB Ramps and Warm Springs Parkway/Bronco Court	6D	Urban Arterial	53,900	32,305	0.599	A	53,009	0.983	E	54,432	1.010	F	0.027	No

Notes:

- VPD = Vehicles Per Day
- V/C = Volume to Capacity Ratio
- LOS = Level of Service, please refer to *Table 3-4* for the LOS definitions
- D = Divided; U = Undivided
- **Bold “V/C”/LOS values** indicate adverse service levels based on the LOS standards mentioned in this report

¹⁵ Source: *Murrieta General Plan 2035; Chapter 5 – Circulation Element; Table 5-2 - Daily Roadway Capacity Values.*

10.0 CALTRANS FACILITIES ANALYSIS

Caltrans requires the use of analysis methods provided in the *Highway Capacity Manual 6th Edition* (HCM 6) for the analysis of ramp intersections. Per Caltrans requirements, Caltrans “endeavors to maintain a target LOS at the transition between LOS “C” and LOS “D” on State highway facilities”; it does not require that LOS “D” (shall) be maintained. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. For this analysis, LOS D is the target level of service standard and will be utilized to assess the project impacts at the state-controlled study intersections.

Ramp Intersection Capacity Analyses were conducted for the following two (2) state-controlled key study intersections:

4. I-215 SB Ramps at Clinton Keith Road
5. I-215 NB Ramps at Clinton Keith Road

10.1 Ramp Intersection Capacity Analysis

Tables 8-1 and **9-1** presented previously in Sections 8.0 and 9.0 summarized the peak hour LOS results for the two (2) ramp intersections for Existing Plus Project Traffic Conditions and Year 2023 Cumulative Plus Project Traffic Conditions, respectively. As summarized previously in Sections 8.0 and 9.0, the two (2) state-controlled key study intersections are forecast to operate at acceptable LOS D or better during AM and PM peak hours under Existing Plus Project Traffic Conditions and Year 2023 Cumulative Plus Project Traffic Conditions. As such, the proposed Project will not impact the two (2) state-controlled key study intersections.

11.0 SITE ACCESS AND INTERNAL CIRCULATION EVALUATION

11.1 Level of Service Analysis For Project Access Locations

As shown previously in *Figure 2-2*, vehicular access to the 116 north units will be provided via one (1) full access unsignalized driveway located along Lee Lane (i.e. Project Driveway No. 1) and via one (1) right-turn in/right-turn out only unsignalized driveway located along Whitewood Road (i.e. Project Driveway No. 2). Vehicular access to the 208 south units will be provided via one (1) right-turn in/right-turn out only unsignalized driveway located along Whitewood Road (i.e. Project Driveway No. 3) and via one (1) full access unsignalized driveway located along Greenburg Place (i.e. Project Driveway No. 4).

Table 11-1 summarizes the intersection operations at the four (4) proposed project driveways under near-term (Year 2023) cumulative traffic conditions at completion and full occupancy of the proposed Project. The operations analysis for the project driveways are based on the *Highway Capacity Manual 6th Edition* (HCM 6) methodology for unsignalized intersections. Review of *Table 11-1* shows that the four (4) Project Driveways are forecast to operate at acceptable LOS C or better during the AM and PM peak hours for near-term (Year 2023) cumulative traffic conditions. As such, project access will be adequate. Motorists entering and exiting the Project site will be able to do so comfortably, safely, and without undue congestion.

Appendix F presents the Year 2023 Cumulative Plus Project level of service calculation worksheets for the four (4) proposed Project driveways.

11.2 Internal Circulation Evaluation

The on-site circulation was evaluated in terms of vehicle-vehicle and vehicle-pedestrian conflicts. Based on our review of the proposed site plan as illustrated in *Figure 2-2*, the on-site circulation layout of the proposed Project on an overall basis is adequate. Curb return radii have been confirmed and are generally adequate for passenger cars, emergency vehicles, and trash/delivery (FedEx, UPS) trucks.

TABLE 11-1
PROJECT DRIVEWAY PEAK HOUR LEVELS OF SERVICE SUMMARY

Project Driveway	Time Period	Intersection Control	Year 2023 Cumulative Plus Project Traffic Conditions	
			HCM	LOS
8. Project Driveway No. 1 at Lee Lane	AM	One-Way	8.8 s/v	A
	PM	Stop	8.8 s/v	A
9. Whitewood Road at Project Driveway No. 2	AM	One-Way	10.6 s/v	B
	PM	Stop	16.0 s/v	C
10. Whitewood Road at Project Driveway No. 3	AM	Two-Way	12.1 s/v	B
	PM	Stop	16.3 s/v	C
11. Project Driveway No. 4 at Greenberg Place	AM	One-Way	8.5 s/v	A
	PM	Stop	8.5 s/v	A

Note:

- s/v = seconds per vehicle

12.0 AREA-WIDE TRAFFIC IMPROVEMENTS

For those intersections where projected traffic volumes are expected to result in impacts, this report recommends traffic improvements that change the intersection geometry to increase capacity. These capacity improvements involve roadway widening and/or re-striping to reconfigure (add lanes) roadways to specific approaches of a key intersection. The identified improvements are expected to:

1. Address the impact of existing traffic, Project traffic and future non-project (ambient traffic growth and related projects) traffic, and
2. Improve Levels of Service to an acceptable range and/or to pre-project conditions.

12.1 Existing Plus Project Recommended Improvements

The results of the intersection capacity analysis presented previously in *Table 8-1* shows that the proposed Project will not significantly impact any of the seven (7) key study intersections under the “Existing Plus Project” traffic scenario. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

The results of the “Existing Plus Project” daily roadway segment analysis presented previously in *Table 8-2* indicates that the proposed Project will not significantly impact any of the two (2) key roadway segments. Given that there are no significant project impacts, no improvements are required under this traffic scenario.

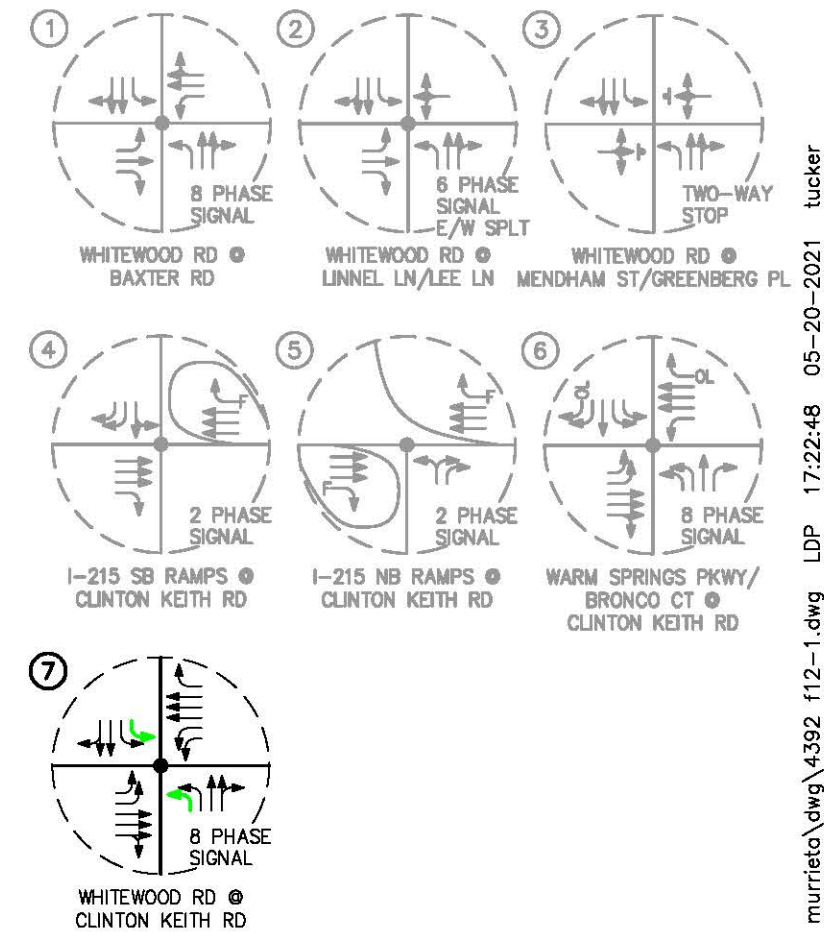
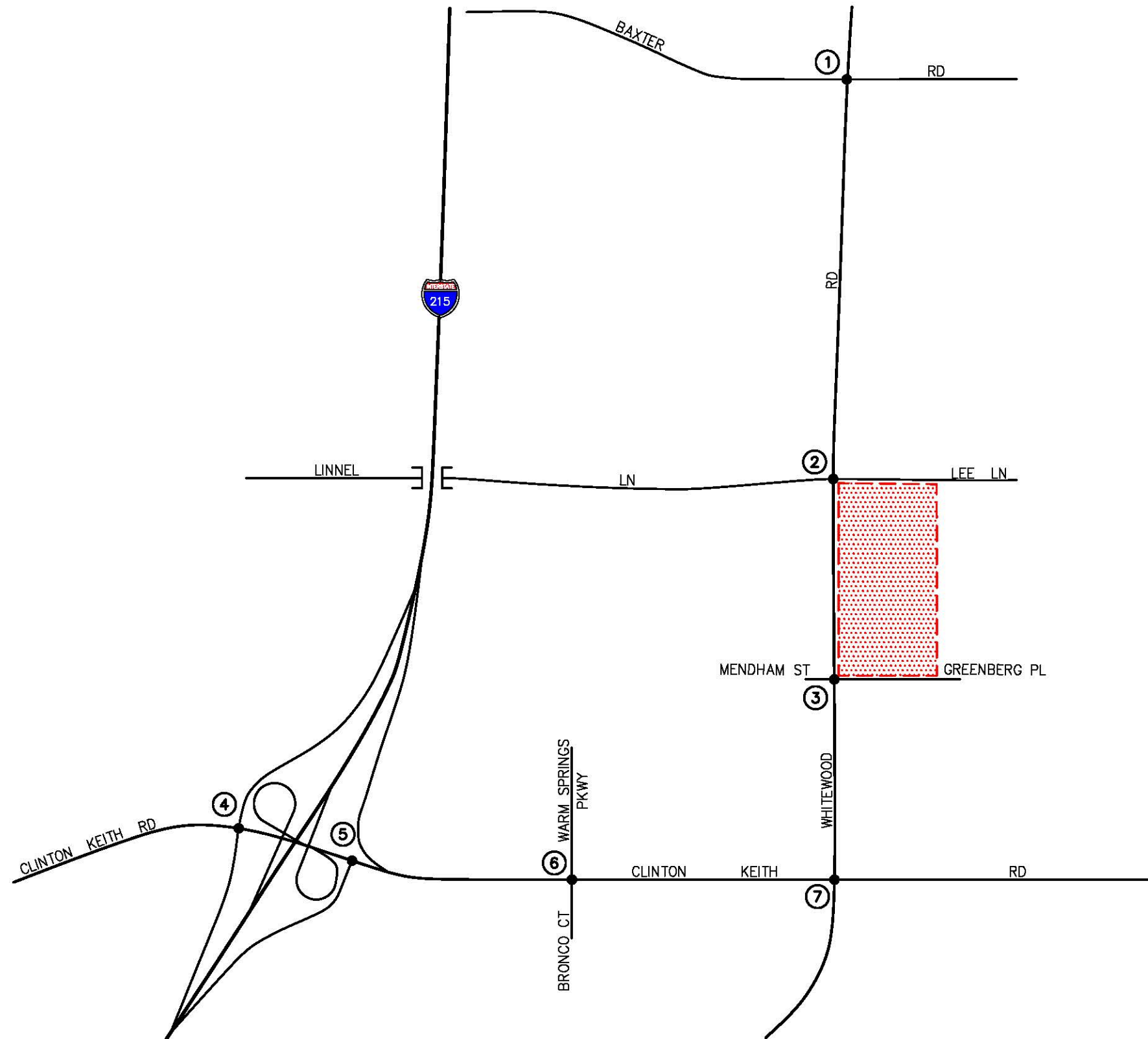
12.2 Year 2023 Plus Project Recommended Improvements

The following improvements listed below have been identified to improve the “Year 2023 Cumulative Plus Project” impact at the one (1) cumulatively impacted key study intersection:

- Intersection No. 7 – Whitewood Road at Clinton Keith Road: Widen and/or restripe the northbound approach along Whitewood Road to provide a second exclusive northbound left-turn lane. Widen and/or restripe the southbound approach along Whitewood Road to provide a second exclusive southbound left-turn lane. Modify the existing traffic signal as necessary.

Figure 12-1 graphically illustrates the recommended improvements for “Year 2023 Cumulative Plus Project” traffic conditions at the one (1) cumulatively impacted key study intersection.

The results of the “Year 2023 Plus Project” daily roadway segment analysis presented previously in *Table 9-2* indicates that the proposed Project will not significantly impact any of the two (2) key roadway segments. Given that there are no significant project impacts, no improvements are required under this traffic scenario.



13.0 PROJECT-RELATED FAIR SHARE CONTRIBUTION

The transportation impacts associated with development of the proposed Project were determined based on the level of service analyses presented previously in *Tables 8-1* and *9-1*. As summarized previously in Section 9.0, the proposed Project is anticipated to create one (1) cumulative impact in the Year 2023. As such, the proposed Project can be expected to pay a proportional “fair-share” of the improvement costs of the impacted intersections to improve the project’s traffic impacts. It should be noted that the recommended improvements are identified above in Section 12.0.

13.1 Year 2023 Project-Related Fair Share Contribution

Table 13-1 presents the AM peak hour and PM peak hour percentage of net traffic impact at the study intersection cumulatively impacted by the proposed Project for Year 2023 traffic conditions. As presented in this table, the first column (1) presents a total of all intersection peak hour movements for existing traffic conditions. The second column (2) presents project only traffic conditions. The third column (3) presents future Year 2023 cumulative traffic conditions with project traffic. The fourth column (4) represents what percentage of total intersection peak hour traffic is project-related traffic.

Review of *Table 13-1* shows that the Project’s traffic percentage at the one (1) cumulatively impacted key study intersection is 16.8% for intersection #7 (Whitewood Road at Clinton Keith Road).

TABLE 13-1
YEAR 2023 PROJECT FAIR SHARE CONTRIBUTION

Key Intersections		(1) Existing Traffic	(2) Project Only Traffic	(3) Year 2023 Cumulative Plus Project Traffic	(4) Net Project Percent Increase
7.	Whitewood Road at Clinton Keith Road	AM	3,555	4,299	16.8%
		PM	3,947	5,280	11.5%

Notes:

Net Project Percent Increase (4) = [Column (2)] / [Column (3) – Column (1)]

14.0 MULTIMODAL CIRCULATION

The on-site circulation layout of the proposed Project as illustrated in *Figure 2-2* on an overall basis is adequate for drivers, pedestrians, bicycles, and public transit users.

Pedestrian Circulation

Pedestrian circulation will be provided via existing public sidewalks along the west side of Whitewood Road in the vicinity of the Project, as well as future sidewalks along the Project frontage on Whitewood Road, Lee Lane and Greenburg Place, which will be installed in conjunction with the Project. These future sidewalks along Whitewood Road, Lee Lane and Greenburg Place will connect to the Project's internal walkways. The existing sidewalk system within the Project vicinity provides direct connectivity to the surrounding residential communities, as well as public transit along Clinton Keith Road. The intersection of Whitewood Road at Linnel Lane/Lee Lane currently provides crosswalks along the western, southern, and eastern legs which currently provides and will continue to provide pedestrians safe and convenient access from the Project site across Whitewood Road and/or Linnel Lane/Lee Lane.

Bike Lanes

Whitewood Road, between Keller Road and Clinton Keith Road, is currently a Class II: Striped Bike Lane (On-Road), providing an exclusive roadway space for cyclists, demarcated through pavement marking and signage. Linnel Lane, west of Whitewood Road, does not currently have any designated bicycle facilities implemented. The *City of Murrieta General Plan 2035 Circulation Element* "identifies measures to implement bicycle and pedestrian networks in the City, allowing residents to travel from neighborhoods to key destinations without having to use their personal automobiles." Per the *City of Murrieta General Plan 2035 Circulation Element*, Whitewood Road, between Keller Road and Clinton Keith Road, is recommended in the future to remain a Class II: Striped Bike Lane (On-Road); Linnel Lane, west of Whitewood Road, is recommended in the future as a Class II: Striped Bike Lane (On-Road). The proposed Project will be consistent with the *City of Murrieta General Plan 2035 Circulation Element*, which will provide bicyclists direct connectivity to the Project site.

Public Transit

Public transit bus service is provided in the Project area by the Riverside Transit Agency (RTA). **Section 3.2** contains descriptions for the following transit route:

- *City Route 61*

The bus stops nearest to the Project site are located along Clinton Keith Road, just east of Bronco Way on the south side of the roadway and just west of Bronco Way on the north side of the roadway.

