TRAFFIC IMPACT REPORT

PROPOSED CORONA WINERY ALONG SILVERADO TRAIL IN NAPA VALLEY

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Prepared for: Corona Winery

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I. INTRODUCTION

This report has been prepared at the request o the Napa County Public Works Department as authorized by the Corona Winery applicant to determine if the proposed Corona Winery along Silverado Trail will result in any significant circulation system impacts at the project entrance or at the nearby Silverado Trail intersections with Soda Canyon Road and Hardman Avenue. Analysis has been provided for harvest Friday and Saturday PM peak hour conditions for existing, year 2019 (first year of full project production) and year 2030 (general plan buildout) horizons.

II. SUMMARY OF FINDINGS

A. "WITHOUT PROJECT" OPERATING CONDITIONS

1. Silverado Trail at the project site now has higher two-way traffic volumes during the Friday PM peak hour than the Saturday afternoon peak traffic hour (1,545 two-way vehicles versus 1,245 two-way vehicles).

2. The Silverado Trail intersections with Soda Canyon Road and Hardman Avenue now have unacceptable operation during harvest Friday PM peak traffic hours, and acceptable levels of service during Saturday afternoon peak traffic hours. Both intersections have harvest Friday PM peak hour volumes exceeding peak hour signal warrant criteria levels, while the Silverado Trail/Hardman Avenue intersection also has Saturday PM peak hour volumes exceeding warrant criteria levels.

3. The Silverado Trail intersections with Soda Canyon Road and Hardman Avenue will be experiencing unacceptable harvest levels of service during most Friday and Saturday PM peak traffic hours in 2019, and during all PM peak traffic hours in 2030.

4. The Silverado Trail intersections with Soda Canyon Road and Hardman Avenue will have PM Peak hour harvest volumes exceeding peak hour signal warrant criteria levels during most Friday and Saturday PM peak traffic hours in 2019, and during all PM peak traffic hours in 2030.

B. PROJECT IMPACTS

1. The project will result in either about 5 inbound or 5 outbound trips during the harvest Friday or Saturday peak traffic hours along Silverado Trail. The project trips during these hours will be associated with visitors conducting tours and tasting by appointment.

2. The project will construct a continuous two-way left turn lane along Silverado Trail extending 50 feet north and 100 feet south of the project entrance.

3. Project traffic during harvest will not produce any significant operational impacts at the Silverado Trail intersections with Soda Canyon Road or Hardman Avenue during Friday or Saturday afternoon peak traffic conditions for the near term (year 2019) or long term (year 2030) analysis horizons.

4. Sight lines will be adequate at the project's proposed driveway connection to Silverado Trail.

5. There would be a minor safety concern at the project entrance intersection due to the offset of the project entrance on the west side of Silverado Trail by about 50 feet from a driveway on the east side of the road serving a single family residence. There could be extremely infrequent instances when there will be a southbound driver in the continuous turn lane making a left into the residential driveway at the same time as a northbound driver is in the same section of the turn lane to make a left into the winery driveway. Overall, given the low number of expected left turn movements during the day, the probability that there would ever be north and southbound left turning drivers using this same section of the continuous turn lane at the same time would be remote. On the positive side, the continuous turn lane would provide significantly increased safety for southbound left turns into the offset residence driveway by eliminating the current possibility of rear-end accidents due to the lack of a left turn deceleration lane. In addition, it would be expected that southbound drivers turning left into the residence with the offset driveway would be aware of the potential issue, as would northbound employees turning left into the Corona Winery, and both would take additional caution when entering the continuous turn lane.

C. CONCLUSIONS & RECOMMENDATIONS

The project would result in no significant off-site circulation system operational impacts nor any sight line impacts at the proposed project driveway connection to Silverado Trail. Therefore, no mitigations are needed for these issues. The County will need to determine if the proposed project driveway location in relation to the offset driveway on the east side of Silverado Trail serving a single family residence will be acceptable given the very remote possibility of north and southbound left turning vehicles using the same section of the continuous turn lane at the same time.

III. PROJECT LOCATION & DESCRIPTION

The Corona Winery will be located on the west side of Silverado Trail about a quarter mile south of the Soda Canyon Road intersection and about 2.2 miles north of Transacts Street in the City of Napa (see **Figure 1**). The project driveway will be located across Silverado Trail and slightly offset from a single family residence driveway. Two closely spaced driveways (one serving a house and one serving a baseball field) are located on the east side of Silverado Trail about 125 feet to the north of the proposed project driveway, while a veterinary clinic driveway is located on the east side of the road about 420 feet to the south of the proposed driveway.

The proposed Corona Winery would have the following yearly production and visitor/special event levels.

- 100,000 gallons per year production.
- Bottling on-site.
- 75 percent or more grapes transported to site (virtually all from the north of the winery).
- Tours and tasting by appointment only – 7 days per week from 10:00 AM to 6:00 PM.
- Food and wine pairing events – 6 per month, maximum 24 visitors per event.
- Marketing events – 6 per year, maximum 75 visitors per event.
- Wine auction – 2 per year, maximum 125 visitors per event.

IV. EXISTING CIRCULATION SYSTEM OPERATION

A. ANALYSIS LOCATIONS

At County request, the following three locations have been evaluated.

- Silverado Trail/Soda Canyon Road intersection
- Silverado Trail/Hardman Avenue intersection
- Silverado Trail/Project Driveway intersection

Figure 2 presents approach geometrics and control at each analysis intersection.

B. VOLUMES

Friday 3:00 to 6:00 PM and Saturday noon to 6:00 PM turn movement counts were conducted by Crane Transportation Group (CTG) in May 2013 at the Silverado Trail intersections with Soda Canyon Road and Hardman Avenue as well as at the four driveways on the east side of Silverado Trail in close proximity to the proposed project driveway. The project driveway is currently a dirt track and was closed on the days of the counts. The peak traffic hours were 4:30-5:30 PM on Friday and 4:00-5:00 PM on Saturday. Resultant peak hour counts are presented in **Figure 3**. Overall, two-way volumes along Silverado Trail at the project entrance were higher during the Friday peak hour (1,545 vehicles per hour [vph] versus 1,245 vph on Saturday).

May peak hour traffic counts were seasonally adjusted to reflect September harvest conditions based upon monthly and day of week adjustment factors utilized in the nearby City of Napa. Overall, May counts would be expected to increase by about 3 percent to reflect fall harvest conditions. Resultant projected 2013 Friday and Saturday peak hour harvest volumes are presented in **Figure 4**.

C. ROADWAYS

Silverado Trail provides the only access to the project site. In the project vicinity it has two well-paved 12-foot travel lanes and 8-foot paved shoulders that are signed and striped as Class II bicycle lanes. The posted speed limit is 55 miles per hour and the roadway is level. However, it traverses a minor horizontal curve just south of the site.

D. INTERSECTION LEVEL OF SERVICE

1. Analysis Methodology

Transportation engineers and planners commonly use a grading system called level of service (LOS) to measure and describe the operational status of the local roadway network. LOS is a description of the quality of a roadway facility's operation, ranging from LOS A (indicating free-flow traffic conditions with little or no delay) to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). Intersections, rather than roadway segments between intersections, are almost always the capacity controlling locations for any circulation system.

Signalized Intersections. For signalized intersections, the 2010 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology was utilized. With this methodology, operations are defined by the level of service and average control delay per vehicle (measured in seconds) for the entire intersection. For a signalized intersection, control delay is the portion of the total delay attributed to traffic signal operation. This includes delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 1** summarizes the relationship between delay and LOS for signalized intersections.

Unsignalized Intersections. For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the 2010 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology for unsignalized intersections was utilized. For side-street stop-controlled intersections, operations are defined by the level of service and average control delay per vehicle (measured in seconds), with delay reported for the stop sign controlled approaches or turn movements, although overall delay is also typically reported for intersections along state highways. For all-way stop-controlled intersections, operations are defined by the average control delay for the entire intersection (measured in seconds per vehicle). The delay at an unsignalized intersection incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

2. Minimum Acceptable Operation

Napa County has no published minimum level of service standards for unsignalized public road or private driveway intersections. The County General Plan (Policy CIR-16) states that the County shall seek to maintain an arterial Level of Service D or better on all County roadways except where maintaining this desired level of service would require installation of more travel lanes than shown on the Circulation Map. For this study, LOS D has been used for unsignalized

intersections as the poorest acceptable operation for the entire intersection, with LOS E as the poorest acceptable operation for a side street stop sign controlled intersection approach. The reason for use of LOS E as the criteria for individual movements and LOS D as the criteria for the overall intersection is that the poorest operation at an unsignalized intersection is typically a specific stop sign controlled movement, unless side street volumes are high, in which case both the overall intersection and stop sign controlled movement are LOS F. Stop sign controlled intersections along Silverado Trail with low volumes of side street traffic tend to have poor stop sign controlled levels of service, but good to acceptable overall operation. As side street volumes increase, overall intersection operation also tends to degrade, but will usually remain one to two or more levels of service better than the stop sign controlled movement. When overall operation also degrades to LOS F operation, it is an indication of large volumes on the stop sign controlled approach, and the potential need for intersection signalization. The combined use of both criteria allows the County to identify those stop sign controlled intersections that have unacceptable delay for side street traffic as well as a sufficient amount of side street traffic that may meet signal warrant criteria levels.

3. Existing Harvest Operation

Table 3 shows that during harvest season, operation of the entire Silverado Trail intersections with Soda Canyon Road and Hardman Avenue would be at acceptable levels of service (LOS A or B) during both the Friday and Saturday peak traffic hours. Likewise, during the Saturday peak traffic hour the stop sign controlled side street approaches to Silverado Trail at both intersections would be operating at acceptable levels of service. However, during the Friday peak traffic hour the stop sign controlled approaches to Silverado Trail at both intersections would be operating at unacceptable levels (LOS F).

E. INTERSECTION PEAK HOUR SIGNAL WARRANT EVALUATION

1. Analysis Methodology

Traffic signals are used to provide an orderly flow of traffic through an intersection. Many times they are needed to offer side street traffic an opportunity to access a major road where high volumes and/or high vehicle speeds block crossing or turn movements. They do not, however, increase the capacity of an intersection (i.e., increase the overall intersection's ability to accommodate additional vehicles) and, in fact, often slightly reduce the number of total vehicles that can pass through an intersection in a given period of time. Signals can also cause an increase in traffic accidents if installed at inappropriate locations.

There are 9 possible tests for determining whether a traffic signal should be considered for installation. These tests, called "warrants", consider criteria such as actual traffic volume, pedestrian volume, presence of school children, and accident history. The intersection volume data together with the available collision histories were compared to warrants contained in the *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, 2010, California Supplement, which has been adopted by the State of California as a replacement for *Caltrans Traffic Manual*. Section 4C of the MUTCD provides guidelines, or warrants, which may indicate need for a traffic signal at an unsignalized intersection. As indicated in the

MUTCD, satisfaction of one or more warrants does not necessarily require immediate installation of a traffic signal. It is merely an indication that the local jurisdiction should begin monitoring conditions at that location and that a signal may ultimately be required.

Warrant 3, the peak hour volume warrant, is often used as an initial check of signalization needs since peak hour volume data is typically available and this warrant is usually the first one to be met. Warrant 3 is based on a curve and takes only the hour with the highest volume of the day into account. Please see the **Appendix** for the warrant chart. To meet this warrant, a minimum of 100 vehicles per hour must approach the intersection on one of the side streets. It should also be noted that Warrant 3 has a second set of criteria based upon a combination of vehicle delay and volumes. This is typically referred to as the peak hour delay warrant.

In areas where there are less than 10,000 people in the immediate vicinity of an intersection or where the travel speeds on the uncontrolled intersection approaches are greater than 40 miles per hour, "rural" warrant criteria apply. They require only 70 percent of the volume levels of "urban" warrant criteria.

2. Signalization Needs Based Upon Warrant Criteria

Table 4 shows that currently, the Silverado Trail/Hardman Avenue intersection has both Friday and Saturday peak hour volumes exceeding rural peak hour signal warrant #3 criteria levels, while the Silverado Trail/Soda Canyon Road intersection has PM peak hour volumes exceeding warrant #3 criteria levels on Friday, but not on Saturday.

F. PLANNED IMPROVEMENTS

There are no planned and funded improvements at any intersection evaluated in this study.[1]

V. FUTURE HORIZON CIRCULATION SYSTEM OPERATION WITHOUT THE PROJECT

Project traffic impacts have been determined for near and long term horizons. The near term horizon reflects the first year that the project will be at full production. Based upon input from the project applicant, the expected first year of full production will be 2019. The long term horizon reflects the County's general plan buildout year, which is 2030. Future horizon year volumes have been determined based upon traffic modeling projections for the year 2030 from the County's General Plan Circulation Element. This document showed an approximate 32 percent growth in weekday PM peak hour traffic along Silverado Trail between the years 2000 and 2030. Projecting straight-line traffic growth for analysis purposes, this translated into about a 7 percent growth in traffic from 2013 to the year 2019, and a 19 percent growth in traffic from 2013 to 2030.

[1] Mr. Paul Wilkinson, Napa County Public Works Department, May 2013.

Since traffic modeling projections were available for a weekday PM peak hour only and not a Saturday peak hour, north and southbound Saturday volumes on Silverado Trail were both uniformly increased by the percentages above. However, due to the greater detail available for weekday volumes which showed higher increases in southbound versus northbound traffic, Friday PM peak hour volumes were adjusted directionally, with the guidance that the two-way volume percent increases should be as listed above.

A. YEAR 2019 WITHOUT PROJECT EVALUATION

1. Volumes

Year 2019 "Without Project" Friday and Saturday PM peak hour harvest volumes are presented in **Figure 5**.

2. Intersection Level of Service

Table 3 shows that in 2019 during harvest season, "Without Project" operation of the entire Silverado Trail intersections with Soda Canyon Road and Hardman Avenue would be at acceptable levels of service during the Friday and Saturday PM peak traffic hours (LOS B or C on a Friday and LOS A at both locations on a Saturday). Likewise, during the Saturday PM peak hour the stop sign controlled Hardman Avenue approach to Silverado Trail would be operating at an acceptable LOS D. However, during the Friday PM peak hour the stop sign controlled side street approaches to both intersections would be operating at unacceptable levels (LOS F) as would the stop sign controlled Soda Canyon Road approach to Silverado Trail during a Saturday PM peak hour.

3. Intersection Signalization Needs

Table 4 shows that in 2019 during harvest season, the Silverado Trail/Hardman Avenue intersection would have both Friday and Saturday PM peak hour "Without Project" volumes exceeding peak hour signal warrant #3 criteria levels, while the Silverado Trail/Soda Canyon Road intersection would have PM peak hour "Without Project" volumes exceeding warrant #3 criteria levels on Friday, but not Saturday.

B. YEAR 2030 WITHOUT PROJECT EVALUATION

1. Volumes

Year 2030 "Without Project" Friday and Saturday PM peak hour harvest volumes are presented in **Figure 6**.

2. Intersection Level of Service

Table 3 shows that in 2030 during harvest season, "Without Project" operation of the entire Silverado Trail intersections with Soda Canyon Road and Hardman Avenue would be at acceptable levels of service during the Friday and Saturday PM peak traffic hours (LOS E at both

locations on a Friday and LOS A at both locations on a Saturday). However, during both the Friday and Saturday PM peak hours, the stop sign controlled side street approaches to both intersections would be operating at unacceptable levels (LOS F).

3. Intersection Signalization Needs

Table 4 shows that in 2030 during the harvest season, both the Silverado Trail/Hardman Avenue and Silverado Trail/Soda Canyon Road intersections would have both Friday and Saturday PM peak hour volumes exceeding peak hour signal warrant #3 criteria levels.

VI. PROJECT IMPACTS

A. SIGNIFICANCE CRITERIA

The following criteria were developed for recent traffic impact analyses in the County. These same criteria have been utilized in this study to determine the significance of impacts due to the project. An impact is considered to be significant if any of the following conditions are met.

- If an unsignalized intersection has "Without Project" overall LOS A, B, C or D operation and deteriorates to LOS E or F operation with the addition of project traffic -- or -- has a stop sign controlled movement operating at LOS A, B, C, D or E and deteriorates to LOS F with the additional project traffic, the impact is considered significant and would require mitigation.

- If an unsignalized intersection already has "Without Project" overall LOS E or F operation – or – if a stop sign controlled movement or approach is already operating at LOS F, an increase in traffic passing through the intersection of 1 percent or more due to the project is considered to be significant and would require mitigation.

- If the addition of project traffic to an unsignalized intersection increases "Without Project" volumes to meet peak hour signal warrant criteria levels, the impact is considered significant and would require mitigation.

- If "Without Project" volumes at an unsignalized intersection already meet peak hour signal warrant criteria levels and the level of service is already at an unacceptable level, an increase in traffic of 1 percent or more due to the project is considered significant and would require mitigation.

B. TRIP GENERATION

Friday and Saturday afternoon trip generation projections were developed with the assistance of the project applicant and their representative for all components of the employee, grape delivery and visitor activities at Corona Winery. Results are presented on an hourly basis in **Table 5** for Friday and Saturday afternoon conditions. As shown, no winery administrative or production

employees would be expected on the local roadway network during harvest Friday or Saturday peak hour conditions, as all employees would be working until at least 6:00 PM during this time of year. Visitor-serving employees would also be working until at least 6:00 PM every day, as tours/tasting by appointment would close at this time. In addition, the one or two grape deliveries per day would typically be scheduled in the morning The only winery-related traffic expected on the local roadway network during the Friday or Saturday PM peak traffic hours along Silverado Trail would be associated with visitors. Assuming an average size group of ± 12 to 13 people entering the winery from 4:00 to 4:30 or leaving between 5:00 and 6:00 PM, this would result in about 5 vehicles accessing the winery during any given ambient peak traffic hour.

C. TRIP DISTRIBUTION

Project traffic was distributed to Silverado Trail in a pattern reflective of existing distribution patterns at other driveways near the project site as well as at the Soda Canyon Road intersection: ± 80 to 90 percent to/from the south and 10 to 20 percent to/from the north The Friday and Saturday project traffic increments expected on Silverado Trail during the times of ambient PM peak hour traffic flow are presented in **Figure 7**, while Friday and Saturday "With Project" PM peak hour volumes for the years 2019 and 2030 are presented in **Figures 8** and **9,** respectively.

D. PLANNED ROADWAY IMPROVEMENTS

The Corona Winery is proposing construction of a continuous two-way left turn lane along Silverado Trail beginning 50 feet north of the project access intersection and extending 100 feet south of the intersection (see **Figure 10**). The 100-foot length of the turn lane south of the project access for storage and deceleration of northbound vehicles turning left into the project site would meet County design guidelines. Breaks would be provided in the continuous turn lane transitions at all locations with driveways on the east side of Silverado Trail.

E. YEAR 2019 INTERSECTION IMPACTS (SODA CANYON ROAD AND HARDMAN AVENUE)

1. Level of Service

Project traffic would not produce a significant level of service impact at either intersection during the year 2019 Friday or Saturday PM peak traffic hours along Silverado Trail. Project traffic would not change any acceptable operation to unacceptable conditions, nor would it increase volumes by 1 percent or more at any location where "Without Project" operation would be unacceptable. Volume increases would be 0.3 percent or less at these locations.

2. Signalization Needs

Project traffic would not produce a significant signalization needs impact at either intersection during the year 2019 Friday or Saturday PM peak traffic hours along Silverado Trail. Project traffic would not increase volumes to meet signal warrant #3 criteria at any location, nor would it increase volumes by 1 percent or more at any location where "Without Project" volumes would

already meet peak hour signal warrant criteria levels. Volume increase would be 0.3 percent or less at these locations.

F. YEAR 2030 INTERSECTION IMPACTS (SODA CANYON ROAD AND HARDMAN AVENUE)

1. Level of Service

Project traffic would not produce a significant level of service impact at either intersection during the Friday or Saturday PM peak traffic hours along Silverado Trail. Project traffic would not change any acceptable operation to unacceptable conditions, nor would it increase volumes by 1 percent or more at any location where "Without Project" operation would be unacceptable. Volume increases would be 0.2 percent or less at these locations.

2. Signalization Needs

Project traffic would not produce a significant signalization needs impact at either intersection during the Friday or Saturday PM peak traffic hours along Silverado Trail. Project traffic would not increase volumes to meet signal warrant #3 criteria at any location, nor would it increase volumes by 1 percent or more at any location where "Without Project" volumes would already meet peak hour signal warrant criteria levels. Volume increase would be 0.2 percent or less at these locations.

G. SIGHT LINE ADEQUACY

Sight lines would be acceptable for drivers turning from the project driveway to Silverado Trail. Sight lines to the north would be 1,000+ feet, while sight lines to the south would be about 770 feet. Based upon a travel speed along Silverado Trail of 65 miles per hour (10 miles per hour higher than the posted speed limit), the required stopping sight distance would be 645 feet.[2]

H. PROJECT DRIVEWAY OFFSET WITH RESIDENTIAL DRIVEWAY ON EAST SIDE OF SILVERADO TRAIL

The location of the proposed project driveway on the west side of Silverado Trail would be offset by about 50 feet to the north of a driveway on the east side of Silverado Trail now serving a single family residence and storage buildings. The project's proposed continuous two-way left turn lane would extend between and beyond both driveways. Due to the positioning of the driveways the offset would result in this 50-foot segment of turn lane having a demand for a southbound left turning vehicle as well as a northbound left turning vehicle. This would be a potentially significant safety concern.

The nine hours of Friday and Saturday turn movement counts in May 2013 at the driveways on the east side of Silverado Trail showed no turns to or from the driveway offset by 50 feet from the proposed project entrance. A single family residence typically generates about 5 inbound

[2] *A Policy on Geometric Design of Highways and Streets*, 2011, AASHTO.

trips per day. Assuming that the majority of trips associated with the offset residential driveway would be to/from the south, there may only be one or two times per day when there would be a southbound vehicle making a left turn into the residence with the offset driveway. On the other hand, there could be 30 or more times during the day when a northbound vehicle makes a left turn into the Corona Winery.

Overall, given the low number of expected left turning movements during the day, the probability that there would ever be north and southbound left turning drivers using this same section of the continuous turn lane at the same time would be remote. On the positive side, the continuous turn lane would provide significantly increased safety for southbound left turns into the offset residence driveway by eliminating the current possibility of rear-end accidents due to the lack of a left turn deceleration lane. In addition, it would be expected that southbound drivers turning left into the residence with the offset driveway would be aware of the potential issue, as would northbound employees turning left into the Corona Winery, and both would take additional caution when entering the continuous turn lane.

VII. CONCLUSIONS & RECOMMENDATIONS

The project would result in no significant off-site circulation system operational impacts nor any sight line impacts at the proposed project driveway connection to Silverado Trail. Therefore, no mitigations are needed for these issues. The County will need to determine if the proposed project driveway location in relation to the offset driveway on the east side of Silverado Trail serving a single family residence will be acceptable given the very remote possibility of north and southbound left turning vehicles using the same section of the continuous turn lane at the same time.

Tables

Table 1

SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: 2010 Highway Capacity Manual (Transportation Research Board).

Table 2

UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Little or no delays	≤ 10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded (for an all-way stop), or with approach/turn movement capacity exceeded (for a side street stop controlled intersection)	> 50.0

Source: 2010 Highway Capacity Manual (Transportation Research Board).

Table 3

INTERSECTION LEVEL OF SERVICE

HARVEST FRIDAY PM PEAK HOUR

LOCATION	EXISTING	YEAR 2019		YEAR 2030	
		W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/ Soda Canyon Rd.	F-152/A-8.4[1] **B-10.5**[3]	F-238/A-8.4 **C-18.0**	F-238/A-8.4 **C-18.0** (.05%)*	F-486/A-8.5 **E-36.4**	F-486/A-8.5 **E-36.4** (.05%)*
Silverado Trail/ Hardman Ave.	F-189/A-9.2[2] **A-6.8**[3]	F-324/A-9.3 **B-14.2**	F-324/A-9.3 **B-14.4** (0.2%)*	F-814/A-9.6 **E-39.8**	F-814/A-9.6 **E-40.1** (0.2%)*

(1) Unsignalized level of service – control delay in seconds. Soda Canyon Road westbound stop sign controlled approach/Silverado Trail southbound left turn.
(2) Unsignalized level of service – control delay in seconds. Hardman Avenue westbound stop sign controlled approach/Silverado Trail southbound left turn.
(3) **Unsignalized level of service – control delay in seconds (entire intersection).**

HARVEST SATURDAY PM PEAK HOUR

LOCATION	EXISTING	YEAR 2019		YEAR 2030	
		W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/ Soda Canyon Rd.	E-41.2/A-8.2[1] **A-2.8**[3]	F-52.3/A-8.2 **A-3.7**	F-52.3/A-8.2 **A-3.7** (.07%)*	F-88.9/A-8.4 **A-6.3**	F-90.6/A-8.4 **A-6.3** (.06%)*
Silverado Trail/ Hardman Ave.	D-27.6/A-8.4[2] **A-1.5**[3]	D-34.0/A-8.5 **A-2.0**	D-34.7/A-8.5 **A-2.0** (0.3%)*	F-56.6/A-8.7 **A-2.4**	F-58.6/A-8.7 **A-2.4** (0.2%)*

(1) Unsignalized level of service – control delay in seconds. Soda Canyon Road westbound stop sign controlled approach/Silverado Trail southbound left turn.
(2) Unsignalized level of service – control delay in seconds. Hardman Avenue westbound stop sign controlled approach/Silverado Trail southbound left turn.
(3) **Unsignalized level of service – control delay in seconds (entire intersection).**

* (Percent project traffic.) Less than a 1% increase is not considered a significant impact.

Year 2010 Highway Capacity Manual (HCM) Analysis Methodology – individual approach or turn movement results Year 2000 HCM results for overall intersection operation. No overall intersection operation results obtainable from 2010 software.
Source: Crane Transportation Group

Table 4

INTERSECTION SIGNAL WARRANT EVALUATION (WARRANT #3 – PEAK HOUR)

Do volumes meet peak hour signal Warrant #3 rural condition criteria?

FRIDAY PM PEAK HOUR

LOCATION	EXISTING	YEAR 2019		YEAR 2030	
		W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/ Soda Canyon Rd.	Yes	Yes	Yes (.05%)*	Yes	Yes (.05%)
Silverado Trail/ Hardman Ave.	Yes	Yes	Yes (0.2%)*	Yes	Yes (0.2%)*

SATURDAY PM PEAK HOUR

LOCATION	EXISTING	YEAR 2019		YEAR 2030	
		W/O PROJECT	WITH PROJECT	W/O PROJECT	WITH PROJECT
Silverado Trail/ Soda Canyon Rd.	No	No	No	Yes	Yes (.06%)
Silverado Trail/ Hardman Ave.	Yes	Yes	Yes (0.3%)*	Yes	Yes (0.2%)

* (Percent project traffic.) Less than a 1% increase is not considered a significant impact.

Source: Crane Transportation Group

Table 5

PROJECT TRIP GENERATION

HARVEST FRIDAY

	TOTAL EMPL.	HOURS	TRIPS					
			3-4 PM		4-5 PM		5-6 PM	
			IN	OUT	IN	OUT	IN	OUT
Admin Employees	6	6AM-6PM	0	0	0	0	0	0
Production Employees – Full Time	6	6AM-6PM	0	0	0	0	0	0
Production Employees – Part Time	6	6AM-6PM	0	0	0	0	0	0
Tours/Tasting Employees	6	9AM-6PM	0	0	0	0	0	0
Grape Delivery Trucks	1-2/day	Between 6AM-6PM*	0	0	0	0	0	0
Visitors	48 total = 19 vehicles**	10AM-6PM	0	5	5	0	0	5

* Grapes typically delivered in the morning.
** 2.6 visitors/vehicle average on weekdays per County data.

HARVEST SATURDAY

	TOTAL EMPL.	HOURS	TRIPS							
			2-3 PM		3-4 PM		4-5 PM		5-6 PM	
			IN	OUT	IN	OUT	IN	OUT	IN	OUT
Admin Employees	6	6AM-6PM	0	0	0	0	0	0	0	0
Production Employees – Full Time	6	6AM-6PM	0	0	0	0	0	0	0	0
Production Employees – Part Time	6	6AM-6PM	0	0	0	0	0	0	0	0
Grape Delivery Trucks	1-2/day	Between 6AM-6PM*	0	0	0	0	0	0	0	0
Tours/Tasting Employees	6	9AM-6PM	0	0	0	0	0	0	0	0
Visitors	48 total = 17 vehicles**	10AM-6PM	5	0	0	5	5	0	0	5

* Grapes typically delivered in the morning.
** 2.8 visitors/vehicle average on Saturdays per County data.

Source: Crane Transportation Group

Figures

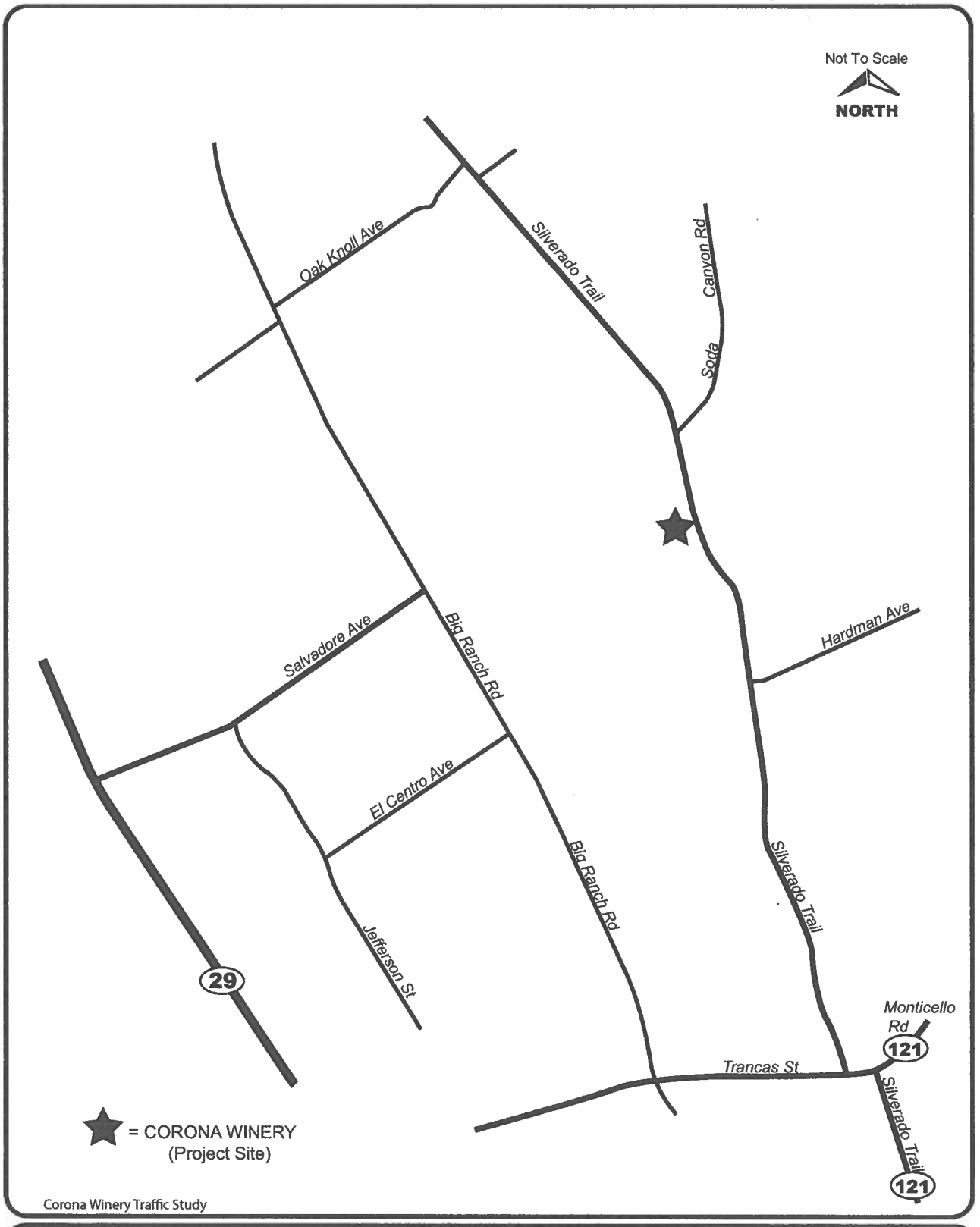
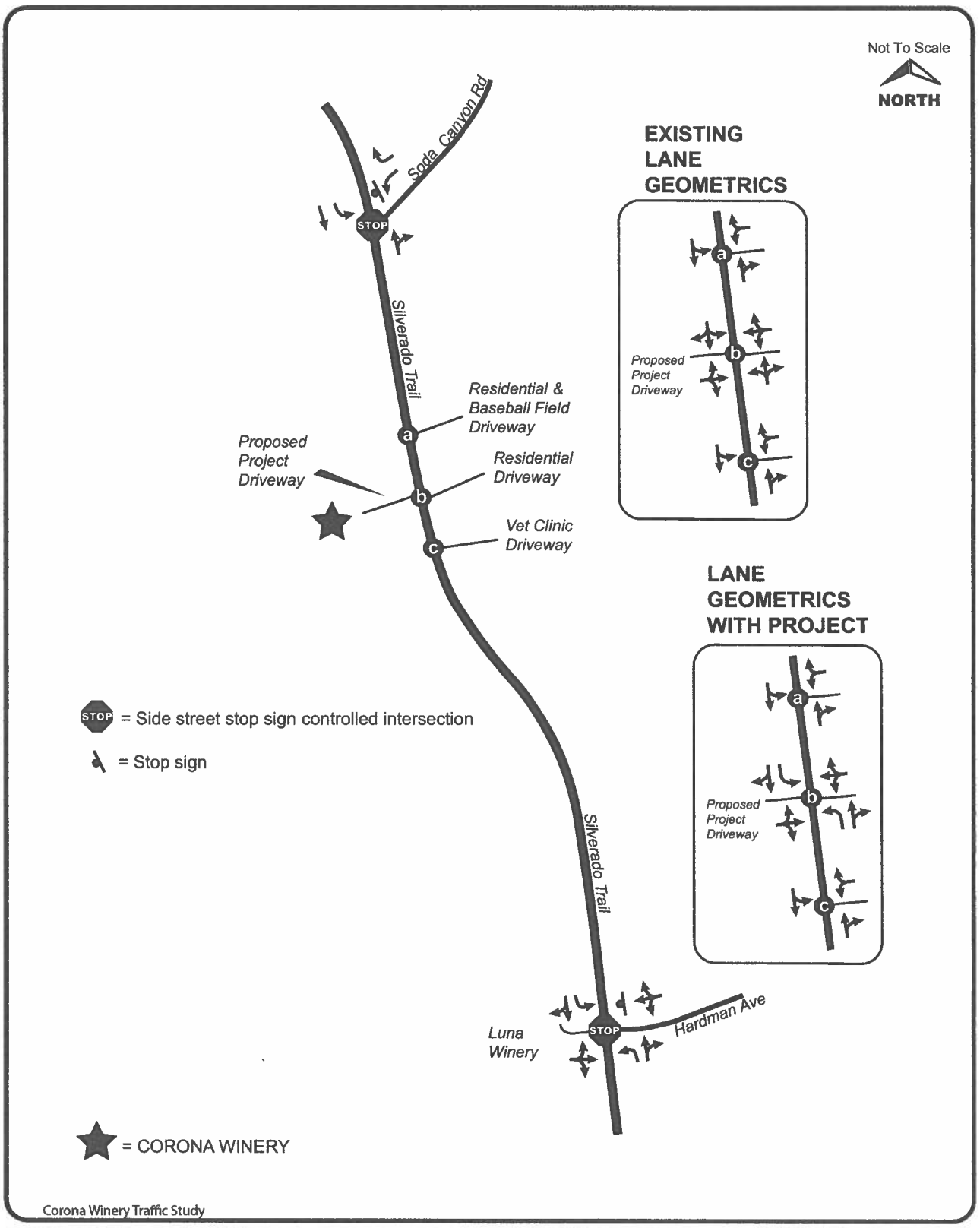


Figure 1
Area Map

CRANE TRANSPORTATION GROUP



CRANE TRANSPORTATION GROUP

Figure 2
Existing and With Project
Lane Geometrics and Intersection Control

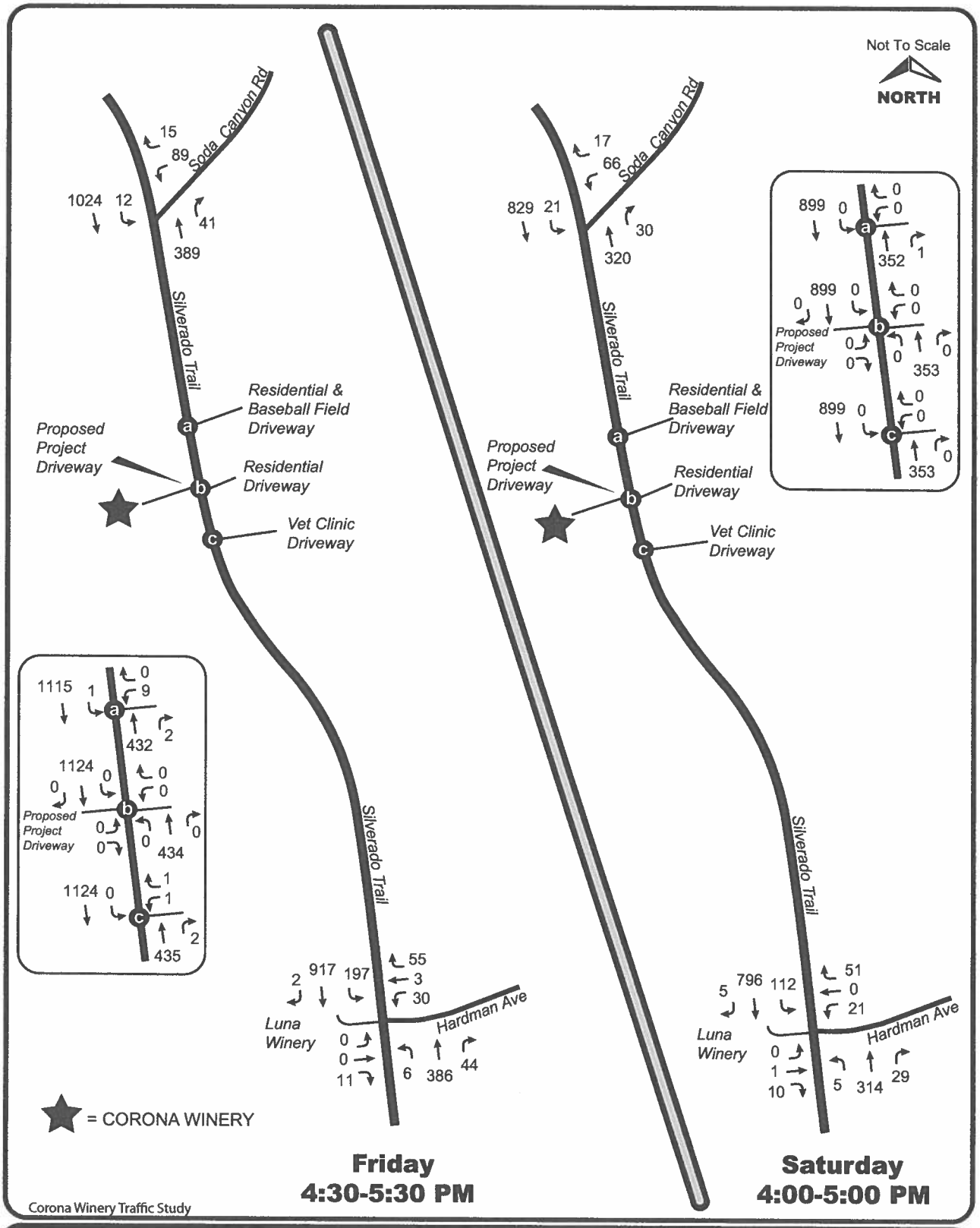


Figure 3

Existing May Friday and Saturday PM Peak Hour Volumes

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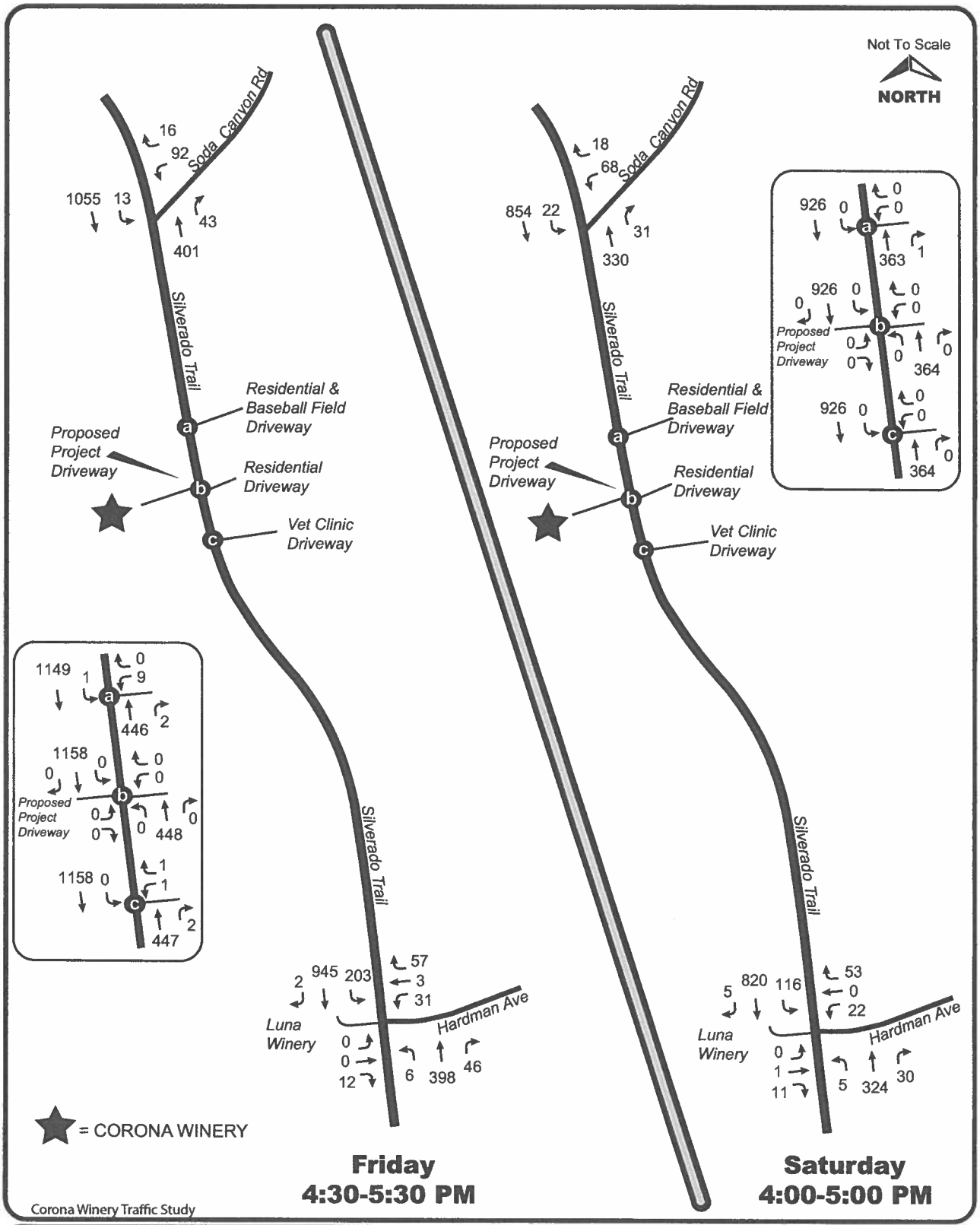

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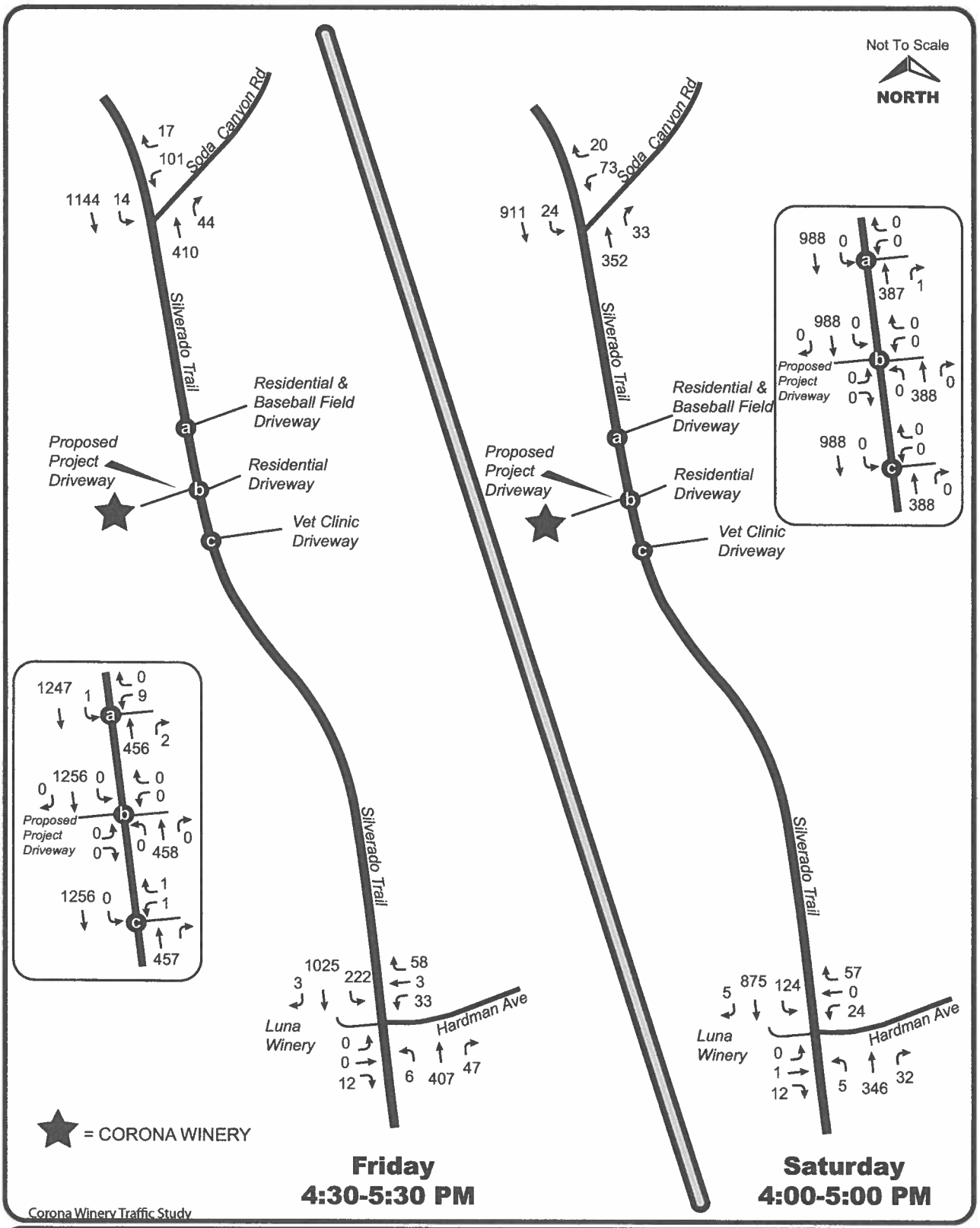
Figure 4
Existing (2013) Without Project
Harvest Friday and Saturday
PM Peak Hour Volumes



Corona Winery Traffic Study

CRANE TRANSPORTATION GROUP

Figure 5
Year 2019 (Without Project)
Harvest Friday and Saturday
PM Peak Hour Volumes

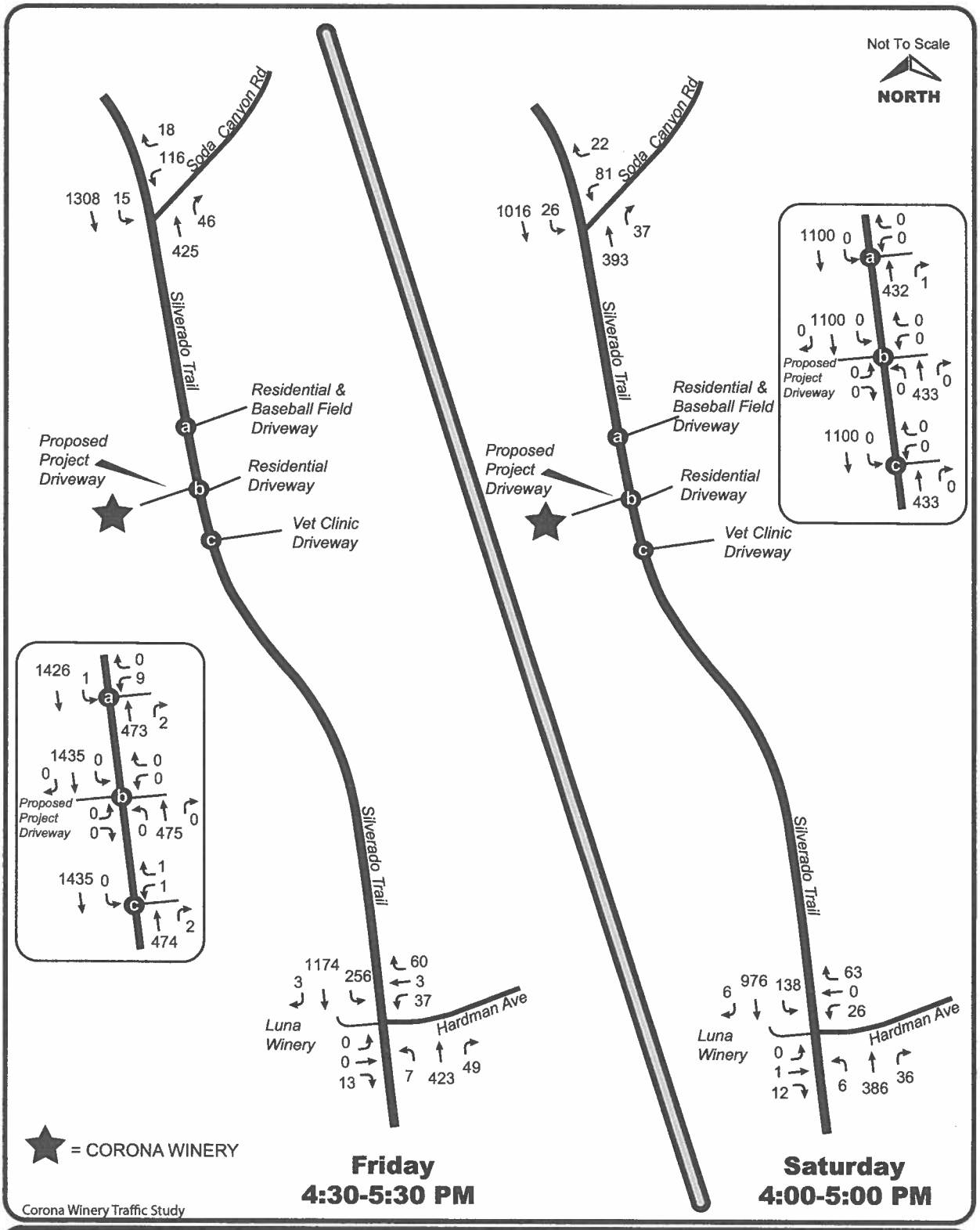


Figure 6
Year 2030 (Without Project)
Harvest Friday and Saturday
PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP

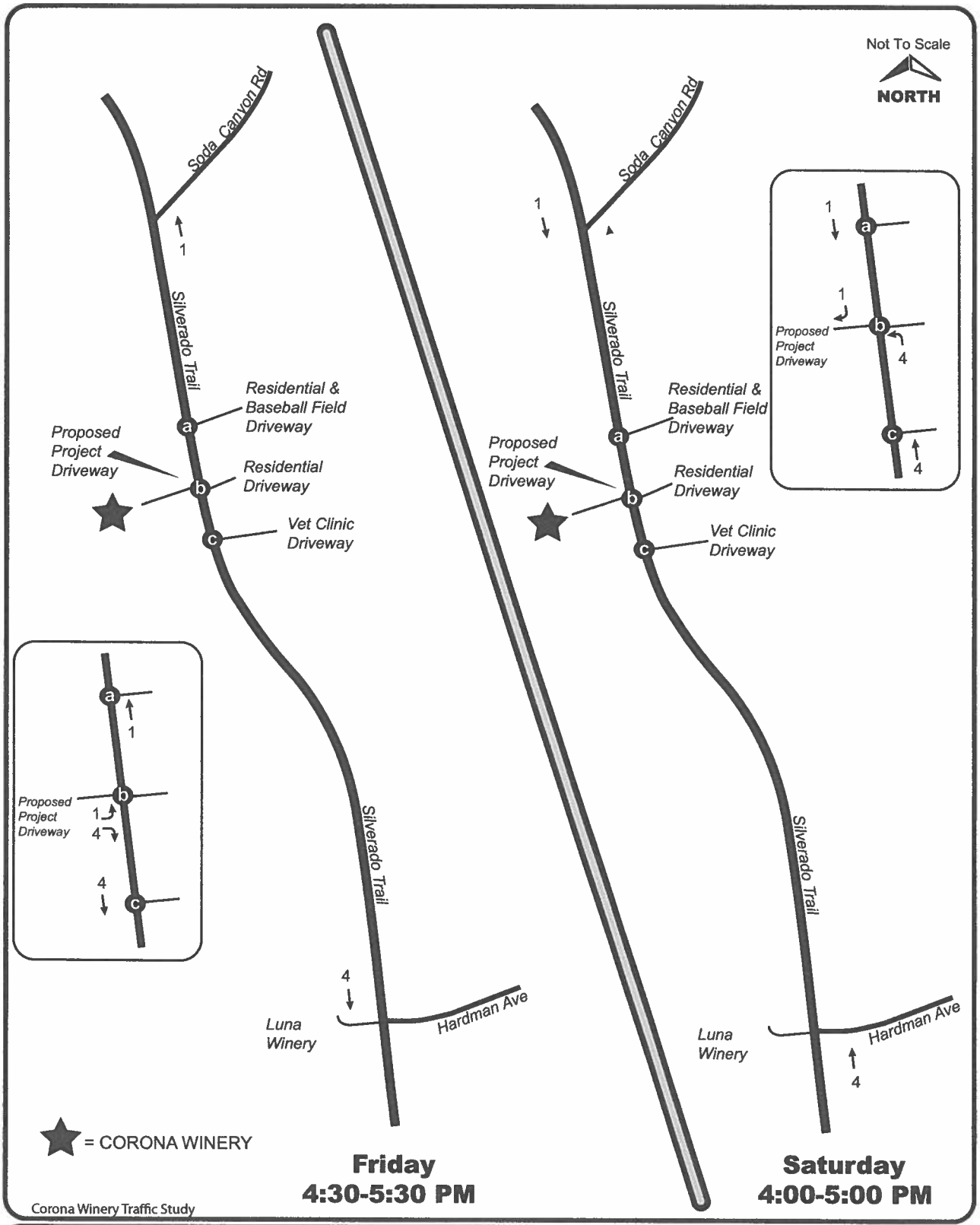


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Figure 7
Project Traffic Increment
Friday and Saturday PM Peak Hours

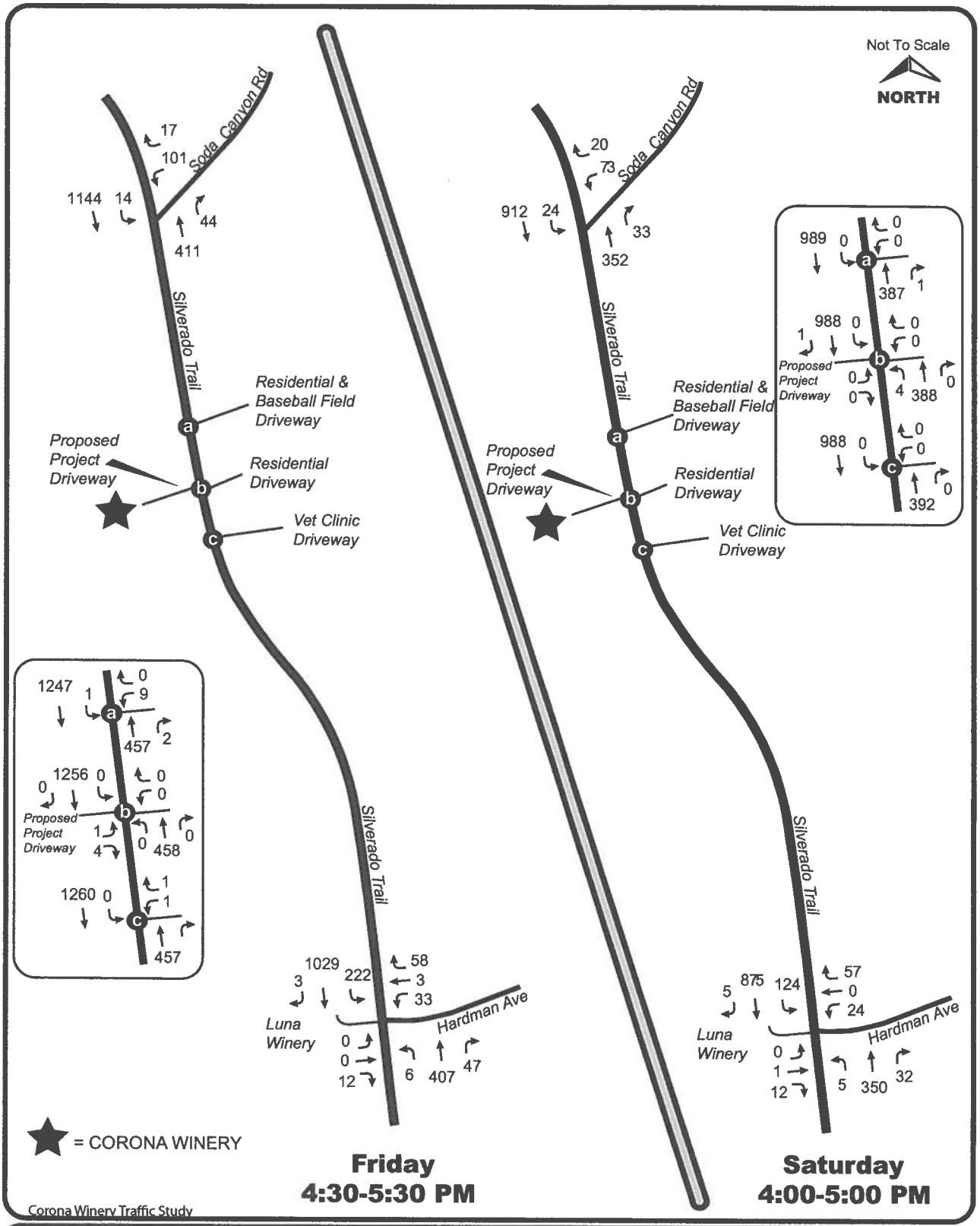

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Figure 8
Year 2019 (With Project)
Harvest Friday and Saturday
PM Peak Hour Volumes

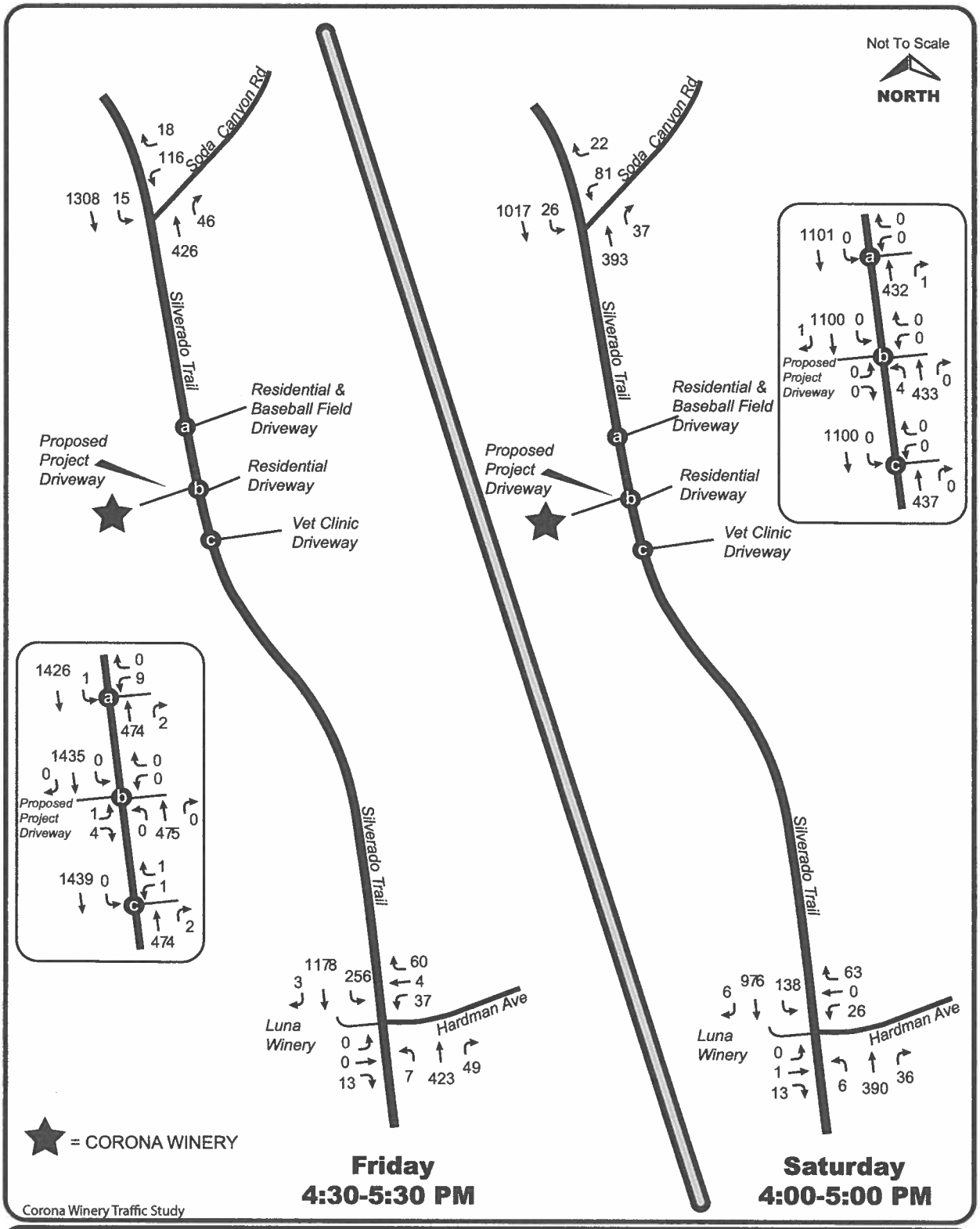

Figure 9
Year 2030 (With Project)
Harvest Friday and Saturday
PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP

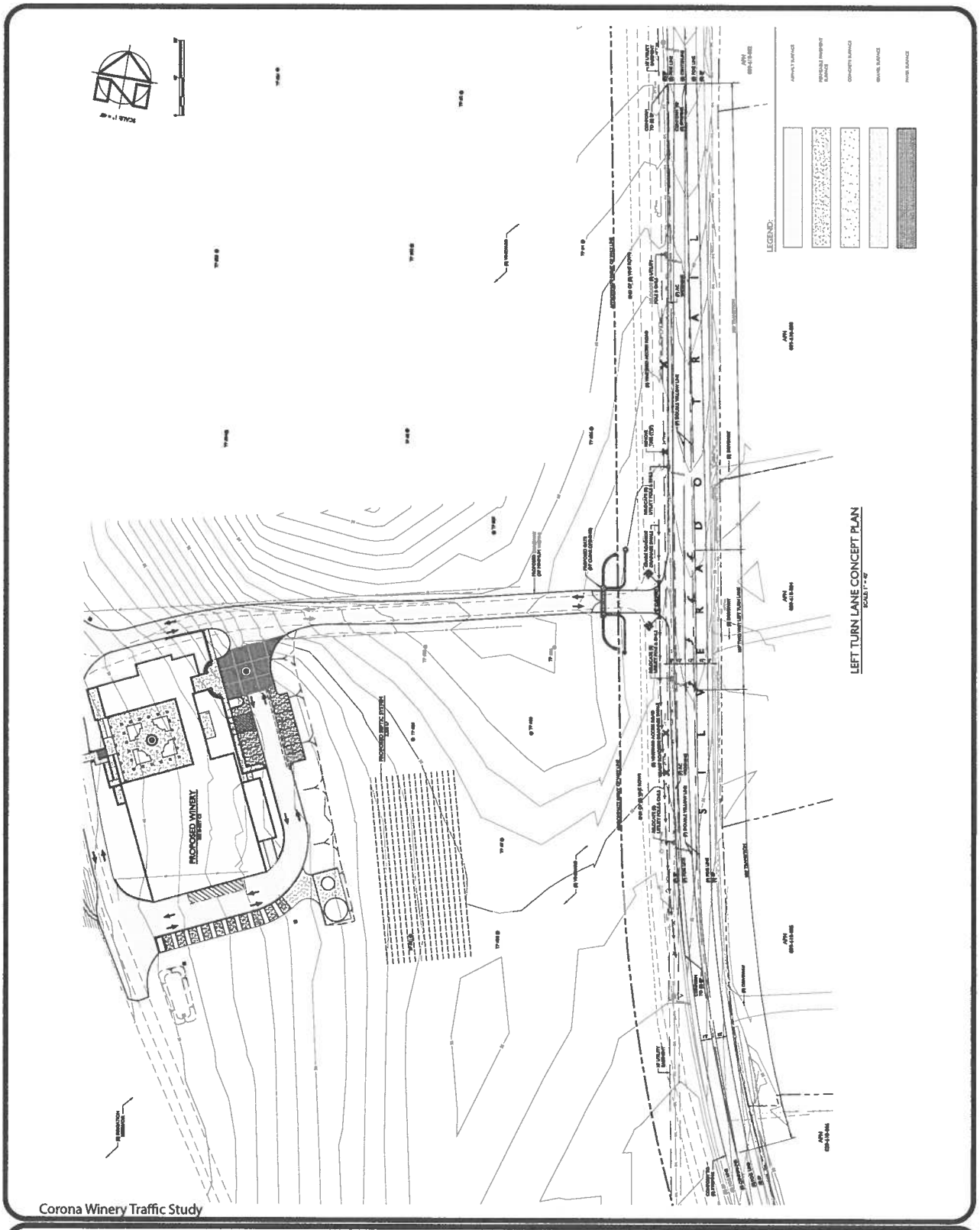

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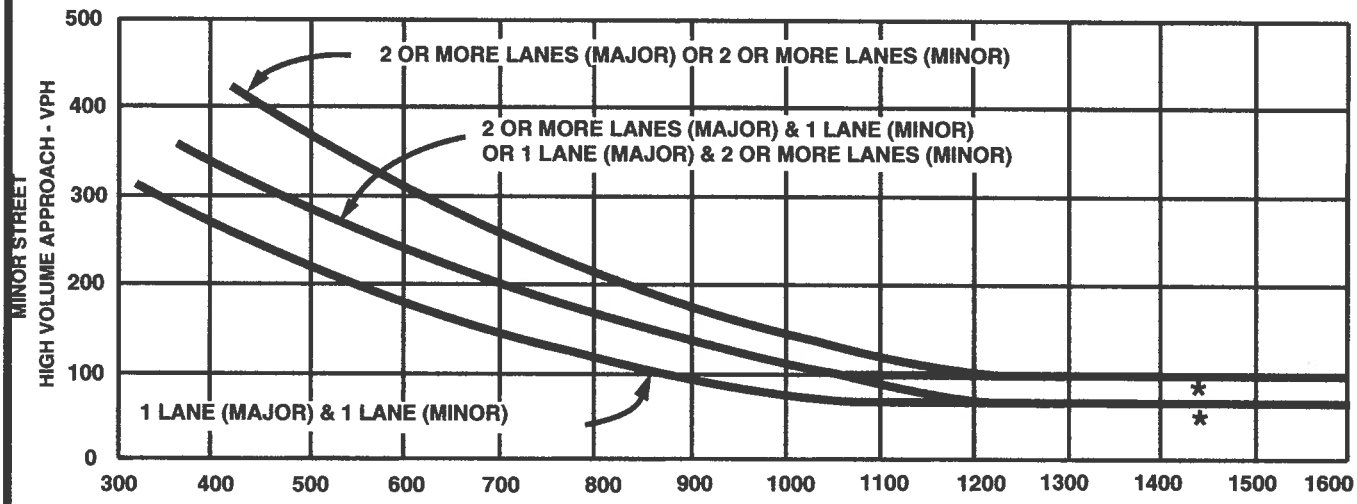
Figure 10

Proposed Continuous Left Turn Lane along Silverado Trail at Project Entrance

Appendix

PEAK HOUR VOLUME WARRANT #3
(Rural Area)



*** NOTE**

100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE

Source: California Manual on Uniform Traffic Control Devices, 2010