“I”

Traffic Study

Napa Vault P14-00296-MOD & P15-00298-TM
Planning Commission Hearing Date October 5, 2016

CRANE TRANSPORTATION GROUP

Central Valley Office:
2621 E. Windrim Court
Elk Grove, CA 95758
(916) 647-3406 *phone*
(916) 647-3408 *fax*

San Francisco Bay Area Office:
6220 Bay View Avenue
San Pablo, CA 94806
(510) 236-9375 *phone*
(510) 236-1091 *fax*

MEMORANDUM

TO: Beth Painter (beth@bpnapa.com)

FROM: Mark D. Crane, P.E.

DATE: May 19, 2015

RE: **TRIP GENERATION PROJECTIONS AND REQUIRED MITIGATIONS – NAPA VAULT STORAGE FACILITY ALONG SOSCOL FERRY ROAD**

Beth:

At your request Crane Transportation Group has developed weekday daily, AM and PM peak hour trip generation projections for the proposed nine-acre Napa Vault storage facility to be located along the south side of Soscol Ferry Road west of Devlin Road. Based upon the applicant's description, the proposed 132 storage units would be owned rather than rented.

The Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition (2012) has trip rates for mini warehouse facilities based upon number of units. These rates have been used for analysis purposes.

EXPECTED WEEKDAY TRIP GENERATION

As shown in **Table 1**, the proposed nine-acre facility would be expected to generate 34 daily two-way trips, 2 inbound trips and 1 outbound trip during the weekday AM peak traffic hour, with 1 inbound and 2 outbound trips during the weekday PM peak traffic hour on the local roadway network.

Table 1

WEEKDAY PEAK HOUR TRIP GENERATION
PROPOSED MINI WAREHOUSE STORAGE FACILITY
ALONG SOSCOL FERRY ROAD

USE	SIZE	DAILY 2-WAY TRIPS		AM PEAK HOUR TRIPS					PM PEAK HOUR TRIPS				
				IN		OUT		2-WAY	IN		OUT		2-WAY
		RATE	VOL	RATE	VOL	RATE	VOL	TOTAL	RATE	VOL	RATE	VOL	TOTAL
Storage	132 units	.25[1]	34	.01[1]	2	.01[1]	1	3	.01[1]	1	.01[1]	2	3

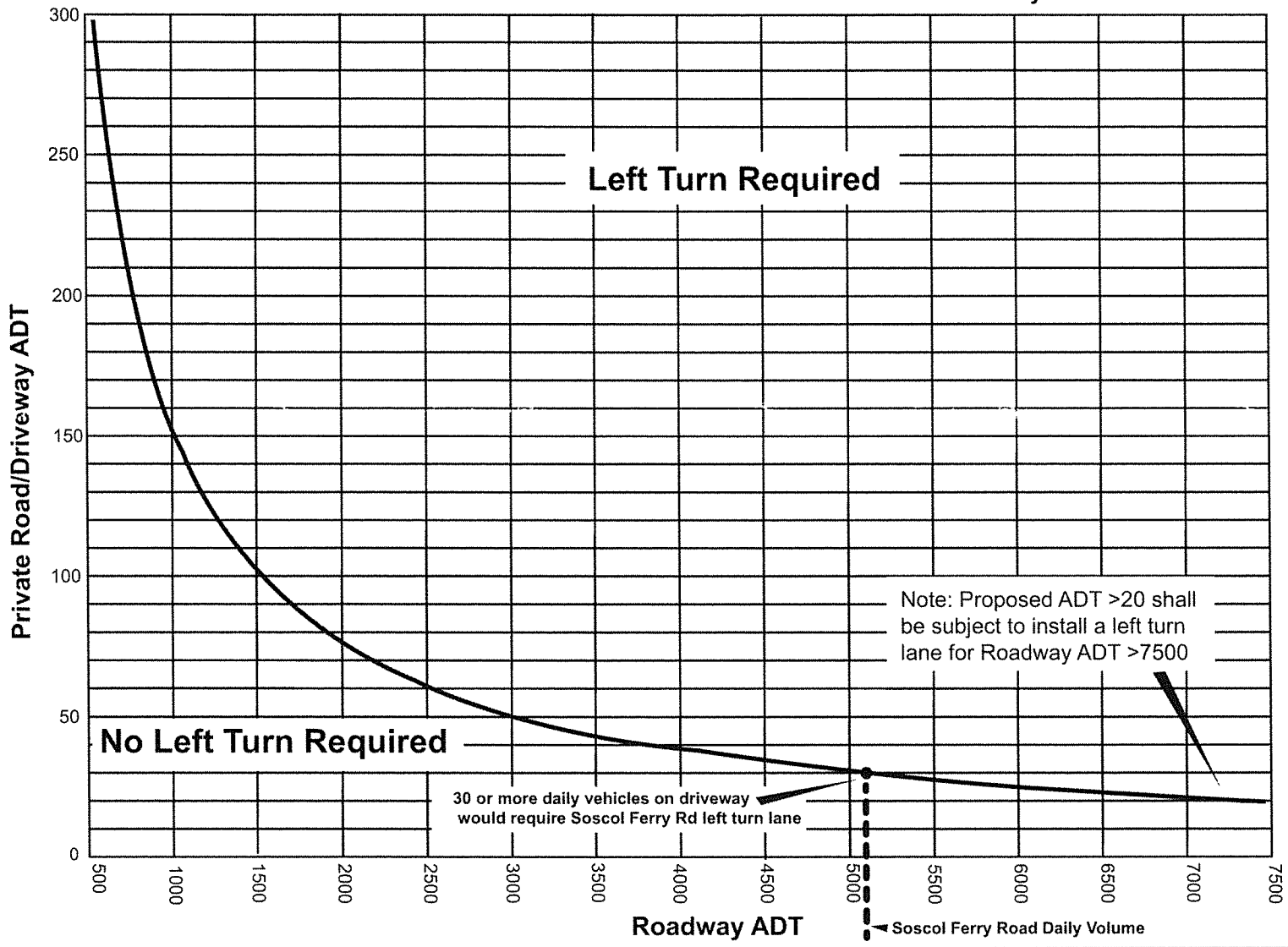
[1] *Trip Generation Manual*, 9th Edition, by the Institute of Transportation Engineers, 2012, Mini Warehouse Use.
Compiled by: Crane Transportation Group

LEFT TURN LANE WARRANT EVALUATION – SOSCOL FERRY ROAD AT PROJECT DRIVEWAY INTERSECTIONS

Soscol Ferry Road currently has an average daily two-way traffic volume of 5,085 vehicles (based upon counts adjacent to the project site on April 28 to May 1 (Tuesday to Friday), 2015. Based upon this volume and use of the County left turn lane warrant chart for driveway connections to County roads (see **Figure 1**), a left turn lane would be warranted on the approach to a driveway with 30 or more daily two-way trips. Since the proposed project will have 34 daily two-way trips split between two driveways, neither will likely meet warrant criteria for provision of a left turn lane on the westbound Soscol Ferry Road intersection approaches.

MINI WAREHOUSE STORAGE FACILITY ALONG SOSCOL FERRY ROAD

COUNTY of NAPA LEFT TURN WARRANT GRAPH at Private Road and Driveway Intersections



CRANE TRANSPORTATION GROUP

Figure 1

COUNTY of NAPA LEFT TURN WARRANT GRAPH
at Private Road and Driveway Intersections
Mini Warehouse Storage Facility along Soscol Ferry Road

CRANE TRANSPORTATION GROUP

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San Pablo, CA 94806
(510) 236-9375 *phone*
(510) 236-1091 *fax*

MEMORANDUM

RECEIVED
SEP 18 2014
Napa County Planning, Building & Environmental Services

TO: Christopher Tibbits (ctibbits@RSAcivil.com)

FROM: Mark D. Crane, P.E.

DATE: August 8, 2014

RE: **TRIP GENERATION PROJECTIONS – SOSCOL FERRY ROAD STORAGE FACILITY**

Chris:

At your request Crane Transportation Group has developed weekday AM and PM peak hour trip generation projections for a proposed nine-acre storage facility along the south side of Soscol Ferry Road west of Devlin Road. Based upon your description, storage units would be owned rather than rented and would be separated into the following three components:

- RV/boat storage 30% (2.7 acres)
- Car collection storage 40% (3.6 acres)
- Dead storage[1] 30% (2.7 acres)

The Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition (2012) has trip rates for mini warehouse facilities, which have been utilized for the car collection and dead storage components. However, since ITE has no rates for RV/boat storage, RV storage trip rate data was obtained from a traffic count study conducted for the project applicant at an existing RV storage facility in Colorado (where the applicant was proposing to build a similar facility).[2] As shown below, the RV storage trip rates are lower than those for mini warehouse uses, but in the same general ballpark.

EXPECTED WEEKDAY TRIP GENERATION

As shown in **Table 1**, the proposed nine-acre facility would be expected to generate 11 inbound and 12 outbound trips during the weekday AM peak traffic hour, with 15 inbound and 15 outbound trips during the weekday PM peak traffic hour on the local roadway network. In

[1] Excess home furnishings, etc.

[2] Study presented in the Appendix.

comparison, the proposed project would only generate 25% of the AM peak hour and 40% of the PM peak hour traffic of a general warehouse development on nine acres.

It should also be noted that the project's proposed storage facilities will be condos and owned and not rented, which is the norm at almost all mini warehouse facilities. This will result in a much lower unit turnover rate for the proposed project and, as a result, lower trip generation than available mini warehouse trip rates would suggest. Overall, the trip generation projections developed for this study are based upon the best available data, but are potentially conservatively high.

Table 1

WEEKDAY PEAK HOUR TRIP GENERATION
PROPOSED STORAGE FACILITY ALONG SOSCOL FERRY ROAD

USE	ACRES	AM PEAK HOUR				PM PEAK HOUR			
		IN		OUT		IN		OUT	
		RATE	VOL	RATE	VOL	RATE	VOL	RATE	VOL
RV/Boat Storage	2.7	1.04[1]	3	1.04[1]	3	1.43[1]	4	1.43[1]	4
Car Collection/ Dead Storage	6.3	1.16[2]	8	1.42[2]	9	1.79[2]	11	1.79[2]	11
TOTAL			11		12		15		15

(1) Felsburg Holt & Ullevig, GarageTown letter report, December 31, 2007.
(2) *Trip Generation Manual*, 9th Edition, by the Institute of Transportation Engineers, 2012, Mini Warehouse Use.

Compiled by: Crane Transportation Group

Appendix

FELSBURG HOLT & ULLEVIG

engineering paths to transportation solutions

December 31, 2007

Mr. Glenn McWilliams
DBM Consulting, Inc.
10390 Bradford Road, Suite 210
Littleton, Colorado 80127

RE: GarageTown Ken Caryl Traffic Analysis
FHU Reference No. 07-158

Dear Mr. McWilliams:

We have prepared this letter to address traffic impacts related to the proposed development of a GarageTown storage facility and offices in Jefferson County, Colorado. In response to review comments generated by Jefferson County staff, this letter evaluates the need for exclusive right-turn deceleration and acceleration lanes along Chatfield Avenue at the proposed site access. Traffic analyses have been performed to estimate the number of vehicles that will be entering and exiting the development via the Chatfield Avenue access and to address whether these levels necessitate installation of an exclusive right turn lane along Chatfield Avenue at the intersection.

Background

The proposed development would occupy approximately 6.5 acres within the southwest corner of the intersection of Chatfield Avenue and Shaffer Place. A vicinity map of the site is shown on **Figure 1** and a site plan of the development is shown on **Figure 2**. The site rests on a hill that slopes down from north to south. The north side of the proposed development would include two office buildings and five storage buildings would occupy the south portion of the site. Access to the site would be provided via three connections to Shaffer Place and one right-in / right-out (RIRO) connection to Chatfield Avenue.

In comments made based on a review of the proposed development, Jefferson County staff requested that a traffic analysis be prepared to determine whether the conflict between traffic from the site traffic flow along Chatfield Avenue would warrant the need for right turn deceleration and acceleration lanes at the intersection of the site access with Chatfield Drive. This particular access would be limited to right turns only.

Per the request of County staff, the need for an acceleration lane was evaluated based on both the Short Term Future (Year 2008) and Long Term Future (Year 2030) traffic conditions.

The following steps were taken to complete this evaluation:

1. Conduct hourly traffic counts along Chatfield Avenue and develop Year 2030 traffic projections
2. Estimate vehicle-trips to be generated by the storage component of the site

6300 South Syracuse Way, Suite 600 Centennial, CO 80111 tel 303.721.1440 fax 303.721.0832
www.fhueng.com info@fhueng.com

3. Assign these trips to the Chatfield Avenue access intersection
4. Based on the *Jefferson County Roadway Design and Construction Manual* (Jefferson County, July 2003), evaluate whether the level of traffic using the access and traffic volumes along Chatfield Avenue are sufficient to warrant a right turn acceleration lane.

Existing and Future Conditions without development

Hourly traffic volumes were recorded along Chatfield Avenue south of Shaffer Place by All Traffic Data Services, Inc. during a June 2007 weekday. As shown on **Figure 3**, Chatfield Avenue currently carries approximately 10,450 vehicles per day (vpd) in both directions. Southbound traffic past the proposed site access peaks at 410 vehicles per hour (vph) during the AM peak hour and 504 vph during the PM peak hour.

Year 2030 traffic volume projections without the development were completed by consulting the Denver Regional Council of Governments' (DRCOG) Year 2030 Regional Travel Demand Model. The model results indicated that daily traffic along Chatfield Avenue would roughly double to approximately 20,200 vpd by the Year 2030. Corresponding increases in peak hour traffic would bring the AM peak hour flow past the proposed site access to 790 vph and the PM peak hour to 975 vph. Projected Year 2030 traffic volumes are shown alongside the existing traffic counts on **Figure 3**.

Trip Generation

Trip generation estimates were developed based on the site land use components that would contribute to traffic volumes at the RIRO access. Based on information provided by the developer, the proposed storage facility would be divided into three equal components: Recreational Vehicle (RV) storage, general storage, and small business storage. Information from a similar RV storage site and information contained in *Trip Generation* (ITE, 7th Edition, 2003) were used to estimate vehicle-trips associated with these elements.

In addition to the storage elements, an estimated 20 percent of the office traffic would utilize the RIRO access as a direct route to and from Chatfield Avenue. Trips associated with this portion were estimated based on trip rates included in *Trip Generation*. The majority of the office space was not included in the calculation because most office traffic would utilize direct accesses to Shaffer Place.

Similar RV Site

Recreational vehicle sites are not a typical land use that is included in the Institute of Transportation Engineers' publication *Trip Generation*. As such, we identified a similar RV Site in Douglas County, Colorado for use in evaluating the level of traffic volumes that could be expected from the proposed site. A similar, though larger, site was found opposite Pinery Parkway along Parker Road.

Traffic volumes at the existing RV Site were recorded during the AM and PM peak hours of a typical weekday as part of another traffic study prepared by Felsburg Holt & Ullevig. These traffic volumes were recorded during August of 2005 and, therefore, represent average summer

conditions for this type of facility, with summer estimated to be the peak activity time of the year. The following table summarizes the recorded traffic volumes.

Table 1
Existing Traffic Volumes – Existing RV Site

Land Use	Unit	Size	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
RV Storage	Acre	7.71 Acres	8	8	16	11	11	22

Of note, the traffic volumes of **Table 1** are likely a conservative estimate of weekday activity for an RV Site of this size. We believe that this is a conservative estimate since the roadway leading to the RV Site also serves an existing sewage treatment plant and the traffic volumes were recorded during typical work-commute periods.

As noted previously, it is known that the existing RV Site is approximately 7.71 acres in size and the size of the proposed RV storage element was determined to be approximately 2.0 acres. This size was compared with the existing RV site acreage to estimate vehicle-trips associated with the proposed RV storage element. Accordingly, the proposed RV storage element would generate approximately 2.0 / 7.71 = 26 percent of the trips generated by the existing site. **Table 2** summarizes these estimates.

Table 2
Projected Traffic Volumes – Proposed RV Site

Land Use	Unit	Size	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
RV Storage	Acre	2.0 Acres	2	2	4	3	3	6

As can be seen in **Table 2**, because of its smaller size, it is projected that the number of vehicle-trips associated with the new site would be about 35 percent of the existing RV Site. Keep in mind that this is likely a conservative estimate for weekday conditions.

We also considered the traffic volume impacts of an RV Site on weekends. Our judgment is that there would be less activity on a Saturday or Sunday if it can be assumed that RV owners typically pick-up and drop-off their campers, etc. before/after weekends and that they are at their recreational destinations on Saturdays and Sundays.

Other Storage / Office

In addition, we evaluated the estimated trip generation of the specialty and small business storage component and the office component based on information contained in *Trip Generation*. **Table 3** includes these trip generation estimates in addition to the RV storage estimates.

Table 2
Projected Traffic Volumes – Total of Components using RIRO Access

Land Use	ITE Code	Size	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
RV Storage	NA	2.0 Acres	2	2	4	3	3	6
General Storage	151	66 KSF[1]	6	4	10	9	8	17
Office	710	3.6 KSF[2]	1	1	2	1	1	2
		Total Trips	9	7	16	13	12	25

Note: KSF = 1,000 Square Feet
[1]Total size of site storage = 99 KSF, and 2/3 is proposed to be general / contractor storage. The remaining storage is RV storage
[2]Equals 20 percent of total office on site, the portion of office that would utilize RIRO access

As shown, the site land uses that would contribute to traffic volumes at the RIRO access would generate approximately 16 vehicle-trips during the AM peak hour and 25 vehicle-trips during the PM peak hour.

Traffic Assignment

Trips associated with the proposed storage facility were assigned to the surrounding roadway network based on the trip distribution percentages shown on **Figure 4**. Based on existing traffic patterns along Chatfield Avenue, it was assumed that 50 percent of site trips would travel to and from the south while 45 percent would utilize Chatfield Avenue north. Shaffer Place west would carry 5 percent of site trips. Using these percentages, approximately 5-7 vph would enter or exit the site during peak hours.

Turn Lane Needs

Based on the *Jefferson County Roadway Design and Construction Manual* (Jefferson County, July 2003), a right-turn acceleration lane is required at accesses with more than 15 vph entering the subject roadway from the intersecting street. Since only 7 or fewer vph are anticipated to enter Chatfield Avenue at the site access during peak hours, an acceleration lane would not be required in the Short Term Future or Long Term Future.

Similarly based on Jefferson County standards, a southbound right-turn deceleration lane would be required along Chatfield Avenue when the peak hour traffic volume exiting the development reaches 5 vph and the southbound flow along Chatfield Avenue reaches 600 vph. As shown on **Figure 4**, turns from southbound Chatfield Avenue into the access would peak at 5 vph during the PM peak hour. Based on projected growth in traffic along Chatfield Avenue, the southbound peak hour flow would reach 600 vph by roughly the Year 2012.

Based on these traffic volumes, it is recommended that a southbound right turn deceleration lane be constructed along Chatfield Avenue with the proposed development. This lane should be constructed to extend as far north as possible, given the constraint of Shaffer Place.

Sincerely,

FELSBURG HOLT & ULLEVIG

Lyle E. DeVries, PE, PTOE
Transportation Engineer

FELSBURG HOLT & ULLEVIG

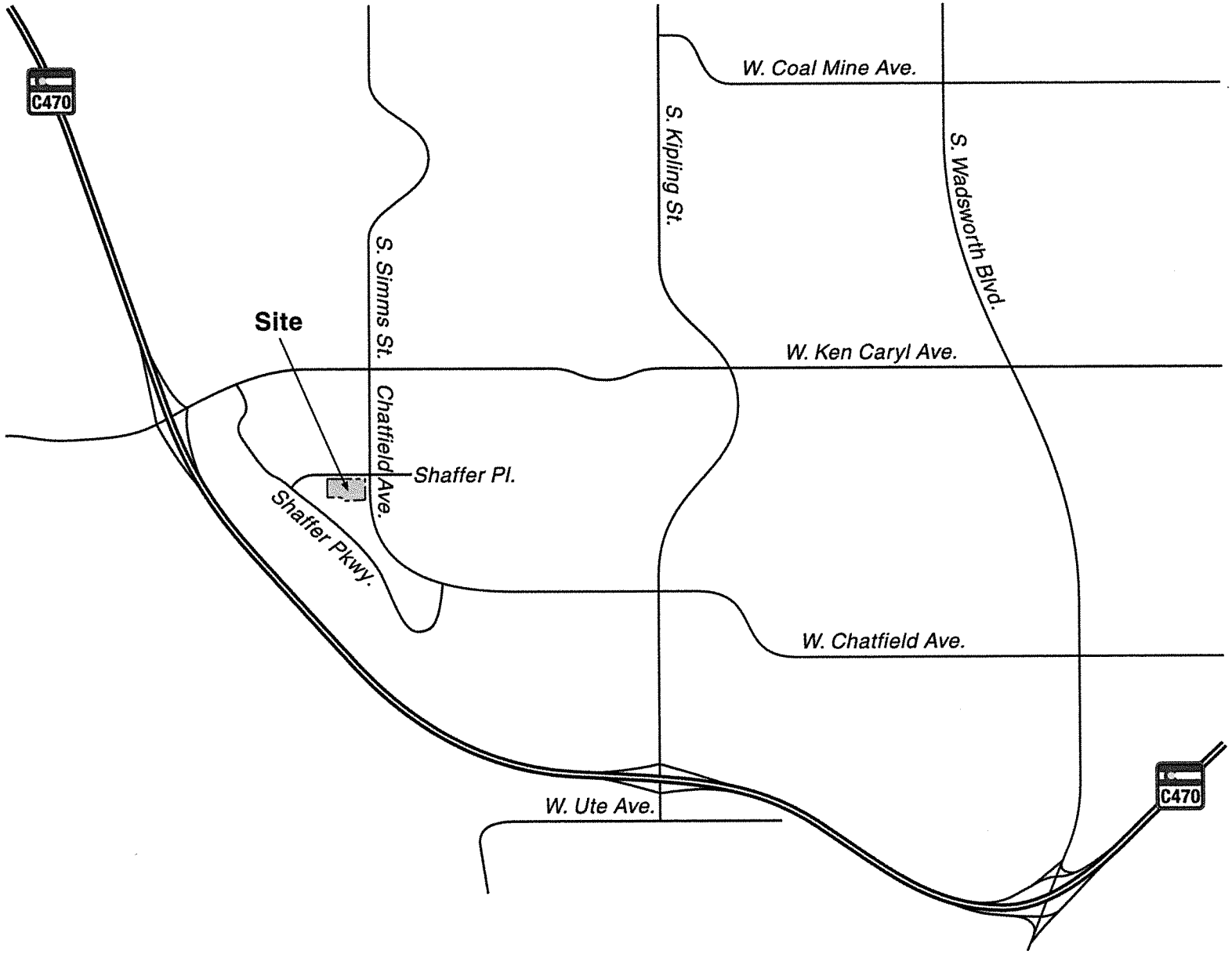

Figure 1

Vicinity Map

North

Garage Town Ken Caryl, 07-158, 6/13/07

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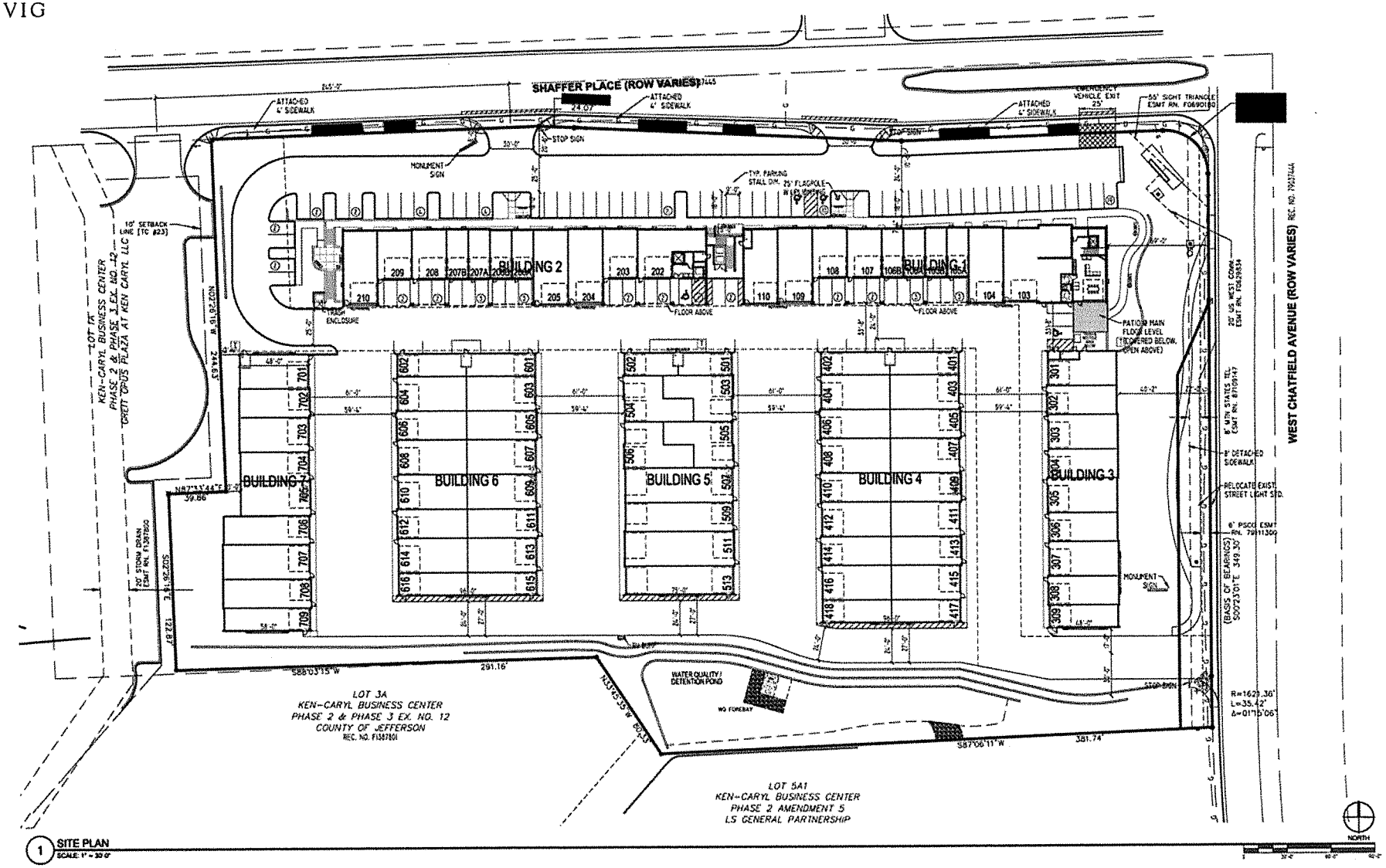

1 SITE PLAN
SCALE: 1" = 30'-0"

Figure 2
Site Plan

North

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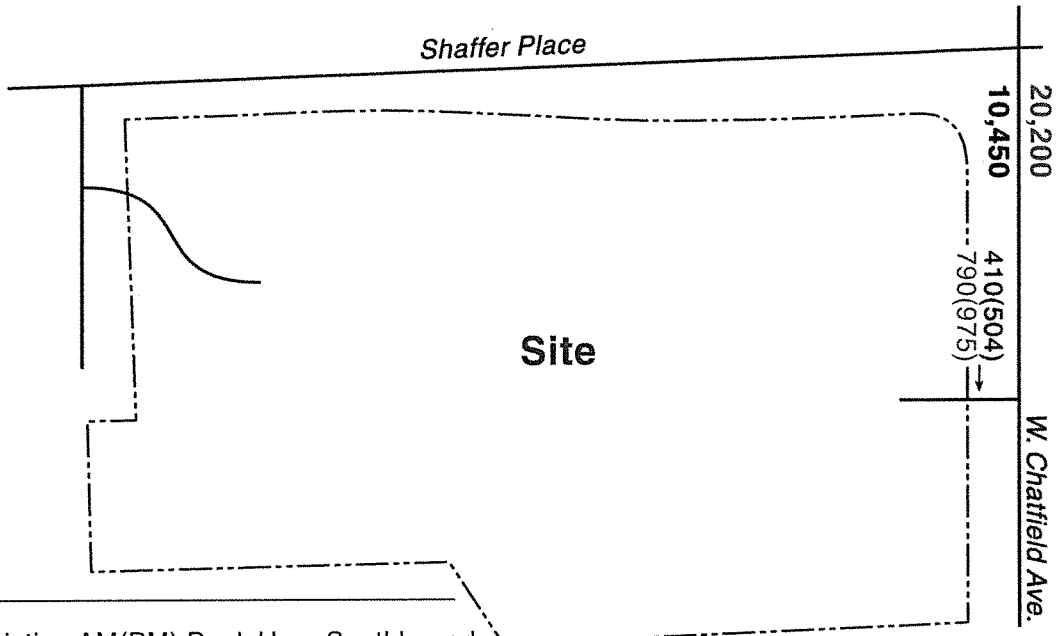


LEGEND

XXX(XXX) = Existing AM(PM) Peak Hour Southbound Traffic Volume (Vehicles Per Hour)

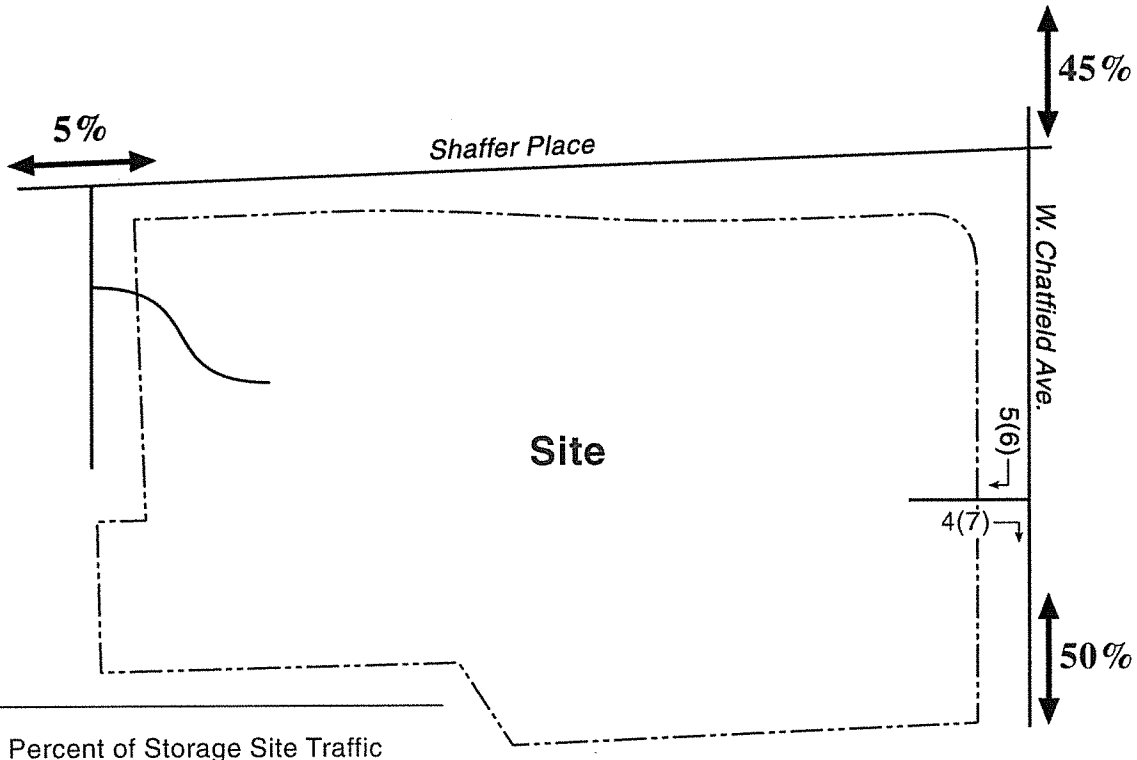
XXX(XXX) = Year 2030 AM (PM) Peak Hour Southbound Traffic Volume (Vehicles Per Hour)

XXXX = Existing Only 2-Way Traffic Volume (Vehicles Per Day)

XXXX = Projected Year 2030 Only 2-Way Traffic Volume (Vehicles Per Day)

Figure 3

Existing and Projected Year 2030 Traffic Volumes



LEGEND

XX% = Percent of Storage Site Traffic Traveling To/From Shown Direction

XXX(XXX) = AM(PM) Peak Hour Site Trips

Figure 4

Storage Site Trip Distribution Assignment (to Chatfield Avenue Access)

North