Exhibit K: Traffic Memo

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Memorandum

To: **Mike McCarthy, City of Tualatin**

Copy: **Pat Larson, Cipole Properties**
Paul Sellke, AKS Engineering & Forestry, LLC

From: **Jennifer Danziger, PE**

Date: **July 17, 2023**

Subject: **Cipole Property – Limited Transportation Assessment**

RENEWS: 12/31/2023

Introduction

This memorandum addresses the trip generation, trip distribution, access, circulation, and safety assessment for the proposed industrial development of Tax Lot 2S121DC 700 located on the north side of SW Herman Road north of the intersection with SW Cipole Road in Tualatin, Oregon. The proposed development includes a 13,790-square-foot (SF) industrial building as illustrated in the attached site plan and show in Figure 1.

Figure 1: Site Location (©Google Earth, 2023)

Project Description

The proposed development includes a 13,790-SF industrial building on Tax Lot 2S121DC 700, which totals approximately 1.44 acres. The building may be partitioned to accommodate two tenants. The parking lot will include 64 spaces, including 3 accessible spaces. Two exterior doors for loading are planned.

Transportation Network Connectivity

The site includes a portion of a shared driveway along its eastern boundary that currently provides access to the public road system at an intersection with SW Herman Road, approximately 340 feet northeast of SW Cipole Road.

SW Herman Road is classified as a minor arterial in the City of Tualatin Transportation System Plan. Near the project site, SW Herman road is two lanes with no urban improvements; however, it widens to three lanes with bike lanes on both sides and sidewalks on the north side east of SW 125th Court.

To the east of the shared driveway, SW Herman Road connects with SW 124th Avenue, classified as a major arterial, and to the west, it connects with SW Cipole Road, classified as a major collector. These roadways provide north-south connections to other major roadways, such as Oregon Highway 99W and SW Tualatin-Sherwood Road.

The characteristics of the nearby roadways carrying most of the traffic to/from the proposed development are summarized in Table 1.

Table 1: Roadway Characteristics

Street Name	Jurisdiction	Functional Classification	Travel Lanes	Posted Speed	Curbs & Sidewalks	On-Street Parking	Bicycle Facilities
SW Herman Road	City of Tualatin	Minor Arterial	2-3	45 mph	Partial North Side	Prohibited	None/ Bike Lanes
SW Cipole Road	Washington County	Major Collector	2	45 mph	Partial Both Sides	Prohibited	None
SW 124th Avenue	City of Tualatin	Major Arterial	4-5	45 mph	Both Sides	Prohibited	Bike Lanes

Site Access & Circulation

A single access to the proposed parking lot will be located along the shared driveway approximately 110 feet north of the centerline of SW Herman Road. The drive aisles within the parking lot will be sufficient to allow a fire truck to turn around, as illustrated in the attached site plan.

A pedestrian connection from the shared driveway to the building will be located approximately 150 feet north of SW Herman Road. Pedestrian crossings will be marked in the parking lot and across the loading area.

Covered bicycle parking will be located at the northeast corner of the building. It can be accessed by both the drive aisles and the on-site pedestrian facilities.

Trip Generation

Trip rates from the *Trip Generation Manual*[1] were used to estimate traffic demand. Specifically, trip rates from land-use code 110, *General Light Industrial*, were referenced to estimate the trip generation based on the number of dwelling units. The estimates are summarized in Table 2 with details attached to this memorandum.

Table 2: Trip Generation

ITE Code	Intensity	Vehicle Type	Morning Peak Hour			Evening Peak Hour			Weekday Trips
			In	Out	Total	In	Out	Total	
110 – General Light Industrial	13,790 SF	Total	9	1	10	1	8	9	68
		Trucks	0	0	0	0	0	0	4
		Passenger Vehicles	9	1	10	1	8	9	64

The resulting trip generation is 10 morning peak hour, 9 evening peak hour, and 68 daily trips. Four (4) truck trips per day are anticipated to occur outside of the peak hours.

According to Tualatin Traffic Study Requirements,[2] a full Transportation Impact Analysis (TIA) is required when a development is "anticipated to generate more than 500 vehicle trip ends per day and/or more than 60 vehicle trip ends in the morning or evening peak hour and/or more than 100 vehicle trip ends during the peak hour of development traffic." The trip generation for the proposed development falls well below these thresholds; therefore, a full TIA is not required.

Trip Distribution

The trip distribution for the site was estimated based on the peak hour turning movements at several nearby intersections. The anticipated distribution of site traffic is assumed to be:

- Approximately 60 percent to/from the east on Herman Road
- Approximately 40 percent to/from the west on Herman Road

With this distribution, no more than 6 trips would be added to any roadway during the morning or evening peak hour.

Crash History

Using data obtained from ODOT's Crash Data System, a review of five years of the most recent available crash history (January 2017 through December 2021) was performed along SW Herman Road. One crash was identified near the intersection of the shared driveway and SW Herman Road; however, it was reported as a

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

[2] https://www.tualatinoregon.gov/engineering/tualatin-traffic-study-requirements

head-on collision that occurred when a northeastbound vehicle crossed the centerline and collided with the oncoming southwestbound vehicle. No crashes involving the shared driveway were reported.

Access Spacing

The site access on SW Herman Road falls under the City of Tualatin access spacing standards. Tualatin Development Code (TDC) Chapter 75.140 Section 17 establishes the spacing standards for SW Herman Road between SW Teton Avenue and SW 124th Avenue. It does not include spacing standards between SW 124th Avenue and SW Cipole Road. The standards for SW Herman Road, where specified, state "On the north side the existing driveways will be allowed to remain. No new driveways will be permitted.

The proposed project will utilize an existing driveway; therefore, it meets the standards applicable to other sections of SW Herman Road.

Sight Distance

A sight distance analysis was performed for the planned project driveways. Both intersection sight distance (ISD) and stopping sight distance (SSD) are assessed. The ISD is an operational measure, intended to provide sufficient line of sight along the major street so that a driver could turn from the minor street without impeding traffic flow. The SSD is the minimum requirement to ensure safe operation of the roadway. Stopping sight distance allows an oncoming driver to see a hazard in the roadway, react, and come to a complete stop if necessary to avoid a collision. According to *A Policy on Geometric Design of Highway and Streets*,[3] as long as the available intersection sight distance is at least equal to the minimum required stopping sight distance for the design speed of the roadway, adequate sight distance is available for safe operation of the intersection.

Intersection Sight Distance

For ISD, the driver's eye is assumed to be 14.5 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The oncoming vehicle driver's eye height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

The posted speed on SW Herman Road is 45 mph; thus, the recommended ISD is 500 feet for the left-turn movement and 430 feet for the right-turn movement. However, the all-way, stop-controlled intersection of SW Herman Road & SW Cipole Road is located approximately 360 feet southwest of the shared driveway. Vehicles approaching from the southwest will be accelerating from a stop. According to AASHTO Figure 2-33, the speed reached over 360 feet is approximately 37 mph, and the average travel speed is expected to be even less; therefore, using the posted speed as the basis for the calculation overestimates the recommended ISD.

The shared driveway has no posted speed. Looking to the north from the site driveway, approaching vehicles are assumed to be traveling at no more than 25 mph resulting in a recommended ISD of 280 feet. The site access is located approximately 100 feet north of SW Herman Road. Looking to the south, approaching vehicles

[3] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.

are assumed to be traveling approximately 20 mph as they turn from SW Herman Road, resulting in a recommended ISD of 225 feet.

Stopping Sight Distance

For SSD, the measurement criteria looking from the driveway is the same but the SSD is also measured from the driver's eye height (3.5 feet) looking towards an object in the roadway at 2.0 feet.

At 45 mph, the required SSD is 360 feet on SW Herman Road.

For the shared driveway at 25 mph, the required SSD is 155 feet and at 20 mph, the SSD is 115 feet.

Available Sight Distance

The sight lines from the share driveway at SW Herman Road are shown in Figure 2 and Figure 3. Looking to the east, available sight distance exceeds the recommended ISD of 500 feet. Looking to the west, available sight distance extends through the all-way, stop-controlled intersection with SW Cipole Road. At approximately 360 feet from the shared driveway, this distance meets the minimum SSD requirement.

Figure 2: Shared Driveway Looking to the Northeast along SW Herman Road

Figure 3: Shared Driveway Looking to the Southwest along SW Herman Road

The sight lines for the proposed site access shown in Figure 4 and Figure 5. Looking to the north, available sight distance exceeds the recommended ISD of 280 feet. Looking to the south, available site distance exceeds the required 115 feet vehicles can be seen approaching the driveway from SW Herman Road.

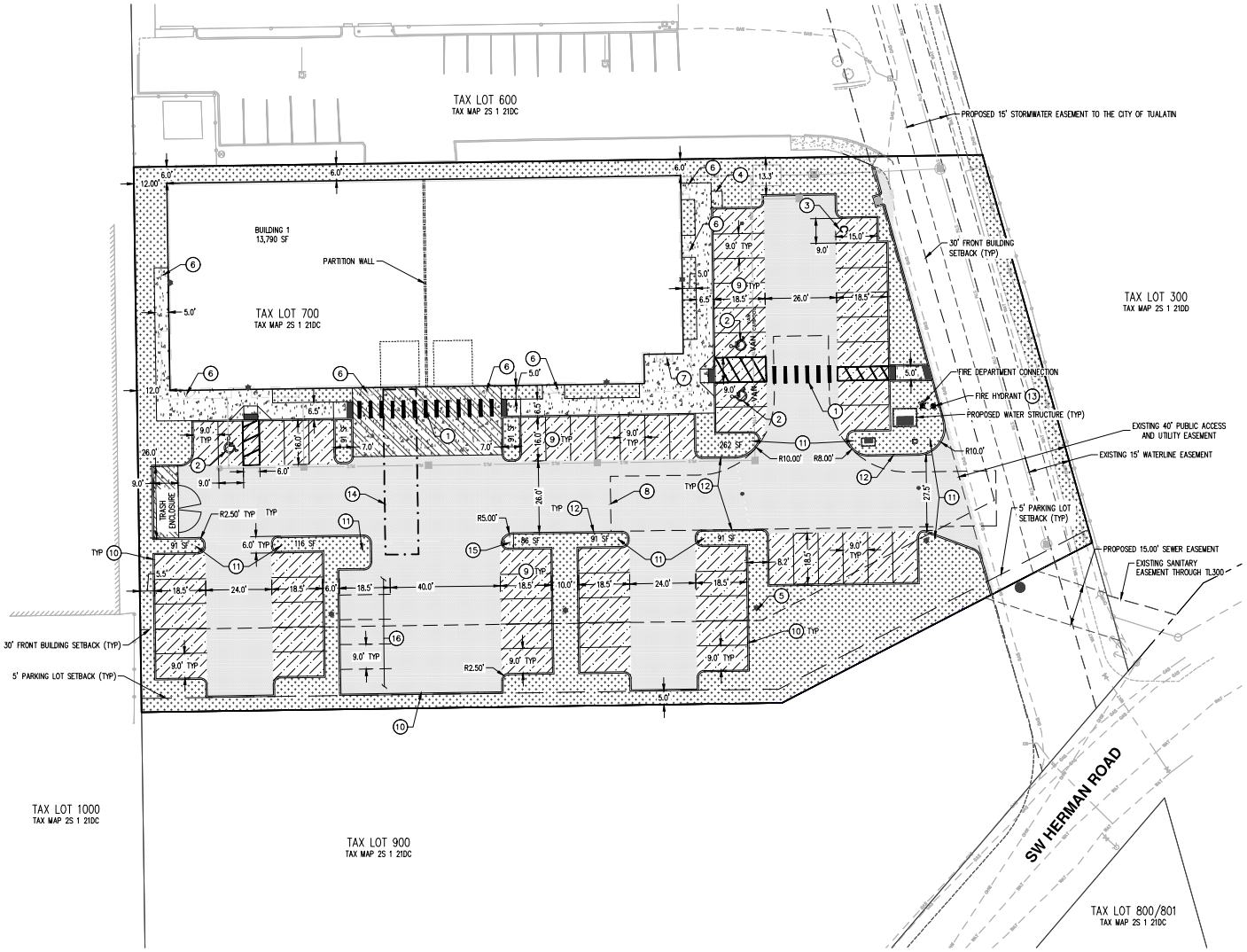
Figure 4: Site Access Looking to the North along Shared Driveway

Figure 5: Site Access Looking to the South along Shared Driveway

Conclusion

Adequate sight distance is available for both the shared driveway intersection with SW Herman Road and the site driveway intersection with the shared driveway.

Attachments:
Site Plan
Crash Data



SITE SUMMARY

PARKING

TOTAL PROVIDED PARKING STALLS :	64
COMPACT STALLS:	1
TEMPORARY/OVERFLOW PARKING STALLS:	5
MINIMUM REQUIRED SPACES:	22
1.6 SPACES PER 1,000 SQUARE FEET OF GROSS FLOOR AREA (13,790 SF/1,000 SF)* 1.6 = 22	

BIKE PARKING

BIKE PARKING SPACES PROVIDED:	2
BIKE PARKING SPACES REQUIRED:	2

AREA

LANDSCAPE AREA:	12,424 SF
TOTAL AREA:	62,666 SF
LANDSCAPE AREA PERCENTAGE OF TOTAL:	19.8%

SURFACING LEGEND

- LIGHT DUTY PAVEMENT
- HEAVY DUTY PAVEMENT 12,500 POUND WHEEL LOAD 75,000 POUND GROSS LOAD
- NEW SIDEWALK
- PCC PAVEMENT
- LANDSCAPE AREAS

SITE KEYED NOTES: (#)

1. PEDESTRIAN CROSSING MARKING.
2. ACCESSIBLE PARKING STALL AND AISLE STRIPING.
3. COMPACT STALL STRIPING PAINTED WITH "C" PRINTED WITH 12" HIGH LETTERING CENTERED IN STALL AND ALIGNED WITH BACK OF STALL STRIPING.
4. COVERED BIKE PARKING (2 SPOTS MINIMUM) (6' X 4')
5. LIGHT POLE (TYP)
6. EXTERIOR DOOR
7. MAIN BUILDING ENTRANCE
8. FIRE TRUCK TURNAROUND
9. MINIMUM PARKING CONFIGURATION REQUIRES A MINIMUM OF 18.5' DEPTH. ALTERNATE CONFIGURATION ALLOWS 18.5' DEPTH STALL OR 16' STALL WITH 2.5' BUMPER OVERHANG.
10. VERTICAL CURB (TYP).
11. CLEAR ZONE MUST BE PROVIDED VERTICALLY BETWEEN A MAXIMUM OF 30 INCHES AND A MINIMUM OF EIGHT FEET AS MEASURED FROM THE GROUND LEVEL.
12. FIRE LANE. CURB TO BE PAINTED RED.
13. ALL PORTIONS OF BUILDING 1 ARE WITHIN 400 FEET OF FIRE HYDRANT.
14. 12' X 60' (MINIMUM) LOADING ZONE.
15. CONCRETE BACKFILL AT CURB NOSE.
16. TEMPORARY/ OVERFLOW PARKING.

N

SCALE: 1" = 20 FEET

20 0 4 10 20

ORIGINAL PAGE SIZE: 22" x 34"

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ENGINEERING • SURVEYING • NATURAL RESOURCES
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PRELIMINARY SITE PLAN
CIPOLE PROPERTY
TUALATIN, OREGON

PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER:	7949
DATE:	05/01/2023
DESIGNED BY:	AMC
DRAWN BY:	JLG
CHECKED BY:	CEG

P4

AKS DRAWING FILE: 7949 SITE.DWG | LAYOUT: P4

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

HERMAN RD and CIPOLE RD, City of Tualatin, Washington County, 01/01/2017 to 12/31/2021

1 - 1 of 1 Crash records shown.

SER# INVEST RD DPT UNLOC?	S D M P R J S W E A U I C O E L G N H R D C S V L K	DATE DAY TIME LAT	CLASS DIST FROM LONG	CITY STREET FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	SPCL USE TRLR QTY OWNER V# TYPE	MOVE FROM TO	PRTC P# TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
03200	N N N N N N	09/01/2020	17	SW HERMAN RD	STRGHT		N	N	CLR	O-STRGHT	01 NONE 0	STRGHT									05
COUNTY		TU	315	SW CIPOLE RD	NE	(NONE)	UNKNOWN	N	DRY	HEAD	PRVTE	SW-NE								000	00
Y		7A			08			N	DAY	INJ	PSNGR CAR		01 DRVR	INJB	49	M	OR-Y		039	000	05
N		45 22 33.25	-122 48			(02)											OR<25				
			39.34																		
											02 NONE 0	STRGHT									
											PRVTE	NE-SW								000	00
											PSNGR CAR		01 DRVR	INJB	27	F	OR-Y		000	000	00
																	OR<25				

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.