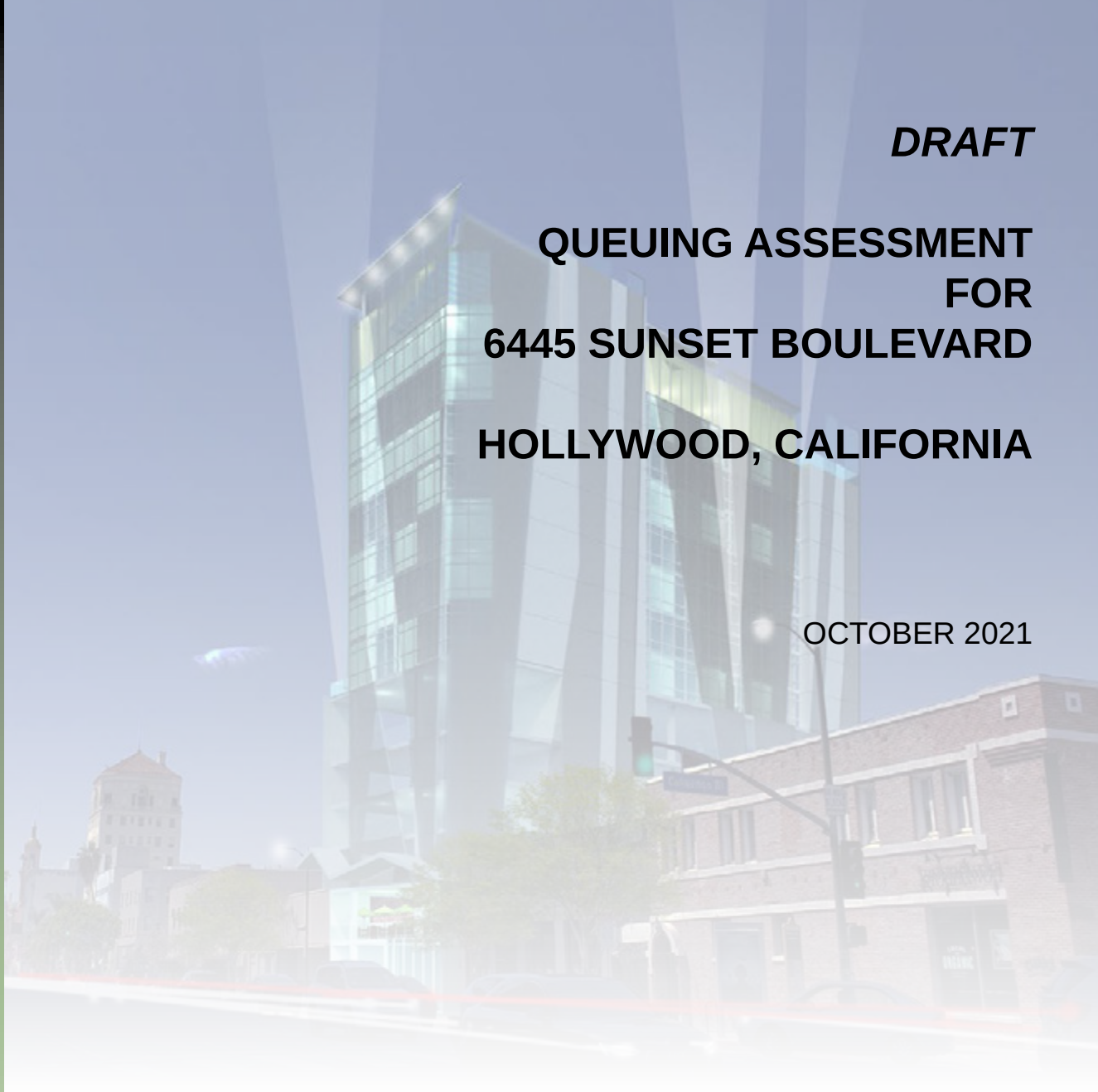
APPENDIX D

Queuing Assessment



DRAFT

QUEUING ASSESSMENT FOR 6445 SUNSET BOULEVARD

HOLLYWOOD, CALIFORNIA

OCTOBER 2021

PREPARED FOR

ARCHEON GROUP

PREPARED BY

Gibson transportation consulting, inc.

DRAFT

QUEUING ASSESSMENT
FOR
6445 SUNSET BOULEVARD

HOLLYWOOD, CALIFORNIA

October 2021

Prepared for:

ARCHEON GROUP

Prepared by:

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Chapter 1
Introduction

Gibson Transportation Consulting, Inc. was asked to conduct an assessment of potential circulation and queuing issues resulting from operation of parking elevators at 6445 Sunset Boulevard (Site) in the City of Los Angeles (City). This report summarizes our assessment.

PROJECT DESCRIPTION

The Site is located within Council District 13, in the Central Hollywood neighborhood of the City, and consists of one lot identified as Assessor Parcel Number 5546013012. The Site is bounded by a private access easement to the north, adjacent commercial developments to the east and west, and Sunset Boulevard to the south. A vicinity map is provided in Figure 1.

The Applicant is proposing the construction of a 13-story hotel development (Project), including 175 hotel rooms and up to 11,400 square feet (sf) of restaurant/bar/lounge space on various levels. Parking for the Project would be provided within three above-ground levels (on floors three to five), with vehicular access provided via one right-turn in/out driveway along Sunset Boulevard. The above-ground parking levels would be accessed via parking elevators and serviced by an on-site valet operation. The existing 10,000 sf of retail uses on the Site would be removed to allow for development of the Project.

PARKING SUPPLY

The Project would provide sufficient off-street parking to satisfy Los Angeles Municipal Code (LAMC) requirements, after applying permissible reductions. In order to provide on-site parking consistent with the LAMC design and supply requirements, the Applicant will install two parking elevators that will provide access to the three above-grade parking levels. A total of 71 parking spaces will be provided on-site, all accessed via the parking elevator.

Figure 2 depicts the ground level site plan.

ACCESS & INTERNAL CIRCULATION

Access to the Site will be provided via a single commercial driveway along Sunset Boulevard, which allows only right-in and right-out turning movements. The internal circulation drive aisle from Sunset Boulevard is a single path that provides approximately 155 linear feet from the public street to the front of the parking elevators. The proposed parking elevators are located at the northeast corner of the property, as far from the public street as possible given the constraints of the Site.

Figure 3 shows the capacity for queuing vehicles on-site. As shown, up to seven vehicles can be stored between Sunset Boulevard and the parking elevators, two can be located in the elevators, and an additional two vehicles can be stored in ground-floor parking spaces in the middle of the circulation aisle. A total of 11 vehicles can be stored on the ground floor without interfering with the exit lane.

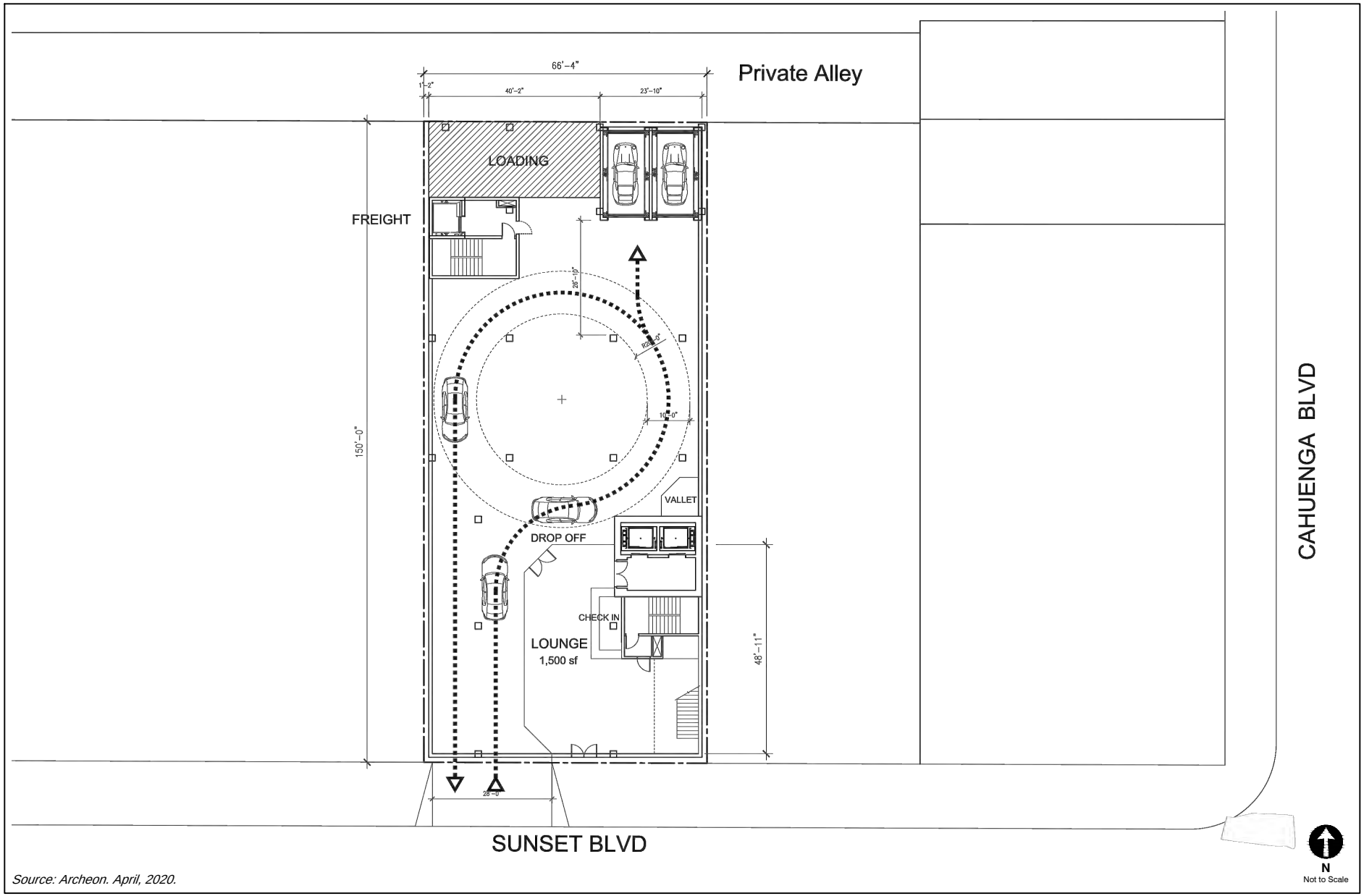
LEGEND

Project Site

N
Not to Scale

PROJECT SITE LOCATION

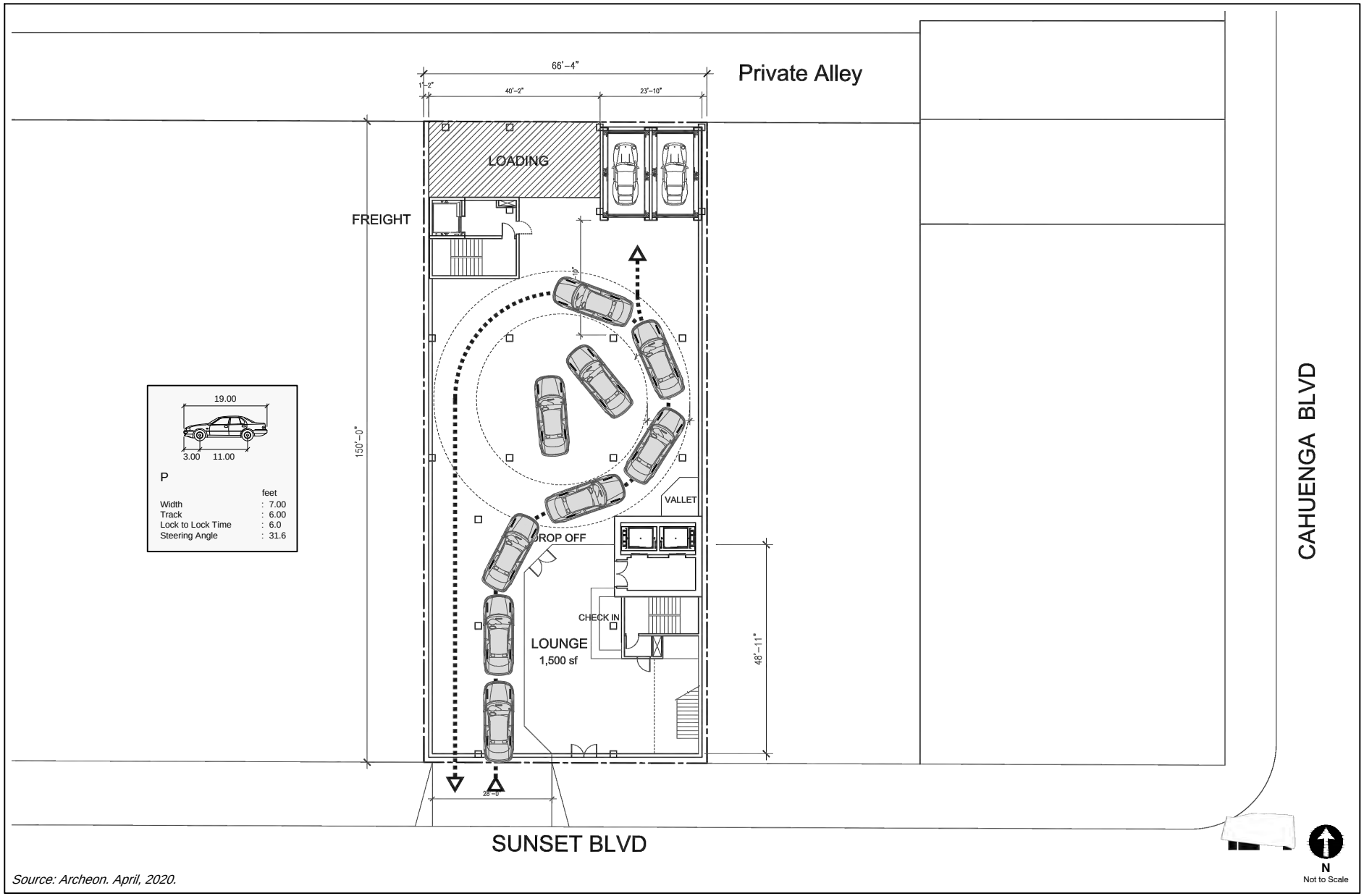
FIGURE 1



Source: Archeon. April, 2020.

PROJECT SITE PLAN

FIGURE 2



Source: Archeon. April, 2020.

PROJECT SITE STACKING
AASHTO "P"

FIGURE
3

Chapter 2
Analysis

This section provides a review of the parking elevators, the trip generation for the overall land use program, and an evaluation of potential vehicle queuing and operational constraints.

PARKING ELEVATORS

A total of two parking elevators will be installed. Each elevator can process one vehicle at a time, as well as store two vehicles, if necessary. As shown in Figure 2, the parking elevators will be located at the northeast corner of the property, approximately 155 linear feet from Sunset Boulevard, allowing for approximately seven vehicles (at a standard of 22 feet each, which includes a safe distance between bumpers, for a total of 154 linear feet) to queue prior to the elevators. In addition, two parking spaces are provided on the ground floor, for a total storage of nine vehicles.

The proposed vendor for the parking elevator system is PFlow Industries, which provided equipment specifications, including power systems, processing durations, size requirements, etc. Additionally, the Applicant team was allowed to observe systems operations in the field to confirm lift times and identify potential issues for the end-user.

Notably, each parking elevator operates with an independent power system; if one elevator has an equipment failure, the remaining elevator will maintain power. Only one vehicle can be loaded at a time in each of the elevators, allowing two vehicles to be moved simultaneously. The elevators can operate at up to 400 feet per minute and the door can open and close in approximately one second. Independent of any loading or unloading procedures, the elevators will take between 10 to 20 seconds, with an average time of 15 seconds, to travel between the ground floor and the parking decks on floors three to five, including opening/closing of the elevator doors. Load-in (entering vehicles) and load-out (exiting vehicles) will be conducted exclusively by trained valets. Processing times are 10 seconds per vehicle loaded or unloaded, or 20 seconds to unload and

then immediately load another vehicle in the elevator. Average total processing time for one inbound vehicle is approximately one minute from the time the elevator doors open on the ground floor to the time the elevator returns to the ground floor ready for the next vehicle. To provide for worst case conditions, this processing time assumes a vehicle will be returned for an outbound trip with each use of the elevator. With two elevators, the proposed system can process an average of two cars per minute.

Elevators will be served by valets and valet attendants. Hotel and restaurant patrons and employees will drop off and pick up their vehicles at a central valet stand, eliminating conditions such as user unfamiliarity or elevator transactions that could extend individual dwell times. The parking system would serve only the on-site land uses and would not be open to the general public.

LAND USE PROGRAM

To determine the anticipated peak hour vehicle demand for the Site and, subsequently, the demand for the parking elevators, trip generation estimates were calculated using the peak hour rates from *Trip Generation Manual, 10th Edition* (Institute of Transportation Engineers, 2017).

Table 1 summarizes the results of the trip generation calculation. In addition to the base trip generation rates, a conservative transit/walk-in reduction of 10% was applied to the gross trip value due to proximity to high-capacity transit (fixed rail station within 0.25 miles, multiple transit routes on Sunset Boulevard, and location within a Transit Oriented District) to account for that portion of employees/visitors who are expected to travel without a personal vehicle. An additional 20% internal capture reduction was applied to the restaurant uses to account for hotel patrons who also patronize the bar/lounge/restaurant portions of the Project without requiring an additional vehicle trip.

The resulting net trips show that the Site has the potential to generate 88 inbound trips in the morning peak hour (with 67 vehicles exiting) and 98 inbound trips in the evening peak hour (with 76 vehicles exiting). These values represent all Site-generated vehicles during the peak hours, including employees, visitors, and deliveries. However, for the purpose of providing a worst-case

analysis, it is assumed that all vehicles arriving during the peak hours will utilize the parking elevators.

VEHICLE QUEUING

For access to the above-ground parking levels, vehicles enter on Sunset Boulevard and travel north approximately 155 linear feet to reach the parking elevators. Valet-assist personnel will be stationed near the elevators and will collect vehicle keys and maneuver vehicles into and out of the parking elevators.

Based on the trip generation calculation, the greatest load-in demand for the parking elevators and the greatest potential to queue vehicles on the internal circulation road and extend into the public right-of-way (ROW) occurs during the afternoon peak hour. Exiting traffic during the afternoon peak hour would have inconsequential effects on the public infrastructure as those vehicles (76 total) would be contained on-site before crossing the sidewalk and entering Sunset Boulevard.

The entering volumes in the afternoon peak have a demand of 98 vehicles in one hour, or approximately 1.63 vehicles per minute if spread evenly over 60 minutes. In reality, however, vehicle activity at a commercial project will typically “platoon,” arriving in small groups interspersed with periods of no traffic. To calculate the platooning effect and provide a more realistic assumption of vehicle arrivals, a Poisson distribution curve was generated.

The M/M/s model, a multi-server queuing model, was utilized for determining arrival patterns for this study. In this model, arrivals follow a Poisson process. The service times are independent and identically distributed, following an exponential distribution. In the M/M/s model, there is no balking or reneging, so all arrivals eventually receive service. The M/M/s distribution curve was calculated assuming two simultaneous transactions (one vehicle in each elevator) and applying the processing time for the parking elevator (30 seconds per vehicle). An additional 30 seconds was added to each load-in vehicle to conservatively account for the time it takes for a vehicle to enter the elevator and for the valet to exit and activate the lift on both the starting floor and the receiving floor, resulting in an overall processing time of one minute per vehicle/per elevator. The overall processing time, after combining both elevators, is approximately two vehicles per minute.

The resulting platooning effect from the M/M/s distribution curve estimates that queuing would occur for up to six vehicles at the 95th percentile. This means that for 5% of the hour (three minutes), it would be expected that queuing could be up to 132 linear feet (six vehicles multiplied by a standard of 22 feet, which includes a safe distance between bumpers). The remaining portion of the hour (57 minutes) is expected to experience queues of fewer than six vehicles. The staging area shown in Figure 3 has adequate room to accommodate this demand on-site without interfering with internal circulation or other surface parking stalls. As a result, the maximum projected queuing for the busiest inbound peak hour will be accommodated on-site and will not have an impact on the public ROW along Sunset Boulevard.

The Poisson calculation summary is provided in the Appendix.

VALET MANAGEMENT

As stated above, the elevator system requires, and will provide, full valet management. While some employees/visitors will eventually become educated on the arrival usage of the system, a valet will be available for load-in and load-out activity and to address any unusual conditions. At minimum, the valet must be trained to manage:

- Vehicle keys
- Parking deck management
- Ground floor vehicle organization
- Vehicle retrieval from all parking decks
- Use of equipment for new users
- Systems malfunctions

As many as 71 vehicles could be parked in the parking garage. Based on the trip generation summary, demand for exiting traffic is similar to arrivals, in that the valet could expect as many as six vehicles at one time. The number of valet personnel required to manage this task will depend on the training and any established protocols for sorting vehicles. For most hours of the day, the Site can likely be managed with two to four people. During the peak hours, it may be necessary to increase staffing.

TABLE 1
TRIP GENERATION ESTIMATES

Land Use	ITE Land Use	Rate Metric	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Trip Generation Rates [a]								
Hotel	310	per room	59%	41%	0.47	51%	49%	0.60
High Turnover (Sit-Down) Restaurant [b]	932	per ksf	55%	45%	9.94	62%	38%	9.77
Proposed Project								
Hotel	310	175 rooms	48	34	82	54	51	105
Transit/Walk Adjustment - 10% [c]			*(5)*	*(3)*	*(8)*	*(5)*	*(6)*	*(11)*
High Turnover (Sit-Down) Restaurant [b]	932	11.400 ksf	62	51	113	69	42	111
Internal Capture Adjustment - 20% [d]			*(12)*	*(11)*	*(23)*	*(14)*	*(8)*	*(22)*
Transit/Walk Adjustment - 10% [b]			*(5)*	*(4)*	*(9)*	*(6)*	*(3)*	*(9)*
TOTAL PROJECT TRIPS			**88**	**67**	**155**	**98**	**76**	**174**

Notes:

ksf: 1,000 square feet

[a] Source: *Trip Generation, 10th Edition* , Institute of Transportation Engineers, 2017.

[b] Hotel trip rates includes ancillary conference/meeting rooms, a lobby lounge and bar, rooftop bar and lounge, guest amenities, as well as retail and restaurant space. However, the restaurant/lounge area within the hotel is open to the public and was therefore analyzed separately.

[c] The Project site is located within a 1/4 mile of a Metro Local Bus stop (Line 2) and 1/2 mile of a Metro B (Red) Line station (Hollywood/Vine Station), therefore a 10% transit adjustment was applied to account for transit usage and walking visitor arrivals.

[d] Internal capture adjustments account for person trips made between distinct land uses within a mixed-use development (e.g., hotel guests visiting the restaurant use).

Chapter 3

Summary

- Parking elevators are to be installed at 6445 Sunset Boulevard.
- A total of 71 parking spaces will be provided in the on-site garage.
- No transactions are required at the elevators and the system would serve only the on-site land use and would not be open to the general public.
- A conservative estimate of vehicular traffic was applied to the analysis to demonstrate worst-case scenarios for ingress/egress queuing, including a low estimate of a 10% reduction for proximity to a fixed-rail station and 20% for internal capture of the non-hotel uses.
- The worst-case queuing on a typical operational day, which may extend to six vehicles (or 132 linear feet), can be accommodated within the on-site staging area without affecting internal circulation, City streets, or the public ROW.
- Valet services will be provided to manage the parking elevators, particularly to assist with elevator loading/unloading activity.
- Implementation of the parking elevator system is not anticipated to impede traffic on Sunset Boulevard or adversely impact movement within the public ROW.

References

Trip Generation Manual, 10th Edition, Institute of Transportation Engineers, 2017.

Appendix

Poisson Distribution Queuing Worksheet

M/M/s Queueing Model

	Data		Results
λ =	1.63	(mean arrival rate)	
μ =	1	(mean service rate)	
s =	2	(# servers)	
		W =	2.978184796
Pr(W > t) =	0.742969	W_q =	1.978184796
when t =	1		
		ρ =	0.815
Prob(W_q > t) =	0.505568		
when t =	1	n	P_n
		0	0.101928375
		1	0.166143251
		2	0.135406749
		3	0.110356501
		4	0.089940548
		5	0.073301547
		6	0.059740761
		7	0.04868872
		8	0.039681307
		9	0.032340265
		10	0.026357316
		11	0.021481212
		12	0.017507188
		13	0.014268358
		14	0.011628712
		15	0.0094774
		16	0.007724081
		17	0.006295126
		18	0.005130528
		19	0.00418138
		20	0.003407825
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		22	0.002263562
		23	0.001844803
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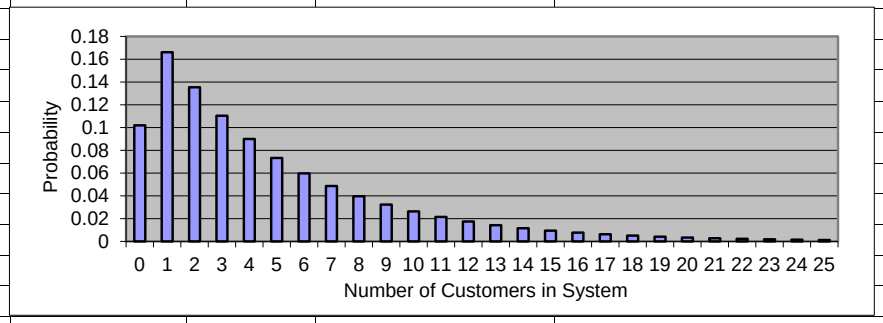

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Lambda	C4
Lq	G5
Mu	C5
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P0	G13
Pn	G13:G38
Rho	G10
s	C6
Time1	C9
Time2	C12
W	G7
Wq	G8