November 12, 2021

Mr. Phil Martin
PHIL MARTIN & ASSOCIATES
1809 E. Dyer Road, Suite 301
Santa Ana, California 92705

RE: Garvey Avenue Specific Plan Amendment 21-01 Project Transportation Assessment
Project No. 19420

Dear Mr. Martin:

Ganddini Group, Inc. is pleased to provide this Transportation Assessment for the proposed Garvey Avenue Specific Plan Amendment 21-01 Project. We trust the findings of this analysis will aid you and the City of Rosemead in assessing the project.

Although this is a technical report, effort has been made to write the report clearly and concisely. A glossary is provided in Attachment A to assist the reader with technical terms.

PROJECT DESCRIPTION

The project site is located within the Garvey Avenue Specific Plan at 7539 and 7545 Garvey Avenue in the City of Rosemead, California. The project site is currently vacant. Figure 1 shows the project location map.

The proposed project involves a Specific Plan Amendment to re-zone two parcels (APN's 5286-022-009 and 5286-022-010) from Garvey Specific Plan (GSP) to Garvey Specific Plan, Incentivized Mixed-Use (GSP-MU) for the development of a seven-story mixed-use development consisting of 75 residential apartment dwelling units and 6,346 square feet of commercial floor area ["Project"]. Figure 2 illustrates the proposed project site plan.

EXISTING SPECIFIC PLAN TRIP GENERATION

The *Traffic Impact Analysis for the Garvey Avenue Specific Plan EIR* (KOA Corporation, May 26, 2016) ["the Garvey Avenue Specific Plan TIA/EIR"] was prepared for the Garvey Avenue Specific Plan. The Garvey Avenue Specific Plan TIA/EIR calculated trip generation based on the potential development intensity changes (i.e., square feet of floor area for non-residential uses such as commercial and industrial and number of units for residential uses) from the existing land uses to the proposed Specific Plan land uses. The Specific Plan area was then Categorized into traffic analysis zones (TAZs). Figure 3 shows the traffic analysis zones used in the Garvey Avenue Specific Plan TIA. The proposed project is located within TAZ 2165-1.

Trip generation change by TAZ was calculated for a realistic buildout scenario and a maximum buildout scenario. Table 1 shows the calculated trip generation for both the realistic and maximum buildout scenarios for TAZ 2165-1.

Figure 1
Project Location Map

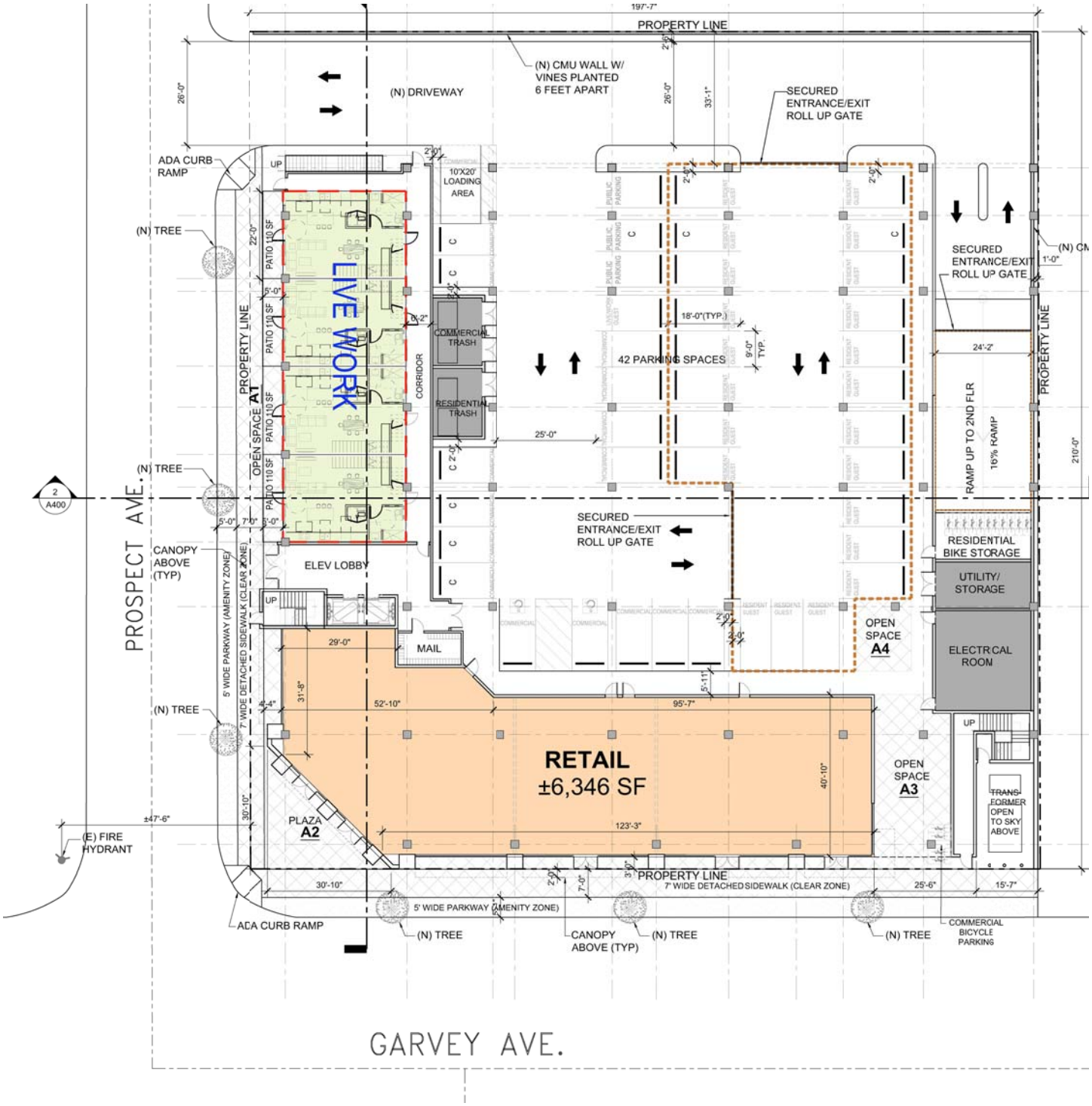

Figure 2
Site Plan

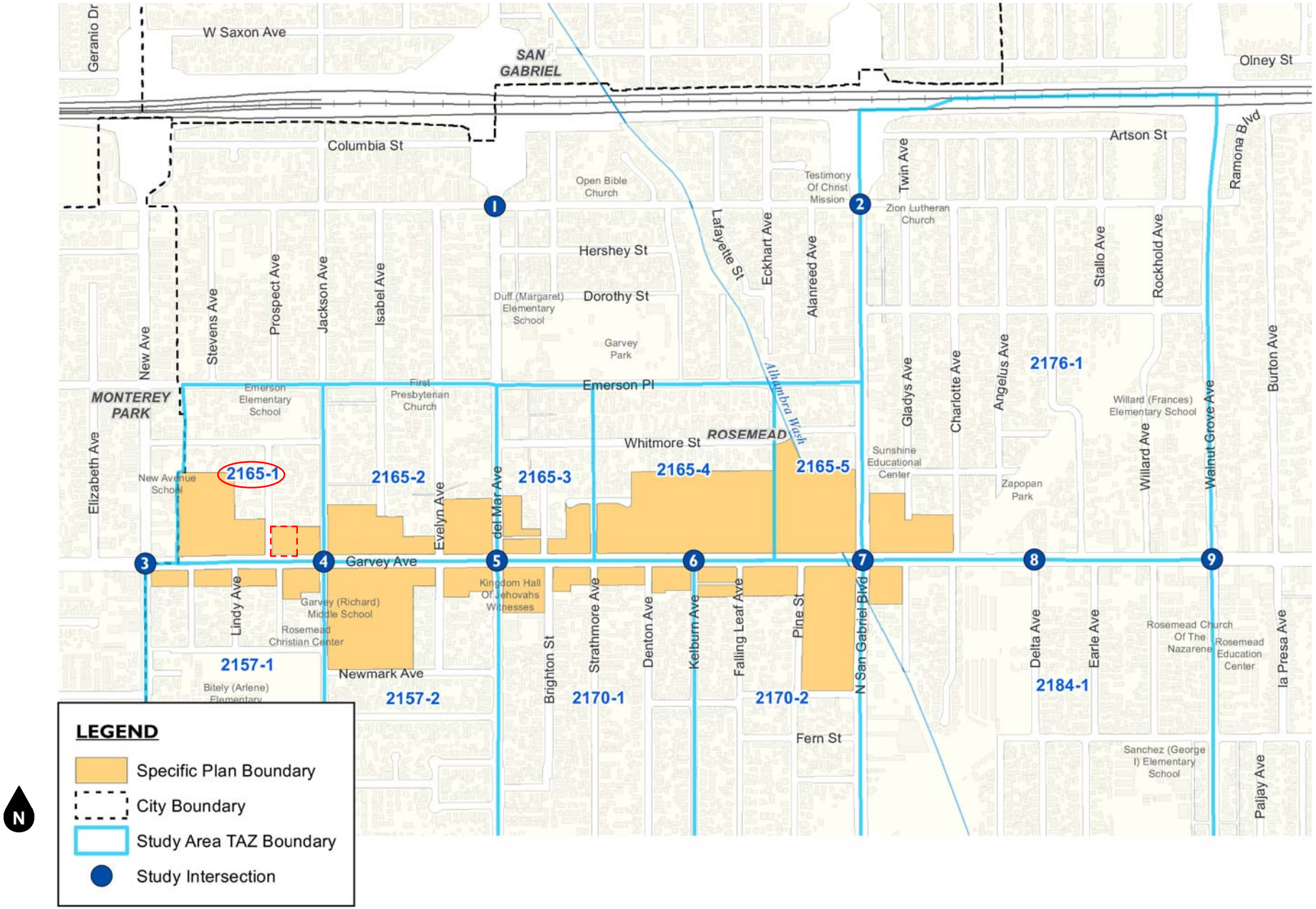

Figure 3
Garvey Avenue Specific Plan Traffic Analysis Zones

Source: Traffic Impact Analysis for the Garvey Avenue Specific Plan EIR, KOA Corporation (May 26, 2016)

Table 1
Existing TAZ 2165-1 Specific Plan Trip Generation

Specific Plan Realistic Buildout[1]							
Trips Generated							
Land Use	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	
Commercial	268	168	436	130	135	265	7,265
Residential	2	9	11	8	5	13	130
Total	270	177	447	138	140	278	7,395

Specific Plan Maximum Buildout[2]							
Trips Generated							
Land Use	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	
Commercial	492	311	803	238	249	487	13,356
Residential	4	17	21	16	9	25	273
Total	496	328	824	254	258	512	13,629

Notes:
(1) Source: *Traffic Impact Analysis for the Garvey Avenue Specific Plan EIR (*KOA Corporation, May 26, 2016), Table 7.
(2) Source: *Traffic Impact Analysis for the Garvey Avenue Specific Plan EIR (*KOA Corporation, May 26, 2016); Table 12.

As shown in Table 1, TAZ 2165-1 was forecast to generate a total of 7,395 daily vehicle trips under the realistic buildout scenario, including 447 vehicle trips during the AM peak hour and 278 vehicle trips during the PM peak hour. TAZ 2165-1 was forecast to generate a total of 13,629 daily vehicle trips under the maximum buildout scenario, including 824 vehicle trips during the AM peak hour and 512 vehicle trips during the PM peak hour.

The proposed project (APNs 5286-022-009 and 5286-022-010) encapsulates a portion of the Specific Plan boundary analyzed as part of TAZ 2165-1. Therefore, to determine the trip generation for the proposed project APNs within the TAZ, the APNs and their associated land square footage was determined for all APNs located within the Specific Plan boundary of TAZ 2165-1 from the Los Angeles County Assessor Portal. Table 2 includes each APN, land use square footage per APN, and the percentage of the APN land use footage to the land use square footage for all APNs combined within the Specific Plan boundary for TAZ 2165-1.

As shown in Table 2, the proposed project APNs constitute 10.56% of the land square footage of the overall Specific Plan boundary within TAZ 2165-1.

Table 3 then calculates the project APN trip generation based on 10.56% of the total TAZ 2165-1 trip generation. As shown in Table 3, the project APNs within TAZ 2165-1 were estimated to generate a total of 781 daily vehicle trips under the realistic buildout scenario, including 47 vehicle trips during the AM peak hour and 30 vehicle trips during the PM peak hour. The project APNs within TAZ 2165-1 were estimated to generate a total of 1,440 daily vehicle trips under maximum buildout scenario, including 87 vehicle trips during the AM peak hour and 54 vehicle trips during the PM peak hour.

Significant impacts and subsequent mitigation measures for the Garvey Avenue Specific Plan were based on the realistic buildout scenario.

PROJECT TRIP GENERATION

Table 4 shows the Project trip generation based upon trip generation rates obtained from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition, 2021). Based on review of the ITE land use descriptions, trip generation rates for Multifamily Housing (Mid-Rise) (ITE Land Use Code 221) and Strip Retail Plaza (<40k) (ITE Land Use Code 822) were determined to adequately represent the proposed project and were used for calculating the project trip generation forecast. The Project trip generation forecast was determined by multiplying the trip generation rates by the land use quantities.

The Project trip generation forecast shown in Table 4 includes internal capture and pass-by trip adjustments in accordance with standard industry practice for mixed-use developments. Internal capture describes the interaction between two different land uses, such as residential and retail, located within the same site. For example, a resident of the Project may walk from their dwelling unit to one of the on-site retail uses, thereby reducing the Project vehicular trip generation by one outbound residential trip and one inbound retail trip. The internal capture adjustments were calculated in accordance with the procedures and worksheet contained in the *ITE Trip Generation Handbook* (3rd Edition, 2017). The internal capture worksheets are provided in Attachment B.

Retail land uses will often locate next to busy roadways to attract motorists already on the street. For example, if a vehicle decides to visit one a retail use on the way home from work, one pass-by trip occurs as the vehicle enters the project site driveway and one pass-by trip occurs as the vehicle exits the project site driveway. Since the vehicle was already using the street system to travel home from work, no new trips are added to the street system as a result of the project, except at the project site driveway(s). Since the trip generation

Table 2
TAZ 2165-1 Parcel Matrix[1]

Assessor Parcel Number (APN)[2]	Land Square Footage (SF)[2]	Percentage of APN to Total TAZ
5286-020-023	99,650	25.48%
5286-020-017	19,958	5.10%
5286-020-018	36,762	9.40%
5286-020-026	22,946	5.87%
5286-020-004	12,043	3.08%
5286-020-003	12,550	3.21%
5286-020-002	28,005	7.16%
5286-020-001	24,365	6.23%
5286-020-030	19,812	5.07%
5286-020-035	39,681	10.15%
5286-022-010 (Project)	**30,611**	**7.83%**
5286-022-009 (Project)	**10,695**	**2.73%**
5286-022-008	9,092	2.32%
5286-022-002	8,881	2.27%
5286-022-005	3,863	0.99%
5286-022-004	4,306	1.10%
5286-022-003	7,837	2.00%
Total	**391,057**	**100.00%**
Proposed Project APNs	**41,306**	**10.56%**

Notes:

(1) Source: *Traffic Impact Analysis for the Garvey Avenue Specific Plan EIR* (KOA Corporation, May 26, 2016); Figure 10.

(2) Data based on Los Angeles County Assessor Portal.

Table 3
Existing TAZ 2165-1 Specific Plan Trip Generation - Project APNs Only

Specific Plan Realistic Buildout[1]							
Trips Generated							
	AM Peak Hour			PM Peak Hour			
Land Use	In	Out	Total	In	Out	Total	Daily
Commercial	28	18	46	14	14	28	767
Residential	0	1	1	1	1	2	14
Total	28	19	47	15	15	30	781

Specific Plan Maximum Buildout[1]							
Trips Generated							
	AM Peak Hour			PM Peak Hour			
Land Use	In	Out	Total	In	Out	Total	Daily
Commercial	52	33	85	25	26	51	1,411
Residential	0	2	2	2	1	3	29
Total	52	35	87	27	27	54	1,440

Notes:

(1) The share of the total Garvey Avenue Specific Plan trip generation allocated to the project APNs was determined based on the the project's total APN square footage as a percentage of all APNs in TAZ 2165-1 (10.56%; see Table 2) multiplied by the total trip generation for TAZ 2165-1 (see Table 1).

Table 4
Project Trip Generation

Trip Generation Rates									
			AM Peak Hour			PM Peak Hour			
Land Use	Source[1]	Unit[2]	% In	% Out	Rate	% In	% Out	Rate	Daily
Multifamily Housing (Mid-Rise)	ITE 221	DU	23%	77%	0.37	61%	39%	0.39	4.54
Strip Retail Plaza (<40k)	ITE 822	TSF	60%	40%	2.36	50%	50%	6.59	54.45

Trips Generated									
			AM Peak Hour			PM Peak Hour			
Land Use	Quantity	Unit[2]	In	Out	Total	In	Out	Total	Daily
Multifamily Housing (Mid-Rise)	75	DU	6	21	27	18	11	29	341
Internal Capture (-28%PM in; -18%PM out)		*[a]*	*0*	*0*	*0*	*-5*	*-2*	*-7*	*-7*
Subtotal - External Residential Trips			6	21	27	13	9	22	334
Strip Retail Plaza (<40k)	6.346	TSF	9	6	15	21	21	42	346
Internal Capture (-10%PM in; -24%PM out)		*[a]*	*0*	*0*	*0*	*-2*	*-5*	*-7*	*-7*
Subtotal - External Retail Trips			9	6	15	19	16	35	339
Pass-by Trips (-40%PM)		*[1]*	*0*	*0*	*0*	*-8*	*-8*	*-16*	*-16*
Subtotal - Retail with Pass-By Adjustment			9	6	15	11	8	19	323
TOTAL NEW PROJECT TRIPS			**15**	**27**	**42**	**24**	**17**	**41**	**657**

(1) Source:

ITE= Institute of Transportation Engineers, *Trip Generation Manual (101h Edition, September 2021)*; ### = Land Use Code(s).

[a] = ITE *Trip Generation Handbook (3rd Edition, 2017)*. Internal capture rates calculated in accordance with procedures in the handbook. The daily internal capture is equal to the sum of the peak hour values.

(2) DU = Dwelling Units; TSF = Thousand Square Feet

rates contained in the ITE *Trip Generation Manual* represent vehicles entering and exiting at the site driveway(s), it is appropriate to reduce the initial trip generation forecast by the applicable pass-by trip rate when calculating the net new trips that will be added to the surrounding street system. Pass-by trip adjustments of were applied in accordance with latest average pass-by rates documented in the ITE *Trip Generation Manual* (11th Edition, 2021).

As shown in Table 4, the proposed Project is forecast to generate approximately 657 daily vehicle trips, including 42 vehicle trips during the AM peak hour and 41 vehicle trips during the PM peak hour.

TRIP GENERATION COMPARISON

Table 5 shows a trip generation comparison between the proposed Project and the estimated share of trips allocated to the Project APNs within TAZ 2165-1 as evaluated in the Garvey Avenue Specific Plan TIA.

As shown in Table 5, the proposed Project is forecast to generate approximately 124 fewer daily vehicle trips, including 5 fewer vehicle trips during the AM peak hour and 11 more vehicle trips during the PM peak hour, compared to the share of trips allocated to the Project APNs as evaluated in the Garvey Avenue Specific Plan TIA/EIR under the realistic buildout scenario.

As also shown in Table 5, the proposed Project is forecast to generate approximately 783 fewer daily vehicle trips, including 45 fewer vehicle trips during the AM peak hour and 13 fewer vehicle trips during the PM peak hour, compared to the share of trips allocated to the Project APNs as evaluated in the Garvey Avenue Specific Plan TIA/EIR under the maximum buildout scenario.

IMPACT ASSESSMENT FOR PROPOSED SPECIFIC PLAN AMENDMENT/ZONE CHANGE

The proposed Project is forecast to generate fewer vehicle trips compared to both the realistic and maximum buildout scenarios analyzed in the Garvey Avenue Specific Plan TIA/EIR, except during the PM peak hour under the realistic buildout scenario in which the proposed project is forecast to generate 11 more vehicle trips. These additional 11 PM peak hour trips are nominal and not anticipated to appreciably affect the level of service (LOS) analysis, significant impact findings, or mitigation measures identified in the Garvey Avenue Specific Plan TIA/EIR. Even if all 11 trips were added to a critical movement, the increase in intersection capacity utilization (ICU) would be approximately 0.007.

More specifically, the following provides a summary of the Project's effect on adjacent study intersections evaluated in the Garvey Avenue Specific Plan TIA/EIR:

- New Avenue/Garvey Avenue: With mitigation, this study intersection was forecast to operate at Level of Service C during the PM peak hour (0.785 ICU). The intersection would continue to operate at Level of Service C with an increase of 11 trips (i.e., 0.007 ICU).

- Jackson Avenue/Garvey Avenue: This study intersection was forecast to operate at Level of Service C during the PM peak hour (0.787 ICU). The intersection would continue to operate at Level of Service C with an increase of 11 trips (i.e., 0.007 ICU).

A significant and unavoidable impact was identified at the study intersection of New Avenue/Garvey Avenue relative to City of Rosemead thresholds. This impact would remain significant and unavoidable with the proposed Project.

Table 5
Project Trip Generation Comparison to Garvey Avenue Specific Plan TIA/EIR

Specific Plan Realistic Buildout[1]							
Trips Generated							
	AM Peak Hour			PM Peak Hour			
Land Use	In	Out	Total	In	Out	Total	Daily
Existing Specific Plan (Project APNs)[1]	28	19	47	15	15	30	781
Proposed Project[2]	15	27	42	24	17	41	657
Difference	**-13**	**+8**	**-5**	**+9**	**+2**	**+11**	**-124**

Specific Plan Maximum Buildout[1]							
Trips Generated							
	AM Peak Hour			PM Peak Hour			
Land Use	In	Out	Total	In	Out	Total	Daily
Existing Specific Plan (Project APNs)[1]	52	35	87	27	27	54	1,440
Proposed Project[2]	15	27	42	24	17	41	657
Difference	**-37**	**-8**	**-45**	**-3**	**-10**	**-13**	**-783**

Notes:
(1) See Table 3

(2) See Table 4

In summary, the proposed Specific Plan Amendment/zone change would not result in any new significant traffic impact impacts or mitigation measures compared to the Garvey Avenue Specific Plan TIA/EIR.

PROSPECT AVENUE PROJECT DRIVEWAY

As noted in the Highway Design Manual: "*Urban Driveways (Refer to Index 205.3); corner sight distance requirements as described above are not applied to urban driveways unless signalized. See Index 405.1(2)(b) underlined standard. If parking is allowed on the major road, parking should be prohibited on both sides of the driveway per the California MUTCD, 3B.19.*"

The California MUTCD, 3B.19, provides the following guidance: *"[12] At all intersections, one stall length on each side measured from the crosswalk or end of curb return should have parking prohibited. A clearance of 6 feet measured from the curb return should be provided at alleys and driveways. [13] At signalized intersections parking should be prohibited for a minimum of 30 feet on the near side and one stall length on the far side. See Figure 3B-21(CA)."*

Based on California MUTCD, Figure 3B-21(CA), parking should be prohibited for one stall length, or 20 feet, on each side of the project driveway.

CRITERIA FOR THE PREPARATION OF TRAFFIC IMPACT ANALYSES

The Garvey Avenue Specific Plan TIA/EIR notes that the program-level mitigation measures identified *"would be implemented as new development occurs as they become justified and are physically and financially feasible within the scope of individual projects."* Therefore, the need for assessment of project-level impacts has been evaluated relative to City of Rosemead guidelines.

Level of Service (LOS) Screening

According to the City of Rosemead *Transportation Study Guidelines for Vehicle Miles Traveled and Level of Service Assessment* (October 2020) "[the City TIA Guidelines"], certain types of projects, because of their size, nature, or location, are exempt from the requirement of preparing a traffic impact analysis.

The City of Rosemead has established guidelines for assessing Level of Service (LOS) impacts for General Plan operational compliance. As specified in the City TIA Guidelines, a traffic impact analysis must be prepared when the project is forecast to generate 50 or more net new vehicle trips during either the AM or PM peak hour.

As previously shown in Table 4, the proposed Project is forecast to generate fewer than 50 net new AM or PM peak hour trips and is therefore exempt from preparation of a Level of Service analysis based on the City-established guidelines.

Vehicle Miles Traveled (VMT) Screening

The Project VMT impact has also been assessed in accordance with the City TIA Guidelines. The City TIA Guidelines establish screening thresholds for certain types of projects that may be presumed to cause a less than significant VMT impact based on substantial evidence provided in the Office of Planning and Research (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018).

The City TIA Guidelines specify the following two screening steps: 1) Project Type Screening; 2) Low VMT Area Screening; and 3) Transit Priority Areas Screening.

Project Type Screening

Some project types have been identified as having the presumption of a less than significant impact as they are local serving by nature, or they are small enough to not warrant assessment. The following uses can be presumed to have a less than significant impact absent substantial evidence to the contrary as their uses are often local serving in nature:

- Local-serving retail (retail establishments less than 50,000 square feet in size)
- Local-serving K-12 schools
- Local parks
- Day care centers
- Local-serving retail uses less than 50,000 square feet, including:
  - Gas stations
  - Banks
  - Restaurants
  - Shopping center
- Local-serving hotels (e.g. non-destination hotels)
- Student housing projects on or adjacent to college campuses
- Local-serving assembly uses (places of worship, community organizations)
- Community institutions (Public libraries, fire stations, local government)
- Affordable, supportive, or transitional housing
- Assisted living facilities
- Senior Housing (as defined by HUD)
- Local serving community colleges that are consistent with the assumptions noted in the RTP/SCS (Regional Transportation Plan / Sustainable Communities Strategy)
- Projects generating less than 110 daily vehicle trips. This generally corresponds to the following "typical" development potentials:
  - 11 single family housing units
  - 16 multi-family, condominiums, or townhouse housing units
  - 10,000 square feet of office
  - 15,000 square feet of light industrial
  - 63,000 square feet of warehousing
  - 79,000 square feet of high-cube transload and short-term storage warehouse
- Public parking garages and public parking lots

The retail component of the proposed Project satisfies the City-established project type screening for local serving retail and may be presumed to result in a less than significant VMT impact.

Transit Priority Area (TPA) Screening

Projects located within a TPA (half mile area around an existing major transit stop or an existing stop along a high-quality transit corridor) may be presumed to have a less than significant impact absent substantial evidence to the contrary. This presumption may not be appropriate if the project:

1. Has a Floor Area Ratio (FAR) of less than 0.75;
2. Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
3. Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency with input from the Metropolitan Planning Organization): or
4. Replaces affordable residential units with a smaller number of moderate or high-income residential units.

There are currently no TPA areas within the City of Rosemead. Therefore, the proposed project does not satisfy the City-established screening criteria for projects located within a TPA.

Low VMT Area Screening

Residential and office projects located within a low VMT generating area may be presumed to have a less than significant impact absent substantial evidence to the contrary. In addition, other employment-related and mixed-use land use projects may qualify for the use of screening if the project can reasonably be expected to generate VMT per resident, per worker, or per service population that is similar to the existing land uses in the low VMT area. A low VMT area is defined as an individual traffic analysis zone (TAZ) where the total daily VMT is lower than 15% below the baseline total daily VMT.

The City of Rosemead *City Council Staff Report: Attachment C – Resolution No. 2020-22* (June 9, 2020) includes low VMT area maps for the City of Rosemead. According to these maps, the proposed project is located in a low VMT area 15% or more below San Gabriel Valley Council of Governments (SGVCOG) average daily residential home-based VMT per capita for Rosemead (2012), in a low VMT area 15% or more below San Gabriel Valley Council of Governments (SGVCOG) average daily home-based VMT per employee for Rosemead (2012), and in a low VMT area 15% or more below San Gabriel Valley Council of Governments (SGVCOG) average daily VMT per service population for Rosemead (2012). Thus, the proposed project is located within all three low VMT areas meeting the 15% or more below SGVCOG baseline VMT criteria.

Transit Priority Area (TPA) Screening

Projects located within a TPA (half mile area around an existing major transit stop or an existing stop along a high-quality transit corridor) may be presumed to have a less than significant impact absent substantial evidence to the contrary. This presumption may not be appropriate if the project:

1. Has a Floor Area Ratio (FAR) of less than 0.75;
2. Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
3. Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency with input from the Metropolitan Planning Organization): or
4. Replaces affordable residential units with a smaller number of moderate or high-income residential units.

There are currently no TPA areas within the City of Rosemead. Therefore, the proposed project does not satisfy the City-established screening criteria for projects located within a TPA.

Mr. Phil Martin
PHIL MARTIN & ASSOCIATES
November 12, 2021

CONCLUSIONS

The proposed Project is forecast to generate approximately 657 daily vehicle trips, including 42 vehicle trips during the AM peak hour and 41 vehicle trips during the PM peak hour.

The proposed Project is forecast to generate approximately 124 fewer daily vehicle trips, including 5 fewer vehicle trips during the AM peak hour and 11 more vehicle trips during the PM peak hour, compared to the share of trips allocated to the Project APNs as evaluated in the Garvey Avenue Specific Plan TIA/EIR under the realistic buildout scenario.

The proposed Specific Plan Amendment/zone change would not result in any new significant traffic impact impacts or mitigation measures compared to the Garvey Avenue Specific Plan TIA/EIR.

The proposed Project is forecast to generate fewer than 50 net new AM or PM peak hour trips and is therefore exempt from preparation of a Level of Service analysis based on the City-established guidelines.

The retail component of the proposed Project satisfies the City-established project type screening for local serving retail and may be presumed to result in a less than significant VMT impact. The proposed project also satisfies the City-established low VMT area screening criteria. Therefore, the proposed Project satisfies the City of Rosemead VMT screening criteria and may be presumed to result in a less than significant VMT impact.

We appreciate the opportunity to assist you on this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 795-3100 x 103.

Sincerely,

GANDDINI GROUP, INC.
Bryan Crawford | Senior Associate
Giancarlo Ganddini, PE, PTP | Principal

Attachments:
A – Glossary
B – Internal Capture Worksheets

ATTACHMENT A

GLOSSARY

ACRONYMS

AC	Acres
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
DU	Dwelling Unit
ICU	Intersection Capacity Utilization
GFA	Gross Floor Area
LOS	Level of Service
PCE	Passenger Car Equivalent
SP	Service Population
TSF	Thousand Square Feet
V/C	Volume/Capacity
VMT	Vehicle Miles Traveled

TERMS

ACTUATED SIGNAL CONTROL: A type of traffic signal control in which display of each phase depends on whether the corresponding phase detector has registered a service call or the phase is on recall.

ACTUATION: Detection of a roadway user that is forwarded to the signal controller.

AVERAGE DAILY TRAFFIC: The average 24-hour volume for a stated period divided by the number of days in that period. For example, Annual Average Daily Traffic is the total volume during a year divided by 365 days.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A point of constriction along a roadway that limits the amount of traffic that can proceed downstream from its location.

CALL: An indication within a signal controller that a particular phase is waiting for service, either through actuation from a roadway user or phase recall.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass through a roadway facility during a specified period.

CHANNELIZATION: The separation of conflicting traffic movements by use of pavement markings, raised curbs, or other suitable means to facilitate free flow movement.

CLEARANCE INTERVAL: Equal to the yellow plus all-red time, if any, when a traffic signal changes between phases (i.e., the amount of time between the end of a green light from one movement to the beginning of a green light for the next).

COORDINATED SIGNAL CONTROL: A type of traffic signal control in which non-coordinated phases associated with minor movements are constrained such that the coordinated phases are served at a specific time during the signal cycle, thus maintaining the efficient progression of traffic flow along the major roadway.

CONTROL DELAY: The portion of delay attributed to the intersection traffic control (such as a traffic signal or stop sign). It includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay.

CORDON: An imaginary boundary line around or across a study area across which vehicles, persons, or other information can be collected for survey and analytical purposes.

CORNER SIGHT DISTANCE: The minimum sight distance required by the driver of a vehicle to cross or enter the lanes of the major roadway without requiring approaching traffic traveling at a given speed to radically alter their speed or trajectory.

CYCLE: A complete sequence of signal indications for all phases.

CYCLE LENGTH: The total time for a traffic signal to complete one full cycle.

DAILY CAPACITY: A theoretical value representing the daily traffic volume that will typically result in a peak hour volume equal to the capacity of the roadway.

DELAY: The total additional travel time experienced by a roadway user (driver, passenger, bicyclist, or pedestrian) beyond that required to travel at a desired speed.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device used to count or determine the presence of a roadway user.

DESIGN SPEED: A speed used for purposes of designing horizontal and vertical alignments of a highway.

DIRECTIONAL SPLIT: The percent of two-way traffic traveling in a specified direction.

DIVERSION: The rerouting of traffic from a normal path of travel between two points, such as to avoid congestion or perform a secondary trip.

FREE FLOW: Traffic flow that is unaffected by a traffic control and/or or upstream or downstream conditions.

GAP: Time or distance between two vehicles measured from rear bumper of the front vehicle to front bumper of the second vehicle.

GAP ACCEPTANCE: The method by which a driver accepts an available gap in traffic to enter or cross the road.

HEADWAY: Time or distance between two successive vehicles measured from same point on both vehicles (i.e., front bumper to front bumper).

LEVEL OF SERVICE: A grading scale of quantitative performance measures representing the quality of service of a transportation facility or service from an average traveler's perspective.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MULTI-MODAL: More than one mode, such as automobile, transit, bicycle, and pedestrian.

OFFSET: The time interval between the beginning of a traffic signal cycle at one intersection and the beginning of signal cycle an adjacent intersection.

PLATOON: A set of vehicles traveling at similar speed and moving as a general group with clear separation between other vehicles ahead and behind.

PASSENGER CAR EQUIVALENT: A metric used to assess the impact of larger vehicles, such as trucks, recreational vehicles, and buses, by converting the traffic volume of larger vehicles to an equivalent number of passenger cars.

PEDESTRIAN CLEARANCE INTERVAL: Also known as the "Flashing Don't Walk" interval, it signals the end of pedestrian entry into the crosswalk following the "Walk" indication and provides time for pedestrians who have already entered the crosswalk to finishing crossing.

PEAK HOUR: The hour within a day in which the maximum volume occurs.

PEAK HOUR FACTOR: The peak hour volume divided by the four times the peak 15-minute flow rate. This

PHASE: In traffic signals, the green, yellow, and red clearance intervals assigned to a specified traffic movement.

PRETIMED SIGNAL: A traffic signal operation in which the cycle length, phasing sequence, and phasing times are predetermined and fixed, regardless of actual demand for any given traffic movement. Also known as a fixed time signal.

PROGRESSION: The coordinated movement of vehicles through signalized intersections along a corridor.

QUEUE: The number of vehicles waiting at a service area such as a traffic signal, stop sign, or access gate.

QUEUE LENGTH: The length of vehicle queue, typically expressed in feet, waiting at a service area such as a traffic signal, stop sign, or access gate.

RECALL: A signal phasing operation in which a specified phase places a call to the signal controller each time a conflicting phase is served, thus ensuring the specified phase will be serviced again.

SEMI-ACTUATED CONTROL: A type of traffic signal control in which only the minor movements are provided detection.

SIGHT DISTANCE: The continuous length of roadway visible to a driver or roadway user.

STACKING DISTANCE: The length of area available behind a service area, such as a traffic signal or gate, for vehicle queuing to occur.

STOPPING SIGHT DISTANCE: The minimum distance required by the driver of a vehicle traveling at a given speed to bring the vehicle to a stop after an object on the road becomes visible, including reaction and response time.

TRIP OR TRIP END: The one-directional movement of a person or vehicle. Every trip has an origin and a destination at its respective ends (i.e., trip ends). In terms of site trip generation, the same vehicle entering and exiting a site generates two trips: one inbound trip and one outbound trip.

TRIP GENERATION RATE: The rate at which a land use generates trips per the specified land use variable, such per dwelling unit or per thousand square feet.

TRUCK: A heavy motor vehicle generally used for transporting goods.

VEHICLE MILES TRAVELED: A measure of the amount and distance of automobile travel essentially calculated as the sum of each trip times the trip length.

ATTACHMENT B

INTERNAL CAPTURE WORKSHEETS

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Garvey Avenue Specific Plan Amendment	**Organization:**	GGI
Project Location:	City of Rosemead	**Performed By:**	BC
Scenario Description:	Proposed Mixed Use	**Date:**	2021.02.17
Analysis Year:	2021	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	ITE822	6.346	TSF	42	21	21
Restaurant				0		
Cinema/Entertainment				0		
Residential	ITE 221	75	DU	29	18	11
Hotel				0		
All Other Land Uses[2]				0		
				71	39	32

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	5	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	2	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	71	39	32
Internal Capture Percentage	20%	18%	22%
External Vehicle-Trips[5]	57	32	25
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	24%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	28%	18%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	Garvey Avenue Specific Plan Amendment
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	21	21	1.00	21	21
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	18	18	1.00	11	11
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		6	1	5	1
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	5	2	0		0
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	0	0	1	0
Retail	0		0	0	8	0
Restaurant	0	11		0	3	0
Cinema/Entertainment	0	1	0		1	0
Residential	0	2	0	0		0
Hotel	0	0	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	2	19	21	19	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	5	13	18	13	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	5	16	21	16	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	2	9	11	9	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.