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To: Gerardo Martinez, Public Works

City of Commerce City

From: Brian Horan, P.E., PTOE

Galloway

Date: April 22, 2024

Revised: September 16, 2024

Re: Mile High Greyhound Park – DPC Companies

Traffic Conformance Letter



INTRODUCTION

This memorandum provides the results of a traffic conformance analysis performed in support of site plan to build commercial uses on Tract B of the Mile High Greyhound Park redevelopment. The site is located in the northeast quadrant of Highway 2 and E 62nd Avenue. The site location is shown on Figure 1.



Figure 1 - Site Location

BACKGROUND

The subject site (Tract B) was previously studied as part of a larger proposed development, Mile High Greyhound Park, which was supported by a Traffic Impact Study (TIS) completed November 2016 by Kimley Horn. The subject site was specifically studied as a portion of "Block 1" in the TIS which was planned for commercial uses including a hotel, retail, and large format retail. The full planning area for Mile High Greyhound Park is shown on Figure 2.



Figure 2 – Overall Mile High Greyhound Park

The TIS analyzed Lot 1 which encompasses the subject site with the following use:

- 64 KSF Retail
- 150 Key Hotel

Excerpts from the TIS are included as Attachment I.

The Applicant, DPC Companies, proposes to develop the subject site within Lot 1 (Tract B) with a single tenant drive through use, coffee shop, and two restaurant uses. A copy of the conceptual site plan is provided as Attachment II.

The following memorandum has been prepared for the City as requested. The purpose is to evaluate the traffic generated by the currently proposed conceptual development in comparison to the assumed development program by the approved TIS.

TIS TRIP GENERATION AND RECOMMENDATIONS

As mentioned previously, the TIS is dated November 2016 and contemplates 64 KSF of Retail and a 150 key hotel for the subject site within the Commercial Lot 1 (Tract B) of Mile High Greyhound Park. The TIS forecasted trip generation estimates for the above development program based on rates/equations published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition and industry standard methodologies which included both internal capture and pass-by rates.

The TIS concluded that in order to accommodate the projected volumes a number of roadway improvements would need to be provided. Suggested intersection geometries were provided for all affected intersections and access points included in the TIS including additional CDOT signalization improvements as a result of the safety study reference in the TIS. Excerpts from the TIS are included herein as Attachment I. As determined by virtual field reconnaissance of the area, the existing

intersections surrounding the subject site have been constructed generally consistent with the recommendations of the TIS.

PROPOSED DEVELOPMENT AND TRIP GENERATION COMPARISON

Overview

The Applicant is proposing two restaurant uses totaling 8,500 SF, a coffee shop with drive-through use and a 5,597 SF single tenant fast food with drive-through use for the subject site in place of the previously assumed retail use by the approved TIS. As such, a comparison of site trips of the approved use to the site trips of the proposed use is required. Trip generation estimates for the weekday AM and PM peak hours, as well as the weekday average daily traffic (ADT), were derived from the standard Institute of Transportation Engineers (ITE) Trip Generation Manual rates/equations, as published in the 11th edition for the proposed development program. This comparison is provided in Table 1.

Proposed Trip Generation

The current version of ITE was utilized to generate the forecasted trips for the proposed development. ITE provides multiple land use codes (LUC) in order to generate trips. LUCs 932, 934 and 937 were selected as the most appropriate for the proposed plan.

Internal capture was applied to the proposed development program consistent with the percentages used in the approved TIS in order to provide a direct comparison. This is likely a conservative estimate as the retail previously studied would likely have a lower internal capture rate than the currently proposed development program.

According to ITE, in some cases the driveway volumes at a particular land use are different from the amount of traffic added to the adjacent street system. Uses such as fast food establishments attract a portion of their trips from traffic that is already present on the road network. Pass-by trip are those trips which are made as intermediate stops on the way to a primary destination. An example of a pass-by trip would be one in which a driver stops to get fast food on his/her way home from work.

The proposed use would experience pass-by trips consistent with the primary use located on site. In recognition of this phenomenon and consistent with ITE published data, the following pass-by reductions were applied to the trip generation analysis as shown in Table 1.

In accordance with these ITE assumptions the proposed use would generate, at build out and full occupancy:

- 240 net new AM weekday peak hour (126 in/ 114 out),
- 115 net new PM weekday peak hour (64 in/ 51 out), and
- 1,578 net new average daily trips.

Trip Generation Comparison

A trip generation analysis comparison is provided on Table 1 and compares the proposed use of two restaurant uses totaling 8,500 SF, a coffee shop with drive-through use and a 5,597 SF single tenant fast food with drive-through use against the approved use of 64 KSF retail distributed between large format retail use, retail use, and a 150 unit hotel use for the subject site.

As shown on Table 1, the comparison of the approved use to the proposed use shows that the proposed use is forecasted to generate:

- 88 additional AM net new weekday peak hour (33 additional in/ 54 additional out),
- 174 fewer PM net new weekday peak hour (84 fewer in/ 89 fewer out), and
- 1,787 fewer net new average daily trips.

Table 1 Mile High Greyhound Park - Tract B Site Trip Generation Comparison

Land Use	Land Use			AM	Peak F	lour	PN	l Peak H	our	Average Daily
	Code	Amount	Units	ln	Out	Total	ln	Out	Total	Trips
Approved TIS Commercial Trips ⁽¹⁾										
Retail (Shopping Center) Internal Trips External Trips Pass-By (26% AM/34% PM/34% ADT) Net New External Trips	820	45,000	SF	48 (4) 44 (11) 32	29 (1) 28 (7) 21	77 (<u>5)</u> 72 (<u>19)</u> 53	140 (17) 123 (42) 81	152 (44) 108 (37) 71	292 (61) 231 (79) 152	3,326 (623) 2,703 (919) 1,785
Retail (Shopping Center) Internal Trips External Trips Pass-By (26% AM/34% PM/34% ADT) Net New External Trips	820	19,000	SF	20 (2) 18 (5) 14	12 0 12 (3) 9	32 (2) 30 (8) 22	59 (7) 52 (18) 34	64 (19) 46 (15) 30	123 (26) 98 (33) 65	1,404 (263) 1,141 (388) 753
Hotel Internal Capture Net New External Trips	310	150	Units	47 <u>0</u> 47	33 (3) 30	80 (3) 77	46 (13) 33	44 (<u>5)</u> 39	90 <u>(18)</u> 72	970 (143) 827
Total Approved Net New External Trips				93	60	152	148	140	289	3,365
Proposed Tract B Commercial Trips ⁽²⁾										
Restaurant Internal Capture (2.7% AM/19.8% PM/18% ADT) External Trips Pass-By (0% AM/43% PM/43% ADT) Net New External Trips	932	8,500	SF	45 (1) 44 0	36 (<u>1)</u> 35 <u>0</u> 35	81 <u>(2)</u> 79 <u>0</u> 79	47 (9) 38 (16) 22	30 (6) 24 (11)	77 (15) 62 (27) 35	911 (164) 747 (321) 426
Fast Food Restaurant with Drive Through Internal Capture (2.7% AM/19.8% PM/18% ADT) External Trips Pass-By (50% AM/55% PM/55% ADT) Net New External Trips	934	5,597	SF	128 (3) 125 (63) 62	122 (<u>4)</u> 118 (<u>59)</u> 59	250 (7) 243 (122) 121	96 (19) 77 (42) 35	89 (18) 71 (39) 32	185 (37) 148 (81) 67	2,616 (471) 2,145 (1,180) 965
Coffee Shop with Drive Through Internal Capture (2.7% AM/19.8% PM/18% ADT) External Trips Pass-By (50% AM/55% PM/55% ADT) Net New External Trips	937	950	SF	42 (1) 41 (21) 20	40 (1) 39 (19) 20	82 (2) 80 (40) 40	19 (<u>4)</u> 15 (<u>8)</u> 7	18 (<u>3)</u> 15 (<u>9)</u> 6	37 (7) 30 (17) 13	507 (<u>91)</u> 416 (<u>229)</u> 187
Total Net New External Trips				126	114	240	64	51	115	1,578

Note(s):

⁽¹⁾ Trip generation recreated from methodlogies and data provided in approved TIS dated November 2016(2) Trip generation based on the Institute of Transportation Engineers' <u>Trip Generation Manual</u>, 11th Edition

The trips from Tract B would be distributed to multiple access points along 62nd Avenue and CO-20 as well as the internal grid of streets. This distribution of trips and the overall reduction in trips throughout the day as well as the PM peak hour would represent minimal impact to the operations of the studied area. No significant impact is anticipated to the existing/proposed network with the approval of this project.

CONCLUSIONS

The conclusions of this analysis are as follows:

- 1. The subject site was previously contemplated as a retail commercial use for the Mile High Greyhound Park development in Commerce City, CO.
- 2. According to the Mile High Greyhound Park Traffic Impact Study (TIS), the subject site (Lot 1/Tract B) was analyzed with the following use:
 - 64 KSF Retail
 - 150 Key Hotel
- 3. Improvements to the local network as recommended by the TIS have been constructed as well as additional CDOT signalization improvements.
- 4. The Applicant, DPC Companies, proposes to develop the subject site with two restaurant uses totaling 8,500 SF, a coffee shop with drive-through use and a 5,597 SF single tenant fast food with drive-through use for the subject site in place of the previously assumed retail use by the approved TIS.
- 5. A comparison of trip generation between the approved and proposed use suggests that the proposed use would generate 88 **additional** net new weekday AM peak hour trips, 174 **fewer** net new weekday PM peak hour tips, and 1,787 **fewer** net new average daily trips.
- 6. Based on the trip generation comparison contained herein, the proposed change in use would not negatively impact the conclusions of the TIS. The traffic impacts associated with the proposed use would be adequately accommodated by the constructed/proposed road network without the need for additional improvements.

We trust that the information contained herein satisfies the request of Commerce City, CO. If you have any questions or need further information, please contact Brian Horan at BrianHoran@gallowayus.com or 303-770-8884.

Attachment I

Mile High Greyhound Park – Traffic Impact Study dated November 2016 Excerpts

Traffic Impact Study

Mile High Greyhound Park (MHGP)

Commerce City, Colorado

Prepared for:

REGen LLC.

Kimley» Horn



Mile High Greyhound Park (MHGP) Redevelopment Project Traffic Impact Study

PREPARED FOR

REGen LLC.

1125 Seventeenth Street Suite 2500 Denver, Colorado 80202

Prepared By:



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NOVEMBER 2016



This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Contents

1.0 Executive Summary	1
2.0 Introduction	2
3.0 Existing and Future Conditions	4
3.1 Existing Roadway Network	4
3.2 Existing Study Area	7
3.3 Existing Traffic Volumes	7
3.4 Unspecified Development Traffic Growth	7
4.0 Project Traffic Characteristics	16
4.1 Trip Generation	16
4.2 Trip Distribution	17
4.3 Traffic Assignment and Background Plus Project Traffic	17
5.0 Traffic Operations Analysis	30
5.1 Analysis Methodology	30
5.2 Key Intersection Operational Analysis	31
5.3 Turn Bay Length Analysis	45
5.4 Queuing Analysis	46
6.0 Conclusions and Recommendations	49

APPENDICES

- Appendix A Intersection Count Sheets
- Appendix B CDOT Traffic Information
- Appendix C Trip Generation Worksheets
- Appendix D Intersection Analysis Worksheets
- Appendix E Queue Analysis Worksheets
- Appendix F Conceptual Site Plan

FIGURES

Figure 1. Vicinity Map	3
Figure 2. Existing Lanes and Control	5
Figure 3. Existing Lanes and Control (60 th & Vasquez)	6
Figure 4. Existing 2015 Traffic Volumes	8
Figure 5. Existing 2015 Traffic Volumes (60 th & Vasquez)	9
Figure 6. 2020 Background Traffic Volumes	10
Figure 7. 2020 Background Traffic Volumes (60th & Vasquez)	11
Figure 8. 2025 Background Traffic Volumes	12
Figure 9. 2025 Background Traffic Volumes (60 th & Vasquez)	13
Figure 10. 2035 Background Traffic Volumes	14
Figure 11. 2035 Background Traffic Volumes (60 th & Vasquez)	15
Figure 12. Trip Distribution	18
Figure 13. Trip Distribution (60 th & Vasquez)	19
Figure 14. 2020 Traffic Assignment	20
Figure 15. 2020 Traffic Assignment (60 th & Vasquez)	21
Figure 16. 2025/2035 Traffic Assignment	22
Figure 17. 2025/2035 Traffic Assignment (60 th & Vasquez)	23
Figure 18. 2020 Background Plus Project Traffic Volumes	24
Figure 19. 2020 Background Plus Project Traffic Volumes (60 th & Vasquez)	25
Figure 20. 2025 Background Plus Project Traffic Volumes	26
Figure 21. 2025 Background Plus Project Traffic Volumes (60 th & Vasquez)	27
Figure 22. 2035 Background Plus Project Traffic Volumes	28
Figure 23. 2035 Background Plus Project Traffic Volumes (60 th & Vasquez)	29
Figure 24. Recommended Lane Configurations and Control	47
Figure 25. Recommended Lane Configurations and Control (60 th & Vasquez)	48

Tables

Table 1. 2020 MHGP Redevelopment Project Traffic Generation	16
Table 2. 2025 MHGP Redevelopment Project Traffic Generation	17
Table 3. Level of Service Definitions	30
Table 4. 60th Avenue & Vasquez Boulevard LOS Results	31
Table 5. 62 nd Avenue & State Highway 2 LOS Results	35
Table 6. 62 nd Avenue and Parkway Drive LOS Results	36
Table 7. 62 nd Avenue and Holly Street LOS Results	38
Table 8. 63 rd Avenue and State Highway 2 LOS Results	39
Table 9. 64 th Avenue and State Highway 2 LOS Results	40
Table 10. 64 th Avenue and State Highway 2 LOS Results	42
Table 11. 64 th Avenue and Holly Street LOS Results	42
Table 12. 66 th Way and Glencoe Street LOS Results	44
Table 13. Turn Lane Queuing Results	46

1.0 EXECUTIVE SUMMARY

A new redevelopment project, the Mile High Greyhound Park (MHGP) Redevelopment Project is proposed on the northwest corner of the 62nd Avenue and Holly Street intersection in Commerce City, Colorado. The project is anticipated to redevelop the existing Mile High Greyhound Park, which contained a race track venue and parking lots. The project is anticipated to redevelop with approximately 675 apartments, 95 townhomes, 72 single family homes, 150 room hotel, 78,500 square feet of retail, 18,000 square feet of institutional uses, and a 26,000 square foot recreational community center. The recreation center has already been built but was not included in the counts, therefore it is included in the evaluation.

The purpose of this study is to identify project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts. The following intersections were incorporated into this traffic study in accordance with Commerce City standards and requirements:

- 60th Avenue and Vasquez Boulevard (US-6/85 & SH-2)
- 62nd Avenue and State Highway 2 (SH-2)
- 62nd Avenue and Parkway Drive
- 62nd Avenue and Holly Street
- 63rd Avenue and State Highway 2 (SH-2)
- 64th Avenue and State Highway 2 (SH-2)
- 64th Avenue and Glencoe Street
- 64th Avenue and Holly Street

In addition, an existing condition analysis was conducted at the 66th Way and Glencoe Street intersection due to public concern about the surrounding street network connectivity.

It is expected that the residential portion of the project will be completed within the next few years and the remainder of the project will be completed by 2025. Analysis was therefore completed for the 2020 short term residential buildout, 2025 mid-term full project buildout, and 2035 long term horizons per Commerce City and Colorado Department of Transportation (CDOT) requirements.

Regional access to the site will continue to be provided by Interstate 25, Interstate 70, Interstate 76, and Interstate 270. Primary access to the site will continue to be provided by 60th Avenue, 62nd Avenue, 64th Avenue, Parkway Drive, Holly Street, and Vasquez Boulevard (US-6/85 & SH-2). Direct access to the proposed MHGP is to be provided from 62nd Avenue, 64th Avenue, SH-2, and Holly Street.

By 2020, buildout of the proposed residential portion of the development is expected to generate approximately 4,594 daily weekday trips. Of these, 438 trips are expected to occur during the morning peak hour, while 427 trips are expected during the afternoon peak hour. By 2025, it is anticipated that full buildout of the project will be complete. Since a mix of uses, residential, hotel, and retail is proposed within the same development, it is anticipated that traffic will be shared between the uses. This internal trip generation, or capture, is most specifically expected to occur between the residential, hotel, and shopping center (retail) uses. Therefore, the ITE internal capture procedure was used to determine the amount of traffic that may be shared between uses, which thereby determines the number of external

trips. Internal capture rates of 18 percent for daily traffic, 2.7 percent for morning peak hour traffic, and 19.8 percent for afternoon peak hour traffic were used, as identified directly from the ITE procedure. Based on this, full buildout of the proposed development is expected to generate approximately 11,513 daily weekday driveway trips. Of these, 740 driveway trips are expected to occur during the morning peak hour, while 1,019 driveway trips are expected during the afternoon peak hour.

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns and volumes, anticipated surrounding development areas, and the proposed access system for the project. Assignment of project traffic was based upon the trip generation described previously and the distributions developed.

Based on the analysis presented in this report, Kimley-Horn believes the proposed Mile High Greyhound Park Redevelopment Project (MHGP) will be successfully incorporated into the existing roadway network. The proposed project development resulted in the following recommendations and conclusions:

- Roadway improvements may be needed at the existing 60th Avenue/Vasquez Boulevard (US-6/85)/State Highway 2 (SH-2)/Parkway Drive signalized intersection. It has been previously discussed that Parkway Drive may be realigned and removed from this intersection to connect with the existing signalized intersection along 60th Avenue, located approximately 500 feet (measured edge to edge) east of Vasquez Boulevard. Although this now seems less likely with the recent developments constructed north of 60th Avenue, it is still an option to improve traffic conditions at this intersection. Another possible improvement could be to consider converting either Parkway Drive or 60th Avenue to one-way traffic movements away from the intersection, eastbound 60th Avenue or northeastbound Parkway Drive. This would improve traffic conditions at this intersection by removing the entering phase of this one approach. It is understood that The Colorado Department of Transportation (CDOT) is currently conducting a study to improve safety conditions at this intersection. Existing issues are present at the intersection today, which will continue to be more of an issue in the future as traffic volumes increase, so the City of Commerce City and CDOT should consider possible improvements to implement within the next few years.
- Since State Highway 2 (SH-2) is a State Highway, it is believed that CDOT Access Permits will be required for the existing SH-2 intersections with 62nd Avenue, 63rd Avenue, and 64th Avenue with development of the project. This is due to traffic volumes increasing by more than 20 percent over existing with the redevelopment project.
- At the State Highway 2 (SH-2) and 64th Avenue intersection, it is recommended that the southbound left turn lane be lengthened to 275 feet plus 160-foot taper based on CDOT State Highway Access Code (SHAC) standards. It is believed that adequate pavement width exists today in the form of a striped median that could be restriped to accommodate this modification.
- As the parcels are being developed within the project, site specific recommendations will be provided
 as it relates to the traffic analysis and access.
- Although no lane specific turn lane improvements were found to be needed at the surrounding key intersections, traffic signal upgrades of equipment will likely be required due to the increase in traffic volumes.

- As the northeast portion of the site is planned for specific development, the drop-off and pick-up timeframes of Central Elementary School should be evaluated to determine potential project impacts or if any mitigation measures would be recommended. This shall occur during the Development Permit process of that future development.
- All on-site improvements should be incorporated into the Civil Drawings, and conform to standards of Commerce City, CDOT, Institute of Transportation Engineers (ITE), and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 TRIP GENERATION

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation*¹ report published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. For this study, the ITE Trip Generation fitted curve and average trip rates that apply to Single-Family Detached Housing (ITE Code 210), Apartment (220), Condominium/ Townhouse (230), Hotel (310), Shopping Center (820), Recreational Community Center (495), and Junior/Community College (540) were used to estimate traffic generated by the proposed development.

By 2020, buildout of the proposed residential portion of the development is expected to generate approximately 4,594 daily weekday trips. Of these, 438 trips are expected to occur during the morning peak hour, while 427 trips are expected during the afternoon peak hour. No internal capture was applied to the residential portion of the project for the 2020 horizon. **Table 1** summarizes the estimated traffic generation for the residential portion of the development.

				Vehicl	es Trips		
		Weekday	AM Pea	k Hour	Weekda	y PM Pea	ak Hour
	Daily	ln	Out	Total	ln	Out	Total
Non Pass-By Trips							
Single Family	643	12	49	61	38	22	60
Apartment	3,446	66	263	329	204	116	320
Townhomes	505	10	39	48	30	17	47
Total Net New Trips	4,594	88	351	438	272	155	427

Table 1. 2020 MHGP Redevelopment Residential Project Traffic Generation

By 2025, it is anticipated that full buildout of the project will be complete. Since a mix of uses, residential, hotel, and retail is proposed within the same development, it is anticipated that traffic will be shared between the uses. This internal trip generation, or capture, is most specifically expected to occur between the residential, hotel, and shopping center (retail) uses. Therefore, the ITE internal capture procedure was used to determine the amount of traffic that may be shared between uses, which thereby determines the number of external trips. Use of ITE is appropriate for calculating internal capture for this type of project and use. Internal capture rates of 18 percent for daily traffic, 2.7 percent for morning peak hour traffic, and 19.8 percent for afternoon peak hour traffic were used, as identified directly from the ITE procedure. Based on this, full buildout of the proposed development is expected to generate approximately 11,513 daily weekday driveway trips. Of these, 740 driveway trips are expected to occur during the morning peak hour, while 1,019 driveway trips are expected during the afternoon peak hour. **Table 2** summarizes the estimated traffic generation for proposed development. The trip generation

¹ Institute of Transportation Engineers, *Trip Generation: An Information Report*, Ninth Edition, Washington DC, 2012.

worksheets are included in **Appendix C**. These calculations illustrate the equations used, directional distribution of trips, and number of daily trips based on the published ITE *Trip Generation Report*.

Table 2. 2025 MHGP Redevelopment Project Traffic Generation

				Vehicle	es Trips		
		Weekday	AM Peal	k Hour	Weekda	y PM Pea	ak Hour
	Daily	In	Out	Total	In	Out	Total
Non Pass-By Trips							
Single Family	643	12	49	61	38	22	60
Apartment	3,446	66	263	329	204	116	320
Townhomes	505	10	39	48	30	17	47
Hotel	827	47	30	70	33	39	72
Retail	4,716	76	49	125	215	188	403
Recreation Center	880	35	18	53	35	36	71
Institutional	496	40	14	54	27	19	46
Total Net New Trips	11,513	286	462	740	582	437	1,019

4.2 TRIP DISTRIBUTION

Distribution of the net new site traffic on the street system was based on the area street system characteristics, existing traffic patterns and volumes, and the access system for the project. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to original source direction. Of note, a relatively low percentage of trip distribution to/from the adjacent neighborhoods was used which provides a conservative analysis for the study area intersections. **Figures 12** and **13** illustrate the expected trip distribution for the site traffic.

4.3 TRAFFIC ASSIGNMENT AND BACKGROUND PLUS PROJECT TRAFFIC

Traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1**. Project traffic assignment for the project conditions during the peak hours studied is shown for the 2020 horizon year in **Figures 14** and **15** and the 2025/2035 horizon years in **16** and **17**. Project traffic volumes were added to the background volumes to represent estimated traffic conditions for the short term 2020 and long term 2035 horizons. The background plus project (total) traffic volumes for the project are illustrated for the 2020 horizon year in **Figures 18** and **19**, 2025 horizon year in **Figures 20** and **21**, and for the 2035 horizon year in **Figures 22** and **23**.

APPENDIX C

Trip Generation Calculations



Project	MHGP Redevelopmen	t			
Subject	Trip Generation for Sin	gle-Family	Detached Housing		
Designed by	Matt Farmen	Date	September 21, 2016	Job No.	96368000
Checked by	Curtis Rowe	_		Sheet No.	1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 9th Edition, Fitted Curve Equations

Land Use Code - Single-Family Detached Housing (210)

Independent Variable - Dwelling Units (X)

$$X = 71$$

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 297)

Average Weekday Directional Distribution: 25% ent. 75% exit. T = 59 Average Vehicle Trip Ends (T) = 0.70 * (71) + 9.94 T = 59 Average Vehicle Trip Ends (71) + 9.94 T = 59 Average Vehicle Trip Ends (71) + 9.94 T = 59

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 298)

Average Weekday Directional Distribution: 63% ent. Ln(T) = 0.90 Ln(X) + 0.51Average Vehicle Trip Ends T = Ln(T) = 0.90 *entering Ln(71) + 0.5149 28 exiting 49 28 77

Peak Hour of Generator, Saturday (page 302)

Average Saturday Directional Distribution: 53% ent. 47% exit. Average Vehicle Trip Ends (T) = 0.89(X) + 8.77T = 72 (T) = 0.89 *(71)34 + 8.77 38 entering exiting 38 34 72

Weekday (page 296)

Average Weekday Directional Distribution: 50% entering, 50% exiting Ln(T) = 0.92 Ln(X) + 2.72 T = 766 Average Vehicle Trip Ends Ln(T) = 0.92 * Ln(71) + 2.72 383 entering 383 exiting

383 + 383 = 766



Project	MHGP Redevelopmer	nt					
Subject	Trip Generation for Ap	artment					
Designed by	Matt Farmen	Date	September 21, 2016	Job No.		963680	00
Checked by	Curtis Rowe			Sheet No.	1	of	1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 9th Edition, Fitted Curve Equations

Land Use Code - Apartment, (220)

Independent Variable - Dwelling Units (X)

X = 675

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 334)

Daily Weekday Directional Distribution: 20% ent. 80% exit. T = 0.49 (X) + 3.73 T = 335 Average Vehicle Trip Ends T = 0.49 * 675.0 + 3.79 67 = 0.49 * 675.0 + 3.79 67 = 0.49 * 675.0 + 3.79 67 = 0.49 * 675.0 + 3.79 67 = 0.49 * 675.0 + 3.79

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 335)

Daily Weekday Directional Distribution: 65% ent. 35% exit. T = 0.55(X) + 17.65 T = 389 Average Vehicle Trip Ends 253 entering 136 exiting 253 + 136 = 389

Weekday (page 333)

Daily Weekday Directional Distribution: 50% entering, 50% exiting T = 6.06 (X) + 123.56 T = 4214 Average Vehicle Trip Ends T = 6.06 * 675.0 + 123.56 2107 entering 2107 exiting

2107 + 2107 = 4214

Kimley»Horn

Project	MHGP Redevelopmen	t			
Subject	Trip Generation for Res	sidential Cor	ndominium/Townhouse		
Designed by	Matt Farmen	Date	September 21, 2016	Job No.	96368000
Checked by	Curtis Rowe			Sheet No.	1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 9th Edition, Fitted Curve Equations

Land Use Code - Residential Condominium/Townhouse (230)

Independent Variable - Dwelling Units (X)

X = 95

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 395)

Directional Distribution: 17% ent. 83% exit. $Ln(T) = 0.80 \ Ln(X) + 0.26$ T = 50 Average Vehicle Trip Ends T = 50 entering 42 exiting T = 50 T = 50 Average Vehicle Trip Ends T = 50 T

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 396)

Directional Distribution: 67% ent. 33% exit. Ln(T) = 0.82 Ln(X) + 0.32 T = 58 Average Vehicle Trip Ends Ln(T) = 0.82 * Ln(95.0) + 0.32 39 entering 19 exiting

Weekday (page 394)

Average Weekday Directional Distribution: 50% entering, 50% exiting Ln(T) = 0.87 Ln(X) + 2.46 T = 616 Average Vehicle Trip Ends Ln(T) = 0.87 * Ln(95.0) + 2.46 308 entering 308 exiting T = 616

Weekday Midday Peak Uses Saturday Peak Hour of Generator (page 400)

Directional Distribution: 54% ent. 46% exit. Average Vehicle Trip Ends (T) = 0.29*(X) + 42.63T = 70 (T) = 0.29 *95 + 42.63 entering 32 exiting 38 32 70



Project	MHGP Redevelopment				
Subject	Trip Generation for Hotel				
Designed by	Matt Farmen	Date	September 21, 2016	Job No.	96368000
Checked by	Curtis Rowe			Sheet No.	1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 9th Edition, Fitted Curve and Average Rate Equations

Land Use Code -Hotel (310)

Independant Variable - Rooms (X)

X = 150

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 614)

		Directio	nal Distributioi	n: 59%	ent. 41%	exit.
(T) = 0.53 (X)		T =	80 Ave	erage Vehicle	Trip Ends	
(T) = 0.53 *	(150.0)	47	entering	33 exi	ting	
		47	T 33	_ 80		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 615)

Directional Distribution: 51% ent. 49% exit. T = 0.60 (X) T = 90 Average Vehicle Trip Ends T = 0.60 * 150 T = 0.60 * 46 entering T = 0.6

Weekday (page 613)

Average Weekday Directional Distribution: 50% entering, 50% exiting T = 970 Average Vehicle Trip Ends T = 970 Average Vehicle Trip En

485 + 485 = 970



Subject Designed by	Trip Generation for Sh Matt Farmen	Date	September 21, 2016	Job No.		96368000	
Checked by	Curtis Rowe		0001001 21, 2010	Sheet No.	1	of	1

Land Use Code - Shopping Center (820)

Independant Variable - 1000 Square Feet Gross Leasable Area (X)

Square Feet Gross Leasable Area = 78.500

X = 78.500

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Page 1562)

Directional Distribution: 62% ent. 38% exit.

T = Ln(T) = 0.61 Ln(X) + 2.24134 Average Vehicle Trip Ends

+ 2.24 51 Ln(T) = 0.61 *Ln(79) entering exiting

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 1563)

Directional Distribution: 48% ent. 52% exit.

T = 509 Average Vehicle Trip Ends Ln(T) = 0.67 Ln(X) + 3.31Ln(T) = 0.67 *244 Ln(79) + 3.31 entering 265 exiting

Weekday (page 1561)

Directional Distribution: 50% entering, 50% exiting Daily Weekday

Ln(T) = 0.65 Ln(X) + 5.83T = 5802 Average Vehicle Trip Ends

Ln(T) = 0.65 *Ln(79) + 5.83 2901 entering 2901 exiting

Saturday Peak Hour of Generator

Directional Distribution: Average Saturday 52% ent. 48% exit.

Ln(T) = 0.65 Ln(X) + 3.78Average Vehicle Trip Ends T = 747

Ln(T) = 0.65 *Ln(79) 388 359 + 3.78 entering exiting

Non Pass-By Trip Volumes (Per ITE Trip Generation Handbook, June 2004)

PM Peak Hour =	34%	Pass-by		Saturday Peak Hour = 26% Pass-by
	IN	Out	Total	
AM Peak	62	38	100	*uses lesser of PM and Saturday pass-by rates (26%)
PM Peak	161	175	336	
Daily	1915	1915	3830	*uses PM peak hour pass-by rate
Saturday Peak	287	265	552	

MHGP Redevelopment

Trip generation for Junior/Community College

Designed by Job No. 096368000 Matt Farmen September 21, 2016 Date 1 of Checked by

Sheet No. Date Curtis Rowe September 22, 2016

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation 9th Edition, Average Rate Equations

Land Use Code -540 Junior/Community College

Independent Variable - 1,000 Sq Ft

Number of Units (X) -18

T = Trip Ends

Peak Hour Adjacent Street Traffic One Hour Between 7 and 9 AM

AM Peak **Directional Distribution:**

Trip Ends Per 1,000 Sq Ft 74% Entering 26% Exiting T = (X) * 2.99Trip Ends T = 5440 Entering 14 Exiting

Peak Hour Adjacent Street Traffic One Hour Between 4 and 6 PM

PM Peak **Directional Distribution:**

T = (X) * 2.54Trip Ends Per 1,000 Sq Ft 58% Entering 42% Exiting T = 46 Trip Ends 19 Exiting 27 Entering

Weekday

Daily Weekday **Directional Distribution:**

Trip Ends Per 1,000 Sq Ft T = (X) * 27.4950% Entering 50% Exiting Trip Ends T = 496248 Entering 248 Exiting

Non-Pass-By Trip Percentage Non-Pass-By Trip Volumes

AM 100% AM Peak 40 Entering 14 Exiting PM 100% PM Peak 27 Entering 19 Exiting

Note: Rounding may occur in calculations

Kimley»Horn

Project MHGP Redevelopment

Trip generation for Recreational Community Center

Designed by Matt Farmen Date September 21, 2016 Job No. 096368000

Checked by Curtis Rowe Date September 22, 2016

_ Kimley ≫ Horn

Job No. 096368000
Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation 9th Edition, Average Rate Equations

Land Use Code - 495 Recreational Community Center

Independent Variable - 1,000 Sq Ft

Number of Units (X) - 26

T = Trip Ends

Peak Hour Adjacent Street Traffic One Hour Between 7 and 9 AM

AM Peak Directional Distribution:

T = (X) * 2.05 Trip Ends Per 1,000 Sq Ft 66% Entering 34% Exiting T = 53 Trip Ends 35 Entering 18 Exiting

Peak Hour Adjacent Street Traffic One Hour Between 4 and 6 PM

PM Peak Directional Distribution:

T = (X) * 2.74 Trip Ends Per 1,000 Sq Ft 49% Entering 51% Exiting T = 71 Trip Ends 35 Entering 36 Exiting

Weekday

Daily Weekday Directional Distribution:

T = (X) * 33.82 Trip Ends Per 1,000 Sq Ft 50% Entering 50% Exiting T = 880 Trip Ends 440 Entering 440 Exiting

Non-Pass-By Trip Percentage Non-Pass-By Trip Volumes

AM 100% AM Peak 35 Entering 18 Exiting PM 100% PM Peak 35 Entering 36 Exiting

Note: Rounding may occur in calculations

Internal Capture Reduction Calculations

Methodology for A.M. Peak Hour and P.M. Peak Hour based on the *Trip Generation Handbook*, 3rd Edition, published by the Institute of Transportation Engineers

Methodology for Daily based on the average of the Unconstrained Rates for the A.M. Peak Hour and P.M. Peak Hour

SUMMARY

GROSS TRIP GENERATION P.M. Peak Hour Daily A.M. Peak Hour Land Use Enter Exit Enter Exit Enter Exit Office 2,901 Retail 2,901 83 51 244 265 Restaurant Cinema/Entertainment 2,798 2,798 183 Residential 90 354 341 Hotel 485 485 47 33 46 44 220 438 492 6,184 6,184 631 **INTERNAL TRIPS**

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Land Use	Daily		A.M. Peak Hour		P.M. Peak Hour	
Land Ose	Enter	Exit	Enter	Exit	Enter	Exit
Office	0	0	0	0	0	0
Retail	465	621	7	2	29	77
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	580	421	2	4	69	29
Hotel	70	73	0	3	13	5
	1,115	1,115	9	9	111	111
% Reduction	18.	0%	2.	7%	19.	8%

EXTERNAL TRIPS

OUTPUT

Land Use	Daily		A.M. Peak Hour		P.M. Peak Hour	
Land Ose	Enter	Exit	Enter	Exit	Enter	Exit
Office	0	0	0	0	0	0
Retail	2,436	2,280	76	49	215	188
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	2,218	2,377	88	350	272	154
Hotel	415	412	47	30	33	39
	5,069	5,069	211	429	520	381
Rec	440	440	35	18	35	36
Institurional	248	248	40	14	27	19
Total	5,757	5,757	286	461	582	436

DAILY

GROSS TRIP GENERATION

DAILY

Land Use	Daily		
Land Ose	Enter	Exit	
Office	0	0	
Retail	2,901	2,901	
Restaurant	0	0	
Cinema/Entertainment	0	0	
Residential	2,798	2,798	
Hotel	485	485	
	6,184	6.184	

Estimated Trip Origins within a Mixed-Use Development (Daily) (Average of A.M. Peak Hour and P.M. Peak Hour)

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Origin	Destination Land Use					
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel
Office		24%	34%	0%	2%	0%
Retail	16%		21%	2%	20%	3%
Restaurant	17%	28%		4%	11%	5%
Cinema/Entertainment	1%	11%	16%		4%	1%
Residential	3%	22%	21%	0%		2%
Hotel	38%	15%	39%	0%	1%	

Estimated Trip Destinations within a Mixed-Use Development (Daily) (Average of A.M. Peak Hour and P.M. Peak Hour)

DAILY

Origin		Destination Land Use					
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel	
Office		20%	13%	1%	2%	0%	
Retail	18%		40%	13%	24%	9%	
Restaurant	22%	29%		16%	11%	38%	
Cinema/Entertainment	3%	2%	2%		2%	1%	
Residential	30%	14%	17%	0%		6%	
Hotel	2%	3%	6%	0%	0%		

*** BASED ON EXIT ***

DAILY

(Exit)		(Enter) Land Use				
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel
Office		0	0	0	0	0
Retail	450		609	58	580	73
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	84	602	574	0		42
Hotel	182	73	187	0	5	

*** BASED ON ENTER ***

DAILY

(EXIT)		(Enter) Land Use				
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel
Office		580	0	0	56	0
Retail	0		0	0	672	41
Restaurant	0	841		0	294	182
Cinema/Entertainment	0	58	0		56	2
Residential	0	392	0	0		29
Hotel	0	87	0	0	0	

*** MINIMUM ***

DAILY

(Exit)		(Enter) Land Use				
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	580	41
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	392	0	0		29
Hotel	0	73	0	0	0	

INTERNAL TRIPS

DAILY

Land Use	Daily			
Land Ose	Enter	Exit		
Office	0	0		
Retail	465	621		
Restaurant	0	0		
Cinema/Entertainment	0	0		
Residential	580	421		
Hotel	70	73		
•	1,115	1,115		

A.M. PEAK HOUR

GROSS TRIP GENERATION

A.M. PEAK

Land Use	A.M. Peak Hour			
Land Ose	Enter	Exit		
Office	0	0		
Retail	83	51		
Restaurant	0	0		
Cinema/Entertainment	0	0		
Residential	90	354		
Hotel	47	33		
	220	438		

Table 6.1 Unconstrained Internal Person Trip Capture Rates for Trip Origins within a Mixed-Use Development (A.M. Peak Hour)

A.M. PEAK

Origin		Destination Land Use						
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel		
Office		28%	63%	0%	1%	0%		
Retail	29%		13%	0%	14%	0%		
Restaurant	31%	14%		0%	4%	3%		
Cinema/Entertainment	0%	0%	0%		0%	0%		
Residential	2%	1%	20%	0%		0%		
Hotel	75%	14%	9%	0%	0%			

Table 6.2 Unconstrained Internal Person Trip Capture Rates for Trip Destinations within a Mixed-Use Development (A.M. Peak Hour)

A.M. PEAK

Origin		Destination Land Use					
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel	
Office		32%	23%	0%	0%	0%	
Retail	4%		50%	0%	2%	0%	
Restaurant	14%	8%		0%	5%	4%	
Cinema/Entertainment	0%	0%	0%		0%	0%	
Residential	3%	17%	20%	0%		0%	
Hotel	3%	4%	6%	0%	0%		

*** BASED ON EXIT ***

A.M. PEAK

(Exit)		(Enter) Land Use					
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel	
Office		0	0	0	0	0	
Retail	15		7	0	7	0	
Restaurant	0	0		0	0	0	
Cinema/Entertainment	0	0	0		0	0	
Residential	7	4	71	0		0	
Hotel	25	5	3	0	0		

*** BASED ON ENTER ***

A.M. PEAK

(Exit)		(Enter) Land Use						
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel		
Office		27	0	0	0	0		
Retail	0		0	0	2	0		
Restaurant	0	7		0	5	2		
Cinema/Entertainment	0	0	0		0	0		
Residential	0	14	0	0		0		
Hotel	0	3	0	0	0			

*** MINIMUM ***

A.M. PEAK

(Exit)			(Enter) L	and Use		
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	2	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	4	0	0		0
Hotel	0	3	0	0	0	

INTERNAL TRIPS

A.M. PEAK

	1 A M D	ali Harri
Land Use	A. IVI. Pe	eak Hour
Edita OSC	Enter	Exit
Office	0	0
Retail	7	2
Restaurant	0	0
Cinema/Entertainment	0	0
Residential	2	4
Hotel	0	3
•	9	9

P.M. PEAK HOUR

GROSS TRIP GENERATION

P.M. PEAK

Land Use	P.M. Peak Hour			
Land Ose	Enter	Exit		
Office	0	0		
Retail	244	265		
Restaurant	0	0		
Cinema/Entertainment	0	0		
Residential	341	183		
Hotel	46	44		
·	631	492		

Table 6.1 Unconstrained Internal Person Trip Capture Rates for Trip Origins within a Mixed-Use Development (P.M. Peak Hour)

P.M. PEAK

Origin		Destination Land Use					
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel	
Office		20%	4%	0%	2%	0%	
Retail	2%		29%	4%	26%	5%	
Restaurant	3%	41%		8%	18%	7%	
Cinema/Entertainment	2%	21%	31%		8%	2%	
Residential	4%	42%	21%	0%		3%	
Hotel	0%	16%	68%	0%	2%		

Table 6.2 Unconstrained Internal Person Trip Capture Rates for Trip Destinations within a Mixed-Use Development (P.M. Peak Hour)

P.M. PEAK

Origin		Destination Land Use					
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel	
Office		8%	2%	1%	4%	0%	
Retail	31%		29%	26%	46%	17%	
Restaurant	30%	50%		32%	16%	71%	
Cinema/Entertainment	6%	4%	3%		4%	1%	
Residential	57%	10%	14%	0%		12%	
Hotel	0%	2%	5%	0%	0%		

*** BASED ON EXIT ***

P.M. PEAK

(Exit)		(Enter) Land Use				
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel
Office		0	0	0	0	0
Retail	5		77	11	69	13
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	7	77	38	0		5
Hotel	0	7	30	0	1	

*** BASED ON ENTER ***

P.M. PEAK

(Exit)	(Enter) Land Use					
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel
Office		20	0	0	14	0
Retail	0		0	0	157	8
Restaurant	0	122		0	55	33
Cinema/Entertainment	0	10	0		14	0
Residential	0	24	0	0		6
Hotel	0	5	0	0	0	

*** MINIMUM ***

P.M. PEAK

(Exit)	(Enter) Land Use					
Land Use	Office	Retail	Restaurant	Cinema/Ent.	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	69	8
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	24	0	0		5
Hotel	0	5	0	0	0	
Residential	0	24 5	0	0	0	5

INTERNAL TRIPS

P.M. PEAK

Land Use	P.M. Peak Hour		
Land Use	Enter	Exit	
Office	0	0	
Retail	29	77	
Restaurant	0	0	
Cinema/Entertainment	0	0	
Residential	69	29	
Hotel	13	5	
-	111	111	

Conceptual Site Plan

MILE HIGH GREYHOUND PARK

SITE CONCEPT UPDATE AUGUST 3, 2016





BLOCK 1 RETAIL 64,000 SF PARKING REQUIRED 150 KEY HOTEL

PARKING REQUIRED TOTAL PARKING REQUIREMENTS

25 SF Lots Вьоск 3 24 SF Lots Вьоск4 22 SF LOTS 10 TOWNHOMES Вьоск 5 12 TOWNHOMES 69 MF Units TOTAL PARKING REQUIRED

IN GARAGE

SURFACE

Вьоск 6 158 MF Units

IN GARAGE SURFACE

Вьоск 7 11 TOWNHOMES 68 MF UNITS TOTAL PARKING REQUIRED

IN GARAGE SURFACE

Вьоск 8

Вьоск 9 23 TOWNHOMES Вьоск 10 23 TOWNHOMES

Вьоск 11 160 MF Units

SURFACE

RETAIL 6,000 SF

TOTAL PARKING REQUIRED IN GARAGE

16 TOWNHOMES 60 MF Units

TOTAL PARKING REQUIRED

TOTAL PARKING REQUIRED

187

401 63

48

97 58

198

41 143

-14

108 18 90

200

50

160

10

200 69

144 13

29

SCALE 1:1	00	
25 50	100	200

5-Story MX	Townhome S
Three Story Walk-Up MF	Detached SF







Attachment II Site Plan





MILE HIGH GREYHOUND

PEDESTRIAN ACCESS EXHIBITS