MEMORANDUM

Date: 4/17/2020

To: Adam Davis

From: Hales Engineering

LICENSED PROFESSIONAL ENGINEER
NO. 295699
RYAN R.
HALES
4/17/2020
STATE OF UTAH

Subject: Cottonwood Heights Gravel Pit TIS

UT17-1161

This memorandum contains a trip generation study done for the Gravel Pit project in Cottonwood Heights. A traffic impact study was completed prior to this, and updates have since been made to the site plan that change the land use and the roadway configuration. The purpose of this memorandum is to evaluate the viability of the new roadway configuration and to determine whether the newly proposed site plan/trips would have an additional impact beyond what was shown in the prior study.

Project Description

The proposed land use for the project is as follows:

- Senior Living Center — 36 Units
- Commercial/Retail — 32,000 sq. ft.
- Condos — 100 Units
- Apartments — 285
- General Office Building — 30,000 sq. ft.
- Hotel — 140 Rooms

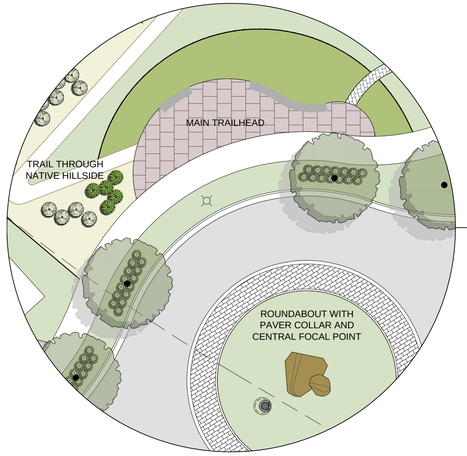
A map displaying the arrangement of the proposed land uses is shown in Figure 1.

Analysis

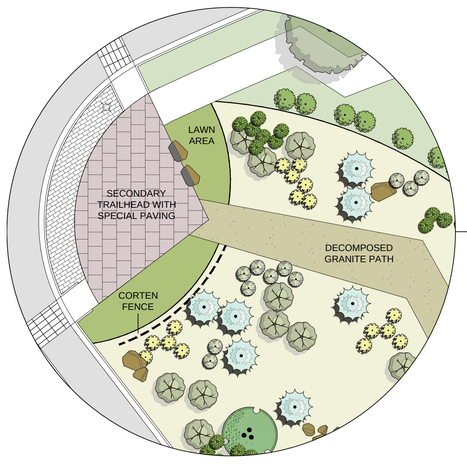
Trip generation for the development was calculated using trip generation rates published in the Institute of Transportation Engineers (ITE), *Trip Generation*, 10th Edition, 2017. Trip generation for the proposed project is included in Table 1.

Because of the mixed-use nature of the development, internal capture reductions were applied utilizing ITE methodologies. Residential units, retail space, and office space are all located within close proximity to each other, meaning that the number of trips external to the development is lower than it would be otherwise. Based on the ITE method, it was calculated that the morning peak hour would be reduced by 5% and the evening peak hour trips would be reduced by 18%.

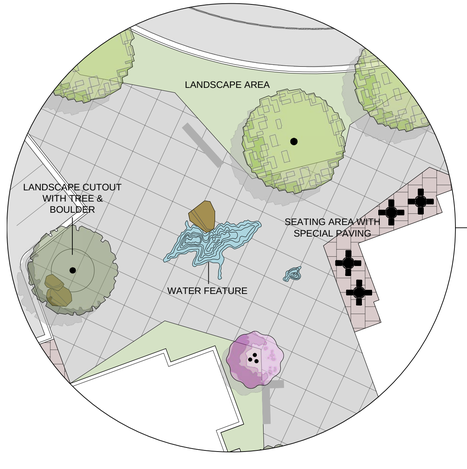
MAJOR TRAILHEAD & MAIN ROUNDABOUT

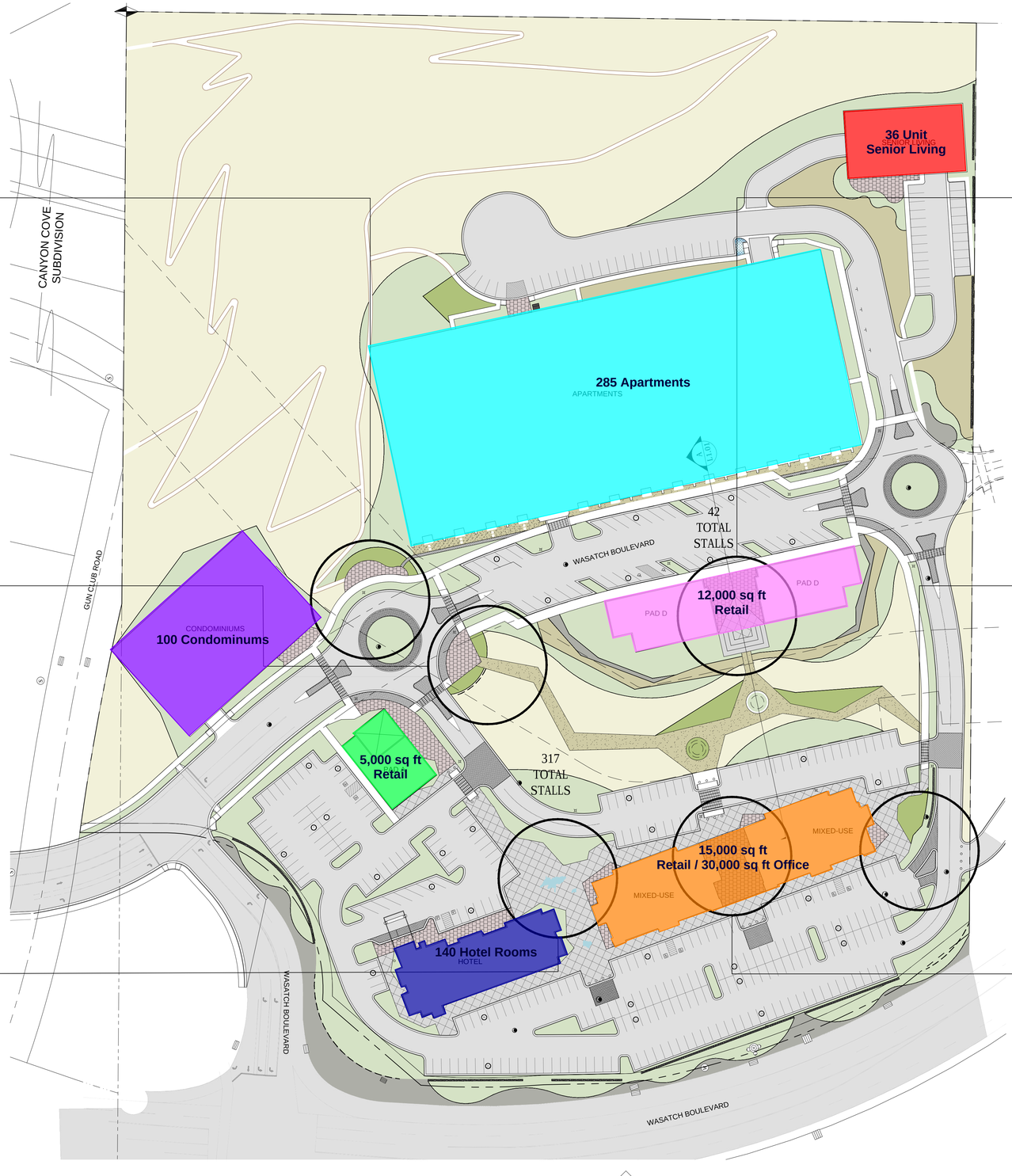


ENTRANCE TO NATIVE CORRIDOR

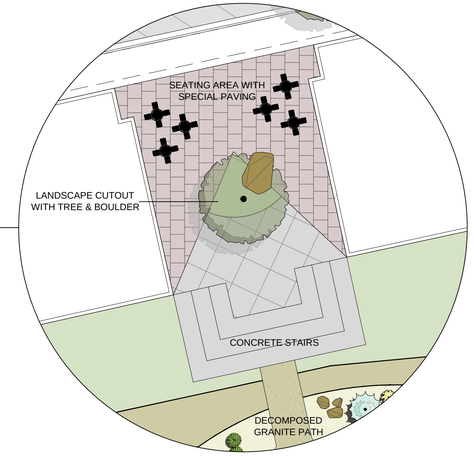


CENTRAL PLAZA

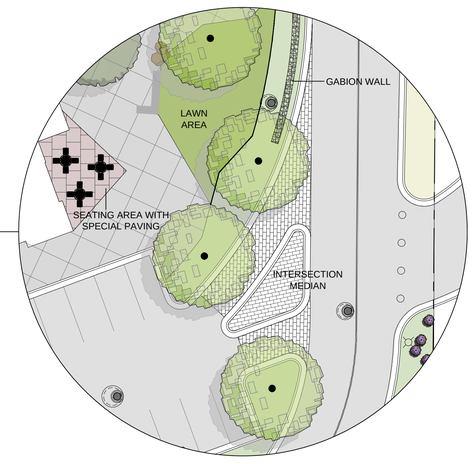




UPPER PLAZA & STAIRS TO NATIVE CORRIDOR



SECONDARY ENTRANCE TO WEST PARKING AREA



INTERIOR PLAZA WITH PUBLIC SEATING

NORTH

SCALE: 1" = 60'

0 30' 60' 120' 180'

L1 - MASTER SITE PLAN

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The total trip generation for the development is as follows:

- Daily Trips: 4,342
- Morning Peak Hour Trips: 273
- Evening Peak Hour Trips: 347

Table 1: Trip Generation

Trip Generation
Cottonwood Heights - Gravel Pit TIS

Weekday Daily Land Use[1]	# of Units	Unit Type	Trip Generation	% Entering	% Exiting	Trips Entering	Trips Exiting	Internal Capture	Net Trips Entering	Net Trips Exiting	Total Daily Trips
Senior Adult Housing-Attached (252)	36	Dwelling Units	120	50%	50%	60	60	11%	53	53	**106**
Multifamily Housing (Mid-Rise) (221)	285	Dwelling Units	1,552	50%	50%	776	776	11%	691	691	**1,382**
Multifamily Housing (Mid-Rise) (221)	100	Dwelling Units	544	50%	50%	272	272	11%	242	242	**484**
Shopping Center (820)	12	1,000 Sq. Ft. GLA	454	50%	50%	227	227	11%	202	202	**404**
Shopping Center (820)	5	1,000 Sq. Ft. GLA	190	50%	50%	95	95	11%	85	85	**170**
Hotel (310)	140	Rooms	1,154	50%	50%	577	577	11%	514	514	**1,028**
Shopping Center (820)	15	1,000 Sq. Ft. GLA	568	50%	50%	284	284	11%	253	253	**506**
General Office Building (710)	30	1,000 Sq. Ft. GFA	294	50%	50%	147	147	11%	131	131	**262**
Project Total Daily Trips						**2,438**	**2,438**		**2,171**	**2,171**	**4,342**
Morning Peak Hour Land Use[1]	# of Units	Unit Type	Trip Generation	% Entering	% Exiting	Trips Entering	Trips Exiting	Internal Capture	Net Trips Entering	Net Trips Exiting	Total a.m. Trips
Senior Adult Housing-Attached (252)	36	Dwelling Units	8	35%	65%	3	5	5%	3	5	**8**
Multifamily Housing (Mid-Rise) (221)	285	Dwelling Units	104	26%	74%	27	77	5%	26	73	**99**
Multifamily Housing (Mid-Rise) (221)	100	Dwelling Units	36	26%	74%	9	27	5%	9	26	**35**
Shopping Center (820)	12	1,000 Sq. Ft. GLA	12	62%	38%	7	5	5%	7	5	**12**
Shopping Center (820)	5	1,000 Sq. Ft. GLA	6	62%	38%	4	2	5%	4	2	**6**
Hotel (310)	140	Rooms	66	59%	41%	39	27	5%	37	26	**63**
Shopping Center (820)	15	1,000 Sq. Ft. GLA	16	62%	38%	10	6	5%	10	6	**16**
General Office Building (710)	30	1,000 Sq. Ft. GFA	36	86%	14%	31	5	5%	29	5	**34**
Project Total a.m. Peak Hour Trips						**130**	**154**		**125**	**148**	**273**
Evening Peak Hour Land Use[1]	# of Units	Unit Type	Trip Generation	% Entering	% Exiting	Trips Entering	Trips Exiting	Internal Capture	Net Trips Entering	Net Trips Exiting	Total p.m. Trips
Senior Adult Housing-Attached (252)	36	Dwelling Units	12	55%	45%	7	5	18%	6	4	**10**
Multifamily Housing (Mid-Rise) (221)	285	Dwelling Units	126	61%	39%	77	49	18%	63	40	**103**
Multifamily Housing (Mid-Rise) (221)	100	Dwelling Units	44	61%	39%	27	17	18%	22	14	**36**
Shopping Center (820)	12	1,000 Sq. Ft. GLA	46	48%	52%	22	24	18%	18	20	**38**
Shopping Center (820)	5	1,000 Sq. Ft. GLA	20	48%	52%	10	10	18%	8	8	**16**
Hotel (310)	140	Rooms	80	51%	49%	41	39	18%	34	32	**66**
Shopping Center (820)	15	1,000 Sq. Ft. GLA	58	48%	52%	28	30	18%	23	25	**48**
General Office Building (710)	30	1,000 Sq. Ft. GFA	36	16%	84%	6	30	18%	5	25	**30**
Project Total p.m. Peak Hour Trips						**218**	**204**		**179**	**168**	**347**

1. Land Use Code from the Institute of Transportation Engineers (ITE) *Trip Generation* ,10th Edition,2017.

SOURCE: Hales Engineering, April 2020

Project traffic is assigned to the roadway network based on the type of trip and the proximity of project access points to major streets, high population densities, and regional trip attractions. Existing travel patterns observed during data collection also provide helpful guidance to establishing these distribution percentages, especially near the site. The resulting distribution of project generated trips during the evening peak hour is as follows:

To/From Project:

- 5% West
- 5% North (Via Wasatch Boulevard)
- 60% North (Via SR-190)
- 30% South

These trip distribution assumptions were used to assign the evening peak hour generated traffic at the study intersections to create trip assignment for the proposed development. After trips were assigned, it was determined that the number of trips entering the development is approximately the same as the number calculated in the prior study (179 trips vs. 183 trips, respectively). The number of exiting trips is reduced significantly from the prior study (168 trips vs. 390 trips) primarily due to the reduction of the size of the office building. For this reason, it is determined that the new configuration is not likely to create any additional impact beyond what was estimated in the prior study on the existing intersections in the study area.

Average Daily Traffic (ADT) was calculated based on the evening peak hour volumes. A map showing the estimated project-generated ADT on project roadways is shown in Figure 2. Based on the projected ADT, it is likely that there will be some reserve capacity for the future development to the south. Should the south roundabout connect to the neighboring project to the south, it is likely that with their (southern project) accesses to SR-190, the roadway for this project would receive very little traffic flow; however, this road has enough reserve capacity to accommodate some additional vehicles.

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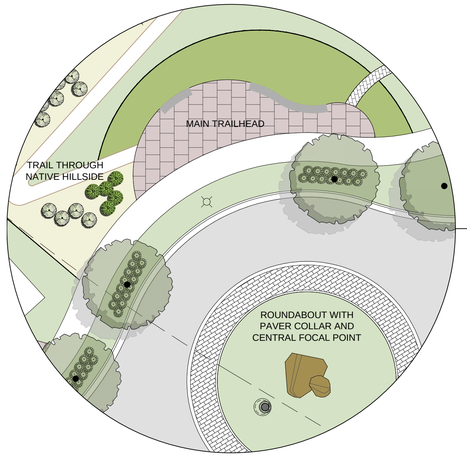

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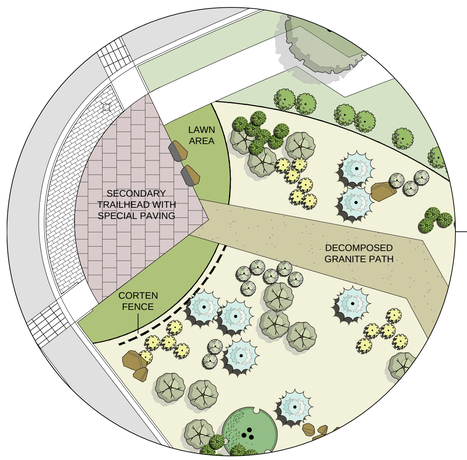

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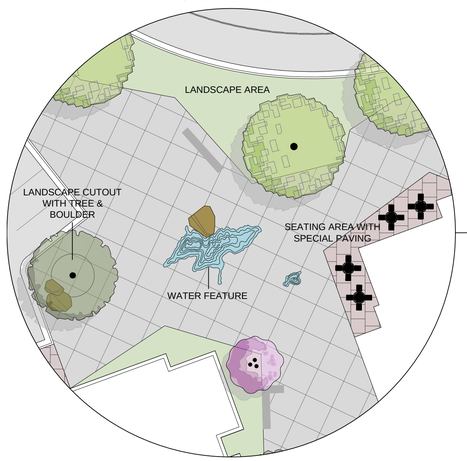

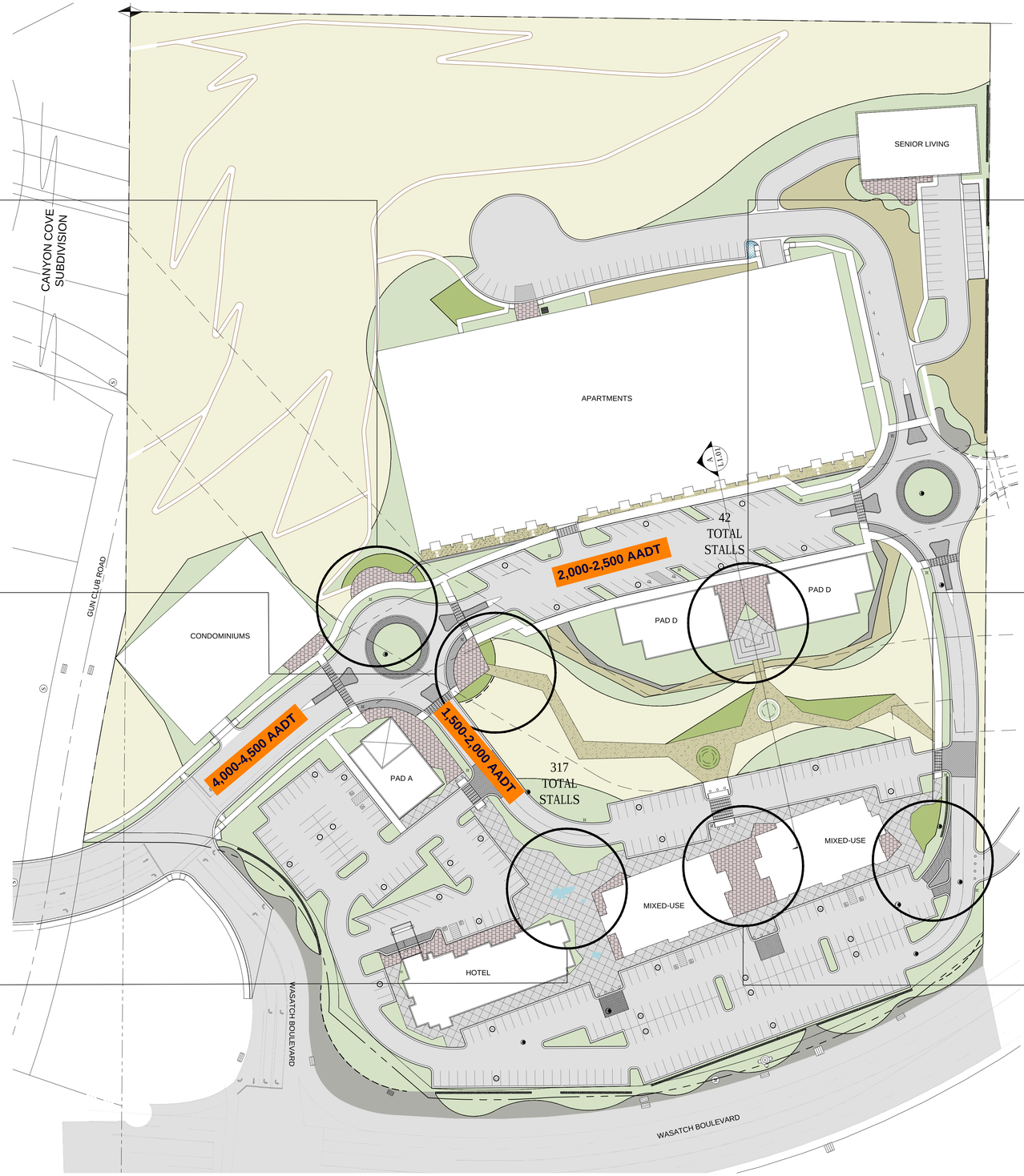

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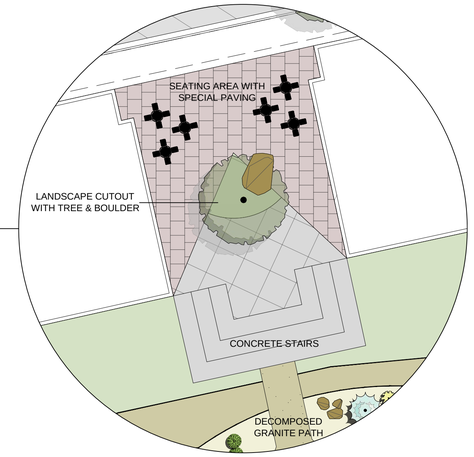

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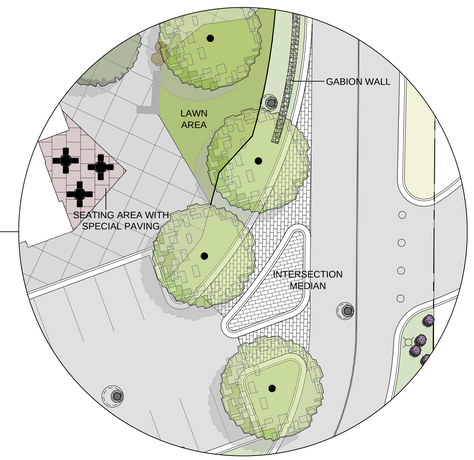

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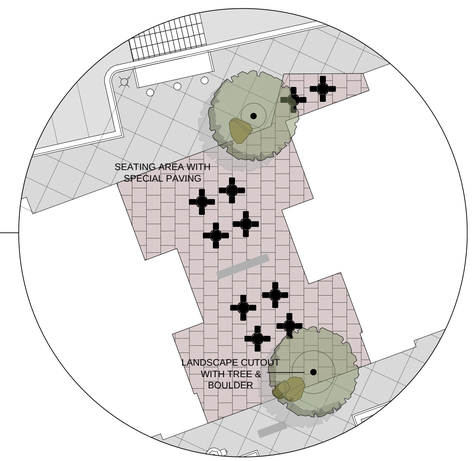

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