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DESIGN MEMORANDUM

To: Mr. Flip Short, Owner (Paragon Star, LLC)
From: David J. Mennenga, P.E., PTOE
Date: February 13, 2019
Subject: Paragon Star Development – Addendum to TIS Report (7-11-16)

As you requested, GBA's traffic engineers have prepared this design memorandum to describe the updated conditions within the proposed Paragon Star development located in Lee's Summit, Missouri. This memorandum is being submitted to the City in support of the preliminary development plans for the internal "village" portion of the proposed development. At the time the original traffic impact study was submitted on July 11, 2016, only a conceptual land use plan was available and was estimated for the internal "village" program. Preliminary plans have now been refined for this portion of the Paragon Star development, and there have also been other minor modifications to the overall development program.

In general, it appears that all the development densities for the proposed on-site land uses are reduced from their previously reported levels. Based upon our preliminary discussions with City staff, the primary purpose of this addendum is to provide a trip generation comparison of the conditions described in the previously submitted traffic impact study contrasted against the currently proposed land use program. The following sections of this design memorandum describe these differences and the expected implications of the proposed changes.

Land Use Program Comparison

For all the proposed land uses within the "village" portion of the Paragon Star development, the anticipated density levels are now reduced from the previously estimated amounts. However, a larger amount of medical office building space than before is now expected. Therefore, the office component of the Paragon Star development's current trip generation estimate has now been delineated between "general office" and "medical office," since these two land uses have different types, frequency, and temporal distribution of their associated trips.

Within the overall Paragon Star development site outside of the "village" component, there are also a few other minor changes proposed. Again, these changes all should have the net effect of reducing the

overall number of site-generated trips for the development. The current proposal includes only 10 soccer fields instead of the 14 previously reported. The previous traffic study assumed that at least half of these fields could accommodate two games simultaneously (i.e., for younger players), and this assumption is still maintained and applied to the current development program. Therefore, the overall number of "effective" fields within the soccer complex would be 15 simultaneous games, reduced from the previous assumption of 21 simultaneous games. In addition, the large indoor pavilion facility previously proposed is no longer included within the current soccer complex plans. The previously assumed square footages for proposed clubhouse areas located throughout the soccer complex will remain.

A summary comparison of the previously reported and currently proposed land use programs for the overall Paragon Star development is provided in the table below:

Land Use Type	Previous TIS Report	Proposed Program	Net Difference
Hotel	240 Rooms	232 Rooms	-8 Rooms
Shopping Center	130,000 s.f.	90,000 s.f.	-40,000 s.f.
General Office Building	140,000 s.f.	35,000 s.f.	-105,000 s.f.
Medical Office Building	--	60,000 s.f.	+60,000 s.f.
Apartments	440 units	410 units	-30 units
Soccer Complex	14 (21 eff.) fields	10 (15 eff.) fields	-4 (-6 eff.) fields
Recreational Comm. Center	140,000 s.f.	20,000 s.f.	-120,000 s.f.

Trip Generation Comparison

The attached ***Table 1*** depicts the trip generation levels for both the planned Phase 1 and the Full Build conditions within the Paragon Star development, as reported in the original Traffic Impact Study submitted in 2016. It should be noted that the trip generation estimates prepared at the time of that report were based upon the data provided by the Institute of Transportation Engineers (ITE) in the 9th edition of their "*Trip Generation Manual*."

The ITE "*Trip Generation Manual*" has gone through a significant revision update in the interim since the original Paragon Star traffic study was submitted. Therefore, the attached ***Table 2*** depicts the anticipated trip generation levels for the development based on the current 10th edition of this reference manual. As shown on ***Table 2***, significant reductions in the expected trip generation levels are expected for all the time periods reported. A reduction of over 5,000 daily vehicle-trips would be expected during the average

weekday, while the weekend (i.e., Saturday) daily trip generation would be reduced by more than 2,000 vehicle-trips. Significant total trip reductions between 300 and 700 vehicles per hour (vph) would also be expected during all critical peak traffic hours (i.e., weekday A.M., weekday P.M., and Saturday mid-day).

Proposed Access Plans

In general, the overall access plan for the Paragon Star development remains the same as described within the previously submitted traffic study. The primary access for the development continues to be planned from View High Drive north of the I-470 interchange at a proposed multi-lane roundabout with Paragon Parkway. A secondary right-in, right-out (RIRO) driveway is still proposed along View High Drive just north of the interchange, yet still located south of the Little Blue River box culvert crossing, to provide direct access into the southern portion of the "village" area.

From the primary multi-lane roundabout, View High Parkway will still be constructed to the northeast as a four-lane divided roadway. Another multi-lane roundabout located about one-quarter mile away from the Paragon Parkway roundabout will provide the most direct access to the soccer complex portion of the development. Since the proposed external street network and internal connectivity are consistent with the previous 2016 plans, the travel patterns associated with the development should remain generally the same as previously reported. Only minor shifts in the internal traffic circulation could be expected with the removal of previously planned surface parking on the Jackson County property south of the soccer complex.

It should be noted that the previously submitted traffic study included no assumption for a direct connection to the north / northeast of the Paragon Star development onto Bannister Road. This was purposefully done in order to provide a "worst case" analysis of the improvement alternatives at the I-470 / View High Drive interchange, where a Diverging Diamond Interchange (DDI) configuration is currently under design. The previous study did assume that 10% of the development-related traffic would access the site from Bannister Road to the north / northwest via the existing View High Drive connection into the primary multi-lane roundabout at Paragon Parkway.

Conclusions and Recommendations

The completed traffic evaluations have determined that the current land use program for the Paragon Star development generally includes less overall density within the "village" portion of the site. In addition, other land use reductions within the soccer complex facilities will also be expected to generate less traffic

than previously reported. However, the external roadway improvements and internal connections have all still been designed based on the recommendations from the previously submitted traffic impact study.

The current designs for the multi-lane roundabouts along View High Drive / Parkway and also for the new DDI configuration at the I-470 / View High Drive interchange should now provide additional "reserve capacity" to accommodate future developments within the City and other regional growth. Therefore, the previously reported operational results can be considered "conservative" in nature. The traffic operations at the study intersections would all be expected to be improved from the previously reported levels due to the reduction in the site-generated trips that is associated with the current land use program for the Paragon Star development.

cc: BDB, CEL, CMN, file

Table 1 #

Previously Reported on 7/11/2016

Trip Generation Summary
Institute of Transportation Engineers (9th Edition)

Paragon Star Development
Lee's Summit, MO

LAND USE CODE	LAND USE	FLOOR AREA Sq. Ft.	MISC. Quantity	MISC. Unit	WEEKDAY ADT (VPD)	A.M. PEAK HOUR (VPH) IN	A.M. PEAK HOUR (VPH) OUT	P.M. PEAK HOUR (VPH) IN	P.M. PEAK HOUR (VPH) OUT	WEEKEND ADT (VPD)	SAT PEAK HOUR (VPH) IN	SAT PEAK HOUR (VPH) OUT
PHASE 1												
310	Hotel		120	Room	701	38	26	37	35	860	49	38
820	Shopping Center	80,000			5,875	84	52	248	268	8,028	393	363
710	General Office Building	90,000			1,212	155	21	30	149	215	21	18
220	Apartment		220	Unit	1,457	22	89	90	49	1,471	55	55
488	Soccer Complex		15	Fields	1,070	10	7	178	88	5,000*	230	249
495	Recreational Community Center	20,000			677	27	14	27	28	182	12	10
	PHASE 1 TOTALS:				**10,992**	**336**	**209**	**610**	**617**	**15,756**	**760**	**733**
FULL SITE												
310	Hotel		240	Room	1,775	75	52	73	71	2,015	95	75
820	Shopping Center	130,000			8,054	113	70	343	371	10,901	539	498
710	General Office Building	140,000			1,696	220	30	40	195	316	33	28
220	Apartment		440	Unit	2,790	44	175	169	91	3,198	100	100
488	Soccer Complex		21	Fields	1,498	13	10	249	123	7000*	337	365
495	Recreational Community Center	20,000			677	27	14	27	28	182	12	10
495	Recreational Community Center	120,000			4,059	162	84	161	168	1,092	69	59
	FULL SITE TOTALS:				**20,549**	**654**	**435**	**1,062**	**1,047**	**24,704**	**1,185**	**1,135**

*Estimated based upon peak hour representing 10% of daily ADT

Table 2

Trip Generation Summary
Institute of Transportation Engineers (10th Edition)

Paragon Star Development
Lee's Summit, MO

LAND USE CODE	LAND USE	Quantity	Unit	WEEKDAY ADT (VPD)	A.M. PEAK HOUR (VPH) IN	A.M. PEAK HOUR (VPH) OUT	P.M. PEAK HOUR (VPH) IN	P.M. PEAK HOUR (VPH) OUT	WEEKEND ADT (VPD)	SAT PEAK HOUR (VPH) IN	SAT PEAK HOUR (VPH) OUT
310	Hotel	232	Rooms	2,193	65	45	75	73	1,938	92	72
820	Shopping Center	90,000	Sq. Ft. GFA	5,597	122	75	241	261	8,349	296	273
710	General Office Building	35,000	Sq. Ft. GFA	384	51	8	7	35	78	10	9
720	Medical / Dental Office	60,000	Sq. Ft. GFA	2,218	111	31	58	148	515	140	106
220	Multifamily Housing (Low-Rise)	410	Units	3,059	42	140	131	77	5,223	205	205
488	Soccer Complex	15	Fields	1,070	9	6	161	83	6,074	267	289
495	Recreational Community Center	20,000	Sq. Ft. GFA	576	51	26	34	38	182	12	10
	TOTALS:			**15,097**	**451**	**331**	**707**	**715**	**22,359**	**1,022**	**964**
	Previous 2016 Traffic Study Report (Table 1)			**20,549**	**654**	**435**	**1,062**	**1,047**	**24,704**	**1,185**	**1,135**
	NET TRIP GENERATION DECREASE			**-5,452**	**-203**	**-104**	**-355**	**-332**	**-2,345**	**-163**	**-171**