

MEMORANDUM

DATE: July 6, 2016

TO: Romi Archer, LSA, Inc.

FROM: Dean Arizabal, LSA, Inc.

SUBJECT: Construction Trip Generation for the Orange County Juvenile Hall Multipurpose Rehabilitation Center Project

LSA, Inc. (LSA) is pleased to present this construction trip generation estimate for the Orange County (OC) Juvenile Hall Multipurpose Rehabilitation Center project, located in the City of Orange (City). The construction trip generation has been prepared using information provided by the OC Public Works Department.

PROJECT CONSTRUCTION

The construction activities for the Juvenile Hall Multipurpose Center are estimated to take approximately 14 to 17 months and will include two phases: Phase 1 – Site Preparation (1 month), and Phase 2 – New Construction (13 to 16 months). The two construction phases will not overlap. Construction will generally occur during typical OC-approved construction hours, Monday through Friday. According to OC Public Works, construction hours for this project are anticipated to be from 7:00 a.m. to 3:30 p.m. on weekdays.

The peak construction-related on-site workforce (per phase) is as follows:

- **Phase 1 (Site Preparation):** 45 workers and 55 trucks (5 removal and 50 dump trucks)
- **Phase 2 (New Construction):** 45 workers and 21 trucks (4 delivery, 12 concrete, and 5 miscellaneous trucks)

The proposed project will not change the capacity of the Juvenile Hall, attract new visitors, increase activities, or require additional staff. Thus, no changes to existing operations will result from the project.

TRIP GENERATION

Construction-related trips will occur during the a.m. peak (7:00–9:00 a.m.) commute period, but not during the p.m. peak (4:00–6:00 p.m.) commute period. As such, construction workers are assumed to arrive prior to the a.m. peak hour and depart prior to the p.m. peak hour each day. Carpooling among employees has not been assumed. Based on the proposed construction hours, truck trips may occur during the a.m. peak hour, but not during the p.m. peak hour. The construction trip generation for the project is shown in Table A.

Table A: Orange County Juvenile Hall Multipurpose Center Construction Trip Generation

Construction Phase		Construction Vehicles				Vehicle Trip Generation							PCE Trip Generation							
						AM Peak Hour			PM Peak Hour			ADT	AM Peak Hour			PM Peak Hour				
Description	Duration	Description	No.	Type	PCE	ADT	In	Out	Total	In	Out		Total	ADT	In	Out	Total	In	Out	Total
1	Site Preparation	1 month	Workers ¹	45	Passenger Car	1	90	0	0	0	0	0	0	90	0	0	0	0	0	0
			Removal Truck ²	5	Large Truck	2	10	1	1	2	0	0	0	20	2	2	4	0	0	0
			Dump Truck ²	50	Large Truck	2	100	6	6	12	0	0	0	200	12	12	24	0	0	0
			Total				200	7	7	14	0	0	0	310	14	14	28	0	0	0
2	New Construction	13-16 months	Workers ¹	45	Passenger Car	1	90	0	0	0	0	0	0	90	0	0	0	0	0	0
			Delivery Truck ²	4	Large Truck	2	8	1	1	2	0	0	0	16	2	2	4	0	0	0
			Concrete Truck ²	12	Large Truck	2	24	2	2	4	0	0	0	48	4	4	8	0	0	0
			Other Truck ^{2,3}	5	Large Truck	2	10	1	1	2	0	0	0	20	2	2	4	0	0	0
			Total				132	4	4	8	0	0	0	174	8	8	16	0	0	0

¹Because construction hours are between 7:00 a.m. and 3:30 p.m., workers are anticipated to arrive prior to the a.m. peak hour and depart prior to the p.m. peak hour.

²Because construction hours are between 7:00 a.m. and 3:30 p.m., truck activity could occur during the a.m. peak hour, but not during the p.m. peak hour.

³Other trucks include water, flatbed, and equipment trucks.

ADT = average daily traffic

PCE = passenger car equivalent

As previously discussed, Phase 1 (Site Preparation) is assumed to have 45 workers, 5 removal trucks, and 50 dump trucks. Phase 2 (New Construction) is assumed to have 45 workers, 4 delivery trucks, 12 concrete trucks, and 5 miscellaneous trucks (i.e., water, flatbed, and equipment trucks). Phases 1 and 2 will not overlap. The vehicle trip generation for each construction phase is provided below:

- **Phase 1 (Site Preparation):** 200 average daily trips (ADT), 14 a.m. peak-hour trips (7 inbound and 7 outbound), and no p.m. peak-hour trips
- **Phase 2 (New Construction):** 132 ADT, 8 a.m. peak-hour trips (4 inbound and 4 outbound), and no p.m. peak-hour trips

Construction trucks may utilize more roadway capacity than passenger vehicles due to their larger size, slower startup times, and reduced maneuverability. To account for the increase in roadway capacity utilized by construction trucks, passenger car equivalent (PCE) factors are used. These factors are applied to the vehicle trip generation to account for the difference in operation characteristics of heavy vehicles. To determine the PCE for the various types of vehicles that could be used during construction of the project, LSA consulted the Highway Capacity Manual. A PCE factor of 1 has been used for construction worker vehicles and a PCE factor of 2 has been applied for the various construction trucks. Based on this information, the construction vehicle trip generation has been converted to PCEs, as provided in Table A.

The PCE trip generation for the two construction phases is as follows:

- **Phase 1 (Site Preparation):** 310 ADT, 28 a.m. peak-hour trips (14 inbound and 14 outbound), and no p.m. peak-hour trips in PCEs
- **Phase 2 (New Construction):** 174 ADT, 16 a.m. peak-hour trips (8 inbound and 8 outbound), and no p.m. peak-hour trips

Because implementation of the project would not change the capacity of the Juvenile Hall, attract new visitors, increase activities, or require additional staff, no increase in operational traffic will result.

CONCLUSION

The City does not have any formal traffic impact analysis criteria. The Orange County Congestion Management Program (CMP) thresholds for requiring a traffic impact analysis include projects with the potential to create an impact of more than 3 percent of level of service (LOS) "E" capacity on CMP Highway system links, to generate 2,400 ADT, or to generate 1,600 ADT with direct access to, or in close proximity to, a CMP Highway system link. Typical thresholds for preparation of a traffic impact analysis (such as in the neighboring cities of Garden Grove and Anaheim) are the project's trip generation of 50 or more peak-hour trips.

For any phase of project construction, construction-related activities would result in at most 310 PCE ADT, 28 PCE trips (14 inbound and 14 outbound) during the a.m. peak hour, and zero trips during the p.m. peak hour, which are well below the minimum requirement for a full traffic analysis. Furthermore, these construction trips are only temporary. Phase 1 (Demolition) is anticipated to last 1 month. Although Phase 2 (New Construction) could last 13 to 16 months, it would only result in a maximum of 174 PCE ADT, 16 PCE trips (8 inbound and 8 outbound) during the a.m. peak hour, and zero trips during the p.m. peak hour. The proposed project is not located in the vicinity of any CMP Highway system links or intersections. Therefore, the project is not anticipated to generate traffic volumes exceeding 3 percent of the LOS "E" capacity at any CMP location. As such, temporary construction impacts to the local circulation system would be less than significant.