

Appendix E Vehicle Miles Traveled (VMT) Analysis

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From: Tyler Mickelson, EIT
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Re: *Jesuit High School Stadium Lighting – Vehicle Miles Traveled (VMT) Analysis*
Sacramento County, California

Date: March 10, 2023



This memorandum documents a Vehicle Miles Traveled (“VMT”) analysis completed for the proposed Jesuit High School Stadium Lighting (“Project” or “Proposed Project”) in Sacramento County, California. The proposed project would install stadium lighting at the existing Marauders Stadium to enable various athletic competitions and practices to be scheduled at night rather than being restricted to daytime/daylight hours. With the passage of SB 743, VMT has become an important indicator for determining if new development will result in a “significant transportation impact” under the California Environmental Quality Act (CEQA). This memorandum summarizes the VMT analysis and resultant findings for the proposed project.

Purpose of Analysis

Passed in 2013, SB 743 changes the focus of a transportation impact analysis in CEQA from measuring impacts to drivers, to measuring the impact of driving. The change has been made by replacing LOS with VMT. This shift in transportation impact focus is intended to better align transportation impact analysis and mitigation outcomes with the State’s goals to reduce greenhouse gas (GHG) emissions, encourage infill development, and improve public health through more active transportation.

In January 2019, the Natural Resources Agency finalized updates to the CEQA Guidelines including the incorporation of SB 743 modifications. The Guidelines’ changes were approved by the Office of Administrative Law and are now in effect. The provisions apply statewide as of July 1, 2020.

To help aid lead agencies with SB 743 implementation, the Governor’s Office of Planning and Research (OPR) produced the Technical Advisory on Evaluating Transportation Impacts in CEQA¹ (December 2018) that provides guidance regarding the variety of implementation questions they face with respect to shifting to a VMT metric. Key guidance from this document includes:

- VMT is the most appropriate metric to evaluate a project’s transportation impact.
- OPR recommends tour- and trip-based travel models to estimate VMT, but ultimately defers to local agencies to determine the appropriate tools.
- Lead agencies have the discretion to set or apply their own significance thresholds.

¹ *Technical Advisory on Evaluating Transportation Impacts in CEQA*. Governor’s Office of Planning and Research State of California. December 2018.

In September 2020, Sacramento County released an updated to their Transportation Analysis Guidelines² that was established for use in implementation of SB 743, including the selection of VMT analysis methodology, setting thresholds of significance, and potential mitigation.

The County Guidelines recommend the following methodology and significance threshold for regional public facilities projects such as private K-12 schools:

- Alternate methods to running the SACSIM model to calculate a project’s effect on regional VMT may be proposed by the applicant, subject to review and approval by the Department of Transportation and Planning and Environmental Review. Alternate methods must demonstrate consistency with the assumptions used to develop the thresholds of significance.
- Based on the Sacramento County Guidelines, the Project is classified as a regional public facility for the purposes of this analysis, which has a significance criterion of a net increase in VMT.
- Projects generating fewer than 237 average daily traffic (ADT) are expected to result in a less-than-significant VMT impact.

Methodology and Assumptions

The number of trips anticipated to be generated by the proposed project was approximated using the football game attendances summarized in **Attachment A**. As shown in **Attachment A**, football games produce the largest number of trips to and from the school for stadium events. Additionally, the Proposed Project would change both the day and times at which football games are played – shifting from Saturday mid-day to Friday evenings – whereas the Project would cause such minimal shifts in the times of Soccer and Lacrosse games that it can reasonably be assumed not to alter any traffic patterns associated with those sports. Therefore, the focus of the analysis was to determine the impact of shifting the times associated with football games under Existing Conditions (on a Saturday during daylight hours) to under Existing plus Proposed Project Conditions (on a Friday evening with stadium lights).

As this analysis was completed after football season had ended, the number of attendees at football games was not counted. In lieu of conducting new counts which would only include one or two games, this analysis utilizes the attendance range provided by Jesuit High School based on actual attendance records, as shown in **Attachment A**. As shown, the average attendance for a regular season home football game is 1,200 attendees based on attendances tabulated during Saturday afternoon games. Therefore, to be conservative and isolate variables beyond this analysis’ ability to account for, the number of attendees was assumed to increase from an average of 1,200 attendees for Saturday games to 1,500 attendees for Friday night games (the maximum average number of attendees shown in **Attachment A**).

To determine the average vehicle occupancy for trips heading to football games a literature review of traffic studies related to high school football stadiums was completed. Previous traffic studies, including a Valley High Sports Complex (Garland Assoc. 2014) and St Vincent Sports Complex (Missiman Inc. 2013), observed average vehicle occupancy of 5.0 and 4.0, respectively, for their evening and weekend events. However, a study conducted for a high school stadium lighting project in Carmel, CA³ observed an average occupancy of 3.24 persons per vehicles, Therefore, a 3.24 vehicle occupancy was conservatively assumed for this study and held constant across Existing and Existing plus Proposed Project scenarios.

As shown in **Table 1**, for the purposes of this analysis it is assumed that 1,200 total people attend football games for Existing Conditions and 1,500 for Existing plus Proposed Project Conditions. When accounting for an average occupancy of 3.24, this results in 371 vehicle trips traveling to the school for football games under Existing Conditions. Under Existing plus Project Conditions, it is assumed that approximately 10-percent of attendees are already on campus. This assumption is based on several factors including:

² *Transportation Analysis Guidelines*. County of Sacramento. September 10, 2020.

³ *Carmel High School Stadium Lighting VMT Assessment*. Hexagon Transportation Consultants, Inc. August 11, 2022.

- Junior Varsity (JV) games occur immediately after school so there is no time for students to leave campus and return. The JV team includes 35 students and 4 coaches⁴.
- Jesuit High School will require students on the Varsity football team to remain on campus after school under Existing plus Proposed Project Conditions. The Varsity team includes 50 student athletes, 6 student managers, and 9 coaches⁵.
- The Freshman football team includes 83 students⁶. Though these players do not play games on the same day as the JV and Varsity teams, it is assumed a large portion will remain on campus for the games occurring on Friday nights.
- The staff and students that will attend the JV game and/or assist in parking and other volunteer activities related to the football games are assumed to remain on campus for the games occurring on Friday nights.

Table 1 – Existing and Existing plus Proposed Project Vehicle Trips

Metric	Existing Conditions	Project Conditions
Total Event Attendees (people) ¹	1,200	1,500
Average vehicle occupancy ²	3.24	3.24
Stay After School Reduction (%) ³	0	10
Total Vehicle Trips Per Event	371	417
Net Change in Vehicle Trips		46

1. Based on average attendance size estimate provided by Jesuit High School of 800-1,500 and include both players, coaching staff, and spectators.
2. Previous traffic studies including a Valley High Sports Complex (Garland Assoc. 2014) and St Vincent Sports Complex (Missiman Inc. 2013) observed average vehicle occupancy of 5.0 and 4.0 respectively for their evening and weekend events. A 3.24 vehicle occupancy was conservatively assumed for this study and held constant across existing and project scenarios.
3. This represents those who choose to stay after school to attend or prepare for the upcoming football game and may include student athletes, staff and coaches, student concessions workers, or other friends and spectators.

Therefore, when accounting for the 10-percent reduction in vehicle trips for those attendees remaining on campus under Existing plus Proposed Project Conditions, the total number of trips is estimated to be 417, a net increase of 46 vehicle trips when compared to Existing Conditions.

As shown in **Attachment A**, in the event that the Varsity football team makes the playoffs, the number of attendees is likely to exceed 1,500. However, the number of home playoff games would not exceed two games per season and the number of attendees for a playoff game would most likely be equal under Existing Conditions compared to Existing plus Proposed Project Conditions. However, for the purposes of this analysis, it was assumed that the number of attendees increased from 2,500 attendees for Existing Conditions to 3,000 attendees under Existing plus Proposed Project Conditions for a playoff game. Note that while the maximum occupancy of the football stadium is 3,180, the football stadium uses bleachers instead of actual seats, so attendance is based on tickets sold rather than stadium occupancy.

⁴ Jesuit High School Sacramento Junior Varsity Football Team Roster. Accessed February 17, 2023.

<https://jesuit.gorepu.com/football/jv/roster>

⁵ Jesuit High School Sacramento Varsity Football Team Roster. Accessed February 17, 2023.

<https://jesuit.gorepu.com/football/varsity/roster>

⁶ Jesuit High School Sacramento Junior Varsity Football Team Roster. Accessed February 17, 2023.

<https://jesuit.gorepu.com/football/frosh/roster>

Table 2 summarizes the number of vehicle trips generated for a playoff game scenario for Existing and Existing plus Proposed Project Conditions. As with a regular season game, an average occupancy of 3.24 was assumed. However, rather than assuming 10-percent of all attendees remain on campus under Existing plus Proposed Project Conditions, it was assumed that an identical number of attendees remained on campus as with a regular season game (approximately 150). Therefore, under Existing plus Proposed Project Conditions, the total number of trips is estimated to be 834, a net increase of 62 vehicle trips when compared to Existing Conditions for a playoff game.

Table 2 – Existing and Existing plus Proposed Project Vehicle Trips

Metric	Existing Conditions	Project Conditions
Total Event Attendees (people)	2,500	3,000
Average vehicle occupancy	3.24	3.24
Stay After School Reduction ¹	0	150
Total Vehicle Trips Per Event	772	880
Net Change in Vehicle Trips		108

1. Assumes an identical number of attendees stay on campus when compared to a regular season game. This includes players, coaching staff, school staff, and spectators.

Other Considerations

As indicated, the analysis utilizes conservative assumptions on both the anticipated number of event attendees (rounding up to 1,500), as well as the number of occupants per vehicle (using the lowest occupancy assumption identified in similar analyses). There are additional factors that could further impact this VMT analysis but which we have decided not to include for certain identified factors. Nevertheless, the following provides a summary of other considerations to better contextualize the results of the VMT analysis performed. These considerations include:

- **Alternative use of the stadium on Saturdays would likely not occur or, to the extent it may, it would involve school-related sporting events already occurring on- or off-site.** Moving the football games from Saturdays to Friday evenings does not result in an increase in other events occurring that are not occurring today. Jesuit High School currently has several other fields with events taking place concurrently with football games on Saturdays or that are occurring off campus at other locations in the area. School leadership has stated that, due to liability insurance purposes, they would rent out the football field on Saturdays with the absence of the 4-6 home games that occur today. If the stadium is used at that time, it would likely be by a school sporting activity which is currently occurring on Saturdays elsewhere on-site. Therefore, no additional VMT is expected to occur related to other activities occurring in place of football games on Saturdays that are not occurring today.
- **Parental pass-by traffic and student athletes driving separate from their parents to games could further reduce project-related VMT but, due to insufficient evidentiary support of the number and frequency of such trips, these variables have been left out of the analysis resulting in a more conservative approach.** The impact of pass-by trips was not included in. Currently the VMT analysis summarized above is assumed that all players, staff, and spectators travel to and from their homes for games occurring on Saturdays. Once game times shift to Fridays, some spectators continue this trend, but the impact of pass-by trips may reduce VMT overall. School leadership has noted that many students and their families live east of the school and at least one parent works in downtown Sacramento. Therefore, the school is on their route home and attending a football game would occur during a vehicle trip that already exists today, the commute trip home

on Friday evenings. This reduces the number of trips for Existing plus Proposed Project Conditions compared to Existing Conditions (2 trips instead of 4). As the precise number of parents for which pass-by trips occur could not be measured, the impact of pass-by trips was not included in the analysis to be conservative. Additionally, many student athletes drive themselves to school on Fridays and drive to Saturday games separate from their families since athletes need to be at the school at least one hour before the game (4 trips on a Saturday rather than 2). Since the precise travel pattern of each student athlete is difficult to ascertain and because the travel pattern changes from year-to-year and student-to-student, this analysis does not include student athletes driving independent of parents under the existing scenario.

- Existing Trips: **Friday**: parent and student to school, parent to work, parent to school, parent and student home. **Saturday**: parent and student to school, parent and student home.
- Existing plus Proposed Project Trips: **Friday**: parent and student to school, parent to work, parent to school, parent and student home. **Saturday**: none

Analysis Results

As noted above, Sacramento County's Guidelines state that projects that generate less than 237 average daily traffic (ADT) are expected to result in a less-than-significant VMT impact. In addition, OPR's Guidelines state that projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant impact on VMT.

As discussed above, the average trip increase per day as a result of the Proposed Project would range from 46 trips for a regular season Friday night football game, and up to 108 trips per day for a playoff game. Per the County's guidelines and OPR recommendations, projects that generate or attract fewer than 237 or 110 trips per day, respectively, may be assumed to cause a less-than-significant transportation impact. Therefore, per the County's Guidelines, it can be presumed that the project would have a less-than-significant transportation impact on VMT.

It should be noted that the VMT assessment focuses only on the increase in VMT due to the anticipated increase in attendees at football games. This is because the daily trips and VMT associated with the current attendees of football games are already being generated by the stadium. The proposed lighting would only change the time of day that the existing daily trips would occur.

Findings

Based on the results of this analysis, the following findings are made:

- The overall VMT impact associated with stadium is de minimus since, on all but 8 days per year, it would not add any additional vehicular trips but merely shift the timing of existing trips.
- On the anticipated 8 days on which there are home football games at the stadium where games are shifting from Saturday afternoon to Friday evening, the average trip increase per day as a result of the Proposed Project would range from 46 trips for a regular season Friday night football game, and up to 108 trips per day for a playoff game.
- Per the County's guidelines, projects that generate or attract fewer than 237 trips per day may be assumed to cause a less-than-significant transportation impact. Therefore, as the Proposed Project would generate up to an additional 108 trips per day for a playoff game **the Project results in a less than significant transportation impact.**

Attachments:

Attachment A – Jesuit High School Sacramento Anticipated Event Lighting

Attachment A

JESUIT HIGH SCHOOL SACRAMENTO ANTICIPATED EVENT LIGHTING

Event	Current Time	Proposed Time	Days	Months	Light Level (approx)	Size Estimate	Amplified Sound	Marching Band
Games - Lacrosse	3-6 p.m.	5-9 p.m.	TBD	Mar-Apr	100%	100-300	Yes	No
Games - Football	Sat. 10 - 4 p.m.	5-10 p.m.	F	Aug-Oct	100%	800-1500	Yes	Yes
Games - Soccer	3-6 p.m.	3-7 p.m.	Tu, Th	Dec-Feb	80%	100-300	No	No
Practice - Football	3:30-6:30	4-7 p.m.	M-Th	Aug-Nov	50%	N/A	No	No
Practice - Soccer	3:30-6:00	4-7 p.m.	M-F	Nov - Feb	50%	N/A	No	No
Practice - Track	3:30-5:00	4-7 p.m.	M-F	Feb-Apr	50%	N/A	No	No
Practice Lacrosse	3:30-6:30	4-8 p.m.	M-F	Feb-Apr	50%	N/A	No	No
Track & Field Special Event	3:00-6:00	3-8 p.m.	Rarely	Mar-Apr	80%	500-900	Yes	No
Soccer Playoffs	4:00-6:00	5-7 p.m.	TBD	Feb	80%	500-900	Yes	No
Lacrosse Playoffs	4:00-6:00	7-9 p.m.	TBD	May	100%	200-500	Yes	No
Football Playoffs	1-4 p.m.	7-10 p.m.	F	Nov	100%	1500-3000	Yes	Yes

Historical Average number of home games regular season	
Football	5
Lacrosse	10
Soccer	14

Historical Average number of home playoff games	
Football	2
Lacrosse	1
Soccer	4
Track & Field Special Event	1

Jesuit High School October 10, 2022