APPENDIX J

VMT ASSESSMENT AND INTERSECTION OPERATIONS,
SITE ACCESS AND PARKING EVALUATION

Hexagon Transportation Consultants, Inc.

Memorandum

Date: July 21, 2021; updated August 11, 2022

To: Stuart Poulter, EMC Planning Group

From: Robert Del Rio, T.E., Luis Descanzo

Subject: VMT Assessment and Intersection Operations, Site Access and Parking Evaluation for the Proposed Carmel High School Stadium Lighting in Carmel-by-the-Sea, California

Hexagon Transportation Consultants, Inc. has completed a vehicle-miles traveled (VMT) assessment and operations evaluation for the proposed installation of stadium lights at the Carmel High School field. Carmel High School (CHS) is located at 3600 Ocean Avenue in unincorporated Monterey County. The location of the CHS stadium and the surrounding study area are shown on Figure 1.

Project Description

The project proposes to add lights to the existing football stadium on campus and add on-site parking and storage. The school district plans to install the stadium lighting by the start of the 2023-2024 school year.

The stadium lights would allow the school to provide flexible nighttime use of the field for various sporting and school events. Table 1 provides a summary of the anticipated use of the stadium with the proposed lighting. As shown in the table, use of lighting during and following athletic practices would generally end by 7:00 PM. Most athletic games would end by 7:00 PM, but no later than 9:30 PM (for example, Friday evening football games), with lighting potentially remaining on after to facilitate safe crowd exiting and for clean-up and other similar activities after game completion. It should be noted that the number of participants shown in the table does not include attendance of spectators.

Currently, football games with up to 500 attendees are played during afternoon hours, or off-site at Monterey Peninsula College or Pacific Grove High School for postseason games. With the stadium lights, the number of attendees is expected to increase from 500 to 800 for most football games. Factors such as team record, opponent and conflicting events are expected to affect attendance. Attendance at all other sports games (soccer, lacrosse, and field hockey) is expected to be lower than that of football games. Because the new Friday evening football games on campus are expected to generate the greatest number of attendees and associated vehicle trips, the transportation study focuses on the potential impacts resulting from the Friday evening football games with an anticipated 800 attendees. All other field uses are expected to have lesser impacts since the total attendance at non-football events will be much less than Friday night football games.

The purpose of this memorandum is to provide an assessment of the project's effect on VMT. The VMT assessment methodology and results are discussed below. The methodology, results, and recommendations of the site access and parking evaluation also are discussed below.

Figure 1
Site Location

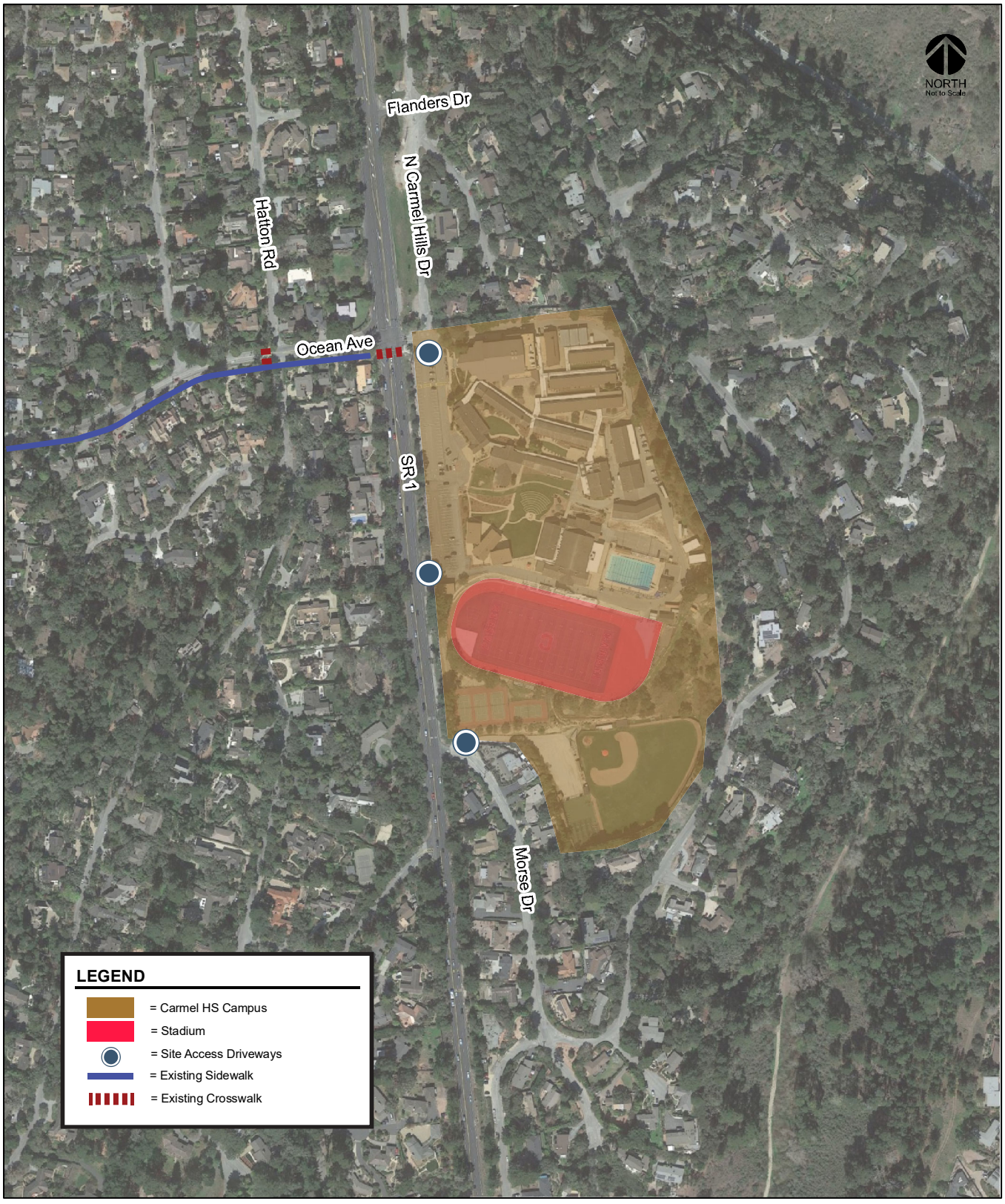


Table 1
Proposed Schedule of Stadium Uses (After Installation of Field Lights)

Sports Team	Days of the Week	Timing		Number of Participants (Student-Athletes, Coaches, and Staff)	Estimated Number of Evening Practices per Week[1]/Home Games per Year (Range)
		Start	End		
Fall Sports (August to November)					
Girls Field Hockey (Varsity)					
Practices	Monday-Friday	5:00 P.M.	7:00 P.M.	25	4-5
Games	Monday-Friday	3:30 P.M.	5:00 P.M.	50	6-8
Girls Field Hockey (Junior Varsity)					
Practices	Monday-Friday	3:30 P.M.	5:00 P.M.	25	4-5
Games	Monday-Friday	4:45 P.M.	6:15 P.M.	25-50	6-8
Football (Varsity)					
Practices	Monday-Friday	3:30 P.M.	5:00 P.M.	50-60	4-5
Games	Friday	7:30 P.M.	9:30 - 10:00 P.M.	100-150	4-6
Football (Junior Varsity)					
Practices	Monday-Friday	3:30 P.M.	5:00 P.M.	40-50	4-5
Games	Friday	5:00 P.M.	7:30 P.M.	100-150	4-6
Winter Sports (November to February)					
Girls Soccer (Varsity)					
Practices	Monday-Friday	3:30 P.M. or 5:00 P.M.	5:00 P.M. or 6:30 P.M.	25	4-5
Games	Monday-Friday	5:30 P.M.	7:30 P.M.	50 (both teams)	8-10
Girls Soccer (Junior Varsity)					
Practices	Monday-Friday	3:30 P.M. or 5:00 P.M.	5:00 P.M. or 6:30 P.M.	25	4-5
Games	Monday-Friday	3:30 P.M.	5:30 P.M.	50 (both teams)	8-10

Boys Soccer (Varsity)					
Practices	Monday-Friday	3:30 P.M. or 5:00 P.M.	5:00 P.M. or 6:30 P.M.	25	4-5
Games	Monday-Friday	3:30 P.M. or 5:00 P.M.	5:00 P.M. or 6:30 P.M.	50 (both teams)	8-10
Boys Soccer (Junior Varsity)					
Practices	Monday-Friday	3:30 P.M. or 5:00	5:00 P.M. or 6:30 P.M.	25	4-5
Games	Monday-Friday	3:30 P.M.	5:30 P.M.	50 (both teams)	8-10
Spring Sports (February to May)					
Girls Lacrosse (Varsity)					
Practices	Monday-Friday	3:30 P.M. or 5:00 P.M.	5:00 P.M. or 6:30 P.M.	25	4-5
Games	Monday-Friday	3:30 P.M.	5:00 P.M.	50 (both teams)	5-7
Girls Lacrosse (Junior Varsity)					
Practices	Monday-Friday	3:30 P.M. or 5:00 P.M.	5:00 P.M. or 6:30 P.M.	25	4-5
Games	Monday-Friday	5:00 P.M.	6:30 P.M.	50 (both teams)	5-7
Boys Lacrosse (Varsity)					
Practices	Monday-Friday	3:30 P.M. or 5:00 P.M.	5:00 P.M. or 6:30 P.M.	25	4-5
Games	Monday-Friday	4:00 P.M.	6:00 P.M.	50 (both teams)	5-7
Boys Lacrosse (Junior Varsity)					
Practices	Monday - Friday	3:30 P.M. or 5:00 P.M.	5:00 or 6:30 P.M.	25	4-5
Games	Monday-Friday	6:00 P.M.	8:00 P.M.	50 (both teams)	5-7
Boys & Girls Track & Field (Varsity and Junior Varsity)					
Practices	Monday-Friday	3:30 P.M.	5:00 P.M.	100	4-5
Meets	Thursday	3:30 P.M.	7:30 P.M.	200 (both teams)	2-4 (track meets)
Total of Evening Games per Year (Range)					74-100

SOURCE: CUSD 2022
NOTE: 1. Field sports practices are generally a combined practice with varsity and junior varsity teams.

VMT Assessment Methodology and Results

Pursuant to Senate Bill (SB) 743, the California Environmental Quality Act (CEQA) 2019 Update Guidelines Section 15064.3, subdivision (b) states that VMT will be the metric in analyzing transportation impacts for CEQA purposes. VMT is the total miles of travel by personal motorized vehicles a project is expected to generate in a day. VMT measures the full distance of personal motorized vehicle-trips with one end within the project. Typically, development projects that are farther from other, complementary land uses (such as a business park far from housing) and in areas without transit or active transportation infrastructure (bike lanes, sidewalks, etc.) generate more driving than development near complementary land uses with more robust transportation options. Therefore, developments located in a central business district with high density and diversity of complementary land uses and frequent transit services are expected to internalize trips and generate shorter and fewer vehicle trips than developments located in a suburban area with low density of residential developments and no transit serve in the project vicinity.

For typical land uses such as residential, office, and commercial developments, daily VMT estimates are calculated based on land use travel patterns during an average weekday. Unlike these typical uses, however, there is a significant variance in day-to-day project generated trips for high school football games since the stadium would host football games only once per week during football season (see paragraph below for additional detail). No vehicular traffic would be generated during non-game days. Calculating only the VMT generated during Friday game days would not accurately represent average weekday VMT. Instead, it is necessary to divide the total number of trips generated during a game week (i.e. the trips generated during a Friday football game) by the five weekdays to provide an average weekly trip estimate.

Daily Trip Generation Estimates

The proposed stadium lighting is expected to result in an increase in attendance for football games and other sporting events. The increase in attendees will result in an increase in vehicular trips and VMT that is currently generated by the sporting events. Currently, football games with up to 500 attendees are played during afternoon hours, or off-site at Monterey Peninsula College or Pacific Grove High School for postseason games. The project would increase the attendance of football games on Friday nights from the current approximately 500 attendees to up to 800 attendees. The football season typically runs for 10 weeks between September and November with approximately 4 to 6 home games hosted by CHS.

Due to pandemic conditions, there were no scheduled high school football games in the surrounding region for which observations of carpooling activity could be collected. Therefore, this analysis utilizes a vehicle occupancy rate based on data previously collected for a homecoming football game on a Friday night at Mitty High School in San Jose, California. Hexagon counted the number of vehicles parked at Mitty High School, at an adjacent church, and on the surrounding streets during the homecoming game on Friday, October 5, 2018, and on a regular Friday night on October 26, 2018.The difference between the two parking counts represents Mitty game night traffic. Based on the number of additional parked vehicles and the estimated attendance at the surveyed Friday night game, the vehicle occupancy rate was calculated to be an average of 3.24 persons per vehicle for the game attendees.

Utilizing the surveyed vehicle occupancy rate and anticipated attendance projections, the average trip increase per day for Friday night football games at Carmel High School would be approximately 37 trips (300 attendees / 3.24 persons per vehicle x 2 trips (inbound and outbound) x 1 event per week / 5 days per week = 37 trips per day). During a homecoming or rivalry game, attendance is expected to increase from the current 1,500 attendees to an anticipated 2,000 attendees. Therefore, the worst-case average

trip increase during the football season would be approximately 62 trips per day for the homecoming and rivalry games.

The stadium lighting also would increase the attendance for other sporting events, such as soccer in winter and lacrosse in the spring, from the current approximately 200 attendees to up to 500 attendees. The total vehicular trips and resulting VMT of non-football events would be lower than those of evening football games since the total attendance for non-football sports events will be less than Friday night football games. Moreover, fall sports (football), winter sports (soccer), and spring sports (lacrosse/track & field) would not occur concurrently. Therefore, the evaluation of Friday evening football games represents a worst-case scenario in terms of total trips and VMT throughout the year.

Bus Shuttle Trips

During some sporting events, off-site parking would be provided at Carmel Middle School, located approximately two miles south of the Carmel High School campus along Carmel Valley Road. Attendees would be shuttled by bus between the off-site parking facility and Carmel High School. Up to 18 bus trips could be required before or after sporting events, for a total of up to 36 trips per event. Therefore, the average trip increase would be approximately 8 trips per day during game weeks.

VMT Assessment

The County of Monterey and the Transportation Agency for Monterey County (TAMC), at the time of this report, have not yet adopted any analysis procedures, standards, or guidelines consistent with SB 743. In the absence of an adopted, or even draft, policy with numeric thresholds, this assessment relies on guidelines published by the Governor's Office of Planning and Research (OPR) in analyzing the project's effects on VMT.

The OPR provides screening threshold recommendations that are intended to identify when a project should be expected to cause a less-than-significant impact without conducting a detailed VMT evaluation. The OPR screening thresholds recommendations are based on project size, maps, transit availability, and provision of affordable housing. The OPR recommendations include the screening threshold criteria listed below:

- OPR recommends that office or residential projects not exceeding a level of 15 percent below existing VMT per capita and employee may indicate a less-than-significant impact on VMT.
- OPR recommends that projects (including office, residential, retail, and mixed-use developments) proposed within ½ mile of an existing major transit stop or within ¼ mile of an existing stop along a high-quality transit corridor may be presumed to have a less-than-significant impact on VMT.
- OPR recommends that 100 percent affordable residential development in infill locations be presumed to have a less-than-significant impact on VMT.
- OPR recommends 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.
- OPR recommends that local-serving retail developments (considered to be less than 50,000 s.f. in size) 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 37 trips for normal Friday night football games and up to 62 trips per day for homecoming and rivalry games. With the proposed bus shuttle, the average trip increase would range between 45 trips for normal Friday night games and 70 trips for homecoming and rivalry games. Per the OPR recommendations, land use projects that generate or attract fewer than 110 trips per day generally may

be assumed to cause a less-than-significant transportation impact. Therefore, per the OPR recommendation, it can be presumed that the project (including the proposed bus shuttle) 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 since 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.

Intersection Operations, Site Access and Parking Evaluation

Existing Roadway Network

Local access to the school campus is provided via Highway 1, Ocean Avenue, Carmel Hills Drive, and Morse Drive. These roadways are described below.

Cabrillo Highway (SR 1) is a four-lane arterial that runs along most of the Pacific coastline of California between Mendocino County to the north and Orange County to the south. Within the Monterey Bay region, SR 1 connects the cities of Carmel, Monterey, Seaside, and Marina. Within the project vicinity, SR 1 has two lanes in each direction with a two-way left-turn lane and left-turn pockets provided at intersections north of Ocean Avenue. South of Ocean Avenue, SR 1 narrows to two lanes in the northbound direction, one lane in the southbound direction, and no median lane. The posted speed limit is 45 miles per hour (mph). Access to the school's main parking lot is provided via its signalized intersection with Ocean Avenue and a right-turn only driveway located approximately 700 feet south of Ocean Avenue. There are no sidewalks or bike lanes along SR 1 in the vicinity of the site.

Ocean Avenue is a two-lane east-west roadway that runs between Carmel High School/Carmel Hills Drive and Carmel Beach to the west. The speed limit on Ocean Avenue is 25 mph. On-street parking is prohibited on both sides of the street in the project vicinity. Ocean Avenue provides direct access to the school's parking lot, approximately 100 feet east of its signalized intersection with SR 1.

Carmel Hills Drive is a two-lane north-south roadway that runs north from Carmel High School/Ocean Avenue and terminates as a dead-end. The speed limit on Carmel Hills Drive is 25 mph. On-street parking is prohibited on both sides of the street in the project vicinity between 7 AM and 6 PM. Carmel Hills Drive provides direct access to the school's parking lot, at its intersection with Ocean Avenue, approximately 100 feet east of SR 1.

Morse Drive is a two-lane residential roadway in the vicinity of the project site. It begins at its unsignalized intersection with SR 1 (approximately 1,180 feet south of Ocean Avenue) and extends south to Carmel Hills Drive, where it transitions west to intersect again with SR 1 (approximately 1,500 feet south of the northerly intersection). The speed limit on Morse Drive is 25 mph. On-street parking is prohibited on both sides of the street in the project vicinity. Morse Drive provides direct access to a small parking lot located at the southern end of the school via a gated access drive aisle located approximately 50 feet east of SR 1.

Observed Existing Traffic Conditions

Traffic conditions were observed during the PM peak hour of traffic on a Friday evening (June 11, 2021 between the hours of 5:00 PM to 5:30 PM) in order to identify existing operational deficiencies.

No significant operational issues were observed along the SR 1 corridor between Carpenter Street and Carmel Valley Road. Northbound and southbound traffic volumes were approximately equal, and no lane imbalances were observed. Northbound and southbound queues at the intersections of SR 1/Carpenter Street, SR 1/Ocean Avenue, and SR 1/Carmel Valley Road did not extend to the next

adjacent signalized intersection and generally free-flowing traffic conditions were observed between intersections. Traffic conditions generally improved (i.e. shorter queues at intersections and decreasing number of vehicles) over the course of the observation period.

At the intersection of SR 1 and Ocean Avenue, no significant intersection operational deficiencies were observed:

- Southbound queues were not observed to extend past the upstream intersection with Flanders Drive and northbound queues were not observed to extend past Morse Drive. Additionally, the northbound left-turn and southbound left-turn pockets had adequate capacity to accommodate observed queues.
- Eastbound queues (within both the left-turn lane and left/through/right-turn lane) were not observed to extend past the upstream intersection with Hatton Road.
- Westbound queues (within both the left-turn lane and left/through/right-turn lane) were not observed to extend past the upstream intersection with North Carmel Hills Drive.

At the stop-controlled intersection of SR 1 and Morse Drive, short queues of fewer than four vehicles were observed waiting to turn onto SR 1. There were few observed vehicles making a southbound left-turn lane onto Morse Drive.

Intersection Operations

Due to the ongoing COVID-19 pandemic and its effect on normal traffic patterns, the evaluation of operations along SR 1 in the project vicinity relies on traffic data and analysis completed prior to the pandemic. Existing operations at the SR 1/Ocean Avenue intersection were obtained from a traffic analysis for a previously proposed development near the project site. The Rio Ranch Marketplace Traffic Impact Analysis (Keith Higgins, December 29, 2017) indicates that SR 1/Ocean Avenue operates at a Level of Service (LOS) C during the standard PM peak-hour based on counts collected on May 25, 2017.

The weekday PM peak hour typically occurs between the hour of 4:00 PM to 6:00 PM. It is during these times that the most congested traffic conditions occur on a typical weekday. However, the new Friday evening football games would not result in a significant increase in trips during the standard PM peak-hour due to the scheduled start time of Friday evening football games. Vehicular activity for the Friday evening football games is expected to occur later in the evening, approximately 30 minutes before and 30 minutes after the start of the varsity football game at 7:00 PM (approximately 6:30 PM to 7:30 PM). Traffic volumes tend to decrease significantly after 6:00 PM. Therefore, the peak arrival of attendees would not coincide with the standard PM peak hour of traffic. Therefore, it can be assumed that the SR 1/Ocean Avenue intersection would operate at LOS C or better conditions during the peak attendee arrival period of Friday evening football games. An intersection operating at LOS C or better is considered acceptable per Monterey County and Caltrans LOS standards.

Based on intersection LOS conditions at the intersection of SR 1/Ocean Avenue and the observed operations along SR 1, the proposed stadium lighting is not expected to result in an adverse effect on traffic operations along SR 1 that would warrant physical improvements. Furthermore, the traffic associated with the Friday night football games would occur only four to six times per year. The infrequent occurrence and short peak arrival and departure periods of attendees does not warrant major roadway improvements. Rather, it is recommended that the school district consider the implementation of temporary traffic control measures discussed in the following sections.

Existing On-Site Parking Facilities

The school's main parking lot is located along the project site frontage facing SR 1. Two-way access is provided via Ocean Avenue at the northern end of the lot, approximately 100 feet east of SR 1. A secondary access driveway located 700 feet south of Ocean Avenue provides direct right-in and right-out only access to SR 1. The lot provides 165 parking spaces. During Friday evening football games, visitors will be permitted to park in all parking spaces, including staff-designated spaces.
An additional parking lot that provides 36 parking spaces is located at the southern end of the school with two-way access provided via Morse Drive. It is estimated that the parking demand for current Saturday afternoon football games is approximately 154 vehicles based on the maximum 500 attendees and the surveyed 3.24 vehicle occupancy rate.

Proposed Parking Facilities

The proposed project includes two, new on-campus parking lots providing an additional 111 parking spaces. The proposed lots would be located northeast of the existing swimming pool, and south of the existing stadium, replacing the tennis courts, which also would include an 18-foot drive aisle, parallel to State Route 1, between the main, existing parking lot to the north and the new parking lot to the south (see Figure 2).

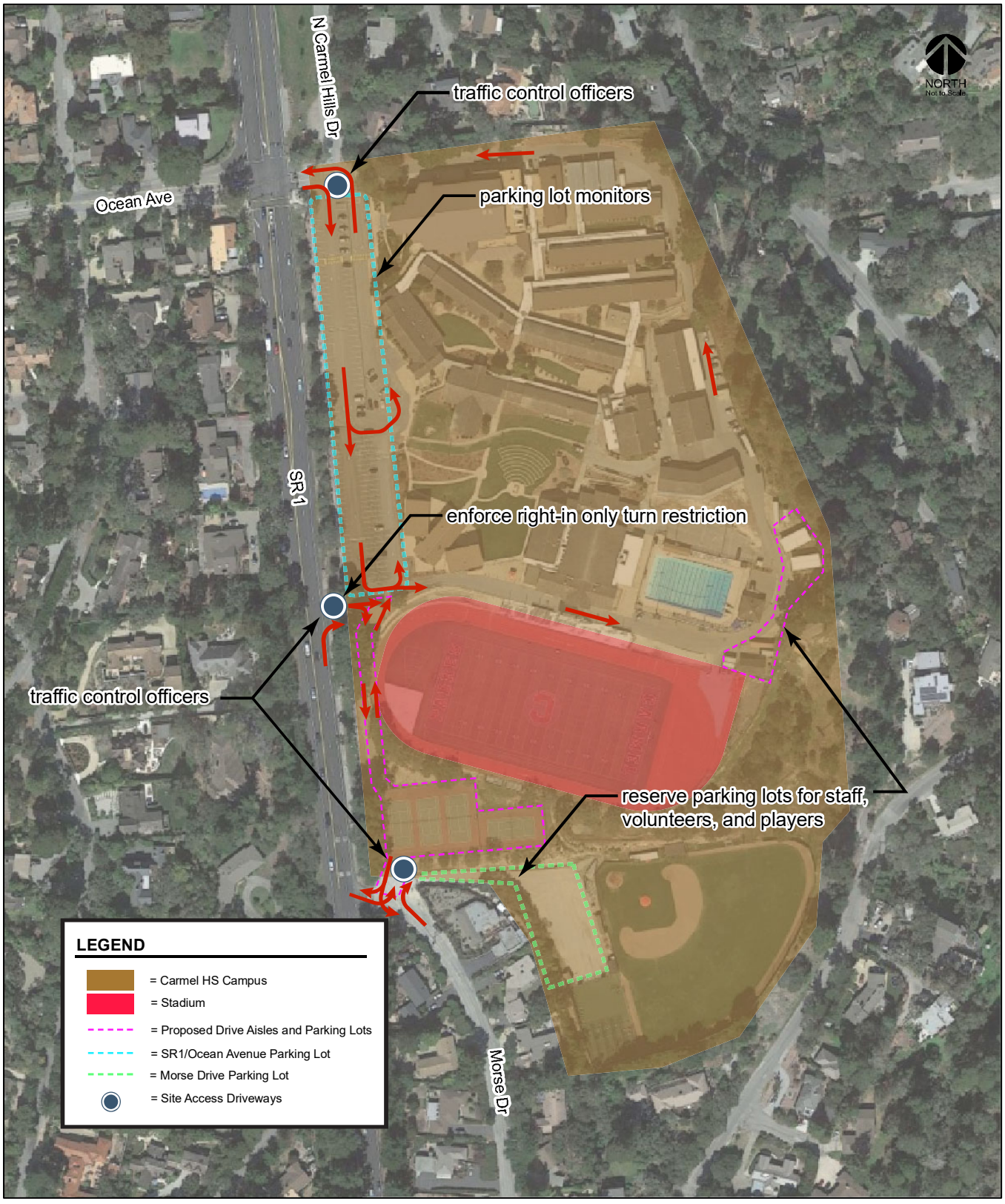
Proposed Parking Operations During Friday Evening Games

It is estimated that the parking demand for normal Friday night football games would be approximately 247 vehicles based on the anticipated 800 attendees and the surveyed 3.24 vehicle occupancy rate. It is likely that on-site parking would be inadequate to meet the parking demand for Friday night football games. Based on the existing capacity of existing parking lots, a majority of traffic would park within the Ocean Avenue parking lot. Circulation within the parking lot consists of a looping southbound-only drive aisle and northbound-only drive aisle which run between the two site access points located at the north and south ends of the lot. A cut-through aisle between the north-south drive aisles is located approximately half-way between the two access points. Circulation is continuous and the existing one-way operation of the drive aisles minimizes conflicts between inbound and outbound vehicles.

However, inbound queues into the parking lot could form during the peak-hour of arrivals. To facilitate access to the parking lot and to prevent excessive queueing onto SR 1, it is recommended that traffic control officers be deployed at both driveways on Ocean Avenue. Parking lot monitors should monitor the availability of parking spaces and should coordinate with officers to close inbound access when the parking lot is full.

The southerly driveway of the Ocean Avenue parking lot is an ingress-only driveway. However, some vehicles may attempt to exit via the southerly driveway, creating delays and potentially inhibiting circulation within the parking lot. During Friday evening football games, it is recommended that temporary signage be installed at the southerly driveway to prohibit vehicles from exiting. The placement of traffic control devices such as traffic cones along SR 1 may not be feasible due to no median being present between the northbound and southbound lanes.

Figure 2
Recommended Temporary Traffic Control Measures



The smaller parking lot on Morse Drive consists of a dead-end drive aisle, requiring vehicles to turn-around when exiting. Due to the limited capacity and to avoid excessive vehicles from attempting to enter the lot, it is recommended that all spaces at the lot be reserved for staff members, players, or volunteers. Signage should be posted at the driveway entrance prohibiting access to the general public.

As noted above, these measures would only be required during football games, which occur 4 to 6 times per year, and during off-peak hours starting approximately 6:00 PM and ending no later than 9:30 PM. Overall, it is recommended that the following measures be included as part of temporary traffic control during football games at the school campus (see Figure 2):

- The school should identify parking demand reduction measures to reduce the effect of football game parking on surrounding residential streets. Measures could include carpool matching, shuttle services from off-site parking, encouraging walking and biking to the games.
- Traffic control officers at each driveway to facilitate flow into and out of the campus parking lots.
- Parking lot monitors to monitor the availability of parking spaces and restrict access when the lot is full.
- Enforce right-in only turn restriction at the southerly driveway.
- Prohibit non-staff, non-volunteers, and non-players parking at the Morse Drive parking lot and proposed new parking lot along the eastern frontage.

Pedestrian and Bicycle Access

Pedestrian facilities in the study area include a crosswalk at the south approach of the SR 1/Ocean Avenue intersection and a sidewalk along the eastbound side of Ocean Avenue between SR 1 and Downtown Carmel. There are no sidewalks and bicycles facilities (i.e. bike lanes and bike routes) along SR 1 and most residential streets in the area, including Morse Drive and Carmel Hills Drive. Therefore, it is anticipated that a majority of attendees would drive to the school campus.