

APPENDIX F
Traffic

MEMORANDUM

To: ~~Josh Saunders~~Sean Kilkenny, Dudek
Carey Fernandes, Dudek

From: Sabita Tewani, Transportation Planner

Subject: Revised Trip Generation and Parking Requirement for Bonita Vista High School Track and Field Improvement Project

Date: ~~June 30, 2017~~August 12, 2020

Attachments: Figure 1, Existing and Future Project Trip Distribution
Figure 2, Bonita Vista High School Parking Supply
Figure 3, Bonita Vista High School Supplemental Parking Supply

This memorandum presents Dudek's estimate of trip generation and parking requirements for the proposed increase in stadium seating capacity at Bonita Vista High School (BVHS) associated with the proposed Bonita Vista High School Track and Field Project (project). The project site is located near the intersection of East H Street and Otay Lakes Road in Chula Vista, California.

PROJECT BACKGROUND AND TRIP GENERATION

The proposed project would involve upgrades to the school's existing football field, including installation of turf, an all-weather track, stadium lights, a sound system, and expanded stadium seating capacity (i.e., grandstand or bleachers). The temporary bleachers that currently accommodate approximately 760 spectators are proposed to be expanded to accommodate 3,000~~2,000~~ people. Since the project proposes an increase in the number of stadium seats, it is anticipated that there would be an increase in vehicular traffic on adjacent roadways and parking demand during football games hosted at the school site. Therefore, this trip generation and parking demand estimate memorandum was prepared to address concerns regarding project impacts on local traffic patterns and existing parking supply.

Trip Generation

Dudek staff examined the trip generation rates for sports facility land use types provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual (ITE 2012) and the San Diego Association of Governments' (SANDAG) (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (SANDAG 2002). Although ITE and SANDAG do

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not provide a trip generation rate for a high school sports facility, they provide trip rates for sports facilities such as outdoor stadiums, sports arenas, and soccer complexes. In addition to these published rates, traffic impact analyses available for similar high school athletic facilities were examined to estimate a trip generation rate for the proposed increase of stadium seating capacity at BVHS.

As shown in Table 1, the SANDAG average daily trip generation rate for an outdoor stadium is 0.200 trips per seat. The traffic impact analyses for the Valley High School Sports Complex in Santa Ana Unified School District (Garland Associates 2014) and St. Vincent Sports Complex at St. Ambrose University (Missman Inc. 2013) estimated that evening (PM) peak-hour trip generation rates of a high school sports facility with 3,500 seats and 2,500 seats, respectively, is in the range of 0.200 to 0.250 trips per seat. The trip generation rate for the Valley High School Sports Complex was based on a trip generation study that was conducted for a high school football game held at Orange Coast College Stadium (Garland Associates 2014). The trip generation rate for the St. Vincent Sports Complex was established using the ITE Trip Generation Manual for a sports arena and soccer complex (Missman Inc. 2013).

The Valley High School Sports Complex project has several similar characteristics to the BVHS track and field improvement project and was considered the most comparable example for the purposes of this analysis. The Valley High School Sports Complex included construction of a new 3,500-seat football stadium with lights, baseball fields, softball fields, outdoor basketball courts, and other amenities. The traffic analysis focused on the football stadium, since that was anticipated to generate the maximum volume of traffic compared to the other facilities proposed at the school site. Additionally, the rate for the Valley High School Sports Complex matches the SANDAG rate for outdoor stadiums (Garland Associates 2014). The St. Vincent Sports Complex project (Missman Inc. 2013) used rates from an older version of ITE's Trip Generation Manual, and was, therefore, considered less applicable.

Based on the trip generation rates available from the above-mentioned sources, and considering that the football games at the BVHS campus would be held during evenings, a rate of 0.200 per seat for the peak-hour trip was used for the proposed project. Using this rate, the proposed increase of stadium seating capacity to ~~3,000~~2,000 is estimated to generate approximately ~~600~~400 vehicle trips during its peak hour, which is anticipated to occur between 6 p.m. and 7 p.m. when the spectators would typically begin to arrive on the campus.

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Table 1
Trip Generation

Study	Number of Seats	Trip Generation Rate	Total Vehicle Trips (Peak Hour)
Brief Guide of Vehicular Traffic Generation rates for the San Diego Region ¹	N/A	0.200 trips per seat (daily weekday rate)	N/A
Traffic Impact Analysis for the Proposed Valley High School Sports Complex, Santa Ana Unified School District ²	3,500	0.200 trips per seat (PM peak hour)	700
St. Vincent Sports Complex Parking & Traffic Study, St. Ambrose University, Davenport, Iowa ³	2,500	0.250 trips per seat (PM peak hour)	625
Proposed Project (BVHS)	3,000 2,000	0.200 trips per seat (PM peak hour)	600 400

Sources:

- ¹ SANDAG 2002
- ² Garland Associates 2014
- ³ Missiman Inc. 2013

SANDAG’s (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region states that the AM and PM highest peak hours of an adjacent street to the project site occur between 6:00 a.m. and 9:30 a.m. and 3:00 p.m. and 6:30 p.m. (SANDAG 2002). The games at BVHS are scheduled to occur in the evenings from 7 p.m. to approximately 10 p.m., which is after the evening peak hour of the adjacent street.

Trip Distribution and Assignment

Currently, BVHS football home games are played at the Southwestern College football stadium. Southwestern College parking lots J North and J East line the stadium to the south and are used by the spectators who attend BVHS games at Southwestern College. According to Sweetwater Unified High School District staff, spectators do not typically park at BVHS and walk to Southwestern College for home games (Jazmin 2017). The parking lots for the Southwestern College football stadium are accessed from East H Street and Otay Lakes Road. With the BVHS home games being relocated to the new BVHS field, it is anticipated that project traffic would use the intersection of East H Street/BVHS parking lot (i.e., south campus parking lot) and Otay Lakes Road/BVHS parking lot (i.e., west campus parking lot) to access parking on BVHS.

To understand the change in traffic patterns that would occur with football games being relocated to BVHS from Southwestern College, Dudek staff examined the trip distribution of football-game-related traffic under existing and proposed project conditions. Average daily traffic volumes were used to estimate an approximate percentage of trips that would use the roadway

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segments to access Southwestern College and BVHS during football games. SANDAG's 2015 average daily traffic volumes for East H Street and Otay Lakes Road in the vicinity of the project site were used to estimate the trip distribution percentage (SANDAG 2015). Based on the trip distribution along roadway segments, driveway trip distribution for existing and proposed conditions for Southwestern College and BVHS parking access was estimated.

Figure 1 shows the trip distribution of traffic generated by BVHS football games (percent project traffic) for existing and proposed conditions. Based on the percentage of traffic along East H Street and Otay Lakes Road, it was estimated that, under existing conditions, approximately 50% of football-game-related project traffic access Southwestern College via East H Street, and the remaining 50% access the college via Otay Lakes Road. Under proposed conditions, it is anticipated that approximately 75% of football-game-related traffic would access BVHS via East H Street, and the remaining 25% would access BVHS via Otay Lakes Road. Dudek staff assumed that a higher percentage of proposed football-game-related traffic would access BVHS off East H Street because there are more parking spaces available near this entrance.

The Final Mitigated Negative Declaration for Southwestern College Whole Site Modernization Project, located southwest of Otay Lakes Road and East H Street across from BVHS, provides a level of service analysis for intersections and roadway segments in the local area. As part of that project, a traffic study evaluated the roadway segments of Otay Lakes Road and East H Street, and the intersections of Otay Lakes Road/East H Street, East H Street/BVHS entrance, and Otay Lakes Road/BVHS driveway near BVHS. Under existing, cumulative, and long-term conditions with and without the proposed Southwestern College Wellness Center (i.e., the Whole Site Modernization Project), analyzed roadway segments and intersections in the vicinity of BVHS were shown to operate under acceptable level of service conditions (KOA Corporation 2015). A level of service analysis of roadway segments and intersections with proposed football game traffic is not included in this memo.

PARKING ANALYSIS

Dudek staff conducted a field survey on Friday, June 16, 2017, to assess the existing parking supply on the BVHS campus. Both on-site parking on the BVHS campus and on-street parking in the vicinity of the project site were counted to provide an estimate of existing parking supply. Parking supply and demand for the proposed project is summarized below.

East H Street is a six-lane roadway with a raised median, Class 2 bike lanes (i.e., dedicated, striped bike lanes within the vehicular right-of-way), and a 45-mile-per-hour (mph) posted speed limit west of Otay Lakes Road (the speed limit increases to 50 mph west of Buena Vista Way). East of Otay

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Lakes Road, East H Street is a four-lane roadway with a raised median, Class 2 bike lanes, and a 35 mph posted speed limit. Southeast of BVHS, street parking is permitted on East H Street.

The north/south segment of Otay Lakes Road/La Media Road runs adjacent to the BVHS campus and, generally, from Bonita Road south to Santa Luna Street. Within the project area, this facility is a six-lane roadway with a raised median, Class 2 bike lanes, and a 40 mph posted speed limit. On-street parking is not permitted on Otay Lakes Road in the vicinity of BVHS.

Parking Supply at BVHS

Figures 2 and 3 illustrate the locations and number of on-site and on-street parking spaces available on and near the BVHS campus. On-site parking on the BVHS campus is available at two main parking lots off East H Street and Otay Lakes Road. The parking lot off East H Street has a capacity of 445 parking spaces, and the parking lot off Otay Lakes Road has a capacity of 115 spaces. On-street parking is available along the north and south sides of East H Street in the vicinity of BVHS, and is included in the estimate of existing parking supply. There are smaller parking areas, referred to as supplemental parking lots in this memo, on the BVHS site that were also identified and counted in the parking supply. Table 2, Parking Supply, lists the available parking spaces on the BVHS campus and nearby along East H Street.

**Table 2
Parking Supply**

Parking Lot	Number of Spaces
Parking Lot off East H Street	445
Parking Lot off Otay Lakes Road	115
On-Site Supplemental Parking Spaces*	95
East H Street	50 (approximately)
Total Parking Spaces	705

* These spaces are located behind gates and in the interior of the BVHS campus, or are marked for BVHS staff use.

Parking Demand at BVHS

Per City of Chula Vista’s Municipal Code, the parking requirement for a high school is 1 space per 4 students. For sports arenas, the parking requirement is 1 space for every 3.5 seats of maximum capacity. BVHS has an enrollment of approximately 2,500 students, and per the City of Chula Vista’s Municipal Code, approximately 625 parking spaces are required on campus. BVHS has adequate parking supply for the high school per City of Chula Vista (City) standards. As proposed, the capacity of BVHS athletic field seating would increase to accommodate

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~~3,000~~2,000 permanent seats. Therefore, the parking requirement for the proposed project was calculated using the City’s parking requirement for a sports arena. As shown in Table 3, Parking Demand, the number of parking spaces required for a sports facility with ~~3,000~~2,000 seats is ~~857~~571 spaces. Therefore, using the City’s parking requirement for a sports arena, existing parking supply on the BVHS campus and on-street parking along East H Street would ~~not~~ be adequate to accommodate parking demand during future footballs held on the BVHS campus.

**Table 3
Parking Demand**

Use	Chula Vista Municipal Code	Bonita Vista High School	No. of Parking Spaces Required	Number of Parking Spaces Available
Sports Arena	1 space for every 3.5 seats of maximum seating capacity	3,000 <u>2,000</u> seats	857 <u>571</u>	Main Parking Lots: 560 spaces
				Supplemental Parking: 95 spaces
				On-Street Parking: 50 spaces

Sources: City of Chula Vista Municipal Code and assessments performed by Dudek staff in 2017.

BVHS Football Games Ticket Sales Analysis

BVHS provided Dudek with ticket sales information for home games held during the 2015/2016 and 2016/2017 seasons. Table 4 shows that ticket sales varied between 754 tickets and 2,245 tickets sold per game. The highest number of tickets was sold on October 9, 2015, with 996 student tickets and 1,249 adult tickets (i.e., a total of 2,245 tickets). The lowest number of tickets was sold on October 7, 2017, with 401 student tickets and 353 adult tickets (i.e., a total of 754 tickets) (Jazmin 2017).

In the absence of any data available for parking demand on the days these games were held, the number of vehicles was estimated assuming an average occupancy of 3.5 persons per vehicle. This average vehicle occupancy rate is based on the City’s Municipal Code parking requirement that specifies that 1 parking space be provided for each 3.5 seats; hence, it was concluded that, on average, 3.5 persons would use one vehicle to arrive at BVHS football games.

Table 4 provides an estimate of the number of vehicles based on ticket sales information and average vehicle occupancy. As shown in Table 4, ticket sales demonstrate that the maximum number of tickets sold in previous seasons was 2,245 (Jazmin 2017), which would generate a parking demand of approximately 641 parking spaces, per the City’s Municipal Code.

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Table 4
Trip Generation Based on BVHS Football Ticket Sales

Date	Number of Student Tickets Sold	Number of Adult Tickets Sold	Total Tickets	Estimated Number of Vehicles (assuming average occupancy 3.5 per car)
8/28/2015	494	724	1,218	348
10/2/2015	480	912	1,392	398
10/9/2015	996	1,249	2,245	641
11/6/2015	1,110	1,033	2,143	612
11/20/2015	637	488	1,125	321
11/27/2015	438	442	880	251
12/11/2015	588	440	1,028	294
9/9/2016	649	630	1,279	365
9/16/2017	686	541	1,227	351
10/7/2017	401	353	754	215
10/14/2017	677	753	1,430	409
10/21/2017	437	553	990	283

Source: Jazmin 2017

TRANSIT

The BVHS campus and immediate vicinity is currently served by four Metropolitan Transit System bus routes. Bus service may be available for spectators to arrive at the BVHS campus for evening sporting and other miscellaneous events, but most of these routes (three of four) do not operate in the project area after 8:30 p.m. The following bus routes serve BVHS (MTS 2017):

1. Route 705 runs between the E Street Trolley Station and Southwestern College via Plaza Bonita and Otay Lakes Road. Route 705 currently provides services during weekdays and Saturdays, but not on Sundays. The closest bus stop to BVHS is located approximately 275 feet north of the East H Street/Otay Lakes Road intersection at the BVHS campus driveway. During weekday service, the last westbound bus operating in the project area leaves Southwestern College on a heading toward the E Street Transit Center at 6:18 p.m. The last eastbound bus operating in the project area arrives at Southwestern College at 6:45 p.m.
2. Route 707 runs between Southwestern College and the Otay Ranch Town Center via East H Street and East Lake Parkway. Route 707 currently provides services during weekdays (Monday–Friday) only. The closest bus stop to BVHS on this route is located along East H Street, both in the eastbound and westbound directions near the East H Street/Auburn Avenue intersection and the East H Street/BVHS parking lot intersection, respectively. During weekday service, the last southbound bus operating in the project area leaves

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Southwestern College on a heading toward Otay Ranch Town Center (via East H Street) at 5:17 p.m. Northbound buses arrive at Southwestern College (passing BVHS) at 6:11 p.m. and 7:26 p.m.

3. Route 709 runs between the H Street Trolley Station and Southwestern College via East H Street. Route 709 currently provides services during weekdays and Saturdays, but not on Sundays. The closest bus stop to BVHS is located along East H Street, both in the eastbound and westbound directions near the East H Street/Buena Vista Way intersection and the East H Street/Otay Lakes Road intersection, respectively. During weekdays, evening service in the project area is relatively consistent, with westbound buses arriving and departing Southwestern College every 30 minutes between approximately 6:15 p.m. and 9:15 p.m. The last westbound bus leaves Southwestern College at 10:14 p.m., and the last eastbound bus departs Southwestern College at 10:45 p.m. and provides service between the college and Olympic Parkway and Eastlake Parkway.
4. Route 712 runs between the Palomar Street Trolley Station and Southwestern College via Palomar Street. Route 712 currently provides services during weekdays and on the weekends. The closest bus stop is located at Southwestern College near Parking Lot O (i.e., on-campus parking lot located adjacent to Otay Lakes Road near main eastern campus driveway). Eastbound buses arrive at Southwestern College every 30 minutes between 5 p.m. and 9 p.m., and westbound buses depart the college every 30 minutes between 5 p.m. and 8 p.m. The last westbound bus departs Southwestern College at 8:16 p.m.

It should be noted that due to shelter in place restrictions because of COVID-19, the frequency of transit services has been reduced and the above-mentioned routes are operating at a modified schedule.

CONCLUSION AND RECOMMENDATIONS

Dudek staff estimated the trip generation and parking demand for the proposed increase of stadium seating capacity at BVHS located near the intersection of East H Street and Otay Lakes Road in Chula Vista, California.

BVHS home football games are currently held at the Southwestern College football stadium. Following implementation of the proposed project, these games would be relocated to the BVHS campus, and the new stadium would be capable of accommodating up to ~~3,000~~2,000 spectators.

As shown in the trip generation section of this memo, the future on-campus football games are anticipated to generate ~~600~~400 peak-hour trips, which are anticipated to occur between 6 p.m.

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and 7 p.m. when the spectators would begin to arrive on campus. Since future on-campus football games are anticipated to generate traffic after the peak hour of the adjacent roadway network, a level of service analysis was not conducted.

As shown in the parking analysis section, BVHS has approximately 560 parking spaces within two main on-site parking lots, and 95 supplemental on-campus parking spaces. Also, approximately 50 parking spaces are available along East H Street to the east of the BVHS campus. Based on the City of Chula Vista Municipal Code, BVHS provides an adequate number of parking spaces for students; however, per the Municipal Code, a sports arena land use type has a greater trip generation rate than a high school. Approximately ~~857~~571 parking spaces would be required for a sports facility with ~~3,000~~2,000 seats and as mentioned above BVHS has approximately 560 parking spaces available within two main on-site parking lots. Therefore, BVHS may need to provide additional parking spaces during events to accommodate capacity crowds at future on-campus football games.

The following measures are recommended to fulfill the shortage of parking spaces during major sports and athletic events (mainly football games) at the BVHS campus:

- Use supplemental parking spaces (illustrated in Figure 3) available on the BVHS campus and on-street parking along East H Street during events that may require additional parking spaces.
- Use other available areas on campus, such as the space adjacent to the baseball field located in the northeast corner of the BVHS site for temporary parking.
- Lease or share the parking lot with Southwestern College during football games that are anticipated to draw capacity crowds and require more parking than are currently available on the BVHS campus and along East H Street.
- Identify other parking facilities in the vicinity of BVHS (i.e., at other Sweetwater Union High School District schools such as Bonita Vista Middle School or at City parks), and consider the feasibility of remote parking with shuttle service to BVHS.

REFERENCES

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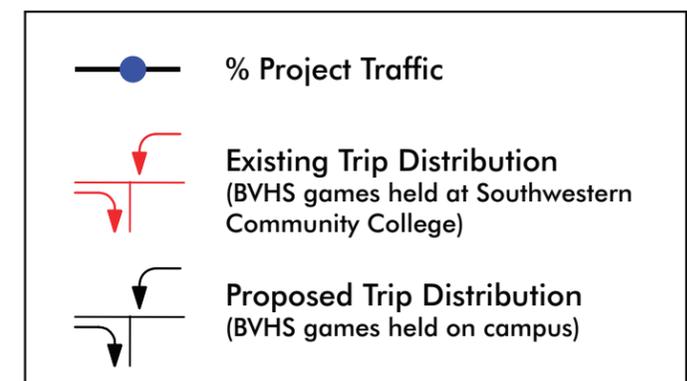
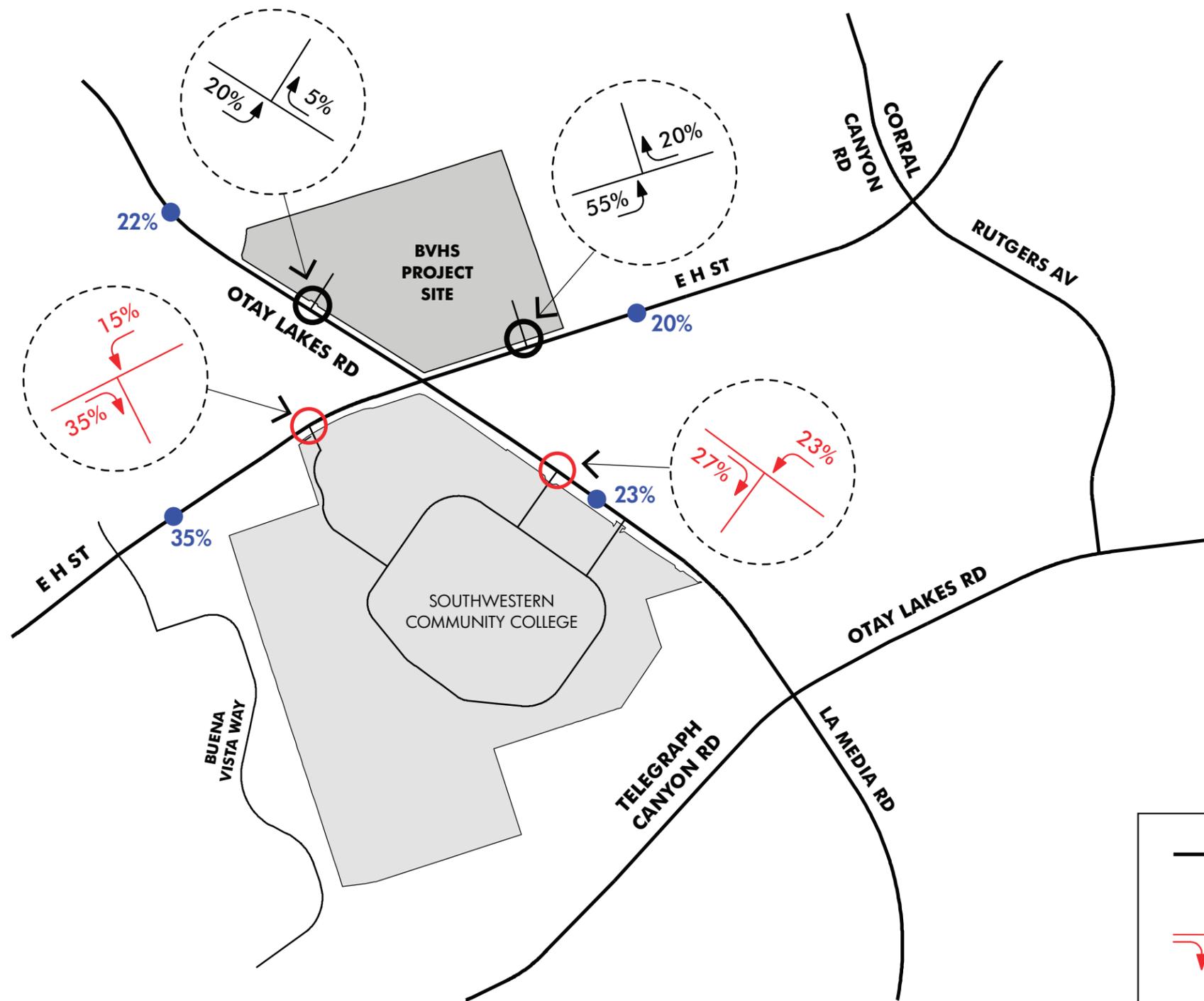
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SOURCE: Background-SANGIS GIS Roads



SOURCE: Bing Maps (Accessed 2017)

DUDEK

Bonita Vista High School Project

FIGURE 2
Bonita Vista High School Parking Supply



SOURCE: Bing Maps (Accessed 2017)

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FIGURE 3
Bonita Vista High School Supplemental Parking Supply

