Traffic Impact Study
American Family Entertainment Center

Prepared for: City of Rancho Cordova

Prepared by: DKS Associates

July 20, 2012

1. Introduction

DKS Associates evaluated the transportation impacts of the proposed American Family Entertainment Center (AFEC) project on Kilgore Road. This report summarizes the methodology, analyses, and conclusions of that assessment

The analysis addresses project traffic impacts on roadways, intersections, and freeway facilities, as well as impacts on bikeway, pedestrian and transit facilities within the project "study area" under existing and cumulative conditions. Mitigation measures are identified to address project impacts where appropriate.

As part of the traffic analysis, the following analyses were conducted:

- Existing Conditions Analysis – Existing roadway operations were analyzed using existing roadway geometrics and existing volumes obtained from traffic count data. This analysis represents the baseline conditions, against which the project impacts are compared.

- Cumulative Conditions Analysis – Roadway conditions that are projected to occur in the year 2035 were also analyzed. This planning horizon incorporates roadway improvement projects in the City's Capital Improvement Plan (CIP) and projects identified in the SACOG *Metropolitan Transportation Plan for 2035* (MTP 2035) that are outside the city limits. This analysis represents the cumulative traffic conditions, for purposes of determining if the project would cause or contribute to a significant cumulative impact.

2. Setting

2.1 Study Area

The site location and surrounding roadway network are shown in **Figure 1**. The project site is in the City of Rancho Cordova on the east side of Kilgore Road. Based on an analysis of the trip generation and trip distribution of the proposed project, plus consultation with City staff, the following intersections and roadway segments were selected for the traffic impact analysis:

Study Intersections

1. Sunrise Boulevard and Zinfandel Drive
2. Sunrise Boulevard and US 50 WB Ramps
3. Sunrise Boulevard and US 50 EB Ramps
4. Sunrise Boulevard and Folsom Boulevard
5. Sunrise Boulevard and Trade Center Drive
6. Sunrise Boulevard and Sun Center Drive
7. Sunrise Boulevard and White Rock Road
8. Kilgore Road and Folsom Boulevard
9. Kilgore Road and Trade Center Drive
10. Kilgore Road and Sun Center Drive
11. Kilgore Road and White Rock Road
12. Zinfandel Drive and US 50 WB Ramps
13. Zinfandel Drive and US 50 EB Ramps/Gold Center Drive
14. Zinfandel Drive and White Rock Road

Roadway Segments

- Sunrise Boulevard: Zinfandel Drive to US 50 WB Ramps
- Sunrise Boulevard: US 50 EB Ramps to Folsom Boulevard
- Sunrise Boulevard: Folsom Boulevard to Trade Center Drive
- Sunrise Boulevard: Trade Center Drive to Sun Center Drive
- Sunrise Boulevard: Sun Center Drive to White Rock Road
- Sunrise Boulevard: White Rock Road to International Drive
- Kilgore Road: Folsom Boulevard to Trade Center Drive
- Kilgore Road: Trade Center Drive to Sun Center Drive
- Kilgore Road: Sun Center Drive to White Rock Road
- Zinfandel Drive: Folsom Boulevard to White Rock Road
- White Rock Road: Zinfandel Drive to Prospect Park Drive
- White Rock Road: Prospect Park Drive to Kilgore Road
- White Rock Road: Kilgore Road to Sunrise Boulevard
- Folsom Boulevard: Zinfandel Drive to Olsen Drive
- Folsom Boulevard: Olsen Drive to Kilgore Road
- Folsom Boulevard: to Kilgore Road to Sunrise Boulevard
- Trade Center Drive: Kilgore Road to Sunrise Boulevard
- Sun Center Drive: Kilgore Road to Sunrise Boulevard

2.2 Roadway Network

Figure 1 indicates the location of the proposed project site and the number of lanes on the major roadways in the project's vicinity. The following describes key transportation facilities within the study area:

U.S. Highway 50 is an east-west freeway that originates in West Sacramento, traverses through El Dorado County and continues across the country. U.S. 50 has four lanes in each direction from west of Bradshaw Road to Sunrise Boulevard. From Sunrise Boulevard to Hazel Avenue it has three lanes in each direction plus a high-occupancy vehicle (HOV) lane. East of Hazel Avenue, U.S. 50 has two lanes in each direction plus an HOV lane.

Sunrise Boulevard is a north-south arterial roadway that originates at Grant Line Road on the south and terminates on the north within City of Roseville. It has two lanes between Grant Line Road and Kiefer Boulevard, five lanes from Kiefer Boulevard to Douglas Road, six lanes between Douglas Road and Fitzgerald Road, five lanes from Fitzgerald Road to White Rock Road, and six lanes north of White Rock Road. The U.S. 50/Sunrise Boulevard interchange, which will provide regional access to the site, is a partial cloverleaf (L-9) configuration with loop on-ramps in the northeast and southwest quadrants and diagonal ramps in all four quadrants. The project site is bound on the west by Sunrise Boulevard.

White Rock Road is an east-west arterial roadway that originates on the west at International Drive and extends east into El Dorado County. It is a two-lane roadway between International Drive and Zinfandel Drive, a six-lane arterial roadway between Zinfandel Drive and Sunrise Boulevard, except for a short five-lane segment east of Kilgore Road. It returns to a two-lane roadway east of Sunrise Boulevard.

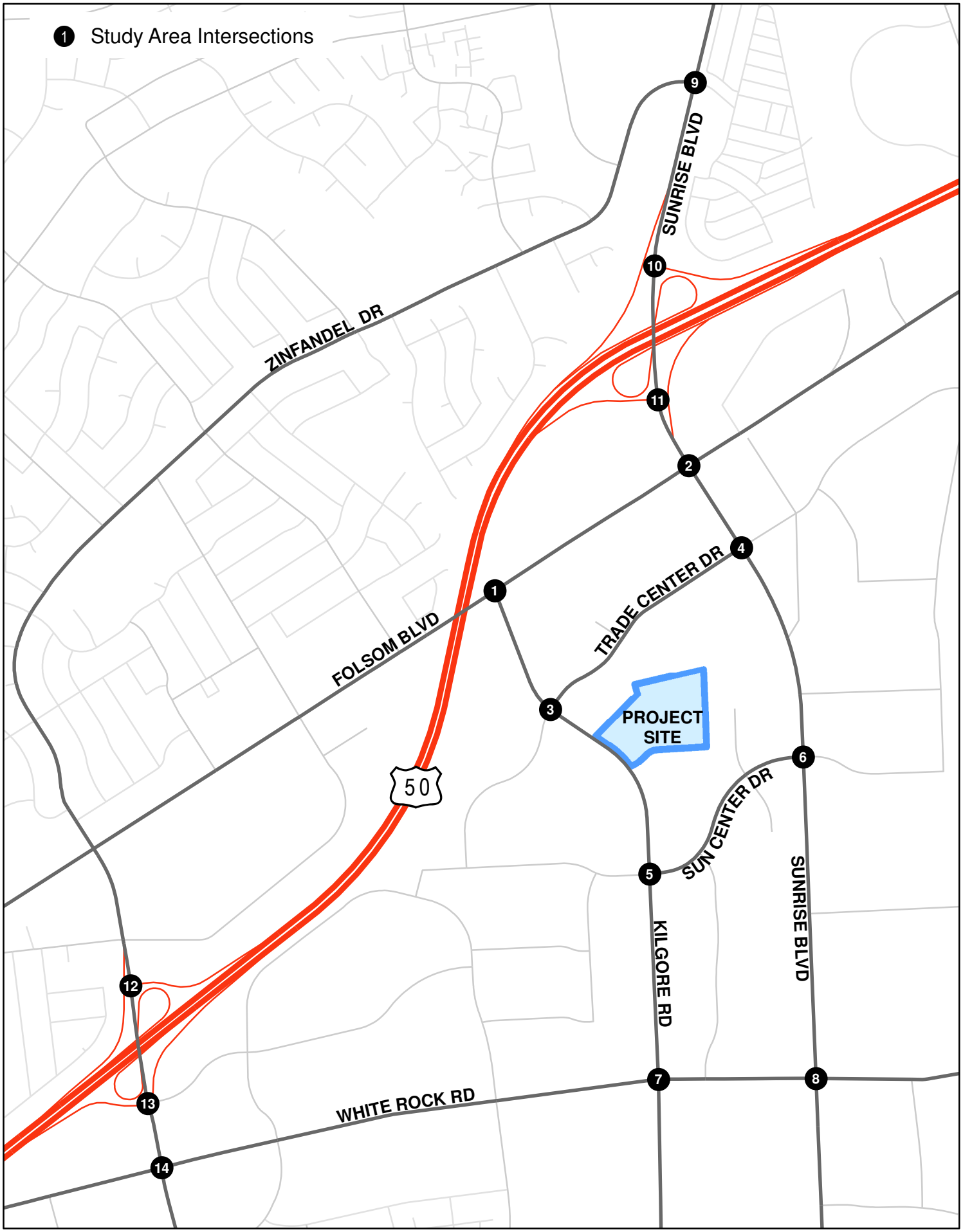


Figure 1
Study Area Roadways and Intersections

Zinfandel Drive originates on the north at Sunrise Boulevard and terminating on the south at Douglas Road. Zinfandel Road is six lanes from the U.S. 50 westbound ramps to about Baroque Drive, four-lanes from Baroque Drive to the City limits and two lanes from the City Limits to Douglas Road. The U.S. 50/Zinfandel Drive interchange is a partial cloverleaf (L-9) configuration with loop on-ramps in the northeast and southwest quadrants and diagonal ramps in all four quadrants.

Folsom Boulevard is a four lane arterial roadway that extends from the Alhambra Boulevard in Sacramento to Greenback Lane in the City of Folsom.

Kilgore Road runs from Folsom Boulevard on the north to Baroque Drive on the south. It has two lanes north of White Rock Road and four lanes south of White Rock Road.

Trade Center Drive is a two lane roadway that runs from Sun Center Drive on the west to Mercantile Drive on the east.

Sun Center Drive is a two lane roadway that runs from Prospect Park Drive on the west to Sunrise Boulevard on the east.

2.3 Level of Service Methodology

Traffic operations with and without the project were evaluated by determining the facility's Level of Service (LOS). LOS represents a quantitative performance measure reported qualitatively on a scale of A to F with LOS A corresponding to the best operating conditions and LOS F the worst.

Intersections

Study intersections were analyzed using procedures and methodologies defined in the Highway Capacity Manual (Transportation Research Board, 2000). LOS definitions for signalized and unsignalized intersections are presented in **Tables 1 and 2** respectively. The LOS for signalized and all-way stop-controlled intersections is based on the average control delay of all vehicles traveling through the intersection. The LOS for side-street stop-controlled intersections is determined by the movement with the greatest average delay.

TABLE 1
LEVEL OF SERVICE CHARACTERISTICS FOR SIGNALIZED INTERSECTIONS

Level of Service	Description	Average Vehicle Delay (seconds)
A	Uncongested operations; all queues clear in single cycle.	≤10
B	Very light congestion; an occasional phase is fully utilized.	>10-20
C	Light congestion; occasional queues on approaches.	>20-35
D	Significant congestion on critical approaches, but intersection is functional. Cars required to wait through more than one cycle during short peaks. No long-standing queues formed.	>35-55
E	Severe congestion with some long-standing queues on critical approaches. Traffic queue may block nearby intersection(s) upstream of critical approach(es).	>55-80
F	Total breakdown, stop-and-go conditions.	>80

SOURCE: Highway Capacity Manual, Transportation Research Board (2000)

TABLE 2
LEVEL OF SERVICE CHARACTERISTICS FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Description	Average Vehicle Delay (seconds)
A	Little or no delay.	0-10
B	Short traffic delays.	>15-10
C	Average traffic delays.	>15-25
D	Long traffic delays.	>25-35
E	Very long traffic delays.	>35-50
F	Stop-and-go conditions.	>50

SOURCE: Highway Capacity Manual, Transportation Research Board (2000)

Roadway Segments

Roadway segments were analyzed by comparing the average daily traffic volume to daily traffic volumes thresholds (i.e., capacities) consistent with those presented in the Rancho Cordova General Plan EIR. **Table 3** displays the daily volume thresholds for various facility types.

TABLE 3
LEVEL OF SERVICE DEFINITIONS FOR STUDY ROADWAYS

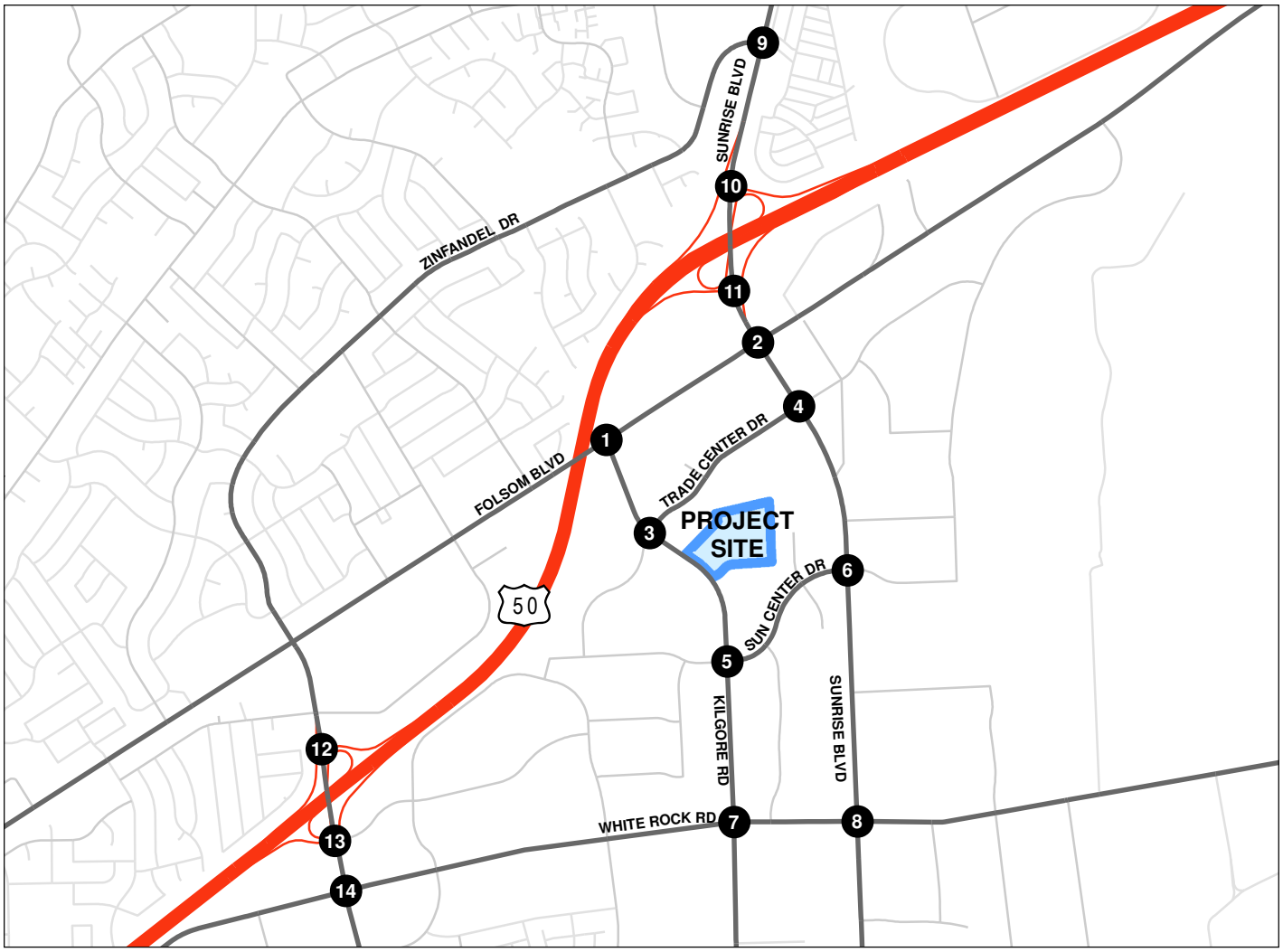
Facility Type	Maximum Daily Volume				
	LOS A	LOS B	LOS C	LOS D	LOS E
2-Lane Arterial - High Access Control	12,000	14,000	16,000	18,000	20,000
4-Lane Arterial - High Access Control	24,000	28,00	32,000	36,000	40,000
6-Lane Arterial - High Access Control	36,000	42,000	48,000	54,000	60,000
2-Lane Arterial - Medium Access Control	10,800	12,600	14,400	16,200	18,000
4-Lane Arterial - Medium Access Control	21,600	25,200	28,800	32,400	36,000
6-Lane Arterial - Medium Access Control	32,400	37,800	43,200	48,600	54,000
2-Lane Arterial - Low Access Control	9,000	10,500	12,000	13,500	15,000
4-Lane Arterial - Low Access Control	18,000	21,000	24,000	27,000	30,000
6-Lane Arterial - Low Access Control	27,000	31,500	36,000	40,500	45,000
2-Lane Rural Highway	1,800	3,600	5,900	10,100	17,000

SOURCE: Rancho Cordova General Plan EIR, 2006.

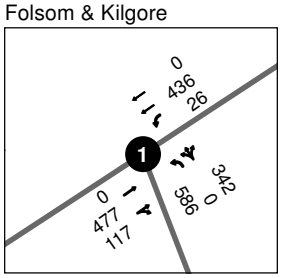
2.4 Existing Traffic Conditions

Existing Peak Hour Traffic Volumes

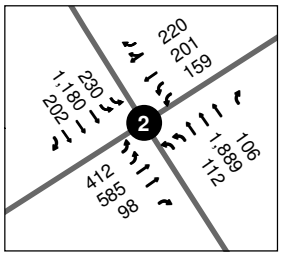
As described in Section 4, the traffic impact study focuses on the proposed project's impacts during a weekday PM peak hour. The traffic counts used for the existing conditions operational analysis were collected on weekdays during the afternoon (between 4:00 and 6:00 PM) peak period. The recent extensions of International Drive (between Kilgore Road and Sunrise Boulevard) and Zinfandel Drive (south to Douglas Road) have changed traffic patterns on some roadways. Thus intersections counts were conducted at 8 of the 14 study intersections in May 2012. For six intersections, traffic counts conducted in 2008 were determined to be adequate for the existing conditions analysis. Roadway segment "hose" traffic counts were collected by the City on weekdays during 2012. **Figure 2** shows existing PM peak hour volumes and geometrics



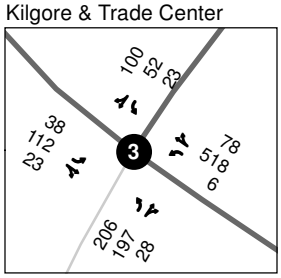
Folsom & Kilgore



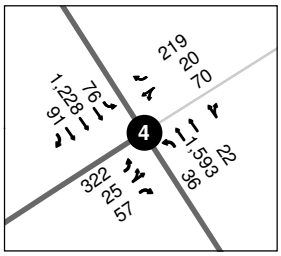
Sunrise & Folsom



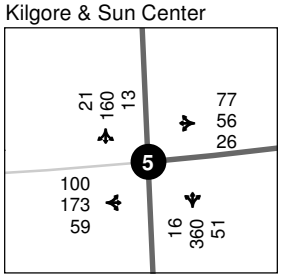
Kilgore & Trade Center



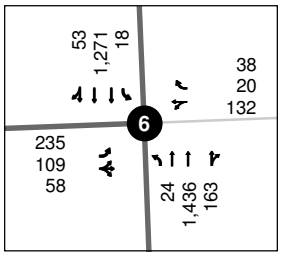
Sunrise & Trade Center



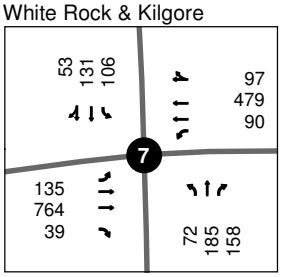
Kilgore & Sun Center



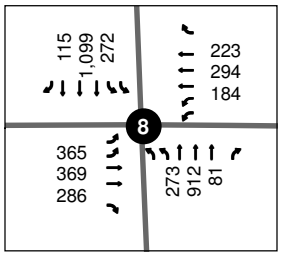
Sunrise & Sun Center



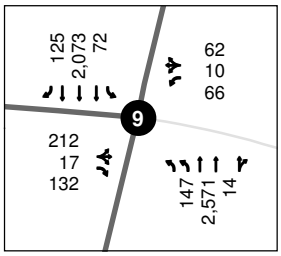
White Rock & Kilgore



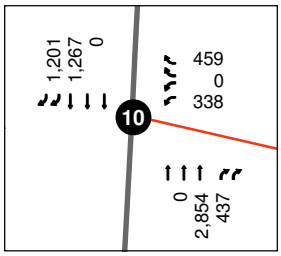
White Rock & Sunrise



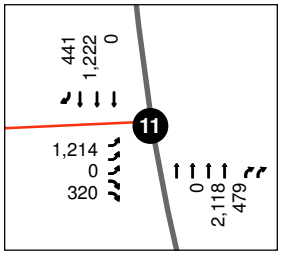
Sunrise & Zinfandel



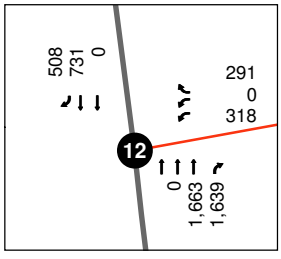
Sunrise & US 50 WB



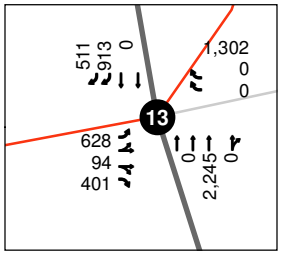
Sunrise & US 50 EB



Zinfandel & US 50 WB



Zinfandel & US 50 EB



White Rock & Zinfandel

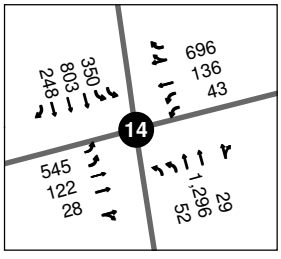


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FIGURE 2
Existing PM Peak Hour Volumes and Intersection Geometrics

Existing Peak Hour Intersection Operations

Table 4 indicates the delay and corresponding LOS for each of the study intersections during both the AM and PM peak hours. Traffic operations were analyzed at each study intersection using the procedures described previously. Of the 14 study intersections, four currently operate at unacceptable conditions during the PM peak hour.

Existing Roadway Segment Operations

Table 5 summarizes the number of lanes, average daily traffic (ADT), volume-to-capacity (v/c) ratio and the calculated LOS for study roadway segments.

TABLE 4
INTERSECTION CONTROL DELAY AND LEVEL OF SERVICE - EXISTING CONDITIONS

Intersection	Traffic Control	PM Peak Hour	
		Delay[1]	LOS[2]
1. Kilgore Road and Folsom Boulevard	Signal	23.0	C
2. Sunrise Boulevard and Folsom Boulevard	Signal	30.5	C
3. Kilgore Road and Trade Center Drive	Signal	29.6	C
4. Sunrise Boulevard and Trade Center Drive	Signal	26.4	C
5. Kilgore Road and Sun Center Drive	4-way Stop	15.6	C
6. Sunrise Boulevard and Sun Center Drive	Signal	24.6	C
7. Kilgore Road and White Rock Road	Signal	29.2	C
8. Sunrise Boulevard and White Rock Road	Signal	33.4	C
9. Sunrise Boulevard and Zinfandel Drive	Signal		**F[3]**
10. Sunrise Boulevard and U.S. 50 Westbound Ramps	Signal	15.3	B
11. Sunrise Boulevard and U.S. 50 Eastbound Ramps	Signal		E[4]
12. Zinfandel Drive/U.S. 50 Westbound Ramps	Signal	**64.5**	**E**
13. Zinfandel Drive/U.S. 50 Eastbound Ramps	Signal	**58.7**	**E**
14. Zinfandel Drive/White Rock Road	Signal	32.1	C
15. Kilgore and Project Main Entrance – All Approaches	Unsignalized		
– Westbound Approach	Stop sign		

1 Average intersection control delay in seconds per vehicle.
2 Level of Service based on Highway Capacity Manual (Transportation Research Board, 2000).
3. Delay fluctuates significantly from day to day but observations indicate that this intersection often operates at LOS F conditions during the PM peak hour.
4. Delay fluctuates significantly from day to day and engineers actively over-ride signal timing to prevent queues on eastbound off-ramp from backing up onto US 50 mainline. Observations indicate that this intersection often operates at LOS E conditions during the PM peak hour.
BOLD text indicates that the intersection operates unacceptably based on the significance criteria.
SOURCE: DKS Associates 2012

TABLE 5
ROADWAY LEVEL OF SERVICE - EXISTING CONDITIONS

Roadway Segment	Lanes	ADT[1]	V/C[2]	LOS[3]
Sunrise Boulevard: Zinfandel Drive to US 50 WB Ramps	6	75,900	1.41	**F**
Sunrise Boulevard: US 50 EB Ramps to Folsom Boulevard	6	61,400	1.14	**F**
Sunrise Boulevard: Folsom Boulevard to Trade Center Drive	6	52,300	0.97	**E**
Sunrise Boulevard: Trade Center Drive to Sun Center Drive	6	*41,700*	0.77	C
Sunrise Boulevard: Sun Center Drive to White Rock Road	6	31,100	0.58	A
Sunrise Boulevard: White Rock Road to International Drive	6	31,300	0.58	A
Kilgore Road: Folsom Boulevard to Trade Center Drive	2	5,100	0.28	A
Kilgore Road: Trade Center Drive to Sun Center Drive	2	6,100	0.34	A
Kilgore Road: Sun Center Drive to White Rock Road	2	6,100	0.34	A
Zinfandel Drive: Folsom Boulevard to US 50	4	8,300	0.46	A
Zinfandel Drive: US 50 to White Rock Road	6	23,700	0.66	B
White Rock Road: Zinfandel Drive to Prospect Park Drive	6	42,300	0.78	C
White Rock Road: Prospect Park Drive to Kilgore Road	6	17,100	0.32	A
White Rock Road: Kilgore Road to Sunrise Boulevard	6	*18,700*	0.35	A
Folsom Boulevard: Zinfandel Drive to Kilgore Road	4	20,300	0.38	A
Folsom Boulevard: to Kilgore Road to Sunrise Boulevard	4	*15,900*	0.44	A
Trade Center Drive: Kilgore Road to Sunrise Boulevard	2	12,900	0.36	A
Sun Center Drive: Kilgore Road to Sunrise Boulevard	2	5,000	0.28	A

1 Average Daily Traffic
2 Volume to capacity ratio (County of Sacramento Traffic Analysis Guidelines, 2004)
3 LOS based on Highway Capacity Manual (Transportation Research Board, 2000)

BOLD indicates unacceptable operations based on the criterion of the governing jurisdiction

SOURCE: DKS Associates 2012

Existing Freeway Operations

Table 6 summarizes existing PM peak hour freeway operations based on the density (in passenger cars per mile per lane) and corresponding PM peak hour LOS for the study mainline segments of U.S. 50.

Table 6
Freeway Mainline Level of Service – PM Peak Hour Existing Conditions

Freeway Mainline Segment	Volume	Density[1]	LOS[2]
Eastbound US 50			
Mather Field Road to Zinfandel Boulevard	7,190	27	D
Zinfandel Boulevard to Sunrise Boulevard	7,060	33	D
Sunrise Boulevard to Hazel Avenue	6,180	37	D
Westbound US 50			
Hazel Avenue to Sunrise Boulevard	5,040	28	D
Sunrise Boulevard to Zinfandel Boulevard	4,860	21	C
Zinfandel Boulevard to Mather Field Road	6,370	25	E

1 Density is reported in passenger cars per mile per lane (pcpmpl).
2 LOS = Level of Service and is based on the Highway Capacity Manual (Transportation Research Board, 2000).

Source: DKS Associates analysis for EIS on Mather Specific Plan, 2010 (based on Freeway performance Measurement System data from April and May 2008)

2.5 Current Bicycle and Pedestrian Facilities

Bicycle facilities can be classified into one of the following three categories:

- Class I Bike Path– Off-street bike paths within exclusive right-of-way
- Class II Bike Lane – Striped on-road bike lanes adjacent to the outside travel lane on preferred corridors for biking
- Class III Bike Route– Shared on-road facility, usually delineated by signage

Bikeway facilities are limited near the project site. According to the *City of Rancho Cordova Bikeway Master Plan (March 2011)* and field observations, the following bikeway facilities are present in the study area project:

- Class I bike path parallel to Sunrise Boulevard from White Rock Road south to Grant Line Road along the Folsom South Canal as part of a regional bikeway system. The path is also present east of Sunrise Boulevard to Hazel Avenue.
- Class II bike lanes along Folsom Boulevard as well as along Zinfandel Drive between White Rock Road and Folsom Boulevard. Kilgore Road adjacent to the project site does not have an on-street Class II bike lane.

Sidewalks are present in the vicinity of the project site along Kilgore Road, Trade Center Drive and Sun Center Drive as well as along the segments of White Rock Road and Sunrise Boulevard that are near the project site.

2.6 Current Transit Service

Sacramento Regional Transit (RT) operates most of the bus and all light-rail transit (LRT) service in Sacramento County. Existing transit service within the study area is described below.

The existing bus routes within the study area.

- RT Route 74 provide service along White Rock Road
- Rancho CordoVan Route 76 which provides service during the morning and evening commute period along Zinfandel Drive between the Zinfandel Plaza LRT Station and the Anatolia Community via Douglas Road.
- Rancho CordoVan Route 77 which provides service throughout the day between the Zinfandel Plaza LRT Station and Baroque Drive via a loop route along Zinfandel Drive, Baroque Drive, Prospect Park Drive and White Rock Road.

Sacramento Regional Transit provides light rail service on the Gold Line that generally runs parallel to U.S. Highway 50 between downtown Sacramento and historic Folsom. Light rail operates with either 15- or 30-minute headways depending on direction and day of week. Within Rancho Cordova, there are four light rail station. The nearest light rail station to the project site is the Sunrise Station

3. Regulatory Setting

Existing transportation polices, laws, and regulations that would apply to the proposed project are summarized below. This information provides context for the impact discussion related to the project's

consistency with applicable regulatory conditions. Further, LOS impacts were determined by comparing project traffic operations against LOS policies set forth by the City of Rancho Cordova.

3.1 State

California Department of Transportation

The California Department of Transportation (Caltrans) is responsible for operating and maintaining the State highway system. In the project vicinity, U.S. 50 and S.R. 16 fall under Caltrans jurisdiction. Caltrans provides administrative support for transportation programming decisions made by the California Transportation Commission (CTC) for state funding programs. The State Transportation Improvement Program (STIP) is a multi-year capital improvement program that sets priorities and funds transportation projects envisioned in long-range transportation plans.

In May 2009, Caltrans released a Corridor System Management Plan (CSMP) for U.S. 50. CSMPs are long-range comprehensive planning documents that define the current level of service (LOS) on a facility and the future LOS when considering feasible long-term projects. Based on the CSMP for U.S. 50, the segments of this facility located within the project study area are expected to operate at LOS F conditions in the future. LOS F is an unacceptable level of service.

3.2 Local

Sacramento Area Council of Governments

The Sacramento Area Council of Governments (SACOG) is an association of local governments in the six-county Sacramento Region. Its members include the counties of Sacramento, El Dorado, Placer, Sutter, Yolo, and Yuba as well as 22 cities. SACOG provides transportation planning and funding for the region, and serves as a forum for the study and resolution of regional issues. In addition to preparing the region's long-range transportation plan, SACOG assists in planning for transit, bicycle networks, clean air, and airport land uses.

The Metropolitan Transportation Plan (MTP) for 2035 (SACOG 2008) is a federally mandated long-range fiscally constrained transportation plan for the six-county area. Most of this area is designated a federal non-attainment area for ozone, indicating that the transportation system is required to meet stringent air quality emissions budgets to reduce pollutant levels that contribute to ozone formation. To receive federal funding, transportation projects nominated by cities, counties, and agencies must be consistent with the MTP.

The 2007/09 Metropolitan Transportation Improvement Program (MTIP) is a list of transportation projects and programs to be funded and implemented over the next 3 years. SACOG submits this document to Caltrans and amends the program on a quarterly cycle.

Sacramento Regional Transit

The Sacramento Regional Transit District (RT) provides public transit service within the project area. RT operates approximately 100 bus routes and 40 miles of light rail covering a 418 square-mile service area. Sacramento Regional Transit's Transit Action Plan (2009) is the long-term plan for transit service over the next 25 years. The Transit Action Plan places significant emphasis on improved transit service throughout the region through a combination of infrastructure investments and service modifications. The Plan defines three planning scenarios and presents a preferred scenario for future implementation.

City of Rancho Cordova

The City of Rancho Cordova provides for the mobility of people and goods within the City. Approximately half of the study intersections are within the City of Rancho Cordova's jurisdiction. The Rancho Cordova General Plan, which was adopted in 2006, contains goals and policies that determine acceptable operations for intersections and roadway segments. The Circulation Element General Plan contains the following LOS policies:

Policy C.1.2: Requires the City to seek to maintain LOS D or better on its roadways; however, it is recognized that this may not be desirable or possible at all locations. Therefore, system level improvements may be implemented to improve traffic flow and/or promote non-vehicular transportation in lieu of meeting providing LOS D.

Policy C.1.3: Recognizes that the desired LOS may be infeasible at certain locations, and requires development projects to provide offsetting improvements to the vehicular and/or non-vehicular transportation system when they impact these locations.

The City's Capital Improvement Program (CIP) identifies planned improvements to roadways, transit, bikeway and pedestrian facilities within the City, cost estimates of those improvements and a nexus study to identify fair-share contributions of new development to identified transportation improvements. The project applicant(s) would be required to pay their fair-share contribution to the CIP.

4. Impacts and Mitigation Measures

4.1 Significance Criteria

According to CEQA *Guidelines*, a project would normally have a significant transportation effect if one of the following were to occur:

a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

b. Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

e. Result in inadequate emergency access?

f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

The project would not result in a change in air traffic patterns. The project would not introduce hazardous design features or incompatible uses. All new and expanded facilities would meet current roadway standards. Therefore, these criteria are not discussed further. Criteria a, b, and f are further described below:

City of Rancho Cordova

With respect to facilities located within the jurisdiction of Rancho Cordova, as outlined in the Rancho Cordova General Plan (2006), the following thresholds were used during the transportation analysis to determine the significance of project impacts:

- Roadway System: An impact is considered significant on intersections and roadways if the project causes the facility to change from LOS D of better to LOS E or F. For facilities that are, or will be (in the cumulative condition), operating at unacceptable levels of service without the project, an impact is considered significant if the project:
    1. Increases the delay at study intersections by more than five seconds; or
    2. Increases the volume-to-capacity (V/C) ratio by more than 0.05 on a roadway.
- Transit System: An impact is considered significant if implementation of the project will disrupt or interfere with existing or planned transit operations or transit facilities or result in demands to transit facilities greater than there is adequate capacity to accommodate.
- Bicycle/Pedestrian System: An impact is considered significant if implementation of the project will result in any of the following:
    1. Eliminate or adversely affect an existing bikeway or pedestrian facility in a way that would discourage its use;
    2. Interfere with the implementation of a planned bikeway as shown in the City's Bicycle Master Plan or the Bikeway and Trails Map in the City's Circulation/Element Plan, or be in conflict with the Pedestrian Master Plan;
    3. Result in unsafe conditions for bicyclists or pedestrians, including unsafe bicycle/pedestrian, bicycle/motor vehicle, or pedestrian/motor vehicle; or

Caltrans

According to the "*Guide for the Preparation of Traffic Impact Studies (Caltrans, December 2002)"*, if a freeway facility currently operates at an unacceptable LOS (e.g., LOS F), then the existing LOS should be maintained. A project impact is said to occur if the addition of project trips exacerbates existing LOS F conditions and leads to a perceptible increase in density on freeway mainline segments or ramp junctions, or a perceptible increase in service volumes in a weaving area. In addition, a project impact is said to occur when the addition of project trips causes a queue on the off-ramp approach to a ramp terminal intersection to extend beyond its storage area and onto the freeway mainline.

The proposed project would cause a significant impact on the freeway mainline or ramps if it:

1. Causes a facility operating at an acceptable level to deteriorate to an unacceptable level; or
2. Produces an additional 10 trips or more to a facility that either currently or will (under cumulative conditions) operate at LOS F.

4.2 Project Land Use and Circulation

The proposed project would be located on the east side of Kilgore Road, about 300 feet south of Trade Center Drive in the City of Rancho Cordova. The proposed project would have two project driveways on Kilgore Road. The basic design criteria for these access points are discussed later in Section 4. The proposed project contains the following uses:

- The AFEC facility, which would initially have 24 bowling alleys, 8 movie theatres and other uses in a 72,622 square foot building. The ultimately AFEC facility will contain 8 additional bowling alleys and 4 additional theatres
- About 20,000 square feet of retail space and a 3,600 square foot restaurant would be located on the project site in buildings separate from the AFEC facility

4.2 Project Traffic Forecasts

The amount of traffic associated with the proposed project was assigned to the transportation system using the following three-step process.

1. Trip generation – Estimated the amount of traffic entering and exiting the project site based on planned land uses and connectivity variables
2. Trip distribution – Used the Sacramento Metropolitan (SACMET) travel demand model to forecast approach and departure paths from the site, along with the percentage of traffic using each path.
3. Trip assignment – Applied a process called the "difference method" to develop Plus Project volume forecasts.

The results of this process are described in detail below.

Trip Generation

Many traffic impact analyses use ITE's Trip Generation to estimate a project's trip generation. While ITE rates are appropriate for the proposed retail and restaurant uses on the site, the proposed AFEC facility is unique blend of entertainment and recreational uses. ITE provides trip rates for some of AFEC's key uses (cinema and bowling alley) but not all of the proposed uses. Also, adding the trip generation estimates of each individual use will overestimate AFEC's total trips since some patrons will go to more than one use. For these reasons, DKS has used information from the Market Feasibility Report rather than ITE trip rates to estimate the traffic generated by the AFEC facility.

Trip Generation of AFEC Facility

A Market Feasibility Report on the AFEC facility was conducted for the City and includes attendance estimates over the first four years of operation with separate estimates by use. The report estimates yearly attendance from three market areas around the project site: 0 to 5 mile, 5 to 10 miles and greater than 20 miles. **Table 7** summarizes the attendance estimates for the cinema and for all other uses combined. The report estimates that 1) over 70 percent of the AFEC's attendance would go to the cinema and 2) less than 10 percent of the project's patrons would come from more than 10 miles away.

TABLE 7
PROJECTED ANNUAL AFEC FACILITY ATTENDANCE (FOURTH YEAR)

Miles	Cinema	Other	Total	Percent
0-5	245,505	74,491	319,996	57.9%
5-10	126,271	55,871	182,142	32.9%
> 10	19,559	22,061	41,620	7.5%
Tourism	4,581	4,581	9,162	1.7%
Total	395,916	157,004	552,920	100.0%
Percent	71.6%	28.4%	100.0%	

Source: "Market Feasibility Study – Cinema and Bowling-Anchored Entertainment Complex", Amusement Entertainment Management, LLC (December 2011)

The AFEC facility would generate most of its traffic on Friday, Saturday and Sunday. Since background traffic volumes on weekends for the roadways near the project site are substantial less than weekday peak commute periods, a traffic impact analysis of weekend conditions is not warranted. The proposed project would generate little traffic during the AM peak periods. Thus the traffic impact study focused on weekday PM peak period conditions.

The City has indicated that the traffic impact analysis should focus on about the 30th highest day for the project's attendance, on a weekday when the project's traffic would overlap with typical background traffic. Since over 70 percent of the AFEC facility's traffic would go to the cinema, the yearly travel patterns of the cinema will dictate when the 30th highest day will occur. **Table 8** shows the 30 highest days for attendance at movie theatres nationwide in 2011, including the day of the week they occurred, the percentage of annual attendance and whether they occurred on a holiday weekend.

This information in **Table 8** indicates that 16 of the 30th highest attendance days occur on Saturday and 9 occur on Fridays. There are a couple of Fridays in May (non-holiday weekend) near the 30th highest day. Thus it was decided that the traffic impact analysis would focus on a Friday in May when the cinema was generating traffic equivalent to the 30th highest day of the year, or about 0.61 percent of the annual attendance estimated for the fourth year of the project in the Market Feasibility Study.

Table 9 shows the estimated trip generation of the "initial" and "ultimate" AFEC facility for the traffic impact analysis. It was decided to use the same percentage of annual attendance (0.61 percent) for the other AFEC uses. Thus the estimated attendance for the initial AFEC facility on the 30th highest day would be 3,372. This compares to the "peak day" attendance of 3,828 estimated in the Market Feasibility Study. On average, the vehicles coming to the AFEC facility will have about 2.5 persons per car. Thus on the 30th highest day there will be about 2,700 daily vehicles trips (3,372 persons/2.5 persons per car or 1,350 inbound plus 1,350 outbound trips) generated by the initial AFEC facility.

The critical hour for total traffic near the project site on a Friday in May will be the during the PM peak hour, which generally occurs between 4:30 PM and 5:30 PM. During that hour, the AFEC is expected to generate about 13 percent of its daily traffic volume and an estimated 57 percent of that traffic would be entering the project's parking lot while 43 percent would be leaving. Thus the initial AFEC facility would generate about 200 inbound and 151 outbound trips during the 30th highest day.

It is anticipated that the "ultimate" AFEC facility would add two theatres (a 25 percent increase from 8 to 10) and eight bowling alleys (a 33 percent increase from 24 to 32) without major changes to other facilities. Since the majority of the AFEC's traffic would go to the cinemas on the 30th highest day, the traffic generation of the ultimate AFEC facility was estimated by increasing the traffic generation of the initial AFEC facility by 25 percent. Thus the ultimate AFEC facility would generate an estimated 3,376 daily and 439 PM peak hour trips on the 30th highest day.

Table 10 shows the estimated trip generation of the ultimate AFEC facility on the 30th highest day. This analysis indicates that most trips would come from within five miles of the site and a limited number of trips would come from more than 10 miles.

TABLE 8
HIGHEST DAYS of YEAR FOR CINEMA ATTENDENCE IN THE US FOR 2011

Day Rank	Date	Day of Week	Percent of Annual Attendance	Holiday Weekend
1	Jul. 15	Friday	1.30%	
2	Nov. 18	Friday	1.04%	
3	May 28	Saturday	0.88%	Memorial Day
4	Jul. 16	Saturday	0.83%	
5	Nov. 19	Saturday	0.81%	
6	May 29	Sunday	0.79%	Memorial Day
7	Jul. 23	Saturday	0.74%	
8	Jul. 2	Saturday	0.74%	Fourth of July
9	May 27	Friday	0.73%	Memorial Day
10	Jul. 30	Saturday	0.70%	
11	Dec. 26	Monday	0.70%	Christmas
12	Jul. 22	Friday	0.69%	
13	Jun. 25	Saturday	0.68%	
14	Jul. 1	Friday	0.68%	Fourth of July
15	Jun. 4	Saturday	0.68%	
16	Jun. 24	Friday	0.68%	
17	Jul. 3	Sunday	0.67%	Fourth of July
18	May 21	Saturday	0.67%	
19	Nov. 25	Friday	0.66%	Thanksgiving
20	Jul. 17	Sunday	0.66%	
21	Aug. 6	Saturday	0.66%	
22	Nov. 26	Saturday	0.65%	Thanksgiving
23	Jan. 1	Saturday	0.64%	New Years
24	Jul. 29	Friday	0.64%	
25	May 7	Saturday	0.63%	
26	Feb. 12	Saturday	0.62%	
27	Dec. 25	Sunday	0.61%	Christmas
28	May 20	Friday	0.61%	
29	Jun. 11	Saturday	0.61%	
30	Jul. 9	Saturday	0.61%	

Day of Week	Holiday Weekend	Non-Holiday Weekend	Total
Friday	3	6	9
Saturday	4	12	16
Sunday	3	1	4
Other	1	0	1
Total	**11**	**19**	**30**

Source: IMDb.com

TABLE 9 ESTEMATED AFEC Facility TRAFFIC GENERATION FOR 30th HIGHEST DAY	
Initial AFEC Facility[1]	
Annual attendance (all uses)[1]	552,920
Percent of annual attendance on 30th highest day	0.61%
Attendance on 30th highest day	3,373
Average persons per car	2.5
Daily vehicles trip (both direction)	2,700
Percentage of daily traffic during PM peak hour (Friday)	13%
PM peak hour trips (30th highest day)	351
Percent of PM peak hour trips inbound / outbound	57% / 43%
PM peak hour trips inbound/outbound	200 / 151
Ultimate AFEC Facility[2]	
Daily vehicles trip (both direction)	3,376
PM peak hour trips (30th highest day)	439
PM peak hour trips inbound/outbound	250 / 189

[1] Estimate from Market Feasibility Report
[2] Trip generation 25% greater than initial facility

Source: DKS Associates, 2012

TABLE 10
ESTIMATED PM PEAK HOUR AND DAILY TRAFFIC VOLUMES
ULTIMATE AFEC FACILITY ON 30th HIGHEST DAY

Miles	PM Peak Hour			Daily
	In	Out	Total	
0-5	149	113	262	2,010
5-10	82	62	144	1,112
> 10	19	14	33	254
Total	**250**	**189**	**439**	**3,376**

Source: DKS Associates, 2012

Total Project Trip Generation

In addition to the AFEC facility, the proposed project also includes 20,000 square feet of retail space and a 3,600 square foot restaurant. The exact retail uses are unknown. Using the ITE formula for shopping centers, the combined 23,600 square feet of retail and restaurant space would have a rate of 10.2 trips per 1,000 square feet. A "high turn-over restaurant" has an average ITE trip rate of 10.5 trips per 1,000 square feet, Since the ITE trip generation rate for some possible retail uses also have similar rates, the ITE formula for shopping centers was used.

A typical trip generation estimate for retail uses recognizes that there will be some level of "pass-by" trips. For this site location on Kilgore Road, a 20 percent reduction in trips generated by the retail and restaurant uses (but not the AFEC facility) was assumed. **Table 11** shows the estimated total traffic generation used in the impact analysis.

TABLE 11
PROPOSED PROJECT's TOTAL TRAFFIC GENERATION ON 30th HIGHEST DAY

Use	PM Peak Hour			Daily
	In	Out	Total	
Ultimate AFEC facility	250	189	439	3,376
Retail/Restaurant	118	122	240	2,670
Total (project driveways)	**368**	**311**	**679**	**6,046**
Total External[1]	**344**	**287**	**631**	**5,512**

[1] Assumes 20 percent of retail/restaurant traffic is "pass-by" trips

Source: DKS Associates, 2012

Trip Distribution

A locally-validated version of the SACMET travel demand forecasting model was used to estimate the distribution of project trips. This model includes land use and roadway/transit network assumptions for existing and cumulative (2035) scenarios. Following is a summary of the procedure DKS used to establish trip distribution.

- Modified the existing roadway and cumulative networks to include the land uses and circulation network near the project.
- Performed an initial run of the SACMET model to determine the model's estimate of the number of trips entering and leaving the project area (i.e., external vehicle trips).
- Compared the model's initial estimate of external vehicle trips to trip generation values presented in **Table 11**
- Applied a scaling factor to adjust the model's external trip predictions to match the proposed project's calculated trip generation.

Figure 3 shows the resulting estimated traffic volumes generated by the ultimate project at intersections near the project site the under Existing Plus Project Conditions.

Trip Assignment

Existing Plus Project traffic volume forecasts for the Proposed Project and alternatives were developed by adding the model's estimate of project-only trips to the existing traffic counts. The resulting traffic volumes at study area intersections are shown on **Figure 4**.

4.3 Impact Analysis

Existing Plus Project Conditions

This section describes the analysis of impacts of the proposed project under existing conditions. The impacts were determined using the results of the intersection, roadway segment level of service analysis and the thresholds of significance described in Section 4.1.

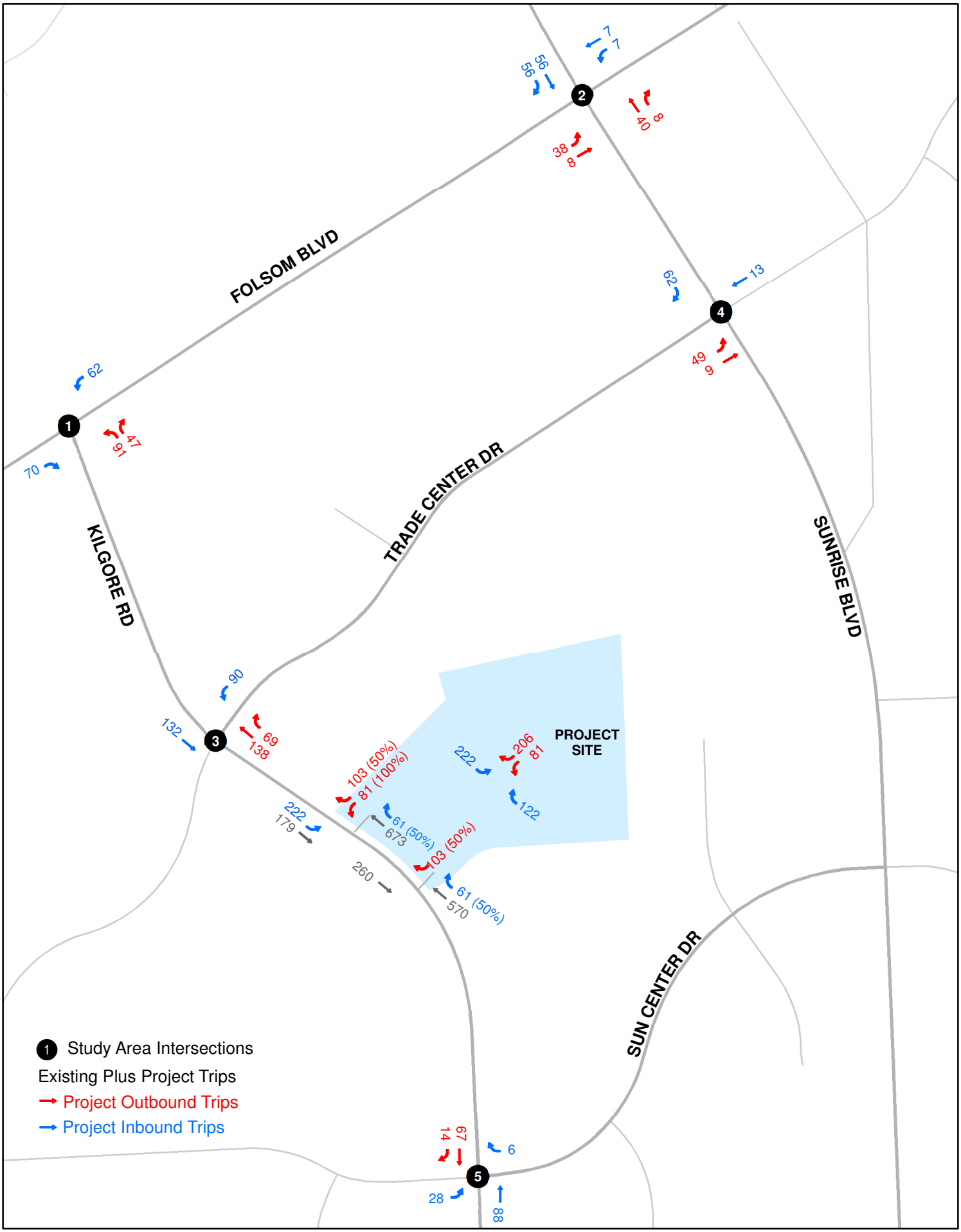
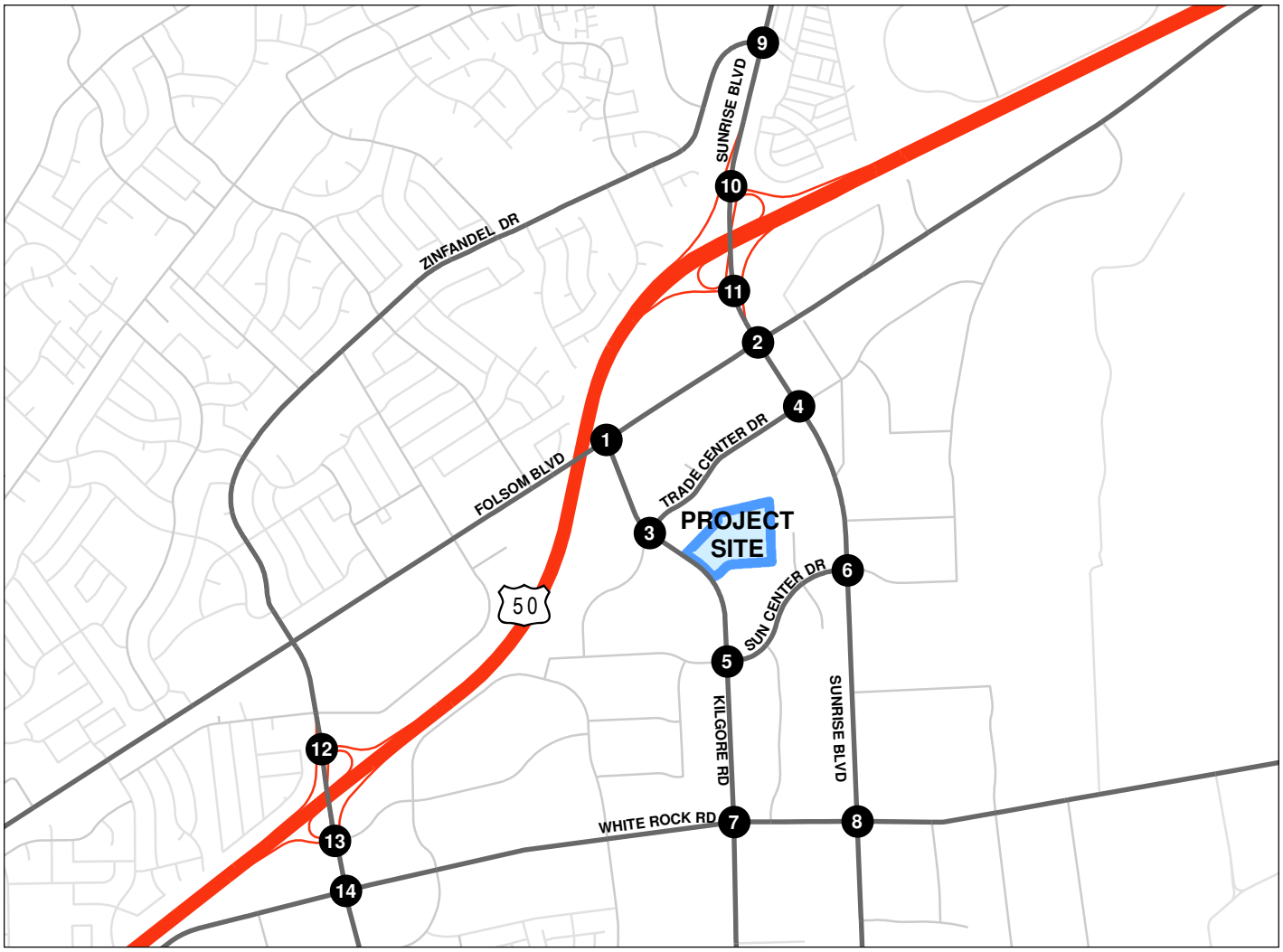
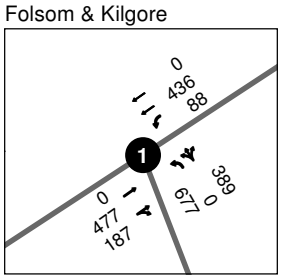
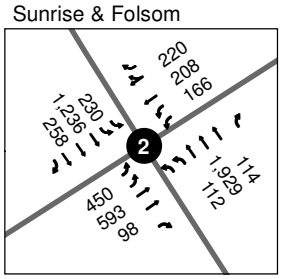
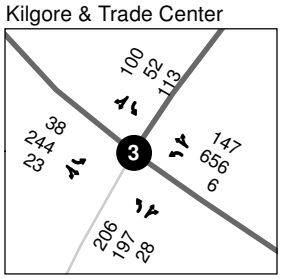


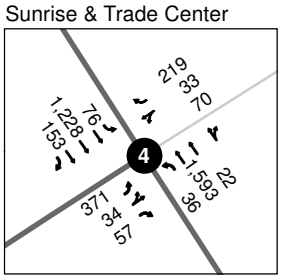
FIGURE 3
Project-Added Volumes - PM Peak Hour Existing Conditions

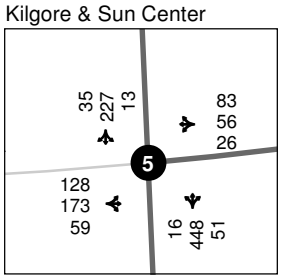


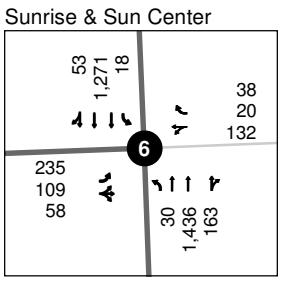


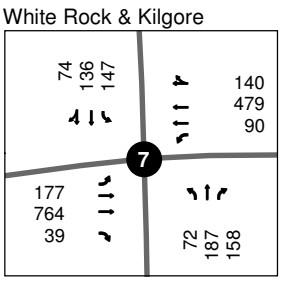


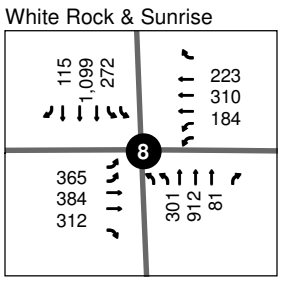


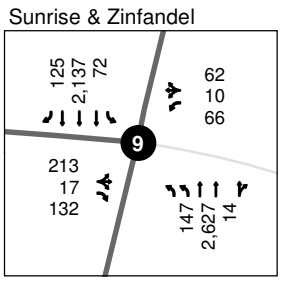


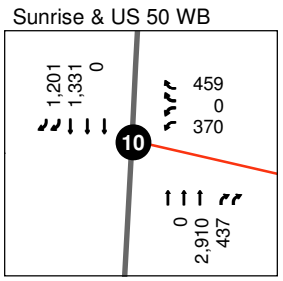


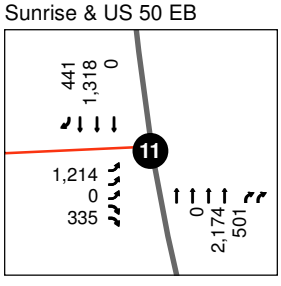


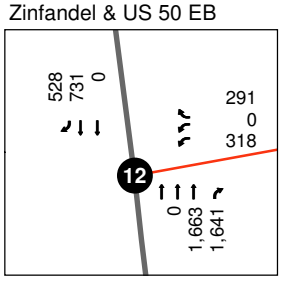


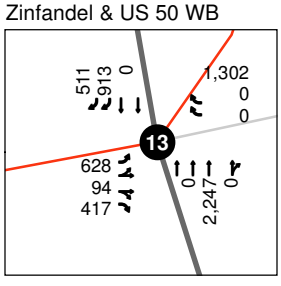


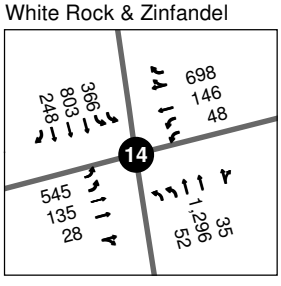












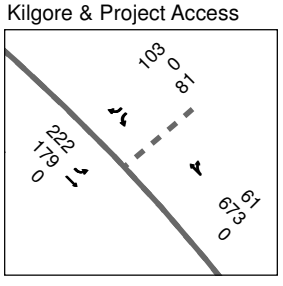


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FIGURE 4
Existing Plus Project PM Peak Hour Volumes

Intersection Levels of Service

Table 12 shows results of the Existing Plus Project intersection operations analysis, which indicates that the proposed project would not cause the any intersections to change from LOS D of better to LOS E or F. For those intersections that currently operate at unacceptable levels of service the proposed project would not increases the delay at study intersections by more than five seconds. Thus, the proposed project would not cause any significant level of service impacts under existing conditions.

Signal Warrant Analysis

Most of the major intersections that would have an increase in traffic volume due to the proposed project are currently signalized. Yet the intersection of Kilgore Road and Sun Center Drive is controlled by stop signs on its four approaches. A signal warrant analysis was conducted at this intersection with and without the proposed project.

The Manual on Uniform Traffic Control Devices (MUTCD) has nine warrants for a traffic signal, four of which are based on traffic volumes and geometry. The proposed project would generate its highest volumes during the evening peak period. For this reason, a "peak hour" signal warrant was conducted for the PM peak hour and is summarized in **Table 13**. This analysis indicates that the intersection of Kilgore Road and Sun Center Drive currently does not meet signal warrants but it would warrant installation of a signal when the traffic generated by proposed project is added to the roadway system.

The analysis also indicates that a traffic signal will not be warranted at the proposed project driveways. The issues related to the design and traffic operations of the project driveway are discussed in more detail in the following section.

Project Driveways

A key question of the traffic impact study is how the intersections of Kilgore Road and the two proposed project driveways would operate. A precise design has not been developed for the project driveways and Kilgore Road along the project frontage. The proposed project would generate a substantial amount of traffic between 4 PM and 6 PM every Friday when there is also a high volume of traffic on Kilgore Road from surrounding office uses. The project frontage along Kilgore Road is about 465 feet long, so the spacing between the two driveways will be close. For these reasons, the driveway access should be design based on conditions during the PM peak hour on Friday and the following criteria should be considered for that the design of the driveway access:

- A continuous two-way left turn lane would not function well with high traffic volumes and closely-spaced project driveways. Adequate space is needed for queue storage for vehicles traveling southbound on Kilgore Road turning left into the project. Those left turning vehicles will conflict with vehicles turn left out of the project driveways. Thus a two-way left turn lane should not be used. Left turns in and out of the project should be allowed at only one "main" project driveway and the second driveway should be restricted to right-turns in and out.
- A channelized left-turn lane for the "main" project driveway can be created with pavement striping, while signage and striping at the second driveway can prohibit left-turns out of that driveway. However, violations with left turns made from the second driveway are anticipated and a raised median to control turn movements is recommended.
- A traffic signal would not be warranted at the main project driveway under Existing Plus Project conditions (but may be warranted under Cumulative Plus Project conditions)

TABLE 12
INTERSECTION LEVELS OF SERVICE – EXISTING PLUS PROJECT

Intersection	LOS Method	No Project		Existing Plus Project	
		LOS[1]	Delay[2]	LOS[1]	Delay[2]
1. Kilgore Road and Folsom Boulevard	Signal	C	23.0	C	26.2
2. Sunrise Boulevard and Folsom Boulevard	Signal	C	30.5	C	31.2
3. Kilgore Road and Trade Center Drive	Signal	C	29.6	C	34.4
4. Sunrise Boulevard and Trade Center Drive	Signal	C	26.4	C	27.4
5. Kilgore Road and Sun Center Drive	4-way Stop	C	15.6	D	25.8
6. Sunrise Boulevard and Sun Center Drive	Signal	C	24.6	C	24.8
7. Kilgore Road and White Rock Road	Signal	C	29.2	C	30.9
8. Sunrise Boulevard and White Rock Road	Signal	C	33.4	C	33.8
9. Sunrise Boulevard and Zinfandel Drive	Signal	**F**	**/3/**	**F**	**/3/**
10. Sunrise Boulevard and U.S. 50 Westbound Ramps	Signal	B	15.3	B	15.4
11. Sunrise Boulevard and U.S. 50 Eastbound Ramps	Signal	**E**	**/4/**	**E**	**/4/**
12. Zinfandel Drive/U.S. 50 Westbound Ramps	Signal	**E**	**64.5**	**E**	**64.5**
13. Zinfandel Drive/U.S. 50 Eastbound Ramps	Signal	**E**	**58.7**	**E**	**58.7**
14. Zinfandel Drive/White Rock Road	Signal	C	32.1	C	32.1
15. Kilgore and Project Main Entrance – All Approaches – Westbound Approach	Unsignalized Stop sign	NA	NA	A E	6.8 35.9

1 Level of Service based on Highway Capacity Manual (Transportation Research Board, 2000).

2 Average intersection control delay in seconds per vehicle.

3. Delay fluctuates significantly from day to day but observations indicate that this intersection often operates at LOS F conditions during the PM peak hour. Proposed project would add less than 5 seconds of delay.

4. Delay fluctuates significantly from day to day and engineers actively over-ride signal timing to prevent queues on eastbound off-ramp from backing up onto US 50 mainline. Observations indicate that this intersection often operates at LOS E conditions during the PM peak hour. Proposed project would add less than 5 seconds of delay.

BOLD text indicates that the intersection operates unacceptably based on the significance criteria.

SOURCE: DKS Associates 2012

TABLE 13
SIGNAL WARRANT ANALYSIS – EXISTING PLUS PROJECT

Intersection		Warrant Met	
		Existing	Existing Plus Project
Kilgore Road and Sun Center Drive		No	Yes
Kilgore and Project Main Entrance	- one outbound lane	NA	No
	- two outbound lanes	NA	No

Source: DKS Associates, 2012

- The location of the main project driveway and channelization/striping to control left turns from the project driveways will need to be carefully designed to minimize impacts to other driveways, both on the west side of Kilgore Road, opposite the project, and on adjacent property on the east side of Kilgore Road, including the neighboring police station.

- The internal circulation within the project's parking lot will dictate how traffic flows to the entrances and needs to be carefully designed so that traffic can readily flow to/from the main driveway.

Freeway Analysis

Table 14 shows the estimated project-related traffic volumes that will be added to segments of the US 50 during the PM peak hour under existing conditions. The proposed project would only increase traffic on those segments by 0.2% to 0.5% and those study freeway segments would operate at LOS C or D during the PM peak hour.

The analysis of intersection at the US 50 off-ramps at the Sunrise Boulevard and Zinfandel interchanges (Table 12) indicates that the proposed project would not cause back-ups on to the US 50 mainline.

Table 14
Project Traffic Added to Freeway Mainline - Existing Conditions

Freeway Mainline Segment	Eastbound				Westbound			
	US 50 without Project		Proposed Project		US 50 without Project		Proposed Project	
	Total Volume	Mixed Flow LOS	Traffic Added	Percent of Total	Total Volume	Mixed-Flow LOS	Traffic Added	Percent of Total
Mather Field Rd to Zinfandel Blvd	7,190	D	26	0.4%	6,370	D	19	0.3%
Zinfandel Blvd to Sunrise Blvd	7,060	D	13	0.2%	4,860	C	10	0.2%
Sunrise Blvd to Hazel Ave	6,180	D	19	0.3%	5,040	C	27	0.5%

Source: DKS Associates, 2012 (freeway volumes and LOS based DKS Associates analysis for EIS on Mather Specific Plan, 2010)

Roadway Segment Levels of Service

Table 15 shows results of the Existing Plus Project roadway segment operations analysis, which indicates that proposed project would not cause the any roadway segment to change from LOS D of better to LOS E or F. For those roadway segments that currently operate at unacceptable levels of service the proposed project would not increase the volume/capacity ratio on study segments by more than 0.5. Thus, the proposed project would not cause any significant level of service impacts under existing conditions.

TABLE 15
ROADWAY LEVEL OF SERVICE – EXISTING PLUS PROJECT

Roadway Segment	Lanes	Existing			Existing Plus Project		
		ADT[1]	V/C[2]	LOS[3]	ADT[1]	V/C[2]	LOS[3]
Sunrise Boulevard: Zinfandel Drive to US 50 WB Ramps	6	75,900	1.41	**F**	76,410	1.42	**F**
Sunrise Boulevard: US 50 EB Ramps to Folsom Boulevard	6	61,400	1.14	**F**	62,210	1.15	**F**
Sunrise Boulevard: Folsom Boulevard to Trade Center Drive	6	52,300	0.97	**E**	52,870	0.98	E
Sunrise Boulevard: Trade Center Drive to Sun Center Drive	6	41,700	0.77	C	41,700	0.77	C
Sunrise Boulevard: Sun Center Drive to White Rock Road	6	31,100	0.58	A	31,130	0.58	A
Sunrise Boulevard: White Rock Road to International Drive	6	31,300	0.58	A	31,540	0.58	A
Kilgore Road: Folsom Boulevard to Trade Center Drive	2	5,100	0.28	A	6,260	0.35	A
Kilgore Road: Trade Center Drive to Project Entrance	2	6,100	0.34	A	7,940	0.44	A
Kilgore Road: Project Entrance to Sun Center Drive	2	6,100	0.34	A	6,960	0.39	A
Kilgore Road: Sun Center Drive to White Rock Road	2	8,300	0.46	A	8,980	0.50	A
Zinfandel Drive: Folsom Boulevard to US 50	4	23,700	0.66	A	23,780	0.66	B
Zinfandel Drive: US 50 to White Rock Road	6	42,300	0.78	B	42,380	0.78	C
White Rock Road: Zinfandel Drive to Prospect Park Drive	6	17,100	0.32	C	17,320	0.32	A
White Rock Road: Prospect Park Drive to Kilgore Road	6	18,700	0.35	A	18,970	0.35	A
White Rock Road: Kilgore Road to Sunrise Boulevard	6	20,300	0.38	A	20,680	0.38	A
Folsom Boulevard: Zinfandel Drive to Kilgore Road	4	15,900	0.44	A	16,600	0.46	A
Folsom Boulevard: to Kilgore Road to Sunrise Boulevard	4	12,900	0.36	A	13,360	0.37	A
Trade Center Drive: Kilgore Road to Sunrise Boulevard	2	5,000	0.28	A	5,680	0.32	A
Sun Center Drive: Kilgore Road to Sunrise Boulevard	2	3,800	0.21	A	3,830	0.21	A

1 Average Daily Traffic
2 Volume to capacity ratio (County of Sacramento Traffic Analysis Guidelines, 2004)
3 LOS based on Highway Capacity Manual (Transportation Research Board, 2000)

BOLD indicates unacceptable operations based on the criterion of the governing jurisdiction

SOURCE: DKS Associates 2012

Cumulative Plus Project Conditions

Cumulative conditions reflect the planned roadway/transit system and estimated traffic volumes for 2035 conditions. This planning horizon incorporates roadway improvement projects in the City's Capital Improvement Plan (CIP) and projects identified in the SACOG *Metropolitan Transportation Plan for 2035* (MTP 2035) that are outside the city limits. Estimated 2035 traffic volumes reflect those estimated in traffic impact studies for recent EIRs as well as those estimated for the City's 2035 CIP.

Figure 5 shows the estimated 2035 PM peak hour traffic volumes at study intersections that represent Cumulative No Project conditions.

Cumulative Plus Project Conditions

This section describes the analysis of impacts of the proposed project evaluated under cumulative conditions. The impacts were determined using the results of the intersection, roadway segment and freeway facility level of service analysis and the thresholds of significance described in Section 4.1.

The distribution of project generated traffic would be somewhat different in 2035 than under existing conditions due to anticipated development. With more residential development in the City of Rancho Cordova east of Sunrise Boulevard, with much of it south of White Rock Road, a higher percentage of the project will enter and exit the project from Kilgore Road south of the project under cumulative conditions than under existing conditions. **Figure 6** shows the estimated traffic volumes generated by the ultimate project at intersections near the project site the under Cumulative Plus Project Conditions.

Cumulative Plus Project traffic volume forecasts were developed by adding the model's estimate of project-only trips (**Figure 6**) to the estimated Cumulative No Project traffic volumes (**Figure 5**). The resulting traffic volumes at study area intersections are shown on **Figure 7**

Intersection Levels of Service

Table 16 shows results of the Cumulative Plus Project intersection operations analysis, which indicates that the proposed project would cause a significant impact at one intersection: Kilgore Road and Sun Center Drive. The average delay at this four-way stop controlled intersection would increase from 35.2 seconds (LOS E) to 102.7 (LOS F).

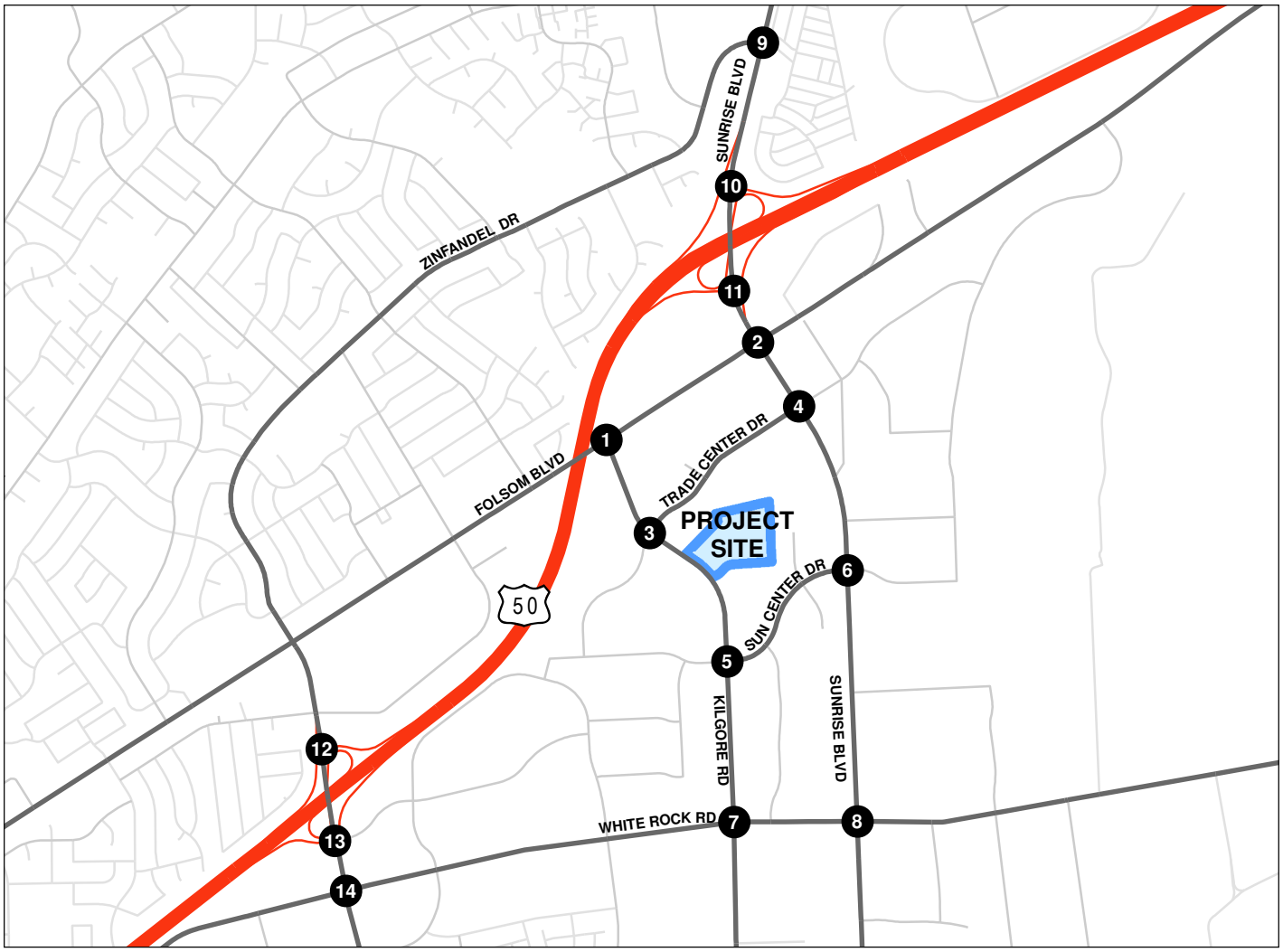
For other study intersections, the proposed would not cause operations to change from LOS D or better to LOS E or F, and for those intersections that would operate at unacceptable levels of service under Cumulative No Project conditions, the proposed project would not increase the average delay by more than five seconds.

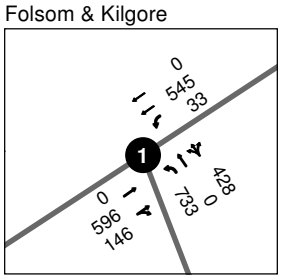
Signal Warrant Analysis

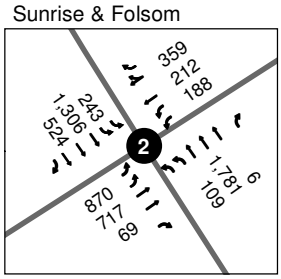
A signal warrant analysis was conducted at the Kilgore Road and Sun Center Drive intersection and at the proposed project's main entrance on Kilgore Road. The analysis, summarized in **Table 17**, indicates that a traffic signal will be warranted if the driveway has only two lanes: one outbound and one inbound. A signal would not be warranted if the project driveway has three lanes: two outbound and one inbound. It is recommended that the intersection of Kilgore Road and the main project driveway should be designed so that signalization could be implemented in the future if needed.

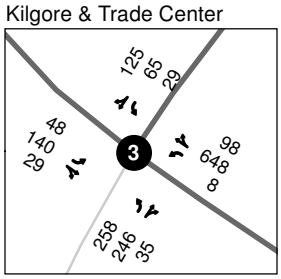
Roadway Segment Levels of Service

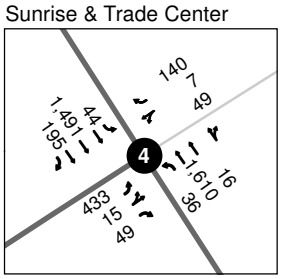
Table 18 shows results of the Cumulative Plus Project roadway segment analysis, which indicates that proposed project would not cause the any roadway segment to change from LOS D or better to LOS E or F. For those roadway segments that currently operate at unacceptable levels of service the proposed project would not increase the volume/capacity ratio on study segments by more than 0.5. Thus, the proposed project would not cause any significant level of service impacts under cumulative conditions.

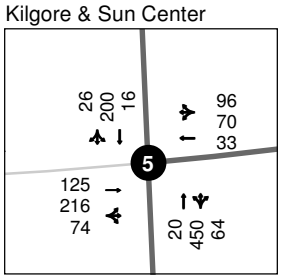


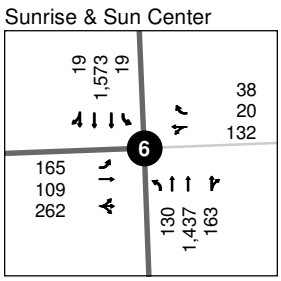


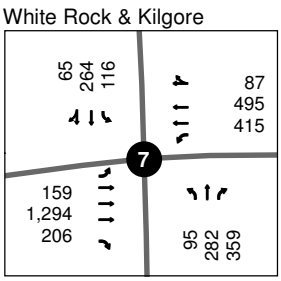


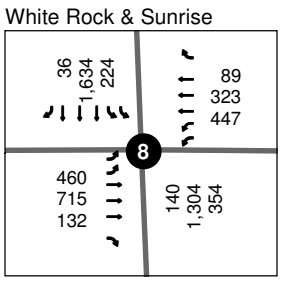


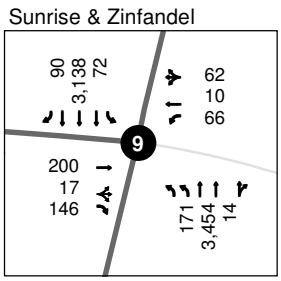


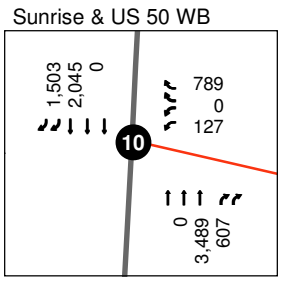


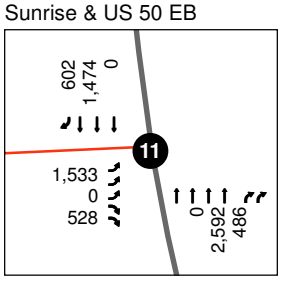


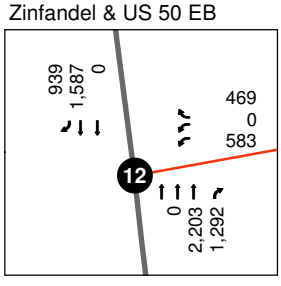


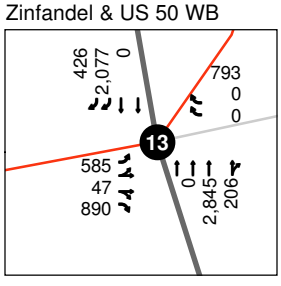












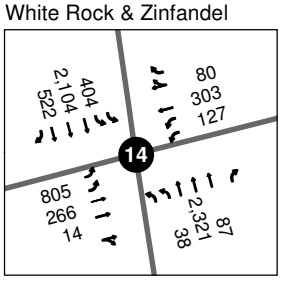


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FIGURE 5
Cumulative No Project PM Peak Hour Volumes and Intersection Geometrics

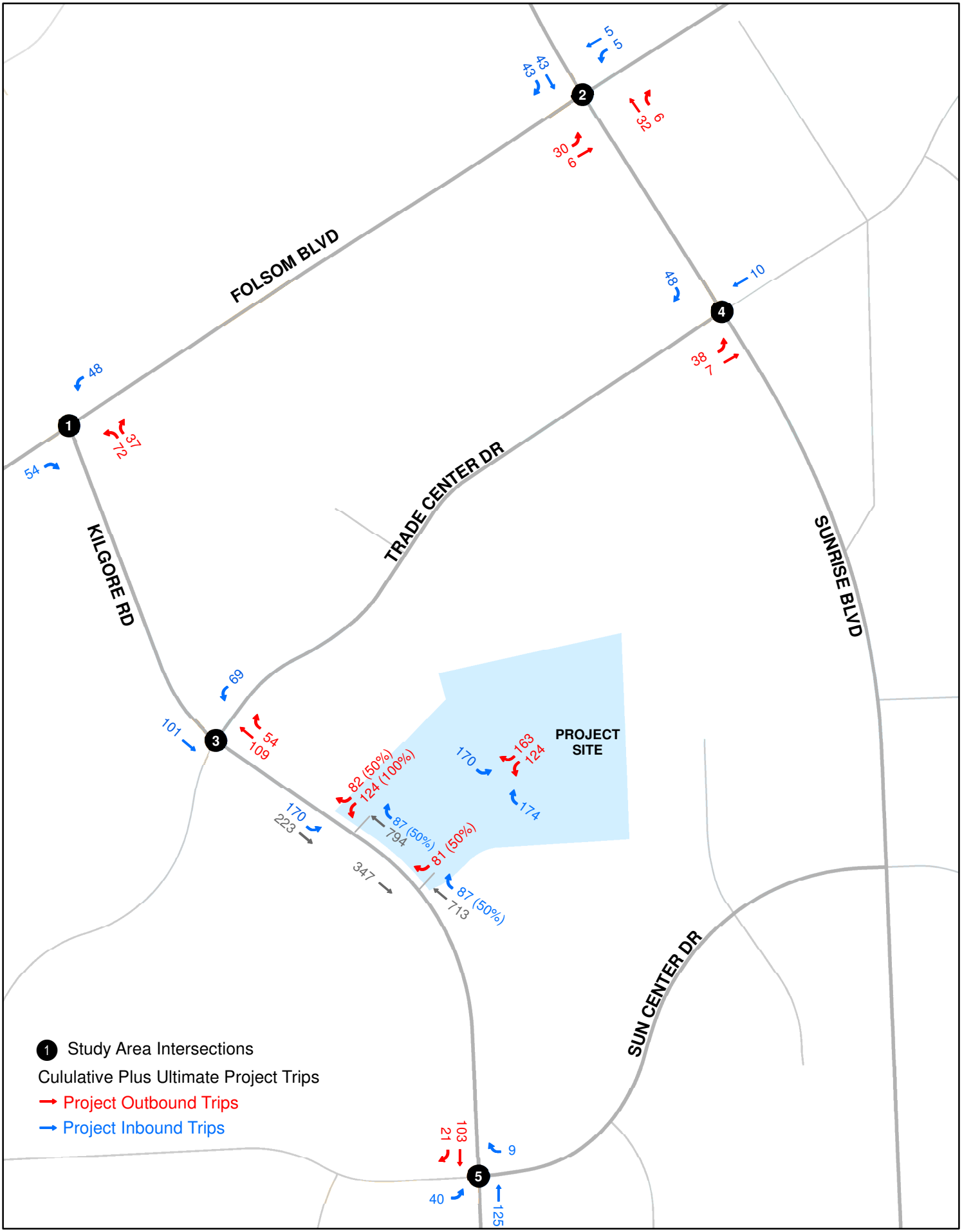
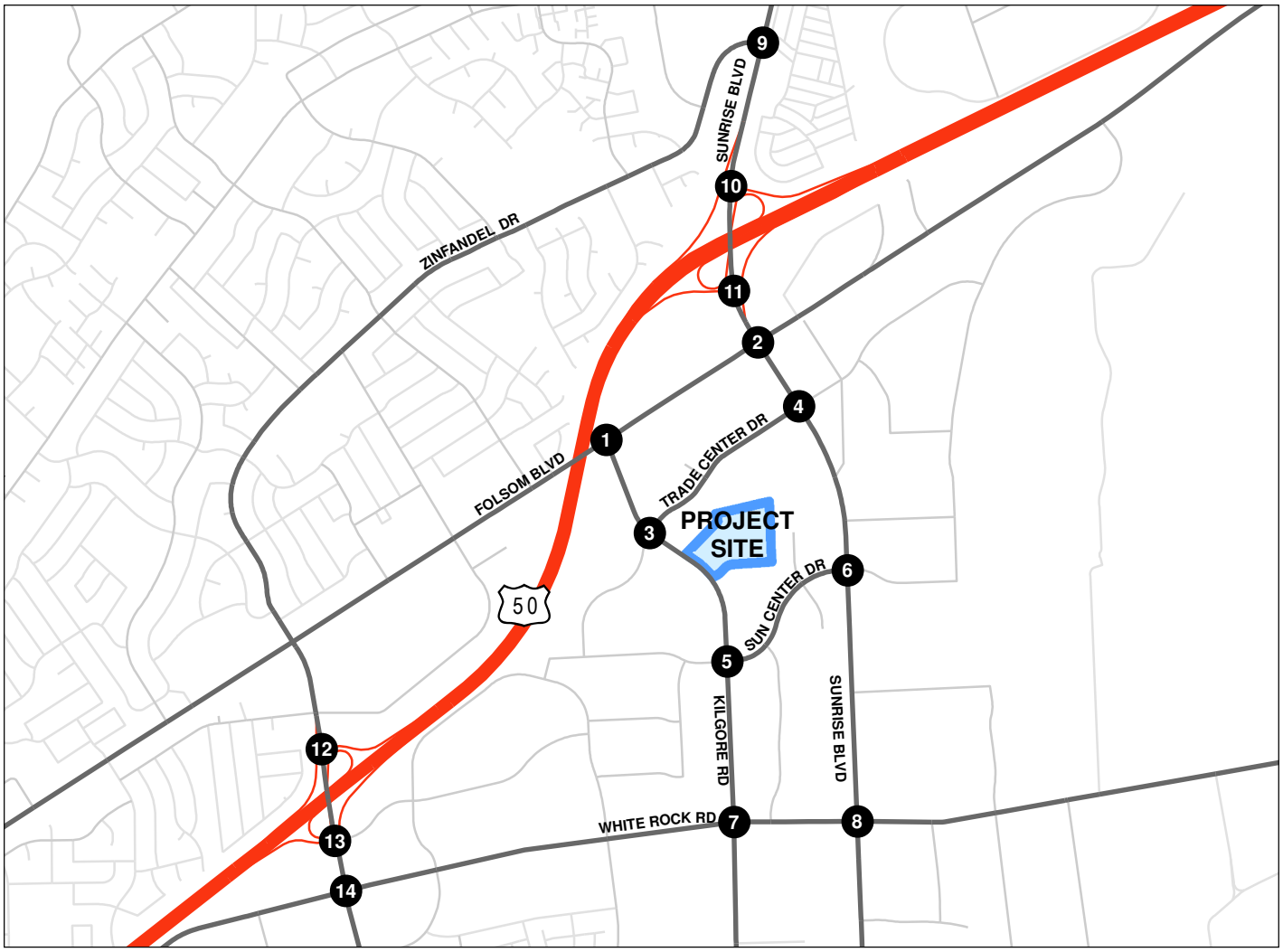
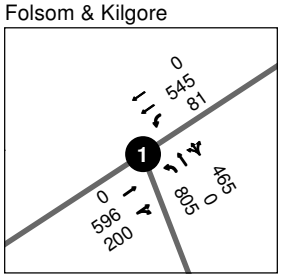


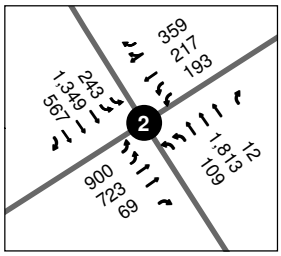
FIGURE 6
Project-Added Volumes - PM Peak Hour Cumulative Conditions



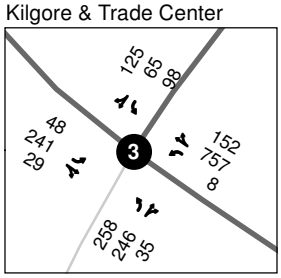
Folsom & Kilgore



Sunrise & Folsom



Kilgore & Trade Center



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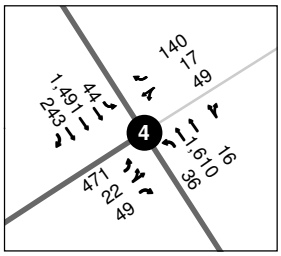
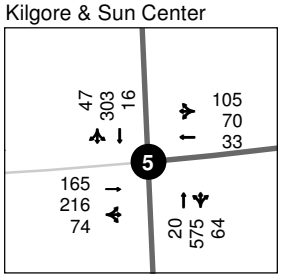
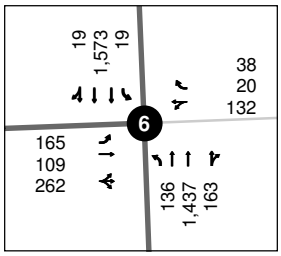


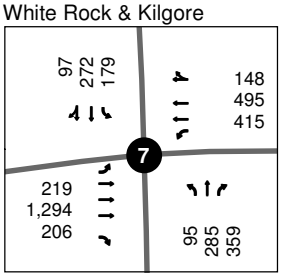
Kilgore & Sun Center



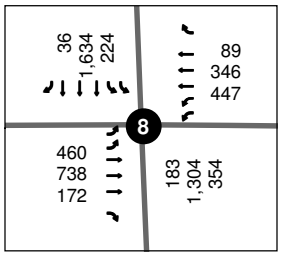
Sunrise & Sun Center



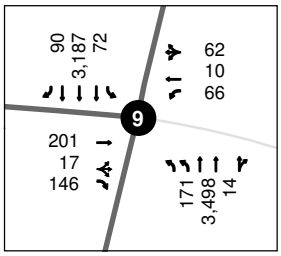
White Rock & Kilgore



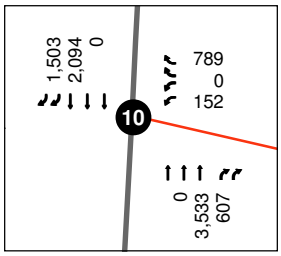
White Rock & Sunrise



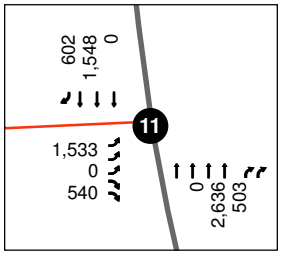
Sunrise & Zinfandel



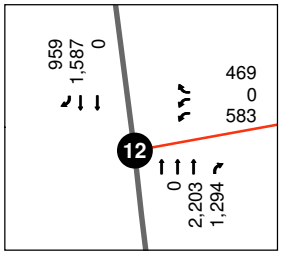
Sunrise & US 50 WB



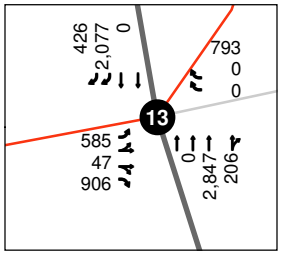
Sunrise & US 50 EB



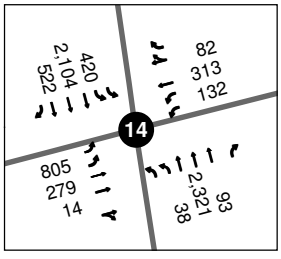
Zinfandel & US 50 WB



Zinfandel & US 50 EB



White Rock & Zinfandel



Kilgore & Project Driveway

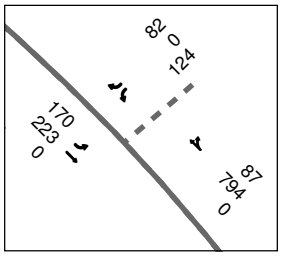


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FIGURE 7
Cumulative Plus Project PM Peak Hour Volumes

Table 16
INTERSECTION LEVELS OF SERVICE – CUMULATIVE PLUS PROJECT

Intersection	LOS Method	No Project		Existing Plus Project	
		LOS[1]	Delay[2]	LOS[1]	Delay[2]
1. Kilgore Road and Folsom Boulevard	Signal	C	26.1	C	30.7
2. Sunrise Boulevard and Folsom Boulevard	Signal	D	43.4	D	46.3
3. Kilgore Road and Trade Center Drive	Signal	D	36.8	D	46.6
4. Sunrise Boulevard and Trade Center Drive	Signal	C	24.0	C	24.8
5. Kilgore Road and Sun Center Drive	4-way Stop	**E**	**35.2**	**F**	**102.7**
6. Sunrise Boulevard and Sun Center Drive	Signal	D	35.0	D	35.2
7. Kilgore Road and White Rock Road	Signal	D	44.2	D	49.1
8. Sunrise Boulevard and White Rock Road	Signal	C	33.4	C	34.2
9. Sunrise Boulevard and Zinfandel Drive	Signal	**F**	**/3/**	**F**	**/3/**
10. Sunrise Boulevard and U.S. 50 Westbound Ramps	Signal	C	30.6	C	32.0
11. Sunrise Boulevard and U.S. 50 Eastbound Ramps	Signal	**E**	**/4/**	**E**	**/4/**
12. Zinfandel Drive/U.S. 50 Westbound Ramps	Signal	D	40.3	D	40.6
13. Zinfandel Drive/U.S. 50 Eastbound Ramps	Signal	**E**	**59.1**	**E**	**59.0**
14. Zinfandel Drive/White Rock Road	Signal	D	50.9	D	52.7
15. Kilgore and Project Main Entrance – All Approaches – Westbound Approach	Unsignalized Stop sign	NA	NA	B F	13.3 86.6

1 Level of Service based on Highway Capacity Manual (Transportation Research Board, 2000).

2 Average intersection control delay in seconds per vehicle.

3. Delay fluctuates significantly from day to day but observations indicate that this intersection often operates at LOS F conditions during the PM peak hour. Proposed project would add less than 5 seconds of delay.

4. Delay fluctuates significantly from day to day and engineers actively over-ride signal timing to prevent queues on eastbound off-ramp from backing up onto US 50 mainline. Observations indicate that this intersection often operates at LOS E conditions during the PM peak hour. Proposed project would add less than 5 seconds of delay.

BOLD text indicates that the intersection operates unacceptably based on the significance criteria.

Shading indicates a significant level of service impact

SOURCE: DKS Associates 2012

TABLE 17
SIGNAL WARRANT ANALYSIS – CUMULATIVE PLUS PROJECT

Intersection		Warrant Met	
		Cumulative No Project	Cumulative Plus Project
Kilgore Road and Sun Center Drive		Yes	Yes
Kilgore and Project Main Entrance	- one outbound lane	NA	Yes
	- two outbound lanes	NA	No

Source: DKS Associates, 2012

TABLE 18
CUMULATIVE PLUS PROJECT ROADWAY LEVEL OF SERVICE

Roadway Segment	Lanes	Cumulative No Project			Cumulative Plus Project		
		ADT[1]	V/C[2]	LOS[3]	ADT[1]	V/C[2]	LOS[3]
Sunrise Boulevard: Zinfandel Drive to US 50 WB Ramps	6	106,500	1.97	**F**	106,800	1.98	**F**
Sunrise Boulevard: US 50 EB Ramps to Folsom Boulevard	6	70,200	1.30	**F**	70,790	1.31	**F**
Sunrise Boulevard: Folsom Boulevard to Trade Center Drive	6	70,300	1.30	**F**	70,730	1.31	**F**
Sunrise Boulevard: Trade Center Drive to Sun Center Drive	6	70,300	1.30	**F**	70,300	1.30	**F**
Sunrise Boulevard: Sun Center Drive to White Rock Road	6	44,200	0.82	D	44,230	0.82	D
Sunrise Boulevard: White Rock Road to International Drive	6	58,300	1.08	**F**	58,620	1.09	**F**
Kilgore Road: Folsom Boulevard to Trade Center Drive	2	6,400	0.36	A	7,290	0.41	A
Kilgore Road: Trade Center Drive to Project Entrance	2	7,600	0.42	A	9,030	0.50	A
Kilgore Road: Project Entrance to Sun Center Drive	2	7,600	0.42	A	8,870	0.49	A
Kilgore Road: Sun Center Drive to White Rock Road	2	11,100	0.62	B	12,180	0.68	B
Zinfandel Drive: Folsom Boulevard to US 50	4	30,800	0.86	D	30,880	0.86	D
Zinfandel Drive: US 50 to White Rock Road	6	61,700	1.14	**F**	61,780	1.14	**F**
White Rock Road: Zinfandel Drive to Prospect Park Drive	6	26,700	0.49	A	26,860	0.50	A
White Rock Road: Prospect Park Drive to Kilgore Road	6	31,400	0.58	A	31,620	0.59	A
White Rock Road: Kilgore Road to Sunrise Boulevard	6	36,000	0.67	B	36,460	0.68	B
Folsom Boulevard: Zinfandel Drive to Kilgore Road	4	26,100	0.73	C	26,670	0.74	C
Folsom Boulevard: to Kilgore Road to Sunrise Boulevard	4	23,100	0.64	B	23,420	0.65	B
Trade Center Drive: Kilgore Road to Sunrise Boulevard	2	6,300	0.35	A	6,840	0.38	A
Sun Center Drive: Kilgore Road to Sunrise Boulevard	2	4,200	0.23	A	4,230	0.24	A

1 Average Daily Traffic
2 Volume to capacity ratio (County of Sacramento Traffic Analysis Guidelines, 2004)
3 LOS based on Highway Capacity Manual (Transportation Research Board, 2000)

BOLD indicates unacceptable operations based on the criterion of the governing jurisdiction

SOURCE: DKS Associates 2012

Freeway Analysis

Table 19 shows the estimated project-related traffic volumes that will be added to study segments of the US 50 during the PM peak hour under existing conditions. The proposed project would only increase traffic on those segments by 0.1% to 0.4% and those study freeway segments would operate at LOS D or E during the PM peak hour.

The analysis of intersection at the US 50 off-ramps at the Sunrise Boulevard and Zinfandel interchanges (Table 16) indicates that the proposed project would not cause back-ups on to the US 50 mainline.

Table 19
Project Traffic Added to Freeway Mainline - Cumulative Conditions

Freeway Mainline Segment	Eastbound				Westbound			
	US 50 without Project		Proposed Project		US 50 without Project		Proposed Project	
	Total Volume	Mixed Flow LOS	Traffic Added	Percent of Total	Total Volume	Mixed-Flow LOS	Traffic Added	Percent of Total
Mather Field Rd to Zinfandel Blvd	9,400	D	26	0.3%	8,140	D	19	0.2%
Zinfandel Blvd to Sunrise Blvd	9,000	E	13	0.1%	6,970	D	10	0.1%
Sunrise Blvd to Rancho Cordova Pkwy	7,790	E	19	0.2%	6,670	D	27	0.4%

Source: DKS Associates, 2012 (freeway volumes and LOS based on DKS Associates analysis for EIS on Mather Specific Plan, 2010)

Bikes and Pedestrians

The addition of the project would result in the addition of visitors and employees to the study area, some of which arrive by cycling or walking.

The City of Rancho Cordova's General Plan Circulation Element envisions a comprehensive network of bikeways, trails and sidewalks. A key element of the future bikeway network is a city bike route along Kilgore Road adjacent to the site. All roadway improvement along the project frontage will need to be designed in accordance with City of Rancho Cordova standards ensuring that the Kilgore bike route can be implemented.

Transit

The addition of the project would result in the addition of employees and visitors to the study area, some of which would utilize transit.

Zoning for the project site is consistent with the City of Rancho Cordova's General Plan; therefore, it's not anticipated that transit ridership generated by the project would adversely affect transit operations already planned for the study area. The General Plan Circulation Element reflects substantial expansion to Regional Transit (RT) bus services through the study area. The bus service expansions include north-south routes on Sunrise Boulevard and an east-west route on White Rock Road. These future bus services would include connections to the Gold Line light rail service.

Summary of Project Impacts and Mitigations

Impact 1: The proposed project would increase PM peak hour and daily traffic volumes on study roadways. The proposed project would have a significant impact on level of service at one intersection.

Tables 12, 15, 16 and 18 summarize the evaluation of the study area intersections and roadway segments under existing and cumulative conditions. A significant impact would occur with the addition of project trips at the intersection of Kilgore Road and Sun Center Drive. Under Existing Plus Project conditions, the proposed project would cause this stop sign controlled intersection to meet warrants for traffic signalization. Under Cumulative Plus Project conditions, the proposed project would cause the average delay at this four-way stop controlled intersection to increase from 35.2 seconds (LOS E) to 102.7 (LOS F), which is a significant impact.

> **Mitigation:** The impacts at the intersection of Kilgore Road and Sun Center Drive under both existing and cumulative conditions would be mitigated by the installation of a traffic signal.

Impact 2: The proposed project would generate substantial traffic volumes at the project entrances during the PM peak hour on Fridays. The proposed project could have a significant impact on traffic operations near the project entrances if an acceptable design is not implemented. This impact is considered potentially significant.

> **Mitigation:** The location and design of project entrances and the access control along the project's Kilgore Road frontage will need to be carefully reviewed to avoid impacts on traffic operations and safety. The following criteria should be considered in that design:
>
> - Left turns in and out of the project should be allowed at only one "main" project driveway and the other driveway should be restricted to right-turns in and out. A two-way left turn lane should not be used
> - A channelized left-turn lane for the "main" project driveway can be created with pavement striping, while signage and striping at the second driveway can prohibit left-turns out of that driveway. However, violations with left turns made from the second driveway are anticipated and a raised median to control turn movements is recommended.
> - The main project driveway should have three lanes: two outbound and one inbound. If only one outbound lane is provided, a traffic signal would be warranted at the main project driveway under cumulative conditions. It is recommended that the intersection of Kilgore Road and the main project driveway should be designed so that signalization could be implemented in the future if needed.
> - The location of the main project driveway and channelization/striping to control left turns from the project driveways will need to be carefully designed to minimize impacts to other driveways, both on the west side of Kilgore Road, opposite the project, and on adjacent property on the east side of Kilgore Road, including the neighboring police station.
> - The internal circulation within the project's parking lot will need to be carefully designed so that traffic can readily flow to/from the main driveway

Impact 3: The proposed project would increase PM peak hour traffic volumes on study freeway segments. However, those segments would operate at acceptable level of service under existing and cumulative conditions. This impact is considered less than significant.

Tables 14 and 19 summarize the evaluation of freeway segments in the study area under existing and cumulative conditions. The proposed project would increase volumes by only 0.1 to 0.5 percent and those segments would operate at level of service D or E. The analysis of intersection at the US 50 off-ramps at the Sunrise Boulevard and Zinfandel interchanges indicates that the proposed project would not cause back-ups on to the US 50 mainline.

Impact 4: The addition of project would increase ridership on some existing and future transit routes. However, the project will not adversely affect existing or planned transit facilities. The proposed project would not conflict with adopted plans, policies or programs regarding transit facilities. This impact is considered less than significant.

Implementation of the project will not disrupt or interfere with existing or planned transit operations or transit facilities or result in demands to transit facilities greater than there is adequate capacity to accommodate.

Impact 5: The addition of project traffic to the transportation network would increase demand for bicycle and pedestrian facilities. However, the project will not adversely affect existing or planned bicycle or pedestrian networks. The proposed project would not conflict with adopted plans, policies or programs. This impact is considered less than significant.

All roadway improvement along the project frontage will need to be designed in accordance with City of Rancho Cordova standards ensuring that the planned Kilgore bike route in the City's Bikeway Master Plan can be implemented. The site design should provide adequate access to the site for bicyclists and pedestrians.