Appendix H

San Francisco 49ers
Santa Clara Stadium

Transportation Impact Analysis

Prepared for:

The City of Santa Clara

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Executive Summary

This report presents the results of the traffic analysis conducted for the proposed San Francisco 49ers Stadium in Santa Clara, California. The results document the impacts to the surrounding transportation system that are associated with developing the proposed project.

Project Description

The project consists of an approximately 68,500 seat football stadium on the existing Great America overflow parking lot. The project site is generally bounded by Tasman Drive to the north, San Tomas Aquino Creek to the west, Silicon Valley Power's Receiving Station to the south, and the Santa Clara Youth Soccer Park and current 49ers training facility to the east (see Figure 1). Approximately, two pre-season, eight regular season, and up to three potential post-season home games will be held at the stadium. The stadium design will allow for the ability to expand seating capacity to 75,000 seats for special events, such as a Super Bowl. In addition to holding home games for the 49ers, the stadium and its facilities could also be used to support Convention Center activities, concerts, and other sporting events such as soccer games and motocross events.

Parking Plan

The parking plan does include on-site parking, but the majority of parking for the stadium will be provided by the existing surface parking lots of surrounding office/ industrial developments. The proposed parking plan will necessitate the coordination and agreement with owners and tenants of the identified potential office/ industrial developments that would provide off-site parking to stadium attendees on proposed game days. It is assumed that the adjacent office buildings will be vacant on Sundays, but the use of their parking lots by stadium attendees during weekday games will require that the offices be vacated prior to the arrival of stadium attendees.

The traffic analysis will be included as part of an Environmental Impact Report (EIR) that will be prepared for the proposed development. A Transportation Management Plan (TMP) has been completed independent of this traffic impact analysis. The TMP identifies estimated trip generation, rough distribution of patrons, and parking demand and supply for the new stadium. Proposed pre-game and

post-game traffic control plans are included as part of the TMP. As such, the TMP was used as a guide in preparation of the traffic analysis.

Scope of Study

This analysis consists of a near-term and long-range analysis to identify the potential traffic impacts related to the proposed stadium and to satisfy the requirements of the City of Santa Clara and CEQA. Although the proposed project is located in the City of Santa Clara, facilities outside of the City of Santa Clara will be affected by the proposed project. Thus, the impacts of the project will be evaluated following the standards and methodologies set forth by the Cities of Santa Clara, San Jose, Sunnyvale, and Milpitas, and the Santa Clara Valley Transportation Authority (VTA).

The study included the analysis of 120 existing intersections located in the cities of Santa Clara, San Jose, Sunnyvale, and Milpitas. In Santa Clara, the study intersections include 18 CMP designated intersections and 55 otherwise undesignated intersections. In the City of San Jose, the study intersections include 21 intersections, 10 of which are CMP intersections. In the City of Sunnyvale, the study intersections include 14 intersections, four of which are CMP intersections. In the City of Milpitas, the study intersections include 12 intersections, two of which are CMP intersections. Freeway facility analysis included 44 directional freeway segments and ramps at 11 interchanges.

The traffic analysis is based upon the time periods when football games will be held at the proposed stadium. The study includes the analysis of the standard weekday PM peak hour (4-6pm), the weekday PM peak hour of the stadium (3-5pm), referred to as early weekday PM in this study, and the Sunday peak hours of the stadium (11am-1pm and 3-5pm), referred to as early and late Sunday in this study, respectively. The AM peak hour was not studied since no games or events would be held during the 7-9am hours and employee and staff trips would be minimal during this time period. To represent a worst case scenario, the Sunday peak hour analysis includes traffic associated with concurrent events at both the proposed stadium and Great America Amusement Park.

Each of the study periods is intended to reflect traffic conditions due to the arrival of attendees to the football games. Departure of attendees will occur during the late evening hours 8-10pm for weekday and late Sunday games and 4-6pm for the early Sunday games. The ambient traffic volumes and activities at surrounding developments during the departure times will be minimal in the project area. As such, full implementation of the TMP will be possible and signalized intersections will be officer controlled and/or timing adjusted. Therefore, detailed intersection level of service analysis for departure periods was not completed as part of the study, but an evaluation of roadway capacity is included.

Trip Generation

The analysis of the effects of the traffic associated with the proposed stadium is based on a sold-out football game and its 68,500 attendees and approximately 2,900 employees. Thus, a sold-out football game at the stadium will generate approximately 71,400 person trips. Attendees and employees will arrive to the games via several transportation modes. The estimated transit ridership is based upon both data collected at Candlestick Point (current San Francisco 49ers stadium) and other NFL stadiums with similar transit opportunities. Of all attendees, it is estimated that 74% would arrive via automobile, 7% by charter bus, and 19% percent would arrive via transit. Thus, of the 68,500 attendees, approximately 55,500 person trips will be made via vehicle and 13,000 via transit. The employee modal split is estimated to be 80% auto (2,320 person trips) and 20% (580 person trips) transit.

The majority of attendees will arrive to the stadium via vehicle. Of the projected 55,500 person trips, approximately 50,500 trips will be made via auto and 5,000 via charter bus. Utilizing vehicle occupancy rates of 2.7 persons per vehicle and 44 persons per charter bus, a total of 18,818 vehicle trips (18,704 via auto and 114 bus trips) are estimated for attendees on sold-out game days.

The arrival and departure of fans and vehicles will vary depending on game start times. Collected data indicates that arrival of fans begins approximately five hours before game time and gradually increases with the maximum arrivals occurring one hour prior to the start of the game. Nearly all fans will depart the stadium within two hours of the game completion with the majority occurring within the first hour of the end of the game. The arrival rate data indicates a total peak demand of 7,369 vehicular trips within the hour just prior to the start of a game. Departure of spectators will primarily occur within the hour after the end of game. It is estimated that approximately 12,000 vehicles will be departing the area within the hour after the end of game.

Project Impacts

Intersection Impacts

Intersection level of service analysis was used to evaluate traffic operations at the study intersections under project condition study scenarios. The analysis is not reflective of anticipated traffic conditions during peak periods of the stadium with the implementation of the TMP and traffic control plan. The analysis provides an evaluation of the magnitude of effects the stadium will have on the transportation system utilizing standard traffic analysis and CEQA evaluation methods. Results of the intersection level of service analysis show that 17 of the 120 study intersections would be impacted by the project during at least one of the weekday study periods and five during at least one of the Sunday study periods according to applicable level of service standards. The location of each of the mitigated intersections is presented below:

- 8 intersections are located in Santa Clara
- 6 intersections are located in San Jose
- 1 intersections is located in Sunnyvale
- 2 intersections are located in Milpitas

Mitigation measures were investigated for all identified weekday study period intersection impacts and are presented and described in Chapter 4. Mitigation measures were not investigated for the Sunday study periods because standard impact criteria only apply to weekday commute periods. Though it is expected that the traffic associated with the stadium will have a significant impact on intersections and other transportation facilities, the infrequency of occurrence (8-10 times per year) does not justify the implementation of costly physical improvements. The implementation of the TMP and traffic control plan will provide for temporary relief of adverse traffic congestion caused by stadium traffic on game days and days of other events. The project is not proposing to fund or implement the possible measures.

Freeway Segment Impacts

The results of the freeway segment analysis showed that 16 of the 44 mixed-flow lanes and one of the 32 HOV lanes on the directional freeway segments studied would be impacted by the project according to CMP level of service standards for freeways. Measures were identified that could reduce the impacts to

freeway segments. The measures primarily consist of transit improvements and enhancements that would provide options for stadium attendees.

Traffic Management Plan
Enhancement of CalTrain, Amtrak/ACE service
Extension of LRT lines
Enhanced Bus Service

Adjusted transit services with major enhancements to provide a convenient means of getting to and from the stadium would reduce auto usage. The reduction in auto usage would be most noticeable on freeways since most transit trips would originate from outside the project area.

The Valley Transportation Authority *Valley Transportation Plan 2030* also identifies improvements to regional facilities, including freeways, for which a regional funding plan could be used to fund. The following improvements to impacted freeway segments are identified in the *VTP 2030:*

US 101 auxiliary lane widenings between Trimble Road and Montague Expressway
US 101 southbound auxiliary lane between Great America Parkway and Lawrence Expressway
SR 237 westbound auxiliary lane between Coyote Creek Bridge and North First Street

Should it be deemed that the identified freeway improvements are feasible and necessary, the project along with other projects within Santa Clara County could contribute towards the funding of the improvements. A fee collection program would need to be established and specific improvements identified.

Full mitigation of significant project impacts on freeway segments would require roadway widening to construct additional through lanes, thereby increasing freeway capacity. Since it is not feasible for an individual development project to bear responsibility for implementing such extensive transportation system improvements due to constraints in acquisition and cost of right-of-way, and no comprehensive project to add through lanes has been developed by Caltrans or VTA for individual projects to contribute to, the significant impacts on the directional freeway segments identified above must be considered significant and unavoidable.

Gameday Transit Service Enhancements

The large demand for transit services, as described previously, will necessitate extensive enhancement of existing transit service. However, the project is not proposing to construct any new transit infrastructure. Therefore, the enhancement of existing transit services will primarily consist of increased service frequencies, additional bus lines, and additional trains to serve the specific demands of the stadium attendees. Tasman Drive will be temporarily closed to facilitate the large crowds that will arrive and depart football games. Tasman Drive will not only serve as a main transit arterial due to the light rail service along it, but also will be the primary gateway route for the majority of pedestrians. Enhancements to each of the components of transit service to meet the anticipated demands of the stadium are described below.

Bus Service. Bus lines from various agencies in the Bay area could be adjusted or special game day buses added. Staging areas for transit buses will be provided along Stars and Stripes Drive and Tasman Drive, just west of the bridge over Lafayette Street. An exclusive ingress and egress route from Lafayette Street via Calle De Luna, Calle Del Sol, and Tasman Drive will be provided for transit buses.

Light Rail Service. As described previously, the VTA light rail service will be a highly desirable means of accessing the stadium due to park-and-ride lots located throughout the south bay and a LRT station within a few hundred feet of the stadium. Increased headways will be necessary to accommodate the demand for light rail. The closed area along Tasman Drive will serve as a staging area for fans to board the light rail at the Great America station.

Heavy Rail Service. Coordination between the heavy rail lines of Caltrain, ACE/Amtrak, and the Capitol Corridor line will be necessary. It may be possible to serve all heavy rail lines at the Great America station, but it will require joint-scheduling of trains, closure of tracks, and possible upgrades to equipment.

The TMP provides further detail on the possible enhancements and adjustments of each of the transit services.

Arrival and Departure Roadway Capacities

There are seven major arterials that will provide ingress and egress access to the stadium core area and identified parking areas. With the peak period arrival and departure projections of 7,369 and 12,082, respectively, there will be a large demand on the major arterials and the freeway ramps that they serve. The distribution of trips on each of the arterials and freeway ramps analyzed are based upon the routes that attendees will be encouraged to use. Critical to the efficient ingress and egress of attendees will be the dispersal of motorists to the identified access and departure routes. Signage will be used to direct motorists to appropriate exits from the freeways and to access identified parking facilities.

The projected traffic volumes indicate that the largest demands on the arterials serving the project area will be placed on Great America Parkway. It is projected that Great America Parkway will serve approximately 1,900 vehicles from the north and 1,800 vehicles from the south during the peak ingress hour and 2,100 vehicles to the north and 2,900 vehicles to the south during the peak egress hour. Though arterial lanes have the capacity to serve as much as 1,800 vph, a lane capacity of only 1,000 vph was assumed to account for pedestrian conflicts and general driver confusion. Based upon existing capacities of the major arterials, it was calculated that it will take no longer than 45-minutes to serve arriving attendees. Since larger volumes of attendees are projected to depart during the first hour after the game, it will take up to one hour and 20-minutes to serve the peak departure demand on arterials.

Ramp volumes indicate that the freeway ramps at the US 101/ Great America Parkway and SR 237/ Great America Parkway interchanges will serve the largest arrival and departure volumes. Demands at these two interchange ramps during the peak arrival period will be approximately 1,000 vph and 1,700 vph during the peak departure period. Based upon existing ramp capacities (assuming lane capacities of 1,000 vph), it will take no longer than one hour to serve the peak arrival demand and one hour and 40 minutes to serve the peak departure demand.

Though arrival and departure demands are projected to exceed existing capacities of the most heavily utilized arterials and ramps, the congestion is expected to dissipate rapidly upon service of the peak demand periods, which will not last more than two hours. It also is likely that motorists will seek alternative routes when wait times at freeway off-ramp become too lengthy. The TMP will implement measures to control the effects of diversion and maintain freeway mainline flow.

Residential Parking Control

Uniformed officers will be responsible for the enforcement of residential parking restrictions in the stadium area. The residential areas located east of Lawrence Expressway between US 101 and Tasman Drive and west of Lafayette Street between Agnew Road and Tasman Drive could potentially be the most affected by stadium parking. An officer will be positioned along with barricades at each of the access points to the neighborhoods. The neighborhoods also will be patrolled to ensure attendees do not park within the neighborhoods or violate parking restrictions. Access to the Adobe Wells mobile home park that is located along the south side of Tasman Drive is provided at Adobe Wells. It is likely that during the peak hours of arrival and departure of attendees that Tasman Drive will experience congestion restricting access to the mobile home park. Thus, it will be necessary for officers to monitor traffic conditions and ensure that residents of the mobile home park have the ability to enter and exit the park entrance.

Pedestrian Routes

With the large numbers of attendees expected for the football games and the use of essentially all parking within a 20-minute walk of the stadium, a large number of fans will be utilizing many streets in the area to get from parking to the stadium. For the most part, pedestrians will not have to cross vehicular traffic, but there are a few areas that will present a conflict between vehicles and pedestrians. The conflict points will be located at signalized intersections with crosswalks that serve as primary entry to identified parking areas. Pedestrians traveling to parking areas northwest of the stadium would cross Great America at either Tasman Drive or Bunker Hill, those traveling west and southwest of the stadium would cross Great America Parkway at Tasman Drive, Old Glory Lane, Patrick Henry Drive, or Mission College Boulevard. Each of the conflict points will be officer controlled to provide an efficient flow of both vehicular and pedestrian traffic. Pedestrians traveling east of the stadium would travel along Tasman Drive and not encounter conflicts with vehicular traffic. Those traveling south of the stadium would utilize the San Tomas Aquino Creek trail or Great America parkway and one of the pedestrian bridges across San Tomas Aquino Creek Pedestrian routes.

The intersection of Great America Parkway and Tasman Drive will serve as the main gateway to the stadium from the majority of identified parking and each of the roadways will provide access from nearly every parking zone. Tasman Drive between Centennial Boulevard and the Great America parking lot driveway will be temporarily closed to vehicular traffic to accommodate the large crowds before and after games. The closure of Tasman Drive will prohibit through traffic along Tasman Drive east of Great America Parkway, but will allow access to parking in the Great America surface lots. Should it be found that vehicular traffic presents a conflict with and impedes pedestrian flow along Tasman Drive, all vehicular access on Tasman Drive should be prohibited.

To further facilitate pedestrian traffic the existing overflow parking lot bridge and the Tasman Drive over-crossing will be widened along with the construction of a new pedestrian-only bridge south of the Tasman Bridge over San Tomas Aquino Creek.

Charter Bus Staging

Parking for charter buses will be permitted along Patrick Henry Drive/Old Ironsides Drive on the north and south of Tasman Drive. There is adequate parking for up to 195 buses within the specified loop. All

charter buses will remain parked for the duration of the football game. All buses will enter and exit via Tasman Drive to the west.

Multi-Team Use of Stadium

Though there currently is no specific plans for the use of the stadium by a second NFL team nor has potential teams, existing or future expansion, been identified, there is the potential that a second NFL team may utilize the stadium.

The origin and fan base of a second team is unknown at this time. But regardless of whether a second team is relocated or is an expansion team, it is expected that the effects on the transportation system by a second team would be similar to those identified within this report for the 49er football games. Though the origin of fans may be slightly different from that which was identified within the report based upon the 49er fan base, the overall effects on the facilities studied in the report and within Santa Clara County as a whole would be similar. The distribution of fans will be dependent upon the origins of a second team. Should the second team be relocated from within the Bay Area to the new stadium, the fan distribution could be slightly different than that of the 49ers outside of Santa Clara County, but overall effects within Santa Clara County would be similar to 49er games. Should the second team be relocated from outside the Bay Area it is likely that a greater amount of fans would originate from within Santa Clara County, and mirror the effects on the transportation system of the 49er games.

Though the effects on the transportation system due to the potential second team use of the stadium would be similar to the 49er games, the second team would double the amount of games held at the stadium, therefore increasing the frequency of impacts identified for the 49er games. It is expected that the proposed TMP to be utilized for 49er games would also be implemented for games of the second team.

Non-Football Events

The stadium may also be utilized to host non-football events throughout the year. Possible events include motocross, x-games, concerts, soccer games, and various festivals. Larger non-football events that would require the use of off-site parking will be restricted to non-summer months to avoid conflict with Great America theme park and take place during evenings and on weekends to avoid conflict with the surrounding office/industrial land uses. Times of use for smaller events that would only utilize on-site stadium parking will not be restricted.

1. Introduction

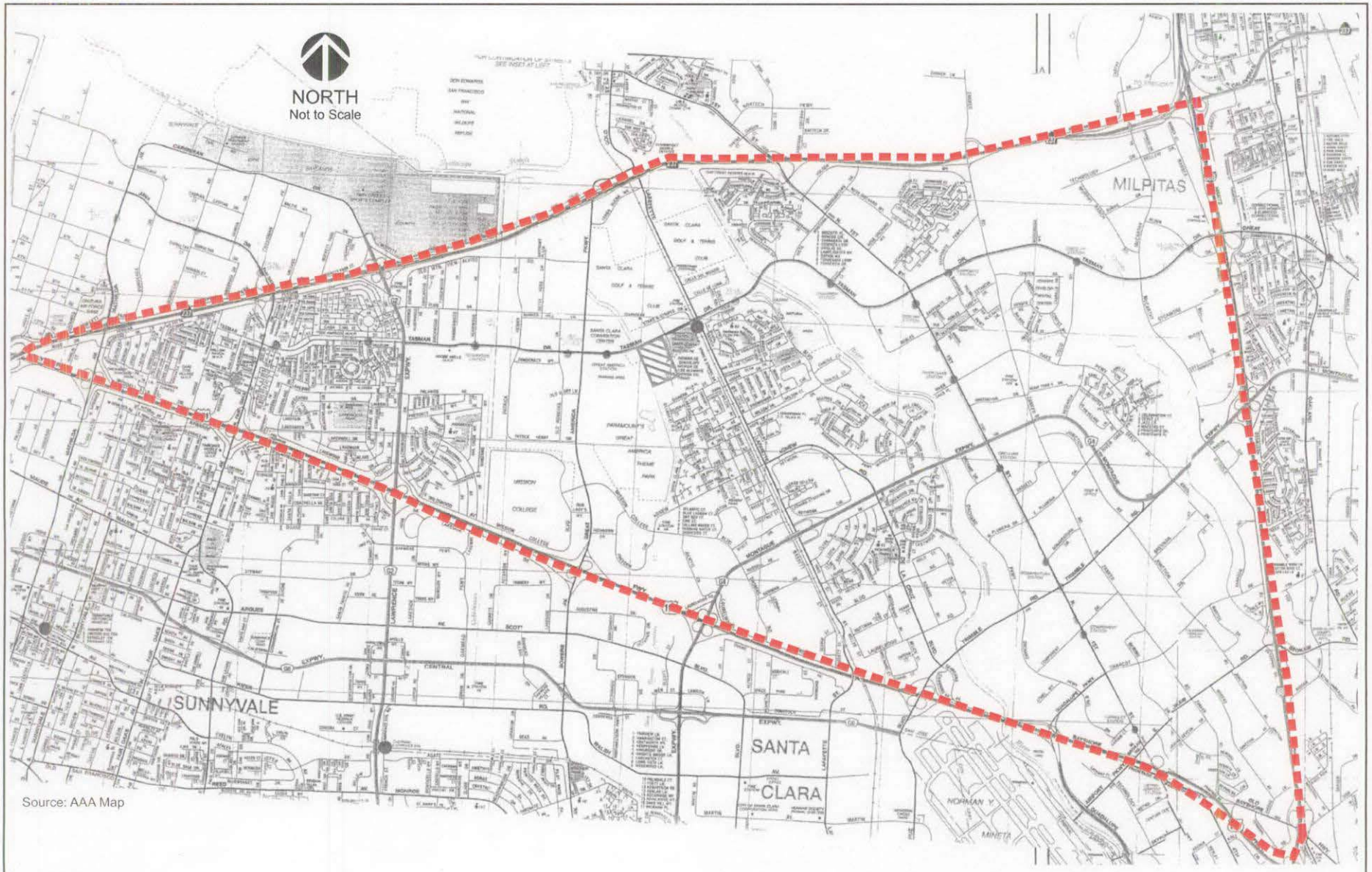
This report presents the results of the traffic analysis conducted for the proposed San Francisco 49ers Stadium in Santa Clara, California. The results document the impacts to the surrounding transportation system that are associated with developing the proposed project.

Project Description

The project consists of an approximately 68,500 seat football stadium on the existing Great America overflow parking lot. The project site is generally bounded by Tasman Drive to the north, San Tomas Aquino Creek to the west, Silicon Valley Power's Receiving Station to the south, and the Santa Clara Youth Soccer Park and current 49er training facility to the east (see Figure 1). Approximately two pre-season, eight regular season, and up to three potential post-season home games will be held at the stadium. The stadium design will allow for the ability to expand seating capacity to 75,000 seats for special events, such as a Super Bowl. In addition to holding home games for the 49ers, the stadium and its facilities could also be used to support Convention Center activities, concerts, and other sporting events such as soccer games and motocross events. Centennial Boulevard, south of Tasman Drive, is proposed to be abandoned and a new two-lane access driveway constructed to provide access to the existing soccer park.

Parking Plan

The parking plan does include on-site parking, but the majority of parking for the stadium will be provided by the existing surface parking lots of surrounding office/ industrial developments. The proposed parking plan will necessitate the coordination and agreement with owners and tenants of the identified potential office/ industrial developments that would provide off-site parking to stadium attendees on proposed game days. It is assumed that the adjacent office buildings will be vacant on Sundays, but the use of their parking lots by stadium attendees during weekday games will require that



LEGEND

= Stadium Core Area

= Project Site

Hexagon
Transportation Consultants, Inc.

SITE LOCATION AND IMMEDIATE STADIUM CORE AREA

Figure 1

49ers Santa Clara Stadium

the offices be vacated prior to the arrival of stadium attendees.

The traffic analysis will be included as part of an Environmental Impact Report (EIR) that will be prepared for the proposed development. A Transportation Management Plan (TMP) has been completed independent of this traffic impact analysis. The TMP identifies the estimated trip generation, rough distribution of patrons, and parking demand and supply for the new stadium. Proposed pre-game and post-game traffic control plans are included as part of the TMP. As such, the TMP was used as a guide in preparation of this traffic analysis. The TMP is included in Appendix F.

Scope of Study

This analysis consists of a near-term and long-range analysis identifying the potential traffic impacts related to the proposed stadium and for the purpose of satisfying the requirements of the City of Santa Clara and
CEQA. Although the proposed project is located in the City of Santa Clara, facilities outside of the City of Santa Clara will be affected by the proposed project. Thus, the impacts of the project also will be evaluated following the standards and methodologies set forth by the Cities of San Jose, Sunnyvale, and Milpitas, and the Santa Clara Valley Transportation Authority (VTA).

Time Periods of Analysis

The traffic analysis is based upon the time periods when football games will be held at the proposed stadium. The study includes the analysis of the standard weekday PM peak hour (4-6pm), the weekday PM peak hour of the stadium (3-5pm), referred to as early weekday PM study period in this study, and the Sunday peak hours of the stadium (11am-1pm and 3-5pm), referred to as early and late Sunday study periods in this study, respectively. The AM peak hour was not studied because no games or events would be held during the 7-9am hours and employee and staff trips would be minimal during this time period. To represent a worst case scenario, the Sunday peak hour analysis includes traffic associated with concurrent events at both the proposed stadium and Great America Amusement Park. Each study period is discussed below.

Each of the study periods is intended to reflect traffic conditions due to the arrival of attendees to the football games. Departure of attendees will occur during the late evening hours (8-10pm) for weekday and late Sunday games and 4-6pm for the early Sunday games. The ambient traffic volumes and activities at surrounding developments during the departure times will be minimal in the project area. As such, full implementation of the TMP will be possible and signalized intersections will be officer controlled and/or timing adjusted. Therefore, detailed intersection level of service analysis for departure periods was not completed as part of the study, but an evaluation of roadway capacity is included.

Sunday Games

Sunday football games with a 1pm start time will generally represent the periods when the stadium will generate the greatest amount of traffic. Ambient traffic volumes on the roadway system are normally lower on Sundays when compared to the standard weekday commute periods. Regardless, existing counts were collected on Sundays between 11am and 1pm. The counts were collected during the summer to capture traffic associated with Great America Amusement Park.

There also is the possibility of games being held Sunday nights, though not as frequent as Sunday day games. It is expected that traffic volumes on the roadway system during Sunday evenings are lower than

Sunday afternoons. To ensure this to be the case, a sampling of counts were collected during the 3-5pm period to compare with the 11am-1pm period.

Sunday (Day Games –1pm start time)
Arrival: 8am-1pm
Departure: 3pm-6pm
Study Period: 11am-1pm (early Sunday)

Sunday (Night Games – 5pm start time)
Arrival: 12-5pm
Departure: 8-10pm
Study Period: 3-5pm (Late Sunday)

Weekday Games

It is likely that as many as two football games during the season could be held during the week, primarily Monday and Thursday nights. The weekday evening games will present the worst case scenario in regards to traffic operations on the roadway system. It is during the weekday evening periods that the ambient traffic volumes on the roadway system are normally the largest and will present a conflict with arrival of traffic bound for the stadium.

The proposed parking plan will necessitate the coordination and agreement with owners and tenants of the identified potential office/ industrial developments that would provide off-site parking to stadium attendees on proposed game days. It is assumed that the adjacent office buildings will be vacant on Sundays, but the use of their parking lots by stadium attendees during weekday games will require that the offices be vacated prior to the arrival of stadium attendees. For the early weekday study period (3-5pm), it is assumed that the identified office developments at which stadium attendees could utilize parking would begin to vacate at 3pm, though it is likely that the office departure would begin earlier. The assumption of a mass departure of office tenants reflects a worst case scenario in which office departures occur concurrently with a significant amount of fans beginning to arrive in the project area.

As a worst case scenario, the weekday standard PM study period assumes the arrival of fans and departure of office tenants during the standard PM peak hour. Though the scenario is very unlikely, it is included in the traffic study to represent the overall effects of stadium generated traffic on typical PM peak hour conditions.

Monday/Thursday (Night Games – 5:30pm start time)
Arrival: 12-5:30pm
Departure: 8-10pm
Study Period: 4-6pm (standard PM) & 3-5PM (early PM)

Special Events

Special events such as concerts and soccer games may also be held at the stadium. The events would likely have start and end times similar to start and end times of both the weekday and Sunday football games. As such, it is assumed that any traffic conditions associated with special events would be reflected in the analysis of football games. Unlike the planned football games, other special events may occur during the summer in conflict with Great America.

Special Events (Concerts/Soccer)
Similar start times as football games

Study Scenarios

Each of the time periods discussed above were evaluated for the following traffic condition scenarios:

Scenario 1: *Existing Conditions.* Existing conditions were represented by existing peak-hour traffic volumes on the existing roadway network. Traffic volumes collected in approximately 2006-2008 were used in this analysis.

Scenario 2: *Background Conditions.* Background conditions were represented by future traffic volumes on the existing roadway network. Background traffic volumes were estimated by adding to existing peak-hour volumes the projected volumes from approved but not yet completed developments within each jurisdiction.

Scenario 3: *Project Conditions.* Background plus project conditions (also referred to as *Project Conditions*) were represented by future traffic volumes with the project. Future traffic volumes with the project (hereafter called *project traffic volumes*) were estimated by adding to background traffic volumes the trips associated with the proposed project. Project conditions were evaluated relative to background conditions in order to determine potential project impacts.

Scenario 4: *Cumulative Growth No Project Conditions.* Traffic volumes for cumulative conditions without the project were estimated by adding traffic associated with pending developments. Cumulative growth conditions represent future traffic volumes on the future transportation network at the time the proposed project is anticipated to be complete (2014). Cumulative growth conditions include traffic growth projected to occur due to the approved development projects, other proposed but not yet approved (pending) development projects, and general background traffic increases.

Scenario 5: *Cumulative Growth With Project Conditions.* Cumulative traffic volumes with the project were estimated by adding to cumulative no project traffic volumes the additional traffic generated by the project.

Methodology

This section presents the methods used to determine the traffic conditions for each scenario described above. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

Data Requirements

The data required for the analysis were obtained from new traffic counts from each of the applicable cities, the 2006 CMP Annual Monitoring Report, and Caltrans. The following data were collected from these sources:

- existing traffic volumes (intersections)
- lane configurations
- signal timing and phasing (for signalized intersections only)
- average speed and density (for freeway segments only)
- existing traffic volumes on freeway mainlines and ramps

Intersection Analysis

Study Intersections

The study included the analysis of 120 existing intersections located in the cities of Santa Clara, San Jose, Sunnyvale, and Milpitas. In Santa Clara, the study intersections include 18 CMP designated intersections and 55 otherwise undesignated intersections. In the City of San Jose, the study intersections include 21 intersections, 10 of which are CMP intersections. In the City of Sunnyvale, the study intersections include 14 intersections, four of which are CMP intersections. In the City of Milpitas, the study intersections include 12 intersections, two of which are CMP intersections.

Intersections that are currently operating at LOS D or worse conditions and to which the project would likely add a significant amount of traffic, 10 trips or more per lane as specified by CMP criteria, were studied. Project traffic will dissipate and disperse significantly once outside of the freeway system surrounding the project area. It is within the immediate project area, or what is referred to as the "stadium core area", where the most significant effects of the stadium will be seen. Thus, the collection of new traffic counts was focused to within the stadium core area. Additionally, much of the interpolation of data required for the analysis is based upon data for facilities within the core area. The study intersections are listed below and shown graphically in Figures 2 though 6.

City of Santa Clara Intersections

1 Patrick Henry Drive and Tasman Drive
2 Old Ironsides Drive and Tasman Drive
3 Great America Parkway and Tasman Drive*
4 Convention Center and Tasman Drive
5 Centennial Boulevard and Tasman Drive
6 Calle Del Sol and Tasman Drive
7 Lick Mill Boulevard and Tasman Drive
8 Great America Parkway and Mission College Boulevard *
9 Marriott Entrance and Mission College Boulevard
10 Freedom Circle (W) and Mission College Boulevard
11 Freedom Circle (E) and Mission College Boulevard
12 Juliette Lane and Mission College Boulevard
13 Burton Drive and Mission College Boulevard
14 Great America Parkway and Yerba Buena Way
15 Great America Parkway and Alviso Road
16 Great America Parkway and Bunker Hill Lane
17 Great America Parkway and Old Glory Lane
18 Great America Parkway and Patrick Henry Drive
19 Great America Parkway and US 101 NB *
20 Bowers Avenue and US 101 SB *
21 Bowers Avenue and Augustine Drive
22 Bowers Avenue and Scott Boulevard *
23 Bowers Avenue and Central Expressway *
24 Bowers Avenue and Walsh Avenue
25 Bowers Avenue and Mead Avenue
26 Bowers Avenue and Chromite Avenue
27 Bowers Avenue and Monroe Street

28 Bowers Avenue and Cabrillo Avenue
29 Bowers Avenue and Barkley Avenue
30 Bowers Avenue and Warburton Avenue
31 Bowers Avenue and El Camino Real *
32 Kiely Boulevard and Benton Street
33 Kiely Boulevard and Kaiser Drive
34 Kiely Boulevard and Homestead Road
35 Lafayette Street and Yerba Buena Way
36 Lafayette Street and Calle de Luna
37 Lafayette Street and Hogan Drive
38 Lafayette Street and Eisenhower Drive
39 Lafayette Street and Hope Drive
40 Lafayette Street and Agnew Road
41 Lafayette Street and Palm Drive
42 Lafayette Street (North) and Montague Expressway
43 Lafayette Street (South) and Montague Expressway
44 Lafayette Street and Central Expressway *
45 Lafayette Street and Walsh Avenue
46 Lafayette Street and Martin Avenue
47 Lafayette Street and Matthew Street/ Memorex Drive
48 Lafayette Street and Reed Street
49 Lafayette Street and El Camino Real *
50 Lafayette Street and Benton Street
51 Lafayette Street and Homestead Road
52 Scott Boulevard and Central Expressway *
53 Scott Boulevard and Walsh Avenue
54 Scott Boulevard and Martin Avenue
55 Scott Boulevard and Monroe Street
56 Scott Boulevard and Warburton Avenue
57 Scott Boulevard and El Camino Real *
58 Scott Boulevard and Benton Street
59 Scott Boulevard and Homestead Road
60 San Tomas Expressway and Homestead Road *
61 San Tomas Expressway and Benton Street
62 San Tomas Expressway and El Camino Real *
63 San Tomas Expressway and Cabrillo Avenue
64 San Tomas Expressway and Monroe Street *
65 San Tomas Expressway and Walsh Avenue
66 San Tomas Expressway and Scott Boulevard *
67 Mission College Boulevard and Montague Expressway *
68 De La Cruz Boulevard and Montague Expressway *
69 Lick Mill Boulevard and Montague Expressway
70 Lawrence Expressway and Cabrillo Avenue
71 Lawrence Exp Ramps and El Camino Real *
72 Lawrence Expressway and Benton Street
73 Lawrence Expressway and Lochinvar Avenue

City of San Jose Intersections

74 Renaissance Drive and Tasman Drive

75 Vista Montana and Tasman Drive
76 Champion Court and Tasman Drive
77 Rio Robles and Tasman Drive
78 North First Street and Tasman Drive
79 Baypointe Parkway and Tasman Drive
80 Zanker Road and Tasman Drive
81 Morgridge Way and Tasman Drive
82 Cisco Way and Tasman Drive
83 North First Street and Montague Expressway *
84 Zanker Road and Montague Expressway *
85 Montague Expressway and River Oaks Parkway
86 Trimble Road and Montague Expressway *
87 O'Toole Avenue and Montague Expressway *
88 Oakland Road/Main Street and Montague Expressway *
89 Trade Zone Boulevard and Montague Expressway *
90 North First Street (South) and SR-237 *
91 North First Street (North) and SR-237 *
92 Great America (South) and SR 237 *
93 Great America (North) and SR 237 *
94 Great America Parkway and Gold Street

City of Sunnyvale Intersections

95 Reamwood Avenue and Tasman Drive
96 Birchwood Avenue and Tasman Drive
97 Lawrence Expressway and Tasman Drive *
98 Vienna Drive and Tasman Drive
99 Fair Oaks Avenue and Tasman Drive
100 Lawrence Expressway and Elko Drive
101 Lawrence Expressway and Sandia Avenue/ Lakehaven Drive
102 Lawrence Expressway (North) and US 101
103 Lawrence Expressway (South) and US 101
104 Lawrence Expressway and Oakmead Parkway
105 Lawrence Expressway and Arques Avenue *
106 Lawrence Expressway and Kifer Road
107 Lawrence Expressway and Reed Avenue/ Monroe Street *
108 Lawrence Expressway and Homestead Road *

City of Milpitas Intersections

109 McCarthy Boulevard and Tasman Drive
110 Alder Drive and Tasman Drive
111 I-880 and Tasman Drive (West)
112 I-880 and Tasman Drive (East)
113 I-880 and Calaveras Boulevard (West)
114 I-880 and Calaveras Boulevard (East)
115 Abbott Avenue and Calaveras Boulevard
116 Serra Way and Calaveras Boulevard
117 Abel Street and Calaveras Boulevard *
118 Milpitas Boulevard and Calaveras Boulevard *

119 Town Center Drive and Calaveras Boulevard
120 Hillview Drive and Calaveras Boulevard

* Denotes CMP Intersection

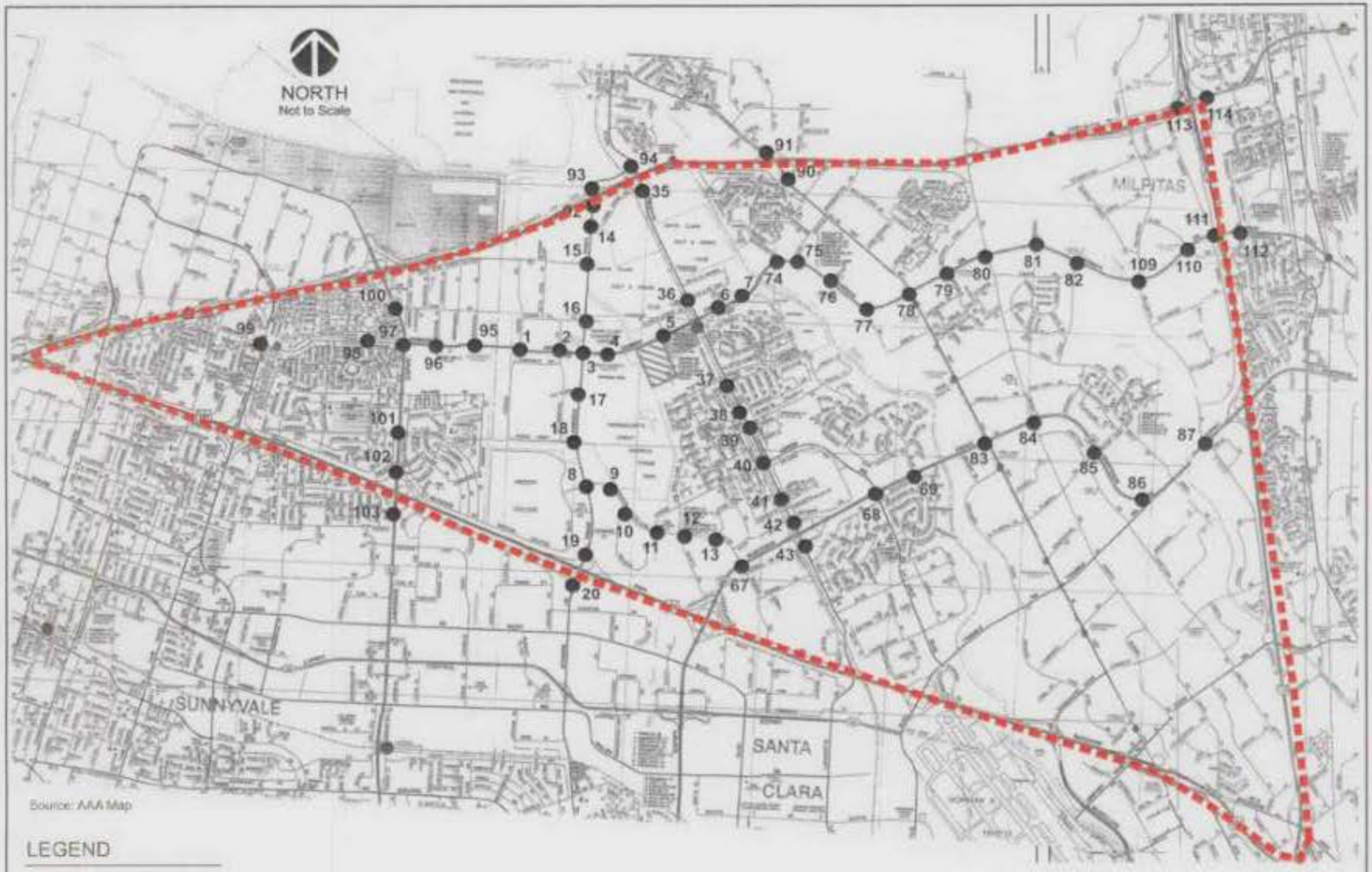


Figure 2

IMMEDIATE STADIUM CORE STUDY INTERSECTIONS

49ers Santa Clara Stadium

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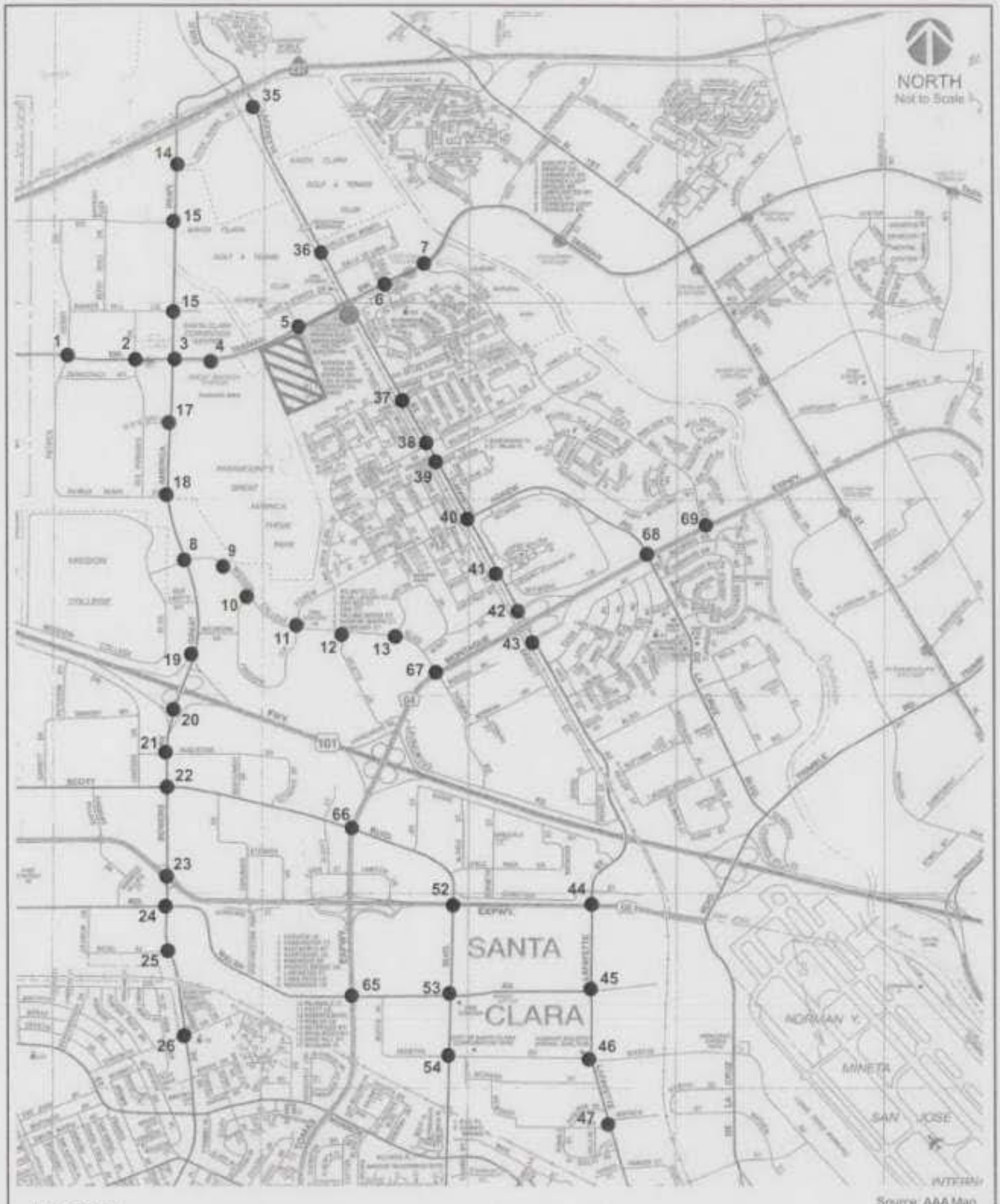


Figure 3

CITY OF SANTA CLARA STUDY INTERSECTIONS

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium

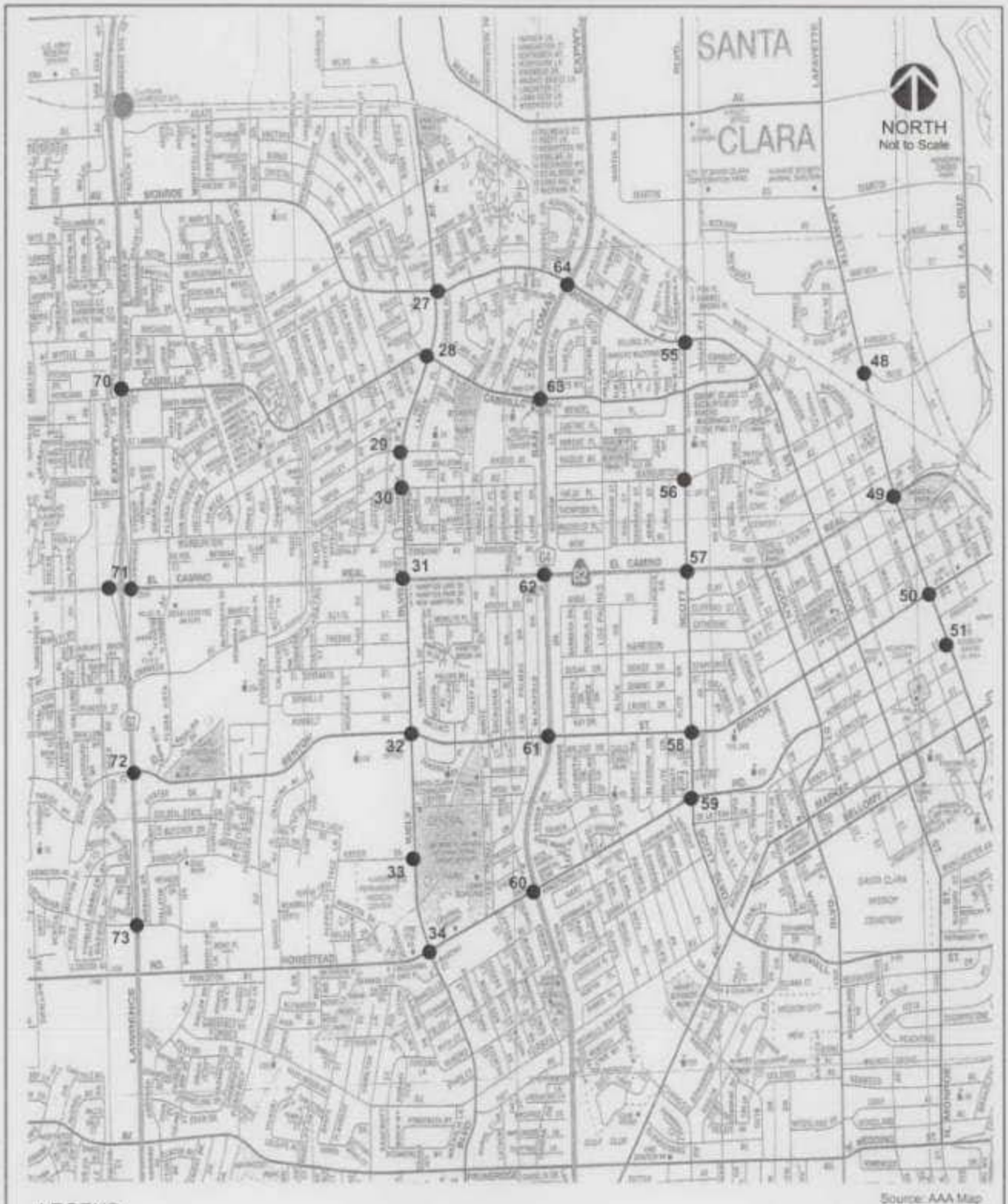
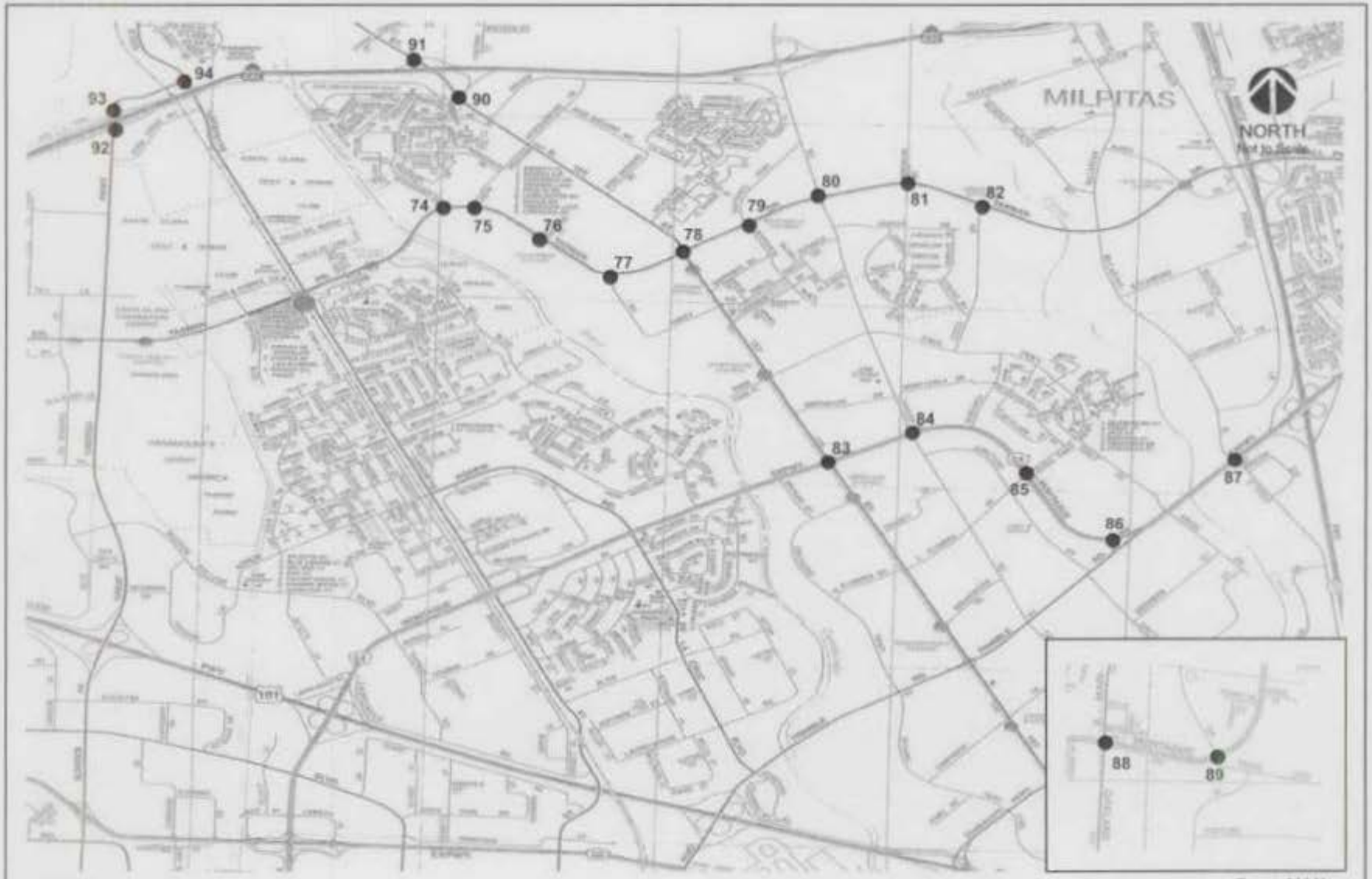


Figure 3 (cont'd)

CITY OF SANTA CLARA STUDY INTERSECTIONS

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



Source: AAA Map

Figure 4

CITY OF SAN JOSE STUDY INTERSECTIONS

49ers Santa Clara Stadium

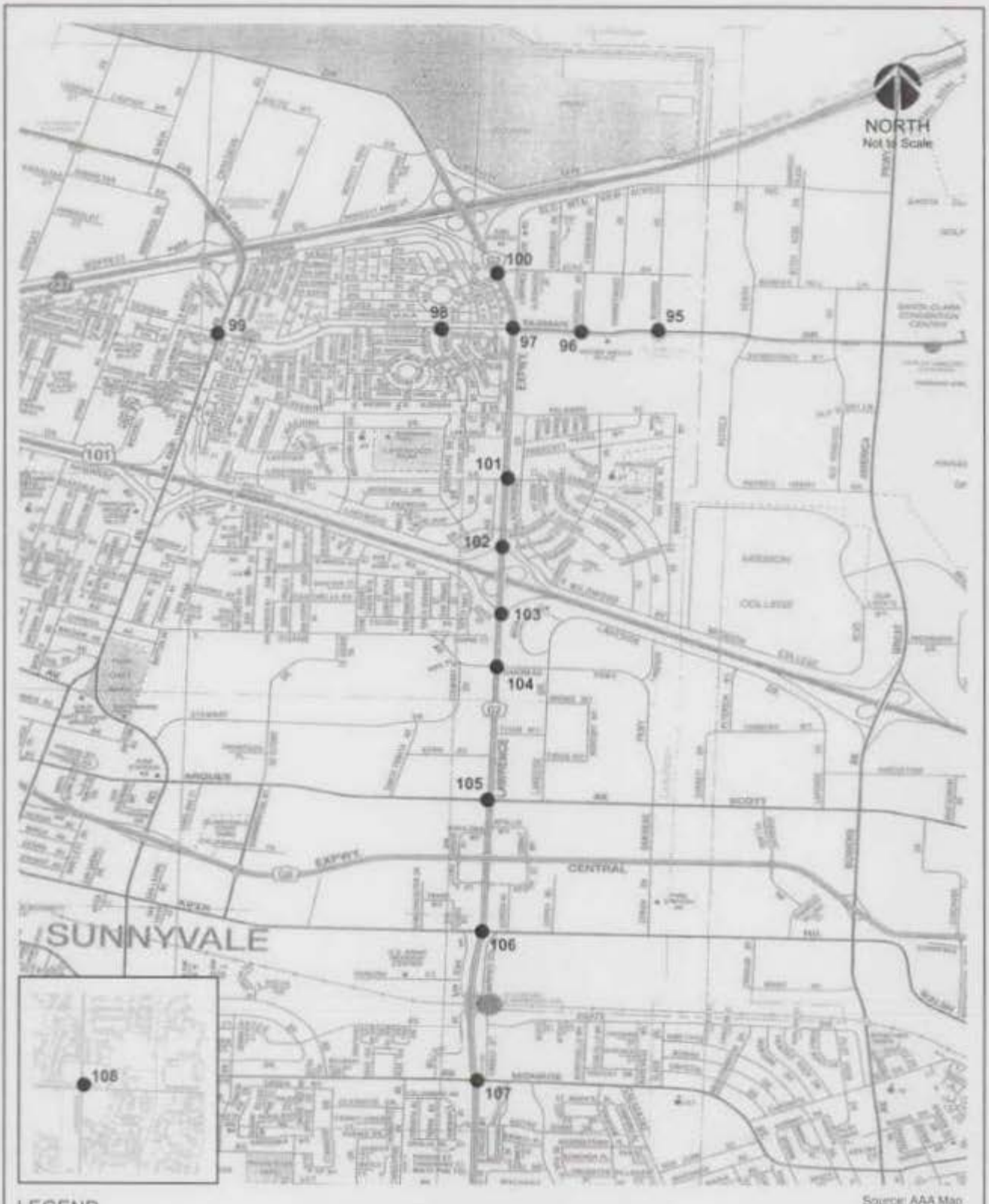


Figure 5

CITY OF SUNNYVALE STUDY INTERSECTIONS

49ers Santa Clara Stadium

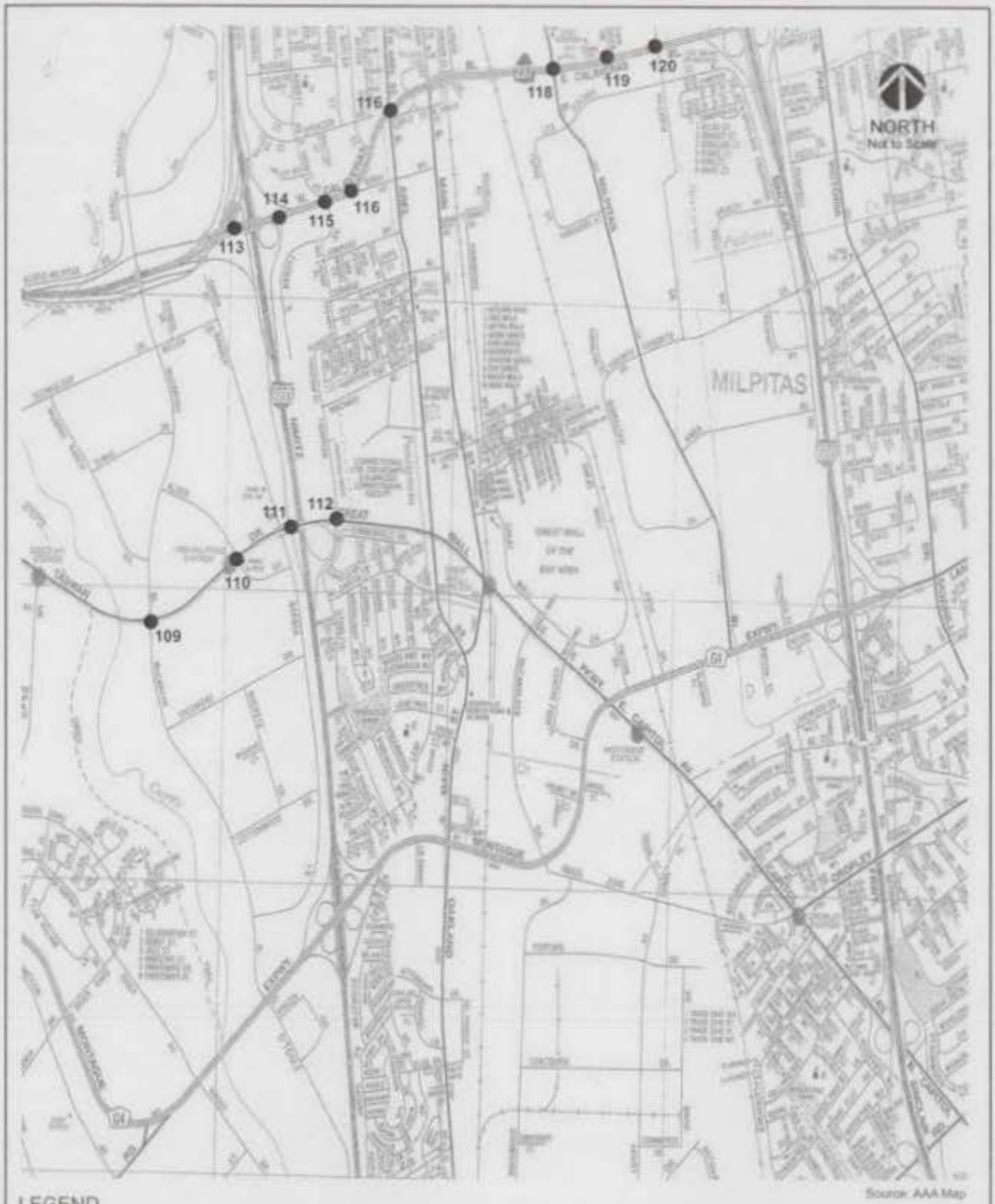


Figure 6

CITY OF MILPITAS STUDY INTERSECTIONS

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium

Signalized Intersections Analysis Methodologies and Level of Service Standards

Traffic conditions at the study intersections were evaluated using level of service (LOS). *Level of Service* is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The various analysis methods are described below.

Each of the cities' level of service methodology for signalized intersections is the 2000 *Highway Capacity Manual* (HCM) method, which is applied using the TRAFFIX software. The 2000 HCM operations method, via TRAFFIX, evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. Since TRAFFIX is also the CMP-designated intersection level of service methodology, each of the cities' methodology employs the CMP default values for the analysis parameters. The local city level of service standards for signalized intersections is as follows:

City of Santa Clara and Milpitas Intersection LOS Standard and Impact Criteria

All non-CMP intersections within the Cities of Santa Clara and Milpitas are required to meet the City's LOS standard of LOS D.

The project is said to create a significant adverse impact on traffic conditions at signalized intersections if for either peak hour:

1. The level of service at the intersection degrades from an acceptable LOS D or better under background conditions to an unacceptable LOS E or F under project conditions, or

2. The level of service at the intersection is an unacceptable LOS E or F under background conditions and the addition of project trips causes both the critical-movement delay at the intersection to increase by four or more seconds and the demand-to-capacity ratio (V/C) to increase by .01 or more.

An exception to this rule applies when the addition of project traffic reduces the amount of average control delay for critical movements (i.e. the change in average control delay for critical movements is negative). In this case, the threshold of significance is an increase in the critical V/C value by .01 or more.

City of San Jose Intersection LOS Standard and Impact Criteria

All intersections within the City of San Jose, including CMP designated intersections, are required to meet the City's LOS standard of LOS D.

The project is said to create a significant adverse impact on traffic conditions at signalized intersections if for either peak hour:

1. The level of service at the intersection degrades from an acceptable LOS D or better under background conditions to an unacceptable LOS E or F under project conditions, or

2. The level of service at the intersection is an unacceptable LOS E or F under background conditions and the addition of project trips causes both the critical-movement delay at the intersection to increase by four or more seconds and the demand-to-capacity ratio (V/C) to increase by .01 or more.

An exception to this rule applies when the addition of project traffic reduces the amount of average control delay for critical movements (i.e. the change in average control delay for critical movements is negative). In this case, the threshold of significance is an increase in the critical V/C value by .01 or more.

City of Sunnyvale Intersection LOS Standard and Impact Criteria

The project is said to create a significant adverse impact on traffic conditions at a non-CMP signalized intersection within the City of Sunnyvale if for any peak hour:

1. The level of service at the intersection degrades from an acceptable LOS D or better under background conditions to an unacceptable LOS E or LOS F under project conditions, or

2. The intersection is already operating at an unacceptable LOS E or LOS F under background conditions and the addition of project traffic causes the intersection critical movement delay to increase by more than four seconds and causes an increase in V/C of 0.01 or greater.

In addition, City of Sunnyvale policy stipulates that reasonable improvement measures be identified where the addition of project traffic changes the level of service at a local intersection by one or more levels (i.e., LOS B to LOS C).

CMP Intersection LOS Standard and Impact Criteria

The only difference between the local city's and CMP level of service analyses is that the project impacts are determined on the basis of different level of service standards. The CMP level of service standard for signalized intersections is LOS E or better. A significant impact by CMP standards is said to be satisfactorily mitigated when measures are implemented that would restore intersection conditions to LOS E or better.

The correlation between average control delay and level of service is shown in Table 1.

Freeway Segment Analysis

Freeway segments that serve the project area were also analyzed as part of the study. The following 22 freeway segments were studied:

US 101, I-880 to Old Bayshore Highway
US 101, Old Bayshore Highway to North First Street
US 101, North First Street to SR-87
US 101, SR-87 to De La Cruz Boulevard
US 101, De La Cruz Boulevard to Montague Expressway
US 101, Montague Expressway to Great America Parkway
US 101, Great America Parkway to Lawrence Expressway
US 101, Lawrence Expressway to Fair Oaks Avenue
US 101, Fair Oaks Avenue to Mathilda Avenue
US 101, Mathilda Avenue to SR-237
I 880, US-101 to Brokaw Road

Table 1
Intersection Level of Service Definitions Based on 2000 HCM

Level of Service	Description	Average Control Delay Per Vehicle (Sec.)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	Less than 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	Greater than 80.0

Source: Transportation Research Board, Highway Capacity Manual (Washington, D.C., 2000), p. 16-2

I 880, Brokaw Road to Montague Expressway
I 880, Montague Expressway to Great Mall Parkway
I 880, Great Mall Parkway to SR-237
SR 237, US-101 to Mathilda Avenue
SR 237, Mathilda Avenue to North Fair Oaks Avenue
SR 237, North Fair Oaks Avenue to Lawrence Expressway
SR 237, Lawrence Expressway to Great America Parkway
SR 237, Great America Parkway to North First Street
SR 237, North First Street to Zanker Road
SR 237, Zanker Road to McCarthy Boulevard
SR 237, McCarthy Boulevard to I-880

Freeway Segment Level of Service Methodology

As prescribed in the CMP technical guidelines, the level of service for freeway segments is estimated based on vehicle density. Density is calculated by the following formula:

$$D = V / (N*S)$$

where:

D= density, in vehicles per mile per lane (vpmpl)
V= peak hour volume, in vehicles per hour (vph)
N= number of travel lanes
S= average travel speed, in miles per hour (mph)

The vehicle density on a segment is correlated to level of service as shown in Table 2. The CMP requires that mixed-flow lanes and auxiliary lanes be analyzed separately from HOV (carpool) lanes. The CMP specifies that a capacity of 2,300 vehicles per hour per lane (vphpl) be used for segments six lanes or wider in both directions and a capacity of 2,200 vphpl be used for segments four lanes wide in both directions. The CMP defines an acceptable level of service for freeway segments as LOS E or better.

Table 2
Freeway Level of Service Based on Density

Level of Service	Density (vehicles/mile/lane)
A	< 11.0
B	11.0 - 18.0
C	18.0 - 26.0
D	26.0 - 46.0
E	46.0 - 58.0
F	> 58.0

CMP Definition of Significant Freeway Segment Impacts

A project is said to create a significant adverse impact on traffic conditions on a CMP freeway segment if for either peak hour:

1. The level of service on the freeway segment is an unacceptable LOS F under project conditions, and

2. The number of project trips on that segment constitutes at least one percent of capacity on that segment.

3. The level of service on the freeway segment degrades from an acceptable LOS under existing conditions to an unacceptable LOS F under project conditions.

A significant impact by CMP standards is said to be satisfactorily mitigated when measures are implemented that would restore freeway conditions to background conditions or better.

Freeway Ramp Analysis

Freeway ramps that serve the project area were also analyzed as part of the study. The following 11 freeway interchanges and associated ramps were studied:

US 101 and Mathilda Avenue
US 101 and North Fair Oaks Avenue
US 101 and Lawrence Expressway
US 101 and Great America Parkway
US 101 and San Tomas Expressway
I 880 and Tasman Drive
SR 237 and Mathilda Avenue
SR 237 and North Fair Oaks Avenue
SR 237 and Lawrence Expressway
SR237 and Great America Parkway
SR 237 and North First Street

Freeway Ramp Level of Service Methodology

Levels of service for freeway ramps were calculated based on a volume-to-capacity ratio (V/C). Freeway ramps level of service definitions based on V/C are shown in Table 3. A capacity of 1,500 vphpl was assumed for freeway ramps based upon the Highway Capacity Manual (pp 25-4). The Caltrans level of service standard for freeway facilities is stated as the transition between LOS C and D. Since there is no adopted city or county evaluation criteria for freeway ramps, the freeway ramp analysis is presented for informative purposes only.

Table 3
Freeway Ramps Levels of Service Based on Volume-to-Capacity Ratio

Level of Service	Description	V/C Ratio
A	Primarily free-flow operations. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	Less than 0.33
B	Reasonably free-flow conditions. The ability to maneuver within the traffic traffic stream is only slightly restricted.	0.33 - 0.53
C	Provides for stable operation, however flows approach the range in which small increases will cause a substantial deterioration in service. Freedom to maneuver withtin the traffic is noticeably restricted.	0.54 - 0.74
D	Borders on unstable flow. Small increases in flow cause substantial deterioration in service. Freedom to maneuver within the traffic stream is severely limited. Minor incidents can be expected to create substantial queuing, as the traffic stream has little space to absorb disruptions.	0.75 - 0.90
E	Operations are extremely unstable. Any incident can be expected to produce a serious breakdown with extensive queuing. Maneuverability within the traffic stream is extremely limited.	0.91 - 1.00
F	Forced or breakdown conditions. Such conditions generally exist within queues forming behind breakdown points.	Greater than 1.00

Source: 2000 Highway Capacity Manual for freeway sections with a 70 mph free flow speed.

Report Organization

The remainder of this report is divided into five chapters. Chapter 2 describes existing conditions in terms of the existing roadway network, transit service, and existing bicycle and pedestrian facilities. Chapter 3 presents the intersection operations under background conditions. Chapter 4 describes the method used to estimate project traffic, its impact on the transportation system, and the identified mitigation measures. Chapter 5 presents the traffic conditions in the study area under cumulative growth conditions with the addition of traffic from development projects that are not yet approved. Chapter 6 presents the conclusions of the traffic impact analysis.

2.
Existing Conditions

This chapter describes the existing conditions for all of the major transportation facilities serving the project area, including the roadway network, transit service, and bicycle and pedestrian facilities. It includes an evaluation of existing traffic conditions at signalized intersections and freeways within and surrounding the project area.

Existing Roadway Network

Regional access to the project site is provided via US 101, I-880, and SR 237 as described below.

US 101 is an eight-lane (three mixed-flow lanes and one high occupancy vehicle (HOV) lane in each direction) freeway in the vicinity of the site. It extends north through San Francisco and south through Gilroy. Regional access to the project area is provided via its interchanges with Lawrence Expressway, Great America Parkway/Bowers Avenue and San Tomas Expressway/Montague Expressway.

I-880 is a six-lane freeway that extends north to Oakland and south into SR 17 to Santa Cruz. I-880 provides connections to both US 101 and SR 237.

SR 237 is a six-lane freeway that extends in an east/west direction between Sunnyvale and Milpitas and provides access to I-880 and US 101. Two of the six lanes (one in each direction) are designated as HOV lanes. Access to the project area is provided via its interchanges with Lawrence Expressway, Great America Parkway, and North First Street.

Local access to the site is provided by Lawrence Expressway, San Tomas Expressway, Montague Expressway, Great America Parkway, Bowers Avenue, Central Expressway, Tasman Drive, Lafayette Street, and Mission College Boulevard. These roadways are described below.

Lawrence Expressway is an eight-lane north-south expressway. South of US 101, the right-most lane in each direction of travel is designated as a carpool (HOV) lane. The HOV lane designation is in effect in both directions of travel during both the AM and PM peak commute hours. During other times, the lane is

open to all users. Lawrence Expressway begins at its junction with SR 237 and extends southward into Saratoga, where it transitions into Quito Road at Saratoga Avenue. Full interchanges are located at US 101 and SR 237.

Great America Parkway is a north-south thoroughfare that begins at US 101 and extends northward to SR 237. Full interchanges are located at both US 101 and SR 237. Great America Parkway is primarily a six-lane road, with an additional northbound lane between Tasman Drive and US 101.

Bowers Avenue is the southern extension of Great America Parkway. It begins at US 101 as a six-lane roadway and extends southward to Kifer Road, where it transitions into a four-lane roadway with a divided median. At Chromite Drive to the south, Bowers Avenue becomes a four-lane road with no median divider. Bowers Avenue continues south to its intersection with El Camino Real (SR 82) where it transitions to Kiely Road. A full interchange is located at US 101. Bowers Avenue provides access to and from the project site via Great America Parkway.

San Tomas Expressway is a north-south expressway that begins at US 101 and extends southward through Santa Clara and San Jose and into Campbell, where it transitions into Camden Avenue at SR 17. Full interchanges are located at US 101 and SR 17. In the north, San Tomas Expressway is an eight-lane roadway including carpool (HOV) lanes. The HOV lane designation is in effect in both directions of travel during both the AM and PM peak commute hours. During other times, the lane is open to all users. South of El Camino Real, San Tomas narrows to a 6-lane facility including HOV lanes. The HOV lane designation in this segment is in effect for only the peak direction of travel (northbound in the AM and southbound in the PM). San Tomas Expressway provides access to and from the project area via its interchange with US 101.

Montague Expressway is generally an east-west expressway that begins at US 101 and extends northward to Lafayette Street and then northeastward to Milpitas where it transitions into Landess Avenue at I-680. Full interchanges are located at I-680, I-880, and US 101. Montague Expressway transitions to San Tomas Expressway at US 101. In the project area, Montague Expressway is a six-lane roadway with carpool (HOV) lanes. The HOV lane designation is in effect in both directions of travel during both the AM and PM peak commute hours. During other times, the lane is open to all users. Montague Expressway provides access to and from the project area via its interchange with US 101.

Central Expressway is a six-lane east-west expressway with carpool (HOV) lanes within the study area. The HOV lane designation is in effect in both directions of travel during both the AM and PM peak commute hours. Central Expressway begins at its junction with De la Cruz Boulevard and extends westward into Palo Alto, where it transitions into Alma Street at San Antonio Road. Central Expressway provides access to and from the project area via Bowers Avenue and San Tomas Expressway.

Tasman Drive is an east-west arterial that extends from Morse Avenue in Sunnyvale eastward to I-880 in Milpitas, where it transitions into Great Mall Parkway. Within the project area, Tasman Drive is a four-lane arterial. The LRT line runs down the median of Tasman Drive between North First Street and Fair Oaks Avenue. Tasman Drive provides direct access to the project site.

Lafayette Street is a north-south arterial that extends from SR 237 south to Poplar Street in Santa Clara where it transitions into Washington Street. Between SR 237 and El Camino Real, Lafayette Street is a four-lane roadway. South of El Camino Real, the cross-section of this facility varies from two to four lanes.

Mission College Boulevard to the west of Great America Parkway is a loop road circumnavigating Mission College and the Mercado Shopping Center. The eastern portion of Mission College Boulevard is a four-lane east-west thoroughfare, running between Great America Parkway and Montague Expressway. This segment of Mission College Boulevard provides access to numerous industrial and office uses, as well as some hotel uses and the major entertainment venue of Great America Amusement Park.

Existing Bicycle and Pedestrian Facilities

There are several bike lanes and bike paths in the vicinity of the project site. Bowers Avenue has bike lanes from Mead Avenue to Great America Parkway. Great America Parkway has bike lanes from US 101 to Gold Street. Scott Boulevard has bike lanes from Central Expressway to Arques Avenue in Sunnyvale. There is a bike path adjacent to San Tomas Aquino Creek that extends from Scott Boulevard to Great America Parkway and Sunnyvale Baylands Park. A trail access point is located on Tasman Drive at the northeast corner of the project site. Bicycle lanes are present on Mission College Boulevard from Wyatt Drive to Great America Parkway. Bicycles are permitted on Great America Parkway, San Tomas Expressway, Montague Expressway and Central Expressway. The existing bicycle facilities within the study area are shown on Figure 7.

Tasman Drive has a continuous sidewalk on the south side of the street between North First Street and Lawrence Expressway. The north side of Tasman Drive has continuous sidewalks from North First Street to Patrick Henry Drive and intermittent sidewalks thereafter to Lawrence Expressway. Pedestrian crosswalks and signalheads with pushbutton actuators are present at all signalized intersections, including the Tasman Drive and Great America Parkway and Tasman Drive and Centennial Boulevard intersections.

Existing Transit Service

Existing local transit service to the study area is provided by the VTA and other agencies and consists of bus and light rail service. Regional transit is provided by Caltrain, ACE, and the Capitol Corridor which have shuttle bus routes along Tasman Drive. The transit service is described below and shown on Figure 8. The transit lines that operate within the study area are listed in Table 4.

VTA Transit Service

Bus Service

The VTA operates several bus routes in the vicinity of the project site. The VTA bus service is described below and shown on Figure 8. The VTA bus lines that operate within walking distance of the project site are listed in Table 4.

Local Route 55 operates on Tasman Drive, Patrick Henry Drive, and Old Ironsides Drive in the study area. It runs from De Anza College to Great America with 15-minute headways in the weekday PM study periods and 30-minute headways during Sunday study periods. Route 55 operates from 5:30 AM to 11:00 PM during weekday and from 8:00 AM to 8:00 PM during Sunday. The nearest bus stop to the project site is located at Tasman Drive and Patrick Henry Drive.

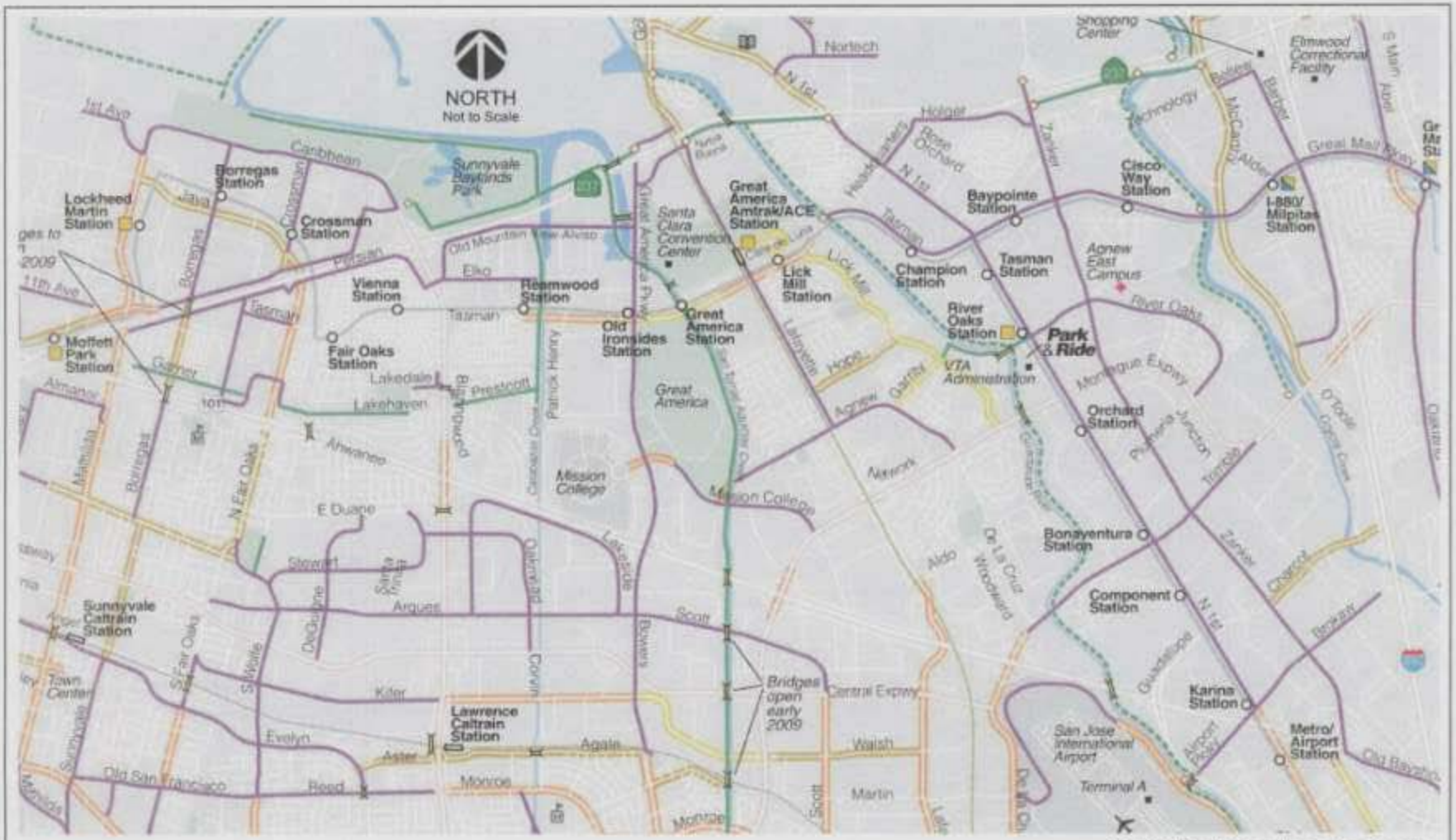
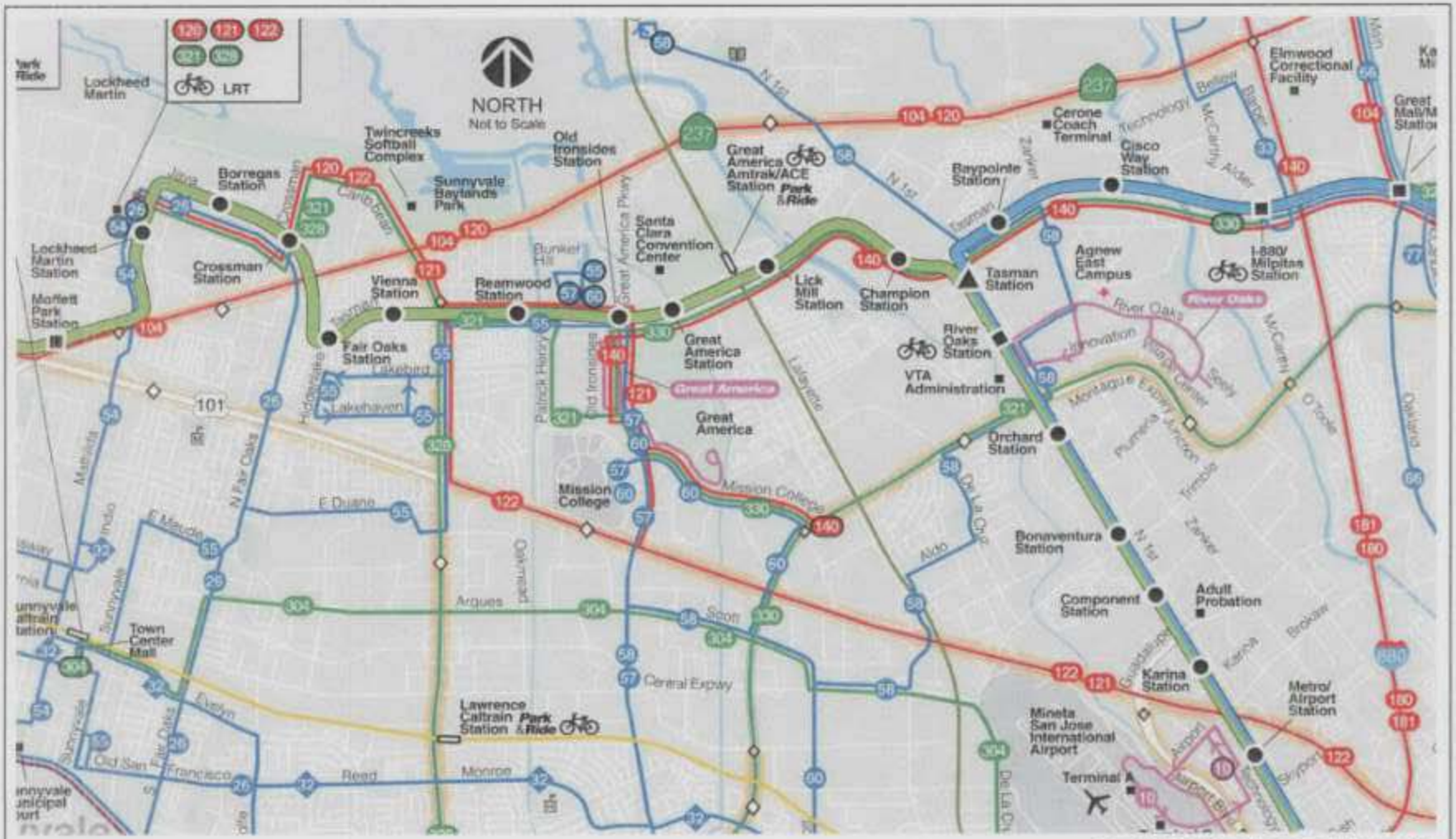


Figure 7

Existing Bicycle Facilites

49ers Santa Clara Stadium



Source: VTA Santa Clara Bus and Rail Map, Jan 2008

LEGEND

VTA Service

- Local Bus Routes
- Local Bus Routes (Scheduled Trips Only)
- Community Bus Routes
- Limited Stop Bus Routes
- Express Bus Routes

- Light Rail: Mountain View -- Winchester
- Light Rail: Alum Rock -- Santa Teresa
- Light Rail: Ohlone/Chynoweth -- Almaden
- Light Rail Station
- Light Rail Station with Park & Ride Lot
- Light Rail Transfer Station
- Free Shuttles to Light Rail Stations

Hexagon Transportation Consultants, Inc.

Figure 8

Existing Transit Service

49ers Santa Clara Stadium

Table 4
VTA Bus Service in the Study Area

Route	Route Description	Weekday Headways /a/ (minutes)	Sunday Headways /a/ (minutes)
Local Route 55	De Anza College to Great America	15	30
Local Route 57	W. Valley College to Great America	30	30
Local Route 60	Winchester Transit Center to Great America	15	30
Express Route 121 /b/	Gilroy Transit Center to Lockheed Martin Transit Center/Moffett Park	30-60	--
Express Route 140 /b/	Fremont BART to Mission College & Montague Expressway	30-60	--
Limited Stop Route 321 /b/	Great Mall/Main Transit Center to Lockheed Martin/Moffett Park	NA	NA
Limited Stop Route 330	Almaden Expressway and Camden Avenue to Tasman Drive	45-55	--

Notes:
/a/ Headways during during study periods.
/b/ Limited hours of operation.

Local Route 57 operates on Bowers Avenue and Great America Parkway in the study area. The nearest bus stop to the project site is located along Great America Parkway, just west of Tasman Drive. It runs from West Valley College to the Old Ironsides Light Rail Station and Great America with 30-minute headways during the weekday peak hours and on Sundays. Route 57 operates from 5:30 AM to 10:45 PM during the weekday and from 8:00 AM to 8:00 PM on Sundays.

Local Route 60 operates on Winchester Boulevard, Monroe Street, and Scott Boulevard in the study area. It runs between the Winchester Transit Center and Great America with 15-minute headways during the weekday peak hours and 30-minute headways on Sundays. Route 60 operates from 5:00 AM to 10:00 PM during the week and from 7:00 AM to 9:00 PM on Sundays. The nearest bus stop to the project site is located at Tasman Drive and Great America Parkway.

Express Route 121 operates on US 101, Great America Parkway, and Tasman Drive during commute hours, with stops at the Old Ironsides/Great America Light Rail Station and at all the express stops on its route in the study area. Route 121 operates between the Gilroy Transit Center and the Lockheed Martin Transit Center/Moffett Park during the weekday peak hours only with 30 to 60-minute headways. Express route 121 does not operate on Sundays.

Express Route 140 operates on Great America Parkway, Old Ironsides Drive, and Patrick Henry Drive during weekday commute hours with stops at the Old Ironsides/Great America Light Rail Station and at all the express stops on its route in the study area. Route 140 operates between the Fremont BART Station and Mission College and Montague Expressway during the weekday peak hours only with 30 to 60-minute headways. Express route 140 does not operate on Sundays.

Limited Stop Route 321 operates on Tasman Drive, Great America Parkway, and Patrick Henry Drive in the study area. It makes one westbound trip during the weekday peak hours between the Great Mall/Main Transit Center and Lockheed Martin/Moffett Park with no service on Sundays.

Limited Stop Route 330 operates on San Tomas Expressway, Montague Expressway, Mission College Boulevard, Great America Parkway, and Tasman Drive on its route between Almaden Expressway and Camden and the I-880/Milpitas Light Rail Station on Tasman Drive at Alder Drive. It operates southbound only with 45 to 55 minute headways during the weekday peak hours with no service on Sunday. Route 330 observes all limited stops along its route in the study area. Stops for Route 330 are present in both the northbound and southbound directions of travel on San Tomas Expressway, just north of Walsh Avenue.

Light Rail Transit (LRT) Service

The project area is served by two light rail transit lines. Both LRT lines provide service on 15-minute headways during weekday commute and Sunday midday hours. The Guadalupe Corridor LRT line provides service between Santa Teresa in south San Jose and the Tasman Corridor LRT in north San Jose. The Guadalupe line runs along the center of North First Street. The Tasman Corridor LRT line, which runs along the center of Tasman Drive, provides service between the Mountain View Caltrain Station and The Great Mall in Milpitas. Both lines intersect at the Baypointe Station. The Tasman line has a stop at Great America Parkway near the Santa Clara Convention Center, which serves as the nearest LRT station to the project site.

Caltrain

The Caltrain system offers passenger rail service between San Francisco and Gilroy, with the nearest stations being the Lawrence and Santa Clara Caltrain Stations. Limited stop trains observe stops at the Santa Clara and Lawrence Stations, with 20-45-minute headways northbound and 30-40-minute headways southbound during weekday commute hours, and 60-minutes headways southbound and northbound on Sundays. Caltrain operates the Mission College Boulevard Area Caltrain Shuttle, which runs on Bowers Avenue and Mission College Boulevard between the Lawrence Caltrain Station and the Intel campus north of Montague Expressway and Mission College Boulevard. The shuttle operates with 50-60-minute headways during the weekday commute hours and on Sundays.

Amtrak/ Ace

The Altamont Commuter Express (ACE) operates between the San Jose Diridon Station and Stockton. Service is provided westbound during the weekday AM commute hours and eastbound during the weekday PM commute hours. No service is provided on Sundays. The Great America ACE station is located at Lafayette Street and Tasman Drive. Headways at the Great America ACE station are 45 to 65 minutes during weekday PM commute hours. The ACE Yellow and Green Shuttles operate between the Great America ACE station and San Tomas Expressway/ Scott Boulevard and Patrick Henry Drive/ Tasman Drive. The nearest shuttle stop to the project site is located on Tasman Drive at the Santa Clara Convention Center. The Yellow and Green shuttles operate northbound and eastbound with one-hour headways, respectively, during the weekday PM commute hours. The ACE system is operated by the San Joaquin Regional Rail Commission (SJRRC).

Capitol Corridor

The Capitol Corridor rail line provides service between Sacramento and San Jose and operates on during weekday commute hours and on Sundays. The Capitol corridor line shares the Great America Station with the ACE service.

Existing Intersection Lane Configurations

The existing lane configurations at the study intersections were provided by city staff and confirmed by observations in the field. Lane configurations for each of the study intersections can be found within the level of service calculations in Appendix D.

Existing Traffic Volumes

Existing traffic volumes used in the analysis were based upon collected counts as well as derived by means of factoring. The existing counts were generally collected in 2006-2008. New counts completed as part of this study were collected in April-August of 2008. All study intersections within the identified project core area were counted during the early Sunday (11am-1pm) study period. Since ambient traffic on Sundays is typically significantly less when compared to weekday commute periods, it was deemed unnecessary to collect Sunday counts at all 120 study intersections. Therefore, Sunday volumes utilized in the analysis for the intersections outside of the project core area were derived by factoring peak hour counts as discussed below. Counts were collected at all study intersections for the weekday study periods and are less than two years old. All new counts and raw data completed as part of this study are presented in Appendix A.

Weekday Study Periods

Existing standard PM peak-hour intersection traffic volumes were obtained from databases and recently completed traffic studies in each of the respective cities and supplemented with new traffic counts at intersections where counts were outdated. New standard PM peak hour counts were collected at a total of 27 study intersections.

Intersection traffic volumes for the early PM weekday study period (3-5pm) were developed by comparing the counts collected during the 4-5pm hour with the standard PM peak hour counts. The 4-5pm hour counts were used because it was assumed that counts collected during the 3-5pm time period would indicate a peak hour between 4-5pm. The factoring was based upon only the counts collected in April of 2008 since the raw data that is needed for the 4-5pm hour is not available for older counts that were not collected as part of this study. Counts at a total of 20 intersections were used for comparison. The comparison of the 4-5pm hour counts with the standard PM peak hour counts indicated that the 4-5pm hour counts were approximately 20% less than the standard PM peak hour counts. Thus, the intersection volumes for the early PM weekday study period were derived by reducing the standard PM peak hour volumes by 20%. A summary of intersections along with histograms is included in Appendix B.

Sunday Study Periods

All study intersections within the core study area were counted during the Sunday study period from 11am-1pm. Traffic volumes for the Sunday 11am-1pm period for study intersections outside of the core study area were estimated utilizing factors. The factors were determined by comparing Sunday counts with standard PM counts at intersections the perimeter of the core study area and along each of the major arterials serving the project area. The comparisons indicated that Sunday volumes were significantly less than the standard PM weekday volumes. The comparison of the selected locations indicated Sunday volumes ranged from 17% to 70% less than the standard weekday PM peak hour volumes. Thus, Sunday volumes for intersections outside the project core area were derived by applying the calculated factors to standard PM peak hour counts. The data utilized to determine the factors for each of the selected locations are included in Appendix B.

Intersection volumes for the Sunday 3-5 pm study period were derived based upon a sampling of intersections for which data was collected. A total of eight intersections within the core project area were counted during the 3-5pm period on Sunday. Counts at the eight selected intersections were compared with counts collected during the 4-6pm period on Sunday for the same intersections. The comparison indicated that the counts collected during the 3-5 pm period were 2% less than the 4-6 pm counts

collected. Thus, the Sunday 3-5 pm study period volumes were derived by reducing the counts collected during the 4-6 pm period at all intersections. A summary of the sampled intersections along with histograms is included in Appendix A.

Existing Intersection Levels of Service

Intersection levels of service are evaluated against the applicable municipal and CMP standards per the governing policies described previously. The level of service results for those study intersections operating at unacceptable levels under existing weekday conditions are summarized in Table 5. The analysis shows that all study intersections are currently operating at acceptable levels during the Sunday study periods. The levels of service results also are shown graphically in Figures 9-18. Tables summarizing the results for all study intersections, as well as levels of service calculation sheets are included in Appendix D.

Intersection Level of Service (Weekday Study Period)

City of Santa Clara Intersection Analysis

The results of the Weekday level of service analysis shows that all of the City of Santa Clara study intersections currently operate at an acceptable LOS D or better under existing conditions during the Weekday study periods.

CMP Intersections

The level of service results for the CMP study intersections located within the City of Santa Clara show that, measured against the CMP level of service standards, all of the CMP intersections currently operate at an acceptable LOS E or better under existing conditions during the Weekday study periods.

City of San Jose Intersection Analysis

The results of the Weekday level of service analysis shows that five, all of which are CMP designated intersections, of the City of San Jose study intersections currently operate at an unacceptable LOS E or F under existing conditions during at least one of the Weekday study periods. All the other City of San Jose study intersections currently operate at acceptable levels of service under existing conditions during the weekday study periods.

83 North First Street and Montague Expressway *
84 Zanker Road and Montague Expressway *
87 O'Toole Avenue and Montague Expressway *
88 Oakland Road/ Main Street and Montague Expressway *
89 Trade Zone Boulevard and Montague Expressway *

*Indicates CMP Intersection

CMP Intersections

The level of service results for the CMP study intersections located within the City of San Jose show that, measured against the CMP level of service standards, one intersection currently operates at an unacceptable LOS F under existing conditions during the standard PM Weekday study period.

83 North First Street and Montague Expressway *

All the other CMP study intersections currently operate at acceptable levels of service.

City of Sunnyvale Intersection Analysis

The results of the Weekday level of service analysis show that all of the City of Sunnyvale study intersections currently operate at an acceptable LOS D or better under existing conditions during the Weekday study periods.

CMP Intersections

The level of service results for the CMP study intersections located within City of Sunnyvale show that, measured against the CMP level of service standards, all of the CMP intersections currently operate at an acceptable LOS D or better under existing conditions during the Weekday study periods.

City of Milpitas Intersection Analysis

The results of the Weekday level of service analysis show that all of the City of Milpitas study intersections currently operate at an acceptable LOS D or better under existing conditions during the Weekday study periods.

CMP Intersections

The level of service results for the CMP study intersections located within the City of Milpitas show that, measured against the CMP level of service standards, all of the CMP intersections currently operate at an acceptable LOS D or better under existing conditions during the Weekday study periods.

Intersection Level of Service (Sunday Study Period)

The results of the Sunday level of service analysis show that all of study intersections currently operate at an acceptable LOS D or better under existing conditions during the Sunday study periods.

Table 5
Weekday Existing Unacceptable Intersection Levels of Service

Study Number	Intersection Name	Study Period	Existing Ave. Delay	Existing LOS
City of San Jose Intersections				
83	North First Street and Montague Expressway *	3-5PM	63.8	E
		4-6PM	103.5	F
84	Zanker Road and Montague Expressway *	3-5PM	49.3	D
		4-6PM	59.5	E
87	O'Toole Avenue and Montague Expressway *	3-5PM	53.4	D
		4-6PM	71.1	E
88	Oakland Road/Main Street and Montague Expressway *	3-5PM	52.0	D
		4-6PM	60.2	E
89	Trade Zone Boulevard and Montague Expressway *	3-5PM	52.0	D
		4-6PM	78.6	E

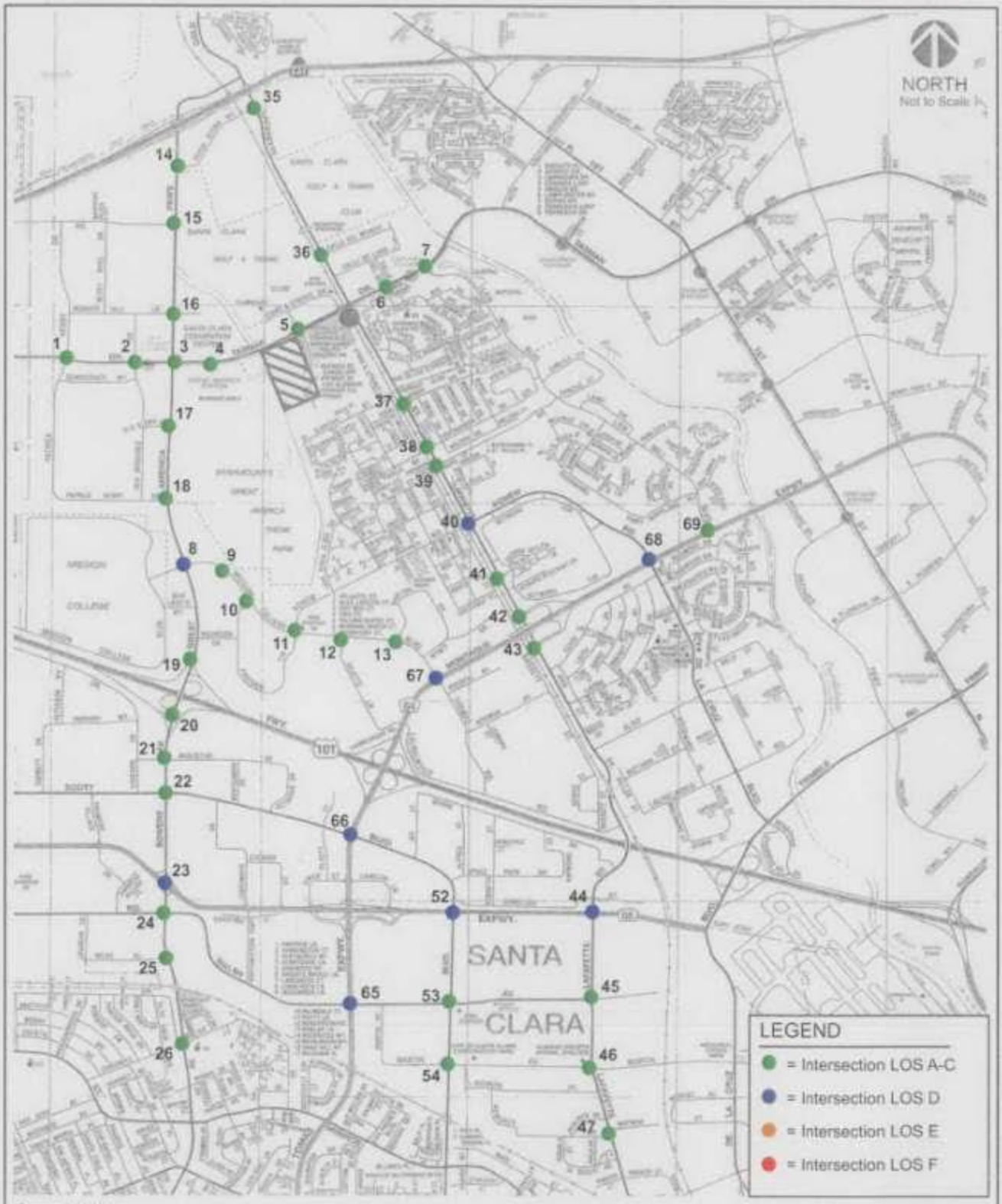
* Denotes CMP Intersections

Figure 9

STADIUM CORE AREA WEEKDAY EXISTING INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



Source: AAA Map

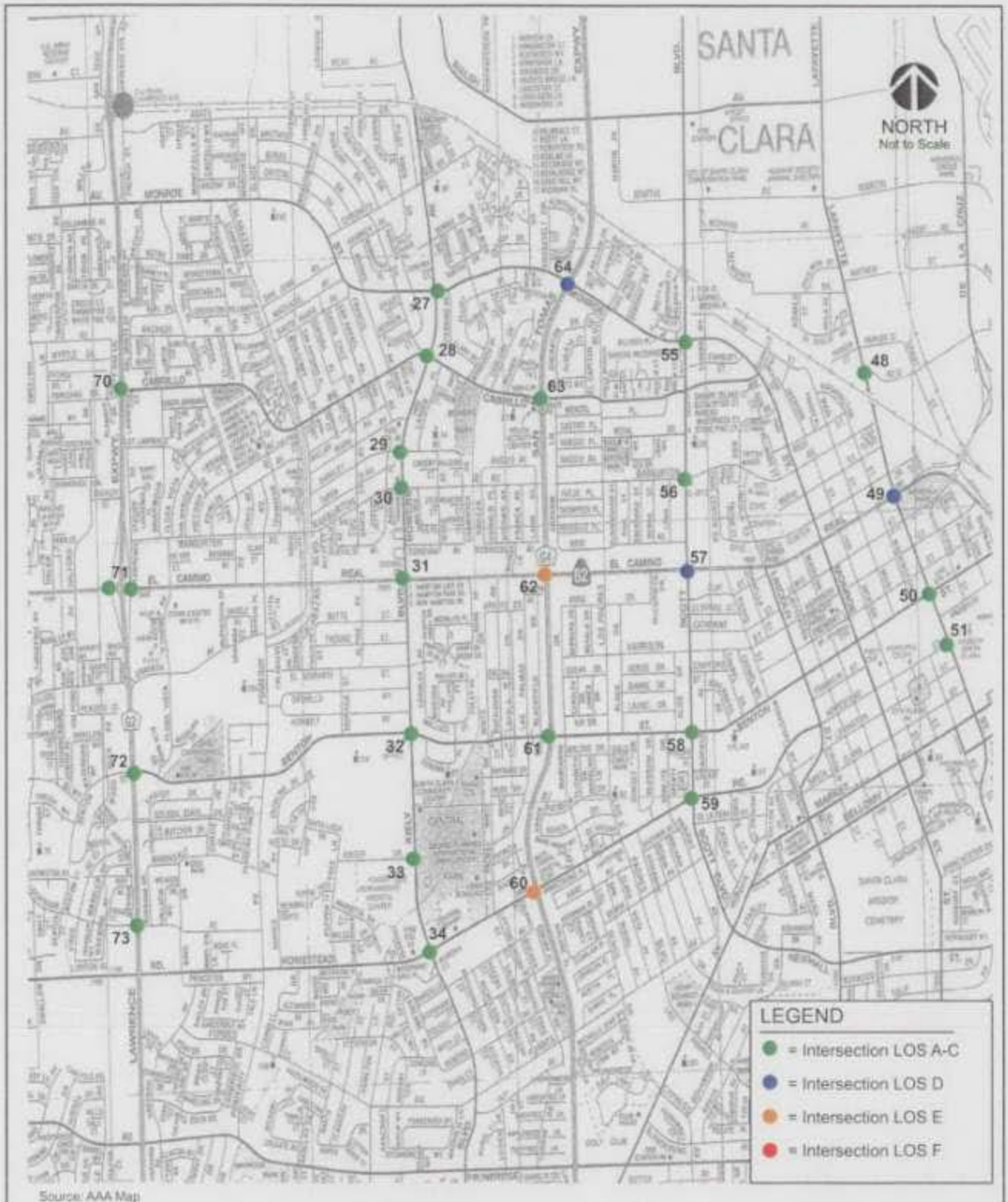
= Project Site

Figure 10

CITY OF SANTA CLARA WEEKDAY EXISTING INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



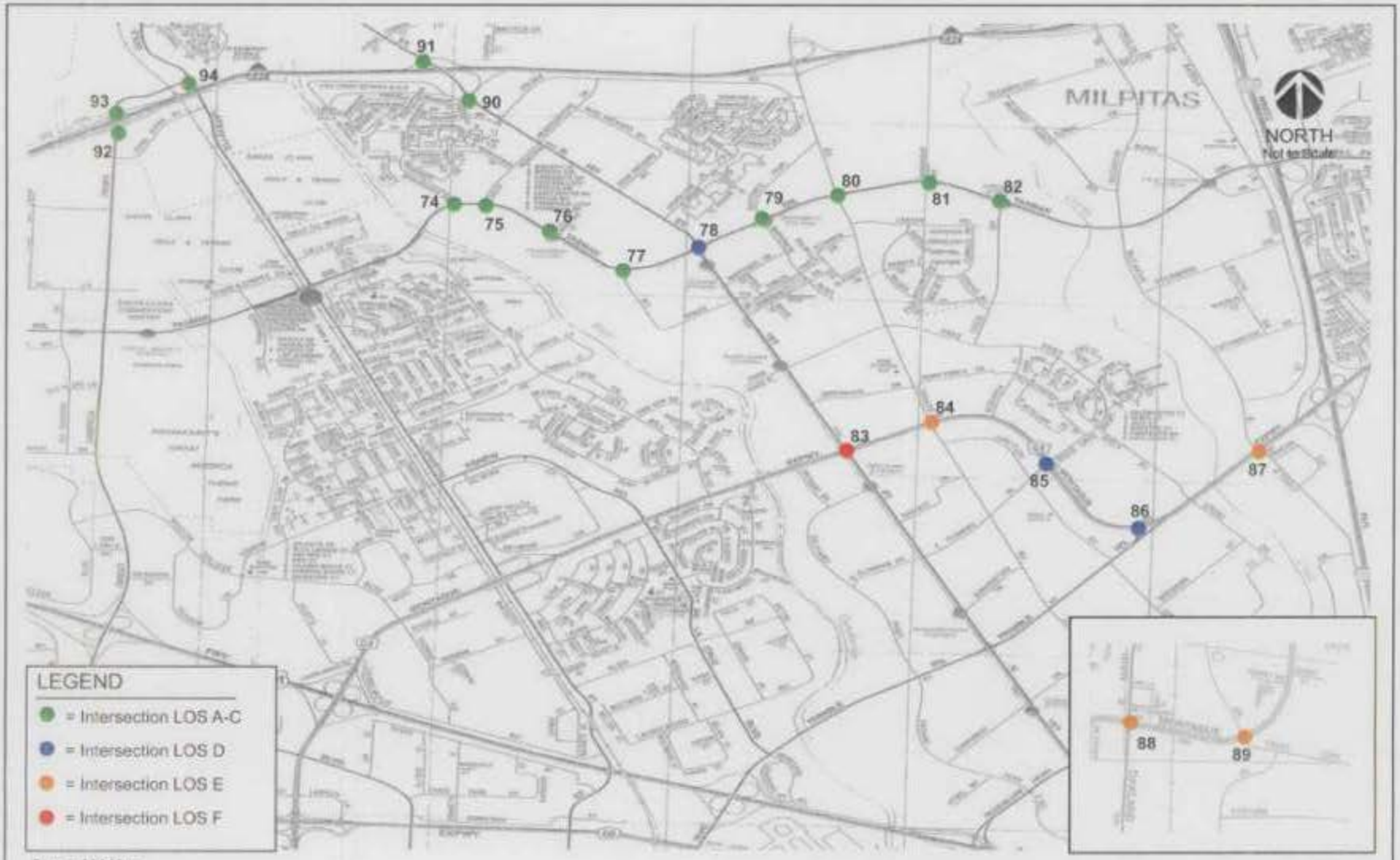
Source: AAA Map

Figure 10 (Cont'd)

CITY OF SANTA CLARA WEEKDAY EXISTING INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



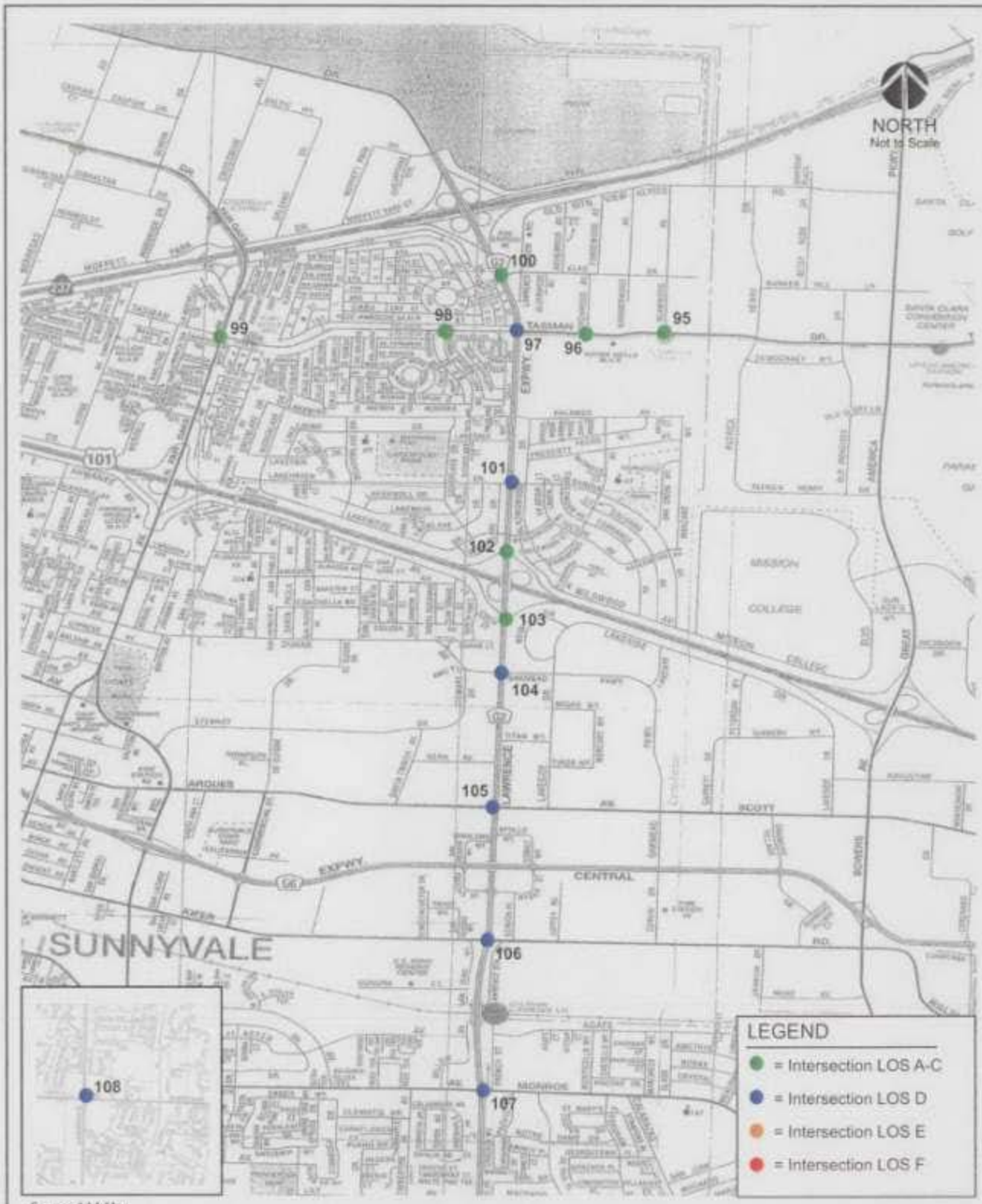
Source: AAA Map

Figure 11

CITY OF SAN JOSE WEEKDAY EXISTING INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



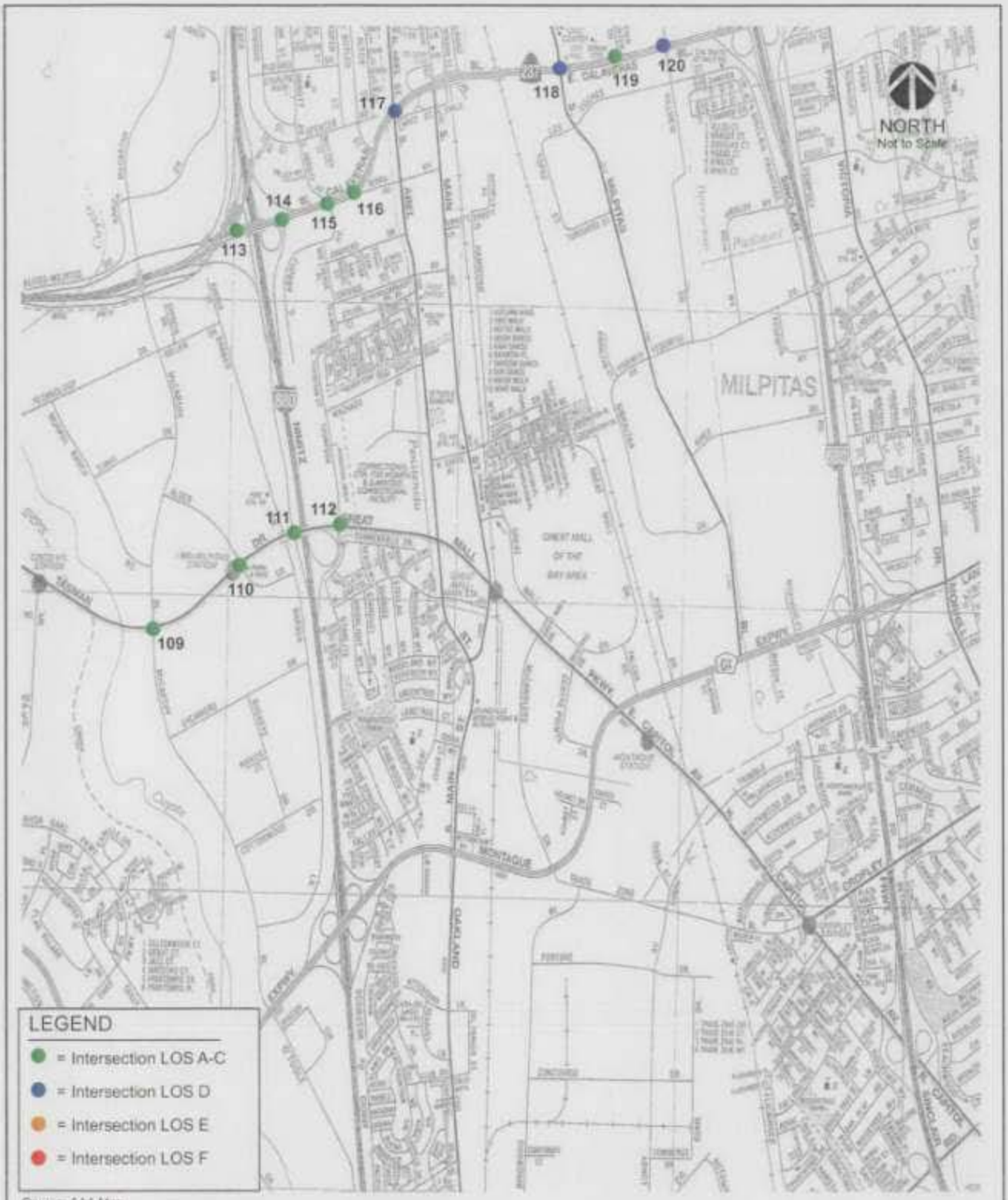
Source: AAA Map

Figure 12

CITY OF SUNNYVALE WEEKDAY EXISTING INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



Source: AAA Map

Figure 13

CITY OF MILPITAS WEEKDAY EXISTING INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

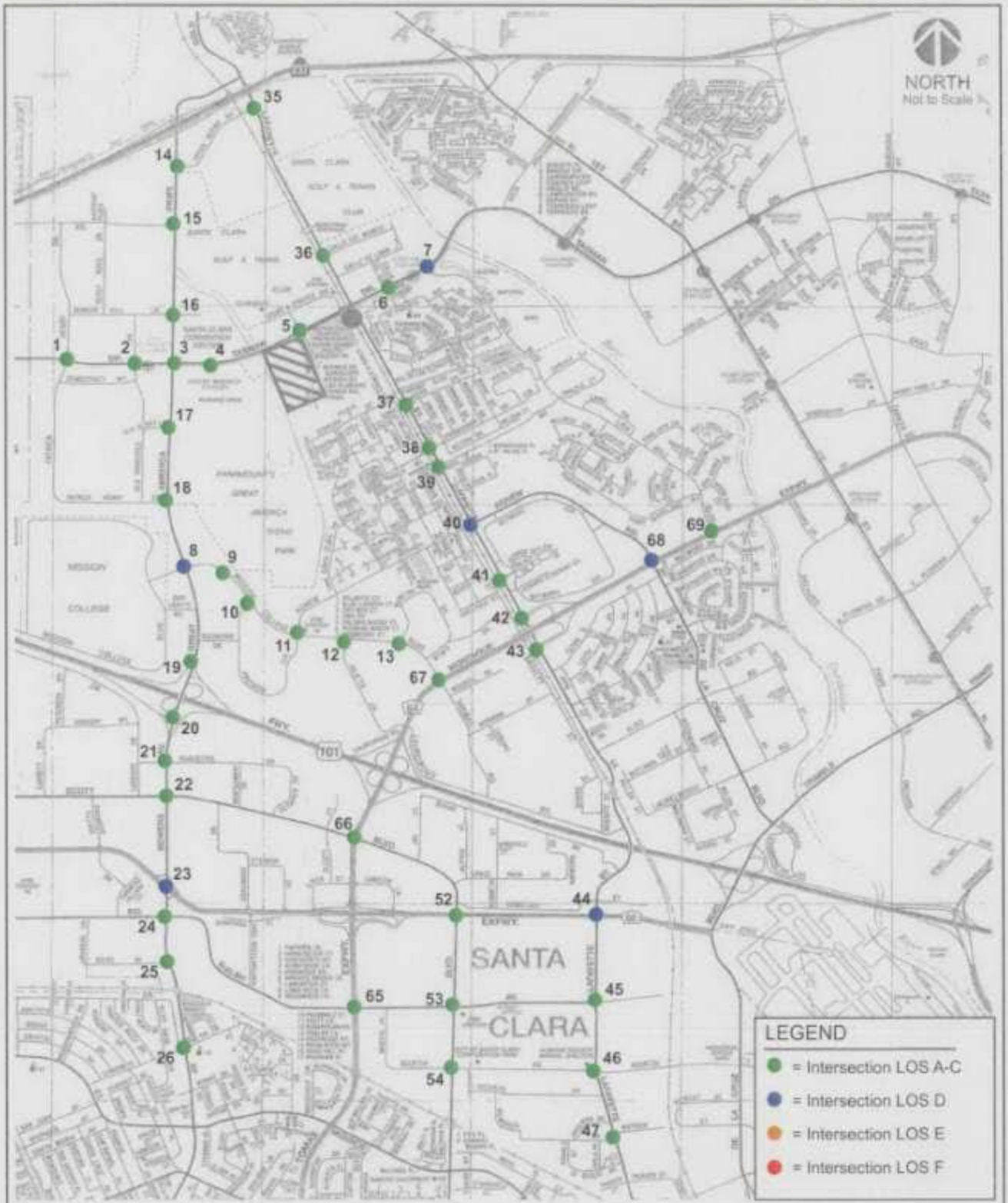
49ers Santa Clara Stadium

Figure 14

STADIUM CORE AREA SUNDAY EXISTING INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



Source: AAA Map

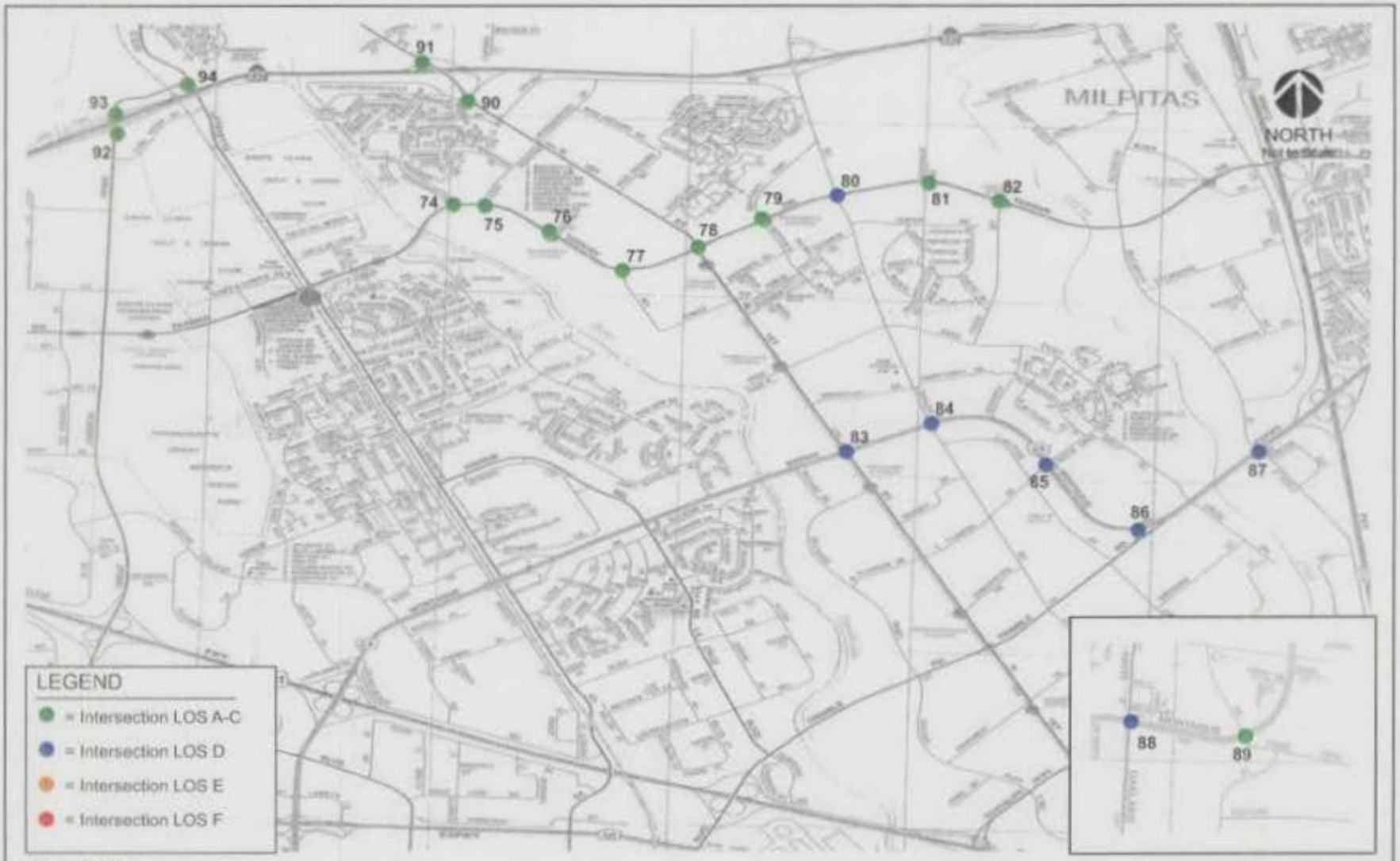
= Project Site

Figure 15

CITY OF SANTA CLARA SUNDAY EXISTING INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



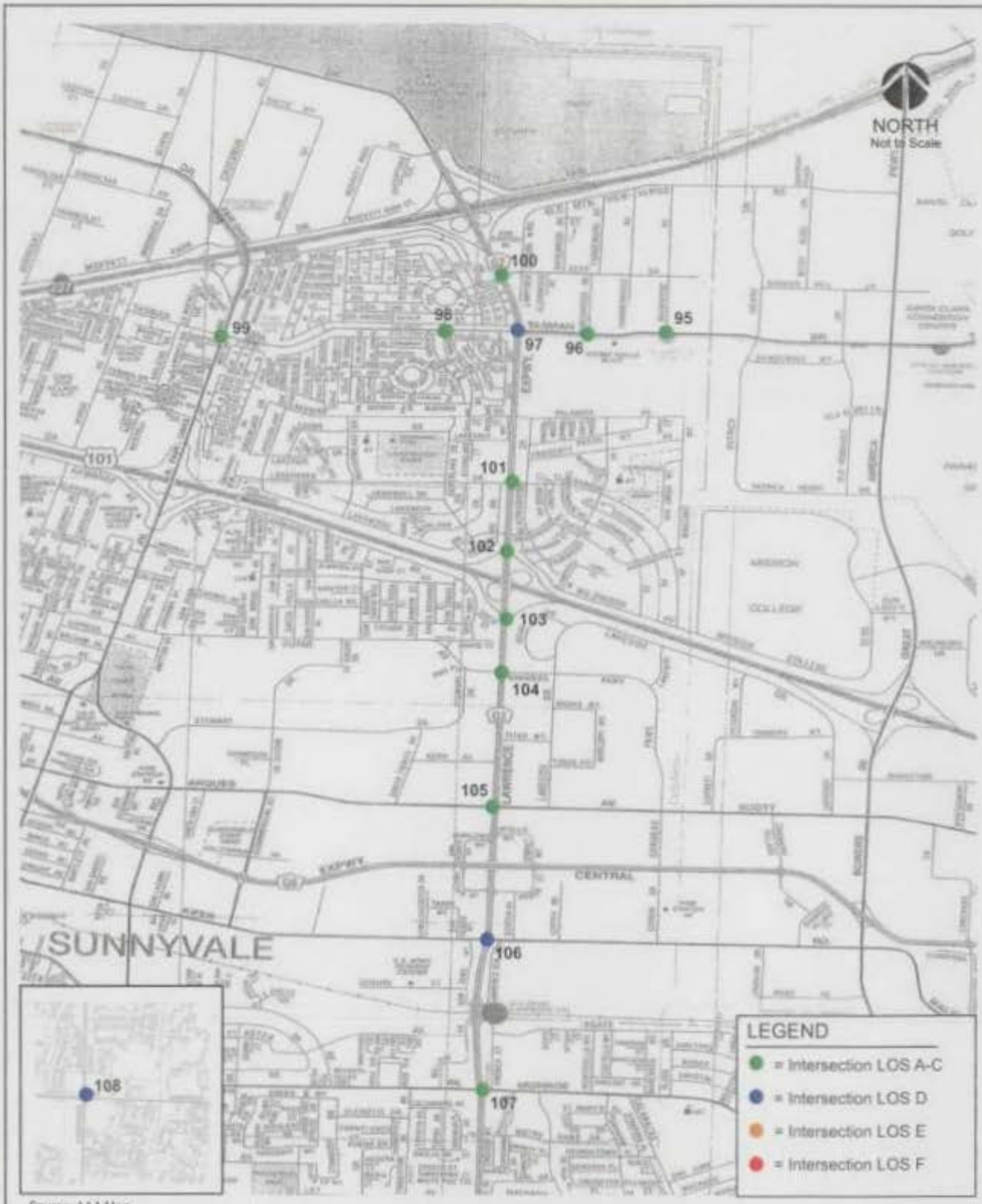
Source: AAA Map

Figure 16

CITY OF SAN JOSE SUNDAY EXISTING INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



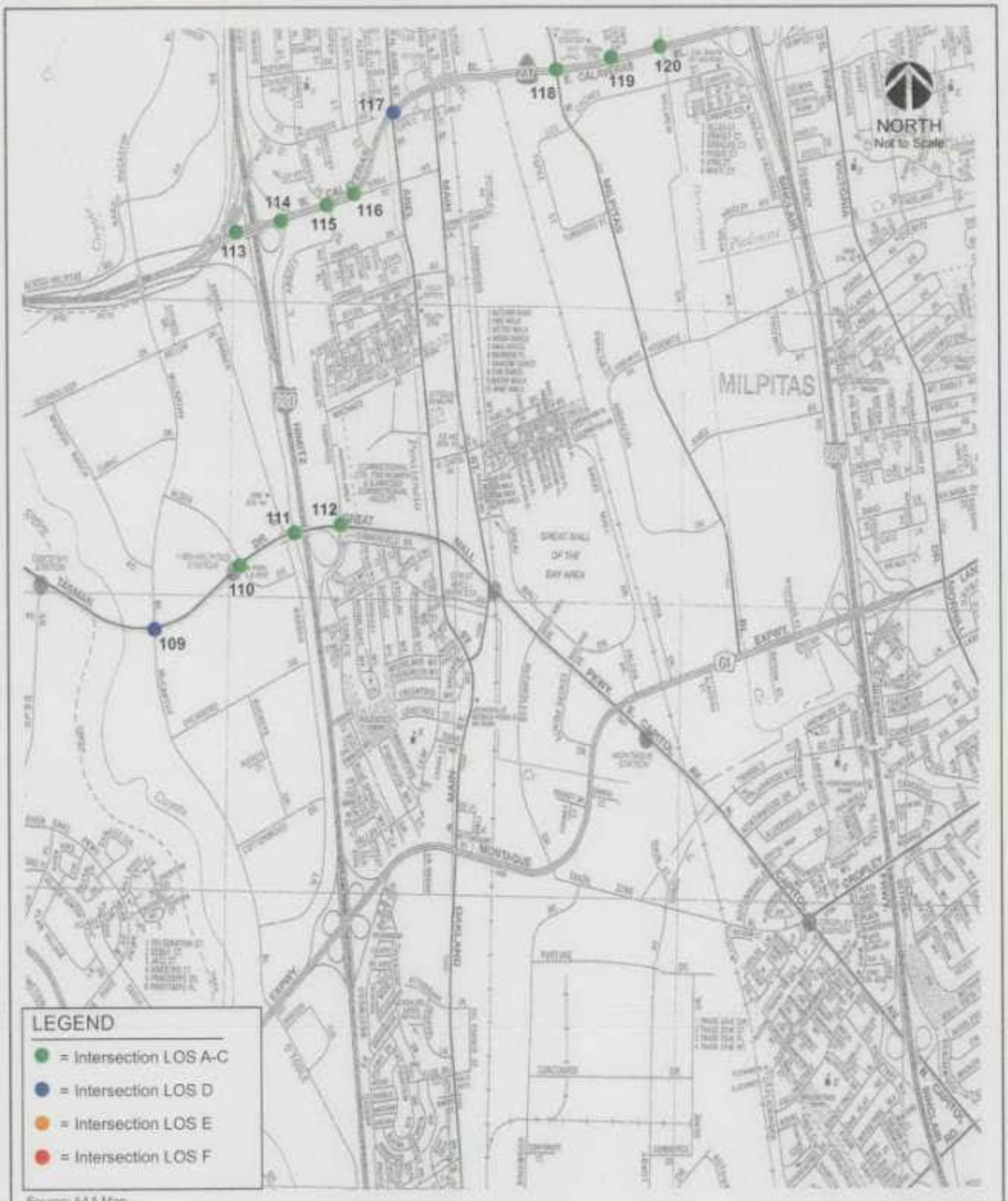
Source: AAA Map

Figure 17

CITY OF SUNNYVALE SUNDAY EXISTING INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



Source: AAA Map

Figure 18

CITY OF MILPITAS SUNDAY EXISTING INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon Transportation Consultants, Inc.

Existing Freeway Ramp Analysis

Traffic volumes for the studied freeway ramps were obtained from 2007 data collected by the Traffic and Vehicle Data Systems Unit for Caltrans District 4. The collected data provides 24-hour volumes along each freeway ramp. Thus, ramp volumes for each of the study periods were taken directly from the Caltrans data without the need for adjustments. All ramp volume data are presented in Appendix A. The freeway ramp analysis indicates that all freeway ramps analyzed currently operate at LOS C or better conditions under each of the study periods. Since there is no adopted city or county evaluation criteria for freeway ramps, the freeway ramp analysis is presented for informative purposes only. Freeway ramp analysis is presented in Tables 6 and 7.

Existing Freeway Segment Levels of Service

Weekday Study Periods

Standard PM peak hour traffic volumes for the subject freeway segments were obtained from the 2006 CMP Annual Monitoring Report. Freeway segment volume data for time periods other than the standard PM peak hour are not available from the CMP. There also is no Caltrans 24-hour data available for the selected study segments. Therefore, traffic volumes for the early weekday PM study period were derived utilizing the available freeway ramp volume data. A factor was calculated based upon a comparison of the 3-5pm and 4-6pm freeway ramp volume data. The factor was then applied to the standard PM peak hour CMP freeway segment volumes to derive the freeway segment volumes for the early weekday PM study period. A summary of the ramp volume histograms is included in Appendix B.

Based on the weekday freeway segment analysis, mixed flow lanes on 17 of the 44 directional freeway segments analyzed currently operate at an unacceptable LOS F during both of the weekday study periods. Three of the 32 HOV lanes on directional freeway segments (with HOV lanes) analyzed currently operate at an unacceptable LOS F during at least one of the weekday study periods. Freeway segment analysis for the Weekday study periods is presented in Table 8. The following freeway segments are currently operating at LOS F conditions under at least one of the weekday study periods:

SR-237, North Fair Oaks Avenue to Lawrence Expressway (Eastbound)
SR-237, Lawrence Expressway to Great America Parkway (Eastbound)
SR-237, Great America Parkway to North First Street (Eastbound)
SR-237, North First Street to Zanker Road (Eastbound)
SR-237, McCarthy Boulevard to I-880 (Eastbound)
SR-237, McCarthy Boulevard to Zanker Road (Westbound)
I-880, Great Mall Parkway to Montague Expressway (Southbound)
I-880, Montague Expressway to Brokaw Road (Southbound)
I-880, Brokaw Road to US-101 (Southbound)
US-101, Fair Oaks Avenue to Lawrence Expressway (Southbound)
US-101, Lawrence Expressway to Great America Parkway (Southbound)
US-101, Great America Pkwy. to Montague Expressway. (Southbound Mixed-Flow & HOV)
US-101, Montague Expressway to De La Cruz Boulevard (Southbound)
US-101, De La Cruz Boulevard to SR-87 (Southbound)
US-101, SR-87 to North First Street (Southbound)
US-101, North First Street to Old Bayshore Highway (Southbound and Mixed-Flow HOV)

US-101, Old Bayshore Highway to I-880 (Southbound and Mixed-Flow HOV)

Sunday Study Periods

Traffic volumes for the Sunday study periods were derived utilizing the available standard PM peak hour CMP freeway segment volumes and the freeway ramp volume data, as was done for the early weekday PM study period. Factors were calculated based upon comparisons of the 11am-1pm and 3-5pm Sunday freeway ramp volume data with the 4-6pm weekday data. Since HOV lanes are not operational during the Sunday study periods, the comparison was based upon the total, mixed-flow plus HOV, standard 4-6pm weekday volumes. The factors were then applied to the standard PM peak hour CMP freeway segment volumes to derive the freeway segment volumes for the Sunday PM study periods. A summary of the ramp volume histograms is included in Appendix B.

Freeway segment analysis for the Sunday study periods is presented in Table 9. All of the studied freeway segments are currently operating at LOS E or better conditions under each of the Sunday study periods.

Table 6
Existing Weekday Freeway Ramp Levels of Service Summary

Interchange	Direction	# Of Lanes	Type	Capacity (vph)	Total Daily Volume	Early PM (3-5) Volume	Early PM (3-5) V/C	Early PM (3-5) LOS	Standard PM (4-6) Volume	Standard PM (4-6) V/C	Standard PM (4-6) LOS
US-101											
Mathilda Avenue	NB off to NB Mathilda Avenue	1	diagonal	1,500	7,037	268	0.179	A	207	0.138	A
	SB on from NB Mathilda Avenue	1	diagonal	1,500	7,765	493	0.329	A	477	0.318	A
	NB on from NB Mathilda Avenue	1	loop	1,500	5,706	362	0.241	A	348	0.232	A
	SB on from SB Mathilda Avenue	1	loop	1,500	5,886	589	0.393	B	651	0.434	B
	NB off to SB Mathilda Avenue	1	loop	1,500	8,866	483	0.322	A	767	0.511	B
	SB off to SB Mathilda Avenue	1	diagonal	1,500	6,785	429	0.286	A	529	0.353	A
North Fair Oaks Avenue	SB on from NB North Fair Oaks Avenue	1	diagonal	1,500	6,991	442	0.295	A	331	0.221	A
	NB off to North Fair Oaks Avenue	1	diagonal	1,500	11,132	644	0.429	B	854	0.569	C
	SB off to NB North Fair Oaks Avenue	1	loop	1,500	1,923	111	0.074	A	160	0.107	A
	SB on from SB North Fair Oaks Avenue	1	loop	1,500	4,195	323	0.215	A	418	0.279	A
	NB on from North Fair Oaks Avenue	1	diagonal	1,500	7,198	393	0.262	A	425	0.283	A
	SB off to SB North Fair Oaks Avenue	1	diagonal	1,500	6,519	592	0.395	B	641	0.427	B
Lawrence Expressway	SB on from NB Lawrence Expressway	2	diagonal	3,000	12,896	671	0.224	A	702	0.234	A
	NB off to Lawrence Expressway	2	diagonal	3,000	19,359	1,156	0.385	B	1,377	0.459	B
	SB off to Lawrence Expressway	1	diagonal	1,500	13,671	978	0.652	C	1,047	0.698	C
	NB on from NB Lawrence Expressway	2	loop	3,000	8,537	450	0.150	A	492	0.164	A
	SB on from SB Lawrence Expressway	1	loop	1,500	5,514	268	0.179	A	296	0.197	A
	NB on from SB Lawrence Expressway	1	diagonal	1,500	5,352	299	0.199	A	322	0.215	A
Great America Parkway	NB off to Great America Parkway	1	diagonal	1,500	17,869	820	0.547	B	1,017	0.678	C
	SB on from NB Great America Parkway	1	diagonal	1,500	6,107	479	0.319	A	495	0.330	A
	NB on from NB Great America Parkway	1	loop	1,500	2,897	186	0.124	A	264	0.176	A
	SB on from SB Great America Parkway	1	loop	1,500	10,192	723	0.482	B	785	0.523	B
	NB on from SB Great America Parkway	1	diagonal	1,500	7,175	465	0.310	A	773	0.515	B
	SB off to Great America Parkway	1	diagonal	1,500	11,373	630	0.420	B	702	0.468	B
San Tomas Expressway	NB off to NB San Tomas Expressway	1	diagonal	1,500	8,157	423	0.282	A	514	0.343	A
	NB off to SB San Tomas Expressway	1	loop	1,500	8,035	487	0.325	A	604	0.403	B
	SB on from SB San Tomas Expressway	1	loop	1,500	8,669	768	0.512	B	768	0.512	B
	SB on from NB San Tomas Expressway	1	diagonal	1,500	6,958	372	0.248	A	457	0.305	A
	NB on from SB San Tomas Expressway	2	diagonal	3,000	10,842	764	0.255	A	1,094	0.365	B
	NB on from NB San Tomas Expressway	1	loop	1,500	8,131	441	0.294	A	393	0.262	A
	SB off to SB San Tomas Expressway	1	diagonal	1,500	8,141	522	0.348	A	709	0.473	B
	SB off to NB San Tomas Expressway	1	loop	1,500	10,787	750	0.500	B	778	0.519	B
I-880											
Tasman Drive	NB off to Great Mall Expressway	2	diagonal	3,000	9,690	494	0.165	A	645	0.215	A
	SB on from Tasman Drive	1	diagonal	1,500	9,747	859	0.573	C	940	0.627	C
	NB on from Tasman Drive	1	loop	1,500	9,573	818	0.545	B	910	0.607	C
	SB off to Tasman Drive/Great Mall Expwy	1	diagonal	1,500	5,059	280	0.187	A	286	0.191	A
SR-237											
Mathilda Avenue	EB off to Mathilda Avenue	2	diagonal	3,000	7,942	300	0.100	A	312	0.104	A
	WB on from Mathilda Avenue	1	diagonal	1,500	10,288	594	0.396	B	874	0.583	C
	EB on from Mathilda Avenue	1	diagonal	1,500	9,979	820	0.547	B	820	0.547	B
	WB off to Mathilda Avenue	1	diagonal	1,500	11,898	557	0.371	B	569	0.379	B
North Fair Oaks Avenue	EB off to North Fair Oaks Avenue	1	diagonal	1,500	2,632	171	0.114	A	234	0.156	A
	WB on from Crossman Avenue/Java Drive	1	diagonal	1,500	2,870	313	0.209	A	355	0.237	A
Lawrence Expressway	WB on from SB Lawrence Expressway	1	diagonal	1,500	1,056	68	0.045	A	87	0.058	A
	WB on from NB Lawrence Expressway	1	loop	1,500	2,618	202	0.135	A	235	0.157	A
	EB off to SB Lawrence Expressway	1	diagonal	1,500	2,603	196	0.131	A	196	0.131	A
	EB off to NB Lawrence Expressway	1	loop	1,500	702	21	0.014	A	50	0.033	A
	WB off to SB Lawrence Expressway	1	loop	1,500	11,722	735	0.490	B	797	0.531	B
	WB off to NB Lawrence Expressway	1	diagonal	1,500	5,715	136	0.091	A	291	0.194	A
	EB on from SB Lawrence Expressway	1	loop	1,500	5,197	656	0.437	B	868	0.579	C
	EB on from NB Lawrence Expressway	1	diagonal	1,500	12,939	715	0.477	B	792	0.528	B
Great America Parkway	EB off Great America Parkway	1	diagonal	1,500	5,840	406	0.271	A	495	0.330	A
	WB on from Great America Parkway	1	diagonal	1,500	4,454	318	0.212	A	454	0.303	A
	WB off to Great America Parkway	1	diagonal	1,500	12,307	562	0.375	B	694	0.463	B
	EB on from Great America Parkway	1	diagonal	1,500	10,464	709	0.473	B	710	0.473	B
North First Street	WB on from North First Steet	1	diagonal	1,500	6,521	470	0.313	A	705	0.470	B
	EB off to North First Steet	1	loop	1,500	5,887	275	0.183	A	280	0.187	A
	WB off to North First Steet	1	diagonal	1,500	5,450	283	0.189	A	278	0.185	A
	EB on from North First Steet	1	diagonal	1,500	7,417	543	0.362	B	523	0.349	A

Notes:
1. Capacity of freeway lanes based on assumed capacity of 1,500 vphpl for all ramps, as prescribed by the Highway Capacity Manual
2. Data provided by Caltrans Data System: 2006 Ramp Volumes on the California State Freeway System, District 4

Table 7
Existing Sunday Freeway Ramp Levels of Service Summary

Interchange	Direction	# Of Lanes	Type	Capacity (vph)	Total Daily Volume	Early (11-1pm) Volume	V/C	LOS	Late (3-5pm) Volume	V/C	LOS
US-101											
Mathilda Avenue	NB off to NB Mathilda Avenue	1	diagonal	1,500	2,235	137	0.091	A	138	0.092	A
	SB on from NB Mathilda Avenue	1	diagonal	1,500	4,808	331	0.221	A	300	0.200	A
	NB on from NB Mathilda Avenue	1	loop	1,500	3,527	235	0.157	A	243	0.162	A
	SB on from SB Mathilda Avenue	1	loop	1,500	1,445	123	0.082	A	86	0.057	A
	NB off to SB Mathilda Avenue	1	loop	1,500	4,834	327	0.218	A	332	0.221	A
	SB off to SB Mathilda Avenue	1	diagonal	1,500	3,684	268	0.179	A	248	0.165	A
North Fair Oaks Avenue	SB on from NB North Fair Oaks Avenue	1	diagonal	1,500	5,440	415	0.277	A	381	0.254	A
	NB off to North Fair Oaks Avenue	1	diagonal	1,500	7,663	587	0.391	B	522	0.348	A
	SB off to NB North Fair Oaks Avenue	1	loop	1,500	1,208	94	0.063	A	94	0.063	A
	SB on from SB North Fair Oaks Avenue	1	loop	1,500	2,293	208	0.139	A	159	0.106	A
	NB on from North Fair Oaks Avenue	1	diagonal	1,500	5,025	384	0.256	A	345	0.230	A
	SB off to SB North Fair Oaks Avenue	1	diagonal	1,500	3,963	277	0.185	A	303	0.202	A
Lawrence Expressway	SB on from NB Lawrence Expressway	2	diagonal	3,000	7,402	569	0.190	A	566	0.189	A
	NB off to Lawrence Expressway	2	diagonal	3,000	10,916	824	0.275	A	789	0.263	A
	SB off to Lawrence Expressway	1	diagonal	1,500	8,508	704	0.469	B	693	0.462	B
	NB on from NB Lawrence Expressway	2	loop	3,000	4,930	342	0.114	A	352	0.117	A
	SB on from SB Lawrence Expressway	1	loop	1,500	3,177	289	0.193	A	194	0.129	A
	NB on from SB Lawrence Expressway	1	diagonal	1,500	3,936	287	0.191	A	254	0.169	A
Great America Parkway	NB off to Great America Parkway	1	diagonal	1,500	9,301	894	0.596	C	631	0.421	B
	SB on from NB Great America Parkway	1	diagonal	1,500	2,896	200	0.133	A	218	0.145	A
	NB on from NB Great America Parkway	1	loop	1,500	1,372	110	0.073	A	118	0.079	A
	SB on from SB Great America Parkway	1	loop	1,500	6,769	524	0.349	A	466	0.311	A
	NB on from SB Great America Parkway	1	diagonal	1,500	3,591	284	0.189	A	278	0.185	A
	SB off to Great America Parkway	1	diagonal	1,500	5,954	523	0.349	A	395	0.263	A
San Tomas Expressway	NB off to NB San Tomas Expressway	1	diagonal	1,500	5,355	337	0.225	A	393	0.262	A
	NB off to SB San Tomas Expressway	1	loop	1,500	4,770	365	0.243	A	352	0.235	A
	SB on from SB San Tomas Expressway	1	loop	1,500	6,117	713	0.475	B	322	0.215	A
	SB on from NB San Tomas Expressway	1	diagonal	1,500	3,902	265	0.177	A	269	0.179	A
	NB on from SB San Tomas Expressway	2	diagonal	3,000	4,945	483	0.161	A	337	0.112	A
	NB on from NB San Tomas Expressway	1	loop	1,500	3,745	284	0.189	A	276	0.184	A
	SB off to SB San Tomas Expressway	1	diagonal	1,500	3,865	256	0.171	A	299	0.199	A
	SB off to NB San Tomas Expressway	1	loop	1,500	4,743	313	0.209	A	375	0.250	A
I-880											
Tasman Drive	NB off to Great Mall Expressway	2	diagonal	3,000	6,014	550	0.183	A	519	0.173	A
	SB on from Tasman Drive	1	diagonal	1,500	7,102	433	0.289	A	664	0.443	B
	NB on from Tasman Drive	1	loop	1,500	7,544	357	0.238	A	777	0.518	B
	SB off to Tasman Drive/Great Mall Expwy	1	diagonal	1,500	3,558	300	0.200	A	342	0.228	A
SR-237											
Mathilda Avenue	EB off to Mathilda Avenue	2	diagonal	3,000	2,089	172	0.057	A	134	0.045	A
	WB on from Mathilda Avenue	1	diagonal	1,500	5,073	399	0.266	A	333	0.222	A
	EB on from Mathilda Avenue	1	diagonal	1,500	5,011	365	0.243	A	353	0.235	A
	WB off to Mathilda Avenue	1	diagonal	1,500	5,878	351	0.234	A	409	0.273	A
North Fair Oaks Avenue	EB off to North Fair Oaks Avenue	1	diagonal	1,500	1,248	98	0.065	A	86	0.057	A
	WB on from Crossman Avenue/Java Drive	1	diagonal	1,500	820	75	0.050	A	52	0.035	A
Lawrence Expressway	WB on from SB Lawrence Expressway	1	diagonal	1,500	579	31	0.021	A	77	0.051	A
	WB on from NB Lawrence Expressway	1	loop	1,500	886	71	0.047	A	66	0.044	A
	EB off to SB Lawrence Expressway	1	diagonal	1,500	1,262	106	0.071	A	104	0.069	A
	EB off to NB Lawrence Expressway	1	loop	1,500	290	46	0.031	A	17	0.011	A
	WB off to SB Lawrence Expressway	1	loop	1,500	9,041	586	0.391	B	635	0.423	B
	WB off to NB Lawrence Expressway	1	diagonal	1,500	929	84	0.056	A	48	0.032	A
	EB on from SB Lawrence Expressway	1	loop	1,500	1,440	110	0.073	A	161	0.107	A
	EB on from NB Lawrence Expressway	1	diagonal	1,500	8,976	657	0.438	B	640	0.427	B
Great America Parkway	EB off Great America Parkway	1	diagonal	1,500	2,138	153	0.102	A	148	0.099	A
	WB on from Great America Parkway	1	diagonal	1,500	2,263	181	0.121	A	166	0.111	A
	WB off to Great America Parkway	1	diagonal	1,500	6,231	536	0.357	A	412	0.275	A
	EB on from Great America Parkway	1	diagonal	1,500	6,000	369	0.246	A	461	0.307	A
North First Street	WB on from North First Steet	1	diagonal	1,500	3,211	329	0.219	A	197	0.131	A
	EB off to North First Steet	1	loop	1,500	3,048	319	0.213	A	167	0.111	A
	WB off to North First Steet	1	diagonal	1,500	5,254	578	0.385	B	304	0.203	A
	EB on from North First Steet	1	diagonal	1,500	5,492	581	0.387	B	378	0.252	A

Notes:
1. Capacity of freeway lanes based on assumed capacity of 1,500 vphpl for all ramps, as prescribed by the Highway Capacity Manual
2. Data provided by Caltrans Data System: 2006 Ramp Volumes on the California State Freeway System, District 4

Table 8
Existing Weekday Freeway Mainline Segment Levels of Service Summary

				Mixed-Flow Lanes					HOV Lane Traffic Volume				
Freeway	Segment	Direction	Study Period	Ave. Speed/a/	# of Lanes	Volume/a/	Density	LOS	Ave. Speed/a/	# of Lanes	Volume/a/	Density	LOS
US-101	I-880 to Old Bayshore Highway	NB	3-5 PM	66	3	4,095	20.7	C	67	1	603	9.0	A
			4-6 PM	66	3	4,550	23.0	C	67	1	670	10.0	A
US-101	Old Bayshore Highway to North First Street	NB	3-5 PM	66	3	4,986	25.2	C	67	1	720	10.7	A
			4-6 PM	66	3	5,540	28.0	D	67	1	800	11.9	B
US-101	North First Street to SR-87	NB	3-5 PM	67	3	2,718	13.5	B	67	1	540	8.1	A
			4-6 PM	67	3	3,020	15.0	B	67	1	600	9.0	A
US-101	SR-87 to De La Cruz Boulevard	NB	3-5 PM	58	3	5,949	34.2	D	67	1	666	9.9	A
			4-6 PM	58	3	6,610	38.0	D	67	1	740	11.0	B
US-101	De La Cruz Boulevard to Montaque Expressway/ Santa Tomas Expressway	NB	3-5 PM	45	3	5,832	43.2	D	67	1	720	10.7	A
			4-6 PM	45	3	6,480	48.0	E	67	1	800	11.9	B
US-101	Montaque Expressway/ Santa Tomas Expressway to Bowers Avenue/ Great America Parkway	NB	3-5 PM	65	3	5,094	26.1	D	67	1	603	9.0	A
			4-6 PM	65	3	5,660	29.0	D	67	1	670	10.0	A
US-101	Bowers Avenue/Great America Parkway to Lawrence Expressway	NB	3-5 PM	42	3	5,670	45.0	D	67	1	783	11.7	B
			4-6 PM	42	3	6,300	50.0	E	67	1	870	13.0	B
US-101	Lawrence Expressway to Fair Oaks Avenue	NB	3-5 PM	61	3	5,931	32.4	D	67	1	909	13.6	B
			4-6 PM	61	3	6,590	36.0	D	67	1	1,010	15.1	B
US-101	Fair Oaks Avenue to Mathilda Avenue	NB	3-5 PM	65	3	5,445	27.9	D	67	1	846	12.6	B
			4-6 PM	65	3	6,050	31.0	D	67	1	940	14.0	B
US-101	Mathilda Avenue to SR-237	NB	3-5 PM	66	3	4,635	23.4	C	63	1	1,926	30.6	D
			4-6 PM	66	3	5,150	26.0	D	63	1	2,140	34.0	D
I-880	US-101 to Brokaw Road	NB	3-5 PM	65	3	5,265	27.0	D	N/A	N/A	N/A		
			4-6 PM	65	3	5,850	30.0	D	N/A	N/A	N/A		
I-880	Brokaw Road to Montague Expressway	NB	3-5 PM	66	3	4,635	23.4	C	N/A	N/A	N/A		
			4-6 PM	66	3	5,150	26.0	D	N/A	N/A	N/A		
I-880	Montague Expressway to Great Mall Parkway	NB	3-5 PM	66	3	4,635	23.4	C	N/A	N/A	N/A		
			4-6 PM	66	3	5,150	26.0	D	N/A	N/A	N/A		
I-880	Great Mall Parkway to SR-237	NB	3-5 PM	47	3	5,841	41.4	D	N/A	N/A	N/A		
			4-6 PM	47	3	6,490	46.0	E	N/A	N/A	N/A		
SR-237	US-101 to Mathilda Avenue	EB	3-5 PM	66	2	3,204	24.3	C	N/A	N/A	N/A		
			4-6 PM	66	2	3,560	27.0	D	N/A	N/A	N/A		
SR-237	Mathilda Avenue to N. Fair Oaks Avenue	EB	3-5 PM	64	2	3,798	29.7	D	67	1	603	9.0	A
			4-6 PM	64	2	4,220	33.0	D	67	1	670	10.0	A
SR-237	N. Fair Oaks Avenue to Lawrence Expressway	EB	3-5 PM	15	2	2,646	88.2	F	67	1	666	9.9	A
			4-6 PM	15	2	2,940	98.0	F	67	1	740	11.0	B
SR-237	Lawrence Expressway to Great America Parkway	EB	3-5 PM	18	2	2,853	79.3	F	67	1	846	12.6	B
			4-6 PM	18	2	3,170	88.1	F	67	1	940	14.0	B
SR-237	Great America Parkway to North First Street	EB	3-5 PM	16	2	2,709	84.7	F	66	1	1,368	20.7	C
			4-6 PM	16	2	3,010	94.1	F	66	1	1,520	23.0	C
SR-237	North First Street to Zanker Road	EB	3-5 PM	27	2	3,357	62.2	F	66	1	1,665	25.2	C
			4-6 PM	27	2	3,730	69.1	F	66	1	1,850	28.0	D
SR-237	Zanker Road to McCarthy Boulevard	EB	3-5 PM	52	2	3,933	37.8	D	66	1	1,665	25.2	C
			4-6 PM	52	2	4,370	42.0	D	66	1	1,850	28.0	D
SR-237	McCarthy Boulevard to I-880	EB	3-5 PM	38	2	5,544	72.9	F	N/A	1	N/A		
			4-6 PM	38	2	6,160	81.1	F	N/A	1	N/A		

Table 8
Existing Weekday Freeway Mainline Segment Levels of Service Summary (cont'd)

Freeway	Segment	Direction	Study Period	Mixed-Flow Lanes Ave. Speed/a/	# of Lanes	Volume/a/	Density	LOS	HOV Lane Traffic Volume Ave. Speed/a/	# of Lanes	Volume/a/	Density	LOS
SR-237	I-880 to McCarthy Boulevard	WB	3-5 PM	65	3	5,094	26.1	D	N/A	N/A	N/A		
			4-6 PM	65	3	5,660	29.0	D	N/A	N/A	N/A		
SR-237	McCarthy Boulevard to Zanker Road	WB	3-5 PM	16	2	3,249	84.6	F	67	1	909	13.6	B
			4-6 PM	16	2	3,610	94.0	F	67	1	1,010	15.1	B
SR-237	Zanker Road to North First Street	WB	3-5 PM	38	2	3,690	48.6	E	67	1	909	13.6	B
			4-6 PM	38	2	4,100	53.9	E	67	1	1,010	15.1	B
SR-237	North First Street to Great America Parkway	WB	3-5 PM	58	2	3,969	34.2	D	67	1	783	11.7	B
			4-6 PM	58	2	4,410	38.0	D	67	1	870	13.0	B
SR-237	Great America Parkway to Lawrence Expressway	WB	3-5 PM	51	2	3,951	38.7	D	67	1	720	10.7	A
			4-6 PM	51	2	4,390	43.0	D	67	1	800	11.9	B
SR-237	Lawrence Expressway to Fair Oaks Avenue	WB	3-5 PM	63	2	3,852	30.6	D	66	1	1,485	22.5	C
			4-6 PM	63	2	4,280	34.0	D	66	1	1,650	25.0	C
SR-237	Fair Oaks Avenue to Mathilda Avenue	WB	3-5 PM	51	3	5,922	38.7	D	N/A	N/A	N/A		
			4-6 PM	51	3	6,580	43.0	D	N/A	N/A	N/A		
SR-237	Mathilda Avenue to US-101	WB	3-5 PM	54	2	3,987	36.9	D	N/A	N/A	N/A		
			4-6 PM	54	2	4,430	41.0	D	N/A	N/A	N/A		
I-880	SR-237 to Great Mall Parkway	SB	3-5 PM	66	3	3,744	18.9	C	N/A	N/A	N/A		
			4-6 PM	66	3	4,160	21.0	C	N/A	N/A	N/A		
I-880	Great Mall Parkway to Montague Expressway	SB	3-5 PM	19	3	4,365	76.6	F	N/A	N/A	N/A		
			4-6 PM	19	3	4,850	85.1	F	N/A	N/A	N/A		
I-880	Montague Expressway to Brokaw Road	SB	3-5 PM	21	3	4,536	72.0	F	N/A	N/A	N/A		
			4-6 PM	21	3	5,040	80.0	F	N/A	N/A	N/A		
I-880	Brokaw Road to US-101	SB	3-5 PM	18	3	4,275	79.2	F	N/A	N/A	N/A		
			4-6 PM	18	3	4,750	88.0	F	N/A	N/A	N/A		
US-101	SR-237 to Mathilda Avenue	SB	3-5 PM	66	3	4,455	22.5	C	66	1	1,305	19.8	C
			4-6 PM	66	3	4,950	25.0	C	66	1	1,450	22.0	C
US-101	Mathilda Avenue to Fair Oaks Avenue	SB	3-5 PM	51	3	5,922	38.7	D	67	1	963	14.4	B
			4-6 PM	51	3	6,580	43.0	D	67	1	1,070	16.0	B
US-101	Fair Oaks Avenue to Lawrence Expressway	SB	3-5 PM	20	3	4,428	73.8	F	66	1	1,602	24.3	C
			4-6 PM	20	3	4,920	82.0	F	66	1	1,780	27.0	D
US-101	Lawrence Expressway to Bowers Avenue/ Great America Parkway	SB	3-5 PM	9	3	2,961	109.7	F	39	1	1,863	47.8	E
			4-6 PM	9	3	3,290	121.9	F	39	1	2,070	53.1	E
US-101	Bowers Avenue/ Great America Parkway to Montague Expressway/ San Tomas Expressway	SB	3-5 PM	10	3	3,132	104.4	F	32	1	1,755	54.8	E
			4-6 PM	10	3	3,480	116.0	F	32	1	1,950	60.9	F
US-101	Montague Expressway/San Tomas Expressway to De La Cruz Boulevard	SB	3-5 PM	13	3	3,582	91.8	F	50	1	1,980	39.6	D
			4-6 PM	13	3	3,980	102.1	F	50	1	2,200	44.0	D
US-101	De La Cruz Boulevard to SR-87	SB	3-5 PM	28	3	5,067	60.3	F	64	1	1,899	29.7	D
			4-6 PM	28	3	5,630	67.0	F	64	1	2,110	33.0	D
US-101	SR-87 to North First Street	SB	3-5 PM	23	3	4,716	68.3	F	52	1	1,962	37.7	D
			4-6 PM	23	3	5,240	75.9	F	52	1	2,180	41.9	D
US-101	North First Street to Old Bayshore Highway	SB	3-5 PM	11	3	3,267	99.0	F	29	1	1,701	58.7	F
			4-6 PM	11	3	3,630	110.0	F	29	1	1,890	65.2	F
US-101	Old Bayshore Highway to I-880	SB	3-5 PM	11	3	3,330	100.9	F	33	1	1,782	54.0	E
			4-6 PM	11	3	3,700	112.1	F	33	1	1,980	60.0	F

/a/ Source: Santa Clara Valley Transportation Authority Congestion Management Program Monitoring Study, 2006.

Table 9
Existing Sunday Freeway Mainline Segment Levels of Service Summary

Freeway	Segment	Direction	Study Period	Mixed-Flow Lanes Ave. Speed/a/	# of Lanes	Volume/a/	Density	LOS
US-101	I-880 to Old Bayshore Highway	NB	11-1 PM	65	4	3,654	14.1	B
			3-5 PM	65	4	4,176	16.1	B
US-101	Old Bayshore Highway to North First Street	NB	11-1 PM	65	4	4,438	17.1	B
			3-5 PM	65	4	5,072	19.5	C
US-101	North First Street to SR-87	NB	11-1 PM	65	4	2,534	9.7	A
			3-5 PM	65	4	2,896	11.1	B
US-101	SR-87 to De La Cruz Boulevard	NB	11-1 PM	65	4	5,145	19.8	C
			3-5 PM	65	4	5,880	22.6	C
US-101	De La Cruz Boulevard to Montaque Expressway/ Santa Tomas Expressway	NB	11-1 PM	65	4	5,096	19.6	C
			3-5 PM	65	4	5,824	22.4	C
US-101	Montaque Expressway/ Santa Tomas Expressway to Bowers Avenue/ Great America Parkway	NB	11-1 PM	65	4	4,431	17.0	B
			3-5 PM	65	4	5,064	19.5	C
US-101	Bowers Avenue/Great America Parkway to Lawrence Expressway	NB	11-1 PM	65	4	5,019	19.3	C
			3-5 PM	65	4	5,736	22.1	C
US-101	Lawrence Expressway to Fair Oaks Avenue	NB	11-1 PM	65	4	5,320	20.5	C
			3-5 PM	65	4	6,080	23.4	C
US-101	Fair Oaks Avenue to Mathilda Avenue	NB	11-1 PM	65	4	4,893	18.8	C
			3-5 PM	65	4	5,592	21.5	C
US-101	Mathilda Avenue to SR-237	NB	11-1 PM	65	4	5,103	19.6	C
			3-5 PM	65	4	5,832	22.4	C
I-880	US-101 to Brokaw Road	NB	11-1 PM	65	3	4,095	21.0	C
			3-5 PM	65	3	5,265	27.0	D
I-880	Brokaw Road to Montague Expressway	NB	11-1 PM	65	3	3,605	18.5	C
			3-5 PM	65	3	4,635	23.8	C
I-880	Montague Expressway to Great Mall Parkway	NB	11-1 PM	65	3	3,605	18.5	C
			3-5 PM	65	3	4,635	23.8	C
I-880	Great Mall Parkway to SR-237	NB	11-1 PM	65	3		23.3	C
			3-5 PM	65	3	5,841	30.0	D
SR-237	US-101 to Mathilda Avenue	EB	11-1 PM	65	2	2,136	16.4	B
			3-5 PM	65	2	1,780	13.7	B
SR-237	Mathilda Avenue to N. Fair Oaks Avenue	EB	11-1 PM	65	3	2,934	15.0	B
			3-5 PM	65	3	2,445	12.5	B
SR-237	N. Fair Oaks Avenue to Lawrence Expressway	EB	11-1 PM	65	3	2,208	11.3	B
			3-5 PM	65	3	1,840	9.4	A
SR-237	Lawrence Expressway to Great America Parkway	EB	11-1 PM	65	3	2,466	12.6	B
			3-5 PM	65	3	2,055	10.5	A
SR-237	Great America Parkway to North First Street	EB	11-1 PM	65	3	2,718	13.9	B
			3-5 PM	65	3	2,265	11.6	B
SR-237	North First Street to Zanker Road	EB	11-1 PM	65	3	3,348	17.2	B
			3-5 PM	65	3	2,790	14.3	B
SR-237	Zanker Road to McCarthy Boulevard	EB	11-1 PM	65	3	3,732	19.1	C
			3-5 PM	65	3	3,110	15.9	B
SR-237	McCarthy Boulevard to I-880	EB	11-1 PM	65	3	3,696	19.0	C
			3-5 PM	65	3	3,080	15.8	B

Table 9
Existing Sunday Freeway Mainline Segment Levels of Service Summary (cont'd)

Freeway	Segment	Direction	Study Period	Mixed-Flow Lanes Ave. Speed/a/	# of Lanes	Volume/a/	Density	LOS
SR-237	I-880 to McCarthy Boulevard	WB	11-1 PM	65	3	2,264	11.6	B
			3-5 PM	65	3	1,698	8.7	A
SR-237	McCarthy Boulevard to Zanker Road	WB	11-1 PM	65	3	1,848	8.4	A
			3-5 PM	65	3	1,386	6.3	A
SR-237	Zanker Road to North First Street	WB	11-1 PM	65	3	2,044	10.5	A
			3-5 PM	65	3	1,533	7.9	A
SR-237	North First Street to Great America Parkway	WB	11-1 PM	65	3	2,112	10.8	A
			3-5 PM	65	3	1,584	8.1	A
SR-237	Great America Parkway to Lawrence Expressway	WB	11-1 PM	65	3	2,076	10.6	A
			3-5 PM	65	3	1,557	8.0	A
SR-237	Lawrence Expressway to Fair Oaks Avenue	WB	11-1 PM	65	3	2,372	12.2	B
			3-5 PM	65	3	1,779	9.1	A
SR-237	Fair Oaks Avenue to Mathilda Avenue	WB	11-1 PM	65	3	2,632	13.5	B
			3-5 PM	65	3	1,974	10.1	A
SR-237	Mathilda Avenue to US-101	WB	11-1 PM	65	2	1,772	13.6	B
			3-5 PM	65	2	1,329	10.2	A
I-880	SR-237 to Great Mall Parkway	SB	11-1 PM	65	3	3,328	17.1	B
			3-5 PM	65	3	2,496	12.8	B
I-880	Great Mall Parkway to Montague Expressway	SB	11-1 PM	65	3	3,880	19.9	C
			3-5 PM	65	3	2,910	14.9	B
I-880	Montague Expressway to Brokaw Road	SB	11-1 PM	65	3	4,032	20.7	C
			3-5 PM	65	3	3,024	15.5	B
I-880	Brokaw Road to US-101	SB	11-1 PM	65	3	3,800	19.5	C
			3-5 PM	65	3	2,850	14.6	B
US-101	SR-237 to Mathilda Avenue	SB	11-1 PM	65	4	5,120	19.7	C
			3-5 PM	65	4	3,200	12.3	B
US-101	Mathilda Avenue to Fair Oaks Avenue	SB	11-1 PM	65	4	6,120	23.5	C
			3-5 PM	65	4	3,825	14.7	B
US-101	Fair Oaks Avenue to Lawrence Expressway	SB	11-1 PM	65	4	5,360	20.6	C
			3-5 PM	65	4	3,350	12.9	B
US-101	Lawrence Expressway to Bowers Avenue/ Great America Parkway	SB	11-1 PM	65	4	4,288	16.5	B
			3-5 PM	65	4	2,680	10.3	A
US-101	Bowers Avenue/ Great America Parkway to Montague Expressway/ San Tomas Expressway	SB	11-1 PM	65	4	4,344	16.7	B
			3-5 PM	65	4	2,715	10.4	A
US-101	Montague Expressway/San Tomas Expressway to De La Cruz Boulevard	SB	11-1 PM	65	4	4,944	19.0	C
			3-5 PM	65	4	3,090	11.9	B
US-101	De La Cruz Boulevard to SR-87	SB	11-1 PM	65	4	6,192	23.8	C
			3-5 PM	65	4	3,870	14.9	B
US-101	SR-87 to North First Street	SB	11-1 PM	65	4	5,936	22.8	C
			3-5 PM	65	4	3,710	14.3	B
US-101	North First Street to Old Bayshore Highway	SB	11-1 PM	65	4	4,416	17.0	B
			3-5 PM	65	4	2,760	10.6	A
US-101	Old Bayshore Highway to I-880	SB	11-1 PM	65	4	4,544	17.5	B
			3-5 PM	65	4	2,840	10.9	A

/a/ Source: Santa Clara Valley Transportation Authority Congestion Management Program Monitoring Study, 2006.

3.
Background Conditions

This chapter describes background traffic conditions. Background conditions are defined as conditions with traffic associated with already approved, but not yet constructed development added to existing conditions traffic. Traffic volumes for background conditions comprise volumes from Year 2006-2008 existing traffic counts plus traffic generated by other approved developments. This chapter describes the planned roadway system and intersection improvements, the procedure used to determine background traffic volumes, and the resulting traffic conditions.

Approved Background Projects

City of Santa Clara staff coordinated meetings with staff of the Cities of San Jose, Sunnyvale, and Milpitas in December 2008. In addition to general discussion of the proposed stadium project, each of the cities were asked to provide a list of approved but not yet built projects within their respective jurisdictions to be included within background conditions of the analysis. Background conditions are comprised of those identified projects within each of the studied jurisdictions. The City of Santa Clara TRAFFIX database was utilized to obtain approved project trips within the City of Santa Clara. Trips for approved projects within the City of San Jose were obtained from the City's Approved Trip Inventory (ATI) database dated September 2008. Approved project trips for the Cities of Sunnyvale and Milpitas were obtained from recent traffic studies.

Though approved project trips for standard weekday commute periods are provided in the identified sources, there are no databases or records maintained for Sunday approved trips. Since the project area consists primarily of industrial and office uses, it is expected that traffic volumes on Sunday that are associated with approved projects in the area would be negligible. As a conservative approach to the Sunday analysis, approved project trips for the Sunday study periods were derived by factoring, similar to that which was done to develop existing volumes for the early weekday and the late Sunday study periods. A list of approved projects and total approved trips at each of the study intersections are included in Appendix B.

Background Roadway Network

Improvements are planned under background conditions at several of the study intersections within the City of San Jose. The City of San Jose has identified various improvement projects that will be implemented as part of the approved North San Jose Development Policy. The following intersection improvements associated with Phase 1 of the North San Jose Development Policy are assumed in the background transportation network. The widening of Montague Expressway to eight lanes is also identified in the county's expressway study as a Tier 1-A improvement. No improvements were assumed within the remaining jurisdictions.

Montague Expressway and North First Street – Widen Montague Expressway from six to eight mixed-flow lanes.

Montague Expressway and Zanker Road – Widen Montague Expressway from six to eight mixed-flow lanes and the addition of second left-turn lanes to the northbound and southbound approaches.

Montague Expressway and River Oaks Circle - Widen Montague Expressway from six to eight mixed-flow lanes.

Montague Expressway and Trimble Road – Widen Montague Expressway from six to eight mixed-flow lanes and a flyover constructed to serve the westbound Montague Expressway to southbound Trimble Road movement.

Montague Expressway and McCarthy Boulevard - Widen Montague Expressway from six to eight mixed-flow lanes.

Montague Expressway and Old Oakland Road – Widen Montague Expressway from six to eight mixed-flow lanes.

Montague Expressway and Trade Zone Boulevard – Widen Montague Expressway from six to eight mixed-flow lanes and the addition of separate through lanes on the northbound and southbound approaches.

Background Bicycle and Pedestrian Facilities

There are no planned improvements to bicycle facilities within the project area. Nor are there any planned bicycle facilities planned according to the City of Santa Clara Transportation Bicycle Network.

Background Transit Service

Transit service under background conditions was assumed to remain unchanged from existing conditions.

Background Intersection Levels of Service

Intersection levels of service are evaluated against the applicable municipal and CMP standards. The level of service results for those study intersections projected to operate at unacceptable levels under weekday background conditions are summarized in Table 10. The levels of service results also are shown graphically in Figures 19-28. Tables summarizing the results for all study intersections, as well as levels of service calculation sheets are included in Appendix D.

Intersection Level of Service (Weekday Study Period)

City of Santa Clara Intersection Analysis

The results of the Weekday level of service analysis show that one of the City of Santa Clara study intersections is projected to operate at an unacceptable LOS F under background conditions during the Weekday study period. All other City of Santa Clara study intersections would operate at an acceptable level of service under background conditions during the weekday study periods.

18 Great America Parkway and Patrick Henry Drive

CMP Intersections

The level of service results for the CMP study intersections located within the City of Santa Clara show that, measured against the CMP level of service standards, three intersections are projected to operate at an unacceptable LOS F under background conditions during the standard Weekday study period. All other CMP study intersections located in the City of Santa Clara would operate at an acceptable level of service under background conditions during the weekday study periods.

8 Great America Parkway and Mission College Boulevard *
60 San Tomas Expressway and Homestead Road *
62 San Tomas Expressway and El Camino Real *

City of San Jose Intersection Analysis

The results of the Weekday level of service analysis show that six, all of which are CMP designated intersections, of the City of San Jose study intersections are projected to operate at an unacceptable LOS E or worse under background conditions during at least one of the Weekday study periods. All other City of San Jose study intersections would operate at an acceptable level of service under background conditions during the weekday study periods.

83 North First Street and Montague Expressway *
84 Zanker Road and Montague Expressway *
87 O'Toole Avenue and Montague Expressway *
88 Oakland Road/Main Street and Montague Expressway *
89 Trade Zone Boulevard and Montague Expressway *
91 North First Street (North) and SR-237 *

*Indicates CMP Intersection

CMP Intersections

The level of service results for the CMP study intersections located within the City of San Jose show that, measured against the CMP level of service standards, six intersections are projected to operate at an unacceptable LOS F under background conditions during at least one of the Weekday study periods. All other CMP study intersections located in the City of San Jose would operate at an acceptable level of service under background conditions during the weekday study periods.

83 North First Street and Montague Expressway *
84 Zanker Road and Montague Expressway *
87 O'Toole Avenue and Montague Expressway *
88 Oakland Road/Main Street and Montague Expressway *
89 Trade Zone Boulevard and Montague Expressway *
91 North First Street (North) and SR-237 *

City of Sunnyvale Intersection Analysis

The results of the Weekday level of service analysis show that two of the City of Sunnyvale study intersections are projected to operate at an unacceptable LOS E under background conditions during the standard Weekday study period. All other City of Sunnyvale study intersections would operate at an acceptable level of service under background conditions during the weekday study periods.

104 Lawrence Expressway and Oakmead Parkway
106 Lawrence Expressway and Kifer Road

CMP Intersections

The level of service results for the CMP study intersections located within the City of Sunnyvale show that, measured against the CMP level of service standards, one intersection is projected to operate at an unacceptable LOS F under background conditions during the standard Weekday study period. All other CMP study intersections located in the City of Sunnyvale would operate at an acceptable level of service under background conditions during the weekday study periods.

108 Lawrence Expressway and Homestead Road *

City of Milpitas Intersection Analysis

The results of the Weekday level of service analysis show that one of the City of Milpitas study intersections is projected to operate at an unacceptable LOS F under background conditions during the standard Weekday study period. All other City of Milpitas study intersections would operate at an acceptable level of service under background conditions during the weekday study periods.

110 Alder Drive and Tasman Drive

CMP Intersections

The level of service results for the CMP study intersections located within the City of Milpitas show that, measured against the CMP level of service standards, all of the CMP study intersections located in the

City of Milpitas would operate at an acceptable level of service under background conditions during the weekday study periods.

Table 10
Weekday Background Unacceptable Intersection Levels of Service

Study Number	Intersection Name	Study Period	Existing Ave. Delay	Existing LOS	Background Ave. Delay	Background LOS
City of Santa Clara Intersections						
8	Great America Parkway and Mission College Boulevard *	3-5PM	44.0	D	50.9	D
		4-6PM	52.2	D	98.5	F
18	Great America Parkway and Patrick Henry Drive	3-5PM	23.6	C	33.8	C
		4-6PM	27.4	C	85.5	F
60	San Tomas Expressway and Homestead Road *	3-5PM	47.3	D	55.1	E
		4-6PM	69.7	E	102.0	F
62	San Tomas Expressway and El Camino Real *	3-5PM	56.8	E	62.1	E
		4-6PM	65.6	E	85.4	F
City of San Jose Intersections						
83	North First Street and Montague Expressway *	3-5PM	59.0	E	121.4	F
		4-6PM	73.9	E	206.8	F
84	Zanker Road and Montague Expressway *	3-5PM	49.3	D	62.3	E
		4-6PM	59.5	E	98.8	F
87	O'Toole Avenue and Montague Expressway *	3-5PM	53.4	D	68.8	E
		4-6PM	71.1	E	96.0	F
88	Oakland Road/Main Street and Montague Expressway *	3-5PM	52.0	D	53.3	D
		4-6PM	60.2	E	58.9	E
89	Trade Zone Boulevard and Montague Expressway *	3-5PM	52.0	D	59.3	E
		4-6PM	78.6	E	101.4	F
91	North First Street (North) and SR-237 *	3-5PM	17.3	B	51.2	D
		4-6PM	18.0	B	139.1	F
City of Sunnyvale Intersections						
104	Lawrence Expressway and Oakmead Parkway	3-5PM	38.9	D	40.7	D
		4-6PM	42.8	D	59.0	E
106	Lawrence Expressway and Kifer Road	3-5PM	47.7	D	46.3	D
		4-6PM	51.9	D	57.1	E
108	Lawrence Expressway and Homestead Road *	3-5PM	43.3	D	46.6	D
		4-6PM	52.0	D	83.5	F
City of Milpitas Intersections						
110	Alder Drive and Tasman Drive	3-5PM	26.6	C	38.0	D
		4-6PM	34.0	C	99.6	F

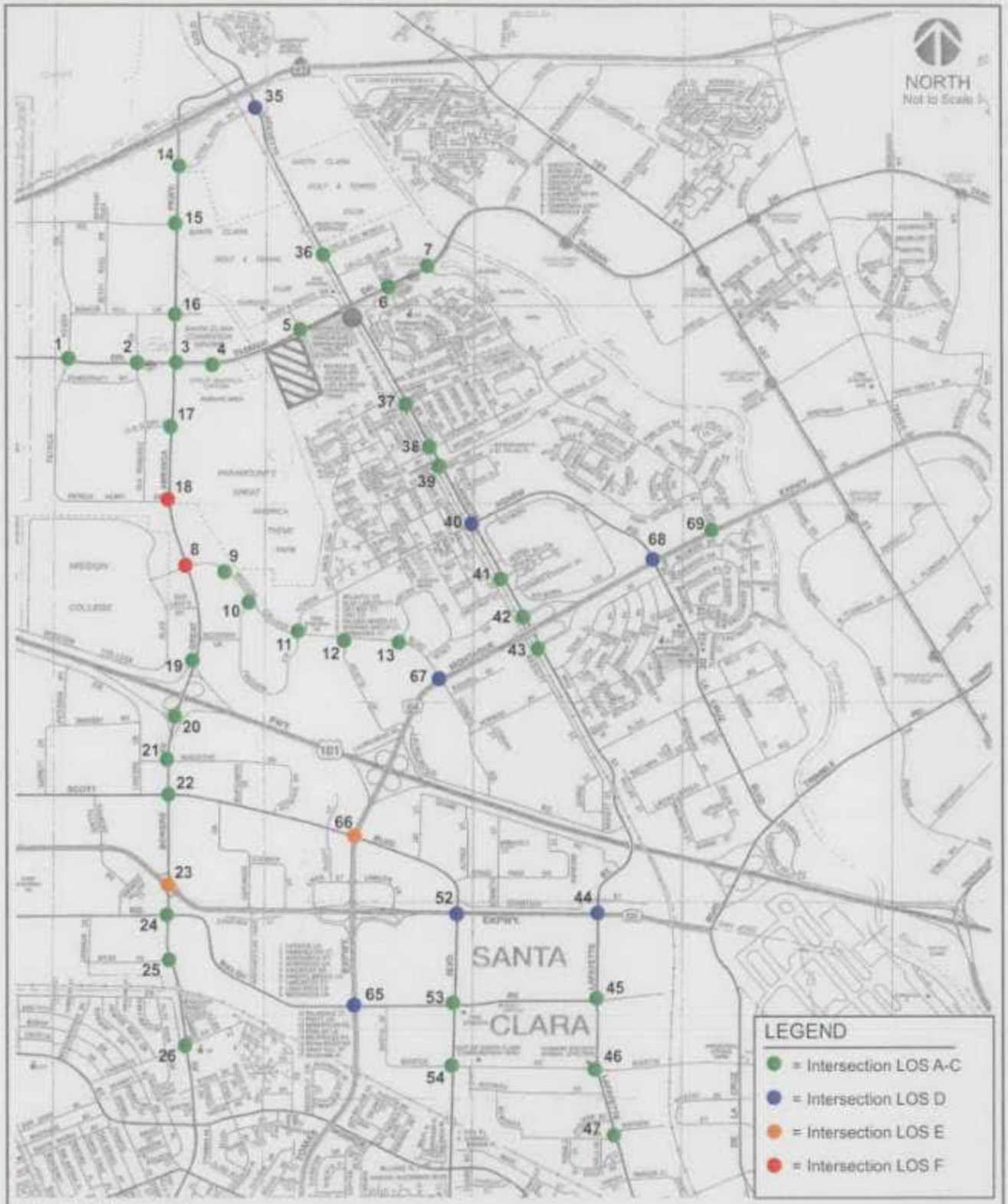
* Denotes CMP Intersections

Figure 19

STADIUM CORE AREA BACKGROUND WEEKDAY INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



Source: AAA Map

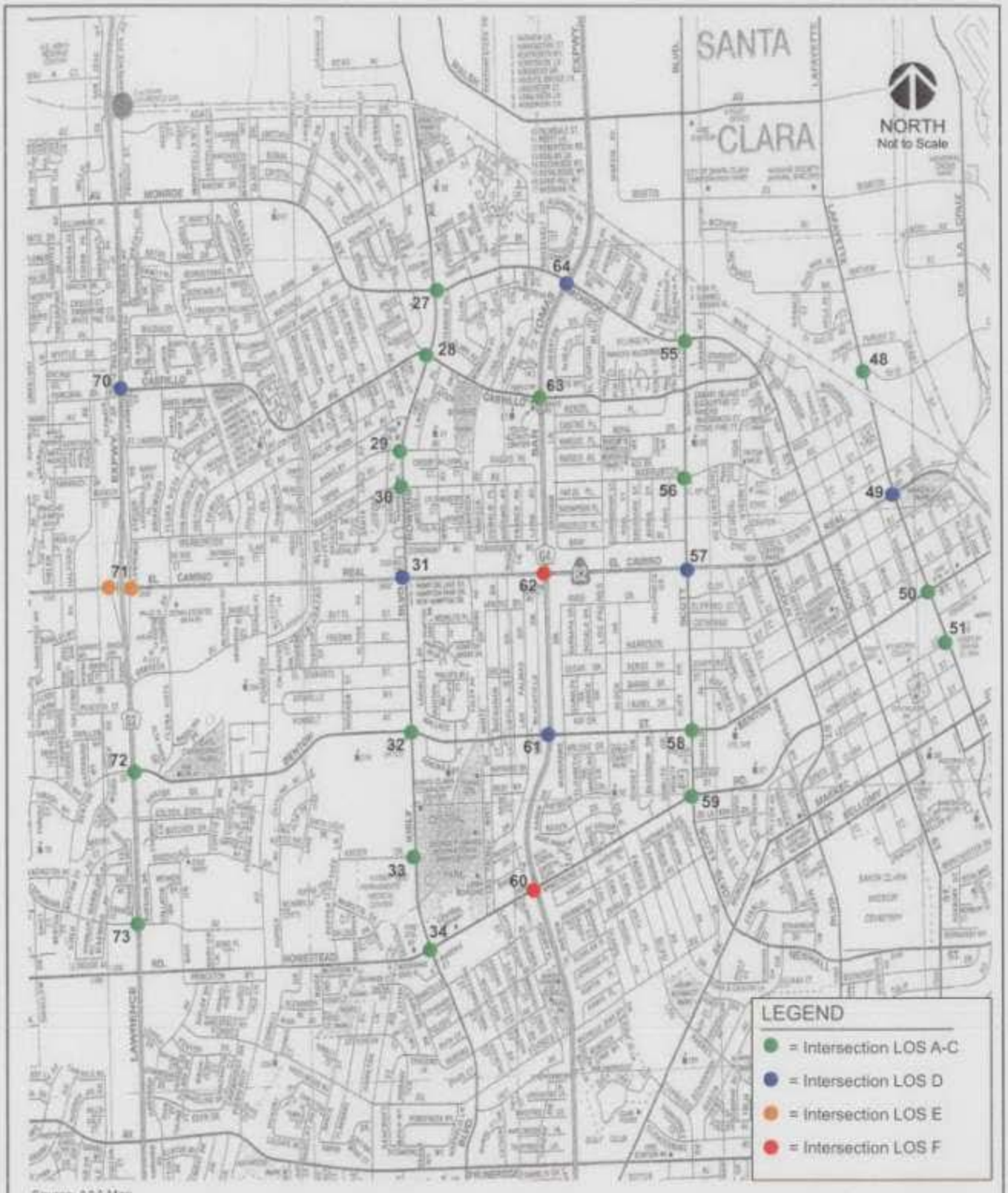
= Project Site

Figure 20

CITY OF SANTA CLARA WEEKDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa clara Stadium



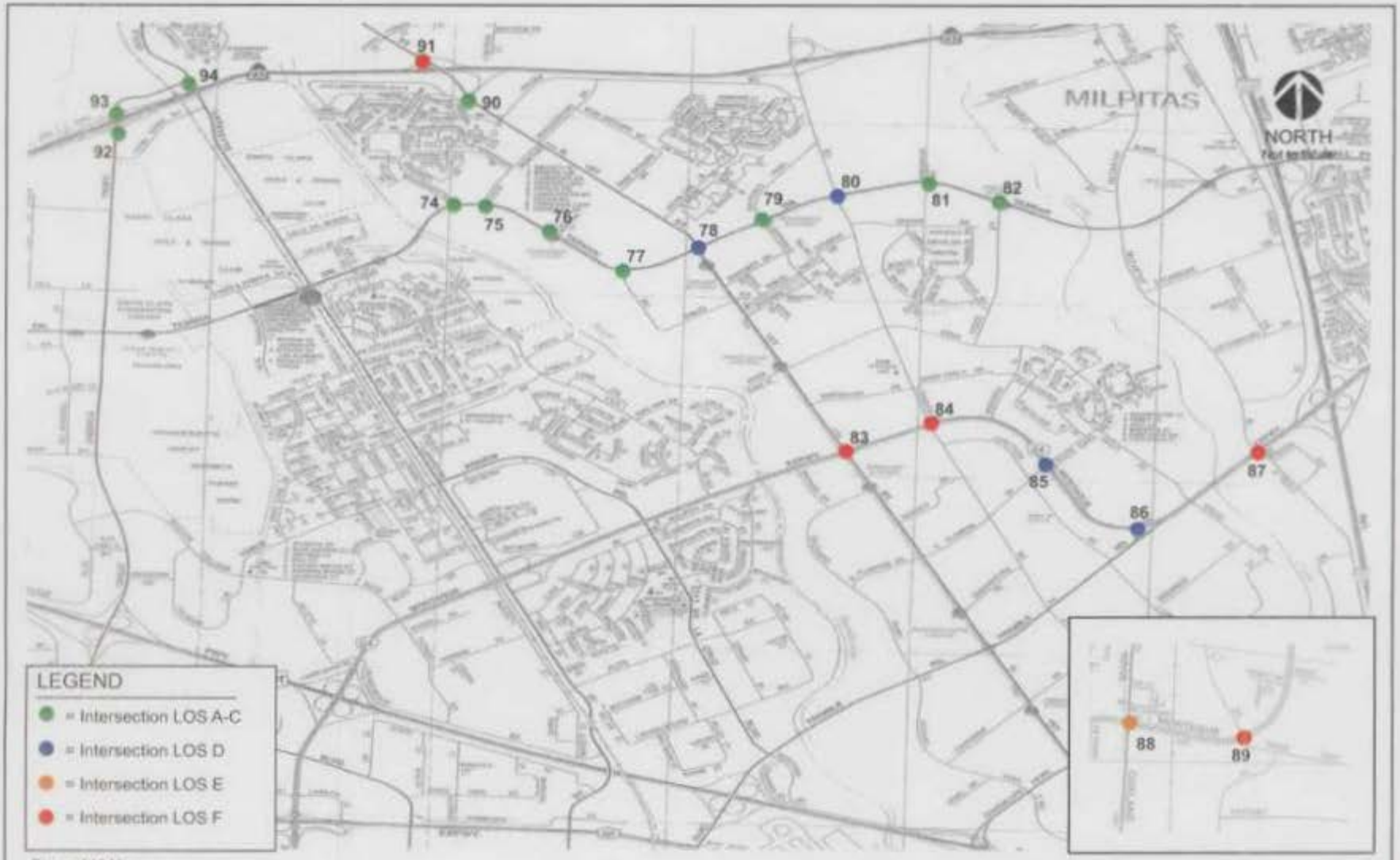
Source: AAA Map

Figure 20 (Cont'd)

CITY OF SANTA CLARA WEEKDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

Hexagon
Transportation Consultants, Inc.

49ers Santa Clara Stadium



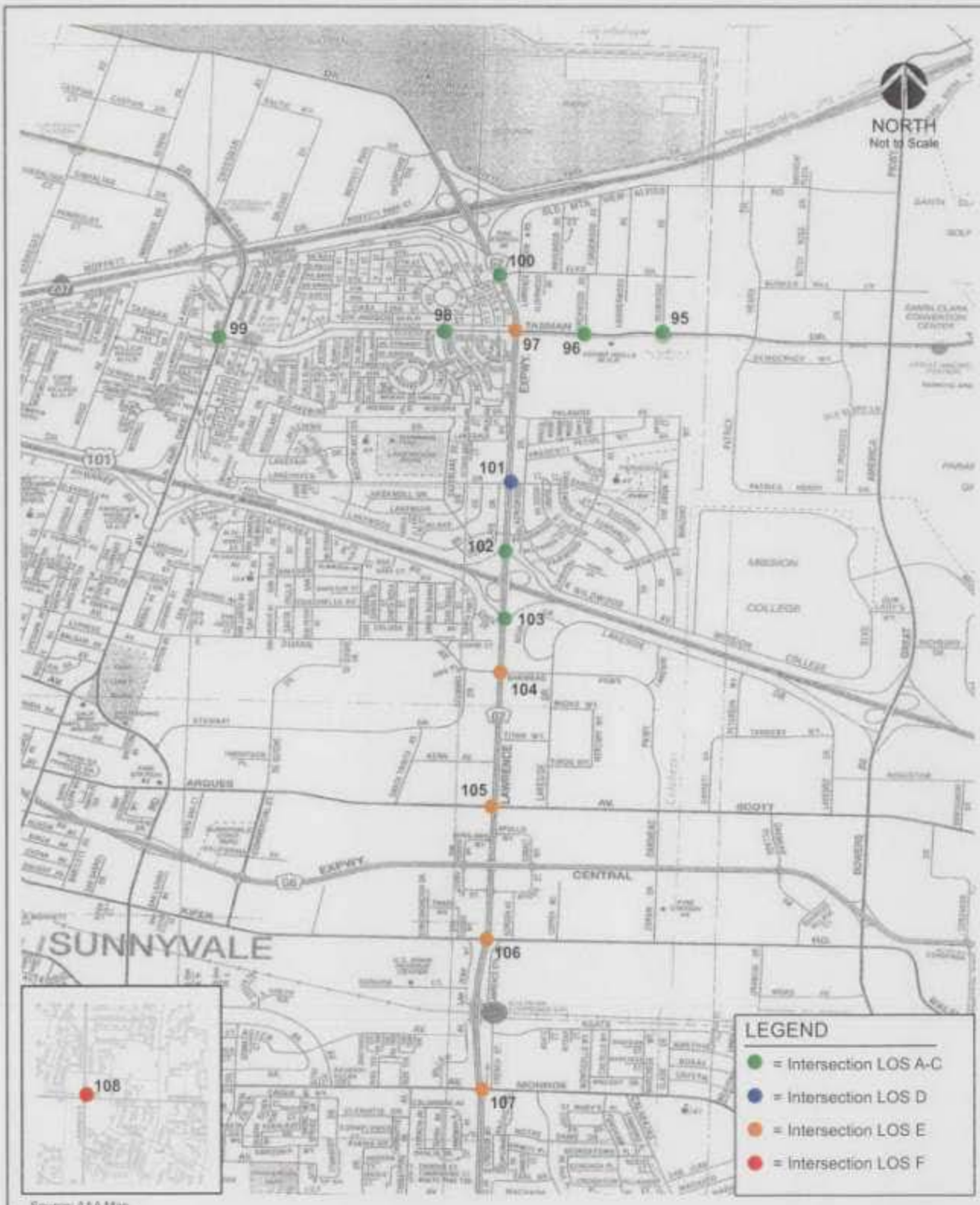
Source: AAA Map

Figure 21

CITY OF SAN JOSE WEEKDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon Transportation Consultants, Inc.



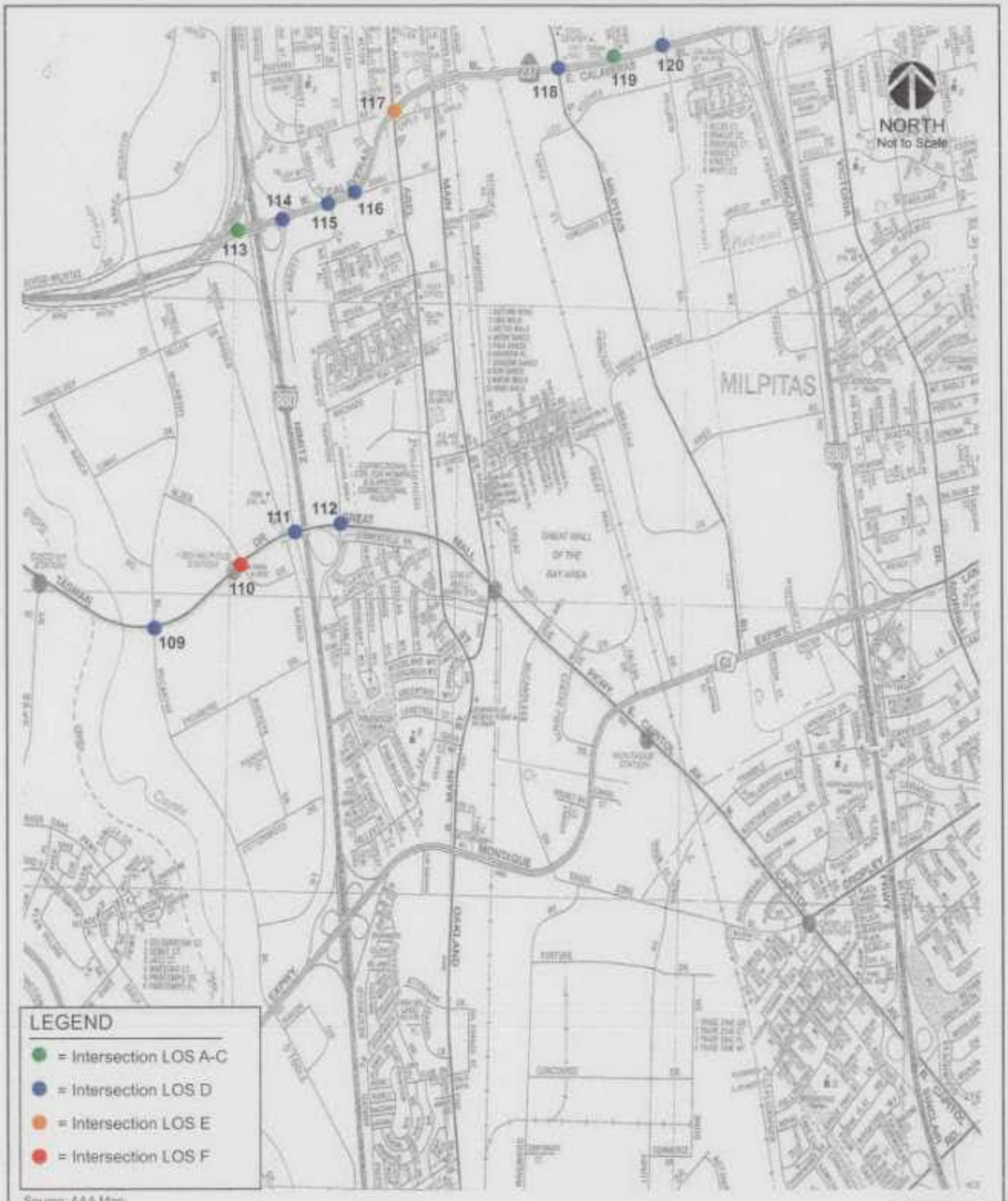
Source: AAA Map

Figure 22

CITY OF SUNNYVALE WEEKDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



Source: AAA Map

Figure 23

CITY OF MILPITAS WEEKDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium

Intersection Level of Service (Sunday Study Period)

City of Santa Clara Intersection Analysis

The results of the Sunday level of service analysis show that all of the City of Santa Clara study intersections are projected to operate at an acceptable LOS D or better under background conditions during the Sunday study periods.

CMP Intersections

The level of service results for the CMP study intersections located within the City of Santa Clara show that, measured against the CMP level of service standards, all of the CMP intersections are projected to operate at an acceptable LOS D or better under background conditions during the Sunday study periods.

City of San Jose Intersection Analysis

The results of the Sunday level of service analysis show that one of the City of San Jose study intersections is projected to operate at an unacceptable LOS F under background conditions during the early Sunday study period. All other City of San Jose study intersections would operate at an acceptable level of service under background conditions during the Sunday study periods.

91 North First Street (North) and SR-237 *

*Indicates CMP Intersection

CMP Intersections

The level of service results for the CMP intersections located within the City of San Jose show that, measured against the CMP level of service standards, one of the study intersections is projected to operate at an unacceptable LOS F under background conditions during the early Sunday study period. All other CMP study intersections located in the City of San Jose would operate at an acceptable level of service under background conditions during the Sunday study periods.

91 North First Street (North) and SR-237 *

City of Sunnyvale Intersection Analysis

The results of the Sunday level of service analysis show that all of the City of Sunnyvale study intersections are projected to operate at an acceptable LOS D or better under background conditions during the Sunday study periods.

CMP Intersections

The level of service results for the CMP intersections located within the City of Sunnyvale show that, measured against the CMP level of service standards, all of the CMP intersections are projected to operate at an acceptable LOS D or better under background conditions during the Sunday study periods.

City of Milpitas Intersection Analysis

The results of the Sunday level of service analysis show that all of the City of Milpitas study intersections are projected to operate at an acceptable LOS D or better under background conditions during the Sunday study periods.

CMP Intersections

The level of service results for the CMP intersections located within the City of Milpitas show that, measured against the CMP level of service standards, all of the CMP intersections are projected to operate at an acceptable LOS D or better under background conditions during the Sunday study periods.

Background Freeway Segment Levels of Service

The analysis of freeway segment level of service is not required for background conditions, per CMP requirements.

Figure 24

STADIUM CORE AREA SUNDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

49ers SantaClara Stadium

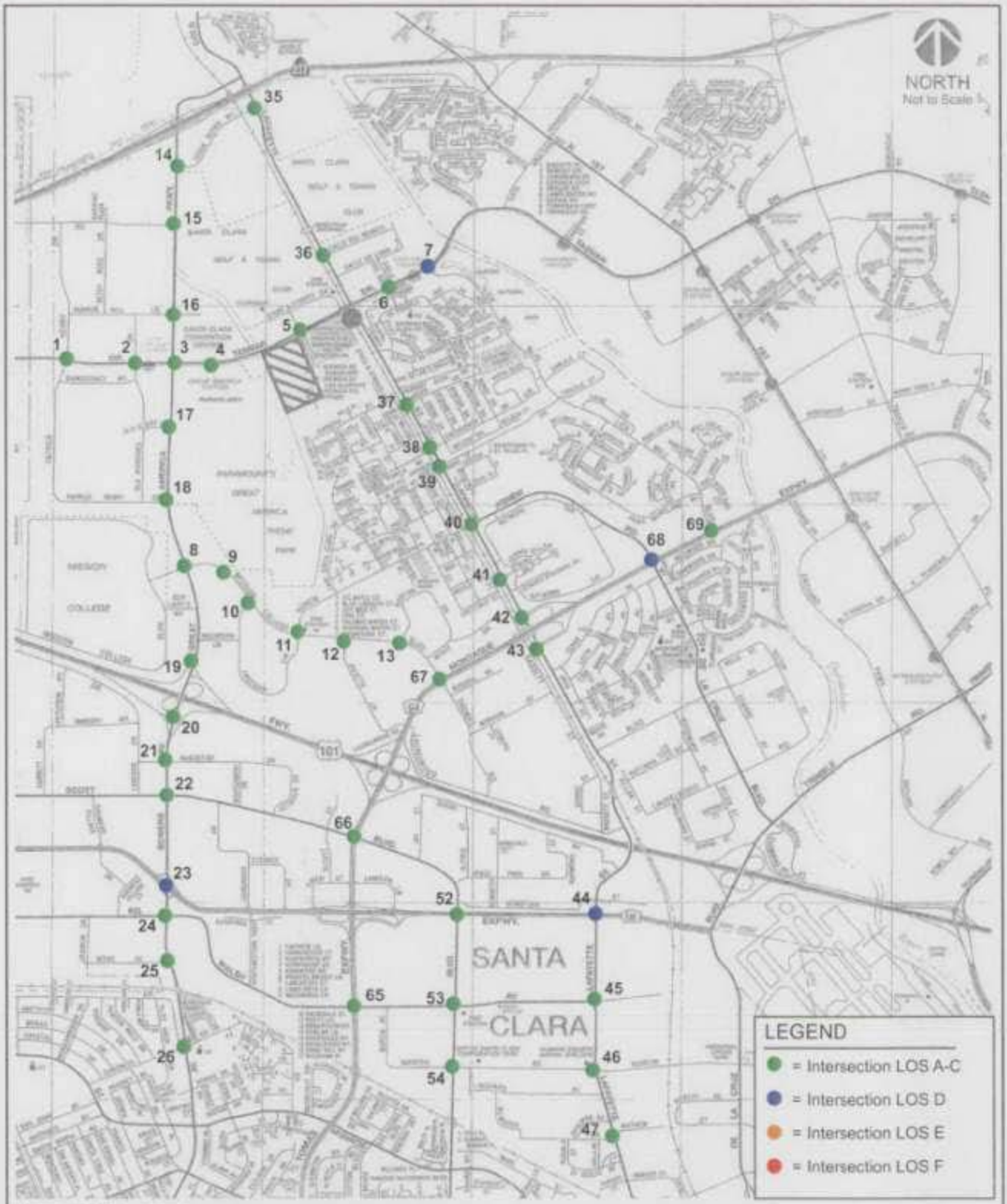
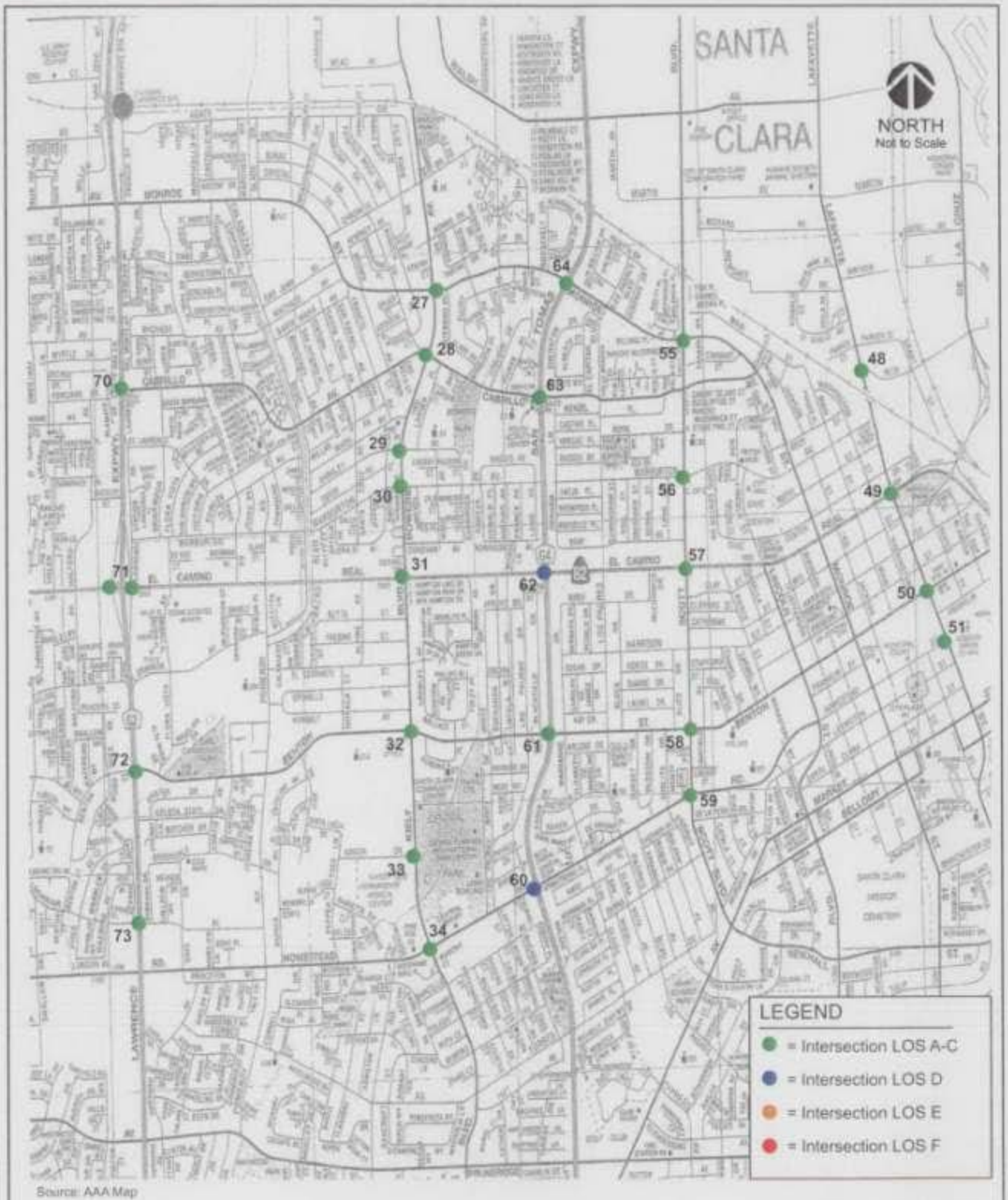


Figure 25

CITY OF SANTA CLARA SUNDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



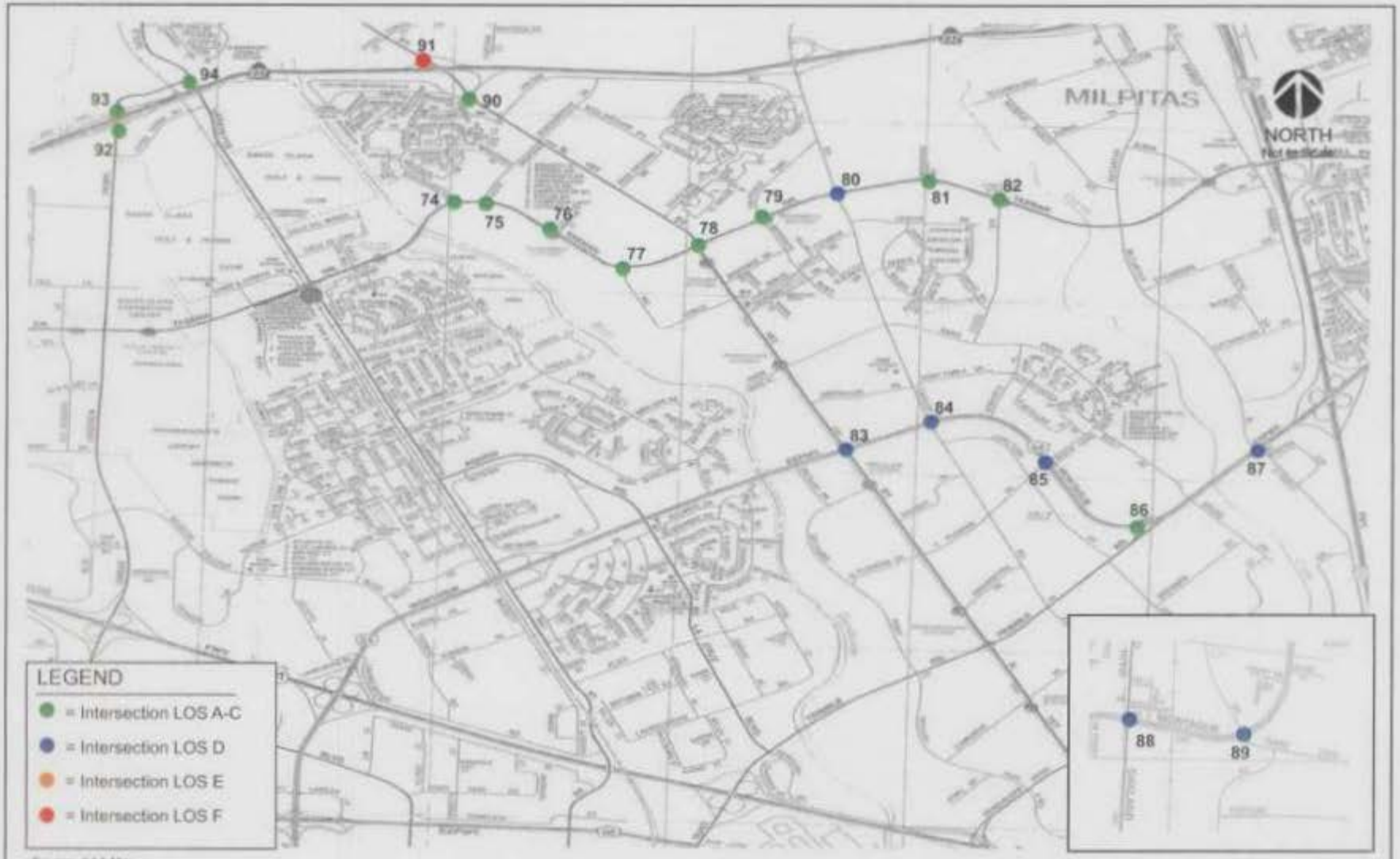
Source: AAA Map

Figure 25 (Cont'd)

CITY OF SANTA CLARA SUNDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



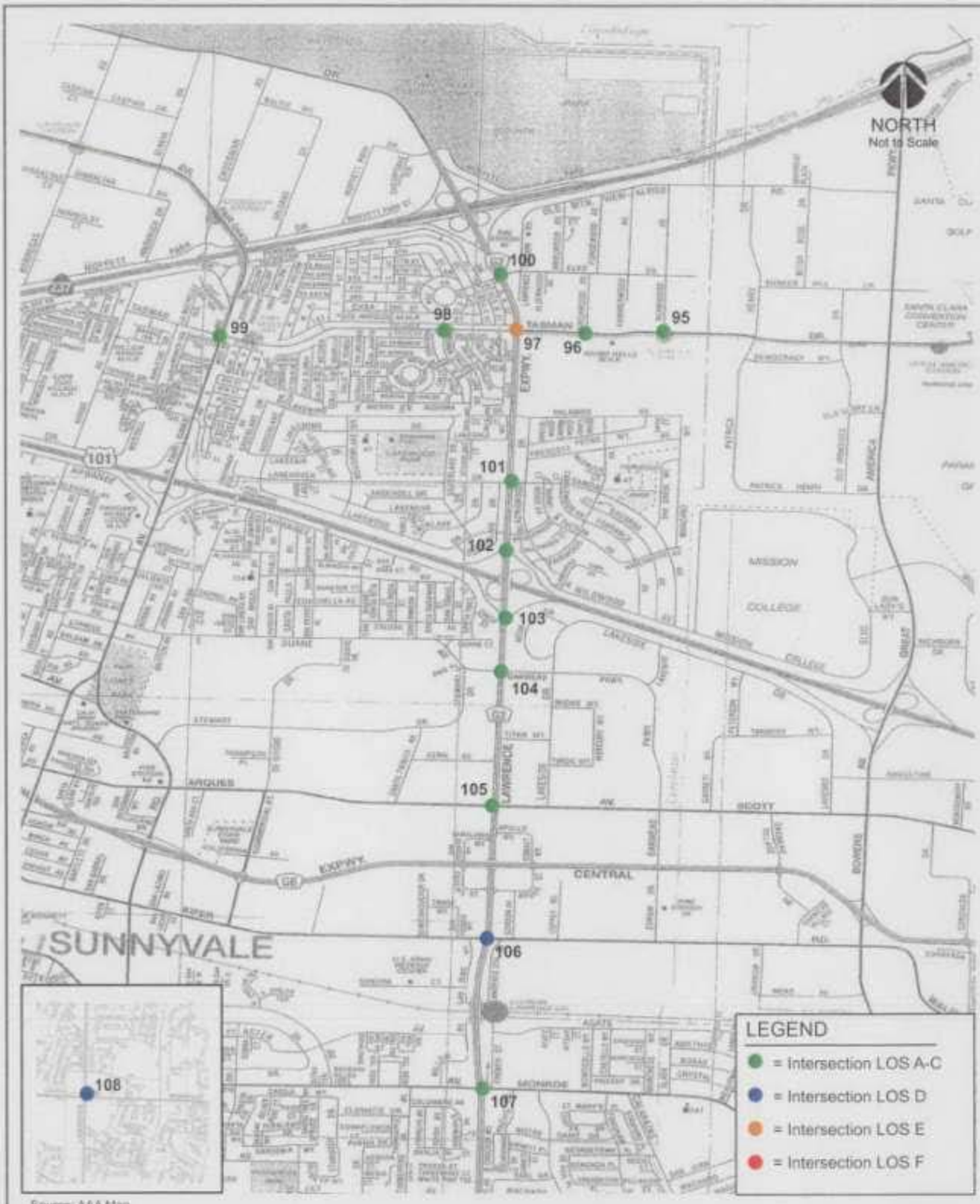
Source: AAA Map

Figure 26

CITY OF SAN JOSE SUNDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon Transportation Consultants, Inc.



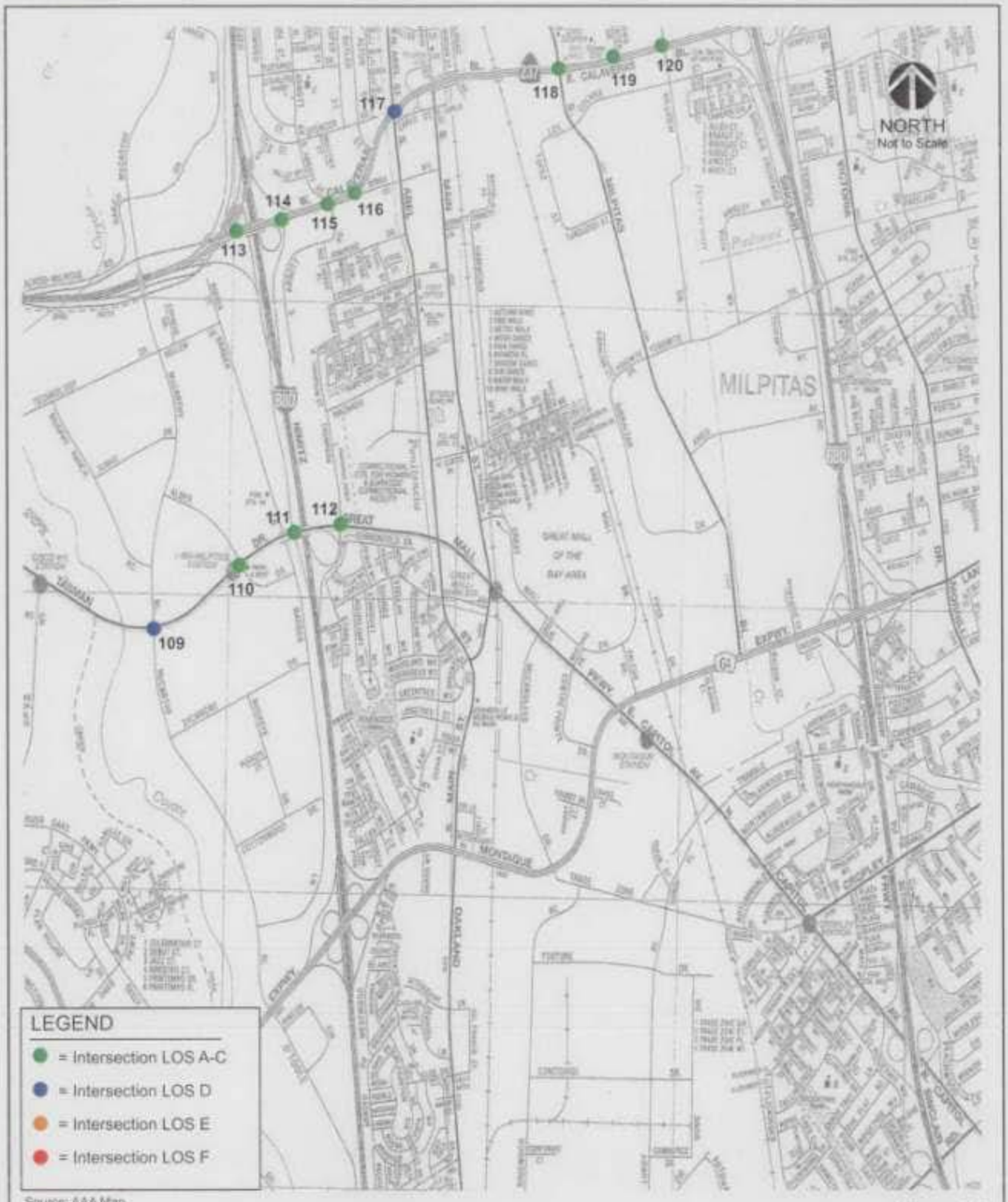
Source: AAA Map

Figure 27

CITY OF SUNNYVALE SUNDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



Source: AAA Map

Figure 28

CITY OF MILPITAS SUNDAY BACKGROUND INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.

4.
Project Impacts and Mitigation Measures

This chapter describes project traffic conditions, significant project impacts, and measures that are identified to mitigate project impacts. Included are estimates of project-generated traffic, identification of the impacts, and descriptions of the mitigation measures. Project conditions are represented by background traffic conditions with the addition of traffic generated by the project.

Project Description

The project consists of an approximately 68,500 seat football stadium on the existing Great America overflow parking lot. The project site is generally bounded by Tasman Drive to the north, San Tomas Aquino Creek to the west, Silicon Valley Power's Receiving Station to the south, and the Santa Clara Youth Soccer Park and current 49ers training facility to the east (see Figure 1). Approximately two pre-season, eight regular season, and up to three potential post-season home games will be held at the stadium. The stadium design will allow for the ability to expand seating capacity to 75,000 seats for special events, such as a Super Bowl. In addition to holding home games for the 49ers, the stadium and its facilities could also be used to support Convention Center activities, concerts, and other sporting events such as soccer games and motocross events. Centennial Boulevard, south of Tasman Drive, is proposed to be abandoned and a new two-lane access driveway constructed to provide access to the existing soccer park.

Transportation Management Plan

A Transportation Management Plan (TMP) for the proposed stadium was completed by DMJM Harris/AECOM in February 2008. A detailed discussion of the management of traffic and parking for stadium attendees and employees are addressed in the TMP. Much of the estimates for the proposed stadium presented in the TMP are based upon data collected at the existing Candlestick Point 49er stadium and other NFL stadiums across the country. The TMP was completed independent of this traffic

impact analysis, but provides assumptions and data that were utilized in this traffic analysis. In fact, the traffic analysis relies solely on the estimates and data presented in the TMP with no adjustments. The data and estimates of critical importance that were provided and utilized in the traffic analysis include the following:

- Modal Split Characteristics
- Transit Operations
- Pedestrian Operations
- Estimates of Vehicular Trip Generation
- Parking Demand and Supply
- Rough Distribution of Attendees
- Proposed Pre-Game and Post-Game Traffic Control Plans

The data and estimates utilized in the traffic analysis are discussed in detail in the following sections. The TMP is provided in Appendix F.

Estimated Attendance and Traffic Projections

The analysis of the effects of the traffic associated with the proposed stadium is based on a sold-out football game. Therefore, trip generation estimates for the stadium are based upon 68,500 attendees and approximately 2,900 employees. The anticipated number employees for the stadium are based upon existing operations at Candlestick Point. Thus, a sold-out football game at the stadium will generate approximately 71,400 person trips. The modal split and other assumptions in regards to trip generation characteristics of the proposed stadium are discussed in the following sections. The estimated vehicular trips and transit usage projections after conversion of person trips to vehicular trips are presented in Table 11.

Modal Split Characteristics

Attendees and employees will arrive to the games via several transportation modes. Based on data for Candlestick Point, other NFL stadiums, and the unique transportation characteristic of the project site, it is anticipated that of all attendees, 74% will arrive via automobile, 7% by charter bus, and 19% percent will arrive via transit. The estimated transit ridership is based upon both data collected at Candlestick Point and other NFL stadiums with similar transit opportunities. For comparison, data from Candlestick Point, which is restricted to bus service alone, indicates an 8% usage of transit. Thus, applying the specified modal split, the 68,500 attendees equate to approximately 55,500 person trips made via vehicle and 13,000 person trips via transit. The employee modal split is estimated to be 80% auto (2,320 person trips) and 20% (580 person trips) transit.

Transit Trips

With the availability of an extensive transit system in the project area, it is expected that the stadium will place less of a demand on regional transportation facilities. Bus, light rail, and heavy rail service will be available to attendees of events at the stadium. As described above, as many as 13,580 transit trips are estimated to be generated by the stadium. Each of the existing transit services described in Chapter 2 will need to be enhanced with additional lines, capacity, and service frequencies to serve the projected transit demand of the stadium. San Francisco 49ers staff met with each of the individual transit agencies that provide service that could be utilized by fans. Though no definite service plans were agreed upon,

potential service capacities and frequencies to meet projected stadium transit demands were discussed. The assumptions discussed below regarding ridership and service capacities for each of the individual transit services are based upon the preliminary capacities discussed at the meetings. Each of the available transit services and projected ridership demands are discussed below.

Table 11
Trip Generation Estimates for the Proposed Stadium

Existing Candelstick Point Park

Fans	Attendees	Percent	Vehicle Occupancy Rate	Number of Vehicels
Auto	57,150	82%	3.0	19,050
Charter Buses	7,100	10%	44.0	161
Transit	5,450	8%	45.0	0
	69,700	100%		19,211
Employees				
Auto	2,610	90%	1.5	1,740
Transit	290	10%	45.0	0
	2,900	100%		1,740
			Total Vehicular Trips	**20,951**

Proposed Santa Clara Stadium

Fans	Attendees	Percent	Vehicle Occupancy Rate	Number of Vehicels
Auto	50,500	74%	2.7	18,704
Charter Buses	5,000	7%	44.0	114
Transit	13,000	19%	45.0	0
	68,500	100%		18,818
Employees				
Auto	2,320	80%	1.5	1,547
Transit	580	20%	45.0	0
	2,900	100%		1,547
			Total Vehicular Trips	**20,365**

Source:
Transportation Plan, DMJM Harris & San Francisco 49ers

Bus and Light Rail Service

The Valley Transportation Authority (VTA) provides the bus and light rail services in the project area. Several bus lines run along Tasman Drive and Great America Parkway and have stops within walking

distance of the stadium site. VTA as well as other transit agencies, such as Sam Trans, in the Bay Area currently run special bus service to Candlestick Point. It is expected that bus services will be adjusted to serve the proposed Santa Clara stadium site with staging areas provided along Stars and Stripes Drive and Tasman Drive. It is estimated that up to 4,500 attendees will be served by bus service.

Light Rail service will provide the most convenient access to the stadium. The Tasman LRT station is located between Centennial Drive and Great America Parkway. With connections to other rail and bus lines and park-and-ride lots throughout the South Bay, light rail service will serve a large portion of stadium transit demands. Improvements to service frequencies and train sizes will be necessary. It is estimated that the light rail system will serve about 4,500 attendees on game days. The LRT service has the capacity to serve up to 5,400 passengers per hour, which is more than enough capacity to serve the projected demand of the stadium. The LRT service capacities are based on 3-car trains running on 10-minute service headways. Each train has the capacity to serve 450 passengers, and trains would operate in both directions of travel.

Heavy Rail Service

There are several heavy rail lines and services that run in close proximity to the stadium site. Each of the rail services primarily provides services during weekday only, but some trains run on weekends to serve special events.

Commuter rail service between Stockton and San Jose is provided by the Altamont Commuter Express (ACE). The ACE service runs along the UPRR rail line that runs along the north side of Lafayette Street near the project site with stops at the Great America Station. The Great America Station is located 1,000 feet from the stadium site. ACE currently runs special weekend trains to Great America as well as other events such as Athletics baseball games. It is expected that ACE service will be adjusted to provide special trains to events at the stadium. Each ACE train consists of five cars with a capacity of 100 passengers per car.

The Capitol Corridor rail line provides service between Sacramento and San Jose and operates on both weekdays and weekends. The Capitol corridor line shares the Great America Station with the ACE/ Amtrak service. As with ACE service, special stadium event trains will be required. Each Capitol Corridor train provides a capacity of 500 passengers per train.

The Caltrain Commuter rail provides service between San Francisco and Gilroy. Though the stadium area is not served directly by Caltrain, there are shuttle services and bus lines that connect Caltrain stations to the stadium area. The nearest Caltrain stations are the Lawrence and Mountain View stations located approximately 3 and 6 miles from the project area, respectively. Since Caltrain serves a large portion of the South Bay and San Francisco, the majority of transit users would benefit from convenient and efficient service to the stadium events. As such, the enhancement of Caltrain service and connections to other transit services is vital to accommodate the projected stadium transit ridership demands. Bus transfers to and from the stadium and each Caltrain station and coordination with LRT service at the Mountain View station will be necessary to serve the estimated 3,000 attendees of games that would utilize Caltrain. The Caltrain service estimates are based on three 5-car trains with a service capacity of 200 passengers per car.

It is estimated that approximately 580 of the 2,900 employees will utilize transit. All employees utilizing private vehicles will be required to park in locations east of Lafayette Street and along Tasman Drive. The location of employee parking along Tasman Drive will provide for convenient use of VTA light rail to the stadium. The employees are not factored into stadium transit demand since the employee demands would

occur before and after peak demand periods for the stadium. Further detail on potential transit service improvements and accommodations for game days is outlined in a subsequent section and the TMP.

Vehicular Trips

The majority of attendees will arrive to the stadium via vehicle. Of the projected 55,500 person trips that would not use transit, 50,500 trips will be made via auto and 5,000 via charter bus. The existing Candlestick Point data indicates a vehicle occupancy rate of 3.0 persons per vehicle. Due to the projected increase in transit usage for the new stadium, it is expected that the vehcile occupancy rate will decrease slightly for autos. The TMP indicates a vehicle occupancy rate of 2.7 person per vehicle. Charter buses have an occupancy rate of 44 persons per bus. Therefore, a total of 18,818 vehicle trips, 18,704 via auto and 114 bus trips, are estimated for attendees on game days.

Arrival/Departure Patterns

The arrival and departure times of fans for the proposed stadium is based upon data for football games at Candlestick Point. The data indicates that the arrival of fans is spread over a five hour period prior to game time, as indicated in Table 12. Data on arrival rates indicate that the majority (39%) of fans arriving via auto do so within the hour just prior to the game start time. The majority (65%) of fans arriving via charter bus also arrive within the hour prior to game time. The arrival rates equate to a total peak demand of 7,369 vehicular trips within the hour just prior to the start of a game. The peak arrival equates to nearly 40% of all vehicular trips. The arrival of the remainder of attendees will be spread over a four hour period before the hour just before the game start time.

The analysis periods were selected to conincide with the peak demand of arrivals for the hour just before the start of games, with the exception of the early PM weekday study period. The early PM weekday study period was selected to represent traffic conditions due to the overlap of fan arrival and adjacent office/industrial development departure, since the proposed parking plan for the stadium will require the use of surrounding office/industrial parking lots. As such, the office buildings will need to be vacated prior to game time. Though traffic management plans assume that the office parking lots planned to be utilized by the stadium will be vacated prior to 3pm on a weekday game day, as a conservative approach, this analysis assumed the overlap of fan arrival and office tenants departure. It was assumed that tenants of the office buildings would begin to depart between 3-5pm. Therefore, the arrival rates of fans to the stadium between the same time period were assumed based on the available arrival data from Candlestick Point. The arrival data indicate that approximitaly 19% of fans arriving via auto and 28% via charter bus arrive more than 60 minutes but less than 120 minutes prior to the game start time. The arrival rates equate to a total of 3,586 vehicular trips during this period. The assumed office/commercial departure is discussed in the following section.

Departure of fans will primarily occur within the hour after the end of game with approximately 65% of the autos and 80% of the charter buses departing within one hour of end of game. It is estimated that approximately 12,000 vehicles will be departing the area within the hour after the end of game. The remaining fans will depart during or within two hours after the end of the game.

Trip Origins and Destinations

The distribution of trips associated with the stadium is largely based upon current season ticket holder information. The existing distribution of season ticket holders data indicates that the majority of attendees of games at Candlestick Point originate in San Francisco, San Mateo and Santa Clara counties. It is

expected that the relocation of the stadium to the South Bay will result in additional season ticket holders and a generally larger fan base in the South Bay and less in other areas. Therefore, there were minor adjustments made to the distribution percentages to account for the relocation of the stadium from San Francisco to Santa Clara. The adjustments primarily consist of route adjustments on the freeway system due to stadium location.

The distribution data for the proposed stadium is presented in Table 13 and provides place of residence by county for current season ticket holders at Candlestick Point. Based upon the Candlestick data, an estimate was made as to which regional facility would be utilized between the stadium and each of the counties. Figure 29 indicates the distribution of trips associated with the proposed stadium on each of the major regional facilities and arterials that serve the stadium. A more refined distribution of trips within the project core area is described and presented in the following section.

Table 12
Arrival and Departure Patterns

General Arrival Pattern

	Auto Trips		Charter Buses		Total Vehicle Trips
	Percent	Trips	Percent	Trips	
>5 Hours	6%	1,122	0%	0	1,122
4-5 Hours	8%	1,496	0%	0	1,496
3-4 Hours	14%	2,619	2%	2	2,621
2-3 Hours	14%	2,619	5%	6	2,624
1-2 Hours	19%	3,554	28%	32	3,586
<1 Hours	**39%**	**7,295**	**65%**	**74**	**7,369**
	100%	18,704	100%	114	18,818

General Departure Pattern

	Auto Trips		Charter Buses		Total Vehicle Trips
	Percent	Trips	Percent	Trips	
During Game	10%	1,870	10%	11	1,882
<1 Hour	**64%**	**11,971**	**80%**	**91**	**12,062**
1-2 Hours	26%	4,863	10%	11	4,874
	100%	18,704	100%	114	18,818

Source:
Transportation Plan, DMJM Harris & San Francisco 49ers

Table 13
Trip Distribution Estimates for the Proposed Stadium

Place of Residence[1]	Existing Patron Orgins	Attendees Using Auto	Auto Trip Distribution	Access Route
Central Valley	3,222	3,085	6%	I-680/I-880
San Francisco	8,869	5,951	11%	US 101 North
San Mateo	12,369	9,367	17%	US 101 North
Marin	3,971	3,180	6%	US 101 North
Sonoma	2,041	1,954	4%	US 101 North
Alameda	4,942	3,242	6%	I-680/I-880
Contra Costa	6,444	4,122	7%	I-680/I-880
Napa	511	489	1%	I-680/I-880
Solano	1,165	1,116	2%	I-680/I-880
Sacramento	2,436	2,333	4%	I-680/I-880
South	1,843	1,764	3%	US 101 South
Other	8,566	8,566	15%	US 101 South
Santa Clara	11,006	10,337	19%	US 101/I-680/I-880
	67,385	55,506	100%	

Access Route	Outside Santa Clara County	Santa Clara County	Total
US 101 North	37%	1%	38%
US 101 South	19%	8%	27%
I-680/I-880	26%	2%	28%
Local Roadways		8%	8%
	81%	19%	100%

Source:
Transportation Plan, DMJM Harris & San Francisco 49ers
[1] Based on existing season ticket holder origins at Candlestick Point

Parking Plan and Trip Assignment

The trips generated by the proposed stadium were assigned to the roadway system based upon the trip distribution pattern discussed above as well as the proposed parking plan for the stadium. The parking plan does include on-site parking, but the majority of parking will be provided by the existing surface parking lots of surrounding office/industrial developments. The parking plan will necessitate the coordination and agreements with development owners and tenants on proposed game days. The areas of identified potential parking sites are presented in Figure 30. The identified parking supply will be more than adequate to accommodate the estimated 18,818 vehicles generated by the stadium discussed in the previous section. The parking plan is outlined in detail in the TMP.

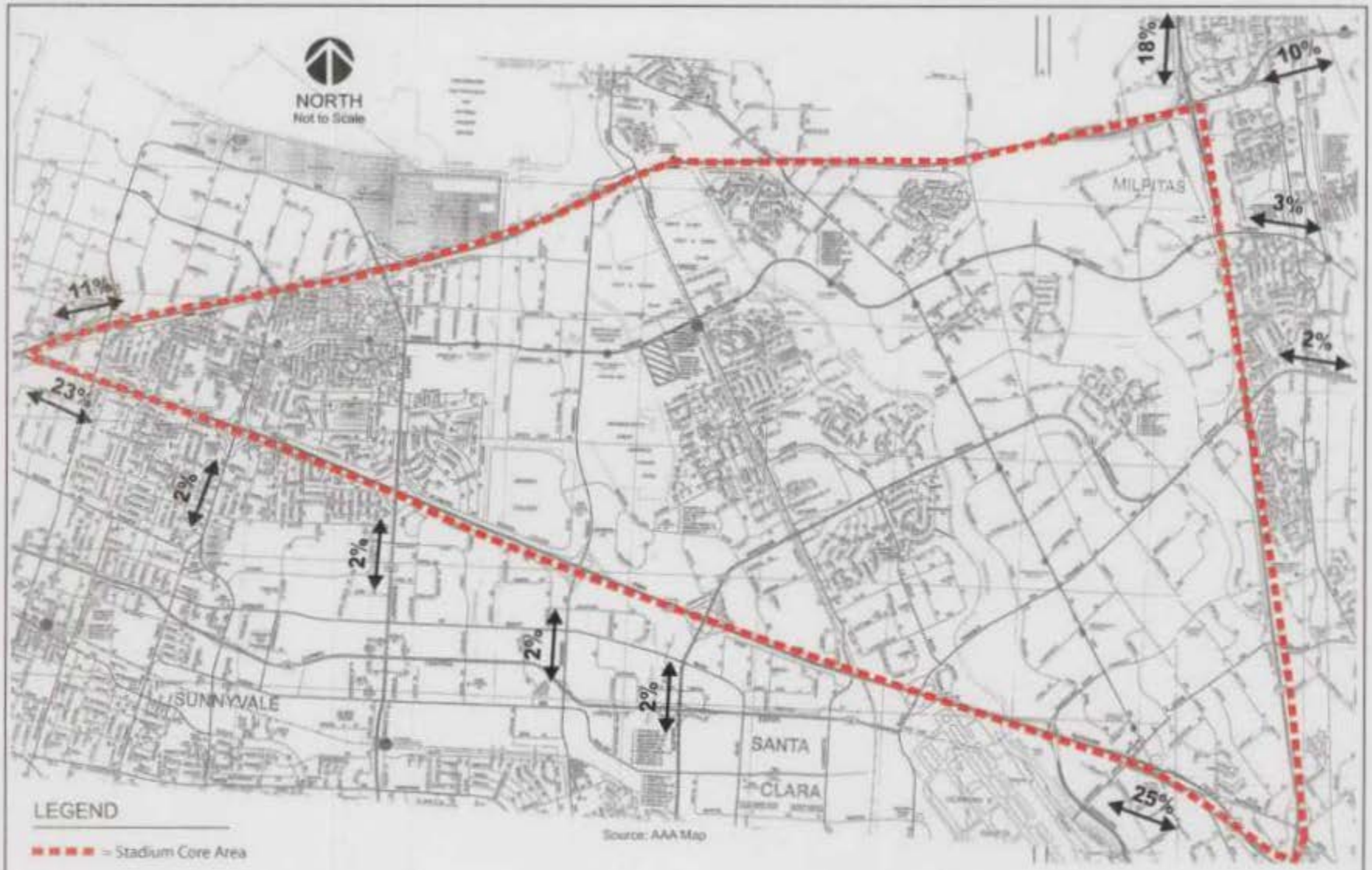


Figure 29

MACRO STADIUM PROJECT TRIP DISTRIBUTION

49ers Santa Clara Stadium

Source: Google Earth

LEGEND

xxx = Parking Spaces Available

= 5 Minutes Walking Radius

= Project Site

Figure 30

IDENTIFIED POTENTIAL PARKING AREAS

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49ers Santa Clara Stadium

On-Site Parking Supply

The on-site parking supply will largely consist of the use of the 6,234 spaces in the Great America parking lot. A 1,708-space parking garage also will be constructed directly north of the stadium along the north side of Tasman Drive and on City owned property. The reminder of on-site parking will be located in the immediate vicinity of the stadium. A total of 9,705 spaces will be available on-site or within a five minute walk to the stadium.

Off-Site Parking Supply

The proposed parking plan includes the use of surrounding office and other development's parking facilities. Based upon data for stadiums across the country, fans are willing to walk no more than 20 minutes to access the stadium. Therefore, the TMP identifies all available parking within a 20-minute walking radius of the stadium that could serve as potential parking for the stadium. There are approximately 11,115 spaces within a 15-minute walking radius and a total of 31,668 spaces within a 20-minute walking radius of the stadium. Employee parking will be restricted to locations east of Lafayette Street along Tasman Drive. Approximately 1,870 parking spaces are located east of Lafayette Street. Though it is expected that employees may carpool, additional employee parking could be made available.

Office Departure Trip Assignment

It is assumed that the adjacent office buildings will be vacant on Sundays, but the use of their parking lots by stadium attendees during weekday games will require that the offices be vacated prior to the arrival of stadium attendees.

For the early weekday study period (3-5pm), it is assumed that the identified office developments at which stadium attendees could utilize parking would begin to vacate at 3pm, though it is likely that the office departure would begin earlier. The assumption of a mass departure of office tenants reflects a worst case scenario in which office departures occur concurrently with a significant amount of fans beginning to arrive in the project area.

The amount of traffic associated with the departure of office tenants was estimated based upon the available parking provided at each of the identified potential parking sites and assumptions for occupancy and vacancy rates. Ultimately, the purpose of the estimation of office departure trips for the early 3-5pm weekday study period is to replicate the magnitude of peak hour volumes during the standard 4-6pm period, during which office departure normally occurs. Thus, the trip estimates for office space to be vacated was balanced with existing PM peak hour volumes. A total of 38,743 parking spaces were assumed in the identified potential parking areas. The identified potential parking locations include parking just outside the 20-minute walking radius and do not include non-office related parking associated with Great America and Mission College. A 20% office vacancy rate also was applied along with a parking occupancy rate of 87%. The parking occupancy rate is based on rates provided in the Institute of Transportation Engineers Manual, *Parking Generation,* to account for occupancy during the 3-5pm weekday period. Based upon vacancy and occupancy rates, a total of 27,097 parking spaces were estimated in the 20-minute radius. To calculate office trip departures, 27,097 parking spaces were translated into equivalent building square footage assuming 4 spaces per 1,000 s.f. of building spaces as prescribed by ITE. This resulted in a total of 6.8 msf of building square footage. It was assumed that the composition of the calculated 6.8 msf of building square footage is equally split between office and research and development space. Using ITE recommended trip generation rates, the total amount of departing office trips were then calculated. Table 14 presents the estimated trips associated with the office

departure. The resulting trips were then assigned to the roadway system based upon typical office travel patterns.

Traffic associated with the potential office space providing parking to be used by stadium attendees is currently part of the existing volumes in the area. Therefore, the trip assignment developed for the office departures was compared with existing PM intersection volumes at selected intersections to ensure that the estimated office departure trips are of a similar magnitude to existing volumes in the area. The office trips were then added to background conditions. The trip distribution utilized in the assignment of office trips is presented in Figure 31.

Table 14
Trip Generation Estimates for Office Departure

				PM Peak Hour					
		Daily	Daily	Pk-Hr	Splits		Trips		
Land Use	Size	Trip Rates[1]	Trips	Rate[1]	In	Out	In	Out	Total
Office Space	3,387,084 s.f.	11.01	37,292	1.19	17%	83%	686	3,351	4,037
Research and Development	3,387,084 s.f.	8.11	27,469	0.86	15%	85%	435	2,464	2,899
Total Project Trips			64,761				1,121	5,815	6,937

Notes:
[1] per 1,000 s.f.
Source: ITE Trip Generation, 8th Edition 2008

As a worst case scenario, the weekday standard PM study period assumes the arrival of fans and departure of office tenants during the standard PM peak hour with no office departure adjustment since the trips are already accounted for in existing counts. Though the scenario is very unlikely, it is included in the traffic study to represent the overall effects of stadium generated traffic on typical PM peak hour conditions.

Stadium Trip Assignment

The method by which stadium trips were assigned to the roadway system was based upon the proposed parking plan since the proposed parking plan will dictate the routes that attendees utilize to reach identified parking. All season ticket holders will be assigned specific parking areas and be provided a map that indicates the preferred route to each parking area. All other stadium attendees will be directed to parking areas from each of the regional transportation facilities.

The assignment of stadium traffic consisted of grouping the identified parking lots into zones based on their location. Each of the areas was then assigned a zone number and the total available parking in each zone was then calculated. The amount of stadium trips assigned to each of the parking areas was calculated based upon the percentage of total parking provided in each zone. The total stadium trips were then assigned to each of the parking zones and the roadway network based upon the TMP identified

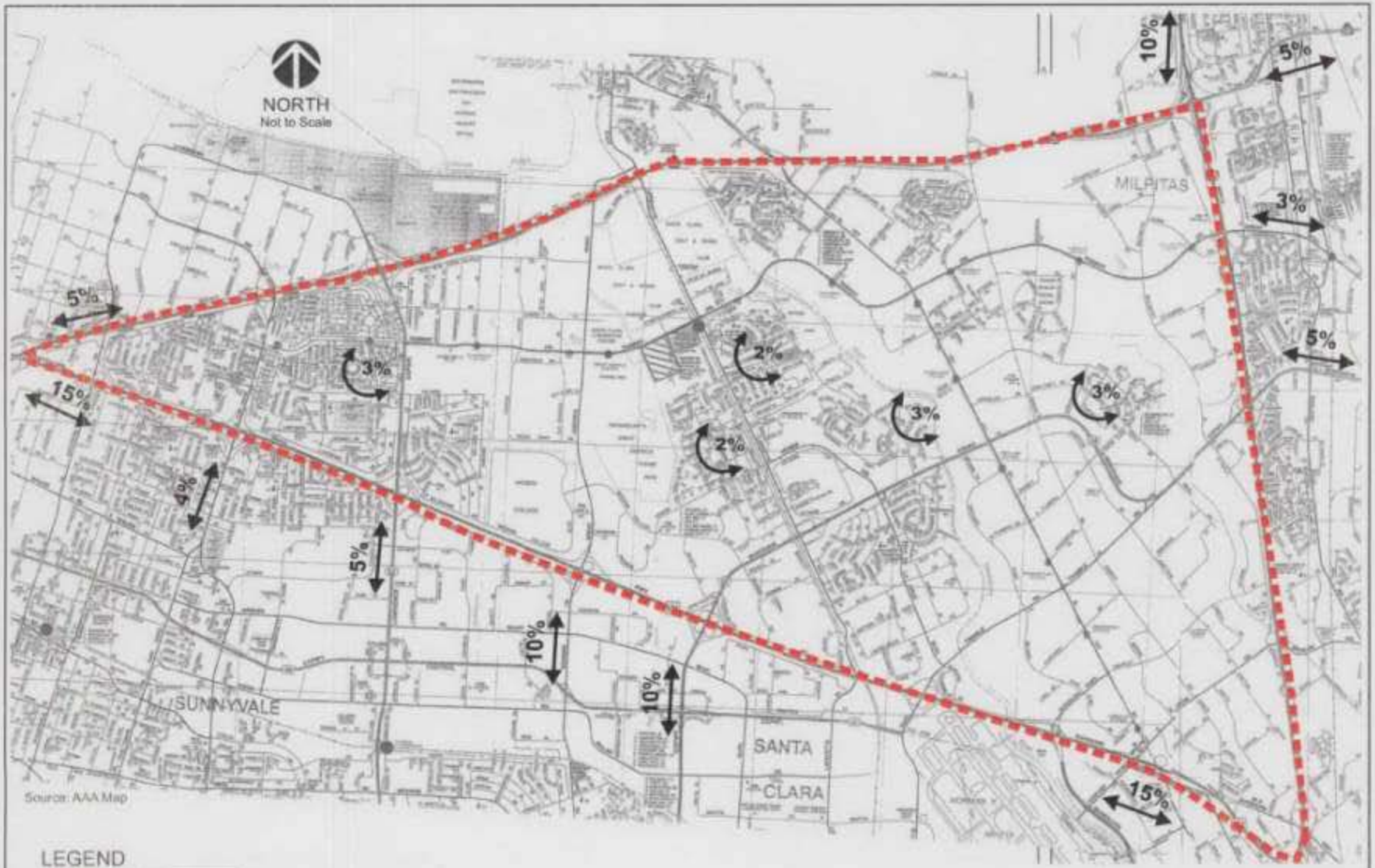

Figure 31

MACRO OFFICE PROJECT TRIP DISTRIBUTION

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.

traffic control plan. The TMP will utilize road closures and traffic control officers to efficiently direct stadium attendees to parking. The road closures, which include the closure of Tasman Drive between Great America Parkway and Centennial Boulevard, required that background traffic be redistributed to alternative routes.

The intent of the traffic control plan is to efficiently serve stadium traffic and will require the restriction of conflicting traffic patterns such as those associated with office departures. Thus, it would not be possible to fully implement the traffic control plan while office departures are occurring. Therefore, to reflect a worst case scenario in which office departures occur while stadium attendees are arriving, as described in the previous section, the assignment of stadium traffic during the weekday scenarios assumes no TMP plan. The weekday assignment reflects stadium attendees arriving and office departures occurring during the same time period, utilizing the existing roadway network with no additional traffic controls as those identified in the TMP.

The assignment of stadium traffic for the Sunday study periods assumes road closures and officer control as outlined in the TMP. Figure 32 presents the distribution of stadium traffic within the boundary of the project core area. The general routes that will be utilized by stadium attendees to and from each of the potential parking areas is presented in Figure 33.

TMP Traffic Control Plan

The traffic control plan that was developed as part of the TMP will serve to move vehicular traffic associated with the stadium efficiently from regional transportation facilities to arterials and into designated parking areas. The traffic control plan, as outlined in the TMP, identifies road closures, intersection lane configuration changes, and locations that will be controlled by uniformed officers. Planned road closures and officer controlled intersections are shown in Figure 34. The officers will facilitate traffic flow and minimize congestion, manage pedestrian traffic to minimize conflicts with vehicular traffic, and communicate with the stadium traffic control center to request signal timing adjustments as needed. The measures that will be taken as part of the traffic control plan to facilitate the efficient ingress and egress of stadium traffic are as follows:

- The stadium will include a traffic control center that will be connected and integrated into the City of Santa Clara's existing electronic traffic control system.
- Nearly every intersection along Great America Parkway and Tasman Drive within the project core area will be officer controlled.
- A total of 25 intersections will be controlled by either one or two officers
- Lane configuration adjustments and turn restrictions will be implemented at all intersections within the project core area.
- The turn restrictions along Great America Parkway and Tasman Drive will allow for a one directional flow of inbound/outbound traffic.
- Signal timing at all intersections within the project core area will be adjusted remotely, where possible, and in the field to provide adequate green time to serve inbound/outbound stadium traffic.
- Advance message signs will be placed at several locations to notify non-stadium traffic of events and associated road closures and delays. Advance message signs will be placed along US 101and SR 237 at Great America Parkway and Tasman Drive at Lawrence Expressway and First Street.

The traffic analysis accounts for the proposed restriction of conflicting traffic flow along Great America Boulevard and Tasman Drive by means of a redistribution of background traffic volumes. Similarly, background traffic volumes also were redistributed to account for the proposed temporary closure of

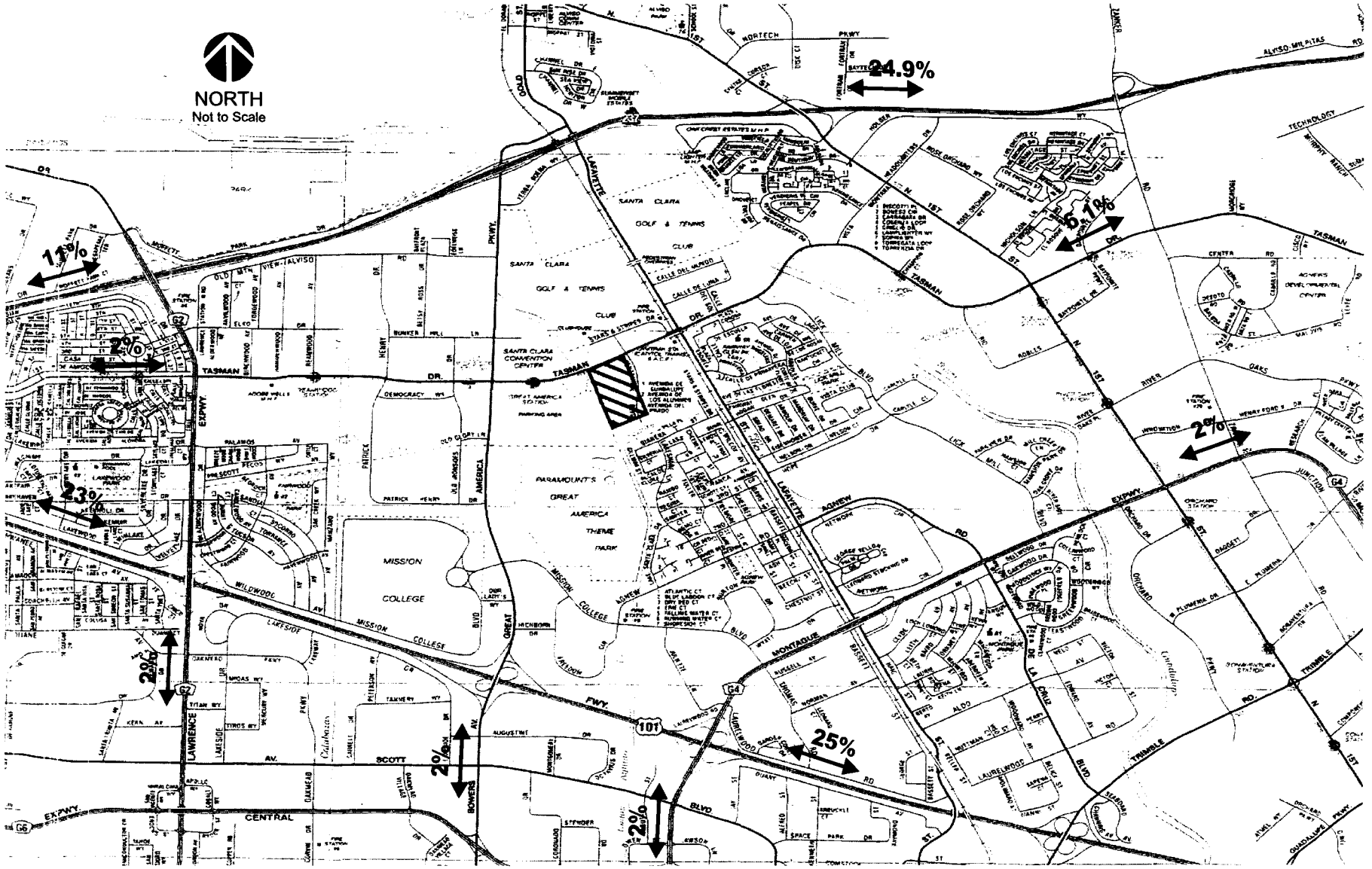

Figure 32

MICRO STADIUM PROJECT TRIP DISTRIBUTION

49ers Santa Clara Stadium

Source: Google Earth

LEGEND

X = Parking Zones

= Identified Routes to Parking Zones

= Project Site

Hexagon
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Figure 33

GENERAL ROUTES TO IDENTIFIED PARKING ZONES

49ers Santa Clara Stadium


NORTH
Not to Scale
LEGEND
= Closed Road
= Officer Control
= Residential Intrusion Control
Hexagon
Transportation Consultants, Inc.
Source: AAA Map
= Project Site
Figure 34
PLANNED ROAD CLOSURES
AND INTERSECTION CONTROL
49ers Santa Clara Stadium

Tasman Drive between Centennial Boulevard and the Great America parking driveway. Changes in nearby development uses, available parking locations, and residential concerns, will necessitate a re-evaluation of the TMP annually to evaluate the effectiveness of the TMP and address any concerns that may arise from implementation of the TMP.

Project Traffic Volumes

Peak-hour traffic volumes for project conditions were produced by adding the stadium project trips, as represented in the above project trip assignment, to each of the applicable background condition traffic volumes to obtain background plus project traffic volumes for each of the study scenarios. The early weekday PM study period also included estimated trips for office departure. Traffic volumes for project conditions are presented in Appendix B.

Project Impacts and Mitigation Measures

This section discusses the project conditions analysis and any impacts associated with the proposed stadium development. Included are descriptions of project impacts to intersections and freeway segments. Mitigation measures were investigated for all identified intersection impacts and are presented and described below. Though it is expected that the traffic associated with the stadium will have a significant impact on intersections and other transportation facilities, the infrequency of occurrence (8-10 times per year) does not justify the implementation of costly physical improvements. The project is not proposing to fund or implement the possible measures. The implementation of the TMP and traffic control plan will provide for temporary relief of adverse traffic congestion caused by stadium traffic on game days and days of other events. Locations in the immediate vicinity of the stadium that provide both access to identified parking and serve as a pedestrian thoroughfare may experience a greater amount of congestion during peak hour arrival and departure periods.

Intersection Impacts and Mitigation Measures (Weekday Study Periods)

Intersection level of service analysis was used to evaluate traffic operations at the study intersections under project condition study scenarios. As described previously, the weekday project conditions analysis presents worst case scenarios for each study period. The analysis is not reflective of anticipated traffic conditions during peak periods of the stadium with the implementation of the TMP and traffic control plan. The analysis provides an evaluation of the magnitude of effects the stadium will have on the transportation system utilizing standard traffic analysis and CEQA evaluation methods.

The results of the analysis show that 24 of the 120 study intersections are projected to operate at unacceptable levels under project conditions during at least one of the weekday study periods based on applicable level of service standards (see Figures 35 through 39). Of these 24 intersections, the project would impact 17 intersections during at least one weekday study period according to the applicable impact criteria (see Table 15). The following intersections will be impacted by the project:

City of Santa Clara Intersections

3	Great America Parkway and Tasman Drive *
8	Great America Parkway and Mission College Boulevard *
14	Great America Parkway and Yerba Buena Way
15	Great America Parkway and Alviso Road

16 Great America Parkway and Bunker Hill Lane
17 Great America Parkway and Old Glory Lane
18 Great America Parkway and Patrick Henry Drive
35 Lafayette Street and Yerba Buena Way

City of San Jose Intersections

83 North First Street and Montague Expressway *
84 Zanker Road and Montague Expressway *
87 O'Toole Avenue and Montague Expressway *
89 Trade Zone Boulevard and Montague Expressway *
91 North First Street (N) and SR 237 *
93 Great America (N) and SR 237 *

City of Sunnyvale Intersections

97 Lawrence Expressway and Tasman Drive *

City of Milpitas Intersections

112 I-880 NB and Tasman Drive
115 Abbott Avenue and Calaveras Boulevard

*Indicates CMP Intersection

A table summarizing the intersection level of service results for all study intersections and calculation sheets is included in Appendix D.

Mitigation measures were investigated for all of the identified intersection impacts. Described below are each of the necessary intersection improvements that would mitigate the identified project impacts (see Table 16 and Figures 40 through 44).

City of Santa Clara Intersection Analysis

The results of the Weekday level of service analysis shows that 10 of the City of Santa Clara study intersections are projected to operate at an unacceptable LOS E or worse under project conditions during at least one of the Weekday study periods. The project will impact 8 of the 10 intersections identified to operate at unacceptable levels. Each of the impacted intersections and possible mitigation measures are described below.

(3) Great America Parkway and Tasman Drive*

Impact: The level of service would be LOS C during the early and standard weekday PM peak hours under background conditions and the intersection would degrade to LOS F during the early and standard weekday PM peak hours under project conditions. This constitutes a significant impact by both City of Santa Clara and CMP standards.

Table 15
Weekday Project Conditions Unacceptable Intersection Levels of Service

Study Number	Intersection Name	Study Period	Background Ave. Delay	Background LOS	Project Conditions Ave. Delay	Project Conditions LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
City of Santa Clara Intersections								
3	Great America Parkway and Tasman Drive *	3-5PM	28.1	C	91.0	F	110.7	0.564
		4-6PM	31.7	C	93.1	F	107.1	0.408
8	Great America Parkway and Mission College Boulevard *	3-5PM	50.9	D	207.9	F	236.7	0.577
		4-6PM	98.5	F	133.9	F	66.9	0.147
14	Great America Parkway and Yerba Buena Way	3-5PM	28.1	C	29.2	C	2.2	0.227
		4-6PM	30.2	C	92.6	F	95.5	0.401
15	Great America Parkway and Alviso Road	3-5PM	10.1	B	82.5	F	115.9	0.559
		4-6PM	11.4	B	186.6	F	238.7	0.621
16	Great America Parkway and Bunker Hill Lane	3-5PM	14.0	B	38.1	D	40.4	0.506
		4-6PM	15.4	B	67.3	E	82.5	0.525
17	Great America Parkway and Old Glory Lane	3-5PM	12.7	B	198.8	F	317.8	0.384
		4-6PM	14.9	B	58.5	E	86.2	0.217
18	Great America Parkway and Patrick Henry Drive	3-5PM	33.8	C	225.5	F	293.7	0.666
		4-6PM	85.5	F	166.5	F	194.3	0.187
35	Lafayette Street and Yerba Buena Way	3-5PM	17.0	C	21.4	C	4.4	0.000
		4-6PM	29.0	D	38.2	E	9.2	0.000
60	San Tomas Expressway and Homestead Road *	3-5PM	55.1	E	58.3	E	5.0	0.028
		4-6PM	102.0	F	101.5	F	0.0	0.000
62	San Tomas Expressway and El Camino Real *	3-5PM	62.1	E	62.9	E	1.5	0.028
		4-6PM	85.4	F	85.2	F	0.0	0.000
City of San Jose Intersections								
83	North First Street and Montague Expressway *	3-5PM	121.4	F	127.8	F	1.0	0.008
		4-6PM	206.8	F	218.5	F	8.1	0.071
84	Zanker Road and Montague Expressway *	3-5PM	62.3	E	61.6	E	-1.4	0.010
		4-6PM	98.8	F	97.7	F	-4.5	0.021
87	O'Toole Avenue and Montague Expressway *	3-5PM	68.8	E	69.5	E	1.0	0.041
		4-6PM	96.0	F	95.0	F	-4.5	0.021
88	Oakland Road/Main Street and Montague Expressway *	3-5PM	53.3	D	53.9	D	1.3	0.032
		4-6PM	58.9	E	58.5	E	0.0	0.000
89	Trade Zone Boulevard and Montague Expressway *	3-5PM	59.3	E	58.2	E	-3.3	0.029
		4-6PM	101.4	F	100.1	F	0.0	0.000
91	North First Street (North) and SR-237 *	3-5PM	51.2	D	52.5	D	1.3	0.009
		4-6PM	139.1	F	138.2	F	-1.2	0.011
93	Great America (N) and SR 237 *	3-5PM	19.8	B	52.9	D	37.4	0.462
		4-6PM	22.0	C	170.3	F	169.6	0.668
City of Sunnyvale Intersections								
97	Lawrence Expressway and Tasman Drive *	3-5PM	62.2	E	72.5	E	16.1	0.140
		4-6PM	78.7	E	91.4	F	4.2	0.003
104	Lawrence Expressway and Oakmead Parkway	3-5PM	40.7	D	41.0	D	0.5	0.019
		4-6PM	59.0	E	59.0	E	0.0	0.000
106	Lawrence Expressway and Kifer Road	3-5PM	46.3	D	46.0	D	0.0	0.019
		4-6PM	57.1	E	56.7	E	0.0	0.000
108	Lawrence Expressway and Homestead Road *	3-5PM	46.6	D	46.8	D	0.5	0.009
		4-6PM	83.5	F	83.2	F	0.0	0.000
City of Milpitas Intersections								
110	Alder Drive and Tasman Drive	3-5PM	38.0	D	54.9	D	21.2	0.096
		4-6PM	99.6	F	98.1	F	0.0	0.000
112	I-880 NB and Tasman Drive	3-5PM	30.7	C	33.4	C	4.0	0.068
		4-6PM	44.8	D	59.2	E	22.5	0.070
115	Abbott Avenue and Calaveras Boulevard	3-5PM	28.9	C	29.4	C	0.9	0.070
		4-6PM	36.4	D	55.3	E	36.7	0.144

* Denotes CMP Intersections

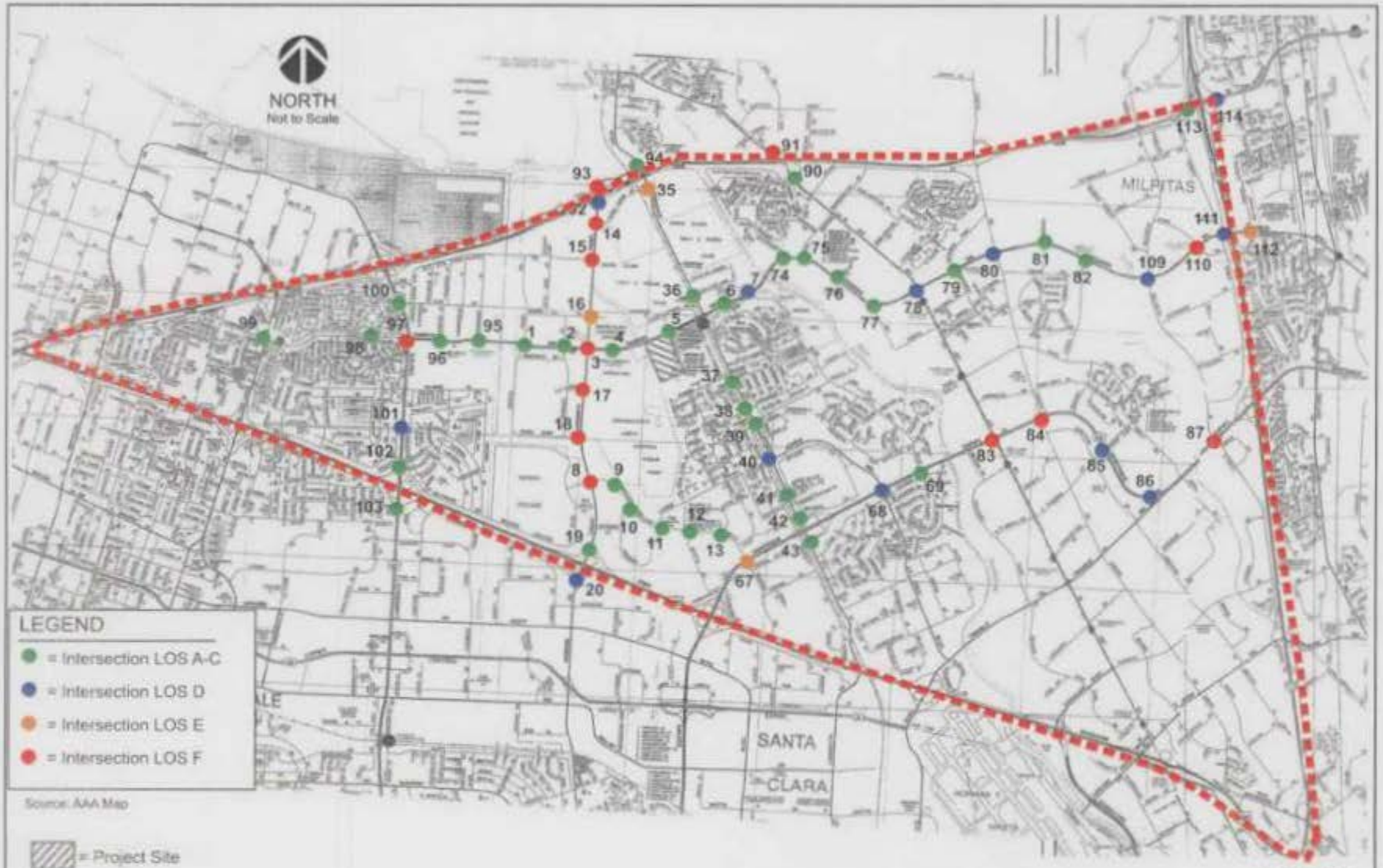

Figure 35

STADIUM CORE AREA WEEKDAY PROJECT INTERSECTION LEVEL OF SERVICE

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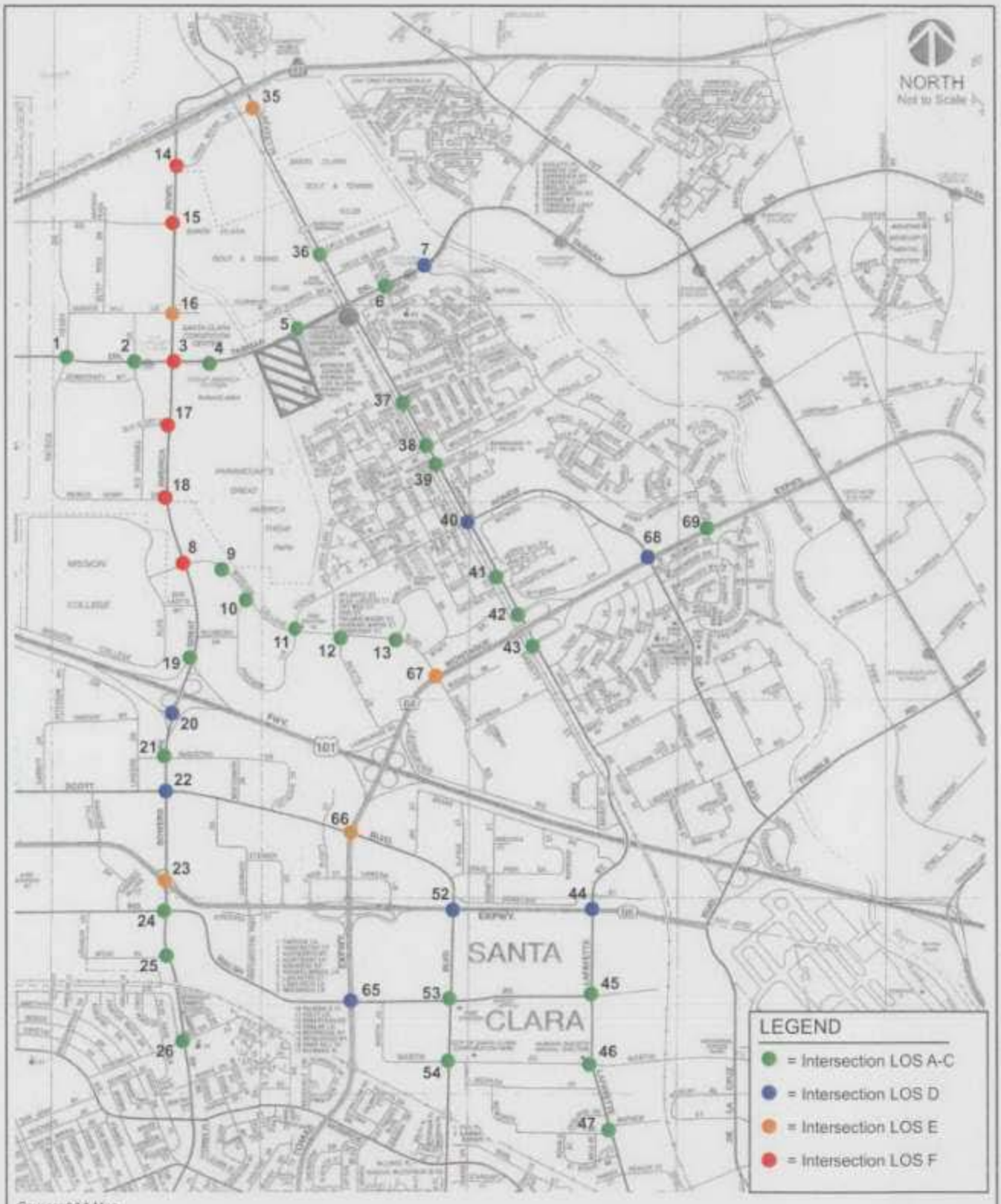
49ers Santa Clara Stadium



Source: AAA Map

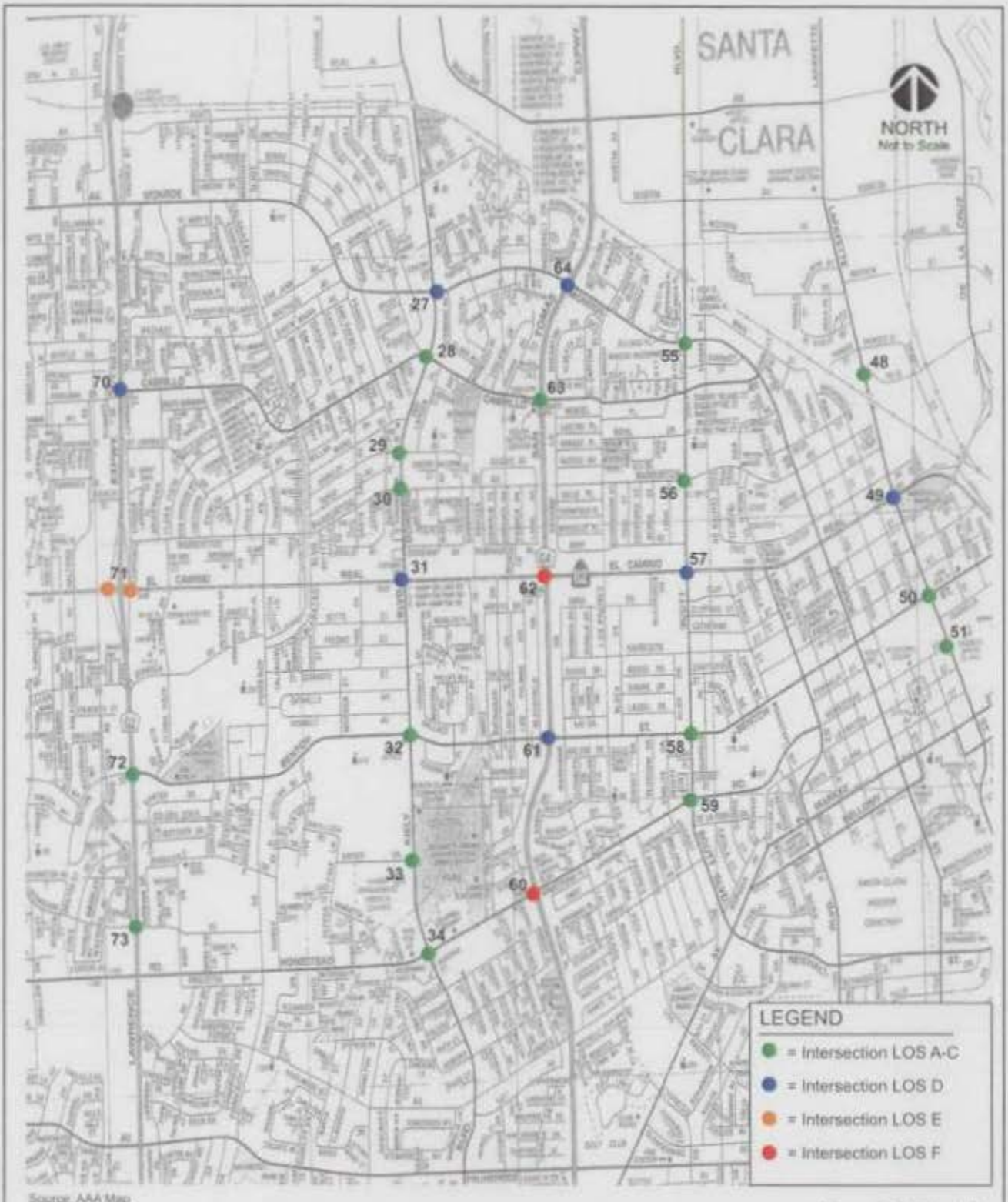
= Project Site

Figure 36

CITY OF SANTA CLARA WEEKDAY PROJECT INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



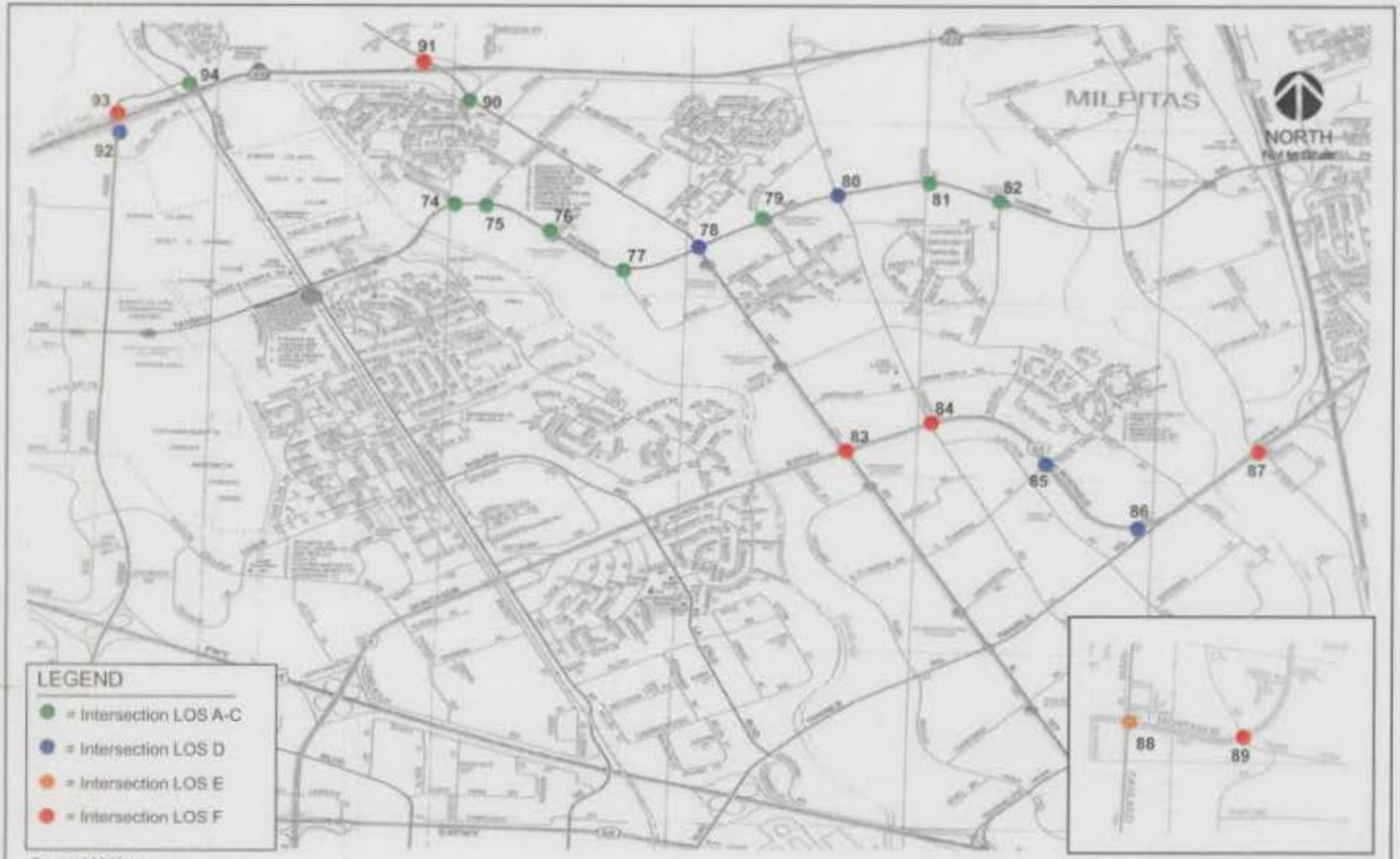
Source: AAA Map

Figure 36 (Cont'd)

CITY OF SANTA CLARA WEEKDAY PROJECT INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



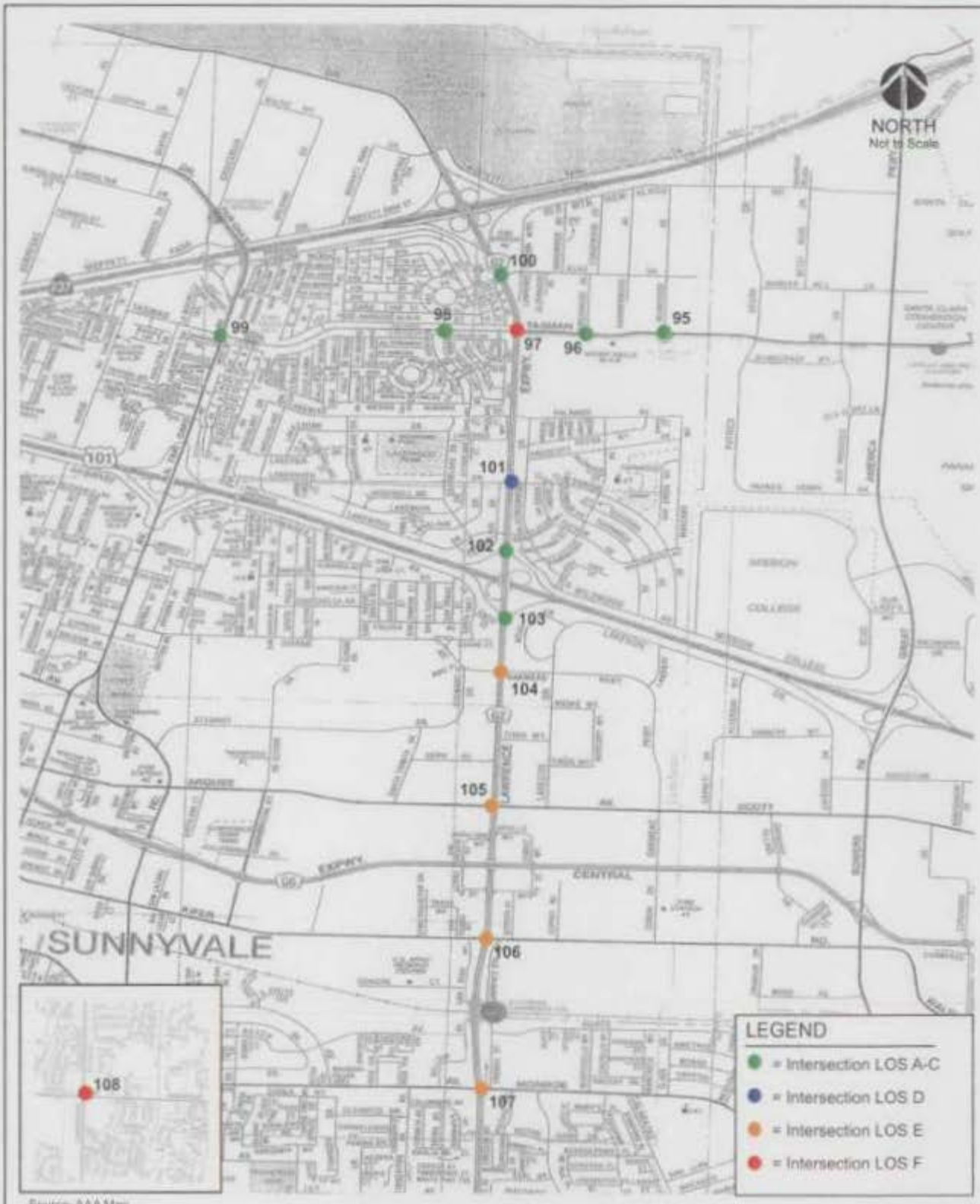
Source: AAA Map

Figure 37

CITY OF SAN JOSE WEEKDAY PROJECT INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon Transportation Consultants, Inc.



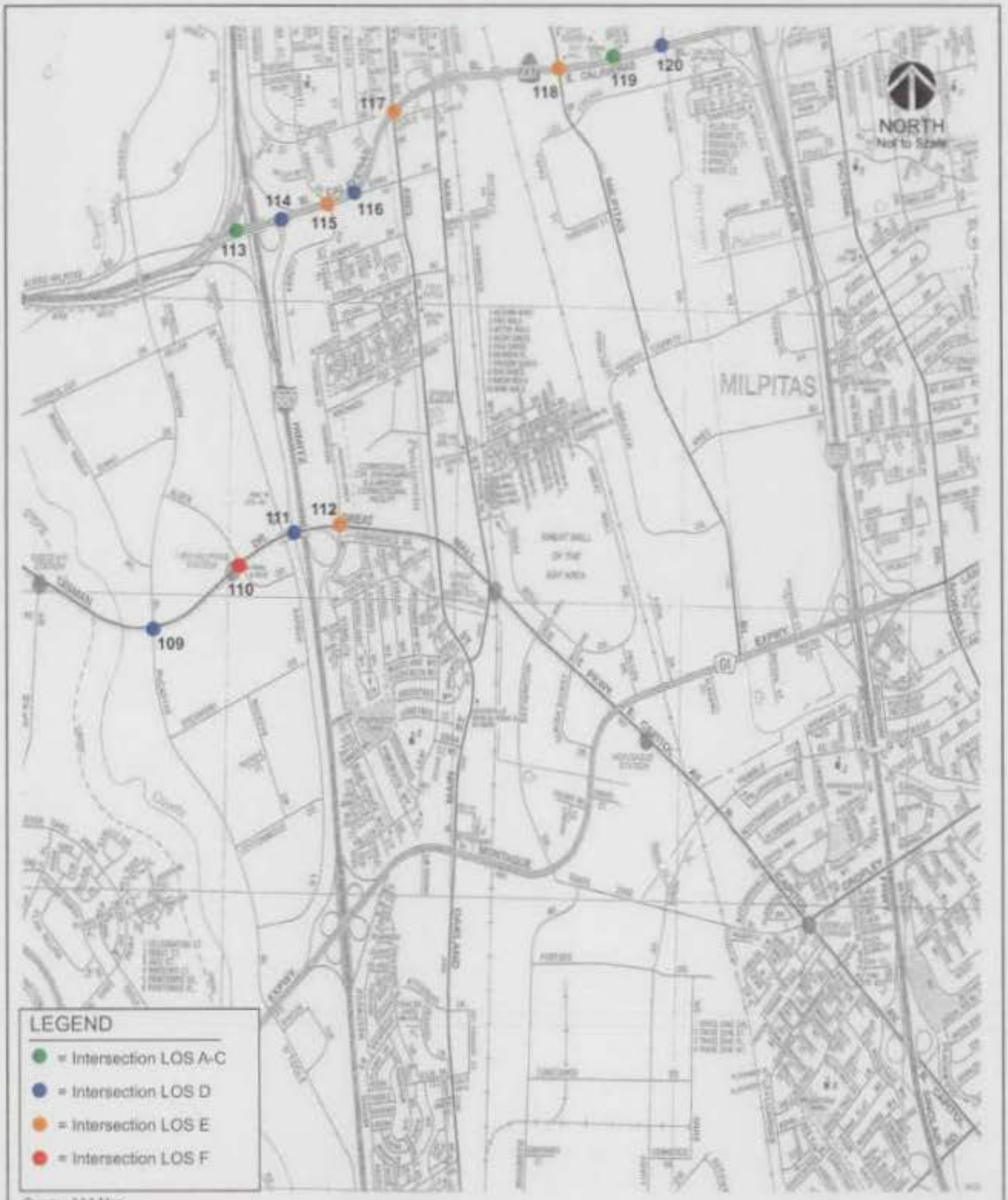
Source: AAA Map

Figure 38

CITY OF SUNNYVALE WEEKDAY PROJECT INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



Source: AAA Map

Figure 39

CITY OF MILPITAS WEEKDAY PROJECT INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of the addition of an exclusive eastbound right-turn lane. The improvement will require acquisition of right-of-way that may not be feasible. The intersection improvement would improve intersection operating levels to LOS E during both the early and standard weekday PM peak hours.

(8) Great America Parkway and Mission College Boulevard*

Impact: The level of service would be LOS D during the early weekday PM peak hour under background conditions and the intersection would degrade to LOS F under project conditions. The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the addition of project traffic would cause the critical-movement delay at the intersection to increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under project conditions. This constitutes a significant impact by both City of Santa Clara and CMP standards.

Mitigation Measure. The necessary improvements to mitigate the project impact at this intersection would consist of the addition of a third northbound left-turn lane, third westbound left-turn lane, a fourth southbound through lane, and a separate westbound right-turn lane. The improvement will require acquisition of right-of-way that may not be feasible. The intersection improvements would improve intersection operating levels to LOS E during both the early and standard weekday PM peak hours.

(14) Great America Parkway and Yerba Buena Way

Impact: The level of service would be LOS C during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS F under project conditions. This constitutes a significant impact by City of Santa Clara standards.

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of the addition of a second westbound left-turn lane. The intersection improvement would improve intersection operating levels to LOS D during the standard weekday PM peak hour.

(15) Great America Parkway and Alviso Road

Impact: The level of service would be LOS B during the early and standard weekday PM peak hours under background conditions and the intersection would degrade to LOS F during the early and standard weekday PM peak hours under project conditions. This constitutes a significant impact by City of Santa Clara standards.

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of the addition of second eastbound and northbound left-turn lanes and an adjustment of signal timing. The intersection improvement would improve intersection operating levels to LOS C during both the early and standard weekday PM peak hours. The intersection will serve as a primary entrance to identified stadium parking and will be officer controlled. Thus, the adjustment of signal timing is only necessary based upon standard intersection level of service operations Though the adjustment of signal timing is not considered an acceptable mitigation for normal peak hour operations, the characteristics of stadium traffic may provide for the need to adjust signal timing.

(16) Great America Parkway and Bunker Hill Lane

Impact: The level of service would be LOS B during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS E under project conditions. This constitutes a significant impact by City of Santa Clara standards.

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of the addition of second westbound and northbound left-turn lanes. The improvement will require acquisition of right-of-way that may not be feasible. The intersection improvement would improve intersection operating levels to LOS D during the standard weekday PM peak hour.

(17) Great America Parkway and Old Glory Lane

Impact: The level of service would be LOS B during the early and standard weekday PM peak hours under background conditions and the intersection would degrade to LOS F and E during the early and standard weekday PM peak hours, respectively, under project conditions. This constitutes a significant impact by City of Santa Clara standards.

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of an adjustment of signal timing. The intersection improvement would improve intersection operating levels to LOS D and B during the early and standard weekday PM peak hours, respectively. The intersection will serve as a primary entrance to identified stadium parking and will be officer controlled. Thus, the adjustment of signal timing is only necessary based upon standard intersection level of service operations Though the adjustment of signal timing is not considered an acceptable mitigation for normal peak hour operations, the characteristics of stadium traffic may provide for the need to adjust signal timing.

(18) Great America Parkway and Patrick Henry Drive

Impact: The level of service would be LOS C during the early weekday PM peak hour under background conditions and the intersection would degrade to LOS F under project conditions. The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the addition of project traffic would cause the critical-movement delay at the intersection to increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under project conditions. This constitutes a significant impact by City of Santa Clara standards.

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of the addition of a second northbound left-turn lane, fourth southbound through lane and a second eastbound right-turn lane. The intersection improvements would improve intersection operating levels to LOS E and D during the early and standard weekday PM peak hours, respectively. Though the improvements will improve intersection operations, the intersection will continue to operate at an unacceptable LOS E during the early weekday PM peak hour. There are no further feasible improvements that can be made at the intersection. The intersection will serve as a primary entrance to identified stadium parking and will be officer controlled.

(35) Lafayette Street and Yerba Buena Way

Impact: The level of service would be LOS D during the standard weekday PM peak hour under

background conditions and the intersection would degrade to LOS E under project conditions. This constitutes a significant impact by City of Santa Clara standards.

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of the signalization of the intersection. The intersection improvement would improve intersection operating levels to LOS C during the standard weekday PM peak hour.

City of San Jose Intersection Analysis

The results of the Weekday level of service analysis shows that eight of the City of San Jose study intersections are projected to operate at an unacceptable LOS E or worse under project conditions during at least one of the Weekday study periods. The project will impact six of the seven intersections identified to operate at unacceptable levels. Each of the impacted intersections and possible mitigation measures are described below.

(83) North First Street and Montague Expressway*

Impact: The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the addition of project traffic would cause the critical-movement delay at the intersection to increase by four or more seconds and the demand-to-capacity ratio (V/C) to increase by .01 or more during the standard PM peak hour under project conditions. This constitutes a significant impact by both City of San Jose and CMP standards.

Mitigation Measure. There are no further feasible improvements beyond that planned Montague widening assumed under background conditions that can be implemented to improve intersection levels of service to acceptable levels. The NSJDP identified the impacts to the intersection associated with its development as significant and unavoidable due to the lack of feasible mitigation measures. A traffic impact fee has been implemented as part of the NSJDP, but is only applicable to development within the NSJDP area. Development that impact intersections within the NSJDP area are required to make a fair-share contribution towards identified improvements.

(84) Zanker Road and Montague Expressway*

Impact: The level of service would be LOS E and F during the early and standard weekday PM peak hours, respectively, under background conditions and the addition of project traffic would cause the demand- to-capacity ratio (V/C) to increase by .01 or more under project conditions. This constitutes a significant impact by both City of San Jose and CMP standards.

Mitigation Measure. There are no further feasible improvements beyond that planned Montague widening assumed under background conditions that can be implemented to improve intersection levels of service to acceptable levels. The NSJDP identified the impacts to the intersection associated with its development as significant and unavoidable due to the lack of feasible mitigation measures. A traffic impact fee has been implemented as part of the NSJDP, but is only applicable to development within the NSJDP area. Development that impact intersections within the NSJDP area are required to make a fair-share contribution towards identified improvements.

(87) O'Toole Avenue and Montague Expressway*

Impact: The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the addition of project traffic would cause the demand- to-capacity ratio (V/C) to increase by .01 or more under project conditions. This constitutes a significant impact by both City of San Jose and CMP standards.

Mitigation Measure. There are no further feasible improvements beyond that planned Montague widening assumed under background conditions that can be implemented to improve intersection levels of service to acceptable levels. The NSJDP identified the impacts to the intersection associated with its development as significant and unavoidable due to the lack of feasible mitigation measures. A traffic impact fee has been implemented as part of the NSJDP, but is only applicable to development within the NSJDP area. Development that impact intersections within the NSJDP area are required to make a fair-share contribution towards identified improvements.

(89) Trade Zone Boulevard and Montague Expressway*

Impact: The level of service would be LOS E during the early weekday PM peak hours under background conditions and the addition of project traffic would cause the demand- to-capacity ratio (V/C) to increase by .01 or more under project conditions. This constitutes a significant impact by City of San Jose standards.

Mitigation Measure. There are no further feasible improvements beyond that planned Montague widening assumed under background conditions that can be implemented to improve intersection levels of service to acceptable levels. The NSJDP identified the impacts to the intersection associated with its development as significant and unavoidable due to the lack of feasible mitigation measures. A traffic impact fee has been implemented as part of the NSJDP, but is only applicable to development within the NSJDP area. Development that impact intersections within the NSJDP area are required to make a fair-share contribution towards identified improvements.

(91) North First Street (N) and SR 237*

Impact: The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the addition of project traffic would cause the critical-movement delay at the intersection to decrease and the demand- to-capacity ratio (V/C) to increase by .01 or more under project conditions. This constitutes a significant impact by both City of San Jose and CMP standards.

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of the addition of an exclusive southbound right-turn lane. The intersection improvement would improve intersection operating levels to LOS E during the standard weekday PM peak hour, which is better than background.

(93) Great America and SR 237 (North)*

Impact: The level of service would be LOS C during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS F under project conditions. This constitutes a significant impact by both City of San Jose and CMP standards.

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of the addition of a third westbound left-turn lane. The improvement will require acquisition of right-of-way that may not be feasible. The intersection improvement would improve intersection operating levels, but the intersection will continue to operate at LOS E. There are no further feasible improvements that can be made at the intersection.

City of Sunnyvale Intersection Analysis

The results of the Weekday level of service analysis shows that four of the City of Sunnyvale study intersections are projected to operate at an unacceptable LOS E or worse under project conditions during at least one of the Weekday study periods. The project will impact one of the four intersections identified to operate at unacceptable levels. Each of the impacted intersections and possible mitigation measures are described below.

(97) Lawrence Expressway and Tasman Drive *

Impact: The level of service would be LOS E during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS F under project conditions. This constitutes a significant impact by CMP standards.

Mitigation Measure. There are no feasible improvements that can be made at the intersection due to insufficient right-of-way. Traffic control at the intersection as identified in the TMP will maintain efficient operations at the intersection.

City of Milpitas Intersection Analysis

The results of the Weekday level of service analysis shows that three of the City of Milpitas study intersections are projected to operate at an unacceptable LOS E or worse under project conditions during at least one of the Weekday study periods. The project will impact two of the three intersections identified to operate at unacceptable levels. Each of the impacted intersections and possible mitigation measures are described below.

(112) I-880 Northbound and Tasman Drive

Impact: The level of service would be LOS D during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS E under project conditions. This constitutes a significant impact by City of Milpitas standards.

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of the addition of a second westbound left-turn lane. The intersection improvement would improve intersection operating levels to LOS D during the standard weekday PM peak hour.

(115) Abbott Avenue and Calaveras Boulevard

Impact: The level of service would be LOS D during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS E under project conditions. This constitutes a significant impact by City of Milpitas standards.

Table 16
Weekday Project Conditions Intersection Level of Service (Impacted Intersections with Mitigation)

Study Number	Intersection Name	Study Period	Background Ave. Delay	Background LOS	Project Conditions Ave. Delay	Project Conditions LOS	Project Conditions Incr. In Crit. Delay	Project Conditions Incr. In Crit. V/C	Project Mitigated Ave. Delay	Project Mitigated LOS
City of Santa Clara Intersections										
3	Great America Parkway and Tasman Drive *	3-5PM	28.1	C	**91.0**	**F**	**110.7**	**0.564**	65.2	E
		4-6PM	31.7	C	**93.1**	**F**	**107.1**	**0.408**	71.0	E
8	Great America Parkway and Mission College Boulevard *	3-5PM	50.9	D	**207.9**	**F**	**236.7**	**0.577**	74.1	E
		4-6PM	98.5	F	**133.9**	**F**	**66.9**	**0.147**	59.1	E
14	Great America Parkway and Yerba Buena Way	3-5PM	28.1	C	29.2	C	2.2	0.227	23.4	C
		4-6PM	30.2	C	**92.6**	**F**	**95.5**	**0.401**	52.3	D
15	Great America Parkway and Alviso Road	3-5PM	10.1	B	**82.5**	**F**	**115.9**	**0.559**	23.5	C
		4-6PM	11.4	B	**186.6**	**F**	**238.7**	**0.621**	22.1	C
16	Great America Parkway and Bunker Hill Lane	3-5PM	14.0	B	38.1	D	40.4	0.506	24.8	C
		4-6PM	15.4	B	**67.3**	**E**	**82.5**	**0.525**	49.1	D
17	Great America Parkway and Old Glory Lane	3-5PM	12.7	B	**198.8**	**F**	**317.8**	**0.384**	39.4	D
		4-6PM	14.9	B	**58.5**	**E**	**86.2**	**0.217**	15.6	B
18	Great America Parkway and Patrick Henry Drive	3-5PM	33.8	C	**225.5**	**F**	**293.7**	**0.666**	57.8	E
		4-6PM	85.5	F	**166.5**	**F**	**194.3**	**0.187**	44.6	D
35	Lafayette Street and Yerba Buena Way	3-5PM	17.0	C	21.4	C	4.4	0.000	20.9	C
		4-6PM	29.0	D	**38.2**	**E**	**9.2**	**0.000**	23.1	C
City of San Jose Intersections										
83	North First Street and Montague Expressway *	3-5PM	121.4	F	127.8	F	1.0	0.008		
		4-6PM	206.8	F	**218.5**	**F**	**8.1**	**0.071**		
84	Zanker Road and Montague Expressway *	3-5PM	62.3	E	**61.6**	**E**	**-1.4**	**0.010**		
		4-6PM	98.8	F	**97.7**	**F**	**-4.5**	**0.021**		
87	O'Toole Avenue and Montague Expressway *	3-5PM	68.8	E	69.5	E	1.0	0.041		
		4-6PM	96.0	F	**95.0**	**F**	**-4.5**	**0.021**		
89	Trade Zone Boulevard and Montague Expressway *	3-5PM	59.3	E	**58.2**	**E**	**-3.3**	**0.029**		
		4-6PM	101.4	F	100.1	F	0.0	0.000		
91	North First Street (North) and SR-237 *	3-5PM	51.2	D	52.5	D	1.3	0.009	25.7	C
		4-6PM	139.1	F	**138.2**	**F**	**-1.2**	**0.011**	64.3	E
93	Great America (N) and SR 237 *	3-5PM	19.8	B	52.9	D	37.4	0.462	30.4	C
		4-6PM	22.0	C	**170.3**	**F**	**169.6**	**0.668**	79.8	E
City of Sunnyvale Intersections										
97	Lawrence Expressway and Tasman Drive *	3-5PM	62.2	E	72.5	E	16.1	0.140		
		4-6PM	78.7	E	**91.4**	**F**	**4.2**	**0.003**		
City of Milpitas Intersections										
112	I-880 NB and Tasman Drive	3-5PM	30.7	C	33.4	C	4.0	0.068	30.0	C
		4-6PM	44.8	D	**59.2**	**E**	**22.5**	**0.070**	42.1	D
115	Abbott Avenue and Calaveras Boulevard	3-5PM	28.9	C	29.4	C	0.9	0.070	28.9	C
		4-6PM	36.4	D	**55.3**	**E**	**36.7**	**0.144**	37.5	D

* = Denotes CMP Intersections
[ ] = Denotes Significant Impacts

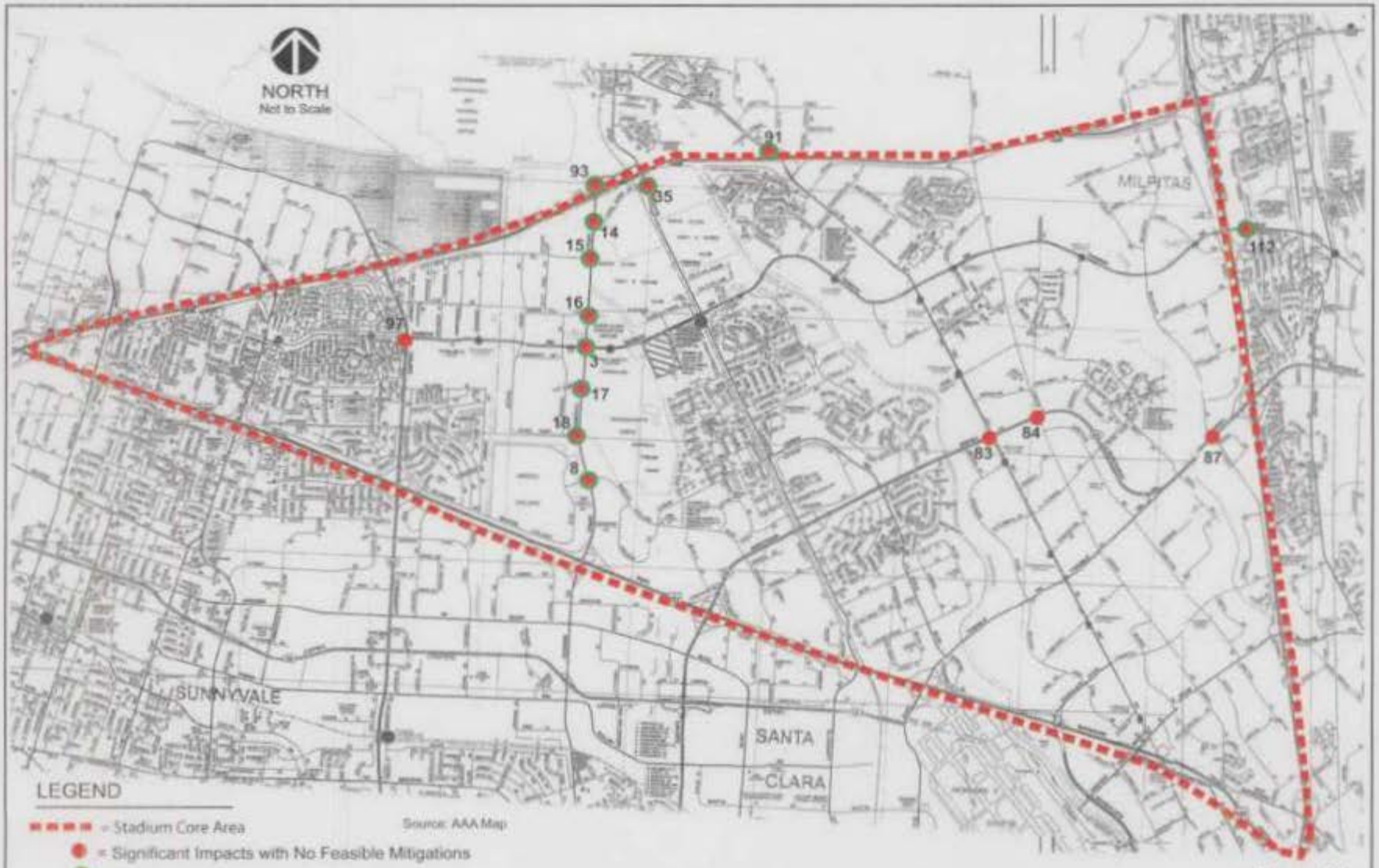


Figure 40

STADIUM CORE AREA WEEKDAY PROJECT IMPACTS AND IMPROVEMENTS

49ers Santa Clara Stadium

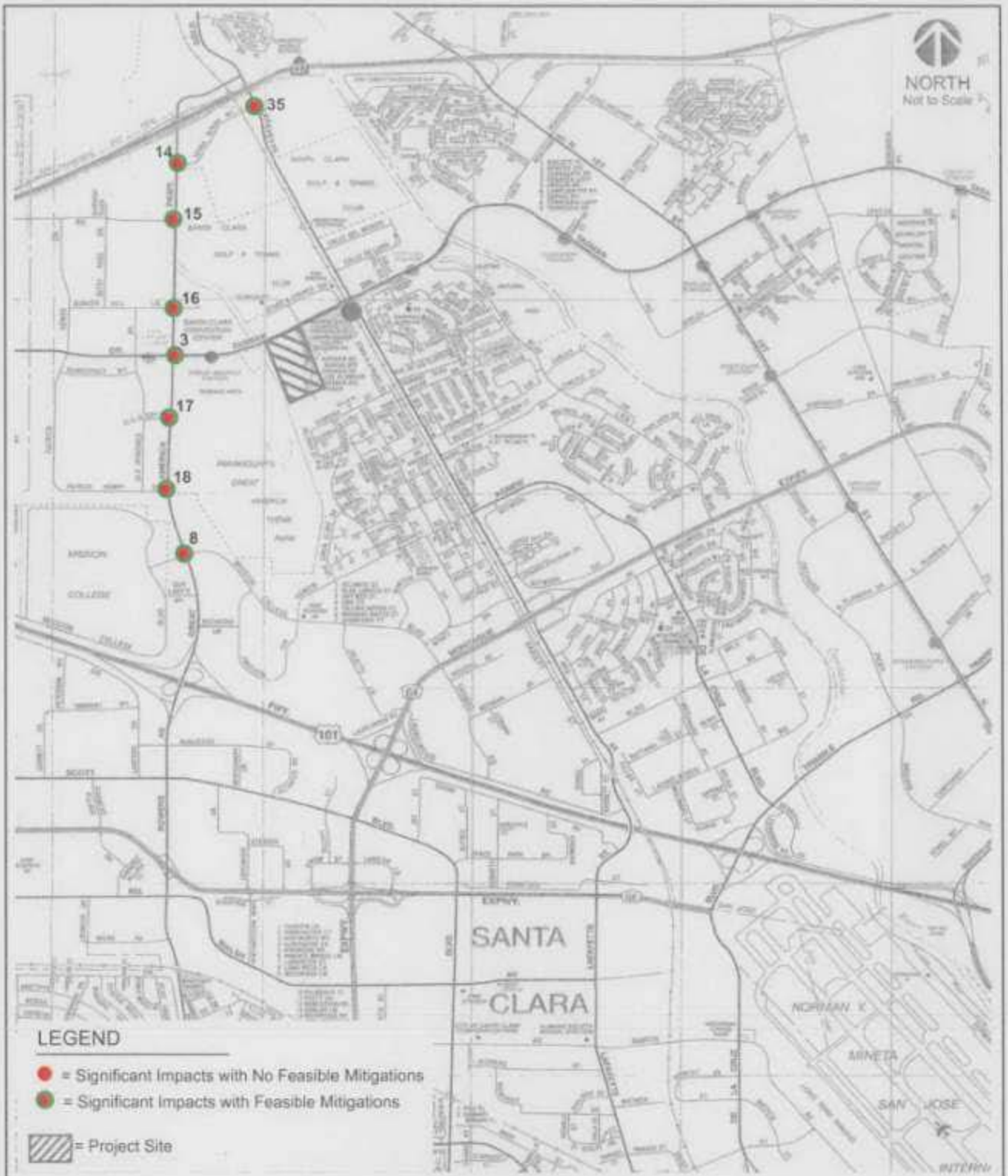


Figure 41

CITY OF SANTA CLARA WEEKDAY PROJECT IMPACTS AND IMPROVEMENTS

Hexagon
Transportation Consultants, Inc.

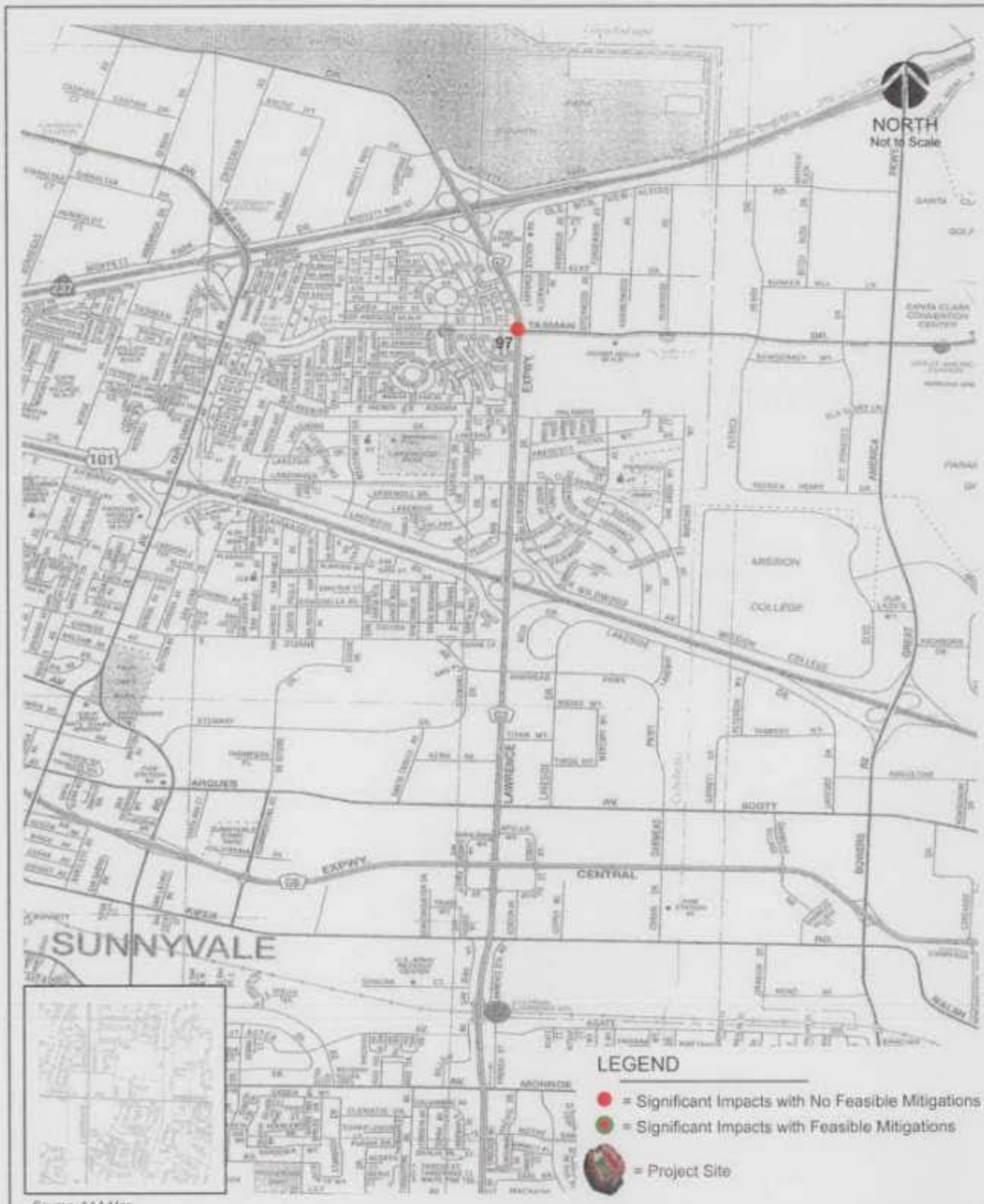
49ers Santa Clara Stadium

Figure 42

CITY OF SAN JOSE WEEKDAY PROJECT IMPACTS AND IMPROVEMENTS

49ers Santa Clara Stadium

Hexagon Transportation Consultants, Inc.



Source: AAA Map

Figure 43

CITY OF SUNNYVALE WEEKDAY PROJECT IMPACTS AND IMPROVEMENTS

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.

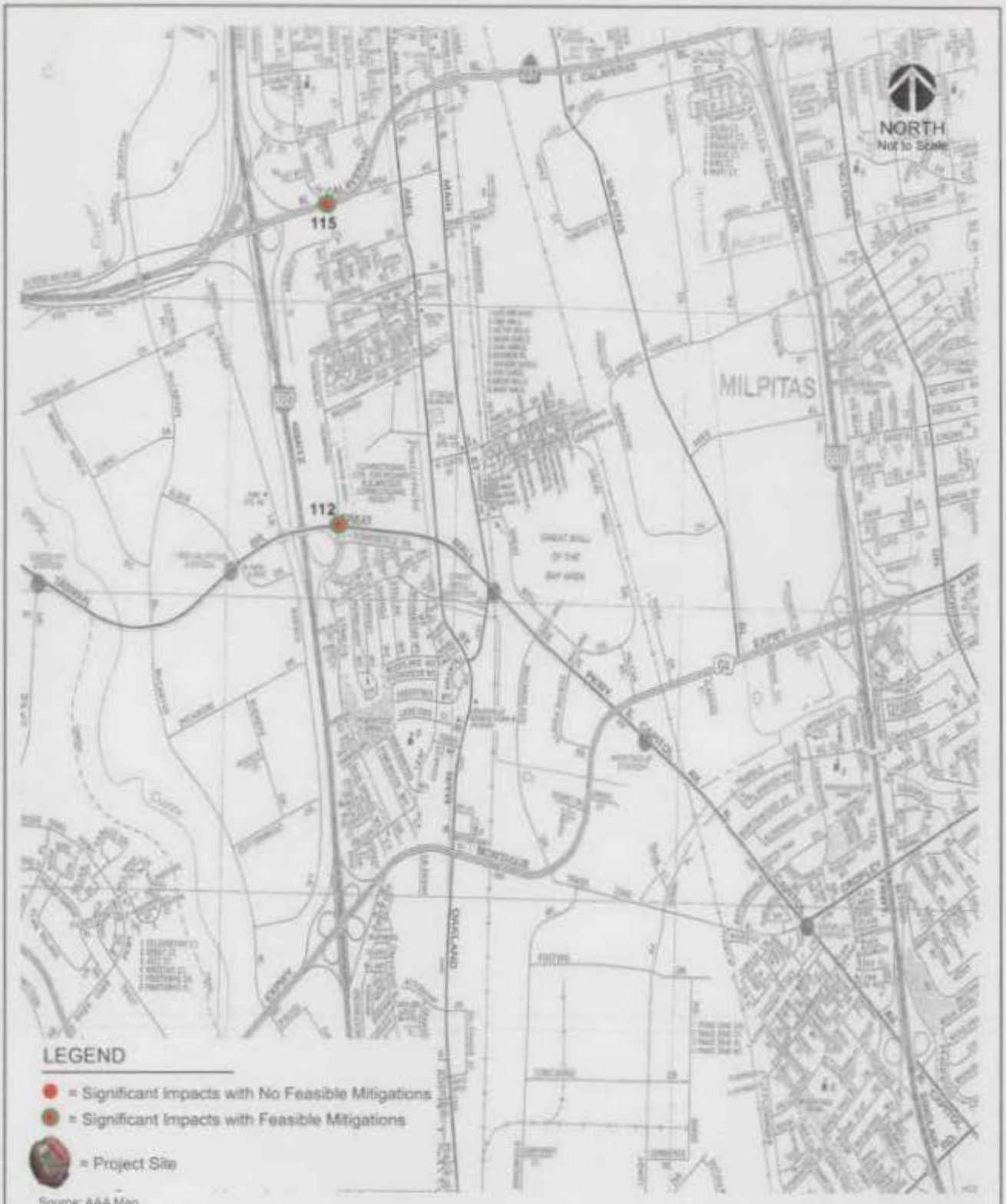


Figure 44

CITY OF MILPITAS WEEKDAY PROJECT IMPACTS AND IMPROVEMENTS

49ers Santa Clara Stadium

Hexagon Transportation Consultants, Inc.

Mitigation Measure. The necessary improvement to mitigate the project impact at this intersection would consist of the addition of a fourth westbound through lane. The City of Milpitas has plans to widen Calaveras Boulevard to eight lanes between Abbott Avenue and Milpitas Boulevard. A traffic impact fee has been implemented to fund the planned widening. Thus, developments that impact intersections along the segment of Calaveras Boulevard are required to pay a fee of $2,500 per PM peak hour trip. The intersection improvement would improve intersection operating levels to LOS D during the standard weekday PM peak hour.

Intersection Impacts and Mitigation Measures (Sunday Study Periods)

The results of the Sunday intersection level of service analysis shows that two of the 120 study intersections are projected to operate at unacceptable levels under project conditions during at least one of the Sunday study periods based on applicable level of service standards (see Figures 45 through 49). The project would impact both of the intersections identified to operate at unacceptable levels during at least one study period, according to the applicable impact criteria (see Table 17). The following intersections will be impacted by the project:

City of San Jose Intersections

83 North First Street and Montague Expressway *
91 North First Street (North) and SR-237 *

*Indicates CMP Intersection

A table summarizing the intersection level of service results for all study intersections and calculation sheets is included in Appendix D.

Mitigation measures were not investigated for the Sunday study periods because standard impact criteria only apply to weekday commute periods. It is expected that during Sunday games, which will be the most frequent event, implementation of the TMP will maintain acceptable intersection operating levels with officer control and other measures.

Table 17
Sunday Project Conditions Intersection Level of Service (Impacted Intersections)

Study Number		Peak Hour	Background Ave. Delay	Background LOS	Project Conditions Ave. Delay	Project Conditions LOS	Project Conditions Incr. In Crit. Delay	Project Conditions Incr. In Crit. V/C
City of San Jose Intersections								
83	North First Street and Montague Expressway *	11-1PM	48.0	D	**62.1**	**E**	**18.5**	**0.399**
		3-5PM	48.2	D	**63.2**	**E**	**20.0**	**0.399**
91	North First Street (North) and SR-237 *	11-1PM	139.2	F	**156.5**	**F**	**39.5**	**0.088**
		3-5PM	18.0	B	23.8	C	5.4	0.104

* = Denotes CMP Intersections
[ ] = Denotes Significant Impacts

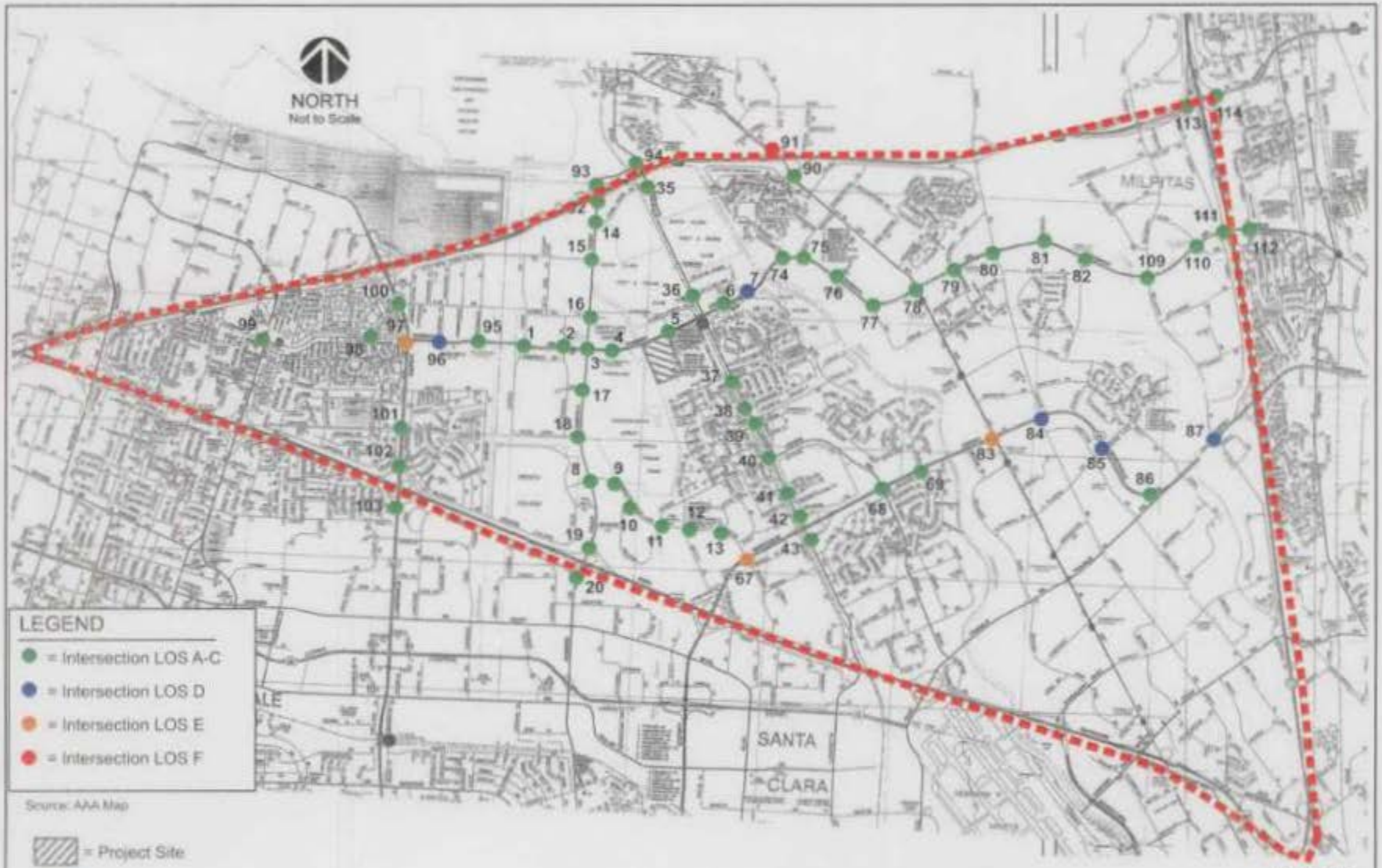
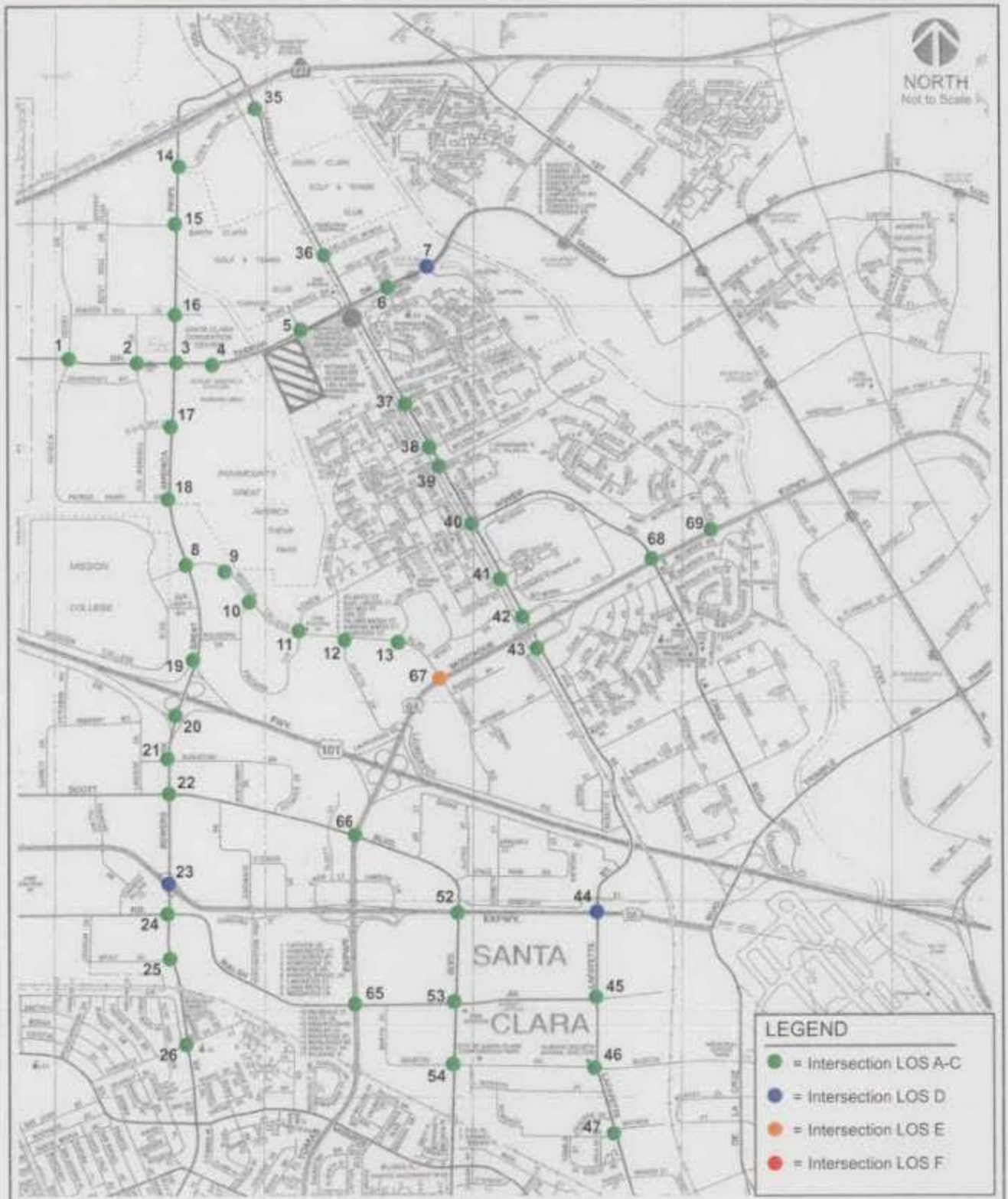


Figure 45

STADIUM CORE AREA SUNDAY PROJECT INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium



Source: AAA Map

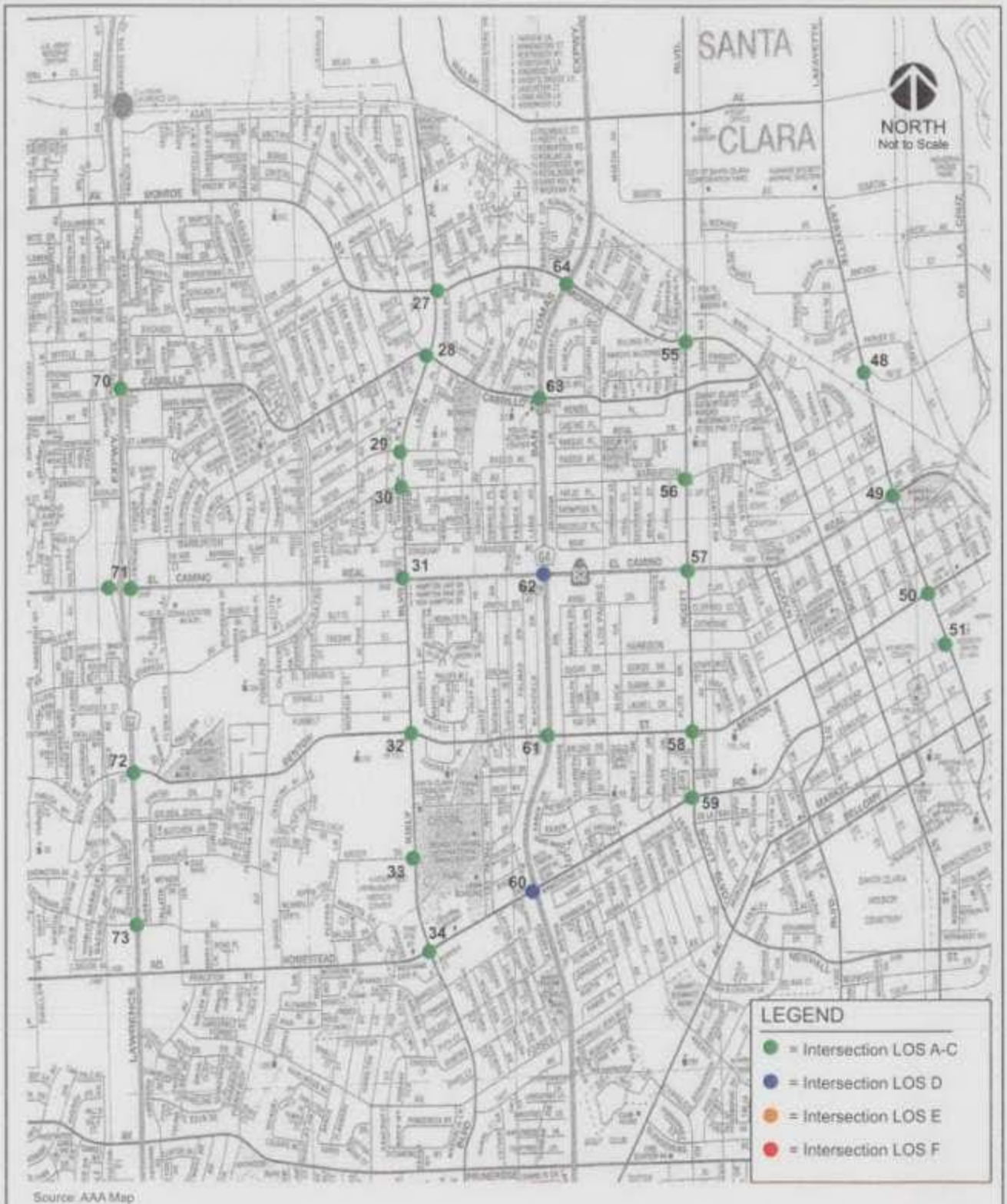
Figure 46

= Project Site

CITY OF SANTA CLARA SUNDAY PROJECT
INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



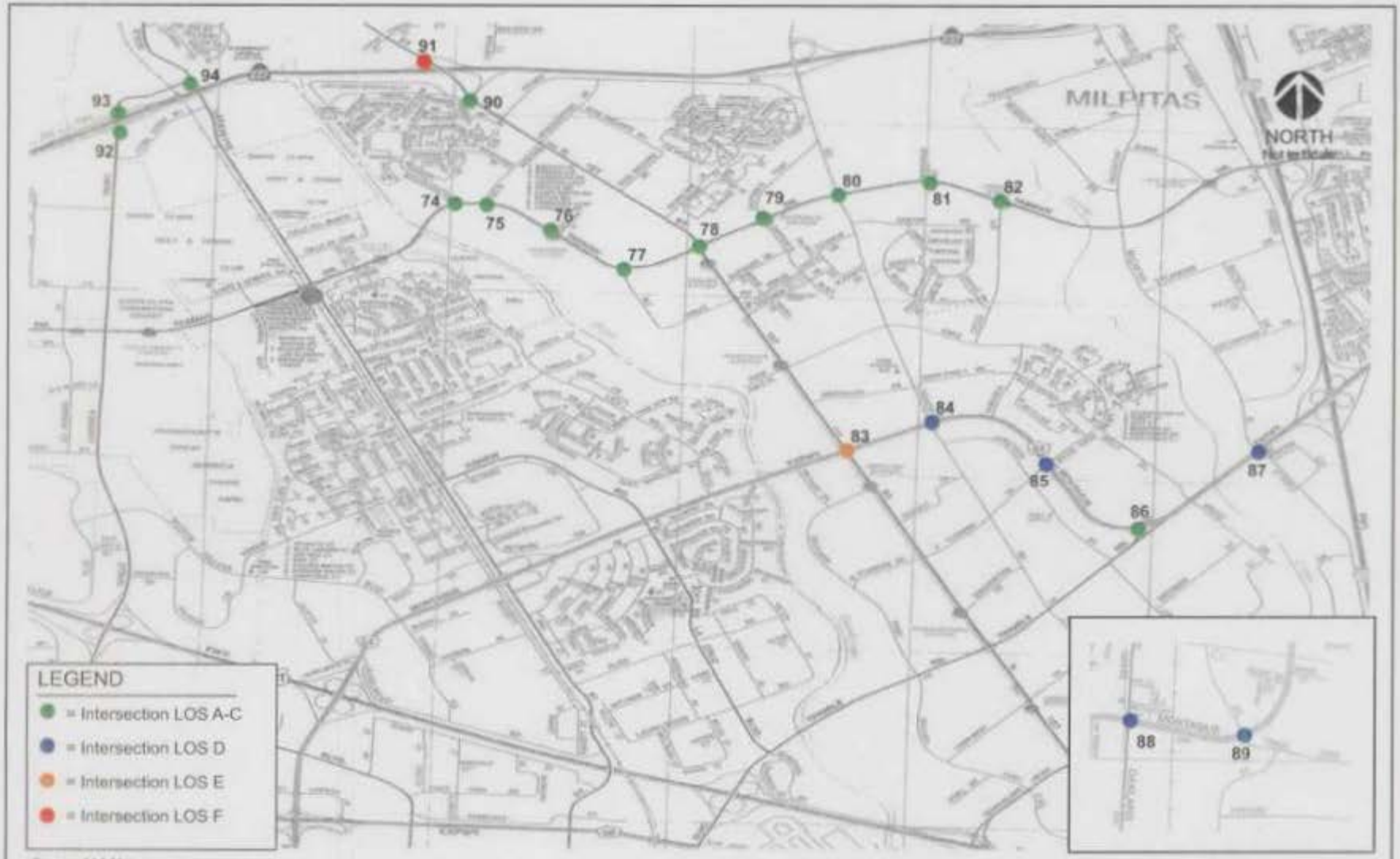
Source: AAA Map

Figure 46 (Cont'd)

CITY OF SANTA CLARA SUNDAY PROJECT INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



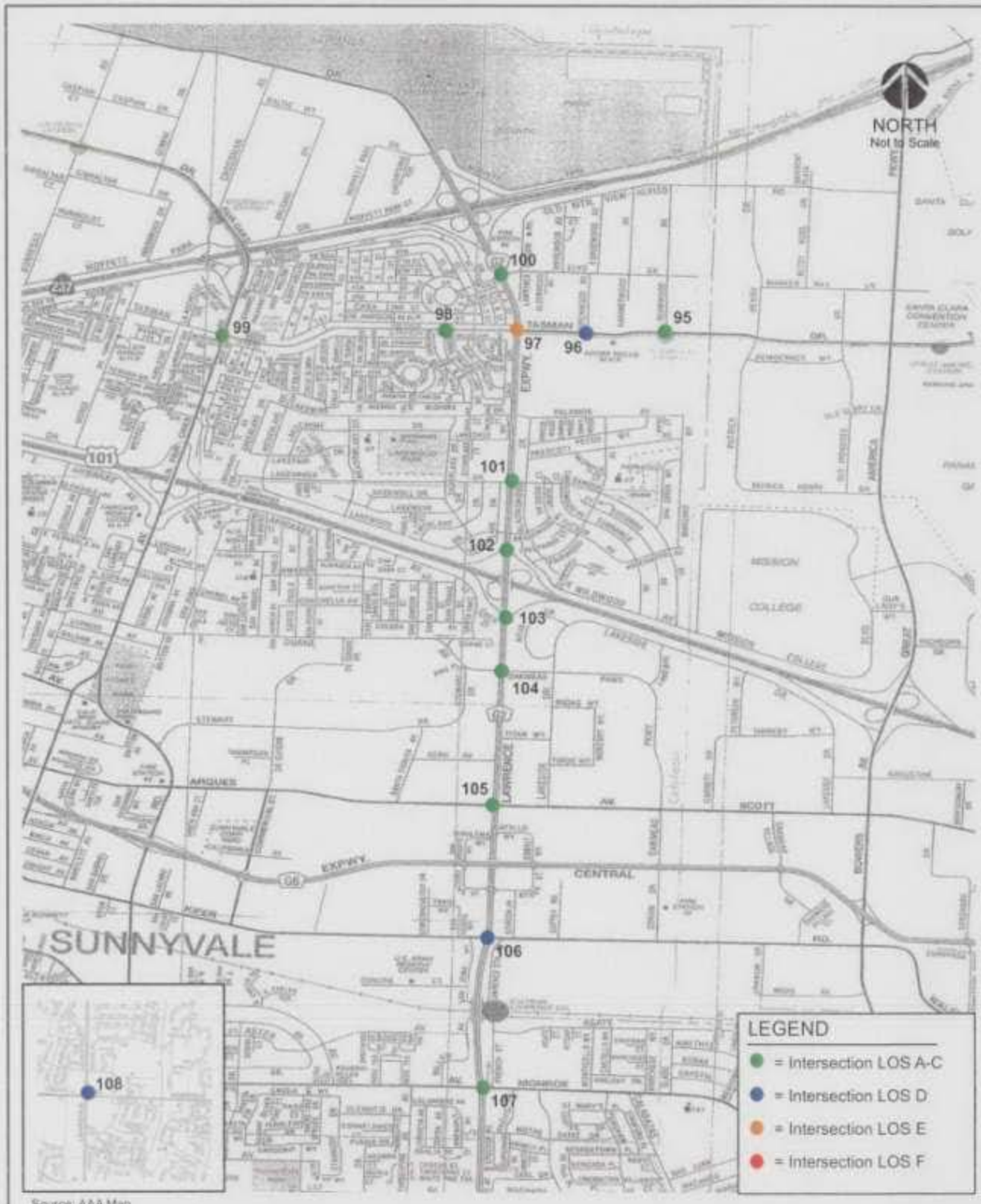
Source: AAA Map

Figure 47

CITY OF SAN JOSE SUNDAY PROJECT INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon Transportation Consultants, Inc.



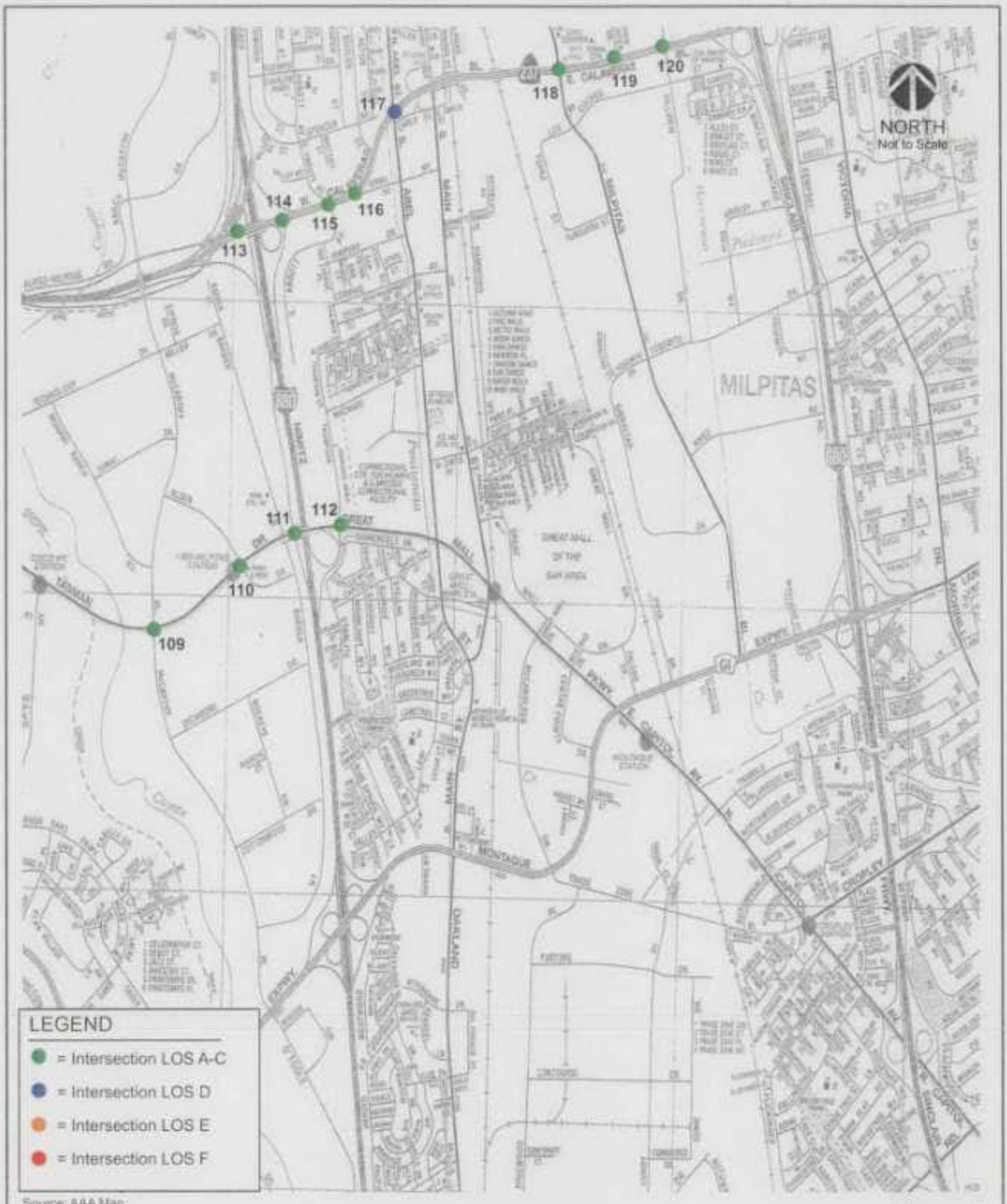
Source: AAA Map

Figure 48

CITY OF SUNNYVALE SUNDAY PROJECT INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



Source: AAA Map

Figure 49

CITY OF MILPITAS SUNDAY PROJECT INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.

Project Conditions Freeway Ramp Analysis

Traffic volumes for project conditions on each of the studied freeway ramps were developed by adding to existing condition volumes the project trips. The project trips were assigned to the freeway ramps in the same manner as with intersections. Since there is no adopted city or county evaluation criteria for freeway ramps, the freeway ramp analysis is presented for informative purposes only.

Weekday Study Periods

The weekday freeway ramp analysis indicates that seven freeway ramps will degrade to LOS D or worse conditions with the addition of project traffic under at least one of the weekday study periods. Weekday freeway ramp analysis is presented in Table 18.

US 101 and Lawrence Expressway Interchange
SB US 101 off to Lawrence Expressway (standard and early PM peak hours)

US 101 and Great America Parkway Interchange
NB US 101 off to Great America Parkway (standard and early PM peak hours)
SB Great America Parkway to SB US 101 (standard PM peak hour)
SB Great America Parkway to NB US 101 (standard PM peak hour)
SB US 101 off to Great America Parkway (standard and early PM peak hours)

SR 237 and Great America Parkway Interchange
WB 237 off to Great America Parkway (standard and early PM peak hours)
Great America Parkway to EB SR 237 (standard PM peak hour)

All other freeway ramps analyzed would operate at LOS C or better conditions during the weekday study periods.

Sunday Study Periods

The Sunday freeway ramp analysis indicates that three freeway ramps will degrade to LOS D or worse conditions with the addition of project traffic under at least one of the Sunday study periods. Sunday freeway ramp analysis is presented in Table 19.

US 101 and Lawrence Expressway Interchange
SB US 101 off to Lawrence Expressway (early and late peak hours)

US 101 and Great America Parkway Interchange
NB US 101 off to Great America Parkway (early and late peak hours)

SR 237 and Lawrence Expressway Interchange
NB Lawrence Expressway to EB SR 237 (early peak hour)

All other freeway ramps analyzed would operate at LOS C or better conditions during the Sunday study periods.

Project Conditions Freeway Segment Levels of Service

Weekday Study Periods

Project traffic volumes on the freeway segments were estimated by adding to existing freeway volumes the estimated project trips on freeway segments. The results of the weekday study period analysis are summarized in Table 20. The results show that the mixed-flow lanes on 19 of the 44 directional freeway segments analyzed would operate at an unacceptable LOS F under project conditions during at least one of the weekday study periods. The results also show that the HOV lane on three of the 32 directional freeway segments (with HOV lanes) analyzed would operate at an unacceptable LOS F during at least one of the weekday study periods under project conditions. All other freeway segments analyzed would operate at LOS E or better during the weekday study periods.

Project traffic would constitute one percent or more of freeway segment capacity in the mixed-flow lanes on 14 of the 19 directional freeway segments that were identified to operate at LOS F. Project traffic would cause freeway segments operating levels to degrade from an acceptable LOS E to LOS F on two additional directional freeway segments and one HOV lane:

US-101, De La Cruz Boulevard to Montague Expressway (Northbound)
SR-237, North Fair Oaks Avenue to Lawrence Expressway (Eastbound)
SR-237, Lawrence Expressway to Great America Parkway (Eastbound)
SR-237, Great America Parkway to North First Street (Eastbound)
SR-237, North First Street to Zanker Road (Eastbound)
SR-237, McCarthy Boulevard to I-880 (Eastbound)
SR-237, McCarthy Boulevard to Zanker Road (Westbound)
SR-237, Zanker Road to North First Street (Westbound)
US-101, Fair Oaks Avenue to Lawrence Expressway (Southbound)
US-101, Lawrence Expressway to Great America Parkway (Southbound)
US-101, Great America Pkwy. to Montague Expwy. (Southbound)
US-101, Montague Expressway to De La Cruz Boulevard (Southbound)
US-101, De La Cruz Boulevard to SR-87 (Southbound)
US-101, SR-87 to North First Street (Southbound)
US-101, North First Street to Old Bayshore Highway (Southbound Mixed-Flow & Northbound HOV)
US-101, Old Bayshore Highway to I-880 (Southbound)

Therefore, based on the CMP criteria for significant impacts on freeways, the project would have a significant impact on all 16 directional freeway segments and one HOV lane under project conditions during at least one of the weekday study periods.

Sunday Study Periods

The results of the Sunday study period analysis are summarized in Table 21. The results show that all of the studied freeway segments are projected to operate at LOS E or better conditions under each of the Sunday study periods.

Freeway Facility Mitigation

There are measures that could reduce the impacts to freeway segments. The measures primarily consist of transit improvements and enhancements that would provide options for stadium attendees. These measures include:

Traffic Management Plan
Enhancement of CalTrain, Amtrak/ACE service
Extension of LRT lines
Enhanced Bus Service

Adjusted transit services with major enhancements to provide a convenient means of getting to and from the stadium would reduce auto usage. The reduction in auto usage would be most noticeable on freeways since most transit trips would originate from outside the immediate project area (i.e. the core).

The Valley Transportation Authority *VTP 2030* also identifies improvements to regional facilities, including freeways, for which a regional funding plan could be used to fund the improvements. The following improvements to impacted freeway segments are identified in the *VTP 2030:*

US 101 auxiliary lane widenings between Trimble Road and Montague Expressway
US 101 southbound auxiliary lane between Great America Parkway and Lawrence Expressway
SR 237 westbound auxiliary lane between Coyote Creek Bridge and North First Street

Should it be deemed that the identified freeway improvements are feasible and necessary, the project along with other projects within Santa Clara County could contribute towards the funding of the improvements. A fee collection program would need to be established and specific improvements identified.

Full mitigation of significant project impacts on freeway segments would require roadway widening to construct additional through lanes, thereby increasing freeway capacity. Since it is not feasible for an individual development project to bear responsibility for implementing such extensive transportation system improvements due to constraints in acquisition and cost of right-of-way, and no comprehensive project to add through lanes has been developed by Caltrans or VTA for individual projects to contribute to, the significant impacts on the directional freeway segments identified above must be considered significant and unavoidable.

Gameday Transit Service Enhancements

The TMP provides further detail on the possible enhancements and adjustments of each of the transit services.

The large demand for transit services, as described previously, will necessitate extensive enhancement of existing transit service. However, the project is not proposing to construct any new transit infrastructure. Therefore, the enhancement of existing transit services will primarily consist of increased service frequencies, additional bus lines, and additional trains to serve the specific demands of the stadium attendees. Tasman Drive will be temporarily closed to facilitate the large crowds that will arrive and depart football games. Tasman Drive will not only serve as a main transit arterial due to the light rail service along it, but also will be the primary gateway route for the majority of pedestrians. Enhancements

Table 18
Project Weekday Freeway Ramp Levels of Service Summary

Interchange	Direction	# Of Lanes	Capacity (vph)	Daily Total Volume	Existing Conditions 3-5 PM Volume	V/C	LOS	Existing Conditions 4-6 PM Volume	V/C	LOS	Project Trips 3-5 PM Volume	Increase	Project Trips 4-6 PM Volume	Increase	Existing Plus Project Conditions 3-5 PM Volume	V/C	LOS	Existing Plus Project Conditions 4-6 PM Volume	V/C	LOS
US-101																				
Mathilda Avenue	NB off to NB Mathilda Avenue	1	1,500	7,037	268	0.179	A	207	0.138	A	0	0.00%	0	0.00%	268	0.179	A	207	0.138	A
	SB on from NB Mathilda Avenue	1	1,500	7,765	493	0.329	A	477	0.318	A	0	0.00%	0	0.00%	493	0.329	A	477	0.318	A
	NB on from NB Mathilda Avenue	1	1,500	5,706	362	0.241	A	348	0.232	A	0	0.00%	0	0.00%	362	0.241	A	348	0.232	A
	SB on from SB Mathilda Avenue	1	1,500	5,886	589	0.393	B	651	0.434	B	0	0.00%	0	0.00%	589	0.393	B	651	0.434	B
	NB off to SB Mathilda Avenue	1	1,500	8,866	483	0.322	A	767	0.511	B	0	0.00%	0	0.00%	483	0.322	A	767	0.511	B
	SB off to SB Mathilda Avenue	1	1,500	6,785	429	0.286	A	529	0.353	A	0	0.00%	0	0.00%	429	0.286	A	529	0.353	A
North Fair Oaks Avenue	SB on from NB North Fair Oaks Avenue	1	1,500	6,991	442	0.295	A	331	0.221	A	0	0.00%	0	0.00%	442	0.295	A	331	0.221	A
	NB off to North Fair Oaks Avenue	1	1,500	11,132	644	0.429	B	854	0.569	C	0	0.00%	0	0.00%	644	0.429	B	854	0.569	C
	SB off to NB North Fair Oaks Avenue	1	1,500	1,923	111	0.074	A	160	0.107	A	0	0.00%	0	0.00%	111	0.074	A	160	0.107	A
	SB on from SB North Fair Oaks Avenue	1	1,500	4,195	323	0.215	A	418	0.279	A	0	0.00%	0	0.00%	323	0.215	A	418	0.279	A
	NB on from North Fair Oaks Avenue	1	1,500	7,198	393	0.262	A	425	0.283	A	0	0.00%	0	0.00%	393	0.262	A	425	0.283	A
	SB off to SB North Fair Oaks Avenue	1	1,500	6,519	592	0.395	B	641	0.427	B	0	0.00%	0	0.00%	592	0.395	B	641	0.427	B
Lawrence Expressway	SB on from NB Lawrence Expressway	2	3,000	12,896	671	0.224	A	702	0.234	A	0	0.00%	0	0.00%	671	0.224	A	702	0.234	A
	NB off to Lawrence Expressway	2	3,000	19,359	1,156	0.385	B	1,377	0.459	B	141	12.20%	0	0.00%	1,297	0.432	B	1,377	0.459	B
	SB off to Lawrence Expressway	1	1,500	13,671	976	0.652	C	1,047	0.698	C	198	20.25%	408	38.97%	1,176	0.784	D	1,455	0.970	E
	NB on from NB Lawrence Expressway	2	3,000	8,537	450	0.150	A	492	0.164	A	0	0.00%	0	0.00%	450	0.150	A	492	0.164	A
	SB on from SB Lawrence Expressway	1	1,500	5,514	268	0.179	A	296	0.197	A	27	10.07%	56	18.92%	295	0.197	A	352	0.235	A
	NB on from SB Lawrence Expressway	1	1,500	5,352	299	0.199	A	322	0.215	A	249	83.28%	0	0.00%	548	0.365	B	322	0.215	A
Great America Parkway	NB off to Great America Parkway	1	1,500	17,869	820	0.547	B	1,017	0.678	C	768	93.66%	1579	155.26%	1,588	1.059	F	2,596	1.731	F
	SB on from NB Great America Parkway	1	1,500	6,107	479	0.319	A	495	0.330	A	0	0.00%	0	0.00%	479	0.319	A	495	0.330	A
	NB on from NB Great America Parkway	1	1,500	2,897	186	0.124	A	264	0.176	A	0	0.00%	0	0.00%	186	0.124	A	264	0.176	A
	SB on from SB Great America Parkway	1	1,500	10,192	723	0.482	B	785	0.523	B	848	117.29%	0	0.00%	1,571	1.047	F	785	0.523	B
	NB on from SB Great America Parkway	1	1,500	7,175	465	0.310	A	773	0.515	B	741	159.35%	0	0.00%	1,206	0.804	D	773	0.515	B
	SB off to Great America Parkway	1	1,500	11,373	630	0.420	B	702	0.468	B	648	102.86%	1332	189.74%	1,278	0.852	D	2,034	1.356	F
San Tomas Expressway	NB off to NB San Tomas Expressway	1	1,500	8,157	423	0.282	A	514	0.343	A	129	30.50%	265	51.56%	552	0.368	B	779	0.519	B
	NB off to SB San Tomas Expressway	1	1,500	8,035	487	0.325	A	604	0.403	B	0	0.00%	0	0.00%	487	0.325	A	604	0.403	B
	SB on from SB San Tomas Expressway	1	1,500	8,669	768	0.512	B	768	0.512	B	153	19.92%	0	0.00%	921	0.614	C	768	0.512	B
	SB on from NB San Tomas Expressway	1	1,500	6,958	372	0.248	A	457	0.305	A	0	0.00%	0	0.00%	372	0.248	A	457	0.305	A
	NB on from SB San Tomas Expressway	2	3,000	10,842	764	0.255	A	1,094	0.365	B	23	3.01%	0	0.00%	787	0.262	A	1,094	0.365	B
	NB on from NB San Tomas Expressway	1	1,500	8,131	441	0.294	A	393	0.262	A	1	0.23%	1	0.25%	442	0.295	A	394	0.263	A
	SB off to SB San Tomas Expressway	1	1,500	8,141	522	0.348	A	709	0.473	B	129	24.71%	0	0.00%	651	0.434	B	709	0.473	B
	SB off to NB San Tomas Expressway	1	1,500	10,787	750	0.500	B	778	0.519	B	27	3.60%	55	7.07%	777	0.518	B	833	0.555	C
I 880																				
Tasman Drive	NB off to Great Mall Expressway	2	3,000	9,690	494	0.165	A	645	0.215	A	0	0.00%	0	0.00%	494	0.165	A	645	0.215	A
	SB on from Tasman Drive	1	1,500	9,747	859	0.573	C	940	0.627	C	0	0.00%	0	0.00%	859	0.573	C	940	0.627	C
	NB on from Tasman Drive	1	1,500	9,573	818	0.545	B	910	0.607	C	0	0.00%	0	0.00%	818	0.545	B	910	0.607	C
	SB off to Tasman Drive/Great Mall Expwy	1	1,500	5,059	280	0.187	A	286	0.191	A	0	0.00%	0	0.00%	280	0.187	A	286	0.191	A
SR 237																				
Mathilda Avenue	EB off to Mathilda Avenue	2	3,000	7,942	300	0.100	A	312	0.104	A	0	0.00%	0	0.00%	300	0.100	A	312	0.104	A
	WB on from Mathilda Avenue	1	1,500	10,288	594	0.396	B	874	0.583	C	0	0.00%	0	0.00%	594	0.396	B	874	0.583	C
	EB on from Mathilda Avenue	1	1,500	9,979	820	0.547	B	820	0.547	B	0	0.00%	0	0.00%	820	0.547	B	820	0.547	B
	WB off to Mathilda Avenue	1	1,500	11,898	557	0.371	B	569	0.379	B	0	0.00%	0	0.00%	557	0.371	B	569	0.379	B
North Fair Oaks Avenue	EB off to North Fair Oaks Avenue	1	1,500	2,632	171	0.114	A	234	0.156	A	0	0.00%	0	0.00%	171	0.114	A	234	0.156	A
	WB on from Crossman Avenue/Java Drive	1	1,500	2,870	313	0.209	A	355	0.237	A	0	0.00%	0	0.00%	313	0.209	A	355	0.237	A
Lawrence Expressway	WB on from SB Lawrence Expressway	1	1,500	1,056	68	0.045	A	87	0.058	A	0	0.00%	0	0.00%	68	0.045	A	87	0.058	A
	WB on from NB Lawrence Expressway	1	1,500	2,618	202	0.135	A	235	0.157	A	250	123.76%	0	0.00%	452	0.301	A	235	0.157	A
	EB off to SB Lawrence Expressway	1	1,500	2,603	196	0.131	A	196	0.131	A	148	75.51%	305	155.61%	344	0.229	A	501	0.334	A
	EB off to NB Lawrence Expressway	1	1,500	702	21	0.014	A	50	0.033	A	0	0.00%	0	0.00%	21	0.014	A	50	0.033	A
	WB off to SB Lawrence Expressway	1	1,500	11,722	735	0.490	B	797	0.531	B	39	5.31%	0	0.00%	774	0.516	B	797	0.531	B
	WB off to NB Lawrence Expressway	1	1,500	5,715	136	0.091	A	291	0.194	A	0	0.00%	0	0.00%	136	0.091	A	291	0.194	A
	EB on from SB Lawrence Expressway	1	1,500	5,197	656	0.437	B	868	0.579	C	0	0.00%	0	0.00%	656	0.437	B	868	0.579	C
	EB on from NB Lawrence Expressway	1	1,500	12,939	715	0.477	B	792	0.528	B	27	3.78%	56	7.07%	742	0.495	B	848	0.565	C
Great America Parkway	EB off Great America Parkway	1	1,500	5,840	406	0.271	A	495	0.330	A	267	65.76%	549	110.91%	673	0.449	B	1,044	0.696	C
	WB on from Great America Parkway	1	1,500	4,454	318	0.212	A	454	0.303	A	359	112.89%	0	0.00%	677	0.451	B	454	0.303	A
	WB off to Great America Parkway	1	1,500	12,307	562	0.375	B	694	0.463	B	1041	185.23%	2139	308.21%	1,603	1.069	F	2,833	1.889	F
	EB on from Great America Parkway	1	1,500	10,464	709	0.473	B	710	0.473	B	745	105.08%	0	0.00%	1,454	0.969	E	710	0.473	B
North First Street	WB on from North First Steet	1	1,500	6,521	470	0.313	A	705	0.470	B	11	2.34%	0	0.00%	481	0.321	A	705	0.470	B
	EB off to North First Steet	1	1,500	5,887	275	0.183	A	280	0.187	A	6	2.18%	13	4.64%	281	0.187	A	293	0.195	A
	WB off to North First Steet	1	1,500	5,450	283	0.189	A	278	0.185	A	17	6.01%	35	12.59%	300	0.200	A	313	0.209	A
	EB on from North First Steet	1	1,500	7,417	543	0.362	B	523	0.349	A	128	23.57%	0	0.00%	671	0.447	B	523	0.349	A

Notes:
1. Capacity of freeway lanes based on assumed capacity of 1,500 vphpl for all ramps, as prescribed by the Highway Capacity Manual
2. Data provided by Caltrans Data System: 2006 Ramp Volumes on the California State Freeway System, District 4

Table 19
Project Sunday Freeway Ramp Levels of Service Summary

Interchange	Direction	# Of Lanes	Capacity (vph)	Daily Total Volume	Existing Conditions 11-1 PM Volume	V/C	LOS	Existing Conditions 3-5 PM Volume	V/C	LOS	Project Trips 11-1 PM Volume	Increase	Project Trips 3-5 PM Volume	Increase	Existing Plus Project Conditions 11-1 PM Volume	V/C	LOS	Existing Plus Project Conditions 3-5 PM Volume	V/C	LOS
US-101																				
Mathilda Avenue	NB off to NB Mathilda Avenue	1	1,500	2,235	87	0.058	A	138	0.092	A	0	0.00%	0	0.00%	87	0.058	A	138	0.092	A
	SB on from NB Mathilda Avenue	1	1,500	4,808	143	0.095	A	300	0.200	A	0	0.00%	0	0.00%	143	0.095	A	300	0.200	A
	NB on from NB Mathilda Avenue	1	1,500	3,527	129	0.086	A	243	0.162	A	0	0.00%	0	0.00%	129	0.086	A	243	0.162	A
	SB on from SB Mathilda Avenue	1	1,500	1,445	47	0.031	A	86	0.057	A	0	0.00%	0	0.00%	47	0.031	A	86	0.057	A
	NB off to SB Mathilda Avenue	1	1,500	4,834	170	0.113	A	332	0.221	A	0	0.00%	0	0.00%	170	0.113	A	332	0.221	A
	SB off to SB Mathilda Avenue	1	1,500	3,684	77	0.051	A	248	0.165	A	0	0.00%	0	0.00%	77	0.051	A	248	0.165	A
North Fair Oaks Avenue	SB on from NB North Fair Oaks Avenue	1	1,500	5,440	177	0.118	A	381	0.254	A	0	0.00%	0	0.00%	177	0.118	A	381	0.254	A
	NB off to North Fair Oaks Avenue	1	1,500	7,663	232	0.155	A	522	0.348	A	0	0.00%	0	0.00%	232	0.155	A	522	0.348	A
	SB off to NB North Fair Oaks Avenue	1	1,500	1,208	35	0.023	A	94	0.063	A	0	0.00%	0	0.00%	35	0.023	A	94	0.063	A
	SB on from SB North Fair Oaks Avenue	1	1,500	2,293	57	0.038	A	159	0.106	A	0	0.00%	0	0.00%	57	0.038	A	159	0.106	A
	NB on from North Fair Oaks Avenue	1	1,500	5,025	260	0.173	A	345	0.230	A	0	0.00%	0	0.00%	260	0.173	A	345	0.230	A
	SB off to SB North Fair Oaks Avenue	1	1,500	3,963	91	0.061	A	303	0.202	A	0	0.00%	0	0.00%	91	0.061	A	303	0.202	A
Lawrence Expressway	SB on from NB Lawrence Expressway	2	3,000	7,402	206	0.069	A	566	0.189	A	87	42.23%	87	15.37%	293	0.098	A	653	0.218	A
	NB off to Lawrence Expressway	2	3,000	10,916	325	0.108	A	789	0.263	A	391	120.31%	391	49.56%	716	0.239	A	1,180	0.393	B
	SB off to Lawrence Expressway	1	1,500	8,508	189	0.126	A	693	0.462	B	695	367.72%	695	100.29%	884	0.589	C	1,388	0.925	D
	NB on from NB Lawrence Expressway	2	3,000	4,930	165	0.055	A	352	0.117	A	0	0.00%	0	0.00%	165	0.055	A	352	0.117	A
	SB on from SB Lawrence Expressway	1	1,500	3,177	101	0.067	A	194	0.129	A	340	336.63%	340	175.26%	441	0.294	A	534	0.356	A
	NB on from SB Lawrence Expressway	1	1,500	3,936	155	0.103	A	254	0.169	A	0	0.00%	0	0.00%	155	0.103	A	254	0.169	A
Great America Parkway	NB off to Great America Parkway	1	1,500	9,301	429	0.286	A	631	0.421	B	1032	240.56%	1032	163.55%	1,461	0.974	E	1,663	1.109	F
	SB on from NB Great America Parkway	1	1,500	2,896	74	0.049	A	218	0.145	A	52	70.27%	52	23.85%	126	0.084	A	270	0.180	A
	NB on from NB Great America Parkway	1	1,500	1,372	30	0.020	A	118	0.079	A	30	100.00%	30	25.42%	60	0.040	A	148	0.099	A
	SB on from SB Great America Parkway	1	1,500	6,769	177	0.118	A	466	0.311	A	0	0.00%	0	0.00%	177	0.118	A	466	0.311	A
	NB on from SB Great America Parkway	1	1,500	3,591	96	0.064	A	278	0.185	A	3	3.13%	3	1.08%	99	0.066	A	281	0.187	A
	SB off to Great America Parkway	1	1,500	5,954	216	0.144	A	395	0.263	A	757	350.46%	757	191.65%	973	0.649	C	1,152	0.768	C
San Tomas Expressway	NB off to NB San Tomas Expressway	1	1,500	5,355	194	0.129	A	393	0.262	A	720	371.13%	720	183.21%	914	0.609	C	1,113	0.742	C
	NB off to SB San Tomas Expressway	1	1,500	4,770	134	0.089	A	352	0.235	A	0	0.00%	0	0.00%	134	0.089	A	352	0.235	A
	SB on from SB San Tomas Expressway	1	1,500	6,117	134	0.089	A	322	0.215	A	0	0.00%	0	0.00%	134	0.089	A	322	0.215	A
	SB on from NB San Tomas Expressway	1	1,500	3,902	166	0.111	A	269	0.179	A	0	0.00%	0	0.00%	166	0.111	A	269	0.179	A
	NB on from SB San Tomas Expressway	2	3,000	4,945	181	0.060	A	337	0.112	A	195	107.73%	195	57.86%	376	0.125	A	532	0.177	A
	NB on from NB San Tomas Expressway	1	1,500	3,745	157	0.105	A	276	0.184	A	72	45.86%	72	26.09%	229	0.153	A	348	0.232	A
	SB off to SB San Tomas Expressway	1	1,500	3,865	91	0.061	A	299	0.199	A	0	0.00%	0	0.00%	91	0.061	A	299	0.199	A
	SB off to NB San Tomas Expressway	1	1,500	4,743	159	0.106	A	375	0.250	A	722	454.09%	722	192.53%	881	0.587	C	1,097	0.731	C
I-880																				
Tasman Drive	NB off to Great Mall Expressway	2	3,000	6,014	133	0.044	A	519	0.173	A	0	0.00%	0	0.00%	133	0.044	A	519	0.173	A
	SB on from Tasman Drive	1	1,500	7,102	84	0.056	A	664	0.443	B	0	0.00%	0	0.00%	84	0.056	A	664	0.443	B
	NB on from Tasman Drive	1	1,500	7,544	83	0.055	A	777	0.518	B	0	0.00%	0	0.00%	83	0.055	A	777	0.518	B
	SB off to Tasman Drive/Great Mall Expwy	1	1,500	3,558	38	0.025	A	342	0.228	A	0	0.00%	0	0.00%	38	0.025	A	342	0.228	A
SR-237																				
Mathilda Avenue	EB off to Mathilda Avenue	2	3,000	2,089	80	0.027	A	134	0.045	A	0	0.00%	0	0.00%	80	0.027	A	134	0.045	A
	WB on from Mathilda Avenue	1	1,500	5,073	150	0.100	A	333	0.222	A	0	0.00%	0	0.00%	150	0.100	A	333	0.222	A
	EB on from Mathilda Avenue	1	1,500	5,011	160	0.107	A	353	0.235	A	0	0.00%	0	0.00%	160	0.107	A	353	0.235	A
	WB off to Mathilda Avenue	1	1,500	5,878	82	0.055	A	409	0.273	A	0	0.00%	0	0.00%	82	0.055	A	409	0.273	A
North Fair Oaks Avenue	EB off to North Fair Oaks Avenue	1	1,500	1,248	21	0.014	A	86	0.057	A	0	0.00%	0	0.00%	21	0.014	A	86	0.057	A
	WB on from Crossman Avenue/Java Drive	1	1,500	820	34	0.023	A	52	0.035	A	0	0.00%	0	0.00%	34	0.023	A	52	0.035	A
Lawrence Expressway	WB on from SB Lawrence Expressway	1	1,500	579	14	0.009	A	77	0.051	A	0	0.00%	0	0.00%	14	0.009	A	77	0.051	A
	WB on from NB Lawrence Expressway	1	1,500	886	32	0.021	A	66	0.044	A	0	0.00%	0	0.00%	32	0.021	A	66	0.044	A
	EB off to SB Lawrence Expressway	1	1,500	1,262	26	0.017	A	104	0.069	A	417	1603.85%	417	400.96%	443	0.295	A	521	0.347	A
	EB off to NB Lawrence Expressway	1	1,500	290	24	0.016	A	17	0.011	A	0	0.00%	0	0.00%	24	0.016	A	17	0.011	A
	WB off to SB Lawrence Expressway	1	1,500	9,041	181	0.121	A	635	0.423	B	454	250.83%	454	71.50%	635	0.423	B	1,089	0.726	C
	WB off to NB Lawrence Expressway	1	1,500	929	63	0.042	A	48	0.032	A	0	0.00%	0	0.00%	63	0.042	A	48	0.032	A
	EB on from SB Lawrence Expressway	1	1,500	1,440	19	0.013	A	161	0.107	A	0	0.00%	0	0.00%	19	0.013	A	161	0.107	A
	EB on from NB Lawrence Expressway	1	1,500	8,976	320	0.213	A	640	0.427	B	516	161.25%	516	80.63%	836	0.557	C	1,156	0.771	C
Great America Parkway	EB off Great America Parkway	1	1,500	2,138	66	0.044	A	148	0.099	A	731	1107.58%	731	493.92%	797	0.531	B	879	0.586	C
	WB on from Great America Parkway	1	1,500	2,263	104	0.069	A	166	0.111	A	0	0.00%	0	0.00%	104	0.069	A	166	0.111	A
	WB off to Great America Parkway	1	1,500	6,231	207	0.138	A	412	0.275	A	1007	486.47%	1007	244.42%	1,214	0.809	D	1,419	0.946	E
	EB on from Great America Parkway	1	1,500	6,000	170	0.113	A	461	0.307	A	0	0.00%	0	0.00%	170	0.113	A	461	0.307	A
North First Street	WB on from North First Steet	1	1,500	3,211	90	0.060	A	197	0.131	A	243	270.00%	243	123.35%	333	0.222	A	440	0.293	A
	EB off to North First Steet	1	1,500	3,048	210	0.140	A	167	0.111	A	179	85.24%	179	107.19%	389	0.259	A	346	0.231	A
	WB off to North First Steet	1	1,500	5,254	367	0.245	A	304	0.203	A	616	167.85%	616	202.63%	983	0.655	C	920	0.613	C
	EB on from North First Steet	1	1,500	5,492	149	0.099	A	378	0.252	A	0	0.00%	0	0.00%	149	0.099	A	378	0.252	A

Notes:
1. Capacity of freeway lanes based on assumed capacity of 1,500 vphpl for all ramps, as prescribed by the Highway Capacity Manual
2. Data provided by Caltrans Data System: 2006 Ramp Volumes on the California State Freeway System. District 4

Table 20
Project Weekday Freeway Segment Levels of Service Summary

				Existing Plus Project Conditions														Project Trips				
				Mixed-Flow						HOV Lane								Mixed-Flow			HOV Lane	
Freeway	Segment	Direction	Peak Hour	Ave. Speed/a/	# of Lanes	Capacity (vph)	Volume/a/	V/C	Density	LOS	Ave. Speed/a/	# of Lanes	Capacity (vph)	Volume/a/	V/C	Density	LOS	Total Volume	Volume	% Capacity	Volume	% Capacity
US-101	I-880 to Old Bayshore Highway	NB	3-5 PM	66	3	6,900	4,877	0.707	24.6	C	47	1	1,800	718	0.399	15.3	B	897	782	11.3%	115	6.4%
			4-6 PM	66	3	6,900	6,156	0.892	31.1	D	47	1	1,800	906	0.504	19.3	C	1842	1,606	23.3%	236	13.1%
US-101	Old Bayshore Highway to North First Street	NB	3-5 PM	66	3	6,900	5,770	0.836	29.1	D	15	1	1,800	833	0.463	55.5	F	897	784	11.4%	113	6.3%
			4-6 PM	66	3	6,900	7,150	1.036	36.1	D	15	1	1,800	1,032	0.574	68.8	F	1842	1,610	23.3%	232	12.9%
US-101	North First Street to SR-87	NB	3-5 PM	67	3	6,900	3,466	0.502	17.2	B	19	1	1,800	689	0.383	36.2	D	897	748	10.8%	149	8.3%
			4-6 PM	67	3	6,900	4,557	0.660	22.7	C	19	1	1,800	905	0.503	47.6	E	1842	1,537	22.3%	305	17.0%
US-101	SR-87 to De La Cruz Boulevard	NB	3-5 PM	58	3	6,900	6,756	0.979	38.8	D	21	1	1,800	756	0.420	36.0	D	897	807	11.7%	90	5.0%
			4-6 PM	58	3	6,900	8,267	1.198	47.5	E	21	1	1,800	925	0.514	44.1	D	1842	1,657	24.0%	185	10.3%
US-101	De La Cruz Boulevard to Montaque Expressway/ Santa Tomas Expressway	NB	3-5 PM	45	3	6,900	6,630	0.961	49.1	E	62	1	1,800	819	0.455	13.2	B	897	798	11.6%	99	5.5%
			4-6 PM	45	3	6,900	8,120	1.177	60.1	F	62	1	1,800	1,002	0.557	16.2	B	1842	1,640	23.8%	202	11.2%
US-101	Montaque Expressway/ Santa Tomas Expressway to Bowers Avenue/ Great America Parkway	NB	3-5 PM	65	3	6,900	5,802	0.841	29.8	D	66	1	1,800	687	0.382	10.4	A	792	708	10.3%	84	4.7%
			4-6 PM	65	3	6,900	7,072	1.025	36.3	D	66	1	1,800	837	0.465	12.7	B	1579	1,412	20.5%	167	9.3%
US-101	Bowers Avenue/Great America Parkway to Lawrence Expressway	NB	3-5 PM	42	3	6,900	6,342	0.919	50.3	E	66	1	1,800	876	0.487	13.3	B	765	672	9.7%	93	5.2%
			4-6 PM	42	3	6,900	6,300	0.913	50.0	E	66	1	1,800	870	0.483	13.2	B	0	0	0.0%	0	0.0%
US-101	Lawrence Expressway to Fair Oaks Avenue	NB	3-5 PM	61	3	6,900	6,687	0.969	36.5	D	66	1	1,800	1,025	0.569	15.5	B	872	756	11.0%	116	6.4%
			4-6 PM	61	3	6,900	6,590	0.955	36.0	D	66	1	1,800	1,010	0.561	15.3	B	0	0	0.0%	0	0.0%
US-101	Fair Oaks Avenue to Mathilda Avenue	NB	3-5 PM	65	3	6,900	6,200	0.899	31.8	D	52	1	1,800	963	0.535	18.5	C	872	755	10.9%	117	6.5%
			4-6 PM	65	3	6,900	6,050	0.877	31.0	D	52	1	1,800	940	0.522	18.1	C	0	0	0.0%	0	0.0%
US-101	Mathilda Avenue to SR-237	NB	3-5 PM	66	3	6,900	5,251	0.761	26.5	D	55	1	1,800	2,182	1.212	39.7	D	872	616	8.9%	256	14.2%
			4-6 PM	66	3	6,900	5,150	0.746	26.0	D	55	1	1,800	2,140	1.189	38.9	D	0	0	0.0%	0	0.0%
I-880	US-101 to Brokaw Road	NB	3-5 PM	65	3	6,900	5,265	0.763	27.0	D	--	--	--	--	--	--	--	0	0	0.0%	--	--
			4-6 PM	65	3	6,900	5,850	0.848	30.0	D	--	--	--	--	--	--	--	0	0	0.0%	--	--
I-880	Brokaw Road to Montague Expressway	NB	3-5 PM	66	3	6,900	4,635	0.672	23.4	C	--	--	--	--	--	--	--	0	0	0.0%	--	--
			4-6 PM	66	3	6,900	5,150	0.746	26.0	D	--	--	--	--	--	--	--	0	0	0.0%	--	--
I-880	Montague Expressway to Great Mall Parkway	NB	3-5 PM	66	3	6,900	4,635	0.672	23.4	C	--	--	--	--	--	--	--	0	0	0.0%	--	--
			4-6 PM	66	3	6,900	5,150	0.746	26.0	D	--	--	--	--	--	--	--	0	0	0.0%	--	--
I-880	Great Mall Parkway to SR-237	NB	3-5 PM	47	3	6,900	6,186	0.897	43.9	D	--	--	--	--	--	--	--	345	345	5.0%	--	--
			4-6 PM	47	3	6,900	6,601	0.957	46.8	E	--	--	--	--	--	--	--	111	111	1.6%	--	--
SR-237	US-101 to Mathilda Avenue	EB	3-5 PM	66	2	4,400	3,598	0.818	27.3	D	--	--	--	--	--	--	--	394	394	9.0%	--	--
			4-6 PM	66	2	4,400	4,371	0.993	33.1	D	--	--	--	--	--	--	--	811	811	18.4%	--	--
SR-237	Mathilda Avenue to N. Fair Oaks Avenue	EB	3-5 PM	64	2	4,400	4,138	0.940	32.3	D	67	1	1,800	657	0.365	9.8	A	394	340	7.7%	54	3.0%
			4-6 PM	64	2	4,400	4,920	1.118	38.4	D	67	1	1,800	781	0.434	11.7	B	811	700	15.9%	111	6.2%
SR-237	N. Fair Oaks Avenue to Lawrence Expressway	EB	3-5 PM	15	2	4,400	2,961	0.673	98.7	F	66	1	1,800	745	0.414	11.3	B	394	315	7.2%	79	4.4%
			4-6 PM	15	2	4,400	3,588	0.815	119.6	F	66	1	1,800	903	0.502	13.7	B	811	648	14.7%	163	9.1%
SR-237	Lawrence Expressway to Great America Parkway	EB	3-5 PM	18	2	4,400	3,064	0.696	85.1	F	66	1	1,800	908	0.505	13.8	B	273	211	4.8%	62	3.5%
			4-6 PM	18	2	4,400	3,603	0.819	100.1	F	66	1	1,800	1,069	0.594	16.2	B	562	433	9.9%	129	7.1%
SR-237	Great America Parkway to North First Street	EB	3-5 PM	16	2	4,400	3,208	0.729	100.3	F	66	1	1,800	1,620	0.900	24.5	C	751	499	11.3%	252	14.0%
			4-6 PM	16	2	4,400	3,019	0.686	94.3	F	66	1	1,800	1,524	0.847	23.1	C	13	9	0.2%	4	0.2%
SR-237	North First Street to Zanker Road	EB	3-5 PM	27	2	4,400	3,940	0.895	73.0	F	66	1	1,800	1,954	1.086	29.6	D	872	583	13.2%	289	16.1%
			4-6 PM	27	2	4,400	3,730	0.848	69.1	F	66	1	1,800	1,850	1.028	28.0	D	0	0	0.0%	0	0.0%
SR-237	Zanker Road to McCarthy Boulevard	EB	3-5 PM	52	2	4,400	4,546	1.033	43.7	D	66	1	1,800	1,924	1.069	29.2	D	872	613	13.9%	259	14.4%
			4-6 PM	52	2	4,400	4,370	0.993	42.0	D	66	1	1,800	1,850	1.028	28.0	D	0	0	0.0%	0	0.0%
SR-237	McCarthy Boulevard to I-880	EB	3-5 PM	38	2	4,400	6,416	1.458	84.4	F	--	1	1,800	--	--	--	--	872	872	19.8%	--	--
			4-6 PM	38	2	4,400	6,160	1.400	81.1	F	--	1	1,800	--	--	--	--	0	0	0.0%	--	--

Table 20
Project Weekday Freeway Segment Levels of Service Summary (cont'd)

				Existing Plus Project Conditions														Project Trips				
				Mixed-Flow						HOV Lane									Mixed-Flow		HOV Lane	
Freeway	Segment	Direction	Peak Hour	Ave. Speed/a/	# of Lanes	Capacity (vph)	Volume/a/	V/C	Density	LOS	Ave. Speed/a/	# of Lanes	Capacity (vph)	Volume/a/	V/C	Density	LOS	Total Volume	Volume	% Capacity	Volume	% Capacity
SR-237	I-880 to McCarthy Boulevard	WB	3-5 PM	65	3	6,900	6,152	0.892	31.5	D	--	--	--	--	--	--	--	1058	1,058	15.3%	--	--
			4-6 PM	65	3	6,900	7,834	1.135	40.2	D	--	--	--	--	--	--	--	2174	2,174	31.5%	--	--
SR-237	McCarthy Boulevard to Zanker Road	WB	3-5 PM	16	2	5,280	4,076	0.772	106.1	F	27	1	1,800	1,140	0.633	42.2	D	1058	827	15.7%	231	12.8%
			4-6 PM	16	2	5,280	5,309	1.005	138.2	F	27	1	1,800	1,485	0.825	55.0	E	2174	1,699	32.2%	475	26.4%
SR-237	Zanker Road to North First Street	WB	3-5 PM	38	2	4,400	4,539	1.032	59.7	F	32	1	1,800	1,118	0.621	34.9	D	1058	849	19.3%	209	11.6%
			4-6 PM	38	2	4,400	5,844	1.328	76.9	F	32	1	1,800	1,440	0.800	45.0	D	2174	1,744	39.6%	430	23.9%
SR-237	North First Street to Great America Parkway	WB	3-5 PM	58	2	4,400	3,969	0.902	34.2	D	59	1	1,800	783	0.435	13.3	B	0	0	0.0%	0	0.0%
			4-6 PM	58	2	4,400	6,226	1.415	53.7	E	59	1	1,800	1,228	0.682	20.8	C	2174	1,816	41.3%	358	19.9%
SR-237	Great America Parkway to Lawrence Expressway	WB	3-5 PM	51	2	4,400	4,443	1.010	43.6	D	64	1	1,800	810	0.450	12.7	B	582	492	11.2%	90	5.0%
			4-6 PM	51	2	4,400	4,390	0.998	43.0	D	64	1	1,800	800	0.444	12.5	B	0	0	0.0%	0	0.0%
SR-237	Lawrence Expressway to Fair Oaks Avenue	WB	3-5 PM	63	2	4,400	4,272	0.971	33.9	D	66	1	1,800	1,647	0.915	25.0	C	582	420	9.5%	162	9.0%
			4-6 PM	63	2	4,400	4,280	0.973	34.0	D	66	1	1,800	1,650	0.917	25.0	C	0	0	0.0%	0	0.0%
SR-237	Fair Oaks Avenue to Mathilda Avenue	WB	3-5 PM	51	3	6,900	6,504	0.943	42.5	D	--	--	--	--	--	--	--	582	582	8.4%	--	--
			4-6 PM	51	3	6,900	6,580	0.954	43.0	D	--	--	--	--	--	--	--	0	0	0.0%	--	--
SR-237	Mathilda Avenue to US-101	WB	3-5 PM	54	2	4,400	4,569	1.038	42.3	D	--	--	--	--	--	--	--	582	582	13.2%	--	--
			4-6 PM	54	2	4,400	4,430	1.007	41.0	D	--	--	--	--	--	--	--	0	0	0.0%	--	--
I-880	SR-237 to Great Mall Parkway	SB	3-5 PM	66	3	6,900	3,744	0.543	18.9	C	--	--	--	--	--	--	--	0	0	0.0%	--	--
			4-6 PM	66	3	6,900	4,160	0.603	21.0	C	--	--	--	--	--	--	--	0	0	0.0%	--	--
I-880	Great Mall Parkway to Montague Expressway	SB	3-5 PM	19	3	6,900	4,365	0.633	76.6	F	--	--	--	--	--	--	--	0	0	0.0%	--	--
			4-6 PM	19	3	6,900	4,850	0.703	85.1	F	--	--	--	--	--	--	--	0	0	0.0%	--	--
I-880	Montague Expressway to Brokaw Road	SB	3-5 PM	21	3	6,900	4,536	0.657	72.0	F	--	--	--	--	--	--	--	0	0	0.0%	--	--
			4-6 PM	21	3	6,900	5,040	0.730	80.0	F	--	--	--	--	--	--	--	0	0	0.0%	--	--
I-880	Brokaw Road to US-101	SB	3-5 PM	18	3	6,900	4,275	0.620	79.2	F	--	--	--	--	--	--	--	0	0	0.0%	--	--
			4-6 PM	18	3	6,900	4,750	0.688	88.0	F	--	--	--	--	--	--	--	0	0	0.0%	--	--
US-101	SR-237 to Mathilda Avenue	SB	3-5 PM	66	3	6,900	5,093	0.738	25.7	C	66	1	1,800	1,492	0.829	22.6	C	825	638	9.2%	187	10.4%
			4-6 PM	66	3	6,900	6,261	0.907	31.6	D	66	1	1,800	1,834	1.019	27.8	D	1695	1,311	19.0%	384	21.3%
US-101	Mathilda Avenue to Fair Oaks Avenue	SB	3-5 PM	51	3	6,900	6,632	0.961	43.3	D	66	1	1,800	1,078	0.599	16.3	B	825	710	10.3%	115	6.4%
			4-6 PM	51	3	6,900	8,038	1.165	52.5	E	66	1	1,800	1,307	0.726	19.8	C	1695	1,458	21.1%	237	13.2%
US-101	Fair Oaks Avenue to Lawrence Expressway	SB	3-5 PM	20	3	6,900	5,049	0.732	84.2	F	67	1	1,800	1,827	1.015	27.3	D	846	621	9.0%	225	12.5%
			4-6 PM	20	3	6,900	6,197	0.898	103.3	F	67	1	1,800	2,242	1.246	33.5	D	1739	1,277	18.5%	462	25.7%
US-101	Lawrence Expressway to Bowers Avenue/ Great America Parkway	SB	3-5 PM	9	3	6,900	3,480	0.504	128.9	F	67	1	1,800	2,190	1.217	32.7	D	846	519	7.5%	327	18.2%
			4-6 PM	9	3	6,900	4,357	0.632	161.4	F	67	1	1,800	2,742	1.523	40.9	D	1739	1,067	15.5%	672	37.3%
US-101	Bowers Avenue/ Great America Parkway to Montague Expressway/ San Tomas Expressway	SB	3-5 PM	10	3	6,900	3,699	0.536	123.3	F	67	1	1,800	2,072	1.151	30.9	D	884	567	8.2%	317	17.6%
			4-6 PM	10	3	6,900	3,480	0.504	116.0	F	67	1	1,800	1,950	1.083	29.1	D	0	0	0.0%	0	0.0%
US-101	Montague Expressway/San Tomas Expressway to De La Cruz Boulevard	SB	3-5 PM	13	3	6,900	4,144	0.601	106.2	F	67	1	1,800	2,290	1.272	34.2	D	872	562	8.1%	310	17.2%
			4-6 PM	13	3	6,900	3,980	0.577	102.1	F	67	1	1,800	2,200	1.222	32.8	D	0	0	0.0%	0	0.0%
US-101	De La Cruz Boulevard to SR-87	SB	3-5 PM	28	3	6,900	5,701	0.826	67.9	F	67	1	1,800	2,137	1.187	31.9	D	872	634	9.2%	238	13.2%
			4-6 PM	28	3	6,900	5,630	0.816	67.0	F	67	1	1,800	2,110	1.172	31.5	D	0	0	0.0%	0	0.0%
US-101	SR-87 to North First Street	SB	3-5 PM	23	3	6,900	5,332	0.773	77.3	F	67	1	1,800	2,218	1.232	33.1	D	872	616	8.9%	256	14.2%
			4-6 PM	23	3	6,900	5,240	0.759	75.9	F	67	1	1,800	2,180	1.211	32.5	D	0	0	0.0%	0	0.0%
US-101	North First Street to Old Bayshore Highway	SB	3-5 PM	11	3	6,900	3,840	0.557	116.4	F	67	1	1,800	2,000	1.111	29.8	D	872	573	8.3%	299	16.6%
			4-6 PM	11	3	6,900	3,630	0.526	110.0	F	67	1	1,800	1,890	1.050	28.2	D	0	0	0.0%	0	0.0%
US-101	Old Bayshore Highway to I-880	SB	3-5 PM	11	3	6,900	3,898	0.565	118.1	F	67	1	1,800	2,086	1.159	31.1	D	872	568	8.2%	304	16.9%
			4-6 PM	11	3	6,900	3,700	0.536	112.1	F	67	1	1,800	1,980	1.100	29.6	D	0	0	0.0%	0	0.0%

a Source: Santa Clara Valley Transportation Authority Congestion Management Program Monitoring Study, 2006.

Table 21
Project Sunday Freeway Segment Levels of Service Summary

					Existing Plus Project Conditions						Project Trips	
					Mixed-Flow						Mixed-Flow	
Freeway	Segment	Direction	Study Period	Ave. Speed/a/	# of Lanes	Capacity (vph)	Volume/a/	Density	V/C	LOS	Volume	% Capacity
US-101	I-880 to Old Bayshore Highway	NB	11-1 PM	65	4	9,200	5,496	21.1	0.597	C	1,842	20.0%
			3-5 PM	65	4	9,200	6,018	23.1	0.654	C	1,842	20.0%
US-101	Old Bayshore Highway to North First Street	NB	11-1 PM	65	4	9,200	6,280	24.2	0.683	C	1,842	20.0%
			3-5 PM	65	4	9,200	6,914	26.6	0.752	D	1,842	20.0%
US-101	North First Street to SR-87	NB	11-1 PM	65	4	9,200	4,376	16.8	0.476	B	1,842	20.0%
			3-5 PM	65	4	9,200	4,738	18.2	0.515	C	1,842	20.0%
US-101	SR-87 to De La Cruz Boulevard	NB	11-1 PM	65	4	9,200	6,987	26.9	0.759	D	1,842	20.0%
			3-5 PM	65	4	9,200	7,722	29.7	0.839	D	1,842	20.0%
US-101	De La Cruz Boulevard to Montaque Expressway/ Santa Tomas Expressway	NB	11-1 PM	65	4	9,200	6,938	26.7	0.754	D	1,842	20.0%
			3-5 PM	65	4	9,200	7,666	29.5	0.833	D	1,842	20.0%
US-101	Montaque Expressway/ Santa Tomas Expressway to Bowers Avenue/ Great America Parkway	NB	11-1 PM	65	4	9,200	5,820	22.4	0.633	C	1,389	15.1%
			3-5 PM	65	4	9,200	6,453	24.8	0.701	C	1,389	15.1%
US-101	Bowers Avenue/Great America Parkway to Lawrence Expressway	NB	11-1 PM	65	4	9,200	5,410	20.8	0.588	C	391	4.3%
			3-5 PM	65	4	9,200	6,127	23.6	0.666	C	391	4.3%
US-101	Lawrence Expressway to Fair Oaks Avenue	NB	11-1 PM	65	4	9,200	5,320	20.5	0.578	C	0	0.0%
			3-5 PM	65	4	9,200	6,080	23.4	0.661	C	0	0.0%
US-101	Fair Oaks Avenue to Mathilda Avenue	NB	11-1 PM	65	4	9,200	4,893	18.8	0.532	C	0	0.0%
			3-5 PM	65	4	9,200	5,592	21.5	0.608	C	0	0.0%
US-101	Mathilda Avenue to SR-237	NB	11-1 PM	65	4	9,200	5,103	19.6	0.555	C	0	0.0%
			3-5 PM	65	4	9,200	5,832	22.4	0.634	C	0	0.0%
I-880	US-101 to Brokaw Road	NB	11-1 PM	65	3	6,900	4,095	21.0	0.593	C	0	0.0%
			3-5 PM	65	3	6,900	5,265	27.0	0.763	D	0	0.0%
I-880	Brokaw Road to Montague Expressway	NB	11-1 PM	65	3	6,900	3,605	18.5	0.522	C	0	0.0%
			3-5 PM	65	3	6,900	4,635	23.8	0.672	C	0	0.0%
I-880	Montague Expressway to Great Mall Parkway	NB	11-1 PM	65	3	6,900	3,605	18.5	0.522	C	0	0.0%
			3-5 PM	65	3	6,900	4,635	23.8	0.672	C	0	0.0%
I-880	Great Mall Parkway to SR-237	NB	11-1 PM	65	3	6,900	4,543	23.3	0.658	C	0	0.0%
			3-5 PM	65	3	6,900	5,841	30.0	0.847	D	0	0.0%
SR-237	US-101 to Mathilda Avenue	EB	11-1 PM	65	2	4,400	2,947	22.7	0.670	C	811	18.4%
			3-5 PM	65	2	4,400	2,591	19.9	0.589	C	811	18.4%
SR-237	Mathilda Avenue to N. Fair Oaks Avenue	EB	11-1 PM	65	3	6,900	3,745	19.2	0.543	C	811	11.8%
			3-5 PM	65	3	6,900	3,256	16.7	0.472	B	811	11.8%
SR-237	N. Fair Oaks Avenue to Lawrence Expressway	EB	11-1 PM	65	3	6,900	3,019	15.5	0.438	B	811	11.8%
			3-5 PM	65	3	6,900	2,651	13.6	0.384	B	811	11.8%
SR-237	Lawrence Expressway to Great America Parkway	EB	11-1 PM	65	3	6,900	3,375	17.3	0.489	B	909	13.2%
			3-5 PM	65	3	6,900	2,964	15.2	0.430	B	909	13.2%
SR-237	Great America Parkway to North First Street	EB	11-1 PM	65	3	6,900	2,897	14.9	0.420	B	179	2.6%
			3-5 PM	65	3	6,900	2,444	12.5	0.354	B	179	2.6%
SR-237	North First Street to Zanker Road	EB	11-1 PM	65	3	6,900	3,348	17.2	0.485	B	0	0.0%
			3-5 PM	65	3	6,900	2,790	14.3	0.404	B	0	0.0%
SR-237	Zanker Road to McCarthy Boulevard	EB	11-1 PM	65	3	6,900	3,732	19.1	0.541	C	0	0.0%
			3-5 PM	65	3	6,900	3,110	15.9	0.451	B	0	0.0%
SR-237	McCarthy Boulevard to I-880	EB	11-1 PM	65	3	6,900	3,696	19.0	0.536	C	0	0.0%
			3-5 PM	65	3	6,900	3,080	15.8	0.446	B	0	0.0%

Table 21
Project Sunday Freeway Segment Levels of Service Summary (cont'd)

					Existing Plus Project Conditions						Project Trips	
					Mixed-Flow						Mixed-Flow	
Freeway	Segment	Direction	Study Period	Ave. Speed/a/	# of Lanes	Capacity (vph)	Volume/a/	Density	V/C	LOS	Volume	% Capacity
SR-237	I-880 to McCarthy Boulevard	WB	11-1 PM	65	3	6,900	4,102	21.0	0.594	C	1,838	26.6%
			3-5 PM	65	3	6,900	3,536	18.1	0.512	C	1,838	26.6%
SR-237	McCarthy Boulevard to Zanker Road	WB	11-1 PM	65	3	7,820	3,686	16.7	0.471	B	1,838	23.5%
			3-5 PM	65	3	7,820	3,224	14.6	0.412	B	1,838	23.5%
SR-237	Zanker Road to North First Street	WB	11-1 PM	65	3	6,900	3,882	19.9	0.563	C	1,838	26.6%
			3-5 PM	65	3	6,900	3,371	17.3	0.489	B	1,838	26.6%
SR-237	North First Street to Great America Parkway	WB	11-1 PM	65	3	6,900	3,573	18.3	0.518	C	1,461	21.2%
			3-5 PM	65	3	6,900	3,045	15.6	0.441	B	1,461	21.2%
SR-237	Great America Parkway to Lawrence Expressway	WB	11-1 PM	65	3	6,900	2,530	13.0	0.367	B	454	6.6%
			3-5 PM	65	3	6,900	2,011	10.3	0.291	A	454	6.6%
SR-237	Lawrence Expressway to Fair Oaks Avenue	WB	11-1 PM	65	3	6,900	2,372	12.2	0.344	B	0	0.0%
			3-5 PM	65	3	6,900	1,779	9.1	0.258	A	0	0.0%
SR-237	Fair Oaks Avenue to Mathilda Avenue	WB	11-1 PM	65	3	6,900	2,632	13.5	0.381	B	0	0.0%
			3-5 PM	65	3	6,900	1,974	10.1	0.286	A	0	0.0%
SR-237	Mathilda Avenue to US-101	WB	11-1 PM	65	2	4,400	1,772	13.6	0.403	B	0	0.0%
			3-5 PM	65	2	4,400	1,329	10.2	0.302	A	0	0.0%
I-880	SR-237 to Great Mall Parkway	SB	11-1 PM	65	3	6,900	3,553	18.2	0.515	C	225	3.3%
			3-5 PM	65	3	6,900	2,721	14.0	0.394	B	225	3.3%
I-880	Great Mall Parkway to Montague Expressway	SB	11-1 PM	65	3	6,900	3,880	19.9	0.562	C	0	0.0%
			3-5 PM	65	3	6,900	2,910	14.9	0.422	B	0	0.0%
I-880	Montague Expressway to Brokaw Road	SB	11-1 PM	65	3	6,900	4,032	20.7	0.584	C	0	0.0%
			3-5 PM	65	3	6,900	3,024	15.5	0.438	B	0	0.0%
I-880	Brokaw Road to US-101	SB	11-1 PM	65	3	6,900	3,800	19.5	0.551	C	0	0.0%
			3-5 PM	65	3	6,900	2,850	14.6	0.413	B	0	0.0%
US-101	SR-237 to Mathilda Avenue	SB	11-1 PM	65	4	9,200	6,815	26.2	0.741	D	1,695	18.4%
			3-5 PM	65	4	9,200	4,895	18.8	0.532	C	1,695	18.4%
US-101	Mathilda Avenue to Fair Oaks Avenue	SB	11-1 PM	65	4	9,200	7,815	30.1	0.849	D	1,695	18.4%
			3-5 PM	65	4	9,200	5,520	21.2	0.600	C	1,695	18.4%
US-101	Fair Oaks Avenue to Lawrence Expressway	SB	11-1 PM	65	4	9,200	7,055	27.1	0.767	D	1,695	18.4%
			3-5 PM	65	4	9,200	5,045	19.4	0.548	C	1,695	18.4%
US-101	Lawrence Expressway to Bowers Avenue/ Great America Parkway	SB	11-1 PM	65	4	9,200	5,714	22.0	0.621	C	1,426	15.5%
			3-5 PM	65	4	9,200	4,106	15.8	0.446	B	1,426	15.5%
US-101	Bowers Avenue/ Great America Parkway to Montague Expressway/ San Tomas Expressway	SB	11-1 PM	65	4	9,200	5,066	19.5	0.551	C	722	7.8%
			3-5 PM	65	4	9,200	3,437	13.2	0.374	B	722	7.8%
US-101	Montague Expressway/San Tomas Expressway to De La Cruz Boulevard	SB	11-1 PM	65	4	9,200	4,944	19.0	0.537	C	0	0.0%
			3-5 PM	65	4	9,200	3,090	11.9	0.336	B	0	0.0%
US-101	De La Cruz Boulevard to SR-87	SB	11-1 PM	65	4	9,200	6,192	23.8	0.673	C	0	0.0%
			3-5 PM	65	4	9,200	3,870	14.9	0.421	B	0	0.0%
US-101	SR-87 to North First Street	SB	11-1 PM	65	4	9,200	5,936	22.8	0.645	C	0	0.0%
			3-5 PM	65	4	9,200	3,710	14.3	0.403	B	0	0.0%
US-101	North First Street to Old Bayshore Highway	SB	11-1 PM	65	4	9,200	4,416	17.0	0.480	B	0	0.0%
			3-5 PM	65	4	9,200	2,760	10.6	0.300	A	0	0.0%
US-101	Old Bayshore Highway to I-880	SB	11-1 PM	65	4	9,200	4,544	17.5	0.494	B	0	0.0%
			3-5 PM	65	4	9,200	2,840	10.9	0.309	A	0	0.0%

/a/ Source: Santa Clara Valley Transportation Authority Congestion Management Program Monitoring Study, 2006.

to each of the components of transit service to meet the anticipated demands of the stadium are described below.

Bus Service. Bus lines from various agencies in the Bay area could be adjusted or special game day buses added. Staging areas for transit buses will be provided along Stars and Stripes Drive and Tasman Drive, just west of the bridge over Lafayette Street. An exclusive ingress and egress route from Lafayette Street via Calle De Luna, Calle Del Sol, and Tasman Drive will be provided for transit buses.

Light Rail Service. As described previously, the VTA light rail service will be a highly desirable means of accessing the stadium due to park-and-ride lots located throughout the south bay and a LRT station within a few hundred feet of the stadium. Increased headways will be necessary to accommodate the demand for light rail. The closed area along Tasman Drive will serve as a staging area for fans to board the light rail at the Great America station.

Heavy Rail Service. Coordination between the heavy rail lines of Caltrain, ACE/Amtrak, and the Capitol Corridor line will be necessary. It may be possible to serve all heavy rail lines at the Great America station, but it will require joint-scheduling of trains, closure of tracks, and possible upgrades to equipment.

Arrival and Departure Roadway Capacities

There are seven major arterials that will provide ingress and egress access to the stadium core area and identified parking areas. With the peak period arrival and departure projections of 7,369 and 12,082, respectively, there will be a large demand on the major arterials and the freeway ramps that they serve. Table 22 indicates arrival and departure stadium trips on each of the primary arterials and freeway ramps that will provide access to the stadium core area. The distribution of trips on each of the arterials and freeway ramps analyzed are based upon the routes that attendees will be encouraged to use. Critical to the efficient ingress and egress of attendees will be the dispersal of motorists to the identified access and departure routes. Signage will be used to direct motorists to appropriate exits from the freeways and to access identified parking facilities. The identified routes and stadium trips are shown in Figure 50.

The projected traffic volumes indicate that the largest demands on the arterials serving the project area will be placed on Great America Parkway. It is projected that Great America Parkway will serve approximately 1,900 vehicles from the north and 1,800 vehicles from the south during the peak ingress hour and 2,100 vehicles from the to and 2,900 vehicles to the south during the peak egress hour. Though arterial lanes have the capacity to serve as much as 1,800 vph, a lane capacity of only 1,000 vph was assumed to account for pedestrian conflicts and general driver confusion. Based upon existing capacities of the major arterials, it was calculated that it will take no longer than 45-minutes to serve arriving attendees. Since larger volumes of attendees are projected to depart during the first hour after the game, it will take up to one hour and 20-minutes to serve the peak departure demand on arterials.

Ramp volumes indicate that the freeway ramps at the US 101/ Great America Parkway and SR 237/ Great America Parkway interchanges will serve the largest arrival and departure volume demands. Demands at these two interchange ramps during the peak arrival period will be approximately 1,000 vph, and 1,700 vph during the peak departure period. Based upon existing ramp capacities (assuming lane capacities of 1,000 vph), it will take no longer than one hour to serve the peak arrival demand and one hour and 40 minutes to serve the peak departure demand.

Though arrival and departure demands are projected to exceed existing capacities of the most heavily utilized arterials and ramps, the congestion is expected to dissipate rapidly upon service of the peak demand periods, which will not last more than two hours. It also is likely that motorists will seek alternative routes when wait times at freeway off-ramp become too lengthy. The TMP will implement measures to control the effects of diversion and maintain freeway mainline flow.

Residential Parking Control

Uniformed officers will be responsible for the enforcement of residential parking restrictions in the stadium area. The residential areas located east of Lawrence Expressway between US 101 and Tasman Drive and west of Lafayette Street between Agnew Road and Tasman Drive could potentially be the most affected by stadium parking. An officer will be positioned along with barricades at each of the access points to the neighborhoods. The neighborhoods also will be patrolled to ensure attendees do not park within the neighborhoods or violate parking restrictions. Access to the Adobe Wells mobile home park that is located along the south side of Tasman Drive is provided at Adobe Wells. It is likely that during the peak hours of arrival and departure of attendees that Tasman Drive will experience congestion restricting access to the mobile home park. Thus, it will be necessary for officers to monitor traffic conditions and ensure that residents of the mobile home park have the ability to enter and exit the park entrance.

Pedestrian Routes

With the large numbers of attendees expected for the football games and the use of essentially all parking within a 20-minute walk of the stadium, a large number of fans will be utilizing many streets in the area to get from parking to the stadium. For the most part, pedestrians will not have to cross vehicular traffic, but there are a few areas that will present a conflict between vehicles and pedestrians. The conflict points will be located at signalized intersections with crosswalks that serve as primary entry to identified parking areas. Pedestrians traveling to parking areas northwest of the stadium would cross Great America at either Tasman Drive or Bunker Hill, those traveling west and southwest of the stadium would cross Great America Parkway at Tasman Drive, Old Glory Lane, Patrick Henry Drive, or Mission College Boulevard. Each of the conflict points will be officer controlled to provide an efficient flow of both vehicular and pedestrian traffic. Pedestrians traveling east of the stadium would travel along Tasman Drive and not encounter conflicts with vehicular traffic. Those traveling south of the stadium would utilize the San Tomas Aquino Creek trail or Great America parkway and one of the pedestrian bridges across San Tomas Aquino Creek Pedestrian routes and volumes are shown in Figure 51.

The intersection of Great America Parkway and Tasman Drive will serve as the main gateway to the stadium from the majority of identified parking and each of the roadways will provide access from nearly every parking zone. Tasman Drive between Centennial Boulevard and the Great America parking lot driveway will be temporarily closed to vehicular traffic to accommodate the large crowds before and after games. The closure of Tasman Drive will prohibit through traffic along Tasman Drive east of Great America Parkway, but will allow access to parking in the Great America surface lots. Should it be found that vehicular traffic presents a conflict with and impedes pedestrian flow along Tasman Drive, all vehicular access on Tasman Drive should be prohibited.

To further facilitate pedestrian traffic the existing overflow parking lot bridge and the Tasman Drive over-crossing will be widened along with the construction of a new pedestrian-only bridge south of the Tasman Bridge over San Tomas Aquino Creek.

Charter Bus Staging

Parking for charter buses will be permitted along Patrick Henry Drive/Old Ironsides Drive on the north and south of Tasman Drive. There is adequate parking for up to 195 buses within the specified loop. All charter buses will remain parked for the duration of the football game. All buses will enter and exit via Tasman Drive to the west.

Multi-Team Use of Stadium

Though there currently is no specific plans for the use of the stadium by a second NFL team nor has potential teams, existing or future expansion, been identified, there is the potential that a second NFL team may utilize the stadium.

The origin and fan base of a second team is unknown at this time. But regardless of whether a second team is relocated or is an expansion team, it is expected that the effects on the transportation system by a second team would be similar to those identified within this report for the 49er football games. Though the origin of fans may be slightly different from that which was identified within the report based upon the 49er fan base, the overall effects on the facilities studied in the report and within Santa Clara County as a whole would be similar. The distribution of fans will be dependent upon the origins of a second team. Should the second team be relocated from within the Bay Area to the new stadium, the fan distribution could be slightly different than that of the 49ers outside of Santa Clara County, but overall effects within Santa Clara County would be similar to 49er games. Should the second team be relocated from outside the Bay Area it is likely that a greater amount of fans would originate from within Santa Clara County, and mirror the effects on the transportation system of the 49er games.

Though the effects on the transportation system due to the potential second team use of the stadium would be similar to the 49er games, the second team would double the amount of games held at the stadium, therefore increasing the frequency of impacts identified for the 49er games. It is expected that the proposed TMP to be utilized for 49er games would also be implemented for games of the second team.

Non-Football Events

The stadium may also be utilized to host non-football events throughout the year. Possible events include motocross, x-games, concerts, soccer games, and various festivals. Larger non-football events that would require the use of off-site parking will be restricted to non-summer months to avoid conflict with Great America theme park and take place during evenings and on weekends to avoid conflict with the surrounding office/industrial land uses. Times of use for smaller events that would only utilize on-site stadium parking will not be restricted. A scaled version of the game day TMP plan will also be implemented during larger non-football events.

This traffic study does not include detailed analysis of non-football events because the attendance of the events would be significantly less than football games. Thus, the analysis of the football games provides a worst-case evaluation of traffic impacts of the stadium. Table 23 presents potential non-football events and their projected attendance.

LEGEND

XX(XX) = Arrival(Departure) Project Trips

= Project Site

Source: Google Earth

Figure 50

IDENTIFIED ROUTES AND STADIUM PROJECT TRIPS

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.

Source: Google Earth

LEGEND

XXX = Number of Pedestrians

= Identified Pedestrian Routes

= Project Site

Figure 51

PEDESTRIAN ROUTES AND VOLUMES

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.

Table 22
Arrival and Departure Roadway Capacities

Street	Number of Lanes	Capacity /a/	Arrival Project Trips	Arrival Time Takes To Dissipate (hour:min)	Departure Project Trips	Departure Time Takes To Dissipate (hour:min)
Great America Parkway (North)	3	3,000	1,866	00:37.0	2,109	00:42.0
Great America Parkway (South)	3	3,000	1,808	00:36.0	2,906	00:58.0
Tasman Drive (East)	2	2,000	444	00:13.0	790	00:23.0
Tasman Drive (West)	2	2,000	1,279	00:38.0	2,744	01:22.0
Lafayette Street (South)	2	2,000	241	00:07.0	430	00:12.0
Lick Mill Boulevard	2	2,000	231	00:06.0	412	00:12.0
Mission College Boulevard	2	2,000	1,500	00:44.0	2,672	01:20.0
Total			7,369		12,062	

Ramp	Number of Lanes	Capacity /a/	Arrival Project Trips	Arrival Time Takes To Dissipate (hour:min)	Departure Project Trips	Departure Time Takes To Dissipate (hour:min)
US 101						
Lawrence Expressway Ramps						
SB on from NB Lawrence Expressway	2	2,000	87	00:02.0	0	00:00.0
NB off to Lawrence Expressway	2	2,000	391	00:11.0	655	00:19.0
SB off to Lawrence Expressway	1	1,000	695	00:41.0	0	00:00.0
NB on from NB Lawrence Expressway	2	2,000	0	00:00.0	0	00:00.0
SB on from SB Lawrence Expressway	1	1,000	340	00:20.0	639	00:38.0
NB on from SB Lawrence Expressway	1	1,000	0	00:00.0	1,389	01:23.0
Great America Parkway Ramps						
NB off to Great America Parkway	1	1,000	1,032	01:01.0	85	00:05.0
SB on from NB Great America Parkway	1	1,000	52	00:03.0	0	00:00.0
NB on from NB Great America Parkway	1	1,000	30	00:01.0	0	00:00.0
SB on from SB Great America Parkway	1	1,000	0	00:00.0	1,688	01:41.0
NB on from SB Great America Parkway	1	1,000	3	00:00.0	943	00:56.0
SB off to Great America Parkway	1	1,000	757	00:45.0	54	00:03.0
San Tomas Expressway Ramps						
NB off to NB San Tomas Expressway	1	1,000	720	00:43.0	0	00:00.0
NB off to SB San Tomas Expressway	1	1,000	0	00:00.0	0	00:00.0
SB on from SB San Tomas Expressway	1	1,000	0	00:00.0	1,179	01:10.0
SB on from NB San Tomas Expressway	1	1,000	0	00:00.0	0	00:00.0
NB on from SB San Tomas Expressway	2	2,000	195	00:05.0	1,182	00:35.0
NB on from NB San Tomas Expressway	1	1,000	72	00:04.0	0	00:00.0
SB off to SB San Tomas Expressway	1	1,000	0	00:00.0	118	00:07.0
SB off to NB San Tomas Expressway	1	1,000	722	00:43.0	319	00:19.0
SR 237						
Lawrence Expressway Ramps						
WB on from SB Lawrence Expressway	1	1,000	0	00:00.0	0	00:00.0
WB on from NB Lawrence Expressway	1	1,000	0	00:00.0	803	00:48.0
EB off to SB Lawrence Expressway	1	1,000	417	00:25.0	0	00:00.0
EB off to NB Lawrence Expressway	1	1,000	0	00:00.0	0	00:00.0
WB off to SB Lawrence Expressway	1	1,000	454	00:27.0	822	00:49.0
WB off to NB Lawrence Expressway	1	1,000	0	00:00.0	0	00:00.0
EB on from SB Lawrence Expressway	1	1,000	0	00:00.0	0	00:00.0
EB on from NB Lawrence Expressway	1	1,000	516	00:30.0	743	00:44.0
Great America Parkway Ramps						
EB off Great America Parkway	1	1,000	731	00:43.0	0	00:00.0
WB on from Great America Parkway	1	1,000	0	00:00.0	1,053	01:03.0
WB off to Great America Parkway	1	1,000	1,007	01:00.0	0	00:00.0
EB on from Great America Parkway	1	1,000	0	00:00.0	1,649	01:38.0
North First Street Ramps						
WB on from North First Steet	1	1,000	243	00:14.0	293	00:17.0
EB off to North First Steet	1	1,000	179	00:10.0	397	00:23.0
WB off to North First Steet	1	1,000	616	00:36.0	0	00:00.0
EB on from North First Steet	1	1,000	0	00:00.0	1,009	01:00.0

Notes:
/a/ Based on capacity of 1,000 vphpl, conservatively assumed to tbe less than the typical arterial capacity to account for pedestrian conflicts and general drive confusion.

Table 23
Non-football Events and Attendances

Possible Non-NFL Events			
Event Type	**Total Estimated Attendance**	**No. of Events per Year**	**Estimated Parking Demand**
X-Games (4-day event)	50,000	1	4,500
Moto-Cross	42,500	1	13,005
International Soccer	40,000	2	12,240
Concerts	37,500	1	11,475
College Football	37,500	1	11,475
Festivals/Antiques Shows	25,000	8	9,000
College Bowl Game	25,000	1	7,650
Car Shows (parking lot event)	12,000	2	1,200
Small Events	50 to 500+	250	varies

5.
Cumulative Growth Conditions

This chapter presents a summary of the traffic conditions that would occur under cumulative conditions. It includes descriptions of nearby pending developments and the procedure used to estimate traffic volumes associated with them. This chapter also presents the results of the intersection level of service calculations. The analysis of cumulative growth conditions was conducted at the request of the City of Santa Clara and is in conformance with the California Environmental Quality Act CEQA.

Transportation Network under Cumulative Growth Conditions

The intersection lane configurations under cumulative conditions were assumed to be the same as described under background conditions.

Cumulative Growth Traffic Volumes

Traffic volumes for cumulative conditions were estimated by adding traffic associated with pending developments within each of the municipalities to background plus project traffic volumes for each of the study periods. Though pending project trips for standard weekday commute periods are available, there is no databases or records maintained for Sunday pending trips. Therefore, pending trips for Sunday study periods were derived by factoring similar to that which was done to develop approved trip volumes. A list of pending projects and total approved trips at each of the study intersections are included in Appendix B.

Cumulative Intersection Impact Criteria

A cumulative impact on traffic conditions at a signalized intersection is determined by application of the local municipal level of service policies and can be said to occur if for either peak hour:

1. The level of service at the intersection degrades from an acceptable LOS D or better under background conditions to an unacceptable LOS E or worse under cumulative conditions.

2. The level of service at the intersection is an unacceptable LOS E or LOS F under background conditions and the addition of cumulative project trips causes the average critical delay to increase by four (4) or more seconds *and* volume-to-capacity ratio (V/C) to increase by 0.01.

Cumulative Conditions Intersection Impacts and Mitigation Measures (Weekday Study Periods)

The results of the analysis show that 40 of the 120 study intersections are projected to be impacted by the total cumulative development. (See Figures 52-56)

Mitigation measures were investigated for all identified intersection impacts and are presented and described below and shown in Figures 57-61. Though it is expected that the traffic associated with the stadium will have a significant impact on intersections and other transportation facilities, the infrequency of occurrence (8-10 times per year) does not justify the implementation of costly physical improvements. The project is not proposing to fund, contribute to funding for, or implement the possible measures. The implementation of the TMP and traffic control plan will provide for temporary relief of adverse traffic congestion caused by stadium traffic on game days and days of other events.

City of Santa Clara Intersections

3	Great America Parkway and Tasman Drive*
8	Great America Parkway and Mission College Boulevard *
14	Great America Parkway and Yerba Buena Way
15	Great America Parkway and Alviso Road
16	Great America Parkway and Bunker Hill Lane
17	Great America Parkway and Old Glory Lane
18	Great America Parkway and Patrick Henry Drive
20	Bowers Avenue and US 101 SB *
21	Bowers Avenue and Augustine Drive
23	Bowers Avenue and Central Expressway *
27	Bowers Avenue and Monroe Street
35	Lafayette Street and Yerba Buena Way
60	San Tomas Expressway and Homestead Road *
61	San Tomas Expressway and Benton Street
62	San Tomas Expressway and El Camino Real *
65	San Tomas Expressway and Walsh Avenue
66	San Tomas Expressway and Scott Boulevard *
67	Mission College Boulevard and Montague Expressway *
71	Lawrence Exp Ramps and El Camino Real *

City of San Jose Intersections

78	North First Street and Tasman Drive
83	North First Street and Montague Expressway *
84	Zanker Road and Montague Expressway *
85	Montague Expressway and River Oaks Parkway

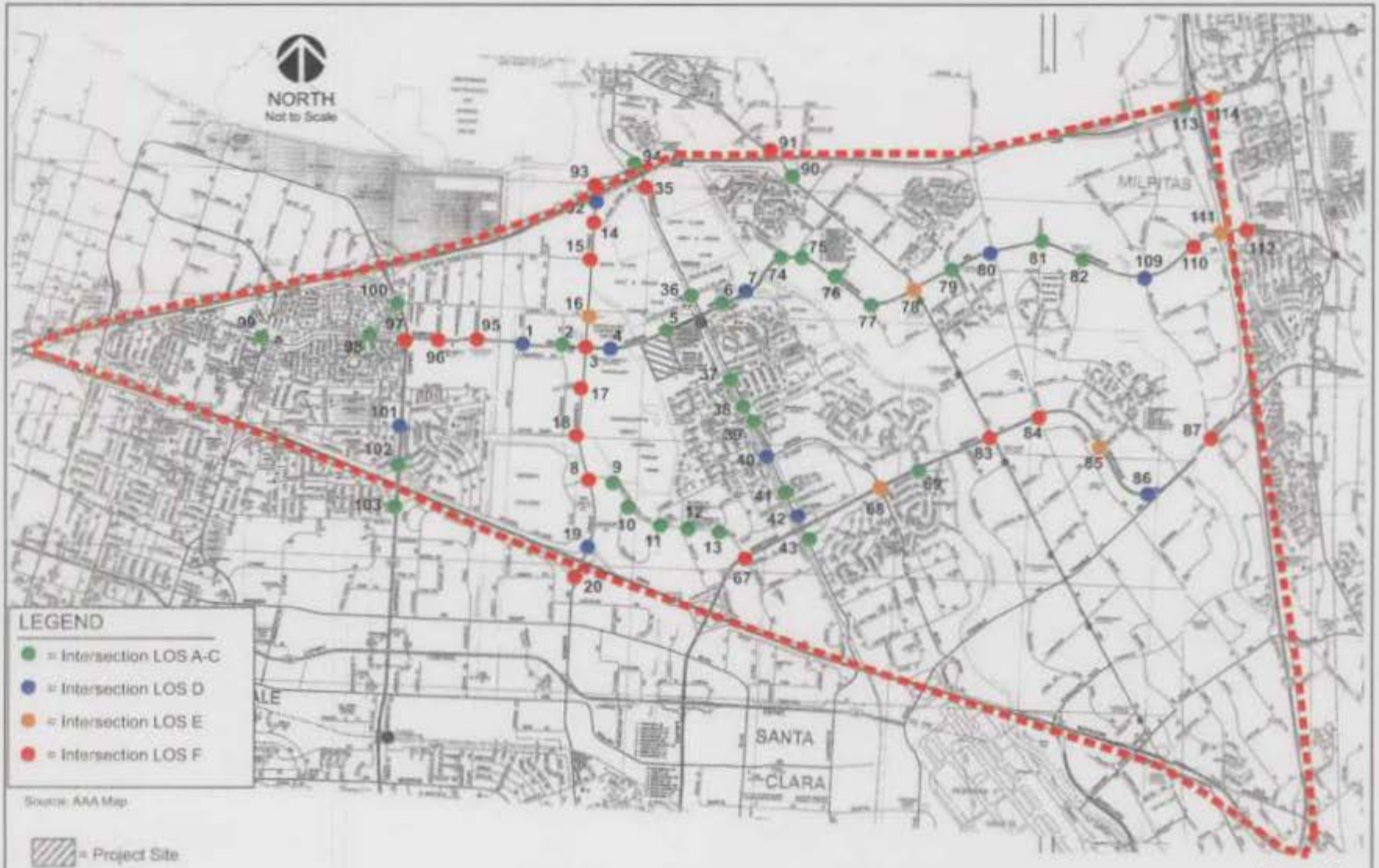
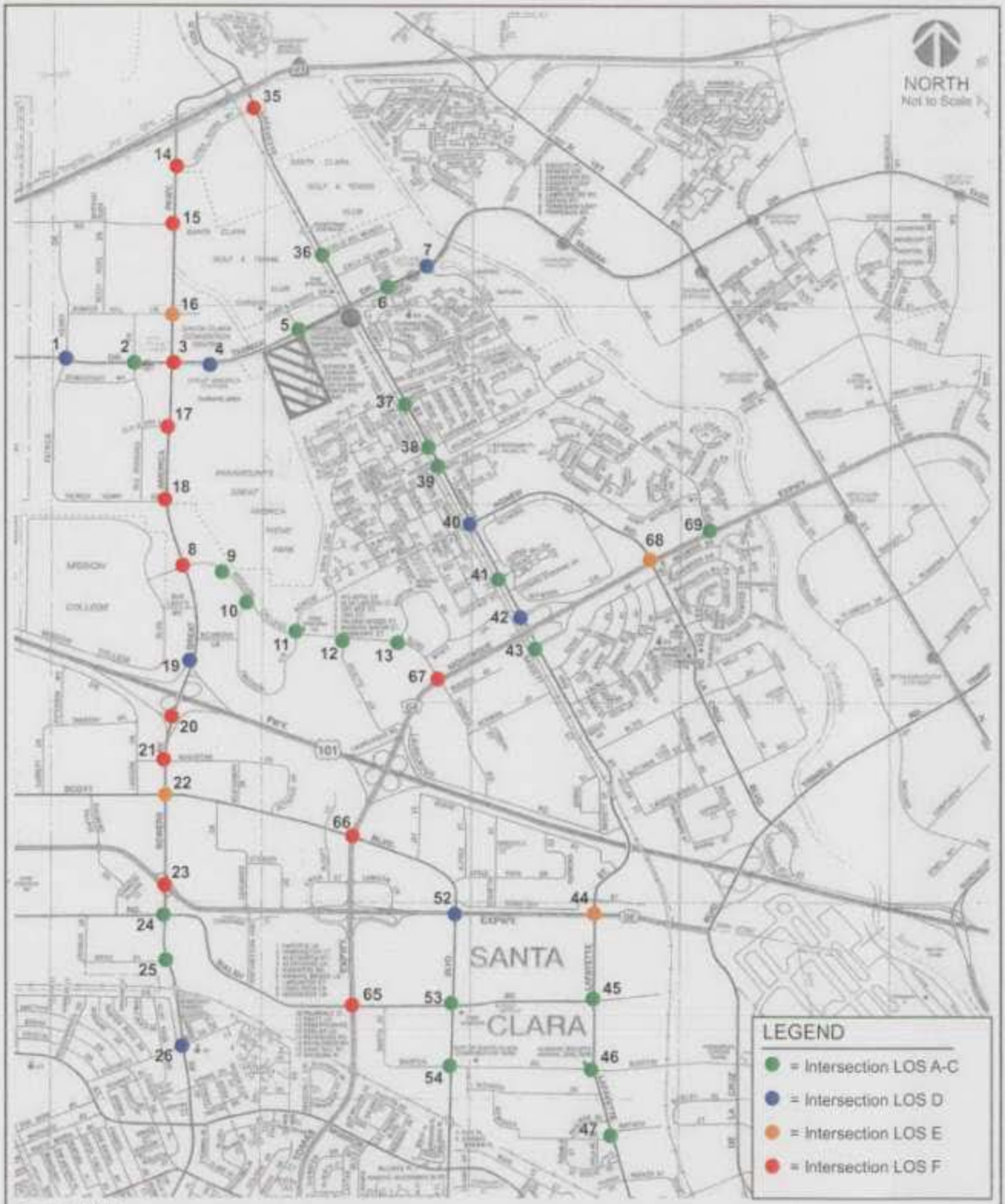


Figure 52

STADIUM CORE AREA WEEKDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



Source: AAA Map

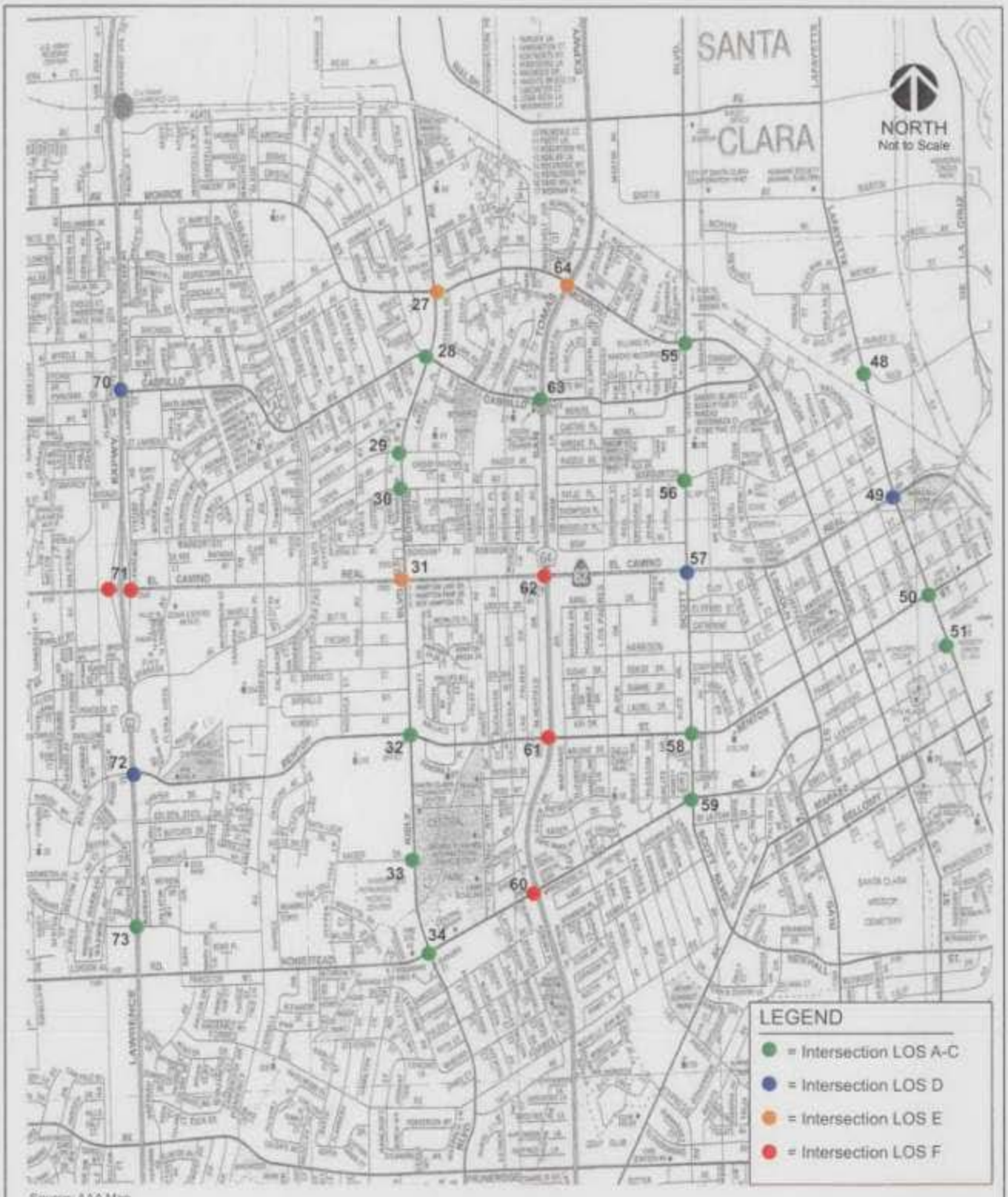
Figure 53

= Project Site

CITY OF SANTA CLARA WEEKDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



Source: AAA Map

Figure 53 (Cont'd)

CITY OF SANTA CLARA WEEKDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

Hexagon
Transportation Consultants, Inc.

49ers Santa Clara Stadium

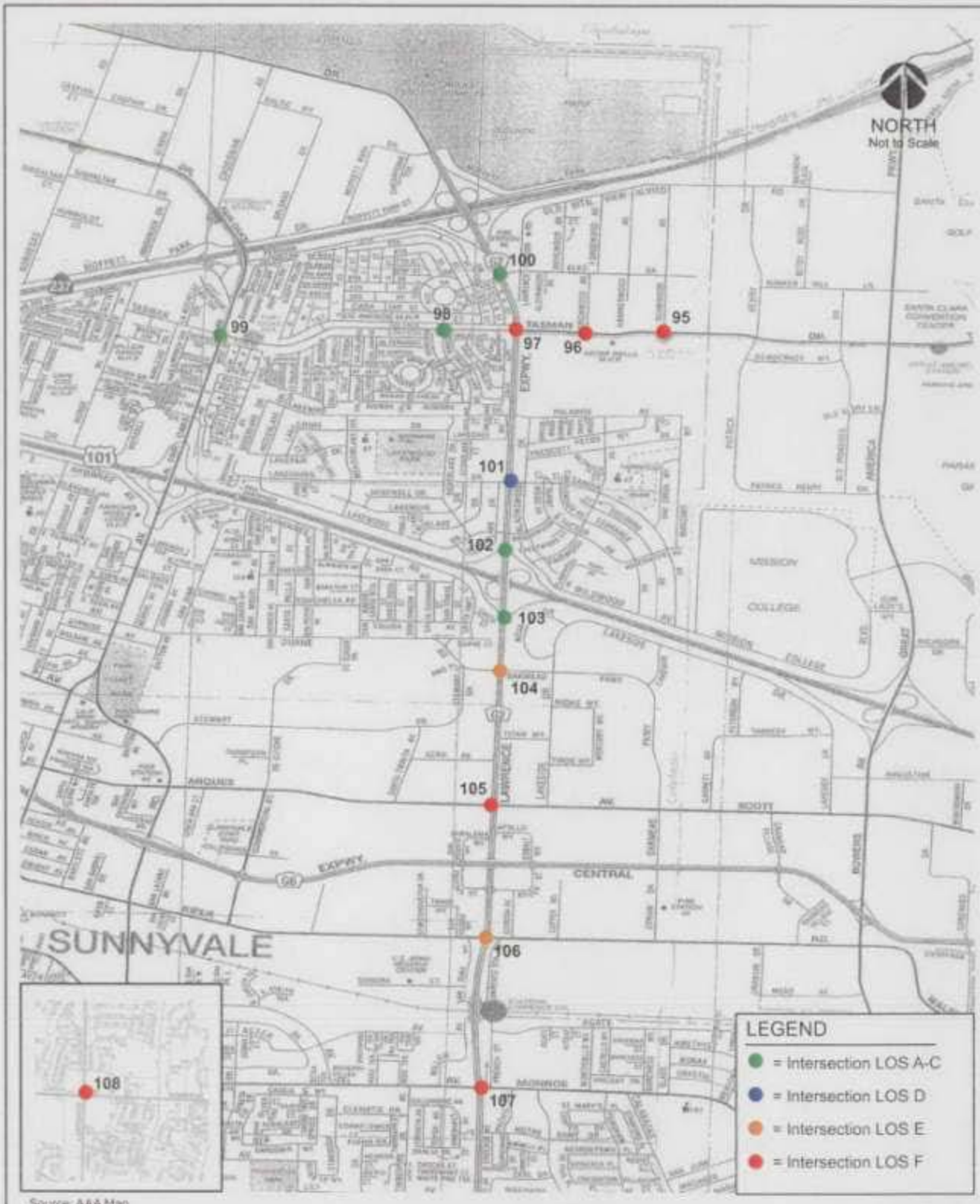
Source: AAA Map

Figure 54

CITY OF SAN JOSE WEEKDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



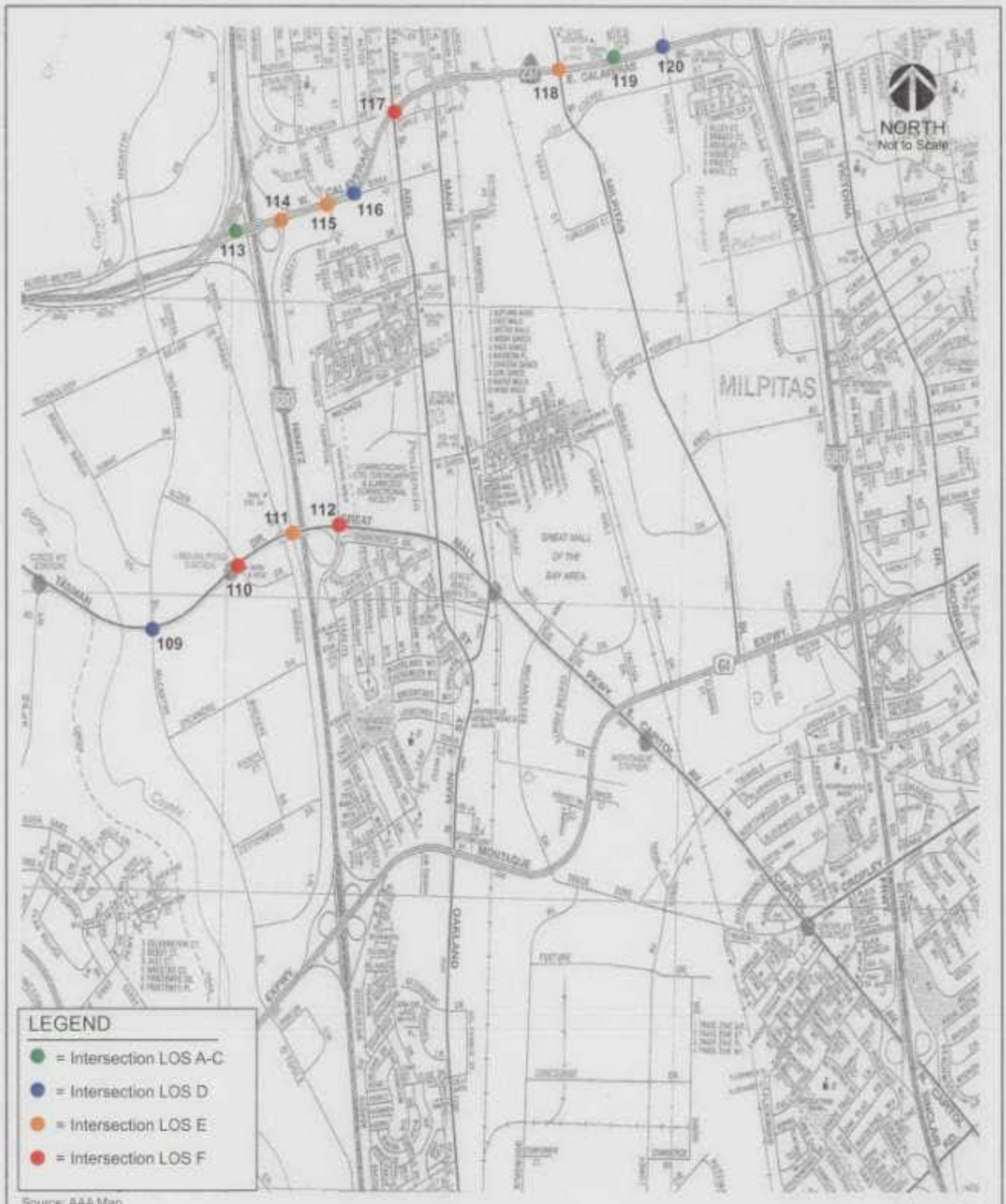
Source: AAA Map

Figure 55

CITY OF SUNNYVALE WEEKDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



Source: AAA Map

Figure 56

CITY OF MILPITAS WEEKDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

Hexagon
Transportation Consultants, Inc.

49ers Santa Clara Stadium

87 O'Toole Avenue and Montague Expressway *
89 Trade Zone Boulevard and Montague Expressway *
93 Great America (North) and SR 237 *

City of Sunnyvale Intersections

95 Reamwood Avenue and Tasman Drive
96 Birchwood Avenue and Tasman Drive
97 Lawrence Expressway and Tasman Drive *
104 Lawrence Expressway and Oakmead Parkway
105 Lawrence Expressway and Arques Avenue *
106 Lawrence Expressway and Kifer Road
107 Lawrence Expressway and Reed Avenue/ Monroe Street *
108 Lawrence Expressway and Homestead Road *

City of Milpitas Intersections

110 Alder Drive and Tasman Drive
111 I-880 and Tasman Drive (West)
112 I-880 and Tasman Drive (East)
114 I-880 and Calaveras Boulevard (West)
115 Abbott Avenue and Calaveras Boulevard
117 Abel Street and Calaveras Boulevard *

* Denotes CMP Intersection

City of Santa Clara Intersection Analysis

The results of the Weekday level of service analysis shows that 19 of the City of Santa Clara study intersections would be impacted by total cumulative development during at least one of the Weekday study periods. Each of the impacted intersections and possible mitigation measures are described below.

(3) Great America Parkway and Tasman Drive*

Impact: The level of service would be LOS C during both the early and standard weekday PM peak hours under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 74% and 64% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be partially mitigated by the addition of exclusive westbound, eastbound, and southbound right-turn lanes. With these improvements, the intersection would continue to operate at LOS F under both the early and standard weekday study periods. There are no further feasible improvements that can be made at the intersection due to insufficient right-of-way.

(8)Great America Parkway and Mission College Boulevard*

Impact: The level of service would be LOS D during the early weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the critical-movement delay at the intersection will increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 67% and 59% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be partially mitigated by the construction of a grade-separated intersection. With this improvement, the intersection would continue to operate at LOS F during the early and standard weekday PM peak hours. There are no other improvements that can be made at the intersection due to insufficient right-of-way

(14) Great America Parkway and Yerba Buena Way

Impact: The level of service would be LOS C during the standard weekday PM peak hour under background conditions, and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 75% and 72% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the adjustment of cycle time. The intersection improvement would improve intersection operating levels to LOS D during the standard weekday PM peak hour.

(15) Great America Parkway and Alviso Road

Impact: The level of service would be LOS B during the early and standard weekday PM peak hours under background conditions, and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 78% and 74% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the addition of second eastbound and northbound left-turn lanes and an adjustment of signal timing. The intersection improvements would improve intersection operating levels to LOS C during both the early and standard weekday PM peak hours.

(16) Great America Parkway and Bunker Hill Lane

Impact: The level of service would be LOS B during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS E under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 80% and 74% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the addition of second westbound and northbound left-turn lanes and an adjustment of cycle time. The intersection improvements would improve intersection operating levels to LOS C during the standard weekday PM peak hour.

(17) Great America Parkway and Old Glory Lane

Impact: The level of service would be LOS B during the early and standard weekday PM peak hours under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 72% and 66% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the addition of a second eastbound right-turn lane, a fourth southbound through lane, and an adjustment of cycle time. The intersection improvements would improve intersection operating levels to LOS C and B during the early and standard weekday PM peak hours, respectively.

(18) Great America Parkway and Patrick Henry Drive

Impact: The level of service would be LOS C during the early weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the critical-movement delay at the intersection will increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 68% and 66% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be partially mitigated by the addition of a second northbound left-turn lane, a fourth southbound through lane, and a second eastbound right-turn lane. The intersection would continue to operate at unacceptable LOS F during the early and standard weekday PM peak hours. There are no further feasible improvements that can be made at the intersection.

(20) Bowers Avenue and US 101 SB *

Impact: The level of service would be LOS A during the standard weekday PM peak hour under background conditions, and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 49% and 37% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the addition of a third eastbound left-turn lane. The intersection improvement would improve intersection operating levels to LOS D during the standard weekday PM peak hour.

(21) Bowers Avenue and Augustine Drive

Impact: This intersection would operate at LOS C during the early and standard weekday PM peak hours under background conditions, and the intersection would degrade to LOS E and F under cumulative conditions, respectively. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 27% and 12% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact at this intersection could be mitigated by adding a second southbound left-turn lane, a second westbound right-turn lane, a third eastbound left-turn lane, a free westbound right-turn lane, and the widening of Bowers Avenue to eight-lanes. The intersection improvement would improve intersection operating levels to LOS C during the both the early and standard weekday PM peak hours.

(23) Bowers Avenue and Central Expressway *

Impact: The level of service would be LOS D and E during the early and standard weekday PM peak hours, respectively, under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 33% and 12% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be partially mitigated by converting the existing HOV lanes on eastbound and westbound Central Expressway to mixed-flow lanes. The Comprehensive County Expressway Planning Study identifies as a Tier 1A project the conversion of HOV lanes to mixed-flow lanes at this intersection. With this modification, the intersection would continue to operate at LOS F during the standard PM peak hour. The Comprehensive County Expressway Planning Study identifies the construction of a full interchange at this intersection as a Tier 2 priority. This improvement would fully mitigate the cumulative impact at this intersection.

(27) Bowers Avenue and Monroe Street

Impact: The level of service would be LOS C during the standard weekday PM peak hour under background conditions, and the intersection would degrade to LOS E under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 56% and 18% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the addition of separate northbound and southbound left-turn lanes with protected phasing. The intersection improvements would improve intersection operating levels to LOS C during the standard weekday PM peak hour.

(35) Lafayette Street and Yerba Buena Way

Impact: The level of service would be LOS D during the standard weekday PM peak hour under background conditions, and the intersection would degrade to LOS E under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The

project will account for approximately 52% and 35% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the signalization of the intersection. The intersection improvement would improve intersection operating levels to LOS C during the standard weekday PM peak hour.

(60) San Tomas Expressway and Homestead Road *

Impact: The level of service would be LOS E during the early weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the critical movement delay at the intersection will increase by four or more seconds and the demand-to-capacity ratio (v/c) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 13% and 4% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by widening San Tomas Expressway to eight lanes. The intersection improvement would improve intersection operating levels to LOS D and E during the early and standard weekday PM peak hours, respectively.

(61) San Tomas Expressway and Benton Street

Impact: The level of service would be LOS D during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 13% and 4% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by widening San Tomas Expressway to eight lanes. The intersection improvement would improve intersection operating levels to LOS C during the standard weekday PM peak hour.

(62) San Tomas Expressway and El Camino Real

Impact: The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the critical-movement delay at the intersection will increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 16% and 4% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be partially mitigated by the addition of a second northbound, a second southbound and a second eastbound left-turn lanes. The intersection would continue to operate at unacceptable LOS F during the standard weekday PM peak hour. There are no further feasible improvements that can be made at the intersection.

(65) San Tomas Expressway and Walsh Avenue

Impact: The level of service would be LOS C during the early weekday PM peak hour under background conditions and the intersection would degrade to LOS E under cumulative conditions. The level of service would be LOS D during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 15% and 4% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by widening San Tomas Expressway to eight lanes and the addition of an exclusive right-turn lane. The intersection improvements would improve intersection operating levels to LOS D during the early and standard weekday PM peak hours.

(66) San Tomas Expressway and Scott Boulevard

Impact: The level of service would be LOS E during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 18% and 5% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no feasible improvements that can be made at the intersection due to right-of-way restrictions.

(67) Mission College Boulevard and Montague Expressway *

Impact: The level of service would be LOS D during the early weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. The level of service would be LOS D during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Santa Clara standards. The project will account for approximately 35% and 18% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by third eastbound and southbound left-turn lanes. The intersection improvements would improve intersection operating levels to LOS D and E during the early and standard weekday PM peak hours, respectively

(71) Lawrence Expressway Ramps and El Camino Real *

Impact: The level of service would be LOS E during the standard weekday PM peak hour under background conditions, and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant cumulative impact by City of Santa Clara standards. The project will account for approximately 27% and 19% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the addition of an exclusive eastbound right-turn lane. The intersection improvement would improve intersection operating levels to LOS E during the standard weekday PM peak hour.

City of San Jose Intersection Analysis

The results of the Weekday level of service analysis shows that seven of the City of San Jose study intersections would be impacted by total cumulative development during at least one of the Weekday study periods. Each of the impacted intersections and possible mitigation measures are described below.

(78) North First Street and Tasman Drive

Impact: The level of service would be LOS D during the early and standard weekday PM peak hours under background conditions, and the intersection would degrade to LOS E under cumulative with project conditions. This constitutes a significant impact by City of San Jose standards. The project will account for approximately 52% and 15% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no feasible improvements that can be made at the intersection due to right-of-way restrictions.

(83) North First Street and Montague Expressway *

Impact: The level of service would be LOS F during the early and standard weekday PM peak hours under background conditions and the critical-movement delay at the intersection will increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of San Jose standards. The project will account for approximately 26% and 8% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no further feasible improvements at the intersection beyond the widening of Montague Expressway to eight lanes as identified as part of the North San Jose Development Policy (NSJDP). As described for project impacts, the NSJDP identified the impacts to the intersection associated with its development as significant and unavoidable due to the lack of feasible mitigation measures. A traffic impact fee has been implemented as part of the NSJDP, but is only applicable to development within the NSJDP area. Development that impact intersections within the NSJDP area are required to make a fair-share contribution towards identified improvements.

(84) Zanker Road and Montague Expressway *

Impact: The level of service would be LOS E during the early weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the critical-movement delay at the intersection will increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of San Jose standards. The project will account for approximately 22% and 8% of the

added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no further feasible improvements at the intersection beyond the widening of Montague Expressway to eight lanes as identified as part of the North San Jose Development Policy (NSJDP). As described for project impacts, the NSJDP identified the impacts to the intersection associated with its development as significant and unavoidable due to the lack of feasible mitigation measures. A traffic impact fee has been implemented as part of the NSJDP, but is only applicable to development within the NSJDP area. Development that impact intersections within the NSJDP area are required to make a fair-share contribution towards identified improvements

(85) River Oaks Parkway and Montague Expressway *

Impact: The level of service would be LOS D during the early weekday PM peak hour under background conditions, and the intersection would degrade to LOS E under cumulative conditions. This constitutes a significant impact by City of San Jose standards. The project will account for approximately 27% and 11% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no further feasible improvements at the intersection beyond the widening of Montague Expressway to eight lanes as identified as part of the North San Jose Development Policy (NSJDP). As described for project impacts, the NSJDP identified the impacts to the intersection associated with its development as significant and unavoidable due to the lack of feasible mitigation measures. A traffic impact fee has been implemented as part of the NSJDP, but is only applicable to development within the NSJDP area. Development that impact intersections within the NSJDP area are required to make a fair-share contribution towards identified improvements.

(87) O'Toole Avenue and Montague Expressway *

Impact: The level of service would be LOS E during the early weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the critical-movement delay at the intersection will increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of San Jose standards. The project will account for approximately 16% and 6% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the construction of a "square loop" intersection as identified as part of the North San Jose Development Policy (NSJDP). The recommended mitigation measure would improve intersection operations to LOS D. A traffic impact fee has been implemented as part of the NSJDP, but is only applicable to development within the NSJDP area. Development that impact intersections within the NSJDP area are required to make a fair-share contribution towards identified improvements.

(89) Trade Zone Boulevard and Montague Expressway *

Impact: The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the critical-movement delay at the intersection will increase

by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of San Jose standards. The project will account for approximately 23% and 9% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no further feasible improvements at the intersection beyond the widening of Montague Expressway to eight lanes as identified as part of the North San Jose Development Policy (NSJDP). As described for project impacts, the NSJDP identified the impacts to the intersection associated with its development as significant and unavoidable due to the lack of feasible mitigation measures. A traffic impact fee has been implemented as part of the NSJDP, but is only applicable to development within the NSJDP area. Development that impact intersections within the NSJDP area are required to make a fair-share contribution towards identified improvements.

(93) Great America and SR 237 (North)*

Impact: The level of service would be LOS C during the standard weekday PM peak hour under background conditions, and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of San Jose standards. The project will account for approximately 84% and 86% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively. These contributions are considered cumulatively significant and thus would constitute an impact.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the addition of a third westbound left-turn lane. The intersection improvement would improve intersection operating levels, but the intersection will continue to operate at LOS F. There are no further feasible improvements that can be made at the intersection.

City of Sunnyvale Intersection Analysis

The results of the Weekday level of service analysis shows that eight of the City of Sunnyvale study intersections would be impacted by total cumulative development during at least one of the Weekday study periods. Each of the impacted intersections and possible mitigation measures are described below.

(95) Reamwood Avenue and Tasman Drive

Impact: The level of service would be LOS A during the early weekday PM peak hour under background conditions, and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Sunnyvale standards. The project will account for approximately 57% and 39% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no feasible improvements that can be made at the intersection due to right-of-way restrictions.

(96) Birchwood Avenue and Tasman Drive

Impact: The level of service would be LOS B during both the early and standard weekday PM peak hours under background and the intersection would degrade to LOS F and E during the early and standard weekday peak hours, respectively, under cumulative conditions.

This constitutes a significant impact by City of Sunnyvale standards. The project will account for approximately 57% and 40% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no feasible improvements that can be made at the intersection due to right-of-way restrictions.

(97) Lawrence Expressway and Tasman Drive *

Impact: The level of service would be LOS E during the early and standard weekday PM peak hours under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Sunnyvale standards. The project will account for approximately 55% and 38% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no feasible improvements that can be made at the intersection due to right-of-way restrictions.

(104) Lawrence Expressway and Oakmead Parkway

Impact: The level of service would be LOS E during the standard weekday PM peak hour under background conditions and the critical-movement delay at the intersection will increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of Sunnyvale standards. The project will account for approximately 19% and 0% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no feasible improvements that can be made at the intersection due to right-of-way restrictions.

(105) Lawrence Expressway and Arques Avenue *

Impact: The level of service would be LOS E during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Sunnyvale standards. The project will account for approximately 22% and 13% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the construction of a grade-separated intersection. The comprehensive county expressway planning study identifies the grade-separated intersection as a Tier 1-B project.

(106) Lawrence Expressway and Kifer Road

Impact: The level of service would be LOS E during the standard weekday PM peak hour under background conditions and the critical-movement delay at the intersection will increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of Sunnyvale standards. The project will account for approximately 24% and 17% of the

added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the construction of a grade-separated intersection. The comprehensive county expressway planning study identifies the grade-separated intersection as a Tier 1-B project.

(107) Lawrence Expressway and Reed Avenue/ Monroe Street *

Impact: The level of service would be LOS E during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Sunnyvale standards. The project will account for approximately 23% and 15% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the construction of a grade-separated intersection. The comprehensive county expressway planning study identifies the grade-separated intersection as a Tier 1-B project.

(108) Lawrence Expressway and Homestead Road *

Impact: The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the critical-movement delay at the intersection will increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of Sunnyvale standards. The project will account for approximately 15% and 10% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. There are no feasible improvements that can be made at the intersection due to right-of-way restrictions.

City of Milpitas Intersection Analysis

The results of the Weekday level of service analysis shows that six of the City of Milpitas study intersections would be impacted by total cumulative development during at least one of the Weekday study periods. Each of the impacted intersections and possible mitigation measures are described below.

(110) Alder Drive and Tasman Drive

Impact: The level of service would be LOS D during the early weekday PM peak hour under background conditions, and the intersection would degrade to LOS F under cumulative conditions. The level of service would be LOS F during the standard weekday PM peak hour under background conditions and the critical-movement delay at the intersection will increase by four or more seconds and the demand- to-capacity ratio (V/C) to increase by .01 or more under cumulative conditions. This constitutes a significant impact by City of Milpitas standards. The project will account for approximately 30% and 7% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be partially mitigated by the addition of a northbound right-turn lane, a third southbound left-turn lane, and a second westbound left-turn lane. The intersection improvement would improve intersection operating levels, but the intersection will continue to operate at LOS E and F during the early and standard weekday PM peak hours, respectively. There are no further feasible improvements that can be made at the intersection

(111) I-880 Southbound and Tasman Drive

Impact: The level of service would be LOS D during the standard weekday PM peak hour under background conditions, and the intersection would degrade to LOS E under cumulative conditions. This constitutes a significant impact by City of Milpitas standards. The project will account for approximately 32% and 7% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the addition of a second eastbound right-turn lane. The intersection improvement would improve intersection operating levels to LOS D during the standard weekday PM peak hour.

(112) I-880 Northbound and Tasman Drive

Impact: The level of service would be LOS D during the standard weekday PM peak hour under background conditions, and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Milpitas standards. The project will account for approximately 45% and 20% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by a second westbound left-turn lane and northbound right-turn lane. The intersection improvement would improve intersection operating levels to LOS D during the standard weekday PM peak hour.

(114) I-880 Northbound and Calaveras Boulevard

Impact: The level of service would be LOS D during the standard weekday PM peak hour under background conditions, and the intersection would degrade to LOS E under cumulative conditions. This constitutes a significant impact by City of Milpitas standards. The project will account for approximately 48% and 36% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the addition of a second northbound right-turn lane. The intersection improvement would improve intersection operating levels to LOS C during the standard weekday PM peak hour.

(115) Abbott Avenue and Calaveras Boulevard

Impact: The level of service would be LOS D during the standard weekday PM peak hour under background conditions, and the intersection would degrade to LOS E under cumulative conditions. This constitutes a significant impact by City of Milpitas standards. The project will account for approximately 53% and 41% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively.

Mitigation Measure. The significant cumulative impact to this intersection could be mitigated by the addition of a fourth westbound through lane. The City of Milpitas has plans to widen Calaveras Boulevard to eight lanes between Abbott Avenue and Milpitas Boulevard. A traffic impact fee has been implemented to fund the planned widening. Thus, developments that impact intersections along the segment of Calaveras Boulevard are required to pay a fee of $2,500 per PM peak hour trip. The intersection improvement would improve intersection operating levels to LOS D during the standard weekday PM peak hour.

(117) Abel Street and Calaveras Boulevard

Impact: The level of service would be LOS E during the standard weekday PM peak hour under background conditions and the intersection would degrade to LOS F under cumulative conditions. This constitutes a significant impact by City of Milpitas standards. The project will account for approximately 46% and 38% of the added cumulative volumes during the early and standard weekday PM peak hours, respectively. These contributions are considered cumulatively significant and thus would constitute an impact.

Mitigation Measure. There are no feasible improvements that can be made at the intersection due to right-of-way restrictions.

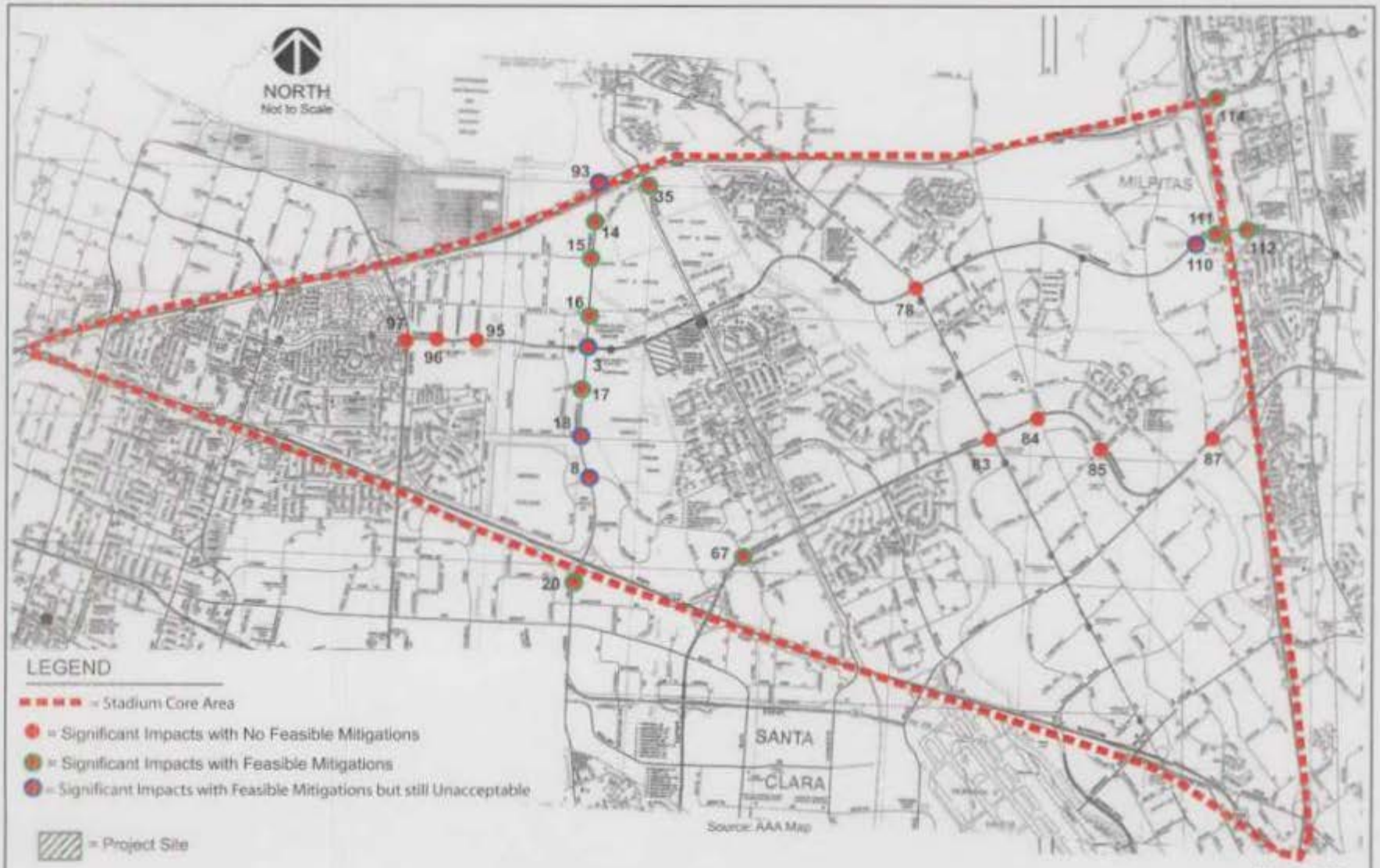


Figure 57

STADIUM CORE AREA WEEKDAY CUMULATIVE IMPACTS AND IMPROVEMENTS

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium

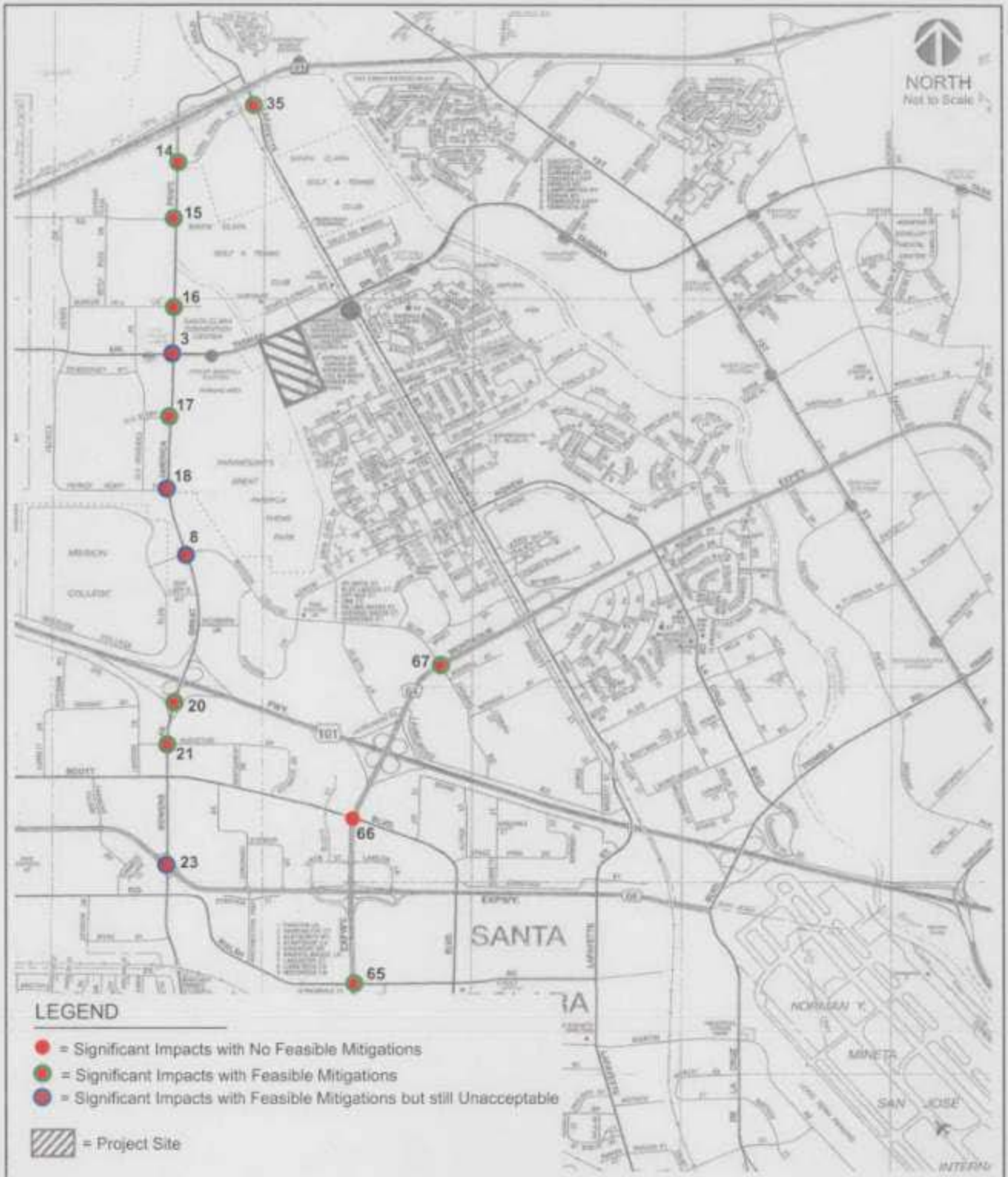
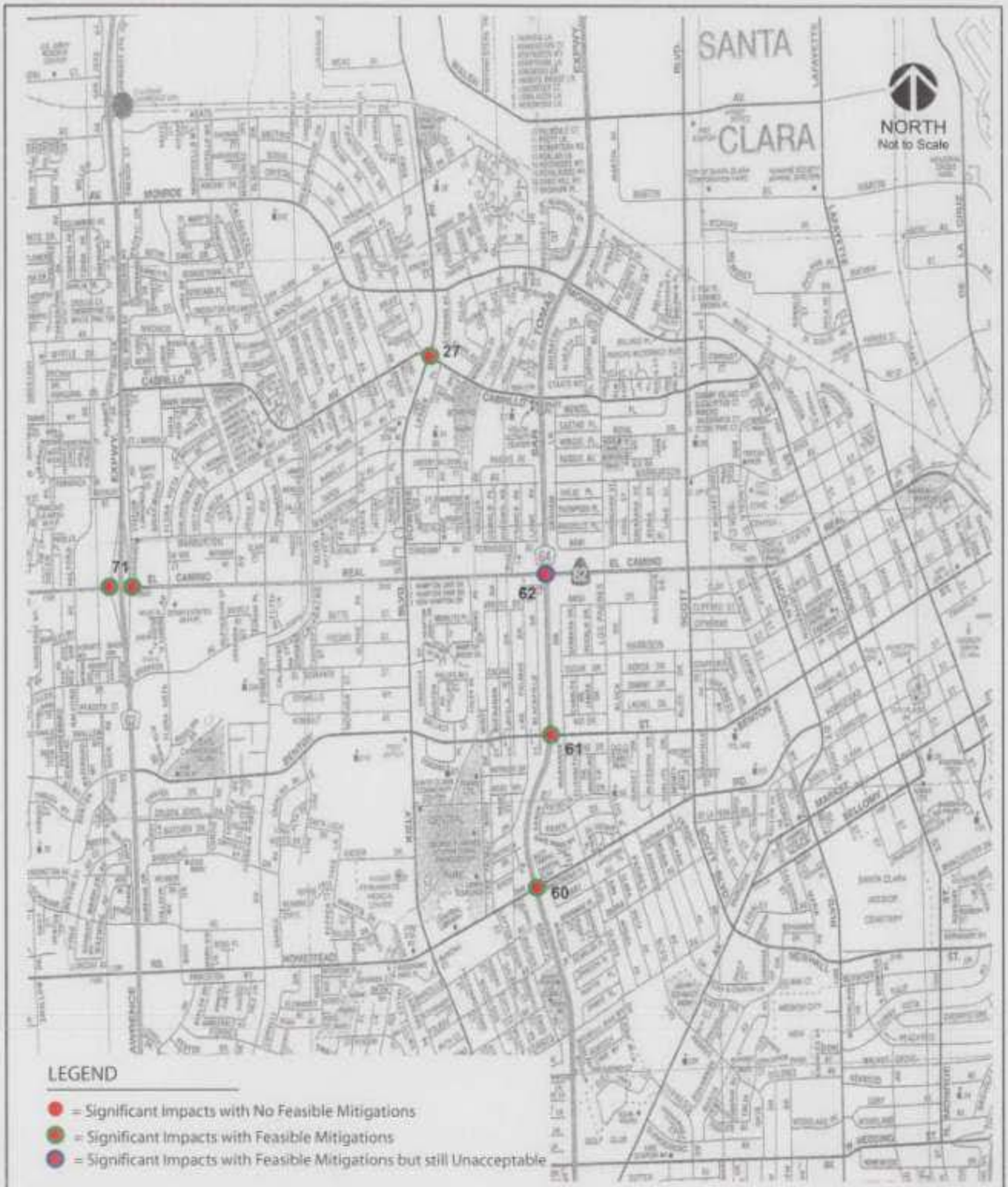


Figure 58

CITY OF SANTA CLARA WEEKDAY CUMULATIVE IMPACTS AND IMPROVEMENTS

Hexagon
Transportation Consultants, Inc.

49ers Santa Clara Staidum



Source: AAA Map

Figure 58 (Cont'd)

CITY OF SANTA CLARA WEEKDAY CUMULATIVE IMPACTS AND IMPROVEMENTS

Hexagon
Transportation Consultants, Inc.

49ers Santa Clara Stadium

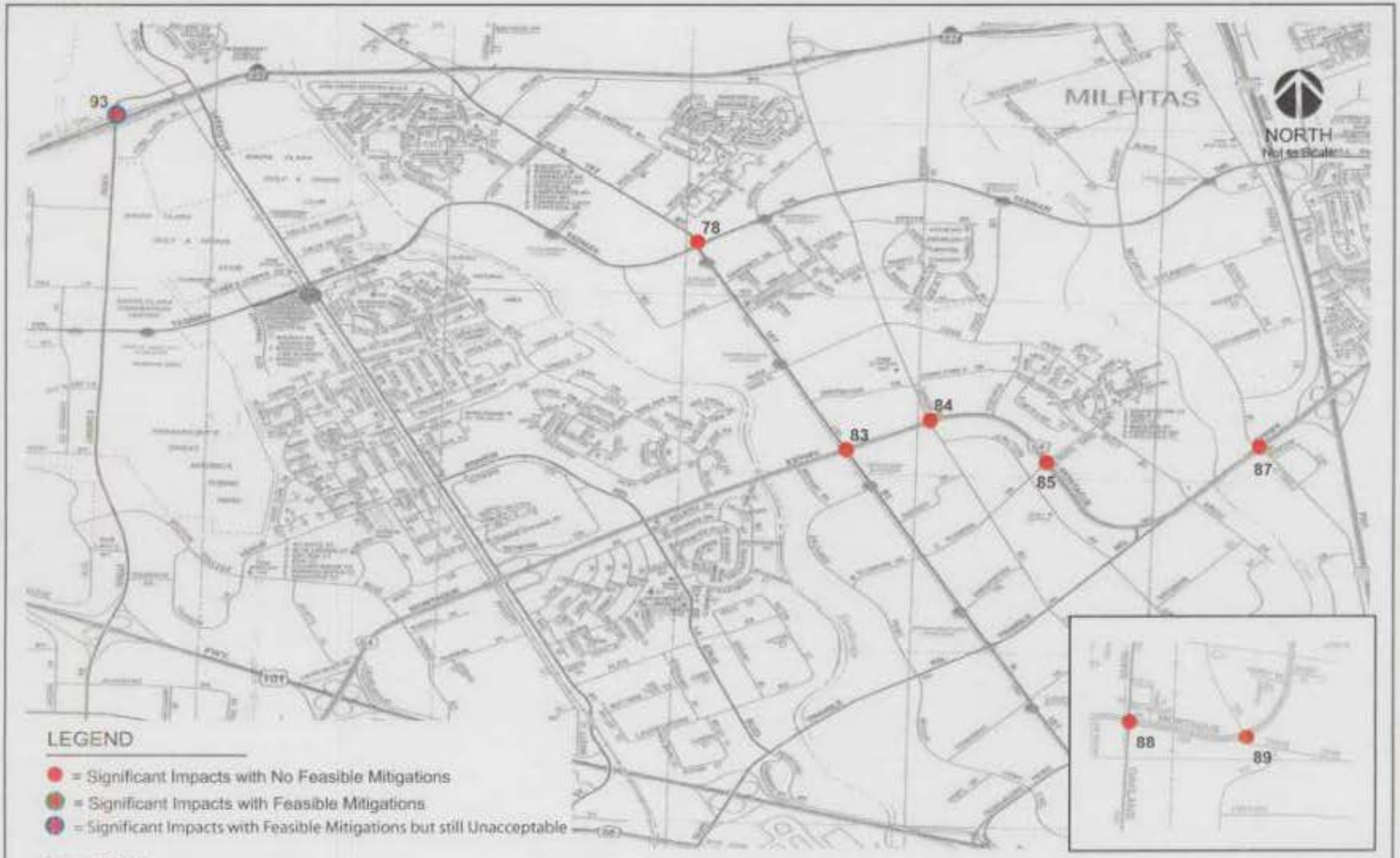
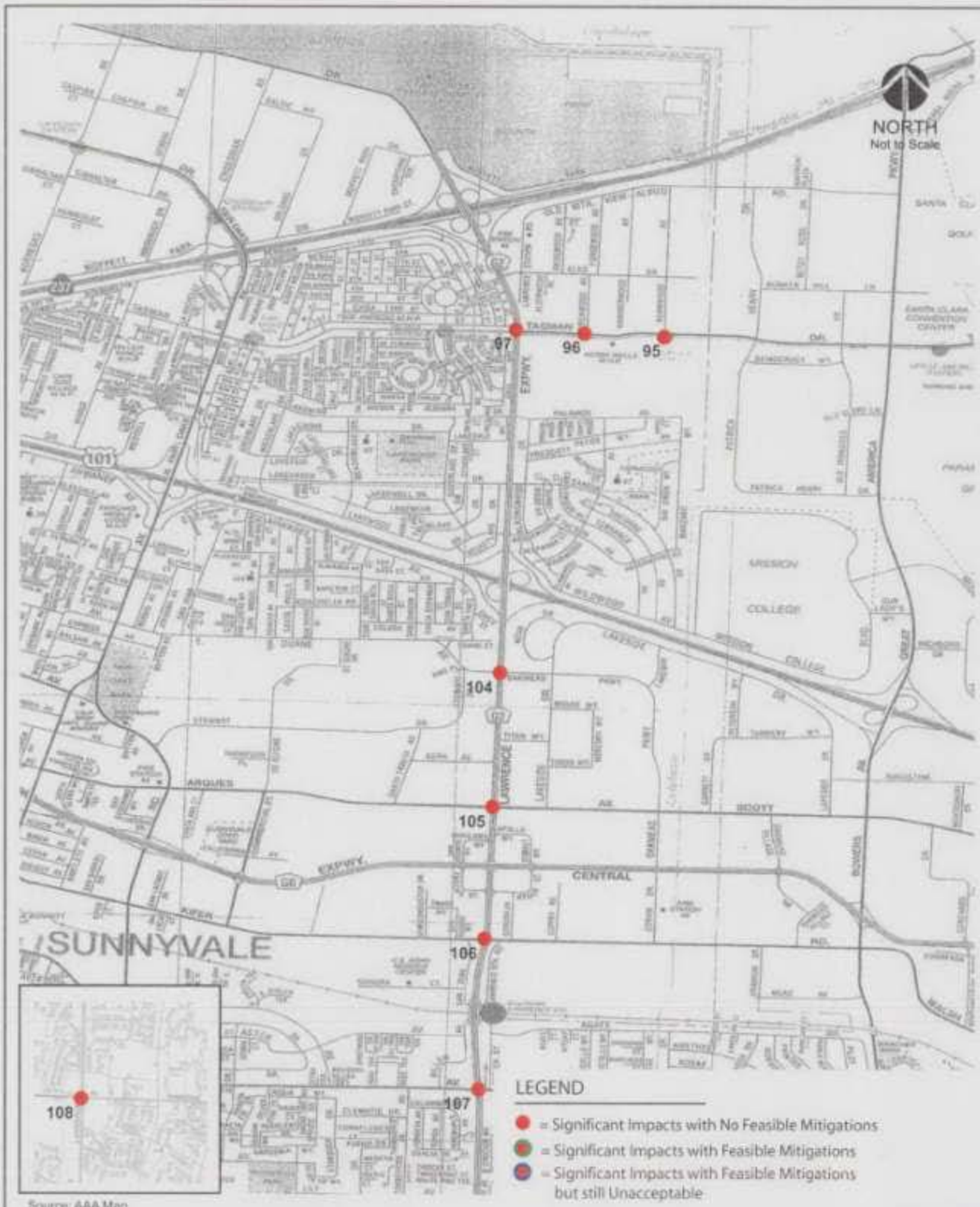


Figure 59

CITY OF SAN JOSE WEEKDAY CUMULATIVE IMPACTS AND IMPROVEMENTS

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



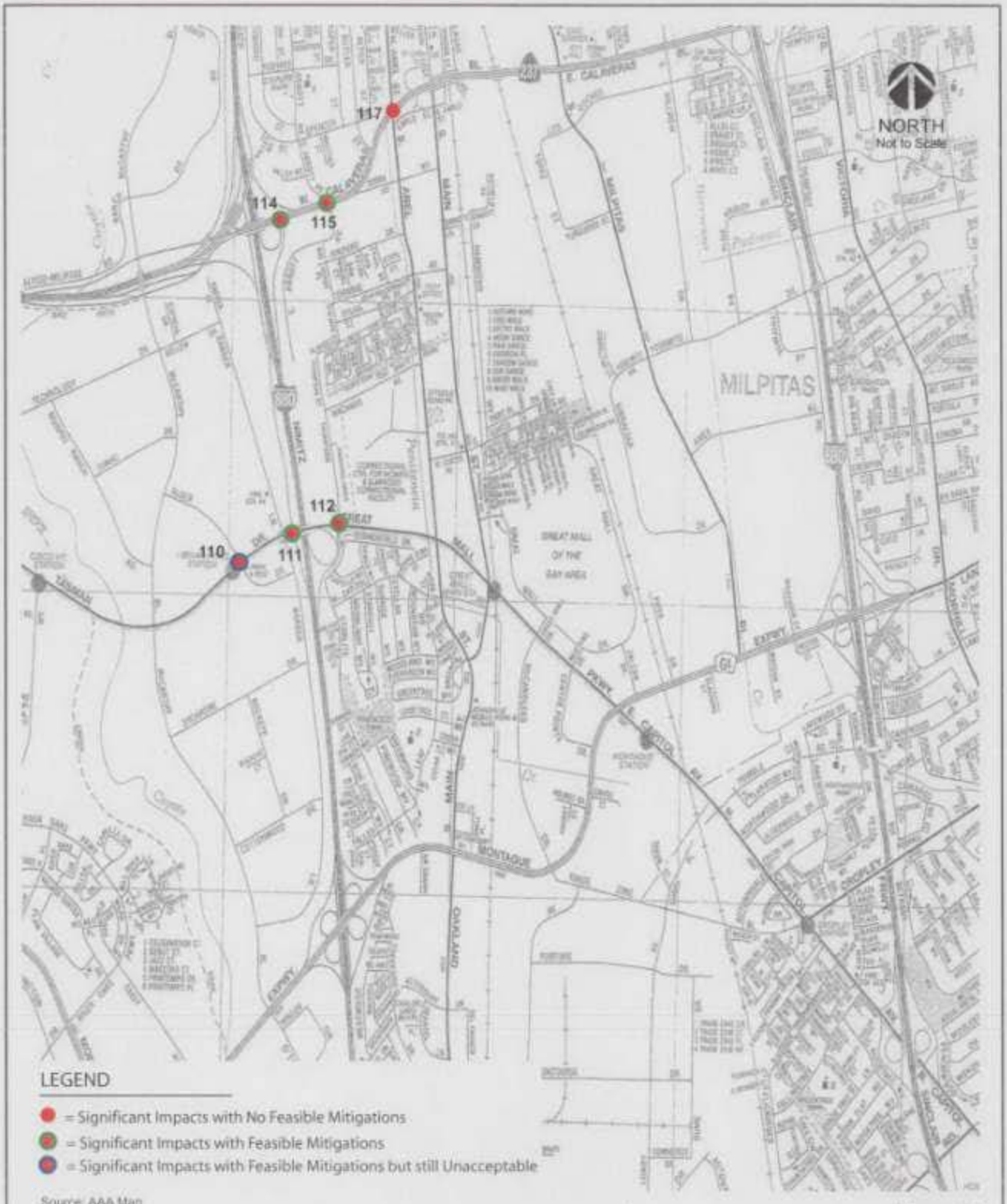
Source: AAA Map

Figure 60

CITY OF SUNNYVALE WEEKDAY CUMULATIVE IMPACTS AND IMPROVEMENTS

49ers Santa Clara Stadium

Hexagon Transportation Consultants, Inc.



Source: AAA Map

Figure 61

CITY OF MILPITAS WEEKDAY CUMULATIVE IMPACTS AND IMPROVEMENTS

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.

Cumulative Conditions Intersection Impacts and Mitigation Measures (Sunday Study Periods)

The results of the Sunday intersection level of service analysis shows that four of the 120 study intersections are projected to operate at unacceptable levels under cumulative conditions during at least one of the Sunday study periods based on applicable level of service standards. (See Figures 62-66)

City of Santa Clara Intersections

10 Freedom Circle (W) and Mission College Boulevard
17 Great America Parkway and Old Glory Lane
67 Mission College Boulevard and Montague Expressway *

City of San Jose Intersections

91 North First Street (North) and SR-237 *

* Denotes CMP Intersection

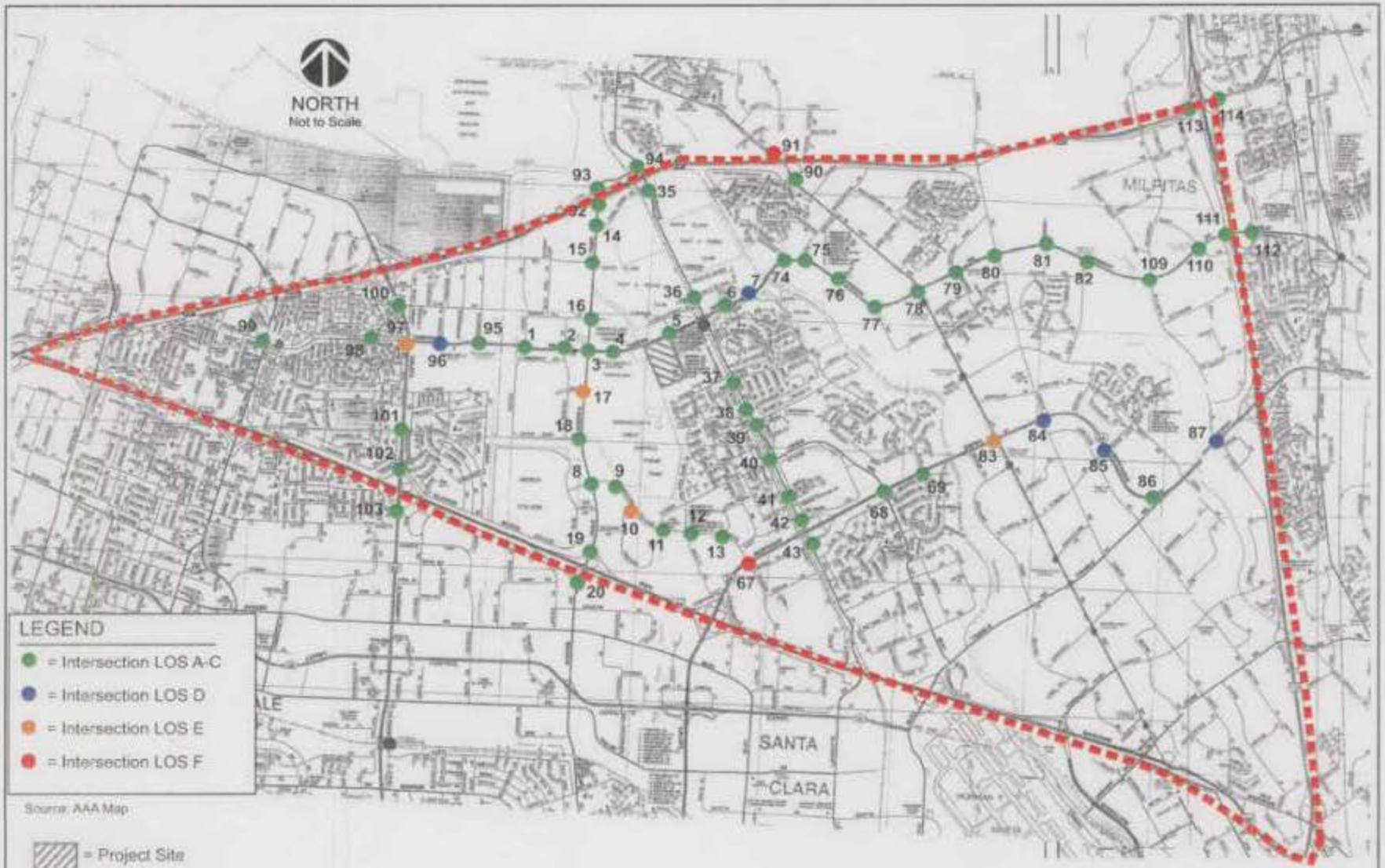
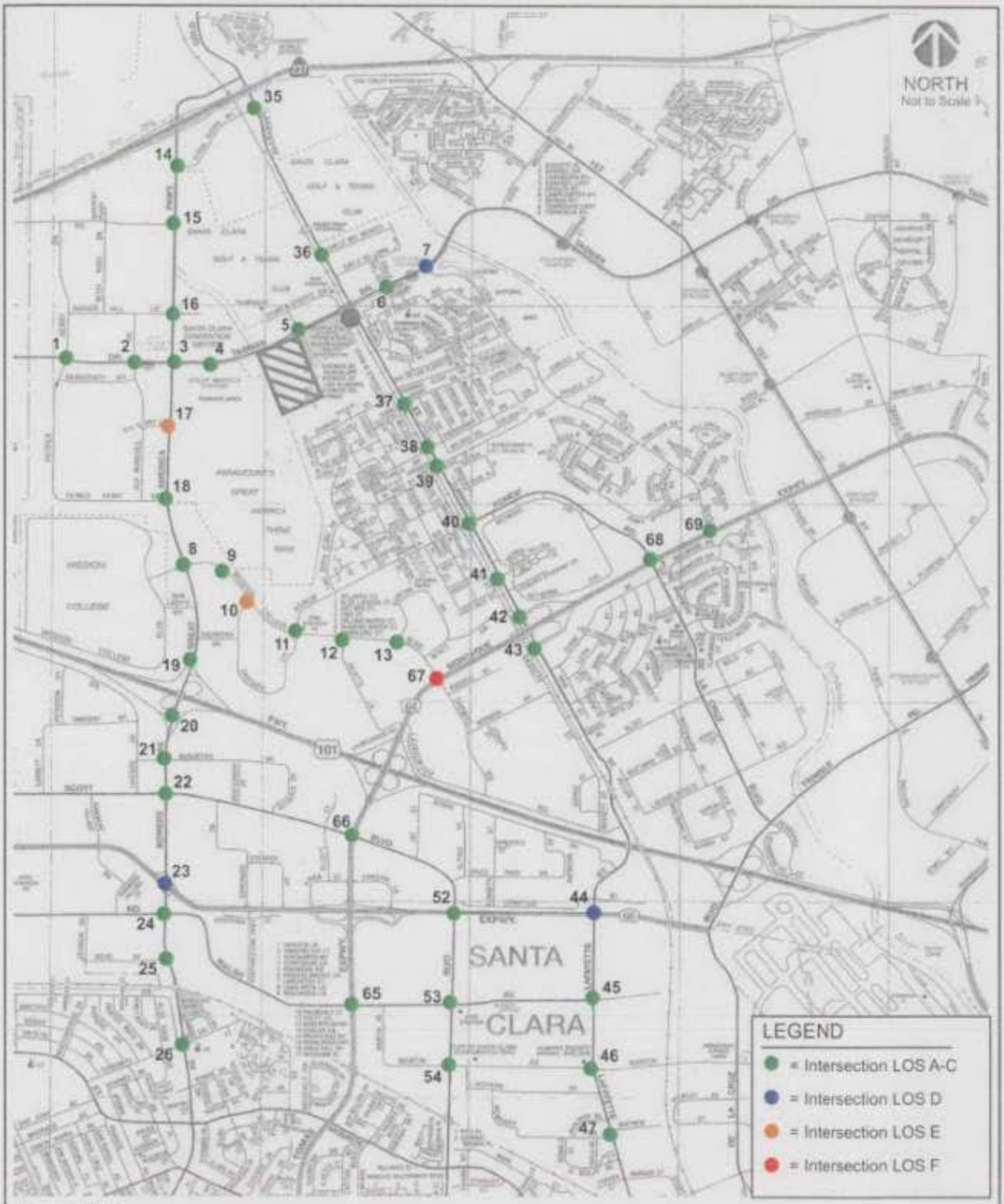


Figure 62

STADIUM CORE AREA SUNDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium



Source: AAA Map

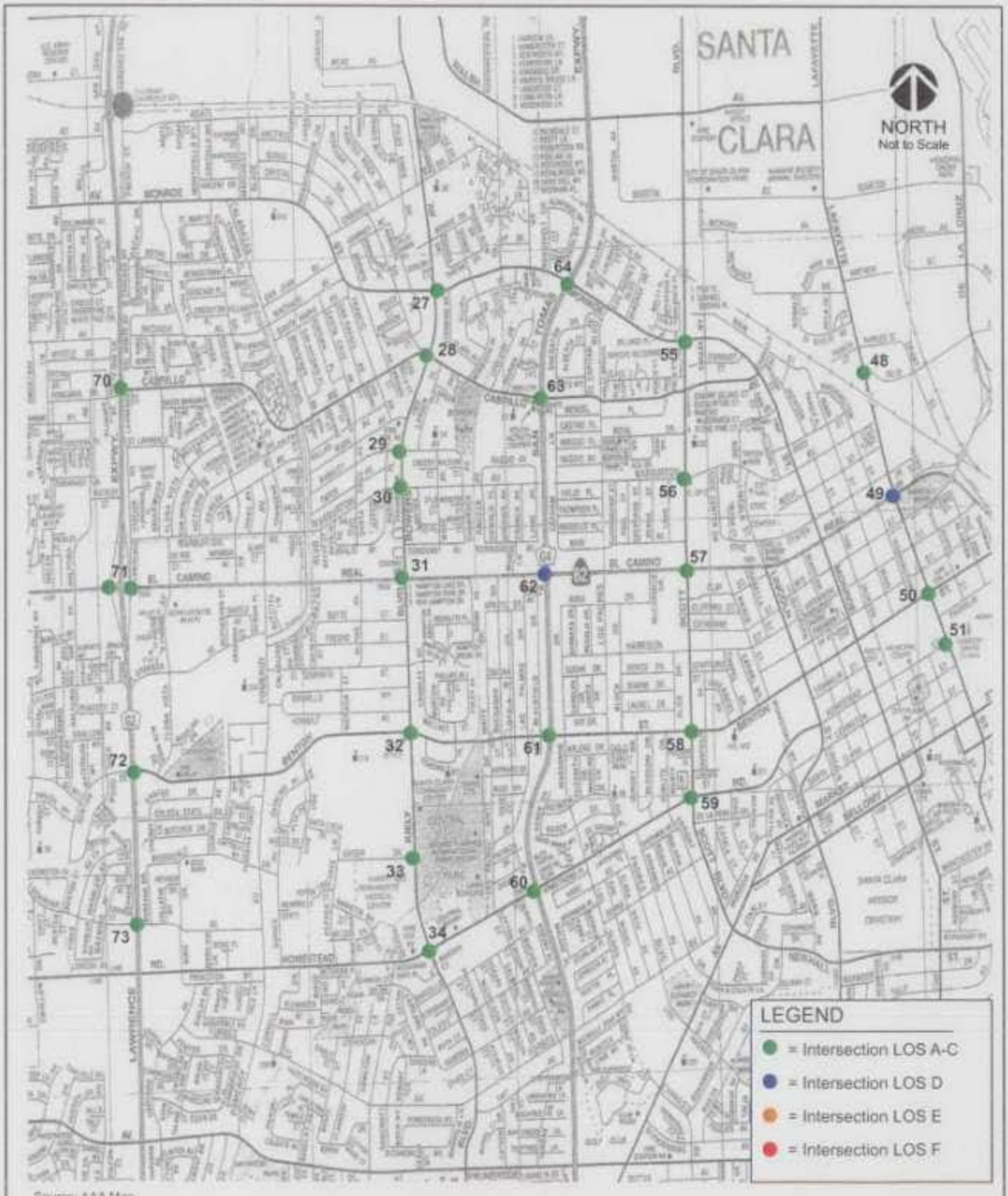
= Project Site

Figure 63

CITY OF SANTA CLARA SUNDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

Hexagon Transportation Consultants, Inc.

49ers Santa Clara Stadium



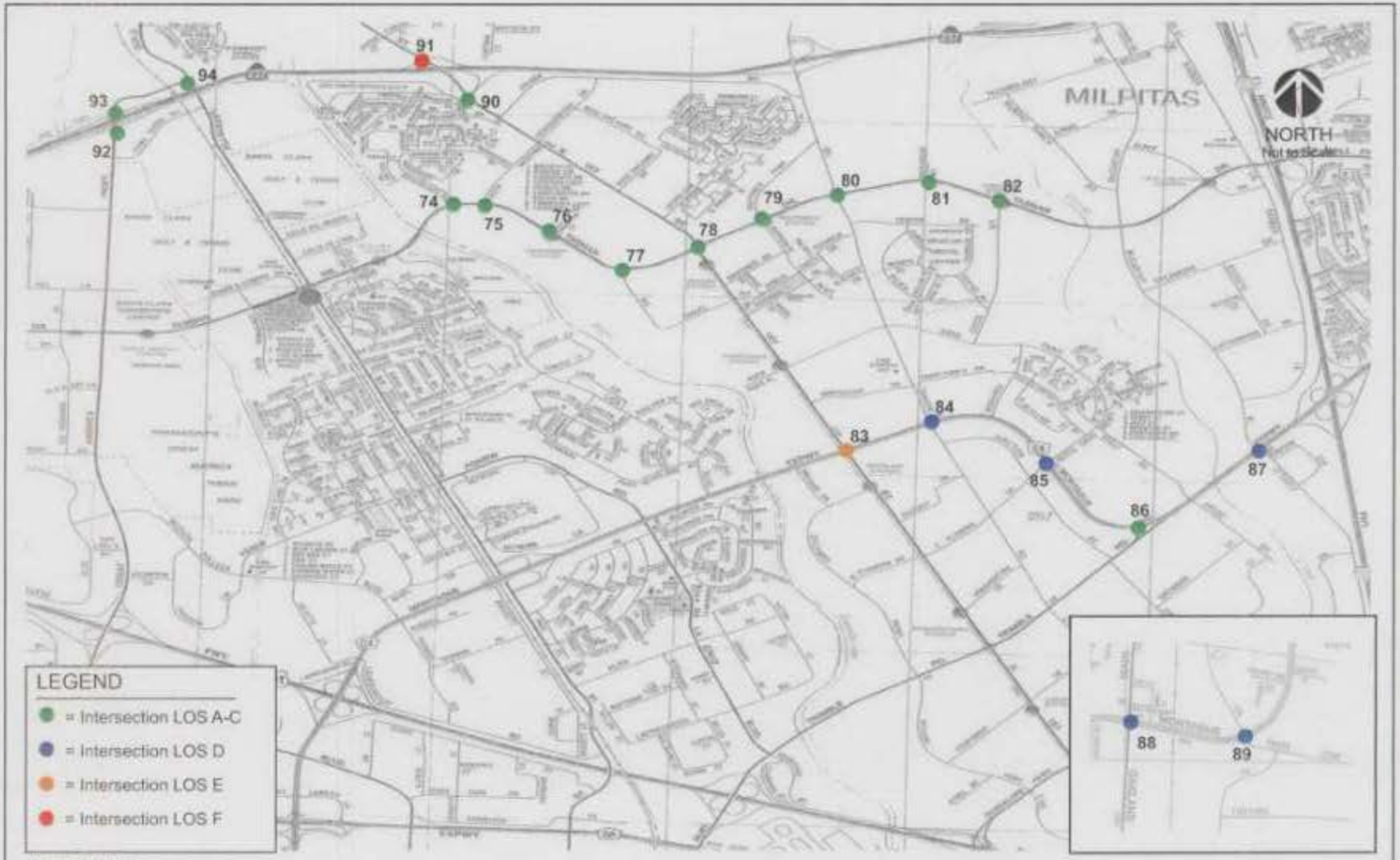
Source: AAA Map

Figure 63 (Cont'd)

CITY OF SANTA CLARA SUNDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

Hexagon
Transportation Consultants, Inc.

49ers Santa Clara Stadium



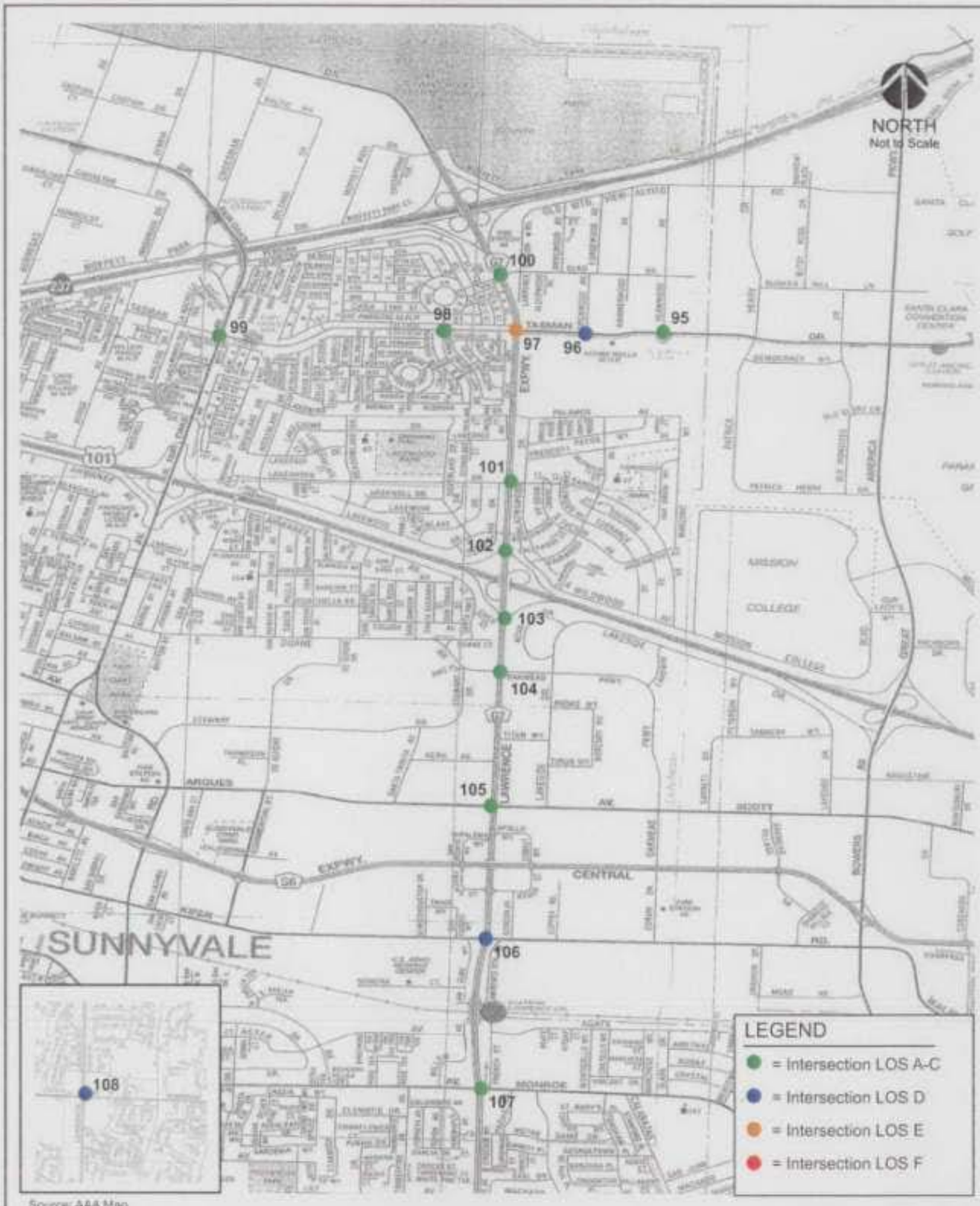
Source: AAA Map

Figure 64

CITY OF SAN JOSE SUNDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon
Transportation Consultants, Inc.



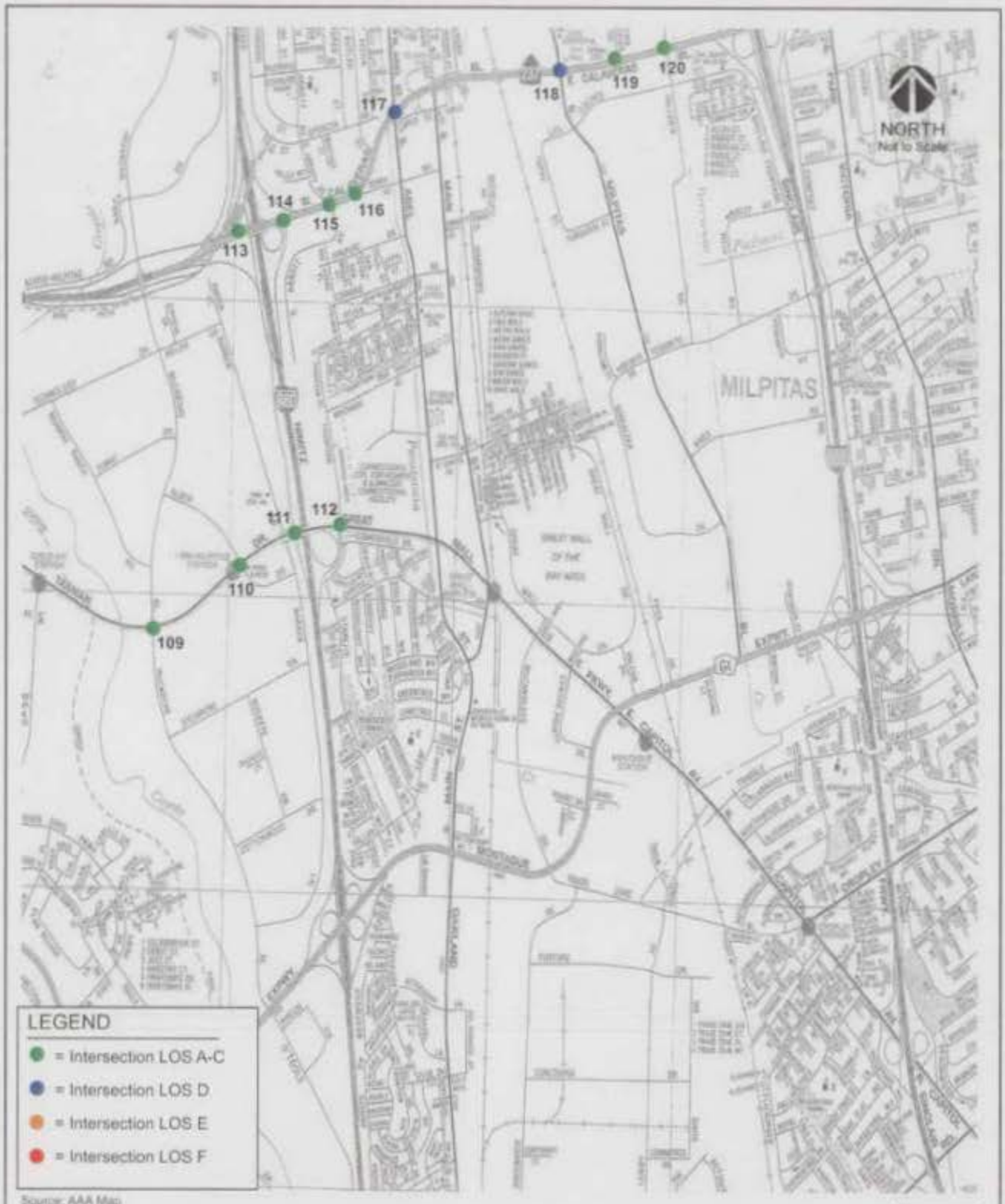
Source: AAA Map

Figure 65

CITY OF SUNNYVALE SUNDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

49ers Santa Clara Stadium

Hexagon Transportation Consultants, Inc.



Source: AAA Map

Figure 66

CITY OF MILPITAS SUNDAY CUMULATIVE INTERSECTION LEVEL OF SERVICE

Hexagon
Transportation Consultants, Inc.

49ers Santa Clara Stadium

Table 24
Weekday Cumulative Conditions Intersection Levels of Service (Impacted Intersection with Mitigation)

Study Number	Intersection Name	Study Period	Background Ave. Delay	Background LOS	Cumulative With Project Ave. Delay	Cumulative With Project LOS	Cumulative With Project Incr. In Crit. Delay	Cumulative With Project Incr. In Crit. V/C	Cumulative Mitigated Ave. Delay	Cumulative Mitigated LOS	Percent Project Contribution
City of Santa Clara Intersections											
3	Great America Parkway and Tasman Drive *	3-5PM	28.1	C	**159.3**	**F**	**211.3**	**0.792**	101.1	F	74%
		4-6PM	31.7	C	**175.4**	**F**	**234.5**	**0.694**	105.6	F	64%
8	Great America Parkway and Mission College Boulevard *	3-5PM	50.9	D	**319.0**	**F**	**393.0**	**0.916**	147.2	F	67%
		4-6PM	98.5	F	**288.0**	**F**	**261.3**	**0.548**	134.3	F	59%
14	Great America Parkway and Yerba Buena Way	3-5PM	28.1	C	36.1	D	16.0	0.357	26.3	C	75%
		4-6PM	30.2	C	**102.8**	**F**	**120.9**	**0.451**	50.1	D	72%
15	Great America Parkway and Alviso Road	3-5PM	10.1	B	**123.0**	**F**	**146.8**	**0.604**	24.1	C	78%
		4-6PM	11.4	B	**197.8**	**F**	**281.0**	**0.677**	28.0	C	74%
16	Great America Parkway and Bunker Hill Lane	3-5PM	14.0	B	46.3	D	57.6	0.549	24.5	C	80%
		4-6PM	15.4	B	**78.1**	**E**	**108.9**	**0.578**	23.7	C	74%
17	Great America Parkway and Old Glory Lane	3-5PM	12.7	B	**257.0**	**F**	**392.7**	**0.558**	21.2	C	72%
		4-6PM	14.9	B	**98.0**	**F**	**146.2**	**0.624**	16.3	B	66%
18	Great America Parkway and Patrick Henry Drive	3-5PM	33.8	C	**388.9**	**F**	**530.2**	**1.143**	152.4	F	68%
		4-6PM	85.5	F	**302.7**	**F**	**369.9**	**0.760**	108.6	F	60%
20	Bowers Avenue and US 101 SB *	3-5PM	8.7	A	24.6	C	19.5	0.477	17.0	B	49%
		4-6PM	9.5	A	**93.0**	**F**	**112.2**	**0.637**	40.2	D	37%
21	Bowers Avenue and Augustine Drive	3-5PM	24.6	C	**108.6**	**F**	**125.8**	**0.586**	25.4	C	27%
		4-6PM	31.4	C	**154.4**	**F**	**190.0**	**0.587**	29.6	C	12%
23	Bowers Avenue and Central Expressway *	3-5PM	51.4	D	**80.8**	**F**	**48.7**	**0.213**	77.1	E	33%
		4-6PM	61.7	E	**97.8**	**F**	**38.5**	**0.145**	81.1	F	12%
27	Bowers Avenue and Monroe Street	3-5PM	30.8	C	51.2	D	21.9	0.356	29.2	C	56%
		4-6PM	34.6	C	**58.0**	**E**	**26.2**	**0.235**	30.0	C	18%
35	Lafayette Street and Yerba Buena Way	3-5PM	17.0	C	26.0	D	6.6	0.185	21.3	C	52%
		4-6PM	29.0	D	**56.0**	**F**	**15.7**	**0.169**	24.0	C	35%
60	San Tomas Expressway and Homestead Road *	3-5PM	55.1	E	**90.1**	**F**	**55.3**	**0.188**	48.7	D	13%
		4-6PM	102.0	F	**157.8**	**F**	**83.3**	**0.200**	71.7	E	4%
61	San Tomas Expressway and Benton Street	3-5PM	29.3	C	44.1	D	22.2	0.190	27.5	C	13%
		4-6PM	47.8	D	**96.5**	**F**	**75.2**	**0.202**	33.6	C	4%
62	San Tomas Expressway and El Camino Real *	3-5PM	62.1	E	75.3	E	21.6	0.172	61.7	E	16%
		4-6PM	85.4	F	**125.7**	**F**	**68.8**	**0.178**	92.5	F	4%
65	San Tomas Expressway and Walsh Avenue	3-5PM	34.0	C	**65.2**	**E**	**40.6**	**0.244**	42.4	D	15%
		4-6PM	49.0	D	**123.7**	**F**	**106.3**	**0.258**	55.0	D	4%
66	San Tomas Expressway and Scott Boulevard *	3-5PM	46.5	D	60.9	E	18.2	0.202			18%
		4-6PM	61.7	E	**99.1**	**F**	**54.0**	**0.202**			5%
67	Mission College Boulevard and Montague Expressway *	3-5PM	35.6	D	**89.7**	**F**	**88.0**	**0.429**	52.1	D	35%
		4-6PM	42.8	D	**103.1**	**F**	**105.1**	**0.352**	67.7	E	18%
71	Lawrence Exp Ramps and El Camino Real *	3-5PM	37.6	D	**44.2**	D	9.5	0.088	38.4	D	27%
		4-6PM	65.3	E	**87.1**	**F**	**33.8**	**0.089**	60.9	E	19%
City of San Jose Intersections											
78	North First Street and Tasman Drive	3-5PM	39.4	D	**60.0**	**E**	**35.2**	**0.240**			52%
		4-6PM	49.8	D	**71.1**	**E**	**38.5**	**0.132**			15%
83	North First Street and Montague Expressway *	3-5PM	121.4	F	**184.1**	**F**	**74.5**	**0.180**			26%
		4-6PM	206.8	F	**300.6**	**F**	**91.2**	**0.259**			8%
84	Zanker Road and Montague Expressway *	3-5PM	62.3	E	**82.0**	**F**	**39.1**	**0.162**			22%
		4-6PM	98.8	F	**116.4**	**F**	**34.0**	**0.158**			8%
85	Montague Expressway and River Oaks Parkway	3-5PM	51.8	D	53.2	D	3.3	0.175			27%
		4-6PM	52.2	D	**57.3**	**E**	**7.7**	**0.168**			11%
87	O'Toole Avenue and Montague Expressway *	3-5PM	68.8	E	**117.0**	**F**	**65.5**	**0.282**			16%
		4-6PM	96.0	F	**179.4**	**F**	**96.9**	**0.616**			6%
89	Trade Zone Boulevard and Montague Expressway *	3-5PM	59.3	E	**74.1**	**E**	**19.5**	**0.149**			23%
		4-6PM	101.4	F	**112.3**	**F**	**15.3**	**0.090**			9%
93	Great America (N) and SR 237 *	3-5PM	19.8	B	76.3	E	64.7	0.543	38.2	D	84%
		4-6PM	22.0	C	**209.1**	**F**	**214.4**	**0.769**	111.4	F	86%
City of Sunnyvale Intersections											
95	Reamwood Avenue and Tasman Drive	3-5PM	8.4	A	**90.6**	**F**	**119.0**	**0.443**			57%
		4-6PM	9.2	A	33.0	C	41.2	0.254			39%
96	Birchwood Avenue and Tasman Drive	3-5PM	17.2	B	**103.1**	**F**	**133.4**	**0.433**			57%
		4-6PM	18.1	B	**56.3**	**E**	**50.4**	**0.247**			40%
97	Lawrence Expressway and Tasman Drive *	3-5PM	62.2	E	**90.8**	**F**	**38.2**	**0.221**			55%
		4-6PM	78.7	E	**117.0**	**F**	**57.3**	**0.152**			38%
104	Lawrence Expressway and Oakmead Parkway	3-5PM	40.7	D	45.1	D	7.2	0.084			19%
		4-6PM	59.0	E	**77.0**	**E**	**31.6**	**0.081**			0%
105	Lawrence Expressway and Arques Avenue *	3-5PM	42.8	D	53.0	D	16.9	0.110			22%
		4-6PM	74.2	E	**103.4**	**F**	**50.4**	**0.115**			13%
106	Lawrence Expressway and Kifer Road	3-5PM	46.3	D	47.4	D	2.9	0.095			24%
		4-6PM	57.1	E	**70.1**	**E**	**23.2**	**0.095**			17%
107	Lawrence Expressway and Reed Avenue/Monroe Street *	3-5PM	37.1	D	48.9	D	20.7	0.108			23%
		4-6PM	77.5	E	**104.9**	**F**	**48.1**	**0.112**			15%
108	Lawrence Expressway and Homestead Road *	3-5PM	46.6	D	52.2	D	10.0	0.066			15%
		4-6PM	83.5	F	**101.1**	**F**	**31.5**	**0.070**			10%
City of Milpitas Intersections											
110	Alder Drive and Tasman Drive	3-5PM	38.0	D	**142.2**	**F**	**133.2**	**0.383**	72.5	E	30%
		4-6PM	99.6	F	**210.4**	**F**	**147.9**	**0.360**	108.3	F	7%
111	I-880 SB and Tasman Drive	3-5PM	19.1	B	36.1	D	58.6	0.255	23.0	C	32%
		4-6PM	35.7	D	**75.9**	**E**	**127.4**	**0.318**	44.3	D	7%
112	I-880 NB and Tasman Drive	3-5PM	30.7	C	52.3	D	32.5	0.165	28.1	C	45%
		4-6PM	44.8	D	**112.5**	**F**	**105.7**	**0.190**	38.6	D	20%
114	I-880 NB and Calaveras Boulevard	3-5PM	19.0	B	37.0	D	29.4	0.223	17.7	B	48%
		4-6PM	37.0	D	**67.4**	**E**	**54.1**	**0.143**	30.6	C	36%
115	Abbott Avenue and Calaveras Boulevard	3-5PM	28.9	C	30.9	C	3.0	0.125	29.3	C	53%
		4-6PM	36.4	D	**67.7**	**E**	**63.5**	**0.211**	42.5	D	41%
117	Abel Street and Calaveras Boulevard *	3-5PM	41.8	D	50.5	D	14.8	0.190			46%
		4-6PM	56.3	E	**91.2**	**F**	**44.8**	**0.141**			38%

* Denotes CMP Intersections
Bold Denotes Significant Impacts

Table 25
Sunday Cumulative Conditions Intersection Levels of Service

Study Number		Peak Hour	Background Ave. Delay	Background LOS	Cumulative With Project Ave. Delay	Cumulative With Project LOS	Cumulative With Project Incr. In Crit. Delay	Cumulative With Project Incr. In Crit. V/C	Project Contribution
City of Santa Clara Intersections									
10	Freedon Circle (W) and Mission College Boulevard	11-1PM	10.0	B	**73.9**	**E**	**75.0**	**0.743**	109%
		3-5PM	9.8	A	49.1	D	47.9	0.703	97%
17	Great America Parkway and Old Glory Lane	11-1PM	12.8	B	**67.5**	**E**	**106.9**	**0.946**	54%
		3-5PM	12.7	B	**62.2**	**E**	**94.7**	**0.930**	55%
67	Mission College Boulevard and Montague Expressway *	11-1PM	28.6	C	**80.7**	**F**	**107.1**	**0.605**	69%
		3-5PM	27.5	C	**76.6**	**E**	**101.9**	**0.560**	73%
City of San Jose Intersections									
91	North First Street (North) and SR-237 *	11-1PM	139.2	F	**160.5**	**F**	**44.8**	**0.100**	95%
		3-5PM	18.0	B	23.0	C	4.8	0.094	76%

* = Denotes CMP Intersections
[ ] = Denotes Significant Impacts

6. Conclusions

The potential impacts of the proposed stadium development were evaluated in accordance with the standards and methodologies set forth by the Cities of Santa Clara, San Jose, Sunnyvale, Milpitas and the Santa Clara Valley Transportation Authority (VTA). The VTA administers the county Congestion Management Program (CMP).

The study included the analysis of AM and PM peak-hour traffic conditions for 120 existing signalized intersections, 44 directional freeway segments, and ramps at eleven freeway interchanges.

Project Impacts

Intersection Impacts

Intersection level of service analysis was used to evaluate traffic operations at the study intersections under project condition study scenarios. The analysis is not reflective of anticipated traffic conditions during peak periods of the stadium with the implementation of the TMP and traffic control plan. The analysis provides an evaluation of the magnitude of effects the stadium will have on this transportation system utilizing standard traffic analysis and CEQA evaluation methods. Results of the intersection level of service analysis show that 17 of the 120 study intersections would be impacted by the project during at least one of the weekday study periods and five during at least one of the Sunday study periods according to applicable level of service standards. The location of each of the mitigated intersections is presented below:

- 8 intersections are located in Santa Clara
- 6 intersections are located in San Jose
- 1 intersections is located in Sunnyvale
- 2 intersections are located in Milpitas

Mitigation measures were investigated for all identified weekday study period intersection impacts and are presented and described in Chapter 4. Mitigation measures were not investigated for the Sunday study periods because standard impact criteria only apply to weekday commute periods. Though it is expected that the traffic associated with the stadium will have a significant impact on intersections and other transportation facilities, the infrequency of occurrence (8-10 times per year) does not justify the implementation of costly physical improvements. The implementation of the TMP and traffic control plan will provide for temporary relief of adverse traffic congestion caused by stadium traffic on game days and days of other events. The project is not proposing to fund or implement the possible measures.

Freeway Segment Impacts

The results of the freeway segment analysis showed that 16 of the 44 mixed-flow lanes and one of the 32 HOV lanes on the directional freeway segments studied would be impacted by the project according to CMP level of service standards for freeways. There are measures that could reduce the impacts to freeway segments. The measures primarily consist of transit improvements and enhancements that would provide options for stadium attendees.

Traffic Management Plan
Enhancement of CalTrain, Amtrak/ACE service
Extension of LRT lines
Enhanced Bus Service

Adjusted transit services with major enhancements to provide a convenient means of getting to and from the stadium would reduce auto usage. The reduction in auto usage would be most noticeable on freeways since most transit trips would originate from outside the project area.

The Valley Transportation Authority *VTP 2030* also identifies improvements to regional facilities, including freeways, for which a regional funding plan could be used to fund. The following improvements to impacted freeway segments are identified in the *VTP 2030:*

US 101 auxiliary lane widenings between Trimble Road and Montague Expressway
US 101 southbound auxiliary lane between Great America Parkway and Lawrence Expressway
SR 237 westbound auxiliary lane between Coyote Creek Bridge and North First Street

Should it be deemed that the identified freeway improvements are feasible and necessary, the project along with other projects within Santa Clara County could contribute towards the funding of the improvements. A fee collection program would need to be established and specific improvements identified.

Full mitigation of significant project impacts on freeway segments would require roadway widening to construct additional through lanes, thereby increasing freeway capacity. Since it is not feasible for an individual development project to bear responsibility for implementing such extensive transportation system improvements due to constraints in acquisition and cost of right-of-way, and no comprehensive project to add through lanes has been developed by Caltrans or VTA for individual projects to contribute to, the significant impacts on the directional freeway segments identified above must be considered significant and unavoidable.

Gameday Transit Service Enhancements

The large demand for transit services, as described previously, will necessitate extensive enhancement of existing transit service. However, the project is not proposing to construct any new transit infrastructure. Therefore, the enhancement of existing transit services will primarily consist of increased service frequencies, additional bus lines, and additional trains to serve the specific demands of the stadium attendees. Tasman Drive will be temporarily closed to facilitate the large crowds that will arrive and depart football games. Tasman Drive will not only serve as a main transit arterial due to the light rail service along it, but also will be the primary gateway route for the majority of pedestrians. Enhancements to each of the components of transit service to meet the anticipated demands of the stadium are described below.

Bus Service. Bus lines from various agencies in the Bay area could be adjusted or special game day buses added. Staging areas for transit buses will be provided along Stars and Stripes Drive and Tasman Drive, just west of the bridge over Lafayette Street. Transit buses would be provided an exclusive ingress and egress route from Lafayette Street via Calle De Luna, Calle Del Sol, and Tasman Drive.

Light Rail Service. As described previously, the VTA light rail service will be a highly desirable means of accessing the stadium due to park-and-ride lots located throughout the south bay and a station within a few hundred feet of the stadium. Increased headways will be necessary to accommodate the demand for light rail. The closed area along Tasman Drive will serve as a staging area for fans to board the light rail at the Great America station.

Heavy Rail Service. Coordination between the heavy rail lines of Caltrain, ACE/Amtrak, and the Capitol Corridor line will be necessary. It may be possible to serve all heavy rail lines at the Great America station, but it will require joint-scheduling of trains, closure of tracks, and possible upgrades to equipment.

The TMP provides further detail on the possible enhancements and adjustments of each of the transit services.

Arrival and Departure Roadway Capacities

There are seven major arterials that will provide ingress and egress access to the stadium core area and identified parking areas. With the peak period arrival and departure projections of 7,369 and 12,082, respectively, there will be a large demand on the major arterials and the freeway ramps that they serve. The distribution of trips on each of the arterials and freeway ramps analyzed are based upon the routes that attendees will be encouraged to use. Critical to the efficient ingress and egress of attendees will be the dispersal of motorists to the identified access and departure routes. Signage will be used to direct motorists to appropriate exits from the freeways and to access identified parking facilities.

The projected traffic volumes indicate that the largest demands on the arterials serving the project area will be placed on Great America Parkway. It is projected that Great America Parkway will serve approximately 1,900 vehicles from the north and 1,800 vehicles from the south during the peak ingress hour and 2,100 vehicles to the north and 2,900 vehicles to the south during the peak egress hour. Though arterial lanes have the capacity to serve as much as 1,800 vph, a lane capacity of only 1,000 vph was assumed to account for pedestrian conflicts and general driver confusion. Based upon existing capacities of the major arterials, it was calculated that it will take no longer than 45-minutes to serve arriving

attendees. Since larger volumes of attendees are projected to depart during the first hour after the game, it will take up to one hour and 20-minutes to serve the peak departure demand on arterials.

Ramp volumes indicate that the freeway ramps at the US 101/ Great America Parkway and SR 237/ Great America Parkway interchanges will serve the largest arrival and departure volumes. Demands at these two interchange ramps during the peak arrival period will be approximately 1,000 vph and 1,700 vph during the peak departure period. Based upon existing ramp capacities (assuming lane capacities of 1,000 vph), it will take no longer than one hour to serve the peak arrival demand and one hour and 40 minutes to serve the peak departure demand.

Though arrival and departure demands are projected to exceed existing capacities of the most heavily utilized arterials and ramps, the congestion is expected to dissipate rapidly upon service of the peak demand periods, which will not last more than two hours. It also is likely that motorists will seek alternative routes when wait times at freeway off-ramp become too lengthy. The TMP will implement measures to control the effects of diversion and maintain freeway mainline flow.

Residential Parking Control

Uniformed officers will be responsible for the enforcement of residential parking restrictions in the stadium area. The residential areas located east of Lawrence Expressway between US 101 and Tasman Drive and west of Lafayette Street between Agnew Road and Tasman Drive could potentially be the most affected by stadium parking. An officer will be positioned along with barricades at each of the access points to the neighborhoods. The neighborhoods also will be patrolled to ensure attendees do not park within the neighborhoods or violate parking restrictions. Access to the Adobe Wells mobile home park that is located along the south side of Tasman Drive is provided at Adobe Wells. It is likely that during the peak hours of arrival and departure of attendees that Tasman Drive will experience congestion restricting access to the mobile home park. Thus, it will be necessary for officers to monitor traffic conditions and ensure that residents of the mobile home park have the ability to enter and exit the park entrance.

Pedestrian Routes

With the large numbers of attendees expected for the football games and the use of essentially all parking within a 20-minute walk of the stadium, a large number of fans will be utilizing many streets in the area to get from parking to the stadium. For the most part, pedestrians will not have to cross vehicular traffic, but there are a few areas that will present a conflict between vehicles and pedestrians. The conflict points will be located at signalized intersections with crosswalks that serve as primary entry to identified parking areas. Pedestrians travelling to parking areas northwest of the stadium would cross Great America at either Tasman Drive or Bunker Hill, those travelling west and southwest of the stadium would cross Great America Parkway at Tasman Drive, Old Glory Lane, Patrick Henry Drive, or Mission College Boulevard. Each of the conflict points will be officer controlled to provide an efficient flow of both vehicular and pedestrian traffic. Pedestrians travelling east of the stadium would travel along Tasman Drive and not encounter conflicts with vehicular traffic. Those travelling south of the stadium would utilize the San Tomas Aquino Creek trail or Great America parkway and one of the pedestrian bridges across San Tomas Aquino Creek Pedestrian routes.

The intersection of Great America Parkway and Tasman Drive will serve as the main gateway to the stadium from the majority of identified parking and each of the roadways will provide access from nearly

every parking zone. Tasman Drive between Centennial Boulevard and the Great America parking lot driveway will be temporarily closed to vehicular traffic to accommodate the large crowds before and after games. The closure of Tasman Drive will prohibit through traffic along Tasman Drive east of Great America Parkway, but will allow access to parking in the Great America surface lots. Should it be found that vehicular traffic presents a conflict with and impedes pedestrian flow along Tasman Drive, all vehicular access on Tasman Drive should be prohibited.

To further facilitate pedestrian traffic the existing overflow parking lot bridge and the Tasman Drive over-crossing will be widened along with the construction of a new pedestrian-only bridge south of the Tasman Bridge over San Tomas Aquino Creek.

Charter Bus Staging

Parking for charter buses will be permitted along Patrick Henry Drive/Old Ironsides Drive on the north and south of Tasman Drive. There is adequate parking for up to 195 buses within the specified loop. All Charter buses will remain parked for the duration of the football game. All buses will enter and exit via Tasman Drive to the west.

Multi-Team Use of Stadium

Though there currently is no specific plans for the use of the stadium by a second NFL team nor has potential teams, existing or future expansion, been identified, there is the potential that a second NFL team may utilize the stadium.

The origin and fan base of a second team is unknown at this time. But regardless of whether a second team is relocated or is an expansion team, it is expected that the effects on the transportation system by a second team would be similar to those identified within this report for the 49er football games. Though the origin of fans may be slightly different from that which was identified within the report based upon the 49er fan base, the overall effects on the facilities studied in the report and within Santa Clara County as a whole would be similar. The distribution of fans will be dependent upon the origins of a second team. Should the second team be relocated from within the Bay Area to the new stadium, the fan distribution could be slightly different than that of the 49ers outside of Santa Clara County, but overall effects within Santa Clara County would be similar to 49er games. Should the second team be relocated from outside the Bay Area it is likely that a greater amount of fans would originate from within Santa Clara County, and mirror the effects on the transportation system of the 49er games.

Though the effects on the transportation system due to the potential second team use of the stadium would be similar to the 49er games, the second team would double the amount of games held at the stadium, therefore increasing the frequency of impacts identified for the 49er games. It is expected that the proposed TMP to be utilized for 49er games would also be implemented for games of the second team.

Non-Football Events

The stadium may also be utilized to host non-football events throughout the year. Possible events include motocross, x-games, concerts, soccer games, and various festivals. Larger non-football events that would require the use of off-site parking will be restricted to non-summer months to avoid conflict with Great America theme park and take place during evenings and on weekends to avoid conflict with the

surrounding office/industrial land uses. Times of use for smaller events that would only utilize on-site stadium parking will not be restricted

San Francisco 49ers
Santa Clara Stadium

Draft Environmental Impact Report
Transportation Impact Analysis

Technical Appendices

Prepared for:

The City of Santa Clara

Prepared by:

Hexagon Transportation Consultants, Inc.

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A CD copy of the TIA technical appendices is available on request from the City of Santa Clara Department of Planning and Inspection.

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