HEXAGON TRANSPORTATION CONSULTANTS, INC.

Freedom Circle Focus Area Plan and Greystar General Plan Amendment

Transportation Analysis

Prepared for:

MIG

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1. Introduction

This report presents the results of the transportation analysis (TA) conducted for the proposed Freedom Circle Focus Area Plan and Greystar General Plan Amendment in Santa Clara, California (see Figure 1). The Freedom Circle Focus Area encompasses approximately 108 gross acres in an employment-rich area of northern Santa Clara, comprising several moderate-intensity office and industrial parks accompanied by surface parking, along with the Santa Clara Marriott hotel. The Focus Area is bounded by San Tomas Aquino Creek to the east, Great America Parkway to the west, Great America Theme Park to the north, and Highway 101 to the south. It is proximate to a range of regional destinations and amenities, including Levi's Stadium, Great America Theme Park, and the Santa Clara Convention Center. The Focus Area would allow, subject to a future planning study, 2,525 dwelling units beyond those anticipated in the Greystar General Plan Amendment (described below), and 2 million square feet of additional office space beyond that allowed under the current high-intensity office designation (see Figure 2). The Freedom Circle Focus Area would maintain the existing roadways and vehicle connections from Great America Parkway and Mission College Boulevard.

The Greystar General Plan Amendment proposes to change the General Plan land use designation for the 13.3-acre Greystar site, which is bounded by San Tomas Aquino Creek to the East, Freedom Circle to the West, and Highway 101 to the south from High Intensity Office (maximum Floor Area Ratio of 2.0) to Very High Density Residential (51-100 Dwelling Unit/Acre). Greystar is proposing a total of 1,075[1] dwelling units in three 7-story buildings. The proposal also includes a two-acre public park with a connection to the San Tomas Aquino Creek trail, and up to 2,000 square feet of neighborhood-serving retail. The Greystar site would have direct vehicular access via three proposed driveways on Freedom Circle.

Scope of Study

The purpose of the transportation analysis (TA) is to satisfy the requirements of the City of Santa Clara and the Congestion Management Program (CMP) of the Santa Clara Valley Transportation Authority (VTA) and the California Environmental Quality Act (CEQA).

[1] This transportation analysis is based on an earlier project description, which contained 1,100 dwelling units. Thus, the analysis of adverse effects associated with the Greystar development is conservative in that it slightly overstates the trips associated with the proposed project. The buildout of the Freedom Circle Focus Area is assumed to include a total of 3,600 d.u. (1,100 d.u. on the Greystar site plus 2,500 d.u. elsewhere in the Focus Area).

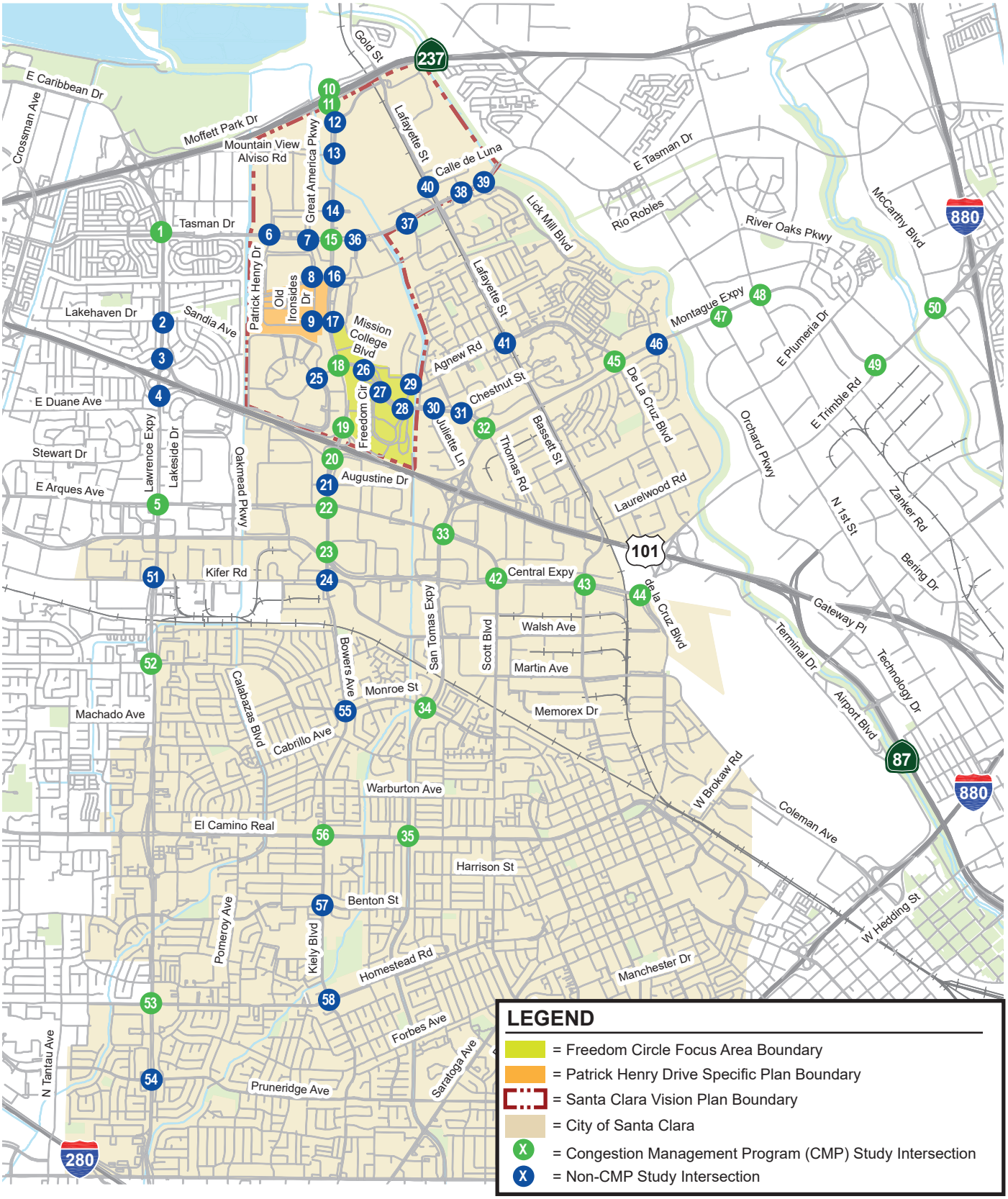


Figure 1
Study Intersections

NORTH
Not to Scale

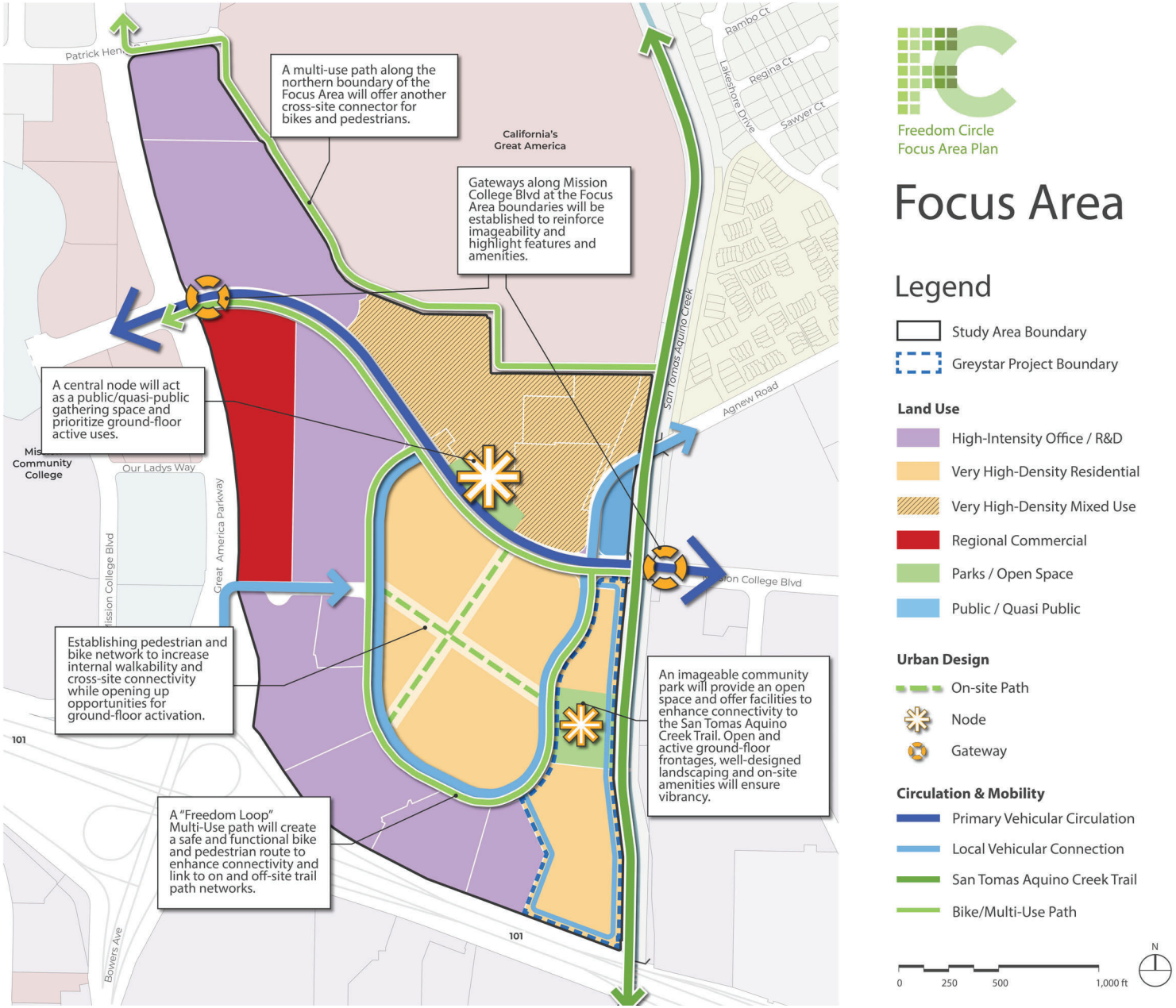


Figure 2
Draft Conceptual Land Use Plan for Freedom Circle Focus Area

It should be noted that this transportation analysis is based on existing conditions as of 2018/2019, prior to the recent reductions in traffic volumes and transit services associated with the current pandemic. Since the institution of shelter in place orders went into effect in March 2020 due to COVID-19, most offices and schools are closed, and people are working at home to the extent possible. As a result, current traffic volumes are a fraction of what they were prior to the virus outbreak and transit providers are operating on reduced schedules. It is not known when traffic conditions will return to pre-virus levels, but it is expected that the current reductions in traffic volumes and transit services are only temporary. Since development of the Freedom Circle Focus Area is anticipated to occur over a period of many years or decades, this transportation analysis is based on pre-virus conditions. Furthermore, future year traffic forecasts reflect assumptions regarding land use developments and transportation improvements developed in 2019 without any modifications to reflect the potential long-range economic effects of the current pandemic. Thus, this transportation analysis is considered to be a conservative evaluation of the project's effects since the growth in traffic volumes reflected in this report may not occur until many years after the horizon years evaluated in this report.

Vehicle Miles Traveled

In 2013, Governor Brown signed Senate Bill 743. SB 743 directed the State Office of Planning and Research (OPR) to develop new California Environmental Quality Act (CEQA) guidelines and to replace Level of Service (LOS) as the evaluation measure for transportation impacts under CEQA with another measure such as Vehicle Miles Traveled (VMT). VMT measures the amount of vehicle trip making and trip length and is a direct measurement of greenhouse gas emissions. A reduction in VMT would promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses that reduces the reliance on individual vehicles.

The City of Santa Clara recently adopted a VMT Transportation Analysis Policy for Environmental Review[2]. The Policy sets forth screening criteria that allow various types of developments such as infill developments, small projects, and/or transit supportive projects near major transit corridors to be presumed to have a less than significant impact on VMT. The Freedom Circle Focus Area Plan and the Greystar General Plan Amendment would qualify as a transit supportive project since they meet the following criteria:

Proximity to Transit

Transit supportive projects must be located within ½ mile of an existing Major Transit Stop or an existing transit stop along a High-Quality Transit Corridor, as those terms are defined by Public Resources Code sections 21064.3 and 21155. A "Major Transit Stop" is defined as a site containing any of the following: (a) an existing rail or bus rapid transit station; (b) the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods; or (3) a major transit stop that is included in Plan Bay Area 2040 (Pub. Res. Code §§ 21064.3, 21155(b)). A "High-Quality Transit Corridor" is defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. (Pub. Res. Code § 21155(b).

[2] City of Santa Clara, Resolution No. 20-8861, "A Resolution of the City of Santa Clara, California to Amend Resolution 5713 to Adopt a Transportation Analysis Policy to Comply with the California Environmental Quality Act Pursuant to State Senate Bill 743 (2013) and CEQA Guidelines Section 15064.3," adopted June 23, 2020.

VTA provides the frequent bus service via Route 57, which runs along Great America Parkway. In addition, VTA provides local bus service via Route 20 and Route 59, which run along Great America Parkway and Mission College Boulevard. Prior to COVID-19 pandemic, both Route 57 and Route 20 had headways of 15-minutes during the peak commute periods. Since the pandemic is temporary and the VTA plans to resume 15-minute headways on these routes as ridership increases, pre-pandemic headways were used to define "High-Quality Transit Corridor". Thus, both Great America Parkway and Mission College Boulevard have fixed-route bus service with service intervals of 15 minutes or less during the AM and PM peak commute periods and are considered High-Quality Transit Corridors. There are three Route 20/59 bus stops near the Freedom Circle Focus area along Mission College Boulevard at Great America Parkway, Freedom Circle, and Agnew Street. All of the parcels within the Freedom Circle Focus area, including the Greystar site, are either within ½ mile of the nearest Route 57 bus stop or the Route 20/59 bus stops. A map showing these transit facilities and a full description of other nearby transit services are presented in Chapter 2 (see Figure 5).

Density

For office/R&D projects, transit supportive projects must have a minimum floor area ratio (FAR) of 0.75. Likewise, residential projects must have a minimum density of 35 dwelling units per acre. The office development allowed in the Freedom Circle Focus Area would equate to an FAR of approximately 1.4. The proposed residential density within the Freedom Circle Focus Area including the Greystar site would be nearly 100 du/ac. Thus, the development densities proposed on the Greystar site and the remainder of the Freedom Circle Focus Area would meet the minimum requirements to be considered a transit supportive project.

Multimodal Transportation Networks

The City Policy requires that transit supportive projects promote multimodal transportation networks. The Freedom Circle Focus Area Plan will provide balanced, multimodal internal circulation as well as easy access to nearby destinations and transit stations. The Plan includes the following planning and design themes that support safe, active, and sustainable travel options for residents, workers, and visitors:

- Maintain existing street hierarchy and provide streetscape alterations to promote pedestrian friendly design to increase pedestrian comfort and safety.
- Expand pedestrian pathways, internal streets, and create new linkages between neighborhoods to improve circulation, connect people to destinations both within and outside of the plan area, and provide a sense of openness in residential areas.
- Retrofit auto-oriented streets to accommodate all travel modes, and develop finer grained streets that are comfortable, inviting, safe, and accessible for all users.
- Build on existing physical assets and enhance connectivity to the San Tomas Aquino Creek trail.
- Provide pedestrian and bicycle routes to transit stops located along major thoroughfares.

In particular, the proposed Greystar development would add a new bicycle and pedestrian connection from Freedom Circle through the project site to the San Tomas Aquino Creek trail. In addition, Greystar would construct Class II bike lanes along the project frontage on Freedom Circle.

Transit-Oriented Design Elements

Transit supportive projects must include transit-oriented design elements. The Freedom Circle Focus Area Plan will include design guidelines and standards to ensure a pedestrian-oriented, mixed-use district that is walkable with convenient connections to high-quality transit. The following urban design principles will ensure the Freedom Circle Focus Area is a transit-oriented development:

- Include a lively mix of core community uses and neighborhood serving retail that provide a broad array of services for residents, workers, and visitors.
- Reduce reliance on private vehicles and improve jobs/housing balance by locating amenities and jobs within walking distance to housing.
- Develop standards and guidelines to enhance overall livability of the area.
- Activate street frontages and ground floor uses to create a cohesive, integrated, environment.

The Greystar project would include neighborhood serving retail space adjacent the proposed public park that would serve residents and park visitors reducing the need for vehicle travel. Furthermore, the Greystar site is located in an employment rich area. Thus, the proposed residential use would improve the diversity of uses and promote alternative modes of travel.

Parking

Transit supportive projects may not include more parking for use by residents, customers, or employees of the project than required by the City Code. With the exception of Greystar, no other development applications have been submitted for projects within the Freedom Circle Focus Area, thus the proposed on-site parking supply is unknown elsewhere. The Freedom Circle Focus Area Plan is expected to follow the parking standards set forth in the City of Santa Clara Municipal Code §18.23.070. The parking ratios in this section were developed for the Lawrence Station Area Plan. The Freedom Circle Focus Area Plan will not require parking at a higher rate than the code requirements in effect in other areas. Thus, it is assumed that future developments within the Freedom Circle Focus Area will not include excess parking and would qualify as transit supportive. Moving forward, development proposals will undergo review upon submittal and any applications that propose excess parking would not qualify as transit supportive and would be required to evaluate their potential impacts on VMT.

As currently proposed, the on-site residential and retail parking at the Greystar project (1,391 spaces) would equal the City Code required parking. Thus, the proposed parking supply is consistent with a transit supportive project.

Affordable Housing

Affordable housing has been shown to generate fewer vehicle miles traveled per capita than market rate housing. Accordingly, the City's VMT Policy states that transit supportive projects must not replace affordable residential units with a smaller number of affordable units, and any replacement units must be at the same level of affordability. Currently, the Freedom Circle Focus Area does not contain any residential dwelling units. The Freedom Circle Focus Area Plan will require 15 percent of the proposed new residential dwelling units be affordable to those earning less than 80 percent of the Area Median Income (AMI). Therefore, the project would add new affordable dwelling units and not result in a loss of affordable units.

Findings

Per the State's guidance and the City's VMT Policy, the Freedom Circle Focus Area Plan qualifies as a transit supportive project and is presumed to have a less than significant impact on VMT. Likewise, the Greystar development would qualify as a transit supportive project presuming on-site parking is reduced so that it does not exceed the parking required by code.

Local Transportation Analysis

Although the Freedom Circle Focus Area Plan does not require a VMT analysis, the City still requires all projects to measure intersection efficiency (LOS) as part of an operational analysis and to provide improvements or address project related operational deficiencies. Thus, this report contains a local

transportation analysis to evaluate the project's consistency with the level of service standards set forth in the City's General Plan and to identify feasible improvements to remedy any deficiencies.

The study area was determined using the City of Santa Clara's (CSC) travel demand forecast model. The study analyzes the effects of the project on the key intersections, freeway segments, and freeway ramps in the study area during the weekday AM and PM peak hours of traffic. Locally, the AM peak hour of traffic is usually between 7:00 and 9:00 AM, and the PM peak hour is typically between 4:00 and 6:00 PM. It is during these periods that the most congested traffic conditions occur on an average weekday.

The Santa Clara County VTA CMP guidelines require that the CMP freeway segments be evaluated to determine the impact of added traffic for projects that generate trips equal to or greater than one percent of the freeway segment's capacity. Implementation of the Focus Area Plan is expected to generate added traffic volume on multiple freeway segments along US 101, SR 237, SR 87, I-680, and I-880. The traffic analysis also includes a capacity analysis for 14 freeway ramps.

Study Intersections

Fifty-eight study intersections were selected in accordance with VTA's *Transportation Impact Analysis Guidelines* (October 2014) and in consultation with Santa Clara staff. The study includes those intersections that provide primary access to the project areas and intersections that would experience a substantial increase in traffic volumes. The study intersections are listed below and shown on Figure 1. Twenty-five study intersections are designated as CMP intersections. Seven of the study intersections are located in the City of Sunnyvale, six of the study intersections are located in the City of San José, and the remaining intersections are in Santa Clara. All study intersections were evaluated against the standards of the applicable municipality, while the CMP intersections also were evaluated against the standards of the Santa Clara County CMP.

1. Lawrence Expressway and Tasman Drive (CMP) [Sunnyvale]
2. Lawrence Expressway and Sandia Avenue/Lakehaven Drive [Sunnyvale]
3. Lawrence Expressway and US 101 Northbound Ramps [Sunnyvale]
4. Lawrence Expressway and US 101 Southbound Ramps [Sunnyvale]
5. Lawrence Expressway and E. Arques Avenue (CMP) [Sunnyvale]
6. Patrick Henry Drive and Tasman Drive
7. Old Ironsides Drive and Tasman Drive
8. Old Ironsides Drive and Old Glory Lane (Unsignalized)
9. Old Ironsides Drive and Patrick Henry Drive (Unsignalized)
10. Great America Parkway and SR 237 Westbound Ramps (CMP) [San José]
11. Great America Parkway and SR 237 Eastbound Ramps (CMP) [San José]
12. Great America Parkway and Great America Way
13. Great America Parkway and Old Mountain View-Alviso Road
14. Great America Parkway and Bunker Hill Lane
15. Great America Parkway and Tasman Drive (CMP)
16. Great America Parkway and Old Glory Lane
17. Great America Parkway and Patrick Henry Drive
18. Great America Parkway and Mission College Boulevard (CMP)
19. Great America Pkwy/Bowers Ave and US 101 Northbound Off Ramp (CMP)
20. Bowers Avenue and US 101 Southbound Off Ramp (CMP)
21. Bowers Avenue and Augustine Drive
22. Bowers Avenue and Scott Boulevard (CMP)
23. Bowers Avenue and Central Expressway (CMP)
24. Bowers Avenue and Kifer Road/Walsh Avenue
25. Mission College Boulevard Loop and Mission College Boulevard

26. Marriott Driveway and Mission College Boulevard
27. Freedom Circle Drive (W) and Mission College Boulevard
28. Agnew Road/Freedom Circle Drive (E) and Mission College Boulevard
29. Great America employee entrance and Agnew Road
30. Juliette Lane and Mission College Boulevard
31. Burton Drive and Mission College Boulevard
32. Mission College Boulevard and Montague Expressway (CMP)
33. San Tomas Expressway and Scott Boulevard (CMP)
34. San Tomas Expressway and Monroe Street (CMP)
35. San Tomas Expressway and El Camino Real (CMP)
36. Convention Center and Tasman Drive
37. Centennial Boulevard and Tasman Drive
38. Calle Del Sol and Tasman Drive
39. Lick Mill Boulevard and Tasman Drive
40. Lafayette Street and Calle De Luna
41. Lafayette Street and Agnew Road
42. Scott Street and Central Expressway (CMP)
43. Lafayette Street and Central Expressway (CMP)
44. De la Cruz Boulevard and Central Expressway (CMP)
45. Agnew Road/De La Cruz Boulevard and Montague Expressway (CMP)
46. Lick Mill Boulevard and Montague Expressway
47. N. 1st Street and Montague Expressway (CMP) [San José]
48. Zanker Road and Montague Expressway (CMP) [San José]
49. Trimble Road and Montague Expressway (CMP) [San José]
50. McCarthy Boulevard/O'Toole Avenue and Montague Expressway (CMP) [San José]
51. Lawrence Expressway and Kifer Road
52. Lawrence Expressway and Reed Avenue/Monroe Street (CMP) [Sunnyvale]
53. Lawrence Expressway and Homestead Road (CMP) [Sunnyvale]
54. Lawrence Expressway and Pruneridge Avenue
55. Bowers Avenue and Monroe Street
56. Bowers Avenue/Kiely Boulevard and El Camino Real (CMP)
57. Kiely Boulevard and Benton Street
58. Kiely Boulevard and Homestead Road

Freeway Segments

- US 101 between SR 85 SR 92
- SR 237 between I-880 and El Camino Real
- SR 87 between SR 85 and US 101
- I-680 between Yosemite Drive and Stoneridge Drive
- I-880 between Montague Expressway and Alvarado Boulevard

Study Freeway Ramps

US 101 and Montague Expressway Interchange

- Southbound On-Ramp from Westbound Montague Expressway
- Northbound Off-Ramp to Eastbound Montague Expressway

US 101 and Great America Parkway Interchange

- Northbound On-Ramp from Southbound Great America Parkway
- Southbound On-Ramp from Southbound Great America Parkway

- Northbound Off-Ramp to Great America Parkway
- Southbound Off-Ramp to Great America Parkway

SR 237 and Great America Parkway Interchange

- Eastbound On-Ramp from Great America Parkway
- Westbound On-Ramp from Great America Parkway
- Eastbound Off-Ramp to Great America Parkway
- Westbound Off-Ramp to Great America Parkway

US 101 and Lawrence Expressway Interchange

- Northbound On-Ramp from Southbound Lawrence Expressway
- Southbound Off-Ramp to Lawrence Expressway

SR 237 and Lawrence Expressway Interchange

- Westbound On-Ramp from Northbound Lawrence Expressway
- Eastbound Off-Ramp to Southbound Lawrence Expressway

Other Transportation Issues

The study includes an evaluation of the project's impacts on transit services and pedestrian and bicycle facilities, and a review of internal vehicular circulation, site access, and parking. In addition, vehicle queuing was evaluated at selected locations where the Focus Area would add a significant number of left-turning vehicles. Lastly, a signal warrant analysis was conducted for the unsignalized study intersections.

Traffic conditions at the study intersections were evaluated for the following scenarios:

- ***Existing Conditions.*** Existing AM and PM peak-hour traffic volumes were obtained from new turning-movement counts conducted in May 2019, previously completed traffic studies, and the latest available CMP database.
- ***Background (Year 2030) Conditions.*** Background traffic volumes were developed using the CSC travel demand forecasting model. In most locations, the model reflects anticipated growth according to ABAG 2030 land use projections. In the Freedom Circle Focus Area, employment is estimated to grow by approximately six percent between the Year 2018 and 2030. In the vicinity of the Focus Area, the model assumes completion of City Place Phases 1-3 and buildout of the Tasman East Specific Plan. The existing land uses are assumed to remain unchanged within the Patrick Henry Specific Plan Area. The analysis reflects planned transportation improvements anticipated to occur by the Year 2030. Intersection levels of service under background conditions were evaluated using the City methodology.
- ***Background Plus Project Conditions.*** The Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition* and the CSC travel demand forecasting model were used to develop traffic forecasts for background plus project conditions under two development scenarios: 1) Greystar project by itself; 2) the buildout of the Freedom Circle Focus Area including the Greystar project. Intersection level of service calculations were conducted to evaluate background plus project traffic conditions during the AM and PM peak hours. Adverse effects on intersection levels of service associated with the Greystar alone and the buildout of the Focus Area were evaluated relative to background conditions.
- ***Cumulative (Year 2040) No Project Conditions.*** Cumulative no project traffic volumes were developed using the CSC travel demand model. Cumulative conditions reflect future development and planned transportation improvements anticipated to occur by the year 2040. The model land use assumptions reflect ABAG land uses in most locations. Within the vicinity of

the Focus Area, the model assumes buildout of City Place, buildout of the proposed Kylli mixed-use project, buildout of the Patrick Henry Drive Specific Plan (Option 2) and no new roadway connection between Patrick Henry Drive and Mission College Boulevard, as well as development of an additional 1,500 dwelling units per a proposed Amendment to the Tasman East Specific Plan. Cumulative no project conditions assume a marginal growth within the Freedom Circle Focus Area based on the ABAG land use projections under the current land use designations and completion of the approved office development at 4301 Great America Parkway. Intersection level of service calculations under cumulative no project conditions were evaluated using the City methodology.

- ***Cumulative Plus Project without Greystar Conditions.*** Cumulative plus project without Greystar conditions reflects the future development anticipated to occur under cumulative no project conditions plus buildout of the Freedom Circle Focus Area with the exception of the Greystar site, which would remain vacant. Traffic forecasts were developed using ITE trip rates and the CSC travel demand model. Intersection levels of service under cumulative plus project without Greystar conditions were evaluated using the City methodology.
- ***Cumulative Plus Project including Greystar Conditions.*** Cumulative plus project including Greystar traffic volumes were developed using ITE trip rates and the CSC travel demand model and reflect trips generated by buildout of the Freedom Circle Focus Area including the Greystar site. Intersection levels of service under cumulative plus project conditions were evaluated using the City methodology.

Methodology

This section presents the methods used to determine traffic conditions on study roadways and effects on traffic operations caused by the project. 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, the City of Santa Clara, City of San José, City of Sunnyvale, the CMP, and field observations. The following data were collected from these sources:

- Existing traffic volumes,
- Lane geometries,
- Signal timing and phasing, and
- Lists of approved and pending developments.

Intersection Level of Service Methodologies and 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.

Signalized Intersections

The Cities of Santa Clara, San José, and Sunnyvale evaluate level of service at signalized intersections based on the *2000 Highway Capacity Manual (HCM)* level of service methodology. This HCM method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. This average delay can then be correlated to a level of service. Table 1 presents the level of service definitions for signalized intersections.

This study utilizes TRAFFIX software to determine intersection levels of service based on the HCM method. Since TRAFFIX is approved by VTA as the level of service analysis software for CMP signalized intersections, the Cities of Santa Clara, San José, and Sunnyvale employ the CMP defaults values for the analysis parameters. TRAFFIX software was used to analyze intersection operations and to identify adverse effects based on the increases in critical-movement delay and the volume-to-capacity ratio (v/c) between no-project and project scenarios.

The Cities of Santa Clara, San José, and Sunnyvale have set forth LOS D as the minimum standard, except on CMP and expressway facilities within Santa Clara and roadways considered "regionally significant" within Sunnyvale, which have a standard of LOS E. Study intersections within Sunnyvale along Lawrence Expressway are considered regionally significant.

Table 1
Signalized Intersection Level of Service Definitions Based on Average Control Delay

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Signal progression is extremely favorable. Most vehicles arrive during the green phase and do not stop at all. Short cycle lengths may also contribute to the very low vehicle delay.	10.0 or less
B	Operations characterized by good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average vehicle delay.	10.1 to 20.0
C	Higher delays may result from fair signal progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though some vehicles may still pass through the intersection without stopping.	20.1 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable signal progression, long cycle lengths, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	This is considered to be the limit of acceptable delay. These high delay values generally indicate poor signal progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Individual cycle failures occur frequently.	55.1 to 80.0
F	This level of delay is considered unacceptable by most drivers. This condition often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes of such delay levels.	greater than 80.0

Source: Transportation Research Board, *2000 Highway Capacity Manual* (Washington, D.C., 2000), p.10-16.

Unsignalized Intersections

The study includes the analysis of two unsignalized intersections located in the City of Santa Clara. The City of Santa Clara does not have a level of service standard for unsignalized intersections. The two unsignalized study intersections were analyzed for operational purposes.

Level of service analysis at unsignalized intersections is generally used to determine the need for modification in the type of intersection control (i.e., all-way stop or signalization). As part of the evaluation, traffic volumes and delays are evaluated to determine if the existing intersection control is appropriate.

For unsignalized intersections, the level of service is reported based on the average delay for all movements. The level of service definitions for unsignalized intersections is shown in Table 2. This study utilizes TRAFFIX software to determine intersection levels of service based on the *2000 HCM* methodology for unsignalized intersections.

Table 2
Unsignalized Intersection Level of Service Definitions Based on Average Delay

Level of Service	Description	Average Delay Per Vehicle (Sec.)
A	Little or no traffic delay	10.0 or less
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays	greater than 50.0

Source: Transportation Research Board, *2000 Highway Capacity Manual* (Washington, D.C., 2000) p17-2.

Traffic Signal Warrant Analysis

An assessment of the need for signalization was conducted for unsignalized study intersections. For this study, the need for signalization was assessed on the basis of the peak hour volume signal warrant (Warrant #3) described in the *2014 California Manual on Uniform Traffic Control Devices* (CA MUTCD). This method provides an indication of whether traffic conditions and peak-hour traffic levels are, or would be, sufficient to justify the installation of a traffic signal. It should be noted that it is just one of the factors/warrants used to indicate whether installation of a traffic control signal is justified.

Freeway Segments

Freeway segments were analyzed as prescribed in the Santa Clara County CMP technical guideline. 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 vehicle 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 3. The CMP requires that mixed-flow lanes and auxiliary lanes be analyzed separately from high-occupancy vehicle (HOV) lanes (otherwise known as carpool lanes). The CMP specifies that a capacity of 2,300 vehicles per hour per lane (vphpl) be used for segments three lanes or wider in one direction, and a capacity of 2,200 vphpl be used for segments two lanes wide in one direction. HOV lanes are specified as having a capacity of 1,650 vphpl.

Table 3
Freeway Segment Level of Service Definitions

Level of Service	Description	Density (vehicles/mile/lane)
A	Average operating speeds at the free-flow speed generally prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	11.0 or less
B	Speeds at the free-flow speed are generally maintained. The ability to maneuver within the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers is still high.	11.0 to 18.0
C	Speeds at or near the free-flow speed of the freeway prevail. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more vigilance on the part of the driver.	18.0 to 26.0
D	Speeds begin to decline slightly with increased flows at this level. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort levels.	26.0 to 46.0
E	At this level, the freeway operates at or near capacity. Operations in this level are volatile, because there are virtually no usable gaps in the traffic stream, leaving little room to maneuver within the traffic stream.	46.0 to 58.0
F	Vehicular flow breakdowns occurs. Large queues form behind breakdown points.	greater than 58.0

Source: Santa Clara County Valley Transportation Authority, Transportation Impact Analysis Guidelines, Updated March 2009 (Based on the *Highway Capacity Manual (2000), Washington, D.C.)*

Freeway Ramps

A freeway ramp analysis was performed in order to verify that the freeway ramps have sufficient capacity to serve the projected traffic volumes with the development of the Freedom Circle Focus Area Plan. This analysis consisted of a volume-to-capacity ratio evaluation of the freeway ramps at the study interchanges. The ramp capacities were obtained from the *Highway Capacity Manual 2000*, and considered the free-flow speed, number of lanes on the ramp, and ramp metering.

Intersection Vehicle Queuing Analysis

The analysis of intersection operations was supplemented with a vehicle queuing analysis at study intersections where the Focus Area would add a substantial number of vehicle trips to the left-turn movements. The analysis provides a basis for estimating future left-turn pocket storage requirements at the study intersections and is presented for informational purposes only, since the City of Santa Clara has not defined a policy related to queuing. Vehicle queues were estimated using a Poisson probability

distribution, which estimates the probability of "n" vehicles for a vehicle movement using the following formula:

$$P(x=n) = \frac{\lambda^n e^{-(\lambda)}}{n!}$$

Where:

P (x=n) = probability of "n" vehicles in queue per lane
n = number of vehicles in the queue per lane
λ = average # of vehicles in the queue per lane (vehicles per hr per lane/signal cycles per hr)

The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95th percentile maximum number of queued vehicles for a particular left-turn movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the left-turn movement. This analysis thus provides a basis for estimating future turn pocket storage requirements at intersections.

For signalized intersections, the 95th percentile queue length value indicates that during the peak hour, a queue of this length or less would occur on 95 percent of the signal cycles or a queue length larger than the 95th percentile queue would only occur on 5 percent of the signal cycles (about 3 cycles during the peak hour for a signal with a 60-second cycle length). Thus, turn pocket storage designs based on the 95th percentile queue length would ensure that storage space would be exceeded only 5 percent of the time for a signalized movement. Vehicle queuing at unsignalized intersections are evaluated based on the delay experienced by the turn movement.

Definition of Adverse Effects

Although measures of congestion such as delay and level of service are no longer used to identify significant impacts under CEQA, a local transportation analysis was conducted to evaluate the project's consistency with the level of service standards set forth in the City's General Plan and to identify feasible improvements to remedy any deficiencies. Deficiencies in intersection operations that meet specific criteria are labeled as an "adverse effect" of the project. Such adverse effects on intersection operations do not constitute significant impacts under CEQA.

Signalized Intersections

According to the Cities of Santa Clara, Sunnyvale, and San José, a project is said to create an adverse effect at a signalized intersection if for either peak hour, either of the following conditions occurs:

1. The level of service at the intersection drops below its respective level of service standard (LOS D or better for all San José intersections and local intersections in Santa Clara and Sunnyvale and LOS E or better for CMP and regionally significant intersections in Santa Clara and Sunnyvale) when project traffic is added, <u>or</u>

2. An intersection that operates below its level of service standard under no-project conditions experiences an increase in critical-movement delay of four (4) or more seconds, <u>and</u> an increase in critical volume-to-capacity ratio (v/c) of one percent (0.01) or more when project traffic is added.

The exception to this criterion is 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 are negative. In this case, the criterion is when the project increases the critical v/c value by 0.01 or more.

Although adverse effects on intersection operations do not constitute significant impacts under CEQA, the City may require developers to implement improvements to address deficiencies in the local transportation network. Adverse effects at signalized intersections can be addressed by one of the following approaches:

- Construct or pay a fair share towards improvements to the subject intersection or proximate to the intersection to increase overall capacity (e.g., traffic signal modifications, construction of additional turn lanes), or
- Construct or pay a fair share towards improvements to the pedestrian or bicycle facilities within the intersection or proximate to the intersection, or
- Construct or pay a fair share towards improved access to transit or transit facility proximate to the intersection, or
- Implement transportation demand management (TDM) measures that will reduce the project traffic at the intersection and improve the deficiency.

Unsignalized Intersections

The City of Santa Clara has not established criteria to define adverse effects for unsignalized intersections. The determination of appropriate improvements to unsignalized intersections typically includes a qualitative and quantitative analysis of movement delay, movement traffic volumes, intersection safety, and need for signalization. For this reason, adverse effects, and the associated improvements to unsignalized intersections are frequently determined on the basis of professional judgment. Like at signalized intersections, adverse effects at unsignalized intersections do not constitute significant impacts under CEQA.

For this study, the following criteria were used to determine if the project would create an adverse effect on traffic conditions at an unsignalized intersection:

1. The addition of project traffic causes the average intersection delay to degrade to LOS E or worse, and
2. The intersection satisfies the California Manual of Uniform Traffic Control Devices (CA MUTCD) peak-hour volume signal warrant.

Freeway Segments and Ramps

A development is said to create a deficiency at a study freeway segment if for either peak hour:

1. The level of service on the freeway segment degrades from an acceptable LOS E or better under existing conditions to an unacceptable LOS F under project conditions or,
2. The level of service on the freeway segment is an unacceptable LOS F under project conditions, and the number of project trips on that segment constitutes at least one percent (0.01) of capacity on that segment.

The VTA does not provide thresholds for acceptable freeway ramp operations; however, the City of Santa Clara considers ramps operating at less than their capacity (less than a volume capacity ratio of 1.00) to be acceptable. For the purpose of this study, the project is said to create a deficiency at a freeway ramp if its implementation:

1. Causes the volume-to-capacity (V/C) ratio of the freeway ramp to exceed 1.0; or
2. Increases the amount of traffic on a freeway ramp that is already exceeding its capacity by more than one percent (1%) of the ramp's capacity.

Report Organization

This report has a total of six chapters. Chapter 2 describes the existing roadway network, transit service, bicycle and pedestrian facilities, and intersection levels of service. Chapter 3 presents the intersection levels of service under background conditions with the addition of traffic from future development and planned transportation improvements anticipated to occur by the year 2030. Chapter 4 describes the method used to forecast 2030 traffic volumes with the proposed Greystar General Plan Amendment alone and with the buildout of the Freedom Circle Focus Area, the resulting intersection levels of service, and potential improvements recommended to address deficiencies identified under background plus project conditions. Chapter 5 presents the traffic conditions in the study area under cumulative conditions with the addition of traffic from future development and planned transportation improvements anticipated to occur by the year 2040. Cumulative conditions were evaluated without the project and with the full buildout of the Freedom Circle Focus Area, with and without Greystar. Chapter 6 presents the analysis of other transportation-related issues, including freeway segment analysis, freeway ramp analysis, vehicle queuing, signal warrants, internal vehicular circulation and site access, parking, and impacts on bicycle, pedestrian, and transit facilities.

2. Existing Conditions

This chapter describes the existing conditions for transportation facilities in the vicinity of the site, including the roadway network, transit services, pedestrian and bicycle facilities, and traffic operations at the study intersections. It should be noted that existing conditions presented in this chapter reflect traffic volumes in 2018/2019, prior to the current pandemic.

Existing Roadway Network

Regional access to the project area is provided via US 101 and SR 237. These roads are described below.

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

SR 237 is a four-lane to six-lane freeway within the vicinity of the study area that extends west to El Camino Real and east to I-880 in Milpitas. East of Mathilda Avenue, SR 237 has two mixed-flow lanes and one HOV lane in each direction. West of Mathilda Avenue, SR 237 has two mixed-flow lanes in each direction. SR 237 provides access to the study area via its interchanges at Great America Parkway, San Tomas Expressway and Lawrence Expressway.

Major roadways serving the Focus Area include Lawrence Expressway, Montague Expressway, Great America Parkway, Bowers Avenue, Mission College Boulevard, and Tasman Drive. Local roads serving the Focus Area include Freedom Circle, Hichborn Drive, and Agnew Road.

Lawrence Expressway is a north-south, eight-lane expressway with a raised median and a posted speed limit of 50 mph. It begins at Saratoga Avenue in the south, crosses through Sunnyvale, and extends northward where it transitions into Caribbean Drive at SR 237. HOV lanes are present on Lawrence Expressway between Stevens Creek Boulevard and Arques Avenue. Lawrence Expressway connects with US 101 and SR 237 via full-access freeway interchanges. Lawrence Expressway includes sidewalks along both sides on most segments and crosswalks at signalized intersections. There are no bike lanes on Lawrence Expressway, but bikes are allowed to ride on the shoulders. On-street parking is not permitted.

Montague Expressway is an east-west expressway that begins at US 101 and extends 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. West of McCarthy Boulevard, Montague Expressway has carpool lanes (also known as high-occupancy vehicle

(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.

Central Expressway is a six-lane east-west expressway that begins at De La Cruz Boulevard and extends westward to San Antonio Road where it transitions into Alma Street in Mountain View. East of San Tomas Expressway, Central Expressway has HOV lanes. It has a posted speed limit of 50 miles per hour (mph).

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 roadway with a raised median and a posted speed limit of 40 mph. There is an additional northbound lane between US 101 and Tasman Drive. Bike lanes are present along both directions of the roadway and on-street parking is not permitted. There are sidewalks on both sides of the street for the whole length of the roadway. Great America Parkway serves the west boundary of the Freedom Circle Focus Area and provides direct access to and from the northern portion of the Focus Area (north of Mission College Boulevard) and indirect access to the southern portion of the Focus Area via its intersections with Mission College Boulevard and Hichborn Drive.

Bowers Avenue is a six-lane north-south street north of Kifer Road, and a four-lane street south of Kifer Road. It transitions from Great America Parkway north of US 101 and extends southerly to El Camino Real, where it transitions to Kiely Boulevard. Bowers Avenue has a speed limit of 35 mph. Bike lanes exist along most of Bowers Avenue except between Central Expressway and Kifer Road.

Tasman Drive is an east-west, two-lane to four-lane roadway with a posted speed limit of 40 mph in the project vicinity. Tasman Drive begins at Morse Avenue in the west and extends east past I-880 and transitions into Great Mall Parkway. The VTA Light Rail tracks are present in the middle of Tasman Drive east of Fair Oaks Avenue. Tasman Drive includes sidewalks along most segments and crosswalks at signalized intersections. Bike routes or lanes are provided, and on-street parking is prohibited within the project vicinity.

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. Mission College Boulevard runs through the Focus Area and provides direct access to and from the Focus Area.

Patrick Henry Drive is a two-lane roadway with center two-way left-turn lane that runs between Tasman Drive and Great America Parkway. The speed limit on Patrick Henry Drive is 25 mph. On-street parking is prohibited. Between Great America Parkway and Old Ironsides Drive, sidewalks are available on both sides of Patrick Henry Drive. West of Old Ironsides Drive, sidewalks are available on the west and south sides of the roadway and only a small section on the north side of the road. Patrick Henry Drive serves as the north boundary of the Freedom Circle Focus Area and provides direct access to and from the northernmost parcels within the Focus Area.

Freedom Circle is a two-lane semicircular loop road with center two-way left-turn lane that circumnavigates area south of Mission College Boulevard. In the west, Freedom Circle intersects with Mission College Boulevard approximately 1,500 feet east of Great America Parkway. It connects to Mission College Boulevard again approximately 0.2 mile to the east, directly opposite Agnew Road. The speed limit on Freedom Circle is 25 mph. On-street parking is prohibited. Sidewalks are available on both sides of the roadway.

Hichborn Drive extends from Great America Parkway to Freedom Circle between the Marriott Hotel site and the Mission Towers office campus. The eastern portion of the street (east of the Mission Towers parking garage driveway) allows two-way traffic flow, while the western portion of the street is limited to one-way (eastbound) flow. Thus, the Great America/Hichborn intersection serves as an

inbound only access point for the Freedom Circle Focus Area. On-street parking is permitted on both sides of the street and a sidewalk is available along the south side of the street.

Agnew Road is a two-lane roadway that runs in east-west direction and extends from Mission College Boulevard to its intersection with Montague Expressway. Agnew Road runs along the east boundary of the Focus Area and provides direct access to the parcel at the northeast corner of the Focus Area. West of Lafayette Street, the speed limit on Agnew Road is 25 mph. Between Lafayette Street and Montague Expressway, the speed limit on Agnew Road is 35 mph. Sidewalks are available on both sides of the roadway in the vicinity of the Focus Area.

Existing Pedestrian Facilities

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections (Figure 3). In the project vicinity, sidewalks and separated pedestrian walkways are provided on the following roadways:

- Both sides of Patrick Henry Drive between Great America Parkway and Old Ironsides Drive
- South and west sides of Patrick Henry Drive between Old Ironsides Drive and Democracy Way
- Both sides of Patrick Henry Drive between Democracy Way and Tasman Drive
- North side of Patrick Henry Drive for a small section west of Old Ironsides Drive
- Both sides of Mission College Boulevard
- One or both sides of the Mission College Boulevard Loop (see Figure 3 for details)
- Both sides of Great America Parkway
- Both sides of Tasman Drive
- Both sides of Freedom Circle
- South side of Hichborn Drive
- Both sides of Agnew Road

Crosswalks are provided at the following intersections in the immediate vicinity of the project site:

- Great America Parkway and Patrick Henry Drive
- Great America Parkway and Mission College Boulevard
- Mission College Boulevard and Marriott driveway
- Mission College Boulevard and Freedom Circle (W)
- Mission College Boulevard and Agnew Road/Freedom Circle I
- Freedom Circle and Hichborn Drive

All of the crosswalks at the signalized study intersections include pedestrian signal heads and push buttons. However, the existing pedestrian transition at some intersections as shown on Figure 3 does not comply with Americans with Disabilities Act (ADA) guidelines.

Pedestrians are permitted to use the shared-use paths such as the San Tomas Aquino Creek Trail, which is immediately adjacent to the eastern edge of the Focus Area, as well as other trails described below.

Existing Bicycle Facilities

The bicycle facilities that exist in the project vicinity (see Figure 4) include multi-use trails/paths (Class I bikeway), striped bike lanes (Class II bikeway), and shared bike routes (Class III bikeway).

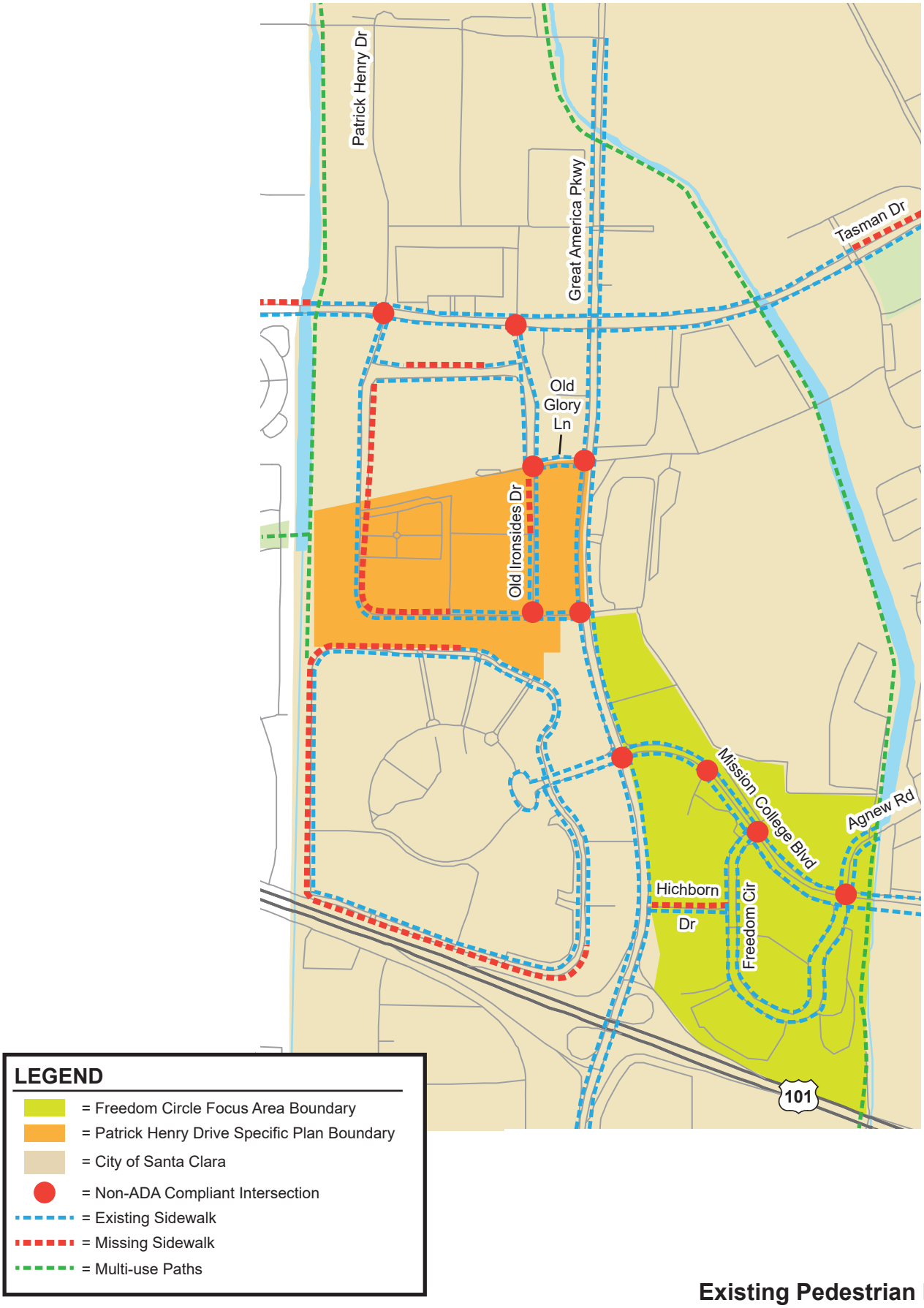


Figure 3
Existing Pedestrian Facilities

NORTH
Not to Scale

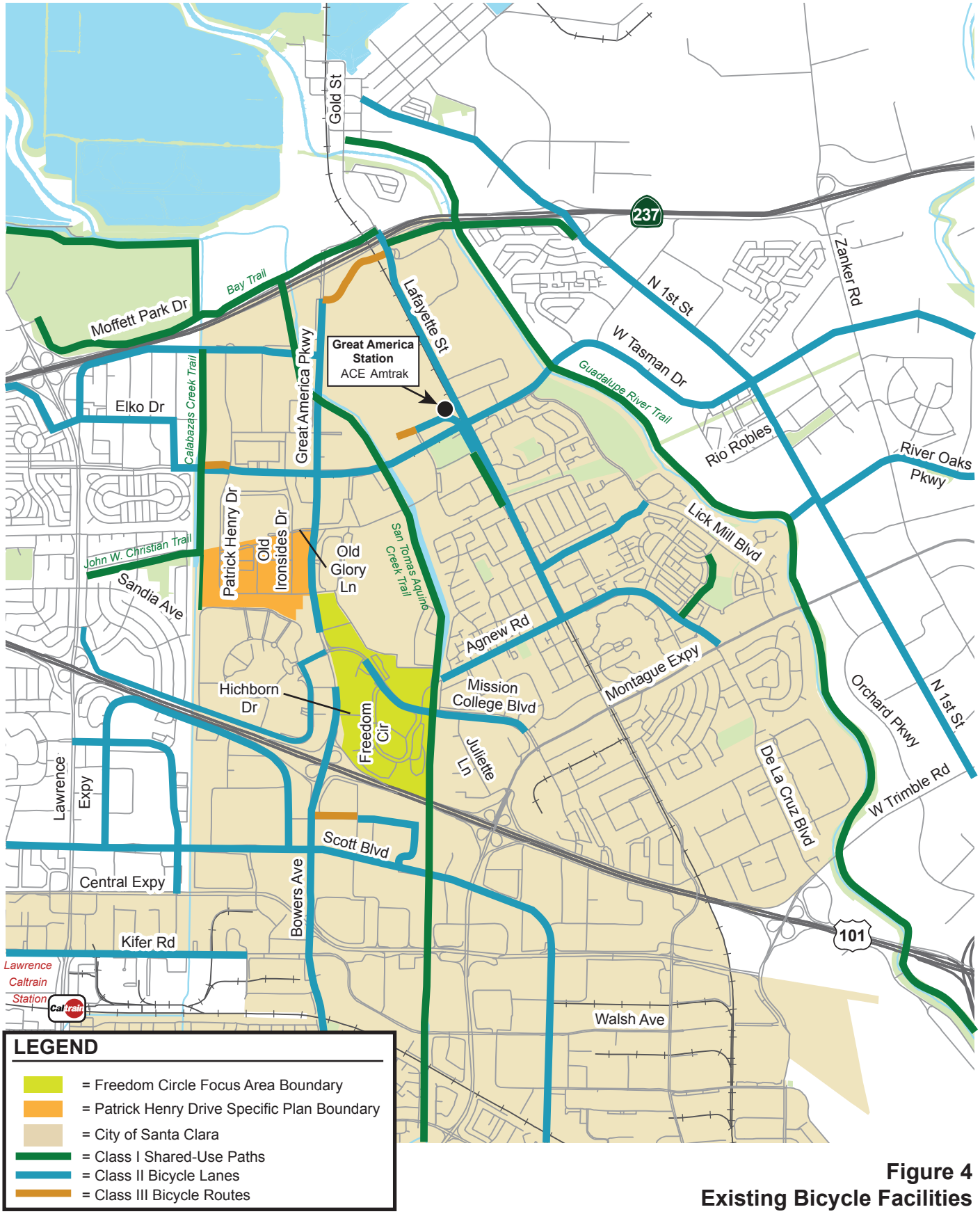


Figure 4
Existing Bicycle Facilities

NORTH
Not to Scale

Class I Trail or Path is an off-street path with exclusive right-of-way for non-motorized transportation used for commuting as well as recreation.

The San Tomas Aquino Creek trail extends from Sunnyvale Baylands Park, north of SR 237, southward to San Tomas Expressway, where it connects to a bike path along the west side of San Tomas Expressway north of Cabrillo Avenue and extends southward to Homestead Road. The trail runs along the eastern edge of the Freedom Circle Focus Area and connects to bike lanes on Great America Parkway, Tasman Drive and Mission College Boulevard.

The Calabazas Creek Trail connects Mountain View-Alviso Road to Mission College and passes near Levi's Stadium. This trail can be accessed via Tasman Drive or Mission College Boulevard. A pedestrian/bike bridge connects the Calabazas Creek Trail with the John W. Christian Greenbelt near the northwestern corner of the Patrick Henry Drive Specific Plan Area.

The John W. Christian Greenbelt is a shared-use path that extends from the Calabazas Creek Trail westward into Sunnyvale to Blazingwood Drive near the Lawrence Expressway/Lakehaven Drive/Sandia Avenue intersection.

The Guadalupe River Trail is located approximately 2.0 miles east of the Focus Area. The northern segment of this trail begins at Gold Street in Alviso and connects to the SR 237 Bikeway. Continuing south, the trail passes beneath most roadways, including SR 237, US 101 and I-880 and connects to downtown San José. The trail can be accessed via the bike lanes on Tasman Drive, a pathway from Lick Mill Boulevard through Thamien Park, and from Montague Expressway.

The Baylands Park Trail is located north of the Focus Area and runs from the Baylands Park in Sunnyvale and tracks parallel to Hwy 237. It serves as the northern trailhead for some of the South Bay's major north to south trails including the Calabazas Creek Trail, the San Tomas Aquino Creek Trail, and the Guadalupe River Trail.

Class II Bike Lanes are lanes on roadways designated for use by bicycles with special lane markings. Within a one-mile radius of the project site, striped bike lanes are present along the following roadway segments:

- Great America Parkway, south of Great America Way (except for a small segment just north and south of Mission College Boulevard)
- Tasman Drive, east of Patrick Henry Drive and west of Calabazas Creek Trail
- Mission College Boulevard, from Montague Expressway to west of Great America Parkway at Marriott Driveway
- Mission College Boulevard Loop south of the intersection at Mission College Blvd
- Bowers Avenue, from Chromite Drive extending onto Great America Parkway
- Lafayette Street, from Gold Street Connector to Agnew Road
- Old Mountain View-Alviso/Lawrence Station Road, from Elko Drive to Great America Parkway
- Agnew Road, from San Tomas Aquino Creek Trail to Montague Expressway
- Elko Drive, from Reamwood Avenue to Lawrence Expressway
- Reamwood Avenue, from Tasman Drive to Elko Drive
- Scott Boulevard, from Monroe Street to Arques Avenue
- Lakeside Drive, from Scott Boulevard to Arques Avenue
- Oakmead Parkway, from Central Expressway to Lawrence Expressway
- Octavius Drive, from Scott Boulevard to Montgomery Drive
- Hope Drive, from Lafayette Street to Lick Mill Boulevard
- N. First Street, from Liberty Street to Charcot Avenue
- River Oaks Parkway, from Guadalupe River Trail to Montague Expressway

Class III Bike Routes are streets designated for bike travel and shared with motor vehicles. Within a one-mile radius of the project site, bike routes are present along the following roadway segments:

- Great America Way, from Great America Parkway to Lafayette Street

Bicycles are also permitted on Central Expressway, Lawrence Expressway, and Montague Expressway. However, due to high speeds and traffic volumes, the expressways are recommended for use only by bicyclists of intermediate to advanced skills.

Existing Transit Services

Existing transit services within the study area are provided by the VTA, the San Joaquin Regional Rail Commission (SJRRC), and the Capitol Corridor Joint Powers Authority. The following discussion of the project's accessibility via transit is based on transit service as of March 2021 and reflects the temporary reductions in transit service that have been implemented in response to the COVID-19 pandemic. The VTA plans to return to the 15-minute headways on Routes 20 and 57 that were in use prior to the pandemic when ridership levels increase.

The VTA provides scheduled bus and light rail transit (LRT) routes through Santa Clara County. In the vicinity of the Freedom Circle Focus Area, VTA provides rapid and local bus services as well as LRT service. VTA bus service near the Freedom Circle Focus Area is provided along Tasman Drive, Great America Parkway, Lawrence Expressway, Mission College Boulevard, and Agnew Road with the closest VTA bus stops located on Great America Parkway and Mission College Boulevard. VTA LRT service includes the Mountain View-Alum Rock (Orange) LRT line and the Winchester-Old Ironsides (Green) LRT line, which run along Tasman Drive in the project vicinity. Old Ironsides and Great America Stations are the nearest LRT stops to the Freedom Circle Focus Area.

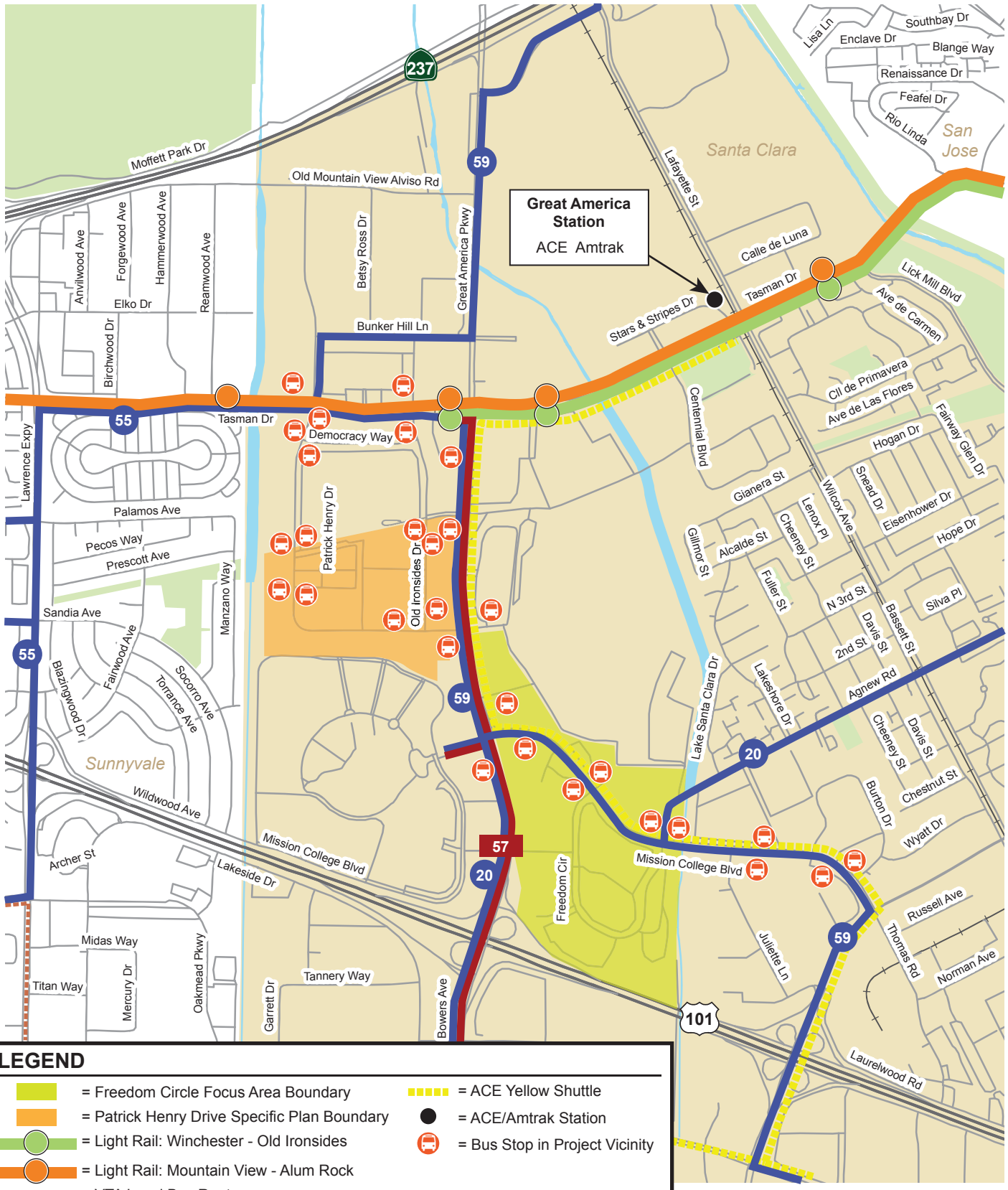
The SJRRC manages the Altamont Corridor Express (ACE) commuter rail service between the Central Valley and Silicon Valley with a shuttle that connects the Freedom Circle Focus Area to the Great America Transit Station. There are several bus stops served by ACE shuttles along Great America Parkway and Mission College Boulevard in the immediate vicinity of the Freedom Circle Focus Area. The Capitol Corridor Joint Powers Authority also operates passenger train service operated by Amtrak between San José and Sacramento and the foothills of the Sierra Nevada with stops at the Great America Transit Station.

Although not within walking distance of the Freedom Circle Focus Area, commuters to the Focus Area also use Caltrain, which provides commuter rail service from San Francisco in the north through San Mateo County to Santa Clara County in the south. Commuters to the study area can access the Sunnyvale Caltrain Station, which is located approximately four miles from the Freedom Circle Focus Area, via VTA bus route 20. Although Caltrain shuttles that previously provided service to the Santa Clara (Lawrence) Caltrain Station have been suspended until further notice, Focus Area residents and workers can cycle to the Santa Clara (Lawrence) Caltrain Station approximately 2.5 miles away via the bike lanes on Great America Parkway/Bowers Avenue and Kifer Road.

Transit services within walking distance (½ mile) of the Focus Area are described below and illustrated on Figure 5.

Mountain View-Alum Rock (Orange) LRT line provides service with headways of 20 minutes during peak hours between Mountain View station and Alum Rock station.

Winchester-Old Ironsides (Green) LRT line provides service with headways of 20 minutes during peak hours between Winchester Station and Old Ironsides Station.



LEGEND

- = Freedom Circle Focus Area Boundary
- = Patrick Henry Drive Specific Plan Boundary
- = Light Rail: Winchester - Old Ironsides
- = Light Rail: Mountain View - Alum Rock
- = VTA Local Bus Route
- = VTA Frequent Bus Route
- = ACE Yellow Shuttle
- = ACE/Amtrak Station
- = Bus Stop in Project Vicinity

Figure 5
Existing Transit Services

NORTH
Not to Scale

VTA Route 20 is a local route, which provides service with headways of 30 minutes during peak hours and 60 minutes during non-peak hours between Milpitas BART station and Sunnyvale Transit Center via Agnew Road and Mission College Boulevard near the project site.

VTA Route 55 is a local route, which provides service with headways of 30 minutes between Old Ironsides Station and De Anza College via Tasman Drive and Lawrence Expressway near the project site.

VTA Route 57 is a rapid route, which provides service with headways of 20 minutes between Old Ironsides Station and West Valley College via Great America Parkway near the project site.

VTA Route 59 is a local route, which provides service with headways of 30 minutes between Valley Fair and Baypointe station via Mission College Boulevard and Great America Parkway near the project site.

Existing Lane Configurations and Traffic Volumes

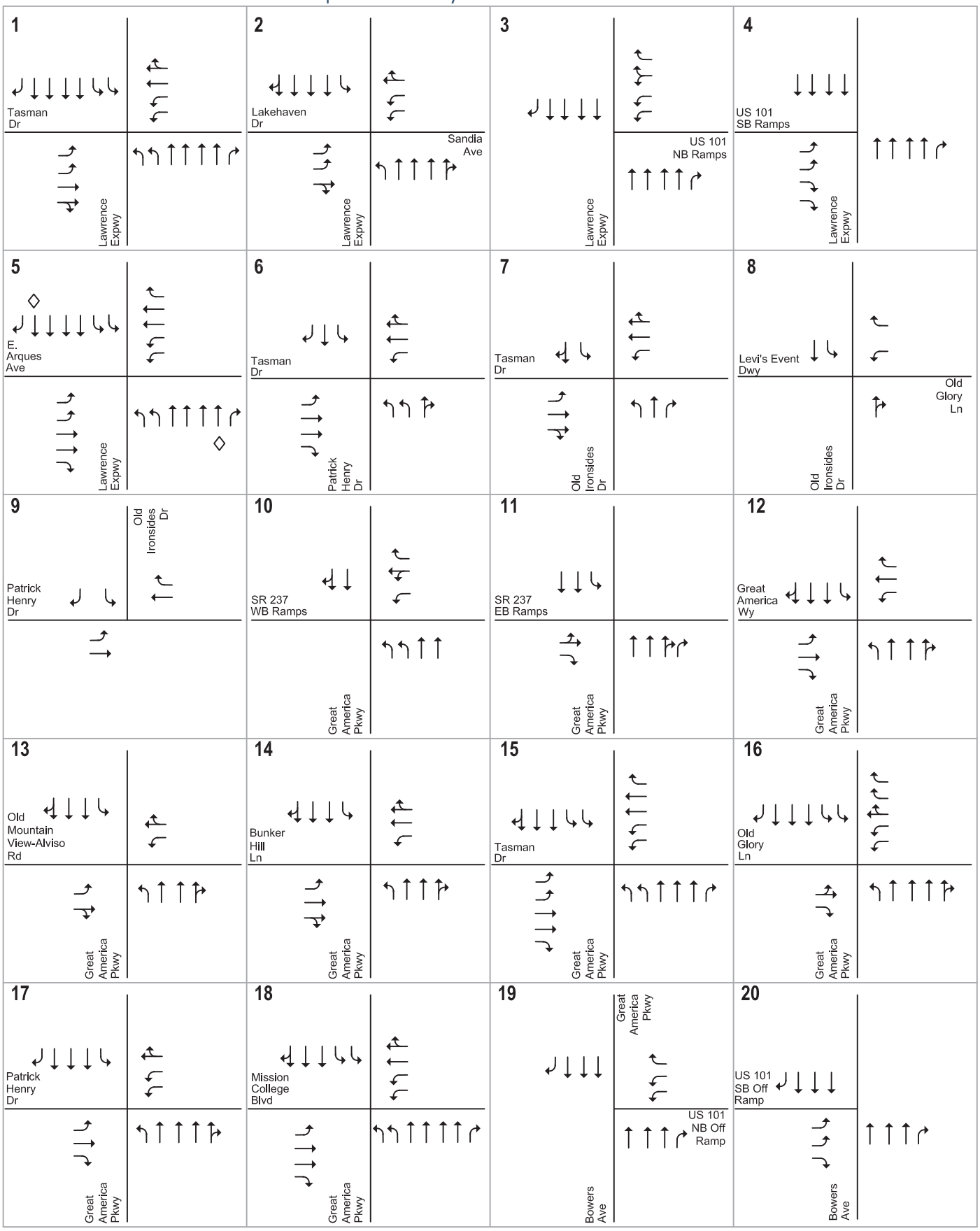
The existing lane configurations at the study intersections were obtained from field observations (see Figure 6).

Existing traffic volumes were obtained from new turning movement counts collected in May 2019, between 7:00 and 9:00 AM and between 4:00 and 6:00 PM, and previously completed traffic studies. PM peak-hour counts for CMP intersections were obtained from the latest available CMP database for the 2018 CMP Annual Monitoring Report. Traffic counts for PM peak hours at Great America Parkway and Patrick Henry Drive from 2018/2019 are lower than 2016 counts. Thus, 2020 traffic volumes were estimated by applying a 2 percent annual growth factor to 2016 PM counts at this intersection. Traffic counts from 2018/2019 are not available for Lafayette Street and Calle De Luna. Thus, 2020 traffic volumes were estimated by applying a 2 percent annual growth factor to 2014 counts. Similarly, 2020 traffic volumes at the Lawrence Expressway intersections at Homestead Road and at Pruneridge Avenue were estimated by applying a 2 percent annual growth factor to 2017 counts. The existing peak-hour intersection volumes are shown on Figure 7. The intersection turning-movement counts conducted for this analysis are presented in Appendix B.

Existing Intersection Levels of Service

The results of the intersection level of service analysis show that most of the study intersections currently are operating at acceptable levels of service (see Table 4). The following intersections operate below the level of service standard:

- 44. De la Cruz Boulevard and Central Expressway (AM peak hour)
- 47. N. 1st Street and Montague Expressway (AM and PM peak hours)
- 50. McCarthy Boulevard/O'Toole Avenue and Montague Expressway (PM peak hour)
- 51. Lawrence Expressway and Kifer Road (PM peak hour)
- 52. Lawrence Expressway and Reed Avenue/Monroe Street (AM peak hour)

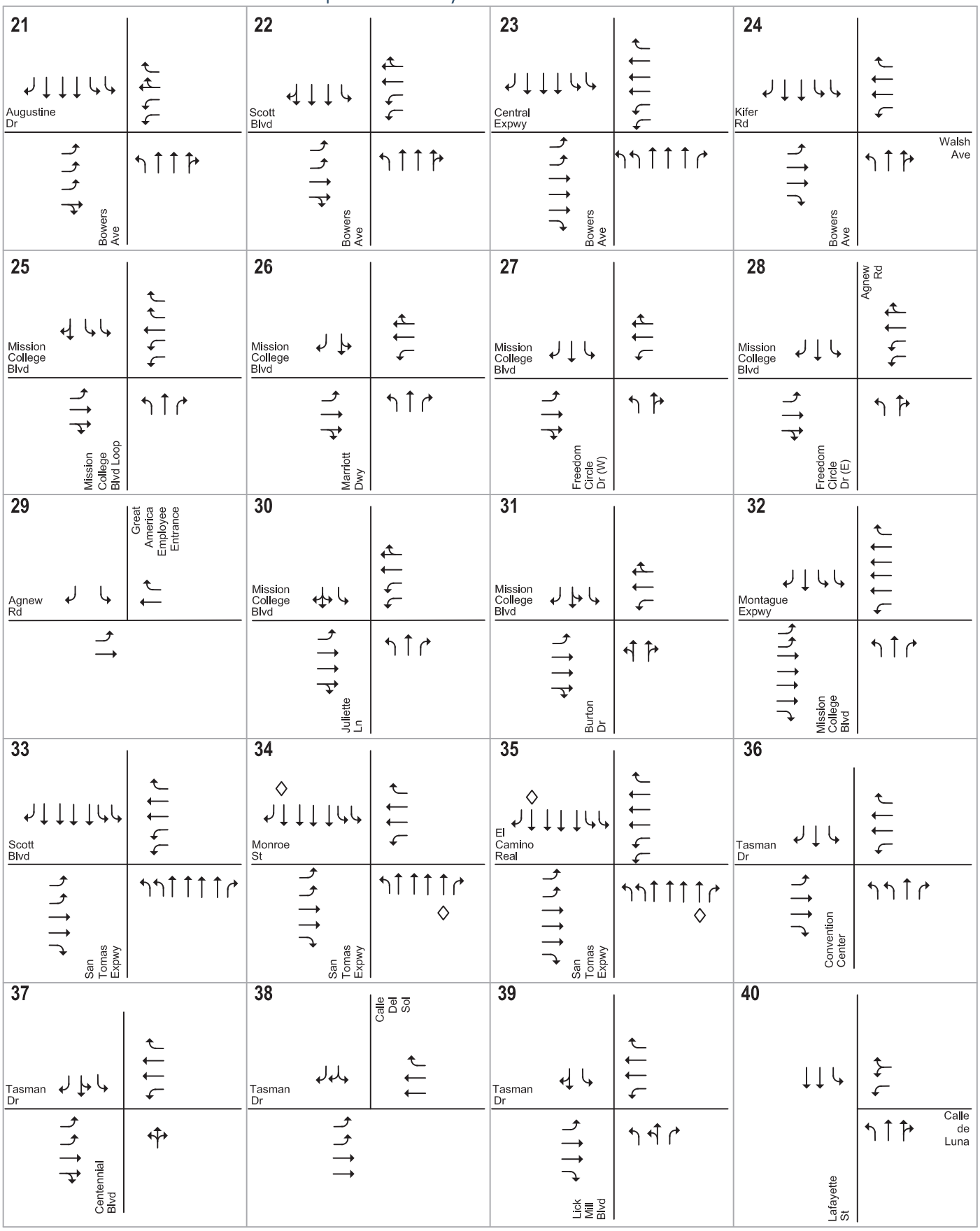


LEGEND

◇ = HOV Lane

Figure 6
Existing Lane Configurations

NORTH
Not to Scale



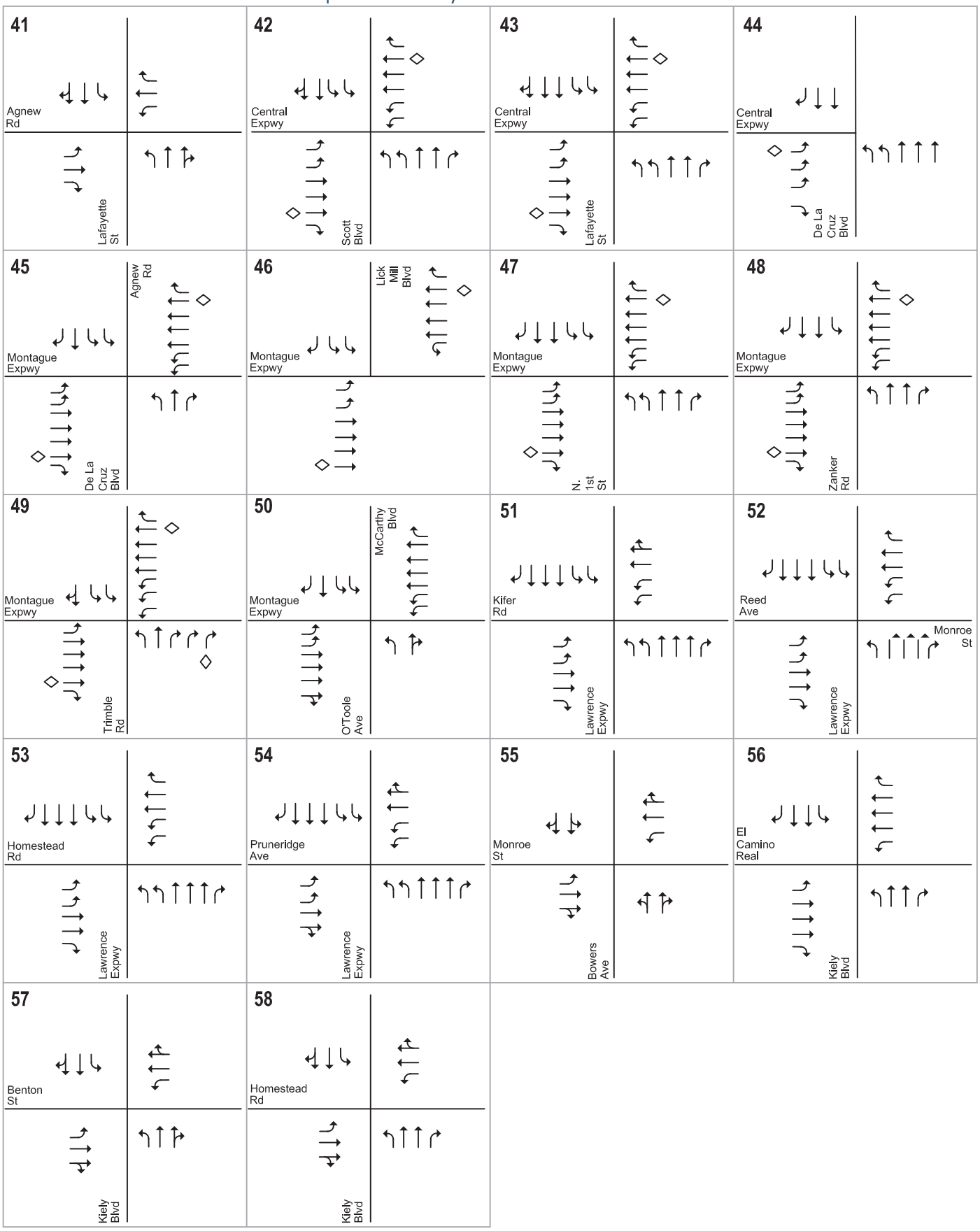
LEGEND

◇ = HOV Lane

Figure 6
Existing Lane Configurations

HEXAGON

NORTH
Not to Scale



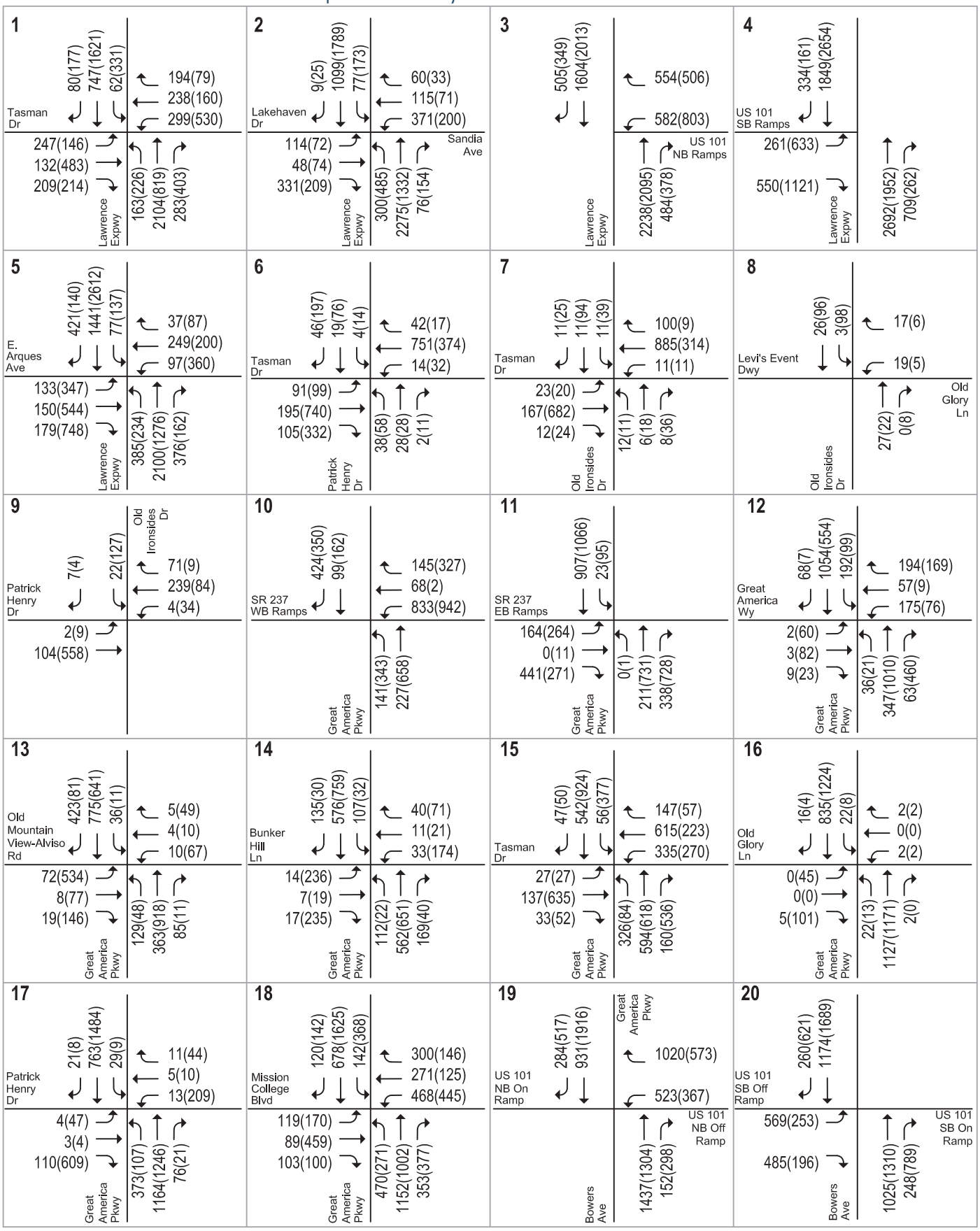
LEGEND

◇ = HOV Lane

Figure 6
Existing Lane Configurations

HEXAGON

NORTH
Not to Scale

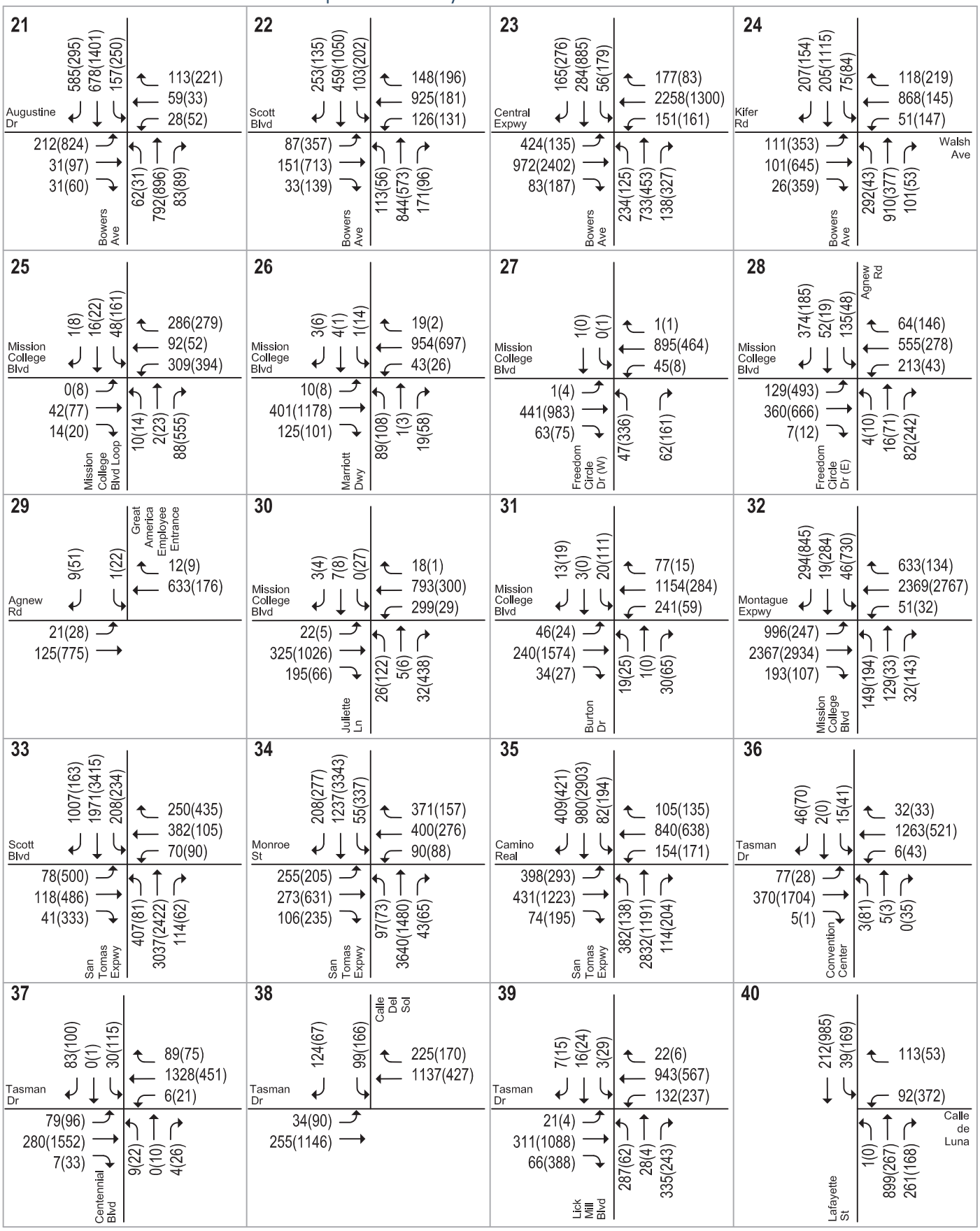


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 7
Existing Traffic Volumes

NORTH
Not to Scale

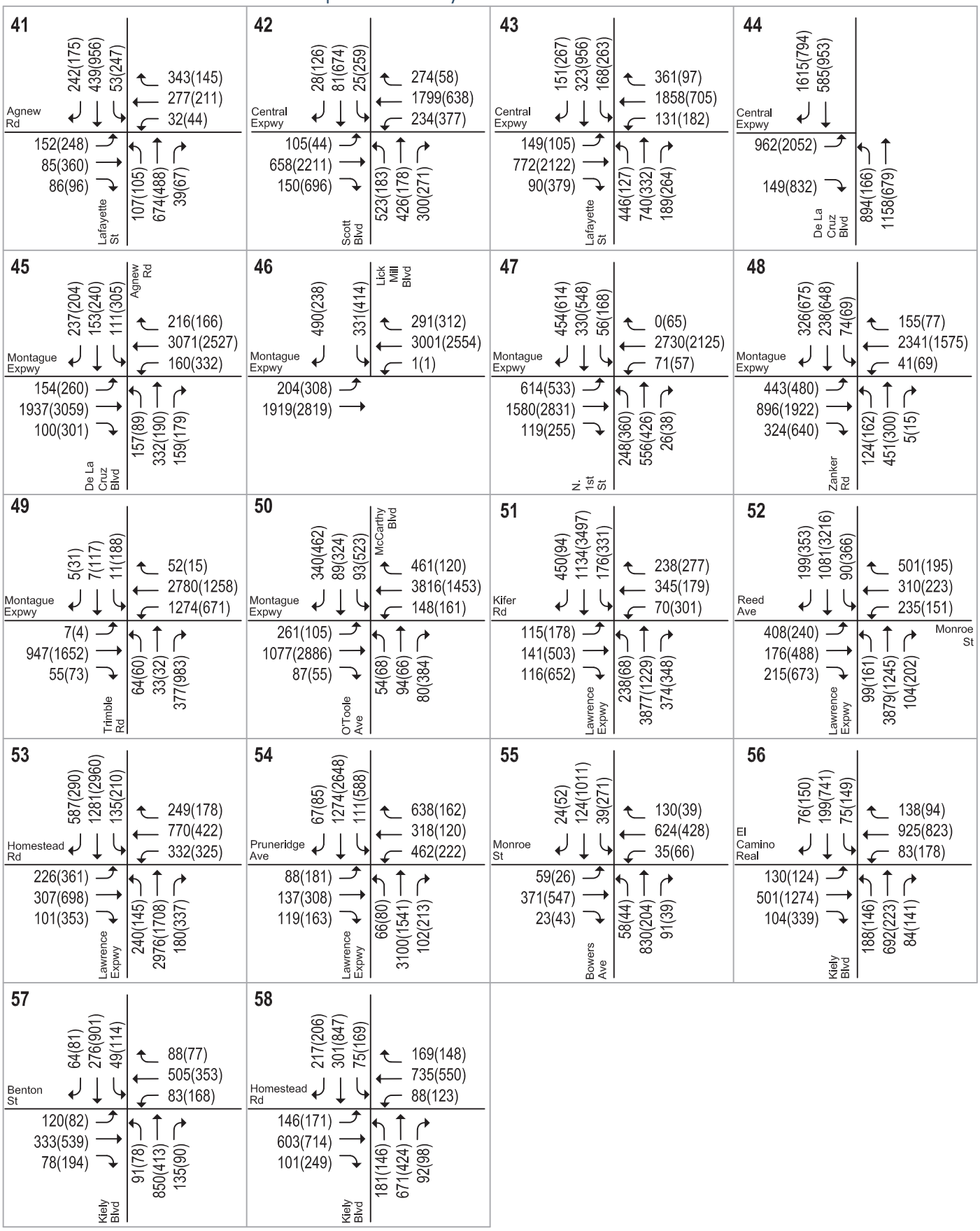


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 7
Existing Traffic Volumes

NORTH
Not to Scale



LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 7
Existing Traffic Volumes

NORTH
Not to Scale

Table 4
Existing Intersection Levels of Service

#	Intersection	Jurisdiction	LOS Standard	Peak Hour	Count Date	Avg Delay	LOS
1	Lawrence Expressway and Tasman Drive	SCC	E	AM	05/17/18	42.0	D
	(CMP)			PM	11/08/18	55.1	E
2	Lawrence Expwy and Sandia Av/Lakehaven Dr	SCC	E	AM	05/17/18	63.4	E
				PM	05/17/18	58.3	E
3	Lawrence Expressway and US 101 NB Ramps	SCC	E	AM	05/17/18	10.0	B
				PM	05/17/18	13.8	B
4	Lawrence Expressway and US 101 SB Ramps	SCC	E	AM	05/17/18	6.6	A
				PM	05/17/18	71.5	E
5	Lawrence Expressway and E. Arques Ave.	SCC	E	AM	05/16/19	37.7	D
	(CMP)			PM	11/13/18	71.6	E
6	Patrick Henry Drive and Tasman Drive	SC	D	AM	05/10/18	17.2	B
				PM	05/10/18	17.7	B
7	Old Ironsides Drive and Tasman Drive	SC	D	AM	05/10/18	6.4	A
				PM	05/10/18	15.9	B
8	Old Ironsides Drive and Old Glory Lane	SC	D	AM	05/10/18	3.6	A
	(Unsignalized)			PM	05/10/18	3.5	A
9	Old Ironsides Drive and Patrick Henry Drive	SC	D	AM	05/10/18	0.8	A
	(Unsignalized)			PM	05/10/18	3.9	A
10	Great America Parkway and SR 237 WB Ramps	SJ	D	AM	05/10/18	15.7	B
	(CMP)			PM	11/01/18	19.0	B
11	Great America Parkway and SR 237 EB Ramps	SJ	D	AM	05/10/18	13.4	B
	(CMP)			PM	11/01/18	14.5	B
12	Great America Parkway and Great America Way	SC	D	AM	05/10/18	23.6	C
				PM	05/10/18	16.9	B
13	Great America Pkwy and Old Mt View-Alviso Rd	SC	D	AM	05/10/18	19.4	B
				PM	05/10/18	44.4	D
14	Great America Parkway and Bunker Hill Lane	SC	D	AM	05/10/18	16.9	B
				PM	05/10/18	29.8	C
15	Great America Parkway and Tasman Drive	SC	E	AM	03/07/18	42.0	D
	(CMP)			PM	11/15/18	28.4	C
16	Great America Parkway and Old Glory Lane	SC	D	AM	05/10/18	10.7	B
				PM	05/10/18	16.9	B
17	Great America Parkway and Patrick Henry Drive	SC	D	AM	05/16/19	29.6	C
				PM	01/01/20 [1]	53.6	D
18	Great America Pkwy and Mission College Blvd	SC	E	AM	03/07/18	44.8	D
	(CMP)			PM	11/15/18	42.6	D
19	Great America Pkwy and US 101 NB Off Ramp	SC	E	AM	05/16/19	11.6	B
	(CMP)			PM	11/15/18	10.0	A
20	Bowers Avenue and US 101 SB Off Ramp	SC	E	AM	05/16/19	13.2	B
	(CMP)			PM	11/15/18	7.6	A
21	Bowers Avenue and Augustine Drive	SC	D	AM	05/10/18	21.3	C
				PM	05/10/18	33.2	C
22	Bowers Avenue and Scott Boulevard	SC	E	AM	05/16/19	40.5	D
	(CMP)			PM	11/15/18	33.5	C
23	Bowers Avenue and Central Expressway	SCC	E	AM	05/16/19	56.2	E
	(CMP)			PM	11/13/18	53.8	D
24	Bowers Avenue and Kifer Road/Walsh Avenue	SC	D	AM	05/16/19	31.2	C
				PM	03/07/18	28.6	C
25	Mission College Loop and Mission College Blvd	SC	D	AM	05/16/19	12.0	B
				PM	05/16/19	25.6	C

Table 4 (Continued)
Existing Intersection Levels of Service

#	Intersection	Jurisdiction	LOS Standard	Peak Hour	Count Date	Avg Delay	LOS
26	Marriott Dwy and Mission College Blvd	SC	D	AM	05/16/19	13.0	B
				PM	05/16/19	12.9	B
27	Freedom Circle W and Mission College Blvd	SC	D	AM	05/24/18	12.3	B
				PM	05/24/18	26.2	C
28	Agnew/Freedom Circle E & Mission College Blvd	SC	D	AM	05/24/18	30.0	C
				PM	05/24/18	31.8	C
29	Great America employee entrance and Agnew Rd	SC	D	AM	05/16/19	3.9	A
				PM	05/16/19	5.2	A
30	Juliette Lane and Mission College Boulevard	SC	D	AM	05/24/18	19.8	B
				PM	05/24/18	30.6	C
31	Burton Drive and Mission College Boulevard	SC	D	AM	05/24/18	20.6	C
				PM	05/24/18	19.1	B
32	Mission College Blvd and Montague Expwy	SCC	E	AM	04/09/19	65.8	E
	(CMP)			PM	11/08/18	52.4	D
33	San Tomas Expressway and Scott Boulevard	SCC	E	AM	05/16/19	30.8	C
	(CMP)			PM	11/13/18	50.7	D
34	San Tomas Expressway and Monroe Street	SCC	E	AM	04/09/19	39.5	D
	(CMP)			PM	11/08/18	38.5	D
35	San Tomas Expressway and El Camino Real	SCC	E	AM	04/09/19	72.6	E
	(CMP)			PM	11/08/18	71.3	E
36	Convention Center and Tasman Drive	SC	D	AM	05/16/19	14.4	B
				PM	05/16/19	14.8	B
37	Centennial Boulevard and Tasman Drive	SC	D	AM	05/16/19	14.8	B
				PM	05/16/19	17.5	B
38	Calle Del Sol and Tasman Drive	SC	D	AM	05/10/18	14.6	B
				PM	05/10/18	18.3	B
39	Lick Mill Boulevard and Tasman Drive	SC	D	AM	05/10/18	27.5	C
				PM	05/10/18	24.8	C
40	Lafayette Street and Calle De Luna	SC	D	AM	01/01/20 [2]	13.1	B
				PM	01/01/20 [2]	19.3	B
41	Lafayette Street and Agnew Road	SC	D	AM	05/10/18	27.9	C
				PM	05/10/18	29.9	C
42	Scott Boulevard and Central Expressway	SCC	E	AM	05/16/19	41.8	D
	(CMP)			PM	11/13/18	64.9	E
43	Lafayette Street and Central Expressway	SCC	E	AM	04/09/19	52.4	D
	(CMP)			PM	11/13/18	53.3	D
44	De la Cruz Boulevard and Central Expressway	SCC	E	AM	04/09/19	**96.8**	**F**
	(CMP)			PM	11/13/18	32.8	C
45	Agnew Rd/De La Cruz Blvd and Montague Expwy	SCC	E	AM	05/16/19	52.3	D
	(CMP)			PM	11/08/18	48.1	D
46	Lick Mill Boulevard and Montague Expressway	SCC	E	AM	05/10/18	38.7	D
				PM	05/10/18	28.4	C
47	N. 1st Street and Montague Expressway	SCC	D	AM	05/10/18	**87.3**	**F**
	(CMP)			PM	11/08/18	**69.9**	**E**
48	Zanker Road and Montague Expressway	SCC	D	AM	05/10/18	50.2	D
	(CMP)			PM	11/08/18	50.5	D
49	Trimble Road and Montague Expressway	SCC	D	AM	05/10/18	36.3	D
	(CMP)			PM	11/08/18	46.7	D
50	McCarthy Blvd/O'Toole Av and Montague Expwy	SCC	D	AM	05/10/18	41.8	D
	(CMP)			PM	11/08/18	**82.3**	**F**

Table 4 (Continued)
Existing Intersection Levels of Service

#	Intersection	Jurisdiction	LOS Standard	Peak Hour	Count Date	Avg Delay	LOS
51	Lawrence Expressway and Kifer Road	SCC	E	AM	03/07/18	54.8	D
				PM	03/07/18	**97.6**	**F**
52	Lawrence Expressway and Reed Ave/Monroe St	SCC	E	AM	03/07/18	**114.8**	**F**
	(CMP)			PM	11/13/18	61.8	E
53	Lawrence Expressway and Homestead Road	SCC	E	AM	01/01/20 [3]	61.8	E
	(CMP)			PM	11/15/18	65.4	E
54	Lawrence Expressway and Pruneridge Avenue	SCC	E	AM	01/01/20 [3]	74.5	E
				PM	01/01/20 [3]	47.4	D
55	Bowers Avenue and Monroe Street	SC	D	AM	10/30/19	31.7	C
				PM	10/30/19	33.9	C
56	Bowers Ave/Kiely Boulevard and El Camino Real	SC	E	AM	10/30/19	28.9	C
	(CMP)			PM	11/15/18	30.4	C
57	Kiely Boulevard and Benton Street	SC	D	AM	05/16/19	34.0	C
				PM	05/10/18	37.9	D
58	Kiely Boulevard and Homestead Road	SC	D	AM	05/16/19	37.3	D
				PM	05/10/18	41.6	D

Notes:
SCC = Santa Clara County, SC = Santa Clara, SJ = San Jose, SV = Sunnyvale
Bold indicates a substandard level of service.
1. Traffic counts from 2018/2019 are lower than 2016 counts. Thus, 2020 traffic volumes were estimated by applying a 2% annual growth factor to 2016 counts.
2. Traffic counts from 2018/2019 are not available. Thus, 2020 traffic volumes were estimated by applying a 2% annual growth factor to 2014 counts.
3. Traffic counts from 2018/2019 are not available. Thus, 2020 traffic volumes were estimated by applying a 2% annual growth factor to 2017 counts.

3. Background Conditions

Background conditions reflect Year 2030 traffic conditions without the land use development envisioned under the proposed Greystar General Plan Amendment or the proposed Freedom Circle Focus Area Plan. This chapter describes background improvements assumed in the Year 2030 transportation network, the procedure used to forecast background traffic volumes, and the resulting traffic conditions.

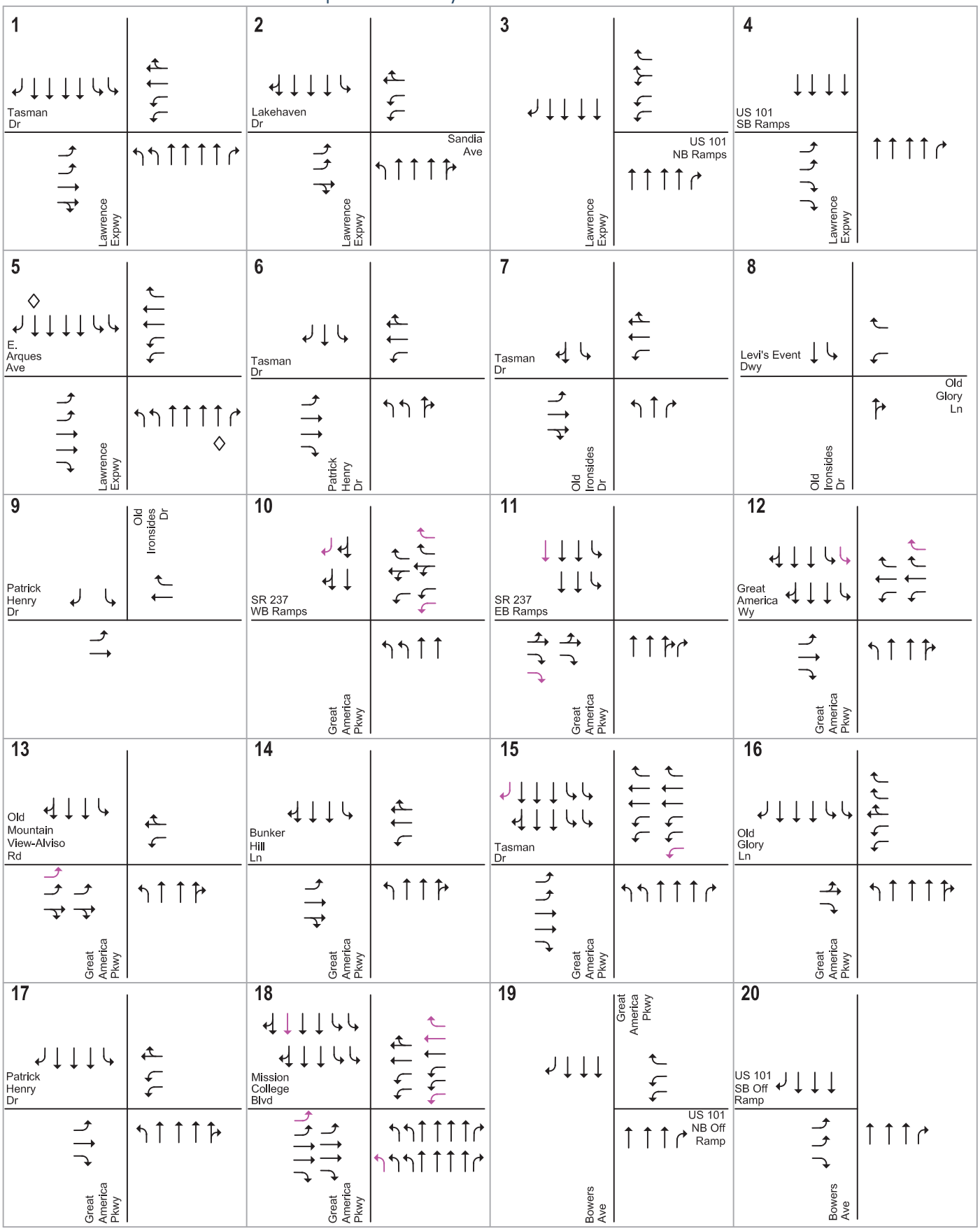
Roadway Network Under Background Conditions

The Year 2030 forecasts produced using the CSC model reflect planned transportation improvements anticipated to occur by the Year 2030. Most notable is the planned BART extension into Silicon Valley. The base year (2018) CSC model reflects BART service that terminated at the Warm Springs/South Fremont Station. In June 2020, BART service commenced on the Phase I extension from Warm Springs to Milpitas and Berryessa/North San José. The Phase II BART extension into downtown San José and Santa Clara is assumed to be complete by 2030.

VTA light rail service also was modified at the end of 2019. While the base year (2018) model assumed that LRT service between Old Ironsides Station and Milpitas would require a transfer, the 2030 model reflects the current LRT lines. The Orange Line now offers direct LRT service with 20-minute headways from the Old Ironsides Station to the Milpitas BART station as well as to the Moffett Park business park in Sunnyvale, Mountain View, and the Alum Rock area of San José. Furthermore, the Green Line now provides direct LRT service with 20-minute headways from the Old Ironsides Station to downtown San José and Campbell. LRT service between the Old Ironsides Station and South San José would require a transfer to the Blue Line.

In addition, the 2030 model assumes the existing carpool (HOV) lanes on US 101 will be converted to express lanes. Carpools with three or more occupants will be permitted to use the express lane free of charge, while vehicles with two or fewer occupants must pay a fee to access the express lane.

The transportation network under background conditions is assumed to include the following improvements at study intersections. The intersection improvements are planned CIP projects or improvements that will be fully funded by the Tasman East Specific Plan, City Place Phases 1, 2, and 3 developments, or the approved data center at 2305 Mission College. Figure 8 shows the lane configurations at the study intersections under background conditions.



LEGEND

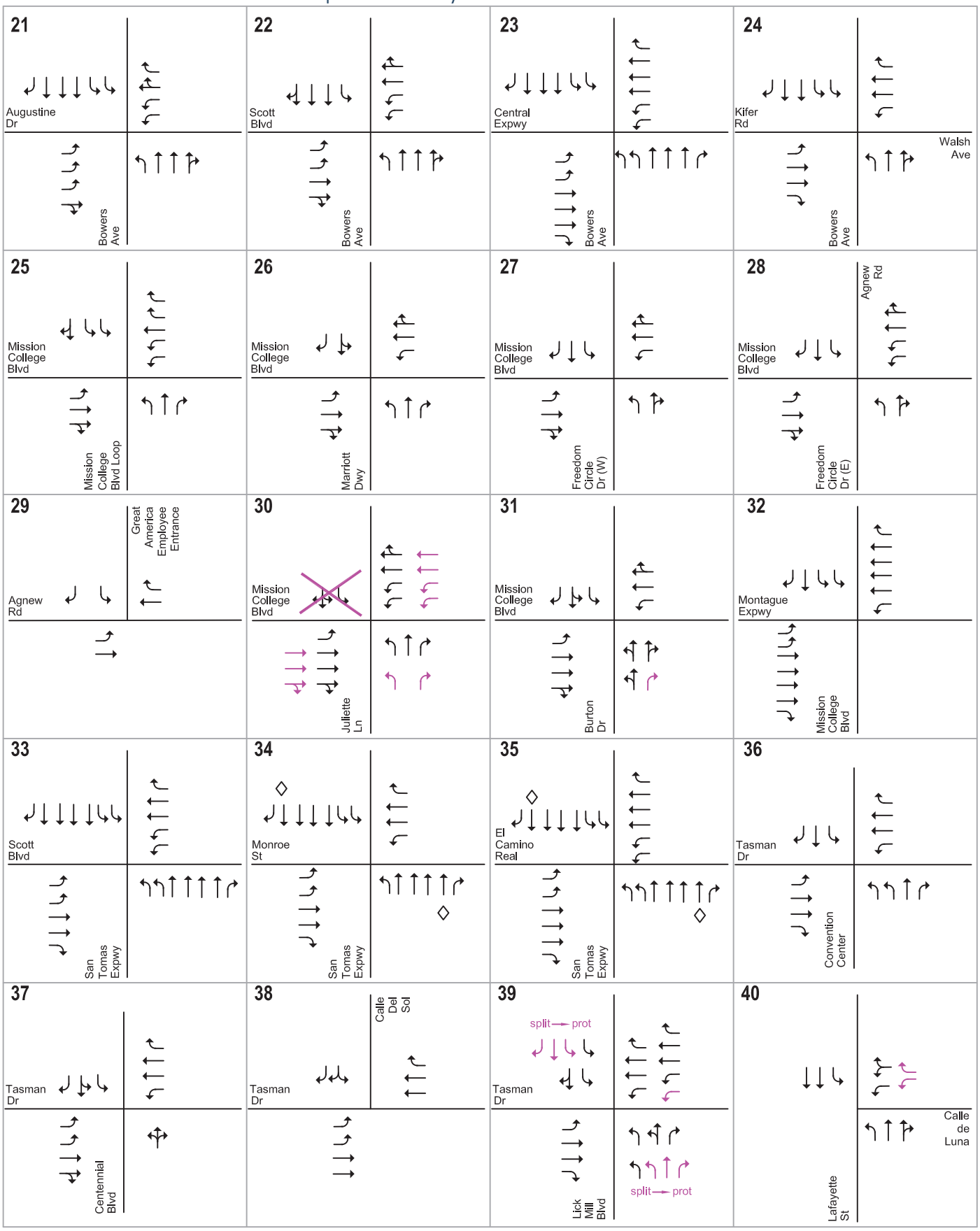
← = Improvement

◇ = HOV Lane

Figure 8
Background No Project Lane Configurations

HEXAGON

NORTH
Not to Scale



LEGEND

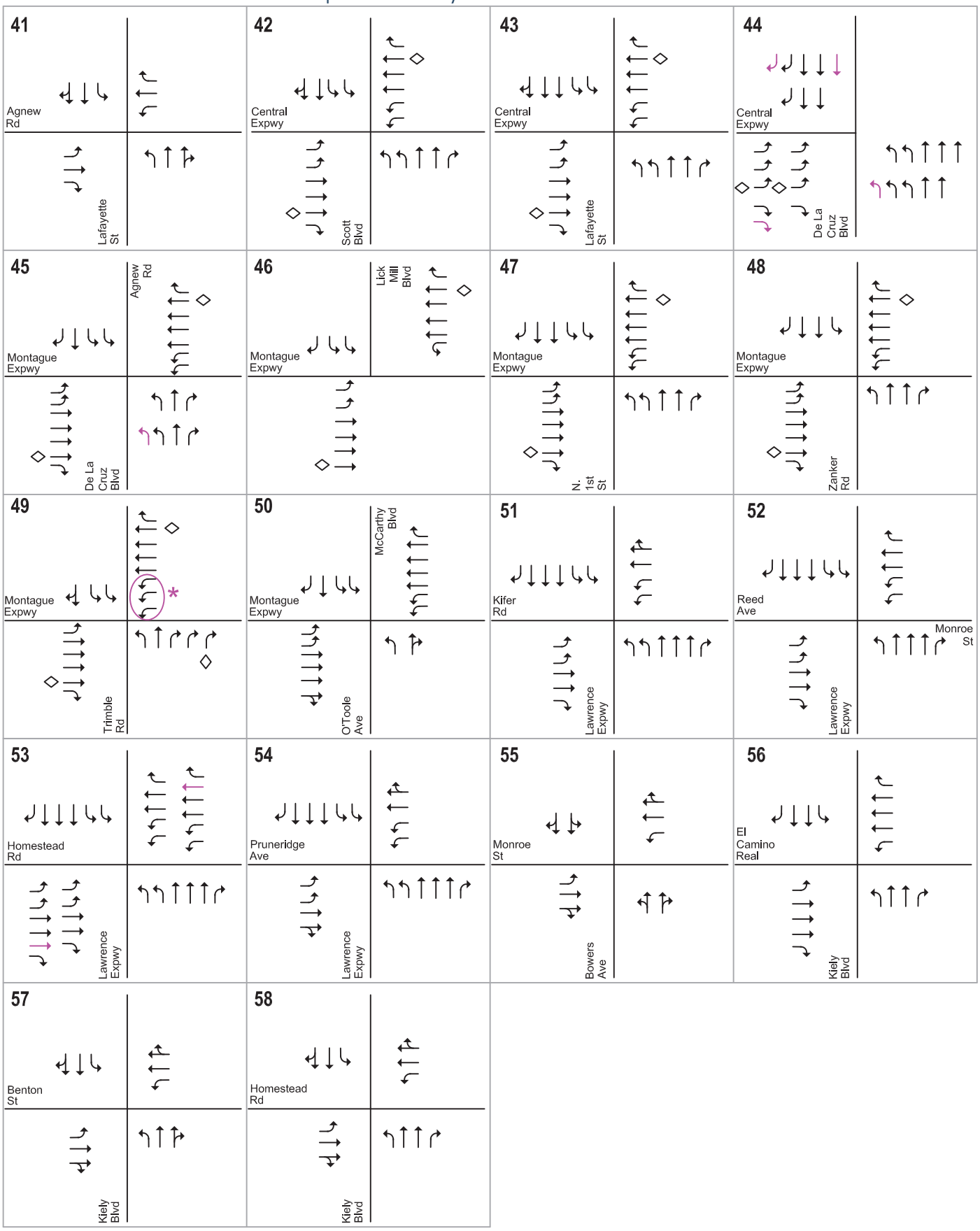
← = Improvement

◇ = HOV Lane

Figure 8
Background No Project Lane Configurations

HEXAGON

NORTH
Not to Scale



LEGEND

← = Improvement

◇ = HOV Lane

* The WBL will be replaced with a new flyover to serve WBL to SB direction.

Figure 8
Background No Project Lane Configurations

HEXAGON

NORTH
Not to Scale

10. Great America Parkway and SR 237 Westbound Ramps: restripe the southbound approach as one through/right-turn lane and one right-turn lane, add a second westbound right-turn lane and a third westbound left-turn lane and associated receiving lane under underpass.

11. Great America Parkway and SR 237 Eastbound Ramps: add a third southbound through lane and a second eastbound right-turn lane.

12. Great America Parkway and Great America Way: add a second westbound right-turn lane with an overlap phase and a second southbound left-turn lane.

13. Great America Parkway and Old Mountain View-Alviso Road: add a second eastbound left-turn lane.

15. Great America Parkway and Tasman Drive: add a southbound right-turn lane and a third westbound left-turn lane.

18. Great America Parkway and Mission College Boulevard: add a third northbound left-turn lane, a third westbound left-turn lane, a second eastbound left-turn lane, and a westbound right-turn pocket.

30. Juliette Lane and Mission College Boulevard: remove the north leg (i.e., southbound movements), the northbound through lane and the eastbound left-turn lane.

31. Burton Drive and Mission College Boulevard: restripe the northbound through/right-turn lane as a right-turn only lane.

39. Lick Mill Boulevard and Tasman Drive: reconfigure northbound and southbound approaches to include two left-turn lanes, one through lane, and one right-turn lane; change the northbound/southbound phasing from split to protected phasing; add a second westbound left-turn lane.

40. Lafayette Street and Calle De Luna: restripe the westbound approach to include one left-turn lane and one right-turn lane.

44. De la Cruz Boulevard and Central Expressway: add a third southbound through lane and a second southbound right-turn lane; add a second eastbound right-turn lane; add a third northbound left-turn lane and remove one northbound through lane.

45. Agnew Road/De La Cruz Boulevard and Montague Expressway: add a second northbound left-turn lane.

49. Trimble Road and Montague Expressway: construction of a flyover to serve westbound left turn traffic from Montague Expressway to southbound Trimble Road.

53. Lawrence Expressway and Homestead Road: add a third eastbound through lane and a third westbound through lane.

Background Traffic Volumes

Background traffic volumes were developed using the CSC travel demand forecasting model. In most locations, the model reflects anticipated growth according to ABAG 2030 land use projections. In the vicinity of the Focus Area, the model assumes completion of City Place Phases 1-3 and buildout of the Tasman East Specific Plan. For consistency, the trip estimates reported in the EIR for each of these developments was hard coded into the model. The proposed Kylli development is not assumed in 2030.

While the ABAG land use data do not reflect any growth in enrollment at Mission College from 2018 to 2030, the forecasts were modified to reflect a five percent increase in enrollment by the Year 2030 based on historic data obtained from the California Community Colleges Chancellor's Office.[3] Figure 9 shows the traffic volumes at the study intersections under background conditions.

Background (Year 2030) land uses within the Freedom Circle Focus Area assume the existing Marriott Hotel with 750 rooms is unchanged and a modest increase (approximately seven percent) in the size of other land uses based on ABAG land use forecasts. Overall, employment within the Focus Area under Background (Year 2030) No Project conditions is expected to be approximately six percent greater than under existing (Year 2018) conditions. The trip generation estimates for the Freedom Circle Focus Area under Background (2030) conditions account for trip reductions for transit use. Table 5 presents the CSC model trip estimates for the background no project conditions within the Focus Area.

Table 5
Trip Generation Estimates for the Freedom Circle Focus Area – Background (2030) Conditions

		Daily			AM Peak Hour					PM Peak Hour				
						Vehicle Trips					Vehicle Trips			
		Rate	Trips	Mode Share	Rate	In	Out	Total	Mode Share	Rate	In	Out	Total	Mode Share
Total Project Trips [1]														
Employment[2]	6,119 jobs	2.95	**18,070**	100.0%	0.25	1,285	269	**1,554**	100.0%	0.32	560	1,414	**1,974**	100.0%
Less External Public Transit Trips			(705)	3.9%		(50)	(11)	(61)	3.9%		(20)	(51)	(71)	3.6%
External Vehicle Trips			**17,365**	96.1%		**1,235**	**258**	**1,493**	96.1%		**540**	**1,363**	**1,903**	96.4%

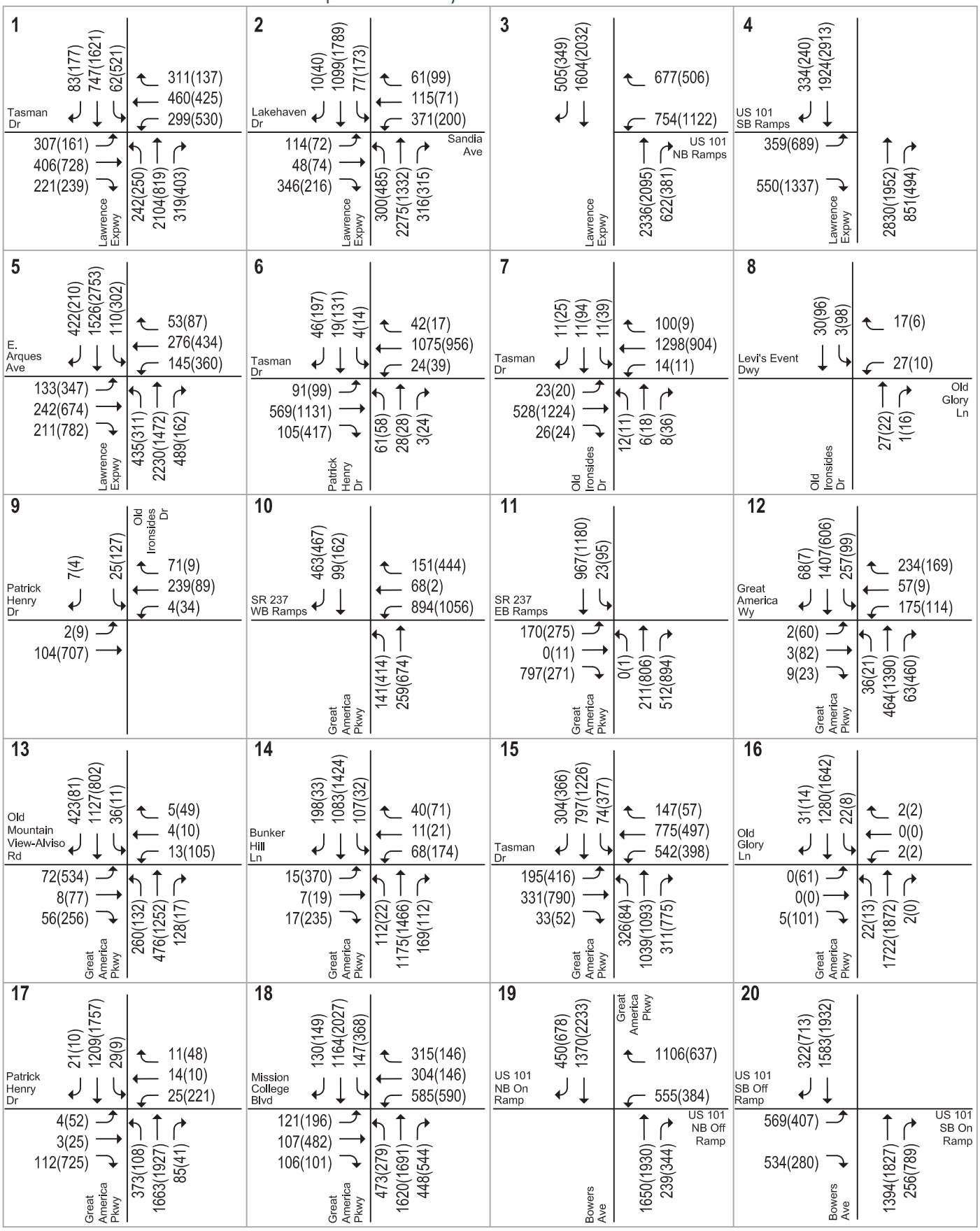
[1] For comparison purposes, project trip estimates listed above do not include external bike/walk trips forecast by the CSC model since ITE trip rates reflect only vehicle trips.
[2] Year 2030 land uses include the Marriott Hotel (750 rooms) and approximately 2,514,000 s.f. of other uses including a mix of office, research & development, and restaurant (which reflect a 7% growth above existing conditions based on ABAG land use forecasts).

Background Intersection Levels of Service

The results of the intersection level of service analysis show that the following 16 study intersections would operate at an unacceptable level of service (LOS E or worse for any San José intersection and locally controlled Santa Clara and Sunnyvale intersections and LOS F for CMP and expressway intersections in Santa Clara and Sunnyvale) during at least one peak hour under background conditions (see Table 6).

4. Lawrence Expressway and US101 Southbound Ramps (PM peak hour)
5. Lawrence Expressway and E. Arques Avenue (PM peak hour)
17. Great America Parkway and Patrick Henry Drive (PM peak hour)
23. Bowers Avenue and Central Expressway (AM and PM peak hours)
32. Mission College Boulevard and Montague Expressway (AM peak hour)
35. San Tomas Expressway and El Camino Real (AM peak hour)
42. Scott Street and Central Expressway (PM peak hour)
44. De La Cruz Boulevard and Central Expressway (AM peak hour)
45. Agnew Road/De La Cruz Boulevard and Montague Expressway (AM and PM peak hours)
47. N. 1st Street and Montague Expressway (AM and PM peak hours)
48. Zanker Road and Montague Expressway (AM and PM Peak hours)
49. Trimble Rd and Montague Expressway (PM peak hour)
50. McCarthy Boulevard/O'Toole Avenue and Montague Expressway (AM and PM peak hours)

[3] https://datamart.cccco.edu/Students/Enrollment_Status.aspx

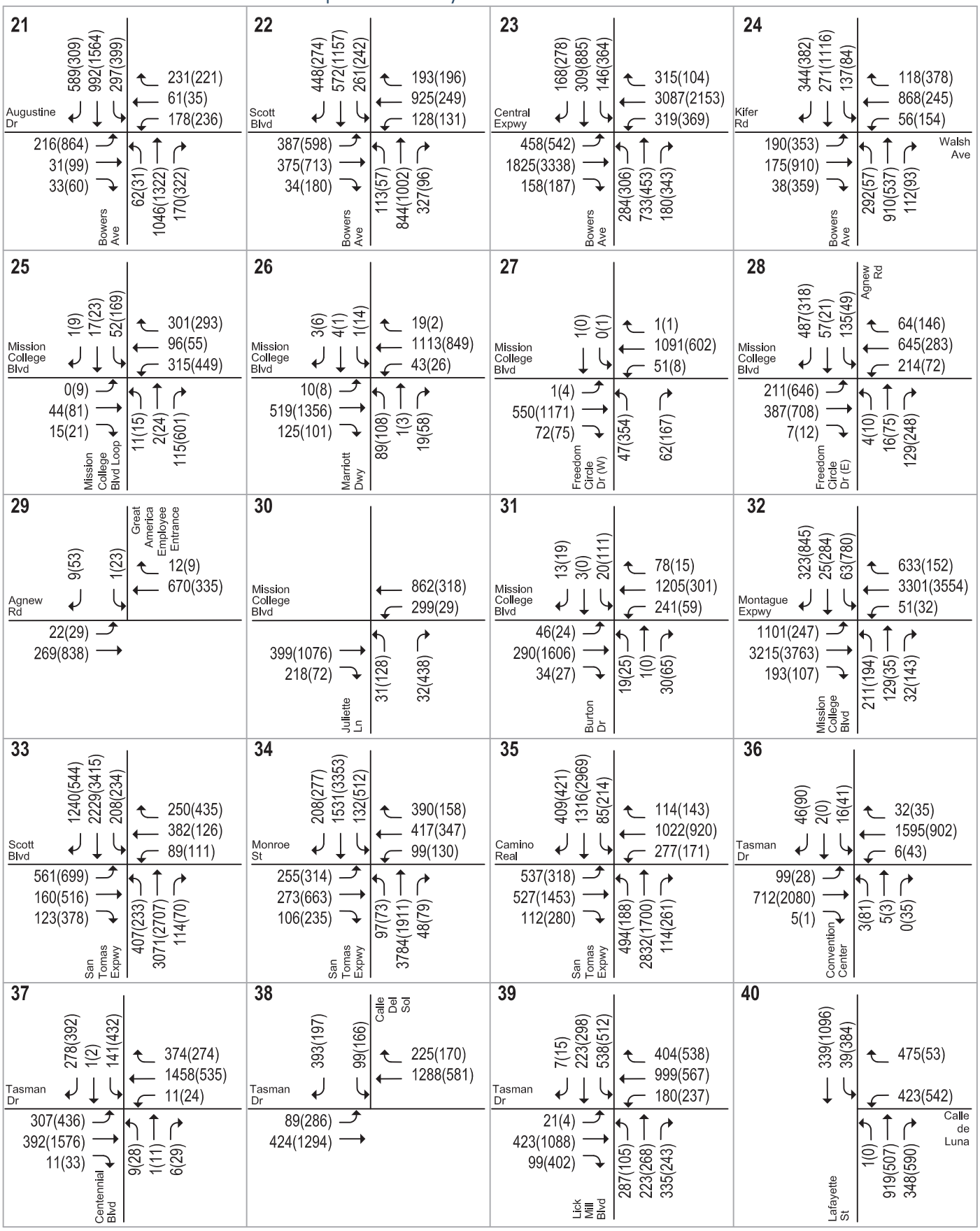


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 9
Background Traffic Volumes

NORTH
Not to Scale

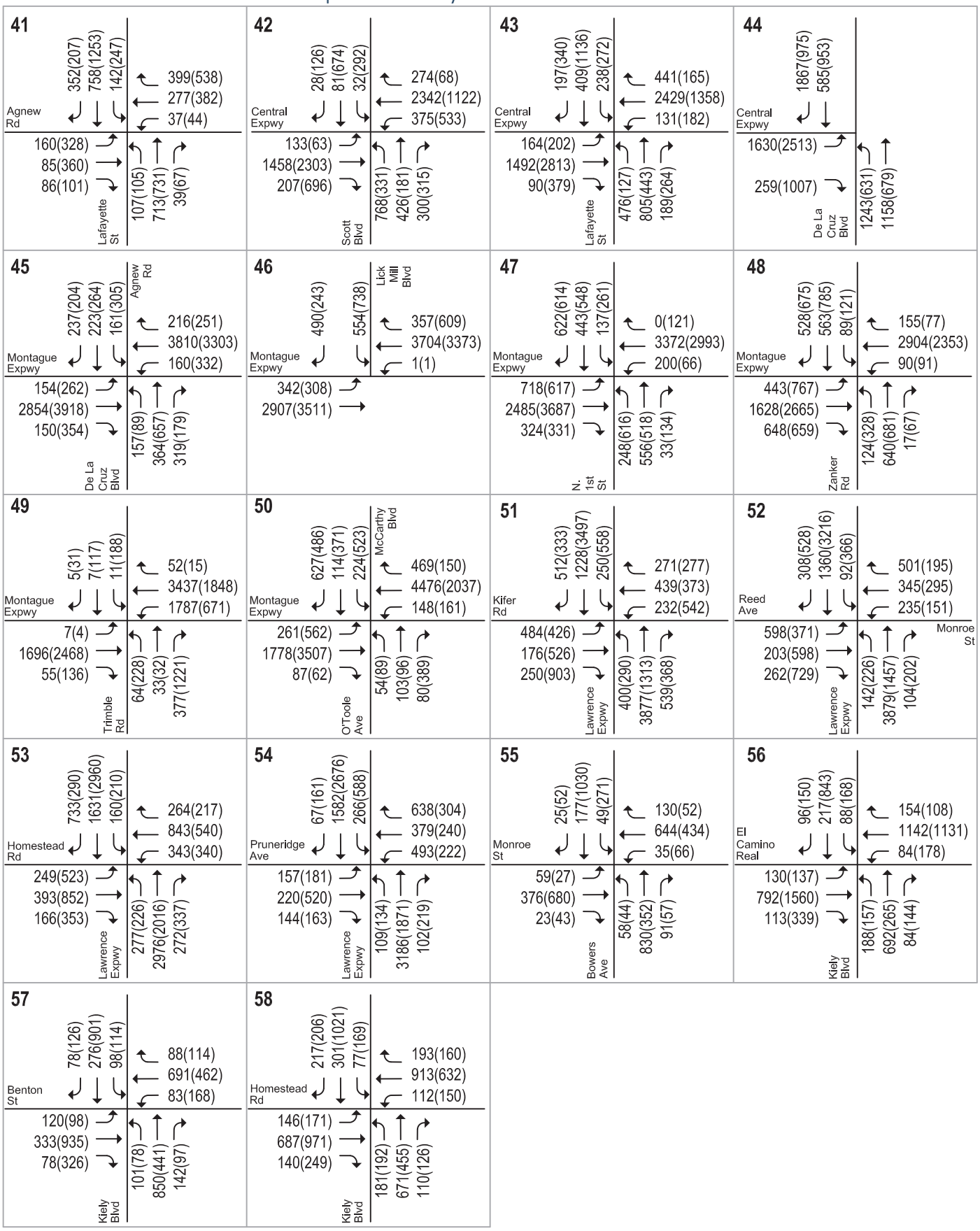


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 9
Background Traffic Volumes

NORTH
Not to Scale



LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 9
Background Traffic Volumes

NORTH
Not to Scale

Table 6
Background Intersection Levels of Service

#	Intersection	Jurisdiction	LOS Standard	Peak Hour	Existing Avg Delay	Existing LOS	Background (2030) No Project Avg Delay	Background (2030) No Project LOS
1	Lawrence Expressway and Tasman Drive	SCC	E	AM	42.0	D	47.6	D
	(CMP)			PM	55.1	E	64.5	E
2	Lawrence Expwy and Sandia Av/Lakehaven Dr	SCC	E	AM	63.4	E	64.3	E
				PM	58.3	E	62.5	E
3	Lawrence Expressway and US 101 NB Ramps	SCC	E	AM	10.0	B	11.6	B
				PM	13.8	B	19.7	B
4	Lawrence Expressway and US 101 SB Ramps	SCC	E	AM	6.6	A	7.2	A
				PM	71.5	E	**109.4**	**F**
5	Lawrence Expressway and E. Arques Ave.	SCC	E	AM	37.7	D	39.9	D
	(CMP)			PM	71.6	E	**81.2**	**F**
6	Patrick Henry Drive and Tasman Drive	SC	D	AM	17.2	B	16.2	B
				PM	17.7	B	18.0	B
7	Old Ironsides Drive and Tasman Drive	SC	D	AM	6.4	A	5.5	A
				PM	15.9	B	10.9	B
8	Old Ironsides Drive and Old Glory Lane	SC	D	AM	3.6	A	3.9	A
	(Unsignalized)			PM	3.5	A	3.6	A
9	Old Ironsides Drive and Patrick Henry Drive	SC	D	AM	0.8	A	0.9	A
	(Unsignalized)			PM	3.9	A	4.4	A
10	Great America Parkway and SR 237 WB Ramps	SJ	D	AM	15.7	B	13.1	B
	(CMP)			PM	19.0	B	18.8	B
11	Great America Parkway and SR 237 EB Ramps	SJ	D	AM	13.4	B	10.7	B
	(CMP)			PM	14.5	B	13.2	B
12	Great America Parkway and Great America Way	SC	D	AM	23.6	C	22.1	C
				PM	16.9	B	17.3	B
13	Great America Pkwy and Old Mt View-Alviso Rd	SC	D	AM	19.4	B	22.2	C
				PM	44.4	D	42.5	D
14	Great America Parkway and Bunker Hill Lane	SC	D	AM	16.9	B	13.3	B
				PM	29.8	C	29.5	C
15	Great America Parkway and Tasman Drive	SC	E	AM	42.0	D	44.5	D
	(CMP)			PM	28.4	C	33.1	C
16	Great America Parkway and Old Glory Lane	SC	D	AM	10.7	B	10.5	B
				PM	16.9	B	13.3	B
17	Great America Parkway and Patrick Henry Drive	SC	D	AM	29.6	C	27.4	C
				PM	53.6	D	**66.5**	**E**
18	Great America Pkwy and Mission College Blvd	SC	E	AM	44.8	D	36.9	D
	(CMP)			PM	42.6	D	40.4	D
19	Great America Pkwy and US 101 NB Off Ramp	SC	E	AM	11.6	B	11.4	B
	(CMP)			PM	10.0	A	9.6	A
20	Bowers Avenue and US 101 SB Off Ramp	SC	E	AM	13.2	B	11.9	B
	(CMP)			PM	7.6	A	10.9	B
21	Bowers Avenue and Augustine Drive	SC	D	AM	21.3	C	26.0	C
				PM	33.2	C	36.4	D
22	Bowers Avenue and Scott Boulevard	SC	E	AM	40.5	D	49.6	D
				PM	33.5	C	37.1	D
23	Bowers Avenue and Central Expressway	SCC	E	AM	56.2	E	**89.0**	**F**
				PM	53.8	D	**103.6**	**F**
24	Bowers Avenue and Kifer Road/Walsh Avenue	SC	D	AM	31.2	C	36.0	D
				PM	28.6	C	30.4	C
25	Mission College Loop and Mission College Blvd	SC	D	AM	12.0	B	12.1	B
				PM	25.6	C	25.2	C

Table 6 (Continued)
Background Intersection Levels of Service

#	Intersection	Jurisdiction	LOS Standard	Peak Hour	Existing Avg Delay	Existing LOS	Background (2030) No Project Avg Delay	Background (2030) No Project LOS
26	Marriott Dwy and Mission College Blvd	SC	D	AM	13.0	B	11.8	B
				PM	12.9	B	12.0	B
27	Freedom Circle W and Mission College Blvd	SC	D	AM	12.3	B	11.0	B
				PM	26.2	C	25.9	C
28	Agnew/Freedom Circle E & Mission College Blvd	SC	D	AM	30.0	C	31.1	C
				PM	31.8	C	31.5	C
29	Great America employee entrance and Agnew Rd	SC	D	AM	3.9	A	3.6	A
				PM	5.2	A	5.1	A
30	Juliette Lane and Mission College Boulevard	SC	D	AM	19.8	B	13.5	B
				PM	30.6	C	22.6	C
31	Burton Drive and Mission College Boulevard	SC	D	AM	20.6	C	20.5	C
				PM	19.1	B	18.8	B
32	Mission College Blvd and Montague Expwy	SCC	E	AM	65.8	E	**98.3**	**F**
	(CMP)			PM	52.4	D	72.7	E
33	San Tomas Expressway and Scott Boulevard	SCC	E	AM	30.8	C	79.0	E
	(CMP)			PM	50.7	D	56.7	E
34	San Tomas Expressway and Monroe Street	SCC	E	AM	39.5	D	43.2	D
	(CMP)			PM	38.5	D	45.8	D
35	San Tomas Expressway and El Camino Real	SCC	E	AM	72.6	E	**85.5**	**F**
	(CMP)			PM	71.3	E	74.5	E
36	Convention Center and Tasman Drive	SC	D	AM	14.4	B	14.8	B
				PM	14.8	B	15.5	B
37	Centennial Boulevard and Tasman Drive	SC	D	AM	14.8	B	25.5	C
				PM	17.5	B	27.3	C
38	Calle Del Sol and Tasman Drive	SC	D	AM	14.6	B	21.8	C
				PM	18.3	B	23.3	C
39	Lick Mill Boulevard and Tasman Drive	SC	D	AM	27.5	C	41.3	D
				PM	24.8	C	41.2	D
40	Lafayette Street and Calle De Luna	SC	D	AM	13.1	B	23.2	C
				PM	19.3	B	36.9	D
41	Lafayette Street and Agnew Road	SC	D	AM	27.9	C	29.3	C
				PM	29.9	C	51.0	D
42	Scott Boulevard and Central Expressway	SCC	E	AM	41.8	D	67.6	E
	(CMP)			PM	64.9	E	**109.5**	**F**
43	Lafayette Street and Central Expressway	SCC	E	AM	52.4	D	75.2	E
	(CMP)			PM	53.3	D	62.6	E
44	De la Cruz Boulevard and Central Expressway	SCC	E	AM	**96.8**	**F**	**107.2**	**F**
	(CMP)			PM	32.8	C	70.3	E
45	Agnew Rd/De La Cruz Blvd and Montague Expwy	SCC	E	AM	52.3	D	**94.4**	**F**
	(CMP)			PM	48.1	D	**106.0**	**F**
46	Lick Mill Boulevard and Montague Expressway	SCC	E	AM	38.7	D	56.1	E
				PM	28.4	C	52.1	D
47	N. 1st Street and Montague Expressway	SCC	D	AM	**87.3**	**F**	**132.6**	**F**
	(CMP)			PM	**69.9**	**E**	**121.4**	**F**
48	Zanker Road and Montague Expressway	SCC	D	AM	50.2	D	**57.5**	**E**
	(CMP)			PM	50.5	D	**79.2**	**E**
49	Trimble Road and Montague Expressway	SCC	D	AM	36.3	D	36.5	D
	(CMP)			PM	46.7	D	**105.7**	**F**
50	McCarthy Blvd/O'Toole Av and Montague Expwy	SCC	D	AM	41.8	D	**75.9**	**E**
	(CMP)			PM	**82.3**	**F**	**134.0**	**F**

Table 6 (Continued)
Background Intersection Levels of Service

#	Intersection	Jurisdiction	LOS Standard	Peak Hour	Existing Avg Delay	Existing LOS	Background (2030) No Project Avg Delay	Background (2030) No Project LOS
51	Lawrence Expressway and Kifer Road	SCC	E	AM	54.8	D	**102.3**	**F**
				PM	**97.6**	**F**	**181.3**	**F**
52	Lawrence Expressway and Reed Ave/Monroe St	SCC	E	AM	**114.8**	**F**	**124.3**	**F**
	(CMP)			PM	61.8	E	71.1	E
53	Lawrence Expressway and Homestead Road	SCC	E	AM	61.8	E	51.7	D
	(CMP)			PM	65.4	E	69.4	E
54	Lawrence Expressway and Pruneridge Avenue	SCC	E	AM	74.5	E	79.6	E
				PM	47.4	D	62.6	E
55	Bowers Avenue and Monroe Street	SC	D	AM	31.7	C	33.4	C
				PM	33.9	C	40.7	D
56	Bowers Ave/Kiely Boulevard and El Camino Real	SC	E	AM	28.9	C	28.9	C
	(CMP)			PM	30.4	C	31.8	C
57	Kiely Boulevard and Benton Street	SC	D	AM	34.0	C	37.2	D
				PM	37.9	D	46.1	D
58	Kiely Boulevard and Homestead Road	SC	D	AM	37.3	D	38.6	D
				PM	41.6	D	**57.9**	**E**

Notes:
SCC = Santa Clara County, SC = Santa Clara, SJ = San Jose, SV = Sunnyvale
Bold indicates a substandard level of service.

51. Lawrence Expressway and Kifer Road (AM and PM peak hours)
52. Lawrence Expressway and Monroe Street (AM peak hour)
58. Kiely Boulevard and Homestead Road (PM peak hour)

All other study intersections would operate at acceptable levels during both the AM and PM peak hours of traffic. The intersection levels of service calculation sheets are included in Appendix B.

4. Background Plus Project Conditions

This chapter describes background plus project traffic conditions. Background plus project conditions were evaluated relative to background conditions in order to determine potential project impacts. This chapter analyzes the proposed Greystar development by itself as well as the full buildout of the Freedom Circle Focus Area, which includes the proposed Greystar development along with additional residential and office development on other sites within the Focus Area.

Roadway Network Under Background Plus Project Conditions

The roadway network under background plus project conditions would be the same as the background roadway network as described in Chapter 3 at all study intersections.

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear were estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM and PM peak hours. As part of the project trip distribution, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment, the project trips are assigned to specific streets and intersections. These procedures are described below.

Trip Generation

Vehicle trips generated by development of the Greystar General Plan Amendment and buildout of the Freedom Circle Focus Area were estimated using the trip rates for a general Urban/Suburban area published in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 10th Edition (2017).* For residential land uses, trips rates for "Multi-family Housing Mid-Rise" (Land Use 221) were used. As defined by the ITE, "mid-rise" multifamily housing are buildings that have between 3 and 10 floors. ITE trip rates for "General Office Building" (Land Use 710) were used for office uses, "Shopping Center" (Land Use 820) trip rates were used for retail uses, and "Hotel" (Land Use 310) trip rates were used for the existing Marriott hotel.

The Greystar site is currently vacant. The proposed Greystar development would construct 1,100 dwelling units and 2,000 square feet of retail space. As shown in Table 7, development of the Greystar project is estimated to generate 6,060 gross daily vehicle trips, 398 (104 inbound and 294 outbound) gross AM peak hour trips, and 492 (299 inbound and 193 outbound) gross PM peak hour trips.

Buildout of the Freedom Circle Focus Area including the Greystar development would result in a total of 3,600 dwelling units, 5,369,000 square feet office space[4], 2,000 square feet retail space, and 750 hotel rooms within the Focus Area. As shown in Table 8, buildout of the Freedom Circle Focus Area is estimated to generate 78,224 gross daily trips, 7,879 (5,902 inbound and 1,977 outbound) gross AM peak hour trips, and 8,216 (2,188 inbound and 6,028 outbound) gross PM peak hour trips.

Table 7
Project Trip Generation Estimates (Year 2030) – Greystar

			Daily		AM Peak Hour					PM Peak Hour				
						Trips					Trips			
Land Use	Size	Rate	Trips	Mode Share	Rate	In	Out	Total	Mode Share	Rate	In	Out	Total	Mode Share
Multifamily Housing (Mid-Rise)	1,100 Dwelling Units	5.44	5,984		0.36	103	293	396		0.44	295	189	484	
Retail	2,000 Square Feet	37.75	76		0.94	1	1	2		3.81	4	4	8	
Total Proposed Project Trips			**6,060**	**100.0%**		**104**	**294**	**398**	**100.0%**		**299**	**193**	**492**	**100.0%**
Less Internal Trips			(28)	0.5%		(1)	(1)	(2)	0.5%		(1)	(1)	(2)	0.3%
Less External Public Transit Trips			(295)	4.9%		(5)	(16)	(21)	5.3%		(13)	(9)	(22)	4.5%
Less Retail Passby Trips			*(15)*	0.2%		*0*	*0*	*0*	0.0%		*(1)*	*(1)*	*(2)*	0.4%
External Vehicle Trips			**5,722**	**94.4%**		**98**	**277**	**375**	**94.2%**		**284**	**182**	**466**	**94.7%**

Source: Trip rates from ITE *Trip Generation Manual, 10th Edition,* 2017. Internal and transit trip reductions derived from CSC travel demand model.

Table 8
Project Trip Generation Estimates (Year 2030) – Focus Area Buildout

			Daily		AM Peak Hour					PM Peak Hour				
						Trips					Trips			
Land Use	Size	Rate	Trips	Mode Share	Rate	In	Out	Total	Mode Share	Rate	In	Out	Total	Mode Share
Multifamily Housing (Mid-Rise)	3,600 Dwelling Units	5.44	19,584		0.36	337	959	1,296		0.44	966	618	1,584	
Total Residential Trips	*3,600 Dwelling Units*	*5.44*	*19,584*		*0.36*	*337*	*959*	*1,296*		*0.44*	*966*	*618*	*1,584*	
General Office Building	5,369,000 Square Feet	9.740	52,294		1.16	5,356	872	6,228		1.15	988	5,186	6,174	
Retail	2,000 Square Feet	37.75	76		0.94	1	1	2		3.81	4	4	8	
Hotel	750 Rooms	8.36	6,270		0.47	208	145	353		0.60	230	220	450	
Total Employment Trips	*5,371,000 Square Feet*		*58,640*			*5,565*	*1,018*	*6,583*			*1,222*	*5,410*	*6,632*	
Total Proposed Project Trips			**78,224**	**100.0%**		**5,902**	**1,977**	**7,879**	**100.0%**		**2,188**	**6,028**	**8,216**	**100.0%**
Less Internal Trips			(3,088)	3.9%		(68)	(68)	(136)	1.7%		(134)	(134)	(268)	3.3%
Less External Public Transit Trips			(5,044)	6.4%		(435)	(176)	(611)	7.8%		(150)	(369)	(519)	6.3%
Less Retail Passby Trips			*(17)*	0.0%		*0*	*0*	*0*	0.0%		*(1)*	*(1)*	*(2)*	0.0%
External Vehicle Trips			**70,075**	**89.6%**		**5,399**	**1,733**	**7,132**	**90.5%**		**1,903**	**5,524**	**7,427**	**90.4%**

Source: Trip rates from ITE *Trip Generation Manual, 10th Edition,* 2017. Internal and transit trip reductions derived from CSC travel demand model.

Since the Freedom Circle Focus Area would include a mix of land uses, a portion of the trips generated by Focus Area developments will both begin and end within the Focus Area, also known as internal trips. Some trips to and from the Focus Area will also occur using alternative modes of travel like public transit. The Year 2030 CSC travel demand forecasting model was used to estimate trip reductions for internalization and transit usage under background conditions. Because the proposed Greystar project would be comprised primarily of residential uses with only a very small amount of retail space, internal trips within the Greystar site are estimated to comprise no more than 0.5 percent of all trips. With full

[4] Size of existing developments (2,349,000 s.f.) plus ABAG projected growth (302,000 s.f.) plus previously approved developments (718,000 s.f.) plus additional development permitted under the Focus Area Plan (2,000,000 s.f.).

buildout of the Freedom Circle Focus Area, the CSC model estimates that approximately 3.9 percent of the daily trips, 1.7 percent of the AM peak hour trips, and 3.3 percent of the PM peak hour trips would be internal within the Focus Area. Internal trips are assumed to be made via an alternative mode such as walking or bicycling. Transit trips are estimated to comprise roughly 5 percent of all Greystar trips and 6 to 8 percent of all trips generated by buildout of the Freedom Circle Focus Area.

The project also includes retail uses, which attract some of their customers from people who are passing by the site as they head to their destination. These customers do not need to make a separate vehicle trip to come to the project site. Such vehicle trips are categorized as pass-by trips as they are not new trips generated on the roadway network and are credited from the project trip generation. The pass-by trip reduction for the retail land uses is assumed to be 25 percent for daily, AM and PM peak hours.

After applying the internal capture, transit, and pass-by reductions, the proposed Greystar development is expected to generate 5,722 net daily vehicle trips, 375 (98 inbound and 277 outbound) net AM peak hour trips, and 466 (284 inbound and 182 outbound) net PM peak hour trips under background plus project conditions. Buildout of the Freedom Circle Focus Area is expected to generate 70,075 net daily vehicle trips, 7,132 (5,399 inbound and 1,733 outbound) net AM peak hour trips, and 7,427 (1,903 inbound and 5,524 outbound) net PM peak hour trips under background plus project conditions.

Trip Distribution and Assignment

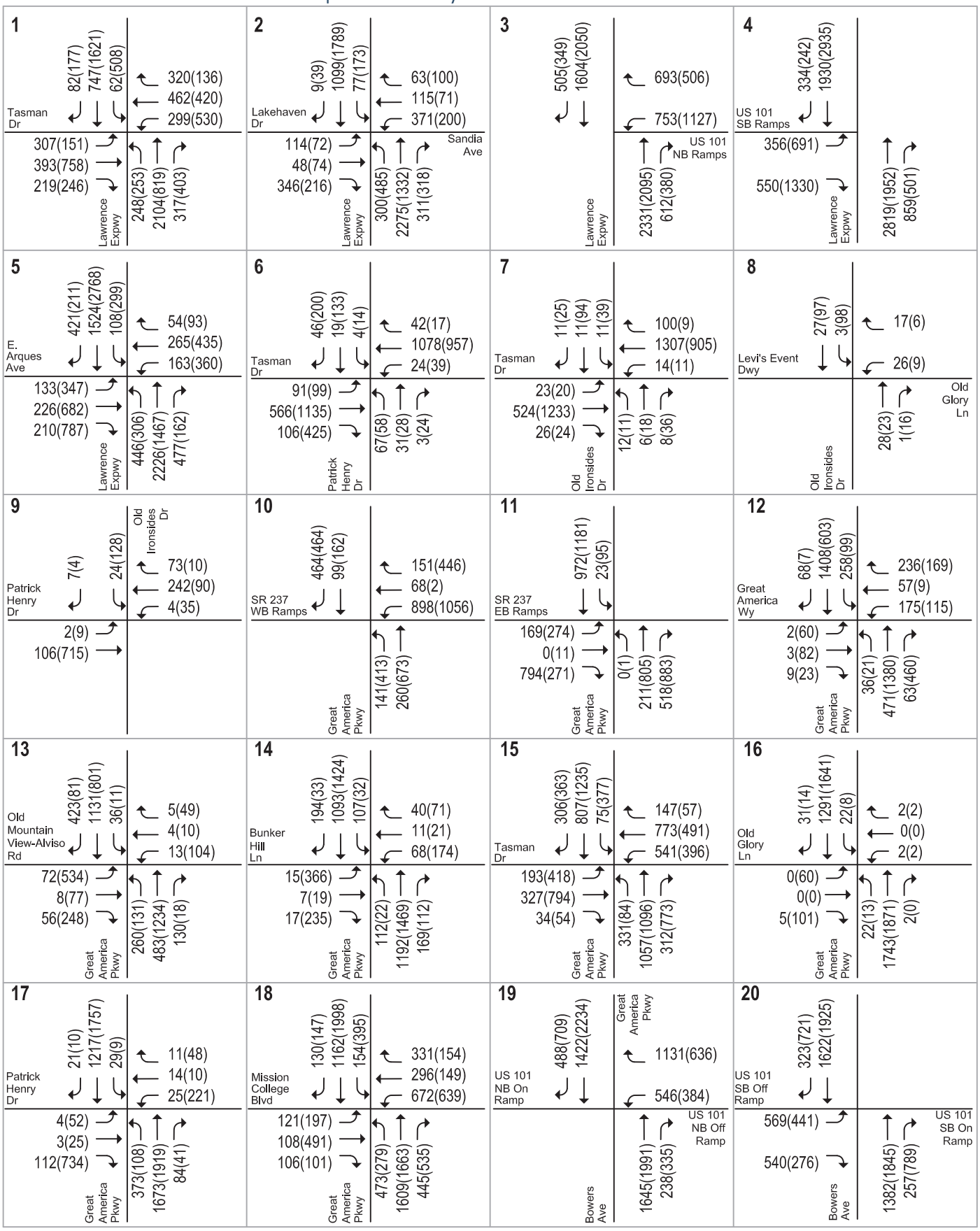
The net project trip estimates were hard coded into the CSC model, which was then used to determine the distribution and assignment of project trips. Note that the trip estimates presented in Table 8 do not include any credits for existing use trips because the CSC model inputs need to reflect the total vehicle trips generated by the Focus Area rather than the incremental increase in trips beyond the existing trip generation.

While the CSC model is capable of estimating gross traffic patterns, it does not accurately model turning movements at study intersections within and immediately adjacent to the Freedom Circle Focus Area. Thus, a more detailed model of the Freedom Circle Focus Area was created using the TRAFFIX software to refine the traffic forecasts for nearby study intersections on Great America Parkway and Mission College Boulevard. Likewise, forecasts also were refined at study intersections within the immediate vicinity of the Patrick Henry Drive Specific Plan Area to ensure the background plus project forecasts are consistent with the method used to develop cumulative (Year 2040) forecasts, which reflect the development of both Plan Areas. The TRAFFIX model represents the future land uses anticipated within the Freedom Circle Focus Area on a parcel level.

Background Plus Project Traffic Volumes

In addition to the new vehicle trips associated with developments within the Freedom Circle Focus Area, model forecasts under background plus project conditions also reflect changes in background no project trips not associated with the Focus Area. For example, the addition 2 million s.f. of additional office space along with the introduction of 3,600 residential units in an employment-rich area of northern Santa Clara are expected to cause changes in trip distribution patterns for background traffic, changes in the mode split choices of other travelers, and a diversion of some vehicles from one route to another in order to avoid the most congested routes and reduce travel time.

Figures 10 and 11 show the traffic volumes forecast under background plus project conditions for the proposed Greystar development alone, and for full buildout of the Freedom Circle Focus Area (including Greystar), respectively. Note that at some intersections, the CSC model shows that the Greystar project would result in modest decreases in traffic volumes in the peak commute direction and increases in trips in the off-peak direction. This is an expected response to the construction of the large



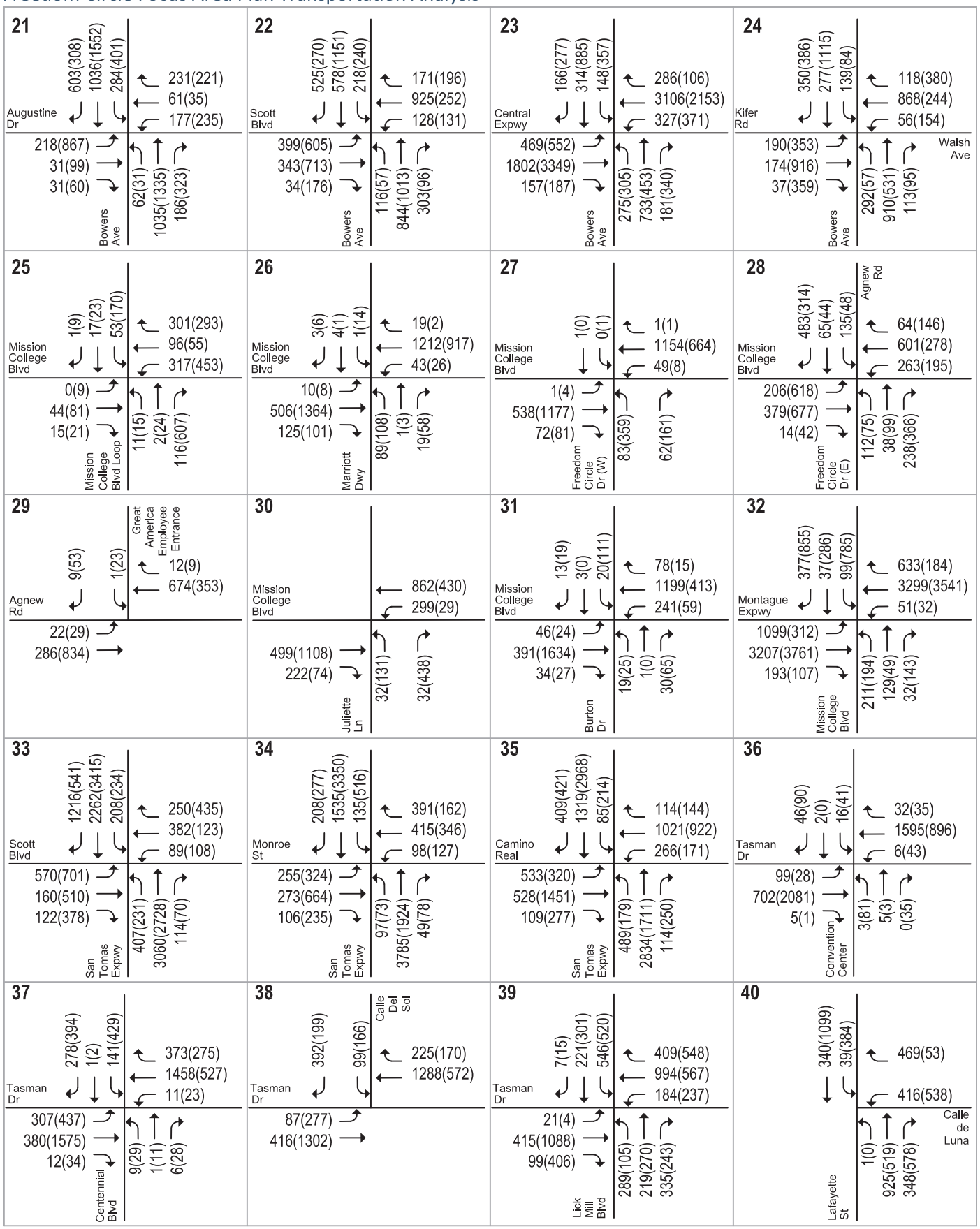
LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 10

Background Plus Project Traffic Volumes - Greystar

NORTH
Not to Scale



LEGEND

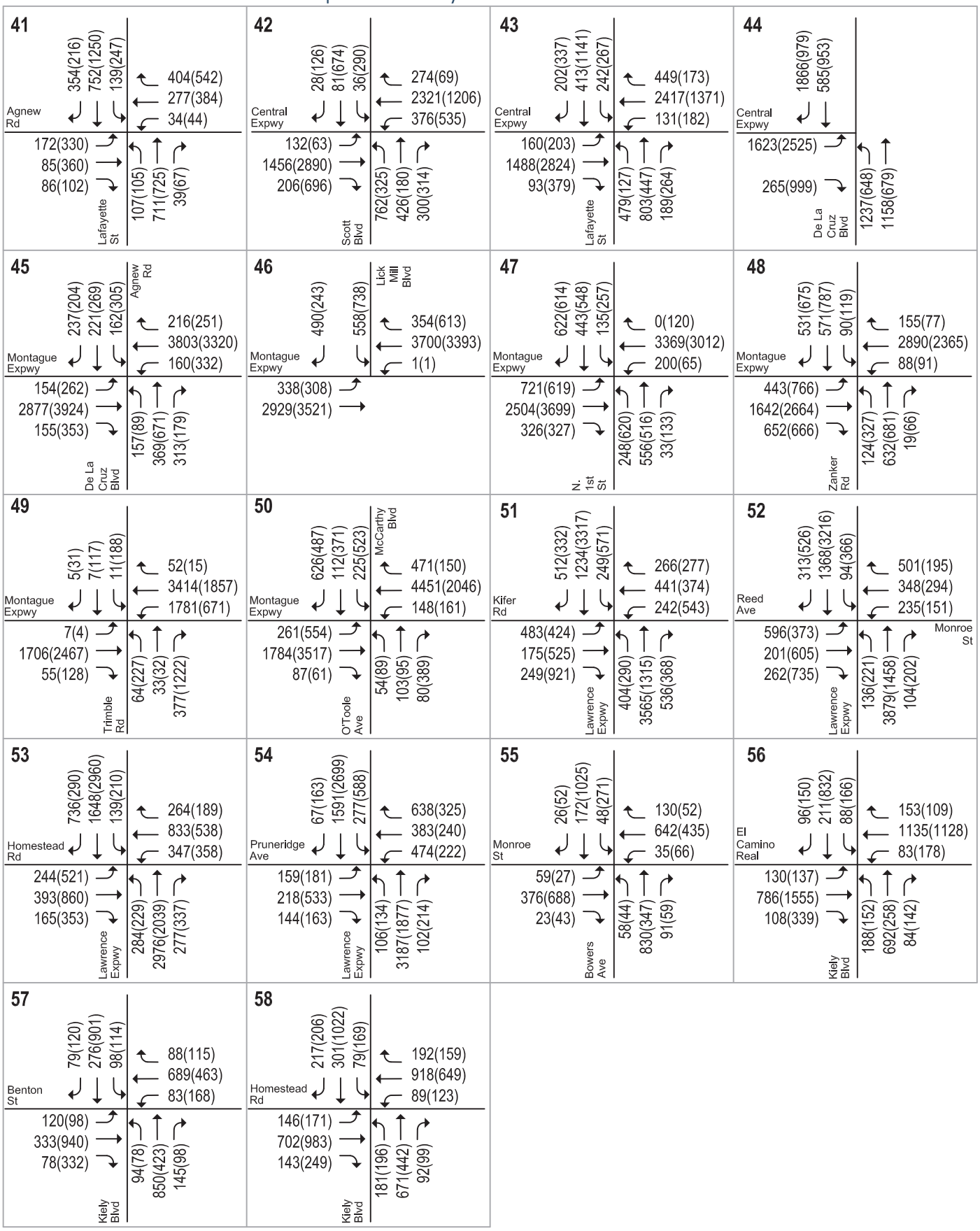
XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 10

Background Plus Project Traffic Volumes - Greystar

HEXAGON

NORTH
Not to Scale

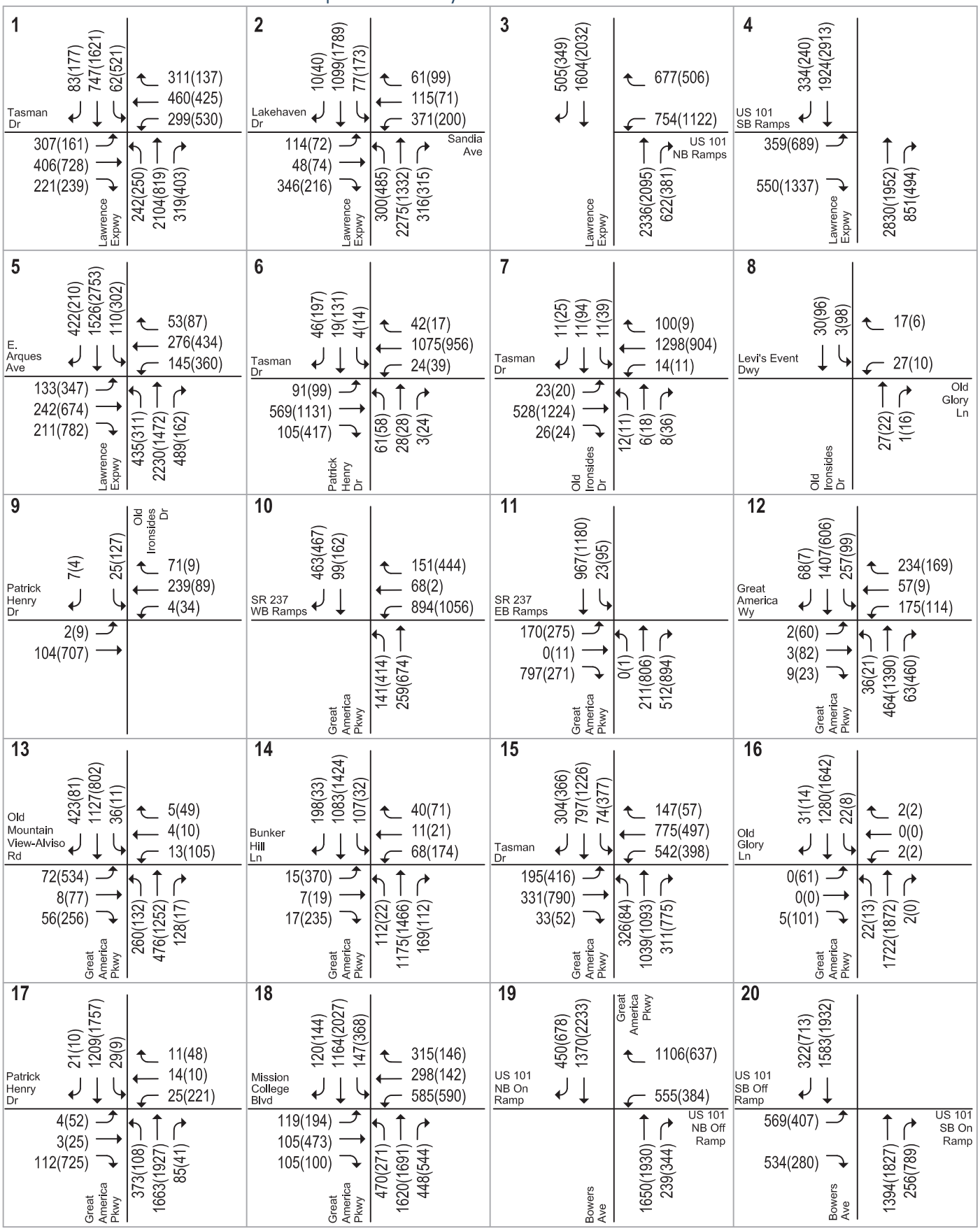


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 10
Background Plus Project Traffic Volumes - Greystar

NORTH
Not to Scale

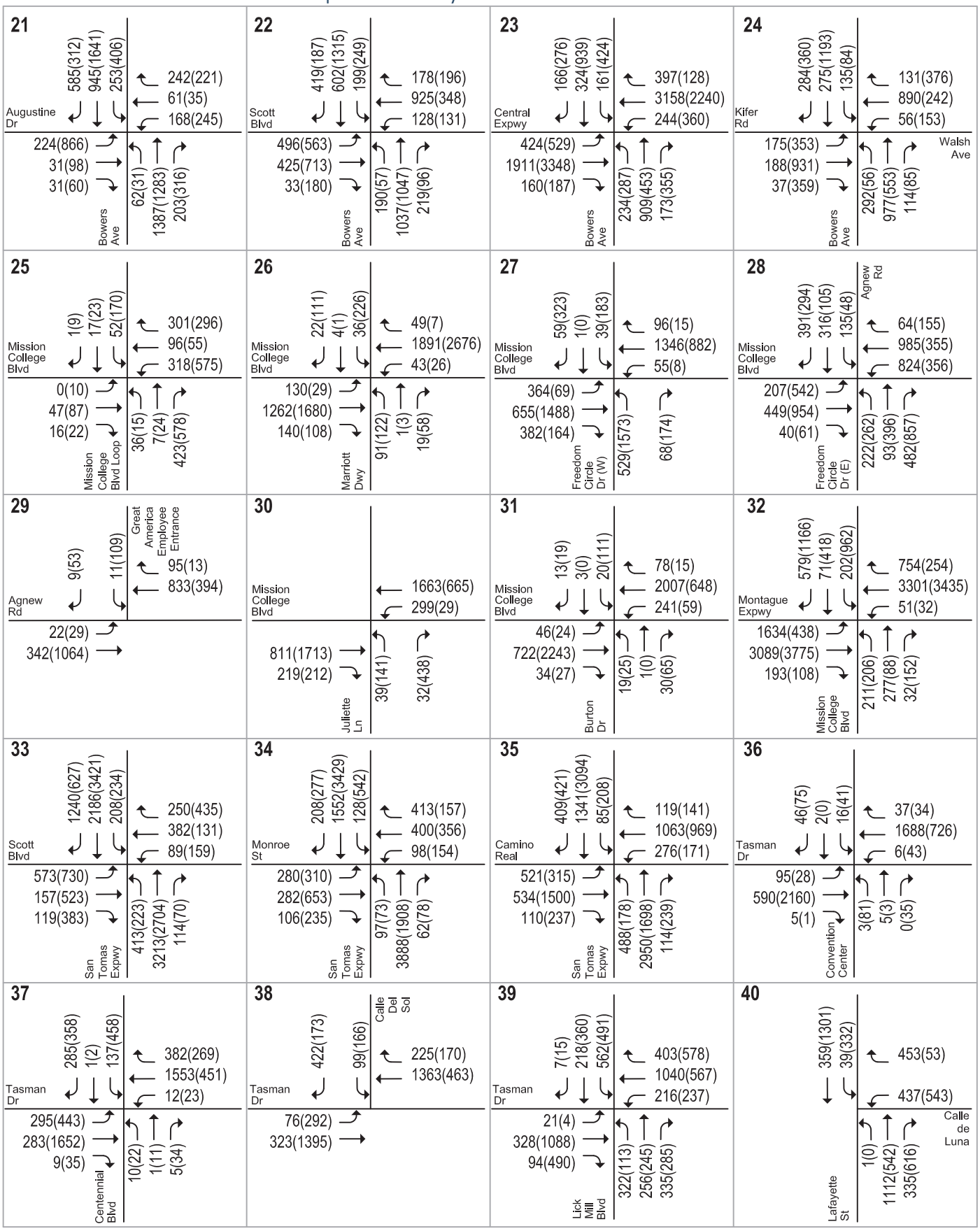


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 9
Background Traffic Volumes

NORTH
Not to Scale



LEGEND

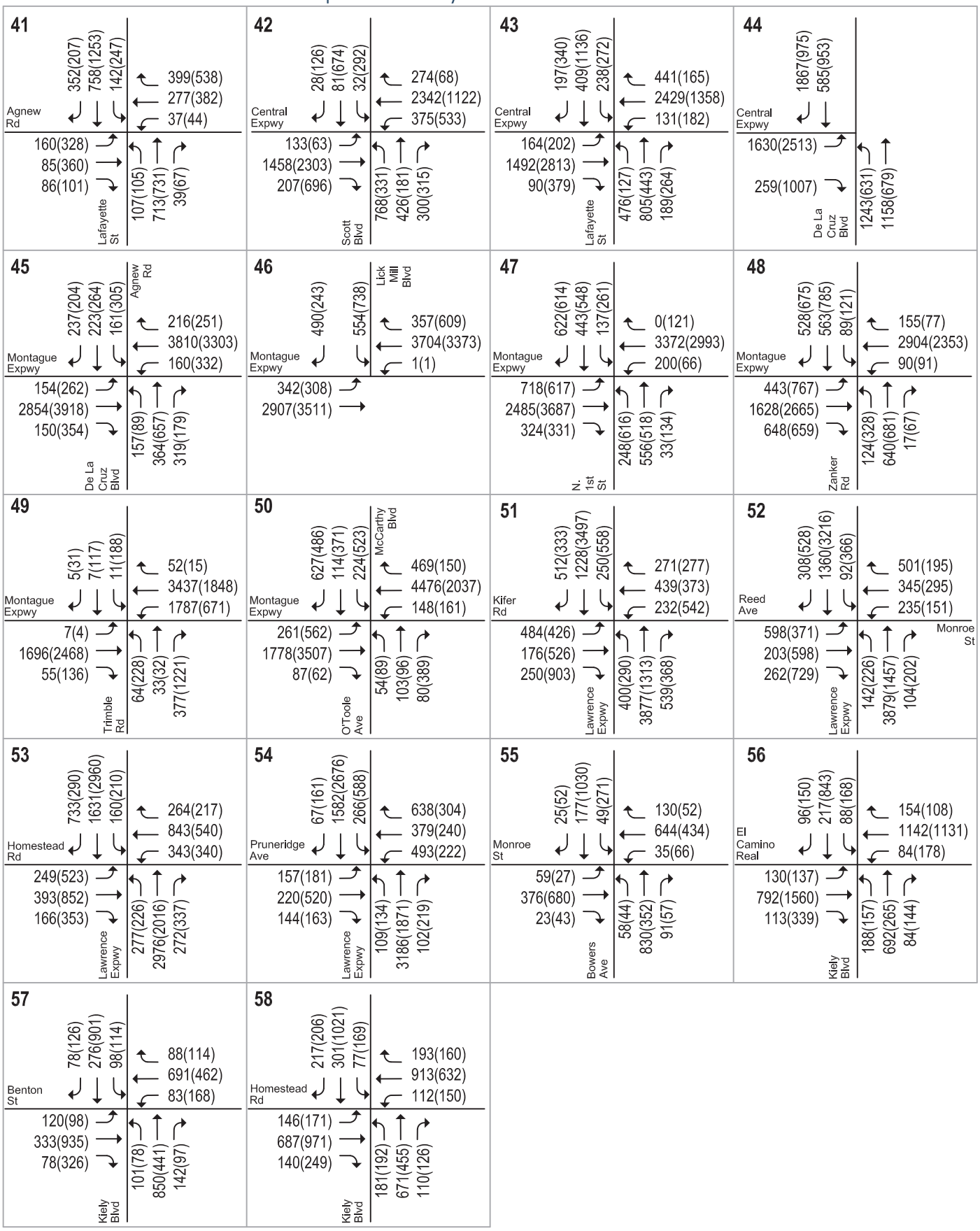
XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 11

Background Plus Project Traffic Volumes - Buildout

HEXAGON

NORTH
Not to Scale



LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 9
Background Traffic Volumes

NORTH
Not to Scale

residential project in a major employment area, resulting in fewer workers commuting long distances from residential areas farther south.

Furthermore, while the model shows that the buildout of the Freedom Circle Focus Area would cause traffic volumes to increase at most locations, a few intersection turn movements are expected to see decreases in traffic volumes due to changes in travel patterns for other nearby land uses. For example, the buildout of the Freedom Circle Focus Area would add a substantial number of trips to northbound Great America Parkway south of Hichborn Drive causing trips for other nearby developments located farther north to divert to other routes resulting in a projected decrease in traffic on northbound Great America Parkway between Mission College Boulevard and Bunker Hill Lane.

Background Plus Project Intersection Levels of Service – Greystar

The results of the intersection level of service analysis (see Table 9) show that following study intersections would continue to operate at unacceptable levels of service under background plus Greystar project conditions.

4. Lawrence Expressway and US101 Southbound Ramps (PM peak hour)
5. Lawrence Expressway and E. Arques Avenue (PM peak hour)
17. Great America Parkway and Patrick Henry Drive (PM peak hour)
23. Bowers Avenue and Central Expressway (AM and PM peak hours)
32. Mission College Boulevard and Montague Expressway (AM peak hour)
35. San Tomas Expressway and El Camino Real (AM peak hour)
42. Scott Boulevard and Central Expressway (PM peak hour)
44. De La Cruz Boulevard and Central Expressway (AM peak hour)
45. Agnew Road/De La Cruz Boulevard and Montague Expressway (AM and PM peak hours)
47. N. 1st Street and Montague Expressway (AM and PM peak hours)
48. Zanker Road and Montague Expressway (AM and PM Peak hours)
49. Trimble Rd and Montague Expressway (PM peak hour)
50. McCarthy Boulevard/O'Toole Avenue and Montague Expressway (AM and PM peak hours)
51. Lawrence Expressway and Kifer Road (AM and PM peak hours)
52. Lawrence Expressway and Reed Avenue/Monroe Street (AM peak hour)
58. Kiely Boulevard and Homestead Road (PM peak hour)

However, development of the Greystar project alone would not cause a four-second increase in the critical-movement delay and a one percent (0.01) increase in the V/C compared to background conditions at any of the study intersections. The level of service calculation sheets are included in Appendix B.

Table 9
Background Intersection Levels of Service - Greystar

			Background (2030) Conditions					
					with Project			
			No Project		Greystar Only			
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
1	Lawrence Expressway and Tasman Drive	AM	47.6	D	47.8	D	0.2	0.003
	(CMP)	PM	64.5	E	66.1	E	3.1	0.012
2	Lawrence Expwy and Sandia Av/Lakehaven Dr	AM	64.3	E	64.4	E	0.0	0.000
		PM	62.5	E	62.6	E	0.3	0.002
3	Lawrence Expressway and US 101 NB Ramps	AM	11.6	B	11.7	B	0.2	0.005
		PM	19.7	B	19.9	B	0.5	0.001
4	Lawrence Expressway and US 101 SB Ramps	AM	7.2	A	7.2	A	0.0	-0.002
		PM	**109.4**	**F**	**107.8**	**F**	**-2.9**	**0.001**
5	Lawrence Expressway and E. Arques Ave.	AM	39.9	D	40.1	D	0.1	0.000
	(CMP)	PM	**81.2**	**F**	**81.5**	**F**	**1.0**	**0.006**
6	Patrick Henry Drive and Tasman Drive	AM	16.2	B	16.3	B	0.2	0.003
		PM	18.0	B	18.1	B	0.1	0.002
7	Old Ironsides Drive and Tasman Drive	AM	5.5	A	5.5	A	0.0	0.003
		PM	10.9	B	10.9	B	0.0	0.003
8	Old Ironsides Drive and Old Glory Lane	AM	3.9	A	3.9	A	0.0	-0.001
	(Unsignalized)	PM	3.6	A	3.5	A	-0.1	0.000
9	Old Ironsides Drive and Patrick Henry Drive	AM	0.9	A	0.8	A	0.0	-0.001
	(Unsignalized)	PM	4.4	A	4.5	A	0.1	0.013
10	Great America Parkway and SR 237 WB Ramps	AM	13.1	B	13.1	B	0.0	0.001
	(CMP)	PM	18.8	B	18.7	B	0.0	-0.001
11	Great America Parkway and SR 237 EB Ramps	AM	10.7	B	10.6	B	-0.1	0.001
	(CMP)	PM	13.2	B	13.2	B	0.0	-0.004
12	Great America Parkway and Great America Way	AM	22.1	C	22.1	C	0.0	0.000
		PM	17.3	B	17.3	B	0.0	-0.002
13	Great America Pkwy and Old Mt View-Alviso Rd	AM	22.2	C	22.1	C	0.0	0.001
		PM	42.5	D	42.3	D	-0.3	-0.009
14	Great America Parkway and Bunker Hill Lane	AM	13.3	B	13.2	B	-0.1	0.004
		PM	29.5	C	29.3	C	-0.2	-0.002
15	Great America Parkway and Tasman Drive	AM	44.5	D	44.5	D	0.1	0.002
	(CMP)	PM	33.1	C	33.1	C	0.0	0.000
16	Great America Parkway and Old Glory Lane	AM	10.5	B	10.5	B	0.0	0.004
		PM	13.3	B	13.3	B	0.0	0.000
17	Great America Parkway and Patrick Henry Drive	AM	27.4	C	27.3	C	0.0	0.002
		PM	**66.5**	**E**	**67.6**	**E**	**1.7**	**0.006**
18	Great America Pkwy and Mission College Blvd	AM	36.9	D	37.7	D	0.8	0.017
	(CMP)	PM	40.4	D	41.3	D	1.2	0.020
19	Great America Pkwy and US 101 NB Off Ramp	AM	11.4	B	11.3	B	-0.1	-0.004
	(CMP)	PM	9.6	A	9.6	A	0.0	0.000
20	Bowers Avenue and US 101 SB Off Ramp	AM	11.9	B	11.7	B	-0.1	0.007
	(CMP)	PM	10.9	B	11.7	B	0.8	0.010
21	Bowers Avenue and Augustine Drive	AM	26.0	C	25.5	C	-0.2	0.007
		PM	36.4	D	36.5	D	0.2	0.004
22	Bowers Avenue and Scott Boulevard	AM	49.6	D	53.5	D	11.5	0.048
	(CMP)	PM	37.1	D	37.1	D	0.1	0.004
23	Bowers Avenue and Central Expressway	AM	**89.0**	**F**	**90.9**	**F**	**2.4**	**0.008**
	(CMP)	PM	**103.6**	**F**	**104.0**	**F**	**0.1**	**0.000**

Table 9 (Continued)
Background Intersection Levels of Service – Greystar

			Background (2030) Conditions					
					with Project			
			No Project		Greystar Only			
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
24	Bowers Avenue and Kifer Road/Walsh Avenue	AM	36.0	D	36.1	D	0.1	0.001
		PM	30.4	C	30.4	C	0.1	0.001
25	Mission College Loop and Mission College Blvd	AM	12.1	B	12.2	B	0.0	0.001
		PM	25.2	C	25.2	C	0.0	0.002
26	Marriott Dwy and Mission College Blvd	AM	11.8	B	11.4	B	-0.3	0.031
		PM	12.0	B	11.8	B	0.0	0.002
27	Freedom Circle W and Mission College Blvd	AM	11.0	B	12.5	B	1.7	0.036
		PM	25.9	C	25.9	C	0.2	0.007
28	Agnew/Freedom Circle E & Mission College Blvd	AM	31.1	C	31.9	C	6.0	-0.023
		PM	31.5	C	36.4	D	5.2	0.068
29	Great America employee entrance and Agnew Rd	AM	3.6	A	3.6	A	0.0	0.002
		PM	5.1	A	5.1	A	0.0	-0.003
30	Juliette Lane and Mission College Boulevard	AM	13.5	B	13.9	B	-0.5	0.006
		PM	22.6	C	22.0	C	-0.1	0.007
31	Burton Drive and Mission College Boulevard	AM	20.5	C	21.4	C	0.0	-0.002
		PM	18.8	B	18.5	B	0.0	0.006
32	Mission College Blvd and Montague Expwy	AM	**98.3**	**F**	**80.0**	**F**	**-0.4**	**0.006**
	(CMP)	PM	72.7	E	52.7	D	0.9	0.030
33	San Tomas Expressway and Scott Boulevard	AM	79.0	E	79.4	E	3.6	0.002
	(CMP)	PM	56.7	E	56.7	E	0.0	0.000
34	San Tomas Expressway and Monroe Street	AM	43.2	D	43.2	D	-0.1	0.000
	(CMP)	PM	45.8	D	46.2	D	0.6	0.003
35	San Tomas Expressway and El Camino Real	AM	**85.5**	**F**	**84.9**	**F**	**-1.4**	**-0.003**
	(CMP)	PM	74.5	E	74.4	E	-0.4	-0.004
36	Convention Center and Tasman Drive	AM	14.8	B	14.8	B	0.0	0.000
		PM	15.5	B	15.5	B	0.0	0.000
37	Centennial Boulevard and Tasman Drive	AM	25.5	C	25.6	C	0.0	0.000
		PM	27.3	C	27.2	C	-0.1	-0.002
38	Calle Del Sol and Tasman Drive	AM	21.8	C	21.8	C	-0.1	-0.001
		PM	23.3	C	23.2	C	0.0	0.003
39	Lick Mill Boulevard and Tasman Drive	AM	41.3	D	41.2	D	0.0	0.000
		PM	41.2	D	41.4	D	0.3	0.004
40	Lafayette Street and Calle De Luna	AM	23.2	C	23.1	C	-0.2	-0.003
		PM	36.9	D	35.9	D	-2.0	-0.010
41	Lafayette Street and Agnew Road	AM	29.3	C	29.8	C	-1.4	0.014
		PM	51.0	D	51.8	D	1.4	0.004
42	Scott Boulevard and Central Expressway	AM	67.6	E	66.3	E	-1.3	-0.002
	(CMP)	PM	**109.5**	**F**	**109.7**	**F**	**0.8**	**0.001**
43	Lafayette Street and Central Expressway	AM	75.2	E	74.5	E	-1.2	-0.002
	(CMP)	PM	62.6	E	62.7	E	0.2	0.004
44	De la Cruz Boulevard and Central Expressway	AM	**107.2**	**F**	**105.7**	**F**	**-1.9**	**-0.003**
	(CMP)	PM	70.3	E	73.6	E	5.6	0.007
45	Agnew Rd/De La Cruz Blvd and Montague Expwy	AM	**94.4**	**F**	**94.0**	**F**	**-0.9**	**0.002**
	(CMP)	PM	**106.0**	**F**	**107.5**	**F**	**2.6**	**0.009**
46	Lick Mill Boulevard and Montague Expressway	AM	56.1	E	56.1	E	0.1	-0.001
		PM	52.1	D	52.1	D	-0.1	0.001

Table 9 (Continued)
Background Intersection Levels of Service – Greystar

			Background (2030) Conditions					
					with Project			
			No Project		Greystar Only			
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
47	N. 1st Street and Montague Expressway	AM	**132.6**	**F**	**132.5**	**F**	**0.0**	**0.000**
	(CMP)	PM	**121.4**	**F**	**123.3**	**F**	**2.5**	**0.005**
48	Zanker Road and Montague Expressway	AM	**57.5**	**E**	**57.2**	**E**	**-0.4**	**0.000**
	(CMP)	PM	**79.2**	**E**	**78.9**	**E**	**-0.4**	**0.001**
49	Trimble Road and Montague Expressway	AM	36.5	D	36.5	D	-0.2	-0.004
	(CMP)	PM	**105.7**	**F**	**105.8**	**F**	**-0.1**	**0.002**
50	McCarthy Blvd/O'Toole Av and Montague Expwy	AM	**75.9**	**E**	**74.8**	**E**	**-1.7**	**-0.004**
	(CMP)	PM	**134.0**	**F**	**133.8**	**F**	**-2.5**	**-0.002**
51	Lawrence Expressway and Kifer Road	AM	**102.3**	**F**	**102.9**	**F**	**-0.7**	**-0.002**
		PM	**181.3**	**F**	**184.8**	**F**	**6.0**	**0.009**
52	Lawrence Expressway and Reed Ave/Monroe St	AM	**124.3**	**F**	**123.7**	**F**	**-0.4**	**-0.001**
	(CMP)	PM	71.1	E	71.6	E	1.1	0.004
53	Lawrence Expressway and Homestead Road	AM	51.7	D	51.5	D	-0.1	-0.006
	(CMP)	PM	69.4	E	69.8	E	0.1	0.000
54	Lawrence Expressway and Pruneridge Avenue	AM	79.6	E	79.2	E	0.8	0.005
		PM	62.6	E	65.1	E	2.3	0.007
55	Bowers Avenue and Monroe Street	AM	33.4	C	33.2	C	-0.2	-0.002
		PM	40.7	D	40.7	D	0.0	0.000
56	Bowers Ave/Kiely Boulevard and El Camino Real	AM	28.9	C	28.9	C	0.0	-0.001
	(CMP)	PM	31.8	C	31.6	C	-0.4	-0.008
57	Kiely Boulevard and Benton Street	AM	37.2	D	37.1	D	0.0	0.000
		PM	46.1	D	46.3	D	0.2	0.002
58	Kiely Boulevard and Homestead Road	AM	38.6	D	38.3	D	0.1	0.003
		PM	**57.9**	**E**	**56.1**	**E**	**-3.7**	**-0.011**

Notes:
Bold indicates a substandard level of service.

Background Plus Project Intersection Levels of Service – Focus Area Buildout

The results of the intersection level of service analysis (see Table 10) show that buildout of the Freedom Circle Focus Area, including the proposed Greystar project, would cause adverse effects at the following 20 intersections:

2. Lawrence Expressway and Sandi Avenue/Lakehaven Drive (PM peak hour)
4. Lawrence Expressway and US 101 southbound ramps (PM peak hour)
5. Lawrence Expressway and Arques Avenue (PM peak hour)
17. Great America Parkway and Patrick Henry Drive (PM peak hour)
18. Great America Parkway and Mission College Boulevard (PM peak hour)
23. Bowers Avenue and Central Expressway (AM and PM peak hours)
27. Freedom Circle and Mission College Boulevard (AM and PM peak hours)
28. Agnew/Freedom Circle and Mission College Boulevard (PM peak hour)
32. Mission College Boulevard/Thomas Road and Montague Expressway (AM peak hour)
35. San Tomas Expressway and El Camino Real (AM and PM peak hours)
42. Scott Boulevard and Central Expressway (PM peak hour)
43. Lafayette Street and Central Expressway (AM peak hour)
44. De La Cruz Boulevard and Central Expressway (AM peak hour)
45. Agnew Road/De La Cruz Boulevard and Montague Expressway (AM peak hour)
47. N. 1st Street and Montague Expressway (AM peak hour)
48. Zanker Road and Montague Expressway (AM peak hour)
50. McCarthy Boulevard/O'Toole Avenue and Montague Expressway (AM peak hour)
54. Lawrence Expressway and Pruneridge Avenue (AM peak hour)

The adverse effects and proposed improvements to alleviate the deficiencies are described below.

The following study intersections also would operate at unacceptable levels of service under background plus Focus Area buildout conditions.

33. San Tomas Expressway and Scott Boulevard (AM peak hour)
49. Trimble Road and Montague Expressway (PM peak hour)
51. Lawrence Expressway and Kifer Road (AM and PM peak hours)
52. Lawrence Expressway and Reed Avenue/Monroe Street (AM peak hour)
58. Kiely Boulevard and Homestead Road (PM peak hour)

However, since buildout of the Freedom Circle Focus Area would not cause the critical-movement delay at the above signalized intersections to increase by four or more seconds and the V/C to increase by one percent (0.01) or more compared to background conditions, the project would not have an adverse effect on the operation of those intersections. The level of service calculation sheets are included in Appendix C.

Adverse Effects and Recommended Improvements – Focus Area Buildout

This section discusses the adverse effects identified under background plus project conditions with full buildout of the Freedom Circle Focus Area and proposed improvements to address the deficiencies under this scenario. As previously stated, adverse effects on intersection operations do not constitute significant impacts under CEQA.

Table 10
Background Intersection Levels of Service – Focus Area Buildout

			Background (2030) Conditions							
					with Project					
			No Project		Freedom Circle Buildout				Freedom Circle Buildout - With Improvement & 10% TDM	
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C	Avg Delay	LOS
1	Lawrence Expressway and Tasman Drive	AM	47.6	D	46.8	D	0.4	0.006		
	(CMP)	PM	64.5	E	68.2	E	8.2	0.048		
2	Lawrence Expwy and Sandia Av/Lakehaven Dr	AM	64.3	E	71.4	E	0.0	0.000		
		PM	62.5	E	**191.0**	**F**	**286.5**	**0.542**		
3	Lawrence Expressway and US 101 NB Ramps	AM	11.6	B	11.4	B	-0.7	0.074		
		PM	19.7	B	36.5	D	29.1	0.085		
4	Lawrence Expressway and US 101 SB Ramps	AM	7.2	A	18.4	B	7.3	0.049	17.4	B
		PM	**109.4**	**F**	**103.5**	**F**	**-13.8**	**0.070**	71.2	E
5	Lawrence Expressway and E. Arques Ave.	AM	39.9	D	42.4	D	4.3	0.048		
	(CMP)	PM	**81.2**	**F**	**91.9**	**F**	**15.5**	**0.049**		
6	Patrick Henry Drive and Tasman Drive	AM	16.2	B	14.8	B	-0.3	-0.007		
		PM	18.0	B	18.8	B	2.4	0.037		
7	Old Ironsides Drive and Tasman Drive	AM	5.5	A	7.6	A	3.0	0.014		
		PM	10.9	B	13.0	B	1.0	0.010		
8	Old Ironsides Drive and Old Glory Lane	AM	3.9	A	1.8	A	-2.1	-0.005		
	(Unsignalized)	PM	3.6	A	4.3	A	0.8	0.038		
9	Old Ironsides Drive and Patrick Henry Drive	AM	0.9	A	2.6	A	1.7	0.142		
	(Unsignalized)	PM	4.4	A	4.1	A	-0.2	-0.058		
10	Great America Parkway and SR 237 WB Ramps	AM	13.1	B	13.2	B	0.0	0.020		
	(CMP)	PM	18.8	B	19.1	B	0.7	0.015		
11	Great America Parkway and SR 237 EB Ramps	AM	10.7	B	10.7	B	0.1	0.006		
	(CMP)	PM	13.2	B	12.6	B	-0.6	0.041		
12	Great America Parkway and Great America Way	AM	22.1	C	21.8	C	-0.3	0.038		
		PM	17.3	B	17.3	B	0.1	0.053		
13	Great America Pkwy and Old Mt View-Alviso Rd	AM	22.2	C	22.3	C	-0.2	0.058		
		PM	42.5	D	39.3	D	-4.5	0.034		
14	Great America Parkway and Bunker Hill Lane	AM	13.3	B	13.0	B	-0.6	0.066		
		PM	29.5	C	28.6	C	-0.6	0.076		
15	Great America Parkway and Tasman Drive	AM	44.5	D	45.3	D	0.6	0.070		
	(CMP)	PM	33.1	C	36.0	D	7.7	0.063		
16	Great America Parkway and Old Glory Lane	AM	10.5	B	12.6	B	0.2	0.196		
		PM	13.3	B	15.3	B	4.0	0.018		
17	Great America Parkway and Patrick Henry Drive	AM	27.4	C	37.2	D	5.6	0.137	25.2	C
		PM	**66.5**	**E**	**89.7**	**F**	**15.6**	**0.035**	**67.2**	**E**
18	Great America Pkwy and Mission College Blvd	AM	37.1	D	54.7	D	21.2	0.264	47.1	D
	(CMP)	PM	40.4	D	**204.5**	**F**	288.9	0.469	61.5	E
19	Great America Pkwy and US 101 NB Off Ramp	AM	11.4	B	9.6	A	-1.2	0.131		
	(CMP)	PM	9.6	A	8.9	A	-0.5	0.069		
20	Bowers Avenue and US 101 SB Off Ramp	AM	11.9	B	15.0	B	2.9	0.125		
	(CMP)	PM	10.9	B	13.0	B	2.1	0.050		
21	Bowers Avenue and Augustine Drive	AM	26.0	C	26.1	C	2.7	0.043		
		PM	36.4	D	36.3	D	0.0	-0.006		
22	Bowers Avenue and Scott Boulevard	AM	49.6	D	52.6	D	3.9	0.064		
	(CMP)	PM	37.1	D	37.9	D	1.3	0.031		
23	Bowers Avenue and Central Expressway	AM	**89.0**	**F**	**91.1**	**F**	**6.5**	**0.040**		
	(CMP)	PM	**103.6**	**F**	**109.8**	**F**	**9.5**	**0.019**		
24	Bowers Avenue and Kifer Road/Walsh Avenue	AM	36.0	D	36.0	D	0.0	0.019		
		PM	30.4	C	30.7	C	-0.6	0.021		
25	Mission College Loop and Mission College Blvd	AM	12.1	B	14.2	B	2.8	0.021		
		PM	25.2	C	23.9	C	-1.3	0.050		

Table 10 (Continued)
Background Intersection Levels of Service – Focus Area Buildout

			Background (2030) Conditions							
					with Project					
			No Project		Freedom Circle Buildout				Freedom Circle Buildout - With Improvement & 10% TDM	
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C	Avg Delay	LOS
26	Marriott Dwy and Mission College Blvd	AM	11.8	B	23.5	C	18.2	0.329		
		PM	12.0	B	51.1	D	61.9	0.440		
27	Freedom Circle W and Mission College Blvd	AM	11.0	B	**70.1**	**E**	**86.9**	**0.680**	46.6	D
		PM	25.9	C	**217.3**	**F**	**283.3**	**0.893**	33.8	C
28	Agnew/Freedom Circle E & Mission College Blvd	AM	31.1	C	42.2	D	17.4	0.297	31.3	C
		PM	31.5	C	**126.1**	**F**	**128.4**	**0.531**	37.5	C
29	Great America employee entrance and Agnew Rd	AM	3.6	A	4.2	A	1.0	0.107		
		PM	5.1	A	11.1	B	8.2	0.205		
30	Juliette Lane and Mission College Boulevard	AM	13.5	B	11.7	B	-19.9	0.260		
		PM	22.6	C	20.4	C	-1.3	0.154		
31	Burton Drive and Mission College Boulevard	AM	20.5	C	31.8	C	16.2	0.265		
		PM	18.8	B	18.6	B	1.2	0.132		
32	Mission College Blvd and Montague Expwy	AM	**98.3**	**F**	**127.0**	**F**	**69.9**	**0.262**		
	(CMP)	PM	72.7	E	69.8	E	22.6	0.139		
33	San Tomas Expressway and Scott Boulevard	AM	79.0	E	**80.8**	**F**	**1.7**	**0.024**		
	(CMP)	PM	56.7	E	57.5	E	1.1	0.008		
34	San Tomas Expressway and Monroe Street	AM	43.2	D	47.4	D	1.2	0.007		
	(CMP)	PM	45.8	D	47.8	D	1.7	0.084		
35	San Tomas Expressway and El Camino Real	AM	**85.5**	**F**	**88.6**	**F**	**8.0**	**0.220**		
	(CMP)	PM	74.5	E	**80.1**	**F**	**9.6**	**0.029**		
36	Convention Center and Tasman Drive	AM	14.8	B	15.2	B	0.0	0.027		
		PM	15.5	B	16.4	B	0.8	0.025		
37	Centennial Boulevard and Tasman Drive	AM	25.5	C	26.5	C	0.4	0.023		
		PM	27.3	C	28.5	C	2.2	0.034		
38	Calle Del Sol and Tasman Drive	AM	21.8	C	22.6	C	0.3	0.026		
		PM	23.3	C	22.2	C	-1.0	0.022		
39	Lick Mill Boulevard and Tasman Drive	AM	41.3	D	41.8	D	3.5	0.022		
		PM	41.2	D	40.4	D	-1.5	-0.021		
40	Lafayette Street and Calle De Luna	AM	23.2	C	23.9	C	0.9	0.062		
		PM	36.9	D	33.9	C	-4.2	-0.016		
41	Lafayette Street and Agnew Road	AM	29.3	C	37.4	D	12.7	0.132		
		PM	51.0	D	50.6	D	-3.3	-0.005		
42	Scott Boulevard and Central Expressway	AM	67.6	E	74.7	E	10.7	0.162		
	(CMP)	PM	**109.5**	**F**	**115.2**	**F**	**5.8**	**0.016**		
43	Lafayette Street and Central Expressway	AM	75.2	E	**82.9**	**F**	**13.1**	**0.047**		
	(CMP)	PM	62.6	E	68.8	E	14.1	0.038		
44	De la Cruz Boulevard and Central Expressway	AM	**107.2**	**F**	**118.2**	**F**	**14.4**	**0.018**	**102.2**	**F**
	(CMP)	PM	70.3	E	75.5	E	10.1	0.010	70.0	E
45	Agnew Rd/De La Cruz Blvd and Montague Expwy	AM	**94.4**	**F**	**93.4**	**F**	**-0.7**	**0.057**		
	(CMP)	PM	**106.0**	**F**	**103.5**	**F**	**-4.0**	**0.002**		
46	Lick Mill Boulevard and Montague Expressway	AM	56.1	E	54.0	D	-7.1	0.017		
		PM	52.1	D	69.6	E	31.1	0.060		
47	N. 1st Street and Montague Expressway	AM	**132.6**	**F**	**141.3**	**F**	**14.2**	**0.032**		
	(CMP)	PM	**121.4**	**F**	**118.7**	**F**	**-13.3**	**-0.018**		

Table 10 (Continued)
Background Intersection Levels of Service – Focus Area Buildout

			Background (2030) Conditions							
					with Project					
			No Project		Freedom Circle Buildout				Freedom Circle Buildout - With Improvement & 10% TDM	
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C	Avg Delay	LOS
48	Zanker Road and Montague Expressway	AM	**57.5**	**E**	**62.2**	**E**	**9.1**	**0.025**	**57.1**	**E**
	(CMP)	PM	**79.2**	**E**	**77.0**	**E**	**-4.2**	**-0.028**	**57.1**	**E**
49	Trimble Road and Montague Expressway	AM	36.5	D	36.6	D	0.8	0.014		
	(CMP)	PM	**105.7**	**F**	**108.7**	**F**	**11.6**	**-0.012**		
50	McCarthy Blvd/O'Toole Av and Montague Expwy	AM	**75.9**	**E**	**82.7**	**F**	**8.4**	**0.025**		
	(CMP)	PM	**134.0**	**F**	**141.5**	**F**	**10.0**	**0.007**		
51	Lawrence Expressway and Kifer Road	AM	**102.3**	**F**	**101.1**	**F**	**2.1**	**-0.004**		
		PM	**181.3**	**F**	**175.3**	**F**	**-10.3**	**-0.019**		
52	Lawrence Expressway and Reed Ave/Monroe St	AM	**124.3**	**F**	**128.4**	**F**	**3.7**	**0.006**		
	(CMP)	PM	71.1	E	73.6	E	5.9	0.019		
53	Lawrence Expressway and Homestead Road	AM	51.7	D	52.0	D	1.1	0.013		
	(CMP)	PM	69.4	E	70.2	E	1.0	0.010		
54	Lawrence Expressway and Pruneridge Avenue	AM	79.6	E	**83.7**	**F**	**7.5**	**0.023**		
		PM	62.6	E	64.1	E	0.5	0.019		
55	Bowers Avenue and Monroe Street	AM	33.4	C	33.9	C	0.6	0.016		
		PM	40.7	D	41.5	D	0.8	0.011		
56	Bowers Ave/Kiely Boulevard and El Camino Real	AM	28.9	C	29.3	C	0.5	0.024		
	(CMP)	PM	31.8	C	32.1	C	0.3	0.009		
57	Kiely Boulevard and Benton Street	AM	37.2	D	37.7	D	1.0	0.018		
		PM	46.1	D	47.7	D	2.3	0.016		
58	Kiely Boulevard and Homestead Road	AM	38.6	D	38.9	D	1.3	0.030		
		PM	**57.9**	**E**	**59.7**	**E**	**1.4**	**0.009**		

Notes:
Bold indicates a substandard level of service.
Bold indicates an adverse effect caused by the project.
OVFL indicates that the result is out of software calculation limits.

In addition to physical improvements recommended to resolve deficiencies at affected intersections, the Freedom Circle Focus Area will include Travel Demand Management (TDM) measures to achieve a 10 percent reduction in VMT per the City's Climate Action Plan. A sensitivity analysis was conducted to determine if a reduction in project vehicle trips due to TDM would avoid any of the adverse effects at study intersections.

2. Lawrence Expressway and Sandia Avenue/Lakehaven Drive

This City of Sunnyvale intersection would operate at an acceptable LOS E under background no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to an unacceptable LOS F during the PM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by widening Lawrence Expressway to add a fifth through lane on the northbound and southbound approaches. However, this improvement is not feasible because it would require acquisition of additional right of way and negatively impact adjacent properties. Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the development. However, a sensitivity analysis shows that a 10 percent

TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The Long-Range Transportation Plan for Santa Clara County (VTP2040) lists a project (VTP ID# R39) that would realign Wildwood Avenue to connect directly with Lawrence Expressway and create a new signalized intersection at Lawrence Expressway and Wildwood Avenue. This improvement would have a beneficial effect on traffic operations at the Lawrence/Sandia/Lakehaven intersection. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement.

4. Lawrence Expressway and US 101 Southbound Ramps

This CMP intersection in the City of Sunnyvale would operate at an unacceptable LOS F under background no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to decrease, but the critical v/c would increase by more than 0.01 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Focus Area could reduce the vehicle trips associated with the development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. Intersection operations could be improved to an acceptable level by converting an eastbound left-turn lane to a shared left-turn/right-turn lane. The cost of this improvement will be fully funded by Freedom Circle Focus Area developments.

5. Lawrence Expressway and E. Arques Avenue

This CMP intersection in the City of Sunnyvale would operate at an unacceptable LOS F under background no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by 15.5 seconds and the critical v/c to increase by 0.049 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

17. Great America Parkway and Patrick Henry Drive

This City of Santa Clara intersection would operate at an unacceptable LOS E during the PM peak hour under background conditions. The buildout of the Freedom Circle Focus Area would cause the average critical movement delay to increase by 15.6 seconds and the critical v/c to increase by 0.035 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by constructing a second northbound left-turn lane and a second eastbound right-turn lane. Although intersection widening for dual right-turn lanes may improve vehicle operations, this improvement conflicts with bicycle and pedestrian policies within the City's *2010-2035 General Plan* (GP), *2018 Bicycle Master Plan* (BMP), and *2019 Pedestrian Master Plan* (PMP). Intersection widening is discouraged by GP Policy 5.8.2-P2 and PMP Policies 1.A.3, 2.A.1, and 2.A.4. Dual right-turn lanes result in challenges with visibility between turning vehicles and pedestrians (*Caltrans Highway Design Manual* 403.6(1)) and this conflicts with GP Policy 5.8.4-P13, BMP Policy

1.A.2 and PMP Policies 1.A.3 and 2.A.5. Furthermore, intersection widening reduces the width of sidewalks and conflicts with GP Policy 5.8.2-P1 and the PMP Pedestrian Recommendation Toolbox. Therefore, intersection widening for dual right-turn lanes is not recommended. With the recommended dual northbound left-turn lanes and a 10 percent TDM reduction, the intersection is expected to continue to operate at an unacceptable LOS E during the PM peak hour under background plus project conditions. The cost of this improvement will be fully funded by Freedom Circle Focus Area developments.

Developments within the Freedom Circle Focus Area also will be responsible for construction of a Class IV separated bikeway on Great America Parkway. This multimodal improvement, which is identified in the City's *Bicycle Master Plan Update 2018*, would encourage residents and employees to leave their vehicles at home by adding a physical barrier between the existing bike lane and the vehicular travel lane, thereby increasing the comfort level for cyclists. Adjacent to the Focus Area, the bikeway improvement will be constructed as part of the Focus Area Plan. Beyond the Focus Area (between Patrick Henry Drive and SR 237), Freedom Circle area stakeholders will pay a fair share fee for future construction of the bikeway on Great America Parkway.

18. Great America Parkway and Mission College Boulevard

This CMP intersection in the City of Santa Clara would operate at an acceptable LOS D during the PM peak hour under background conditions. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to an unacceptable LOS F during the PM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved to an acceptable LOS E by converting Hichborn Drive from one-way (eastbound only) flow to two-way flow with a 60-foot right-of-way width, adding a traffic signal at Great America Parkway and Hichborn Drive to allow left and right turns in and out, and synchronizing the new signal with the traffic signal at Great America Parkway and Mission College Boulevard. In addition, the US 101 northbound off-ramp right turn to northbound Great America Parkway would be modified to reduce the curb radius to 50 feet. With the recommended improvements and a 10 percent TDM reduction, the intersection is expected to operate at an acceptable LOS E during the PM peak hour under background plus project conditions. The cost of this improvement will be fully funded by Freedom Circle Focus Area developments.

23. Bowers Avenue and Central Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under background no project conditions during the AM and PM peak hours. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the AM and PM peak hours. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Focus Area could reduce the vehicle trips associated with the Freedom Circle development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

27. Freedom Circle (W) and Mission College Boulevard

This City of Santa Clara intersection would operate at an acceptable LOS B and LOS C under background no project conditions during the AM and PM peak hours, respectively. The buildout of the

Freedom Circle Focus Area would cause the intersection to degrade to an unacceptable LOS E during the AM peak hour and to LOS F during the PM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by adding an eastbound right-turn lane, removing the crosswalk on the west leg, relocating bus stops to the east side of the intersection, restriping the northbound approach for one right-turn lane, one shared through/left-turn lane and one left-turn lane, and implementing split-phase signal control for the north and south legs. The construction of these improvements along with the planned Class IV separated bike lanes on Mission College Boulevard would require widening Mission College Boulevard and require the dedication of additional right of way on the east side of the intersection. The dedication is required to install a far side bus stop and near side bus stop in accordance with VTA Bus Stop and Passenger Facilities Standards. Intersection operations could be further improved by the proposed improvements at Great America Parkway and Hichborn Drive: converting Hichborn Drive from one-way (eastbound only) flow to two-way flow and adding a traffic signal at Great America Parkway and Hichborn Drive to allow left and right turns in and out... This roadway network change would provide another route out of the Freedom Circle Focus Area and thus reduce the northbound left-turn volume at the Freedom Circle W/Mission College Boulevard intersection. With the recommended improvement on the eastbound and northbound approaches, the improvements at Great America Parkway and Hichborn Drive, and a 10 percent TDM reduction, the intersection is expected to operate an acceptable LOS D or C during the AM and PM peak hours, respectively. Therefore, these improvements would be sufficient to fully offset the adverse effect on intersection operations. The cost of these improvements will be fully funded by Freedom Circle Focus Area developments.

28. Agnew Road/Freedom Circle (E) and Mission College Boulevard

This City of Santa Clara intersection would operate at an acceptable LOS C during the PM peak hour under background no project conditions. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to an unacceptable LOS F during the PM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by adding a northbound right-turn lane. The intersection is expected to operate at an acceptable LOS D during the PM peak hour with the recommended improvement and a 10 percent TDM reduction. Thus, the recommended improvement would be sufficient to fully offset the adverse effect on intersection operations. The cost of this improvement will be fully funded by Freedom Circle Focus Area developments.

32. Mission College Boulevard/Thomas Road and Montague Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F during the AM peak hour under background conditions. The buildout of the Freedom Circle Focus Area would cause the average critical movement delay to increase by more than four seconds and the critical v/c to increase by more than 0.01 during the AM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Focus Area could reduce the vehicle trips associated with the Freedom Circle development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. Intersection operations could be improved by constructing a partial grade separation with a flyover from eastbound Montague Expressway to northbound Mission College Boulevard. This improvement was identified as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

35. San Tomas Expressway and El Camino Real

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F during the AM peak hour and an acceptable LOS E during the PM peak hour under background no project conditions. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by 8.0 seconds and the critical v/c to increase by 0.220 during the AM peak hour and would cause the intersection to degrade to an unacceptable LOS F during the PM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures could reduce the vehicles trips associated with the Freedom Circle Focus Area developments. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

42. Scott Boulevard and Central Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under background no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicles trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

43. Lafayette Street and Central Expressway

This CMP intersection in the City of Santa Clara would operate at an acceptable LOS E under background no project conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to an unacceptable LOS F during the AM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicles trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

44. De La Cruz Boulevard and Central Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under background no project conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0

seconds and the critical v/c to increase by more than 0.01 during the AM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The analysis of background conditions at this intersection assumes the following planned improvements: a third southbound through lane and a second southbound right-turn lane; a second eastbound right-turn lane; a third northbound left-turn lane and removal of one northbound through lane. The planned conversion of the existing HOV lanes on Central Expressway to mixed-flow lanes is anticipated to be complete sometime between the Year 2030 and 2040. Thus, this improvement is assumed under cumulative conditions but not background conditions. While the intersection would continue to operate at LOS F under background plus project conditions during the AM peak hour with this planned improvement and a 10 percent TDM reduction, the delay would be less than under no project conditions. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement.

45. Agnew Road/De La Cruz Boulevard and Montague Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under background no project conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to decrease but the critical v/c to increase by more than 0.01 during the AM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. This intersection is included in the City of Santa Clara *Multimodal Improvement Plan* (MIP). MIP Actions intended to address the LOS deficiency at this intersection include installation of crosswalk motion sensors, accessible pedestrian signals, upgraded safety lighting, travel time data collection systems, traffic monitoring cameras, and periodic retiming of signal coordination at intersections along Agnew Road/De La Cruz Boulevard. The Freedom Circle Focus Area developments should provide fair-share funding towards these multimodal improvements.

47. N. 1st Street and Montague Expressway

This CMP intersection in the City of San José would operate at an unacceptable LOS F under background conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by 14.2 seconds and the critical v/c to increase by 0.032 during the AM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development and lessen the adverse effect. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

48. Zanker Road and Montague Expressway

This CMP intersection in the City of San José would operate at an unacceptable LOS E under background conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by 9.1 seconds and the critical v/c to increase by 0.025 during the AM peak hour. This constitutes an adverse effect on intersection operations.

The City of San José plans to widen Zanker Road to three lanes in each direction from River Oaks Parkway to Trimble Road and to add a second left-turn lane on both the northbound and southbound approaches. This improvement is anticipated to be complete sometime between the Year 2030 and 2040. Thus, this improvement is assumed under cumulative conditions but not background conditions. While the intersection would continue to operate at an unacceptable LOS E with this planned improvement and a 10 percent TDM reduction, the delay would be less than under no project conditions. The Freedom Circle Focus Area developments should either pay the North San José fee, or a fair-share contribution for the improvement, or a fair-share contribution for off-setting multimodal improvements based on the Focus Area's percent contribution to the traffic volume growth at the intersection.

50. McCarthy Boulevard/O'Toole Avenue and Montague Expressway

This CMP intersection in the City of San José would operate at an unacceptable LOS E under background conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to LOS F and cause the intersection's average critical movement delay to increase by 8.4 seconds and the critical v/c to increase by 0.025 during the AM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicles trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The City of San José plans to construct a "square-loop" interchange to replace the at-grade intersection. This improvement is anticipated to be complete sometime between the Year 2030 and 2040. Thus, this improvement is assumed under cumulative conditions but not background conditions. The Freedom Circle Focus Area developments should either pay the North San José fee, or a fair-share contribution for this improvement.

54. Lawrence Expressway and Pruneridge Avenue

This City of Santa Clara intersection would operate at an acceptable LOS E under background conditions during the AM and PM peak hours. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to unacceptable LOS F during the AM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures could reduce the vehicle trips associated with the Freedom Circle Focus Area. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board approved improvement projects.

Summary of Background Plus Project Conditions – Focus Area Buildout

Table 11 presents a summary of the intersections that would be adversely affected under background plus project conditions with buildout of the Freedom Circle Focus Area and the improvements recommended. The table also shows the development level triggering the need for each improvement both as a percentage of the Freedom Circle Focus Area buildout and as the total daily vehicle trips generated by all parcels within the Focus Area. With the exception of planned improvements to intersections on County Expressways and planned multimodal improvements, to which the project would pay a fair-share contribution, the project will fully fund the improvements required to offset adverse effects identified under background plus project conditions.

Table 11
Summary of Affected Intersections under Background Plus Project Conditions – Focus Area Buildout

#	Intersection	Jurisdiction	Development Level Triggering Need for Improvement % (daily trips)	Recommended Improvements	Project Responsibility
2	Lawrence Expwy and Sandia Av/Lakehaven Dr	SCC	13.6% 9,543	Realign Wildwood Avenue to connect with Lawrence Expressway and create a new signalized intersection (VTP 2040)	% of Total Traffic
4	Lawrence Expressway and US 101 SB Ramps	SCC	14.3% 10,011	Convert eastbound left-turn lane to a shared left-turn/right-turn lane	100%
5	Lawrence Expressway and E. Arques Ave. *(CMP)*	SCC	25.8% 18,084	Construct grade separated interchange (Measure B Expressway Program)	% of Total Traffic
17	Great America Parkway and Patrick Henry Drive	SC	28.6% 20,021	Add a second northbound left-turn lane Construct Class IV bikeway on Great America Parkway adjacent Plan Construct Class IV bikeway on Great America Parkway between SR 237 and Patrick Henry Drive (Bicycle Master Plan Update 2018)	100% 100% % of Total Traffic
18	Great America Pkwy and Mission College Blvd *(CMP)*	SC	24.1% 16,910	Convert Hichborn Drive from one-way (eastbound only) flow to two-way flow with a 60-feet right-of-way width, add a traffic signal at Great America Parkway and Hichborn Drive to allow left and right turns in and out, synchronize the new signal with the traffic signal at Great America Parkway and Mission College Boulevard, reduce the curb radius at the US 101 northbound off-ramp right turn to northbound Great America Parkway to 50 feet.	100%
23	Bowers Avenue and Central Expressway (CMP)	SCC	52.6% 36,882	Construct grade separated interchange (2040 Expressway Plan)	% of Total Traffic
27	Freedom Circle W and Mission College Blvd	SC	15.2% 10,654	Add an eastbound right-turn lane; Remove west leg crosswalk; Relocate bus stops to the east side of the intersection; Restripe south leg with 1 left-turn, 1 left-turn/through, 1 right-turn lane; Make north leg and south leg split phase; Convert Hichborn Dr. to 2-way flow and add a signal at Great America Parkway.	100%
28	Agnew/Freedom Circle E & Mission College Blvc	SC	24.8% 17,408	Add a northbound right-turn lane	100%
32	Mission College Blvd and Montague Expwy *(CMP)*	SCC	5.7% 4,010	Construct partial grade separation (2040 Expressway Plan)	% of Total Traffic
35	San Tomas Expressway and El Camino Real *(CMP)*	SCC	50.0% 35,038	Construct grade separated interchange (2040 Expressway Plan)	% of Total Traffic
42	Scott Boulevard and Central Expressway *(CMP)*	SCC	69.0% 48,328	Construct grade separated interchange (2040 Expressway Plan)	% of Total Traffic

Table 11 (continued)
Summary of Affected Intersections under Background Plus Project Conditions – Focus Area Buildout

#	Intersection	Jurisdiction	Development Level Triggering Need for Improvement % (daily trips)	Recommended Improvements	Project Responsibility[1]
43	Lafayette Street and Central Expressway *(CMP)*	SCC	62.3% 43,683	Construct grade separated interchange (2040 Expressway Plan)	% of Total Traffic
44	De la Cruz Boulevard and Central Expressway *(CMP)*	SCC	55.6% 38,931	Convert the existing HOV lanes on Central Expressway to mixed-flow lanes (VTP 2040)	% of Total Traffic
45	Agnew Rd/De La Cruz Blvd and Montague Expwy *(CMP)*	SCC	17.5% 12,294	Implement measures identified in Multimodal Improvement Plan	% of Total Traffic
47	N. 1st Street and Montague Expressway *(CMP)*	SCC	31.3% 21,898	Construct grade separated interchange (2040 Expressway Plan)	% of Total Traffic
48	Zanker Road and Montague Expressway *(CMP)*	SCC	44.0% 30,802	Widen Zanker Rd to 3 lanes in each direction from River Oaks Parkway to Trimble Rd and add a 2nd left-turn lane on both the NB and SB approaches (North San José Deficiency Plan)	Pay North San José fee or fair-share contribution
50	McCarthy Blvd/O'Toole Av and Montague Expwy *(CMP)*	SCC	47.6% 33,369	Construct grade separated "square loop" interchange (North San José Area Development Policy, Phase 3, 2017)	Pay North San José fee or fair-share contribution
54	Lawrence Expressway and Pruneridge Avenue	SCC	53.3% 37,373	Construct grade separated interchange (2040 Expressway Plan)	% of Total Traffic

Notes:
SCC = Santa Clara County, SC = Santa Clara, SJ = San Jose, SV = Sunnyvale

5. Cumulative Conditions

This chapter describes the roadway traffic operations under cumulative no project conditions, cumulative plus project conditions without Greystar, and cumulative plus project conditions including Greystar. Cumulative conditions represent the Year 2040. Cumulative no project conditions include all anticipated developments in the area including the buildout of the Patrick Henry Drive Specific Plan (PHDSP) Option 2 except development of the Freedom Circle Focus Area. Cumulative plus project conditions including Greystar were evaluated relative to cumulative plus project conditions without Greystar to identify adverse effects of the Greystar General Plan Amendment. Cumulative plus project conditions including Greystar also were evaluated relative to cumulative no project conditions to identify adverse effects of the Freedom Circle Focus Area Plan. This chapter describes cumulative improvements assumed in the Year 2040 transportation network, the procedure used to forecast cumulative traffic volumes, the resulting traffic conditions, and improvements recommended to alleviate adverse effects of the Greystar General Plan Amendment and the Freedom Circle Focus Area Plan.

Roadway Network under Cumulative Conditions

The transportation network under cumulative conditions is assumed to include all of the background transportation improvements described in Chapter 3 plus the following additional improvements at study intersections. The intersection improvements are planned CIP projects and improvements that will be funded by City Place as mitigation for buildout of the project. Figure 12 shows the lane configurations at the study intersections under cumulative conditions.

38. Calle Del Sol and Tasman Drive: reconfigure southbound approach to include two left-turn lanes and one right-turn lane with overlap phase.

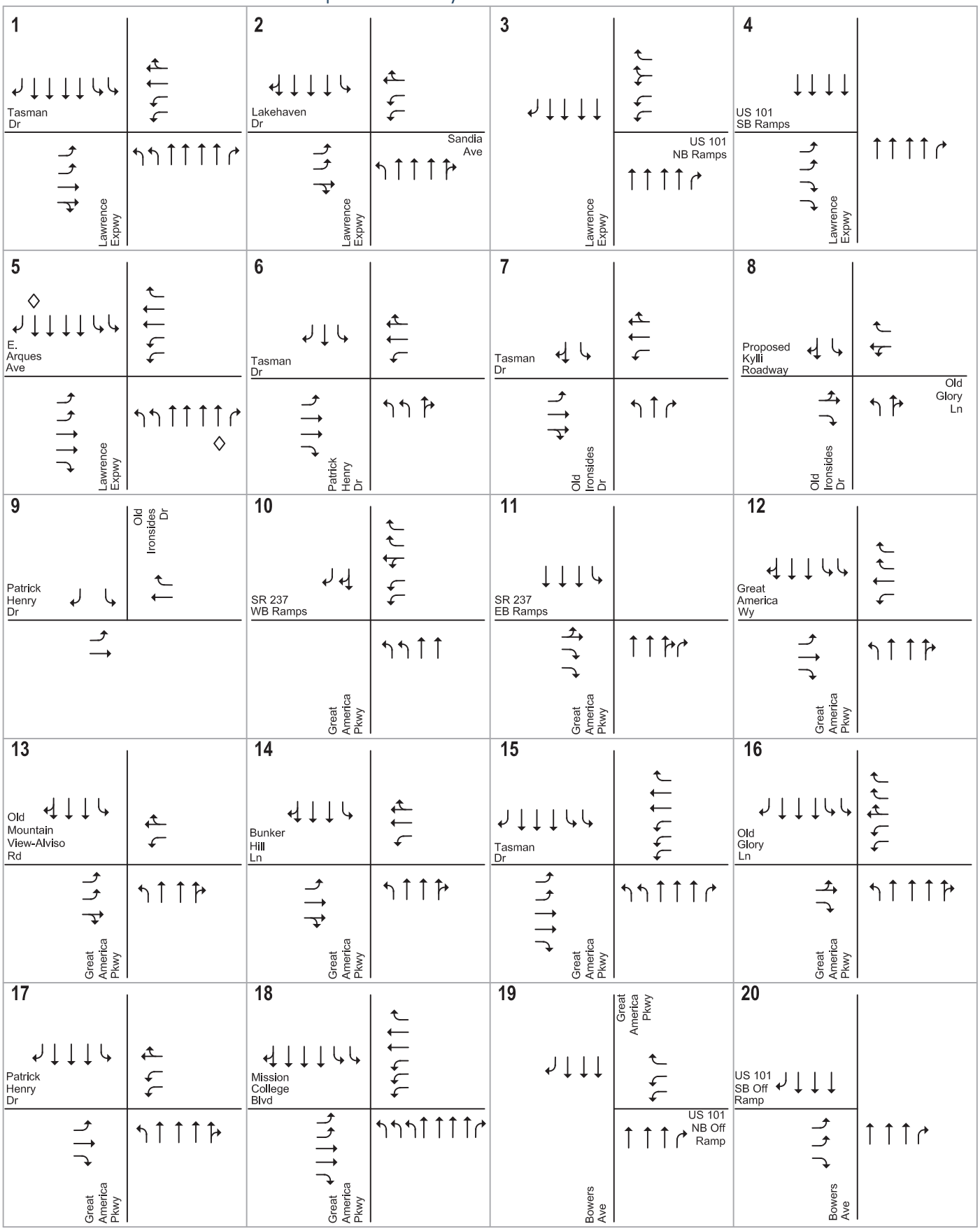
40. Lafayette Street and Calle De Luna: reconstruct the westbound approach to include two left-turn lanes and one right-turn lane.

41. Lafayette Street and Agnew Road: add a second eastbound left-turn lane and a second southbound left-turn lane.

42. Scott Boulevard and Central Expressway: convert Central Expressway HOV lane to mixed-flow lane, resulting in 3 mixed-flow lanes in each direction (eastbound and westbound).

43. Lafayette Street and Central Expressway: convert Central Expressway HOV lane to mixed-flow lane, resulting in 3 mixed-flow lanes in each direction (eastbound and westbound).

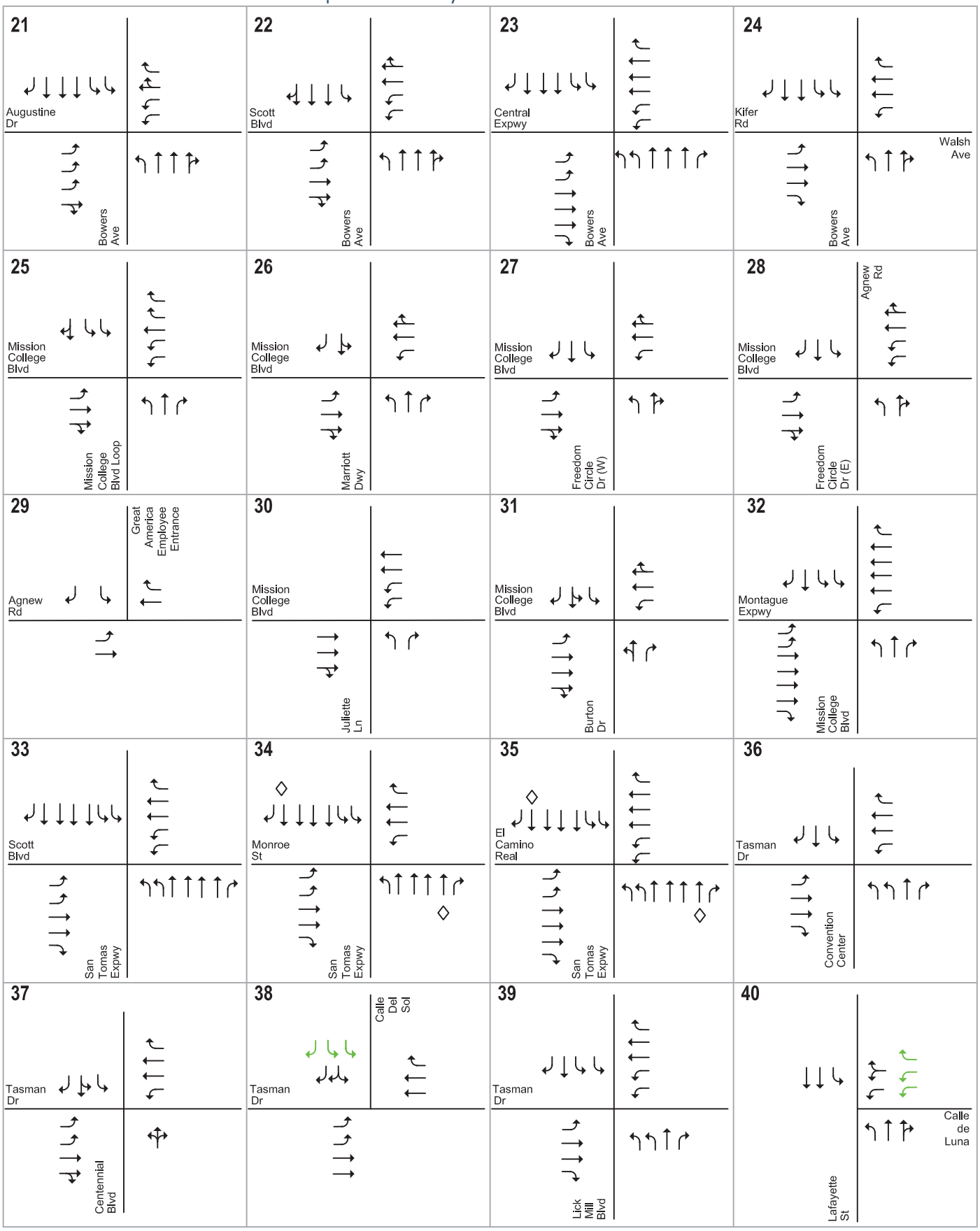
44. De la Cruz Boulevard and Central Expressway: convert Central Expressway HOV lane to mixed-flow lane, resulting in 3 mixed-flow lanes in eastbound direction.



LEGEND
← = Cumulative Improvement
◇ = HOV Lane

Figure 12
Cumulative No Project Lane Configurations

NORTH
Not to Scale

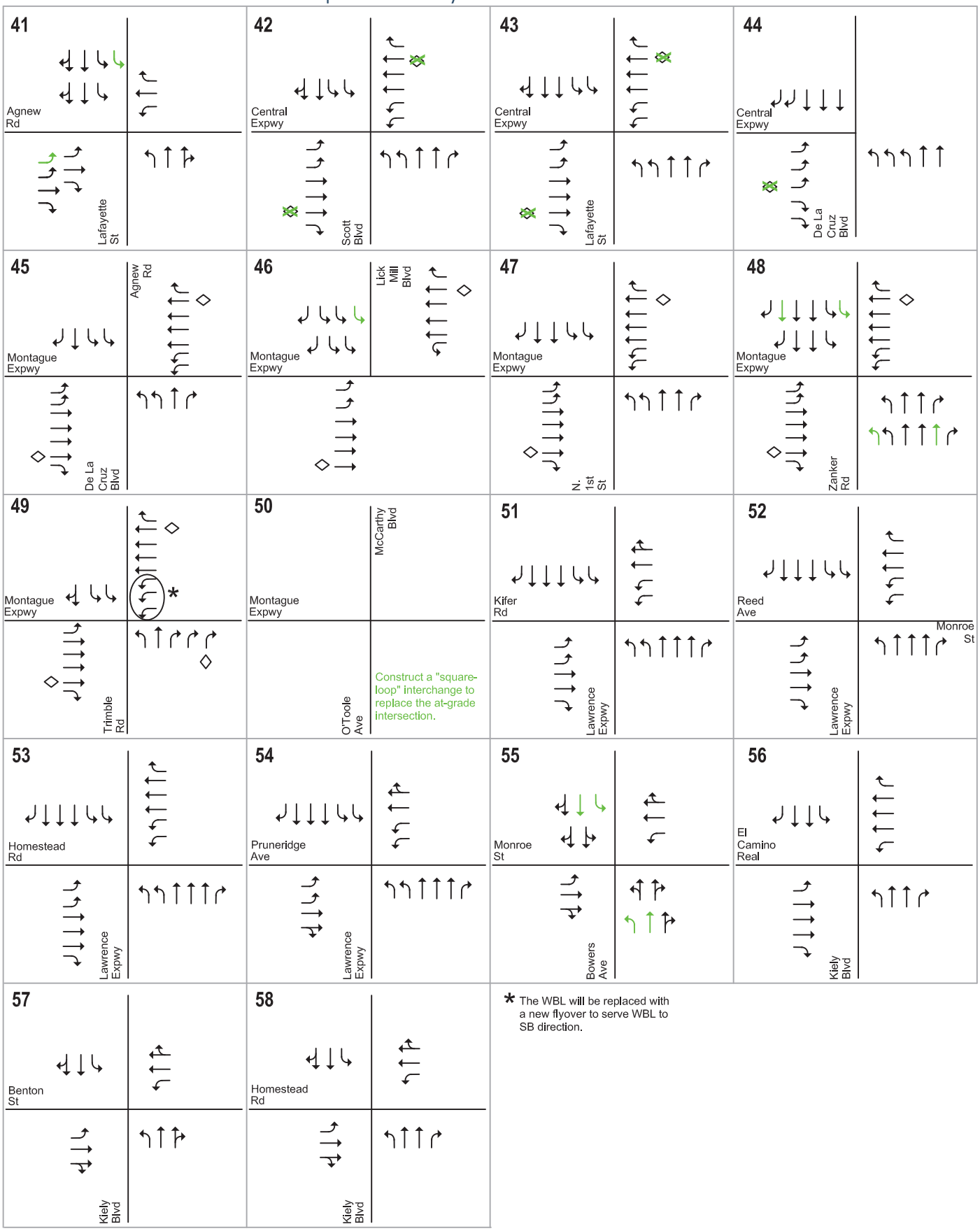


LEGEND
⟵ = Cumulative Improvement
◇ = HOV Lane

Figure 12
Cumulative No Project Lane Configurations

HEXAGON

NORTH
Not to Scale



* The WBL will be replaced with a new flyover to serve WBL to SB direction.

LEGEND

⟵ = Cumulative Improvement

◇ = HOV Lane

Figure 12
Cumulative No Project Lane Configurations

46. Lick Mill Boulevard and Montague Expressway: add a third southbound left-turn lane.

48. Zanker Road and Montague Expressway: widen Zanker Road to three lanes in northbound and southbound directions from River Oaks Parkway to Trimble Road; Add a second northbound left-turn lane and a second southbound left-turn lane.

50. McCarthy Boulevard/O'Toole Avenue and Montague Expressway: construction of a "square-loop" interchange to replace the at-grade intersection.

55. Bowers Avenue and Monroe Street: add a northbound left-turn lane and a southbound left-turn lane and change northbound and southbound approaches from split to protected left-turn phasing.

Cumulative plus project conditions assume the above transportation improvements and the same intersection lane configuration as shown in Figure 12.

Cumulative Traffic Volumes

Cumulative No Project Traffic Volumes

Traffic volumes under cumulative no project conditions (see Figure 13) were estimated using the CSC travel demand forecast model. The model land use assumptions reflect ABAG 2040 land use projections in most locations. In the vicinity of the Focus Area, the model assumes buildout of City Place and the Tasman East Specific Plan Area as well as development of an additional 1,500 dwelling units per a proposed Amendment to the Tasman East Specific Plan.

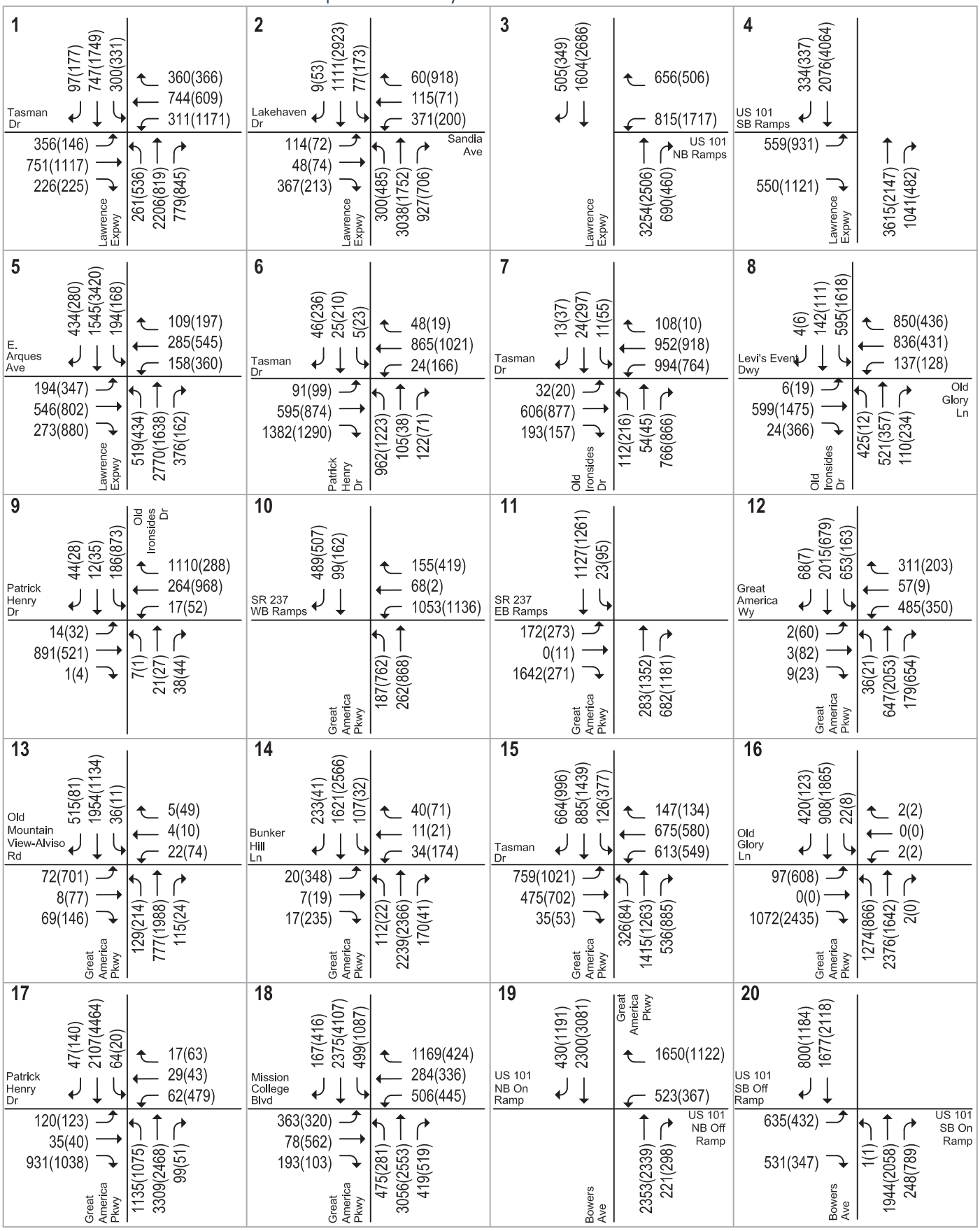
Cumulative no project conditions also assume buildout of the proposed Kylli site located immediately north of the PHDSP Area and the buildout of the PHDSP Option 2. As originally proposed, the Kylli mixed-use development totaled 10.61 million gross square feet. The application is currently on hold as Kylli works to prepare a reduced-density plan with reduced heights based on feedback from the FAA. While the reduced density plan has not yet been finalized, for the purpose of this analysis, the Kylli site is assumed to contain 3,170 residential dwelling units, 3,060,000 s.f. of office space, approximately 250,000 s.f. of retail/restaurant space, a 300-room hotel, a 600-student elementary school and a 160-student day care.

The PHDSP Option 2 land uses under this cumulative scenario are assumed to include approximately 10,300 residential units and 1,095,000 s.f. of non-residential uses, including 785,000 s.f. of office space, 150,000 s.f. of retail space, a 45,000 s.f. library, 25,000 s.f. of community/civic uses, and 90,000 s.f. of flex space, which is assumed to be an equal mix of office space, retail space, and residential amenities.

Like under background no project conditions, cumulative no project conditions assume a modest level of job growth (approximately 13 percent) above the existing employment within the Freedom Circle Focus Area. In addition, cumulative no project conditions assume the construction of the approved Sobrato development at 4301 Great America Parkway, which would add 718,000 s.f. of office space to the existing uses.

While the ABAG land use data do not reflect any growth in enrollment at Mission College from 2018 to 2040, the forecasts were modified to reflect a ten percent increase in enrollment by the Year 2040 based on historic data obtained from the California Community Colleges Chancellor's Office.

Generally, traffic volumes under Cumulative (Year 2040) conditions are greater than that under Background (Year 2030) conditions. However, trips generated by the proposed Kylli mixed-use development and the Patrick Henry Drive Specific Plan Area, which are assumed to be completed in

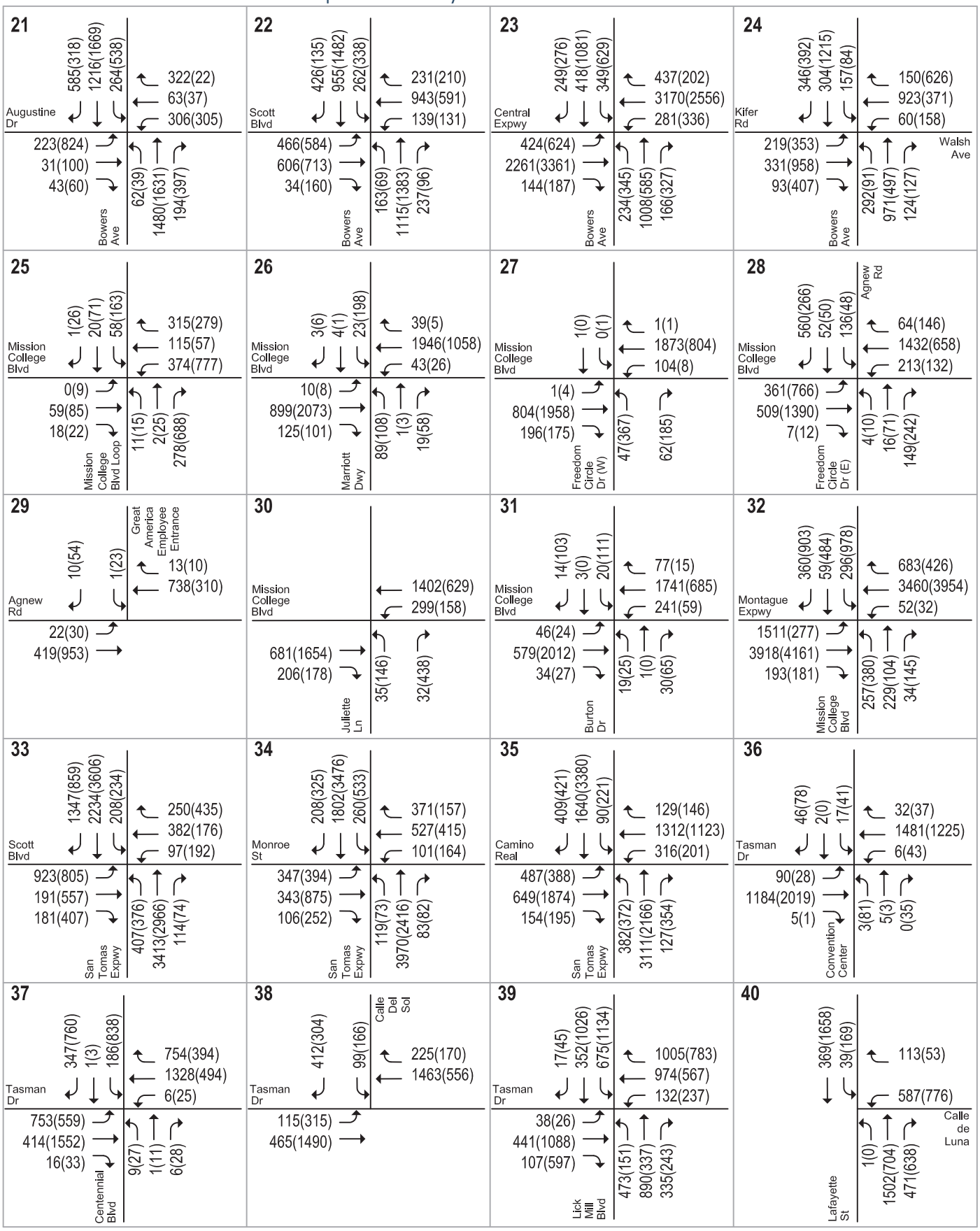


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 13
Cumulative No Project Traffic Volumes

NORTH
Not to Scale

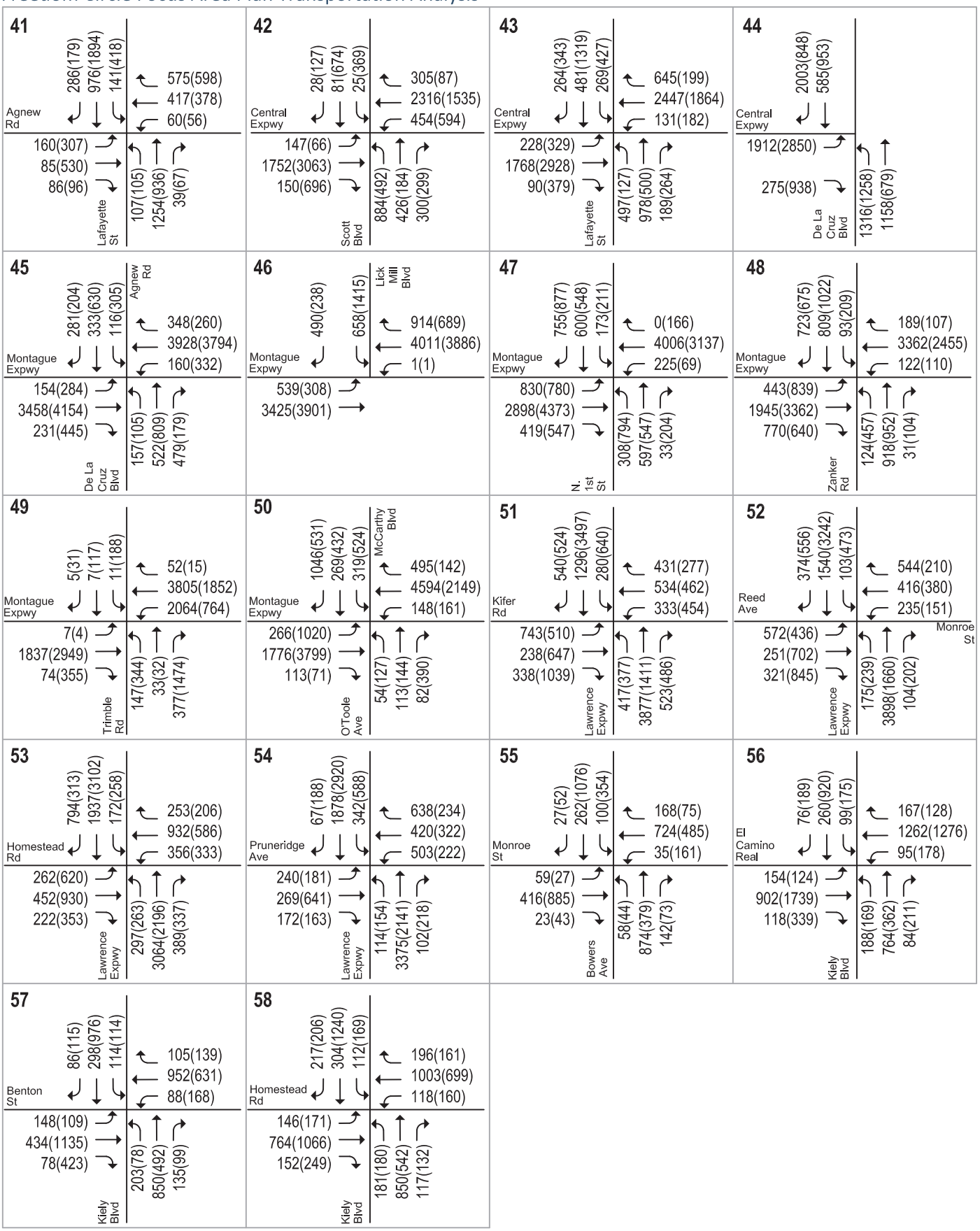


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 13
Cumulative No Project Traffic Volumes

NORTH
Not to Scale



LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 13
Cumulative No Project Traffic Volumes

NORTH
Not to Scale

the Year 2040 but not 2030, would displace other traffic resulting in a decrease in traffic volume for certain movements. For example, the eastbound through movement at the Tasman/Old Ironsides intersection would be approximately 350 vehicles lower under Cumulative Conditions than under Background Conditions during the PM peak hour due to the large increase in traffic (830 vehicles) that would be added to the northbound right-turn movement from the Kylli and PHDSP developments.

Cumulative Plus Project Traffic Volumes Without Greystar

This scenario reflects full buildout of the Freedom Circle Focus Area with the exception of the Greystar site, which would remain vacant. Traffic volumes under cumulative plus project conditions without Greystar were estimated using the CSC travel demand forecast model. The land use assumptions outside the Focus Area are unchanged from the above cumulative no project scenario. Except for the Greystar site, the land uses assumptions within the Freedom Circle Focus Area are the same as under background plus project conditions (see Chapter 4). Like under background plus project conditions, the trips generated by the Focus Area development were estimated based on ITE trip rates and reductions for internal trips and transit usage based on CSC model estimates.

The development of Freedom Circle Focus Area without Greystar is estimated to generate 72,164 gross daily trips including 7,481 AM peak hour trips and 7,724 PM peak hour trips. After applying the trip reductions, the Focus Area development without Greystar is expected to generate 65,168 net daily vehicle trips, 6,723 (5,245 inbound and 1,478 outbound) net AM peak hour trips, and 7,021 (1,662 inbound and 5,359 outbound) net PM peak hour trips under cumulative conditions (see Table 12). See Figure 14 for traffic volumes under cumulative plus project conditions without Greystar.

Table 12
Project Trip Generation Estimates – Focus Area Without Greystar

					AM Peak Hour					PM Peak Hour				
		Daily				Trips					Trips			
Land Use	Size	Rate	Trips	Mode Share	Rate	In	Out	Total	Mode Share	Rate	In	Out	Total	Mode Share
Multifamily Housing (Mid-Rise)	2,500 Dwelling Units	5.44	13,600		0.36	234	666	900		0.44	671	429	1,100	
Total Residential Trips	*2,500 Dwelling Units*	*5.44*	*13,600*		*0.36*	*234*	*666*	*900*		*0.44*	*671*	*429*	*1,100*	
General Office Building	5,369,000 Square Feet	9.74	52,294		1.16	5,356	872	6,228		1.15	988	5,186	6,174	
Hotel	750 Rooms	8.36	6,270		0.47	208	145	353		0.60	230	220	450	
Total Employment Trips	*5,369,000 Square Feet*		*58,564*			*5,564*	*1,017*	*6,581*			*1,218*	*5,406*	*6,624*	
Total Proposed Project Trips			**72,164**	**100.0%**		**5,798**	**1,683**	**7,481**	**100.0%**		**1,889**	**5,835**	**7,724**	**100.0%**
Less Internal Trips			(2,054)	2.8%		(43)	(43)	(86)	1.1%		(92)	(92)	(184)	2.4%
Less External Public Transit Trips			(4,942)	6.8%		(510)	(162)	(672)	9.0%		(135)	(384)	(519)	6.7%
External Vehicle Trips			**65,168**	**90.3%**		**5,245**	**1,478**	**6,723**	**89.9%**		**1,662**	**5,359**	**7,021**	**90.9%**

Source: Trip rates from ITE *Trip Generation Manual, 10th Edition,* 2017. Internal and transit trip reductions derived from CSC travel demand model.

Cumulative Plus Project Traffic Volumes Including Greystar

This scenario reflects full buildout of the Freedom Circle Focus Area including the Greystar site. Traffic volumes under cumulative plus project including Greystar conditions were estimated using the CSC travel demand forecast model. The land use assumptions outside the Focus Area are unchanged from the above cumulative no project scenario. The land uses assumptions within the Freedom Circle Focus Area are the same as under background plus project conditions (see Chapter 4). Like under background plus project conditions, the trips generated by the Focus Area development were estimated based on ITE trip rates, a 25-percent pass-by trip reduction for retail uses, and reductions for internal trips and transit usage based on CSC model estimates.

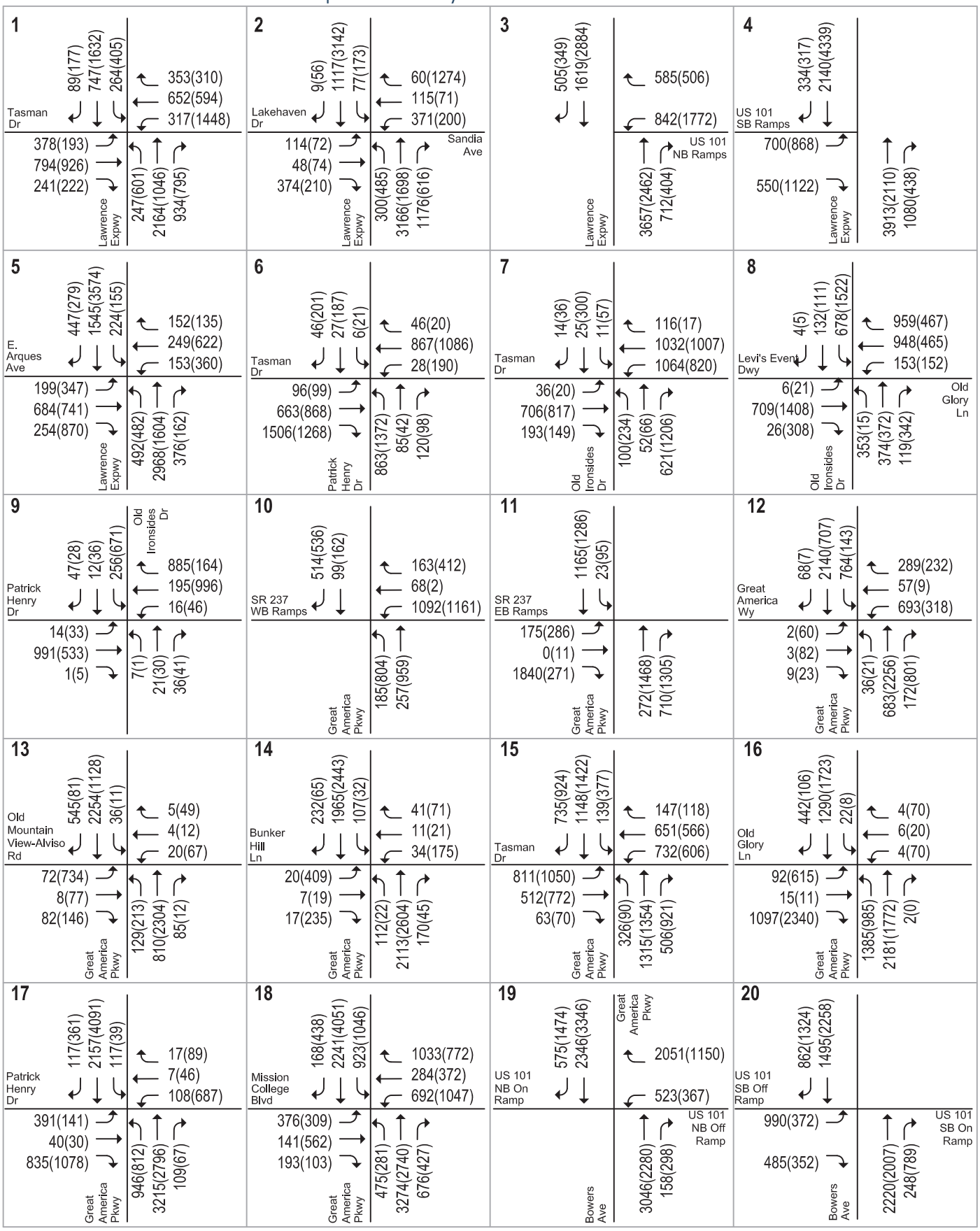
The gross project trips generated by the development of Freedom Circle Focus Area including Greystar remain the same as described in Chapter 4. After applying the trip reductions, the Focus Area development including Greystar is expected to generate 70,250 net daily vehicle trips, 7,070 (5,342 inbound and 1,728 outbound) net AM peak hour trips, and 7,438 (1,917 inbound and 5,521 outbound) net PM peak hour trips under cumulative conditions (see Table 13). See Figure 15 for traffic volumes under cumulative plus project conditions including Greystar.

Table 13
Project Trip Generation Estimates – Focus Area Including Greystar

			Daily			AM Peak Hour					PM Peak Hour				
						Trips					Trips				
Land Use	Size		Rate	Trips	Mode Share	Rate	In	Out	Total	Mode Share	Rate	In	Out	Total	Mode Share
Multifamily Housing (Mid-Rise)	3,600	Dwelling Units	5.44	19,584		0.36	337	959	1,296		0.44	966	618	1,584	
Total Residential Trips	*3,600*	*Dwelling Units*	*5.44*	*19,584*		*0.36*	*337*	*959*	*1,296*		*0.44*	*966*	*618*	*1,584*	
General Office Building	5,369,000	Square Feet	9.74	52,294		1.16	5,356	872	6,228		1.15	988	5,186	6,174	
Retail	2,000	Square Feet	37.75	76		0.94	1	1	2		3.81	4	4	8	
Hotel	750	Rooms	8.36	6,270		0.47	208	145	353		0.60	230	220	450	
Total Employment Trips	*5,371,000*	*Square Feet*		*58,640*			*5,565*	*1,018*	*6,583*			*1,222*	*5,410*	*6,632*	
Total Proposed Project Trips				**78,224**	**100.0%**		**5,902**	**1,977**	**7,879**	**100.0%**		**2,188**	**6,028**	**8,216**	**100.0%**
Less Internal Trips				(2,430)	3.1%		(54)	(54)	(108)	1.4%		(107)	(107)	(214)	2.6%
Less External Public Transit Trips				(5,527)	7.1%		(506)	(195)	(701)	8.9%		(164)	(398)	(562)	6.8%
Less Retail Passby Trips				*(17)*	0.0%		*0*	*0*	*0*	0.0%		*(1)*	*(1)*	*(2)*	0.0%
External Vehicle Trips				**70,250**	**89.8%**		**5,342**	**1,728**	**7,070**	**89.7%**		**1,917**	**5,521**	**7,438**	**90.5%**

Source: Trip rates from ITE *Trip Generation Manual, 10th Edition,* 2017. Internal and transit trip reductions derived from CSC travel demand model.

Compared to Cumulative No Project Conditions, Cumulative traffic volumes with buildout of the Freedom Circle Focus Area including Greystar show substantial increases in traffic volumes in the peak commute directions due to the addition of a large number of jobs in an area that is already rich in jobs. The buildout of the Freedom Circle Focus Area would also cause decreases in traffic volumes for some movements in the off-peak direction (eastbound Montague Expressway, for example) as the proposed new jobs would attract trips from residents in planned nearby residential developments such as the Patrick Henry Drive Specific Plan Area, the Kylli mixed-use site, the City Place development, and the Tasman East Specific Plan Area that would otherwise commute to other jobs farther away.



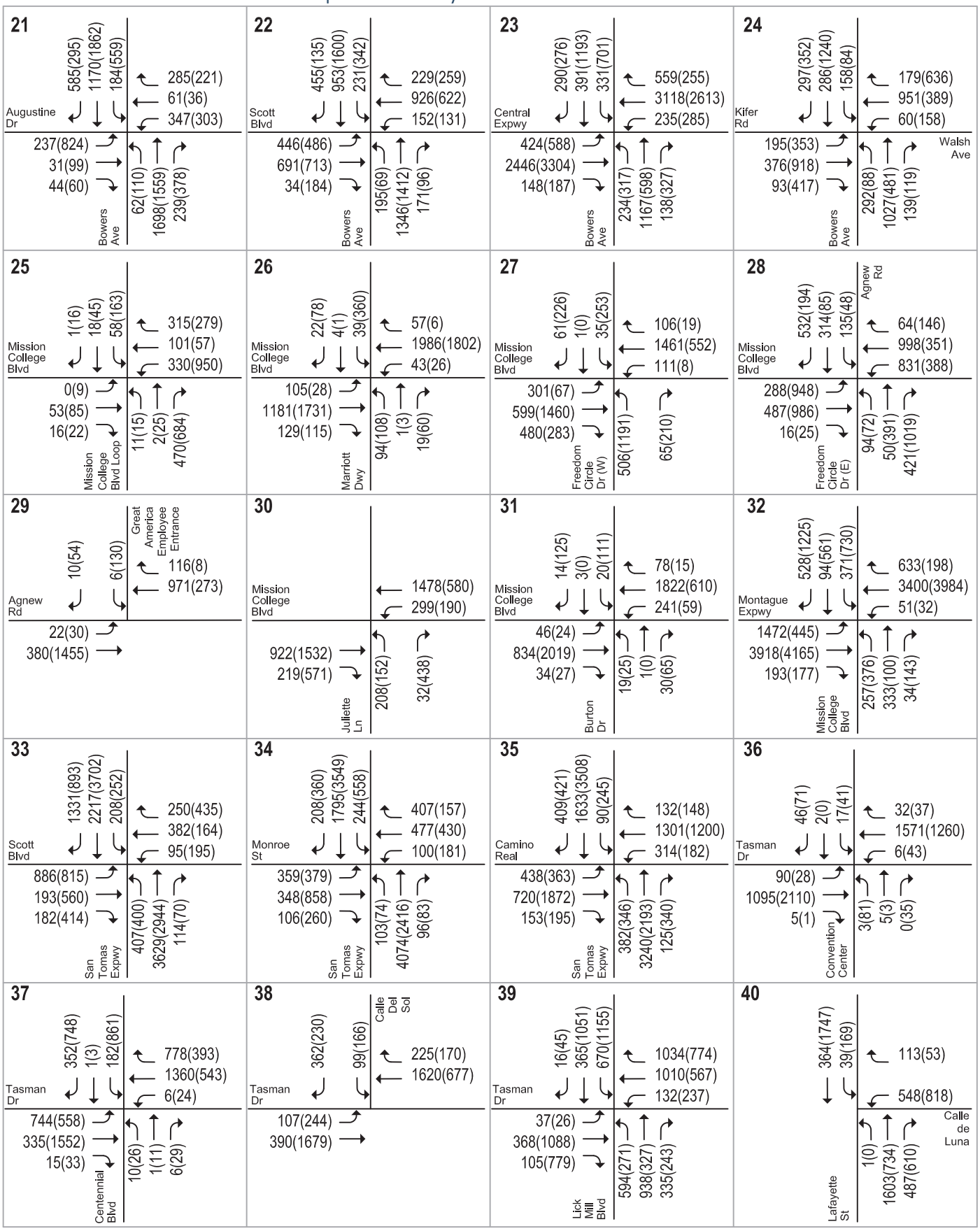
LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 14

Cumulative Plus Freedom Circle Without Greystar Traffic Volumes

NORTH
Not to Scale



LEGEND

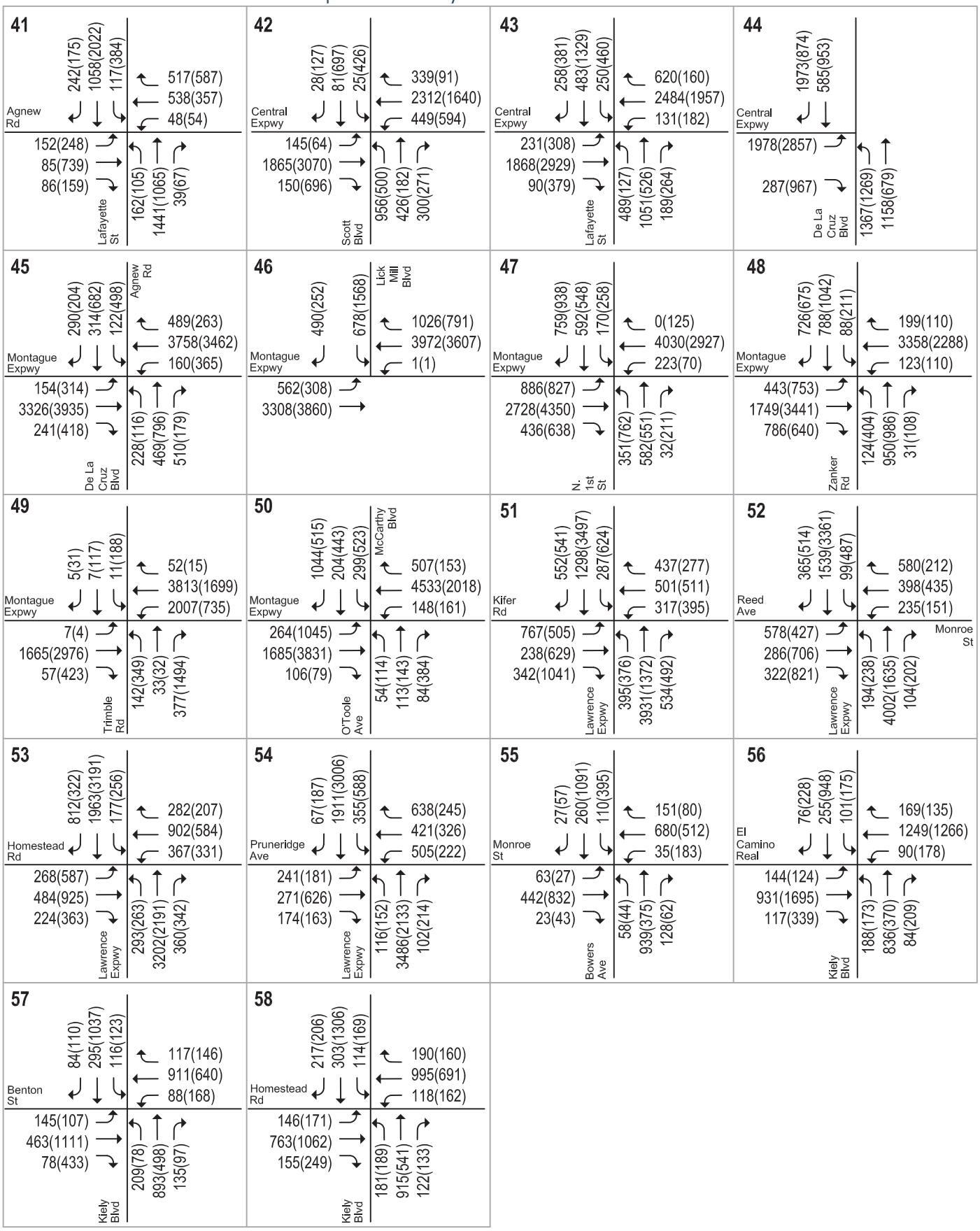
XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 14

Cumulative Plus Freedom Circle Without Greystar Traffic Volumes

HEXAGON

NORTH
Not to Scale



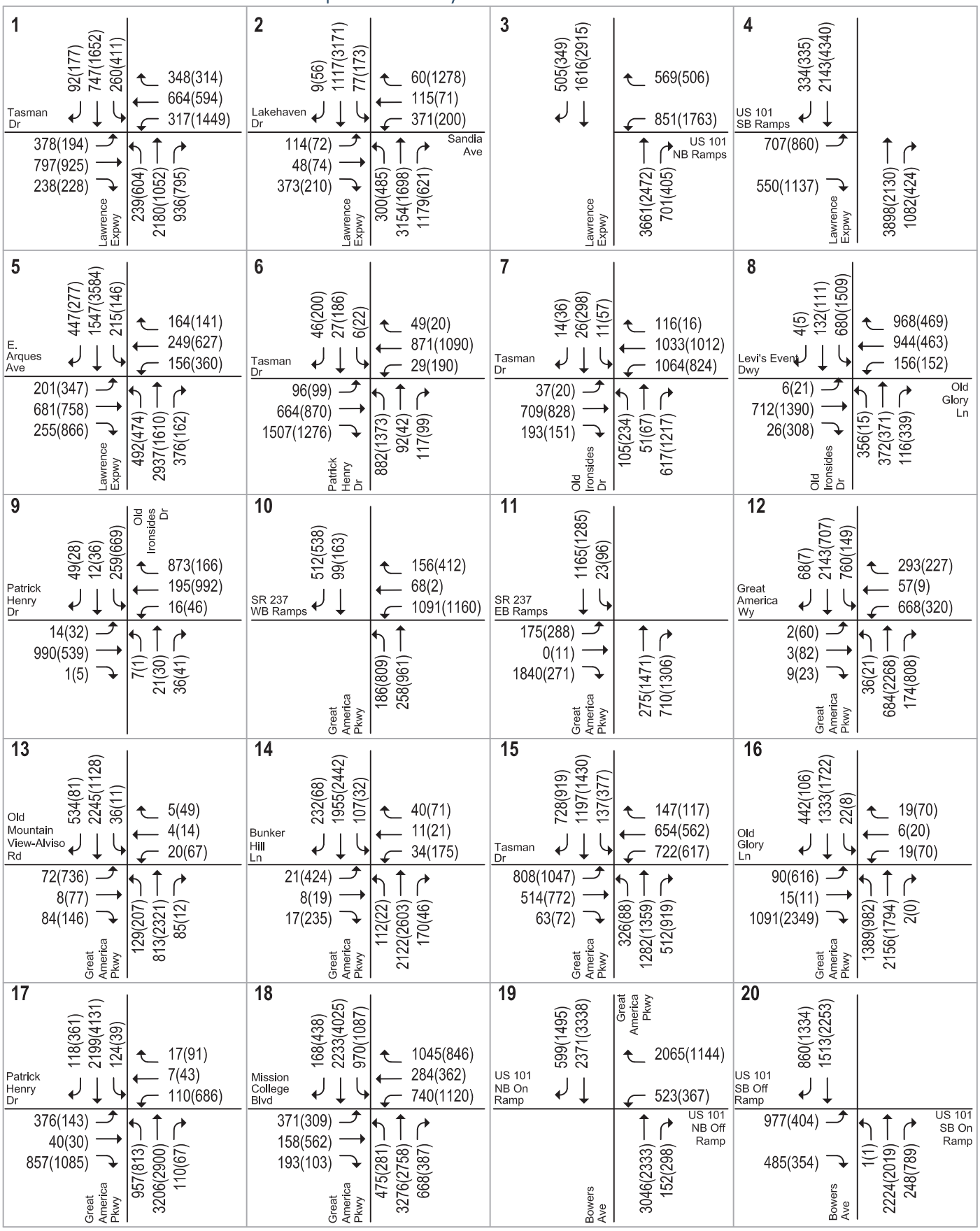
LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 14

Cumulative Plus Freedom Circle Without Greystar Traffic Volumes

NORTH
Not to Scale



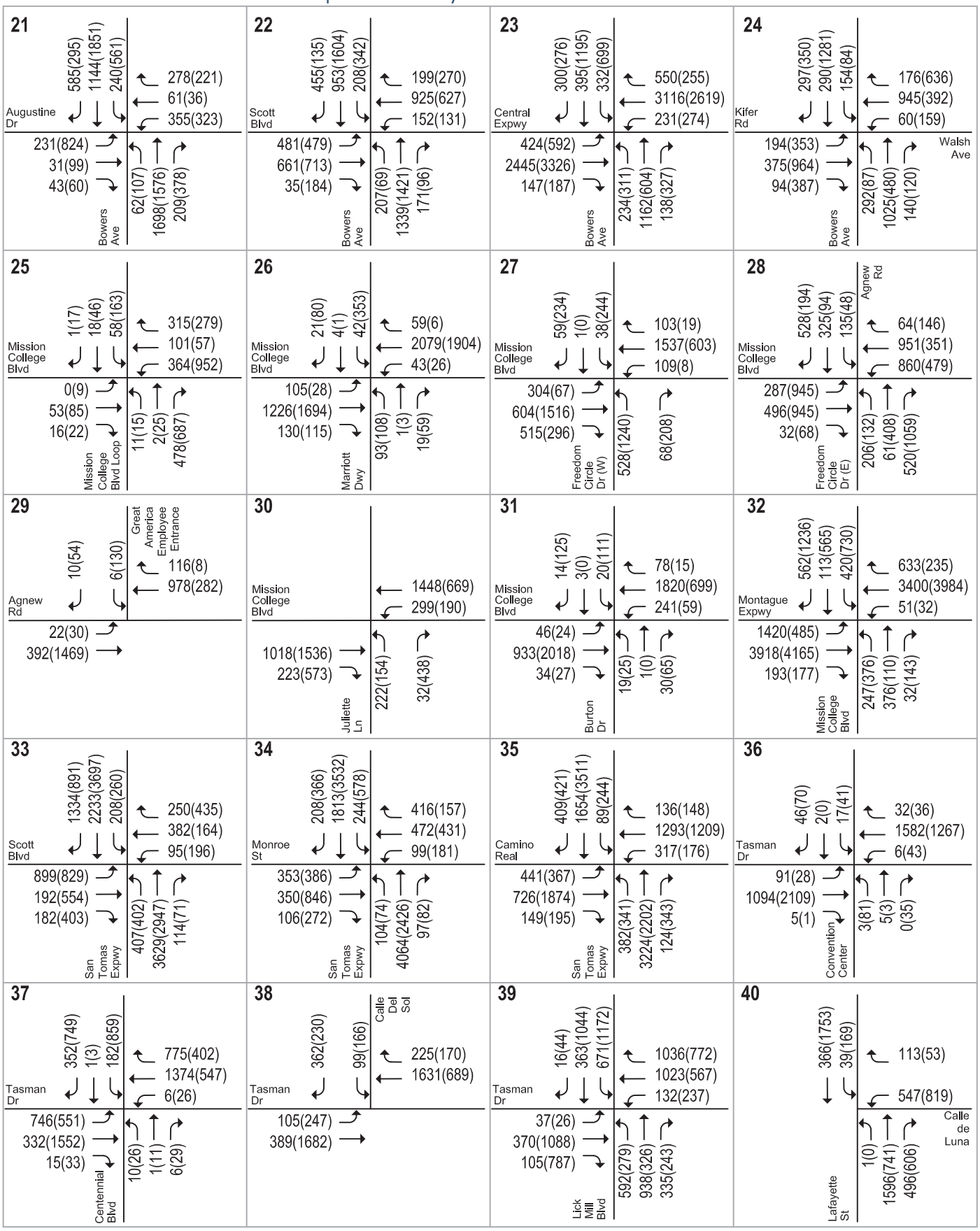
LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 15

Cumulative Plus Project Including Greystar Traffic Volumes

NORTH
Not to Scale



LEGEND

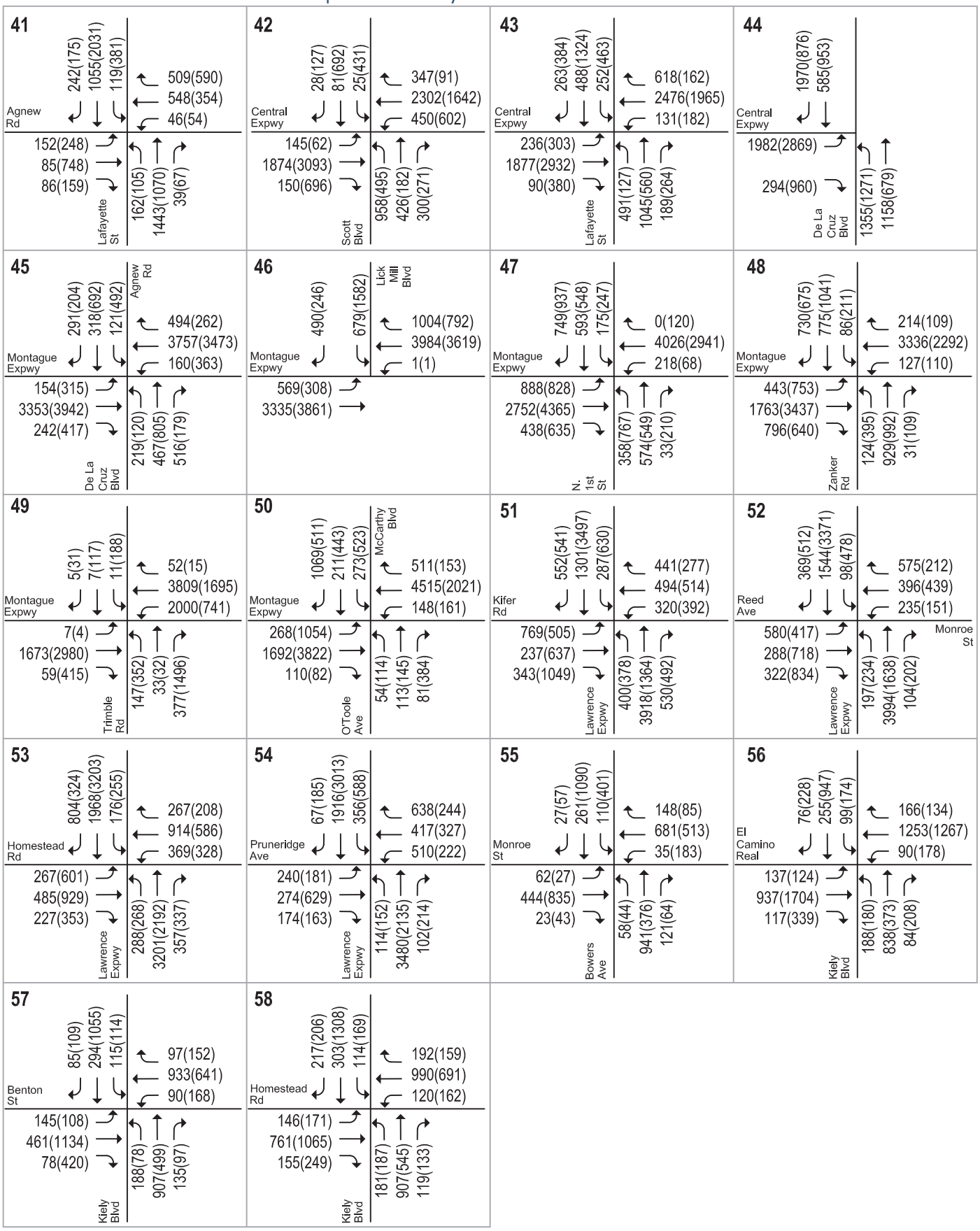
XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 15

Cumulative Plus Project Including Greystar Traffic Volumes

HEXAGON

NORTH
Not to Scale



LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 15

Cumulative Plus Project Including Greystar Traffic Volumes

NORTH
Not to Scale

Cumulative No Project Intersection Levels of Service

This scenario was developed as the baseline to identify the adverse effects attributable to the full buildout of the Freedom Circle Focus Area including the Greystar site. The results of the intersection level of service analysis show that the following 31 study intersections would operate at an unacceptable level during at least one peak hour under cumulative no project conditions (see Table 14).

1. Lawrence Expressway and Tasman Drive (PM peak hour)
2. Lawrence Expressway and Sandia Avenue/Lakehaven Drive (AM and PM peak hours)
5. Lawrence Expressway and E. Arques Ave (PM peak hour)
6. Patrick Henry Drive and Tasman Drive (AM and PM peak hours)
8. Old Ironsides Drive and Old Glory Lane (AM and PM peak hours)
9. Old Ironsides Drive and Patrick Henry Drive (AM and PM peak hours)
12. Great America Parkway and Great America Way (PM peak hour)
16. Great America Parkway and Old Glory Lane (AM and PM peak hours)
17. Great America Parkway and Patrick Henry Drive (AM and PM peak hours)
18. Great America Parkway and Mission College Boulevard (AM and PM peak hours)
23. Bowers Avenue and Central Expressway (AM and PM peak hours)
32. Mission College Boulevard and Montague Expressway (AM and PM peak hours)
33. San Tomas Expressway and Scott Boulevard (AM peak hour)
35. San Tomas Expressway and El Camino Real (AM and PM peak hours)
39. Lick Mill Boulevard and Tasman Drive (AM and PM peak hours)
41. Lafayette Street and Agnew Road (PM peak hour)
42. Scott Boulevard and Central Expressway (PM peak hour)
43. Lafayette Street and Central Expressway (PM peak hour)
44. De La Cruz Boulevard and Central Expressway (AM and PM peak hours)
45. Agnew Road/De La Cruz Boulevard and Montague Expressway (AM and PM peak hours)
46. Lick Mill Boulevard and Montague Expressway (PM peak hour)
47. N. 1st Street and Montague Expressway (AM and PM peak hours)
48. Zanker Road and Montague Expressway (AM and PM peak hours)
49. Trimble Road and Montague Expressway (PM peak hour)
51. Lawrence Expressway and Kifer Road (AM and PM peak hours)
52. Lawrence Expressway and Reed Avenue/Monroe Street (AM and PM peak hours)
54. Lawrence Expressway and Pruneridge Avenue (AM peak hour)
57. Kiely Boulevard and Benton Street (PM peak hour)
58. Kiely Boulevard and Homestead Road (PM peak hour)

All other study intersections would operate at acceptable levels during both the AM and PM peak hours of traffic. The intersection level of service calculation sheets are included in Appendix C.

Table 14
Cumulative Intersection LOS without and with Focus Area Buildout

			Cumulative (2040) Conditions							
					With Project					
			No Project		Freedom Circle Buildout (including Greystar)				Freedom Circle Buildout (including Greystar) w/ Improv & 10% TDM	
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C	Avg Delay	LOS
1	Lawrence Expressway and Tasman Drive	AM	66.5	E	64.2	E	-10.7	-0.051		
	(CMP)	PM	**167.9**	**F**	**196.1**	**F**	**56.0**	**0.049**		
2	Lawrence Expwy and Sandia Av/Lakehaven Dr	AM	**135.1**	**F**	**158.0**	**F**	**49.8**	**0.156**		
		PM	**OVFL**	**F**	**OVFL**	**F**	**OVFL**	**0.569**		
3	Lawrence Expressway and US 101 NB Ramps	AM	11.7	B	11.9	B	-0.3	0.029		
		PM	65.4	E	68.8	E	3.6	0.043		
4	Lawrence Expressway and US 101 SB Ramps	AM	19.2	B	32.1	C	21.0	0.091		
		PM	77.3	E	70.9	E	-0.7	0.044		
5	Lawrence Expressway and E. Arques Ave.	AM	46.9	D	50.2	D	4.1	0.028		
	(CMP)	PM	**112.2**	**F**	**123.1**	**F**	**17.1**	**0.015**		
6	Patrick Henry Drive and Tasman Drive	AM	**61.0**	**E**	**82.4**	**F**	**40.6**	**0.089**		
		PM	**66.3**	**E**	**70.5**	**E**	**-4.5**	**-0.008**		
7	Old Ironsides Drive and Tasman Drive	AM	36.0	D	48.1	D	21.4	0.075		
		PM	47.7	D	**64.6**	**E**	**9.7**	**0.066**		
8	Old Ironsides Drive and Old Glory Lane	AM	**OVFL**	**F**	**OVFL**	**F**	**OVFL**	**-65.584**	**66.8**	**E**
	(Unsignalized)	PM	**OVFL**	**F**	**OVFL**	**F**	**OVFL**	**0.085**	**121.7**	**F**
9	Old Ironsides Drive and Patrick Henry Drive	AM	**OVFL**	**F**	**295.5**	**F**	**-273.4**	**-10.339**		
	(Unsignalized)	PM	**OVFL**	**F**	**OVFL**	**F**	**-1992.0**	**-10.045**		
10	Great America Parkway and SR 237 WB Ramps	AM	13.6	B	13.8	B	0.2	0.017		
	(CMP)	PM	21.4	C	22.0	C	1.1	0.033		
11	Great America Parkway and SR 237 EB Ramps	AM	9.4	A	9.3	A	0.0	0.011		
	(CMP)	PM	12.4	B	12.8	B	0.5	0.048		
12	Great America Parkway and Great America Way	AM	42.3	D	**93.3**	**F**	**63.5**	**0.160**		
		PM	**67.6**	**E**	**91.5**	**F**	**30.3**	**0.056**		
13	Great America Pkwy and Old Mt View-Alviso Rd	AM	16.9	B	18.4	B	2.0	0.076		
		PM	41.6	D	42.1	D	2.3	0.080		
14	Great America Parkway and Bunker Hill Lane	AM	11.7	B	11.6	B	-0.2	-0.025		
		PM	25.7	C	30.1	C	5.9	0.063		
15	Great America Parkway and Tasman Drive	AM	48.0	D	48.6	D	4.8	0.024		
	(CMP)	PM	52.7	D	54.0	D	4.5	0.009		
16	Great America Parkway and Old Glory Lane	AM	**250.8**	**F**	**OVFL**	**F**	**49.9**	**0.112**	50.6	D
		PM	**OVFL**	**F**	**OVFL**	**F**	**-3.3**	**-0.009**	**276.2**	**F**
17	Great America Parkway and Patrick Henry Drive	AM	**275.9**	**F**	**234.4**	**F**	**-73.1**	**-0.136**		
		PM	**OVFL**	**F**	**OVFL**	**F**	**-59.4**	**-0.134**		
18	Great America Pkwy and Mission College Blvd	AM	**106.7**	**F**	**122.6**	**F**	**33.5**	**-0.276**	**90.3**	**F**
	(CMP)	PM	**58.1**	**E**	**229.5**	**F**	**206.3**	**0.192**	**143.3**	**F**
19	Great America Pkwy and US 101 NB Off Ramp	AM	9.9	A	9.6	A	0.4	0.132		
	(CMP)	PM	8.3	A	8.4	A	0.2	0.048		
20	Bowers Avenue and US 101 SB Off Ramp	AM	12.0	B	16.4	B	4.8	0.172		
	(CMP)	PM	11.1	B	10.1	B	-0.9	0.016		
21	Bowers Avenue and Augustine Drive	AM	28.6	C	28.7	C	0.6	0.060		
		PM	41.4	D	41.1	D	-0.5	-0.008		
22	Bowers Avenue and Scott Boulevard	AM	60.3	E	60.6	E	3.9	-0.013		
	(CMP)	PM	49.5	D	49.3	D	-0.2	0.002		
23	Bowers Avenue and Central Expressway	AM	**98.6**	**F**	**93.7**	**F**	**-7.6**	**0.013**	**93.4**	**F**
	(CMP)	PM	**126.5**	**F**	**129.7**	**F**	**-8.5**	**-0.025**	**128.7**	**F**
24	Bowers Avenue and Kifer Road/Walsh Avenue	AM	39.2	D	38.8	D	-0.3	0.012		
		PM	46.1	D	48.7	D	4.1	0.023		
25	Mission College Loop and Mission College Blvd	AM	12.6	B	12.4	B	-0.6	-0.008		
		PM	23.2	C	21.5	C	0.6	0.069		

Table 14 (cont.)
Cumulative Intersection LOS without and with Focus Area Buildout

			Cumulative (2040) Conditions							
					With Project					
			No Project		Freedom Circle Buildout (including Greystar)				Freedom Circle Buildout (including Greystar) w/ Improv & 10% TDM	
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C	Avg Delay	LOS
26	Marriott Dwy and Mission College Blvd	AM	10.4	B	25.7	C	21.2	0.112		
		PM	18.0	B	25.8	C	8.9	0.018		
27	Freedom Circle W and Mission College Blvd	AM	11.0	B	**73.6**	**E**	**90.8**	**0.450**	49.5	D
		PM	32.0	C	**168.8**	**F**	**196.4**	**0.456**	36.0	D
28	Agnew/Freedom Circle E & Mission College Blvd	AM	37.2	D	45.1	D	15.8	0.043	32.5	C
		PM	38.5	D	**223.3**	**F**	**272.6**	**0.731**	**68.9**	**E**
29	Great America employee entrance and Agnew Rd	AM	3.5	A	4.7	A	1.7	0.151		
		PM	5.4	A	41.8	D	43.9	0.406		
30	Juliette Lane and Mission College Boulevard	AM	12.1	B	21.3	C	11.5	0.139		
		PM	22.0	C	22.2	C	0.3	0.055		
31	Burton Drive and Mission College Boulevard	AM	24.8	C	26.0	C	1.9	0.026		
		PM	18.6	B	18.7	B	0.0	0.001		
32	Mission College Blvd and Montague Expwy	AM	**126.8**	**F**	**140.8**	**F**	**23.7**	**0.085**		
	(CMP)	PM	**121.9**	**F**	**133.0**	**F**	**21.0**	**0.118**		
33	San Tomas Expressway and Scott Boulevard	AM	**166.3**	**F**	**156.3**	**F**	**-22.2**	**0.022**		
	(CMP)	PM	66.6	E	69.8	E	5.7	0.021		
34	San Tomas Expressway and Monroe Street	AM	59.1	E	62.2	E	4.0	-0.004		
	(CMP)	PM	53.3	D	54.8	D	-0.2	0.010		
35	San Tomas Expressway and El Camino Real	AM	**100.6**	**F**	**102.4**	**F**	**3.5**	**0.002**		
	(CMP)	PM	**120.3**	**F**	**123.2**	**F**	**6.2**	**0.005**		
36	Convention Center and Tasman Drive	AM	13.1	B	13.4	B	0.3	0.033		
		PM	14.4	B	14.8	B	0.8	0.028		
37	Centennial Boulevard and Tasman Drive	AM	35.3	D	36.3	D	-2.0	-0.022		
		PM	41.6	D	42.1	D	-1.2	-0.004		
38	Calle Del Sol and Tasman Drive	AM	26.3	C	24.6	C	-2.4	0.014		
		PM	24.6	C	19.8	B	-4.3	0.009		
39	Lick Mill Boulevard and Tasman Drive	AM	**112.7**	**F**	**124.4**	**F**	**22.4**	**0.050**		
		PM	**79.4**	**E**	**98.0**	**F**	**52.7**	**0.141**		
40	Lafayette Street and Calle De Luna	AM	22.4	C	22.3	C	0.0	0.021		
		PM	24.3	C	25.6	C	-7.0	0.017		
41	Lafayette Street and Agnew Road	AM	42.5	D	**63.7**	**E**	**31.7**	**0.059**		
		PM	**78.2**	**E**	**119.3**	**F**	**87.9**	**0.176**		
42	Scott Boulevard and Central Expressway	AM	71.8	E	79.7	E	14.7	0.047		
	(CMP)	PM	**108.5**	**F**	**116.4**	**F**	**5.7**	**0.015**		
43	Lafayette Street and Central Expressway	AM	55.9	E	57.7	E	-1.3	0.020		
	(CMP)	PM	**81.5**	**F**	**82.9**	**F**	**-1.7**	**0.019**		
44	De la Cruz Boulevard and Central Expressway	AM	**108.3**	**F**	**117.0**	**F**	**11.6**	**0.025**		
	(CMP)	PM	**229.5**	**F**	**232.8**	**F**	**6.5**	**0.007**		
45	Agnew Rd/De La Cruz Blvd and Montague Expwy	AM	**116.8**	**F**	**99.9**	**F**	**-23.4**	**-0.057**		
	(CMP)	PM	**137.7**	**F**	**138.1**	**F**	**-1.1**	**0.040**		
46	Lick Mill Boulevard and Montague Expressway	AM	69.0	E	74.3	E	10.4	0.011		
		PM	**104.8**	**F**	**131.7**	**F**	**46.7**	**0.033**		
47	N. 1st Street and Montague Expressway	AM	**187.9**	**F**	**197.9**	**F**	**17.6**	**0.027**		
	(CMP)	PM	**179.7**	**F**	**147.0**	**F**	**-34.0**	**0.117**		

Table 14 (cont.)
Cumulative Intersection LOS without and with Focus Area Buildout

			Cumulative (2040) Conditions							
					With Project					
			No Project		Freedom Circle Buildout (including Greystar)				Freedom Circle Buildout (including Greystar) w/ Improv & 10% TDM	
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C	Avg Delay	LOS
48	Zanker Road and Montague Expressway	AM	**80.8**	**F**	**80.7**	**F**	**-1.4**	**0.000**		
	(CMP)	PM	**74.4**	**E**	**64.7**	**E**	**-19.3**	**-0.069**		
49	Trimble Road and Montague Expressway	AM	42.3	D	41.1	D	0.1	0.001		
	(CMP)	PM	**150.6**	**F**	**156.7**	**F**	**17.9**	**-0.016**		
50	McCarthy Blvd/O'Toole Av and Montague Expwy	AM	--	--	-- --	--	--	--		
	(CMP)	PM	--	--	-- --	--	--	--		
51	Lawrence Expressway and Kifer Road	AM	**190.5**	**F**	**194.2**	**F**	**7.9**	**0.009**		
		PM	**221.1**	**F**	**219.4**	**F**	**-1.2**	**-0.015**		
52	Lawrence Expressway and Reed Ave/Monroe St	AM	**123.3**	**F**	**134.2**	**F**	**14.5**	**0.038**		
	(CMP)	PM	**87.2**	**F**	**86.4**	**F**	**-2.7**	**0.012**		
53	Lawrence Expressway and Homestead Road	AM	53.5	D	55.6	E	4.0	0.034		
	(CMP)	PM	76.7	E	76.8	E	**0.4**	**0.010**		
54	Lawrence Expressway and Pruneridge Avenue	AM	**94.5**	**F**	**101.0**	**F**	**9.6**	**0.022**		
		PM	73.3	E	72.0	E	-3.6	0.010		
55	Bowers Avenue and Monroe Street	AM	32.1	C	32.4	C	0.4	0.004		
		PM	36.0	D	37.1	D	0.7	0.005		
56	Bowers Ave/Kiely Boulevard and El Camino Real	AM	30.2	C	30.2	C	-0.1	0.010		
	(CMP)	PM	33.4	C	34.0	C	1.0	0.008		
57	Kiely Boulevard and Benton Street	AM	41.8	D	42.0	D	0.4	0.008		
		PM	**63.0**	**E**	**68.3**	**E**	**8.2**	**0.023**		
58	Kiely Boulevard and Homestead Road	AM	42.6	D	43.6	D	1.7	0.014		
		PM	**76.8**	**E**	**83.7**	**F**	**10.2**	**0.027**		

Notes:
Bold indicates a substandard level of service.
Bold indicates an adverse effect caused by the project.
OVFL indicates that the result is out of software calculation limits.

Cumulative Plus Project Intersection Levels of Service Without Greystar

This scenario reflects full buildout of the Freedom Circle Focus Area with the exception of the Greystar site, which would remain vacant. This scenario was developed as the baseline to identify the adverse effects attributable to the development of the Greystar General Plan Amendment. The results of the intersection level of service analysis under cumulative plus project conditions without Greystar show that the following 35 intersections would operate at an unacceptable level during at least one peak hour (see Table 15):

1. Lawrence Expressway and Tasman Drive (PM peak hour)
2. Lawrence Expressway and Sandia Avenue/Lakehaven Drive (AM and PM peak hours)
5. Lawrence Expressway and E. Arques Avenue (PM peak hour)
6. Patrick Henry Drive and Tasman Drive (AM and PM peak hours)
7. Old Ironsides Drive and Tasman Drive (PM peak hour)
8. Old Ironsides Drive and Old Glory Lane (AM and PM peak hours)
9. Old Ironsides Drive and Patrick Henry Drive (AM and PM peak hours)
12. Great America Parkway and Great America Way (AM and PM peak hours)
16. Great America Parkway and Old Glory Lane (AM and PM peak hours)
17. Great America Parkway and Patrick Henry Drive (AM and PM peak hours)
18. Great America Parkway and Mission College Boulevard (AM and PM peak hours)
23. Bowers Avenue and Central Expressway (AM and PM peak hours)
25. Mission College Loop and Mission College Boulevard (PM peak hour)
27. Freedom Circle (W) and Mission College Boulevard (AM and PM peak hours)
28. Agnew Road/Freedom Circle (E) and Mission College Boulevard (PM peak hour)
32. Mission College Boulevard and Montague Expressway (AM and PM peak hours)
33. San Tomas Expressway and Scott Boulevard (AM peak hour)
35. San Tomas Expressway and El Camino Real (AM and PM peak hours)
39. Lick Mill Boulevard and Tasman Drive (AM and PM peak hours)
41. Lafayette Street and Agnew Road (AM and PM peak hours)
42. Scott Boulevard and Central Expressway (PM peak hour)
43. Lafayette Street and Central Expressway (PM peak hour)
44. De La Cruz Boulevard and Central Expressway (AM and PM peak hours)
45. Agnew Road/De La Cruz Boulevard and Montague Expressway (AM and PM peak hours)
46. Lick Mill Boulevard and Montague Expressway (PM peak hour)
47. N. 1st Street and Montague Expressway (AM and PM peak hours)
48. Zanker Road and Montague Expressway (AM and PM peak hours)
49. Trimble Road and Montague Expressway (PM peak hour)
51. Lawrence Expressway and Kifer Road (AM and PM peak hours)
52. Lawrence Expressway and Monroe Street (AM and PM peak hours)
54. Lawrence Expressway and Pruneridge Avenue (AM peak hour)
57. Kiely Boulevard and Benton Street (PM peak hour)
58. Kiely Boulevard and Homestead Road (PM peak hour)

All other study intersections would operate at acceptable levels during both the AM and PM peak hours of traffic. The intersection level of service calculation sheets are included in Appendix C.

Table 15
Cumulative Intersection LOS without and with Greystar

			Cumulative (2040) Conditions							
			Freedom Circle (without Greystar)		Freedom Circle Buildout (including Greystar)				Freedom Circle Buildout (including Greystar) w/ Improv & 10% TDM	
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C	Avg Delay	LOS
1	Lawrence Expressway and Tasman Drive	AM	64.1	E	64.2	E	-0.2	0.001		
	(CMP)	PM	**195.7**	**F**	**196.1**	**F**	**0.4**	**0.006**		
2	Lawrence Expwy and Sandia Av/Lakehaven Dr	AM	**158.8**	**F**	**158.0**	**F**	**1.4**	**0.002**		
		PM	**OVFL**	**F**	**OVFL**	**F**	**3.7**	**0.010**		
3	Lawrence Expressway and US 101 NB Ramps	AM	11.9	B	11.9	B	-0.1	-0.005		
		PM	70.1	E	68.8	E	-2.3	0.002		
4	Lawrence Expressway and US 101 SB Ramps	AM	31.3	C	32.1	C	1.3	0.000		
		PM	69.8	E	70.9	E	2.9	0.005		
5	Lawrence Expressway and E. Arques Ave.	AM	50.4	D	50.2	D	-0.1	0.000		
	(CMP)	PM	**123.7**	**F**	**123.1**	**F**	**-0.7**	**-0.001**		
6	Patrick Henry Drive and Tasman Drive	AM	**82.0**	**F**	**82.4**	**F**	**0.3**	**0.001**		
		PM	**70.0**	**E**	**70.5**	**E**	**1.7**	**0.005**		
7	Old Ironsides Drive and Tasman Drive	AM	47.2	D	48.1	D	1.6	0.004		
		PM	**62.1**	**E**	**64.6**	**E**	**4.0**	**0.011**	**64.5**	**E**
8	Old Ironsides Drive and Old Glory Lane	AM	**OVFL**	**F**	**OVFL**	**F**	**OVFL**	**1.752**	**67.4**	**E**
	(Unsignalized)	PM	**OVFL**	**F**	**OVFL**	**F**	**OVFL**	**-0.025**	**122.1**	**F**
9	Old Ironsides Drive and Patrick Henry Drive	AM	**298.5**	**F**	**295.5**	**F**	**-3.1**	**-0.142**		
	(Unsignalized)	PM	**OVFL**	**F**	**OVFL**	**F**	**-19.5**	**-0.065**		
10	Great America Parkway and SR 237 WB Ramps	AM	13.8	B	13.8	B	0.0	-0.001		
	(CMP)	PM	21.9	C	22.0	C	0.1	0.003		
11	Great America Parkway and SR 237 EB Ramps	AM	9.3	A	9.3	A	0.0	0.000		
	(CMP)	PM	12.8	B	12.8	B	0.1	0.003		
12	Great America Parkway and Great America Way	AM	**100.9**	**F**	**93.3**	**F**	**-8.7**	**-0.017**		
		PM	**89.0**	**F**	**91.5**	**F**	**3.0**	**0.008**		
13	Great America Pkwy and Old Mt View-Alviso Rd	AM	18.5	B	18.4	B	-0.1	-0.003		
		PM	42.1	D	42.1	D	0.2	0.005		
14	Great America Parkway and Bunker Hill Lane	AM	11.6	B	11.6	B	0.0	0.001		
		PM	29.3	C	30.1	C	1.0	0.009		
15	Great America Parkway and Tasman Drive	AM	48.7	D	48.6	D	0.2	0.009		
	(CMP)	PM	54.8	D	54.0	D	-2.1	-0.006		
16	Great America Parkway and Old Glory Lane	AM	**OVFL**	**F**	**OVFL**	**F**	**-0.7**	**-0.001**		
		PM	**OVFL**	**F**	**OVFL**	**F**	**1.6**	**0.004**		
17	Great America Parkway and Patrick Henry Drive	AM	**224.4**	**F**	**234.4**	**F**	**14.5**	**0.032**	**89.2**	**F**
		PM	**OVFL**	**F**	**OVFL**	**F**	**5.8**	**0.013**	**284.8**	**F**
18	Great America Pkwy and Mission College Blvd	AM	**115.4**	**F**	**122.6**	**F**	**14.2**	**0.028**	**90.3**	**F**
	(CMP)	PM	**220.0**	**F**	**229.5**	**F**	**20.1**	**0.034**	**143.3**	**F**
19	Great America Pkwy and US 101 NB Off Ramp	AM	9.6	A	9.6	A	0.0	0.000		
	(CMP)	PM	8.4	A	8.4	A	0.0	-0.001		
20	Bowers Avenue and US 101 SB Off Ramp	AM	16.6	B	16.4	B	0.0	0.004		
	(CMP)	PM	9.2	A	10.1	B	0.8	0.010		
21	Bowers Avenue and Augustine Drive	AM	27.6	C	28.7	C	2.3	0.018		
		PM	40.8	D	41.1	D	0.4	0.004		
22	Bowers Avenue and Scott Boulevard	AM	60.0	E	60.6	E	0.5	-0.013		
	(CMP)	PM	48.8	D	49.3	D	0.8	0.004		
23	Bowers Avenue and Central Expressway	AM	**93.8**	**F**	**93.7**	**F**	**-0.1**	**-0.001**		
	(CMP)	PM	**129.6**	**F**	**129.7**	**F**	**0.3**	**0.003**		
24	Bowers Avenue and Kifer Road/Walsh Avenue	AM	39.2	D	38.8	D	-0.6	-0.005		
		PM	47.5	D	48.7	D	2.1	0.011		
25	Mission College Loop and Mission College Blvd	AM	12.6	B	12.4	B	-0.6	0.014		
		PM	**21.4**	**C**	**21.5**	**C**	**0.0**	**0.001**		

Table 15 (cont.)
Cumulative Intersection LOS without and with Greystar

			Cumulative (2040) Conditions							
			Freedom Circle (without Greystar)		Freedom Circle Buildout (including Greystar)				Freedom Circle Buildout (including Greystar) w/ Improv & 10% TDM	
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C	Avg Delay	LOS
26	Marriott Dwy and Mission College Blvd	AM	23.5	C	25.7	C	3.4	0.029		
		PM	26.1	C	25.8	C	0.3	0.016		
27	Freedom Circle W and Mission College Blvd	AM	**64.4**	**E**	**73.6**	**E**	**14.1**	**0.041**	49.5	D
		PM	**151.7**	**F**	**168.8**	**F**	**24.3**	**0.052**	36.0	D
28	Agnew/Freedom Circle E & Mission College Blvd	AM	40.8	D	45.1	D	6.7	0.056	33.6	C
		PM	**213.2**	**F**	**223.3**	**F**	**14.4**	**0.033**	**85.5**	**F**
29	Great America employee entrance and Agnew Rd	AM	4.7	A	4.7	A	0.1	0.004		
		PM	39.7	D	41.8	D	2.6	0.009		
30	Juliette Lane and Mission College Boulevard	AM	20.4	C	21.3	C	0.9	0.000		
		PM	22.6	C	22.2	C	0.0	0.001		
31	Burton Drive and Mission College Boulevard	AM	26.1	C	26.0	C	-0.1	-0.001		
		PM	18.8	B	18.7	B	0.0	0.000		
32	Mission College Blvd and Montague Expwy	AM	**135.7**	**F**	**140.8**	**F**	**7.4**	**0.023**		
	(CMP)	PM	**130.9**	**F**	**133.0**	**F**	**3.7**	**0.016**		
33	San Tomas Expressway and Scott Boulevard	AM	**152.7**	**F**	**156.3**	**F**	**6.7**	**0.004**		
	(CMP)	PM	69.1	E	69.8	E	1.3	0.002		
34	San Tomas Expressway and Monroe Street	AM	62.8	E	62.2	E	-1.3	-0.005		
	(CMP)	PM	54.9	D	54.8	D	-6.6	-0.102		
35	San Tomas Expressway and El Camino Real	AM	**103.8**	**F**	**102.4**	**F**	**-2.0**	**-0.004**		
	(CMP)	PM	**123.4**	**F**	**123.2**	**F**	**-0.3**	**-0.003**		
36	Convention Center and Tasman Drive	AM	13.4	B	13.4	B	0.1	0.004		
		PM	14.8	B	14.8	B	0.0	0.000		
37	Centennial Boulevard and Tasman Drive	AM	36.0	D	36.3	D	-2.8	-0.035		
		PM	42.0	D	42.1	D	0.9	0.005		
38	Calle Del Sol and Tasman Drive	AM	24.6	C	24.6	C	0.0	0.003		
		PM	19.8	B	19.8	B	0.0	0.001		
39	Lick Mill Boulevard and Tasman Drive	AM	**123.9**	**F**	**124.4**	**F**	**0.6**	**0.001**		
		PM	**97.2**	**F**	**98.0**	**F**	**0.5**	**0.001**		
40	Lafayette Street and Calle De Luna	AM	22.4	C	22.3	C	0.0	0.000		
		PM	25.6	C	25.6	C	0.1	0.002		
41	Lafayette Street and Agnew Road	AM	**61.9**	**E**	**63.7**	**E**	**3.0**	**0.008**		
		PM	**116.8**	**F**	**119.3**	**F**	**4.3**	**0.008**		
42	Scott Boulevard and Central Expressway	AM	79.5	E	79.7	E	0.4	0.003		
	(CMP)	PM	**114.4**	**F**	**116.4**	**F**	**1.8**	**0.004**		
43	Lafayette Street and Central Expressway	AM	57.7	E	57.7	E	0.3	0.004		
	(CMP)	PM	**83.0**	**F**	**82.9**	**F**	**-1.6**	**-0.001**		
44	De la Cruz Boulevard and Central Expressway	AM	**119.1**	**F**	**117.0**	**F**	**-2.6**	**-0.002**		
	(CMP)	PM	**231.6**	**F**	**232.8**	**F**	**1.4**	**0.003**		
45	Agnew Rd/De La Cruz Blvd and Montague Expwy	AM	**98.9**	**F**	**99.9**	**F**	**-0.2**	**-0.002**		
	(CMP)	PM	**136.9**	**F**	**138.1**	**F**	**1.2**	**0.003**		
46	Lick Mill Boulevard and Montague Expressway	AM	73.1	E	74.3	E	2.1	0.004		
		PM	**129.4**	**F**	**131.7**	**F**	**4.0**	**0.003**		
47	N. 1st Street and Montague Expressway	AM	**198.1**	**F**	**197.9**	**F**	**0.5**	**0.003**		
	(CMP)	PM	**145.6**	**F**	**147.0**	**F**	**1.3**	**0.003**		

Table 15 (cont.)
Cumulative Intersection LOS without and with Greystar

			Cumulative (2040) Conditions							
			Freedom Circle (without Greystar)		Freedom Circle Buildout (including Greystar)				Freedom Circle Buildout (including Greystar) w/ Improv & 10% TDM	
#	Intersection	Peak Hour	Avg Delay	LOS	Avg Delay	LOS	Incr. In Crit. Delay	Incr. In Crit. V/C	Avg Delay	LOS
48	Zanker Road and Montague Expressway	AM	**81.7**	**F**	**80.7**	**F**	**-1.5**	**-0.001**		
	(CMP)	PM	**65.3**	**E**	**64.7**	**E**	**-1.1**	**-0.003**		
49	Trimble Road and Montague Expressway	AM	40.7	D	41.1	D	-0.1	-0.001		
	(CMP)	PM	**155.7**	**F**	**156.7**	**F**	**1.0**	**0.000**		
50	McCarthy Blvd/O'Toole Av and Montague Expwy	AM	--	-- --	--	--	--	--		
	(CMP)	PM	--	-- --	--	--	--	--		
51	Lawrence Expressway and Kifer Road	AM	**193.9**	**F**	**194.2**	**F**	**0.0**	**-0.002**		
		PM	**217.4**	**F**	**219.4**	**F**	**2.8**	**0.005**		
52	Lawrence Expressway and Reed Ave/Monroe St	AM	**134.8**	**F**	**134.2**	**F**	**-1.1**	**-0.004**		
	(CMP)	PM	**85.4**	**F**	**86.4**	**F**	**3.0**	**0.009**		
53	Lawrence Expressway and Homestead Road	AM	55.6	E	55.6	E	0.1	0.000		
	(CMP)	PM	75.8	E	76.8	E	**2.1**	**0.009**		
54	Lawrence Expressway and Pruneridge Avenue	AM	**101.2**	**F**	**101.0**	**F**	**-0.5**	**-0.001**		
		PM	71.6	E	72.0	E	0.6	0.002		
55	Bowers Avenue and Monroe Street	AM	33.1	C	32.4	C	-1.0	-0.021		
		PM	36.9	D	37.1	D	0.0	0.001		
56	Bowers Ave/Kiely Boulevard and El Camino Real	AM	30.4	C	30.2	C	-0.3	-0.004		
	(CMP)	PM	33.7	C	34.0	C	0.5	0.006		
57	Kiely Boulevard and Benton Street	AM	48.7	D	42.0	D	-9.6	-0.093		
		PM	**66.3**	**E**	**68.3**	**E**	**3.2**	**0.009**		
58	Kiely Boulevard and Homestead Road	AM	51.9	D	43.6	D	-13.1	-0.078		
		PM	**83.7**	**F**	**83.7**	**F**	**0.0**	**0.000**		

Notes:
Bold indicates a substandard level of service.
Bold indicates an adverse effect caused by the project.
OVFL indicates that the result is out of software calculation limits.

Cumulative Plus Project Intersection Levels of Service Including Greystar

The following study intersections would operate at unacceptable levels of service under cumulative plus project conditions including Greystar.

1. Lawrence Expressway and Tasman Drive (PM peak hour)
2. Lawrence Expressway and Sandia Avenue/Lakehaven Drive (AM and PM peak hours)
5. Lawrence Expressway and E. Arques Avenue (PM peak hour)
6. Patrick Henry Drive and Tasman Drive (AM and PM peak hours)
7. Old Ironsides Drive and Tasman Drive (PM peak hour)
8. Old Ironsides Drive and Old Glory Lane (AM peak hour)
12. Great America Parkway and Great America Way (AM and PM peak hours)
16. Great America Parkway and Old Glory Lane (AM and PM peak hours)
17. Great America Parkway and Patrick Henry Drive (AM and PM peak hours)
18. Great America Parkway and Mission College Boulevard (AM and PM peak hours)
23. Bowers Avenue and Central Expressway (AM and PM peak hours)
27. Freedom Circle (W) and Mission College Boulevard (AM and PM peak hours)
28. Agnew Road/Freedom Circle (E) and Mission College Boulevard (PM peak hour)
32. Mission College Boulevard and Montague Expressway (AM and PM peak hours)
33. San Tomas Expressway and Scott Boulevard (AM peak hour)

35. San Tomas Expressway and El Camino Real (AM and PM peak hours)
39. Lick Mill Boulevard and Tasman Drive (AM and PM peak hours)
41. Lafayette Street and Agnew Road (AM and PM peak hours)
42. Scott Boulevard and Central Expressway (PM peak hour)
43. Lafayette Street and Central Expressway (PM peak hour)
44. De La Cruz Boulevard and Central Expressway (AM and PM peak hours)
45. Agnew Road/De La Cruz Boulevard and Montague Expressway (AM and PM peak hours)
46. Lick Mill Boulevard and Montague Expressway (PM peak hour)
47. N. 1st Street and Montague Expressway (AM and PM peak hours)
48. Zanker Road and Montague Expressway (AM and PM peak hours)
49. Trimble Road and Montague Expressway (PM peak hour)
51. Lawrence Expressway and Kifer Road (AM and PM peak hours)
52. Lawrence Expressway and Monroe Street (AM and PM peak hours)
54. Lawrence Expressway and Pruneridge Avenue (AM peak hour)
57. Kiely Boulevard and Benton Street (PM peak hour)
58. Kiely Boulevard and Homestead Road (PM peak hour)

The intersection level of service calculation sheets are included in Appendix C. The intersection levels of service under cumulative plus project conditions including Greystar were compared against cumulative no project conditions to identify the adverse effects attributable to the full buildout of the Freedom Circle Focus Area.

Compared to results under cumulative no project conditions, buildout of the Freedom Circle Focus Area would cause adverse effects at the following 26 intersections (see Table 14):

1. Lawrence Expressway and Tasman Drive (PM peak hour)
2. Lawrence Expressway and Sandia Avenue/Lakehaven Drive (AM and PM peak hours)
5. Lawrence Expressway and E. Arques Avenue (PM peak hour)
6. Patrick Henry Drive and Tasman Drive (AM peak hour)
7. Old Ironsides Drive and Tasman Drive (PM peak hour)
8. Old Ironsides Drive and Old Glory Lane (PM peak hour)
12. Great America Parkway and Great America Way (AM and PM peak hours)
16. Great America Parkway and Old Glory Lane (AM peak hour)
18. Great America Parkway and Mission College Boulevard (PM peak hour)
23. Bowers Avenue and Central Expressway (AM peak hour)
27. Freedom Circle (W) and Mission College Boulevard (AM and PM peak hours)
28. Agnew Road/Freedom Circle (E) and Mission College Boulevard (PM peak hour)
32. Mission College Boulevard and Montague Expressway (AM peak hour)
33. San Tomas Expressway and Scott Boulevard (AM peak hour)
39. Lick Mill Boulevard and Tasman Drive (AM and PM peak hours)
41. Lafayette Street and Agnew Road (AM and PM peak hours)
42. Scott Boulevard and Central Expressway (PM peak hour)
43. Lafayette Street and Central Expressway (PM peak hour)
44. De La Cruz Boulevard and Central Expressway (AM peak hour)
45. Agnew Road/De La Cruz Boulevard and Montague Expressway (PM peak hour)
46. Lick Mill Boulevard and Montague Expressway (PM peak hour)
47. N. 1st Street and Montague Expressway (AM and PM peak hours)
52. Lawrence Expressway and Monroe Street (AM peak hour)
54. Lawrence Expressway and Pruneridge Avenue (AM peak hour)
57. Kiely Boulevard and Benton Street (PM peak hour)
58. Kiely Boulevard and Homestead Road (PM peak hour)

The intersection levels of service under cumulative plus project conditions including Greystar were compared against cumulative plus project conditions without Greystar to identify adverse effects attributable to the development of the Greystar General Plan Amendment. Compared to the results under cumulative plus project conditions without Greystar, the Greystar General Plan Amendment would cause adverse effects at the following seven intersections: (see Table 15).

7. Old Ironsides Drive and Tasman Drive (PM peak hour)
8. Old Ironsides Drive and Old Glory Lane (AM peak hour)
17. Great America Parkway and Patrick Henry Drive (AM and PM peak hours)
18. Great America Parkway and Mission College Boulevard (AM and PM peak hours)
27. Freedom Circle (W) and Mission College Boulevard (AM and PM peak hours)
28. Agnew Road/Freedom Circle (E) and Mission College Boulevard (PM peak hour)
32. Mission College Boulevard and Montague Expressway (AM and PM peak hours)

The adverse effects and proposed improvements to alleviate the deficiencies for Greystar only and for Freedom Circle buildout are described below.

Adverse Effects and Recommended Improvements Solely for Greystar

This section discusses the adverse effects solely attributable to the development of the Greystar site under cumulative conditions and proposed improvements to address the deficiencies. It should be noted that adverse effects on intersection operations do not constitute significant impacts under CEQA.

The Greystar development will include TDM measures to achieve a 10 percent reduction in VMT per the City's Climate Action Plan. A sensitivity analysis was conducted to determine if a reduction in project vehicle trips due to TDM would avoid any of the adverse effects at study intersections.

7. Old Ironsides Drive and Tasman Drive

This City of Santa Clara intersection would operate at an unacceptable LOS E cumulative plus project conditions without Greystar during the PM peak hour. The development of the Greystar site would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by installing a second westbound left-turn lane and a second northbound right-turn lane. The addition of a second westbound left-turn lane is considered to be infeasible as it would require the acquisition of additional right of way on the northeast quadrant of the intersection. Furthermore, as described above, dual northbound right-turn lanes are not recommended because they would adversely affect cyclists and pedestrians and conflict with City policies.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. A sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would cause a decrease in critical v/c ratio such that the project would not be considered to have an adverse effect on intersection operations. Thus, TDM measures are expected to be sufficient to avoid the adverse effect without any physical improvements at this intersection.

8. Old Ironsides Drive and Old Glory Lane

This unsignalized intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative plus project conditions without Greystar during the AM and PM peak hours. The poor level of service is due to the trips associated with buildout of the Patrick Henry Specific Plan and the proposed Kylli mixed-use development, which would have access via the west leg at this intersection.

The development of the Greystar site would exacerbate the deficiency at this intersection. Furthermore, the intersection is expected to satisfy the peak-hour signal warrant. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by installing a traffic signal, adding a second southbound left-turn lane, a second eastbound through lane, an exclusive northbound right-turn lane, an exclusive eastbound right-turn lane, and an exclusive westbound left-turn lane. With the recommended improvements and a 10 percent TDM reduction, the intersection would continue to operate at an unacceptable LOS E or LOS F, however the delay would be less than that under cumulative plus project conditions without Greystar. Greystar should provide fair-share funding towards this improvement.

17. Great America Parkway and Patrick Henry Drive

This City of Santa Clara intersection would operate at an unacceptable LOS F under cumulative plus project conditions without Greystar during the AM and PM peak hours. The development of the Greystar site would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during both AM and PM peak hours. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by constructing a second northbound left-turn lane. While the intersection is expected to operate at an unacceptable LOS F during the AM and PM peak hours with the recommended dual northbound left-turn lanes and a 10 percent TDM reduction, the average delay would be less than under cumulative plus project without Greystar conditions. Thus, the recommended improvement plus TDM measures would be sufficient to fully offset the adverse effect on intersection operations. Greystar should provide fair-share funding towards this improvement.

18. Great America Parkway and Mission College Boulevard

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative plus project conditions without Greystar during the AM and PM peak hours. The development of the Greystar site would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the AM and PM peak hours. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Greystar site could reduce the vehicle trips associated with the development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction for Greystar would not be sufficient to avoid the adverse effect on intersection operations.

The adverse effect at this intersection could be lessened by converting Hichborn Drive from one-way (eastbound only) flow to two-way flow with a 60-foot right-of-way width, adding a traffic signal at Great America Parkway and Hichborn Drive to allow left and right in and out, and synchronizing the new signal with the traffic signal at Great America Parkway and Mission College Boulevard. In addition, the US 101 northbound off-ramp right turn to northbound Great America Parkway would be modified to reduce the curb radius to 50 feet. With the recommended improvements and a 10 percent TDM reduction, the intersection is expected to continue to operate an unacceptable LOS F during the AM and PM peak hours. However, the average delay would decrease compared to cumulative plus project conditions without Greystar. Thus, the recommended improvements plus TDM measures would be sufficient to fully offset the adverse effect on intersection operations. Greystar should provide fair-share funding towards the improvements at Great America Parkway and Hichborn Drive.

27. Freedom Circle (W) and Mission College Boulevard

This City of Santa Clara intersection would operate at an unacceptable LOS E and F under cumulative plus project conditions without Greystar during the AM and PM peak hours, respectively. The development of the Greystar site would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the AM and PM peak hours. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by adding an eastbound right-turn, removing the crosswalk on the eastbound leg, relocating bus stops to the east side of the intersection, restriping the northbound approach for one right-turn lane, one shared through/left-turn lane and one left-turn lane, and implementing split-phase signal control on the north and south legs. The construction of these improvements along with the planned Class IV separated bike lanes on Mission College Boulevard would require widening Mission College Boulevard and require the dedication of additional right of way on the east side of the intersection. The dedication is required to install a far side bus stop and near side bus stop in accordance with VTA Bus Stop and Passenger Facilities Standards. Intersection operations could be further improved by the proposed improvements at Great America Parkway and Hichborn Drive: converting Hichborn Drive from one-way (eastbound only) flow to two-way flow and adding a traffic signal at Great America Parkway and Hichborn Drive to allow left and right turns in and out. This roadway network change would provide another route out of the Freedom Circle Focus Area and thus reduce the northbound left-turn volume at the Freedom Circle W/Mission College Boulevard intersection. With the recommended improvements on the eastbound and northbound approaches, improvements at Great America Parkway and Hichborn Drive, and a 10 percent TDM reduction, the intersection is expected to operate an acceptable LOS D during both the AM and PM peak hours. Thus, the recommended improvements plus TDM measures would be sufficient to fully offset the adverse effect on intersection operations. Greystar should provide fair-share funding towards these improvements.

28. Agnew Road/Freedom Circle (E) and Mission College Boulevard

This City of Santa Clara intersection would operate at an unacceptable LOS F under cumulative plus project conditions without Greystar during the PM peak hour. The development of the Greystar site would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by adding a second eastbound left-turn lane and widening the northbound approach to include one left-turn lane, one through lane, and two right-turn lanes. The addition of a second lane on the north leg (Agnew Road) to receive the dual eastbound left-turn lanes would require the dedication of right of way from adjacent properties within the Freedom Circle Focus Area and/or narrowing the sidewalk and thus is considered to be infeasible. Furthermore, as described above, dual right-turn lanes are not recommended as they would adversely affect cyclists and pedestrians and conflict with City of Santa Clara policies. Thus, only the addition of a single northbound right-turn lane is recommended. While the intersection would continue to operate at LOS F during the PM peak hour with the recommended improvement on the northbound approach and a 10 percent TDM reduction, the average delay would be less than under cumulative plus project conditions without Greystar. Thus, the recommended improvement plus TDM measures would be sufficient to fully offset the adverse effect on intersection operations. Greystar should provide fair-share funding towards this improvement.

32. Mission College Boulevard and Montague Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative plus project conditions without Greystar during the AM peak hour. During the AM peak hour, the intersection's average critical movement delay would increase by more than 4.0 seconds and the critical v/c would increase by more the 0.010. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Greystar site could reduce the vehicle trips associated with the development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction for Greystar would not be sufficient to avoid the adverse effect on intersection operations.

Intersection operations could be improved by constructing a partial grade separation with a flyover from eastbound Montague Expressway to northbound Mission College Boulevard. This improvement was identified as part of the 2040 Expressway Plan. Greystar should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

Adverse Effects and Recommended Improvements for Focus Area Buildout

This section discusses the adverse effects associated with buildout of the Freedom Circle Focus Area under cumulative conditions and proposed improvements to address the deficiencies. It should be noted that adverse effects on intersection operations do not constitute significant impacts under CEQA.

The Freedom Circle Focus Area will include TDM measures to achieve a 10 percent reduction in VMT per the City's Climate Action Plan. A sensitivity analysis was conducted to determine if a reduction in project vehicle trips due to TDM would avoid any of the adverse effects at study intersections.

1. Lawrence Expressway and Tasman Drive

This CMP intersection in the City of Sunnyvale would operate at an unacceptable LOS F under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01. This constitutes an adverse effect on intersection operations.

Operation of the Lawrence/Tasman intersection could be improved by adding a westbound right-turn lane. However, this improvement is not feasible since it would require acquisition of additional right of way and result in a significant loss of parking on the adjacent commercial development. Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The County identified an improvement that would depress the light rail transit (LRT) line under this intersection as part of the 2040 Expressway Plan. Depressing the LRT would reduce delay for both trains and vehicle traffic. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

2. Lawrence Expressway and Sandia Avenue/Lakehaven Drive

This City of Sunnyvale intersection would operate at an unacceptable LOS F under cumulative no project conditions during the AM and PM peak hours. The buildout of the Freedom Circle Focus Area

would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the AM and PM peak hours. This constitutes an adverse effect on intersection operations.

As described in Chapter 4, improvements to the at-grade intersection are not feasible due to right of way constraints and impacts on adjacent properties. Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The Long-Range Transportation Plan for Santa Clara County (VTP2040) lists a project (VTP ID# R39) that would realign Wildwood Avenue to connect directly with Lawrence Expressway and create a new signalized intersection at Lawrence Expressway and Wildwood Avenue. This improvement would have a beneficial effect on traffic operations at the Lawrence/Sandia/Lakehaven intersection. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement.

5. Lawrence Expressway and E. Arques Avenue

This CMP intersection in the City of Sunnyvale would operate at an unacceptable LOS F under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by 17.1 seconds and the critical v/c to increase by 0.015 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

6. Patrick Henry Drive and Tasman Drive

This City of Santa Clara intersection is expected to operate at an unacceptable LOS E under cumulative no project conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the AM peak hour. This constitutes an adverse effect on intersection operations.

Vehicle delay at this intersection could be reduced by installing a second eastbound right-turn lane. However, as stated previously, dual right-turn lanes are not recommended because they would adversely affect cyclists and pedestrians and conflict with City policies.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The adverse effect at this intersection could be lessened by the construction of a Class IV separated bikeway on Great America Parkway. This improvement, which is identified in the City's *Bicycle Master Plan Update 2018*, would encourage cycling by adding a physical barrier between the existing bike lane and the vehicular travel lane, thereby increasing the comfort level for cyclists. Adjacent to the Focus Area, the bikeway improvement will be constructed as part of the Focus Area Plan. Beyond the Focus

Area (between Patrick Henry Drive and SR 237), Freedom Circle area stakeholders will pay a fair share fee for future construction of the bikeway on Great America Parkway.

7. Old Ironsides Drive and Tasman Drive

This City of Santa Clara intersection would operate at an acceptable LOS D under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to an unacceptable LOS E during the PM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by installing a second westbound left-turn lane and a second northbound right-turn lane. The addition of a second westbound left-turn lane is considered to be infeasible as it would require the acquisition of additional right of way on the northeast quadrant of the intersection. Furthermore, as described above, dual northbound right-turn lanes are not recommended because they would adversely affect cyclists and pedestrians and conflict with City policies. Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The adverse effect at this intersection could be lessened by the construction of a Class IV separated bikeway on Great America Parkway. This improvement is identified in the City's *Bicycle Master Plan Update 2018*. Adjacent to the Focus Area, the bikeway improvement will be constructed as part of the Focus Area Plan. Beyond the Focus Area (between Patrick Henry Drive and SR 237), Freedom Circle area stakeholders will pay a fair share fee for future construction of the bikeway on Great America Parkway.

Furthermore, the *Bicycle Master Plan* lists a spot improvement at this intersection that would tighten the curb radius on the northeast corner. The Freedom Circle Focus Area developments should provide fair-share funding towards these improvements.

8. Old Ironsides Drive and Old Glory Lane

This unsignalized intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative no project conditions during the AM and PM peak hours. The poor level of service is due to the trips associated with buildout of the Patrick Henry Specific Plan and the proposed Kylli mixed-use development, which would have access via the west leg at this intersection. The buildout of the Freedom Circle Focus Area would exacerbate the deficiency at this intersection. Furthermore, the intersection is expected to satisfy the peak-hour signal warrant. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by installing a traffic signal, adding a second southbound left-turn lane, a second eastbound through lane, an exclusive northbound right-turn lane, an exclusive eastbound right-turn lane, and an exclusive westbound left-turn lane. With the recommended improvements and a 10 percent TDM reduction, the intersection would continue to operate at an unacceptable LOS E or LOS F, however the delay would be less than that under cumulative no project conditions. The Freedom Circle Focus Area developments should provide fair-share funding towards these improvements.

12. Great America Parkway and Great America Way

This City of Santa Clara intersection would operate at an acceptable LOS D during the AM peak hour and an unacceptable LOS E during the PM peak hour under cumulative no project conditions. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to an unacceptable

LOS F during the AM peak hour and would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

Intersection operations could be improved by adding a northbound right-turn lane. This improvement is not considered feasible as it would require acquisition of additional right-of-way. Intersection operations could be improved by the construction of a Class IV separated bikeway on Great America Parkway. This multimodal improvement, which is identified in the City's *Bicycle Master Plan Update 2018*, would encourage residents and employees to leave their vehicles at home by adding a physical barrier between the existing bike lane and the vehicular travel lane, thereby increasing the comfort level for cyclists. Adjacent to the Focus Area, the bikeway improvement will be constructed as part of the Focus Area Plan. Beyond the Focus Area (between Patrick Henry Drive and SR 237), Freedom Circle area stakeholders will pay a fair share fee for future construction of the bikeway on Great America Parkway.

16. Great America Parkway and Old Glory Lane

This City of Santa Clara intersection would operate at an unacceptable LOS F under cumulative no project conditions during the AM peak hour. The buildout of the Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the AM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by adding a second northbound left-turn lane. With this improvement and a 10 percent TDM reduction, the intersection is expected to operate at an acceptable LOS D during the AM peak hour. During the PM peak hour, the intersection would continue to operate at LOS F, however the average delay would be less than that under cumulative no project conditions. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement.

18. Great America Parkway and Mission College Boulevard

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the PM peak hour. This constitutes an adverse effect on intersection operations.

As described above, intersection improvements are not feasible because it would require acquisition of additional right of way and negatively impact adjacent properties. Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The adverse effect at this intersection could be lessened by converting Hichborn Drive from one-way (eastbound only) flow to two-way flow with a 60-foot right-of-way width, adding a traffic signal at Great America Parkway and Hichborn Drive to allow left and right turns in and out, and synchronizing the new signal with the traffic signal at Great America Parkway and Mission College Boulevard. In addition, -the US 101 northbound off-ramp right turn to northbound Great America Parkway would be modified to

reduce the curb radius to 50 feet. With the recommended improvements and a 10 percent TDM reduction, the intersection is expected to continue to operate an unacceptable LOS F during the PM peak hour. However, the critical v/c would decrease compared to cumulative no project conditions. Thus, the recommended improvements plus TDM measures would be sufficient to fully offset the adverse effect on intersection operations. The cost of this improvement will be fully funded by Freedom Circle Focus Area developments.

23. Bowers Avenue and Central Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative no project conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the average critical movement delay to decrease while the critical v/c would increase by more than 0.01 during the AM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. A sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would cause a decrease in critical v/c ratio such that the project would not be considered to have an adverse effect on intersection operations. Thus, TDM measures are expected to be sufficient to avoid the adverse effect without any physical improvements at this intersection.

27. Freedom Circle (W) and Mission College Boulevard

This City of Santa Clara intersection would operate at an acceptable LOS B and C under cumulative no project conditions during the AM and PM peak hours, respectively. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to an unacceptable LOS E during the AM peak hour and to LOS F during the PM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by adding an eastbound right-turn lane, removing the crosswalk on the eastbound leg, relocating bus stops to the east side of the intersection, restriping the northbound approach for one right-turn lane, one shared through/left-turn lane and one left-turn lane, and implementing split-phase signal control on the north and south legs. The construction of these improvements along with the planned Class IV separated bike lanes on Mission College Boulevard would require widening Mission College Boulevard and require the dedication of additional right of way on the east side of the intersection. The dedication is required to install a far side bus stop and near side bus stop in accordance with VTA Bus Stop and Passenger Facilities Standards.

Intersection operations could be further improved by the proposed improvements at Great America Parkway and Hichborn Drive: converting Hichborn Drive from one-way (eastbound only) flow to two-way flow and adding a traffic signal at Great America Parkway and Hichborn Drive to allow left and right turns in and out. This roadway network change would provide another route out of the Freedom Circle Focus Area and thus reduce the northbound left-turn volume at the Freedom Circle W/Mission College Boulevard intersection. With the recommended improvements on the eastbound and northbound approaches, the improvements at Great America Parkway and Hichborn Drive, and a 10 percent TDM reduction, the intersection is expected to operate an acceptable LOS D during the AM and PM peak hours. Therefore, these improvements would be sufficient to avoid the adverse effect on intersection operations. The cost of these improvements will be fully funded by Freedom Circle Focus Area developments.

28. Agnew Road/Freedom Circle (E) and Mission College Boulevard

This City of Santa Clara intersection would operate at an acceptable LOS D under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to an unacceptable LOS F during the PM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by adding a second eastbound left-turn lane and widening the northbound approach to include one left-turn lane, one through lane, and two right-turn lanes. The addition of a second lane on the north leg (Agnew Road) to receive the dual eastbound left-turn lanes would require the dedication of right of way from adjacent properties within the Freedom Circle Focus Area and/or narrowing the sidewalk and thus is considered to be infeasible. Furthermore, as described above, dual right-turn lanes are not recommended as they would adversely affect cyclists and pedestrians and conflict with City of Santa Clara policies. Thus, only the addition of a single northbound right-turn lane is recommended. With the recommended improvement on the northbound approach and a 10 percent TDM reduction, the intersection would continue to operate at LOS E during the PM peak hour. Therefore, this improvement would not be sufficient to avoid the adverse effect on intersection operations. The cost of this improvement will be fully funded by Freedom Circle Focus Area developments.

Developments within the Freedom Circle Focus Area also will be responsible for the construction of a Class IV separated bikeway on Mission College Boulevard. This improvement, which is identified in the City's *Bicycle Master Plan Update 2018*, would encourage cycling by adding a physical barrier between the existing bike lane and the vehicular travel lane, thereby increasing the comfort level for cyclists. Within the Plan Area, the bikeway improvement will be constructed as part of the Focus Area Plan. Beyond the Focus Area, Freedom Circle Focus Area stakeholders will pay a fair share fee for future construction of the bikeway on Mission College Boulevard between the Mission College Loop and Great America Parkway and between San Tomas Aquino Creek and Montague Expressway.

32. Mission College Boulevard and Montague Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative no project conditions during the AM and PM peak hours. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to decrease while the critical v/c to increase by more the 0.010 during the AM and PM peak hours. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area. However, a sensitivity analysis shows that even a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. Intersection operations could be improved by constructing a partial grade separation with a flyover from eastbound Montague Expressway to northbound Mission College Boulevard. This improvement was identified as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

33. San Tomas Expressway and Scott Boulevard

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative no project conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to decrease while the critical v/c would increase by more than 0.01 during the AM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area. However, a sensitivity analysis shows that even a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the Comprehensive County Expressway Planning Study 2008 Update. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

39. Lick Mill Boulevard and Tasman Drive

This City of Santa Clara intersection would operate at an unacceptable LOS F and E under cumulative no project conditions during the AM and PM peak hours, respectively. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c would increase by more than 0.01 during the AM and PM peak hours. This constitutes an adverse effect on intersection operations.

Planned improvements associated with City Place that are assumed under cumulative no project conditions include reconfiguring the northbound and southbound approaches to two left-turn lanes, one through lane, and one right-turn lane. In addition, the signal phasing would be changed from split phase to protected left turns for the northbound and southbound approaches. Lastly, a second westbound left-turn lane is planned. Intersection operations could be further improved by converting the right-turn lane to a free right-turn lane. This improvement is not recommended because it would have an adverse effect on pedestrians and bicyclists. Implementation of TDM measures could reduce the vehicle trips associated with the Freedom Circle Focus Area. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The adverse effect at this intersection could be lessened by the construction of a Class IV separated bikeway on Lick Mill Boulevard, which is identified in the City's *Bicycle Master Plan Update 2018*. This multimodal improvement would add to the bicycle network in northern Santa Clara encouraging commuters and residents to cycle instead of traveling by motor vehicle. The Freedom Circle Focus Area developments should provide fair-share funding towards this multimodal improvement.

41. Lafayette Street and Agnew Road

This City of Santa Clara intersection would operate at an acceptable LOS D and an unacceptable LOS E under cumulative no project conditions during the AM and PM peak hours, respectively. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to an unacceptable LOS E during the AM peak hour. During the PM peak hour, the intersection would degrade to LOS F while the average critical delay would increase by more than 4.0 seconds and the critical v/c ratio would increase by more than 0.01. This constitutes an adverse effect on intersection operations.

Intersection operations under cumulative conditions could be improved by adding a southbound right-turn lane. However, the addition of a southbound right-turn lane is considered infeasible because it would require the acquisition of additional right of way. Implementation of TDM measures could reduce the vehicle trips associated with the Freedom Circle Focus Area. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The adverse effect at this intersection could be lessened by the construction of a Class IV separated bikeway on Lafayette Street. This multimodal improvement, which is identified in the City's *Bicycle Master Plan Update 2018*, would encourage residents and employees to bike to nearby destinations

including City Place. The Freedom Circle Focus Area developments should provide fair-share funding towards this multimodal improvement.

42. Scott Boulevard and Central Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicles trips associated with the Focus Area. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

43. Lafayette Street and Central Expressway

This CMP intersection in the City of Santa Clara would operate at an acceptable LOS F under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to decrease while the critical v/c would increase by more than 0.01. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicles trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

44. De La Cruz Boulevard and Central Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative no project conditions during the AM peak hour. The buildout of the Freedom Circle would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the AM peak hour. This constitutes an adverse effect on intersection operations.

The analysis of cumulative conditions at this intersection assumes the following planned improvements: a third southbound through lane and a second southbound right-turn lane; a second eastbound right-turn lane; a third northbound left-turn lane and removal of one northbound through lane. In addition, cumulative conditions include the planned conversion of the existing HOV lanes on Central Expressway to mixed-flow lanes. Further improvements are not considered feasible since it would require extensive widening to add additional through lanes on both roadways that would entail acquisition of additional right of way adversely affecting adjacent properties as well as reconstruction of the railroad bridge over Central Expressway just west of the intersection. Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The adverse effect at this intersection could be lessened by the construction of a Class IV separated bikeway on De La Cruz Boulevard. This improvement, which is identified in the City's *Bicycle Master Plan Update 2018*, would provide an important link for cyclists between the southern and northern portions of Santa Clara and connect to buffered bike lanes on Trimble Road in San José. This intersection is also included in the City of Santa Clara *Multimodal Improvement Plan* (MIP). MIP Actions intended to address the LOS deficiency at this intersection include installation of crosswalk motion sensors, accessible pedestrian signals, upgraded safety lighting, travel time data collection systems, traffic monitoring cameras, and periodic retiming of signal coordination at intersections along De La Cruz Boulevard. The Freedom Circle Focus Area developments should provide fair-share funding towards these multimodal improvements.

45. Agnew Road/De La Cruz Boulevard and Montague Expressway

This CMP intersection in the City of Santa Clara would operate at an unacceptable LOS F under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to decrease while the critical v/c to increase by more than 0.01 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Cumulative no project conditions assume the addition of a second northbound left-turn lane. Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The adverse effect at this intersection could be partially offset by the implementation of improvements listed in the City of Santa Clara *Multimodal Improvement Plan* (MIP). MIP Actions intended to address the LOS deficiency at this intersection include installation of crosswalk motion sensors, accessible pedestrian signals, upgraded safety lighting, travel time data collection systems, traffic monitoring cameras, and periodic retiming of signal coordination at intersections along Agnew Road and De La Cruz Boulevard. The Freedom Circle Focus Area developments should provide fair-share funding towards these multimodal improvements.

46. Lick Mill Boulevard and Montague Expressway

This City of Santa Clara intersection would operate at an unacceptable LOS F under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical delay to increase by more than 4.0 seconds and the critical v/c ratio to increase by more than 0.01 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Cumulative no project conditions assume the addition of a third southbound left-turn lane. Implementation of TDM measures within the Freedom Circle Focus Area could reduce the vehicle trips associated with the Focus Area development. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within the Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The adverse effect at this intersection could be lessened by the construction of a Class IV separated bikeway on Lick Mill Boulevard, which is identified in the City's *Bicycle Master Plan Update 2018*. This multimodal improvement would add to the bicycle network in northern Santa Clara encouraging commuters and residents to cycle instead of traveling by motor vehicle. The Freedom Circle Focus Area developments should provide fair-share funding towards this multimodal improvement.

47. N. 1st Street and Montague Expressway

This CMP intersection in the City of San José would operate at an unacceptable LOS F under cumulative no project conditions during the AM and PM peak hours. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the AM peak hour. During the PM peak hour, the buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to decrease while the critical v/c would increase by more than 0.01. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures could reduce the vehicle trips associated with the Freedom Circle Focus Area. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

52. Lawrence Expressway and Reed Avenue/Monroe Street

This CMP intersection in the City of Sunnyvale would operate at an unacceptable LOS F under cumulative no project conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the AM peak hour. During the PM peak hour, the buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to decrease while the critical v/c would increase by more than 0.01. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures could reduce the vehicle trips associated with the Freedom Circle Focus Area. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

54. Lawrence Expressway and Pruneridge Avenue

This City of Santa Clara intersection would operate at an unacceptable LOS F under cumulative no project conditions during the AM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the AM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures could reduce the vehicle trips associated with the Freedom Circle Focus Area. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The County identified the need for a grade-separated interchange at this location as part of the 2040 Expressway Plan. The Freedom Circle Focus Area developments should provide fair-share funding towards this improvement. The funds collected for this improvement are subject to programming by the County for Board approved improvement projects.

57. Kiely Boulevard and Benton Street

This City of Santa Clara intersection would operate at an unacceptable LOS E under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection's average critical movement delay to increase by more than 4.0 seconds and the critical v/c to increase by more than 0.01 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Implementation of TDM measures could reduce the vehicle trips associated with the Freedom Circle Focus Area. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within Focus Area would not be sufficient to avoid the adverse effect on intersection operations. The adverse effect at this intersection could be lessened by the construction of Class IIB buffered bike lanes on Benton Street, which is identified in the City's *Bicycle Master Plan Update 2018*. Furthermore, the *Pedestrian Master Plan 2019* recommends the construction of curb extensions as a spot improvement at this intersection. These multimodal improvements would encourage active transportation modes as an alternative to traveling by motor vehicle. The Freedom Circle Focus Area developments should provide fair-share funding towards these improvements.

58. Kiely Boulevard and Homestead Road

This City of Santa Clara intersection would operate at an unacceptable LOS E under cumulative no project conditions during the PM peak hour. The buildout of the Freedom Circle Focus Area would cause the intersection to degrade to LOS F while the intersection's average critical movement delay would increase by more than 4.0 seconds and the critical v/c would increase by more than 0.01 during the PM peak hour. This constitutes an adverse effect on intersection operations.

Intersection operations could be improved by adding an eastbound right-turn lane. However, this would require eliminating on-street parking, which would negatively affect adjacent properties. Thus, this improvement is not recommended. Implementation of TDM measures could reduce the vehicle trips associated with the Freedom Circle Focus Area. However, a sensitivity analysis shows that a 10 percent TDM trip reduction within Focus Area would not be sufficient to avoid the adverse effect on intersection operations.

The adverse effect at this intersection could be reduced by construction of Class IIB buffered bike lanes on Bowers Avenue from Chromite Drive to El Camino Real. This upgrade from the existing Class III bike route would increase the comfort level of cyclists along this key route through central Santa Clara. Furthermore, the *Pedestrian Master Plan 2019* identifies spot improvements at this intersection including reducing the curb radius, adding curb ramps, constructing transit waiting area improvements and public space activation/parklet. The Freedom Circle Focus Area developments should provide fair-share funding towards these multimodal improvements.

Summary of Cumulative Plus Project Conditions

A summary of the adverse effects associated with the Greystar General Plan Amendment and with buildout of the Freedom Circle Focus Area under cumulative conditions, the recommended improvements, and funding responsibilities are provided in Tables 16 and 17, respectively.

Table 16
Summary of Affected Intersections under Cumulative Plus Project Conditions - Greystar

#	Intersection	Jurisdiction	Recommended Improvements	Project Responsibility
7	Old Ironsides Drive and Tasman Drive	SC	TDM Measures with 10% Trip Reduction	100%
8	Old Ironsides Drive and Old Glory Lane *(Unsignalized)*	SC	Install a traffic signal and add a 2nd SB LT lane, a 2nd EB TH lane, a NB RT lane, an EB RT lane, and a WB LT lane	% of Total Traffic
17	Great America Parkway and Patrick Henry Drive	SC	Add a second northbound left-turn lane	% of Total Traffic
18	Great America Pkwy and Mission College Blvd *(CMP)*	SC	Convert Hichborn Drive from one-way (eastbound only) flow to two-way flow with a 60-feet right-of-way width, add a traffic signal at Great America Parkway and Hichborn Drive to allow left and right turns in and out, synchronize the new signal with the traffic signal at Great America Parkway and Mission College Boulevard, reduce the curb radius at the US 101 northbound off-ramp right turn to northbound Great America Parkway to 50 feet.	% of Total Traffic
27	Freedom Circle W and Mission College Blvd	SC	Add an eastbound right-turn lane; Remove west leg crosswalk; Relocate bus stops to the east side of the intersection; Restripe south leg with 1 left-turn, 1 left-turn/through, 1 right-turn lane; Make north leg and south leg split phase; Convert Hichborn Dr. to 2-way flow and add a signal at Great America Parkway.	% of Total Traffic
28	Agnew/Freedom Circle E & Mission College Blvd	SC	Add a northbound right-turn lane.	% of Total Traffic
32	Mission College Blvd and Montague Expwy *(CMP)*	SCC	Construct partial grade separation (2040 Expressway Plan)	% of Total Traffic

Notes:
SCC = Santa Clara County, SC = Santa Clara, SJ = San Jose, SV = Sunnyvale

Table 17
Summary of Affected Intersections under Cumulative Plus Project Conditions – Focus Area Buildout

#	Intersection	Jurisdiction	Recommended Improvements	Project Responsibility
1	Lawrence Expressway and Tasman Drive *(CMP)*	SCC	Depress LRT under the intersection (2040 Expressway Plan)	% of Total Traffic
2	Lawrence Expwy and Sandia Av/Lakehaven Dr	SCC	Same improvements as proposed under background conditions	% of Total Traffic
5	Lawrence Expressway and E. Arques Ave. *(CMP)*	SCC	Same improvements as proposed under background conditions	% of Total Traffic
6	Patrick Henry Drive and Tasman Drive	SC	Construct Class IV bikeway on Great America Parkway adjacent Plan Construct Class IV bikeway on Great America Parkway between SR 237 and Patrick Henry Drive (Bicycle Master Plan Update 2018)	100% % of Total Traffic
7	Old Ironsides Drive and Tasman Drive	SC	Construct Class IV bikeway on Great America Parkway adjacent Plan area Construct Class IV bikeway on Great America Parkway between SR 237 and Patrick Henry Drive (Bicycle Master Plan Update 2018) and tighten curb radius on NE corner (Bicycle Master Plan Update 2018)	100% % of Total Traffic % of Total Traffic
8	Old Ironsides Drive and Old Glory Lane *(Unsignalized)*	SC	Install a traffic signal and add a 2nd SB LT lane, a 2nd EB TH lane, a NB RT lane, an EB RT lane, and a WB LT lane	% of Total Traffic
12	Great America Parkway and Great America Way	SC	Construct Class IV bikeway on Great America Parkway adjacent Plan Construct Class IV bikeway on Great America Parkway between SR 237 and Patrick Henry Drive (Bicycle Master Plan Update 2018)	100% % of Total Traffic
16	Great America Parkway and Old Glory Lane	SC	Add a second northbound left-turn lane	% of Total Traffic
18	Great America Pkwy and Mission College Blvd (CMP)	SC	Same improvements as proposed under background conditions	100%
23	Bowers Avenue and Central Expressway (CMP)	SCC	TDM Measures with 10% Trip Reduction	100%
27	Freedom Circle W and Mission College Blvd	SC	Same improvements as proposed under background conditions	100%
28	Agnew/Freedom Circle E & Mission College Blvd	SC	Same improvement as proposed under background conditions and Construct Class IV bikeway on Mission College Boulevard within the Plan Area (Bicycle Master Plan Update 2018) Construct Class IV bikeway on Mission College Boulevard between the Mission College Loop and Great America Parkway and between San Tomas Aquino Creek and Montague Expressway.	100% % of Total Traffic

Table 17 (continued)
Summary of Affected Intersections under Cumulative Plus Project Conditions – Focus Area Buildout

#	Intersection	Jurisdiction	Recommended Improvements	Project Responsibility
32	Mission College Blvd and Montague Expwy *(CMP)*	SCC	Same improvements as proposed under background conditions	
33	San Tomas Expressway and Scott Boulevard *(CMP)*	SCC	Construct grade separated interchange (Comprehensive County Expressway Planning Study 2008 Update)	% of Total Traffic
39	Lick Mill Boulevard and Tasman Drive	SC	Construct a Class IV separated bikeway on Lick Mill Boulevard (Bicycle Master Plan Update 2018)	% of Total Traffic
41	Lafayette Street and Agnew Road	SC	Construct a Class IV separated bikeway on Lafayette Street (Bicycle Master Plan Update 2018)	% ot Total Traffic
42	Scott Boulevard and Central Expressway *(CMP)*	SCC	Same improvements as proposed under background conditions	
43	Lafayette Street and Central Expressway *(CMP)*	SCC	Same improvements as proposed under background conditions	
44	De la Cruz Boulevard and Central Expressway *(CMP)*	SCC	Construct Class IV separated bikeway on De La Cruz Boulevard (Bicycle Master Plan Update 2018) and implement measures identified in Multimodal Improvement Plan	% of Total Traffic
45	Agnew Rd/De La Cruz Blvd and Montague Expwy *(CMP)*	SCC	Same improvements as proposed under background conditions	
46	Lick Mill Boulevard and Montague Expressway	SCC	Construct Class IV separated bikeway on Lick Mill Boulevard (Bicycle Master Plan Update 2018)	% of Total Traffic
47	N. 1st Street and Montague Expressway *(CMP)*	SCC	Same improvements as proposed under background conditions	
52	Lawrence Expressway and Reed Ave/Monroe St *(CMP)*	SCC	Construct grade separated interchange (2040 Expressway Plan)	% of Total Traffic

Table 17 (continued)
Summary of Affected Intersections under Cumulative Plus Project Conditions – Focus Area Buildout

#	Intersection	Jurisdiction	Recommended Improvements	Project Responsibility
54	Lawrence Expressway and Pruneridge Avenue	SCC	Same improvements as proposed under background conditions	
57	Kiely Boulevard and Benton Street	SC	Construct Class IIB buffered bike lanes on Benton Street (Bicycle Master Plan Update 2018) and spot improvements including curb extensions (Pedestrian Master Plan 2019)	% of Total Traffic
58	Kiely Boulevard and Homestead Road	SC	Construct Class IIB buffered bike lanes on Bowers Avenue between Chromite Drive and El Camino Real (Bicycle Master Plan Update 2018) and spot improvements including reducing the curb radius, adding curb ramps, transit waiting area improvements and public space activation/parklet (Pedestrian Master Plan 2019)	% of Total Traffic

Notes:
SCC = Santa Clara County, SC = Santa Clara, SJ = San Jose, SV = Sunnyvale

6. Other Transportation Issues

This chapter presents other transportation issues associated with the project, including:

- Freeway segment traffic operations
- Freeway ramp traffic operations
- Vehicle queuing analysis
- Signal warrant analysis at unsignalized study intersections
- Site access and internal vehicular circulation within the Freedom Circle Focus Area
- Parking analysis
- Impacts on pedestrians, bicycles, and transit facilities

Unlike the level of service analysis, which is based on level of service standards adopted by the Cities of Santa Clara, Sunnyvale, and San José and the Valley Transportation Authority, many topics contained in this chapter are based on professional judgment in accordance with the standards and methods employed by the traffic engineering community. Although intersection level of service deficiencies identified in the previous chapters and operational issues described in this chapter are not considered CEQA impacts, they do describe traffic conditions that are relevant to describing the transportation environment with the proposed Freedom Circle Focus Area. In contrast, impacts on pedestrians, bicycle, and transit facilities were evaluated according to the CEQA checklist.

Freeway Segment Traffic Operations

Traffic volumes for the study freeway segments in Santa Clara County were obtained from the 2018 CMP Annual Monitoring Report. The existing levels of service for study freeway segments in San Mateo and Alameda Counties were obtained from the 2018 and 2019 CMP Monitoring Program Reports, respectively. The results show that the mixed-flow lanes and/or HOV lane(s) on the following study freeway segments currently operate at LOS F in at least one direction during at least one peak hour:

- US 101, northbound between Bernal Road and Silver Creek Valley Road (AM peak hour)
- US 101, northbound between Silver Creek Valley Road and Hellyer Avenue (AM peak hour)
- US 101, northbound between Hellyer Avenue and Yerba Buena Road (AM peak hour)
- US 101, northbound between Yerba Buena Road to Capitol Expressway (AM peak hour)
- US 101, northbound between Capitol Expressway to Tully Road (AM peak hour)
- US 101, northbound between Tully Road to Story Road (AM peak hour)
- US 101, northbound between Story Road to I-280 (AM peak hour)
- US 101, northbound between I-280 to Santa Clara Street (AM peak hour)

- US 101, northbound between Santa Clara Street to McKee Road (AM peak hour)
- US 101, northbound between McKee Road and Oakland Road (AM Peak Hour)
- US 101, northbound between Oakland Road and I-880 (AM Peak Hour)
- US 101, northbound between I-880 and Old Bayshore Highway (AM Peak Hour)
- US 101, northbound between Old Bayshore Highway and N. First Street (AM Peak Hour)
- US 101, northbound between N. First Street and Guadalupe Parkway (AM Peak Hour)
- US 101, northbound between Guadalupe Parkway and De La Cruz Boulevard (AM Peak Hour)
- US 101, northbound between De La Cruz Boulevard and Montague Expressway/San Tomas Expressway (AM Peak Hour)
- US 101, northbound between Montague Expressway/San Tomas Expressway and Bowers Avenue/Great America Parkway (AM Peak Hour)
- US 101, northbound between Bowers Avenue/Great America Parkway and Lawrence Expressway (AM Peak Hour)
- US 101, northbound between Lawrence Expressway and N. Fair Oaks Avenue (AM Peak Hour)
- US 101, northbound between N. Fair Oaks Avenue and N. Mathilda Avenue (AM Peak Hour)
- US 101, northbound between N. Mathilda Avenue and SR 237 (AM Peak Hour)
- US 101, northbound between SR 237 and Moffett Boulevard (AM Peak Hour)
- US 101, northbound between Moffett Boulevard and SR 85 (Both Peak Hours)
- US 101, northbound between SR 85 and to N. Shoreline Boulevard (Both Peak Hours)
- US 101, northbound between N. Shoreline Boulevard and Rengstorff Avenue (Both Peak Hours)
- US 101, northbound between Rengstorff Avenue and San Antonio Avenue (PM Peak Hour)
- US 101, northbound between San Antonio Avenue and Oregon Expressway (PM Peak Hour)
- US 101, northbound between Oregon Expressway and Embarcadero Road (Both Peak Hours)
- US 101, northbound between Santa Clara County Line and Whipple Avenue (Both Peak Hours)
- US 101, northbound between Whipple Avenue and SR 92 (Both Peak Hours)
- US 101, southbound between SR 92 and Whipple Avenue (Both Peak Hours)
- US 101, southbound between Whipple Avenue and Santa Clara County Line (Both Peak Hours)
- US 101, southbound between Embarcadero Road and Oregon Expressway (PM Peak Hour)
- US 101, southbound between Oregon Expressway and San Antonio Avenue (PM Peak Hour)
- US 101, southbound between San Antonio Avenue and Rengstorff Avenue (PM Peak Hour)
- US 101, southbound between Rengstorff Avenue and N. Shoreline Boulevard (PM Peak Hour)
- US 101, southbound between N. Shoreline Boulevard and SR 85 (PM Peak Hour)
- US 101, southbound between SR 85 and Moffett Boulevard (PM Peak Hour)
- US 101, southbound between Moffett Boulevard and SR 237 (PM Peak Hour)
- US 101, southbound between SR 237 and N. Mathilda Avenue (PM Peak Hour)
- US 101, southbound between N. Mathilda Avenue and N. Fair Oaks Avenue (PM Peak Hour)
- US 101, southbound between N. Fair Oaks Avenue and Lawrence Expressway (PM Peak Hour)
- US 101, southbound between Lawrence Expressway and Bowers Avenue/Great America Parkway (PM Peak Hour)
- US 101, southbound between Bowers Avenue/Great America Parkway and Montague Expressway/San Tomas Expressway (PM Peak Hour)
- US 101, southbound between Montague Expressway/San Tomas Expressway and De La Cruz Boulevard (PM Peak Hour)
- US 101, southbound between Guadalupe Parkway and N. First Street (PM Peak Hour)
- US 101, southbound between N. First Street and Old Bayshore Highway (PM Peak Hour)
- US 101, southbound between Old Bayshore Highway and I-880 (PM Peak Hour)
- US 101, southbound between I-880 and Oakland Road (PM Peak Hour)
- SR 237, eastbound between SR 85 and Central Parkway (AM Peak Hour)

- SR 237, eastbound between Maude Avenue and US 101 (PM Peak Hour)
- SR 237, eastbound between US 101 and Mathilda Avenue (PM Peak Hour)
- SR 237, eastbound between Mathilda Avenue and N. Fair Oaks Avenue (PM Peak Hour)
- SR 237, eastbound between N. Fair Oaks Avenue and Lawrence Expressway (PM Peak Hour)
- SR 237, eastbound between Lawrence Expressway and Great America (PM Peak Hour)
- SR 237, eastbound between Great America Parkway and N. First Street (PM Peak Hour)
- SR 237, eastbound between N. First Street and Zanker Road (PM Peak Hour)
- SR 237, westbound between I-880 and McCarthy Boulevard (AM Peak Hour)
- SR 237, westbound between McCarthy Boulevard and Zanker Road (AM Peak Hour)
- SR 237, westbound between Zanker Road and N. First Street (AM Peak Hour)
- SR 237, westbound between N. First Street and Great America Parkway (AM Peak Hour)
- SR 237, westbound between Great America Parkway and Lawrence Expressway (AM Peak Hour)
- SR 237, westbound between Lawrence Expressway and N. Fair Oaks Avenue (Both Peak Hours)
- SR 237, westbound between N. Fair Oaks Avenue and Mathilda Avenue (Both Peak Hours)
- SR 237, westbound between Mathilda Avenue and US 101 (PM Peak Hour)
- SR 237, westbound between US 101 and Maude Avenue (PM Peak Hour)
- SR 237, westbound between Maude Avenue and Central Parkway (PM Peak Hour)
- SR 237, westbound between Central Parkway and SR 85 (PM Peak Hour)
- SR 237, westbound between SR 85 and to El Camino Real (AM Peak Hour)
- SR 87, northbound between SR 85 and Capitol Expressway (AM Peak Hour)
- SR 87, northbound between Capitol Expressway and Curtner Avenue (AM Peak Hour)
- SR 87, northbound between Curtner Avenue and Almaden Road (AM Peak Hour)
- SR 87, northbound between I-280 and Julian Street (AM Peak Hour)
- SR 87, northbound between Julian Street and Coleman Avenue (AM Peak Hour)
- SR 87, northbound between Taylor Street and Skyport Drive (AM Peak Hour)
- SR 87, northbound between Skyport Drive and US 101 (AM Peak Hour)
- SR 87, southbound between US 101 and Skyport Drive (PM Peak Hour)
- SR 87, southbound between Skyport Drive and Taylor Street (PM Peak Hour)
- SR 87, southbound between Taylor Street and Coleman Street (PM Peak Hour)
- SR 87, southbound between Julian Street and I-280 (PM Peak Hour)
- SR 87, southbound between I-280 and Alma Avenue (PM Peak Hour)
- SR 87, southbound between Alma Avenue and Almaden Avenue (PM Peak Hour)
- I-680, northbound between Scott Creek Road and SR 262 (PM Peak Hour)
- I-680, northbound between SR 262 and Durham Road (PM Peak Hour)
- I-680, northbound between Durham Road and Washington Boulevard (PM Peak Hour)
- I-680, northbound between Washington Boulevard and SR 238 (PM Peak Hour)
- I-680, northbound between SR 238 and Vargas Road (PM Peak Hour)
- I-680, northbound between Vargas Road and Andrade Road (PM Peak Hour)
- I-680, southbound between Bernal Avenue and Sunol Boulevard (AM Peak Hour)
- I-680, southbound between Stoneridge Drive and Bernal Avenue (AM Peak Hour)
- I-680, southbound between Jacklin Road and Calaveras Boulevard/SR 237 (PM Peak Hour)
- I-680, southbound between Calaveras Boulevard/SR 237 and Yosemite Drive (PM Peak Hour)
- I-880, northbound between Dixon Landing Road to SR 262 (PM Peak Hour)
- I-880, northbound between Stevenson Boulevard and Decoto Road (PM Peak Hour)
- I-880, northbound between Decoto Road and Alvarado Boulevard (PM Peak Hour)
- I-880, southbound between Decoto Road and Stevenson Boulevard (AM Peak Hour)

- I-880, southbound between Alvarado Boulevard and Decoto Boulevard (AM Peak Hour)
- I-880, southbound between Great Mall Parkway and Montague Expressway (Both Peak Hours)
- I-880, southbound between SR 237 and Great Mall Parkway (PM Peak Hour)
- I-880, southbound between Dixon Landing and SR 237 (AM Peak Hour)

Per the CMP guidelines, the analysis of freeway segments with buildout of the Freedom Circle Focus Area was evaluated under existing (2018/2019) plus project conditions. As described previously, trips associated with buildout of the Freedom Circle Focus Area in the Year 2018 were estimated using ITE trip rates, a 25-percent pass-by trip reduction, and reductions for internalization and transit usage based on CSC model estimates. The gross project trips remain the same as described in Chapter 4.

After applying reductions for internal capture, transit use, and pass-by trips, the Freedom Circle Focus Area development is expected to generate 70,075 net daily vehicle trips, 7,132 (5,399 inbound and 1,733 outbound) net AM peak hour trips, and 7,427 (1,903 inbound and 5,524 outbound) net PM peak hour trips under existing conditions (See Table 18).

Table 18
Freedom Circle Focus Area Trip Generation Estimates (Year 2018)

			Daily			AM Peak Hour					PM Peak Hour				
							Trips					Trips			
Land Use	Size		Rate	Trips	Mode Share	Rate	In	Out	Total	Mode Share	Rate	In	Out	Total	Mode Share
Multifamily Housing (Mid-Rise)	3,600	Dwelling Units	5.44	19,584		0.36	337	959	1,296		0.44	966	618	1,584	
Total Residential Trips	*3,600*	*Dwelling Units*	*5.44*	*19,584*		*0.36*	*337*	*959*	*1,296*		*0.44*	*966*	*618*	*1,584*	
General Office Building	5,369,000	Square Feet	9.740	52,294		1.160	5,356	872	6,228		1.150	988	5,186	6,174	
Retail	2,000	Square Feet	37.75	76		0.94	1	1	2		3.81	4	4	8	
Hotel	750	Rooms	8.36	6,270		0.47	208	145	353		0.60	230	220	450	
Total Employment Trips	*5,371,750*	*Square Feet*	*10.916*	*58,640*			*5,565*	*1,018*	*6,583*			*1,222*	*5,410*	*6,632*	
Total Proposed Project Trips				**78,224**	**100.0%**		**5,902**	**1,977**	**7,879**	**100.0%**		**2,188**	**6,028**	**8,216**	**100.0%**
Less Internal Trips				(3,088)	3.9%		(68)	(68)	(136)	1.7%		(134)	(134)	(268)	3.3%
Residential				(1,544)	7.9%		(18)	(50)	(68)	5.2%		(82)	(52)	(134)	8.5%
Employment				(1,544)	2.6%		(50)	(18)	(68)	1.0%		(52)	(82)	(134)	2.0%
Less External Public Transit Trips				(5,044)	6.4%		(435)	(176)	(611)	7.8%		(150)	(369)	(519)	6.3%
Residential				(1,634)	8.3%		(36)	(103)	(139)	10.7%		(78)	(50)	(128)	8.1%
Employment				(3,410)	5.8%		(399)	(73)	(472)	7.2%		(72)	(319)	(391)	5.9%
Less Retail Passby Trips				*(17)*	0.0%		*0*	*0*	*0*	0.0%		*(1)*	*(1)*	*(2)*	0.0%
External Vehicle Trips				**70,075**	**89.6%**		**5,399**	**1,733**	**7,132**	**90.5%**		**1,903**	**5,524**	**7,427**	**90.4%**
Residential				16,406			283	806	1,089			806	516	1,322	
Employment				53,669			5,116	927	6,043			1,097	5,008	6,105	

Source: Trip rates from ITE *Trip Generation Manual, 10th Edition,* 2017. Internal and transit trip reductions derived from CSC travel demand model.

The freeway analysis results (see Tables 19, 20, and 21) reflect the net increase in freeway trips above that generated by the existing Focus Area uses. Due to the existing freeway congestion in the vicinity of the Freedom Circle Focus Area, the model shows that freeway traffic volumes would increase very little under existing plus project conditions compared to existing conditions. To ensure that the transportation analysis does not under report potential adverse effects on freeway segments, the freeway analysis was conducted based on the difference in the CSC model project trip assignment on each freeway segment for the proposed uses compared to the existing uses. Thus, the freeway analysis reflects the net increase in trips generated by buildout of the Focus Area without any subtraction for existing traffic that would divert to other roadways due to the project. At the same time, the model forecasts on local roadways presented in previous chapters include traffic that is expected to divert from the freeway due to the addition of project-generated traffic. Thus, the transportation analysis reflects a conservative, worst-case evaluation of the project's effects on both freeways and local streets.

The mixed-flow lanes on the following freeway segments would be adversely affected under existing plus project conditions due to the buildout of the Freedom Circle Focus Area:

- US 101, northbound between Santa Clara County Line and Whipple Avenue (PM Peak Hour)
- US 101, northbound between Whipple Avenue and SR 92 (PM Peak Hour)
- US 101, northbound between Bernal Road and Silver Creek Valley Road (AM peak hour)
- US 101, northbound between Silver Creek Valley Road and Hellyer Avenue (AM peak hour)
- US 101, northbound between Hellyer Avenue and Yerba Buena Road (AM peak hour)
- US 101, northbound between Yerba Buena Road to Capitol Expressway (AM peak hour)
- US 101, northbound between Capitol Expressway to Tully Road (AM peak hour)
- US 101, northbound between Tully Road to Story Road (AM peak hour)
- US 101, northbound between Story Road to I-280 (AM peak hour)
- US 101, northbound between I-280 to Santa Clara Street (AM peak hour)
- US 101, northbound between Santa Clara Street to McKee Road (AM peak hour)
- US 101, northbound between McKee Road and Oakland Road (AM Peak Hour)
- US 101, northbound between Oakland Road and I-880 (AM Peak Hour)
- US 101, northbound between I-880 and Old Bayshore Highway (AM Peak Hour)
- US 101, northbound between Old Bayshore Highway and N. First Street (AM Peak Hour)
- US 101, northbound between N. First Street and Guadalupe Parkway (AM Peak Hour)
- US 101, northbound between Guadalupe Parkway and De La Cruz Boulevard (AM Peak Hour)
- US 101, northbound between De La Cruz Boulevard and Montague Expressway/San Tomas Expressway (AM Peak Hour)
- US 101, northbound between Montague Expressway/San Tomas Expressway and Bowers Avenue/Great America Parkway (AM Peak Hour)
- US 101, northbound between Bowers Avenue/Great America Parkway and Lawrence Expressway (AM Peak Hour)
- US 101, northbound between Lawrence Expressway and N. Fair Oaks Avenue (AM Peak Hour)
- US 101, northbound between N. Fair Oaks Avenue and N. Mathilda Avenue (AM Peak Hour)
- US 101, northbound between SR 237 and Moffett Boulevard (AM Peak Hour)
- US 101, northbound between Moffett Boulevard and SR 85 (AM and PM Peak Hours)
- US 101, northbound between SR 85 and N. Shoreline Boulevard (AM and PM Peak Hour)
- US 101, northbound between N. Shoreline Boulevard and Rengstorff Avenue (PM Peak Hour)
- US 101, northbound between Rengstorff Avenue and San Antonio Avenue (PM Peak Hour)
- US 101, northbound between San Antonio Avenue and Oregon Expressway (PM Peak Hour)
- US 101, northbound between Oregon Expressway and Embarcadero Road (PM Peak Hour)
- US 101, southbound between SR 92 and Whipple Avenue (AM Peak Hour)
- US 101, southbound between Whipple Avenue and Santa Clara County Line (AM Peak Hour)

- US 101, southbound between N. Shoreline Boulevard and SR 85 (PM Peak Hour)
- US 101, southbound between SR 85 and Moffett Boulevard (PM Peak Hour)
- US 101, southbound between Moffett Boulevard and SR 237 (PM Peak Hour)
- US 101, southbound between SR 237 and N. Mathilda Avenue (PM Peak Hour)
- US 101, southbound between N. Mathilda Avenue and N. Fair Oaks Avenue (PM Peak Hour)
- US 101, southbound between N. Fair Oaks Avenue and Lawrence Expressway (PM Peak Hour)
- US 101, southbound between Lawrence Expressway and Bowers Avenue / Great American Parkway (PM Peak Hour)
- US 101, southbound between Bowers Avenue / Great American Parkway and Montague Expressway / San Tomas Expressway (PM Peak Hour)
- US 101, southbound between Montague Expressway / San Tomas Expressway and De La Cruz Boulevard (PM Peak Hour)
- US 101, southbound between Guadalupe Parkway and N. First Street (PM Peak Hour)
- US 101, southbound between N. First Street and Old Bayshore Highway (PM Peak Hour)
- US 101, southbound between Old Bayshore Highway and I-880 (PM Peak Hour)
- US 101, southbound between I-880 and Oakland Road (PM Peak Hour)
- US 101, southbound between Oakland Road and McKee Road (PM Peak Hour)
- SR 237, eastbound between SR 85 and Central Expressway (AM Peak Hour)
- SR 237, eastbound between Maude Avenue and US 101 (PM Peak Hour)
- SR 237, eastbound between Great America Parkway and N. First Street (PM Peak Hour)
- SR 237, eastbound between N. First Street and Zanker Road (PM Peak Hour)
- SR 237, westbound between I-880 and McCarthy Boulevard (AM Peak Hour)
- SR 237, westbound between McCarthy Boulevard and Zanker Road (AM Peak Hour)
- SR 237, westbound between Zanker Road and N. 1st Street (AM Peak Hour)
- SR 237, westbound between N. 1st Street and Great America Parkway (AM Peak Hour)
- SR 237, westbound between US 101 and Maude Avenue (PM Peak Hour)
- SR 237, westbound between Maude Avenue and Central Parkway (PM Peak Hour)
- SR 237, westbound between Central Parkway and SR 85 (PM Peak Hour)
- SR 237, westbound between SR 85 and El Camino Real (AM Peak Hour)
- SR 87, northbound between SR 85 and Capitol Expressway (AM Peak Hour)
- SR 87, northbound between Capitol Expressway and Curtner Avenue (AM Peak Hour)
- SR 87, northbound between Curtner Avenue and Almaden Road (AM Peak Hour)
- SR 87, northbound between Almaden Road and Alma Avenue (AM Peak Hour)
- SR 87, northbound between I-280 and Julian Street (AM Peak Hour)
- SR 87, northbound between Julian Street and Coleman Avenue (AM Peak Hour)
- SR 87, northbound between Taylor Street and Skyport Drive (AM Peak Hour)
- SR 87, northbound between Skyport Drive and US 101 (AM Peak Hour)
- SR 87, southbound between US 101 and Skyport Drive (PM Peak Hour)
- SR 87, southbound between Skyport Drive and Taylor Street (PM Peak Hour)
- SR 87, southbound between Taylor Street and Coleman Street (PM Peak Hour)
- SR 87, southbound between Julian Street and I-280 (PM Peak Hour)
- SR 87, southbound between I-280 and Alma Avenue (PM Peak Hour)
- SR 87, southbound between Alma Avenue and Almaden Avenue (PM Peak Hour)
- I-880, southbound between Great Mall Parkway and Montague Expressway (AM Peak Hour)
- I-880, southbound between Dixon Landing and SR 237 (AM Peak Hour)
- I 680, northbound between Scott Creek Road and SR 262 (PM Peak Hour)
- I 680, northbound between SR 262 and Durham Road (PM Peak Hour)
- I 680, northbound between Durham Road and Washington Boulevard (PM Peak Hour)

- I 680, northbound between Washington Boulevard and SR 238 (PM Peak Hour)
- I 680, northbound between SR 238 and Vargas Road (PM Peak Hour)
- I 680, northbound between Vargas Road and Andrade Road (PM Peak Hour)
- I 680, southbound between Bernal Avenue and Sunol Boulevard (AM Peak Hour)
- I 680, southbound between Stoneridge Drive and Bernal Avenue (AM Peak Hour)
- I-880, northbound between Dixon Landing and SR 262 (PM Peak Hour)

Furthermore, the buildout of the Freedom Circle Focus Area also would adversely affect 42 high occupancy vehicle (HOV) lane segments.

The VTA's Valley Transportation Plan (VTP) 2040 identifies freeway express lane projects along US 101 between Cochrane Road and Whipple Avenue. The planned conversion of the existing HOV lane to an express lane and the construction of a second express lane in each direction would increase the capacity of the freeway and help to address the deficiency in freeway operations to which the project would contribute. The Phase 3 portion of the Silicon Valley Express Lanes Project, which extends along US 101 from SR 237 to San Mateo County, is currently under construction and is anticipated to open in 2021. Phase 5, which will extend the US 101 express lanes south from SR 237 to I-880, is expected to be completed in 2025. The San Mateo 101 Express Lanes Project is currently under construction and is expected to be completed in 2022.

The Phase 2 portion of the Silicon Valley Express Lane Project, which extends along SR 237 from N. First Street to Mathilda Avenue, opened in November 2019. The level of service listed in the above table are taken from VTA's 2018 Congestion Management Program Monitoring Report, and thus do not reflect the newly opened express lane. Additional freeway improvements such as the addition of mixed-flow lanes are generally not feasible due to right of way constraints and secondary impacts associated with induced travel.

The Alameda County Transportation Commission (Alameda CTC), in cooperation with the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA), environmentally cleared the construction of an HOV/express lane on northbound I-680 from the SR 237 interchange in Santa Clara County to north of the SR 84 interchange in Alameda County. The project was split into two phases. Phase 1, which entailed the construction of nine miles of a HOV/continuous access express lane in the northbound direction on I-680 between SR 262 and SR 84 was completed in 2020. Additionally, the adjacent I-680 Southbound Express Lane is being upgraded to improve access. Tolling operations for both directions will begin in spring 2022. Phase 2 will construct five miles of HOV/express lane along the northbound direction on I-680 from SR-237 to Auto Mall Parkway through widening I-680 along with other necessary improvements, including structure widening/modification and retaining walls. Future development of Phase 2 will be performed in close coordination with the Santa Clara Valley Transportation Authority.

The Metropolitan Transportation Commission (MTC) completed the conversion of existing I-880 HOV lanes that run from Hegenberger Road to Dixon Landing Road in the southbound direction and from Dixon Landing Road to Lewelling Boulevard in the northbound direction to express lanes in 2020. The conversion involved lane striping and installing sign structures, signs, tolling equipment, traffic monitoring video cameras, a data communications network, lighting, median barrier replacement and CHP observation areas. The highway also was widened in three locations to accommodate merge lanes into and out of the future express lanes. The level of service listed in the above table are taken from the 2018 Congestion Management Program Monitoring Report, and thus do not reflect the newly opened HOV/express lanes on I-680 and I-880.

Table 19
Santa Clara County Freeway Segment Traffic Operations

			Existing Conditions								Existing + Project							
			Mixed-Flow				HOV Lane				Mixed-Flow				HOV Lane			
Freeway Segment	Dir	Peak Hour	# of Lanes[1]	Capacity[2]	Density	LOS[1]	# of Lanes[1]	Capacity[2]	Density	LOS[1]	Density	LOS	Project Trips	% of Capacity	Density	LOS	Project Trips	% of Capacity
US 101 SR 85 to Bernal Rd	NB	AM	3	6,900	35	D	1	1,650	25	C	35	D	66	1.0%	25	C	16	1.0%
		PM	3	6,900	21	C	1	1,650	25	C	21	C	10	0.1%	25	C	4	0.2%
US 101 Bernal Rd to Silver Creek Valley Rd	NB	AM	3	6,900	**60**	F	1	1,650	21	C	**61**	F	**78**	**1.1%**	21	C	16	1.0%
		PM	3	6,900	20	C	1	1,650	9	A	20	C	12	0.2%	9	A	4	0.2%
US 101 Silver Creek Valley Rd to Hellyer Ave	NB	AM	3	6,900	**120**	F	1	1,650	**92**	F	**123**	F	**80**	**1.2%**	**94**	F	25	**1.5%**
		PM	3	6,900	27	D	1	1,650	7	A	27	D	13	0.2%	7	A	6	0.4%
US 101 Hellyer Ave to Yerba Buena Rd	NB	AM	3	6,900	**111**	F	1	1,650	**72**	F	**114**	F	**82**	**1.2%**	**73**	F	25	**1.5%**
		PM	3	6,900	33	D	1	1,650	8	A	33	D	13	0.2%	8	A	6	0.4%
US 101 Yerba Buena Rd to Capitol Expwy	NB	AM	3	6,900	**101**	F	1	1,650	**63**	F	**103**	F	**78**	**1.1%**	**64**	F	25	**1.5%**
		PM	3	6,900	25	C	1	1,650	7	A	25	C	13	0.2%	7	A	6	0.4%
US 101 Capitol Expwy to Tully Rd	NB	AM	3	6,900	**80**	F	1	1,650	**60**	F	**82**	F	**129**	**1.9%**	**61**	F	34	**2.1%**
		PM	3	6,900	35	D	1	1,650	11	A	35	D	23	0.3%	11	B	7	0.4%
US 101 Tully Rd to Story Rd	NB	AM	3	6,900	**78**	F	1	1,650	**84**	F	**81**	F	**216**	**3.1%**	**87**	F	47	**2.8%**
		PM	3	6,900	22	C	1	1,650	8	A	22	C	34	0.5%	8	A	11	0.7%
US 101 Story Rd to I-280	NB	AM	3	6,900	**89**	F	1	1,650	**84**	F	**93**	F	**216**	**3.1%**	**87**	F	47	**2.8%**
		PM	3	6,900	15	B	1	1,650	7	A	15	B	34	0.5%	7	A	11	0.7%
US 101 I-280 to Santa Clara St	NB	AM	3	6,900	**120**	F	1	1,650	**122**	F	**129**	F	**240**	**3.5%**	**130**	F	70	**4.2%**
		PM	3	6,900	19	C	1	1,650	12	B	19	C	36	0.5%	12	B	16	1.0%
US 101 Santa Clara St to McKee Rd	NB	AM	3	6,900	**110**	F	1	1,650	**97**	F	**118**	F	**265**	**3.8%**	**103**	F	82	**5.0%**
		PM	3	6,900	21	C	1	1,650	10	A	21	C	39	0.6%	10	A	18	**1.1%**
US 101 McKee Rd to Oakland Rd	NB	AM	3	6,900	**112**	F	1	1,650	**87**	F	**123**	F	**351**	**5.1%**	**93**	F	101	**6.1%**
		PM	3	6,900	23	C	1	1,650	7	A	23	C	54	0.8%	7	A	24	**1.5%**
US 101 Oakland Rd to I-880	NB	AM	3	6,900	**107**	F	1	1,650	**100**	F	**117**	F	**354**	**5.1%**	**107**	F	101	**6.1%**
		PM	3	6,900	20	C	1	1,650	5	A	20	C	63	0.9%	5	A	24	**1.5%**
US 101 I-880 to Old Bayshore Hwy	NB	AM	3	6,900	**127**	F	1	1,650	**98**	F	**144**	F	**408**	**5.9%**	**105**	F	101	**6.1%**
		PM	3	6,900	16	B	1	1,650	12	B	16	B	82	1.2%	12	B	24	**1.5%**
US 101 Old Bayshore Hwy to N. First St	NB	AM	3	6,900	**122**	F	1	1,650	**108**	F	**139**	F	**443**	**6.4%**	**118**	F	119	**7.2%**
		PM	3	6,900	17	B	1	1,650	8	A	17	B	104	1.5%	9	A	36	**2.2%**
US 101 N. First St to Guadalupe Pkwy	NB	AM	3	6,900	**108**	F	1	1,650	**110**	F	**121**	F	**483**	**7.0%**	**122**	F	136	**8.2%**
		PM	3	6,900	14	B	1	1,650	9	A	14	B	105	1.5%	10	A	52	**3.2%**
US 101 Guadalupe Pkwy to De La Cruz Blvd	NB	AM	3	6,900	**127**	F	1	1,650	**107**	F	**146**	F	**444**	**6.4%**	**119**	F	136	**8.2%**
		PM	3	6,900	19	C	1	1,650	9	A	20	C	189	2.7%	10	A	52	**3.2%**
US 101 De La Cruz Blvd to Montague Expwy / San Tomas Expwy	NB	AM	3	6,900	**76**	F	1	1,650	**71**	F	**86**	F	**675**	**9.8%**	**71**	F	0	0.0%
		PM	3	6,900	24	C	1	1,650	11	A	25	C	278	4.0%	11	A	0	0.0%
US 101 Montague Expwy / San Tomas Expwy to Bowers Ave / Great America Pkwy	NB	AM	3	6,900	**97**	F	1	1,650	**86**	F	**102**	F	**203**	**2.9%**	**86**	F	0	0.0%
		PM	3	6,900	28	D	1	1,650	11	A	29	D	149	2.2%	11	A	0	0.0%
US 101 Bowers Ave / Great American Pkwy to Lawrence Expwy	NB	AM	3	6,900	**93**	F	1	1,650	**81**	F	**98**	F	**223**	**3.2%**	**81**	F	0	0.0%
		PM	3	6,900	29	D	1	1,650	16	B	33	D	818	11.9%	16	B	0	0.0%
US 101 Lawrence Expwy to N. Fair Oaks Ave	NB	AM	3	6,900	**84**	F	1	1,650	**73**	F	**87**	F	**156**	**2.3%**	**75**	F	54	**3.3%**
		PM	3	6,900	29	D	1	1,650	12	B	32	D	562	8.1%	14	B	107	**6.5%**
US 101 N. Fair Oaks Ave to N. Mathilda Ave	NB	AM	3	6,900	**60**	F	1	1,650	54	E	**62**	F	**153**	**2.2%**	56	E	54	**3.3%**
		PM	3	6,900	24	C	1	1,650	11	A	27	D	518	7.5%	13	B	107	**6.5%**
US 101 N. Mathilda Ave to SR 237	NB	AM	3	6,900	49	E	1	1,650	**71**	F	50	E	155	2.2%	**73**	F	40	**2.4%**
		PM	3	6,900	24	C	1	1,650	20	C	26	D	444	6.4%	21	C	98	**5.9%**
US 101 SR 237 to Moffett Blvd	NB	AM	3	6,900	**67**	F	1	1,650	**64**	F	**68**	F	**109**	**1.6%**	**65**	F	40	**2.4%**
		PM	3	6,900	53	E	1	1,650	33	D	56	E	318	4.6%	34	D	98	**5.9%**
US 101 Moffett Blvd to SR 85	NB	AM	3	6,900	**97**	F	1	1,650	**67**	F	**99**	F	**105**	**1.5%**	**68**	F	22	**1.3%**
		PM	3	6,900	**93**	F	1	1,650	36	D	**99**	F	**275**	**4.0%**	37	D	64	**3.9%**

Table 19 (Continued)
Santa Clara County Freeway Segment Traffic Operations

				Existing Conditions								Existing + Project							
				Mixed-Flow				HOV Lane				Mixed-Flow				HOV Lane			
Freeway	Segment	Dir	Peak Hour	# of Lanes[1]	Capacity[2]	Density	LOS[1]	# of Lanes[1]	Capacity[2]	Density	LOS[1]	Density	LOS	Project Trips	% of Capacity	Density	LOS	Project Trips	% of Capacity
US 101	SR 85 to N. Shoreline Blvd	NB	AM	4	9,200	75	F	1	1,650	34	D	76	F	99	1.1%	34	D	22	1.3%
			PM	4	9,200	68	F	1	1,650	34	D	71	F	284	3.1%	35	D	64	3.9%
US 101	N. Shoreline Blvd to Rengstorff Ave	NB	AM	3	6,900	70	F	2	3,300	34	D	71	F	50	0.7%	34	D	22	0.7%
			PM	3	6,900	112	F	2	3,300	18	B	117	F	158	2.3%	18	C	64	1.9%
US 101	Rengstorff Ave to San Antonio Ave	NB	AM	3	6,900	54	E	2	3,300	25	C	54	E	45	0.7%	25	C	22	0.7%
			PM	3	6,900	91	F	2	3,300	23	C	94	F	137	2.0%	23	C	64	1.9%
US 101	San Antonio Ave to Oregon Expwy	NB	AM	3	6,900	58	E	2	3,300	40	D	58	F	48	0.7%	32	D	17	0.5%
			PM	3	6,900	77	F	2	3,300	45	D	79	F	145	2.1%	36	D	47	1.4%
US 101	Oregon Expwy to Embarcadero Rd	NB	AM	3	6,900	68	F	1	1,650	72	F	69	F	43	0.6%	73	F	17	1.0%
			PM	3	6,900	61	F	1	1,650	66	F	63	F	149	2.2%	68	F	47	2.8%
US 101	Embarcadero Rd to Oregon Expwy	SB	AM	3	6,900	27	D	1	1,650	36	D	28	D	165	2.4%	37	D	39	2.4%
			PM	3	6,900	100	F	1	1,650	86	F	101	F	41	0.6%	87	F	15	0.9%
US 101	Oregon Expwy to San Antonio Ave	SB	AM	3	6,900	37	D	2	3,300	19	C	38	D	158	2.3%	16	B	39	1.2%
			PM	3	6,900	95	F	2	3,300	34	D	96	F	48	0.7%	27	D	15	0.5%
US 101	San Antonio Ave to Rengstorff Ave	SB	AM	3	6,900	50	E	2	3,300	19	C	51	E	154	2.2%	19	C	51	1.5%
			PM	3	6,900	92	F	2	3,300	20	C	93	F	47	0.7%	20	C	19	0.6%
US 101	Rengstorff Ave to N. Shoreline Blvd	SB	AM	3	6,900	38	D	2	3,300	22	C	39	D	172	2.5%	22	C	51	1.5%
			PM	3	6,900	66	F	2	3,300	25	C	67	F	57	0.8%	25	C	19	0.6%
US 101	N. Shoreline Blvd to SR 85	SB	AM	3	6,900	38	D	1	1,650	37	D	39	D	248	3.6%	38	D	51	3.1%
			PM	3	6,900	68	F	1	1,650	51	E	69	F	89	1.3%	51	E	19	1.2%
US 101	SR 85 to Moffett Blvd	SB	AM	3	6,900	31	D	1	1,650	17	B	32	D	269	3.9%	18	C	72	4.4%
			PM	3	6,900	95	F	1	1,650	84	F	97	F	103	1.5%	86	F	40	2.4%
US 101	Moffett Blvd to SR 237	SB	AM	3	6,900	44	D	1	1,650	31	D	46	E	334	4.8%	32	D	72	4.4%
			PM	3	6,900	76	F	1	1,650	57	E	78	F	114	1.7%	58	E	40	2.4%
US 101	SR 237 to N. Mathilda Ave	SB	AM	3	6,900	23	C	1	1,650	40	D	25	C	455	6.6%	41	D	72	4.4%
			PM	3	6,900	87	F	1	1,650	60	F	90	F	151	2.2%	61	F	40	2.4%
US 101	N. Mathilda Ave to N. Fair Oaks Ave	SB	AM	3	6,900	24	C	1	1,650	18	B	26	D	478	6.9%	19	C	71	4.3%
			PM	3	6,900	72	F	1	1,650	68	F	74	F	159	2.3%	69	F	42	2.5%
US 101	N. Fair Oaks Ave to Lawrence Expwy	SB	AM	3	6,900	28	D	1	1,650	17	B	31	D	579	8.4%	17	B	0	0.0%
			PM	3	6,900	92	F	1	1,650	106	F	96	F	201	2.9%	106	F	0	0.0%
US 101	Lawrence Expwy to Bowers Ave / Great American Pkwy	SB	AM	3	6,900	35	D	1	1,650	15	B	38	D	642	9.3%	15	B	0	0.0%
			PM	3	6,900	111	F	1	1,650	102	F	118	F	218	3.2%	102	F	0	0.0%
US 101	Bowers Ave / Great American Pkwy to Montague Expwy / San Tomas Expwy	SB	AM	3	6,900	21	C	1	1,650	14	B	22	C	97	1.4%	14	B	0	0.0%
			PM	3	6,900	108	F	1	1,650	109	F	114	F	199	2.9%	109	F	0	0.0%
US 101	Montague Expwy / San Tomas Expwy to De La Cruz Blvd	SB	AM	3	6,900	25	C	1	1,650	11	A	26	D	241	3.5%	12	B	63	3.8%
			PM	3	6,900	111	F	1	1,650	71	F	120	F	285	4.1%	76	F	147	8.9%
US 101	De La Cruz Blvd to Guadalupe Pkwy	SB	AM	3	6,900	25	C	1	1,650	6	A	26	C	196	2.8%	7	A	63	3.8%
			PM	3	6,900	52	E	1	1,650	36	D	56	E	433	6.3%	38	D	147	8.9%
US 101	Guadalupe Pkwy to N. First St	SB	AM	3	6,900	16	B	1	1,650	3	A	17	B	138	2.0%	4	A	41	2.5%
			PM	3	6,900	75	F	1	1,650	73	F	79	F	300	4.3%	77	F	116	7.0%
US 101	N. First St to Old Bayshore Hwy	SB	AM	3	6,900	13	B	1	1,650	2	A	13	B	96	1.4%	3	A	41	2.5%
			PM	3	6,900	160	F	1	1,650	108	F	175	F	261	3.8%	114	F	116	7.0%
US 101	Old Bayshore Hwy to I-880	SB	AM	3	6,900	18	B	1	1,650	6	A	18	B	11	0.2%	7	A	27	1.6%
			PM	3	6,900	136	F	1	1,650	90	F	152	F	280	4.1%	95	F	97	5.9%
US 101	I-880 to Oakland Rd	SB	AM	3	6,900	18	B	1	1,650	7	A	18	C	76	1.1%	7	A	27	1.6%
			PM	3	6,900	109	F	1	1,650	77	F	116	F	228	3.3%	80	F	97	5.9%
US 101	Oakland Rd to McKee Rd	SB	AM	3	6,900	16	B	1	1,650	4	A	16	B	72	1.0%	4	A	17	1.0%
			PM	3	6,900	56	E	1	1,650	36	D	58	F	235	3.4%	37	D	78	4.7%

Table 19 (Continued)
Santa Clara County Freeway Segment Traffic Operations

			Existing Conditions								Existing + Project							
			Mixed-Flow				HOV Lane				Mixed-Flow				HOV Lane			
Freeway Segment	Dir	Peak Hour	# of Lanes[1]	Capacity[2]	Density	LOS[1]	# of Lanes[1]	Capacity[2]	Density	LOS[1]	Density	LOS	Project Trips	% of Capacity	Density	LOS	Project Trips	% of Capacity
US 101 McKee Rd to Santa Clara St	SB	AM	3	6,900	19	C	1	1,650	10	A	19	C	51	0.7%	10	A	17	**1.0%**
		PM	3	6,900	52	E	1	1,650	46	D	54	E	191	2.8%	48	E	78	**4.7%**
US 101 Santa Clara St to I-280	SB	AM	3	6,900	16	B	1	1,650	4	A	16	B	44	0.6%	4	A	16	1.0%
		PM	3	6,900	53	E	1	1,650	38	D	55	E	172	2.5%	39	D	70	**4.2%**
US 101 I-280 to Story Rd	SB	AM	3	6,900	14	B	1	1,650	5	A	14	B	31	0.4%	5	A	11	0.7%
		PM	3	6,900	31	D	1	1,650	34	D	32	D	140	2.0%	35	D	45	**2.7%**
US 101 Story Rd to Tully Rd	SB	AM	3	6,900	19	C	1	1,650	4	A	19	C	27	0.4%	4	A	11	0.7%
		PM	3	6,900	42	D	1	1,650	28	D	43	D	125	1.8%	29	D	45	**2.7%**
US 101 Tully Rd to Capitol Expwy	SB	AM	3	6,900	20	C	1	1,650	7	A	20	C	26	0.4%	7	A	10	0.6%
		PM	3	6,900	38	D	1	1,650	21	C	39	D	99	1.4%	22	C	40	**2.4%**
US 101 Capitol Expwy to Yerba Buena Rd	SB	AM	3	6,900	21	C	1	1,650	7	A	21	C	25	0.4%	7	A	10	0.6%
		PM	3	6,900	24	C	1	1,650	20	C	25	C	103	1.5%	21	C	40	**2.4%**
US 101 Yerba Buena Rd to Hellyer Ave	SB	AM	3	6,900	28	D	1	1,650	7	A	28	D	17	0.2%	7	A	8	0.5%
		PM	3	6,900	36	D	1	1,650	16	B	36	D	78	1.1%	16	B	24	**1.5%**
US 101 Hellyer Ave to Silver Creek Valley Rd	SB	AM	3	6,900	22	C	1	1,650	7	A	22	C	18	0.3%	7	A	5	0.3%
		PM	3	6,900	29	D	1	1,650	21	C	29	D	84	1.2%	21	C	15	0.9%
US 101 Silver Creek Valley Rd to Bernal Rd	SB	AM	3	6,900	13	B	1	1,650	8	A	13	B	14	0.2%	8	A	5	0.3%
		PM	3	6,900	19	C	1	1,650	12	B	19	C	66	1.0%	12	B	15	0.9%
US 101 Bernal Rd to SR 85	SB	AM	3	6,900	15	B	1	1,650	5	A	15	B	11	0.2%	5	A	5	0.3%
		PM	3	6,900	35	D	1	1,650	22	C	35	D	53	0.8%	22	C	15	0.9%
SR 237 El Camino Real to SR 85	EB	AM	2	4,400	44	D	0	--	--	--	45	D	114	2.6%	--	--	-	-
		PM	2	4,400	19	C	0	--	--	--	19	C	44	1.0%	--	--	-	-
SR 237 SR 85 to Central Pkwy	EB	AM	2	4,400	**73**	**F**	0	--	--	--	**76**	**F**	**128**	**2.9%**	--	--	-	-
		PM	2	4,400	25	C	0	--	--	--	25	C	53	1.2%	--	--	-	-
SR 237 Central Pkwy to Maude Ave	EB	AM	2	4,400	51	E	0	--	--	--	53	E	144	3.3%	--	--	-	-
		PM	2	4,400	33	D	0	--	--	--	33	D	57	1.3%	--	--	-	-
SR 237 Maude Ave to US 101	EB	AM	2	4,400	23	C	0	--	--	--	24	C	120	2.7%	--	--	-	-
		PM	2	4,400	**99**	**F**	0	--	--	--	**101**	**F**	**56**	**1.3%**	--	--	-	-
SR 237 US 101 to Mathilda Ave	EB	AM	2	4,400	40	D	0	--	--	--	40	D	25	0.6%	--	--	-	-
		PM	2	4,400	**121**	**F**	0	--	--	--	**122**	**F**	**24**	**0.5%**	--	--	-	-
SR 237 Mathilda Ave to N. Fair Oaks Ave	EB	AM	2	4,400	33	D	1	1,650	12	B	33	D	2	0.0%	13	B	51	**3.1%**
		PM	2	4,400	**100**	**F**	1	1,650	**96**	**F**	**101**	**F**	**24**	**0.5%**	**97**	**F**	23	**1.4%**
SR 237 N. Fair Oaks Ave to Lawrence Expwy	EB	AM	2	4,400	33	D	1	1,650	19	C	33	D	2	0.0%	20	C	51	**3.1%**
		PM	2	4,400	**115**	**F**	1	1,650	**62**	**F**	**116**	**F**	**24**	**0.5%**	**63**	**F**	23	**1.4%**
SR 237 Lawrence Expwy to Great America Pkwy	EB	AM	2	4,400	32	D	1	1,650	18	B	32	D	0	0.0%	20	C	119	**7.2%**
		PM	2	4,400	**101**	**F**	1	1,650	**69**	**F**	**101**	**F**	**0**	**0.0%**	**70**	**F**	23	**1.4%**
SR 237 Great America Pkwy to N. First St	EB	AM	2	4,400	32	D	1	1,650	21	C	33	D	104	2.4%	21	C	0	0.0%
		PM	2	4,400	**106**	**F**	1	1,650	**64**	**F**	**117**	**F**	**251**	**5.7%**	**64**	**F**	0	0.0%
SR 237 N. First St to Zanker Rd	EB	AM	2	4,400	45	D	1	1,650	15	B	46	D	83	1.9%	15	B	21	**1.3%**
		PM	2	4,400	**72**	**F**	1	1,650	47	E	**76**	**F**	**188**	**4.3%**	48	E	64	**3.9%**
SR 237 Zanker Rd to McCarthy Blvd	EB	AM	2	4,400	28	D	1	1,650	15	B	28	D	69	1.6%	15	B	21	**1.3%**
		PM	2	4,400	42	D	1	1,650	28	D	44	D	179	4.1%	29	D	64	**3.9%**
SR 237 McCarthy Blvd to I-880	EB	AM	2	4,400	21	C	1	1,650	7	A	22	C	56	1.3%	7	A	21	**1.3%**
		PM	2	4,400	20	C	1	1,650	38	D	22	C	148	3.4%	39	D	64	**3.9%**
SR 237 I-880 to McCarthy Blvd	WB	AM	2	4,400	**113**	**F**	1	1,650	**65**	**F**	**120**	**F**	**141**	**3.2%**	**67**	**F**	66	**4.0%**
		PM	2	4,400	20	C	1	1,650	9	A	20	C	37	0.8%	9	A	0	0.0%
SR 237 McCarthy Blvd to Zanker Rd	WB	AM	2	4,400	**115**	**F**	1	1,650	**74**	**F**	**148**	**F**	**199**	**4.5%**	**77**	**F**	66	**4.0%**
		PM	2	4,400	32	D	1	1,650	17	B	39	D	59	1.3%	17	B	0	0.0%

Table 19 (Continued)
Santa Clara County Freeway Segment Traffic Operations

				Existing Conditions								Existing + Project							
				Mixed-Flow				HOV Lane				Mixed-Flow				HOV Lane			
Freeway	Segment	Dir	Peak Hour	# of Lanes[1]	Capacity[2]	Density	LOS[1]	# of Lanes[1]	Capacity[2]	Density	LOS[1]	Density	LOS	Project Trips	% of Capacity	Density	LOS	Project Trips	% of Capacity
SR 237	Zanker Rd to N. 1st St	WB	AM	2	4,400	**98**	**F**	1	1,650	**70**	**F**	**105**	**F**	**199**	**4.5%**	**73**	**F**	66	**4.0%**
			PM	2	4,400	45	D	1	1,650	11	A	46	D	61	1.4%	11	A	0	0.0%
SR 237	N. 1st St to Great America Pkwy	WB	AM	2	4,400	**92**	**F**	1	1,650	**84**	**F**	**98**	**F**	**196**	**4.5%**	**88**	**F**	66	**4.0%**
			PM	2	4,400	38	D	1	1,650	14	B	39	D	61	1.4%	14	B	0	0.0%
SR 237	Great America Pkwy to Lawrence Expwy	WB	AM	2	4,400	**103**	**F**	1	1,650	**82**	**F**	**103**	**F**	**0**	**0.0%**	**86**	**F**	77	**4.7%**
			PM	2	4,400	27	D	1	1,650	15	B	27	D	12	0.3%	16	B	59	**3.6%**
SR 237	Lawrence Expwy to N. Fair Oaks Ave	WB	AM	2	4,400	**95**	**F**	1	1,650	**93**	**F**	**96**	**F**	**38**	**0.9%**	**94**	**F**	7	0.4%
			PM	2	4,400	**61**	**F**	1	1,650	38	D	**61**	**F**	**15**	**0.3%**	39	D	49	**3.0%**
SR 237	N. Fair Oaks Ave to Mathilda Ave	WB	AM	3	6,900	**89**	**F**	0	--	--	--	**90**	**F**	**38**	**0.6%**	--	--	--	--
			PM	3	6,900	**84**	**F**	0	--	--	--	**84**	**F**	**15**	**0.2%**	--	--	--	--
SR 237	Mathilda Ave to US 101	WB	AM	2	4,400	51	E	0	--	--	--	51	E	31	0.7%	--	--	--	--
			PM	2	4,400	**82**	**F**	0	--	--	--	**82**	**F**	**13**	**0.3%**	--	--	--	--
SR 237	US 101 to Maude Ave	WB	AM	2	4,400	36	D	0	--	--	--	37	D	72	1.6%	--	--	--	--
			PM	2	4,400	**95**	**F**	0	--	--	--	**100**	**F**	**141**	**3.2%**	--	--	--	--
SR 237	Maude Ave to Central Pkwy	WB	AM	2	4,400	39	D	0	--	--	--	40	D	61	1.4%	--	--	--	--
			PM	2	4,400	**77**	**F**	0	--	--	--	**80**	**F**	**130**	**3.0%**	--	--	--	--
SR 237	Central Pkwy to SR 85	WB	AM	2	4,400	28	D	0	--	--	--	28	D	49	1.1%	--	--	--	--
			PM	2	4,400	**64**	**F**	0	--	--	--	**66**	**F**	**110**	**2.5%**	--	--	--	--
SR 237	SR 85 to El Camino Real	WB	AM	2	4,400	**65**	**F**	0	--	--	--	**66**	**F**	**42**	**1.0%**	--	--	--	--
			PM	2	4,400	43	D	0	--	--	--	44	D	108	2.5%	--	--	--	--
SR 87	SR 85 to Capitol Expwy	NB	AM	2	4,400	**95**	**F**	1	1,650	**137**	**F**	**98**	**F**	**81**	**1.8%**	**141**	**F**	17	**1.0%**
			PM	2	4,400	18	B	1	1,650	12	B	18	C	15	0.3%	12	B	7	0.4%
SR 87	Capitol Expwy to Curtner Ave	NB	AM	2	4,400	**113**	**F**	1	1,650	**100**	**F**	**118**	**F**	**106**	**2.4%**	**102**	**F**	22	**1.3%**
			PM	2	4,400	29	D	1	1,650	10	A	29	D	18	0.4%	10	A	8	0.5%
SR 87	Curtner Ave to Almaden Rd	NB	AM	2	4,400	**108**	**F**	1	1,650	**80**	**F**	**113**	**F**	**112**	**2.5%**	**81**	**F**	28	**1.7%**
			PM	2	4,400	31	D	1	1,650	20	C	31	D	21	0.5%	20	C	9	0.5%
SR 87	Almaden Rd to Alma Ave	NB	AM	2	4,400	58	E	1	1,650	49	E	**60**	**F**	**144**	**3.3%**	50	E	32	**1.9%**
			PM	2	4,400	46	D	1	1,650	17	B	46	E	25	0.6%	17	B	11	0.7%
SR 87	Alma Ave to I-280	NB	AM	2	4,400	35	D	1	1,650	27	D	36	D	124	2.8%	28	D	34	**2.1%**
			PM	2	4,400	42	D	1	1,650	15	B	42	D	29	0.7%	15	B	12	0.7%
SR 87	I-280 to Julian St	NB	AM	2	4,400	**93**	**F**	1	1,650	**72**	**F**	**98**	**F**	**151**	**3.4%**	**73**	**F**	36	**2.2%**
			PM	2	4,400	15	B	1	1,650	11	A	15	B	29	0.7%	11	B	12	0.7%
SR 87	Julian St to Coleman Ave	NB	AM	2	4,400	**102**	**F**	1	1,650	**63**	**F**	**108**	**F**	**149**	**3.4%**	**65**	**F**	52	**3.2%**
			PM	2	4,400	34	D	1	1,650	13	B	35	D	62	1.4%	13	B	24	**1.5%**
SR 87	Coleman St to Taylor St	NB	AM	2	4,400	51	E	1	1,650	46	D	53	E	146	3.3%	47	E	53	**3.2%**
			PM	2	4,400	21	C	1	1,650	7	A	22	C	62	1.4%	7	A	25	**1.5%**
SR 87	Taylor St to Skyport Dr	NB	AM	2	4,400	**62**	**F**	1	1,650	36	D	**65**	**F**	**186**	**4.2%**	37	D	56	**3.4%**
			PM	2	4,400	17	B	1	1,650	4	A	18	B	76	1.7%	4	A	28	**1.7%**
SR 87	Skyport Dr to US 101	NB	AM	2	4,400	**128**	**F**	1	1,650	**102**	**F**	**140**	**F**	**193**	**4.4%**	**107**	**F**	56	**3.4%**
			PM	2	4,400	25	C	1	1,650	8	A	26	C	85	1.9%	8	A	28	**1.7%**
SR 87	US 101 to Skyport Dr	SB	AM	2	4,400	21	C	1	1,650	8	A	22	C	82	1.9%	8	A	26	**1.6%**
			PM	2	4,400	**100**	**F**	1	1,650	36	D	**105**	**F**	**135**	**3.1%**	37	D	63	**3.8%**
SR 87	Skyport Dr to Taylor St	SB	AM	2	4,400	23	C	1	1,650	4	A	24	C	67	1.5%	4	A	24	**1.5%**
			PM	2	4,400	**100**	**F**	1	1,650	28	D	**105**	**F**	**130**	**3.0%**	29	D	62	**3.8%**
SR 87	Taylor St to Coleman St	SB	AM	2	4,400	23	C	1	1,650	6	A	23	C	59	1.3%	6	A	22	**1.3%**
			PM	2	4,400	**94**	**F**	1	1,650	36	D	**97**	**F**	**103**	**2.3%**	37	D	57	**3.5%**
SR 87	Coleman Ave to Julian St	SB	AM	2	4,400	30	D	1	1,650	7	A	30	D	59	1.3%	7	A	22	**1.3%**
			PM	2	4,400	55	E	1	1,650	28	D	56	E	100	2.3%	29	D	57	**3.5%**

Table 19 (Continued)
Santa Clara County Freeway Segment Traffic Operations

				Existing Conditions								Existing + Project							
				Mixed-Flow				HOV Lane				Mixed-Flow				HOV Lane			
Freeway	Segment	Dir	Peak Hour	# of Lanes[1]	Capacity[2]	Density	LOS[1]	# of Lanes[1]	Capacity[2]	Density	LOS[1]	Density	LOS	Project Trips	% of Capacity	Density	LOS	Project Trips	% of Capacity
SR 87	Julian St to I-280	SB	AM	2	4,400	14	B	1	1,650	6	A	14	B	35	0.8%	6	A	14	0.8%
			PM	2	4,400	**69**	**F**	1	1,650	36	D	**71**	**F**	**81**	**1.8%**	36	D	33	**2.0%**
SR 87	I-280 to Alma Ave	SB	AM	2	4,400	15	B	1	1,650	8	A	15	B	26	0.6%	8	A	11	0.7%
			PM	2	4,400	**82**	**F**	1	1,650	54	E	**84**	**F**	**62**	**1.4%**	55	E	29	**1.8%**
SR 87	Alma Ave to Almaden Ave	SB	AM	2	4,400	27	D	1	1,650	6	A	27	D	23	0.5%	6	A	10	0.6%
			PM	2	4,400	**81**	**F**	1	1,650	47	E	**83**	**F**	**78**	**1.8%**	48	E	28	**1.7%**
SR 87	Almaden Ave to Curtner Ave	SB	AM	2	4,400	20	C	1	1,650	8	A	20	C	19	0.4%	8	A	8	0.5%
			PM	2	4,400	48	E	1	1,650	35	D	49	E	75	1.7%	35	D	25	**1.5%**
SR 87	Curtner Ave to Capitol Expwy	SB	AM	2	4,400	16	B	1	1,650	6	A	16	B	17	0.4%	6	A	8	0.5%
			PM	2	4,400	43	D	1	1,650	28	D	44	D	71	1.6%	28	D	21	**1.3%**
SR 87	Capitol Expwy to SR 85	SB	AM	2	4,400	23	C	1	1,650	6	A	23	C	12	0.3%	6	A	5	0.3%
			PM	2	4,400	31	D	1	1,650	19	C	31	D	40	0.9%	19	C	14	0.8%
I-680	Yosemite Dr to Calaveras Blvd / SR 237	NB	AM	4	9,200	22	C	0	--	--	--	22	C	0	0.0%	--	--	--	--
			PM	4	9,200	28	D	0	--	--	--	28	D	74	0.8%	--	--	--	--
I-680	Calaveras Blvd / SR 237 to Jacklin Rd	NB	AM	3	6,900	39	D	0	--	--	--	39	D	0	0.0%	--	--	--	--
			PM	3	6,900	26	C	0	--	--	--	26	D	73	1.1%	--	--	--	--
I-680	Jacklin Rd to Scott Creek Rd	NB	AM	3	6,900	28	D	0	--	--	--	28	D	0	0.0%	--	--	--	--
			PM	3	6,900	22	C	0	--	--	--	22	C	86	1.2%	--	--	--	--
I-680	Scott Creek Rd to Jacklin Rd	SB	AM	3	6,900	25	C	1	1,650	18	B	25	C	90	1.3%	18	C	17	**1.0%**
			PM	3	6,900	40	D	1	1,650	12	B	40	D	3	0.0%	12	B	6	0.4%
I-680	Jacklin Rd to Calaveras Blvd / SR 237	SB	AM	3	6,900	24	C	1	1,650	18	B	24	C	85	1.2%	18	C	17	**1.0%**
			PM	3	6,900	**79**	**F**	1	1,650	16	B	**79**	**F**	**2**	**0.0%**	16	B	6	0.4%
I-680	Calaveras Blvd / SR 237 to Yosemite Dr	SB	AM	4	9,200	24	C	0	--	--	--	24	C	100	1.1%	--	--	--	--
			PM	4	9,200	**95**	**F**	0	--	--	--	**95**	**F**	**4**	**0.0%**	--	--	--	--
I-880	Montague Expwy to Great Mall Pkwy	NB	AM	3	6,900	22	C	1	1,650	17	B	22	C	0	0.0%	17	B	0	0.0%
			PM	3	6,900	28	D	1	1,650	13	B	28	D	32	0.5%	13	B	3	0.2%
I-880	Great Mall Pkwy to SR 237	NB	AM	3	6,900	27	D	1	1,650	27	D	27	D	0	0.0%	27	D	0	0.0%
			PM	3	6,900	34	D	1	1,650	20	C	34	D	30	0.4%	20	C	3	0.2%
I-880	SR 237 to Dixon Landing	NB	AM	3	6,900	24	C	1	1,650	11	A	27	D	51	0.7%	11	B	21	**1.3%**
			PM	3	6,900	46	D	1	1,650	39	D	53	E	174	2.5%	40	D	64	**3.9%**
I-880	Great Mall Pkwy to Montague Expwy	SB	AM	3	6,900	**60**	**F**	1	1,650	30	D	**62**	**F**	**200**	**2.9%**	30	D	6	0.4%
			PM	3	6,900	**68**	**F**	1	1,650	28	D	**68**	**F**	**38**	**0.6%**	28	D	11	0.7%
I-880	SR 237 to Great Mall Pkwy	SB	AM	3	6,900	44	D	1	1,650	36	D	45	D	120	1.7%	36	D	-5	-0.3%
			PM	3	6,900	**82**	**F**	1	1,650	38	D	**82**	**F**	**13**	**0.2%**	38	D	11	0.7%
I-880	Dixon Landing to SR 237	SB	AM	3	6,900	57	E	1	1,650	**122**	**F**	**66**	**F**	**135**	**2.0%**	**129**	**F**	**61**	**3.7%**
			PM	3	6,900	29	D	1	1,650	19	C	33	D	18	0.3%	19	C	11	0.7%

Notes:
HOV = high-occupancy vehicle; LOS = level of service.
1. Number of lanes and level of service (LOS) on each segment are taken from VTA's *2018 Congestion Management Program Monitoring Report*.
2. Capacity is based on the capacities cited in VTA's *Transportation Impact Analysis Guidelines* (2014).
Bold indicates a substandard level of service.
Outline indicates an adverse effect associated with the Freedom Circle development.

Table 20
Alameda County Freeway Segment Traffic Operations

				Existing [1]			Project Conditions	
Freeway	Segment	Dir	Peak Hour	# of Lanes	Capacity	LOS	Project Trips	% Capacity
I 680	Scott Creek Road to SR 262	NB	AM	3	6,900	A	3	0.04%
			PM	3	6,900	**F**	**88**	**1.28%**
I 680	SR 262 to Durham Road	NB	AM	3	6,900	A	24	0.35%
			PM	3	6,900	**F**	**87**	**1.26%**
I 680	Durham Road to Washington Boulevard	NB	AM	3	6,900	A	23	0.33%
			PM	3	6,900	**F**	**94**	**1.36%**
I 680	Washington Boulevard to SR 238	NB	AM	3	6,900	A	21	0.30%
			PM	3	6,900	**F**	**88**	**1.28%**
I 680	SR 238 to Vargas Road	NB	AM	4	9,200	A	21	0.23%
			PM	4	9,200	**F**	**93**	**1.01%**
I 680	Vargas Road to Andrade Road	NB	AM	4	9,200	A	21	0.23%
			PM	4	9,200	**F**	**93**	**1.01%**
I 680	Andrade Road to Calaveras Road	NB	AM	3	6,900	A	21	0.30%
			PM	3	6,900	E	93	1.35%
I 680	Calaveras Road to SR 84	NB	AM	3	6,900	A	19	0.28%
			PM	3	6,900	C	72	1.04%
I 680	SR 84 to Sunol Boulevard	NB	AM	3	6,900	B	19	0.28%
			PM	3	6,900	A	72	1.04%
I 680	Sunol Boulevard to Bernal Avenue	NB	AM	3	6,900	D	17	0.25%
			PM	3	6,900	A	62	0.90%
I 680	Bernal Avenue to Stoneridge Drive	NB	AM	3	6,900	A	17	0.25%
			PM	3	6,900	B	63	0.91%
I 680	SR 262 to Scott Creek Road	SB	AM	4	9,200	A	106	1.15%
			PM	4	9,200	A	3	0.03%
I 680	Durham Road to SR 262	SB	AM	4	9,200	C	92	1.00%
			PM	4	9,200	A	14	0.15%
I 680	Washington Boulevard to Durham Road	SB	AM	4	9,200	D	101	1.10%
			PM	4	9,200	A	14	0.15%
I 680	SR 238 to Washington Boulevard	SB	AM	4	9,200	B	99	1.08%
			PM	4	9,200	A	13	0.14%
I 680	Vargas Road to SR 238	SB	AM	4	9,200	A	108	1.17%
			PM	4	9,200	A	17	0.18%
I 680	Sheridon Road to Vargas Road	SB	AM	4	9,200	B	108	1.17%
			PM	4	9,200	A	17	0.18%
I 680	Andrade Road to Sheridon Road	SB	AM	5	11,500	B	108	0.94%
			PM	5	11,500	A	17	0.15%
I 680	SR 84 to Andrade Road	SB	AM	4	9,200	B	90	0.98%
			PM	4	9,200	A	14	0.15%
I 680	Sunol Boulevard to SR 84	SB	AM	3	6,900	D	101	1.46%
			PM	3	6,900	A	14	0.20%
I 680	Bernal Avenue to Sunol Boulevard	SB	AM	3	6,900	**F**	**88**	**1.28%**
			PM	3	6,900	A	13	0.19%
I 680	Stoneridge Drive to Bernal Avenue	SB	AM	3	6,900	**F**	**80**	**1.16%**
			PM	3	6,900	A	12	0.17%

Table 20 (continued)
Alameda County Freeway Segment Traffic Operations

				Existing [1]			Project Conditions	
Freeway	Segment	Dir	Peak Hour	# of Lanes	Capacity	LOS	Project Trips	% Capacity
I 880	Dixon Landing Road to SR 262	NB	AM	6	13,800	A	44	0.32%
			PM	6	13,800	**F**	**155**	**1.12%**
I 880	SR 262 to Auto Mall Parkway	NB	AM	4	9,200	A	24	0.26%
			PM	4	9,200	E	126	1.37%
I 880	Auto Mall Parkway to Stevenson Boulevard	NB	AM	4	9,200	A	21	0.23%
			PM	4	9,200	D	112	1.22%
I 880	Stevenson Boulevard to Decoto Road	NB	AM	4	9,200	A	120	1.30%
			PM	4	9,200	**F**	13	0.14%
I 880	Decoto Boulevard to Alvarado Boulevard	NB	AM	4	9,200	A	75	0.82%
			PM	4	9,200	**F**	9	0.10%
I 880	SR 262 to Dixon Landing Road	SB	AM	4	9,200	D	257	2.79%
			PM	4	9,200	A	43	0.47%
I 880	Auto Mall Parkway to SR 262	SB	AM	4	9,200	D	182	1.98%
			PM	4	9,200	A	21	0.23%
I 880	Stevenson Boulevard to Auto Mall Parkway	SB	AM	4	9,200	D	161	1.75%
			PM	4	9,200	A	20	0.22%
I 880	Decoto Road to Stevenson Road	SB	AM	4	9,200	**F**	22	0.24%
			PM	4	9,200	C	5	0.05%
I 880	Alvarado Boulevard to Decoto Boulevard	SB	AM	4	9,200	**F**	18	0.20%
			PM	4	9,200	C	4	0.04%

Notes:
1. Existing freeway conditions are based on 2018 Congestion Management Program Monitoring Report of Alamdea County.
Bold indicates a substandard level of service.
Outline indicates an adverse effect associated with the Freedom Circle development.

Table 21
San Mateo County Freeway Segment Traffic Operations

				Existing [1]			Project Conditions	
Freeway	Segment	Dir	Peak Hour	# of Lanes	Capacity	LOS	Project Trips	% Capacity
US 101	Santa Clara County Line to Whipple Avenue	NB	AM	4	9,200	**F**	82	0.89%
			PM	4	9,200	**F**	**106**	**1.15%**
US 101	Whipple Avenue to SR 92	NB	AM	4	9,200	**F**	29	0.32%
			PM	4	9,200	**F**	**93**	**1.01%**
US 101	SR 92 to Whipple Avenue	SB	AM	4	9,200	**F**	**94**	**1.02%**
			PM	4	9,200	**F**	26	0.28%
US 101	Whipple Avenue to Santa Clara County Line	SB	AM	4	9,200	**F**	**117**	**1.27%**
			PM	4	9,200	**F**	33	0.36%

Notes:
1. Existing freeway conditions are based on 2019 Congestion Management Program Monitoring Report of San Mateo County.
Bold indicates a substandard level of service.
Outline indicates an adverse effect associated with the Freedom Circle development.

While the SR 87 Corridor Study, dated October 2018, stated that there is no room to expand the freeway, it identified technology-based improvements and innovative solutions to maximize use of the existing infrastructure and lead to lower levels of solo driving and higher use of other available modes of travel along the corridor. Potential improvements identified in the study include converting the southbound ramp from US 101 southbound to SR 87 southbound from one to two lanes, use of shoulders as part-time lanes, converting HOV lanes to express lanes, technology-based improvements, and multimodal improvements. Implementation of TDM measures would reduce vehicle trips generated by the Freedom Circle Focus Area, lessening the project's effect on nearby freeways. However, even with an aggressive TDM program, the project would have an adverse effect on many freeway segments.

Developments within the Freedom Circle Focus Area should be required to provide fair share funding for the above-listed freeway improvements as they come along if full funding is not secured by then.

Freeway Ramp Traffic Operations

A freeway ramp operations analysis was performed to verify that the nearby freeway ramps have sufficient capacity to serve the projected traffic volumes with the development of the Freedom Circle Focus Area. This analysis consisted of a volume-to-capacity (v/c) ratio evaluation of the freeway ramps at the study interchanges that provide access to the Focus Area. The ramp capacities were obtained from the *Highway Capacity Manual 2000*, and consider the free-flow speed, number of lanes on the ramp, and ramp metering. It should be noted that the evaluation of freeway ramps is not required based on the VTA's *Transportation Impact Analysis Guidelines*, nor are there adopted methodologies and impact criteria for the analysis of freeway ramps.

Freeway ramp traffic operations analysis was conducted for ramps at the following interchanges:

- US 101/Montague Expressway
- US 101/Great America Parkway
- SR 237/Great America Parkway
- US 101/Lawrence Expressway
- SR 237/Lawrence Expressway

Table 22 presents the existing freeway ramp parameters (ramp type, number of lanes, ramp meter locations, and peak-hour traffic volumes) as well as the existing v/c ratio. The existing traffic volume is well below the capacity on all study freeway ramps.

Table 23 presents an analysis of freeway ramps with the trips added by buildout of the Freedom Circle Focus Area. Under existing plus project conditions, all but one study ramp are expected to have sufficient capacity (v/c < 1.0) during both peak hours. The volume on the US 101 Northbound On Ramp from southbound Great America Parkway is expected to exceed the ramp capacity during the PM peak hour due to the buildout of the Freedom Circle Focus Area. This ramp currently has a single lane with ramp metering equipment that limits the ramp capacity to 900 vehicle per hour. The capacity of this ramp could be doubled by widening the ramp to add a second lane for high-occupancy vehicles that merges back to a single lane after the ramp meter. This improvement would require Caltrans approval. It is recommended that the Freedom Circle Focus Area developments fund this improvement.

Vehicle Queuing Analysis

The analysis of intersection levels of service was supplemented with a vehicle queuing analysis for left-turn lanes at intersections where buildout of the Freedom Circle Focus Area would add a substantial number of left turns. This analysis provides a basis for estimating future storage requirements at the

Table 22
Existing Freeway Ramp Operations

Interchange	Ramp	Type	Peak Hour	Lanes			Existing Conditions		
				Mixed-Flow	HOV	Meter[1]	Capacity[2]	Peak Volume[3]	v/c
US 101/Montague Expressway	NB Off-Ramp to Eastbound Montague Expressway	Diagonal	AM	1	-	-	2,000	248	0.12
			PM				2,000	358	0.18
	SB On-Ramp from Westbound Montague Expressway	Loop	AM	1	1	Equipment Present	1,800	298	0.17
			PM				1,800	270	0.15
US 101/Great America Parkway	NB On-Ramp from Southbound Great America Parkway	Diagonal	AM	1	-	Equipment Present	900	284	0.32
			PM				900	517	0.57
	SB On-Ramp from Southbound Great America Parkway	Loop	AM	1	1	Equipment Present	1,800	260	0.14
			PM				1,800	621	0.35
US 101/Great America Parkway	NB Off-Ramp to Great America Parkway	Diagonal	AM	1	-	-	2,000	1,543	0.77
			PM				2,000	940	0.47
	SB Off-Ramp to Great America Parkway	Diagonal	AM	1	-	-	2,000	1,054	0.53
			PM				2,000	449	0.22
SR 237/Great America Parkway	EB On-Ramp from Great America Parkway	Diagonal	AM	1	1	Equipment Present	1,800	361	0.20
			PM				1,800	823	0.46
	WB On-Ramp from Great America Parkway	Diagonal	AM	1	-	Equipment Present	900	565	0.63
			PM				900	693	0.77
SR 237/Great America Parkway	EB Off-Ramp to Great America Parkway	Diagonal	AM	1	-	-	2,000	605	0.30
			PM				2,000	546	0.27
	WB Off-Ramp to Great America Parkway	Diagonal	AM	1	-	-	2,000	978	0.49
			PM				2,000	1,269	0.63
US 101/Lawrence Expressway	NB On-Ramp from Southbound Lawrence Expressway	Diagonal	AM	1	1	Equipment Present	1,800	505	0.28
			PM				1,800	349	0.19
	SB On-Ramp from Southbound Lawrence Expressway	Loop	AM	1	1	Equipment Present	1,800	337	0.19
			PM				1,800	162	0.09
US 101/Lawrence Expressway	NB Off-Ramp to Lawrence Expressway	Diagonal	AM	2	-	-	3,800	1,136	0.30
			PM				3,800	1,309	0.34
	SB Off-Ramp to Lawrence Expressway	Diagonal	AM	2	-	-	3,800	811	0.21
			PM				3,800	1,754	0.46
SR 237/Lawrence Expressway	WB On-Ramp from Northbound Lawrence Expressway	Loop	AM	1	-	Equipment Present	900	282	0.31
			PM				900	191	0.21
	EB Off-Ramp to Southbound Lawrence Expressway	Diagonal	AM	1	-	-	2,000	79	0.04
			PM				2,000	620	0.31

Notes:
NB=northbound, SB=southbound, EB=eastbound, WB=westbound, v/c = volume-to-capacity ratio

[1] As a conservative approach, if an on-ramp has meter equipment present, the ramp is analyzed assuming it is metered.
[2] Ramp capacities were obtained from the Highway Capacity Manual, 2000 (pg 25-4), and considered the free-flow speed, the number of lanes on the ramp, and ramp metering.
[3] Peak-hour volumes are obtained through intersection counts or the Caltrans Performance Measurement System (PeMS) database.

Table 23
Freeway Ramp Operations under Existing Plus Project Conditions

Interchange	Ramp	Type	Peak Hour	Existing Conditions			Existing + Project Conditions			
				Capacity[1]	Peak Volume[2]	v/c	Project Trips	Peak Volume	% of Capacity	v/c
US 101/Montague Expressway	NB Off-Ramp to Eastbound Montague Expressway	Diagonal	AM	2,000	248	0.12	454	702	22.7%	0.35
			PM	2,000	358	0.18	310	668	15.5%	0.33
	SB On-Ramp from Westbound Montague Expressway	Loop	AM	1,800	298	0.17	219	517	12.2%	0.29
			PM	1,800	270	0.15	212	482	11.8%	0.27
US 101/Great America Parkway	NB On-Ramp from Southbound Great America Parkway	Diagonal	AM	900	284	0.32	173	457	19.2%	0.51
			PM	900	517	0.57	595	1,112	66.1%	**1.24**
	SB On-Ramp from Southbound Great America Parkway	Loop	AM	1,800	260	0.14	128	388	7.1%	0.22
			PM	1,800	621	0.35	184	805	10.2%	0.45
US 101/Great America Parkway	NB Off-Ramp to Great America Parkway	Diagonal	AM	2,000	1,543	0.77	56	1,599	2.8%	0.80
			PM	2,000	940	0.47	179	1,119	9.0%	0.56
	SB Off-Ramp to Great America Parkway	Diagonal	AM	2,000	1,054	0.53	285	1,339	14.3%	0.67
			PM	2,000	449	0.22	181	630	9.1%	0.32
SR 237/Great America Parkway	EB On-Ramp from Great America Parkway	Diagonal	AM	1,800	361	0.20	12	373	0.7%	0.21
			PM	1,800	823	0.46	221	1,044	12.3%	0.58
	WB On-Ramp from Great America Parkway	Diagonal	AM	900	565	0.63	68	633	7.6%	0.70
			PM	900	693	0.77	145	838	16.1%	0.93
SR 237/Great America Parkway	EB Off-Ramp to Great America Parkway	Diagonal	AM	2,000	605	0.30	208	813	10.4%	0.41
			PM	2,000	546	0.27	174	720	8.7%	0.36
	WB Off-Ramp to Great America Parkway	Diagonal	AM	2,000	978	0.49	52	1,030	2.6%	0.52
			PM	2,000	1,269	0.63	-42	1,227	-2.1%	0.61
US 101/Lawrence Expressway	NB On-Ramp from Southbound Lawrence Expressway	Diagonal	AM	1,800	505	0.28	4	509	0.2%	0.28
			PM	1,800	349	0.19	-3	346	-0.2%	0.19
	SB On-Ramp from Southbound Lawrence Expressway	Loop	AM	1,800	337	0.19	-5	332	-0.3%	0.18
			PM	1,800	162	0.09	64	226	3.6%	0.13
US 101/Lawrence Expressway	NB Off-Ramp to Lawrence Expressway	Diagonal	AM	3,800	1,136	0.30	-15	1,121	-0.4%	0.30
			PM	3,800	1,309	0.34	263	1,572	6.9%	0.41
	SB Off-Ramp to Lawrence Expressway	Diagonal	AM	3,800	811	0.21	5	816	0.1%	0.21
			PM	3,800	1,754	0.46	54	1,808	1.4%	0.48
SR 237/Lawrence Expressway	WB On-Ramp from Northbound Lawrence Expressway	Loop	AM	900	282	0.31	-62	220	-6.9%	0.24
			PM	900	191	0.21	16	207	1.8%	0.23
	EB Off-Ramp to Southbound Lawrence Expressway	Diagonal	AM	2,000	79	0.04	56	135	2.8%	0.07
			PM	2,000	620	0.31	-155	465	-7.8%	0.23

Notes:
NB=northbound, SB=southbound, EB=eastbound, WB=westbound, v/c = volume-to-capacity ratio

[1] Ramp capacities were obtained from the Highway Capacity Manual, 2000 (pg 25-4), and considered the free-flow speed, the number of lanes on the ramp, and ramp metering.

[2] Peak-hour volumes are obtained through intersection counts or the Caltrans Performance Measurement System (PeMS) database.

[3] As a conservative approach, if an on-ramp has meter equipment present, the ramp is analyzed assuming it is metered.

intersections under existing and cumulative plus project conditions, which includes development of both the Freedom Circle Focus Area and the PHDSP Area along with other nearby planned and proposed developments including the Kylli project, City Place, and the Tasman East Specific Plan. Vehicle queues were estimated using a Poisson probability distribution, described in Chapter 1. The following left-turn movements were selected for evaluation:

- Bowers Avenue and US 101 SB Off-Ramp – Eastbound left turn
- Great America Parkway and Mission College Boulevard – Westbound and southbound left turn
- Great America Parkway and Patrick Henry Drive – Southbound and westbound left turn
- Great America Parkway and Tasman Drive –Westbound left turn
- Marriott Driveway and Mission College Boulevard – Eastbound left turn
- Freedom Circle (W) and Mission College Boulevard – Northbound and eastbound left turn
- Freedom Circle (E)/Agnew Road and Mission College Boulevard – Northbound, westbound, and eastbound left turn
- Mission College Boulevard and Montague Expressway – Southbound and eastbound left turn
- Great America Parkway and SR 237 Westbound Ramps – Northbound and westbound left turn

The queuing analysis results are presented in Table 24. The results show that seven of the nine intersections studied are expected to have insufficient turn lane storage to accommodate the anticipated traffic volumes in the Year 2040. The feasibility of potential improvements to address the queue storage deficiencies is discussed below. It should be noted that this analysis is conservative since the queue storage requirements could be reduced somewhat (up to 10 percent) through the implementation of TDM measures.

Great America Parkway and Mission College Boulevard – Westbound and Southbound Left Turn

Currently there are two left-turn lanes each 250 feet long on the westbound Mission College Boulevard approach. Under existing conditions, the 95th percentile queue exceeds the existing storage by 150 and 100 feet during the AM and PM peak hours, respectively. Planned improvements at this intersection include the addition of a third westbound left-turn lane. Even with this increase in queue storage, the traffic volumes under cumulative plus project conditions would result in queues that spill out of the triple left-turn pocket. The Freedom Circle Focus Area developments will be required to convert Hichborn Drive into a two-way street and construct a full-access signalized intersection at Great America Parkway and Hichborn Drive to offset the adverse effect on intersection levels of service. This roadway network change would reduce the traffic volume making the westbound left turn at the Great America/Mission College intersection. With the planned third westbound left-turn lane, traffic reassignment due to the signalization of Great America Parkway and Hichborn Drive, and a 10 percent TDM reduction, the 95th percentile queue would be reduced to 300 feet per lane, which would still exceed the available storage during the AM peak hour. The length of the turn lanes could be extended to accommodate the projected 95th percentile queue (300 feet) by modifying the landscaped median island.

The existing storage capacity for the southbound left-turn movement on Great America Parkway is approximately 200 feet in the inner lane and 600 feet in the outer left-turn lane for an average of 400 feet per lane. Under existing conditions, the available storage is sufficient to accommodate the 95th percentile queue. Under cumulative conditions, this movement is expected to exceed the available storage during both the AM and PM peak hours, with a maximum queue of 725 feet per lane. T he proposed improvements at Great America Parkway and Hichborn Drive would cause some southbound Great America Parkway traffic to divert from turning left at Mission College Boulevard to

turning left at Hichborn Drive. With the reassignment in traffic due to the improvements at Hichborn Drive and a 10 percent TDM reduction, the 95th percentile queue would be reduced to 575 feet per lane, which would still exceed the available storage during both peak hours. The turn lanes could be extended by modifying the existing landscaped median. However, there is not sufficient space to accommodate the 95th percentile queue at this intersection while also accommodating the queue storage required for the northbound left turn at the Great America/Patrick Henry intersection, which would face lengthy queues as a result of the trips added by the Patrick Henry Drive Specific Plan and Kylli developments.

Table 24
Left-Turn Storage Queuing Analysis

	Bowers Av/US 101 SB Off Ramp		Great America Pkwy/Mission College Blvd				Great America Pkwy/Patrick Henry Dr			
	EBL		WBL		SBL		SBL		WBL	
Measurement	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Existing										
Cycle/Delay[1] (sec)	78	110	156	140	156	140	156	160	156	160
Volume (vph)	569	253	468	445	142	368	29	9	13	209
Lanes	2	2	2	2	2	2	1	1	2	2
Volume (vphpl)	285	127	234	223	71	184	29	9	7	105
Avg. Queue (veh)	6.2	3.9	10.1	8.7	3.1	7.2	1.3	0.4	0.3	4.6
Avg. Queue (ft.)	154	97	254	216	77	179	31	10	7	116
95th %. Queue (veh)	10	7	16	14	6	12	3	2	1	8
95th %. Queue (ft.)	250	175	400	350	150	300	75	50	25	200
Storage (ft/ln)	780	780	250	250	400	400	380	380	125	125
Adequate (Y/N)	Y	Y	**N**	**N**	Y	Y	Y	Y	Y	**N**
Cum + Project										
Cycle/Delay[1] (sec)	78	110	156	140	156	140	156	160	156	160
Volume (vph)	977	404	740 [3]	1120 [3]	970 [3]	1087 [3]	124	39	110	686
Lanes	2	2	3	3	2	2	1	1	2	2
Volume (vphpl)	489	202	247	373	485	544	124	39	55	343
Avg. Queue (veh)	10.6	6.2	10.7	14.5	21.0	21.1	5.4	1.7	2.4	15.2
Avg. Queue (ft.)	265	154	267	363	525	528	134	43	60	381
95th %. Queue (veh)	16	11	16	21	29	29	9	4	5	22
95th %. Queue (ft.)	400	275	400	525	725	725	225	100	125	550
Storage (ft/ln)	780	780	250	250	400	400	380	380	125	125
Adequate (Y/N)	Y	Y	**N**	**N**	**N**	**N**	Y	Y	Y	**N**

[1] Vehicle queue calculations based on cycle length for signalized intersections, and movement delay for unsignalized intersections.

[2] Assumes 25 Feet Per Vehicle Queued

[3] The WBL and SBL volumes at Great America Parkway/Mission College Boulevard under cumulative plus project conditions do not reflect the traffic reassignment expected as a result of signalization at the Great America Parkway/Hichborn Drive intersection.

Table 24 (continued)
Left-Turn Storage Queuing Analysis

	Great America Pkwy/Tasman Dr		Marriott Dwy/Mission College Blvd		Freedom Circle (W)/Mission College Blvd				Freedom Circle (E)/Agnew Rd/Mission College Blvd			
	WBL		EBL		NBL		EBL		NBL		WBL	
Measurement	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Existing												
Cycle/Delay[1] (sec)	156	90	100	100	130	130	130	130	130	130	130	130
Volume (vph)	335	270	10	8	47	336	1	4	4	10	213	43
Lanes	2	2	1	1	1	1	1	1	1	1	2	2
Volume (vphpl)	168	135	10	8	47	336	1	4	4	10	107	22
Avg. Queue (veh)	7.3	3.4	0.3	0.2	1.7	12.1	0.0	0.1	0.1	0.4	3.8	0.8
Avg. Queue (ft.)	181	84	7	6	42	303	1	4	4	9	96	19
95th %. Queue (veh)	12	7	1	1	4	18	1	1	1	2	7	2
95th %. Queue (ft.)	300	175	25	25	100	450	25	25	25	50	175	50
Storage (ft/ln)	270	270	160	160	115	115	150	150	150	150	110	110
Adequate (Y/N)	**N**	Y	Y	Y	Y	**N**	Y	Y	Y	Y	**N**	Y
Cum + Project												
Cycle/Delay[1] (sec)	156	90	100	100	130	130	130	130	130	130	130	130
Volume (vph)	722	617	105	28	528 [3]	1240 [3]	304	67	206	132	860	479
Lanes	3	3	1	1	2	2	1	1	1	1	2	2
Volume (vphpl)	241	206	105	28	264	620	304	67	206	132	430	240
Avg. Queue (veh)	10.4	5.1	2.9	0.8	9.5	22.4	11.0	2.4	7.4	4.8	15.5	8.6
Avg. Queue (ft.)	261	129	73	19	238	560	274	60	186	119	388	216
95th %. Queue (veh)	16	9	6	2	15	30	17	5	12	9	22	14
95th %. Queue (ft.)	400	225	150	50	375	750	425	125	300	225	550	350
Storage (ft/ln)	270	270	160	160	115	115	150	150	150	150	110	110
Adequate (Y/N)	**N**	Y	Y	Y	**N**	**N**	**N**	Y	**N**	**N**	**N**	**N**

*Volume reflects total EB approach volume in the single shared-lane approach.

[1] Vehicle queue calculations based on cycle length for signalized intersections, and movement delay for unsignalized intersections.

[2] Assumes 25 Feet Per Vehicle Queued

[3] The NBL volumes at Freedom Circle (W)/Mission College Boulevard under cumulaitve plus project conditions do not reflect the traffic reassignment expected as a result of signalization at the Great America Parkway/Hichborn Drive intersection.

Table 24 (continued)
Left-Turn Storage Queuing Analysis

	Freedom Circle (E)/Agnew Rd/ Mission College Blvd		Mission College Blvd/Montague Expressway				Great America Pkwy/SR 237 Westbound Ramps			
	EBL		SBL		EBL		NBL		WBL/T	
Measurement	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Existing										
Cycle/Delay[1] (sec)	130	130	190	190	190	190	52	72	52	72
Volume (vph)	129	493	46	730	996	247	141	343	901	944
Lanes	1	1	2	2	2	2	2	2	2	2
Volume (vphpl)	129	493	23	365	498	124	71	172	451	472
Avg. Queue (veh)	4.7	17.8	1.2	19.3	26.3	6.5	1.0	3.4	6.5	9.4
Avg. Queue (ft.)	116	445	30	482	657	163	25	86	163	236
95th %. Queue (veh)	8	25	3	27	35	11	3	7	11	15
95th %. Queue (ft.)	200	625	75	675	875	275	75	175	275	375
Storage (ft/ln)	350	350	310	310	700	700	210	210	480	480
Adequate (Y/N)	Y	**N**	Y	**N**	**N**	Y	Y	Y	Y	Y
Cum + Project										
Cycle/Delay[1] (sec)	130	130	190	190	190	190	52	72	52	72
Volume (vph)	287	945	420	730	1420	485	186	809	1159	1162
Lanes	1	1	2	2	2	2	2	2	3	3
Volume (vphpl)	287	945	210	365	710	243	93	405	386	387
Avg. Queue (veh)	10.4	34.1	11.1	19.3	37.5	12.8	1.3	8.1	5.6	7.7
Avg. Queue (ft.)	259	853	277	482	937	320	34	202	140	194
95th %. Queue (veh)	16	44	17	27	48	19	3	13	10	13
95th %. Queue (ft.)	400	1100	425	675	1200	475	75	325	250	325
Storage (ft/ln)	350	350	310	310	700	700	210	210	480	480
Adequate (Y/N)	**N**	**N**	**N**	**N**	**N**	Y	Y	**N**	Y	Y

[1] Vehicle queue calculations based on cycle length for signalized intersections, and movement delay for unsignalized intersections.

[2] Assumes 25 Feet Per Vehicle Queued

Great America Parkway and Patrick Henry Drive – Westbound Left Turn

Under existing conditions, the 95th percentile queue for the westbound left-turn (200 feet per lane) exceeds the available storage (125 feet per lane) during the PM peak hour. Buildout of the Freedom Circle Focus Area would more than triple the traffic volume at this location resulting in a 95th percentile queue of 550 feet per lane. The length of the turn lanes could be extended to approximately 350 feet by restriping the roadway. However, even with this change, queues are expected to spillback into the parking lots of the adjacent properties during the PM peak hour.

Great America Parkway and Tasman Drive –Westbound Left Turn

The westbound left-turn queue is expected to grow from 300 feet per lane in two lanes under existing conditions to as much as 400 feet per lane in three lanes in the Year 2040 during the AM peak hour. The left-turn pocket could be extended from the existing length of 270 feet to 425 feet by modifying the existing landscaped median.

Freedom Circle (W) and Mission College Boulevard – Northbound and Eastbound Left Turn

The 95th percentile queue (450 feet) currently exceeds the available storage (115 feet) for the northbound left-turn movement during the PM peak hour. The addition of a second northbound left-turn lane is recommended at this intersection to offset the adverse effect of Freedom Circle Focus Area developments under cumulative plus project conditions. This improvement can be accomplished within the existing curb-to-curb width. Even with the added lane, the 95th percentile queue is expected to exceed the available storage during both peak hours with a maximum queue of 750 feet per lane. The proposed conversion of Hichborn Drive to a two-way street and construction of a full-access signalized intersection at Great America Parkway and Hichborn Drive would reduce the traffic volume making the northbound left turn at the Freedom Circle (W)/Mission College intersection. With the recommended improvements on the eastbound and northbound approaches, signalization of Great America Parkway and Hichborn Drive, and a 10 percent TDM reduction, the 95th percentile queue would be reduced to 250 feet per lane, which would still exceed the available storage during both peak hours. The recommended dual left-turn lanes should be extended beyond the current turn-lane length to approximately 250 feet by restriping the roadway, and adjacent properties should avoid locating driveways in close proximity to Mission College Boulevard when they redevelop to avoid issues with queue spillback.Under existing conditions, the eastbound left-turn queue can be accommodated within the existing turn pocket storage. However, in the Year 2040, the trips associated with buildout of the Freedom Circle Focus Area are expected to cause the left-turn queue on eastbound Mission College Boulevard to extend up to 425 feet, which would exceed the existing turn pocket length by 275 feet. The turn lane could be extended to a maximum length of approximately 300 feet by modifying the existing landscaped median. However, there is not sufficient space to accommodate the 95th percentile queue at this intersection due to its proximity to the Marriott Driveway/Mission College Boulevard intersection.

Freedom Circle (E)/Agnew Road and Mission College Boulevard – Northbound, Westbound, and Eastbound Left Turn

Currently, the northbound left-turn lane on the northbound Freedom Circle (E) approach at Mission College Boulevard is approximately 150 feet long. The existing queue storage is sufficient to accommodate the 95th percentile queue under existing conditions. However, the trips associated with buildout of the Freedom Circle development would cause the 95th percentile queue to grow to 300 feet during the AM peak hour and 225 feet during the PM peak hour under cumulative plus project conditions. The existing left-turn lane could be extended to accommodate the projected queue length by restriping the two-way left-turn lane as a dedicated turn lane for another 150 feet. The adjacent

properties should avoid locating driveways in close proximity to Mission College Boulevard so that site access is not impeded by left-turn queues on Freedom Circle.

The site plan for the proposed Greystar development shows three driveways on Freedom Circle including one at the northern edge of the project site that is only about 70 feet south of Mission College Boulevard. It is recommended that this driveway be limited to right-turns in and out only since it would frequently be blocked by queues on Freedom Circle. Furthermore, vehicles wanting to turn left into this driveway from southbound Freedom Circle would have to stop in the through lane while waiting for a break in traffic flow in the northbound lanes causing traffic on Freedom Circle to back up onto Mission College Boulevard.

The dual left-turn lanes on the westbound Mission College Boulevard approach are only 110 feet long. Under existing conditions, the 95th percentile queue exceeds the available storage during the AM peak hour. Over 800 vehicles are expected to make this left turn by the Year 2040 in the AM peak hour due to the buildout of the Freedom Circle Focus Area, resulting in a 95th percentile queue of 550 feet per lane. Extending the westbound left-turn lanes to accommodate the projected queue length would require modifications to the median on the San Tomas Aquino Creek bridge.

The trips associated with the Freedom Circle Focus Area also are expected to exacerbate the queue storage deficiency for the eastbound left-turn lane. Currently, the 95th percentile queue (625 feet) exceeds the available storage (350 feet) by about 11 vehicles during the PM peak hour. Traffic growth by the Year 2040 would cause the 95th percentile queue to grow to 1,100 feet during the PM peak hour. The addition of a second eastbound left-turn lane is not feasible because it would require acquisition of additional right of way in order to add another receiving lane on the north leg (Agnews Road). The existing turn lane could be extended by modifying the landscaped median; however, it is not feasible to accommodate the projected queue length in a single lane due to the proximity of the upstream signalized intersection at Freedom Circle (W).

Mission College Boulevard and Montague Expressway – Southbound and Eastbound Left Turn

Currently there are two left-turn lanes, each 310 feet long, on the southbound Mission College Boulevard approach. Under existing conditions, the queue storage is adequate during the AM peak hour, and the 95th percentile queue exceeds the existing storage by 365 feet during the PM peak hour. The traffic volumes under cumulative plus project conditions are expected to increase during the AM peak hour resulting in queues that exceed the length of the dual left-turn pocket by 115 feet. The cumulative plus project forecast for the PM peak hour shows that the southbound left-turn volume would be unchanged. The length of the turn lanes cannot be extended due to the proximity of Wyatt Drive.

Under existing conditions, the 95th percentile queue for the eastbound left-turn movement on Montague Expressway currently extends beyond the storage capacity during the AM peak hour. Under Cumulative Plus Project conditions, the 95th percentile queue length is expected to grow to 1,200 feet per lane during the AM peak hour, which exceeds the available storage by 500 feet. The 2040 Expressway Plan identifies a partial grade separation at this intersection that would replace the eastbound dual left-turn lanes with a flyover. The flyover would eliminate signal control of the eastbound left-turn movement and thus resolve the queuing deficiency. The Freedom Circle Focus Area developments would provide fair share funding towards this improvement to offset the adverse effect on this intersection caused by the project. The funds collected for this improvement are subject to programming by the County for Board-approved projects.

Great America Parkway and SR 237 Westbound Ramps – Northbound Left Turn

The existing storage capacity for the northbound left-turn lane on Great America Parkway is approximately 210 feet, or 8 vehicles per lane. The traffic growth expected by the Year 2040 is estimated to result in a 95th percentile queue length of 325 feet per lane. The left-turn storage cannot be increased because the turn lanes extend to the upstream intersection at the SR 237 Eastbound Ramps.

Signal Warrant Analysis

The study evaluated two unsignalized T-intersections: Old Ironsides Drive/Old Glory Lane and Old Ironsides Drive/Patrick Henry Drive. The Old Ironsides Drive/Old Glory Lane intersection is stop controlled for the westbound Old Glory Lane approach. The Old Ironsides Drive/Patrick Henry Drive intersection is stop controlled on the southbound Old Ironsides Drive approach. Under cumulative conditions, which includes the Patrick Henry Drive Specific Plan Option 2 development, the parcel on the south side of Patrick Henry Drive, opposite to Old Ironsides Drive, is assumed to redevelop and have a driveway that would create a new south leg so that the intersection would have four legs. It was assumed that the intersection would include a single shared approach lane on the south leg. The north leg would be re-striped with one left-turn lane and one shared through/right-turn lane.

The level of service analysis (see Chapters 2 to 5) shows that both intersections would operate at an acceptable level (LOS A) under background no project and background plus project conditions. In the year 2030, neither intersection would meet the signal warrant both with or without the proposed Greystar General Plan or the buildout of the Freedom Circle Focus Area. In the year 2040, both intersections would operate at unacceptable levels (LOS F) and satisfy the signal warrant both with and without the proposed buildout of the Freedom Circle Focus Area during the AM and PM peak hours. The signal warrant calculations are included in Appendix D.

As noted above, both the proposed Greystar project and the full buildout of the Freedom Circle Focus Area would cause an adverse effect at the intersection of Old Ironsides Drive and Old Glory Lane under cumulative conditions. The Freedom Circle Focus Area developments including the Greystar development should provide fair-share funding towards signalization and the addition of a second southbound left-turn lane, a second eastbound through lane, an exclusive northbound right-turn lane, an exclusive eastbound right-turn lane, and an exclusive westbound left-turn lane. Although the intersection of Old Ironsides Drive and Patrick Henry Drive also would meet signal warrants under cumulative conditions, neither the Greystar development nor the full buildout of the Freedom Circle Focus Area would cause an adverse effect at this intersection. Thus, these developments will not be required to contribute to a new traffic signal or other geometric improvements at this intersection.

Site Access and Internal Circulation

The Freedom Circle Focus Area would maintain the existing roadways and vehicle connections from Great America Parkway and Mission College Boulevard with no new public roadways. Aside from Greystar, which has submitted a formal development application, detailed site plans showing access and circulation for new developments in the Freedom Circle Focus Area have not yet been prepared. Thus, the analysis of site access and internal vehicular circulation is limited to only the Greystar site. This review is based on the site plan, dated November 13, 2020 (see Figure 16).

Vehicle Site Access

In the vicinity of the Greystar site, Freedom Circle runs in a north-south direction and serves as the western boundary of the project site. A new two-way semi-circular private street (26 feet wide) is proposed around the perimeter of the Greystar site to provide vehicular connections between parking

garages in the project area and Freedom Circle. The semi-circular street would connect to Freedom Circle at two locations as shown on Figure 16 and provide access to the parking garages in Buildings A, B, and C. In addition to the proposed site access at each end of the new private street, the proposed Building C parking garage also would have direct access to Freedom Circle via a driveway (24 feet wide) approximately 600 feet south of Mission College Boulevard.

According to the City of Santa Clara Municipal Code, Chapter 18.74 (Parking Regulations), two-way driveways providing access to 25 or more residential parking spaces or garage spaces shall have a minimum width of 26 feet (24-foot pavement with 1-foot clearance on each side).

> **Recommendation:** The width of the parking garage entrances should be modified to satisfy the City's driveway design standards.

As discussed in the intersection queuing analysis, the northern driveway would be located only about 70 feet south of Mission College Boulevard. It would frequently be blocked by queues on Freedom Circle. Furthermore, vehicles wanting to turn left into this driveway from southbound Freedom Circle would have to stop in the through lane while waiting for a break in traffic flow in the northbound lanes causing queues on Freedom Circle that extend onto Mission College Boulevard.

> **Recommendation:** The northern site driveway should be limited to right turns in and out only.

As shown on Table 7, the Greystar development is estimated to generate 375 vehicle trips (98 inbound and 277 outbound) during the AM peak hour, which would be less than two vehicles entering and about five vehicles exiting every minute. During the PM peak hour, the Greystar project would generate 468 vehicle trips (284 inbound and 182 outbound), which would be about five vehicles entering and three vehicles exiting every minute.

The operation of site driveways were evaluated assuming the northern driveway would be restricted right turns in and out only. The total volume expected to use the northern driveway on Freedom Circle is 68 vehicles (3 inbound and 65 outbound) during the AM peak hour and 54 vehicles (10 inbound and 44 outbound) during the PM peak hour. The total volume expected to use the southern driveway on Freedom Circle is 236 vehicles (69 inbound and 167 outbound) during the AM peak hour and 311 vehicles (202 inbound and 109 outbound) during the PM peak hour. The total volume expected to use the middle driveway is 71 vehicles (26 inbound and 45 outbound) during the AM peak hour and 101 vehicles (72 inbound and 29 outbound) during the PM peak hour. Under background plus project conditions, the outbound traffic at all driveways is expected to experience minor delays corresponding to LOS C or better and would not cause any operational issues on the project site. While southbound left-turn traffic using the two-way left-turn lane on Freedom Circle to turn into the middle and southern driveways may experience minor delays while waiting for a gap in oncoming traffic, the delay is expected to be less than 10 seconds per vehicle on average and result in a 95th percentile queue length of two vehicles. Thus, the projected traffic volumes could be served satisfactorily by the proposed three access points on Freedom Circle with the recommended turn restrictions.

The operation of the Greystar driveways also were evaluated under cumulative conditions with full buildout of the Freedom Circle Focus Area. The Irvine property, which would have a driveway directly opposite the middle Greystar driveway, is assumed to redevelop replacing the existing 419,000 s.f. of office/research and development space with 1,223,000 s.f. of office space and 2,500 multifamily dwelling units. The traffic volumes at this Irvine driveway were estimated based on the trip distribution pattern and the location of other driveways. Figure 16 shows the estimated turning-movement volumes at each of the Greystar driveway intersections. The northern and southern Greystar driveway intersections are expected to operate at an acceptable level with stop control on the driveway (see Table 25). The middle Greystar driveway intersection would operate at an unacceptable level (LOS F) under two-way stop control on the driveways during both the AM and PM peak hours due to the heavy traffic volume projected to use the Irvine driveway. The intersection also would operate at LOS F as a single-lane roundabout. The intersection is expected to meet the peak-hour signal warrant under

cumulative conditions with full buildout of the Freedom Circle Focus Area due to the traffic volumes at the Irvine driveway. With signalization, the intersection is expected to operate at an acceptable level (LOS C).

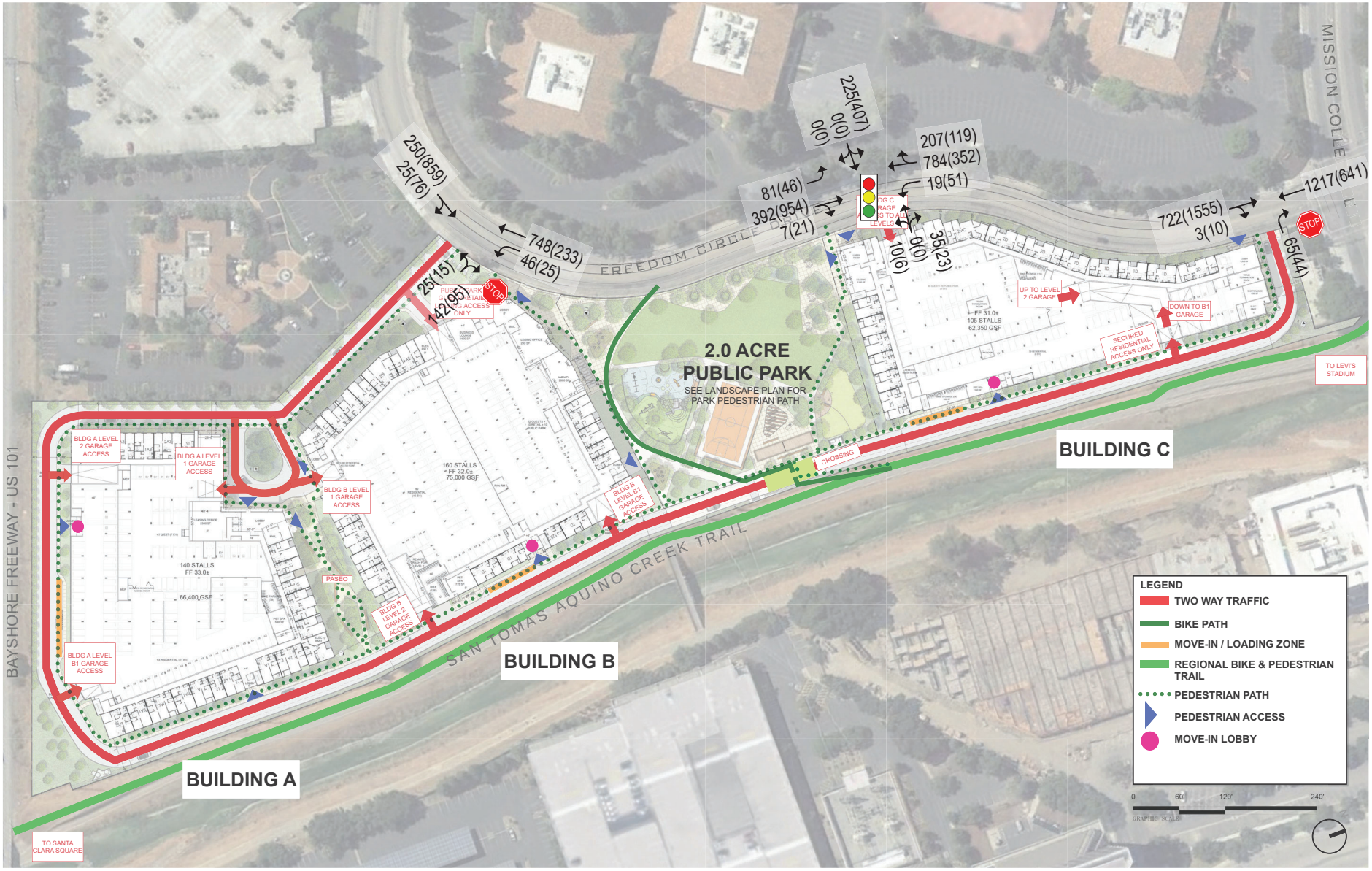


Figure 16
Greystar Site Circulation Plan With Cumulative Plus Project Including Greystar Traffic Volumes

Table 25
Cumulative Levels of Service at Greystar Driveway Intersections

Intersection	Peak Hour	Traffic Control	Avg. Delay (sec)	LOS
Freedom Circle and Northern Greystar Dwy	AM PM	OWSC	0.5 1.1	A A
Freedom Circle and Middle Greystar Dwy/Irvine Dwy	AM PM	Signal	14.2 25.1	B C
Freedom Circle and Southern Greystar Dwy	AM PM	OWSC	2.3 2.5	A A

Note:
OWSC = One-Way Stop Control

On-Site Circulation

The on-site circulation was reviewed in accordance with generally accepted traffic engineering standards. Generally, the proposed plan would provide adequate connectivity through the parking areas for vehicles, bicycles, and pedestrians.

On-site parking for the proposed project would be provided via three separate parking garages (Garages A, B, and C): one for each building. From the southern driveway, the new semi-circular street would first lead to an entrance to the public parking area reserved for guests, retail, and leasing on level 1 of Garage B. The new semi-circular street would then connect to a U-shaped one-way loop between Buildings A and B that would include a passenger loading area and entrances to level 1 of Garages A and B. The one-way U-shaped travel lane would be 20 feet wide, which would meet the City's standard for a one-way drive aisle. Entrances to garage level 2 and level B1 of Building A would be located at the southwest and southeast corners of the building, respectively. Entrances to garage level 2 and level B1 of Building B would be located at the southwest and southeast corners of the building, respectively. In addition, there would be one entrance to level B1 located along the east side of Building C.

The current site plan does not label the slope of the garage ramps. Commonly cited parking publications recommend grades of up to 16% on ramps where no parking is permitted, but grades of up to 20% are cited as acceptable when ramps are covered (i.e., protected from weather) and not used for pedestrian walkways.

Recommendation:

The garage entrances should be free and clear of any obstructions to optimize sight distance, thereby ensuring that exiting vehicles can see other vehicles traveling on the circular road. Any landscaping and signage should be located in such a way as to ensure an unobstructed view for drivers entering and exiting the garage.

The slopes of all garage ramps should be reviewed to ensure they meet appropriate design standards.

Parking Garages

All parking spaces in the parking garages are oriented at a 90-degree angle from the drive aisles. The 24-foot-wide drive aisles would not meet the City of Santa Clara minimum requirement (25 feet) for 90-degree standard parking spaces on double-loaded drive aisles with two-way traffic.

The site plan shows good circulation through the three-level garage. The parking garages include multiple dead-end drive aisles on each level. Although dead-end aisles are generally undesirable, extra space has been provided to allow a vehicle to turn around, which is acceptable. Dead-end aisles are also not a concern in areas where spaces are reserved for residents.

The parking space dimensions are not marked on the current site plan. According to the City of Santa Clara Municipal Code, Chapter 18.74, standard parking spaces must be 18 feet long and 9 feet wide (10 feet wide if they are next to a wall).

> **Recommendation:** The width of the parking garage drive aisles should be modified to satisfy the City's driveway design standards.
>
> Prior to final design, the width of the drive aisle and the parking space dimensions should be measured to confirm that they comply with City of Santa Clara standards

Emergency Vehicles, Truck Access and Circulation

As shown on the site plan, emergency vehicles would access the project site from the northern driveway on Freedom Circle Drive. The width of the semi-circular street surrounding the project site would be 26 feet wide, which is not wide enough for emergency vehicles to turn around. Therefore, with the current design, emergency vehicles would have to enter from the northern driveway and exit from the southern driveway.

A loading zone is proposed along the south side of Building A and the east side of Buildings B and C. Loading zones are also proposed on Freedom Circle at the northern and southern edges of the proposed park.

The site plan also shows multiple trash termination rooms in the parking garage for each building. Trash staging and collection would occur along the proposed perimeter street. Garbage trucks would be able to enter the site from either the northern or southern driveway and circulate through the site without having to turn around on site.

Pedestrian and Bicycle On-Site Circulation

Within the site, pedestrian paths are shown throughout the project site, providing connections between sidewalks on the adjacent streets, the proposed buildings, parking garages, and other amenities on-site. The project site plan shows that the project would provide sidewalks along the inner side of the new semi-circular street surrounding the project area, which would connect the sidewalk on Freedom Circle Drive and lobby entrances in each of the new buildings. The site plan also shows that multiple pedestrian paths would be built crossing the Paseo area between Buildings A and B and the public park between Buildings B and C. The pedestrian paths in the public park area would connect to the sidewalk along Freedom Circle Drive. In addition, the project would construct a new connection to the San Tomas Aquino Creek trail on the east side of the proposed public park. These proposed pedestrian facilities would provide adequate pedestrian circulation within and through the project site. Improvements to pedestrian facilities that provide access to the project site are discussed below.

The project site plan shows that the project would provide a new bike path on the south edge of public park that would lead to a new connection to the San Tomas Aquino Creek trail. The site plan shows that width of the bike path would vary with a minimum width of 10 feet. Per the City of Santa Clara *Bicycle Plan Update 2018*, the path should have a minimum width of eight feet with two-foot shoulders on each side. The proposed project also would include bicycle amenities such as bike parking and a bike shop. Bike parking is discussed in the following section.

Parking Analysis

The parking analysis focuses on the proposed Greystar development as no other development applications have been submitted for other parcels within the Freedom Circle Focus Area.

As mentioned previously, the proposed Greystar project requires a General Plan Amendment to change the land use designation on the project site from High Intensity Office/R&D to Very High Density Residential. The parking standards for the proposed site will be established in the Freedom Circle Focus Area Plan. It is expected that the Freedom Circle Focus Area Plan will follow the parking standards set forth in the City of Santa Clara Municipal Code §18.23.070. The parking ratios in this section were developed for the Lawrence Station Area Plan.

Vehicle Parking

The parking requirements applicable to the proposed project are listed below.

- Minimum 1.0 parking space for every studio and one-bedroom residential unit
- Minimum 2.0 parking spaces for every two-bedroom residential unit
- Minimum 4.0 parking spaces for every 1,000 square feet for retail uses

The proposed Greystar development would include 170 studios, 597 one-bedroom units, and 308 two-bedroom units. Based on the parking ratios listed above, the project would be required to provide 1,383 spaces for residential use and 8 spaces for retail uses (see Table 26).

Table 26
Vehicle Parking Analysis

Land Use	Proposed Size		Required Parking Spaces[2]	Proposed Parking Spaces[2]
Residential				
Studio	170	units	170	
1 BR	597	units	597	
2 BR	308	units	616	
Total	1,075	units	1,383	1,383
Retail	2,000	s.f.	8	8
Total Vehicle Parking Spaces			***1,391***	***1,391***

Notes:
s.f. = square feet
[1] The number of spaces required is based on the parking ratios set forth in the City of Santa Clara Zoning Code Section 18.23.070.
[2] Proposed parking listed above excludes 20 spaces designated for visitors to the proposed public park.

The project would provide 1,383 on-site parking spaces for residential use and 8 spaces on site for retail use, which equals the parking requirement for each use. The Lawrence Station Area Plan does not include public park space, so Santa Clara Municipal Code §18.23.070 does not set parking

standards for this use. As requested by the City's Parks and Recreation Department, the project would provide 20 parking spaces for park users.

The City of Santa Clara's VMT Transportation Analysis Policy for Environmental Review sets forth criteria that must be met for a project near a major transit corridor to be considered transit supportive, and thus presumed to have a less than significant impact on VMT. One of the criteria states that transit supportive projects may not include more parking for use by residents, customers, or employees of the project than required by the City Code. As currently proposed, the on-site parking at the Greystar project (1,391 spaces) would equal the City Code required parking. Thus, the proposed parking supply is consistent with a transit supportive project.

Electric Vehicle Parking Spaces

Based on 2019 Green Building Standard Code (CAL Green) (Section 4.106.4.2), for new multifamily dwelling development, 10 percent of total parking spaces on the building site should be electric vehicle charging spaces (EV spaces) capable of supporting future EVSE. The project currently proposes 15% of the parking spaces would be EV-ready or EV-future spaces, which would meet the Cal Green requirements.

Bicycle Parking

The bicycle parking spaces were evaluated based on the requirements set forth in the City of Santa Clara Municipal Code §18.23.070.

- Residential developments: One Class I bicycle parking space per 3 units and two Class II spaces per 15 units.
- Non-residential developments: One Class I space per 30 employees or fraction thereof and two Class II spaces for every 3,000 square feet of floor area.

Based on the above ratios, the Greystar project would be required to provide a total of 501 bicycle parking spaces for the proposed residential uses (with 358 long-term spaces and 143 short-term spaces) and 1 Class I and 2 Class II bicycle parking spaces for the proposed retail use.

As shown on the site plan (Sheet A-000), the project proposes to provide 359 long-term bicycle parking spaces and 35 short-term bicycle parking spaces for a total of 394 bicycle parking spaces for residential uses and 2 spaces (1 long-term space and 1 short-term space) for the proposed retail use. The proposed number of bicycle parking spaces would not meet the required number of short-term bicycle parking spaces, with 38 fewer short-term parking spaces than required.

> **Recommendation:** Short-term (Class II) bicycle parking should be added in accordance with the bicycle parking requirements set forth in the City of Santa Clara Municipal Code §18.23.070.

Effects on Pedestrians, Bicycles, and Transit Facilities

The following sections describe the potential impact of the project on pedestrian, bicycle, and transit facilities and services. Impacts are identified based on the significance criteria as described below.

Significance Criteria

Significant impacts to pedestrian or bicycle facilities would occur when a project or an element of the project:

1. Creates a hazardous condition that does not currently exist for pedestrians and bicyclists, or otherwise interferes with pedestrian accessibility to the site and adjoining areas; or

2. Conflicts with an existing or planned pedestrian or bicycle facility; or
3. Conflicts with policies related to bicycle and pedestrian activity adopted by the City of Santa Clara.

Significant impacts to transit service would occur if the project:

1. Disrupts existing transit services or facilities; or
2. Conflicts with an existing or planned transit facility; or
3. Conflicts with transit policies adopted by the City of Santa Clara or VTA.

Pedestrian Facilities

The project would improve pedestrian access to the Freedom Circle Focus Area. Currently, Mission College Boulevard has sidewalks along both sides of the street between the Mission College Boulevard loop road and Montague Expressway while Freedom Circle has sidewalks along both sides for its entire length. Sidewalks are also present along the south side of Hichborn Drive that connect Great America Parkway with Freedom Circle. The Focus Area currently comprises very large parcels that make walking distances excessive between properties. The plan would implement a fine-grain network of internal bike and pedestrian paths that would improve cross-site connectivity and significantly shorten walking distances.

While the Freedom Circle Focus Area lies adjacent to the San Tomas Aquino Creek Trail, currently the only trail connection in the vicinity is located at Mission College Boulevard. The Freedom Circle Focus Area would provide a new multi-use path along the north edge of the Focus Area that would connect the San Tomas Aquino Creek Trail with Patrick Henry Drive and provide another cross-site connector for bikes and pedestrians. The Greystar site plan also shows the project would add a new trail connection approximately 750 feet south of Mission College Boulevard. This new trail connection would connect to two pedestrian paths on either side of the proposed park and a multiuse bike/pedestrian trail through the park providing public access between the trail and Freedom Circle.

Besides the shopping areas described above, typical destinations for pedestrians include schools, parks, and transit stops. The existing and planned pedestrian network would allow access to all nearby facilities. Parks are planned within the Freedom Circle Focus Area. Additional parks are planned within the Patrick Henry Drive Specific Plan Area and within the proposed Kylli development, both of which are located northwest of the Freedom Circle Focus Area. Bus stops are currently located within the Focus Area on Great America Parkway and Mission College Boulevard. Light rail service is provided along Tasman Drive with the closest station being about a mile north of the Focus Area. Thus, except for schools, which are discussed below, most of the daily needs of future residents could be met within walking distance of the planned mixed-use district.

In summary, the project would have a beneficial impact on pedestrian facilities. It would build several new pedestrian connections, and it is located in an area that is near existing and planned services.

Bicycle Facilities

The area surrounding the Freedom Circle Focus Area has numerous bicycle facilities, including trails and bike lanes. There are north-south trails along Calabazas Creek, San Tomas Aquino Creek, and the Guadalupe River. These trails connect to the Bay Trail on the north edge of Santa Clara. There are east-west bike lanes on Tasman Drive, Mission College Boulevard, and several other streets. There is also a bike and pedestrian bridge over Calabazas Creek that connects to the John W. Christian trail in Sunnyvale.

In addition to recreational riding, there would likely be many future residents of the Freedom Circle Focus Area who would ride to work. There are bike lane and bike trail connections to most surrounding employment areas. Existing employment zones to the north of the project could be reached via bike lanes on Great America Parkway or via the San Tomas Aquino Creek trail. Bicyclists could access planned employment in the Kylli development via the proposed new multi-use path along the northern boundary of the Focus Area. There also is a large amount of employment planned as part of the City Place development. This area could be reached via the San Tomas Aquino Creek trail and the bike lanes on Tasman Drive. The same bike lanes on Tasman Drive could be used to reach the employment area in North San José. The Guadalupe River trail could be used to reach downtown San José. Employment areas south of the project site could be reached via the San Tomas Aquino Creek trail or bike lanes on Great America Parkway/Bowers Avenue. Likewise, the existing and planned bicycle facilities would allow people who work within the Freedom Circle Focus Area to bike to their homes in the Patrick Henry Drive Specific Plan Area, the Kylli development, City Place, and the Tasman East Specific Plan Area.

Consistent with the City's *Bicycle Master Plan Update 2018*, Class IV protected bike lanes will be provided on Mission College Boulevard and on Great America Parkway adjacent to the Plan (between US 101 and Patrick Henry Drive). In addition, Freedom Circle would be retrofit to add Class II bike lanes. In summary, the project would have a beneficial impact to bicycle facilities. Also, the Freedom Circle Focus Area is well situated to take advantage of numerous existing bicycle facilities that provide connections to all likely destinations.

Access to Schools

The Freedom Circle Focus Area would generate an increase in school attendance. The Kylli development is planning to build an elementary school as part of the project. This school would be more than one mile away from Freedom Circle Focus Area residential uses, which is beyond walking distance for elementary students. There are no other elementary schools within walking distance of the Focus Area.

Likewise, the Santa Clara Unified School District does not have any middle schools or high schools in the close proximity to the Freedom Circle Area. The nearest schools are several miles away. Given the distance of the schools, no middle school or high school students would be expected to walk, and few students would bicycle. Therefore, students would need to get to school by transit or car.

Transit Services

Bus service in the vicinity of the Focus Area is currently limited due to COVID-19. The VTA expects to resume frequent network service with 15-minute headways on certain routes when ridership levels increase. Existing bus routes serving the Freedom Circle Focus Area include an ACE shuttle and three VTA routes along Great America Parkway and/or Mission College Boulevard. The Freedom Circle Focus Area is located about one mile southeast of the Old Ironsides light rail station on Tasman Drive. The Focus Area is not served by a Caltrain shuttle. However, VTA route 20 connects to the Sunnyvale Caltrain station, and light rail connects to the Mountain View Caltrain station. Both connections are indirect.

The project would not interfere or conflict with existing or planned transit facilities. To the contrary, the project would contribute to grade separation projects at intersections with light rail in the median, HOV type signal improvements that could support future bus rapid transit facilities, and transit signal priority at signalized intersections. Thus, the project is expected to have a positive effect on transit services at these locations.

An evaluation of the effects of project traffic on transit vehicle delay also was completed. The analysis was completed for transit routes that serve the project vicinity utilizing estimated vehicle delay presented in the intersection level of service analysis contained in Chapters 3 and 4. The results of the transit delay analysis are presented in Table 27. The analysis shows that for most routes, the traffic associated with the Greystar project would increase delay to transit vehicles by 15 seconds or less per vehicle. Traffic associated with the buildout of the Freedom Circle Focus Area would have a greater effect on transit vehicle delay. For bus routes 55 and 57, the transit vehicle delay would increase by less than 40 seconds. For bus routes 20, 59, and the ACE Yellow shuttle, the buildout of the Freedom Circle Focus Area would cause transit vehicle delay to increase by roughly 1 to 16 minutes. With the exception of the ACE Yellow route, which currently has a total travel time of roughly 25 minutes from end to end, the other routes shown are quite lengthy with total end-to-end travel times of between 40 and 65 minutes. The required 10 percent TDM trip reduction and the recommended roadway and multimodal improvements would reduce the project's effect on transit vehicle delay. The VTA has not established policies or significance criteria related to transit vehicle delay. Thus, this data is presented for informational purposes only.

Table 27
Transit Vehicle Delay in Study Area

			Projected Change in Transit Vehicle Delay (sec/veh)			
			Due to Greystar		Due to Freedom Circle Buildout	
Bus Route	Study Area Streets	Direction	AM	PM	AM	PM
20	Arques Ave/Scott Blvd, Bowers Ave/Great America Pkwy, Mission College Blvd, Agnew Rd, Montague Expwy	Eastbound	15.0	11.8	61.9	523.7
		Westbound	-26.6	-2.1	97.2	561.1
55	Lawrence Expwy, Tasman Dr	Northbound	-0.1	-0.3	18.2	0.6
		Southbound	0.0	0.0	0.0	26.5
57	Bowers Ave/Great America Pwy, Mission College Blvd, Tasman Dr, Patrick Henry Dr, Old Ironsides Dr	Northbound	-5.8	0.7	32.9	38.4
		Southbound	-2.4	0.5	7.6	16.1
59	Scott Blvd, San Tomas Expwy, Mission College Blvd, Great America Pkwy, Old Ironsides Dr	Northbound	-2.9	17.2	944.2	317.8
		Southbound	10.5	-38.6	53.5	341.4
ACE Yellow	Bowers Ave, Scott Blvd, San Tomas Expwy, Mission College Blvd, Great America Pkwy, Tasman Dr	Outbound	6.7		74.0	
		Inbound		7.6		259.5

Note:
Projected increase in transit delay based on a comparison of background vs. background plus project intersection movement delays calculated by TRAFFIX.

Summary of Proposed Improvements Related to Other Transportation Issues

A summary of other transportation issues associated with the Greystar General Plan Amendment and with buildout of the Freedom Circle Focus Area, the recommended improvements, and funding responsibilities are provided in Table 28.

Table 28
Summary of the Proposed Improvements related to Other Transportation Issues

	Facility / Location	Recommended Improvements	Project Responsibility
Freeway Segments:			
	US 101	Convert the existing HOV lane to an express lane and construct a second express lane in each direction along US 101 between Cochrane Road and Whipple Avenue (Valley Transportation Plan 2040)	% of Total Traffic
	I-680	Construct an HOV/express lane on northbound I-680 from the SR 237 interchange in Santa Clara County to north of the SR 84 interchange in Alameda County.	% of Total Traffic
	SR 87	1. Implement technology-based and multimodal improvements identified in the SR 87 Corridor Study. 2. Convert the southbound ramp from US 101 southbound to SR 87 southbound from one to two lanes, use of shoulders as part-time lanes, and convert HOV lanes to express lanes.	% of Total Traffic % of Total Traffic
Freeway Ramps:			
	US 101 Northbound On Ramp from southbound Great America Parkway	Add a second lane for high-occupancy vehicles that merges back to a single lane after the ramp meter.	100%
Left-Turn Lane Storage:			
18	Great America Parkway and Mission College Boulevard – Westbound Left Turn	Extend the planned triple left-turn lanes to approximately 300 feet by modifying the median.	100%
18	Great America Parkway and Mission College Boulevard – Southbound Left Turn	Extend the outermost left-turn lane by approximately 150 feet by modifying the landscaped median.	100%
17	Great America Parkway and Patrick Henry Drive – Westbound Left Turn	Extend the left-turn lanes to approximately 350 feet by restriping the roadway.	100%
15	Great America Parkway and Tasman Drive –Westbound Left Turn	Extend the left-turn pocket to 425 feet by modifying the existing landscaped median.	100%
27	Freedom Circle (W) and Mission College Boulevard – Northbound Left Turn	Add a second northbound left-turn lane and extend the turn-lane to approximately 250 feet by restriping the roadway.	100%
27	Freedom Circle (W) and Mission College Boulevard – Eastbound Left Turn	Extend the turn lane to approximately 300 feet by modifying the existing landscaped median	100%
28	Freedom Circle (E)/Agnew Road and Mission College Boulevard – Northbound Left Turn	Extend the left-turn lane to 300 feet by restriping the two-way left-turn lane as a dedicated turn lane	100%
28	Freedom Circle (E)/Agnew Road and Mission College Boulevard – Eastbound Left Turn	Extend the left-turn lane to approximately 450 feet by modifying the existing lanescaped median.	100%
32	Mission College Boulevard and Montague Expressway – Eastbound Left Turn	Construct partial grade separation. (Same improvements as proposed under background conditions.)	% of Total Traffic
Signalization:			
8	Old Ironsides Drive and Old Glory Lane	Install a traffic signal and add a 2nd SB LT lane, a 2nd EB TH lane, a NB RT lane, an EB RT lane, and a WB LT lane (same improvements as proposed under cumulative conditions).	% of Total Traffic
n/a	Freedom Circle/Irvine driveway/Greystar drivew	Install a traffic signal.	100%
Bicycle Facilities: *			
	Mission College Boulevard	Construct Class IV protected bike lanes within the Plan Area	100%
	Great America Parkway	Construct Class IV protected bike lanes adjacent to the Plan Area (between US 101 and Patrick Henry Drive).	100%
	Freedom Circle	Construct Class II bike lanes along the entire length of the street	100%
	Internal to Greystar site	Construct Class I bike/pedestrian trail on the south edge of the public park to connect Freedom Circle with the San Tomas Aquino Creek Trail	100%

* See Tables 11, 16 and 17 for additional off-site bicycle improvements required to offset intersection LOS deficiencies.