

**Council Meeting: October 22, 2013**

**SUBJECT: Discussion and Possible Action on a Specific Plan Amendment to Consider Elimination of the Required Residential Frontage Road Along the West Side of S. Mathilda Avenue for Blocks 14, 15 and 16 of the Downtown Specific Plan (between Washington Avenue and Olive Avenue) and Approval of EIR Addendum.**

### **REPORT IN BRIEF**

The Mathilda Avenue frontage road was first identified as a desirable urban design feature in the Downtown Urban Design Plan (DUDP) in 2002. The Frontage Road concept was formally adopted for Blocks 14, 15 and 16 of the Downtown Specific Plan (DSP) in 2003. It was included as an urban design feature that was part of a strategy to turn Mathilda Avenue into Downtown's "front door" by creating a pedestrian friendly boulevard with a sense of arrival and address (Attachment A, DSP Map).

In August 2012, as part of a consideration for a development project, Council initiated a General Plan Amendment study to consider eliminating the requirement for a frontage road on Mathilda Avenue and consider an alternative street design.

After completing an analysis, staff considers Mathilda Avenue without a frontage road to be a superior urban design option. Although the lane for street parking would be eliminated, Mathilda Avenue without a frontage road allows inclusion of a buffered bicycle lane and a wider sidewalk which are multi-modal solutions and consistent with current City policy on complete streets. The required dedication from private property owners would be reduced from 33 feet to approximately 15 feet creating the potential for a visually improved streetscape with additional landscaped frontage on development projects and room for undergrounding of utilities like transformers. Wider sidewalks, as well as a comfortable landscaped pedestrian realm that is separated from busy vehicle through-lanes by a buffered bicycle lane and street trees are "complete street" features that make the public right-of-way more accessible and comfortable for all users.

The technical transportation analysis and the staff analysis both indicate that the decision to have or not have a frontage road is an urban design decision and not a transportation efficiency or safety requirement. There are no significant impacts to the capacity or flow of the transportation system with or

without the frontage road. Vehicle trips assumed to be rerouted to adjacent streets would not exceed street capacity or create safety issues. Impacts to adjacent residential streets would also be minimal. From an urban design perspective, the frontage road conveys a more auto-oriented solution than a balanced pedestrian, bicycle and vehicle solution.

The inclusion of a frontage road in the DSP was not a required environmental mitigation. The CEQA analysis for this study confirms that there are no environmental impacts associated with eliminating the frontage road.

Implementing the frontage road requires that it be improved simultaneously over all three blocks. The DSP also states that it should be installed simultaneously. This process requires waiting for all three blocks of dedication to occur – a process that could take decades. A fair-share cost would be secured from each developer over time but may not be adequate to cover costs when implementation finally occurs.

Implementation without a frontage road could be accomplished block-by-block with partial frontage improvements being accomplished as each development occurs. A fair-share mechanism to accumulate funds would not be required. This approach should reduce implementation time for Mathilda Avenue improvements and eliminate the City's risk of cost overruns that could occur if the frontage road were constructed many years after funds are collected.

On September 23, 2013, the Planning Commission held a public hearing on the issue. The Commission voted to recommend approval in accordance with staff's recommendation.

Staff recommends that the City Council adopt a resolution to amend the Downtown Specific Plan to eliminate the frontage road and replace it with a revised street cross section and setback requirements.

## **BACKGROUND**

At a public hearing on August 28, 2012, the City Council considered an application from Summerhill Homes to initiate a change to the DSP to increase the residential density for a proposed multi-family development at 455-491 S. Mathilda Avenue and to initiate a modification to the DSP to eliminate the requirement for a separated frontage road along the west side of Mathilda Avenue for Blocks 14, 15 and 16 of the DSP. At that meeting Council declined to initiate the density change related to a proposed high density multi-family residential project by Summerhill Apartment Communities. Council did initiate a study to consider elimination of the frontage road. This report provides the findings of that study. The related development application will be considered separately at a future hearing. There would be no increase in allowable density

in Blocks 14, 15 and 16 of the DSP as a result of eliminating the planned frontage road.

### **EXISTING POLICY**

General Plan Goals and Policies relevant to this study are found in Attachment B.

### **CEQA REVIEW**

An addendum to the 2003 Downtown Specific Plan Environmental Impact Report (EIR) was prepared in accordance with CEQA and adopted City guidelines by the City's consultant David J. Powers and Associates and paid for by the applicant (Summerhill Homes) (Attachment C). A technical transportation analysis was prepared by Fehr & Peers Transportation Consultants. The study was completed under contract with the City and paid for by Summerhill Apartment Communities. The study considers the impacts of eliminating the frontage road on the transportation system.

The planned frontage road concept in the DSP was an urban design feature and was not a required environmental mitigation of impacts associated with buildout of the DSP. The addendum to the DSP EIR was based on an Initial Study that evaluated all potential environmental impacts and found that there would be no mitigation required for eliminating the planned frontage road as all environmental categories in the Initial Study had either no impacts or were less than significant.

### **DISCUSSION**

#### **Frontage Road History**

The Downtown Specific Plan (DSP) was originally adopted in 1993. Prior to an update in 2003, the Downtown Stakeholders Advisory Committee was created by the City Council and conducted a series of 6 monthly workshops to formulate recommendations to Council regarding a ten-year DSP update. The Committee transmitted to Council the Downtown Urban Design Plan (DUDP) that articulated the aspirational vision for Downtown Sunnyvale as "*an enhanced, traditional downtown serving the community with a variety of destinations in a pedestrian-friendly environment.*" The DUDP was a stakeholder driven document created with the assistance of City staff and the firm of ELS Architecture and Urban Design. It outlined specific design principles to assist in reaching the stakeholder's vision for Downtown Sunnyvale. It was adopted by the City Council in August 2002 and provided guidance for the Downtown Specific Plan update of 2003.

The frontage road concept was first identified in the DUDP. The street system in Downtown was classified into a hierarchy of tree-lined boulevards, avenues and streets to enhance pedestrian routes and create a pedestrian-friendly walking environment. Mathilda Avenue was classified as a Boulevard. According to the DUDP:

*Mathilda Avenue has the potential to become a boulevard, establishing a sense of arrival and address, and creating an awareness of the broader downtown district. Recommendations for development along Mathilda address improving the quality of its pedestrian environment and reinforcing its potential as the downtown's "front door" by concentrating office uses on the east side adjacent to existing commercial use, and residential uses on the west side adjacent to existing residential neighborhoods.*

One of the development strategies of the DUDP was to “create a sense of arrival and address” for the Downtown. Through the recommended strategies of the DUDP and subsequently the adopted standards and regulations of the DSP, this sense of arrival and address would be created through density and building placement with well-defined street edges using office buildings on the east side and multi-family residential buildings on the west side. In the DUDP Mathilda’s western edge was envisioned to contain a “local lane” (now referred to as the frontage road in the DSP). The frontage road was to be a single southbound vehicular lane separated from the southbound through-lanes by means of a planted median and including one lane of parallel parking. The purpose of the frontage road was to buffer the housing from vehicular bustle on Mathilda and establish a sense of address for the proposed residential sites. Sidewalks were intended to be planted with shade trees and have special lighting and street furniture to improve vehicular and pedestrian quality.

A cross-section and plan for Mathilda Avenue with the planned frontage road was adopted in the DUDP and subsequently into the 2003 DSP (Attachment D). The establishment of the frontage road requires that the City secure an additional 33 foot dedication from private properties on the west side of Mathilda Avenue when new development occurs. The frontage road would consist of a 7-foot wide raised median separation between it and the three southbound through-lanes on Mathilda Avenue. The frontage road would be a 15-foot wide southbound vehicle lane with an 8-foot wide parking lane and a 10-foot wide sidewalk that includes tree wells. The DSP did not envision a bike lane as presently planned in the City’s Bicycle Plan. No building setbacks are required (i.e. the buildings could be immediately adjacent to the edge of the public right-of-way and sidewalk).

## **No Frontage Road Alternative**

The no frontage road alternative was first considered by the City Council at a public hearing on August 28, 2012 as part of a request for a General Plan Amendment. As no engineered plan or analysis of the planned frontage road was prepared as part of the DSP, and there is now interest in developing high density residential uses on the west side of Mathilda Avenue in accordance with the DSP, the Council considered this to be an appropriate time to reevaluate the frontage road concept in light of recent downtown design and complete street concepts and policies.

City staff has developed a revised cross section for Mathilda Avenue without a frontage road. This alternative would require an approximate 15-foot dedication from adjacent private properties and would result in an 8-foot wide buffered bike lane (striped separation only – no raised median) and a typical 13-foot wide public sidewalk (includes curb and 4-foot tree wells). There would be no on-street parking (Attachment E).

The area no longer needed from the original planned 33-foot dedication would remain as private property (approx. 18 feet). This area could create opportunities for front landscaping and area to underground utility boxes and similar features. This additional landscape area can improve the pedestrian experience. The adopted building setback for Blocks 14, 15 and 16 is 0 feet. Staff is recommending that with elimination of the frontage road, the existing 0 foot setback in the DSP be revised to require a minimum of 5 feet and an average of 10 feet. As an alternative, Council could maintain a setback of 0 feet for ground floor retail space, which would allow for storefronts to abut the sidewalk.

Although the land available for development will increase, the reduction in dedication does not result in an increase in the number of potential dwelling units as the number of units is established by Block in the DSP. Units could increase, however, as a result of the State density bonus law for affordable units.

## **Transportation**

### **Traffic Operations Analysis**

Because Mathilda Avenue is an important high volume arterial street, a technical study was completed to thoroughly evaluate the traffic operations and safety with and without the frontage road. A scope of work for the study was prepared by staff and the analysis was completed by Fehr & Peers Transportation Consultants. The study assessed existing and future operations on Mathilda Avenue (driveway access, traffic flow and collision history) both with and without a frontage road. Existing and future trip generation was

analyzed as well as various scenarios for trip distribution (with and without a frontage road and some projected limited access assumed for Charles Avenue). A scenario was included for the related Summerhill Apartment Homes project to be heard at a future hearing.

The frontage road was not an essential element for avoiding road hazards on Mathilda Avenue. In fact, the *Fehr & Peers* study found the frontage road has the potential for auto/auto and auto/pedestrian conflicts at intersections as vehicles enter the through-traffic stream from the frontage road and recommended further study of operations and traffic control if the frontage road were to remain under consideration.

The results of this analysis (not implementing the frontage road) indicate neither new impacts nor a substantial increase in the severity of the impacts. Assuming planned development consistent with the DSP, all study intersections would operate at acceptable levels and the elimination of the planned frontage road would not cause any secondary transportation impacts.

The conclusions of the traffic operations analysis and CEQA analysis indicate that there is little to no difference in vehicle operations between the frontage road and the no frontage road alternatives. Providing for bicycle access and improved pedestrian access are more critical issues than changes in traffic.

Although the DSP does not preclude driveways on Mathilda Avenue, the DSP states that blocks in the West of Mathilda District should not be reconfigured into more than 4 parcels which will limit the number of future driveways directly onto Mathilda Avenue. The DSP also assumes that some driveways will utilize the streets at the north and south ends of each block in the future.

The traffic analysis indicates that any impacts from traffic volumes and operations would be minimal on Charles Avenue if some projects from Blocks 14, 15 and 16 took future access directly onto Charles under either scenario (frontage road or no frontage road). Doing so would also not affect other streets.

### Transit Policies

Amending the DSP to not construct a frontage road on the west side of Mathilda Avenue will not conflict with adopted policies, plans, or programs regarding public transit or nonmotorized transportation. The frontage road was not intended as a transit-supportive feature rather the frontage road design was intended to separate 'local' from 'through' traffic. It would reduce the space available to transit riders waiting at bus stops. The no frontage road alternative may allow opportunities to maintain or enhance transit features along Mathilda Avenue, such as bus duck-outs and bus shelters with ample space for transit riders.

The proposed DSP amendment to eliminate the planned frontage road from the west side of Mathilda Avenue would not affect the existing or future demand for transit (which is based on land use), or the availability of transit serving the downtown area. The alternative designs available for Mathilda Avenue in lieu of constructing a frontage road would have adequate right-of-way to allow for the efficient performance of existing and planned transit, including bus stops/duckouts, shelters, etc.

### Pedestrians

As identified earlier in this report, a number of City policies support development of a multi-modal transportation system. The addition of a frontage road has the potential to improve conditions for pedestrians traveling on the west side of Mathilda Avenue.

New development anticipated in the DSP is likely to bring more pedestrians to the downtown area, which could increase the potential for conflict between vehicles and pedestrians. Because vehicles traveling on the frontage road would typically move more slowly than vehicles traveling on the main roadway, adding a frontage road could improve pedestrian comfort and reduce conflicts between pedestrians and vehicles.

The no frontage road alternative would substitute a wider pedestrian sidewalk and an 8 foot wide buffered bicycle lane. This alternative could also provide a sense of separation, create a comfortable pedestrian realm and would be a significant improvement for pedestrians over current conditions.

### Bicycles

Lower speeds and volumes of vehicle traffic on the frontage road may also be perceived to improve safety for bicyclists. Some bicyclists may feel more comfortable using the separated frontage road. However, it is more likely that experienced commuter bicyclists will continue to use the southbound through-lanes of Mathilda Avenue.

The frontage road allocates space for a one-way travel lane and a parking lane but no bicycle lane. It is unlikely that experienced bicyclists that use Mathilda Avenue would veer from the southbound through lanes and cut in and out of the frontage road segments to travel south on Mathilda. Cyclists that use the frontage road would encounter potential conflicts at the end of each block where the frontage road ends and they must merge back on to Mathilda. Adding bicycle lanes on Mathilda with the planned frontage road will likely require alteration or reduction of the center median in order to create space without affecting the existing number of travel lanes.

## Parking

The planned frontage road would feature an 8-foot wide parking lane in front of future residential projects on the west side of Mathilda Avenue. The no frontage road alternative has no parking lane. The frontage road provides convenient locations for drop off and pick up of passengers away from fast moving traffic. Without the frontage road, passengers will have to be picked up on site of each residential project or on another nearby street.

The General Plan contains policies that specify that parking of vehicles is not to be considered a transport use. As stated previously in this report, General Plan Policy LT-5.12 states that public space dedicated to the safe movement of vehicles, bicycles and pedestrians takes priority over non-transport uses. Also Policy LT-5.14 states that historical precedence for street space dedicated for parking shall be a lesser consideration than providing street space for transportation uses when determining the appropriate future use of street space. The DSP did not contemplate frontage road parking augmenting required off-street parking. Any new development on Mathilda Avenue would still be required to meet minimum City parking standards for resident and guest parking.

## **Emergency Response Impacts**

The adopted cross-section for the Mathilda frontage road includes a 7-foot raised median, and a 15-foot southbound travel lane next to an 8-foot parking lane. Four story buildings would be separated from the street by a 10-foot wide sidewalk.

Although a typical fire engine (10 feet wide) could use the frontage road for limited types of fire, rescue and medical responses, current codes require at least a 20-foot wide emergency vehicle access lane. A 26-foot wide lane is required near three-story and taller buildings where aerial ladder trucks will need to stage and extend truck stabilizers for fire-fighting and rescue operations.

With a frontage road, an aerial ladder truck serving future four story apartments would be required to stage outside of the frontage road in the two western-most through-lanes of Mathilda Avenue in order to extend the stabilizers needed to safely deploy the aerial ladder and allow for typical fire fighting operations. In addition to blocking at least two 12-foot wide southbound through-lanes, staging in Mathilda Avenue would require the responders to work through a 40-foot obstructed area containing the raised landscaped frontage road median as well as two rows of street trees, a parking lane and the public sidewalk in order to reach the adjacent four-story buildings. The aerial ladder can extend approximately 100 feet and could

reach over this area from the through lanes of Mathilda Avenue, but this is less than ideal.

The proposed alternative with no frontage road would allow emergency response trucks and engines to stage adjacent to the public sidewalk. They would utilize the proposed 8 foot wide buffered bike lane (with no raised median) and the two western southbound through lanes of Mathilda Avenue (total 31 feet available). There would be fewer obstructions for responders to work around. The distance from the curb to the adjacent private property line would be 13 feet. The adopted building setback for Blocks 14, 15 and 16 is 0 feet. Staff is recommending that with elimination of the frontage road, the setback be revised from 0 to a minimum of 5 feet and an average of 10 feet. Alternatively, Council could maintain a setback of 0 feet for ground floor retail space.

### **Implementation Scenarios**

Implementation of the frontage road design would likely take many years to acquire the necessary 33-foot wide roadway dedication. A mechanism to collect a fair-share cost would have to be secured from each developer over time. The DSP implementation plan states that the frontage road between Washington Avenue and Olive Avenue (Blocks 14, 15 and 16) should be installed simultaneously. This was likely taking into consideration the block-by-block entries and exits to Mathilda Avenue through lanes and the need to coordinate the design of these transitions and how they would affect traffic safety and flow on Mathilda between Evelyn and El Camino Real. Without the requirement for additional land dedication redevelopment of Blocks 14, 15 and 16 may occur sooner. It may be possible to install the frontage road one entire block at a time but the transition from block to block may be confusing and complicated if done incrementally and also raises safety concerns.

The required dedication for the no frontage road alternative will be approximately 15 feet instead of 33 feet. Implementation without a frontage road could likely be accomplished incrementally block-by-block with partial frontage improvements being accomplished with each new development and without establishing a fair-share cost mechanism. It may take fewer years overall to complete individual blocks as opposed to all three blocks simultaneously, thereby quickening the completion of the DSP vision for Mathilda Avenue as a pedestrian and bicycle friendly boulevard. This alternative will also allow the City to implement the Bicycle Plan to install bicycle facilities.

### **Urban Design**

Urban design is the process of designing and shaping cities, towns and villages. Whereas architecture focuses on individual buildings, urban design addresses

the larger scale of groups of buildings, of streets and public spaces, whole neighborhoods and districts, and entire cities, to make areas functional, attractive, and sustainable.

The urban design principles associated with Mathilda Avenue in the DSP involve creating a district through use of a street hierarchy. These street spaces are created by street “edges” formed by the buildings that frame them. Mathilda was identified as a boulevard to be framed and given character by a strong architectural identity. The scale, density and placement of the four-story residential and office buildings on each side form the west edge and “front door” of Downtown that is dressed by the details of quality architecture and materials, friendly pedestrian spaces and street landscaping and furniture.

The planned frontage road was part of the design in that it was meant to provide a sense of address or arrival for the future residents on the west side of Mathilda Avenue. It was meant to buffer the housing from Mathilda traffic and create an area for resident drop off and pick up as well as an area for guests to park temporarily.

The no frontage road alternative would also contribute to the urban design of Mathilda. The sense of address for the residential buildings created by the frontage road may be lost without a frontage road but it can be gained in building architecture that provides architectural interest for main entryways. The “local lane” feeling would be lost as there would no longer be a raised median separation and no on-street parking; however, the buffered bike lane, slightly wider sidewalk and additional landscaping can provide some sense of separation. With construction of office buildings on the east side with generous sidewalks and street trees, it is worthwhile to reconsider if a similar pedestrian streetscape treatment and building/sidewalk relationship is more appropriate than an auto oriented frontage road.

## **Conclusion**

The following table provides a comparison of the two alternatives for the west side of Mathilda Avenue between Washington Avenue and Olive Avenue (Blocks 14, 15 and 16 in the DSP).

<b>Feature/Concept/Issue</b>	<b>Frontage Road Adopted 2003 DSP</b>	<b>No Frontage Road Alternative</b>
Meets City Goals and Policies <ul style="list-style-type: none"> <li>• Citywide Vision</li> <li>• General Plan</li> <li>• DSP</li> <li>• Bike Plan</li> </ul>	Yes  No multi-modal No- parking provided over bike lane  Yes – improves street character No – pedestrian & bike linkages  No	Yes  Yes multi-modal Yes – bike lane provided over parking  Yes- improves street character Yes – pedestrian & bike linkages  Yes
Pedestrian Buffer (from through-lanes)	8 ft. parking lane (with raised median)	8 ft. bike lane
Separated Drop Off	Yes	No
Street Parking	Yes	No
Bike Lane	No	Yes
Sidewalk Width	10 ft.	13 ft. (typical with curb and tree wells)
Private Property Dedication	33 ft.	15 ft. (approx.)
Implementation	By entire block. Likely 3 blocks simultaneously	Site by site
Emergency Response	40 ft. from Mathilda southbound through-lanes	Approx 15 ft. from curb adjacent to sidewalk
Urban Design	Provides Downtown edge, “front door” & sense of address  Buffered pedestrian realm.  Auto oriented	Provides Downtown edge and “front door” but relies on private development to create sense of address  Wider sidewalk  More landscaping for comfortable pedestrian realm  Multi-modal oriented

**FISCAL IMPACT**

The right-of-way for either design option will be provided in the form of dedication when new development occurs along the west side of Blocks 14, 15 and 16 in the DSP at no cost to the City. Street frontage improvements (street widening, painting, curb, gutter, sidewalk, street trees and other pedestrian improvements) will be at the developers cost. These improvements will either be installed at the time of development or a fair-share exaction will be imposed. Private development will also pay the City's Transportation Impact Fee as required by code.

**PUBLIC CONTACT**

A public outreach meeting was held for this study on May 30, 2013. Five members of the public attended including some property owners along Blocks 14, 15 and 16 and a property owner from Block 17 (north of the project area). City staff made a presentation regarding the study and the technical transportation analysis. The main concern from those attending was the required dedication along Mathilda Avenue and how it would affect their individual properties.

A joint study session with the City Council and the Planning Commission was held on July 23, 2013. The study session was on the City Council agenda and was open to the public. Six Councilmembers and six Planning Commissioners attended. City staff made a presentation regarding the study and the technical transportation analysis. Councilmembers and Planning Commissioners asked questions, made comments and requested additional information. Four members of the public spoke and expressed opinions. Notes from the Study Session were provided as an information only report to the Council on August 23, 2013 (Attachment F).

Public contact regarding this item was made through the following ways:

1. Posting the Planning Commission agenda on the City's official-notice bulletin board outside City Hall; posting the City Council agenda on the City's official-notice bulletin board at the Sunnyvale Senior Center, Community Center and Department of Public Safety; and by making the Planning Commission and City Council agendas and reports available at the Sunnyvale Public Library, the Office of the City Clerk and on the City's website;
2. Publication in the *Sun* newspaper, at least 10 days prior to the hearing;
3. Notices mailed to property owners, business owners and tenants located within at least 500 feet of the boundaries of DSP Blocks 14, 15

and 16 (Attachment G). Neighborhood associations in the project vicinity were also notified.

On September 23, 2013, this issue was considered by the Planning Commission at a public hearing (Attachment I, Minutes). Four members of the public spoke on this issue. Two of them suggested that the project should be reviewed by the Bicycle and Pedestrian Advisory Commission (BPAC). The Planning Commission asked staff to explore the possibility of a BPAC hearing. Staff took this under advisement. The BPAC will consider this item on October 17, 2013. The outcome of that meeting will be conveyed to the City Council by staff at the City Council meeting.

### **ALTERNATIVES**

1. Adopt the Downtown Specific Plan EIR addendum and attached Resolution amending the Downtown Specific Plan to eliminate the requirement for a frontage road and adding a revised Mathilda Avenue cross section. Update related sections of the DSP to reflect the new plan.
2. Retain the frontage road feature in the Downtown Specific Plan.

### **RECOMMENDATION**

Staff recommends Alternative 1.

As a result of this study, both alternatives generally meet the urban design goals of the DSP. Neither alternative has significant traffic or environmental impacts.

The main benefits of adding a frontage road are separation of local and through traffic, separation of pedestrians, the addition of on-street parking to serve local businesses and new residential developments, and convenient passenger drop-off and pick-up.

The no frontage road alternative better addresses multi-modal policies and policies about use of the public street space and provides an enhanced bicycle lane over parking. Implementation of the no frontage road alternative can be implemented as each block is redeveloped, which makes it a more feasible option. Emergency response to new residential uses can occur under both

scenarios but is less disruptive to Mathilda traffic, safer and more straight forward with no frontage road. With no frontage road there is no change in allowable dwelling units but due to increased lot size, density is marginally lower.

To support this new plan without a frontage road, staff is recommending the allowable building setback be revised to require a minimum of 5 feet and an average of 10 feet for residential buildings.

Reviewed by:

Hanson Hom, Director, Community Development Department  
Prepared by: Gerri Caruso, Principal Planner  
Reviewed by: Trudi Ryan, Planning Officer

Reviewed by:

Kent Steffens, Director, Public Works

Approved by:

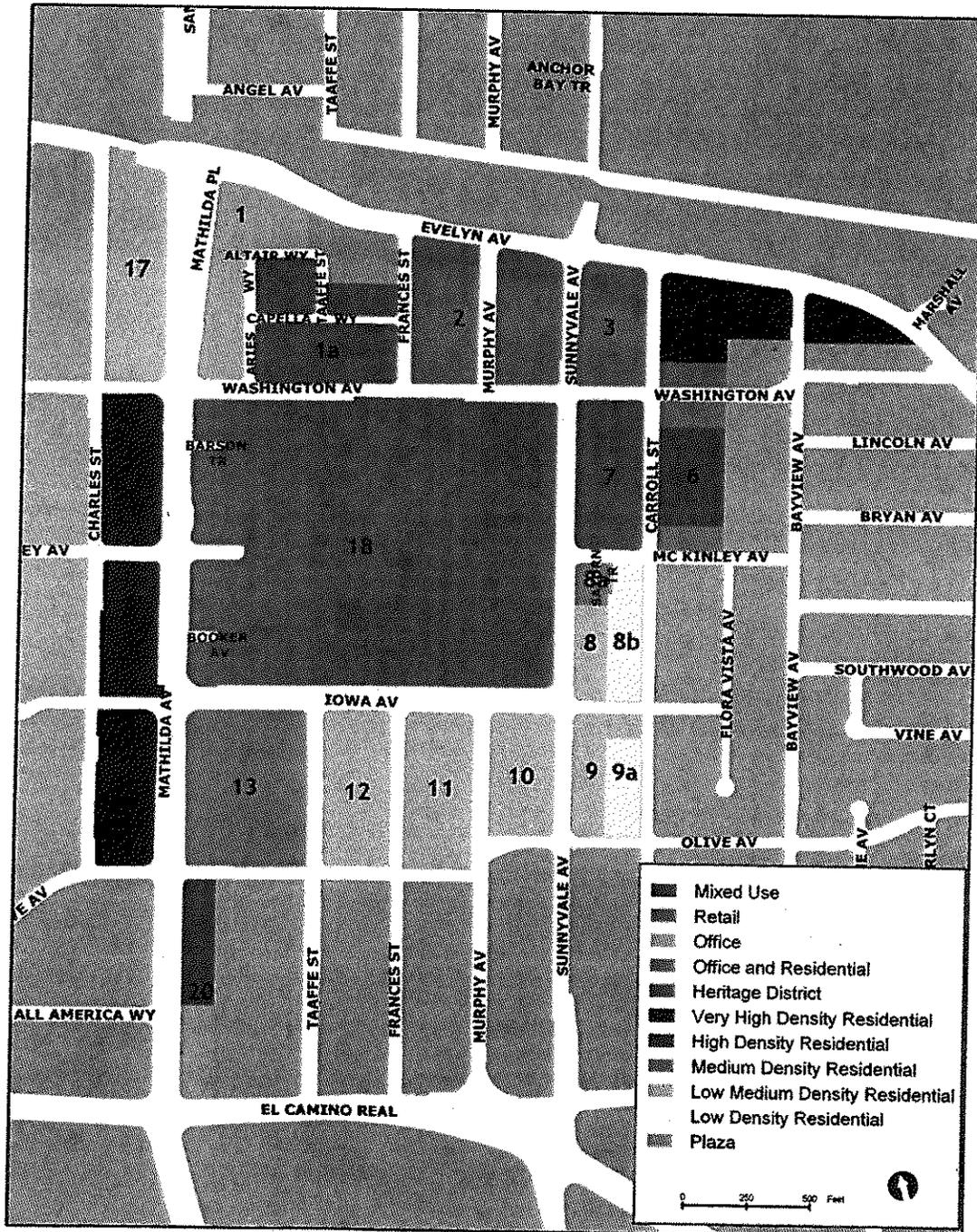
Gary M. Luebbbers  
City Manager

**Attachments**

- A. Downtown Specific Plan Map
- B. General Plan Goals and Policies
- C. Environmental Analysis - Addendum to the Downtown Specific Plan EIR including Transportation Analysis by Fehr & Peers
- D. Adopted Frontage Road Plan
- E. No Frontage Road Alternative Plan
- F. Notes from Joint Study Session July 23, 2013
- G. Public Noticing Area Map
- H. Draft Resolution
- I. Minutes from the Planning Commission meeting on September 23, 2013

# **Attachment A**

### Attachment 1 Downtown Specific Plan Map



## **Attachment B**

## Attachment 2 General Plan Goals and Policies

### Sunnyvale Community Vision

Goal XI. Balanced Transportation: To provide and maintain a balanced multi-modal transportation system which provides choice, convenience and efficiency for movement of people and goods.

### General Plan

Policy LT-1.9 Support flexible and appropriate alternative transportation modes and transportation system management measures that reduce reliance on the automobile and serve changing regional and City-wide land use and transportation needs.

Goal LT-5 Effective and Safe Transportation - Attain a transportation system that is effective, safe, pleasant, and convenient.

LT-5.1e. Promote the reduction of single occupant vehicles (SOV) trips and encourage an increase in the share of trips taken by other forms of travel.

Policy LT-5.5 Support a variety of transportation modes.

LT-5.5e Implement the City of Sunnyvale Bicycle Plan.

Policy LT-5.8 Provide a safe and comfortable system of pedestrian and bicycle pathways.

Policy LT-5.9 Appropriate accommodations for motor vehicles, bicycles, and pedestrians shall be determined for city streets to increase the use of bicycles for transportation and to enhance the safety and efficiency of the overall street network for bicyclists, pedestrians and motor vehicles.

Policy LT-5.10 All modes of transportation shall have safe access to City streets.

Policy LT-5.12 City streets are public space dedicated to the movement of vehicles, bicycles and pedestrians. Providing safe accommodations for all transportation modes takes priority over non-transportation uses. Facilities that meet minimum appropriate safety standards for transport uses shall be considered before non-transport uses are considered.

Policy LT-5.13 Parking is considered the storage of transportation vehicles and shall not be considered a transport use.

Policy LT-5.14 Historical precedence for street space dedicated for parking shall be a lesser consideration than providing street space for transportation uses when determining the appropriate future use of street space.

### **Downtown Specific Plan**

Goal C. Promote a balanced street system that serves all users well regardless of their mode of travel.

Policy C.2. Encourage strong pedestrian and bicycle linkages through the downtown.

Policy C.4. Encourage shared parking in the downtown to minimize the amount of land devoted for parking areas and manage parking so it does not dominate mode choice decisions or the built environment.

Goal E. Improve street character.

Policy E.1. Create a sense of arrival and address through the improvement of major arterials to the downtown in accordance with the proposed streetscape designs.

Policy E.2. Improve the quality of key vehicular and pedestrian linkages that function as important feeders into the downtown, such as Sunnyvale, Washington and Iowa Avenues.

### **2006 Bicycle Plan**

Figure 5.1 Regarding the Bicycle Capital Improvement Program indicates restriping on Mathilda Avenue between Washington Avenue and El Camino Real to accommodate restriped bicycle lanes. The 2013/2014 adopted City of Sunnyvale Projects Project includes a partially funded project for bicycle lanes on Mathilda Avenue from Hwy. 101 to El Camino Real for year 2013.

## **Attachment C**



PLANNING DIVISION  
CITY OF SUNNYVALE  
P.O. BOX 3707  
SUNNYVALE, CALIFORNIA 94088-3707

**NOTICE OF INTENT TO ADOPT  
INITIAL STUDY / ADDENDUM**

This form is provided as a notification of an intent to adopt a Negative Declaration which has been prepared in compliance with the provisions of the California Environmental Quality Act of 1970, as amended, and Resolution #193-86.

**PROJECT TITLE:**

Application for a **Specific Plan Amendment Study** filed by the City of Sunnyvale.

**PROJECT DESCRIPTION AND LOCATION (APN):**

**FILE #:** 2012-7772  
**Location:** West side of South Mathilda Avenue for Blocks 14, 15, and 16 of the Downtown Specific Plan (between Washington Avenue and Olive Avenue).  
**Proposed Project:** **SPECIFIC PLAN AMENDMENT STUDY** to consider elimination of the required frontage road in the Downtown Specific Plan.  
**Environmental Review:** Addendum to the 2003 Downtown Specific Plan Environmental Impact Report (EIR)  
**Staff Contact:** Gerri Caruso, (408) 730-7591, gcaruso@sunnyvale.ca.gov

**WHERE TO VIEW THIS DOCUMENT:**

The **Addendum**, its supporting documentation and details relating to the project are on file and available for review and comment in the Office of the Secretary of the Planning Commission, City Hall, 456 West Olive Avenue, Sunnyvale.

This **Addendum** may be protested in writing by any person prior to 5:00 p.m. on **Tuesday, October 8, 2013**. Protest shall be filed in the Department of Community Development, 456 W. Olive Avenue, Sunnyvale and shall include a written statement specifying anticipated environmental effects which may be significant. A protest of the Addendum will be considered by the adopting authority, whose action on the protest may be appealed.

**HEARING INFORMATION:**

A public hearing on the project is scheduled for:

**Monday, September 23, 2013** at 8:00 p.m. and **Tuesday, October 8, 2013** at 7:00 p.m. in the Council Chambers, City Hall, 456 West Olive Avenue, Sunnyvale.

**TOXIC SITE INFORMATION:**

(No) listed toxic sites are present at the project location.

Circulated On August 30, 2013

Signed: \_\_\_\_\_

Shaunn Mendrin, Senior Planner

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Project Title	Mathilda Avenue Frontage Road Removal Project
Lead Agency Name and Address	City of Sunnyvale P.O. Box 3707, Sunnyvale, CA 94088-3707
Contact Person	Gerri Caruso, Principal Planner
Phone Number	408-730-7591
Project Location	West side of Mathilda Avenue between Washington Ave. and Olive Ave
Applicant's Name	City of Sunnyvale
Project Address	N/A
Zoning	N/A, Public Right-of-way
General Plan	N/A, Public Right-of-way
Other Public Agencies whose approval is required	None

Description of the Project: The project entails the proposed elimination of a planned frontage road, on the west side of Mathilda Avenue between Evelyn Avenue and Olive Avenue. The frontage road was anticipated as part of the Downtown Specific Plan (DSP) in the City of Sunnyvale.

DETAILED PROJECT DESCRIPTION:

Background

The City of Sunnyvale adopted the DSP in 2003 as an update to the 1993 DSP. The DSP covers roughly 125 acres in an area bounded by Evelyn Avenue to the north, Bayview Avenue to the east, El Camino Real to the south, and Charles Street to the west. The 2003 DSP focused on five primary goals:

1. Develop land uses in the General Plan adopted by the City Council in June 2003 in an attractive and cohesive physical form that clearly identifies Sunnyvale's downtown.
2. Establish the downtown as the cultural, retail, financial, and entertainment center of the community complemented by employment, housing, and transit opportunities.
3. Promote a balanced street system that serves all users well regardless of their mode of travel.
4. Protect and enhance existing neighborhoods.
5. Improve the street character.

The DSP calls for the creation of a "boulevard" configuration for Mathilda Avenue with pedestrian and frontage improvements, and assumes the development of a one-way frontage road on the west side of Mathilda Avenue between Washington Avenue and Olive Avenue. The frontage road is intended to provide access and circulation needs for properties along the west side of Mathilda Avenue while limiting driveway access points off the arterial corridor of Mathilda Avenue.

Three blocks on the west side of Mathilda Avenue within the study area are planned for redevelopment under the DSP. The three blocks are as follows:

- **Block 14**, bounded by Mathilda Avenue, Olive Avenue, Charles Street and Iowa Avenue;

- **Block 15**, bounded by Mathilda Avenue, Iowa Avenue, Charles Street and McKinley Avenue;
- **Block 16**, bounded by Mathilda Avenue, McKinley Avenue, Charles Street and Washington Avenue.

The DSP calls for high-density residential development on these blocks, with up to 173 units planned for Blocks 14 and 16 and 152 units for Block 15. Additionally, up to 10,000 square feet of ground-floor retail space is allowed, located on corners facing Mathilda (DSP, page 84). The DSP encourages below-grade or podium parking structures on these blocks, with entrances on the side streets (i.e. north and south-facing block faces) and limited access via Charles Street (page 85). Land use assumptions for Year 2035 conditions are summarized in Appendix A, *Fehr & Peers, Mathilda Avenue Carriage Road Transportation Evaluation, Table 3*. While the DSP traffic analysis completed in 2003 was based on forecasted 2020 land use assumptions, the current 2013 traffic analysis employed updated land use assumptions for the year 2035 since the regional model from which the City's model derives regional traffic information has been updated to a 2035 future year.

The DSP calls for a one-way frontage road on the west side of Mathilda Avenue, with an 8 foot wide parking lane, a 15 foot wide travel lane and a 7 foot wide landscaped median separating the frontage road from through travel lanes. The Specific Plan does not provide a detailed description of how the frontage road would operate. The frontage road dimensions described in the DSP require a dedication of 33 feet on the west side of Mathilda Avenue to construct the frontage road. On the east side of Mathilda Avenue, 27 foot wide sidewalks would be constructed using a 10 foot dedication along with the fourth northbound travel lane and existing right-of-way. The existing center median would be narrowed to accommodate wider travel lanes. The conceptual design of the Specific Plan frontage road is summarized in Appendix A, **Table 7** and in **Figure 8**. The DSP's frontage road concept would add parking spaces to the west side of Mathilda Avenue, where on-street parking is currently prohibited. Currently, parking is only present on the east side of Mathilda Avenue between El Camino Real and Olive Avenue.

A proposed housing development application has been filed with the City by Summerhill Homes on a 1.61 acre site on Block 14. The site has a General Plan Designation of *Very High Density Residential* and a zoning designation of *Downtown Specific Plan Block 14*, and the project is currently undergoing review by the City for conformance with the DSP and is the subject of a separate Initial Study evaluating the project's environmental impacts, tiered from the DSP EIR. The proposed housing project design assumes the Mathilda Avenue frontage road is not implemented, and therefore land area that would have been dedicated for right-of-way for the frontage road, discussed above, is instead utilized for improved pedestrian and bicycle amenities and by the private development project.

#### Surrounding Uses and Setting

Mathilda Avenue runs for approximately half a mile through downtown Sunnyvale, from El Camino Real to the Caltrain tracks overcrossing north of Washington Avenue. Sunnyvale's Civic Center complex lies to the west of Mathilda Avenue, between Olive Avenue and El Camino Real; north of Olive Avenue, Mathilda Avenue's west side is bordered by single-family homes, offices, banks and small commercial developments. The east side of Mathilda Avenue contains a mixture of low-density residential development and small commercial enterprises south of Olive Avenue. North of Olive Avenue, Mathilda Avenue's east side is generally bordered by office buildings. East of Mathilda Avenue and north of Iowa Avenue, commercial developments include Macy's and Target department stores and the small businesses of the Murphy Station Heritage Landmark District. The Sunnyvale Caltrain Station is located on Evelyn Avenue less than a quarter-mile east of Mathilda Avenue.

In the Downtown area, Mathilda Avenue has three southbound lanes, a landscaped center median that narrows to accommodate left turn pockets, and four northbound lanes. Travel lanes vary in width between ten and fourteen feet, averaging a width of eleven feet. South of Olive Avenue, the fourth northbound lane is used as a parking lane. **Table 1** of Appendix A provides a schematic cross-section of Mathilda Avenue in the study area.

Sidewalks are continuous within the study area and are generally about five and a half feet wide, although they widen to ten feet north of Booker Avenue, adjacent to new development on Mathilda Avenue's east

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side. There are five bus stops on Mathilda Avenue within the downtown area; bus service is infrequent, with Valley Transportation Authority (VTA) buses arriving approximately twice per hour during the AM and PM peaks. Within the study area, Mathilda Avenue does not currently have bicycle facilities.

#### Existing Traffic Conditions

Traffic operations at five study intersections along Mathilda Avenue were evaluated during the morning peak-hour occurring between 7:00 am to 9:00 am and evening peak-hour occurring between 4:00 pm to 6:00 pm. Additionally, traffic operations at two intersections on Charles Avenue were evaluated. Vehicle, pedestrian and bicycle counts were conducted in November 2012 during the AM (7:00 AM - 9:00 AM) and PM (4:00 PM - 6:00 PM) peak periods at the following five study intersections:

1. Mathilda Avenue and Washington Avenue
2. Mathilda Avenue and McKinley Avenue
3. Mathilda Avenue and Iowa Avenue
4. Mathilda Avenue and Olive Avenue
5. Mathilda Avenue and El Camino Real

Additional AM and PM peak period counts were conducted in February 2013 at the following two study intersections:

6. Charles Street and Iowa Avenue
7. Charles Street and Olive Avenue.

To measure existing traffic levels using driveways along Mathilda Avenue, driveway counts were also conducted in February 2013 at twelve driveways along Mathilda Avenue between Washington Avenue and Olive Avenue. The locations of study intersections are shown in **Figure 1** of Appendix A.

Field observations were conducted during the AM peak hour (8:00 AM - 9:00 AM) and PM peak hour (5:00 PM - 6:00 PM) in December 2012 to evaluate intersection operations and vehicle queuing and to confirm street geometry. Subsequent field observations were conducted in March 2013 to observe the influence of driveway operations on southbound vehicle traffic.

Observations confirmed that traffic flow along Mathilda Avenue is heaviest in the northbound direction during the AM peak hour and in the southbound direction during the PM peak period. During the AM peak hour, northbound vehicles were observed to occasionally slow after departing the intersection of Mathilda Avenue and Washington Avenue, which indicates that delay from intersections north of the study corridor are influencing traffic in the downtown area. All intersections operate at LOS D or better under Existing conditions, except the intersection of Mathilda Avenue/El Camino Real, which operates at LOS E during the PM peak hour, with an average delay of 58.7 seconds.

#### Proposed Action

The project involves an amendment to the DSP, specifically modifying the DSP to remove a planned frontage road on the west side of Mathilda Ave between Evelyn Ave and Olive Ave. A decision on the pending Summerhill Homes housing development application for a portion of Block 14 will be made separately and subsequently from the proposed DSP frontage road amendment.

The frontage road is a DSP plan element, not a mitigation measure for planned growth, and elimination of a plan element has no direct environmental impacts in that the proposed action is to not implement an improvement. The potential for secondary effects (i.e. from future diverted traffic that would have utilized the frontage road) is discussed below to determine if there are any new impacts and/or a substantial increase in the severity of the impacts disclosed in the 2003 DSP EIR. The proposed change in the project would be limited to elimination of a planned frontage road from the DSP and

1. would not expand the project (DSP) area,
2. would not introduce a new land use,
3. would not increase or intensify the amount of DSP development,
4. would not result in a larger project (DSP) resident population,
5. would not reconfigure the approved DSP land use plan, and
6. would not disturb additional land area,

beyond what was proposed and evaluated in the adopted 2003 DSP EIR. For these reasons, the revised project (i.e. implementation of the 2003 DSP without a frontage road on the west side of Mathilda Ave) would not result in new or substantially increased impacts in the following areas:

- Aesthetics
- Agricultural Resources
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Utilities and Service Systems

On-site Development: None proposed/required (amendment of a plan)

Construction Activities and Schedule: None proposed/required (amendment of a plan)

Off-site Improvements: None proposed/required (amendment of a plan)

Previous Environmental Review:

In 2003, the City prepared and certified an EIR covering the DSP. As part of the traffic analysis, a total of 33 intersections were analyzed for level of service during the AM and PM peak hours, along with seven neighborhood street segments and four freeway segments. Conditions assuming DSP implementation were forecast for 2020 using the City of Sunnyvale traffic model. Level of service impacts were shown for the intersection of Sunnyvale Avenue and El Camino Real, for which mitigation was incorporated into the DSP.

#### **EVALUATION OF ENVIRONMENTAL IMPACTS:**

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4. "Negative Declaration: Potentially Significant Unless Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section 17, "Earlier Analysis," may be cross-referenced).
5. Earlier analysis may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c) (3) (d). In this case, a brief discussion should identify the following:
6. Earlier Analysis Used. Identify and state where they are available for review.
7. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
8. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project
9. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g. general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist below.

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Aesthetics             | <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Public Services                    |
| <input type="checkbox"/> Agricultural Resources | <input type="checkbox"/> Hydrology/Water Quality       | <input type="checkbox"/> Recreation                         |
| <input type="checkbox"/> Air Quality            | <input type="checkbox"/> Land Use/Planning             | <input type="checkbox"/> Transportation/Traffic             |
| <input type="checkbox"/> Biological Resources   | <input type="checkbox"/> Mineral Resources             | <input type="checkbox"/> Utilities/Service Systems          |
| <input type="checkbox"/> Cultural Resources     | <input type="checkbox"/> Noise                         | <input type="checkbox"/> Mandatory Findings of Significance |
| <input type="checkbox"/> Geology/Soils          | <input type="checkbox"/> Population/Housing            |   |

**MANDATORY FINDINGS OF SIGNIFICANCE (see checklist for further information):**

Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

- Yes  
 No

Mandatory Findings of Significance? Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of the past projects, the effects of other current projects, and the effects of probable future projects)?

- Yes
- No

Mandatory Findings of Significance? Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

- Yes
- No

**DETERMINATION:**

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

I find that the proposed project MAY have a "potential significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Checklist Preparer: Gerri Caruso

Date: 8.29.13

Title: Principal Planner

City of Sunnyvale

Signature: 

The CEQA Guidelines §15162 state that when an EIR has been certified or negative declaration adopted for a project, no subsequent EIR (or negative declaration) shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in light of the whole record, one or more of the following:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

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2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
  - a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
  - b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;
  - c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
  - d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

CEQA Guidelines §15164 state that the lead agency or a responsible agency shall prepare an addendum to a previously adopted Negative Declaration (or EIR) if some changes or additions are necessary, but none of the conditions described in §15162 (as described above) calling for preparation of a subsequent Negative Declaration (or EIR) have occurred.

Planning	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source Other Than Project Description and Plans
1. Aesthetics -Substantially damage scenic resources, including, but not limited to trees, historic buildings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sunnyvale General Plan Map, Community Character and Land Use and Transportation Chapters of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
2. Aesthetics -Substantially degrade the existing visual character or quality of the site and its surroundings including significant adverse visual changes to neighborhood character	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sunnyvale Downtown Specific Plan 2003 <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a> Sunnyvale General Plan Map, Community Character and Land Use Chapters of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
3. Aesthetics -Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sunnyvale Downtown Specific Plan 2003 <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a> General Plan Map, Community Character and Land Use and Transportation Chapters of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
4. Population and Housing - Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure) in a way that is inconsistent with the Sunnyvale General Plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sunnyvale Downtown Specific Plan 2003 <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a> Land Use and Transportation Chapter of the Sunnyvale General Plan, General Plan Map
5. Population and Housing -Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sunnyvale Downtown Specific Plan 2003 <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a> Housing Chapter, Land Use and Transportation Chapter of the Sunnyvale General Plan and General Plan Map <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
6. Population and Housing -Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sunnyvale Downtown Specific Plan 2003 <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a> Housing Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>

<p>7. Land Use Planning - Physically divide an established community?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Sunnyvale Downtown Specific Plan 2003 <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a> Sunnyvale General Plan Map <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a></p>
<p>8. Land Use Planning conflict - With the Sunnyvale General Plan, Zoning Ordinance, San Francisco Bay Conservation and Development Commission (BCDC) area or related specific plan adopted for the purpose of avoiding or mitigating an environmental effect?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Land Use and Transportation Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a> Title 19 (Zoning) of the Sunnyvale Municipal Code <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a></p>
<p>9. Transportation and Traffic - Result in inadequate parking capacity?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Downtown Specific Plan, 2003. <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a></p>
<p>10. For a project located the Moffett Field AICUZ or an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Moffett Field Air Installations Compatible Use Zones (AICUZ) Map, Santa Clara County ALUC Moffett Field CLUP, Sunnyvale Zoning Map <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a> Sunnyvale General Plan Map <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a></p>
<p>11. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>There are no private airstrips in or in the vicinity of Sunnyvale</p>
<p>12. For a project within the vicinity of Moffett Federal Airfield, would the project result in a safety hazard for people residing or working in the project area?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Moffett Field Air Installations Compatible Use Zones (AICUZ) Map, Santa Clara County ALUC Moffett Field CLUP</p>
<p>13. Agricultural Resources - Conflict with existing zoning for agricultural use, or a Williamson Act contract?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Sunnyvale Zoning Map <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a></p>
<p>14. Noise - Exposure of persons to or generation of noise levels in excess of standards established in the Noise Sub-Element, Noise limits in the Sunnyvale Municipal Code, or applicable standards of the California Building Code?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i></p>
<p>15. Noise -Exposure of persons to or generation of excessive groundborne vibration?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Project Description Safety and Noise Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a></p>

16. Noise - A substantial permanent or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i>
17. Biological Resources - Have a substantially adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Sunnyvale Zoning Map <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a>
18. Biological Resources -Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Sunnyvale Zoning Map <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a>
19. Biological Resources -Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Sunnyvale Zoning Map <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a>
20. Biological Resources -Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sunnyvale Municipal Code 19.90 Tree Preservation Ordinance <a href="http://sunnyvale.ca.gov/">http://sunnyvale.ca.gov/</a> Sunnyvale Inventory of Heritage Trees
21. Biological Resources -Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Sunnyvale Zoning Map <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a>
22. Historic and Cultural Resources - Cause a substantial adverse change in the significance of a historical resource or a substantial adverse change in an archeological resource?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Community Character Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a> Sunnyvale Inventory or Heritage Resources The United States Secretary of the Interior's "Guidelines for Rehabilitation" Criteria of the National Register of Historic Places
23. Historic and Cultural Resources - Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description.

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<p>24. Public Services - Would the project result in substantial adverse physical impacts associated with the provision of new or expanded public schools, the construction of which could cause significant environmental impacts, in order to maintain acceptable performance objectives?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p><b>Project Description</b> The following public school districts are located in the City of Sunnyvale: Fremont Union High School District, Sunnyvale Elementary School District, Cupertino Union School District and Santa Clara Unified School District.</p>
<p>25. Air Quality - Conflict with or obstruct implementation of the BAAQMD air quality plan? How close is the use to a major road, hwy. or freeway?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>BAAQMD CEQA Guidelines Sunnyvale General Plan Map Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a> 2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i></p>
<p>26. Air Quality - Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>BAAQMD CEQA Guidelines AB 32, 2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i></p>
<p>27. Air Quality -Would the project conflict with any applicable plan, policy or regulation of any agency adopted for the purpose of reducing the emissions of greenhouse gases?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>BAAQMD CEQA Guidelines CA AB 32 Global Warming Solutions Act, 2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i></p>
<p>28. Air Quality -Violate any air quality standard or contribute substantially to an existing or projected air quality violation.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>BAAQMD CEQA Guidelines Sunnyvale Air Quality Sub-Element, 2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i></p>
<p>29. Air Quality -Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>BAAQMD CEQA Guidelines Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a> 2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i></p>
<p>30. Air Quality -Expose sensitive receptors to substantial pollutant concentrations?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>BAAQMD CEQA Guidelines Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a> 2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i></p>

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31. Seismic Safety - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Safety and Noise Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
32. Seismic Safety - Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Safety and Noise Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
33. Seismic Safety-Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Safety and Noise Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
34. Seismic Safety-Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Safety and Noise Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>

Further Discussion if "Less Than Significant" with or without mitigation:

**9. Parking capacity (Less than Significant Impact)** - The DSP's frontage road concept would have the benefit of adding parking spaces to the west side of Mathilda Avenue, where on-street parking is currently prohibited. Currently, parking is only present on the east side of Mathilda Avenue between El Camino Real and Olive Avenue. However, foregoing potential future parking benefits provided by the frontage road is not an impact to the existing environment. Compared to baseline environmental conditions, alternative cross sections for Mathilda Avenue (in lieu of a frontage road on the west side) that lack on-street parking will not result in inadequate parking capacity in that they will simply maintain the status quo, which includes no on-street parking on the west side of the street. This is not an environmental impact under CEQA. Future development on Blocks 14-16 will be reviewed by the City and conditioned to provide adequate off-street parking consistent with City requirements.

**14, 16. Noise (Less Than Significant Impact)**- As discussed in Appendix A, the removal of the planned frontage road on the west side of Mathilda Avenue from the DSP will not result in a significant re-distribution in travel patterns, either under existing or future 2035 conditions with full implementation of the DSP, that would cause a substantial increase in traffic on the surrounding streets serving the downtown, and therefore there would be no substantial increase in noise levels beyond conditions disclosed in the 2003 DSP EIR.

**25 - 30. Air Quality and Greenhouse Gas Emissions (Less Than Significant Impact):** The frontage road would not increase trip generation associated with the DSP; the potential for distributing traffic from not implementing the frontage road that could lead to increased vehicle miles traveled (VMT) and/or decreased average speeds, and resulting increases in vehicle-generated air pollutants and greenhouse gas emissions (GHG) was analyzed. However, as discussed in Appendix A, re-directed traffic from not implementing the frontage road would not increase VMT associated with the DSP and therefore would not lead to any new air quality or GHG impacts nor a substantial increase in the severity of the impacts disclosed in the 2003 DSP EIR.

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Transportation	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source Other Than Project Description and Plans
35. Exceeds the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all modes of transportation including nonmotorized travel and all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian walkways, bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i>
36. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measurements, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i>
37. Results in a change in air traffic patterns, including either an increase in air traffic levels or a change in flight patterns or location that results in substantial safety risks to vehicles, bicycles, or pedestrians?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description 2003 Downtown Specific Plan EIR,
38. Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i>
39. Conflict with adopted policies, plans, or programs regarding public transit or nonmotorized transportation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i>
40. Affect the multi-modal performance of the highway and/or street and/or rail and/or off road nonmotorized trail transportation facilities, in terms of structural, operational, or perception-based measures of effectiveness (e.g. quality of service for nonmotorized and transit modes)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i>
41. Reduce, sever, or eliminate pedestrian or bicycle circulation or access, or preclude future planned and approved bicycle or pedestrian circulation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i>

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Transportation	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source Other Than Project Description and Plans
42. Cause a degradation of the performance or availability of all transit including buses, light or heavy rail for people or goods movement?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Transportation Evaluation, Fehr & Peers

Further Discussion if "Less Than Significant" with or without mitigation:

**35. Existing Circulation System Capacity (Less Than Significant Impact)** - The City's intent to modify the DSP to eliminate the planned frontage road on Mathilda Avenue could have secondary effects by diverting traffic compared to what was assumed in the 2003 DSP EIR traffic analysis. Appendix A provides an analysis of future DSP traffic conditions with and without the frontage road that is compared to existing conditions. The results of this analysis (not implementing the frontage road) indicate no new impacts nor a substantial increase in the severity of the impacts disclosed in the Table 7.11 of the 2003 DSP EIR.

Automobile trip generation estimates for Year 2035 conditions were developed using land use intensities described in the 2003 DSP and standard vehicle trip rates. In total, new land uses on Blocks 14, 15 and 16 are expected to generate 370 new AM peak hour vehicle trips and 711 PM peak hour vehicle trips. Trip generation for Year 2035 conditions is summarized in Appendix A, Table 4.

*Year 2035 No Frontage Road (Charles Access)*

Level of service analysis was conducted for Year 2035 No Frontage Road (Charles Access) conditions. Under this scenario, the intersection of Mathilda Avenue and El Camino Real is forecasted to operate at LOS E during the AM peak period, with an average vehicle delay of 73.8 seconds, and at LOS D during the PM peak hour, with an average vehicle delay of 51.2 seconds. The remaining study intersections would operate at LOS D or above during both AM and PM peak hours. See Appendix A, Table 9. The intersection of Mathilda Avenue and El Camino Real is a Santa Clara County Congestion Management Program (CMP) intersection, and LOS E is the minimum acceptable level of service for CMP intersections. Therefore, assuming planned development consistent with the DSP, the study intersections would operate at acceptable levels, and the elimination of the planned frontage road would not cause any secondary transportation impacts.

**36. Conflict with Congestion Management Program (Less Than Significant Impact)** – as noted above, in 2035 assuming development consistent with the DSP and no frontage road on the west side of Mathilda Avenue, the study intersection of Mathilda Ave/El Camino Real, which is the only CMP intersection that could be affected by the project, would operate at an acceptable LOS E.

**38. Roadway Hazards (Less Than Significant Impact)** – Amending the DSP to not include a frontage road on the west side of Mathilda Avenue will not introduce a hazardous design feature, such as a sharp curve or dangerous intersection, or an incompatible use that would increase road hazards. Without the frontage road, the new development planned on Blocks 14, 15, and 16 will have access on Mathilda, cross streets, and/or Charles Street, and each development project design will be reviewed and permitted by the City to ensure adequate sight distances, turn movements, etc. for vehicles entering and exiting Mathilda Avenue, to avoid increasing hazards. The frontage road was not an essential element to avoiding road hazards on Mathilda Avenue. In fact, the Fehr & Peers Mathilda Avenue Transportation Evaluation (Appendix A, pg.34), found the frontage road has the potential for conflicts at intersections as vehicles enter the through-traffic stream from the frontage road, and recommended further study of operations and traffic control if the frontage road were to remain under consideration.

**39. Conflict with Transit Policies or Programs** - Amending the DSP to not construct a frontage road on the west side of Mathilda Avenue will not conflict with adopted policies, plans, or programs regarding public transit or nonmotorized transportation in that the frontage road was not designed primarily as a transit-supportive feature, rather the frontage road design (as noted in Appendix A) was intended to separate 'local' from 'through' traffic, and would have reduced the space

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available to transit riders waiting at bus stops. Developing alternative future roadway cross sections will allow opportunities to maintain or enhance transit features along Mathilda Avenue, such as bus duck-outs and bus shelters with ample space for transit riders.

**40. Multi-modal Performance Effectiveness (Less Than Significant Impact)** – CEQA requires an evaluation of a project's impacts as measured against baseline (typically existing) environmental conditions, which was discussed in the preceding paragraphs under Question #35. **Existing Circulation System.** However, discussion of the comparative impacts of proceeding to implement the planned frontage road would also be useful for the decision-making process. Based on the results presented in Appendix A (pages 27-29), the addition of a frontage road would not substantially affect vehicle capacity on Mathilda Avenue and would therefore have no substantial effect on vehicle level of service. However, the presence or absence of a frontage road may have other effects on vehicle, pedestrian and bicycle circulation. Access and traffic circulation effects are discussed below.

*Access and Traffic Circulation Effects of Frontage Road*

While vehicle capacity would not be substantially affected, a frontage road may slightly reduce travel speeds for through-moving vehicles by reducing the number of access points on the main thoroughfare. As a result, it would slightly increase the delay caused by vehicles entering the frontage road from the southbound right turn lane of Mathilda Avenue. Forecasts of corridor travel speeds and times (see Appendix A) indicate that intersection travel times on the corridor could be slightly longer with a frontage road than without one. During the PM peak hour, southbound travel times on Mathilda Avenue in Year 2035 are forecasted at 240 seconds under Frontage Road conditions, and 237 seconds under No Frontage Road (Charles Access) conditions. It is therefore unlikely that adding a frontage road would substantially improve travel speeds and vehicle throughput in Year 2035.

*Block Access without Frontage Road*

Assuming that the frontage road is not developed, it is anticipated that vehicle access to land uses within the study area will be primarily via driveways on Mathilda Avenue and side streets, with the exception of Block 14. On Block 14, there would be no vehicle access via Mathilda Avenue, and the majority of vehicle trips will enter and exit through driveways on Charles Avenue. This is consistent with current development proposal by Summerhill Homes, which calls for mid-block driveways on Charles Street only.

**41. Pedestrian or Bicycle Circulation or Access (Less Than Significant Impact)** – CEQA requires an evaluation of a project's impacts as measured against baseline (typically existing) environmental conditions. On that basis, deciding to not implement the frontage road will have no direct effects on existing conditions.

However, discussion of the comparative impacts of proceeding to implement the planned frontage road would also be useful for the decision-making process. The addition of a frontage road has the potential to improve conditions for some bicyclists and pedestrians traveling on the west side of Mathilda Avenue. New development anticipated in the DSP is likely to bring more pedestrians to the downtown area, which could increase the potential for conflict between vehicles and pedestrians. Because vehicles traveling on the frontage road would typically move more slowly than vehicles traveling on the main roadway, adding a frontage road would tend to improve pedestrian comfort and reduce conflicts between pedestrians and vehicles. Lower speeds and volumes of vehicle traffic on the frontage road would also improve perceived safety for bicyclists. As a result, the main benefits of adding a frontage road are separation of local and through traffic, improved conditions for bicyclists that choose to use the frontage road and pedestrian travel, and the addition of on-street parking to serve local businesses and new residential developments. However, foregoing potential future benefits is not an impact to the existing environment under CEQA.

**42. Performance or Availability of Transit (Less Than Significant Impact)** – the proposed DSP amendment to eliminate the planned frontage road from the west side of Mathilda Avenue would not affect the existing or future *demand* for transit (which is based on land use), or the *availability* of transit serving the downtown area. The alternative designs available for Mathilda Avenue in lieu of constructing a frontage road would have adequate right-of-way to allow for the efficient performance of existing and planned transit, including bus stops/duckouts, shelters, etc.

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Building	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source Other Than Project Description and Plans
43. Hydrology and Water Quality - Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	FEMA Flood Insurance Rate Map Effective 5/18/09 <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a> , California Building Code, Title 16 (Building) of the Sunnyvale Municipal Code <a href="http://sunnyvale.ca.gov/">http://sunnyvale.ca.gov/</a>
44. Hydrology and Water Quality - Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	FEMA Flood Insurance Rate Map Effective 5/18/09 <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a> , California Building Code, Title 16 (Building) of the Sunnyvale Municipal Code <a href="http://sunnyvale.ca.gov/">http://sunnyvale.ca.gov/</a>
45. Hydrology and Water Quality - Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1995 ABAG Dam Inundation Map <a href="http://www.abag.ca.gov">www.abag.ca.gov</a> , California Building Code, Title 16 (Building) of the Sunnyvale Municipal Code <a href="http://sunnyvale.ca.gov/">http://sunnyvale.ca.gov/</a>
46. Geology and Soils -Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sunnyvale Municipal Code 12.60, Storm Water Quality Best Sunnyvale Management Practices Guideline Manual <a href="http://sunnyvale.ca.gov/">http://sunnyvale.ca.gov/</a>
47. Geology and Soils -Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Safety and Noise Chapter of the Sunnyvale General Plan, <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a> California Plumbing, Mechanical, and Electrical Codes and Title 16 (Building) of the Sunnyvale Municipal Code <a href="http://sunnyvale.ca.gov/">http://sunnyvale.ca.gov/</a>
48. Geology and Soils -Be located on expansive soil, as defined by the current building code, creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description California Plumbing, Mechanical, and Electrical Codes and Title 16 (Building) of the Sunnyvale Municipal Code <a href="http://sunnyvale.ca.gov/">http://sunnyvale.ca.gov/</a>

Further Discussion: None required.

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Engineering	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source Other Than Project Description and Plans
49. Utilities and Service Systems: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
50. Utilities and Service Systems: Require or result in construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
51. Utilities and Service Systems: Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
52. Utilities and Service Systems: Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
53. Utilities and Service Systems: Result in a determination by the wastewater treatment provider which services or may serve the project determined that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
54. Utilities and Service Systems: Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
55. Hydrology and Water Quality - Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Regional Water Quality Control Board (RWQCB) Region 2 Municipal Regional Permit

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Engineering	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source Other Than Project Description and Plans
56. Hydrology and Water Quality - Substantially degrade groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Santa Clara Valley Water District Groundwater Protection Ordinance <a href="http://www.valleywater.org">www.valleywater.org</a>
57. Hydrology and Water Quality - Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
58. Hydrology and Water Quality - Create or contribute runoff which would exceed the capacity of existing or planned storm water drainage systems in a manner which could create flooding or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	RWQCB, Region 2 Municipal Regional Permit, Stormwater Quality BMP Guidance Manual for New and Redevelopment Projects <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a>
59. Hydrology and Water Quality - Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Santa Clara Valley Water District (SCVWD) Guidelines and Standards for Land Use Near Streams <a href="http://www.valleywater.org">www.valleywater.org</a> City of Sunnyvale Stormwater Quality Best Management Practices (BMP) Guidance Manual for New and Redevelopment Projects <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a>
60. Utilities and Service Systems: Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Environmental Management Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>

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<p>61. Public Services Infrastructure? Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Project Description Safety and Noise Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a></p>
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Further Discussion if "Less Than Significant" with or without mitigation: None required.

Public Safety	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source Other Than Project Description and Plans
<p>62. Public Services Police and Fire protection - Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Safety and Noise Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a></p>
<p>63. Public Services Police and Fire protection - Would the project result in inadequate emergency access?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>2003 Downtown Specific Plan EIR, 2013 Mathilda Ave Carriage Road Transportation Evaluation, <i>Fehr &amp; Peers</i></p>

Further Discussion if "Less Than Significant" with or without mitigation:

**63. Emergency Access (Less than Significant)** – Amending the DSP to not implement a frontage road would not directly modify baseline conditions and therefore would not result in inadequate emergency access. The alternative street section designs available for Mathilda Avenue in lieu of constructing a frontage road would maintain adequate emergency access.

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Public Safety – Hazardous Materials	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source Other Than Project Description and Plans
64. Hazards and Hazardous Materials - Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description
65. Hazards and Hazardous Materials - Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description
66. Hazards and Hazardous Materials - Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description Sunnyvale Zoning Map <a href="http://www.sunnyvaleplanning.com">www.sunnyvaleplanning.com</a>
67. Hazards and Hazardous Materials - Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Project Description
68. Hazards and Hazardous Materials - Impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Safety and Noise Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>

Further Discussion if "Less Than Significant" with or without mitigation: None required.

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Community Services	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source Other Than Project Description and Plans
69. Public Services Parks? Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Land Use and Transportation Chapter of the Sunnyvale General Plan, Community Character Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
70. Recreation - Would the project increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Land Use and Transportation Chapter of the Sunnyvale General Plan, Community Character Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>
71. Recreation - Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Land Use and Transportation Chapter of the Sunnyvale General Plan, Community Character Chapter of the Sunnyvale General Plan <a href="http://www.generalplan.inSunnyvale.com">www.generalplan.inSunnyvale.com</a>

Further Discussion if "Less Than Significant" with or without mitigation: None required.

## ENVIRONMENTAL SOURCES

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**City of Sunnyvale General Plan:**  
Sunnyvale General Plan Consolidated in (2011)  
[www.generalplan.inSunnyvale.com](http://www.generalplan.inSunnyvale.com)

- Community Vision
- Land Use and Transportation
- Community Character
- Housing
- Safety and Noise
- Environmental Management
- Appendix A: Implementation Plans

**City of Sunnyvale Municipal Code:**  
<http://sunnyvale.ca.gov/>

- Title 8 Health and Sanitation
- Title 9 Public Peace, Safety or Welfare
- Title 10 Vehicles and Traffic
- Title 12 Water and Sewers
- Chapter 12.60 Storm Water Management
- Title 13 Streets and Sidewalks
- Title 16 Buildings and Construction
  - Chapter 16.52 Fire Code
  - Chapter 16.54 Building Standards for Buildings Exceeding Seventy –Five Feet in Height
- Title 18 Subdivisions
- Title 19 Zoning
  - Chapter 19.28 Downtown Specific Plan District
  - Chapter 19.29 Moffett Park Specific plan District
  - Chapter 19.39 Green Building Regulations
  - Chapter 19.42 Operating Standards
  - Chapter 19.54 Wireless Telecommunication Facilities
  - Chapter 19.81 Streamside Development Review
  - Chapter 19.96 Heritage Preservation
- Title 20 Hazardous Materials

### Specific Plans:

- Downtown Specific Plan
- El Camino Real Precise Plan
- Lockheed Site Master Use Permit
- Moffett Park Specific Plan
- 101 & Lawrence Site Specific Plan
- Southern Pacific Corridor Plan
- Lakeside Specific Plan
- Arques Campus Specific Plan

### Environmental Impact Reports:

- Futures Study Environmental Impact Report
- Lockheed Site Master Use Permit Environmental Impact Report

- Tasman Corridor LRT Environmental Impact Study (supplemental)
- Kaiser Permanente Medical Center Replacement Center Environmental Impact Report (City of Santa Clara)
- Downtown Development Program Environmental Impact Report
- Caribbean-Moffett Park Environmental Impact Report
- Southern Pacific Corridor Plan Environmental Impact Report
- East Sunnyvale ITR General Plan Amendment EIR
- Palo Alto Medical Foundation Medical Clinic Project EIR
- Luminaire (Lawrence Station Road/Hwy 237 residential) EIR
- NASA Ames Development Plan Programmatic EIS
- Mary Avenue Overpass EIR
- Mathilda Avenue Bridge EIR

### Maps:

- General Plan Map
- Zoning Map
- City of Sunnyvale Aerial Maps
- Flood Insurance Rate Maps (FEMA)
- Santa Clara County Assessor's Parcel
- Utility Maps
- Air Installations Compatible Use Zones (AICUZ) Study Map
- 2010 Noise Conditions Map

### Legislation / Acts / Bills / Resource Agency Codes and Permits:

- Subdivision Map Act
- San Francisco Bay Region
- Municipal Regional Stormwater NPDES Permit
- Santa Clara County Valley Water District Groundwater Protection Ordinance
- Section 404 of Clean Water Act
- CA Assembly Bill 32 Global Warming Solutions Act

### Lists / Inventories:

- Sunnyvale Cultural Resources Inventory List
- Heritage Landmark Designation List
- Santa Clara County Heritage Resource Inventory
- Hazardous Waste & Substances Sites List (State of California)
- List of Known Contaminants in Sunnyvale
- USFWS / CA Dept. F&G Endangered and Threatened Animals of California

## ENVIRONMENTAL SOURCES

<http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEAnimals.pdf>

- The Leaking Underground Petroleum Storage Tank List [www.geotracker.waterboards.ca.gov](http://www.geotracker.waterboards.ca.gov)
- The Federal EPA Superfund List [www.epa.gov/region9/cleanup/california.html](http://www.epa.gov/region9/cleanup/california.html)
- The Hazardous Waste and Substance Site List [www.dtsc.ca.gov/SiteCleanup/Cortese\\_List.cfm](http://www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm)

### Guidelines and Best Management Practices

- Storm Water Quality Best Management Practices Guidelines Manual 2007
- Sunnyvale Citywide Design Guidelines
- Sunnyvale Industrial Guidelines
- Sunnyvale Single-Family Design Techniques
- Sunnyvale Eichler Guidelines
- Blueprint for a Clean Bay
- Santa Clara Valley Water District (SCVWD) Guidelines and Standards for Land Use Near Streams
- The United States Secretary of the Interior's Guidelines for Rehabilitation
- Criteria of the National Register of Historic Places

### Transportation:

- California Department of Transportation Highway Design Manual
- California Department of Transportation Traffic Manual
- California Department of Transportation Standard Plans & Standard Specifications
- Highway Capacity Manual
- Institute of Transportation Engineers - Trip Generation Manual & Trip Generation Handbook
- Institute of Transportation Engineers - Traffic Engineering Handbook
- Institute of Transportation Engineers - Manual of Traffic Engineering Studies
- Institute of Transportation Engineers - Transportation Planning Handbook
- Institute of Transportation Engineers - Manual of Traffic Signal Design
- Institute of Transportation Engineers - Transportation and Land Development
- U.S. Dept. of Transportation Federal Highway Administration Manual on Uniform Traffic Control Devices for Street and Highways & CA Supplements
- California Vehicle Code
- Santa Clara County Congestion Management Program and Technical Guidelines
- Santa Clara County Transportation Agency Short Range Transit Plan
- Santa Clara County Transportation Plan
- Traffic Volume Studies, City of Sunnyvale Public Works Department of Traffic Engineering Division

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- Statewide Integrated Traffic Records System
- Sunnyvale Zoning Ordinance – including Titles 10 & 13
- City of Sunnyvale General Plan – Land Use and Transportation Chapter
- City of Sunnyvale Bicycle Plan
- City of Sunnyvale Neighborhood Traffic Calming Program
- Valley Transportation Authority Bicycle Technical Guidelines
- Valley Transportation Authority Community Design & Transportation – Manual of Best Practices for Integrating Transportation and Land Use
- Santa Clara County Sub-Regional Deficiency Plan
- City of Sunnyvale Deficiency Plan
- AASHTO: A Policy on Geometric Design of Highways and Streets
- Santa Clara County ALUC Moffett Field Comprehensive Land Use Plan

### Public Works:

- Standard Specifications and Details of the Department of Public Works
- Storm Drain Master Plan
- Sanitary Sewer Master Plan
- Water Master Plan
- Solid Waste Management Plan of Santa Clara County
- Geotechnical Investigation Reports
- Engineering Division Project Files
- Subdivision and Parcel Map Files

### Miscellaneous Agency Plans:

- ABAG Projections 2010
- Bay Area Clean Air Plan
- BAAQMD CEQA Guidelines

### Building Safety:

- California Building Code,
- California Energy Code
- California Plumbing Code,
- California Mechanical Code,
- California Electrical Code
- California Fire Code
- Title 16.52 Sunnyvale Municipal Code
- Title 16.53 Sunnyvale Municipal Code
- Title 16.54 Sunnyvale Municipal Code
- Title 19 California Code of Regulations
- National Fire Protection Association (NFPA) standards

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**OTHER :**

**Project Specific Information**

- Mathilda Avenue Carriage Road Transportation Evaluation dated 7/26/13, see Appendix A.

## LEAD AGENCY AND CONSULTANTS

**Lead Agency:**

**City of Sunnyvale**  
Gerri Caruso, Principal Planner  
Jack Witthaus, Transportation and Traffic Manager

**Consultants:**

**David J. Powers and Associates, Inc.**  
Environmental Consultants and Planners  
Akoni Daniels, Principal Project Manager  
Matthew Gilliland, Assistant Project Manager

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**Fehr & Peers, Inc.**  
Transportation Consultants

**ENVIRONMENTAL SOURCES**

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**Appendix A**

**Mathilda Avenue Carriage Road Transportation Evaluation dated 7/26/13  
By Fehr & Peers**

# FEHR & PEERS

## MEMORANDUM

**Date:** July 26, 2013  
**To:** Jack Witthaus, City of Sunnyvale  
**From:** Matt Haynes, Sarah Peters and Alisar Aoun, Fehr & Peers  
**Subject:** *Mathilda Avenue Carriage Road Transportation Evaluation*

SJ12-1406

### INTRODUCTION

This memorandum presents a transportation assessment of the proposed "carriage" road on the west side of Mathilda Avenue between Evelyn Avenue and Olive Avenue. The study evaluates operations with and without the proposed carriage road, assuming new land uses are developed along the corridor consistent with the Downtown Specific Plan and Year 2035 General Plan development assumptions.

The City of Sunnyvale's *Downtown Specific Plan (2003)* assumes the development of a one-way carriage road on the west side of Mathilda Avenue between Evelyn Avenue and Olive Avenue. The carriage road is intended to provide access and circulation needs for properties along the west side of Mathilda Avenue while limiting driveway access points off the arterial corridor of Mathilda Avenue.

This study evaluates three access alternatives for the west side of Mathilda Avenue. Conditions in Year 2035 were evaluated with the proposed frontage road and for two scenarios without the proposed carriage road. The study scenarios are outlined below:

- 1. Existing (2012/2013) Conditions** – Conditions based on data collected in December 2012 and February 2013.
- 2. Year 2035 Without Carriage Road Conditions (Mathilda Avenue Access)** – No carriage road would be constructed. Primary access to the two blocks on the west side of Mathilda Avenue between Iowa Avenue and Washington Avenue would be via driveways on Mathilda Avenue. To maintain consistency with current development plans, primary access for the block between Olive Avenue and Iowa Avenue would be via Charles Avenue, with some access provided on Mathilda Avenue. Project trips are added to base volumes forecasted using the City of Sunnyvale's *existing General Plan for Year 2035 conditions*.

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**3. Year 2035 Without Carriage Road Conditions (Charles Street Access between Iowa Avenue and Olive Avenue)**

No carriage road would be constructed; primary access to the blocks between Iowa Avenue and Washington Avenue would be via driveways on Mathilda Avenue. For the block between Iowa Avenue and Olive Avenue (Block 14 in the *Downtown Specific Plan*), primary access would be via Charles Avenue, with no driveways via Mathilda Avenue. Project trips are added to base volumes forecasted using the City of Sunnyvale's *existing General Plan*.

**4. Year 2035 With Carriage Road Conditions**

The carriage road as described in the *Downtown Specific Plan (2003)* would be constructed parallel to the southbound lanes of Mathilda Avenue. Primary access to the blocks on the west side of Mathilda Avenue, between Olive Avenue and Washington Avenue, would be via driveways on the carriage road. Project trips are added to base volumes forecasted using the City of Sunnyvale's *existing General Plan*.

Traffic operations at five study intersections along Mathilda Avenue were evaluated during the morning peak-hour occurring between 7:00 am to 9:00 am and evening peak-hour occurring between 4:00 pm to 6:00 pm. Additionally, traffic operations at two intersections on Charles Avenue were evaluated for the Charles Street Access scenario described above.

## EXISTING CONDITIONS

### *Data Collection*

Vehicle, pedestrian and bicycle counts were conducted in November 2012 during the AM (7:00 AM - 9:00 AM) and PM (4:00 PM - 6:00 PM) peak periods at the following five study intersections:

1. Mathilda Avenue and Washington Avenue
2. Mathilda Avenue and McKinley Avenue
3. Mathilda Avenue and Iowa Avenue
4. Mathilda Avenue and Olive Avenue
5. Mathilda Avenue and El Camino Real

Additional AM and PM peak period counts were conducted in February 2013 at the following two study intersections:

6. Charles Street and Iowa Avenue
7. Charles Street and Olive Avenue.

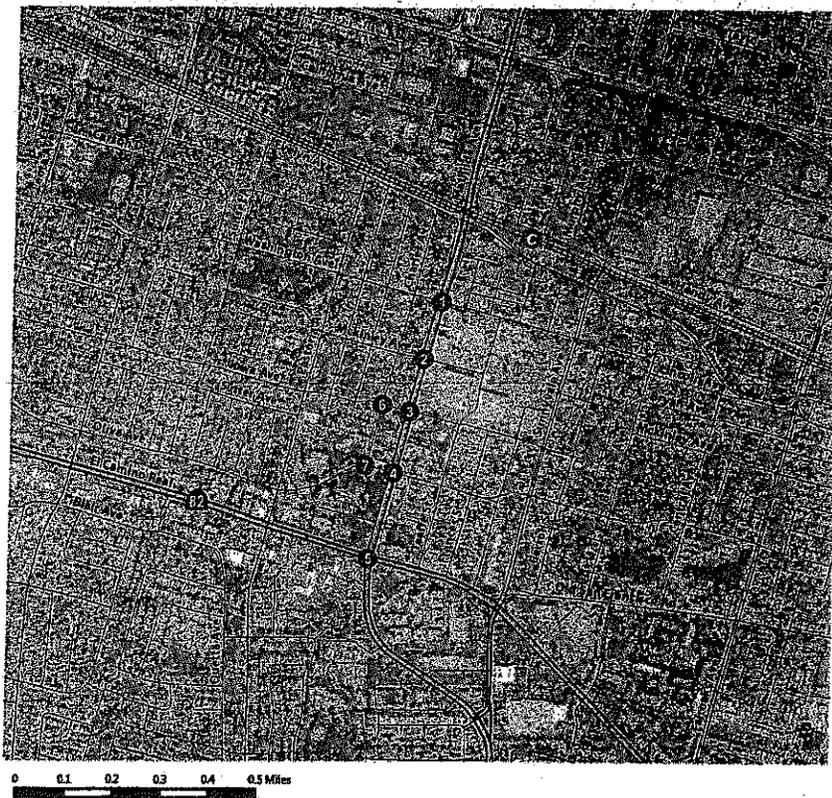
To measure existing traffic levels using driveways along Mathilda Avenue, driveway counts were also conducted in February 2013 at twelve driveways along Mathilda Avenue between Washington Avenue and Olive Avenue. **Figure 1** shows the locations of study intersections.

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Field observations were conducted during the AM peak hour (8:00 AM – 9:00 AM) and PM peak hour (5:00 PM – 6:00 PM) in December 2012 to evaluate intersection operations and vehicle queuing and to confirm street geometry. Subsequent field observations were conducted in March 2013 to observe the influence of driveway operations on southbound vehicle traffic.

Observations confirmed that traffic flow along Mathilda Avenue is heaviest in the northbound direction during the AM peak hour and in the southbound direction during the PM peak period. During the AM peak hour, northbound vehicles were observed to occasionally slow after departing the intersection of Mathilda Avenue and Washington Avenue, which indicates that delay from intersections north of the study corridor are influencing traffic in the downtown area.



**Legend**

- Study Intersection
- Ⓢ Caltrain Station
- Railroad

**Figure 1**

**Mathilda Carriage Road  
Study Intersections**

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Date: March, 2019



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During field observations, the fourth northbound lane on Mathilda Avenue, which is used as a parking lane south of Olive Avenue, was largely unused, including during the AM peak hour when northbound traffic is heaviest. All three southbound travel lanes were heavily used during the PM peak hour.

Vehicles entering driveways on the west side of Mathilda Avenue were observed to cause some delay for southbound through vehicles. Depending on the density of southbound traffic, queues of up to four vehicles were observed to form behind vehicles entering driveways on the west side of Mathilda. Vehicles exiting driveways were not observed to cause delays, as drivers typically waited until platoons of southbound vehicles had cleared the driveway exit. No substantial queuing was observed at the intersections of Charles Avenue/Iowa Avenue and Charles Avenue/Olive Avenue.

During field observations in December, construction activity was observed east of Mathilda Avenue along McKinley Avenue. As a result, the second southbound left turn lane at Mathilda Avenue and Washington Avenue and the second eastbound left turn lane at Mathilda Avenue and McKinley Avenue were temporarily closed pending alterations to the median on Mathilda Avenue. These lanes were removed from the model to analyze Existing Conditions, but they were included for the Year 2035 analysis scenarios.

#### *Street Geometry and Land Use*

Mathilda Avenue runs for approximately half a mile through downtown Sunnyvale, from El Camino Real to the Caltrain tracks overcrossing north of Washington Avenue. Sunnyvale's Civic Center complex lies to the west of Mathilda Avenue, between Olive Avenue and El Camino Real; north of Olive Avenue, Mathilda Avenue's west side is bordered by single-family homes and small commercial developments. The east side of Mathilda Avenue contains a mixture of low-density residential development and small commercial enterprises south of Olive Avenue. North of Olive Avenue, Mathilda Avenue's east side is generally bordered by office buildings. East of Mathilda Avenue and north of Iowa Avenue, commercial developments include Macy's and Target department stores and the small businesses of the Murphy Avenue Historic District. The Sunnyvale Caltrain Station is located on Evelyn Avenue less than a quarter-mile east of Mathilda Avenue.

In the downtown area, Mathilda Avenue has three southbound lanes, a landscaped center median that narrows to accommodate left turn pockets, and four northbound lanes. Travel lanes vary in width between ten and fourteen feet, averaging a width of eleven feet. South of Olive Avenue, the fourth northbound lane is used as a parking lane. **Table 1** provides a schematic cross-section of Mathilda Avenue in the study area.

Sidewalks are continuous within the study area and are generally about five and a half feet wide, although they widen to ten feet north of Booker Avenue, adjacent to new development on Mathilda Avenue's east side. There are five bus stops on Mathilda Avenue within the downtown area; bus service is infrequent, with Valley Transportation Authority (VTA) buses arriving approximately twice per hour during the AM and PM peaks. **Figure 2** shows existing transit routes within the study area.

Within the study area, Mathilda Avenue does not currently have bicycle facilities. **Figure 3** shows existing bicycle facilities near the study area.

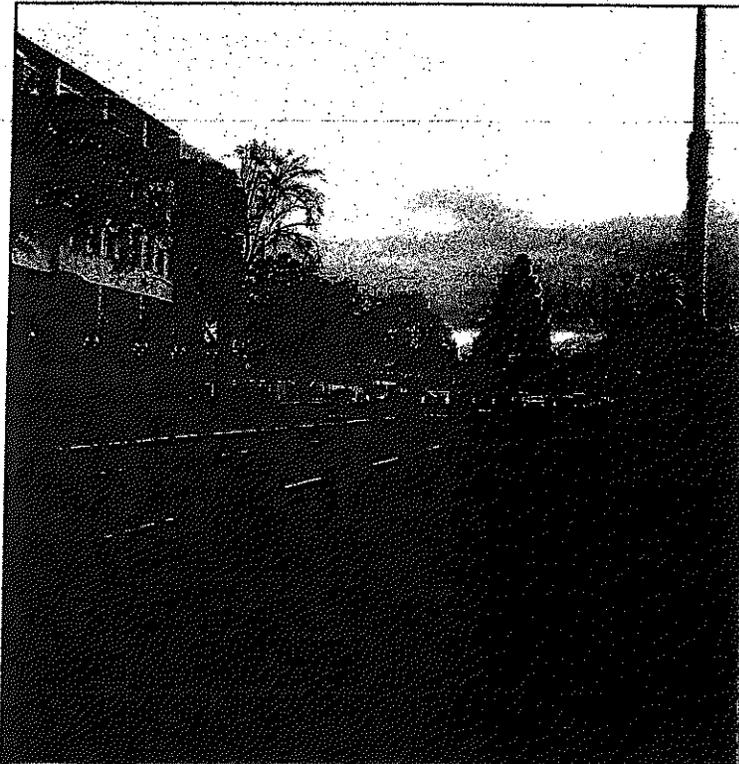
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**TABLE 1**  
**MATHILDA AVENUE EXISTING STREET CONFIGURATION (SCHEMATIC)**  
(Dimensions in feet)

Side Walk (ft)	Southbound Travel Lanes			Landscape Median / Left Turn Lane	Northbound Travel Lanes				Side Walk (ft)
5.5	11.0	11.0	11.0	32.0	11.0	11.0	11.0	11.0	5.5
Total Right of Way (ROW) 120-125 Note: Roadway and lane widths vary along the Mathilda Avenue corridor.									

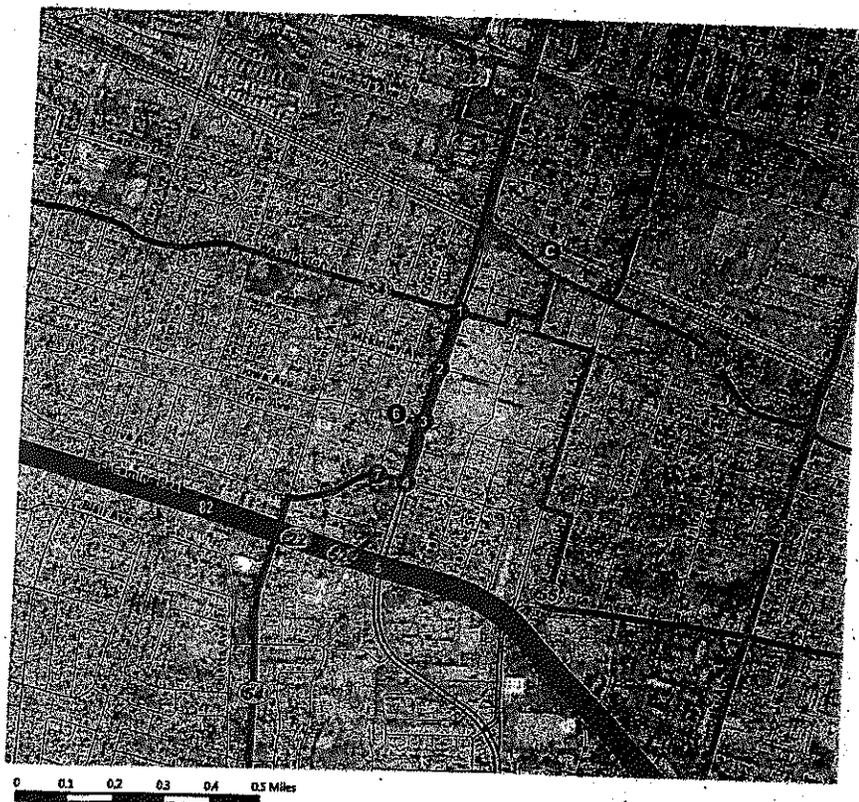
Source: Fehr & Peers, 2013.



Sidewalks on west side of Mathilda Avenue, south of Washington Avenue.

**Traffic, Bicycle and Pedestrian Volumes**

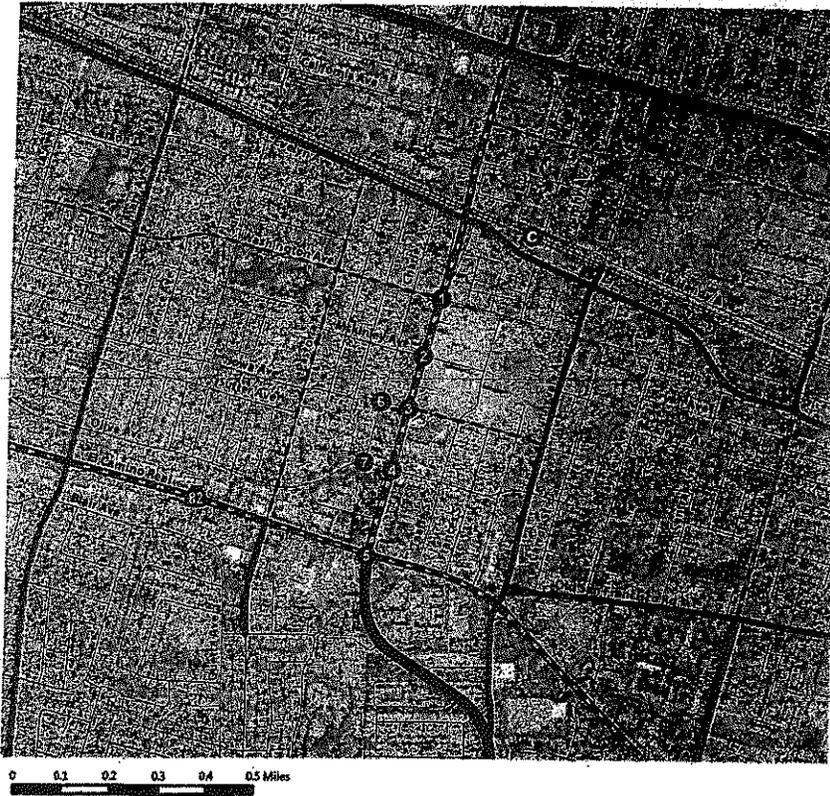
AM and PM peak hour turning movement volumes for the five study intersections were collected in November 2012. Automobile turning volumes at study intersections are shown in **Figure 4**; bicycle and pedestrian volumes are shown in **Figure 5**. A schematic illustration of driveway turning movements is shown in **Figure 6**.



**Figure 2**  
**Mathilda Carriage Road**  
**Existing Transit Routes**

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Date: March, 2015





**Legend**

- Study Intersection
- ⊙ Caltrain Station
- ==== Railroad
- Existing Bicycle Facilities**
- Class II Bicycle Lane
- - - - Class III Bicycle Route
- Proposed Bicycle Facilities**
- - - - Class II Bicycle Lane
- - - - Class III Bicycle Route

**Figure 3**  
**Mathilda Carriage Road**  
**Existing & Proposed Bicycle Facilities**

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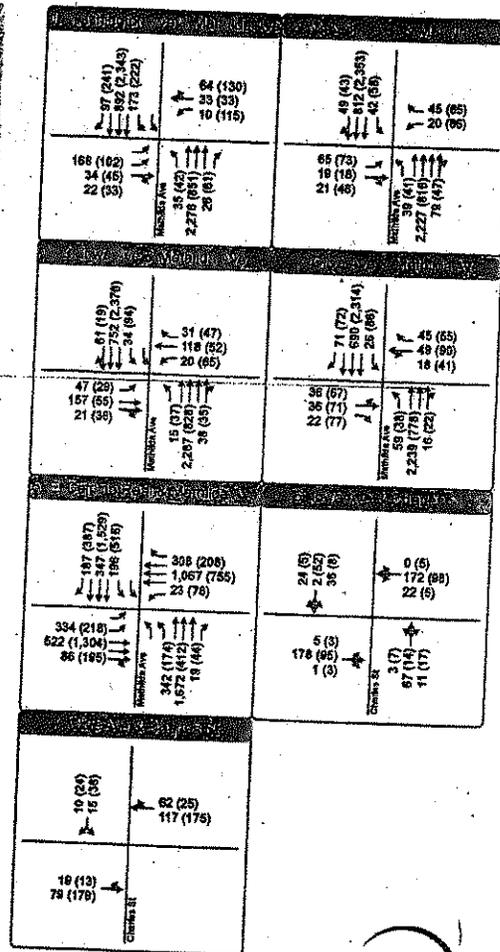




**Figure 4**  
**Mathilda Carriage Road**  
**Existing Vehicle Volumes**

**Legend**

- Study Intersection
- ⊙ Caltrain Station
- ##### Railroad
- ↔ Turn Lane
- AM (PM) Peak-Hour Vehicle Traffic Volume



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Date: March, 2015





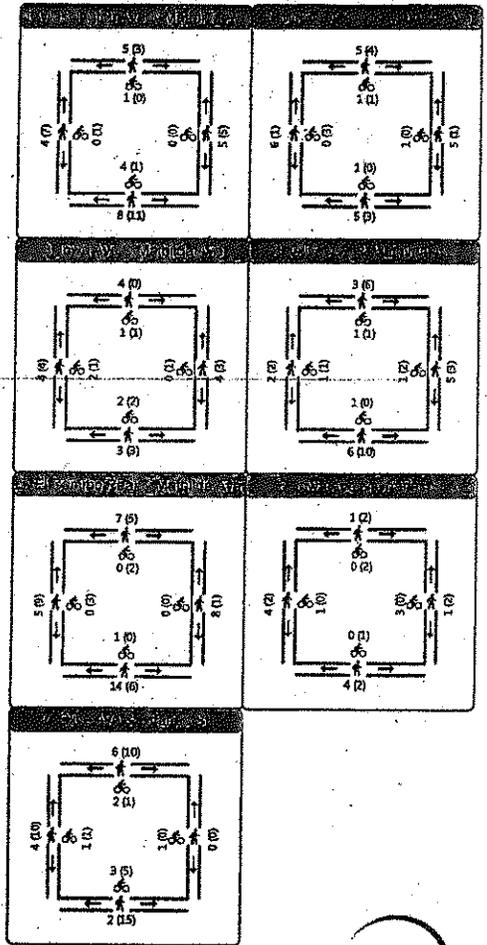
0 0.1 0.2 0.3 0.4 0.5 Miles

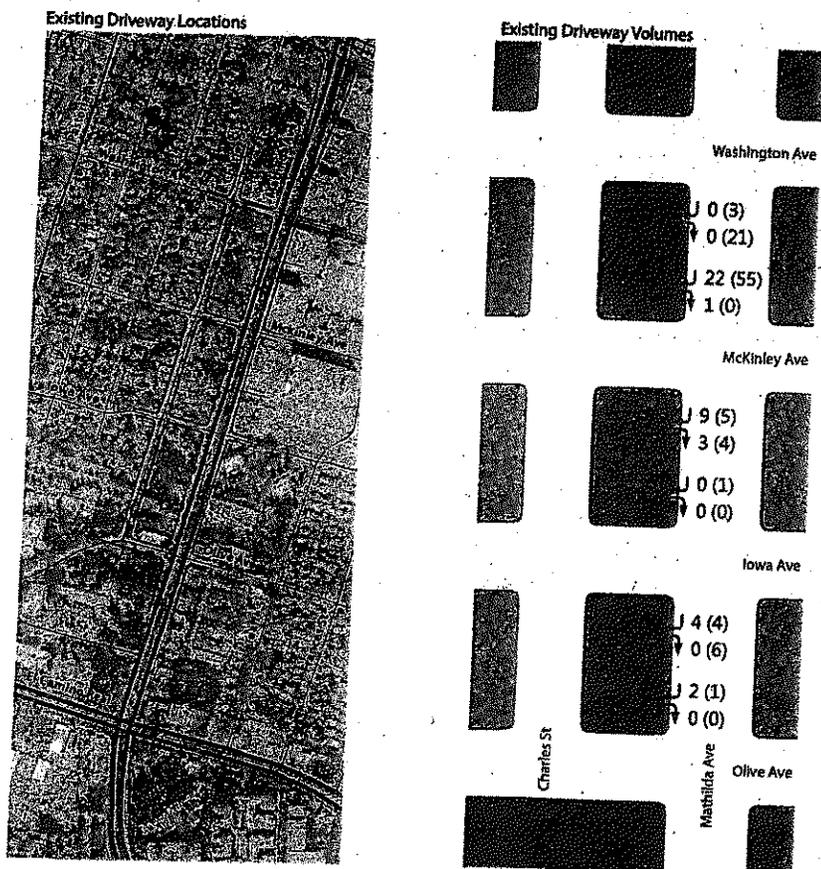
**Legend**

- Study Intersection
- ⊙ Caltrain Station
- ##### Railroad
- AM (PM) Peak-Hour Pedestrian Crossing Volume
- AM (PM) Peak-Hour Bicycle Approach Volume

**Figure 5**  
**Mathilda Carriage Road**  
**Existing Bicycle and Pedestrian Volumes**

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Date: March, 2013





**Figure 6**  
**Mathilda Carriage Road**  
**Existing PM Peak Period Driveway Volumes (Schematic)**

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Date: March, 2019



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*Vehicle Collision History*

Based on data taken from the City of Sunnyvale's Crossroads collision database, 180 vehicular collisions were recorded for the five year period between 2007 through 2011 along the Mathilda Avenue corridor. Almost 30 percent of these collisions were categorized as rear-end collisions. There were three documented collisions with bicyclists and none with pedestrians.

The corridor area nearest Mathilda Avenue and El Camino Real had the highest number of collisions, with ninety-nine total collisions, fifteen of which were rear-end collisions. The Washington, McKinley, Iowa, and Olive intersections follow with forty-six, fourteen, twelve, and nine collisions, respectively; about half of these were rear-end collisions. Although mid-block and rear-end collisions may occur as a result of conflicts between vehicles entering and exiting driveways and vehicles traveling along a street, there is not enough evidence to draw conclusions about whether the collisions observed along the Mathilda Avenue corridor were related to driveway access or the result of other factors.

The five-year vehicular collision history on the study corridor is summarized in **Table 2**.

**TABLE 2  
MATHILDA AVENUE VEHICULAR COLLISIONS, 2007-2011**

Nearest Intersection	Total Collisions	Rear-end Collisions	Collisions with Bicyclists/Pedestrians
Mathilda/ Washington	46	18	0
Mathilda/ McKinley	14	10	0
Mathilda/ Iowa	12	5	1
Mathilda/ Olive	9	5	0
Mathilda/ El Camino Real	99	15	2
<b>TOTAL</b>	<b>180</b>	<b>53</b>	<b>3</b>

Source: City of Sunnyvale Crossroads Collision Database, 2013.

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## YEAR 2035 CONDITIONS

### Trip Generation

Three blocks on the west side of Mathilda Avenue within the study area were evaluated under Year 2035 conditions. As defined in the City of Sunnyvale's *Downtown Specific Plan* (2003), the three blocks are as follows:

- **Block 14**, bounded by Mathilda Avenue, Olive Avenue, Charles Street and Iowa Avenue;
- **Block 15**, bounded by Mathilda Avenue, Iowa Avenue, Charles Street and McKinley Avenue;
- **Block 16**, bounded by Mathilda Avenue, McKinley Avenue, Charles Street and Washington Avenue.

The *Downtown Specific Plan* calls for high-density residential development on these blocks, with up to 173 units planned for Blocks 14 and 16 and 152 units for Block 15. Additionally, up to 10,000 square feet of ground-floor retail space is allowed, located on corners facing Mathilda (*Downtown Specific Plan*, page 84). The *Downtown Specific Plan* encourages below-grade or podium parking structures on these blocks, with entrances on the side streets (i.e. north and south-facing block faces) and limited access via Charles Street (page 85). Land use assumptions for Year 2035 conditions are summarized in **Table 3**.

Automobile trip generation estimates for Year 2035 conditions were developed using land use intensities described in the *Downtown Specific Plan* and vehicle trip rates from the 9<sup>th</sup> Edition of *Trip Generation* (2012), published by the Institute of Transportation Engineers (ITE). Trip rates for apartments (ITE Rate #220) were used to estimate trip generation from the residential development; trip rates for shopping centers (ITE Rate #820) were used to estimate trip generation from corner retail. In total, new land uses on Blocks 14, 15 and 16 are expected to generate 370 new AM peak hour vehicle trips and 711 PM peak hour vehicle trips. Trip generation for Year 2035 conditions is summarized in **Table 4**.

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**TABLE 3  
LAND USE ASSUMPTIONS FOR YEAR 2035 SCENARIOS**

Block	Driveway/Access	Block Face	Scenario		
			No Carriage Road	Charles Access	Carriage Road
General Assumptions			- Mid-block parcels will be aggregated and redeveloped as high density residential possibly with ground-level retail. - Corner retail may develop separately from mid-block uses. - Retail uses at corners will have driveways on side streets (Iowa, Olive, Washington, McKinley). - Carriage road permits more access via Mathilda (reduces conflicts with arterial traffic)		
17	Mathilda Ave.	East	Primary residential access	No access	- Primary residential access - Some retail access.
	Charles Ave.	West	Secondary residential access	Sole residential access	Secondary residential access
	Iowa Ave.	North	Driveway for north corner retail	Driveway for north corner retail	Primary driveway for north corner retail
	Olive Ave.	South	Driveway for south corner retail	Driveway for south corner retail	Primary driveway for south corner retail
18	Mathilda Ave.	East	Primary residential access	Primary residential access	- Primary residential access - Some retail access
	Charles Ave.	West	Secondary residential access	Secondary residential access	Secondary residential access
	McKinley Ave.	North	Driveway for north corner retail	Driveway for north corner retail	Primary driveway for north corner retail
	Iowa Ave.	South	Driveway for south corner retail	Driveway for south corner retail	Primary driveway for south corner retail
19	Mathilda Ave.	East	Primary residential access	Primary residential access	- Primary residential access - Some retail access
	Charles Ave.	West	Secondary residential access	Secondary residential access	Secondary residential access
	Washington Ave.	North	Driveway for north corner retail	Driveway for north corner retail	Primary driveway for north corner retail
	McKinley Ave.	South	Driveway for south corner retail	Driveway for south corner retail	Primary driveway for south corner retail

Sources: City of Sunnyvale *Downtown Specific Plan*, 2003; Fehr & Peers, July 2013.



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The City of Sunnyvale's travel demand model was used to develop baseline volumes for the five study intersections for the Year 2035, based on land uses assumed in the City's current General Plan. Corridor volumes on Mathilda and intersection volumes for Mathilda and El Camino Real were based directly on model results, and side street volumes for the six remaining study intersections were forecasted using the "difference method" to account for traffic growth at these intersections.

Vehicle turning movements were also adjusted based on the expected locations of new land use developments on the Mathilda Avenue corridor. Trips from Blocks 14, 15 and 16 were added to these background volumes according to the trip distributions developed for each scenario.

**Trip Distribution**

Trip distribution for Year 2035 scenarios were developed from an analysis of peak hour turning movements at existing driveways and of likely parcels for redevelopment.

Peak hour turning movement counts at the twelve driveways that access Blocks 14, 15 and 16 are reported in **Table 5** below.

**TABLE 5  
EXISTING DRIVEWAY TURNING MOVEMENTS ON MATHILDA AVENUE**

Block	Total Driveways	AM			PM		
		In	Out	Total	In	Out	Total
14	3	6	0	6	5	6	11
15	2	8	2	12	6	4	10
16	5	22	1	23	58	21	79
<b>Total</b>	<b>12</b>	<b>37</b>	<b>4</b>	<b>41</b>	<b>69</b>	<b>31</b>	<b>100</b>

Source: Fehr & Peers, 2013.

Turning movement counts for driveways on Mathilda Avenue are lower than estimated ITE trip generation for existing land uses on these blocks. Peak-hour entrances and exits at driveways on Mathilda Avenue account for approximately 10 percent of the total trip generation for the three blocks that would be expected from rates published in ITE's *Trip Generation* (9<sup>th</sup> edition), although the rate varies by driveway, in/out movement and AM or PM peak hour.

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The discrepancy between expected and observed driveway turning movements indicates that driveway counts on Mathilda Avenue do not represent the total trip generation from existing land uses. This suggests other driveway entrances not on Mathilda account for most of the trips to and from these parcels. Since most parcels on these three blocks have frontages on at least one street in addition to Mathilda Avenue, and because the *Downtown Specific Plan* discourages access on Mathilda Avenue, it is likely that only a fraction of trips generated by future development will be distributed onto Mathilda Avenue.

We assume that more trips would be routed onto Mathilda Avenue under the Carriage Road scenario than under the No Carriage Road scenario, because a carriage road would provide a buffer between faster moving traffic in the through travel lanes and slower traffic entering and exiting driveways. We also estimate that trip distribution percentages would be the same during AM and PM peak hours.

We assume that the majority of trips in all scenarios would enter and exit the study area via Mathilda Avenue rather than accessing the area via local streets to the west. However, it is likely that some trips traveling to and from areas west of Mathilda or via the Central Expressway would travel via Mary Avenue or Pastoria Avenue, which are parallel to Mathilda Avenue. Therefore, twenty-five percent of all trips were assumed to enter and exit the network via side streets and Charles Street without traveling on Mathilda. This is consistent with observed driveway counts on Mathilda Avenue, which are considerably lower than projected trip generation for these blocks.

Subject to the above constraints, up to half of the vehicles using side-street driveways were assumed to enter and exit the study area without traveling on Mathilda Avenue. Of trips not using Mathilda Avenue, the remainder was assumed to have origins and destinations on Charles Street driveways.

#### *Year 2035 No Carriage Road (Mathilda Access)*

The Year 2035 No Carriage Road (Mathilda Access) scenario assumes that the proposed carriage road will not be constructed. Primary access to the two blocks on the west side of Mathilda Avenue between Iowa Avenue and Washington Avenue would be via driveways on Mathilda Avenue; however, driveways would be provided on Olive Avenue, Iowa Avenue, McKinley Avenue and Washington Avenue to provide access to land uses adjacent to these streets. Some access would also be provided on Charles Street.

On the block between Olive Avenue and Iowa Avenue (Block 14 in the *Downtown Specific Plan*), where current development plans call for mid-block driveways on Charles Street only, primary access would be via Charles Street. Some access would also be provided on Mathilda Avenue, Iowa Avenue and Olive Avenue.

Vehicle access to retail uses would likely be via side-street driveways on Olive Avenue, Iowa Avenue, McKinley Avenue and Washington Avenue; access to residential uses would be via mid-block driveways on Mathilda Avenue or Charles Street. As described in the *Downtown Specific Plan*, future development within the study area will require consolidation of driveways on each block.

Under this scenario, the majority of trips would enter and exit via Mathilda Avenue or one of the side streets. This is consistent with the *Downtown Specific Plan*, which calls for limited access on Charles Street. Compared

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to the No Carriage Road (Charles Access) scenario, this scenario would have slightly lower vehicle traffic on the primarily residential side streets.

*Year 2035 No Carriage Road (Charles Access)*

The Year 2035 No Carriage Road (Charles Access) scenario assumes that the carriage road proposed in the *Downtown Specific Plan* will not be developed, and that vehicle access to land uses within the study area will be primarily via driveways on Mathilda Avenue and side streets, with the exception of Block 14. On Block 14, there would be no vehicle access via Mathilda Avenue, and the majority of vehicle trips will enter and exit through driveways on Charles Avenue. This is consistent with current development proposals, which call for mid-block driveways on Charles Street only. This scenario differs from *Downtown Specific Plan* guidelines by providing greater levels of vehicle access via Charles Street than via Mathilda Avenue.

Compared to the No Carriage Road (Mathilda Access) scenario, this scenario would provide more access to Block 14 via Charles Street, less via Iowa Avenue and Olive Avenue, and none via Mathilda Avenue. For the blocks between Washington Avenue and Iowa Avenue (Blocks 15 and 16 in the *Downtown Specific Plan*), access is the same for both No Carriage Road scenarios.

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*Year 2035 Carriage Road*

The Year 2035 Carriage Road (Charles Access) scenario assumes that the carriage road proposed in the *Downtown Specific Plan* will be developed. Vehicle access to land uses within the study area would be primarily via driveways on Mathilda Avenue, with some access via side streets and Charles Street. Vehicle access to retail uses would be via driveways on Mathilda Avenue and on side streets (Olive Avenue, Iowa Avenue, McKinley Avenue and Washington Avenue). Most residential trips would enter and exit via Mathilda Avenue.

Compared to the other scenarios, this option would reduce vehicle traffic on side streets by facilitating additional driveway access via the Mathilda Avenue frontage road.

To calculate intersection Level of Service (LOS) and travel times along the Mathilda Avenue corridor, trips to and from each block face were assigned to the street network. Trip distribution results for the three future year scenarios are summarized in **Table 6** and shown in **Figure 7**.

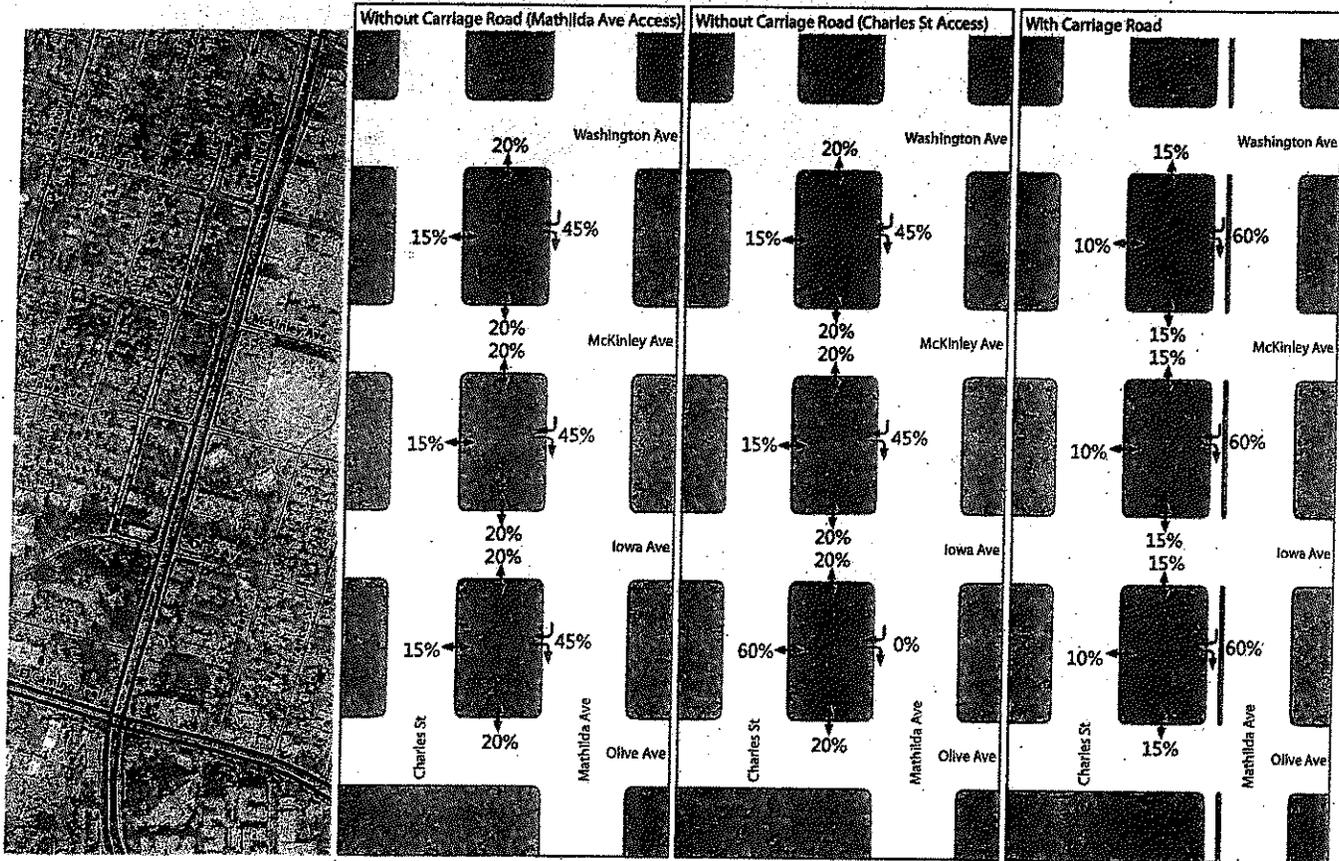
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**TABLE 6  
YEAR 2035 TRIP DISTRIBUTION**

Block	Driveways on	Block Face	Scenario		
			No Carriage Road (Default Access)	No Carriage Road (Changes Access)	Carriage Road
14	Mathilda Ave.	East	45%	0%	60%
	Charles Ave.	West	15%	60%	10%
	Iowa Ave.	North	20%	20%	15%
	Olive Ave.	South	20%	20%	15%
15	Mathilda Ave.	East	45%	45%	60%
	Charles Ave.	West	15%	15%	10%
	McKinley Ave.	North	20%	20%	15%
	Iowa Ave.	South	20%	20%	15%
16	Mathilda Ave.	East	45%	45%	60%
	Charles Ave.	West	15%	15%	10%
	Washington Ave.	North	20%	20%	15%
	McKinley Ave.	South	20%	20%	15%

Source: Fehr & Peers, 2013.



XX% Trip Distribution Percentage Shown by Blockface

Figure 7

**Mathilda Carriage Road  
Trip Distribution by Scenario (Percentage Shown by Blockface)**

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Date: July, 2019



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**Downtown Specific Plan Carriage Road Design**

The *Downtown Specific Plan* recommends the development of a carriage road on the west side of Mathilda Avenue. The goal of the carriage road is to provide access and circulation improvements for properties along the west side of Mathilda Avenue while limiting driveways and access points off the arterial corridor of Mathilda Avenue.

The Downtown Specific Plan calls for a one-way carriage road to west side of Mathilda Avenue, with an 8 foot wide parking lane, a 15 foot wide travel lane and a 7 foot wide landscaped median separating the carriage road from through travel lanes. The Specific Plan does not provide a detailed description of how the carriage road would operate.

The carriage road dimensions described in the *Downtown Specific Plan* require a dedication of 33 feet on the west side of Mathilda Avenue to construct the carriage road. On the east side of Mathilda Avenue, 27 foot wide sidewalks would be constructed using a 10 foot dedication along with the fourth northbound travel lane and existing right-of-way. The existing center median would be narrowed to accommodate wider travel lanes. The conceptual design of the Specific Plan carriage road is summarized in **Table 7** and in **Figure 8**.

Wider sidewalks reduce the need for building setbacks from the public right-of-way. As a result, the *Downtown Specific Plan* does not require minimum setbacks for developments that dedicate public right-of-way. Parcels developed since 2003 along the east side of Mathilda Avenue have included narrower sidewalks (between 10' and 15' wide including setbacks) than are called for in the Specific Plan.

The *Downtown Specific Plan's* carriage road concept would add parking spaces to the west side of Mathilda Avenue, where on-street parking is currently prohibited. Currently, parking is only present on the east side of Mathilda Avenue between El Camino Real and Olive Avenue.

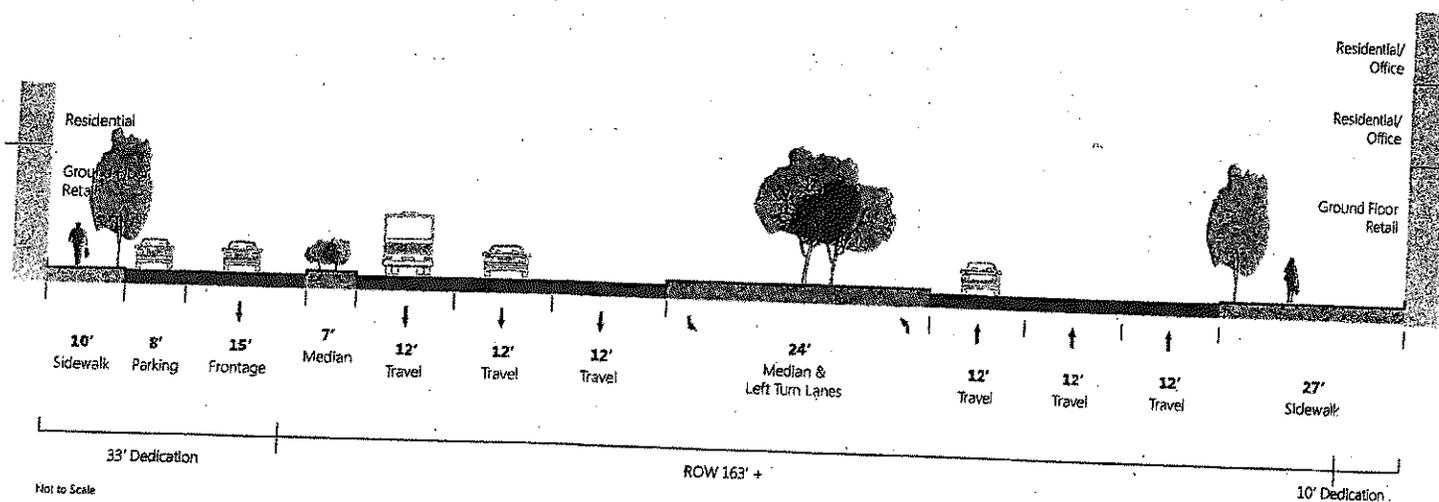
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**TABLE 7**  
**DOWNTOWN SPECIFIC PLAN CARRIAGE ROAD CONCEPT CONFIGURATION**  
(Dimensions in feet)

Street (west)	Parking	Carriage Road	Planted Median	Southbound Travel Lanes			Landscaped Median / Turn Lanes	Northbound Travel Lanes			Street (east)	
10.0	8.0	15.0	7.0	12.0	12.0	12.0	24.0	12.0	12.0	12.0	27.0	
Total right-of-way: 155 (ROW is reduced to approximately 145-150 feet if sidewalks on east side are reduced to 10-foot width consistent with recent office development along the corridor)												
Dedication: 38'												Dedication: 10'

Sources: Fehr & Peers, 2013; City of Sunnyvale Downtown Specific Plan, 2002.



**Figure 8**  
**Specific Plan Carriage Road**  
**(Mid-block, Facing North)**

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Date: March, 2013



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#### **Level of Service Methodology**

The operations of roadway facilities are described with the term *level of service*. Level of Service (LOS) is a qualitative description of traffic from the driver's perspective based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, the least congested operating conditions, to LOS F, the most congested operating conditions. LOS E represents "at-capacity" operations. When traffic volumes exceed the capacity, stop-and-go conditions result, and operations are designated as LOS F.

Signalized intersections are analyzed using the method described in Chapter 16 of the 2000 Highway Capacity Manual (HCM) (Special Report 209, Transportation Research Board). This method evaluates signalized intersection operations on the average control vehicular delay.

Control delay includes initial deceleration delay, queue move-up time, stopped delay, and acceleration delay. The average control delay for signalized intersection is calculated using the Synchro 7.0 analysis software and is correlated to a LOS designation as shown in **Table 8**.

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**TABLE 8  
SIGNALIZED INTERSECTION LOS CRITERIA**

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	80.0

Source: Fehr & Peers, 2013.

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### **Level of Service Analysis**

Level of service analysis was conducted using the Synchro traffic operations modeling software package. A weekday peak hour Synchro model was developed for the length of Mathilda Avenue from El Camino Real to Washington Avenue and for the block between Iowa Avenue and Olive Avenue on the west side of Mathilda Avenue. Synchro traffic simulation software is based on procedures outlined in the Transportation Research Board's 2000 *Highway Capacity Manual* (HCM). The Synchro models were coded with existing peak hour volumes, posted speed limit, vehicle mix, and current traffic signal timings. Traffic signal-related information such as phasing and initial timings (minimum green, maximum green, gap, etc.) for the five study intersections was input based on Synchro files provided by the City of Sunnyvale and adjusted to replicate field conditions. Additional detail such as turn pocket lengths and intersection spacing was coded based on field measurements.

The Synchro model was converted to SimTraffic to verify that the model accurately reflects conditions observed in the field. SimTraffic captures the random nature of driver behavior and models the interaction between vehicles in a study network. Traffic simulation better accounts for delays under congested conditions including pedestrian crossings, queue blocking, and queue interactions between adjacent intersections when compared to traditional analysis methods. SimTraffic models reflecting existing field conditions require calibration to ensure that traffic volumes, queue lengths, and other operational observations are satisfactorily replicated.

SimTraffic is a stochastic model where different seed numbers generate different driver behaviors (i.e., accepting available gaps for turns, changing lanes, etc.) and system results. The *Guidelines for Applying Traffic Microsimulation Modeling Software* recommends multiple runs to account for this stochastic nature of the model and to achieve confidence in the simulated results.

#### *Existing*

To model Existing conditions, turning volumes from driveways counted in February 2013 were added to intersection turning volumes counted in December 2013. Intersection volumes were then balanced upwards. While this method is likely to slightly overestimate total volumes traveling on Mathilda Avenue, we preferred to present a conservative analysis of operations at study intersections rather than potentially undercount vehicles entering and exiting driveways within the study area. Turning volumes from intersection counts on Charles Avenue were likewise added to Mathilda Avenue intersections in order to present a conservative analysis. This resulted in an average delay at the Mathilda Avenue/Olive Avenue intersection of 25.4 seconds, which is slightly higher than what was calculated in our previous study.

All intersections operate at LOS D or better under Existing conditions, except the intersection of Mathilda Avenue/El Camino Real, which operates at LOS E during the PM peak hour, with an average delay of 58.7 seconds.

#### *Year 2035 No Carriage Road (Mathilda Access)*

Level of service analysis was conducted for No Carriage Road (Mathilda Access) conditions, with signal cycle lengths and offsets optimized. Under this scenario, the intersection of Mathilda Avenue and El Camino Real is

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forecasted to operate at LOS E during the AM peak hour, with an average vehicle delay of 76.3 seconds, and at LOS D during the PM peak hour, with an average vehicle delay of 54.8 seconds. The remaining study intersections would operate at LOS D or above during both AM and PM peak hours.

*Year 2035 No Carriage Road (Charles Access)*

Level of service analysis was conducted for Year 2035 No Carriage Road (Charles Access) conditions, with signal cycle lengths and offsets optimized. Under this scenario, the intersection of Mathilda Avenue and El Camino Real is forecasted to operate at LOS E during the AM peak period, with an average vehicle delay of 73.8 seconds, and at LOS D during the PM peak hour, with an average vehicle delay of 51.2 seconds. The remaining study intersections would operate at LOS D or above during both AM and PM peak hours.

*Year 2035 Carriage Road*

Level of service analysis was conducted for Year 2035 Carriage Road conditions, with signal cycle lengths and offsets optimized. All intersections are forecasted to operate at LOS D or better, with the exception of Mathilda Avenue/El Camino Real, which is forecasted to operate at LOS E during the AM peak period, with an average vehicle delay of 73.9 seconds, and at LOS D during the PM peak hour, with an average vehicle delay of 50.6 seconds.

Trips into driveways on Mathilda Avenue were modeled as through trips at the upstream intersection, assuming they would enter the carriage road mid-block instead of turning in directly from a side street. Average vehicle delay is generally consistent across all three scenarios. However, compared to the other two Year 2035 scenarios the Charles Access scenario shows slightly higher level of service at the Mathilda Avenue/Olive Avenue intersection and slightly lower level of service at the Mathilda Avenue/Iowa Avenue intersection. The Charles Access scenario assumes that there will be no access to Block 14 via Mathilda Avenue. This eliminates the need for vehicles to make U-turns from the northbound or southbound left turn lanes at Mathilda/Olive in order to access driveways on the west side of Mathilda, thereby reducing delay at this intersection. At the Mathilda/Iowa intersection, however, more vehicles make eastbound left turns under the Charles Access scenario than under either of the other two study scenarios, which slightly increases average delay.

Depending on the ultimate layout of the frontage road intersections, reported delay may differ from what would actually occur under field conditions. Further analysis, using a more detailed traffic operations simulation software (such as VISSIM) and development of more detailed alternatives for carriage road operations and traffic control, would be needed to accurately assess level of service and plan carriage road operations.

Average delay and level of service during the AM and PM peak hours for all scenarios are reported in **Table 9**. Turning movement volumes for the three future scenarios are shown in **Figures 9, 10 and 11**.

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**TABLE 9  
EXISTING VERSUS YEAR 2035 CONDITIONS LEVEL OF SERVICE**

Intersection	Peak Hour	Existing		2035 Existing Road		2035 No-Change Road			
						Mainline Access		On-Ramp Access	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Mathilda Ave & Washington Ave	AM	20.1	C	33.1	C	30.3	C	32.1	C
	PM	30.6	C	52.8	D	52.3	D	48.2	D
2. Mathilda Ave & McKinley Ave	AM	8.3	A	9.7	A	14.0	B	18.3	A
	PM	15.4	B	22.1	C	21.5	C	22.7	C
3. Mathilda Ave & Iowa Ave	AM	16.1	B	8.4	A	10.3	B	9.5	A
	PM	15.2	C	36.8	D	35.2	D	46.4	D
4. Mathilda Ave & Olive Ave	AM	8.6	A	22.9	C	20.1	C	18.8	B
	PM	25.4	C	47.9	D	44.9	D	39.9	D
5. Mathilda Ave & El Camino Real	AM	48.9	D	73.9	E	76.3	E	73.8	E
	PM	58.7	E	50.6	D	54.8	D	51.2	D
6. Charles St & Iowa Ave*	AM	12.9	A					17.7	A
	PM	10.8	A					16.6	A
7. Charles St & Olive Ave*	AM	9.9	A					12.1	A
	PM	10.9	A					14.2	A

Source: Fehr & Peers, 2013.

Asterisk (\*) indicates unsignalized intersection.

1. Whole intersection weighted average control delay expressed in seconds per vehicle calculated using methods described in the 2000 Highway Capacity Manual. For intersections #6 and #7, which are side-street stop controlled, intersection delay is reported for the worst approach, and LOS is reported for the entire intersection.
2. LOS = Level of service. LOS calculations conducted using the Synchro corridor analysis software package. Signal cycle lengths, phasing and offsets were optimized for 2035 General Plan conditions to align with City of Sunnyvale current practice.

**Corridor Speeds**

SimTraffic was used to calculate average travel speeds and times during the AM and PM peak hours for the Mathilda Avenue corridor between Washington Avenue and El Camino Real. Southbound travel speeds, which reflect delay resulting from driveway traffic along the west side of Mathilda Avenue, showed little variation between Year 2035 scenarios. Southbound vehicles are forecasted to have an average speed of 18-20 miles per hour during the PM peak hour under all Year 2035 scenarios. During the AM peak hour,

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southbound travel speeds are forecasted at 21-22 miles per hour in Year 2035. Travel speeds for all Year 2035 scenarios are summarized in **Table 10**.

**TABLE 10**  
**CORRIDOR ARTERIAL SPEEDS**  
(Average peak hour vehicle speed in miles per hour, including intersection delay)

Corridor	Peak Hour	No Carriage Road (Matilda Access)		No Carriage Road (Clara Access)		Carriage Road	
		NB	SB	NB	SB	NB	SB
Matilda Avenue (Washington-El Camino Real)	AM	18	21	17	22	18	22
	PM	19	20	21	18	19	20

Source: Fehr & Peers, 2013.  
Results reflect signal phasing optimized for SimTraffic evaluation.

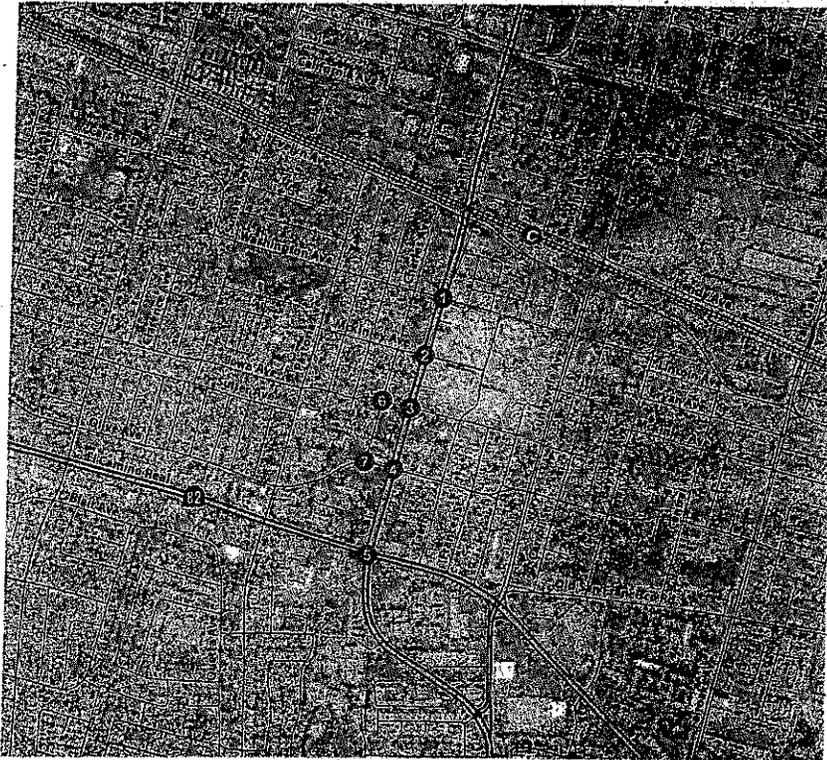
Travel times on the corridor under future year scenarios are shown in **Table 11**. Travel times vary no more than 20 seconds between the three Year 2035 scenarios.

Further analysis, using a more detailed traffic operations simulation software (such as VISSIM) and development of more detailed alternatives for carriage road operations and traffic control, would be needed to accurately assess level of service and plan carriage road operations.

**TABLE 11**  
**CORRIDOR ARTERIAL TRAVEL TIMES**  
(Average peak hour vehicle travel time in seconds, including intersection delay)

Corridor	Peak Hour	No Carriage Road (Matilda Access)		No Carriage Road (Clara Access)		Carriage Road	
		NB	SB	NB	SB	NB	SB
Matilda Avenue (Washington-El Camino Real)	AM	133.7	133.6	145.6	152.6	148.7	150.8
	PM	131.9	133.1	148.8	146.3	133.6	126.2

Source: Fehr & Peers, 2013.  
Results reflect signal phasing optimized for SimTraffic evaluation.



0 0.1 0.2 0.3 0.4 0.5 Miles

**Legend**

- Study Intersection
- Caltrain Station
- ==== Railroad
- ↔ Turn Lane
- AM (PM) Peak-Hour Vehicle Traffic Volume

**Figure 9**  
**Mathilda Carriage Road**  
**Year 2035: No Carriage Road - Mathilda Access Scenario Vehicle Volumes**

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Date: July, 2013

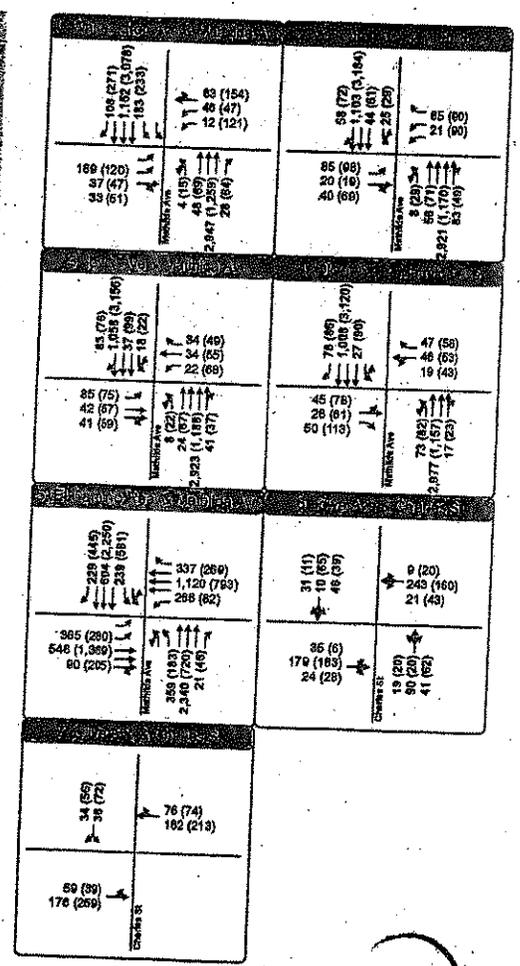
<p>108 (271) 1,152 (3,078) 183 (233)</p> <p>189 (120) 37 (47) 5 (5)</p> <p>4 (28) 48 (59) 2,947 (1,259) 28 (64)</p> <p>58 (72) 1,105 (3,164) 44 (68) 28 (22)</p> <p>65 (60) 21 (80)</p>	<p>77 (63) 1,064 (3,179) 37 (99) 19 (22)</p> <p>70 (68) 42 (67) 43 (66)</p> <p>4 (28) 48 (59) 2,947 (1,259) 28 (64)</p> <p>83 (92) 1,531 (3,138) 27 (90) 20 (23)</p> <p>47 (66) 28 (61) 36 (66)</p> <p>67 (68) 17 (23) 2,983 (1,700)</p>	<p>229 (445) 604 (2,329) 23 (581)</p> <p>384 (280) 549 (1,369) 90 (203)</p> <p>358 (193) 2,380 (728) 21 (46)</p> <p>337 (269) 1,120 (793) 268 (82)</p>
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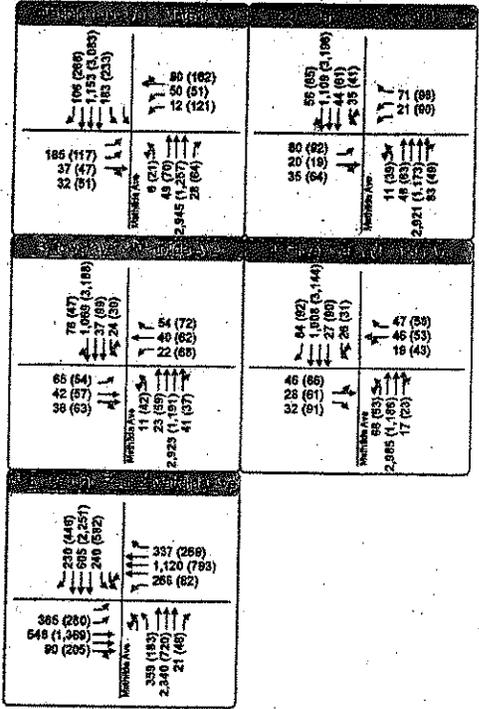
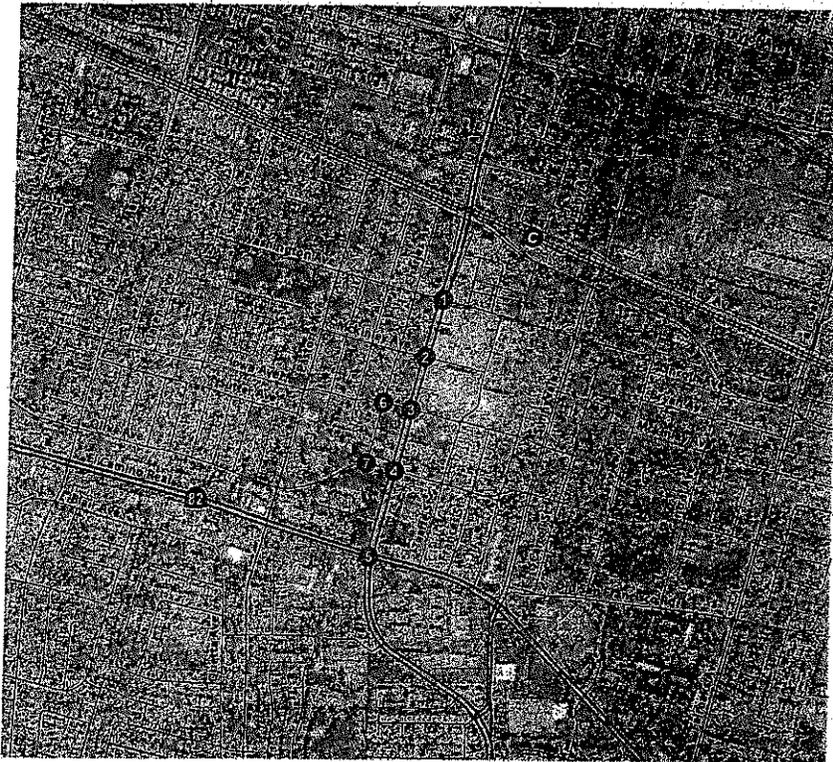




**Figure 10**  
**Mathilda Carriage Road**  
**Year 2035: No Carriage Road - Charles Access Scenario Vehicle Volumes**

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Date: July, 2019





0 0.1 0.2 0.3 0.4 0.5 Miles

**Legend**

- Study Intersection
- ⊙ Caltrain Station
- ==== Railroad
- ↔ Turn Lane
- AM (PM) Peak-Hour Vehicle Traffic Volume

Figure 11

**Mathilda Carriage Road  
Year 2035: Carriage Road Scenario Vehicle Volumes**

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Date: July, 2015



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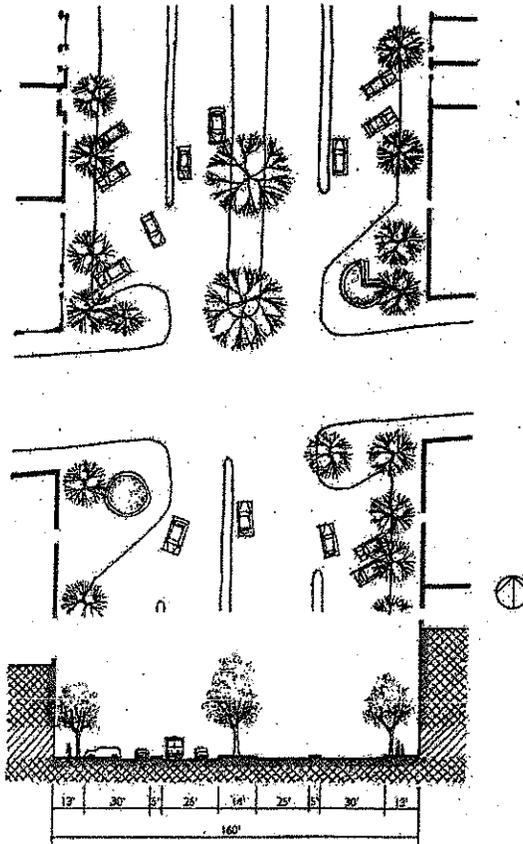
**Access and Traffic Circulation Effects of Carriage Road**

Based on the results presented above, the addition of a carriage road would not substantially affect vehicle capacity on Mathilda Avenue and would therefore have no substantial effect on vehicle level of service. However, the presence or absence of a carriage road may have other effects on vehicle, pedestrian and bicycle circulation. Access and traffic circulation effects are discussed below.

While vehicle capacity would not be substantially affected, a carriage road may slightly reduce travel speeds for through-moving vehicles by reducing the number of access points on the main thoroughfare. As a result, it would slightly increase the delay caused by vehicles entering the carriage road from the southbound right turn lane of Mathilda Avenue. Forecasts of corridor travel speeds and times indicate that intersection travel times on the corridor could be slightly longer with a carriage road than without one. During the PM peak hour, southbound travel times on Mathilda Avenue in Year 2035 are forecasted at 240 seconds under Carriage Road conditions, 237 seconds under No Carriage Road (Charles Access) conditions and 230 seconds under No Carriage Road (Mathilda Access) conditions. It is therefore unlikely that adding a carriage road would substantially improve travel speeds and vehicle throughput in Year 2035.

One of the frequently-cited benefits of a street with frontage or carriage roads (also referred to as a multi-way boulevard) is that they separate local traffic from through traffic. With a carriage road, vehicles would enter and exit the main roadway at intersections, reducing the number of mid-block conflicts between through traffic and vehicles entering and exiting driveways.

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Plan view of Shattuck Avenue carriage road in Berkeley  
Source: Jacobs, MacDonald, & Rofe, *The Boulevard Book*, 2003.

However, additional conflicts could arise at intersections as vehicles enter the through-traffic stream from the carriage road. If a carriage road remains under consideration, we recommend that further study of carriage road operations and traffic control be conducted before construction.

The addition of a carriage road has the potential to improve conditions for bicyclists and pedestrians traveling on the west side of Mathilda Avenue. New development anticipated in the *Downtown Specific Plan* is likely to bring more pedestrians to the downtown area, which could increase the potential for conflict between vehicles and pedestrians. Because vehicles traveling on the carriage road would typically move more slowly than vehicles traveling on the main roadway,

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adding a carriage road would tend to improve pedestrian comfort and reduce conflicts between pedestrians and vehicles. Lower speeds and volumes of vehicle traffic on the carriage road would also improve perceived safety for bicyclists.

As a result, the main benefits of adding a carriage road are separation of local and through traffic, improved conditions for bicycle and pedestrian travel, and the addition of on-street parking to serve local businesses and new residential developments.

#### **Year 2035 Scenario Comparison**

The addition of a carriage road would generally lead to a slight reduction in intersection delay. The carriage road is forecasted to reduce average vehicle delay at study intersections by up to 2.3 seconds under Year 2035 conditions, although it is anticipated to increase delay at the Mathilda Avenue/El Camino Real intersection by up to 3 seconds when compared to No Carriage Road scenarios. The carriage road would also add on-street parking, which could meet short-term parking and delivery needs for retail customers and residents.

Constructing a carriage road would provide a buffer from southbound through traffic for pedestrians and bicyclists on the west side of Mathilda Avenue. However, the addition of a carriage road would create a longer crossing distance for pedestrians on Mathilda (though increased pedestrian crossing distance is partially addressed by the fact that pedestrians can cross the street in multiple sections, and carriage road crossings are sometimes only stop-controlled – which reduces the effective crossing distance). It would also reduce the space available to transit riders waiting at bus stops. Pedestrian and transit issues could be mitigated by adding curb bulbs to the carriage road median strip at bus stops and crosswalks. Targeted pedestrian and bicycle improvements that could be implemented along with the addition of a carriage road are outlined in the section on Alternative Cross Sections Designs, under Option 3.

In order to properly understand the benefits and drawbacks of the three access alternatives, measures of effectiveness were developed for vehicle operations, transit, bicycle and pedestrian modes, and parking. Operations on Mathilda Avenue under the three future year scenarios were then compared to each other using these measures. **Table 12** presents a comparative chart of the results.

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**TABLE 12**  
**OPERATIONAL COMPARISON: YEAR 2035 SCENARIOS**

Year 2035 Scenario	Pedestrian, Bicyclist and Transit User Conditions				Traffic Conditions and Parking	
	Bus Waiting/Boarding	Bicyclist Comfort	Pedestrian Crossing Experience	Pedestrian Comfort	Traffic Situation	Parking Availability
No Carriage Road (Mathilda Access)	—	—	—	—	—	—
No Carriage Road (Charles Access) <i>Block 14 results</i>	—	—	—	—	—	—
Carriage Road	↓	↑	—	↑	—	↑

Source: Fehr & Peers, 2013.

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## ALTERNATIVE CROSS SECTION DESIGNS

Redevelopment on the west side of Mathilda Avenue provides the opportunity to address the transportation needs of all travel modes consistent with the goals of the existing General Plan, the Administrative Draft Land Use and Transportation Element/Climate Action Plan (LUTE/CAP) and the *Downtown Specific Plan*. Currently, Mathilda Avenue through downtown Sunnyvale lacks dedicated bicycle facilities. In addition, pedestrian access is limited by narrow sidewalks, large curb radii and long crossing distances at intersections. While the frontage road concept outlined in the *Downtown Specific Plan* improves pedestrian facilities by providing wider sidewalks on both sides of the street and slightly reducing crossing distances, it does not identify specific improvements for bicycle travel. Mathilda Avenue is an important north-south bicycle connection in Sunnyvale as it is one of a limited number of streets that crosses the Caltrain railroad tracks.

We developed several cross section designs for Mathilda Avenue that improve pedestrian and bicycle conditions and maintain or improve existing conditions for transit riders. The following criteria were used in developing the cross sections:

- Provide a north-south bicycle connection on Mathilda Avenue;
- Reduce pedestrian crossing distance across Mathilda Avenue (both for pedestrian accessibility to and from downtown but also to reduce the amount of signal green time devoted to cross streets when a pedestrian is crossing the street);
- Where possible, maintain local access to existing and proposed land uses along the corridor;
- Maintain or improve bus stop layouts and access on the corridor;
- Reduce required right of way dedication (if possible).

The three cross section designs require either no dedications or a smaller right-of-way dedication than the Specific Plan frontage road concept. Options 1 and 2 would be compatible with the two "No Carriage Road" scenarios; Option 3 would be feasible with the construction of the carriage road on Mathilda Avenue.

Parcels developed since 2003 along the east side of Mathilda Avenue have included narrower sidewalks (between 10 and 15 feet wide including setbacks) than are called for in the *Downtown Specific Plan*. A fourth northbound lane on Mathilda, which operates as parking lane south of Olive Avenue and a travel lane north of Olive Avenue, is currently underutilized as a travel lane. In our proposed designs we recommend repurposing it for bicycle travel, as a reduction in the number of northbound lanes does not substantially affect traffic conditions along the corridor.

The landscaped center median would need to be modified to accommodate most of these modifications. In addition to landscaping, the existing median includes streetlights, signage and

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other utilities. As a result, implementing any of these options may require relocating some utilities and removing trees from the median.

There may be opportunities to implement these alternatives at lower cost if double left-turn lanes in the southbound direction were reduced or eliminated,<sup>1</sup> or if dedications to accommodate bicycle facilities and wider sidewalks were required from new development along Mathilda Avenue.

*Option 1: Restriping with Minimal Median Reduction*

This option would add 8 foot wide buffered bicycle lanes (Class II bicycle facility) to Mathilda Avenue by eliminating the underutilized fourth northbound travel lane, realigning the center median and reducing the center median width. Providing the desired sidewalk widths of 14 to 20 feet described in the *Downtown Specific Plan* would require additional dedications from adjacent property owners. **Figure 12** shows the street configuration proposed for Option 1.

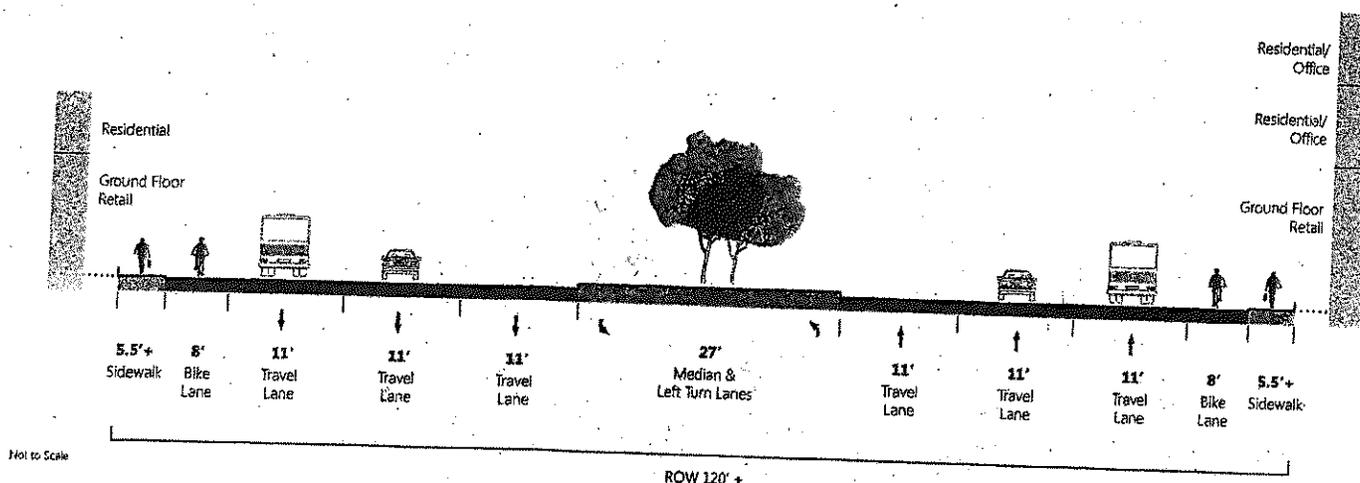
Buffered bicycle lanes would consist of a 5 foot bicycle lane (adjacent to sidewalk) and a 3 foot diagonally striped buffer (adjacent to travel lane). At bus stops and intersections, the striped buffer would be replaced with a dashed line to show. Class II bicycle facilities typically share space with buses at transit stops, so this configuration would be relatively easy for both bicyclists and transit vehicle operators to negotiate.

Some design variations may be possible with Option 1 as well, including:

- Narrowing travel lanes to 10.5 feet would allow for a 30 foot wide median, reducing the need to relocate utilities from the median area.
- 7 foot buffered bike lanes (with a 5 foot lane and 2 foot buffer) would likewise allow for slightly wider planted median.
- Dedications on west side could allow for wider sidewalks.

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<sup>1</sup> Under existing conditions, peak-hour southbound left turn volumes are under 300 vehicles at all study intersections except for the intersection of Mathilda Avenue and El Camino, making this a feasible treatment for most of the study corridor.



Not to Scale

**Figure 12**  
**Cross Section Option One**  
**(Mid-block, Facing North)**

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Date: March, 2018



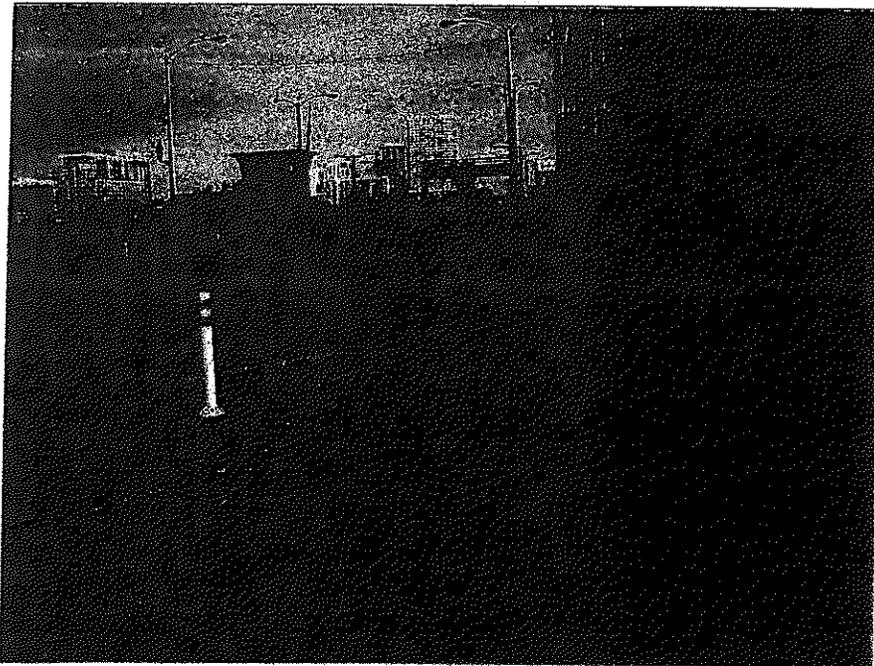
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*Option 2: Cycle Tracks and Widened Sidewalks*

The option reduces median width more than Option 1 and narrows travel lanes slightly in order to provide 8' wide sidewalks on both sides of Mathilda Avenue. It provides cycle tracks (physically-separated bicycle facilities) to improve bicyclist comfort and access on both sides of the street. Providing the desired sidewalk widths of 14 to 20 feet described in the Downtown Specific Plan would require additional dedications. **Figure 13** shows the street configuration proposed for Option 2.

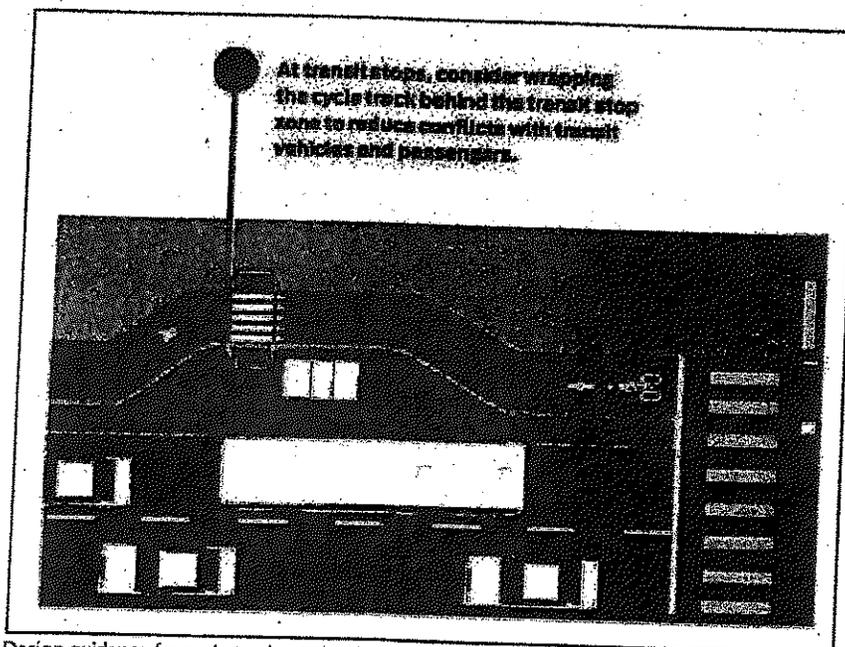
A cycle track is a physically-separated bicycle facility implemented on a city street. Cycle tracks are typically separated from vehicle traffic by a parking lane, raised curbs or a buffer that incorporates tubular markers, bollards or movable planters. At driveways and other locations with unsignalized right turns, bicycle lanes with pavement markings to indicate bicyclist right-of-way replace cycle tracks.



Cycle track with flexible delineators in buffer, Chicago, Illinois.

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At transit stops, the cycle track would shift behind the bus loading zone to prevent conflicts with transit vehicles and passengers. Pedestrians would cross the cycle track from the sidewalk to access the transit stop. Safety features include a raised crossing area and truncated dome paving material, to slow cyclists and alert pedestrians that they are crossing a bicycle path.



Design guidance for cycle tracks at transit stops.

Source: NACTO Bikeway Design Guide, 2012.

Several intersection treatments are available to reduce conflict between through-moving bicycles conflict and left- and right-turning vehicles. These treatments include:

- Moving stop lines in adjacent mixed-flow lanes backwards to increase cyclist visibility. In San Francisco this has been combined with an experimental "bike box" treatment, in which bicycles wait in a designated space ahead of cars and proceed first through intersections.
- Adding warning signs and pavement markings to show bicycle paths through intersections, (see Appendix for examples).
- Adding bicycle signal heads or signage directing bicyclists to obey pedestrian signals (see Appendix for examples).

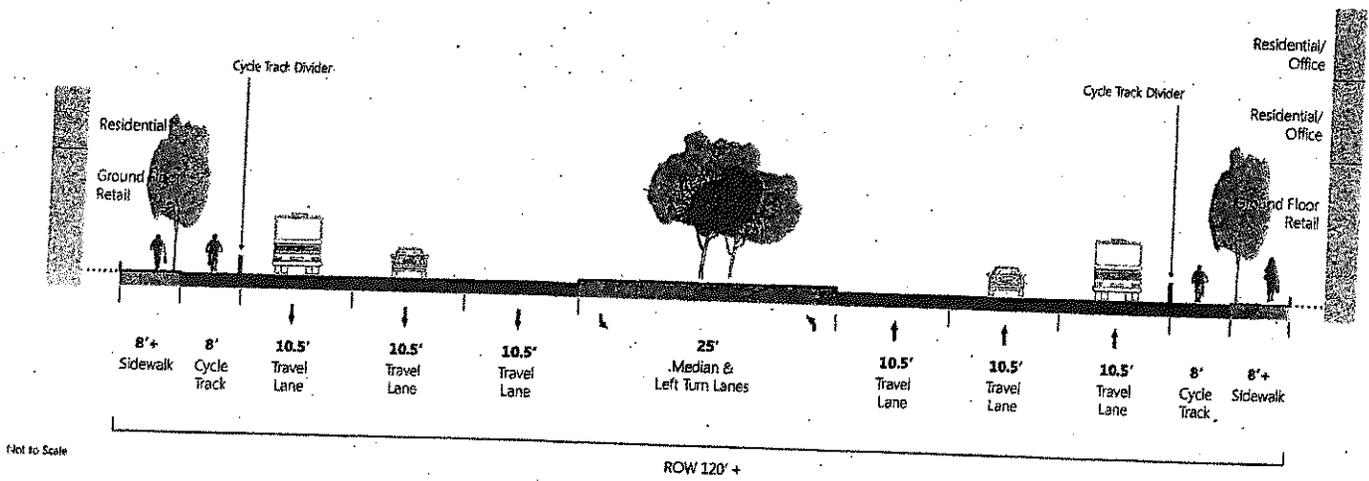
Maintenance costs for cycle tracks can be slightly higher than for Class II bicycle lanes for a few reasons. First, vertical separators require maintenance and periodic replacement. Second, debris can accumulate in cycle tracks, presenting a safety concern if they are not cleared regularly.

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Design variations possible under Option 2 include:

- Dedications of 2 feet (west side) and 6 to 12 feet (east side) would allow desired sidewalk widths of 10 feet (west side) and 14 to 20 feet (east side).
- A raised cycle track could be used instead of vertical barriers. If a raised cycle track were considered, sidewalks with a continuous furniture/planting zone (minimum 8' wide) are recommended to reduce the risk of cyclists intruding into pedestrian walkways and vice versa.
- Eliminating southbound double left turn lanes would reduce the need to realign the center median, potentially providing cost savings to the project.



**Figure 13**  
**Cross Section Option Two**  
**(Mid-block, Facing North)**

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*Option 3: Narrower Carriage Road and Added Northbound Bicycle Lanes*

This option provides a narrower carriage road than described in the Downtown Specific Plan, a shared (Class III) bicycle facility in the frontage road and a buffered bicycle lane in the existing fourth northbound travel lane, and widens sidewalks on both sides of Mathilda Avenue.

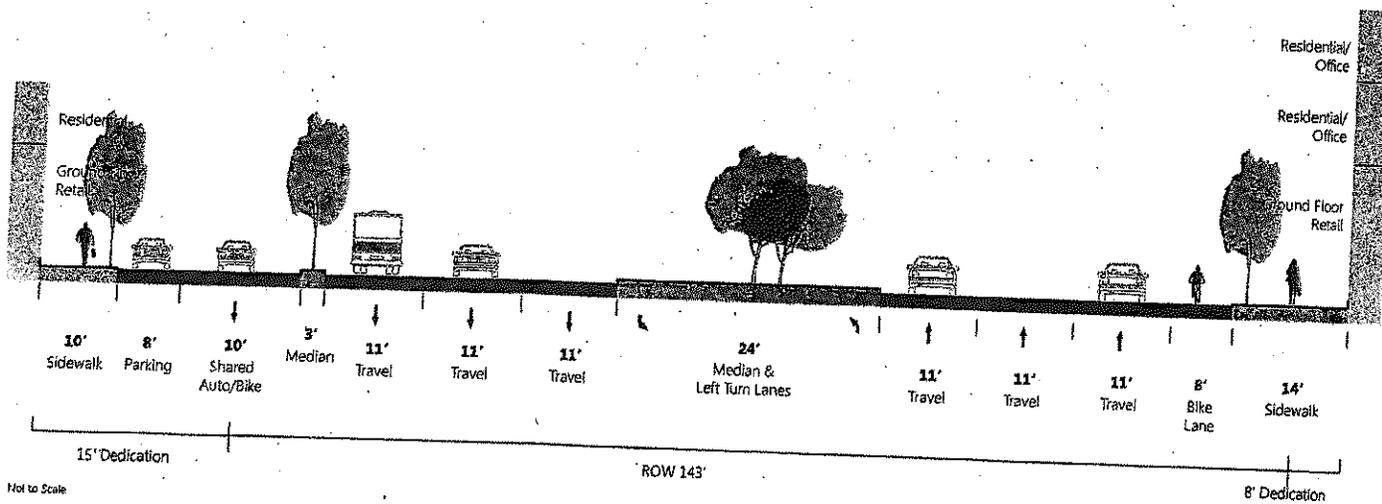
The west side carriage road proposed in Option 3 would provide an 8 foot parking lane, a 10 foot shared-use travel lane with center shared lane markings ("sharrows") and a 3 foot landscaped median separating the carriage road from through travel lanes. A 10 foot shared-use travel lane is similar to the configurations of recently-constructed boulevards, such as Octavia Boulevard in San Francisco. It would require dedications of 15 feet from development on the west side of Mathilda Avenue. A dedication of 8' from development on the east side of Mathilda Avenue would allow for wider sidewalks consistent with the goals of the Downtown Specific Plan. **Figure 14** shows the street configuration proposed for Option 3.

In addition to wider sidewalks, this option presents several advantages for pedestrians. The frontage road would separate pedestrians on the west side of Mathilda Avenue from fast-moving through traffic. It would also allow for the implementation of curb extensions, which we recommend at intersections to provide a shorter pedestrian crossing distance on Mathilda Avenue. Reduced pedestrian crossing distance would also reduce delay for northbound and southbound vehicles by reducing the amount of signal "green time" needed to facilitate pedestrian crossings.

Because a 3 foot wide median does not provide an adequate accessible boarding area for transit riders, we recommend special treatments at transit stops under this alternative. Parking should be removed and the frontage road median widened to accommodate transit riders boarding and exiting buses.

Design variations possible under Option 3 include:

- Larger dedications from developers would allow for wider sidewalks.
- *Double carriage road:* An additional 13 foot dedication on the east side of Mathilda Avenue would allow for a true boulevard-style road configuration similar to that along the west side of the street. This would have the advantage of further reducing pedestrian crossing distances and adding street parking.
- Eliminating southbound double left turn lanes would reduce the need to realign the center median, providing cost savings to the project.



**Figure 14**  
**Cross Section Option Three**  
**(Mid-block, Facing North)**

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*Evaluation of Project Benefits*

Measures of effectiveness were developed for transit, bicycle and pedestrian modes, parking and cost and constructability. The *Downtown Specific Plan* frontage road concept and the three options outlined above were then compared to existing conditions on Mathilda Avenue using these measures. **Figure 15** presents a comparative chart of the results.

Options 1-3 provide clear benefits for bicyclists by providing dedicated bicycle facilities, which are not included in the *Downtown Specific Plan* frontage road concept. Option 2 and Option 3, as well as the Specific Plan frontage road concept, provide improvements to pedestrian access and safety as well as enhancing the streetscape. Both Option 3 and the Specific Plan carriage road concept would add on-street parking (approximately 30 to 80 spaces given current driveway locations), while Options 1 and 2 would remove approximately 15 parking spaces from the east side of Mathilda Avenue between Olive Avenue and El Camino Real.

Both carriage road options would have greater and longer-term construction impacts than Options 1 and 2, and would entail approximately the same costs. Additional evaluation of potential project costs is described below.

Figure 15: Measures of Effectiveness Comparison Chart

Improvements	Transit Rider Access & Experience		Bicyclist Access and Experience			Accessibility & Pedestrian Safety			Streetscape Environment (neighborhood character)		Traffic Circulation and Parking		Cost			Constructability	
	Waiting/Boarding Experience	Accessibility	Bicycle Access	Bicyclist Safety	Bicyclist Comfort	Crossing Experience	Pedestrian Comfort	Accessibility	Street Identity	Landscaping Opportunities	Traffic circulation	Parking capacity*	Capital	Operating/Maintenance	Land Dedication Required	Time to Complete	Construction Impacts
<i>Alternatives compared to Existing Conditions</i>																	
Downtown Specific Plan Frontage Road	—	↓	—	—	↑	—	↑	↑	↑	↑	—	↑	\$\$\$	\$	\$\$\$	** *	***
Option 1: Add Bicycle Lanes	—	—	↑	↑	↑	—	—	—	—	—	—	↓	\$	\$	—	**	*
Option 2: Cycle Track & Wider Sidewalks	↑	—	↑	↑	↑	↑	↑	↑	↑	↑	—	↓	\$\$	\$\$	—	**	**
Option 3: Frontage Road, Cycle Track & Wider Sidewalks	↑	—	↑	↑	↑	↑	↑	↑	↑	↑	—	↑	\$\$\$	\$\$	\$\$	** *	***

\* The addition of bicycle lanes or cycletracks on Mathilda Avenue NB between El Camino Real and Olive Avenue would result in the removal of approximately 15 parking spaces. The frontage road concepts described in the Downtown Specific Plan and Option 3 would both add approximately 8-15 parking spaces on the west side of each block.

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*Order of Magnitude Cost Estimates*

While precise estimates of relative costs for each of the three options outlined above are beyond the scope of this study, planning-level cost estimates, which are shown in **Table 13**, provide a general understanding of the relative costs of each option. Information about land prices and the full relocation costs of utilities along the Mathilda Avenue corridor were not available at the time of this study. These estimates should therefore be taken as providing an order of magnitude estimate for construction costs and are not intended as a substitute for more detailed construction cost estimates.

These planning-level estimates are based on recent project cost information provided by the City of Sunnyvale and additional project cost information gathered by Fehr & Peers. Based on this information, the lowest-cost option is Option 1, which provides Class II bicycle facilities but no other improvements and totals approximately \$600,000 to \$900,000. However, Option 1 does not provide a substantial benefit to bicycle and pedestrian circulation in the area. Option 2, which provides a physically-separated bicycle facility and widened sidewalks, would cost approximately \$1.5 to \$1.9 million. Option 3, which adds a carriage road, parking, bicycle facilities and sidewalks, would cost approximately \$2.3 to \$2.7 million.

The center median would have to be realigned to accommodate all of the options outlined above, except for those variations in which bicycle facilities and sidewalks are constructed using dedications from development on the west side of Mathilda Avenue or roadway width previously allocated to double left turn lanes. In addition to landscaping, the existing median includes streetlights, signage and other utilities. The cost of implementing any of these options would include relocating these utilities.

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**TABLE 13**  
**ESTIMATED PLANNING LEVEL CONSTRUCTION COSTS FOR OPTIONS 1-3**

Item	Option 1	Option 2	Option 3
Frontage road construction	\$ -	\$ -	\$ 595,000
Median electrical work	\$ 275,000	\$ 275,000	\$ 275,000
Median reconstruction and landscaping	\$ 360,000	\$ 360,000	\$ 360,000
Road restriping	\$ 25,000	\$ 25,000	\$ 25,000
Bicycle facility construction	\$ 40,000	\$ 195,000	\$ 100,000
Sidewalk widening and landscaping	\$ -	\$ 795,000	\$ 1,155,000
<b>Total</b>	<b>\$ 700,000</b>	<b>\$ 1,650,000</b>	<b>\$ 2,500,000</b>

Source: Fehr & Peers 2013.

## CONCLUSIONS

The addition of a carriage road is not forecasted to substantially affect travel speeds or level of service along the Mathilda Avenue corridor in Downtown Sunnyvale. The carriage road concept outlined in the *Downtown Specific Plan* is unlikely to provide travel time savings for southbound vehicles on Mathilda Avenue. Its primary benefits would lie in the addition of street parking and improved comfort for pedestrians and bicyclists traveling along the west side of Mathilda. Benefits for pedestrians, bicyclists and transit users could also be captured with the installation of a narrower carriage road or bicycle facilities, as outlined in the alternative cross section designs described in this memo.

New development consistent with the Specific Plan provides the opportunity to improve conditions for all travel modes in downtown Sunnyvale. The final selection of a design option for Mathilda Avenue depends upon the City's priorities, including cost concerns, the desire to require dedications for development along the corridor, and the need to accommodate users of different transportation modes, and the desire for additional street parking adjacent to future residences and retail businesses.