



APPENDICES

Appendices

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Appendix A: Community and Stakeholder Engagement Results

Colma Serramonte Blvd. and Collins Ave. Master Plan



Online Survey Summary Report

April 2018

Prepared by

DYETT & BHATIA

Urban and Regional Planners



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I Introduction

In 2017, the Town of Colma began a master planning process for the Serramonte Boulevard and Collins Avenue corridors. The plan will outline a vision for this key commercial district and provide guidance for strategic improvements to circulation, streetscape, infrastructure, and aesthetics to improve the overall design and function of this important business center in the years to come.

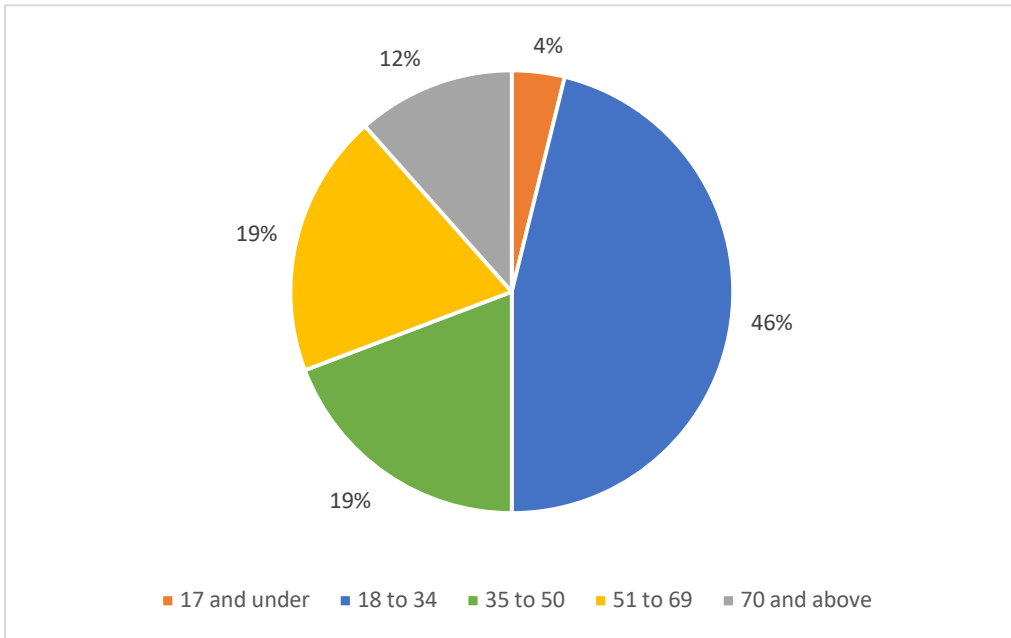
Community outreach represents a pivotal part of the master planning process, and an exciting opportunity for community members, visitors and employees of the area to envision the future of the two corridors and identify challenges and opportunities that will provide direction for their development. For more information on the Serramonte Boulevard and Collins Avenue Master Plan, please visit: <https://www.colma.ca.gov/current-projects/>.

The Serramonte Boulevard and Collins Avenue Survey focused on the community's overall impressions of the corridors and potential improvements that could be made to the corridors in terms of ameliorating aesthetics, multimodal access and safety and overall enjoyment of one's time spent in the area. The survey was developed using Maptionnaire, an online survey tool, and made available on the project website from February 2, 2018 to March 31, 2018. The survey was promoted through various sources: on the Town of Colma website, through flyers delivered to community members and left at employers and retailers throughout the area, through the Town of Colma business newsletter and resident newsletter, and by asking community members to complete hard copies of the survey at the Colma senior lunch. A total of 34 completed responses were received.

This report summarizes the feedback provided by the online survey. Feedback from the online survey, in addition to feedback from other outreach efforts and analysis in the Existing Conditions Report, will serve as a valuable reference to guide City staff, the Planning Commission, the City Council, the consultant team, and others in formulating design and policy concepts and options for the Serramonte Boulevard and Collins Avenue Master Plan.

Of the respondents that provided their zip code, almost half indicated Colma zip codes for their home addresses (94014 and 94080). The remaining respondents hailed from a range of Bay Area communities, including Pacifica, Daly City, San Bruno Redwood City, and San Francisco. Nearly half of respondents were between the ages 18 and 34, followed by equal numbers of respondents belonging to both the 35 to 50 age group and 51 to 69 group (Figure 1-1).

Figure I-1: Question 9 - "How old are you?"



2 Survey Results

Highlights of the online survey are discussed and summarized below. The full set of responses to open-ended questions is included in Appendix A.

2.1 Analysis of Survey Responses

Online survey participants were asked eight questions about their ideas, priorities, and concerns about the Serramonte Boulevard and Collins Avenue corridors. Some questions were open-ended while others provided multiple choices, prompting respondents to select one or multiple answers. Open-ended responses were synthesized and summarized to reveal broader patterns of responses.

The percentages below refer to the number of responses for that particular question, or named the given subject in their response to an open-ended question. In many cases, participants gave multiple responses or did not fully answer a question, thus totals may not add up, or may add to more than 100 percent.

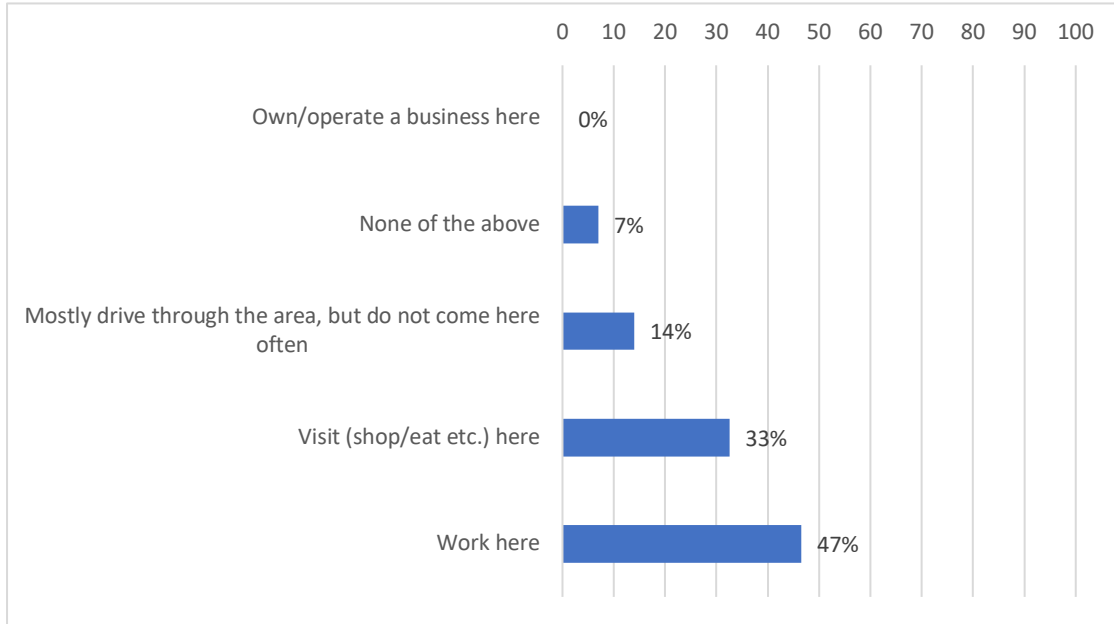
INTERACTION WITH THE CORRIDORS

The survey began with five questions that addressed the community's connection with and overall impression of the Corridors.

Question 1: What is your connection to the Serramonte/Collins area?

Nearly half of respondents work in the Serramonte/Collins area, while a little over 30 percent visit the Corridors to shop or eat. Almost 14 percent of respondents indicated that they tend to drive through the area occasionally. None of the survey participants owned or operated a business in the area, and just three people had a connection to the Serramonte/Collins area that was not listed as an option.

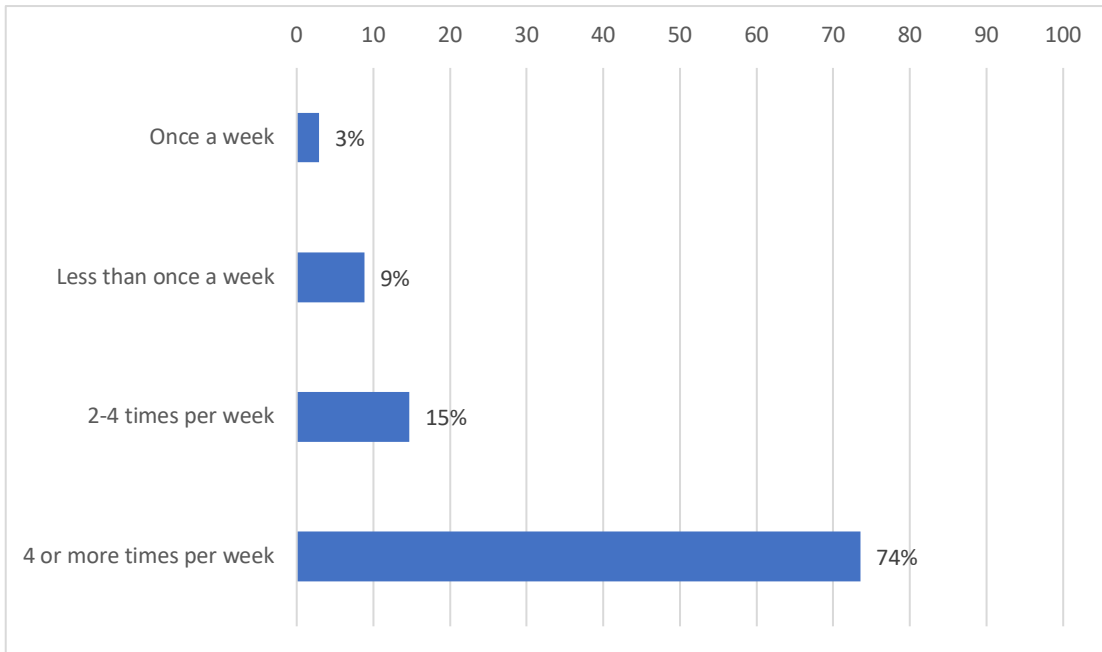
Figure 2-1: Question 1 – “What is your connection to the Serramonte/Collins area?”



Question 2: How often do you come to the area?

Almost three-quarters of respondents indicated that they come to the Corridors four or more times a week. A much smaller number of survey participants reported visiting the Colma/Serramonte area anywhere from once a week to 3 times per week.

Figure 2-2: Question 2 - “How often do you come to the area?”



Question 3: What mode of transportation do you most frequently use when coming to the area?

Out of the 34 respondents, 82 percent reported that they drive alone in order to access the Colma/Serramonte area; 22 individuals within this group also indicated that they come to the Corridors more than four times per week. Three of the 34 survey participants indicated that they carpool into the area, and just one person utilizes a taxi service. A follow up question on parking was asked of those that indicated they drove to access the corridors. The majority of these respondents reported that their employer provides parking; however more than a quarter indicated that they park on the street (Figure 2-4).

Nearly six percent of participants bike or walk to the area, and all of these respondents in this group indicated that they visit the area more than four days per week. None of the survey respondents reported using BART or another form of public transit to access the corridors.

Figure 2-3: Question 3 - “What mode of transportation do you most frequently use when coming to the area?”

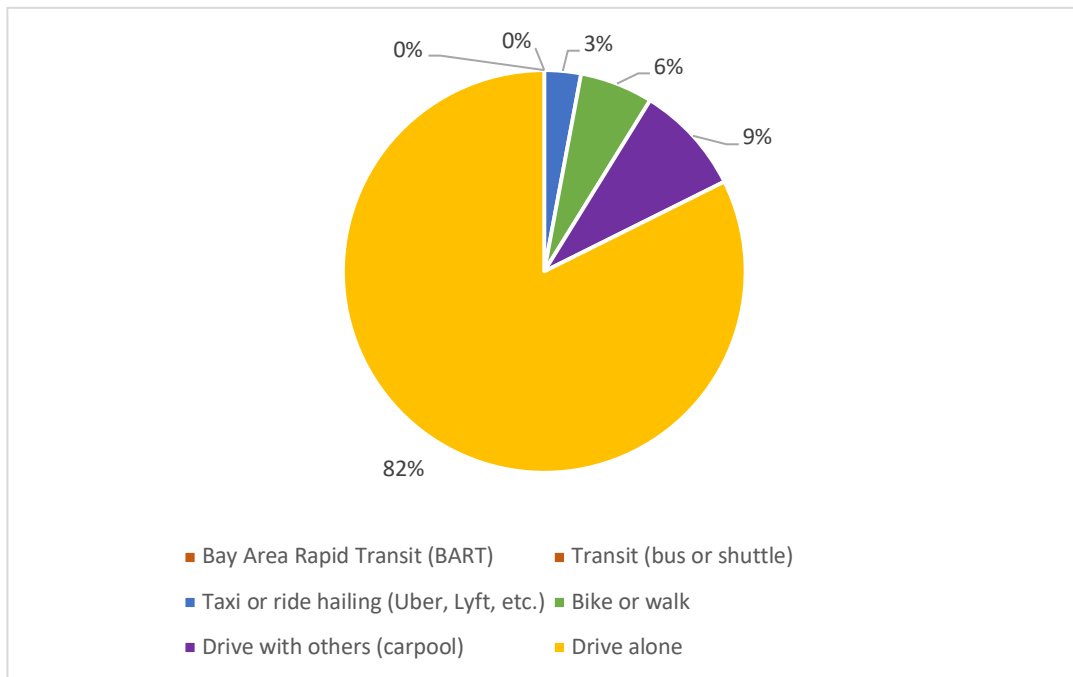
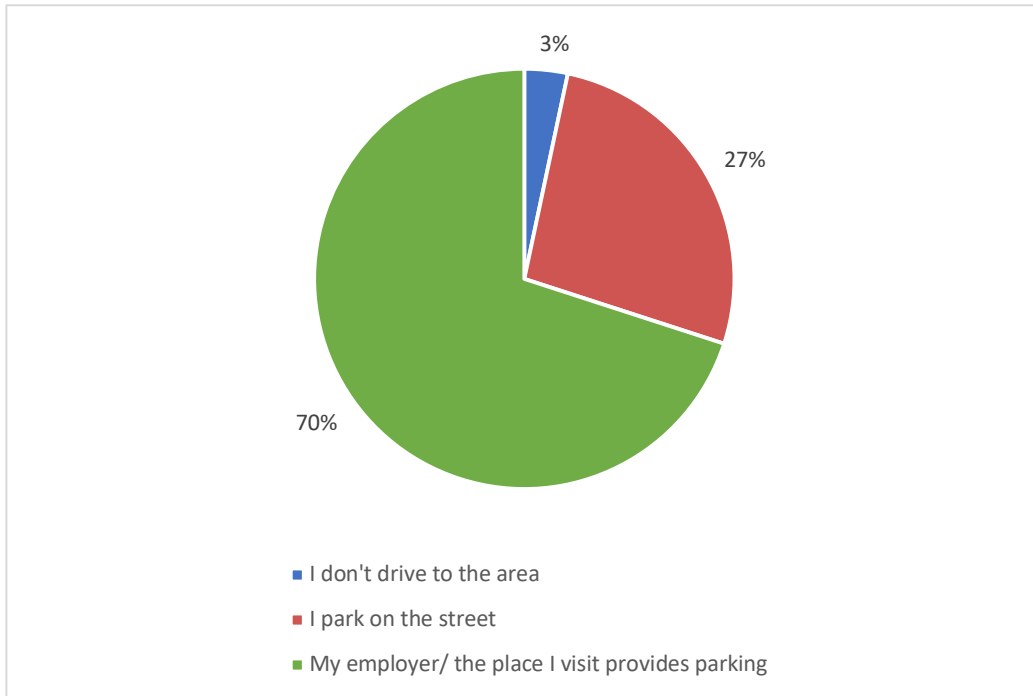


Figure 2-4: Question 4 - “If you drive to the area, select all that apply.”



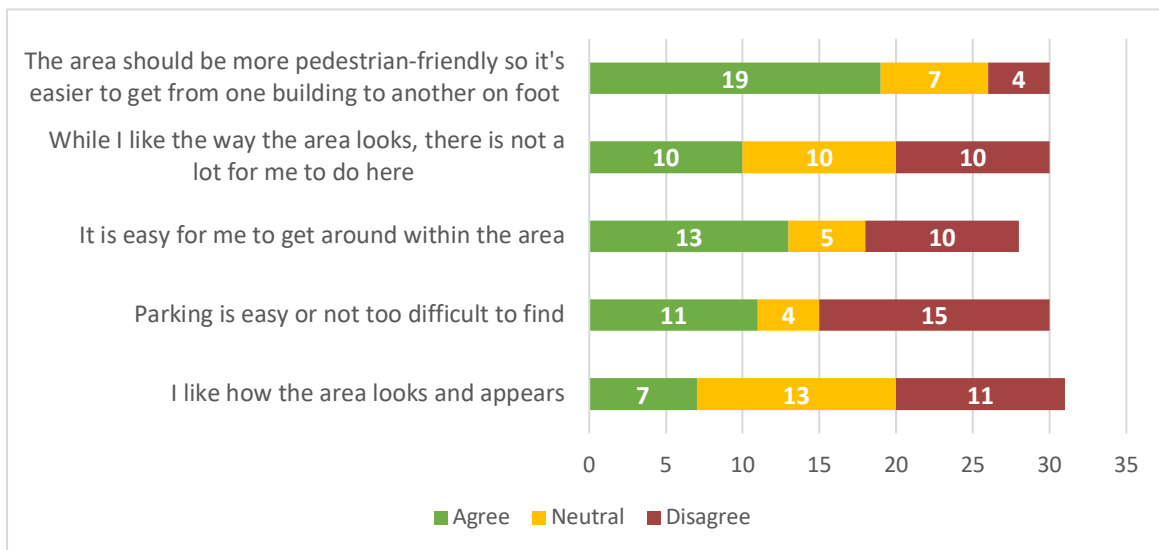
IMPRESSION OF THE CORRIDORS

Question 5: Do you agree or disagree on the following statements having to do with your general impression about Serramonte Boulevard and Collins Avenue?

In order to gauge respondents' overall impression of the corridors, respondents were instructed to mark their level of agreement with five statements involving the Serramonte Boulevard and Collins Avenue area's look, feel, and ease of access.

Participants were not required to respond to every statement, therefore totals do not add up to 34 for each statement. Most respondents agreed that the area needs to be more pedestrian-friendly to make walking between destinations easier. There were equal numbers of people in agreement, disagreement, and with neutral reactions in response to the statement indicating that the area looks nice, though it does not offer many activities or things to do. Participants were divided regarding the ease of getting around within the area. Half of respondents did not think parking is easy to find. Finally, most participants responded neutrally to a statement regarding the area's look and appearance, while about almost one third of those that responded to this statement indicated that they did not like it.

Figure 2-5: Question 5 - "Do you agree or disagree on the following statements having to do with your general impression about Serramonte Boulevard and Collins Avenue?"



IMPROVEMENTS TO THE CORRIDORS

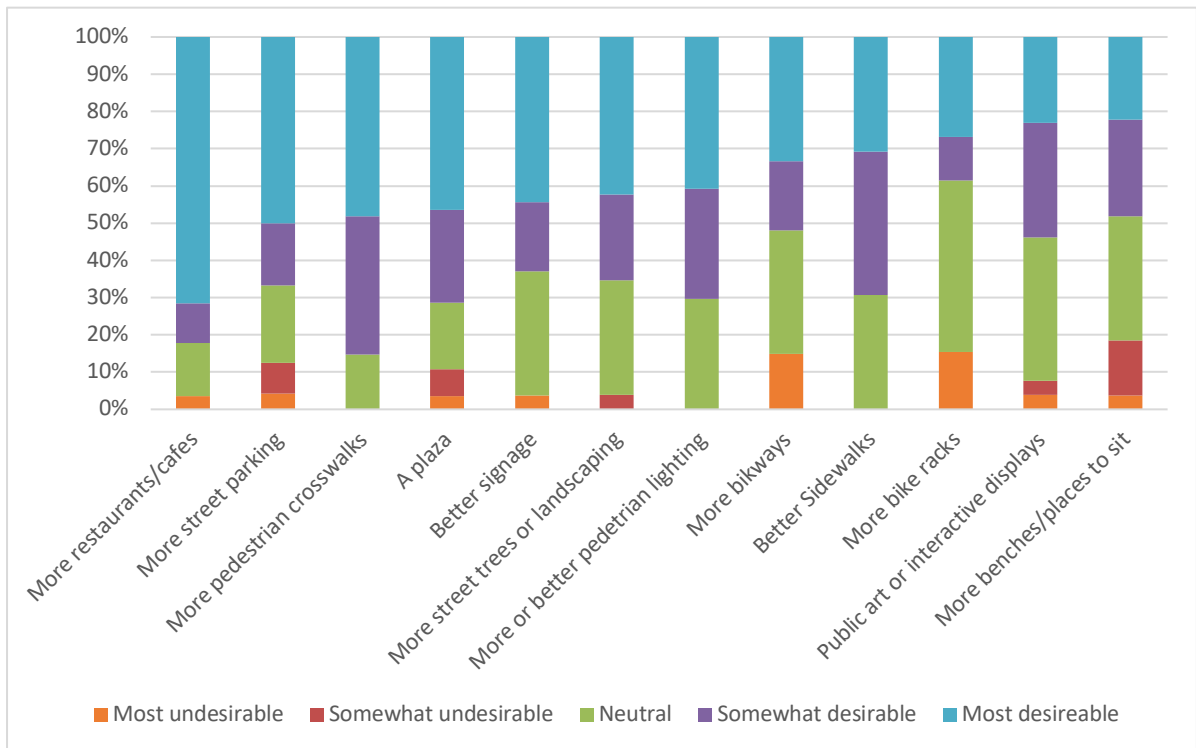
The last 3 questions in the survey addressed specific needs and improvements to the Corridors.

Question 6: Please rate the desirability of the following amenities or attractions you would like to see in the area.

Respondents were asked to rate each amenity or attraction on a scale from “most undesirable” to “most desirable.” Out of all the categories, more bikeways and bike racks received the highest number of “most undesirable” ratings, though each of these amenities received higher numbers of neutral rankings.

The majority of respondents chose “most desirable” for over half of the categories, including more restaurants and cafés (71%), more street parking (50%), more pedestrian crosswalks (48%), a plaza (46%), better signage (46%), more trees and landscaping (42%), and better pedestrian lighting (41%).

Figure 2-6: Question 6 - “Please rate the desirability of the following amenities or attractions you would like to see in the area.”



Question 7: Do you have any additional priorities, thoughts, or ideas about potential improvements to Serramonte Boulevard and Collins Avenue?

Open-ended responses to this question tended to focus on employee parking, safety along both roadways, and uses along the corridors. The majority of respondents noted the need for more parking, particularly for employees. There was also support for carving out space for a turn lane on Serramonte Boulevard as a way to reduce the traffic that builds up due to the amount of turns being made to enter the dealerships. Concerns were raised regarding pedestrian safety and jaywalking along Serramonte Boulevard, and it was suggested that additional pedestrian crossings may be necessary. The Serramonte Boulevard and Collins Avenue intersection was flagged as an unsafe intersection by one respondent, and another indicated that Collins Avenue is faced with a perennial speeding issue. Finally, some respondents expressed a desire for more activity along Serramonte Boulevard. To this end, more dining and entertainment establishments, public art, a plaza, and better connectivity between retail destinations were proposed.

Question 8: Please pin to the map the types of improvements that you believe should be made along Serramonte Boulevard and Collins Avenue.

By far the largest number of pins was dedicated to crosswalks, shown in the figures below as turquoise pins. Although crosswalks pins were spread out across Serramonte Boulevard and Collins Avenue, there were a few key places in which people felt strongly about. Two respondents noted a need for a crosswalk in front of Enterprise Rent-A-Car. Three respondents pinned a crosswalk on Serramonte Boulevard in front of the Subaru dealership, which would be connected to the Nissan and Hyundai dealerships.

There were a number of respondents that pinned sidewalks to Collins Avenue, where the sidewalk is not continuous on the north side of the street. Two survey participants indicated the need for an intersection where the Kohl's parking lot meets Serramonte Boulevard, as people are often left waiting to exit for some time. Six respondents pinned bikeways, which were mostly spread out along Serramonte Boulevard.

Responses to this question were further broken down by participants' main interaction with the corridors as indicated in the first question of the survey. Visitors who shop and eat in the area pinned more intersections near the Ford dealership on Serramonte Boulevard than any other group (Figure 2-8). They also indicated a desire for more crosswalks strictly along Serramonte Boulevard, especially in front of the Subaru dealership, however those who work in Colma pinned crosswalks much more frequently along both Collins Avenue and Serramonte Boulevard (Figure 2-9). Five bikeways were pinned by employees, four of which were along Serramonte Boulevard.

Figure 2-7: Question 8 - “Please pin to the map the types of improvements that you believe should be made along Serramonte Boulevard and Collins Avenue.”

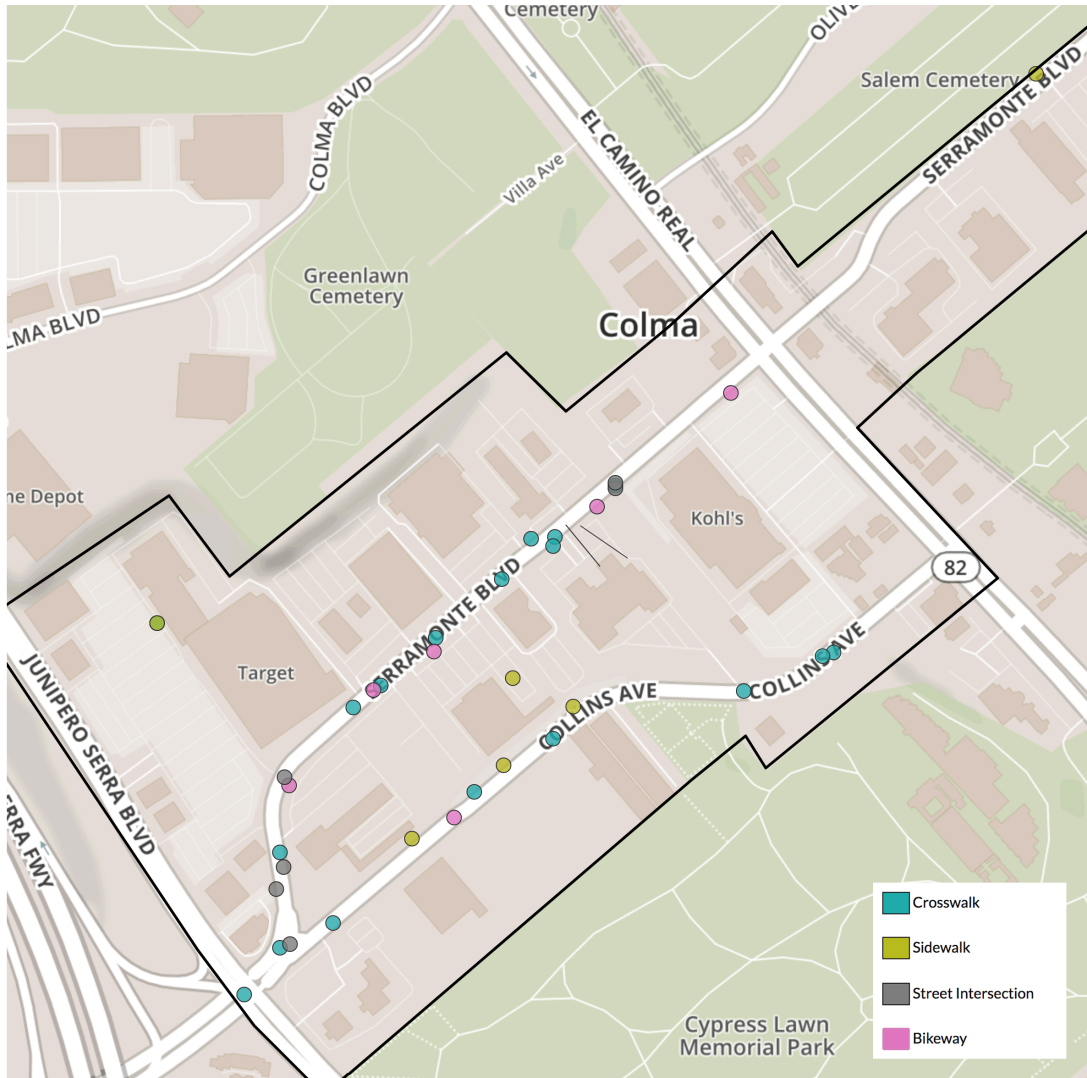


Figure 2-8: Visitor Responses to Question 8

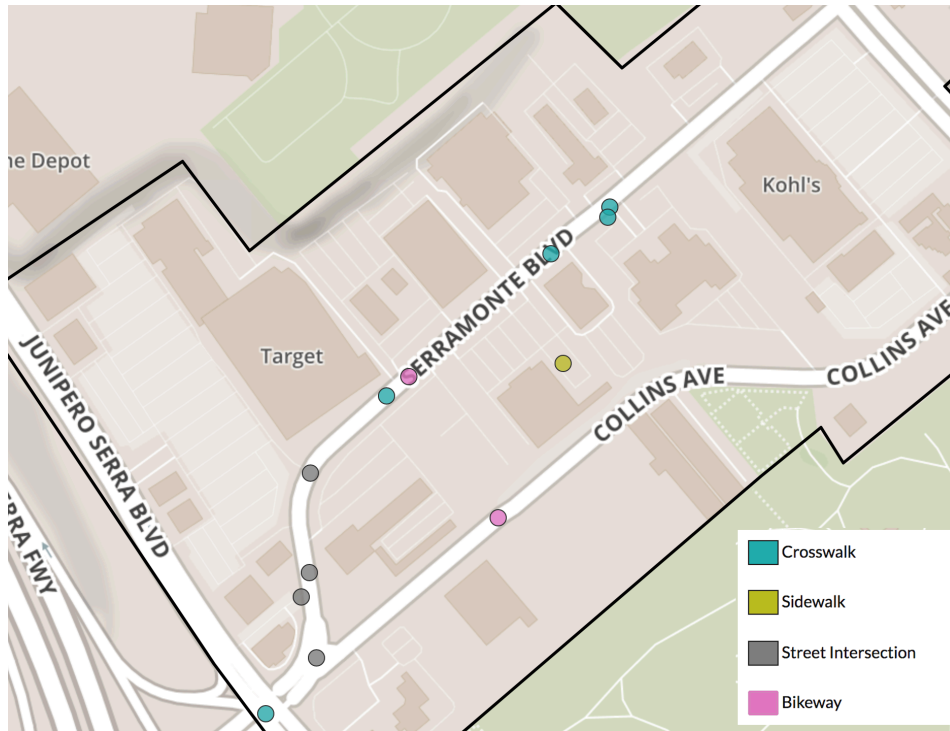
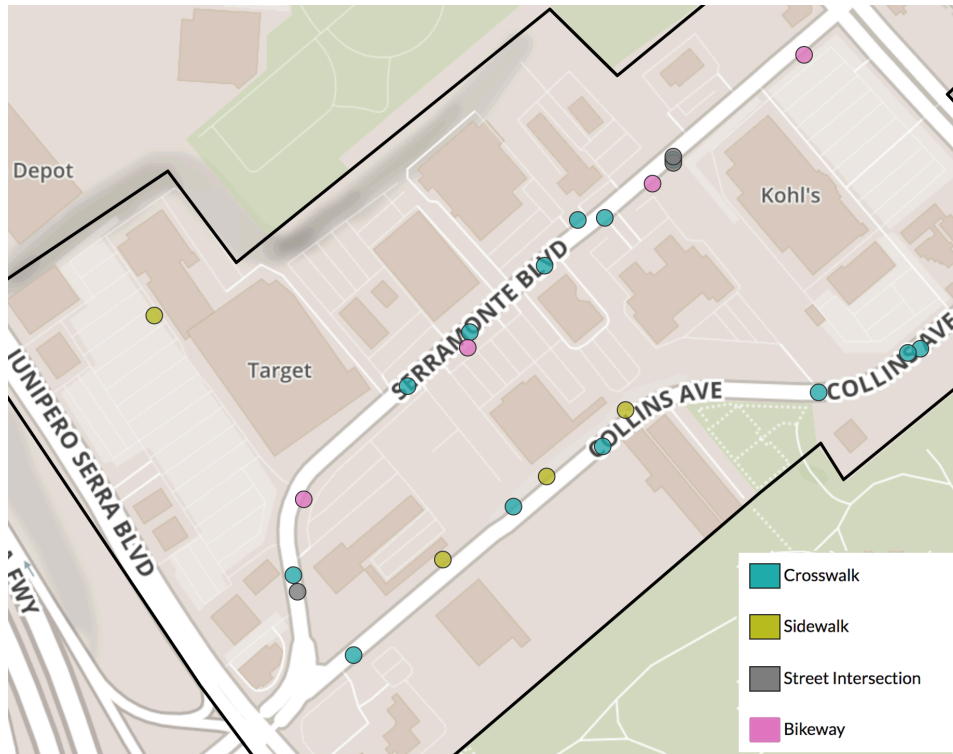


Figure 2-9: Worker Responses to Question 8



2.2 Next Steps

Together with existing conditions research and input from other community outreach activities, the survey results will inform the development of preliminary roadway concept alternatives for both Serramonte Boulevard and Collins Avenue, and subsequent steps in the planning process. Alternatives will represent ways in which the overall design and function of this important commercial area could be improved in the years to come.

The Alternatives will be evaluated for their impacts on fiscal conditions and transportation. Results of this evaluation will be shared with the public, and Colma community members and stakeholders will have the opportunity to share which alternative or which aspects of various alternatives would be best for the corridors in the future. City Council will provide direction on a preferred concept design plan, which will serve as the foundation for the final Master Plan.

Appendix A: Open-Ended Responses

7. Do you have any additional priorities, thoughts, or ideas about potential improvements to Serramonte Boulevard and Collins Avenue? (14 Responses Total)

1. A parking structure would be nice so we do not have to fight to find parking.
2. even out the dips on Serramonte Blvd, widen Collins Avenue. it would be great to have a bigger plaza with a small movie theater. Move Starbucks to different location, their drive through traffic is horrible.
3. Left turn on westbound Collins is an obvious problem. Parking shortage for Starbucks and Chipolte is a disaster as well as the driveway transition to Serramonte Blvd. This area needs traffic planning.
4. Love this area and all the businesses! Would be great to have more quick-casual eateries for families. But doing a great job already
5. More parking available for people that work in the area. More signs for Collins RD for drivers, people drive double the 25 MPH speed limit. Pedestrian crossing.
6. Parking is one of the main issues around Serramonte area when it comes to the employees that work around .
7. Please provide more parking
8. Special lane for all of the cars making left turns into dealerships. Many of these improvements depend on what is in the master plan. If there is a plaza and public art, then bike racks would be important. Don't need bike racks at dealerships. Don't need street parking for what is on the street now.
9. The focus on car dealerships is really heavy and dealerships are located on both sides of the street, often causing a build-up when visitors are trying to cross traffic to turn into a dealership.

Also, while it would be nice to have more connections between buildings, the retail stores are so far apart from each other it would be hard to connect them all. Additionally, I feel like the current retail offerings (Babies "R" Us, Dollar Tree, and Kohl's) are not exactly stores that people would want to casually browse or walk through like you would at the mall. Perhaps build a plaza connecting all of the stores together and add more desirable stores not already offered nearby? (though the Volkswagen/Subaru dealership is right in between Dollar Tree and Kohl's..)

10. The hills are too steep in that area to ever have much pedestrian traffic. Only people who absolutely need to walk will; you won't attract more walkers with benches or a plaza. Investing in pedestrian improvements doesn't seem like a priority for the area. However, I do think adding a crosswalk or two would help with the jaywalking issue.
11. The intersection at Serramonte and Collins feels dangerous
12. There absolutely needs to be better parking for us employees. I work at Serramonte Subaru and everyday we have to park in the Kohl's parking lot where we, everyday, have the possible circumstance of being towed. It is not good and this should be improved. We should have a safe spot to leave our vehicles for the work day.
13. There should be one stop sign between the Target at Junipero Serra Blvd and EL Camino Real on Serramonte Blvd, it's a very long street.

14. We have a lot of businesses here and it would be nice to have a parking lot/structure for us. I work at Serramonte VW and it would save me a lot of time to park close by. I also work until 8 pm, and the walk to my car can be a bit intimidating. So something close would be ideal . We have talked to stores that are closer by if we can share parking lots, although they agree, we get towed.

10. What is your home zip code? (20 Responses Total)

1. 94014
2. 94014
3. 94014
4. 94014
5. 94014
6. 94014
7. 94014
8. 94015
9. 94015
10. 94044
11. 94044
12. 94044
13. 94061
14. 94066
15. 94080
16. 94080
17. 94080
18. 94124
19. 94137
20. 95123

11. Before you go, please let us know if you have any additional inputs about the project or comments about the survey itself. (6 Responses Total)

1. I am happy to hear you are making improvements. Like I mentioned employee parking needs to be improved.
2. I would like to see: " Colma Riverwalk Plaza "Above and below the ground. Small boutique shops, fine dinning, coffee shops, children playground with movable sky sealing, art displays specially about Colma's History. On top floor: small plant botanical garden of California with nice coffee shop and few restaurant . Maybe a Cinema, or a small Theater for young artist, working with local schools. Actually that would be great to give a place for young adults a place to express their talent.
Free transportation from the Colma Bart, so people can visit us from the City.

Create something that people would come to see from all over the World.

Let' put the City of the Soul on the World Map!

This is the most organized City I ever lived. I'm strongly believe you can create something extraordinary .

3. It was simply and fast.
4. MORE PARKING!!!
5. Please don't close any current businesses! My family and I use this shopping area as our main place to get things.
6. Please make Collins and Serramonte Blvd. safer

Colma Serramonte Blvd. and Collins Ave. Master Plan



Stakeholder Interviews Memo

February 2018

Prepared by

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I Introduction

I.1 Goals and Objectives of Project

Serramonte Boulevard is an east-west arterial street with two lanes in each direction that serves Colma's commercial area and is a thoroughfare that connects traffic to and from the Interstate 280 freeway, Daly City, Junipero Serra Boulevard, El Camino Real and Hillside Boulevard. Collins Avenue is a two-lane collector that connects El Camino Real and Serramonte Boulevard, and serves a retirement community, car dealerships and auto body shops, and a variety of light industrial activities. Due to incremental developments along both Corridors over the last few decades, both lack uniformity in mobility improvements, including safe pedestrian infrastructure, on-street parking, and turn lanes serving businesses, as well as appearance.

The Town of Colma is in the process of preparing a Master Plan for the Serramonte Boulevard and Collins Avenue Corridors. More specifically, the plan will outline a vision for this key commercial district and provide guidance for strategic improvements to circulation, streetscape, infrastructure, and aesthetics to improve the overall design and function of this important business center in the years to come. Specific objectives identified for the Master Plan include:

- **Streetscape and Traffic Improvements.** Carry out streetscape and traffic improvements to provide safe, accessible, attractive, and vibrant corridors with a cohesive design and aesthetic elements.
- **Economic Development.** Support and increase commercial business activities while fostering a dynamic and sustainable business district that can respond to changing market conditions.
- **Land Use and Urban Design.** Incorporate land use and urban design elements that sustain and enhance the function and unique identity of Serramonte Boulevard and Collins Avenue.
- **Sustainability.** Create design alternatives that promote sustainable development and green infrastructure along the corridor.

1.2 Purpose and Format of Stakeholder Interviews

Stakeholder interviews are one tool by which the planning team learns from community members about the challenges facing the Corridors and the opportunities for the future. As part of the community outreach effort for the preparation of the Serramonte Boulevard and Collins Avenue Master Plan, the planning team interviewed 12 stakeholders on February 8, 2018. All interviews were conducted at the Colma Police Department. The interviews were conducted in groups of three to four, with one hour allotted for each interview session. Stakeholders included business owners and representatives and property owners.

The purpose of the interviews was to learn about stakeholders' experiences living, working, and owning businesses and property in the Corridor, and to learn from their perspectives about what is working well, and not so well, in the study area. Specifically, interviewees were asked about their priorities and vision for the Corridors. Stakeholders were asked how they would prioritize the accommodation of bike infrastructure, parking, and pedestrian facilities in the Serramonte Boulevard and Collins Avenue roadways. They were also asked what types of streetscape improvements and parking management strategies they would like to see. Business and property owners/managers were asked about the operational and logistical challenges they currently face and how public improvements to the Corridors could help mitigate them. In addition to these particular topics, interviewees were given the opportunity to discuss issues of significance to them.

It is important to recognize that the issues presented in this memo may not necessarily be representative of the community at large, or a comprehensive assessment of opportunities and challenges faced along the Corridors. While the stakeholders represented a diversity of business interests along the Corridors, the results cannot be generalized as the sentiments of the community at large. Resident and visitor opinions and comments are anticipated to be captured by the online survey. It is also important to recognize that information presented by the stakeholders included perception and opinion. Nonetheless, the valuable insight shared during the interviews greatly informs the planning process for the Serramonte Boulevard and Collins Avenue Master Plan.

The full list of discussion questions and prompts are included in Appendix A. The list of participants is included in Appendix B. The following summary presents the range of responses organized by topic area, without attributing any remarks to specific individuals.

2 Stakeholder Comments

2.1 Key Themes

During the stakeholder interviews, several themes were identified. Those mentioned by many stakeholders are summarized below for quick reference. The following sections provide the varying individual perspectives on these topics as well as additional issues that were raised.

- Parking is a concern on both Corridors, particularly in terms of a shortage of employee parking.
- Serramonte Boulevard should be safer and easier to cross and more pleasant and attractive to walk along.
- Vehicular traffic and congestion is a significant concern; any streetscape improvements should manage or mitigate congestion in some fashion.
- Increasing the public's knowledge of Auto Row and other businesses in Colma through the use of monument signage would help to increase traffic and sales along the Corridors.
- Speeding is an issue on both Serramonte Boulevard and Collins Avenue.
- The Collins Avenue/ Serramonte Boulevard and Collins Avenue/ El Camino Real intersections are unsafe and lead to many close calls.

2.2 Stakeholder Comments

A comprehensive summary of comments made by the stakeholders, organized by topic, follows.

MOBILITY

In general, stakeholders were concerned about pedestrian safety, a lack of parking, particularly for employees of Colma businesses, vehicular traffic, and certain unsafe intersections. Several stakeholders acknowledged that a shuttle from the BART station to businesses along the Corridors would be useful, and that cycling could be another way of connecting employees and visitors coming from BART to Colma businesses.

Pedestrian Facilities

- Safe crosswalks at various locations along Serramonte Boulevard are needed to facilitate efficient pedestrian mobility and to discourage jaywalking. Raised or signalized crosswalks could be considered. Crosswalk location suggestions include the following:

- Between the Ford property/ auto-dealerships and Vivana Fair. A fair number of people that wish to take an efficient route from the dealerships to go to Starbucks, Chipotle etc. can be observed crossing here.
- The intersection/crosswalk in front of Target should be lit up or signalized; it is currently not a crossing that feels safe.
- Between the Dollar Tree site and Lexus and Nissan sites.
- Some stakeholders wondered how many pedestrians actually walk along Serramonte Boulevard, and whether proposed pedestrian infrastructure investments would be worthwhile.
- Stakeholders' opinions regarding pedestrian infrastructure on Collins Avenue tended to reflect a desire for improvements to the existing sidewalk on the north side of the street while maintaining the south side of the street as space for parking.

Bicycle Facilities

- While some support for a bicycle lane on Serramonte Boulevard existed among stakeholders, stakeholders were generally wary of supporting bicycle lanes if that meant reducing the number of lanes on Serramonte Boulevard.
- A Ford representative brought up the possible introduction of Ford Go-Bike bikeshare docks and bicycles in Colma.

Transit

- Some stakeholders, particularly those that transport vehicle service customers, agreed that a coordinated shuttle service from BART to the Corridors would be a great addition given that people don't like walking from BART. Lucky Chances offers shuttles from the Colma BART station for patrons and employees. It was noted that there could be potential to align with Chariot or another such service.

Traffic

- Some stakeholders agreed that traffic seems to be manageable at the moment, while others stated that congestion was the number one issue, especially along Serramonte Boulevard.
- Many stakeholders agreed that taking away one lane in either direction to accommodate a center turn lane on Serramonte Boulevard could alleviate congestion. Another suggestion to this end was to allow for right turns only out of businesses.
- Some stakeholders raised the concern that additional crosswalks along Serramonte Boulevard would impede the flow of traffic.
- The Collins Avenue and Serramonte Boulevard intersection (at Junipero Serra Boulevard) was seen by most as a problematic, unsafe intersection. Suggestions for improvements included the following:
 - Traveling westward along Collins should be right turn only onto Serramonte.

- For those turning left onto Collins from Serramonte, a flashing yield sign would help alert drivers that they must yield to eastbound traffic coming from Serramonte.
- In addition to other loading and unloading locations in the study area, car haulers use Collins Avenue to load and unload vehicles and it should be kept this way by giving specific instructions to car hauler operations. However, Collins Avenue gets tight as a result of these operations and traffic can pile up. If parts of Collins were widened or improved in some other manner for car haulers, auto dealers would benefit.
- Several stakeholders advocated for a stop light at El Camino and Collins; the number of screeching brakes heard all day is astounding.
- Speeding is an issue along both Corridors. Collins Avenue in particular would benefit from more prominent speed limit signs or speed humps to discourage speeding, especially at the curve located on the east section of the roadway.

Parking Requirements

- Collins Avenue is in need of parking regulations that would prohibit parking between 2am and 5am, as some vehicles are parked there for weeks.
 - Permits could be issued for trucks loaded up overnight that will leave in the morning, as drivers are being ticketed.
- There are not enough parking spaces for other businesses because local car dealers are using Collins Avenue as their personal parking lot. Preference was expressed that more parking on the north side of Collin's Avenue would be more beneficial than a sidewalk.

Off-Street Parking

- There is not enough off-street parking to accommodate demand; employees park very far away from their place of work.
- Some businesses' parking lots are underutilized (Kohl's and Christy Vaults mentioned); Kohl's has parking agreements with some businesses already.
- A public parking structure would be useful – it would increase business. Opportunity sites include the following:
 - Kohl's site
 - The backside of the Serra shopping center behind Aaron Brothers
 - Vacant lot on Collins near the flower shop

On-Street Parking

- Not enough on-street parking along the Corridors; Collins Avenue is over-parked as a result.

ECONOMIC DEVELOPMENT

Stakeholders were asked about prospects for growth and economic development, and how public investments in the Corridors could help businesses remain competitive and relevant. Several stakeholders highlighted that better interstate signage would help attract business. Auto-dealer representatives and some retail representatives reported that their utilization of their respective properties weren't likely to change much with the arrival and adoption of evolving technologies such as autonomous vehicles.

- The word needs to be put out there more about Auto Row and other stores – retail sales peaked last year and have slightly dropped since. Better interstate signage could help attract more traffic to the area. Similarly, coordination with Caltrans is required to trim the trees blocking the Target sign and Serra Center.
- An Auto Row association might help increase regional visibility of Colma auto dealers.
- Dealerships feel they may need more space once autonomous vehicles take off since they would essentially become fleet managers. Two dealers indicated that their companies have predicted that between now and 2030, automated features in cars will improve, and that fleets would not become fully autonomous until 2030.
- Target is unsure about the change in their property utilization given the arrival of new business ventures including a collaboration with Shipt, a same day home delivery service, though it is predicted that physical infrastructure needs will not grow as Target stores transition from traditional big box stores to a mixture of brick and mortar retail and online shopping fulfillment center. Target indicated that they may be requesting a separate entrance on the south end of the store, with a corresponding curb pick-up lane for customers picking up ordered merchandise.

STREETSCAPE

Stakeholders were asked what streetscape improvements and amenities they would like to see along the Corridors. Some stakeholders suggested improvements to lighting, while others believed it wasn't an issue. Most stakeholders shared a desire to add aesthetic elements in order to make the Corridors more attractive.

Lighting

- Midnight/2am lighting turns off at the dealerships. Coordination for timing could be useful.
- Auto dealerships are the main source of light, so when they go off it is very dark overall.
- Lighting on Collins is fine according to some, and very dark according to others. The overgrowth of trees was said to worsen this.

Aesthetics/Beautification

- Light posts that are aligned and visually pleasing when you look down Serramonte.
- More greenery would be nice, but not if it would take up space on the roadway.

- Palm trees were a divisive topic.
- Urban progressive – the opposite of suburban – a modern look.
- More trashcans are needed to get rid of the problem of trash on streets.
- Large cement structure with “Colma” written on it using greenery – but this would need to be maintained.
- Brick sidewalk or roadway elements instead of concrete.
- Some stakeholders wondered whether beautifying the space would generate more foot traffic, given that their impression that it’s mostly employees who walk around.
- The word needs to be put out there more about Auto Row and other stores – retail sales peaked last year and have slightly dropped since. Need to attract more traffic to the area, which could be accomplished through an increase in freeway signage, billboards, and electric signs.
- Opportunity area for signage on south side of Serramonte Boulevard along Junipero Serra Boulevard (1500 Collins Avenue).

Appendix A: Stakeholder Interview Questions

Challenges and Opportunities

1. What's working well on Serramonte Boulevard and Collins Avenue today?
2. What do you think are the greatest challenges facing these Corridors today?
3. What are your biggest operational or logistical challenges?
4. What is your vision/ what are your priorities for how these Corridors should develop or change over the next 20 years? What do you think will be the key challenges along the Corridors in that time period?

Transportation and Parking

1. Where would you say the majority of your employees and patrons are coming from?
2. Where do your employees park?
3. Where or how do you take delivery of vehicles?
4. There is limited space on the roadway to accommodate different features and modes of travel: vehicle/truck travel lanes, sidewalks, bicycles, parking, medians, turn lanes, and landscaping. Is the space allocated appropriately now? What changes would you like to see?
5. Where do you consider to be the most problematic "hot spots" within our study area? Think about safety (for people driving and on foot), congestion, and similar concerns. Show us on the map.
6. What types of streetscape improvements would you like to see along the Corridor? Think about elements that would contribute to the creation of a unique identity along the Corridor such as gateway elements, lighting, landscaping, street furniture etc.
7. What improvements are needed to improve connections to the Corridor from the surrounding area?
8. Are your property/ business's parking and loading needs currently being met?

Economic Development

1. What is the current status of the regional auto sales market, and what are the major challenges that Colma auto dealers face to remain competitive in the coming years?
2. Where do you see your industry heading or evolving over the next 5 or 10 years?
3. Given the realities of the competitive market, what is a realistic percentage that overall auto sales in Colma could increase over the next 10 years, under favorable circumstances?

4. Thinking about the range of factors, including evolving technologies, such as autonomous cars, car sharing services, etc., and how those changes may affect traditional car dealers, how do dealers expect their local operations to change over time?
5. How will these changes affect the utilization of your property?
6. Given answers to prior question, what kinds of things can Colma do to help local auto dealers remain competitive and relevant?
 - a. Short term – next 1 to 5 years
 - b. Longer term – 6 years and beyond
7. What kinds of public improvements will generate the best return on investment in terms of supporting increased auto sales [or, for non-auto oriented businesses, general sales] over time?

Lighting

1. Do we need to coordinate lighting along the two Corridors better? Are lights kept on all night?

Wrap-up

1. Do you have any other ideas or concerns that we haven't asked about?

Appendix B: Stakeholders Interviewed

<i>Stakeholder</i>	<i>Affiliation</i>
Anthony Caprini	Precision Autobody
Arash Haidari	Subaru/Volkswagen
Bob Christiansen	Christy Vaults
Catherine Hughes	Serra Center
Dustin Chase	Lucky Chances
James Carlson	Home of Peace
John Saddi	Target
Lou Hanhan	Precision Autobody
Sohail Tabar	Ford
Tony Uccelli	480 Collins Avenue
Victor Hung	Vivana Fair

Stakeholder Review Summary

COLLINS/ SERRAMONTE INTERSECTION

- Preference to maintain full access
- Suggestion to include a keep clear area to facilitate left turns from Collins onto Serramonte to get onto freeway
- Crosswalk at current proposed location seems dangerous because people speed as they turn onto to Collins from Serramonte
 - Suggestion to put a crosswalk a little further down Collins

COLLINS AVENUE

- Preference for Option 1
 - Principal driver is parking, which people don't want to lose
 - Concern re: removing parking for car carriers, especially if Kohl's site is developed
 - Desire for:
 - Maximized parking
 - Reduced speed
 - No bike lanes
 - Some car carrier parking
 - Aesthetic improvements
- Re: Option 2: Is a bike lane necessary? What is it connecting cyclists to?
 - Interest in finding out how cyclists get to BART, the mall
 - A bike lane on El Camino Real to BART should be addressed first, that seems critical
 - The Town just received a planning grant for ECR – they will plan for ped/bike improvements on ECR

SERRAMONTE EAST

- A little bit of a split between options 1 and 2
- Is the uphill desirable for bikes?
 - Does the low number of cyclists warrant the expense of the renovation?
 - Note: bike lane isn't coming at an expense of anything else
- Benefit of Option 2 east: aesthetic continuity of center median if Option 2 is chosen for Serra west

SERRAMONTE WEST

- Preference for Option 2
- Most of the dealers don't unload on Serramonte – only one dealer?
- Would prefer not to unload on Serramonte, though-if Kohl's space becomes unavailable for unloading that could be an issue.
- Amazon could acquire babies r us site: how will that impact Serramonte West?

URBAN DESIGN TREATMENTS

- -Signage important so we can demonstrate it's auto row – monument signage perhaps to illustrate the depth of dealerships
- In terms of nomenclature, auto row aligned with the name of the exit more than the town (Serramonte auto row)
- Signage also important for cemeteries given that they're another visitor draw
- How do we coordinate signage for
 - Town
 - Cemeteries
 - Dealerships
 - Others?
- Directional signage would be appreciated
 - Michael: challenges with City attorney re: directional signage
- Re: trees, responsibility needs to be discussed – where dealership property ends and where public starts – it's been up for debate for landscape responsibility
 - Brad (Public Works): 1986 – handshake agreement – dealers would pay for irrigation and maintenance
- Precedent trees to look at:
 - School street in Daly City – nice trees
 - Palm trees on mission street in Daly City an example of poorly maintained palm trees
 - Brian – unique climate which limits trees we could choose
 - Brisbane box?
 - Brad (Public Works): go with an evergreen so less maintenance for Public Works
- **Stakeholders would like to see a sample of trees**

Appendix B: Plant, Furnishings and Materials Palette



DESIGN STANDARDS

Serramonte Blvd Master Plan

March 20, 2019

ENHANCED PAVEMENT

- Specialty Pavement - Type 1
- Specialty Pavement - Type 2

PEDESTRIAN IMPROVEMENT

- Pedestrian Safety
- Crosswalk Markings
- Signature Lighting - Serramonte
- Increased Pedestrian Lighting - Collins
- Street Furniture
- Fence

SIGNAGE

PLANT MATERIAL

- Trees
- Shrubs, Perennials and Grasses
- Plant Characteristics

SPECIALTY PAVEMENT - TYPE 1



Existing Pavers, Hillside Blvd

Type 1A: Serramonte and Collins Crosswalks

Match color of existing paver installations on Hillside Boulevard.

Pavestone Holland Stone
Herringbone 8 cm or similar.

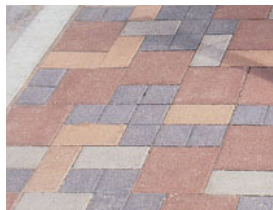


Holland Stone
Source: Pavestone

Type 1B: Serramonte Boulevard Sidewalks and Medians

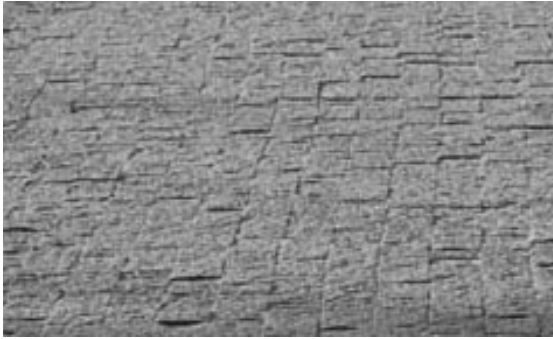
Signature blend: type 1A plus two contrasting colors. Coordinate with street lamp colors and site furnitures.

Pavestone Holland Stone
Herringbone 6 and 8 cm or similar.



Sample color blend
Source: Pavestone

SPECIALTY PAVEMENT - TYPE 2

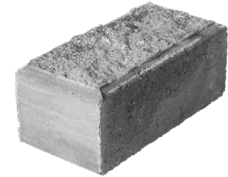


Source: Pavestone

Type 2: Collins Avenue

Split-face concrete unit pavers adjacent to pedestrian crossing. Neutral grey color; high-contrast paver colors limited to extent of crosswalk.

Pavestone Classic Split
Herringbone 8 cm or similar.





Existing Beacon and
Detectable Warning Pavers
Hillside Boulevard
SOURCE: CSG Consultants

**Rectangular rapid flashing beacon (RRFB) At
Serramonte Boulevard Mid-Block Crossings**

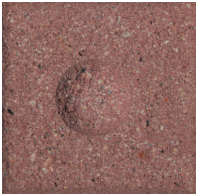
Similar to existing beacons at Hillside
Boulevard pedestrian crossings

Push-button activation

**Detectable Warning Pavers at Serramonte and
Collins Pedestrian Crossings**

Color to match existing installation at Hillside
Boulevard.

Tectura Detectable Warning ADA Pavers,
color A-80 or similar



CROSSWALK MARKINGS



High-Contrast Striping at Serramonte and Collins Pedestrian Crossings

High-contrast striping on type 1 pavers



Sharks Teeth Markings at Collins Pedestrian Crossing

High-contrast “shark teeth” road markings

SIGNATURE LIGHTING - SERRAMONTE



Description: **High-Low and Pedestrian Scale Street Lighting**

Transitional style in both High-low and pedestrian configurations, with signature powdercoat color. Philips Domus or similar.

Manufacturer: Phillips
Luminaire: Domus LED
Bracket: VC series, pictured
Post: Traditional, 14' and 25'
Color: Textured Burgundy

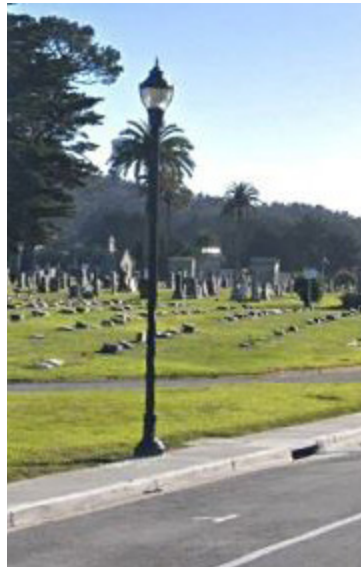


RD2TX
Textured Burgundy

INCREASED PEDESTRIAN LIGHTING - COLLINS



Existing cobra head



New pedestrian standard
Hillside Boulevard
Source: Google Earth

Description: Street Lighting Infill and New Pedestrian Lighting

Infill with Cobra head to match existing poles. Add pedestrian lighting to match existing standard on Hillside Boulevard.

Luminaire: Holophane Washington Postlite

Decorative Pole: Holophane North Yorkshire

STREET FURNITURE



**Signature seating: Forms + Surfaces Pacifica Bench,
96" length with short back and armrests
Surface mount
Powdercoated Steel to match signature lighting**



Description: Vinyl coated black fence to replace existing chain link barrier as required, Collins Avenue
Size: 4' High
Material: Chain link or welded wire



Large Monument Sign



Small Monument Sign



Wayfinding Sign

Description: Coordinated signage program, inspirational images.
Size: TBD
Material: TBD



Lophostemon conferta
Brisbane Box



Tristaniopsis laurina
Water Gum

Scientific Name Common Name	Foliage	Height (feet)	Spread (feet)	Exposure	Water Use	Fall Color	Bloom Color	Bloom Season	Comments
TREES									
<i>Lophostemon confertus</i> Brisbane Box	E	30-50	10-30	FS	L	—	W	SP	Fast growing. Existing along Serramonte Boulevard
<i>Tristaniopsis laurina</i> Water Gum	E	20-35	15-30	FS/PS	L	—	Y	SP/SU	Slow growing. Fragrant flower. Existing on Serramonte and Hillside.

Foliage

D = Deciduous
E = Evergreen

Exposure

FS = Full Sun
PS = Part Shade
SH = Shade

Water Use

M = Medium
L = Low

Color

T = Tan
W = White
Y = Yellow
PN = Pink
PR = Purple

Season

SP = Spring
SU = Summer
AU = Autumn
WI = Winter

* Approved for use in bioretention or flow-through planters in San Mateo, per San Mateo County approved plant list for stormwater measures.

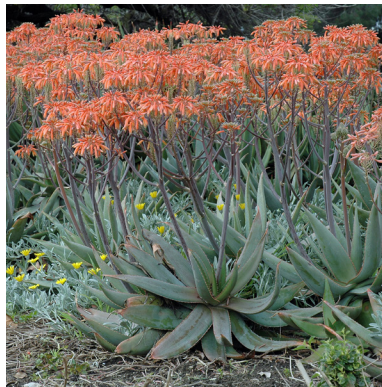
** Locally occurring native plant

SHRUBS, PERENNIALS AND GRASSES

Design intent: The following planting palette includes a mixture of eye-catching flowers, foliage colors and textures to provide interest in all seasons. Selections are predominantly low-growing and easily maintained below three feet without shearing, and with proper spacing, the plants' spread should not encroach upon walking surfaces or roads. They are tolerant of wind and coastal influence and the list includes several locally native species that can be found growing naturally on nearby San Bruno Mountain . These selections are commonly available in the trade, and are appropriate for a streetscape application. Plants approved for use in bioretention facilities in San Mateo County are indicated with an asterisk.



* *Achillea millefolium*



Aloe striata



Artemisia 'Powis Castle'



Bulbine frutescens



Calamagrostis foliosa



Calandrinia spectabilis

SHRUBS, PERENNIALS AND GRASSES



Ceanothus 'Valley Violet'



* *Chondropetalum tectorum*



Cistus 'Little Miss Sunshine'



Corethrogyne (Lessingia) filaginifolia 'Silver Carpet'



Erigeron glaucus 'Bountiful'



* *Eriogonum latifolium*



* *Festuca idahoensis*



Hesperaloe parviflora



* *Juncus patens*

SHRUBS, PERENNIALS AND GRASSES



Lomandra 'Breeze'



Loropetalum 'Purple Pixie'



* *Monardella villosa*



Nandina 'Flirt'



Phormium 'Jack Spratt'



Salvia spathacea



Sidalcea malviflora



Teucrium cossonii



Verbena lilacina 'De la Mina'

PLANT CHARACTERISTICS

Scientific Name Common Name	Height (feet)	Spread (feet)	Exposure	Water Use	Foliage Color	Bloom Color	Bloom Season	Comments
SHRUBS, PERENNIALS AND GRASSES								
<i>Achillea millefolium</i> Yarrow	1-2	2-3	FS	L	Light Green	W	SP-SU	(*) (**) Mix with Calamagrostis and Sidalcea
<i>Aloe striata</i> Coral Aloe	2-3	1-2	FS	L	Light Green	O	SP	
<i>Artemisia 'Powis Castle'</i> Wormwood	2-4	4-6	FS	L	Silver	—	—	
<i>Bulbine frutescens</i> Stalked Bulbine	1-2	1-2	FS	L	Light Green	Y	SP-SU	Bright green leaves form a dense clump
<i>Calamagrostis foliosa</i> Leafy Reed Grass	1-2	1-2	FS/PS	M	Dark Green	T	SP-AU	CA native. Mix with <i>Achillea</i> and <i>Sidalcea</i>
<i>Calandrinia spectabilis</i> Rock Purslane	1-3	2-3	FS/PS	L	Light Green	PN	SP-AU	
<i>Chondropetalum tectorum</i> Cape Rush	3	3-4	FS/PS	L	Dark Green	—	—	(*) Do not shear.
<i>Corethrogyne 'Silver Carpet'</i> Silver Carpet Beach Aster	.5	4-8	FS	L	Silver	PN	SP-SU	CA native
<i>Cistus 'Little Miss Sunshine'</i> Variegated Rock Rose	1-2	1-2	FS	L	Green	W	SP	Variegated foliage
<i>Erigeron glaucus 'Bountiful'</i> Seaside Daisy	.5	2	FS	L	Light Green	PR	SP-SU	(**)
<i>Eriogonum latifolium</i> Coast Buckwheat	1-2	2	FS	L	Silver	W	SP-AU	(**)
<i>Festuca idahoensis</i> Idaho Fescue	1-2	1-2	FS/PS	VL	Blue Green	T	SP-SU	(*) (**)
<i>Hesperaloe parviflora</i> Red Yucca	3-4	4-5	FS	L	Blue Green	PN	SP-SU	
<i>Juncus patens</i> California Gray Rush	2-3	2-3	FS/PS	L	Blue Green	—	—	(*) (**)
<i>Lomandra 'Breeze'</i> Dwarf Mat Rush	2-3	2-4	FS/SH	L	Light Green	Y	SU	Inconspicuous flowers

Foliage

D = Deciduous

E = Evergreen

Exposure

FS = Full Sun

PS = Part Shade

SH = Shade

Water Use

M = Medium

L = Low

Color

T = Tan

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PN = Pink

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Season

SP = Spring AU = Autumn

SU = Summer WI = Winter

* Approved for use in bioretention or flow-through planters in San Mateo, per San Mateo County approved plant list for stormwater measures.

** Locally occurring native plant

PLANT CHARACTERISTICS

Scientific Name Common Name	Height (feet)	Spread (feet)	Exposure	Water Use	Foliage color	Bloom Color	Bloom Season	Comments
SHRUBS, PERENNIALS AND GRASSES								
<i>Loropetalum</i> 'Purple Pixie' Dwarf Fringe Flower	1	4-5	FS/ PS	L	Red	PN	SP- AU	
<i>Monardella villosa</i> Coyote Mint	2	2	FS/ PS	VL	Light Green	PR	SP- SU	(**)
<i>Nandina domestica</i> Heavenly Bamboo	1-2	1-2	FS/ PS	L	Red	—	—	
<i>Phormium</i> 'Jack Spratt' Dwarf Phormium	1-2	1-2	FS/ PS	L	Red	—	—	
<i>Salvia spathacea</i> Hummingbird Sage	1-2	4-5	FS/ PS	L	Light Green	PN	SP- SU	(**) Spreads by rhizomes
<i>Sidalcea malviflora</i> Checkerbloom	.5	4	FS	M	Light Green	PN	SP	(**) Mix with Calamagrostis and Achillea
<i>Teucrium cossonii</i> Majorcan germander	.5	2-3	FS	VL	Blue Green	PR	SP- SU	Fragrant
<i>Verbena lilacina</i> 'De La Mina' Cedros Island Verbena	1-2	3-4	FS	L	Light Green			

Foliage

D = Deciduous
E = Evergreen

Exposure

FS = Full Sun
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Water Use

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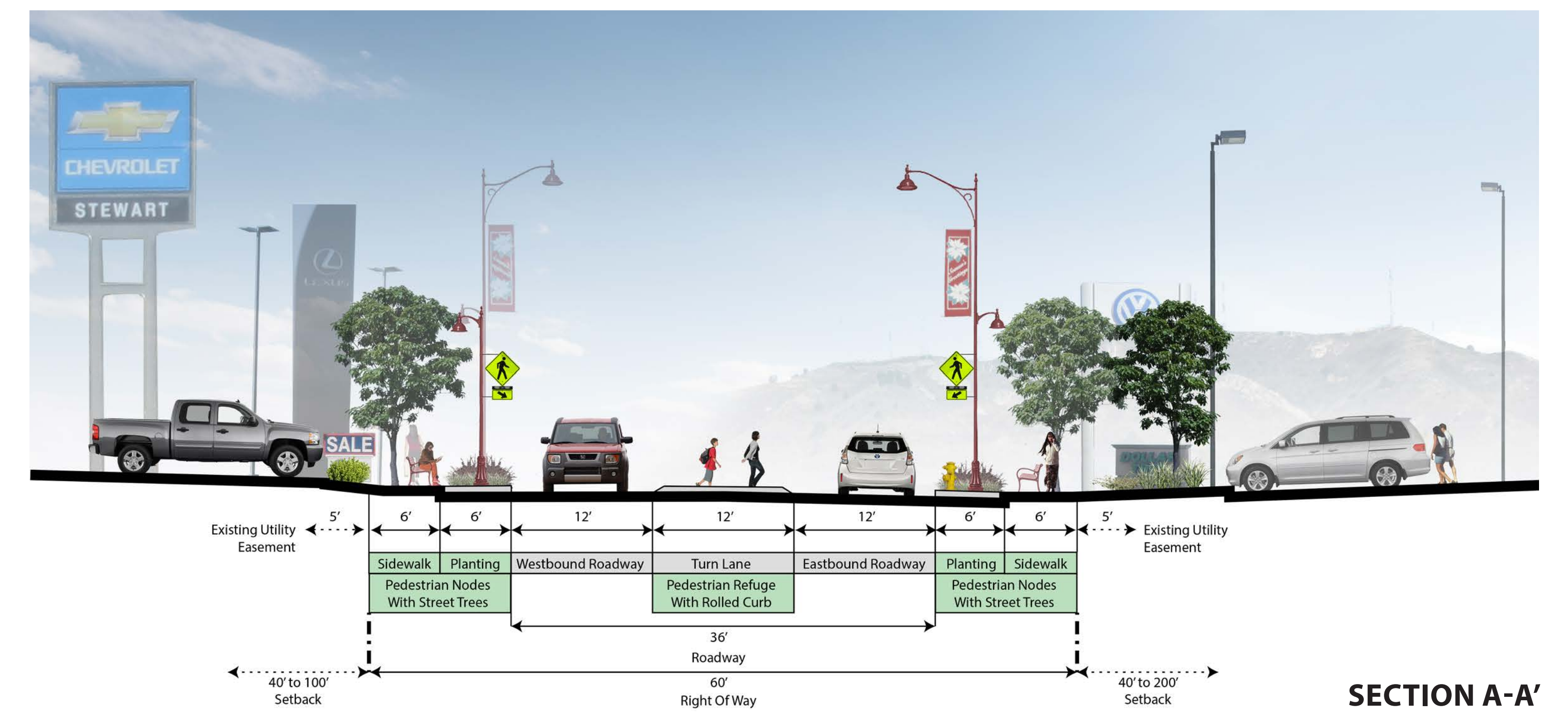
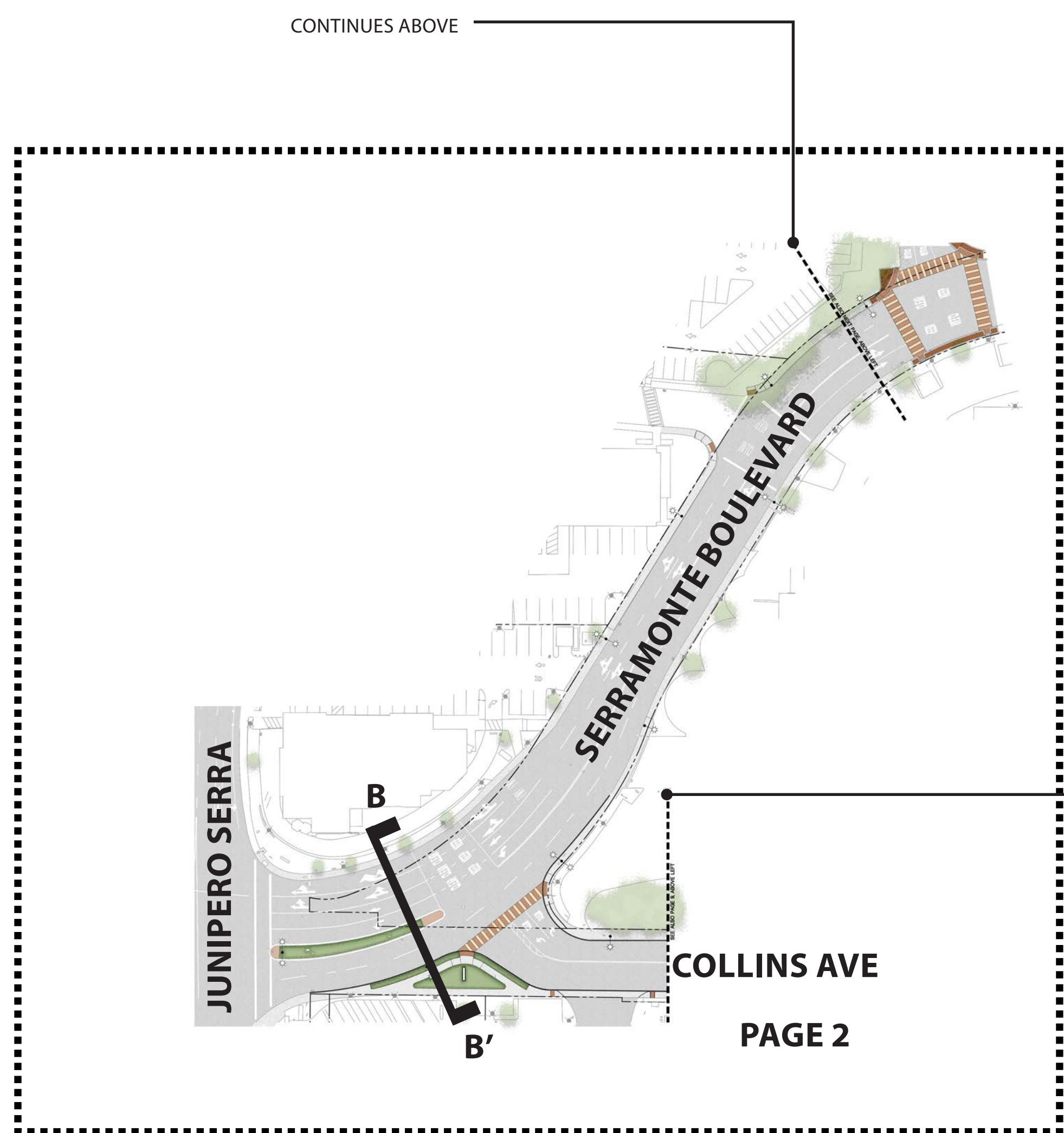
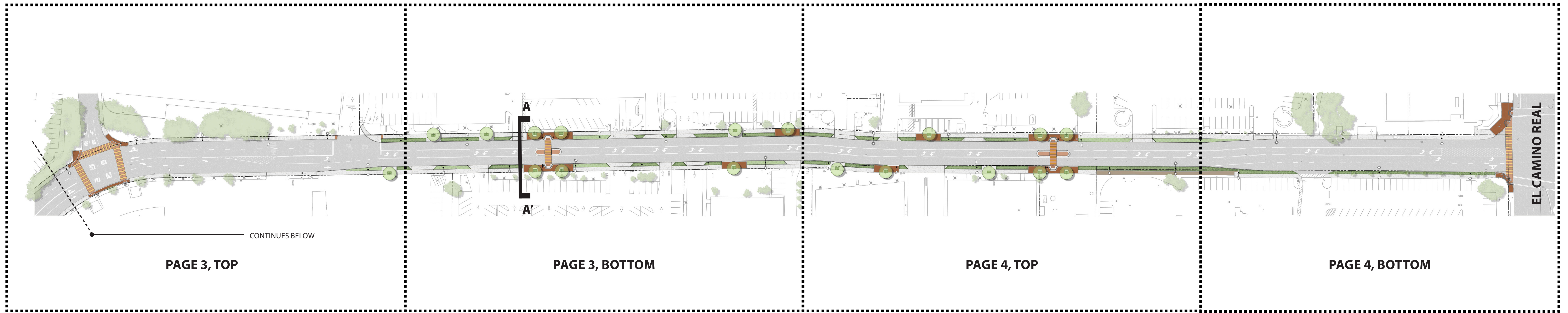
Season

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AU = Autumn

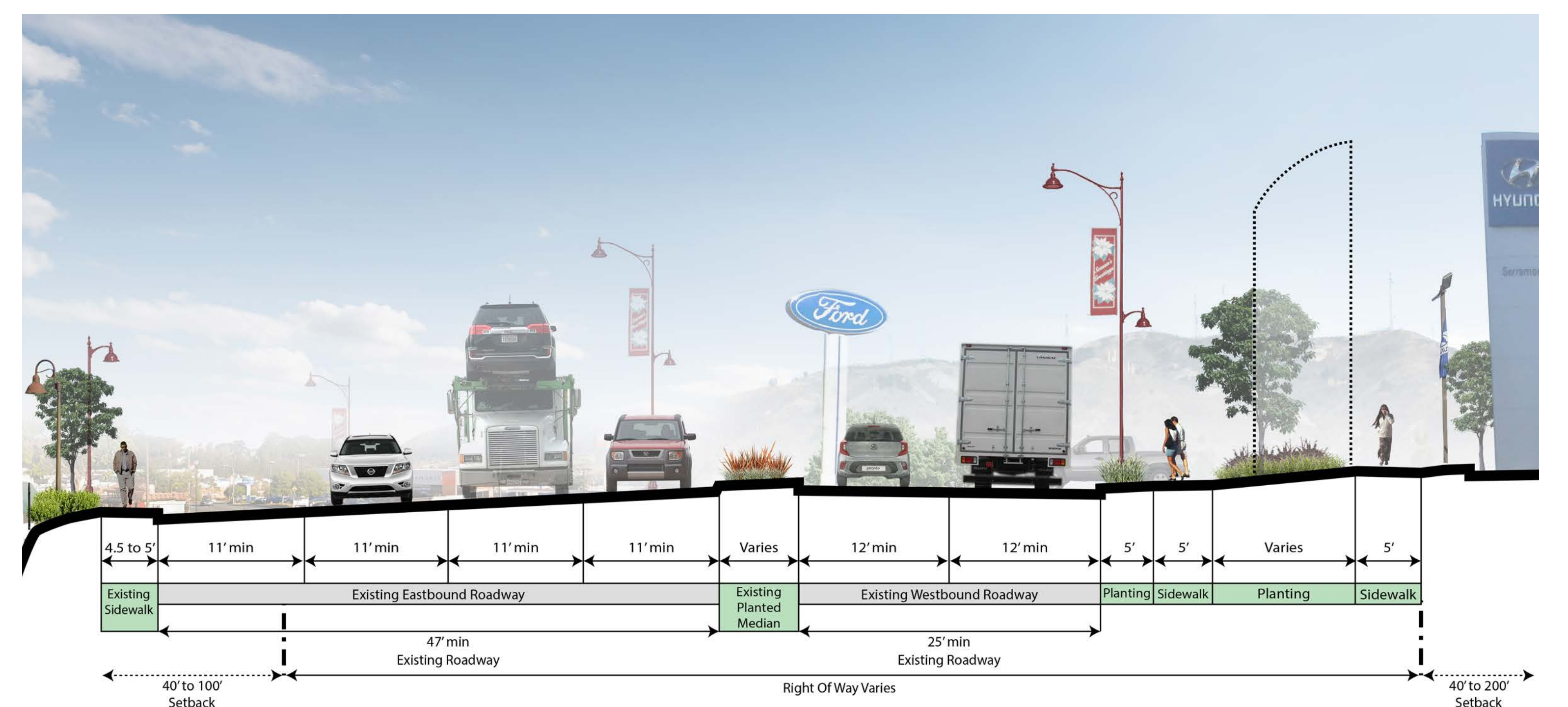
* Approved for use in bioretention or flow-through planters in San Mateo, per San Mateo County approved plant list for stormwater measures.

** Locally occurring native plant

Appendix C: Streetscape Design

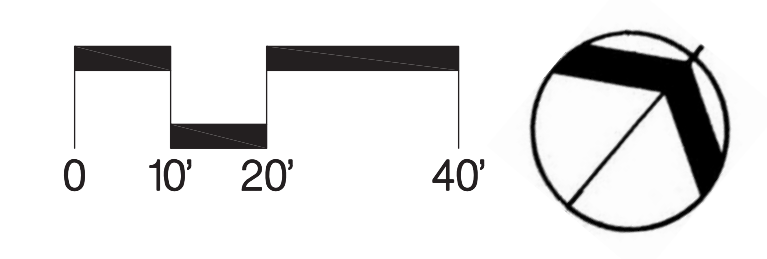
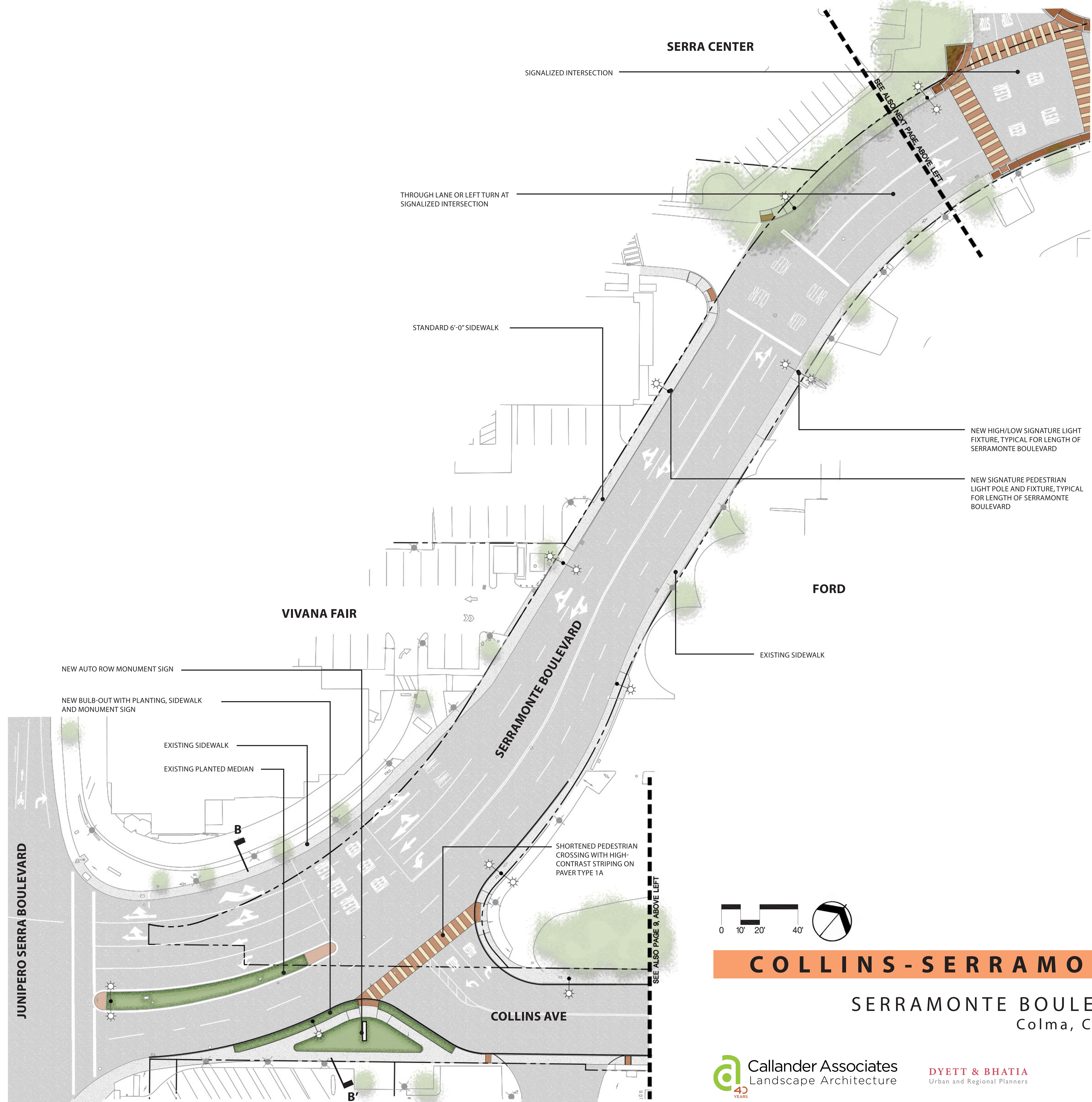


SECTION A-A'



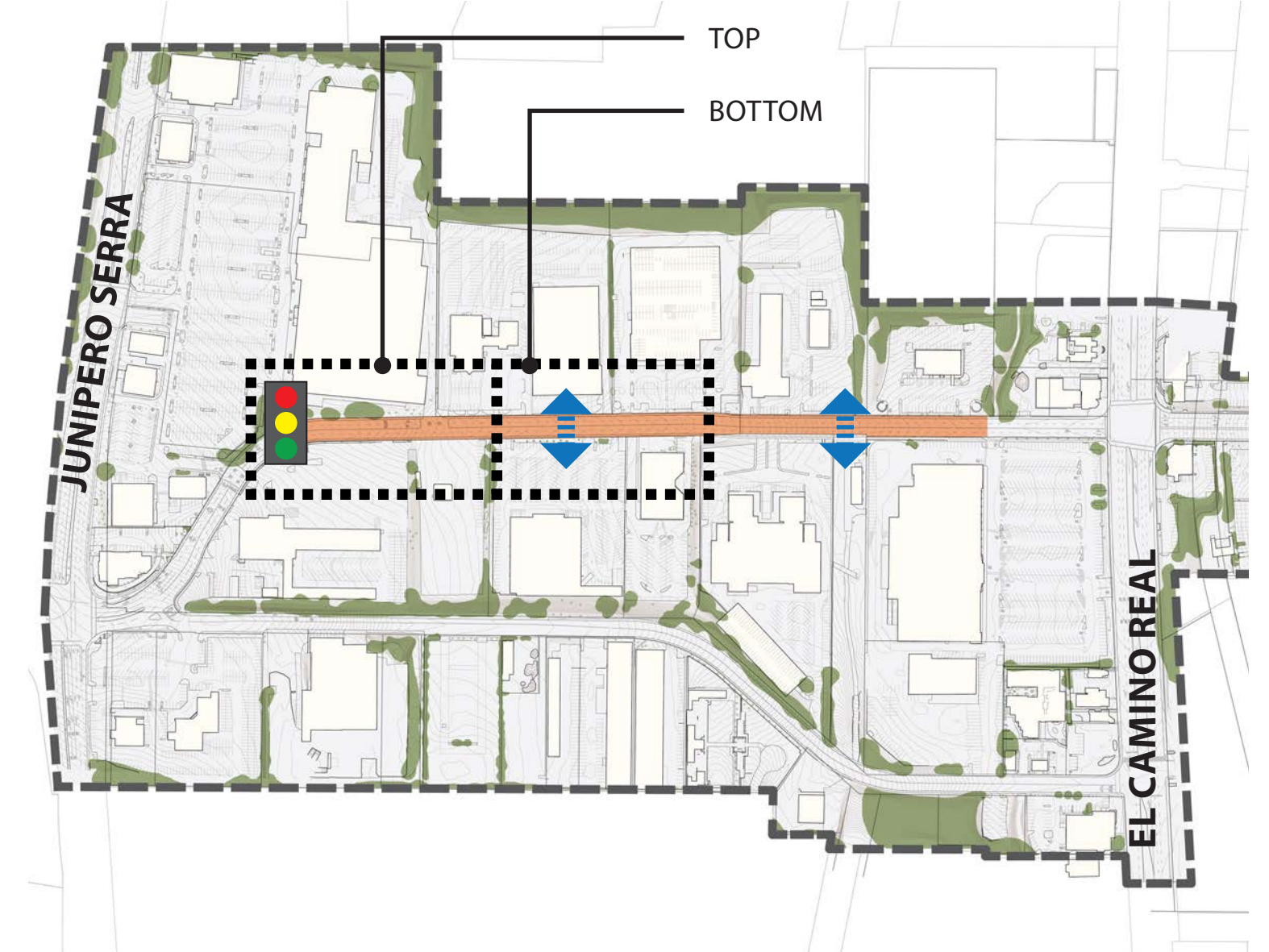
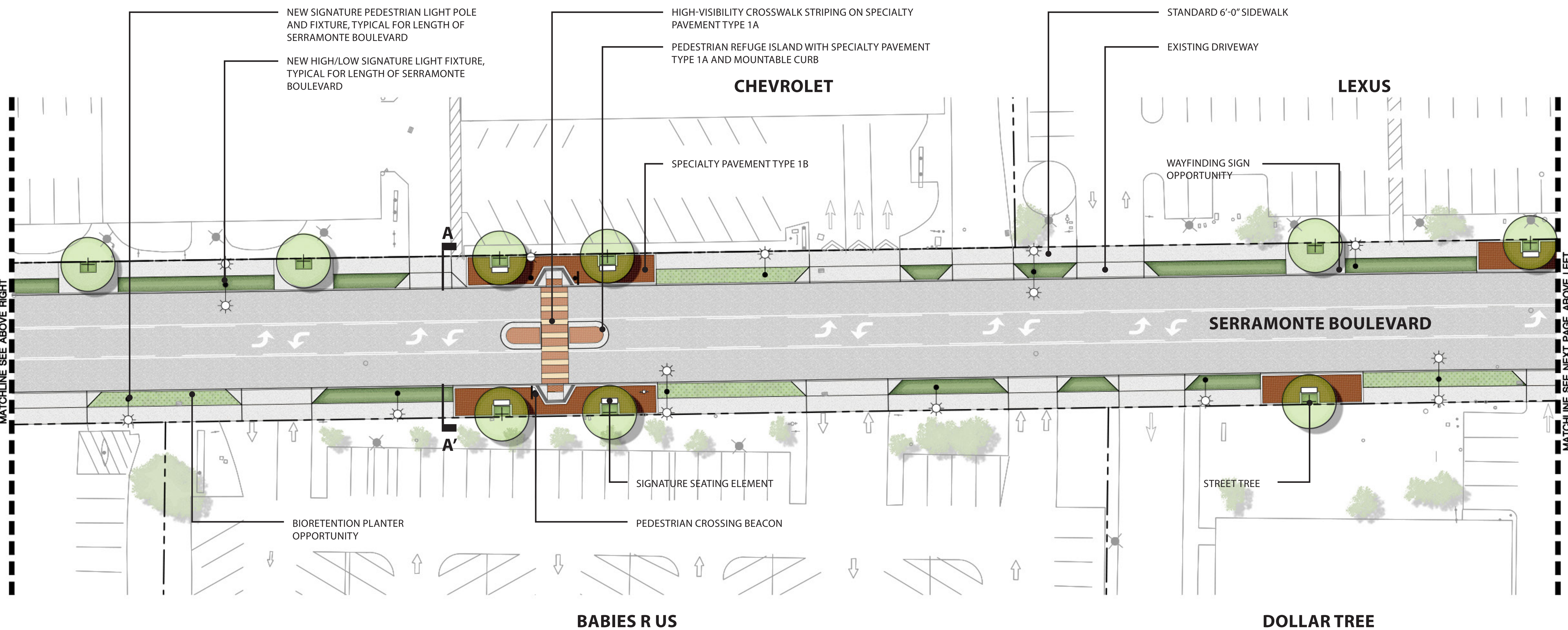
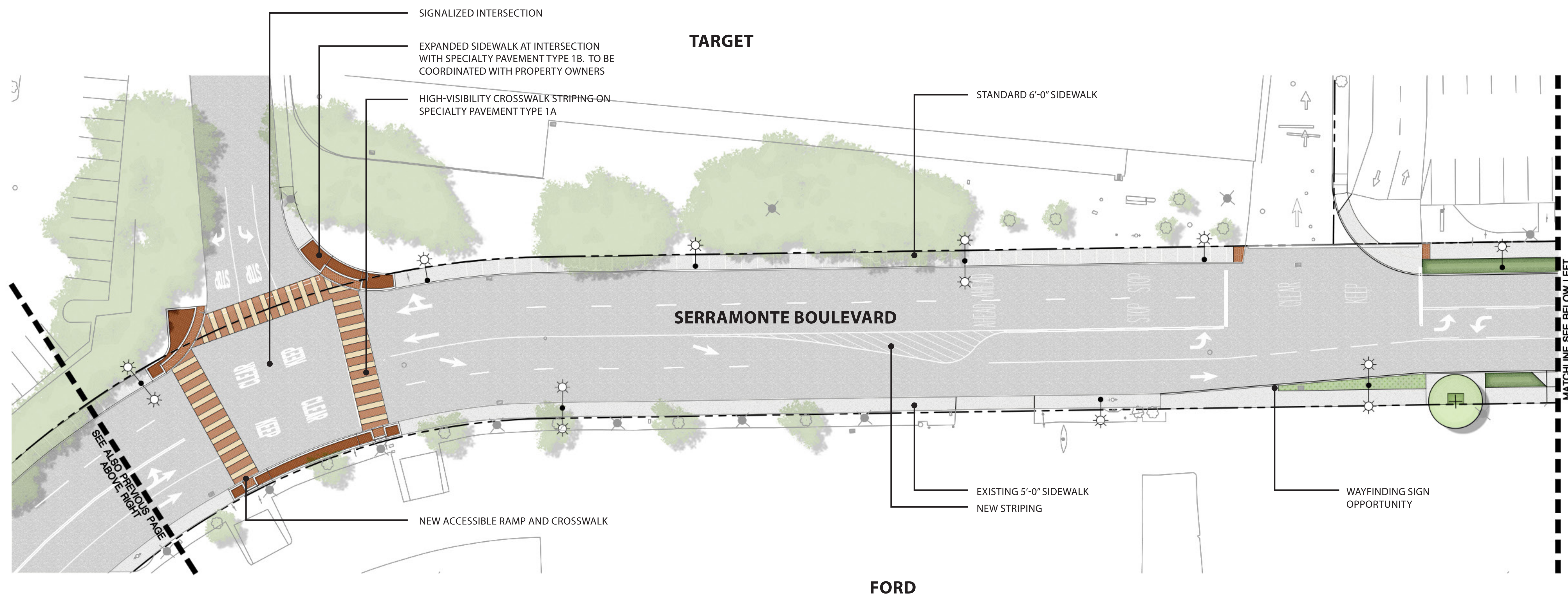
SECTION B-B'

SERRAMONTE WEST

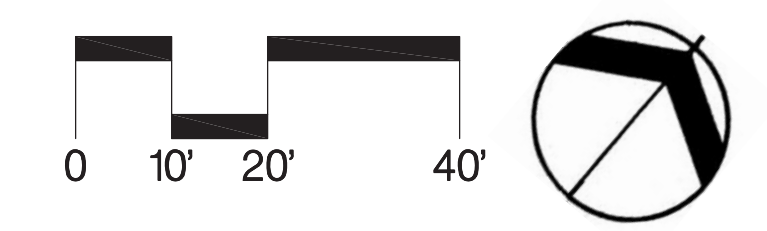


COLLINS - SERRAMONTE INTERSECTION

SERRAMONTE BOULEVARD MASTER PLAN
Colma, California

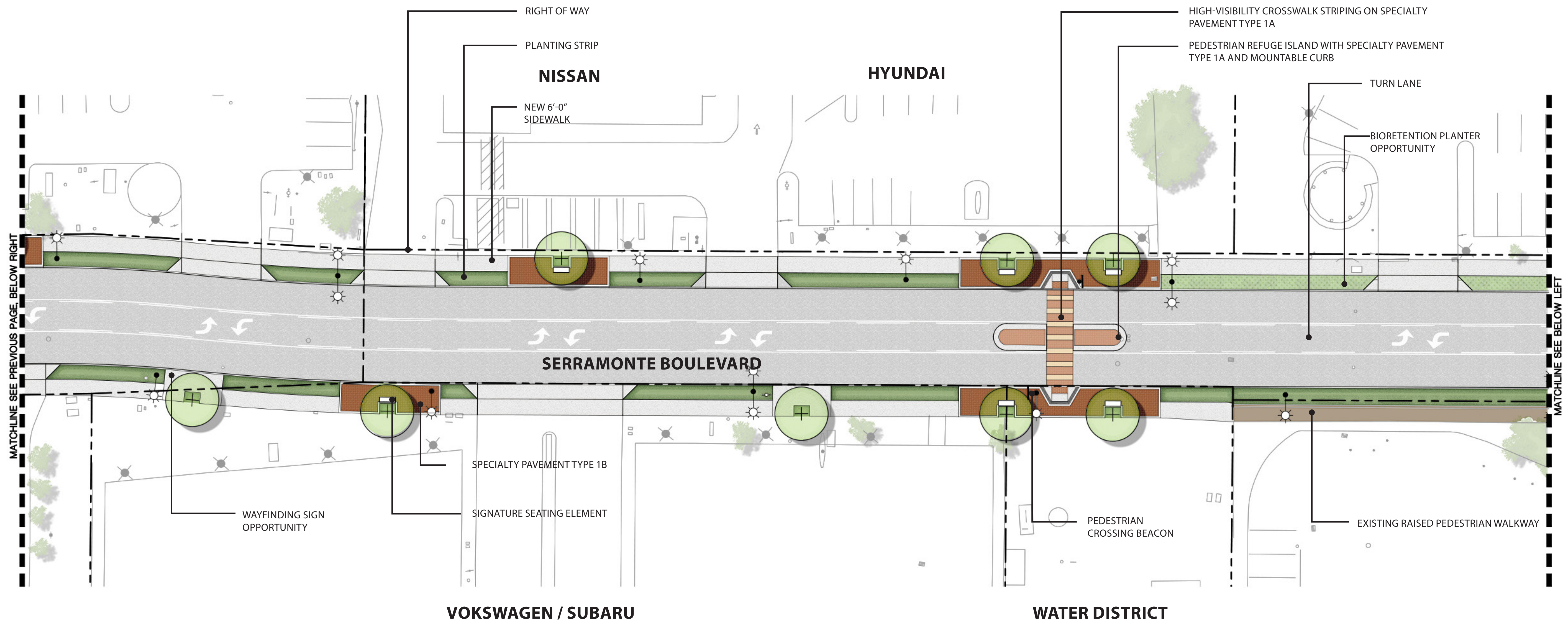


KEY MAP



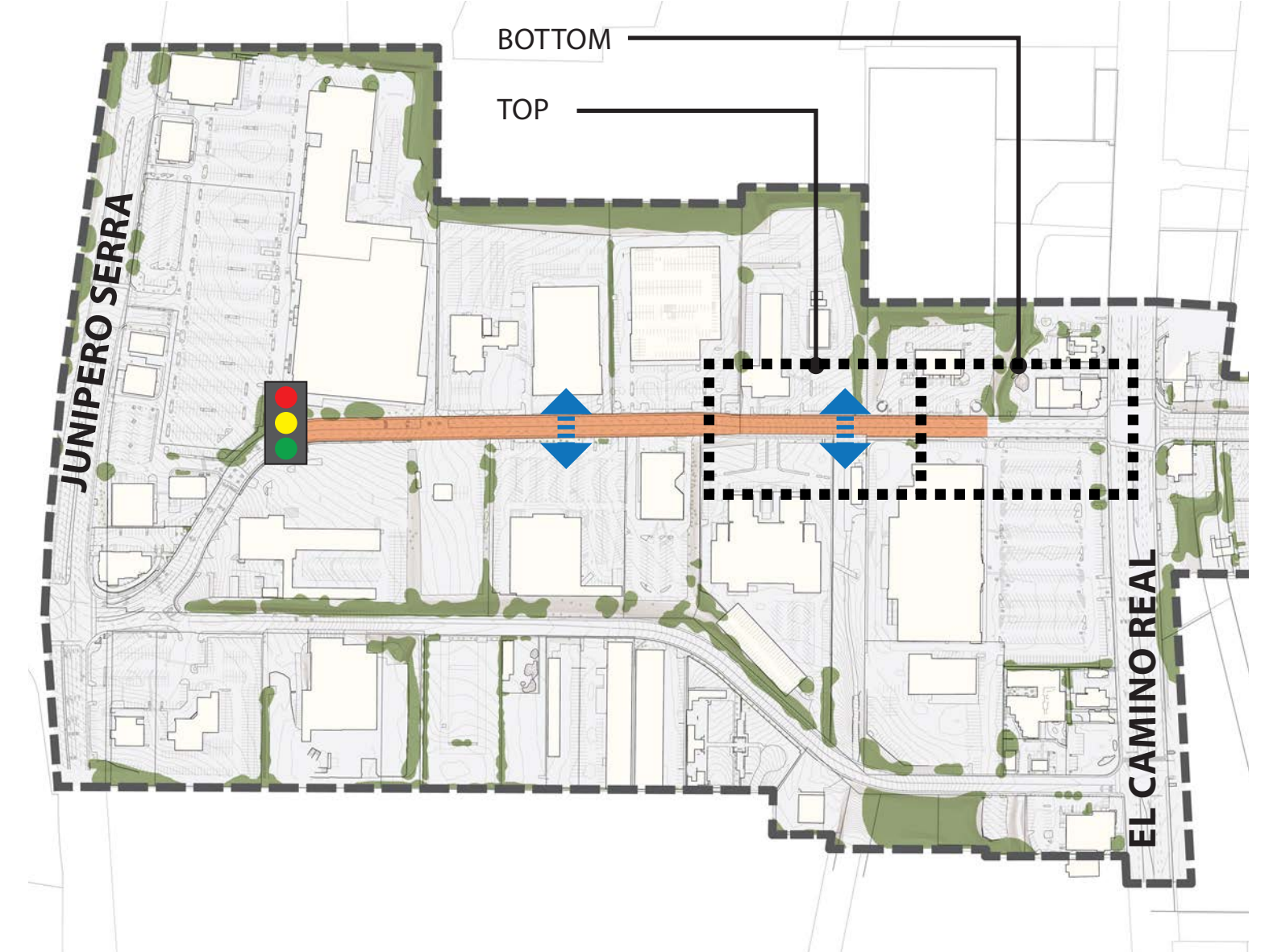
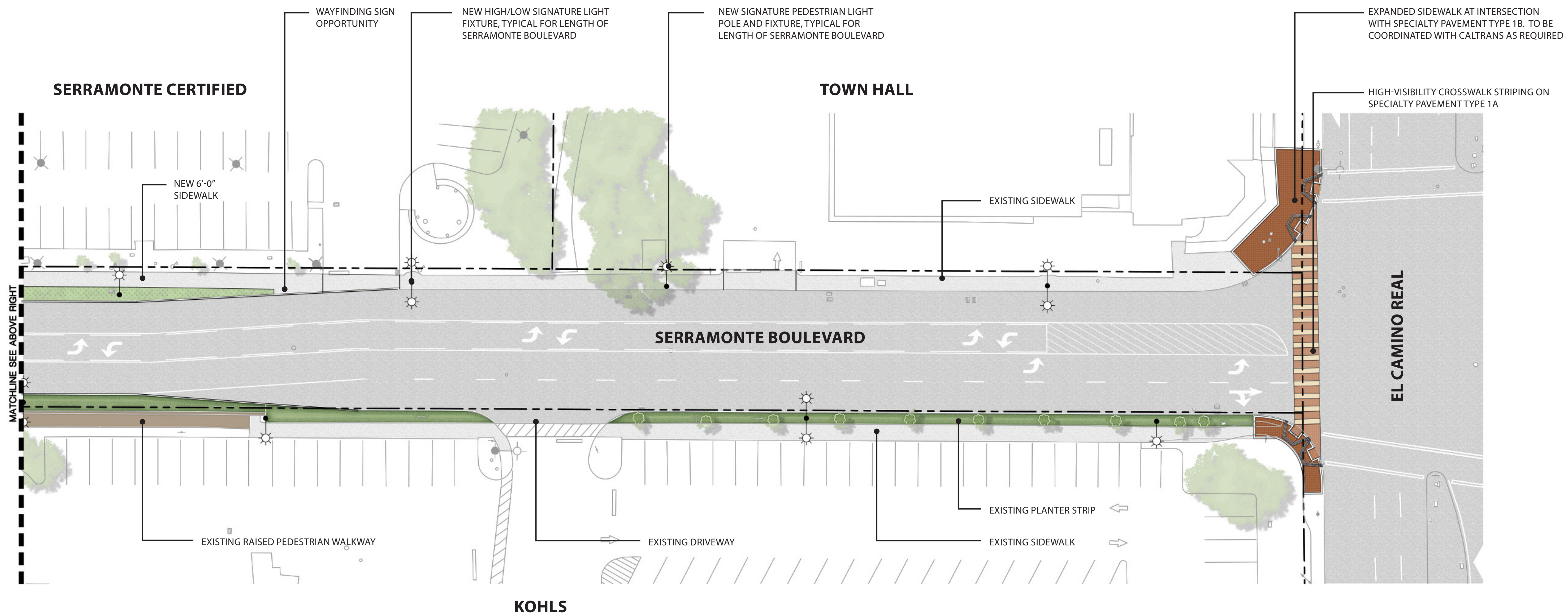
SERRAMONTE WEST

SERRAMONTE BOULEVARD MASTER PLAN
Colma, California

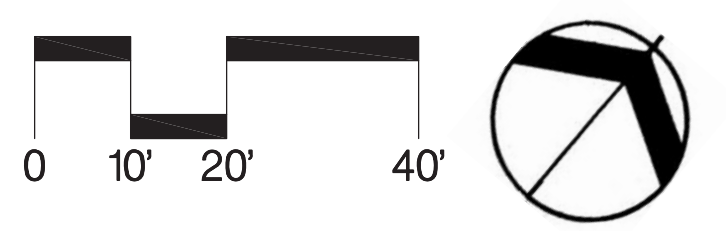


VOLKSWAGEN / SUBARU

WATER DISTRICT

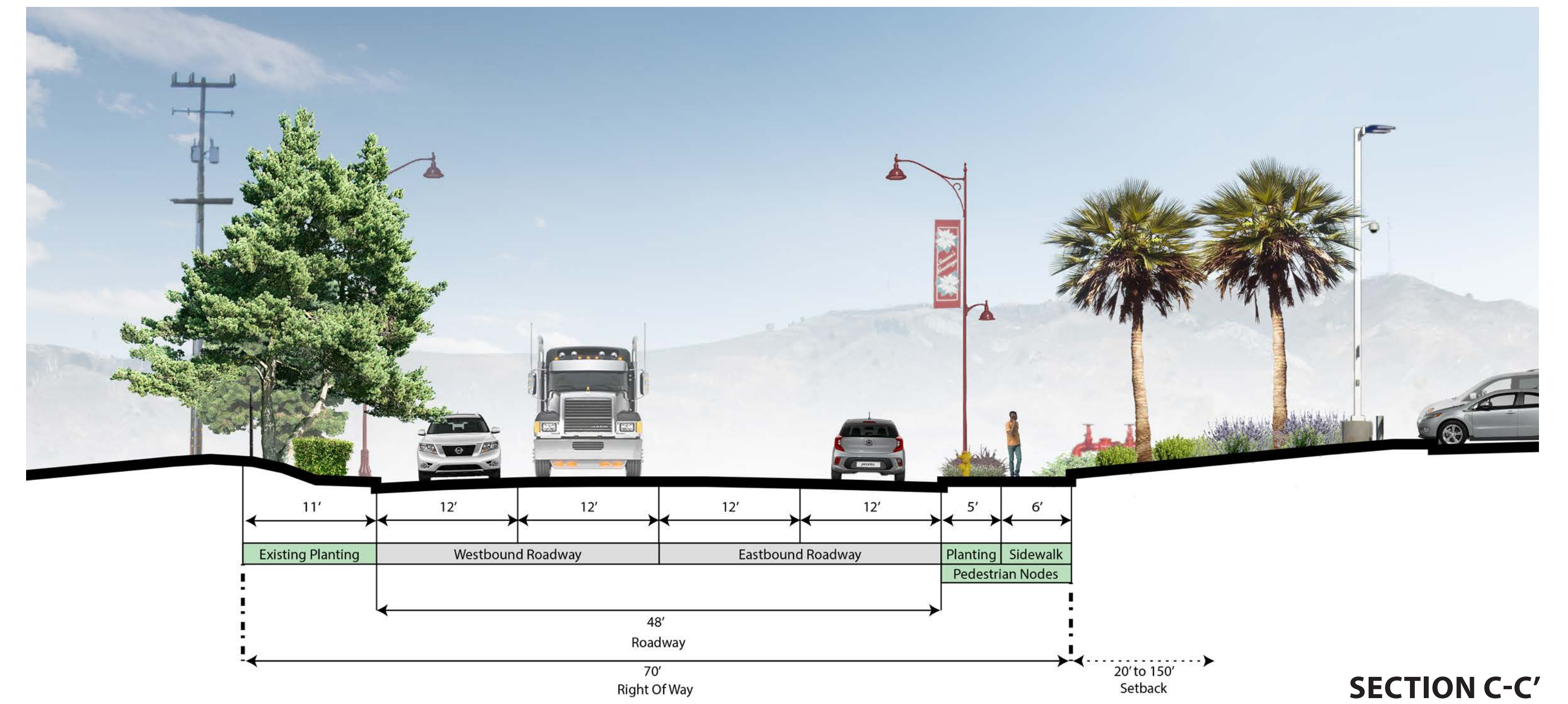
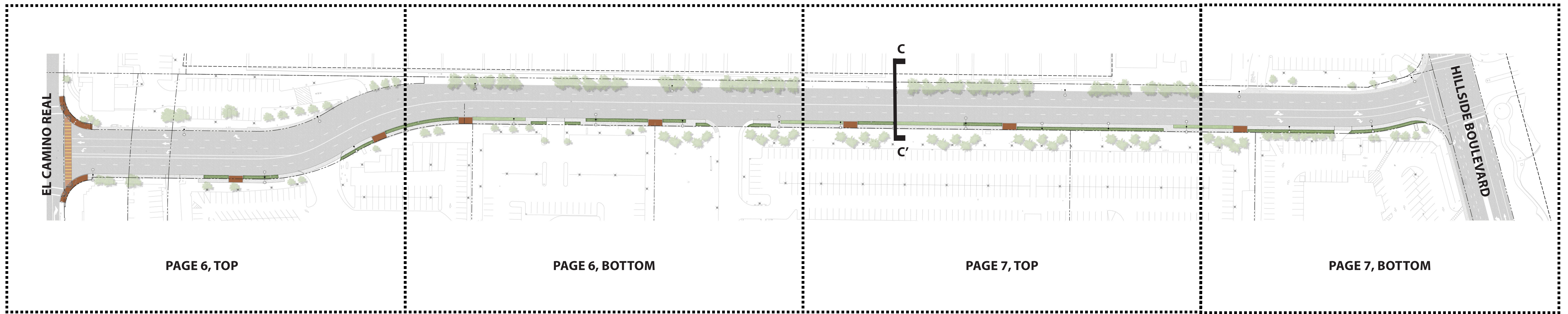


KEY MAP



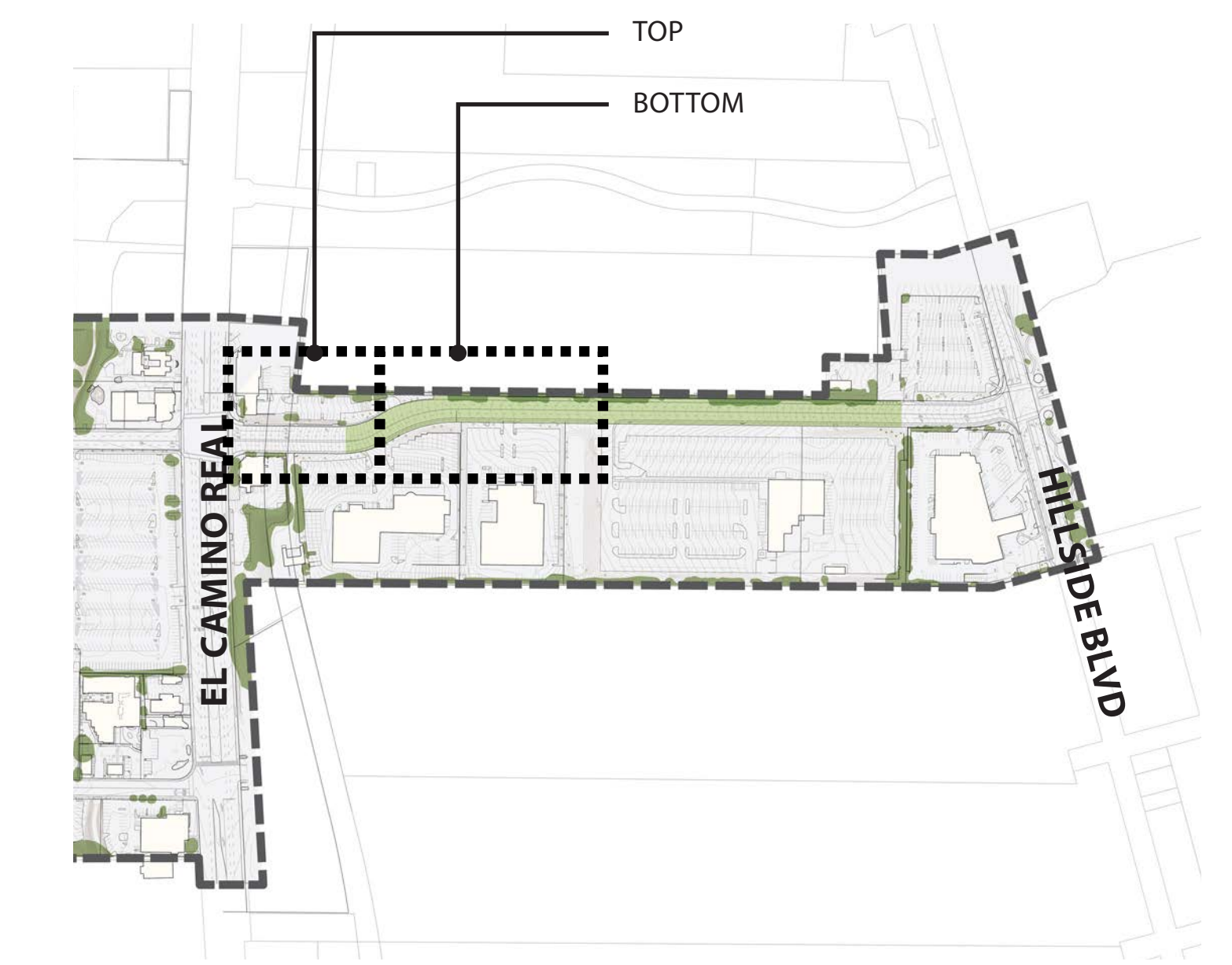
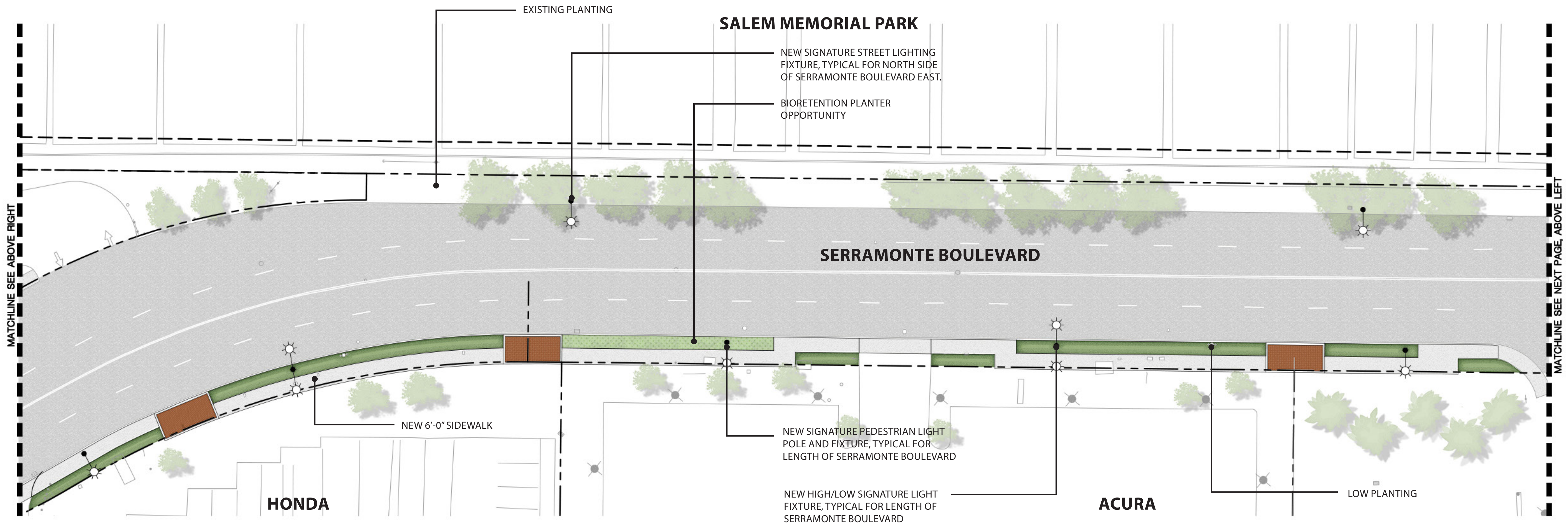
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Colma, California

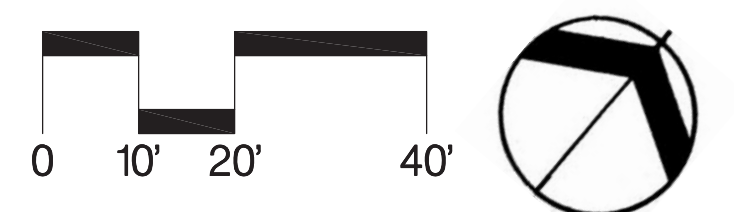


SERRAMONTE EAST

SERRAMONTE BOULEVARD MASTER PLAN Colma, California

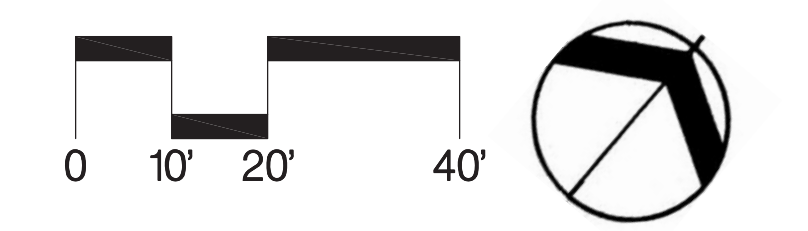
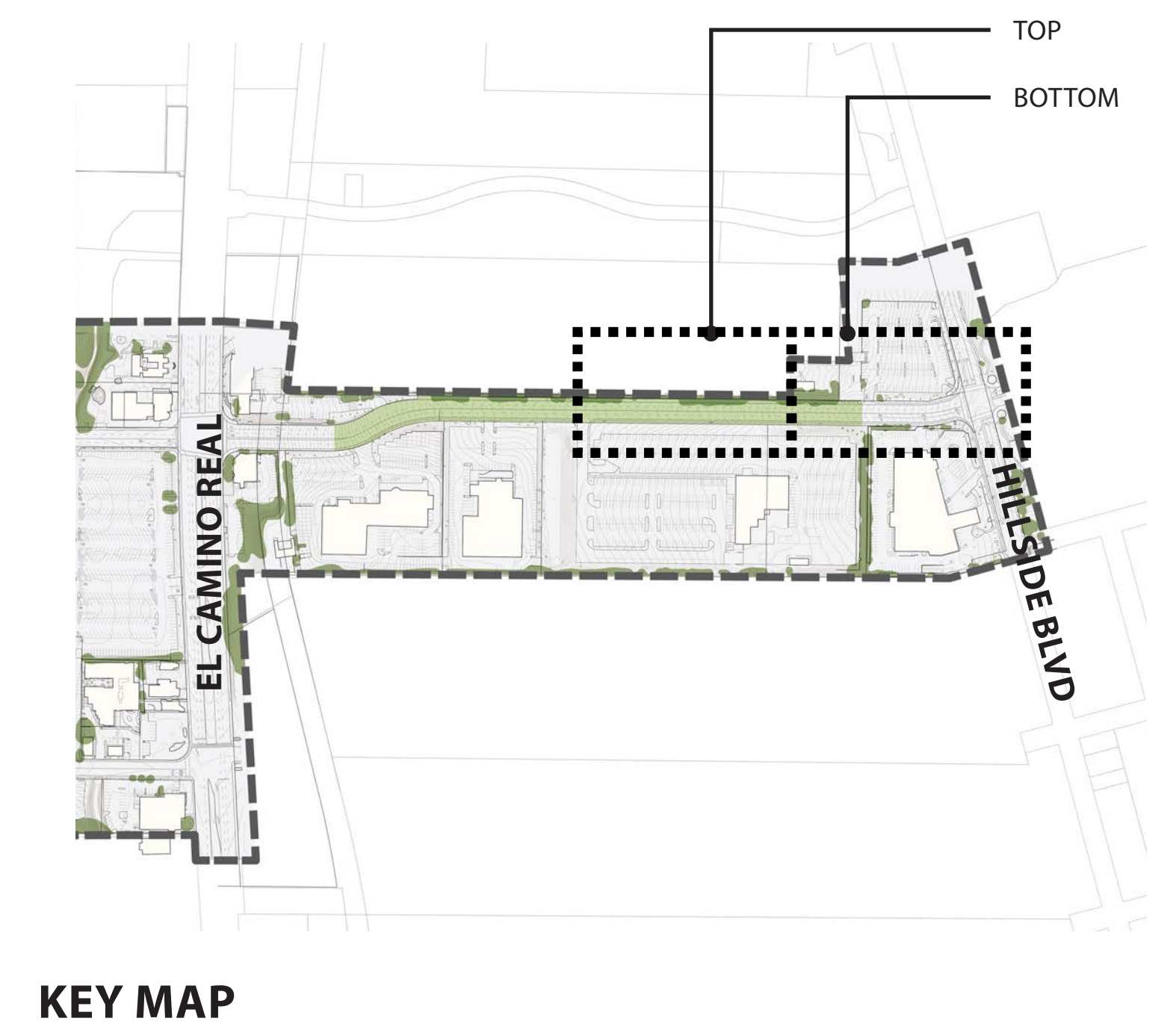
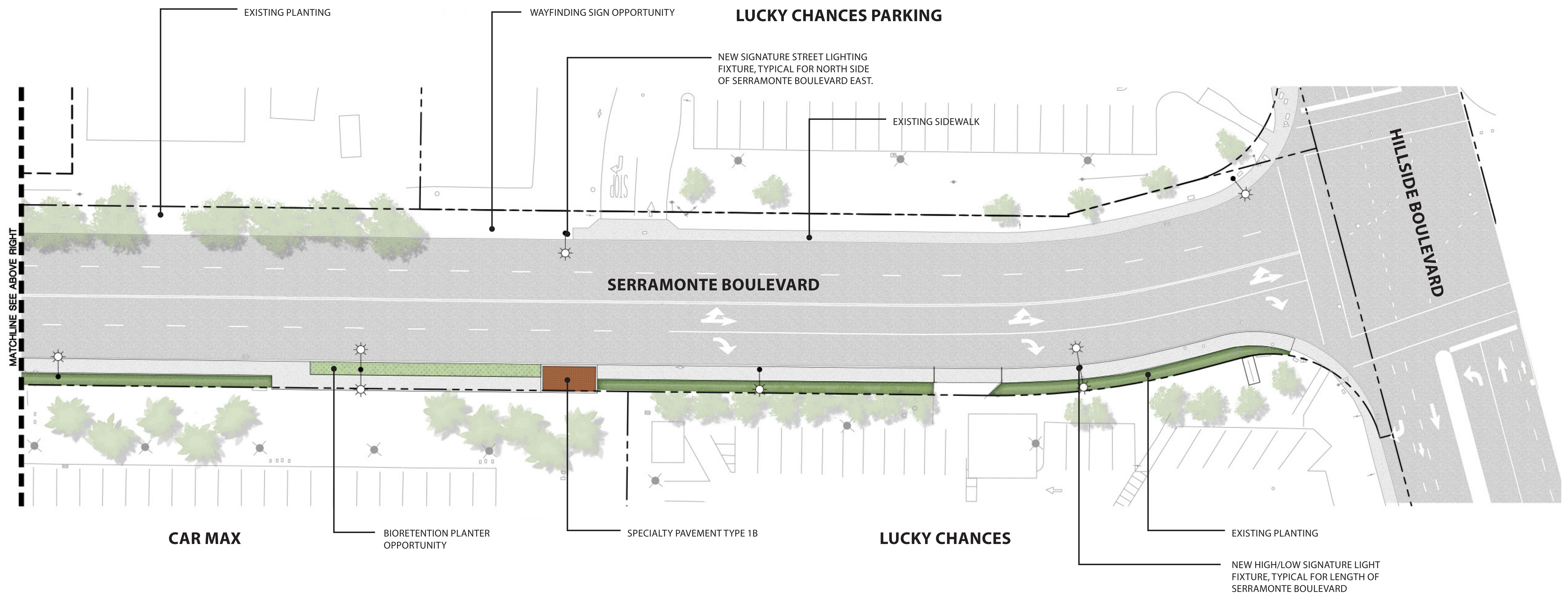
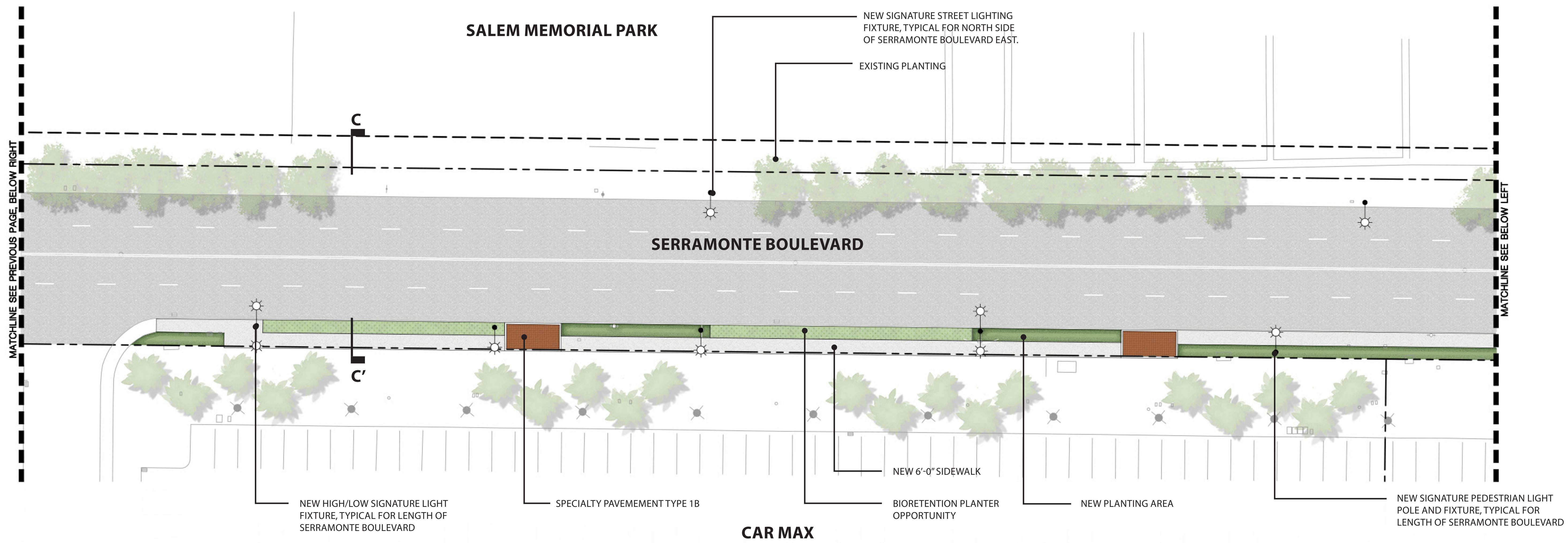


KEY MAP



SERRAMONTE EAST

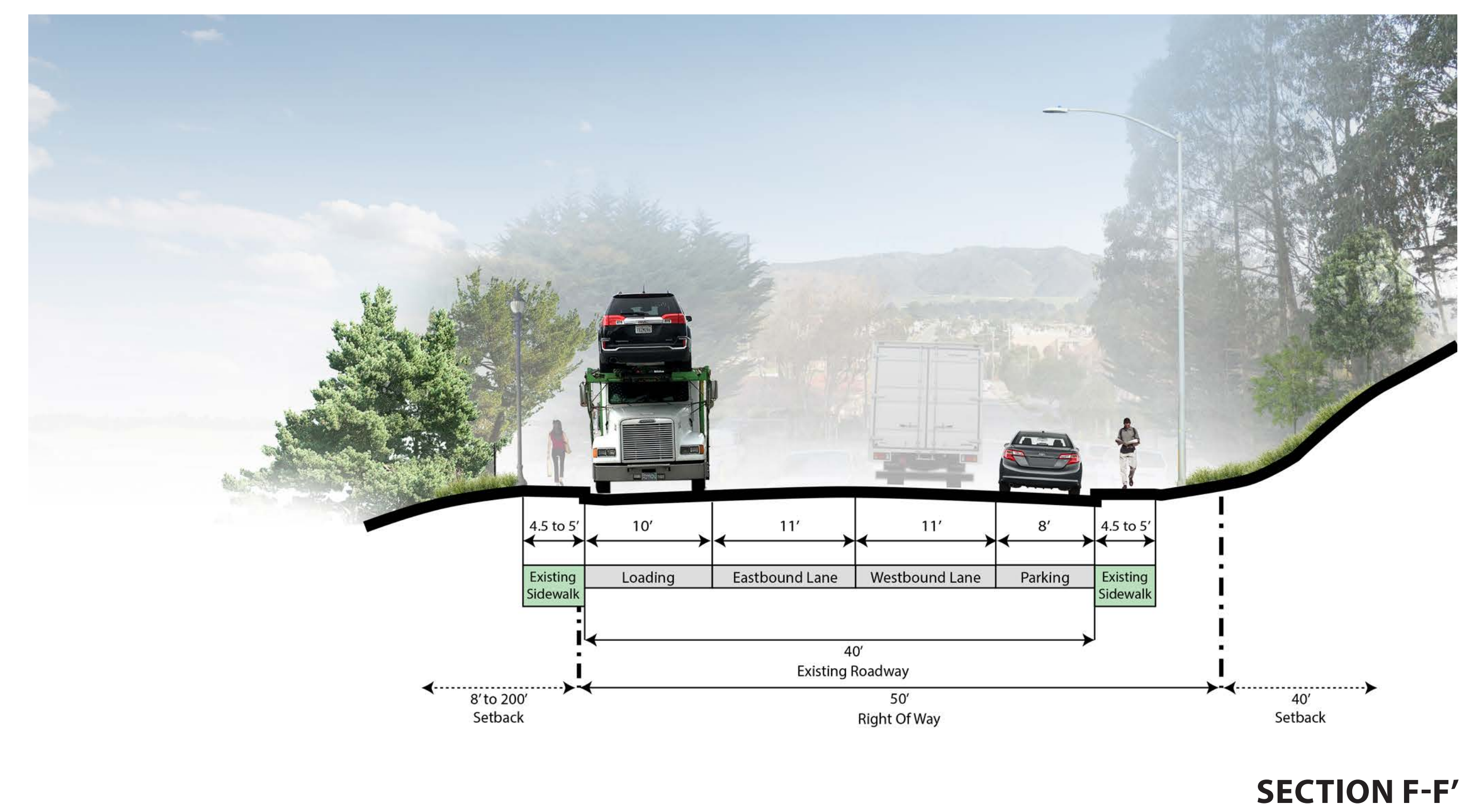
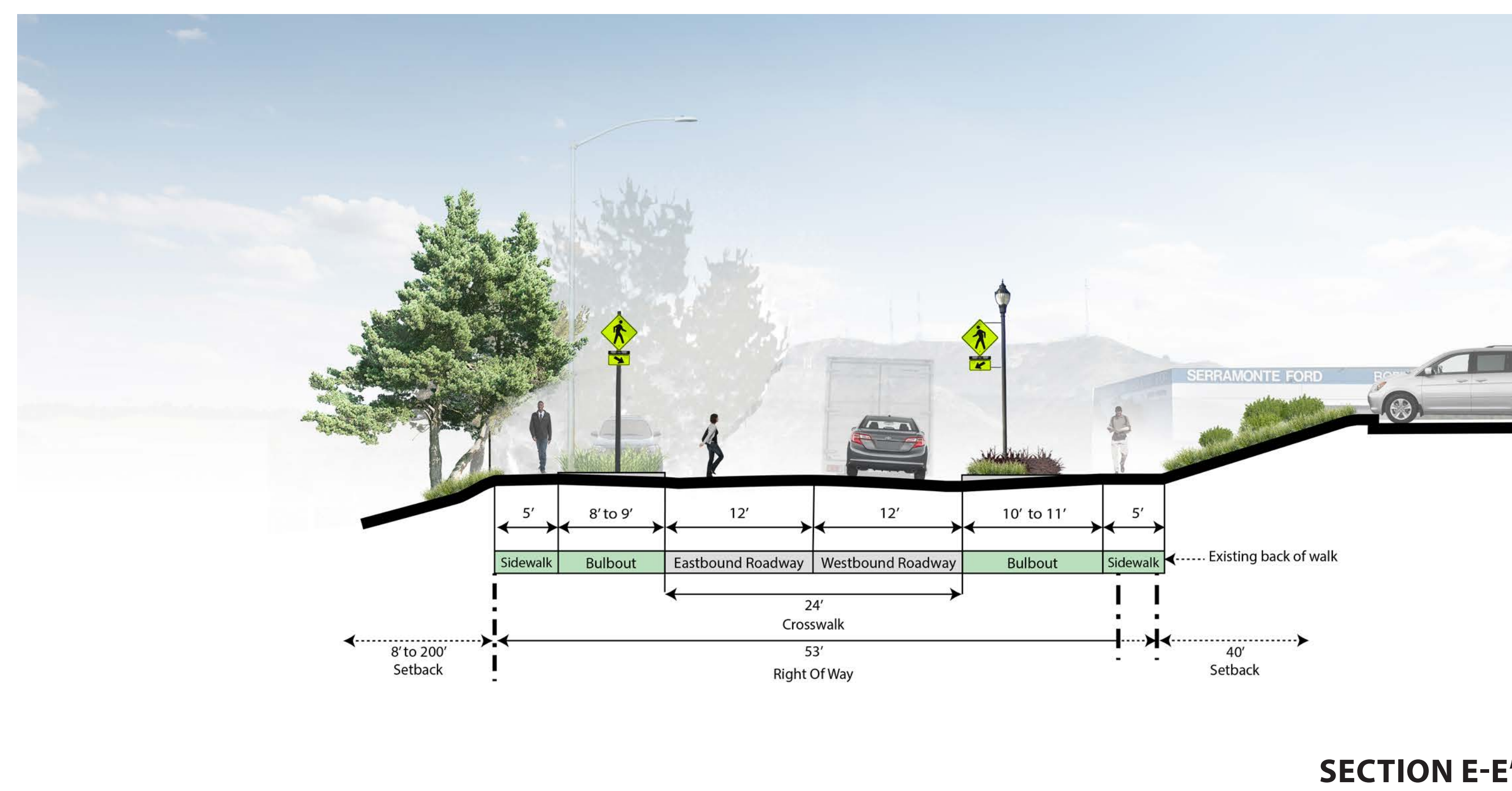
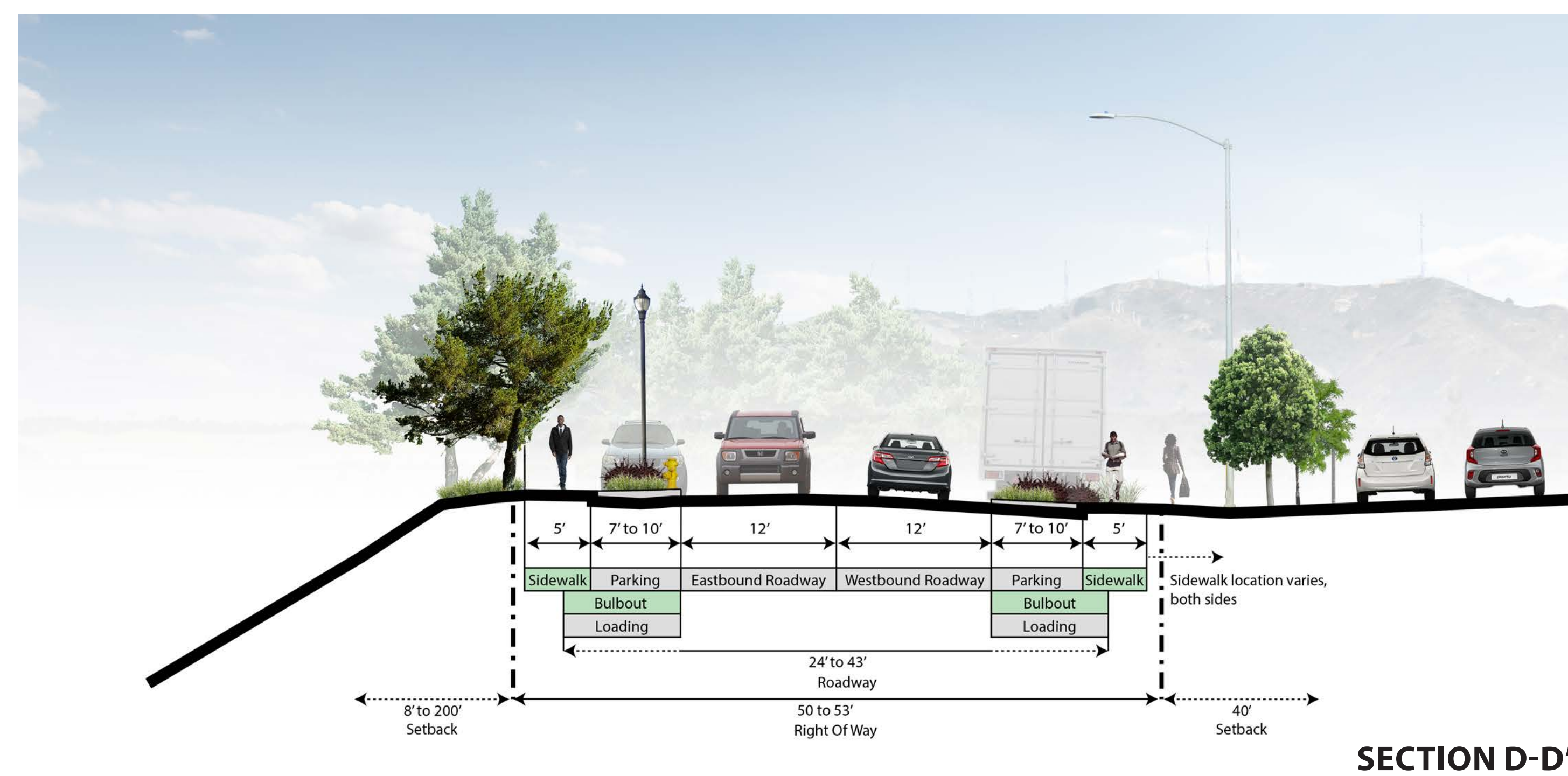
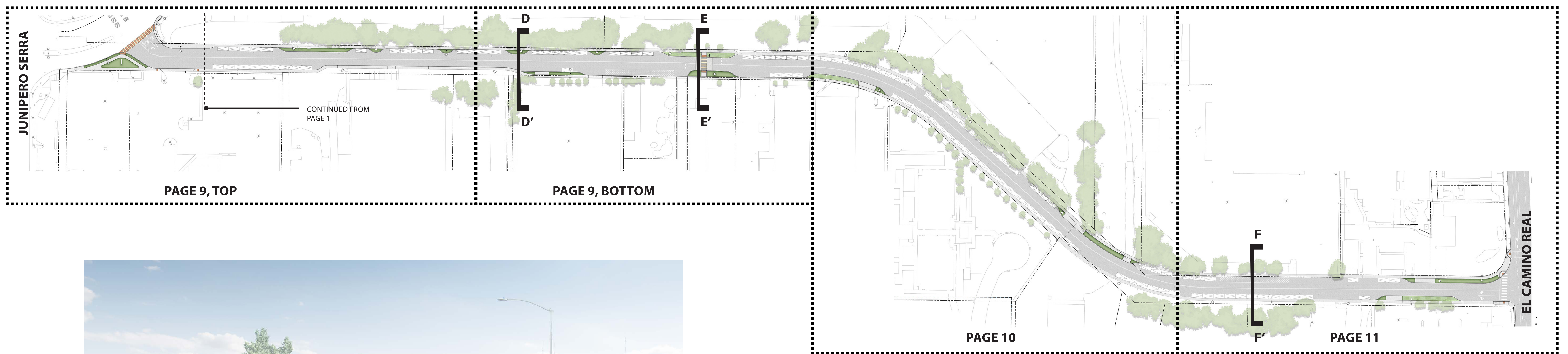
SERRAMONTE BOULEVARD MASTER PLAN Colma, California



SERRAMONTE EAST

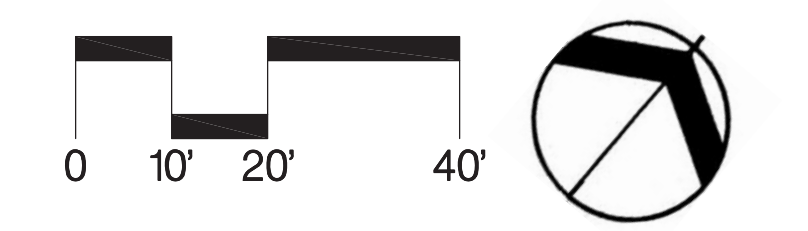
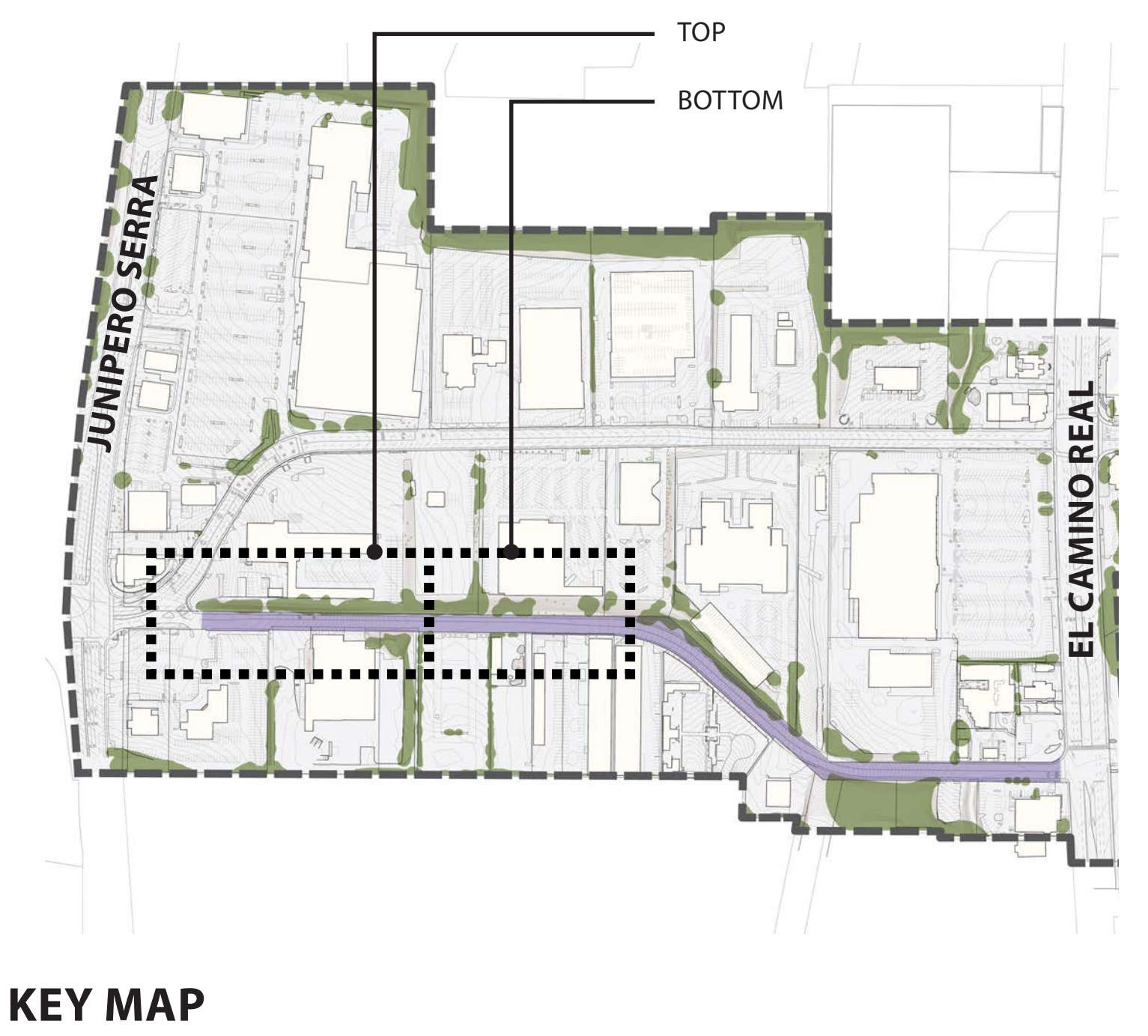
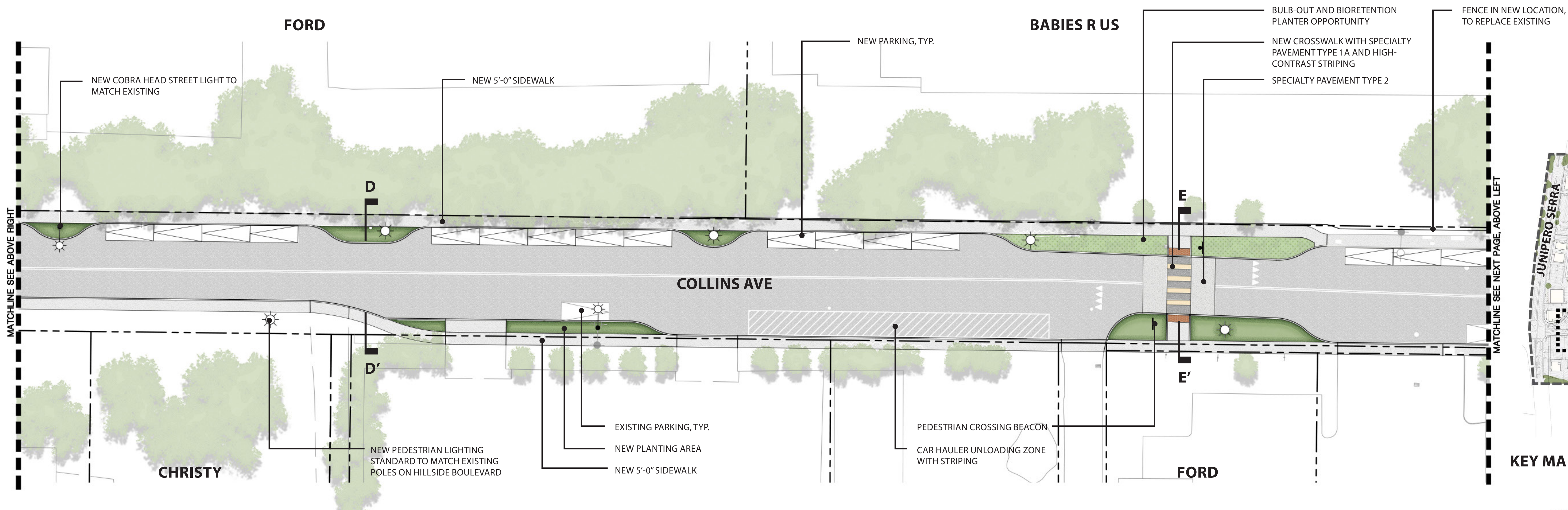
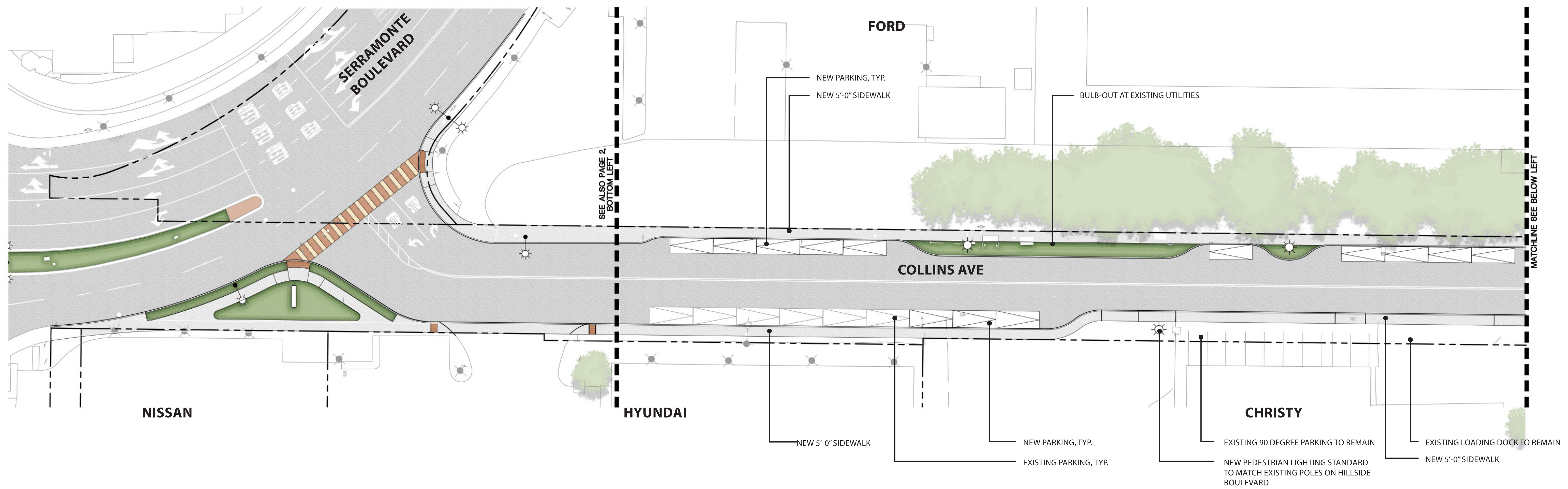
SERRAMONTE BOULEVARD MASTER PLAN
Colma, California

SERRAMONTE BOULEVARD

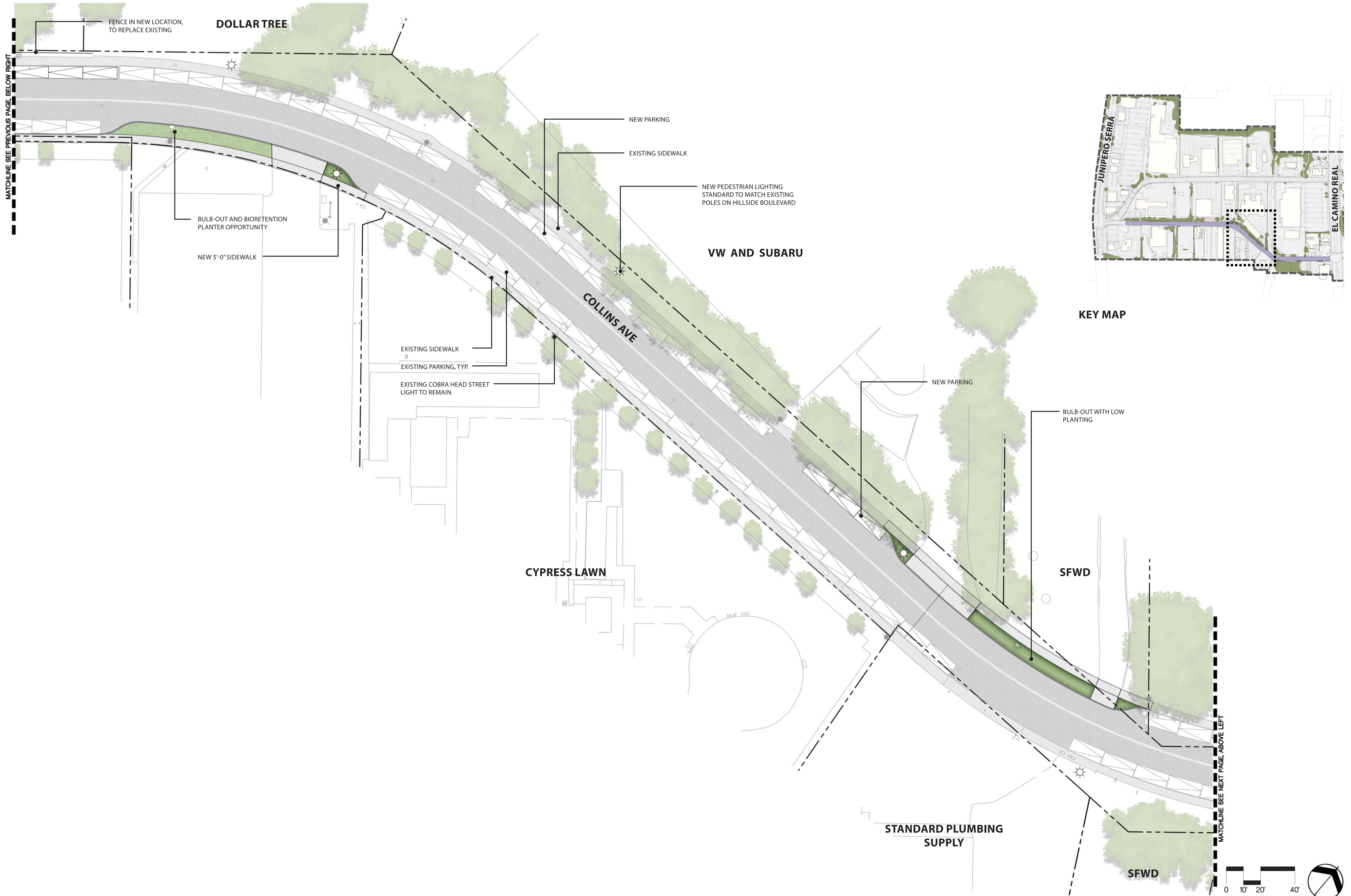


COLLINS AVE

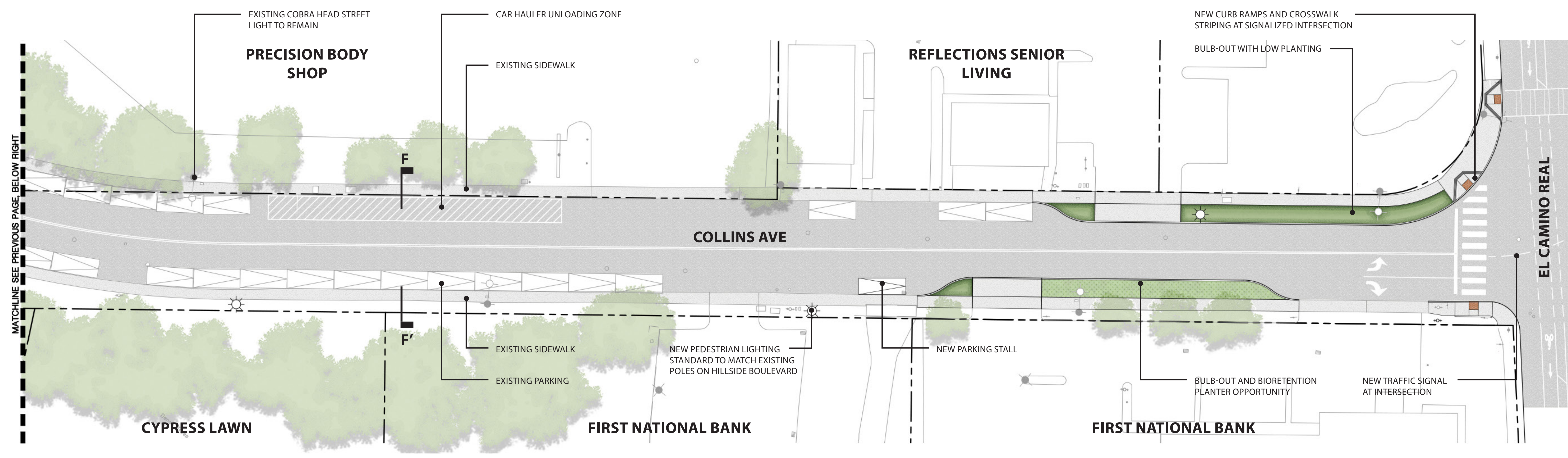
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Colma, California



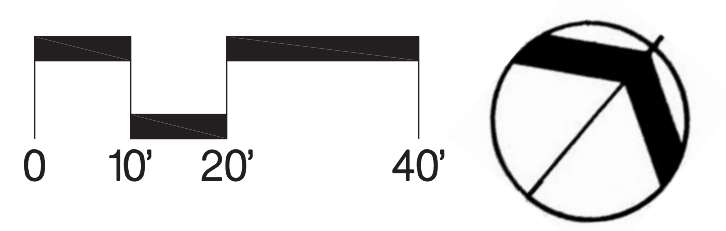
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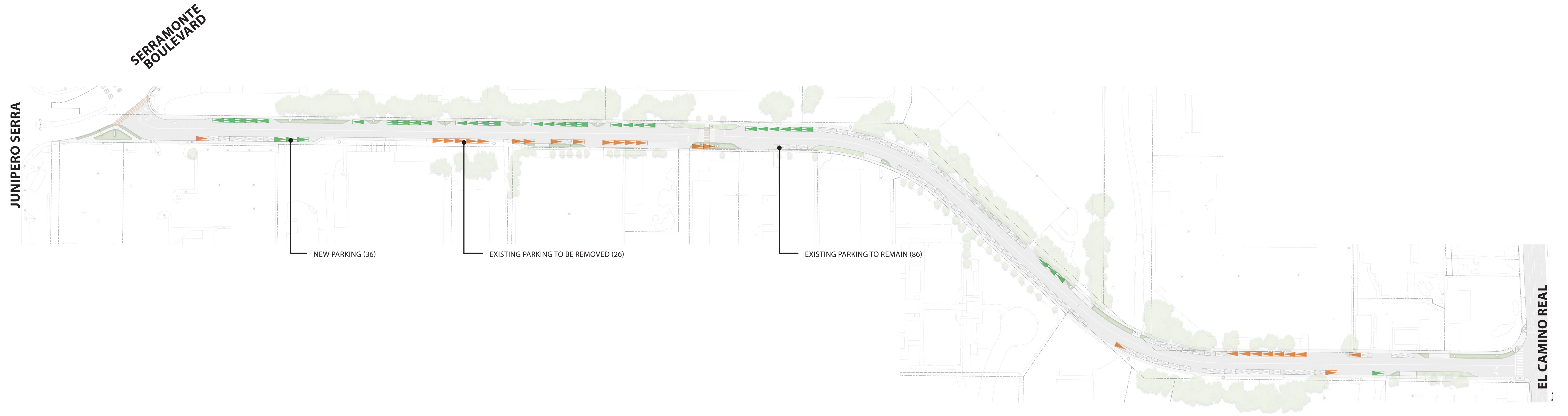
COLLINS AVE



KEY MAP



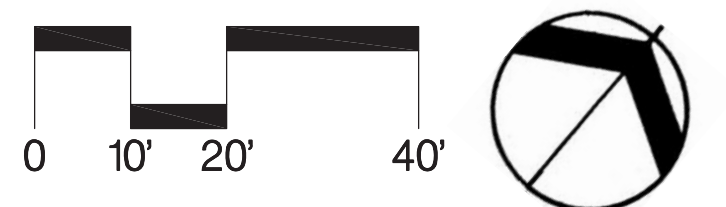
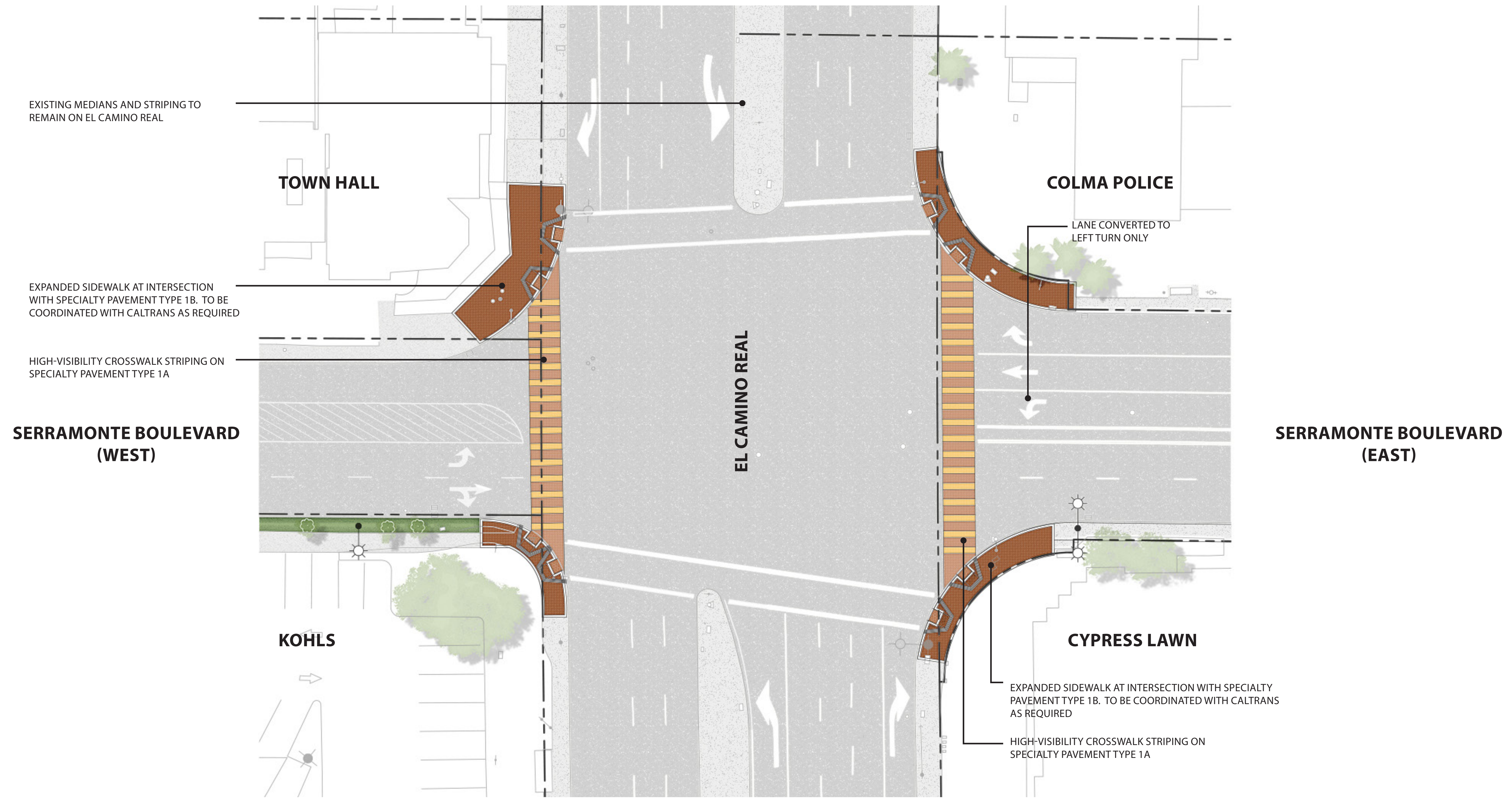
COLLINS AVE



PARKING ANALYSIS	
EXISTING PARKING TO REMAIN:	80
NEW PARKING:	+ 36
TOTAL STALLS:	116
EXISTING PARKING:	- 106
NET PARKING GAIN:	+10

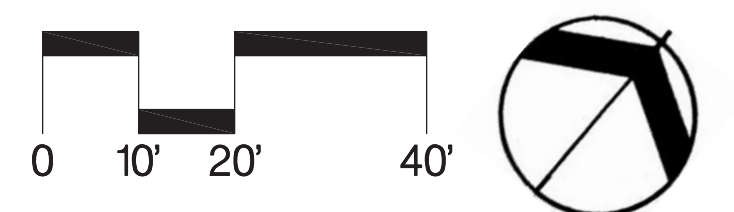
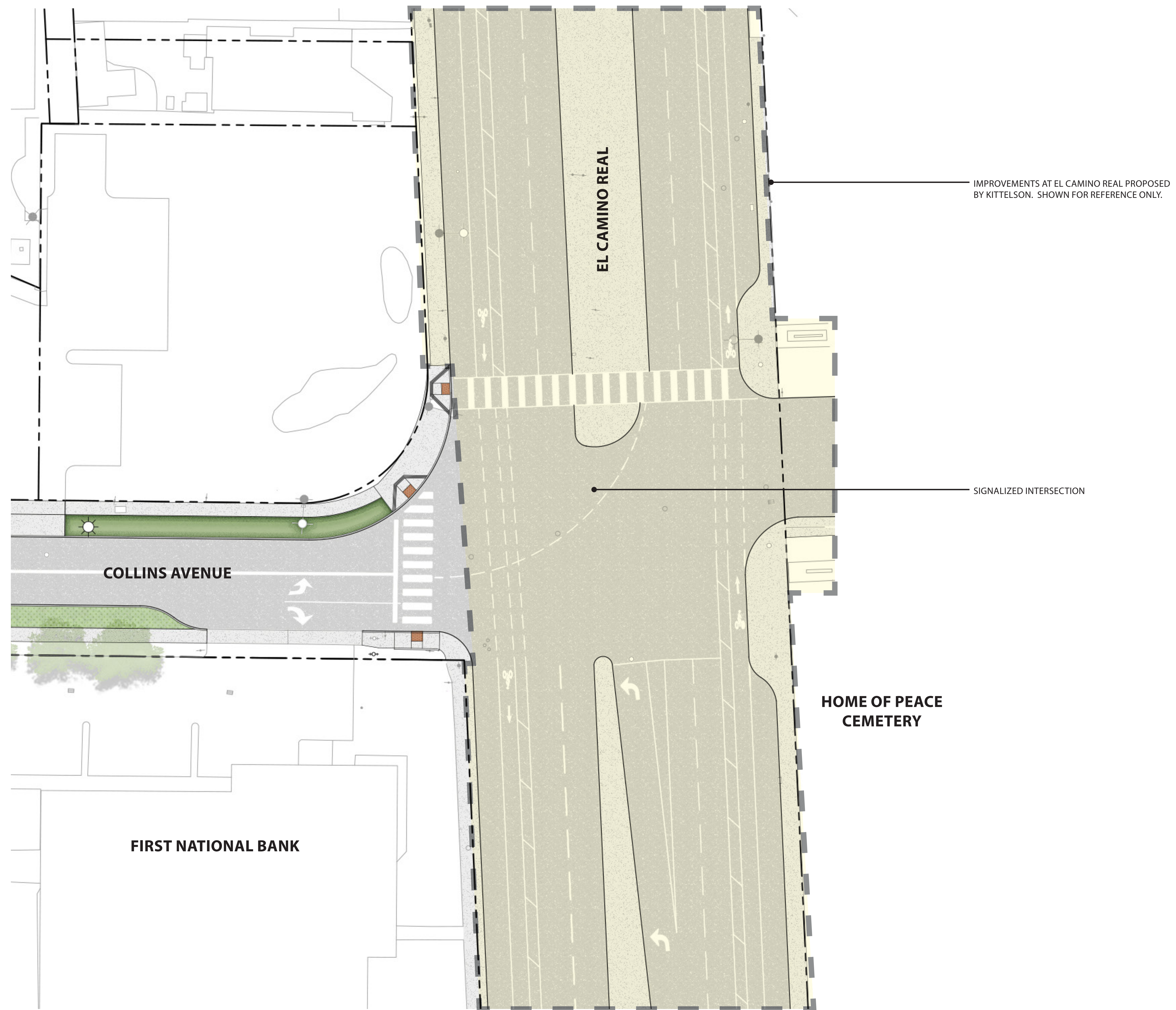
COLLINS AVE. PARKING ANALYSIS

SERRAMONTE BOULEVARD MASTER PLAN Colma, California



ECR - SERRAMONTE INTERSECTIONS

SERRAMONTE BOULEVARD MASTER PLAN
Colma, California



ECR - COLLINS INTERSECTION

SERRAMONTE BOULEVARD MASTER PLAN
Colma, California

Appendix D: Lighting Program

SECTION 114

LIGHTING AND ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 WORK INCLUDED

Work shall include providing conduit and conductors to electrical service points, coordinating service connections with PG&E, installing and wiring service cabinets, trenching, conduit, conductors, backfill, pull boxes, foundations, installation and testing of electroliers.

1.02 SUBMITTALS

Certificates of Compliance, in accordance with Section 6-3.05E, "Certificates of Compliance" of the Standard Specification shall be required from the supplier of all conduit, conductors, pull boxes, and all other equipment, and delivered to the Engineer prior to ordering of materials.

PART 2 – MATERIAL AND EQUIPMENT

2.01 CONDUIT

Conduit to be installed underground shall be schedule 40 PVC type, with no concrete cover.

The conduit in an electrolier foundation and between the foundation and the nearest pull box shall be rigid steel type.

After conductors have been installed, the ends of the conduits terminating at pull boxes and cabinets shall be sealed with an approved sealing compound. Conduits entering pull boxes shall enter at an angle not greater than 45 degrees from the horizontal.

2.02 SPLICES

Splices for street light conductors shall be insulated Type T or Type ST per Caltrans Standard Plan ES 13A.

2.03 PULL BOXES

Pull boxes for street lights shall be number 3-1/2. Pull box covers for street lights shall be marked with letters at least one-inch in height spelling out "STREET LIGHTING." Pull box covers for traffic signals shall be marked with letters at least one-inch in height spelling out "SIGNAL." Section joints of precast pull boxes shall be sealed with compound as recommended by the manufacturer. Grout shall not be placed in the bottom of the pull boxes. Pull boxes for signals shall be number 5.

Lids for boxes and vaults not in regular vehicle traffic areas shall be designed to support a single wheel load of 8,000 pounds over a 10" square area. Lids for boxes in vehicular traffic areas shall be designed and constructed to meet ASTM C851 standards.

2.04 CONDUCTORS AND WIRING

Conductors shall conform to the provisions in Section 86-2.08, "Conductors," of the Standard Specifications and these Specifications.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificate of Compliance," of the Standard Specifications for all the conductors and cables furnished for the Contract.

At least 6 feet of slack shall be provided in the pull box nearest each signal standard, for those conductors terminating in that standard.

Conductors shall not be pulled into conduits until the pull boxes have been set to grade, crushed rock sumps have been installed, and conduits have been bonded and grounded. The ends of all unused cables shall be sealed. The ends of all cables shall be sealed prior to being installed into conduits.

Signal cable shall not be used. Conductors and DLC's shall be installed as shown in the Conductor Schedule on the plans.

All conductors shall be spliced in pullboxes using method described in the latest Caltrans Standard Specifications. Wiring for traffic signal equipment shall not be daisy-chained.

All conductors and DLC shall be labeled and identified in each and every pullbox. A minimum of 6 feet (3 feet up and 3 feet down) of service loop shall be provided in each pull box.

All Loop wire shall be Type 2 Loop wire and detector Lead-in cables (DLC) shall be Type B lead-in cable. The Loop wire shall be suitable for use with Hot-Melt Rubberized Asphalt sealant. The copper drain wire from the DLC shall be connected to the equipment ground in the controller cabinet. All DLC wires shall be twisted prior to landing on the detector input panel to prevent cross-talk and chatter. All conductors and DLC wire shall have soldered non-insulated space forks installed in the controller cabinet end.

Hot-Melt rubberized asphalt sealant shall be used to seal all traffic loop detector loops slots. Asphaltic Emulsions sealant and elastomeric sealant shall not be used.

2.05 COBRA HEAD RETROFIT

A. GENERAL

Cobra Head Retrofit kit shall replace the existing High Pressure Sodium Luminaires at the Olivet and Serramonte intersections. The electrolier, mast arm, and location shall remain the same unless otherwise noted on the plans.

B. LUMINAIRE

Luminaire SHALL BE 108W LED, 4000K, Type II distribution pattern. American Electric part number ATB0 30B LED E10 R2 or approved equal. The refractor or lens for luminaires shall be clear tempered glass.

All luminaires shall be provided with individual photoelectric outdoor lighting controls and dual voltage 120V-240V integral ballasts.

Luminaires shall be wired to a "multiple circuit."

2.06 DECORATIVE LIGHT RETROFIT

A. GENERAL

Decorative Light Retrofit kit shall replace the existing High Pressure Sodium Luminaires on the southeast side of Hillside between Hoffman St and Serramonte St with LED Luminaires. The post, base, foundation, luminaire housing, and location shall remain the same unless otherwise noted on the plans.

B. LUMINAIRE

Luminaire shall be fitted with 60 Watt LED 4000K lamps and compatible ballasts. Holophane part number WAUERETRO 60W 4K AS B36 DMH or approved equal.

All luminaires shall be provided with individual photoelectric outdoor lighting controls and dual voltage 120V-240V integral ballasts.

Luminaires shall be wired to a "multiple circuit."

2.07 DECORATIVE STREET LIGHTS (Single Fixture)

A. STANDARD

The lighting post shall be all aluminum, one-piece construction, with a classic tapered and fluted base design. The standard shall be Holophanes' catalog number NYA 16 F5J 17 P07 ABG BK or approved equal. The base and standard shall have a standard black finish color. Color options shall be subject to approval of the Engineer.

The base shall be heavy wall, cast aluminum produced from certified ASTM 356.1 Ingot per ASTM B-179-95a or ASTM B26-95. The straight shafts shall be extruded from aluminum, ASTM 6061 alloy. The tapered shaft shall be extruded from aluminum, ASTM 6063 alloy, spun to a tapered shape. All material heat treated to a T6 temper.

The shaft shall be double welded to the base casting and shipped as one piece for maximum structural integrity. The shaft shall be circumferentially welded inside the base casting at two locations. All exposed welds below 8' above adjacent grade shall be ground smooth. All welding shall be per ANSI/AWS D1.2-90. All welders shall be certified per Section 5 of ANSI/AWS D1.2-90.

The post shall be a minimum of 16' in height with a 17" diameter base. The shaft diameter shall be 5" nominal dimension. At the top of the post, an integral 3" O.D. tenon with a transitional tenon ring shall be provided for luminaire mounting.

The post shall be provided with four, hot dip galvanized L-type anchor bolts to be installed on a 12" diameter bolt circle. A door shall be provided in the base for anchorage and wiring access. A grounding screw shall be provided inside the base opposite the door.

B. LUMINAIRE

Decorative Street Lights (Single Fixture) shall be fitted with 60 Watt LED 4000K lamps and compatible ballasts. The luminaire shall be borosilicate glass Acorn Style with finial, band, decorative full top cover, medallions and decorative ribs. Luminaire shall be Holophane "Washington Postlite" or approved equal. Decorative ribs, finial, and band shall be finished to match the color of the post and base. Luminaire shall produce lighting patterns conforming to IES distribution type IV or as required. Interior assemblies and ballasts shall match the light output requirements specified. The luminaire shall be equipped with an access door to allow changing of the ballast assembly without disassembly of the luminaire. Holophane part number WAUE 60W 4K AS B3B6 FH with WLEDHS18 or approved equal.

The optical assembly shall be a molded thermal shock resistant borosilicate glass reflector and refractor. The luminaire housing shall be cast aluminum and provide an enclosure for a plug-in electrical module. A slip fitter shall be provided to accept a 2-7/8 inch to 3-1/8 inch O.D. tenon.

2.08 DECORATIVE STREET LIGHTS (Double Fixture)

A. STANDARD

The post, base, and foundation, shall be consistent with the Single Fixture Standard detailed above in paragraph 2.07A.

In addition a Crossarm shall be provided at the top of the post. Crossarm shall have 2 arms oriented at 180° with 30" between the center of the fixture positions. Finish shall be black to match post, base, and fixtures. Holophane part number ACA/2 BKH.

DYETT & BHATIA

Urban and Regional Planners

M E M O R A N D U M

To: Abdulkader Hashem, Associate Engineer; Michael Laughlin, Planner, Town of Colma
From: Dyett & Bhatia Urban and Regional Planners and Zeiger Engineers
Re: Lighting Improvements Study
Date: 01/18/2019

The following memorandum summarizes the results of Zeiger Engineers' lighting improvements study of Collins Avenue and Serramonte Blvd.

COLLINS AVENUE

Key Findings from Task 4: Existing Conditions

- Illuminance does not comply with the recommended luminance and illuminance values for collector commercial streets of 0.8 average luminance with a ratio of 3:1. Upgrading the illuminance of Collins Ave is recommended.
- There are 14 existing 27-foot single head streetlights, and 1 existing streetlight mounted on a wooden pole.

Proposed Lighting Improvements: Low Cost – Adding to Existing Lights

- On the north side of Collins Ave, it is impractical to attach light fixtures to existing utility poles. The low cost option thus includes the installation of seven new streetlights to match existing lights on south side of Collins Ave.
- New streetlights consist of:
 - Seven 27.5' round tapered steel poles by Valmont with 8' mast arms and LED cobra-head light fixtures by Leotek, #EC3-10M2, 63 watts, IES type 3 distribution with integral photocell.

Proposed Lighting Improvements: High Cost – Complete Retrofit/ Undergrounding

- The high cost option, following completion of the undergrounding of high voltage overhead power lines with construction of new sidewalk on north side, includes supplementing existing streetlights with four matching cobra-head fixtures, and 14 new pedestrian-scale streetlights matching the streetlight standard on Hillside Boulevard in the Town of Colma. Two pedestrian lights matching this style would be relocated from Serramonte Boulevard to Collins Avenue. Installation of a new unmetered service pedestal with integral photocell and controls for street lighting is also recommended.
- New streetlights consist of:
 - Fourteen pedestrian-scale fixtures to match the Hillside lighting standard in Colma

DYETT & BHATIA

Urban and Regional Planners

- Four 27.5' round tapered steel poles by Valmont with 8' mast arms and LED cobra-head light fixtures by Leotek, #EC3-10M2, 63 watts, IES type 3 distribution with integral photocell.
- One unmetered service pedestal.

SERRAMONTE BLVD. WEST

Key Findings from Task 4: Existing Conditions

- Illuminance does not comply with the recommended luminance and illuminance values for major commercial streets of 1.2 fc average luminance with a ratio of 3:1. Upgrading the illuminance of Serramonte West is recommended.
- There are 15 existing 27 feet single head streetlights and 1 existing 27-foot twin head streetlight.

Proposed Lighting Improvements: Low Cost – Adding to Existing Lights

- The low cost option includes leaving existing streetlights and installing 33 new infill pedestrian streetlights, as well as two new streetlights to match existing lights on the north side of Serramonte West near the intersection with Junipero Serra Boulevard.
- New streetlights consist of:
 - 33 Lumec Domus fixture #DMS50-55W32LED, 53 watts, mounted at 14', IES type 3 distribution w/2' decorative arm and round traditional steel pole, 14' high, 2-piece decorative base, Lumec #RS805V-14.
 - Two streetlights matching existing lights be installed on the north side of Serramonte West near the intersection with Junipero Serra Blvd.

Proposed Lighting Improvements: High Cost – Complete Retrofit

- The high cost option includes removing existing streetlights and adding 16 new hi/lo streetlights, four new vehicular-level lights, and 33 new pedestrian lights.
- New streetlights consist of:
 - 16 new hi/lo streetlights: High mounted Lumec Domus fixture #DMS50-90W80LED, 90 watts mounted at 25', IES type 2 distribution w/4' decorative arm, low mounted Lumec Domus fixture #DMS50-55W32LED, 53 watts mounted at 14', IES type 3 distribution w/2' decorative arm, and round traditional steel pole, 25' high, 2-piece decorative base, Lumec #RS805V-25
 - Four Twin Lumec Domus fixtures #DMS50-90W80LED, 90 watts, mounted at 25', IES type 2 distribution and round traditional steel pole, 25' high, 2-piece decorative base, Lumec #RS805V-25
 - 33 pedestrian streetlights: Lumec Domus fixture #DMS50-55W32LED, 53 watts, mounted at 14', IES type 3 distribution w/2' decorative arm and

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round traditional steel pole, 14' high, 2-piece decorative base, Lumec #RS805V-14

SERRAMONTE BLVD. EAST

Key Findings from Task 4: Existing Conditions

- Illuminance does not comply with the recommended luminance and illuminance values collector commercial streets of 0.8 fc average luminance with a ratio of 3:1. Upgrading the illuminance of Serramonte East is recommended.
- There are 16 existing 27-foot single head streetlights.

Proposed Lighting Improvements: Low Cost – Adding to Existing Lights

- The low cost option includes leaving existing streetlights and installing seven new pedestrian streetlights as well as three new vehicular-level streetlights to match those existing.
- New streetlights consist of:
 - Seven new infill pedestrian streetlights consisting of: Lumec Domus fixture #DMS50-55W32LED, 53 watts, mounted at 14', IES type 3 distribution w/2' decorative arm and round traditional steel pole, 14' high, 2-piece decorative base, Lumec #RS805V-14
 - Three new streetlights to match those existing on the corridor.

Proposed Lighting Improvements: High Cost – Complete Retrofit

- The high cost option includes removing existing streetlights and adding eight new hi/lo streetlights, twelve new vehicular-level lights, and seven new pedestrian lights.
 - Eight new hi/lo streetlights: High mounted Lumec Domus fixture #DMS50-90W80LED, 90 watts mounted at 25', IES type 2 distribution w/4' decorative arm, low mounted Lumec Domus fixture #DMS50-55W32LED, 53 watts mounted at 14', IES type 3 distribution w/2' decorative arm, and round traditional steel pole, 25' high, 2-piece decorative base, Lumec #RS805V-25.
 - 12 new streetlights: Lumec Domus fixture #DMS50-90W80LED, 90 watts, mounted at 25', IES type 2 distribution w/4' decorative arm and round traditional steel pole, 25' high, 2-piece decorative base, Lumec #RS805V-25.
 - Seven new pedestrian streetlights: Lumec Domus fixture #DMS50-55W32LED, 53 watts, mounted at 14', IES type 3 distribution w/2' decorative arm and round traditional steel pole, 14' high, 2-piece decorative base, Lumec #RS805V-14.

Appendix E: Cost Estimations and Cost-Benefit Analysis

Memorandum

To: Rajeev Bhatia, Dyett & Bhatia

From: Matt Kowta, Managing Principal

Date: April 5, 2018

Re: Updated Colma Serramonte and Collins Master Plan Existing Market Conditions Memo

Introduction

The purpose of this memo is to provide background information to support the preparation of the Serramonte and Collins Master Plan, for the Town of Colma. This memo provides analysis and review of demographic, economic, and real estate conditions for the Master Plan study area. It includes a focus on current retail sales volumes within the study area and changes since the 2012 Economic Development Strategy. This memo also includes a review of the Town's major General Fund revenue trends, and implications of the demographic, economic, fiscal and real estate findings for the current project.

This version of the memo has been updated from the January 29, 2018 version of the memo, to reflect findings from the Stakeholder Interviews conducted in February. Modifications from the January 29 version of the memo can be found in new "Stakeholder Input" section and minor modifications to the "Implications for Serramonte and Collins Master Plan" section. Both of these sections can be found at the end of the memo.

Demographic and Economic Trends

This section reviews and analyzes recent demographic and economic data to provide the market context for the Town's Master Plan efforts. It provides a streamlined update of the analysis BAE conducted as part of the Town's 2012 Economic Development Plan. The following data are drawn from the 2000 U.S. Census, the 2011-2015 American Community Survey, the State of California Department of Finance, the State Employment Development Department, and the Esri Business Analyst platform (a private demographic and economic data provider). Census data from 2010 are not used because they reflect an inaccurate count of Colma's population and households.¹ As was done in the 2012 study, the Town of Colma is

¹ The Census Bureau inaccurately included a 119-unit affordable housing complex outside the Town boundaries in Colma's 2010 Census counts. The Town successfully challenged the 2010 counts, and the Census Bureau released corrected 2010 population and household counts in 2013. However, population and household characteristics data were not updated to correspond to the corrected counts. Because those data still reflect the inclusion of the affordable housing complex, their inclusion would significantly skew the demographic and economic profile of Colma.

compared to a larger Market Area defined to include the communities of Brisbane, Broadmoor, Colma, Daly City, Pacifica, San Bruno, and South San Francisco. Colma is also compared to the City and County of San Francisco and the nine-county Bay Area region (“the Region”) for benchmarking purposes.

Population and Households

The California Department of Finance estimates that Colma’s 2017 population is 1,506 residents and 430 households. It is the smallest incorporated city in the Bay Area by population. As indicated in Table 1, Colma’s population has grown 3.6 percent since 2010, an addition of 52 people. Colma’s rate of population growth since 2010 is significantly lower than that of the Market Area (6.3 percent), San Francisco (8.6 percent), and the Region (7.9 percent).

According to the Department of Finance, Colma added zero net new households over the same seven-year period. Because the Town’s population growth was absorbed within the same number of households, Colma experienced an increase in average household size, from 3.31 persons in 2010 to 3.49 persons in 2017. In both 2010 and 2017, Colma had a significantly larger average household size than the other comparison geographies. Colma’s 2017 average household size is the fourth highest of any Bay Area city, after East Palo Alto, Gilroy and Union City.

Table 2 describes household characteristics per the 2000 Census and the 2011-2015 American Community Survey. During the 2011-2015 sampling period, over two-thirds of Colma’s households were family households (i.e., groups of individuals sharing a dwelling who are related by birth, marriage, or adoption). This reflects a decline from 2000, when family households constituted nearly three-fourths of all Colma households. Despite the decline, Colma maintained a higher proportion of family households than San Francisco and the Region.

Table 1: Population and Households, 2010-2017

	2010	2017	% Change 2010-2017
Town of Colma			
Population	1,454	1,506	3.6%
Households	430	430	0.0%
Avg. Household Size	3.31	3.49	
Market Area (a)			
Population	248,788	264,385	6.3%
Households	82,936	83,774	1.0%
Avg. Household Size	2.98	3.13	
San Francisco			
Population	805,235	874,228	8.6%
Households	345,168	365,755	6.0%
Avg. Household Size	2.26	2.32	
Bay Area (b)			
Population	7,150,739	7,714,638	7.9%
Households	2,606,288	2,720,908	4.4%
Avg. Household Size	2.69	2.78	

Notes:

(a) The Market Area consists of Brisbane, Colma, Daly City, Pacifica, San Bruno, and South San Francisco. Data for Broadmoor were unavailable because it is an unincorporated area.

(b) The nine-county Bay Area consists of the following counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

Sources: California Department of Finance, 2010, 2017; BAE, 2017.

Tenure

As shown in Table 2, 55.3 percent of Colma’s households owned their homes in the 2011-2015 period. While Colma had a lower percentage of owner households than the Market Area,

it significantly exceeded San Francisco and was slightly higher than the Region. Unlike the Market Area and Region, Colma’s proportion of owner households grew between 2000 and the 2011-2015 period.

Table 2: Household Characteristics, 2000 and 2011-2015 Five-Year Sample

Town of Colma	2000 (a)	2011-2015 (b)
Household Type		
Families (c)	74.5%	68.2%
Non-Families	25.5%	31.8%
Tenure		
Owner	52.0%	55.3%
Renter	48.0%	44.7%
Market Area (d)		
Household Type		
Families (c)	72.1%	71.0%
Non-Families	27.9%	29.0%
Tenure		
Owner	63.0%	59.4%
Renter	37.0%	40.6%
San Francisco		
Household Type		
Families (c)	44.0%	45.8%
Non-Families	56.0%	54.2%
Tenure		
Owner	35.0%	36.4%
Renter	65.0%	63.6%
Bay Area (e)		
Household Type		
Families (c)	64.7%	65.7%
Non-Families	35.3%	34.3%
Tenure		
Owner	57.7%	55.2%
Renter	42.3%	44.8%

Notes:

- (a) 2000 Census data are used instead of 2010 Census data because the latter reflect a miscount of Colma’s population and households.
- (b) 2011-2015 five-year sampling data are used because one-year estimates are unavailable for Colma and several Market Area cities.
- (c) A family is a group of two people or more related by birth, marriage, or adoption and residing together.
- (d) The Market Area consists of Brisbane, Colma, Daly City, Pacifica, San Bruno, and South San Francisco.
- (e) The nine-county Bay Area consists of the following counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

Sources: U.S. Census Bureau, 2010 Census SF-1, 2011-2015 American Community Survey; BAE, 2017

Household Income

Household income estimates from the 2011-2015 American Community Survey indicate that Colma has a lower average household income than the comparison areas. In the 2011-2015 period, Colma’s median household income (adjusted to 2015 dollars) was \$77,337, approximately \$5,200 less than the Market Area median.

An income distribution is shown in Table 3. Approximately a third of Colma’s households are in each of the following income brackets: less than \$50,000, \$50,000 to \$99,999, and greater than \$100,000. Compared to the Market Area and Region, Colma had a higher proportion of households in the lowest bracket and a significantly lower proportion in the highest bracket.

Within the lowest bracket, Colma’s households were concentrated in the middle. Colma’s proportion of households at the very lowest income levels (less than \$25,000) was modestly higher than the Market Area but generally similar to the Region. Colma diverged from all other comparison geographies with its notably high proportion of households with income between \$25,000 and \$34,999, and a low proportion at the \$35,000 to \$49,999 level.

Table 3: Household Income, 2011-2015 Five-Year Sample

Income Category	Colma	Market Area (a)	San Francisco	Bay Area (b)
Less than \$15,000	8.5%	6.2%	12.6%	8.5%
\$15,000-\$24,999	7.8%	6.3%	7.4%	7.0%
\$25,000-\$34,999	12.0%	6.1%	6.0%	6.6%
\$35,000-\$49,999	5.9%	10.2%	8.2%	9.6%
\$50,000-\$74,999	11.1%	16.9%	12.8%	14.7%
\$75,000-\$99,999	20.0%	14.1%	10.4%	11.9%
\$100,000-\$149,999	14.6%	21.2%	16.4%	17.7%
\$150,000-\$199,999	9.6%	9.9%	9.7%	9.9%
\$200,000 or greater	10.5%	9.1%	16.4%	14.2%
Total	100.0%	100.0%	100.0%	100.0%
Median HH Income	\$77,337	\$82,576	\$81,294	\$82,727

Notes:

(a) The Market Area consists of Brisbane, Broadmoor, Colma, Daly City, Pacifica, San Bruno, and South San Francisco.

(b) The nine-county Bay Area consists of the following counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

Sources: U.S. Census Bureau, 2011-2015 American Community Survey; BAE, 2017

percent of all Colma households—had incomes between \$100,000 and \$149,999. However, this is a low proportion relative to the comparison geographies, especially the Market Area which had 21.2 percent of households within this range. Colma’s proportion of households with income between \$150,000 and \$199,999 was generally consistent with the comparison geographies. Its proportion with income more than \$200,000 was slightly higher than the Market Area and lower than the Region.

Employment

Employment by industry data from 2010 and 2016 for San Mateo County were obtained from the Quarterly Census of Employment and Wages (QCEW) published by the California Employment Development Department (EDD). The employment figures are annual averages derived from quarterly reports submitted to EDD by San Mateo County employers. Employment-by-industry data at the two-digit NAICS (North American Industry Classification System) level are shown in Table 4.

In 2016, the five largest industries in San Mateo County by employment were Professional and Technical Services (13.5 percent of total employment), Accommodation and Food Service (9.4 percent), Health Care and Social Assistance (9.3 percent), Retail Trade (8.6 percent), and Government/Public Administration (8.1 percent).

Within the middle bracket, most households were at the higher end. It had a low proportion of households in the category between \$50,000 and \$74,999 compared to all other comparison geographies. However, one-fifth of Colma’s households had income between \$75,000 to \$99,000, a markedly higher proportion than any other comparison geography.

Within the highest bracket, Colma’s households were concentrated at the lower end. Most households within this bracket—and nearly 15

San Mateo County experienced a 23.3 percent growth in employment between 2010 and 2016, slightly higher than the 21.4 percent growth for the Region overall. Only San Francisco and Santa Clara counties experienced greater growth. This reflects San Mateo County's overall robust recovery from the Great Recession. The five industries with the greatest percentage employment growth in San Mateo County between 2010 and 2016 (omitting the Unclassified sector) were Information (80.3 percent growth), Management of Companies and Enterprises (60.5 percent), Educational Services (51.9 percent), Construction (45.6 percent), and Professional and Technical Services (40.4 percent). Much of this growth in these industries is likely related, directly or indirectly, to the expansion of the tech and biotech sectors in San Mateo County. In terms of absolute numeric growth, Health Care and Social Assistance, Accommodations and Food Service, and Transportation, Warehousing, and Utilities join Professional and Technical services and Information in the top five.

Table 4: Employment by Industry, San Mateo County, 2010-2016

Industry	2010		2016		# Change 2010-2016	% Change 2010-2016
	Number	Percent	Number	Percent		
Natural Resources and Mining	1,768	0.6%	1,833	0.5%	65	3.7%
Construction	12,504	3.9%	18,210	4.6%	5,706	45.6%
Manufacturing	26,555	8.4%	25,138	6.4%	-1,417	-5.3%
Wholesale Trade	11,286	3.6%	11,891	3.0%	605	5.4%
Retail Trade	32,970	10.4%	33,636	8.6%	666	2.0%
Transportation, Warehousing, and Utilities	24,521	7.7%	30,281	7.7%	5,760	23.5%
Information	17,519	5.5%	31,578	8.1%	14,059	80.3%
Finance and Insurance	13,176	4.1%	15,435	3.9%	2,259	17.1%
Real Estate, Renting, and Leasing	5,432	1.7%	6,984	1.8%	1,552	28.6%
Professional and Technical Services	37,602	11.8%	52,812	13.5%	15,210	40.4%
Management of Companies and Enterprises	4,610	1.5%	7,399	1.9%	2,789	60.5%
Administrative and Waste Services	17,688	5.6%	21,183	5.4%	3,495	19.8%
Educational Services	5,053	1.6%	7,678	2.0%	2,625	51.9%
Health Care and Social Assistance	27,984	8.8%	36,498	9.3%	8,514	30.4%
Arts, Entertainment, and Recreation	5,072	1.6%	5,849	1.5%	777	15.3%
Accommodation and Food Service	28,666	9.0%	36,761	9.4%	8,095	28.2%
Other Services	13,959	4.4%	14,777	3.8%	818	5.9%
Government	30,540	9.6%	31,603	8.1%	1,063	3.5%
Unclassified	734	0.2%	2,092	0.5%	1,358	185.0%
Total	317,639	100.0%	391,638	100.0%	73,999	23.3%

Sources: California Employment Development Department, 2010, 2016; BAE, 2017.

For the 2012 study, BAE utilized business license data obtained from the Town which were sorted, coded, tabulated, and compared to published data for San Mateo County. For the

purposes of this analysis, BAE utilizes data from Esri Business Analyst (“Esri”), a private data vendor. Esri summarizes business records maintained by a leading business database, Infogroup. Because the records rely on a variety of sources, including directories and postal data, the resulting data have a higher susceptibility to error than government data. Areas with a relatively small number of employees, like Colma, are especially vulnerable to errors in employment counts. For that reason, employment counts should not be relied upon or directly compared to other sources, like QCEW or BAE’s 2012 analysis. However, Esri’s overall distributions and trends are considered to be generally indicative of existing conditions.

Table 5: Employment by Industry, Colma, 2017

Industry	Colma		Colma's Share of County
	Number	Percent	
Natural Resources and Mining	0	0.0%	0.0%
Construction	30	0.7%	0.2%
Manufacturing	7	0.2%	0.0%
Wholesale Trade	39	0.9%	0.3%
Retail Trade	2,328	51.0%	5.5%
Transportation, Warehousing, and Utilities	31	0.7%	0.2%
Information	0	0.0%	0.0%
Finance and Insurance	7	0.2%	0.0%
Real Estate, Renting, and Leasing	16	0.4%	0.1%
Professional and Technical Services	28	0.6%	0.1%
Management of Companies and Enterprises	0	0.0%	0.0%
Administrative and Waste Services	52	1.1%	0.3%
Educational Services	10	0.2%	0.1%
Health Care and Social Assistance	23	0.5%	0.1%
Arts, Entertainment, and Recreation	627	13.7%	8.2%
Accommodation and Food Service	207	4.5%	0.6%
Other Services	874	19.1%	3.7%
Government	255	5.6%	1.0%
Unclassified	30	0.7%	2.1%
Total	4,564	100.0%	1.2%

Sources: Esri Business Analyst, 2017; BAE, 2017.

According to Esri, Colma’s 2017 employment is largely concentrated in three major industries that together constitute 83.8 percent of total employment: Retail Trade (51.0 percent of total employment), Other Services (19.1 percent), and Arts, Entertainment, and Recreation (13.7 percent). Other industries for which Esri reports significant numbers of local employees include Government (5.6 percent) and Accommodation and Food Service (4.5 percent), though Town staff indicate that the Government employment figure is likely over-estimated. According to Esri, all other industries account for approximately one percent or less of total employment. This distribution is generally consistent with BAE’s findings in the 2012 study.

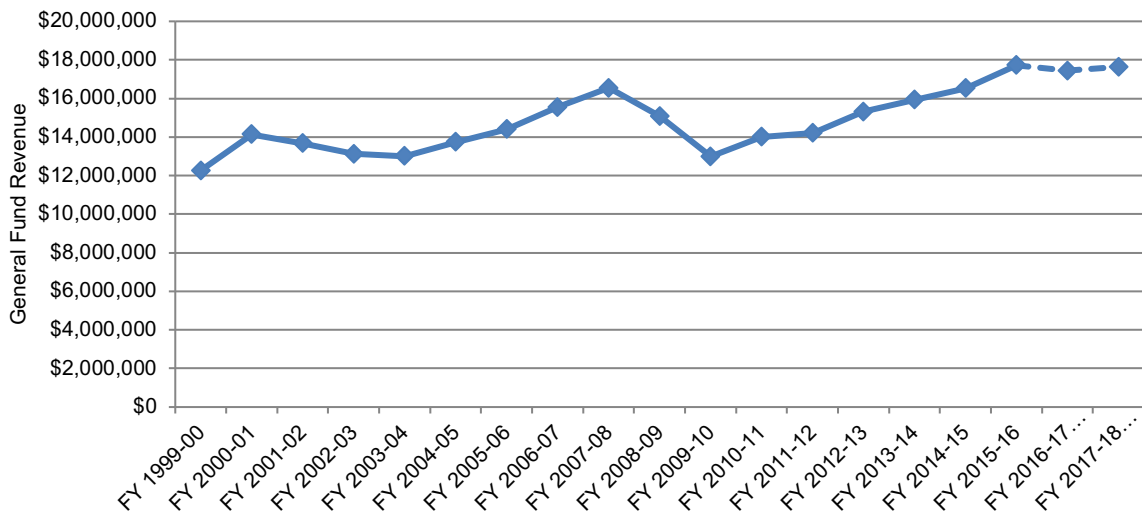
Fiscal Revenue Overview

As discussed in the 2012 study, Colma’s fiscal situation is highly dependent upon revenues generated by commercial activity, particularly retail sales. Given that the vast majority of Colma’s commercial activity takes place within the Serramonte and Collins Master Plan area, it is important to understand the Town’s current fiscal context, to which the area heavily contributes. This section extends the fiscal revenue analysis undertaken in the 2012 Economic Development study to FY 2015-16, the most recent year for which actual revenues are reported. It also includes projected revenues for FY 2016-17 and FY 2017-18. BAE sourced these General revenue data from Town of Colma’s published annual budgets.

General Fund Revenue Trends

Figure 1 illustrates the General Fund revenue trends from 1999 to the FY 2017-18 projection. FY 2009-10, the last year of actual revenue data analyzed in the 2012 study, recorded the lowest General Fund revenues (\$12.9 million) since FY 1999-2000. This followed a dramatic decline in revenues from the pre-Great Recession high of \$16.5 million only two fiscal years prior. At the time of the 2012 study, Town budgets projected that future revenues would hover near the FY 2009-10 level, a cautious forecast indicative of the uncertainty of economic recovery at the time. However, actual revenues in the years following FY 2009-10 were more favorable than anticipated. Between FY 2009-10 and FY 2015-16, General Fund revenue grew at an annual average rate of 5.3 percent, approaching the average annual growth experienced during the mid-2000s economic expansion (6.2 percent between FYs 2003-2004 and 2007-08). By FY 2015-16, General Fund revenues reached \$17.7 million, surpassing their pre-Recession high.

Figure 1: Colma General Fund Revenue Trends, Actual and Projected, 1999-2018

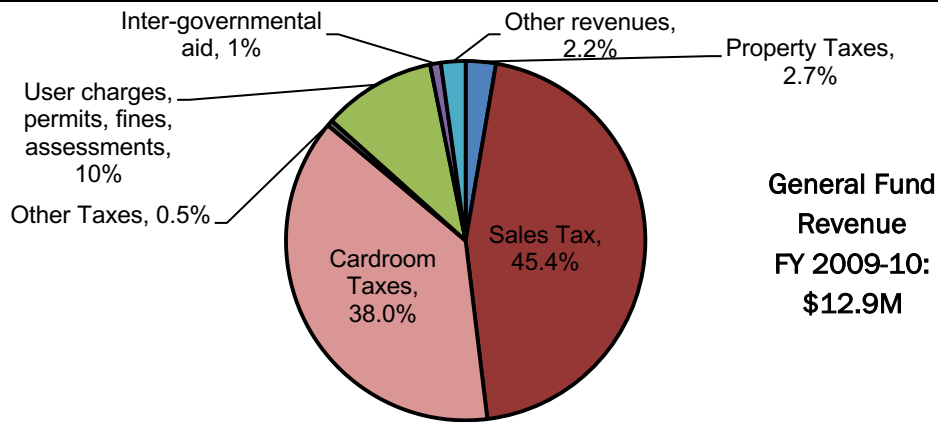


Sources: Town of Colma, 1999-2017; BAE, 2017.

General Fund Revenue Sources

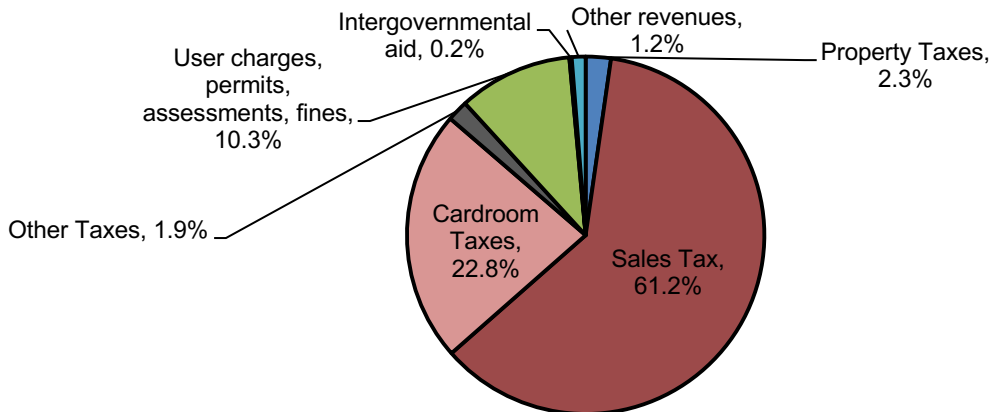
Figure 2 and Figure 3 illustrate the sources of Colma’s General Fund revenues in FYs 2009-10 and 2015-16, respectively. In FY 2009-10, 45.4 percent of General Fund revenues came from sales tax and 38.0 percent from cardroom taxes, with the two combined representing 83.4 percent of the Town’s General Fund revenues. These two sources together constituted a similar percentage of total revenues in FY 2015-16. However, the sales tax share grew to 61.2 percent while the cardroom tax share declined to 22.8 percent. Other revenue sources, such as property tax, user charges, permit fees, and fines, and inter-governmental aid, continue to contribute to the General Fund at similar proportions as they did in FY 2009-10.

Figure 2: Breakdown of General Fund Revenues, Colma, FY 2009-2010



Sources: Town of Colma, 2011; BAE, 2017.

Figure 3: Breakdown of General Fund Revenues, Colma, FY 2015-2016



Sources: Town of Colma, 2017; BAE, 2017.

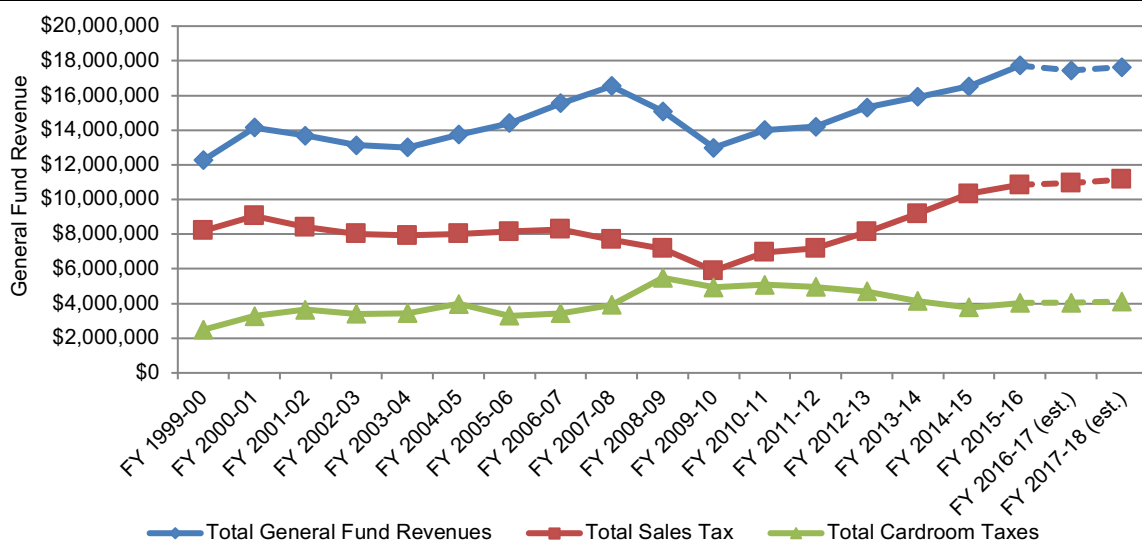
The Town is heavily reliant on sales and cardroom tax revenues because it is uniquely limited in its ability to increase its revenues from other sources, particularly property taxes. Because nearly all the Town's land area is either fully developed or dedicated to cemetery uses, there is little opportunity to grow the Town's taxable property base through new development. With little vacant land, there are also limited opportunities to bring in new industries. Between FY 2009-10 and FY 2015-16, the Town's property tax revenues grew at an average annual rate of 2.2 percent. In FY 2015-16, property tax revenues constituted only 2.3 percent of total General Fund revenues.

Cardroom taxes provide a significant and relatively steady base of revenue for the Town. The Town's single cardroom, Lucky Chances, pays to the Town a monthly tax based on the gross revenues it earns. The rate of taxation grows with gross revenue, ranging from five to twenty percent of gross revenues, plus a fixed amount. For example, if the cardroom earns more than \$3.0 million in gross revenues in a month, it must pay the Town 20 percent of those gross revenues plus \$287,000. Since FY 1999-2000, the Town has collected between \$2.5 million and \$5.5 million in annual cardroom tax revenues each year. Cardroom tax revenues reached their highest point in FY 2008-09 when Lucky Chances increased its number of tables and updated its games and marketing strategy. Cardroom tax revenues remained steady near \$5 million throughout the Great Recession before declining slightly during the economic recovery. According to the Town budget, this decline was due to increased competition from other cardrooms in the region. As of FY 2015-16, cardroom tax revenues were approximately \$4.0 million. The Town budget anticipates that cardroom tax revenues will continue to hover near this level through FY 2017-18.

With cardroom tax revenues remaining flat or declining, sales tax revenues are becoming even more important to the Town's revenue situation. Sales tax revenues account for the largest share of the Town's General Fund revenues, by far. In FY 2015-16, sales tax revenues constituted 61.2 percent of General Fund revenues, up from 45.4 percent in FY 2009-10. This growth in share is due to the strong increase in sales tax revenues relative to steady or declining revenues from other sources, including property and cardroom taxes. In FY 2009-10, at the height of the Recession, sales tax revenues and cardroom tax revenues were closer to each other than they had ever been (\$5.9 million and \$4.9 million, respectively) as taxable sales collapsed and cardroom revenues grew. By FY 2015-16, however, sales tax revenues had grown to \$10.9 million, while cardroom tax revenues had declined to \$4.0 million.

Comparing sales tax and cardroom revenues in real terms, as shown in **Error! Reference source not found.**, underscores the importance of sales tax growth to Colma's General Fund revenue recovery since FY 2009-10. The sales tax revenue trend line nearly mirrors that of total General Fund revenues, while cardroom tax revenues slowly declined. The next section describes the retail sales trends that delivered this strong sales tax revenue growth.

Figure 4: Sales Tax, Cardroom Tax, and Total General Fund Revenue Trends, Town of Colma, FY 1999-2000 to FY 2017-2018 (Projected)



Sources: Town of Colma, 2017; BAE, 2017.

Retail Sales Trends

As described in the previous section, retail sales are fundamental to the Town’s fiscal stability and economic vitality. In the 2012 study, BAE concluded that, despite the collapse of consumer spending during the Great Recession, Colma’s retail sector was fundamentally strong and well-positioned for recovery. Given that regional and national economic conditions have changed dramatically since 2012, a re-evaluation of Colma’s retail sales performance and relative strength in the region is timely. This section analyzes taxable retail sales data for the Retail Trade Area (RTA), the Town of Colma, and the Serramonte and Collins Master Plan Area. BAE compiled taxable retail sales time-series data for each municipality in the RTA from the State Board of Equalization (SBOE) and adjusted to 2016 dollars. Although SBOE reports taxable sales by business type for each municipality in California, such data are only published after 2014. Fortunately, the Town’s sales tax consultant, HdL Companies, provided detailed data describing Colma’s sales tax revenue allocations by type of business from 2005 through the second quarter of 2017. These data are used as a proxy for actual taxable retail sales, to identify longer term trends in the Town and Master Plan Area.

Retail Trade Area Context

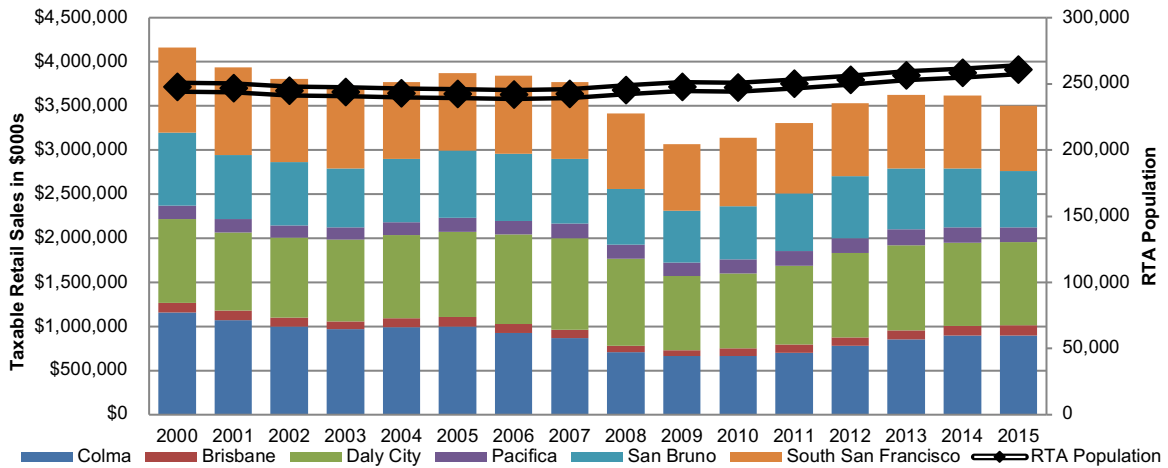
Consistent with the 2012 study, BAE defined the RTA as the following municipalities in northern San Mateo County: Brisbane, Colma, Daly City, Pacifica, South San Francisco, and San Bruno. BAE selected these communities because, except for Pacifica, they are within a short drive of Colma, such that Colma shoppers may regularly patronize stores in those communities and their residents have good access to Colma’s offerings. Pacifica was included because Colma is a plausible regional retail destination for Pacifica residents. These areas

include the majority, but not all, of Colma's regular shoppers and, as such, represent the Town's primary trade area. Unincorporated communities near Colma, such as Broadmoor and San Bruno Mountain, were omitted from the RTA analysis because SBOE does not report taxable sales for individual unincorporated communities.

Colma also likely draws shoppers from San Francisco, particularly those who reside in the parts of the city with convenient access to Colma via I-280. However, as was done in the 2012 study, BAE omitted San Francisco from the RTA because of data limitations and analytical concerns. Because SBOE publishes taxable retail sales data at the city level, it is not practical for this analysis to include only the portions of San Francisco that are most likely to regularly exchange shoppers with Colma. Further, Colma's trade area for automobile sales is much larger than the RTA defined the purposes of this memorandum. Auto shoppers are generally willing to travel greater distances to seek out deals and make comparisons than those shopping for other goods. In the 2012 study, BAE identified that significant proportions of Colma's automobile purchasers come from San Francisco and communities throughout San Mateo County, Santa Clara County, and even the East Bay. However, because communities at greater distance from Colma represent steadily decreasing portions of Colma's auto buyers they are not included in this RTA analysis.

Figure 5 illustrates the population and taxable retail sales trends between 2000 and 2015. Over that period, the RTA's population grew by 14,680 people or 5.9 percent. Its annual taxable retail sales declined 15.8 percent, on an inflation-adjusted basis. The RTA's taxable retail sales trendline reflected national business cycles, with a modest decline during the recession in the early 2000s, a small recovery in the middle of the decade, and a more dramatic collapse during the Great Recession. Taxable retail sales grew at an increasing rate from 2009 to 2012, before slowing in 2013 and declining slightly in 2014 and 2015. As of 2015, taxable sales in the RTA had yet to recover to pre-Great Recession levels.

Figure 5: Retail Trade Area Taxable Retail Sales and Population Trends, 2000-2015



Note:

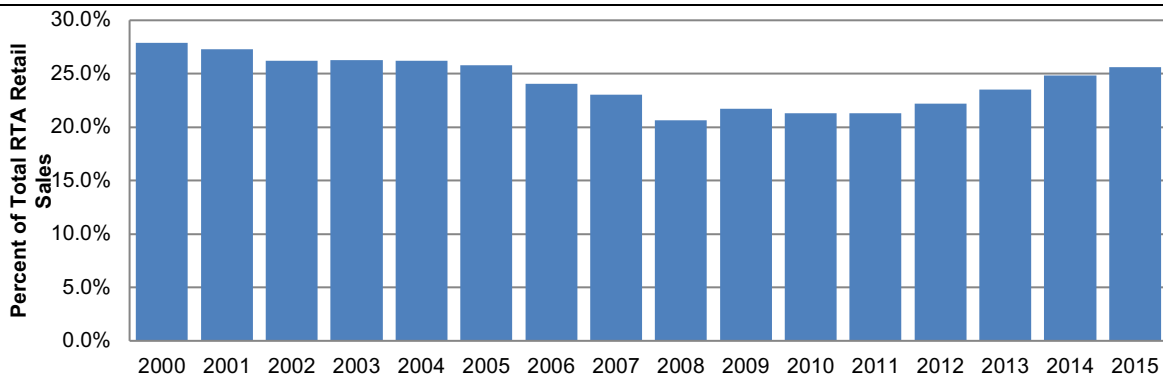
All sales shown in 2016 dollars.

Sources: State of California, Board of Equalization, 2017; State of California, Department of Finance, 2017; BAE, 2017.

Despite having the smallest population in the RTA, Colma has been among the top three RTA generators of taxable retail sales activity since at least 2000. As shown in Figure 6, Colma generated between 20.7 percent and 27.9 percent of the RTA’s taxable retail sales over the 2000 to 2015 period. Colma was the RTA’s largest taxable retail sales generator from 2000 to 2005. Daly City, the largest municipality in the RTA by population, exceeded Colma’s taxable retail sales in 2005. South San Francisco, the RTA’s second most populous municipality, surpassed Colma in 2007. From 2013 to 2015, Colma was the second largest taxable retail sales generator after Daly City. Given that Colma’s taxable retail sales growth from 2009 to 2015 (34.9 percent) strongly outpaced that of Daly City (11.7 percent), Colma may soon become the top taxable retail sales generator in the RTA, if it is not currently.

Colma exhibited significantly greater variability in its annual taxable retail sales than other RTA municipalities between 2000 and 2015. The spread between Colma’s highest and lowest annual taxable sales figures (\$496.1 million) is more than double the nearest municipality’s spread. Colma’s year-over-year variability was also significant. Out of the 16 years examined, Colma experienced the RTA’s largest year-over-year real declines in four years (2002, 2006, 2007, and 2008) and largest year-over-year real growth in three years (2012, 2013, and 2014). Its year-over-year decline in 2008 (\$162.8 million) and growth in 2012 (\$80.6 million) were the largest such changes recorded by any municipality in the RTA between 2000 and 2015.

Figure 6: Colma Taxable Retail Sales as a Share of RTA Taxable Retail Sales, 2000-2015



Note:
Based on sales figures adjusted to 2016 dollars.
Sources: State of California, Board of Equalization, 2017; BAE, 2017.

Colma’s significant variability in taxable retail sales indicates that its retail sector is more sensitive to changes in the broader economy than those of other RTA municipalities. The municipalities with taxable retail sales figures similar to Colma’s (Daly City, South San Francisco, and San Bruno) have much larger resident populations that probably provide some stability in the form of a “captive” audience of local shoppers to support local retailers. A larger population base can also support a more diverse mix of retail establishments. Having a more diverse retail base that includes a larger share of recession-resilient sectors enables these municipalities to be less affected by the “boom and bust” of consumer spending cycles. Colma’s retail sector, in contrast, is primarily region-serving and dominated by an industry that is highly sensitive to consumer confidence: automobile sales. This places Colma in an optimal position to benefit when consumer confidence is high and an especially vulnerable position when consumer confidence declines. Further, the prominence of retail sales of automobiles to individual owners in Colma’s overall retail sales mix may be jeopardized in the future, if predictions of increased use of car sharing/car sourcing services such as Uber and Lyft and use of autonomous car fleets become as popular as some analysts predict.

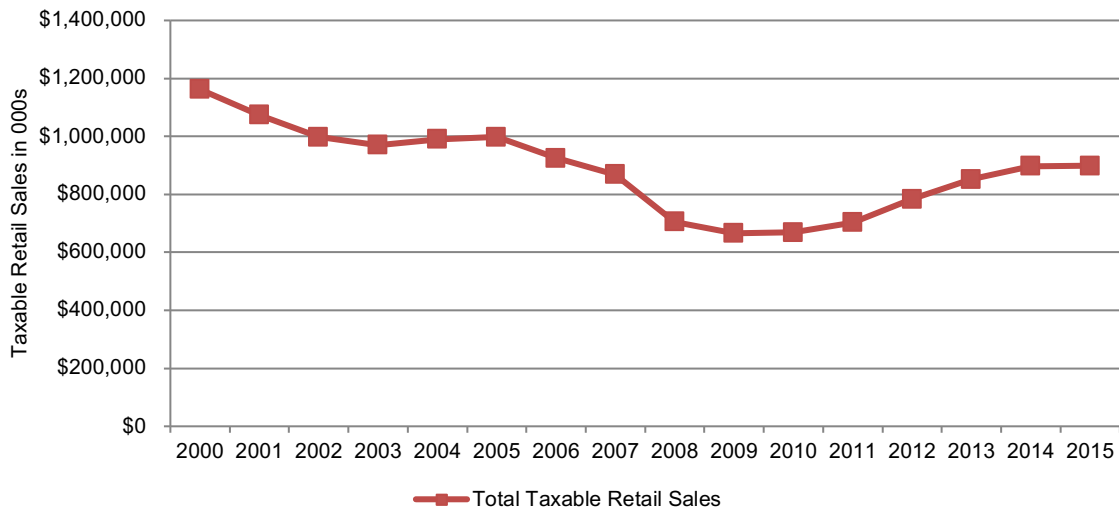
Retail Performance in Colma

Colma’s local taxable retail sales performance from 2000 to 2015 is shown in Figure 7. Unsurprisingly, the Great Recession had a strong negative impact on Colma’s retail sector, as demonstrated by a 23.3 percent decline in taxable retail sales from 2007 to 2009. However, Colma’s taxable retail sales had already started to decline in 2005. From its low point in 2009, Colma experienced accelerating year-over-year taxable retail sales growth through 2012. The growth continued, but at a decelerating rate, through 2015. Overall, Colma’s taxable retail sales grew 34.9 percent between 2009 and 2016. Total townwide taxable retail sales in 2016 were \$927.3 million.² On an inflation-adjusted basis, this represents an

² Note that the figures referenced in this section reflect taxable retail sales activity that occurs within the Town of Colma. The Town receives sales tax equal to approximately one percent of local taxable sales.

approximately 22.7 percent decline from 2000. Some of this decline can be attributed to an approximately 15.8 percent taxable sales decline in the RTA overall, some of which may be due to increasing online sales. The balance of the Town’s decline can be attributed to a slight loss of market share within the RTA, as Brisbane and Pacifica actually increased their taxable sales over the same time period, and Daly City’s 2015 taxable sales were nearly the same as in 2000, on an inflation-adjusted basis.

Figure 7: Taxable Retail Sales Trends, Town of Colma, 2000-2015



Note:
 All sales shown in 2016 dollars.
 Sources: State of California, Board of Equalization, 2017; BAE, 2017.

Figure 8 illustrates taxable retail sales by type of business type, based on sales tax revenue allocation data obtained through HdL Companies. To comply with state disclosure rules, BAE sorted narrower business categories into the broad categories shown below. Because of differences in methodology between published SBOE data and HdL data, data points from the two sources should not be compared directly.

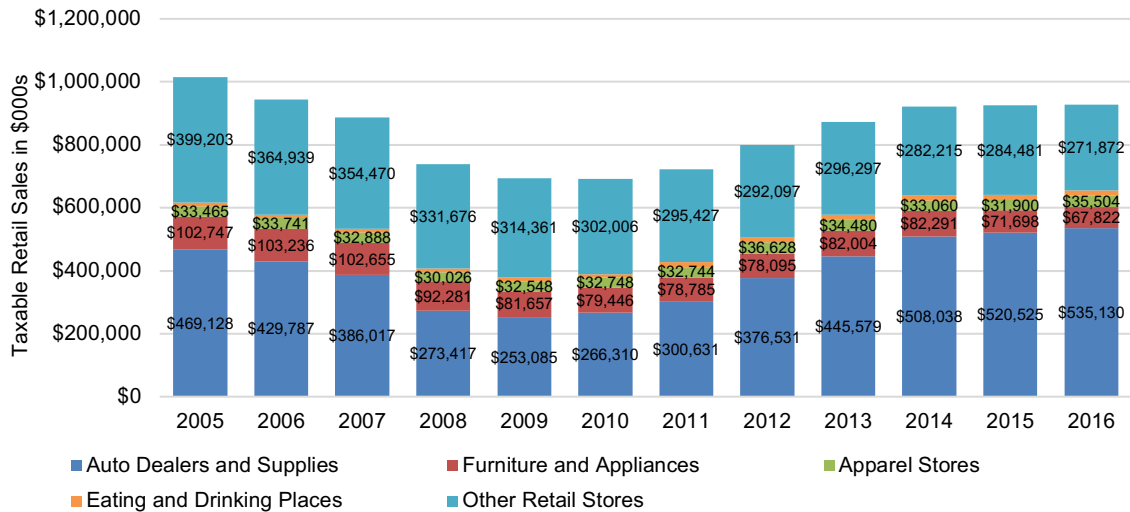
Automobile dealers and related industries generated the largest share of Colma’s taxable retail sales in all but three years between 2005 and 2016. As automobile sales faltered because of the Great Recession, “Other Retail Stores,” a broad category that includes large-format retailers including Target and Home Depot, delivered the largest share of taxable retail sales.

In addition to the local sales tax revenue allocation, the Town of Colma receives an allocation of pooled sales tax revenues from the State. Pooled sales tax revenues are from sales taxes collected on transactions that are not associated with a specific point of sale within the state (e.g., certain sales tax revenues collected on sales of taxable goods to California residents over the Internet and remitted to the State). Pooled revenues are allocated to local jurisdictions based on their share of countywide and statewide taxable sales. In the most recent four quarters for which data are reported (Q4, 2016 through Q3, 2017), Colma’s additional pooled sales tax revenues were an amount equal to approximately 20 percent of the Town’s sales tax revenues from local taxable sales.

These retailers were far less negatively impacted by the Great Recession than auto dealers. After 2012, as the broader economy improved, auto dealers and related industries constituted a growing majority of the Town’s taxable retail sales.

Furniture and appliances, apparel, and food and drink retailers generated much lower taxable retail sales. Of these, furniture and appliance retailers were the hardest hit by the Great Recession, with a 23.3 percent taxable retail sales decline between 2007 and 2011. Despite some positive sales growth between 2011 and 2014, furniture and appliance sales had not rebounded to pre-Recession levels by 2016. Apparel stores showed modest post-Recession growth (9.1 percent between 2009 and 2016). Sales in Eating and Drinking establishments grew even more significantly (46.2 percent), bolstered by new additions to Colma’s dining inventory.

Figure 8: Taxable Retail Sales by Type of Business, Town of Colma, 2008-2016



Notes:

The data in this figure are from a different source than the previous figure. Because of differences in methodologies, totals from different sources should not be directly compared to one another.

All sales shown in 2016 dollars.

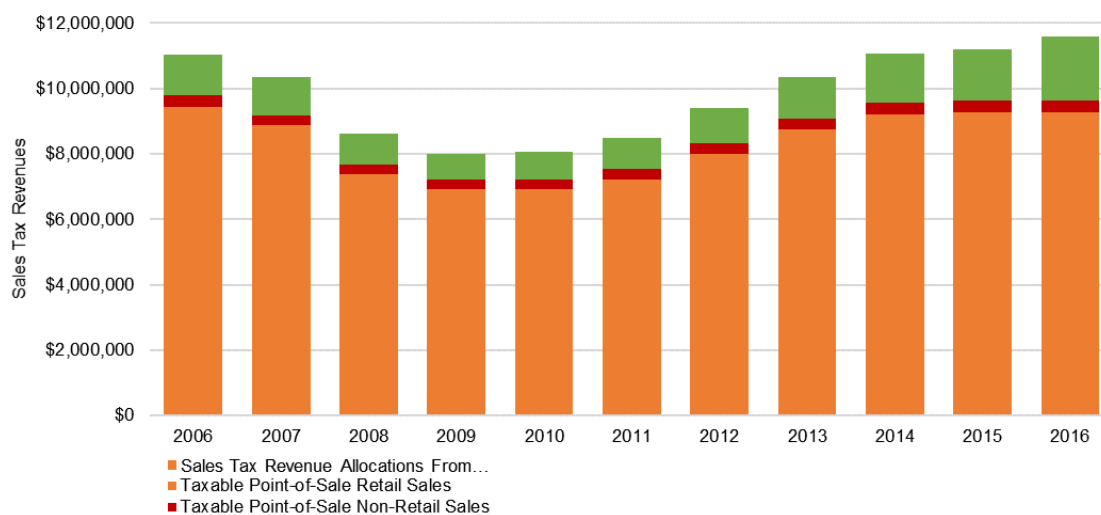
Sources: HdL Companies, 2017; BAE, 2017.

Shifting Sales Tax Revenue Composition

As mentioned previously, some of the Town’s inflation-adjusted decline in local taxable retail sales activity may be due shifting consumer habits, including increased use of the Internet for shopping, which reduces local point-of-sale transactions in “bricks and mortar” retail establishments. In recognition of this, the State of California began distributing “pooled” sales tax revenues collected on transactions that do not have specific in-state point of sale locations. The local share of the sales tax collected on these transactions is placed in a countywide pool for the county in which the purchased good will be put to its first functional use (in the case of internet sales, the county to which the good is delivered). When a good’s first functional use cannot be traced to a particular county, the local sales tax share is placed in a statewide pool.

Revenues in these county and statewide pools are allocated quarterly to localities based on their proportionate share of taxable sales at the countywide and statewide levels, respectively. Figure 9 illustrates that in 2006³, Colma received approximately \$1.3 million (inflation-adjusted to 2016 \$) from the county and statewide pools, growing to approximately \$1.9 million in 2016. Figure 9 also shows that the Town’s non-retail sales tax revenue has trended up slightly on an inflation-adjusted basis, from about \$345,000 in 2005 to about \$371,000 in 2016. These data show that although Colma’s local taxable retail sales declined on an inflation-adjusted basis between 2006 and 2016, the growth of pooled sales tax revenue, which is driven by Colma’s local taxable sales performance, has helped the Town to replace lost sales tax revenue from local taxable sales and increase its overall sales tax revenue collection by about five percent between 2006 and 2016.

Figure 9: Sales Tax Revenue Allocations by Source, Town of Colma, 2005-2016



Notes:

All data are adjusted to 2016 dollars.

This figure combines data from two sources. Pool allocation data from 2006 to 2010 were obtained from HdL Companies.

Pool allocation data from 2011 to 2016 were obtained from SBOE.

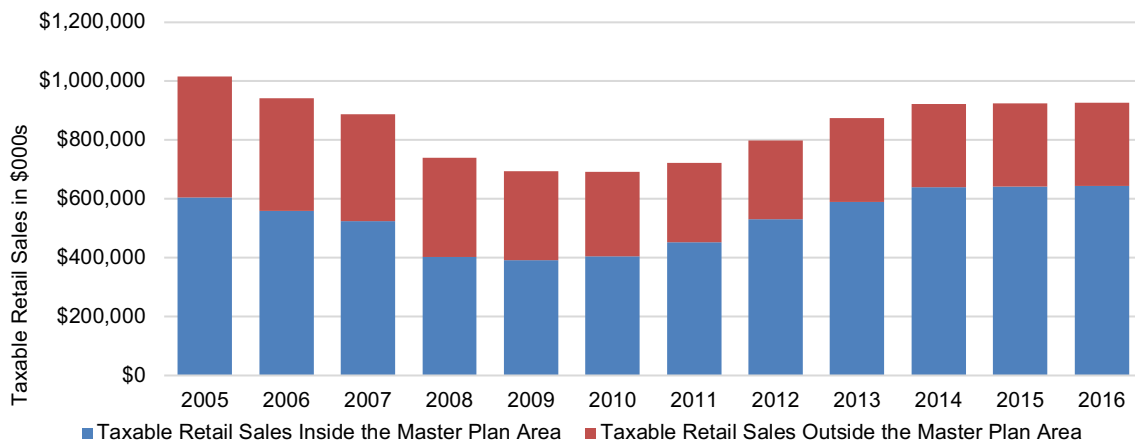
Sources: State of California Board of Equalization, 2017; HdL Companies, 2017; BAE, 2017.

Retail Performance in the Serramonte and Collins Master Plan Area

The Serramonte and Collins Master Plan Area has generated the majority of the Town’s taxable retail sales since at least 2005, as illustrated in **Error! Reference source not found..** The Master Plan Area includes many of the Town’s strongest taxable retail sales generators, including all the Town’s auto dealerships, a major shopping center, several standalone large-format retail stores, and the Lucky Chances cardroom. In 2016, the Master Plan Area generated 69.6 percent of the Town’s taxable retail sales, or \$645.0 million.

³ Although Colma received pooled sales tax revenues prior to 2006, this was the first calendar year for which BAE obtained a detailed breakout of sales tax revenues by type.

Figure 10: Taxable Retail Sales Inside and Outside of the Serramonte-Collins Master Plan Area, 2005-2016



Note:

All sales shown in 2016 dollars.

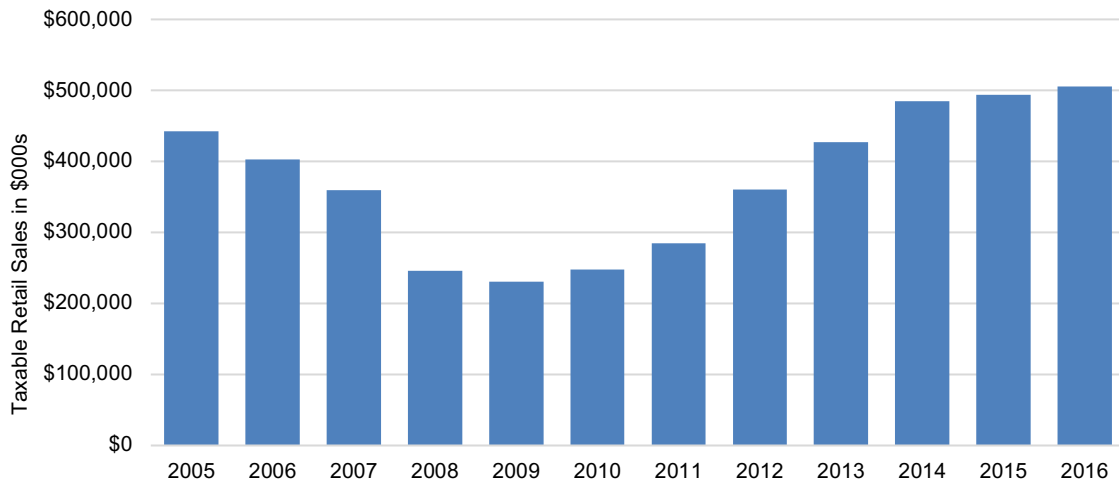
Sources: HdL Companies; BAE, 2017.

Because of confidentiality issues related to the Master Plan Area’s limited number of establishments, BAE is unable to publish data assessing taxable retail sales performance by narrow business category. Instead, BAE utilized two broad categories: automobile sales and other retail.

As repeatedly discussed in this memo, automobile sales generate a remarkably high proportion of the Town’s taxable retail sales. In 2016, automobile sales delivered 57.7 percent of the Town’s taxable retail sales and 78.4 percent of the Master Plan Area’s taxable retail sales. As shown in Figure 9, auto sales have fluctuated dramatically between 2005 and 2016. The Great Recession had a major negative impact on auto sales, as demonstrated by a 35.9 percent decline between 2007 and 2010. However, as BAE noted in its 2012 study, auto sales had been slowly declining since at least 2001.

Post-Recession, auto sales rebounded relatively quickly, with a modest 7.4 percent growth from 2009 to 2010 followed by a dramatic 15.0 percent growth the following year. The strongest year-over-year growth took place from 2012 to 2013, with 26.6 percent growth. This impressive boost was made possible by the opening of a new Subaru dealership. Since then, auto sales have continued to grow, albeit at a much slower pace than that of 2009 to 2013. Over the seven years from 2009 to 2016, auto-related taxable sales grew at an average annual rate of 11.9 percent.

Figure 9: Automobile Sales, Serramonte-Collins Master Plan Area, 2005-2016



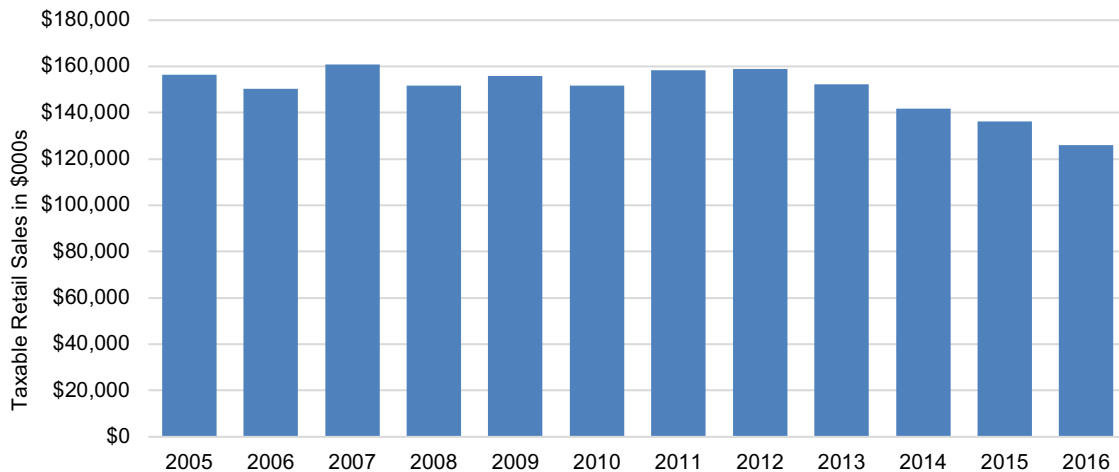
Note:

All sales shown in 2016 dollars.

Sources: HdL Companies; BAE, 2017.

The other retailers in the Master Plan Area showed far less variability in their taxable retail sales between 2005 and 2016, as illustrated in Figure 10. The non-auto retail sector even maintained relatively stable taxable retail sales volumes during the Great Recession. Although the Great Recession negatively impacted certain business types, growth in more recession-resilient retail sectors offset those losses. As the Great Recession subsided, the non-auto retail sector began a notable decline in taxable retail sales that continued through 2016. Non-auto taxable retail sales declined 20.7 percent from 2012 to 2016. This decline may be attributable to broader shifts in consumer spending patterns away from brick-and-mortar stores toward online retailers. While the non-auto retail sector represents a smaller share of taxable retail sales than the auto sector, its relative stability makes it a critical base. The Town may wish to strengthen that base to ensure that the Master Plan Area—and Colma overall—are less negatively impacted when broader economic conditions harm auto sales.

Figure 10: Non-Auto Taxable Retail Sales, Serramonte-Collins Master Plan Area, 2005-2016



Note:

All sales shown in 2016 dollars.

Sources: HdL Companies; BAE, 2017.

Retail Real Estate

This section reviews the retail real estate market within the Serramonte and Collins Master Plan Area and compares it to the Town of Colma. BAE compiled the data from CoStar, a leading national commercial real estate data vendor.

Retail Market Summary

As of the fourth quarter of 2017, the Serramonte and Collins Master Plan Area contained 705,074 square feet of retail space, or 58.6 percent of the Town's total retail inventory. This square footage includes interior building area only and does not include exterior sales area used by auto dealerships. Retail development added 4,464 square feet to the Master Plan Area's retail inventory in 2010 and 2011, and 10,521 square feet were removed in 2012. Despite this overall loss in inventory, total occupancy increased by 21,341 square feet between the first quarter of 2010 and the fourth quarter of 2017. This is due to the lease-up of previously vacant space. CoStar reported zero vacancies in the Master Plan Area throughout 2017. The Master Plan Area has maintained consistently low vacancy rates since at least 2008. During the Great Recession, the Master Plan Area vacancy rate peaked at 5.9 percent, a rate that would be considered healthy in most markets.

Quarterly net absorption in the Master Plan Area was zero, as there was no vacant inventory to be absorbed. Net absorption since 2010 has been positive, despite the inventory loss mentioned above.

Net absorption figures in the Master Plan Area reflect higher demand for space than those of the Town of Colma overall; however, townwide retail occupancy is still strong with CoStar indicating 36,293 vacant square feet. Current information published on the 280 Metro

Table 6: Retail Real Estate Summary, Serramonte-Collins Master Plan Area and Town of Colma, Q4 2017

All Retail, Q4 2017	Master Plan Area	Town of Colma
Inventory	705,074	1,202,897
Inventory (% Town)	58.6%	100.0%
Occupancy		
Occupied Stock	705,074	1,166,604
Vacant Stock	0	36,293
Vacancy Rate	0.0%	3.0%
Net Absorption		
Net Absorption, Q4 2017	0	(14,916)
Net Absorption, Q1 2010 - Q4 2017	21,341	(10,527)
Annual Average, 2010-2017	1,378	(680)
Full Service Asking Rents (a)		
Avg. Asking Rent (psf), Q4 2016	\$6.22	\$6.22
Avg. Asking Rent (psf), Q4 2017	\$5.00	\$5.92
% Change	-19.6%	-4.8%

Note:

(a) Due to a lack of available data for NNN rents in Colma, full service rent data were used instead. Because Colma has a very limited stock of available listings from which to calculate average asking rents, the data may reflect an unrepresentative sample of actual retail rents. The data should be interpreted with caution.

Sources: CoStar, 2017; BAE, 2017.

Center, which is outside of the Master Plan area, indicates that with the recent closing of the Nordstrom Rack as well as several smaller vacant in-line store spaces, that center has about 41,233 vacant square feet. This information indicates that the Q4 Costar data may somewhat understate current vacancies, but the Town's overall retail vacancy rate is still very low.

Average asking rents, as recorded by CoStar, are extremely high in both the Master Plan Area and the Town of Colma. However, those numbers should be interpreted with extreme caution. CoStar tabulates average asking rents using the most recent listings for available space. Because the Master Plan Area and Colma seldom have available listings, the rent figures may reflect a small sample unrepresentative of the actual retail real estate market.

Specifically, it is safe to assume that a typical property in the Master Plan Area would command a lower rent than the \$5.00 per square foot figure that CoStar reports. For comparison, retail space in neighboring Daly City commanded \$1.78 per square foot in the third quarter of 2017. Given the Master Plan Area's consistently low vacancy rate and strong net absorption figures, it is also reasonable to assume that a typical space in the Master Plan Area could command higher rents than those of Daly City.

Retail Centers

There are several significant retail properties within the Serramonte and Collins Master Plan Area. Table 7 details these centers. It focuses on retail stores and omits auto dealerships and properties with service-providing users. The largest retail property in the Master Plan Area is the Serra Center with 225,376 rentable square feet. Anchored by a Target, it also features large in-line tenants, including BevMo, and Michaels. It also includes smaller specialty

retailers, such as Mancini's SleepWorld, Mattress Firm, Verizon, Carter's, GameStop and Aaron Brothers, and several restaurants. It is near the intersection of Serramonte Blvd. and Junipero Serra Blvd. with convenient access to and from Interstate 280.

Other large properties in the Master Plan Area are standalone. A Kohl's at Serramonte Boulevard, southwest of El Camino Real features 97,321 rentable square feet and a 400-space parking lot. Further southwest on Serramonte Boulevard, a 36,397-square-foot Babies "R" Us and an 18,000-square-foot Dollar Tree are adjacent to one another but on their own lots with their own large surface parking lots.







The newest retail property in the Master Plan Area is Viviana Fair, just south of the Serra Center at the intersection of Serramonte Boulevard and Junipero Serra Boulevard. Built in 2010, the 6,627-square-foot center features four small food and drink tenants: Starbucks, Chipotle, Popeyes Chicken, and Poke Bowl.

The remaining retail property in the Master Plan Area is a standalone flower shop on El Camino Real (Lester's Flowers).

Other non-retail commercial and office uses in the plan area include:

- Enterprise Car Rental;
- First National Bank and offices;
- Standard Plumbing;
- Light industrial uses at 480 Collins Avenue;
- Christy Vault Manufacturing;
- Precision Body Shop and Detailing;
- Cypress Lawn Pre-Planning Offices;
- Serramonte Ford Collision Center;
- A portion of Cypress Lawn westside campus (cemetery comes out to Collins Avenue);
- Town of Colma Town Hall and Police Station;
- Peninsula Reflections Senior Assisted Living;
- A veterinary office; and
- Two dental offices

Table 7: Retail Properties in the Serramonte-Collins Master Plan Area, December 2017

<u>Name/Address</u>	<u>Gross Leasable Area (SF)</u>	<u>Anchor Tenants</u>	<u>In-Line Tenants</u>	<u>Parking</u>	<u>Details</u>
Serra Center 4915-5075 Junipero Serra Blvd. 	225,376	Target, BevMo!, Michaels, CVS	Mattress Firm, Carter's, Verizon, MetroPCS, Mancini's Sleep World, Aaron Brothers, Sizzler, Black Bear Diner, H&R Block	Approx. 800 surface spaces	Power center with multiple buildings; Built between 1972 and 1987; Target owns its own pad.
1200 El Camino Real 	97,321	Kohl's	None	400 surface spaces	Freestanding, single-tenant building, built 2004.
775 Serramonte Blvd. 	36,397	Babies "R" Us	None	200 surface spaces	Freestanding, single-tenant building.
735 Serramonte Blvd. 	18,000	Dollar Tree	None	80 surface spaces	Freestanding, single-tenant building, built 1975.
990 Serramonte Blvd. 	6,627	Starbucks, Chipotle, Poke Bowl,	None	35 surface spaces	Small center tailored to casual food and drink tenants; built 2010.
1242-1250 El Camino Real 	200	Lester's Flower Shop	None	5 surface spaces	Built 1920; small shop in front of a residence.

Notes:

All retail properties in the study area have zero percent vacancy as of December 2017.
 BAE omitted all auto-related retail properties and storefront medical office spaces from this list.
 Sources: CoStar, 2017; BAE, 2017.

Stakeholder Input

As part of the planning process, the Town of Colma and Dyett & Bhatia organized a series of interview sessions involving plan area stakeholders. Dyett & Bhatia has produced a separate Stakeholder Interviews Report which fully details this activity. In terms of economic conditions in the area, input collected during the interviews generally focused on the need for circulation/mobility, parking, and signage improvements for the area. This revolved around the following needs:

- Improved circulation, to make it easier for autos to circulate through the area and for access by vehicle transport trucks that need space to stage and unload vehicles
- Improved traffic safety to protect employees and patrons from hazards such as speeding and unsafe street crossings for pedestrians.
- Parking improvements, to ensure adequate parking for employee and customer vehicles, and space for vehicles being stored for sale or for repairs/service
- Improvements to facilitate mobility by alternative transportation means, such as shuttles to/from the Colma BART station.
- Collins Avenue business and property owners expressed more concern about parking and possibly adding permit parking than about sidewalk and bicycle improvements. In addition, they expressed concern about speeds and the need for traffic calming measures.
- Serramonte business and property owners showed more interest in upgrading appearance and sidewalks than in providing dedicated bicycle improvements.
- Improved “visibility” of the Serramonte and Collins Master Plan Area to the regional marketplace. This includes freeway signage to make the plan area more visible within the regional market area, and programmatic approaches, such as joint marketing campaigns to promote the Master Plan Area as a regional shopping destination.

Stakeholders recognized that due to the Master Plan Area’s nature as an auto sales hub, auto circulation will likely remain a priority in the area. Stakeholders also indicated that it will be important to give businesses and property owners flexibility to adapt to changing needs due to the evolution of the bricks and mortar retail industry in response to the rise of e-commerce (e.g., local bricks and mortar stores incorporating e-commerce fulfillment functions) and potential changes in how people access the area due to technologies such as car-sharing and autonomous vehicles (e.g., need for curbside pick-up/drop-off areas). Auto dealers also mentioned the potential shift to functions relating to serving as the fleet management hubs for autonomous vehicles. At the same time, stakeholders felt that these changes would occur over an extended period of time (e.g., between now and 2030), and this means there is a short-term need for solutions based on today’s technologies.

Implications for Serramonte and Collins Master Plan

- With limited residential development, and a mostly built-out inventory of land, Colma's commercial districts along El Camino Real and in the Serramonte and Collins Master Plan Area are currently, and will continue to be, prominent features within the Town.
- Retail sales and the associated retail sales tax revenues represent the Town of Colma's most important industry, and this role has become increasingly important since the Great Recession.
- The Serramonte and Collins Master Plan Area accounts for an increasingly large share of the Town's overall retail sales activity and also hosts the Town's sole cardroom, which remains one of the most important single revenue generators for the Town's budget.
- Retail sales and cardroom activity in the Serramonte and Collins Master Plan Area generate approximately \$6.5 million in annual sales tax revenue and \$4.0 million in annual cardroom revenue, respectively, representing approximately 60.7 percent of the Town's current General Fund revenue.
- It is very important for Colma to position itself as an attractive destination for shoppers coming from nearby communities, as sales captured from out-of-town residents fuel most of Colma's retail sales. The same can also be said of Colma's cardroom activity and related card room tax revenues.
- Overall RTA taxable sales levels have declined on an inflation-adjusted basis since 2000, and Colma faces challenges to retaining its extraordinarily large share of retail sales, due to stiff competition from other jurisdictions that also covet retail sales tax revenues. Additional challenges include changes to consumer shopping habits (e.g., online sales) that threaten traditional bricks and mortar retailers, and technological changes that could fundamentally alter patterns of car buying and ownership that would in turn affect auto sales, one of Colma's most important retail sectors.
- Retail real estate within the Serramonte and Collins Master Plan Area is essentially fully occupied; thus, economic development efforts should focus on maintaining occupancy and helping existing businesses to maintain and increase their sales levels.
- These factors all indicate that Colma should pay close attention to the need to help maintain the Serramonte and Colma Master Plan Area as a functional and attractive commercial area. At the same time, the Town should be sensitive to potential changes that could create shifts in the types of business activity conducted in the area. This may include the need to help existing businesses adapt to changing conditions or to consider new uses such a hotel or offices.
- The Town should maintain close communications with major retailers, the auto dealers, and the card room over shifts in their industries and how they use property in the Master Plan Area, to anticipate any changes needed at the Town regulatory level that will encourage effective adaptation and long-term business success

- Uncertainty about the exact long-term impact of expected changes related to e-commerce and transportation technologies means that the Town and stakeholders should be cautious with large investments that are specifically tied to current operating models and technologies. Instead, investments should be strategically designed to enhance the Master Plan Area's flexibility and adaptability over time, while addressing short-term needs. For example, parking improvements should be designed so that they will accommodate today's fleet of primarily privately owned vehicles, but with an eye towards utility for a fleet of the future that may involve a large component of autonomous vehicles, and also the possibility that the mix of uses within the Master Plan Area will change over time
- If successful in helping to maintain and increase sales tax revenue generation from the current \$653.9 million taxable retail sales base within the Serramonte and Collins Master Plan Area, investments in public improvements within the Master Plan Area can generate critically important returns on investment for the Town.

Serramonte Boulevard and Collins Avenue Master Plan: Summary of Recommended Phasing Costs

<i>Phase/Cost</i>	<i>Serramonte West</i>	<i>Serramonte East</i>	<i>Collins</i>	<i>TOTAL</i>
<i>Phase I High</i>	\$6,204,600	\$0	\$0	\$6,204,600
<i>Phase I Low</i>	\$4,686,000	\$0	\$0	\$4,686,000
<i>Phase II High</i>	\$0	\$2,549,000	\$0	\$2,549,000
<i>Phase II Low</i>	\$0	\$1,523,000	\$0	\$1,523,000
<i>Phase III High</i>	\$0	\$0	\$4,993,000	\$4,993,000
<i>Phase III Low</i>	\$0	\$0	\$2,893,000	\$2,893,000
<i>Construction Cost High</i>	\$6,204,600	\$2,549,000	\$4,993,000	\$13,746,600
<i>Construction Cost Low</i>	\$4,686,000	\$1,523,000	\$2,893,000	\$9,102,000
<i>Soft Costs High</i>	\$1,880,000	\$820,000	\$1,528,000	\$4,228,000
<i>Soft Costs Low</i>	\$1,440,000	\$522,000	\$919,000	\$2,881,000
<i>Project Cost High</i>	\$8,085,000	\$3,369,000	\$6,521,000	\$17,975,000
<i>Project Cost Low</i>	\$6,126,000	\$2,045,000	\$3,812,000	\$11,983,000

Serramonte Collins Master Plan - Construction Cost Estimates

PHASE 1

Item	Description	Unit	Unit Price	Serramonte West - High Cost		Serramonte West - Low Cost		Serramonte East - High Cost		Serramonte East - Low Cost		Collins - High Cost		Collins - Low Cost	
				Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
A.	Road Work														
	Curb and Gutter	LF	\$40.00	4000	\$160,000.00	4000	\$160,000.00								
	Curb	LF	\$25.00	200	\$5,000.00	200	\$5,000.00								
	Concrete Sidewalk	SF	\$20.00	19000	\$380,000.00	10000	\$200,000.00								
	Concrete Driveway	EA	\$15,000.00	12	\$180,000.00	12	\$180,000.00								
	ADA Ramps	EA	\$8,000.00	14	\$112,000.00	14	\$112,000.00								
	Microsurfacing	SF	\$0.50	152000	\$76,000.00	152000	\$76,000.00								
	Asphalt (Conform)	SF	\$20.00	400	\$8,000.00	400	\$8,000.00								
	Landscaping	LS		1	\$120,000.00	1	\$120,000.00								
	Bioretention	SF	\$150.00	2500	\$375,000.00	2500	\$375,000.00								
	Specialty Paving	SF	\$100.00	4000	\$400,000.00										
	Paving (Stamped Colored Asphalt)	SF	\$50.00			4000	\$200,000.00								
	SUBTOTAL (A)				\$1,816,000.00		\$1,436,000.00		\$0.00		\$0.00		\$0.00		\$0.00
B.	Demolition Work														
	Remove Existing Curb and Gutter	LF	\$10.00	5600	\$56,000.00	5600	\$56,000.00								
	Remove Existing Sidewalk	SF	\$5.00	19000	\$95,000.00	10000	\$50,000.00								
	Sawcut	LF	\$2.50	5600	\$14,000.00	5600	\$14,000.00								
	Remove Existing Catch Basin	EA	\$5,000.00	7	\$35,000.00	7	\$35,000.00								
	Relocate Existing Electrical Structure	EA	\$15,000.00												
	Relocate Manhole	EA	\$15,000.00												
	Relocate Streetlight	EA	\$15,000.00												
	Remove Existing Stripping & Markers	LS		1	\$30,000.00	1	\$30,000.00								
	SUBTOTAL (B)				\$230,000.00		\$185,000.00		\$0.00		\$0.00		\$0.00		\$0.00
C.	Utility Work														
	Undergrounding Joint Trench	LF	\$750.00												
	Treatment Area Storm Drain	EA	\$15,000.00	7	\$105,000.00	7	\$105,000.00								
	Signature High-Low Street Lighting/Ped Lighting	EA	\$25,000.00	53	\$1,325,000.00	35	\$875,000.00								
	Conventional Street Lighting/Ped Lighting	EA	\$20,000.00												
	Street Lighting Infill (Cobra head)/Ped Lighting	EA	\$20,000.00												
	SUBTOTAL (C)				\$1,430,000.00		\$980,000.00		\$0.00		\$0.00		\$0.00		\$0.00
D.	Miscellaneous Work														
	Traffic Control	LS		1	\$150,000.00	1	\$150,000.00								
	Street Furniture	LS		1	\$180,000.00										
	Erosion Control	LS		1	\$40,000.00	1	\$40,000.00								
	SUBTOTAL (D)				\$370,000.00		\$190,000.00		\$0.00		\$0.00		\$0.00		\$0.00
E.	Signing and Striping														
	Signing and Striping	LS		1	\$250,000.00	1	\$180,000.00								
	Traffic Signal	LS			\$500,000.00	1	\$500,000.00								
	SUBTOTAL (E)				\$750,000.00		\$680,000.00		\$0.00		\$0.00		\$0.00		\$0.00
	TOTAL (A+B+C+D+E)				\$4,596,000.00		\$3,471,000.00		\$0.00		\$0.00		\$0.00		\$0.00
	10% Minor Items		10%		\$459,600.00		\$347,100.00		\$0.00		\$0.00		\$0.00		\$0.00
	25% Construction Contingency		25%		\$1,149,000.00		\$867,750.00		\$0.00		\$0.00		\$0.00		\$0.00
	TOTAL CONSTRUCTION COST				\$6,204,600.00		\$4,685,850.00		\$0.00		\$0.00		\$0.00		\$0.00

Serramonte Collins Master Plan - Construction Cost Estimates

PHASE 2

Item	Description	Unit	Unit Price	Serramonte West - High Cost		Serramonte West - Low Cost		Serramonte East - High Cost		Serramonte East - Low Cost		Collins - High Cost		Collins - Low Cost	
				Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
A. Road Work															
	Curb and Gutter	LF	\$40.00												
	Curb	LF	\$25.00												
	Concrete Sidewalk	SF	\$20.00					13000	\$260,000.00	7000	\$140,000.00				
	Concrete Driveway	EA	\$15,000.00					4	\$60,000.00	4	\$60,000.00				
	ADA Ramps	EA	\$8,000.00					4	\$32,000.00	4	\$32,000.00				
	Microsurfacing	SF	\$0.50												
	Asphalt (Conform)	SF	\$20.00					1300	\$26,000.00	1300	\$26,000.00				
	Landscaping	LS						1	\$100,000.00	1	\$100,000.00				
	Bioretention	SF	\$150.00					1400	\$210,000.00	1400	\$210,000.00				
	Specialty Paving	SF	\$100.00					2000	\$200,000.00						
	Paving (Stamped Colored Asphalt)	SF	\$50.00							1100	\$55,000.00				
	SUBTOTAL (A)				\$0.00		\$0.00		\$888,000.00		\$623,000.00		\$0.00		\$0.00
B. Demolition Work															
	Remove Existing Curb and Gutter	LF	\$10.00												
	Remove Existing Sidewalk	SF	\$5.00					10000	\$50,000.00	6000	\$30,000.00				
	Sawcut	LF	\$2.50												
	Remove Existing Catch Basin	EA	\$5,000.00												
	Relocate Existing Electrical Structure	EA	\$15,000.00												
	Relocate Manhole	EA	\$15,000.00												
	Relocate Streetlight	EA	\$15,000.00												
	Remove Existing Stripping & Markers	LS													
	SUBTOTAL (B)				\$0.00		\$0.00		\$50,000.00		\$30,000.00		\$0.00		\$0.00
C. Utility Work															
	Undergrounding Joint Trench	LF	\$750.00												
	Treatment Area Storm Drain	EA	\$15,000.00					4	\$60,000.00	4	\$60,000.00				
	Signature High-Low Street Lighting/Ped Lighting	EA	\$25,000.00					27	\$675,000.00						
	Conventional Street Lighting/Ped Lighting	EA	\$20,000.00							10	\$200,000.00				
	Street Lighting Infill (Cobra head)/Ped Lighting	EA	\$20,000.00												
	SUBTOTAL (C)				\$0.00		\$0.00		\$735,000.00		\$260,000.00		\$0.00		\$0.00
D. Miscellaneous Work															
	Traffic Control	LS						1	\$100,000.00	1	\$100,000.00				
	Street Furniture	LS													
	Erosion Control	LS						1	\$15,000.00	1	\$15,000.00				
	SUBTOTAL (D)				\$0.00		\$0.00		\$115,000.00		\$115,000.00		\$0.00		\$0.00
E. Signing and Striping															
	Signing and Striping	LS						1	\$100,000.00	1	\$100,000.00				
	Traffic Signal	LS													
	SUBTOTAL (E)				\$0.00		\$0.00		\$100,000.00		\$100,000.00		\$0.00		\$0.00
	TOTAL (A+B+C+D+E)				\$0.00		\$0.00		\$1,888,000.00		\$1,128,000.00		\$0.00		\$0.00
	10% Minor Items		10%		\$0.00		\$0.00		\$188,800.00		\$112,800.00		\$0.00		\$0.00
	25% Construction Contingency		25%		\$0.00		\$0.00		\$472,000.00		\$282,000.00		\$0.00		\$0.00
	TOTAL CONSTRUCTION COST				\$0.00		\$0.00		\$2,848,800.00		\$1,522,800.00		\$0.00		\$0.00

Serramonte Collins Master Plan - Construction Cost Estimates

PHASE 3

Item	Description	Unit	Unit Price	Serramonte West - High Cost		Serramonte West - Low Cost		Serramonte East - High Cost		Serramonte East - Low Cost		Collins - High Cost		Collins - Low Cost	
				Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
A.	Road Work														
	Curb and Gutter	LF	\$40.00									3100	\$124,000.00	260	\$10,400.00
	Curb	LF	\$25.00												
	Concrete Sidewalk	SF	\$20.00									20000	\$400,000.00	20000	\$400,000.00
	Concrete Driveway	EA	\$15,000.00									13	\$195,000.00	13	\$195,000.00
	ADA Ramps	EA	\$8,000.00									5	\$40,000.00	5	\$40,000.00
	Microsurfacing	SF	\$0.50									97000	\$48,500.00	97000	\$48,500.00
	Asphalt (Conform)	SF	\$20.00									4080	\$82,000.00	4080	\$81,600.00
	Landscaping	LS										1	\$100,000.00	1	\$15,000.00
	Bioretenation	SF	\$150.00									2600	\$390,000.00	500	\$75,000.00
	Specialty Paving	SF	\$100.00									800	\$80,000.00	800	\$80,000.00
	Paving (Stamped Colored Asphalt)	SF	\$50.00												
	SUBTOTAL (A)				\$0.00		\$0.00		\$0.00		\$0.00		\$1,459,500.00		\$945,500.00
B.	Demolition Work														
	Remove Existing Curb and Gutter	LF	\$10.00									3000	\$30,000.00	250	\$2,500.00
	Remove Existing Sidewalk	SF	\$5.00									7100	\$35,500.00	7100	\$35,500.00
	Sawcut	LF	\$2.50									3100	\$7,750.00	3100	\$7,750.00
	Remove Existing Catch Basin	EA	\$5,000.00									3	\$15,000.00	3	\$15,000.00
	Relocate Existing Electrical Structure	EA	\$15,000.00									1	\$15,000.00	1	\$15,000.00
	Relocate Manhole	EA	\$15,000.00									1	\$15,000.00	1	\$15,000.00
	Relocate Streetlight	EA	\$15,000.00									1	\$15,000.00	1	\$15,000.00
	Remove Existing Stripping & Markers	LS										1	\$30,000.00	1	\$30,000.00
	SUBTOTAL (B)				\$0.00		\$0.00		\$0.00		\$0.00		\$163,250.00		\$135,750.00
C.	Utility Work														
	Undergrounding Joint Trench	LF	\$750.00									940	\$705,000.00		
	Treatment Area Storm Drain	EA	\$15,000.00									4	\$60,000.00	2	\$30,000.00
	Signature High-Low Street Lighting/Ped Lighting	EA	\$25,000.00												
	Conventional Street Lighting/Ped Lighting	EA	\$20,000.00									20	\$400,000.00		
	Street Lighting Infill (Cobra head)/Ped Lighting	EA	\$20,000.00											7	\$140,000.00
	SUBTOTAL (C)				\$0.00		\$0.00		\$0.00		\$0.00		\$1,165,000.00		\$170,000.00
D.	Miscellaneous Work														
	Traffic Control	LS										1	\$120,000.00	1	\$120,000.00
	Street Furniture	LS													
	Erosion Control	LS										1	\$40,000.00	1	\$20,000.00
	SUBTOTAL (D)				\$0.00		\$0.00		\$0.00		\$0.00		\$160,000.00		\$140,000.00
E.	Signing and Striping														
	Signing and Striping	LS										1	\$150,000.00	1	\$150,000.00
	Traffic Signal	LS										1	\$600,000.00	1	\$600,000.00
	SUBTOTAL (E)				\$0.00		\$0.00		\$0.00		\$0.00		\$750,000.00		\$750,000.00
	TOTAL (A+B+C+D+E)				\$0.00		\$0.00		\$0.00		\$0.00		\$3,698,000.00		\$2,141,250.00
	10% Minor Items		10%		\$0.00		\$0.00		\$0.00		\$0.00		\$370,000.00		\$214,125.00
	25% Construction Contingency		25%		\$0.00		\$0.00		\$0.00		\$0.00		\$924,500.00		\$535,312.50
	TOTAL CONSTRUCTION COST				\$0.00		\$0.00		\$0.00		\$0.00		\$4,992,500.00		\$2,890,687.50

Memorandum

To: Abdulkader Hashem and Michael Laughlin, Town of Colma

Cc: Jossie Ivanov, Dyett & Bhatia

From: Matt Kowta, MCP, Managing Principal

Date: September 4, 2019

Re: Colma Serramonte Collins Master Plan – Final Master Plan Materials

This memo includes several components which can be incorporated into the Final Colma Serramonte Collins Master Plan:

- Capital Costs and Phasing - A brief summary of the estimated capital costs and phasing.
- Final Cost Benefit Analysis – A discussion of costs and potential payback period for the proposed capital improvements based on BKF’s updated cost estimates.
- Implementation - Outline of key implementation activities.
- Funding and Financing - Potential financing and funding options, both public and private.
- Feasibility of Implementation - A brief summary of conclusions and recommendations about the nature and feasibility of implementing the Preferred Alternative within the study area, including opportunities for public/private partnerships.

Capital Costs and Phasing

This section presents the estimated capital costs and suggested phasing for the proposed Master Plan area public improvements design concept prepared by the landscape architecture firm Callander and Associates, with cost estimates prepared by BKF Engineers. Two versions of the improvements are analyzed: the high-cost option showing the full range of proposed improvements and the low-cost option used for comparison. The low-cost alternative identifies some opportunities to reduce and/or substitute more economical improvements in place of more expensive improvements while preserving much of the same overall functionality of the high-cost option.

San Francisco

2600 10th St., Suite 300
Berkeley, CA 94710
510.547.9380

Sacramento

803 2nd St., Suite A
Davis, CA 95616
530.750.2195

Los Angeles

448 South Hill St., Suite 701
Los Angeles, CA 90013
213.471.2666

Washington DC

700 Pennsylvania Ave. SE, 2nd Floor
Washington, DC 20003
202.588.8945

New York City

234 5th Ave.
New York, NY 10001
212.683.4486

Overview of Public Improvements and Costs

The public improvements included in the high- and low-cost options for the design concept primarily involve roadway and streetscape elements, including sidewalks, pedestrian and bicycle amenities, wayfinding and other elements within the roadway and the public right of way adjacent to the roadway. Table 1 provides a summary of the two cost options. This Appendix also contains the detailed cost worksheets prepared by BKF Engineers, which are summarized in Table 1. As shown, there are two sets of cost estimates – a high-cost and a low-cost option. The high-cost option incorporates the full suite of improvements that are designed to have the greatest aesthetic and functional impact while the low-cost option retains most of the functionality of the high cost option, but compromises on some aesthetic elements with a goal of economizing where possible. The functional differences between the two cost options are limited, as both incorporate the following key elements:

- Conversion from two lanes of travel in each direction in the Serramonte West segment (Serramonte Boulevard between Junipero Serra Boulevard and El Camino Real) to one lane of travel in each direction with a center left turn lane. This is not expected to result in a significant change in travel time or level of service under existing conditions, but would help to improve access to businesses along the segment by patrons and employees; improve vehicle safety by separating vehicle making left turns from through traffic; improve pedestrian safety and comfort with the incorporation of bulb-outs at intersections, pedestrian refuge islands, and wider sidewalks; and improve overall corridor appearance by incorporating landscaping, wider sidewalks with room for street furniture, and improved signage
- Along Serramonte West and East (between El Camino Real and Hillside Boulevard) - streetscape/pedestrian improvements such as pedestrian nodes with signature pavement treatment; pedestrian refuges; street lighting improvements; and bioretention improvements for stormwater management.
- Along Collins Avenue (between Junipero Serra Boulevard and El Camino Real) - incorporation of a sidewalk along the north side of Collins Avenue, to increase accessibility along the street and improve pedestrian safety; and re-configuration of on-street parking to allow for a net increase of 10 parking spaces to serve businesses in the area.
- All of the above improvements will help to support increased land use intensities that are proposed as part of the Master Plan, including increased lot coverage, floor area ratio, and building heights in the Commercial and Mixed-Use Town Center land use districts.

Key cost-savings in the low-cost option as compared to the high-cost option include: less improvement to the pedestrian realm (less removal of sidewalk obstructions/less sidewalk

widening, no pedestrian scale lighting), and less impactful placemaking (loss of or reduced quality of signature elements such as light fixtures, street furniture, and high-impact, high quality paving treatments; and a smaller, at-grade monument sign on Serramonte West instead of a larger, raised, post-mounted sign.

Table 1: Serramonte Boulevard and Collins Avenue Master Plan Improvement Cost Options

<i>Phase/Cost</i>	<i>Serramonte West</i>	<i>Serramonte East</i>	<i>Collins</i>	TOTAL
<i>Phase I High</i>	\$6,204,600	\$0	\$0	\$6,204,600
<i>Phase I Low</i>	\$4,686,000	\$0	\$0	\$4,686,000
<i>Phase II High</i>	\$0	\$2,549,000	\$0	\$2,549,000
<i>Phase II Low</i>	\$0	\$1,523,000	\$0	\$1,523,000
<i>Phase III High</i>	\$0	\$0	\$4,993,000	\$4,993,000
<i>Phase III Low</i>	\$0	\$0	\$2,893,000	\$2,893,000
<i>Construction Cost High</i>	\$6,204,600	\$2,549,000	\$4,993,000	\$13,746,600
<i>Construction Cost Low</i>	\$4,686,000	\$1,523,000	\$2,893,000	\$9,102,000
<i>Soft Costs High</i>	\$1,880,000	\$820,000	\$1,528,000	\$4,228,000
<i>Soft Costs Low</i>	\$1,440,000	\$522,000	\$919,000	\$2,881,000
<i>Project Cost High</i>	\$8,085,000	\$3,369,000	\$6,521,000	\$17,975,000
<i>Project Cost Low</i>	\$6,126,000	\$2,045,000	\$3,812,000	\$11,983,000

Source: BKF Engineers, 2019

Phasing

As shown in Table 1, BKF has broken the capital improvements into three phases, with Phase I estimated at \$8,085 at the high end and \$6,126,000 at the low end. Phase II represents approximately \$3.4 million in costs at the high end, and Phase III amounting to roughly \$6.5 million at the high end. With total capital improvement costs of approximately \$18 million (including soft costs) under the high-cost option, the low-cost option total of approximately \$12 million would represent an approximately \$6 million cost savings over the high-cost option.

The recommended phasing is guided by the recognition that it is unlikely that the Town of Colma will be able to secure all needed funding for the full suite of capital improvements and undertake construction of all improvements at once. Rather, the phasing scheme recognizes that the improvement projects can be separated by sub-area and by components within sub-areas as funding becomes available. The recommended phasing also seeks to ensure that sequencing of projects is handled so that re-doing projects completed in early phases is not necessary as later projects are undertaken.

Cost Benefit Analysis

The purpose of this section is to provide a preliminary cost benefit assessment for the proposed public improvements within the Serramonte Boulevard and Collins Avenue Master Plan area design concept. Analysis is provided for both the high-cost and low-cost options; however, given that the low-cost option is presented for the purposes of comparison and providing examples of a range of cost estimates only, the high cost option is the focus of the analysis.

This assessment includes a quantitative element and a qualitative element. The quantitative element identifies the percentage increase in annual Master Plan area taxable sales from the current baseline established in the Existing Conditions analysis that would be necessary for the Town to achieve a ten-year payback of its investment in public improvements. The qualitative assessment then provides discussion of the likelihood that the Town would realize the revenue increases due to implementation of the public improvements necessary to achieve a ten-year payback. Considerations include the nature of the proposed improvements and their responsiveness to concerns identified by Plan Area stakeholders and the potential of the design concept improvements to help retain existing plan area business activity and stimulate sales increases, and the magnitude of revenue increases needed to meet a ten-year payback target.

The cost-benefit assessment is intended to help inform the public and decision-makers regarding the benefit of implementing the improvements associated with the proposed Design Concept relative to its cost. While the low-cost option is not intended to be interpreted as an alternative design concept, it is presented to provide a range of costing approaches. The ultimate implementation of the Master Plan could thus incorporate elements that represent a hybrid of the high- and low-cost options analyzed here.

Quantitative Assessment

As detailed in BAE's Existing Market Conditions memo dated April 5, 2018, the Serramonte and Collins Master Plan Area has generated the majority of the Town's taxable retail sales since at least 2005. The Master Plan Area includes many of the Town's strongest taxable retail sales generators, including all the Town's auto dealerships, a major shopping center, and several standalone large-format retail stores. In 2016, the Master Plan Area generated just under 70 percent of the Town's taxable retail sales, or \$645 million. In addition to sales tax generation, the Master Plan area includes the Lucky Chances cardroom, which generates cardroom tax - another of the Town's important general revenue sources. Cities typically receive a local sales tax allocation of approximately one percent of taxable sales reported in their jurisdiction. This means taxable sales in the Master Plan area generated approximately \$6.45 million in annual sales tax revenues for the Town. The Lucky Chances card room is the only generator of card room taxes for the Town, which amounted to approximately \$4.0 million per year as reported in the 2018 memo.

Revenue Increases Needed to Achieve Ten-Year Payback for Public Improvement Investments

The revenue increase needed to achieve payback of public improvement investments in a ten-year timeframe is a function of the level of existing revenues and the cost of the new improvements. Considering just the Town's existing sales tax and card room tax revenues within the Master Plan area, totaling approximately \$10.45 million, the required revenue increases to achieve a ten-year payback for public improvements are summarized in Table 2, simply dividing the total improvement cost under each cost scenario by ten. If the time value of money was incorporated into these calculations, the annual revenue increase would need to be somewhat larger to offset the fact that public investments would be made up-front, but the increased revenues would accumulate over a ten-year period, during which there would be carrying costs or opportunity costs associated with the funds not yet repaid.

As shown in Table 2, the annual revenue increase needed under the high-cost option is approximately \$1.8 million and the annual revenue increase needed under the low-cost option is approximately \$1.2 million. On a percentage increase basis, these translate to approximately 17 and 11 percent increases from current annual Plan Area sales tax and card room revenues, respectively.

Table 2: Ten-Year Payback Requirements

	Cost Option	
	High	Low
Estimated Public Improvement Cost	\$17,973,600	\$11,980,500
Annual Revenue Increase Needed to Achieve Ten-Year Payback (\$ increase)	\$1,797,360	\$1,198,050
Current Revenues	\$10,450,000	\$10,450,000
Annual Revenue Increase Needed to Achieve Ten-Year Payback (% increase)	17%	11%

Source: BAE 2018, 2019.

Qualitative Assessment

The Existing Conditions memo outlined a number of challenges to maintaining and increasing the taxable sales and card room revenues within the Plan Area, but also highlighted the critical importance to the Town's fiscal position of doing so. A key finding in the memo is that because of the Town's limited resident population base, it is very important for the Plan Area to be visible and attractive to residents of surrounding areas who travel to Colma for shopping. Businesses interviewed as part of the Master Plan stakeholder outreach process generally focused on the need for circulation/mobility, parking, urban design, signage and pedestrian improvements for the area. Stakeholders felt that these types of improvements would help to improve access to businesses, employee and customer safety and attractiveness, and the area's visibility to the regional marketplace.

According to the Landscape Architecture Foundation's *Landscape Performance Series (LPS)*, which evaluates the performance of landscape design projects throughout the world based on a series of environmental, social, and economic metrics, streetscape projects that focus on enhancing the pedestrian experience and improving multimodal connectivity and safety in existing retail corridors can have positive economic impacts. For example, three LPS case studies in Lincoln, Nebraska, Houston, Texas, and St. Louis, Missouri reported increased property values following streetscape and multimodal infrastructure investments in existing retail corridors, while the case study in St. Louis also reported an increase in sales tax following these investments.¹ Additionally, cities up and down the Peninsula, such as Mountain View and Redwood City, have invested in streetscape improvements that have, in part, contributed to thriving commercial districts. It should be noted, however, that streetscape and multimodal improvements are only one component of successful economic development and retail strategy, and that the nearby examples cited above were paired with other initiatives, such as encouraging complimentary pedestrian-oriented land uses and development patterns, that played a critical role in the overall success. Because of this, assessing the economic benefits strictly attributable to streetscape and multimodal improvements is challenging.

The Plan Area is a mature commercial district with relatively little vacant and underutilized land. Where there is opportunity for intensification to take advantage of the proposed increases in allowable lot coverage, floor-area-ratio, and height limits, it is likely that much of the net increase in development would be attributable uses that do not generate card room tax revenues or retail sales taxes. The former is because card rooms are a relatively unique enterprise and it is unlikely that the Plan Area would attract a second card room operation. The latter is because brick and mortar retail faces significant barriers to expansion due to the increasing share of retail transactions conducted over the internet.

The rapid expansion of online retailing is having a noticeable impact on the retail sector, with increases in market share by online retailers drawing sales away from brick and mortar establishments, particularly impacting retailers that sell large volumes of commodity goods compared to those that sell more unique, discretionary items.² This has largely contributed to the contraction of many national and regional retail chains. Bloomberg Business Week reports that at 105 million square feet, 2017 set the record for the amount of

¹ Landscape Architecture Foundation. *Landscape Performance Series. Case Study Briefs*. Accessed April 25, 2019. Available at: <https://www.landscapeperformance.org/case-study-briefs?op>

² Commodity goods are those which consumers buy on a regular basis, are familiar with the available choices, and for which their purchasing decisions are based on price and convenience. These are the types of goods for which online shopping is an ideal tool. As opposed to commodity purchases, discretionary purchases involve items that consumers purchase less frequently, and which are not necessities. So-called because consumers spend their discretionary time and income on them, discretionary purchases may involve specialty items for which expert sales help is needed and/or for which the experience of purchasing the items and the sales and after-sale support experience is important. Online shopping is not as conducive to this type of purchase.

retail space closed by national retail chains, with 2018 on track to possibly surpass this record at 77 million square feet of planned closures as of April 2018.³ While Town sales tax revenue trends do not indicate that local retail activity has actually begun to decline, the Town's recent budget information indicates that growth in local sales tax revenues appears to be slowing, which may hint at the local beginning of trends predicted above.

Additionally, structural changes are expected in the auto industry due to the emergence of ridesharing and autonomous vehicles which could result in consumers being less dependent on personally-owned vehicles and result in lower sales tax revenues attributable to retail automotive sales in traditional dealerships. U.S. car sales have remained strong due to unexpected increases in demand from millennials, but the industry is expected to face significant disturbances and uncertain sales patterns.⁴ One survey of dealership owners and industry experts concludes there will be fewer dealerships in the future, with those that remain repositioning their business model so that traditional retail plays less of a role, by adding or expanding the role of finance divisions, mobility services, and fleet management.⁵

Further, for Colma, it will be difficult to increase retail demand through population growth because Colma itself and the surrounding areas of the Peninsula are mature and limited in their ability to grow, which presents significant challenges to increasing residential development and population growth, and resultant expansion of the customer base.

Based on the above considerations, it is likely that any intensification of development in the Plan Area will be an incremental process that occurs over a period of more than ten years. Therefore, potential increases in overall Plan Area taxable sales and card room revenues would need to rely on the existing quantity of retail and card room space making marginal improvements in their already strong sales performance.

The addition of new non-retail and non-card room activities to the area over time may help retailers and the card room in that other uses, such as office and hotel, could bring people to the area who otherwise would not have been present, and would then represent a new "captive" base of potential patrons who can bolster demand for retailers and the card room as long as the alternative uses do not displace retail space or the card room.

³ *Retail's Real Estate Glut is Growing*, Bloomberg Business Week, p. 31, April 23, 2018.

⁴ Eisenstein, Paul and McDuffie, John Paul. (Jan 29, 2019). The U.S. Auto Industry in 2019: Twists, Turns and Bumps Ahead. Knowledge@Wharton. Available at: <https://knowledge.wharton.upenn.edu/article/the-u-s-auto-industry-in-2019-twists-turns-and-bumps-ahead/>

⁵ Lareau, Jamie and Lutz, Hannah. (November 26, 2017). Forecasting the Future of Auto Retailing: A New Department –Mobility—Alongside Parts, Services and the F&I Office. Automotive News. Available at: https://www.autonews.com/article/20171126/INDUSTRY_REDESIGNED/171129853/forecasting-the-future-of-auto-retailing

If the Town is concerned about targeting new uses that could help to bolster Town revenues and/or help to replace revenues that might be lost if the Town's retail sales activity contracts due to factors mentioned above, some uses will be more attractive than others. Lodging uses, which generate transient occupancy taxes (TOT) in addition to property taxes can be a very strong revenue generator and would help to diversify the Town's revenue base. Based on BAE's experience analyzing lodging uses in infill locations within jurisdictions that collect a TOT, BAE would expect new lodging uses in Colma to be strongly net fiscally positive, depending on the land use being replaced, after accounting for changes in Town service costs and changes in Town General Fund revenues. Office uses and residential uses each have revenue generation potential because they will primarily generate revenues in the form of property taxes. Based on BAE's experience analyzing fiscal impacts of office uses in infill locations in other jurisdictions that charge a nominal business license fee, as Colma does, as opposed to a more substantial gross receipts, or per employee-based fee, BAE would expect new office uses in the plan area to be at least fiscally neutral, if not fiscally positive. However, on a per acre basis, the fiscal benefits to the Town of Colma from new Plan Area office uses would likely be less than the fiscal benefits of a successful new lodging use. As compared to office uses, residential uses will potentially be less fiscally attractive than office uses because the two uses may have similar revenue generation potential since property tax will be the largest direct revenue generator for both office and residential development. Meanwhile, residents demand more municipal services, including recreation, than office employees who spend only a limited amount of time within the community compared to residents. Based on this, we would expect new Plan Area office uses to be more fiscally attractive to the Town than residential uses. The caveat with all of the preceding discussion regarding fiscal attractiveness of different land uses is that any project can have distinct fiscal implications due to its own unique characteristics, creating exceptions to the preceding generalizations about different land use types.

Assuming the full capital costs for design concept implementation aligning with the high-cost option, the Town of Colma would need to realize an approximately 17 percent increase in annual Plan Area sales tax and card room revenues to achieve a ten-year payback of the investments in public improvements. Given the challenges that the Plan Area will face in substantially increasing taxable sales and card room business activity (e.g., mature, mostly built out market area, strong external competitive forces, etc.), sales increases would likely be due to marginal gains from improved performance (i.e., sales per square foot) in the existing inventory of retail and card room space, rather than due to large sales volume increases from adding substantially to the existing inventory of revenue-generating space. Thus, it would be difficult for the design concept improvements to stimulate a 17 percent Plan Area sales volume increase. Given that the low-cost option retains most of the functionality of the high-cost option, the City may wish to consider incorporating some of the low-cost option's cost-saving elements into the ultimate plan designs, to reduce the overall implementation costs and reduce the magnitude of revenue increase needed to achieve a ten-year payback. By selectively implementing a combination of elements from the high-cost and low-cost options,

the Town could provide almost all of the functionality of the high-cost scenario, and achieve significant aesthetic improvements compared to existing conditions. Assuming availability of resources to fund the improvements, a reduced local investment will limit the Town's risk.

In evaluating the risk of investing in public improvements and whether a ten-year payback can be achieved under any cost scenario, the Town should also evaluate the risk of not making investments in supporting the area. Given the Town's reliance on revenues generated in the Plan Area, there is likely a great benefit to investing in the maintenance and improvement of the functionality and attractiveness of the area, even if the investments ultimately fail to generate a ten-year payback, if stakeholders agree that the investments could simply help to maintain and limit any potential revenue reductions that could occur due to factors that are largely beyond the Town's and local businesses' control. In any cost scenario, if the Town can pursue grant funding opportunities for some of the public improvements, this will reduce the outlay of local funds and reduce the sales tax and card room tax increases necessary to achieve a ten-year payback on the investment of local funds.

Public Improvements Investment Strategy

Streetscape and multimodal mobility enhancements can help improve the economic performance of retail areas, though by precisely how much is difficult to quantify. Because it is difficult to quantify the benefit, this analysis suggests that the Town focus Master Plan implementation on improvements that create most of the desired benefits while weighing one-time implementation costs and long-term maintenance costs. In choosing a refined set of public improvements that actually get built, the Town may wish to consider trying to optimize by focusing on high-impact improvements that are relatively low-cost and/or which bring potential to leverage local resources with outside funding sources. An example of the latter is the roadway re-configuration in the Serramonte West area, which could be eligible for certain types of regional, state, or federal grant funding. An example of the former would be to selectively substitute some elements from the low-cost option into the final improvement designs in place of the most expensive elements that may not create substantially more positive impacts. For example, the Town could consider utilizing colored concrete in place of specialty paving on Serramonte West, or utilizing existing street lights and supplementing with new lights versus a comprehensive replacement of all street lights. Finally, because taxable sales increases and card room revenue increases rely on attracting more customers to the area and encouraging existing and new customers to spend more money in the area, it may be most cost effective for the Town to focus on those improvements that will have the greatest impact on the customer experience. This type of strategy would suggest that the Town place a lower priority on aesthetic improvements to Collins Avenue compared to improvements on Serramonte Boulevard, where the customer-facing functions of the Plan Area's major revenue-generating businesses are located. Overall, the above strategies would reduce the total capital requirements and increase the potential for payback of public investments in a reasonable amount of time.

Implementation

The Town of Colma has established the design vision for the Colma Serramonte Master Plan Area (Plan Area) through an inclusive public process that addresses the needs and aspirations of the Plan Area stakeholders. Implementation of the Colma Serramonte Collins Master Plan will require concerted efforts on the part of the Town and Plan Area property owners over the long-term. The Plan provides a template for improvements to the Plan Area that will guide implementation even as there are changes in Town leadership, and turnover of Plan Area businesses and property owners. It is expected that the Town of Colma will update the plan periodically as needed to reflect progress on implementation and changing conditions, to ensure that the Plan remains relevant.

Consistency with Other Policies. As necessary, the Town will update other Town codes, plans, and policies to ensure consistency and a mutually reinforcing set of policies.

Plan Administration. The Town will administer the Plan, using it as a guide to ensure that future improvement projects are consistent with the overall vision and proceed in a coordinated fashion to avoid the need to re-do improvements because the sequencing is not correct.

Project Planning and Construction. The Town Public Works & Engineering Department will integrate Plan Area public improvements into the Town's Capital Improvement Plan (CIP) and shepherd the projects through the process of securing funding, developing detailed plans and specifications, managing the bidding process for contractors, negotiating construction contracts, and overseeing completion of the projects.

Minimization of Business Disruption. The Town will coordinate carefully with property owners and businesses to plan and implement individual improvement projects so that disruption to businesses and their patrons is minimized.

Business Retention, Expansion, Recruitment. The Town will work to retain existing businesses and attract new businesses that are compatible with the Plan's vision, to maximize the utility of the planned improvements and maximize the return on the investments in public improvements.

Town Resource Prioritization. Plan implementation will require investment of Town resources, including staff time and Town money. The Town Council will prioritize use of available Town resources for Plan implementation when the use of Town resources can leverage other public or private investments (cash or in-kind) to support projects that will help to improve the business environment, increase vehicle, pedestrian, and bicycle safety, and maintain and expand the generation of Town revenues. Within the Plan Area, the Town will prioritize the use

of available funds where they can make the greatest impact on preserving and enhancing the viability of the Plan Area as a successful business district.

Funding and Financing

Although providing Town staff support for Plan implementation will be a key factor in the Plan's success, the Town will also need to marshal considerable financial resources to fully implement the plan. The Town's implementation responsibilities relating to funding will include:

Monitor Funding Opportunities. The Town will monitor opportunities to apply for grant funding when available. These may include options such as One Bay Area Grants (OBAG) from the Metropolitan Transportation Commission that support improvements such as bicycle and pedestrian access and safety improvements within Priority Development Areas (PDAs), including the El Camino Real PDA which includes substantial portions of the Plan Area.

Reviewing and Updating the Town's Impact Fee Program. The Town of Colma currently does not charge development impact fees for public facilities like the types of improvements envisioned in the Serramonte Collins Master Plan; however, given the Master Plan area's prominent central location and economic function within the Town, it may be appropriate to study the nexus between the development that may occur within the Town and the need for improvements identified in the Master Plan. If sufficient nexus is demonstrated, the Town may determine that it is appropriate to establish and collect an impact fee from new development within the Master Plan Area only, or within a larger area such as the Town as a whole, to help pay for new development's share of the cost of the Plan's capital improvements.

Coordinate with Private Development Activity. The Town will monitor new private development projects to identify opportunities for them to contribute to plan implementation – either through in-kind improvements or through contribution of funds.

Explore New Funding Sources. The Town will convene property owners and explore interest in public-private partnerships to generate funding to help pay for new public improvements through mechanisms such as those described in the financing section below.

Facilitate Financing Tools. While many public improvement projects included in the Plan maybe undertaken incrementally, on a pay-as-you go basis, the Town and Plan Area stakeholders may determine that it is desirable to generate up-front funding for more expensive projects, to be repaid over time through one or more funding and financing tools.

- The Town may explore opportunities for the formation of a lighting and landscaping assessment district (LLAD), Community Facilities District (CFD), or other form of assessment/special tax district to help fund capital investments and/or ongoing streetscape maintenance activities

- The Town may consider formation of an Enhanced Infrastructure Financing District (EIFD) as a way to direct new Town tax revenues generated from within the Plan Area towards a fund that would help to pay for new capital improvements. As a mechanism that relies on future increases in existing revenues to generate funding for capital improvements, an EIFD may be found to be less effective in a largely built out area such as the Plan Area as compared to mechanisms such as the LLAD or CFD, which can generate substantial new revenues, even if limited new development occurs.

Table 3 provides a summary of key elements included in the design concept and potential funding sources.

Table 3: Potential Funding Sources by Project Element

Potential Funding Sources					
Project Elements	Impact Fees	Developer Contributions	Assessment or CFD	EIFD	Grants
Roadway Surface	x			x	x
Signage and Striping	x			x	x
Landscaping		x	x	x	x
Bioretention	x	x	x	x	x
Curb, Gutter, Sidewalk	x	x	x	x	x
ADA Ramps	x	x	x	x	x
Street Furniture		x	x	x	x
Street Lighting		x	x	x	x
Traffic Signals	x			x	x
Storm Drainage	x	x	x	x	x

Source: BAE, 2019.

Update Land Use Controls. The Town will consider updating land use policies to enable the Plan Area to adapt in the event that changes in market conditions and trends create the need for the Town to embrace business activities which diverge from the Plan Area’s current strengths in new auto dealerships and various types of community- and destination-oriented retail sales. Such changes will seek to accommodate new uses which can generate local employment opportunities and help to maintain the tax base upon which the Town relies to generate revenues in support of high quality local services.

Feasibility of Implementing the Preferred Alternative

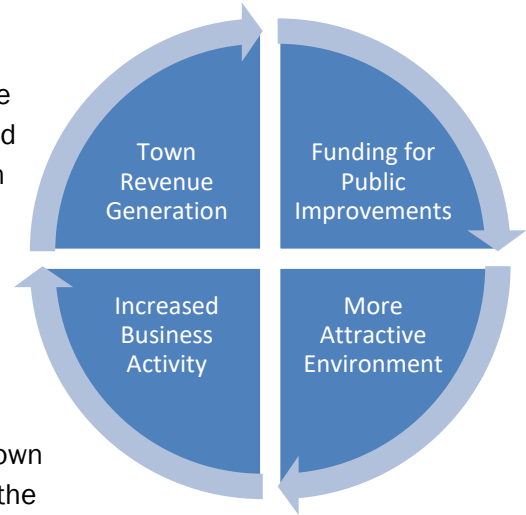
Following are brief conclusions regarding the feasibility of implementing the preferred alternative.

Feasibility of Implementation

While the full cost of Plan implementation is substantial, the Plan is modular and allows for incremental implementation. The improvement projects can be separated by sub-area and by components within phases as funding becomes available; however, care will be required to ensure that sequencing of projects is handled so that re-doing projects completed in early phases is not necessary as later projects are undertaken.

The Plan includes relatively inexpensive projects that can be undertaken early, such as pavement re-stripping, which would not interfere with any other parts of the plan. The Town can explore funding and financing tools that could generate new revenues and/or provide a mechanism to undertake more expensive projects that are difficult to handle on a pay-as-you-go basis.

Even if funding constraints delay or ultimately prevent full implementation of the planned public improvements, the Town can prioritize the use of limited funds where they can have the greatest impact. To this end, the implementation strategy can prioritize investments in the Serramonte West sub-area which is the most visible and which is most intensively used by businesses and their patrons. In addition, the implementation strategy can also prioritize the types of improvements which are likely to make the most difference in the user experience, including pedestrian access and safety improvements.



Public/Private Partnerships

The Town and private business and property owner interests are aligned around the objectives of the Plan – to create a safer and more attractive environment for businesses, their employees, and their patrons. By structuring the Plan around addressing these needs, as expressed by Plan Area stakeholders, the Town has created the opportunity to form public/private partnerships to help implement the plan. Taken as a whole, the Plan can be viewed as a virtuous circle of public/private partnership whereby the Town plans, coordinates, and organizes funding for projects that will create benefits for the Plan Area’s businesses, property owners, and the public at large in the form of a more functional and attractive business district. These improvements will support business retention, expansion, and recruitment and increased patronage, leading to increases in business activity which will in turn create tax revenues that can help support additional investments in public improvements.

Public/private partnerships may take various forms, such as:

- Joint public and private funding for public improvements – the Town can contribute public funds, including its ability to secure grants from various public funding sources for public improvements while the private sector can contribute funding to leverage the

public dollars either through voluntary mechanisms such as “sponsorships”, compulsory mechanisms such as development agreements or conditions of approval for development projects, or through more comprehensive mechanisms such as formation of a CFD which would garner participation of property owners within the Plan Area.

- Joint public and private funding for streetscape maintenance through mechanisms such as creation of a Lighting and Landscaping Assessment District or a similar mechanism, with the Town contributing funds as well.
- Coordination of public improvements with private development projects – the Town could seek to prioritize public improvement projects that will support new private development investments, such as programming streetscape improvements along a segment of roadway where a private owner has committed to investing in their Plan Area property.
- Joint public and private efforts to promote the Plan Area to shoppers/visitors and prospective businesses – the City and local businesses can collaborate to promote the area by coordinating marketing and outreach activities.

Appendix X: Detailed Capital Improvement Cost Estimates

[Note to D&B: Please include your 9-4-19 cost estimate and phasing worksheets as appendix here.]

MEMORANDUM

Date: March 4, 2019 **BKF Job Number:** 20170194-10

From: Jason Mansfield, P.E.

Subject: Town of Colma – Serramonte Boulevard and Collins Avenue Master Plan
Conceptual Level Engineer’s Opinion of Construction Cost

BKF has prepared this conceptual level engineer’s opinion of probable construction cost for Town of Colma’s Serramonte Boulevard and Collins Avenue Master Plan. This has been separated into three different segments:

Serramonte West – between Junipero Serra Boulevard and El Camino Real
Serramonte East – between El Camino Real and Hillside Boulevard
Collins Avenue – between Junipero Serra Boulevard and El Camino Real

Each segment has a separate “low cost” and “high cost” alternative:

Legend

- Full improvements
 - Lower cost alternate

Serramonte West:

- Monument sign: raised, post-mounted
 - Monument sign: small, at grade
- Widened sidewalks
 - Only widen sidewalk where sidewalk is moving and must be re-built.
- Pedestrian nodes with signature paving (pavers)
 - Change signature pavement to colored concrete / signature aggregate / stenciled sandblast
- High visibility crosswalks with pavers and striping
 - Change pavers to stamped colored asphalt
- Pedestrian refuge island with rolled curb and signature pavers
 - Pedestrian refuge island with rolled curb and stamped colored concrete
- Signature lighting: remove existing fixtures, and add new vehicular, hi/low and pedestrian-only fixtures
 - Utilize existing streetlights, and add new matching lights as well as infill pedestrian lights.
- Street furniture
 - Eliminate street furniture
- Bioretention
 - Also bioretention (this is a county requirement)

- Wayfinding signs
 - Also wayfinding signs

Serramonte East:

- Widened sidewalks
 - Only widen sidewalk where sidewalk is moving and must be re-built.
- Pedestrian nodes with signature paving (pavers)
 - Change signature pavement to colored concrete / signature aggregate / stenciled sandblast
- High visibility crosswalks with pavers and striping (at El Camino intersection)
 - Change pavers to stamped colored asphalt
- Signature lighting: remove existing fixtures, and add new vehicular, hi/low and pedestrian-only fixtures
 - Utilize existing conventional streetlights, and add new matching streetlights as well as infill pedestrian streetlights.
- Street furniture: no street benches as per Staff's direction. Maintain the specialty paving at the intervals indicated.
 - Same as full improvements
- Bioretention
 - Also bioretention (this is a county requirement)
- Wayfinding signs
 - Also wayfinding signs

Collins:

- Underground utility poles. Utilize existing conventional streetlights, add four new conventional (cobras) streetlights, and add pedestrian lights to match those on Hillside Blvd. on north and south sides. Reuse the two lights that fit this standard adjacent to Vivana Fair. Unmetered service pedestal to be installed.
 - Utilize the existing conventional streetlights, and add new matching streetlights. No pedestrian-scale streetlights installed.
- Bulb-outs at crosswalks, inside curves, and east end of street at El Camino.
 - Bulb-outs at crosswalk only
- Bioretention
 - Also bioretention (this is a county requirement)

Appendix F: Circulation Analysis



Serramonte Boulevard and Collins Avenue Master Plan Circulation Analysis

Prepared for the
Town of Colma

July 8, 2019

490 Mendocino Avenue, Suite 201 **SANTA ROSA**, CA 95401 707.542.9500

505 17th Street, 2nd Floor **OAKLAND**, CA 94612 510.444.2600

1276 Lincoln Avenue, Suite 204 **SAN JOSE**, CA 95125 650.314.8313

w-trans.com



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Appendices

- A. Turning Movement Count Data
- B. Synchro Analysis





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Executive Summary

Background

The purpose of the Serramonte Boulevard and Collins Avenue Master Plan (Master Plan) Circulation Analysis is to examine transportation improvements developed throughout the project tasks that would enhance mobility, connectivity, safety, and accessibility for roadway users of all ages and abilities, including automobiles, trucks and other large vehicles, bicyclists, and pedestrians, on Collins Avenue from Serramonte Boulevard to El Camino Real and on Serramonte Boulevard from Junipero Serra Boulevard to Hillside Avenue in the Town of Colma.

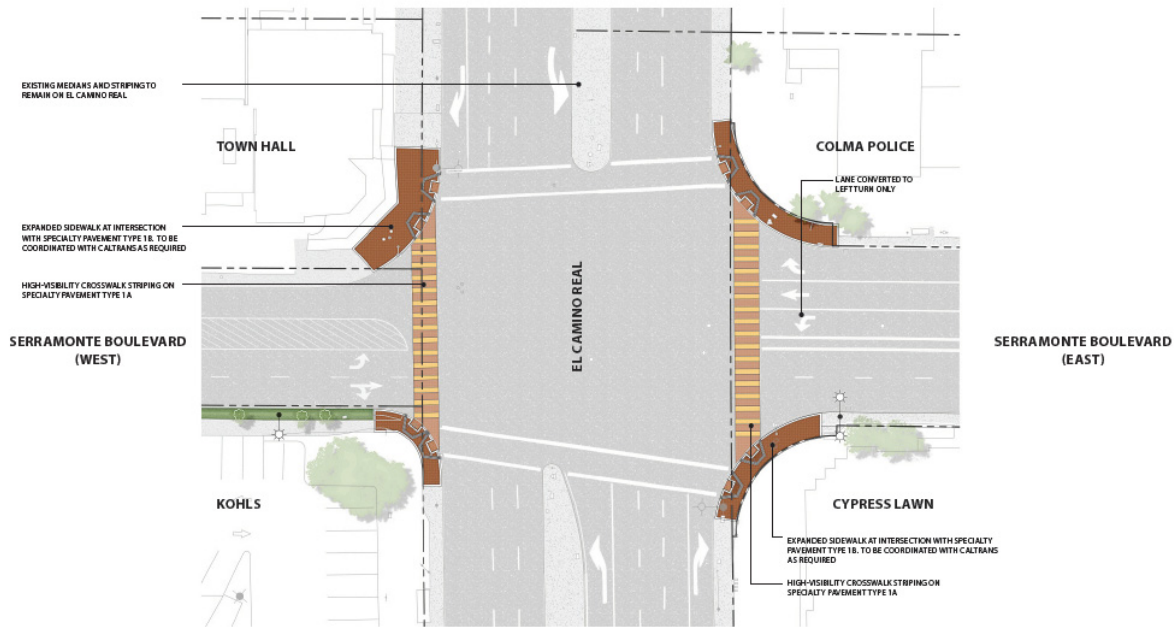
Existing Traffic Conditions

- Daily traffic volumes on Serramonte Boulevard average approximately 20,000 vehicles per day. Traffic volumes along the Serramonte Boulevard peak during the typical morning commute to work and during the typical evening commute home.
- On El Camino Real between Serramonte Boulevard and Collins Avenue the 85th percentile speed was measured at 40 miles per hour.
- Under Existing Conditions, all of the study intersections operate at LOS D or better with the exception of the all-way stop controlled intersection of Serramonte Boulevard/Serra Center Driveway which operates at LOS E during the weekday p.m., weekend midday, and weekend p.m. peak periods.
- Left-turn queues exceed the storage capacity at three study intersections during at least one peak period under Existing Conditions.
- A signal warrant analysis was performed on the unsignalized study intersections to determine the need for a traffic signal. The intersection of Serramonte Boulevard/Serra Center Driveway satisfies the signal warrant during all but one peak periods, and the intersection of El Camino Real/Collins Avenue satisfies the signal warrant criteria during all peak periods.
- Under Existing Conditions, during peak periods the average travel speed on Serramonte Boulevard was between 17 and 20 miles per hour in the eastbound direction and between 14 and 18 miles per hour in the westbound direction.
- Under Existing Conditions, Serramonte Boulevard has a Performance Index of 48.0 during the a.m. peak weekday hour and 96.0 during the p.m. peak weekday hour. During the weekend peak periods, Serramonte Boulevard has a Performance Index of 112.5 during the midday peak hour and 105.0 during the evening peak hour. A lower Performance Index indicates better corridor operations.

Master Plan Recommendations

Recommended Improvements

El Camino Real and Serramonte Boulevard:



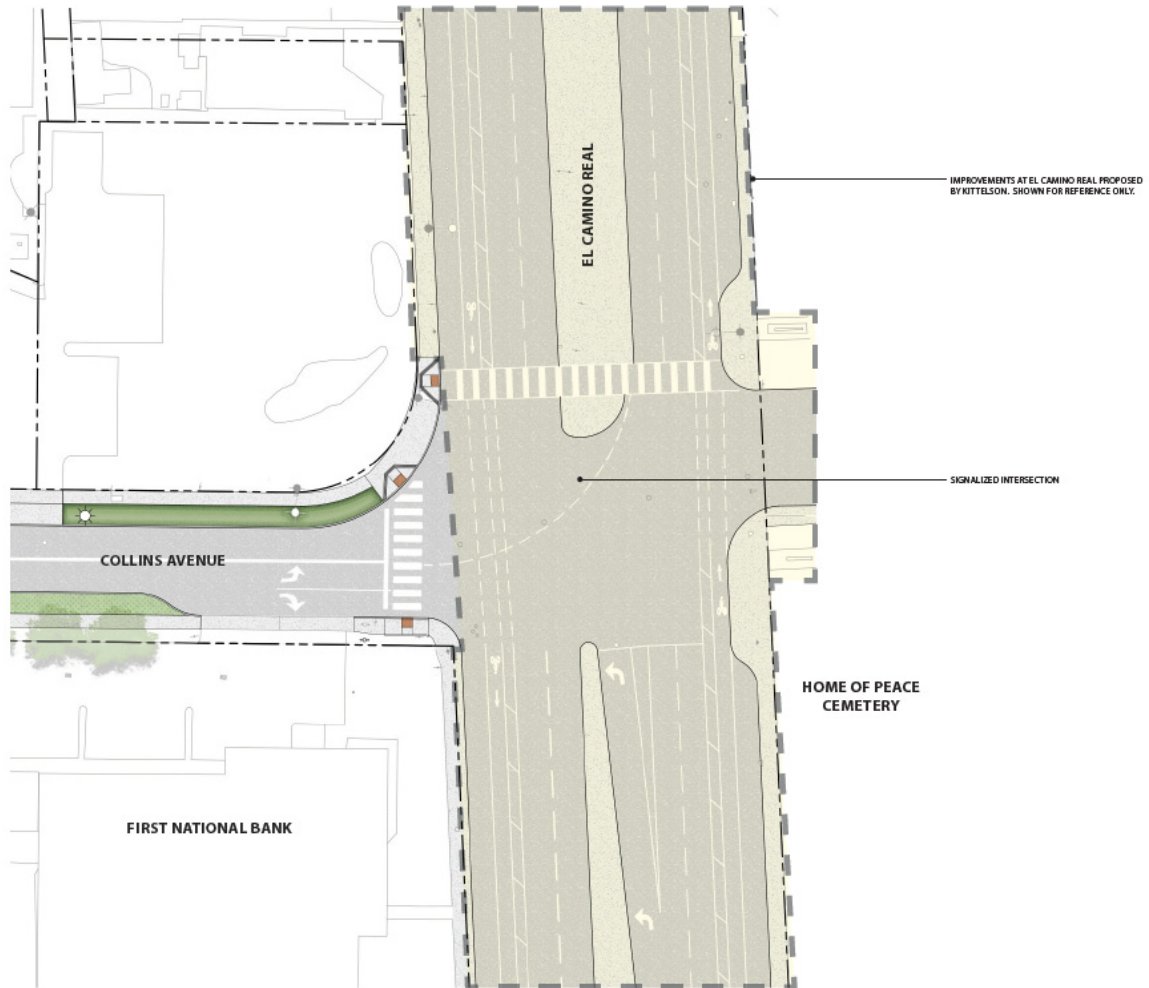
- Convert the Eastbound and Westbound Serramonte Boulevard approaches to protected left-turn phasing from split phase.
- Reconfigure the Eastbound Approach as follows:
 - One left-turn lane
 - One shared through-right turn lane
- Reconfigure the Westbound Approach as follows:
 - One left-turn lane
 - One through lane
 - One shared-through right turn lane
- Update the signal infrastructure and timing in conjunction with the proposed change in phasing
- Construct pedestrian refuge median on El Camino Real with a raised “nose” with pedestrian push buttons.

Serramonte Boulevard and Hillside Boulevard:



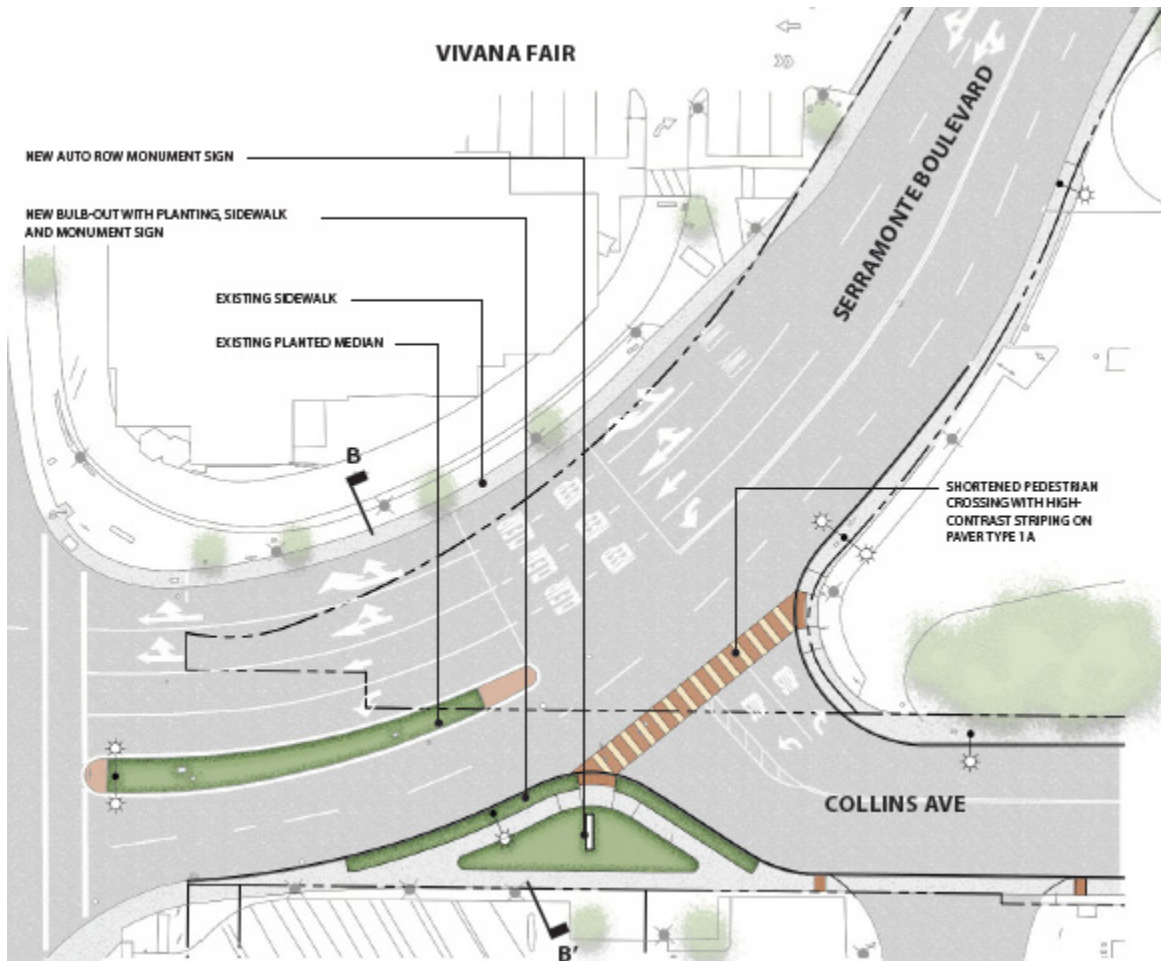
- Update intersection bike lane tracking through intersection

El Camino Real and Collins Avenue:



- Install a traffic signal
- Construct pedestrian refuge median on El Camino Real with a raised “nose” to provide an area for pedestrians to wait

Serramonte Boulevard and Collins Avenue:



- Remove slip right-turn lane
- Construct raised pedestrian plaza or gateway feature in place of right turn lane
- Add marked crosswalk
- Install accessible curb ramps

Serramonte Boulevard and Junipero Serra Boulevard:

- Construct pedestrian refuge median on Serramonte Boulevard with a raised “nose” to provide an area for pedestrians similar to the refuge on Junipero Serra Boulevard
- Add bicycle markings through intersection along Junipero Serra Boulevard

Serramonte Boulevard and the Serra Center Driveway nearest to Target:

- Install a traffic signal with protected-permitted left-turn phasing on eastbound Serramonte Boulevard

Recommended Serramonte Boulevard (West) Improvements

- A road diet between the Serra Center Driveway and El Camino Real. The road diet would convert the existing four lane roadway to one lane in each direction with a center two-way left turn lane. The remaining right-of-

way would be used to expand the sidewalks and install landscaping. The road diet provides improved driveway access, increased pedestrian safety, and maintains sufficient vehicular capacity

- A push-button activated mid-block RRFB crossing with a pedestrian refuge island and pedestrian crossing beacon between the Chevrolet dealership and the former Babies R Us project site
- A push-button activated midblock RRFB crossing with a pedestrian refuge island and pedestrian crossing beacon at the location of the Water District easement
- Expanded sidewalk at Serramonte Boulevard/El Camino Real and add high-visibility crosswalk striping

Recommended Serramonte Boulevard (East) Improvements

- No roadway configuration changes are proposed from El Camino Real to Hillside Avenue.
- Expanded sidewalk at Serramonte Boulevard/El Camino Real and add high-visibility crosswalk striping

Recommended Collins Avenue Improvements

- A reduction in the travel lane width to promote safety, decrease speeds, and increase parking capacity in response to stakeholder feedbacks
- Construct new on-street parking spaces
- Construct bulb-outs at existing utilities to maintain adequate sidewalk width
- Install cobra head street lighting
- Implement new planting areas
- Install black vinyl chain link fencing
- Designate two car hauler unloading zone locations
- A push-button activated midblock RRFB crossing with a pedestrian refuge island and pedestrian crossing beacon at the location of the Ford dealership lot

Master Plan Traffic Conditions

- Under Master Plan Conditions, the study intersections are expected to operate at the same or better level of service as compared to Existing Conditions. The installation of a traffic signal at the intersection of Serramonte Boulevard and the Serra Center Driveway and the reconfiguration of the intersection approaches at the intersection of Serramonte Boulevard and El Camino Real provide the greatest reduction in vehicle delay. The Master Plan Conditions are compared to the Existing Conditions in Table 9 and Table 10.
- Left-turn queuing is expected to continue to exceed the storage capacity at the intersections of Serramonte Boulevard and the I-280 Onramp, Serramonte Boulevard and Junipero Serra Boulevard, as well as El Camino Real and Serramonte Boulevard during at least one peak period under Master Plan Conditions.
- The corridor travel time is not expected to experience significant changes under Master Plan Conditions.
- Upon the implementation of the Master Plan, Serramonte Boulevard would be expected to operate with a Performance Index of 42.3, down from 48.0, during the a.m. peak weekday period and 78.2, down from 96.0, during the p.m. peak weekday period. During the weekend periods, it would be expected to operate with a Performance Index of 89.3 during the midday peak, down from 112.5, during the midday peak period and 88.6, down from 105.0 during the evening peak. These reductions in Performance Index indicate that the corridor is operating better under Master Plan Conditions.

Transportation Setting

Operational Analysis

Study Area and Periods

The study area, shown in Figure 1, consists of the following intersections:

1. Serramonte Boulevard/I-280 Southbound Ramps
2. Serramonte Boulevard/I-280 Northbound Ramps
3. Serramonte Boulevard/Junipero Serra Boulevard
4. Serramonte Boulevard /Collins Avenue
5. Serramonte Boulevard/Serra Center Driveway
6. El Camino Real/Serramonte Boulevard
7. Serramonte Boulevard/Hillside Boulevard
8. El Camino Real/Collins Avenue
9. Junipero Serra Boulevard/Serra Center Driveway

The study area, shown in Figure 1, consists of the following roadways:

1. Serramonte Boulevard
2. Collins Avenue
3. Juniper Cerro Boulevard
4. El Camino Real
5. Hillside Avenue

Operating conditions during the weekday a.m. and p.m. peak periods were evaluated to capture the highest volumes on the local transportation network during the work week. The morning peak period occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute. The p.m. peak period occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute.

Operating conditions during the weekday midday and weekend p.m. peak periods were evaluated as these time periods reflect the highest traffic volumes area wide and for the proposed project based the surrounding land uses. The weekend evening peak period occurs between 4:00 and 6:00 p.m., while the weekend midday peak period occurs between 12:00 and 2:00 p.m.

Traffic volumes collected for the purpose of this study were collected at study intersections and driveways by Kittleson & Associates and W-Trans on November 1st & 30th, 2017, as well as December 02, 2017. Turning movement counts at driveways were determined based on the number of vehicles entering and exiting the driveways and the directional distribution of vehicles traveling past the driveway. Turning movement counts were balanced using engineering judgement in order to reconcile the data collected on three separate days over the course of two months. The new data collected by W-Trans was provided to the Town in Excel spreadsheets and provided in Appendix A.

Study Intersections

1. **Serramonte Blvd/I-280 Southbound Ramps** is a signalized tee intersection with protected left-turns and a channelized right-turn for the southbound approach. There are no pedestrian or bicycle facilities at this intersection.



Serramonte Boulevard/Collins Avenue Master Plan
Figure 1 – Study Area and Lane Configurations

2. **Serramonte Blvd/ I-280 Northbound Ramps** is a signalized tee intersection with protected left-turns on the eastbound approach. There are no pedestrian or bicycle facilities at this intersection
3. **Serramonte Boulevard/Junipero Serra Boulevard** is a signalized four-legged intersection with protected left-turns on all four approaches. There are pedestrian crossings on the east and south legs. These crosswalks include a pedestrian refuge island with pedestrian push buttons. Additionally, there are Class II bike facilities on the northbound and southbound approaches.
4. **Serramonte Boulevard /Collins Ave** is a tee intersection with stop control on the Collins Avenue approach. A channelized right-turn is present for vehicles traveling eastbound. No marked pedestrian crossing points or bicycle facilities are present at this intersection.
5. **Serramonte Boulevard/Serra Center Driveway** is an all-way stop controlled tee intersection. Pedestrian crossings are present on the north and east legs of the intersection. No bicycle facilities are present at this intersection.
6. **El Camino Real/Serramonte Blvd** is a signalized four-legged intersection with protected left-turn phasing on the northbound and southbound approaches. The eastbound and westbound approaches operate with split phasing. There are crosswalks with pedestrian signal heads on all four approaches. There are no bicycle facilities present at this intersection.
7. **Serramonte Blvd/Hillside Ave** is a four-legged signalized intersection; however, the east leg is a private driveway to Cypress Lawn Cemetery. There are crosswalks with pedestrian signal heads on all four approaches. The northbound and southbound approaches have protected left-turn phasing. The eastbound and westbound approaches operate with protected/permitted left-turn phasing. Class II bicycle lanes are present on Hillside Boulevard in the north-south direction.
8. **El Camino Real/Collins Avenue** is a two-way stop controlled four-legged intersection with a private driveway as the east leg. The east and westbound legs of the intersection are stop controlled. Pedestrian crossings exist on the north and west leg. The northbound left turn lane has storage for approximately 5 vehicles. There are no bicycle facilities present at this intersection.
9. **Junipero Serra Boulevard/Serra Center Driveway** is a signalized tee intersection with protected left-turn phasing on the southbound approach. There are crosswalks with pedestrian signal heads on the westbound and southbound approaches. Class II bicycle lanes are present on Junipero Serra Boulevard in the north-south direction.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

Study Roadways

1. **Serramonte Boulevard** is a four-lane east-west oriented arterial with 11 foot travel lanes. A raised median is present from the I-280 Southbound ramp to the intersection of Collins Avenue. The posted speed limit along Serramonte Boulevard is 30 mph. There are many driveways located along Serramonte Boulevard between Junipero Serra Boulevard and Hillside Avenue, however no center two-way left turn lane is present. Drivers wishing to make a left-turn into any of these driveways have to slow or stop in the travel lane to wait for an adequate gap in traffic.
2. **Collins Avenue** is a two-lane east-west collector with 12 foot travel lanes. There is on-street parking along Collins Avenue between Serramonte Boulevard and El Camino Real. Collins is a heavily traveled cut-through route to access El Camino Real. The posted speed limit is 25 mph.
3. **Junipero Serra Boulevard** is a four to five lane north-south oriented arterial with 11-foot travel lanes. A raised median is present along the roadway and the posted speed limit is 40 mph.
4. **El Camino Real** is a six-lane north-south oriented regional connector with 10 foot travel lanes. A raised median is present along the roadway segment and the posted speed limit is 40 mph.
5. **Hillside Avenue** is a two-lane north-south oriented roadway with 12 foot travel lanes. The posted speed limit along Hillside Avenue is 30 mph.

Study Driveways

The study area also included the following driveways:

1. **Hyundai Auto Dealership Driveway** is located south of the intersection Serramonte Boulevard and Collins Avenue on Collins Avenue.
2. **Ford Auto Dealership Driveway** is located on the south side of Serramonte Boulevard approximately 100 feet east of the intersection of Serramonte Boulevard and Collins Avenue.
3. **Starbucks Driveway** is located on the north side of Serramonte Boulevard approximately 150 feet east of the intersection of Serramonte Boulevard and Collins Avenue.
4. **Serramonte Boulevard Serra Center Driveway** is located on the north side of Serramonte Boulevard approximately 125 west of the stop-controlled intersection of Serramonte Boulevard and Serra Center Driveway.
5. **Ford Auto Dealership Driveway** is located on the south side of Serramonte Boulevard across from the Serra Center Driveway (Driveway #4) approximately 150 feet west of the stop-controlled intersection of Serramonte Boulevard and Serra Center Driveway.
6. **Stewart Chevrolet Auto Dealership** is located on the north side of Serramonte Boulevard approximately 800 feet east of the intersection of Serramonte Boulevard and Serra Center Driveway.
7. **Serramonte Subaru Driveway** is located on the south side of Serramonte Boulevard approximately 850 feet west of the intersection of Serramonte Boulevard and El Camino Real. The driveway is approximately 50 feet wide.
8. **Serramonte Boulevard Kohl's Driveway** is located on the south side of Serramonte Boulevard approximately 300 feet west of the intersection of Serramonte Boulevard and El Camino Real.
9. **Honda of Serramonte Driveway** is located on the south side of Serramonte Boulevard approximately 350 feet east of the intersection of Serramonte Boulevard and El Camino Real. The driveway is approximately 60 feet wide.
10. **Acura of Serramonte Driveway** is also located on the south side of Serramonte Boulevard approximately 750 feet east of the Serramonte Boulevard and El Camino Real intersection.
11. **Car Max Driveway** is also located on the south side of Serramonte Boulevard approximately 1,100 feet east of the Serramonte Boulevard and El Camino Real intersection.
12. **El Camino Real Kohl's Driveway** is located on El Camino Real approximately 325 feet south of the intersection of Serramonte Boulevard and El Camino Real. The driveways is approximately 50 feet wide.
13. **Serra Center Driveway** is located on east side of Junipero Serra Boulevard north of the signalized Serra Center Driveway on Junipero Serra Boulevard.

Alternative Transportation Modes

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian countdown heads, curb ramps, and various streetscape amenities such as lighting, benches, etc. In general, a network of sidewalks, crosswalks, pedestrian countdown heads, and curb ramps provide access for pedestrians in the vicinity of the Serramonte Boulevard and Collins Avenue Master Plan project area; however, sidewalk gaps, obstacles, and barriers can be found along some of the roadways within the study area. Existing gaps and obstacles along the roadways impact convenient and continuous access for pedestrians. The lack of infrastructure or presence of obstacles present safety concerns in locations where appropriate pedestrian infrastructure should be present.

1. **Serramonte Boulevard** –Pedestrian crosswalks are present on the east and south legs of the intersection at Junipero Serra Boulevard to allow pedestrians to bypass the freeway ramp intersections. No crosswalks are present at the tee intersection of Collins Avenue and Serramonte Boulevard which represents a major gap in pedestrian connectivity and a potential safety concern, as identified in the Town's Systemic Safety Study.

Pedestrian crosswalks are present on the south and west legs of the intersection at Serra Center Driveway. Pedestrian crosswalks are also present on all four approaches at the intersection of Serramonte Boulevard/El Camino Real and Serramonte Boulevard/Hillside Boulevard. There are no pedestrian crossing opportunities between the Serra Center Driveway and El Camino Real along Serramonte Boulevard, a distance of approximately 2,000 feet. Lighting along the roadway is provided by overhead street lights.

2. **Collins Avenue** – Continuous sidewalks are present along Collins Avenue with the exception of a 0.20 mile section near Serramonte Boulevard. It should be noted that continuous sidewalk access is blocked by a fence extending into the roadway from a service driveway at 1500 Collins Avenue. Curb cuts are present at the driveways along the roadway. Overhead street lights are present along the corridor.
3. **Junipero Serra Boulevard** – Continuous sidewalks are provided along Junipero Serra Boulevard within the study area, with the exception of the west side of the roadway north of Serramonte Boulevard where pedestrians are prohibited near the freeway ramp intersections. Lighting along the roadway is provided by overhead street lights.
4. **El Camino Real** – Continuous sidewalks are provided on El Camino Real within the study area. Curb ramps and marked crosswalks are present at the intersection of El Camino Real and Serramonte Boulevard. However, truncated domes are only present on curb ramps at the northeast and southeast corners of the intersection. Lighting along the roadway is provided by overhead lighting.
5. **Hillside Boulevard** – Continuous sidewalks are present within study area on both sides of Hillside Boulevard between Villa Avenue and Collins Avenue. Curb ramps and marked crosswalks are present at all pedestrian crossing opportunities within the study area. Additionally, overhead street lights provide lighting along the roadway.

Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2017, classifies bikeways into four categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

Within the study area, no marked bicycle facilities are provided on Serramonte Boulevard between Gellert Boulevard and Hillside Boulevard. Bicyclists must ride in the roadway and/or on sidewalks. Table 1 summarizes the existing bicycle facilities located near the study area.

Table 1 – Bicycle Facility Summary				
Status Facility	Class	Length (miles)	Begin Point	End Point
Existing				
Serramonte Boulevard	II	0.23	Callan Boulevard	Serramonte Center
Junipero Serra Boulevard	II	0.56	Town Limits	Town Limits
Hillside Boulevard	II	1.71	Town Limits	Town Limits

Transit Facilities

The Colma BART Station is located approximately one mile north of Serramonte Boulevard and Collins Avenue Master Plan project area. Commuter rail service is provided via BART throughout Alameda, Contra Costa, San Francisco, San Mateo, and Santa Clara County. Service is provided seven days a week between the hours of 4:00 a.m. and 1:00 a.m. and operates on headways of 15-60 minutes depending on the day of the week.

The San Mateo County Transit District (SamTrans) provides fixed route bus service in the Town of Colma. SamTrans Local Route 112 provides service to between the Colma Bay Area Rapid Transit (BART) Station and the Linda Mar Shopping Center in the City of Pacifica. Within the Town of Colma, Route 112 stops at the intersection of Serramonte Boulevard and Junipero Serra Boulevard, west of the Chipotle drive-through entrance. Route 112 operates Monday through Friday on approximately 60 minute headways between 6:30 a.m. and 8:00 p.m. Saturday and Sunday service operates on approximately 60 minute headways between 8:30 a.m. and 6:30 p.m.

SamTrans Local Route 120 provides service between Colma BART Station and the Daily City BART Station. The route stops at the intersection of Serramonte Boulevard and Junipero Serra Boulevard, west of the Chipotle drive-through entrance. Route 120 operates Monday through Friday on approximately 15 minute headways between 5:00 a.m. and 12:00 a.m. Saturday service operates on approximately 60 minute headways between 6:00 a.m. and 12:00 a.m. Sunday service operates on approximately 30-minute headways between 6:00 a.m. and 11:00 p.m.

SamTrans Local Route 122 provides service between the South San Francisco BART Station and the Stonestown Shopping Center. The route stops at the intersection of Serramonte Boulevard and Junipero Serra Boulevard, west of the Chipotle drive through entrance. Route 122 operates Monday through Friday on approximately 30 minute headways between 5:00 a.m. and 11:30 p.m. Saturday and Sunday service operates on approximately 30 minute headways between 8:00 a.m. and 11:30 p.m.

SamTrans Route ECR provides service between the Palo Alto Transit Center and the Daly City BART Station. The route stops at the intersection of Serramonte Boulevard and El Camino Real. Route ECR operates Monday through Friday on approximately 15 minute headways between 4:00 a.m. and 2:00 a.m. Saturday and Sunday service operates on approximately 20-30 minute headways between 4:30 a.m. and 2:00 a.m.

Two bicycles can be carried on most SamTrans buses. Bike rack space is on a first come, first served basis. Additional bicycles are allowed on SamTrans buses at the discretion of the driver with a limit of two bicycles inside the bus.

Dial-a-ride, also known as paratransit, or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. SamTrans Paratransit is designed to serve the needs of individuals with disabilities within the Town of Colma.

Existing Capacity Analysis

The Existing Conditions capacity analysis included intersection level of service, left-turn lane queuing, the need for the installation of a traffic signal at unsignalized study intersections, a simulation of the travel time on Serramonte Boulevard, and a review the corridor Performance Index. The Existing Conditions baselines will be used to understand the potential impact of the Master Plan.

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2000. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The Levels of Service for the intersections with side-street stop controls, or those which are unsignalized and have one or two approaches stop controlled, were analyzed using the “Two-Way Stop-Controlled” intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The study intersections with stop signs on all approaches were analyzed using the “All-Way Stop-Controlled” Intersection methodology from the HCM. This methodology evaluates delay for each approach based on turning movements, opposing and conflicting traffic volumes, and the number of lanes. Average vehicle delay is computed for the intersection as a whole and is then related to a Level of Service.

The study intersections that are currently controlled by a traffic signal were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using optimized signal timing.

The ranges of delay associated with the various levels of service are indicated in Table 2.

Table 2 – Intersection Level of Service Criteria

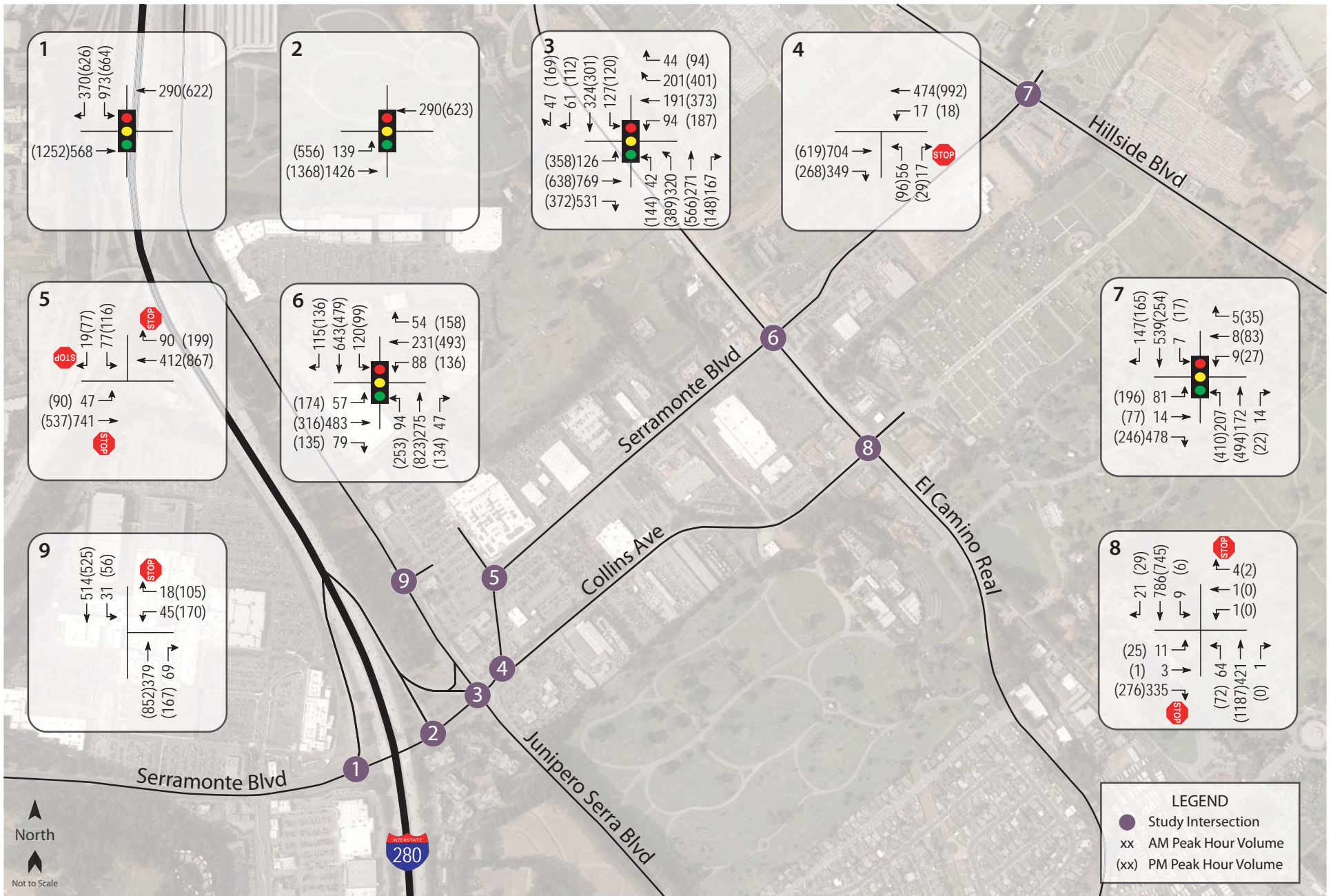
LOS	Two-Way Stop-Controlled	All-Way Stop-Controlled	Signalized
A	Delay of 0 to 10 seconds.	Delay of 0 to 10 seconds.	Delay of 0 to 10 seconds.
B	Delay of 10 to 15 seconds.	Delay of 10 to 15 seconds.	Delay of 10 to 20 seconds.
C	Delay of 15 to 25 seconds.	Delay of 15 to 25 seconds.	Delay of 20 to 35 seconds.
D	Delay of 25 to 35 seconds.	Delay of 25 to 35 seconds.	Delay of 35 to 55 seconds.
E	Delay of 35 to 50 seconds.	Delay of 35 to 50 seconds.	Delay of 55 to 80 seconds.
F	Delay of more than 50 seconds.	Delay of more than 50 seconds.	Delay of more than 80 seconds.

Reference: *Highway Capacity Manual*, Transportation Research Board, 2000

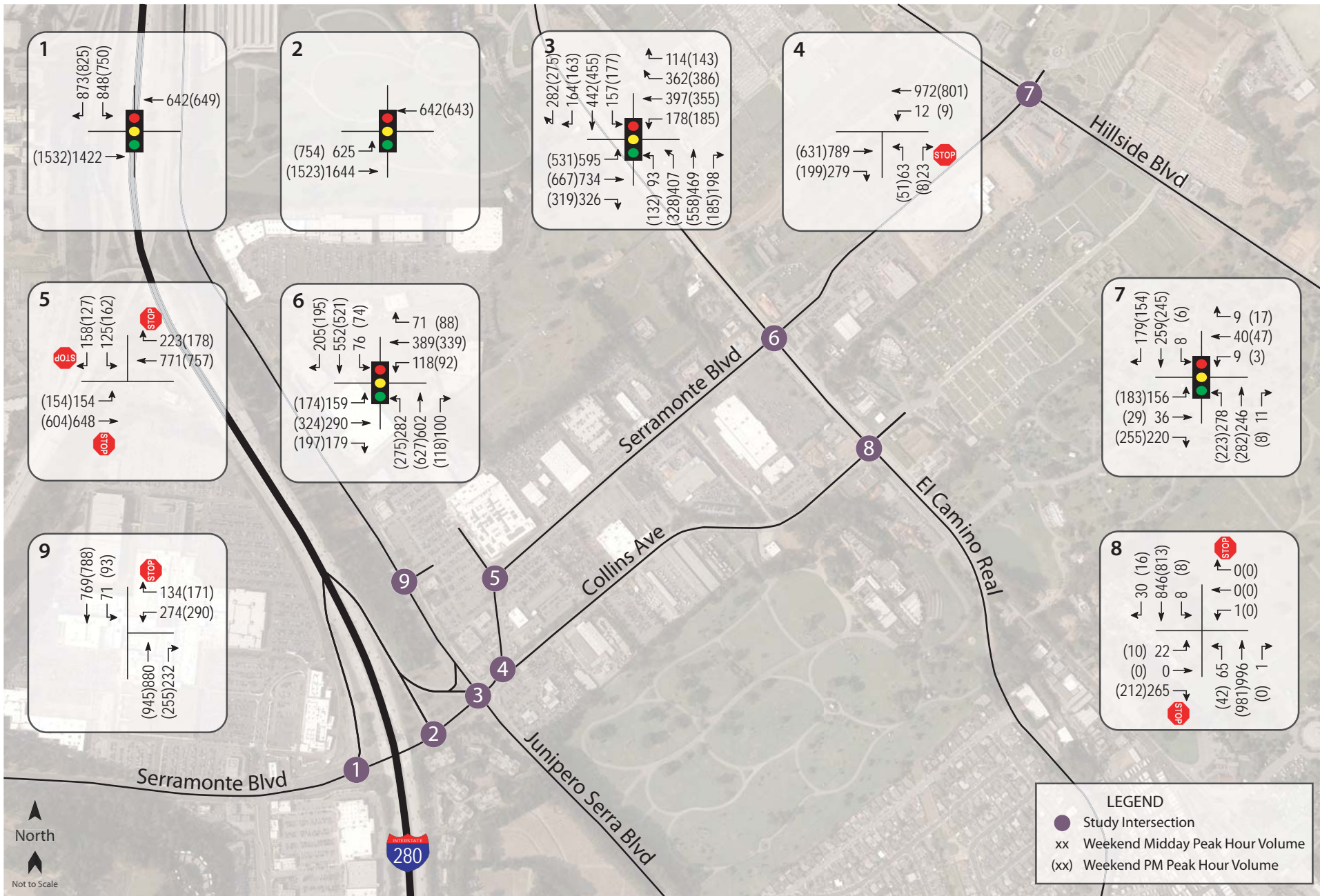
Existing Conditions: Intersection Levels of Service

Under existing conditions, all intersections operate at LOS D or better with the exception of the all-way stop controlled intersection of Serramonte Boulevard and Serra Center Driveway which operates at LOS E during the weekday p.m., weekend midday, and weekend p.m. peak periods. The existing traffic volumes are shown in Figure 2 for the weekday peak periods and in Figure 3 for the weekend peak periods. A summary of the intersection level of service calculations is shown in Table 3 for the weekday peak periods and in Table 4 for the weekend peak periods. Copies of the Level of Service calculations are provided in Appendix B.

The location of the study driveways is shown in Figure 4. The existing traffic volumes at the study driveways are shown in Figure 5 for the weekday peak periods and in Figure 6 for the weekend peak periods.



Serramonte Boulevard/Collins Avenue Master Plan
 Figure 2 – Existing Weekday Traffic Volumes



Serramonte Boulevard/Collins Avenue Master Plan
Figure 3 – Existing Weekend Traffic Volumes



Serramonte Boulevard/Collins Avenue Master Plan
Figure 4 – Study Driveway Locations



Serramonte Boulevard/Collins Avenue Master Plan
Figure 5 – Existing Weekday Driveway Ins and Outs





Serramonte Boulevard/Collins Avenue Master Plan
Figure 6 – Existing Weekend Driveway Ins and Outs

Table 3 – Existing Weekday Peak Hour Intersection Levels of Service

Study Intersection Approach	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. Serramonte Blvd/I-280 Southbound Ramps	10.8	B	12.6	B
2. Serramonte Blvd/I-280 Northbound Ramps	1.6	A	3.7	A
3. Serramonte Boulevard/Junipero Serra Blvd	26.1	C	33.6	C
4. Serramonte Blvd/Collins Ave	0.7	A	1.1	A
<i>Northbound Approach</i>	<i>13.7</i>	<i>B</i>	<i>16.8</i>	<i>C</i>
5. Serramonte Blvd/Serra Center Driveway	16.6	C	40.7	E
6. El Camino Real/Serramonte Blvd	26.6	C	35.1	D
7. Serramonte Blvd/Hillside Blvd	27.5	C	28.0	C
8. El Camino Real/Collins Ave	2.7	A	1.7	A
<i>Eastbound Approach</i>	<i>10.3</i>	<i>B</i>	<i>11.3</i>	<i>B</i>
<i>Westbound Approach</i>	<i>12.3</i>	<i>B</i>	<i>11.4</i>	<i>B</i>
9. Junipero Serra Blvd / Serra Center Driveway	11.6	B	10.0	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

Table 4 – Existing Weekend Peak Hour Intersection Levels of Service

Study Intersection Approach	Weekend Midday Peak		Weekend PM Peak	
	Delay	LOS	Delay	LOS
1. Serramonte Blvd/I-280 Southbound Ramps	15.7	B	16.0	B
2. Serramonte Blvd/I-280 Northbound Ramps	3.7	A	4.4	A
3. Serramonte Boulevard/Junipero Serra Blvd	41.5	D	40.4	D
4. Serramonte Blvd/Collins Ave	0.8	A	0.6	A
<i>Northbound Approach</i>	<i>17.3</i>	<i>C</i>	<i>15.0</i>	<i>B</i>
5. Serramonte Blvd/Serra Center Driveway	48.9	E	41.4	E
6. El Camino Real/Serramonte Blvd	34.4	C	33.9	C
7. Serramonte Blvd/Hillside Blvd	23.9	C	18.8	B
8. El Camino Real/Collins Ave	1.6	A	1.3	A
<i>Eastbound Approach</i>	<i>10.7</i>	<i>B</i>	<i>10.1</i>	<i>B</i>
<i>Westbound Approach</i>	<i>29.4</i>	<i>D</i>	<i>0.0</i>	<i>A</i>
9. Junipero Serra Blvd / Serra Center Driveway	10.7	B	10.6	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

Existing Conditions: Queuing

Under Existing Conditions, the projected maximum queues in left-turn lanes at the study intersections were determined using the SIMTRAFFIC application of Synchro and averaging the 95th percentile queues projected queue for each of ten runs. Summarized in Table 5 are the 95th percentile left turn queues at the study intersections where left-turn lanes are present, and the queue spillback has the potential to impede the flow of traffic in the adjacent travel lane. Copies of the SIMTRAFFIC projections are contained in Appendix B.

Table 5 – 95th Percentile Left Turn Queues at Study Intersections with Left-Turn Lanes

Study Intersection Approach	Available Storage	95 th Percentile Queues			
		Weekday AM	Weekday PM	Weekend Mid	Weekend PM
2. Serramonte Blvd/I-280 Northbound Ramp Eastbound Left	400	74	195	318	536
3. Serramonte Blvd/Junipero Serra Blvd Northbound Left	590	267	389	404	373
Eastbound Left	532	141	326	512	452
Southbound Left	320	108	119	184	209
Westbound Left	145	112	176	173	175
6. El Camino Real/Serramonte Blvd Northbound Left	200	114	240	247	244
Southbound Left	300	139	123	93	101
7. Serramonte Blvd/Hillside Ave Northbound Left	300	236	300	196	157
Southbound Left	75	34	62	37	28
8. El Camino Real/Collins Ave Northbound Left	130	36	36	36	30
9. Junipero Serra Blvd / Serra Center Driveway Southbound Left	210	50	65	76	95

Notes: Maximum Queue based on the average of the maximum value from ten SIMTRAFFIC runs; all distances are measured in feet; **Bold** text = queue length exceeds available storage

Left-turn storage exceeds existing storage capacity at three study intersections during at least one peak period. At the Serramonte Boulevard and I-280 Northbound Ramp intersection, the eastbound left-turn queue exceeds the capacity during the weekend p.m. peak period. The westbound left-turn queues at the Serramonte Boulevard and Junipero Serra Boulevard intersection extend through the Serramonte Boulevard and Collins Avenue intersection and could impede vehicles attempting to turn left off of Collins Avenue on to Serramonte Boulevard during all peak periods except for during the weekday a.m. peak period. The northbound left-turn queues at the El Camino Real and Serramonte Boulevard intersection exceed the storage capacity during all peak periods except for during the weekday a.m. peak period.

Existing Conditions: Signal Warrants

A signal warrant analysis was performed to determine potential need for a traffic signal at the following unsignalized study intersections: Serramonte Blvd and Collins Avenue, Serramonte Boulevard and Serra Shopping Center Driveway, and El Camino Real and Collins Avenue.

Chapter 4C of the *California Manual on Uniform Traffic Control Devices* (CA-MUTCD) provides guidance on when a traffic signal should be considered. There are nine different warrants, or criteria, presented, as follows:

- Warrant 3, Peak Hour Volume

Warrant 3, which is often the first warrant to be met, includes a notice that this signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time. Under the Peak Hour Warrant the need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

- A. If all three of the following conditions exist for the same one hour (any four consecutive 15-minute periods) of an average day:
 1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: four vehicle-hours for a one-lane approach; or five vehicle-hours for a two-lane approach, and
 2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
 3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.
- B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

Additionally, the Highway Capacity Manual states, "If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-4 may be used in place of Figure 4C-3 to evaluate the criteria in the second category of the Standard." While the Town of Colma's population is under 10,000 residents, it is not an isolated community. Both South San Francisco and Daly City are considered "built-up areas" within significantly larger populations which border the town limits of Colma. For this reason, Figure 4C-3 was used to conduct signal warrants at study intersections.

For the purposes of this study, Warrant 3, the Peak Hour volume warrant, which determines the need for traffic control based on the highest volume hour of the day, was used as an initial indication of traffic control needs. The use of this signal warrant is common practice for planning studies. Other warrants, which are more generally applicable to existing traffic issues, require collection of traffic volumes for the highest four or eight hours of the day, review of the collision history, and evaluation of the system surrounding the location.

The intersection of Serramonte Boulevard and Serra Center Driveway satisfies Warrant 3 during all peak periods except during the a.m. peak period. Similarly, a signal warrant was met for all peak periods at the intersection of El Camino Real and Collins Avenue. Additional daily traffic count data should be collected to review Warrant 1

and Warrant 2 to confirm all of the traffic volume warrants are satisfied at these intersections. The intersection of Serramonte Boulevard and Collins Avenue does not satisfy the conditions of Warrant 3 during any peak period.

Existing Conditions: Corridor Travel Time

The SIMTRAFFIC application of Synchro was used to model corridor travel time in the study area. Table 6 provides a summary of modeled existing travel time and average speed from the microsimulation model along Serramonte Boulevard between the I-280 Southbound Ramp intersection and the Hillside Avenue intersection. This information is provided for reference and will be used to understand the potential impact of roadway configuration changes along Serramonte Boulevard as part of this project.

Direction of Travel	Weekday AM Peak		Weekday PM Peak		Weekend Midday Peak		Weekend Evening Peak	
	Average TT	Average Speed	Average TT	Average Speed	Average TT	Average Speed	Average TT	Average Speed
EB Serramonte Blvd	4:06	20	4:33	18	4:32	18	4:51	17
<i>Approaching JSB</i>	<i>1:21</i>	<i>17</i>	<i>1:30</i>	<i>16</i>	<i>1:42</i>	<i>14</i>	<i>1:58</i>	<i>12</i>
<i>JSB to El Camino Real</i>	<i>1:43</i>	<i>17</i>	<i>1:53</i>	<i>16</i>	<i>1:53</i>	<i>16</i>	<i>1:55</i>	<i>16</i>
<i>El Camino Real to Hillside Blvd</i>	<i>1:02</i>	<i>29</i>	<i>1:10</i>	<i>26</i>	<i>0:57</i>	<i>32</i>	<i>0:58</i>	<i>31</i>
WB Serramonte Blvd	3:49	18	4:36	15	4:54	14	4:44	15
<i>Hillside Blvd to El Camino Real</i>	<i>1:35</i>	<i>19</i>	<i>1:56</i>	<i>15</i>	<i>1:40</i>	<i>18</i>	<i>1:41</i>	<i>18</i>
<i>El Camino Real to JSB</i>	<i>1:38</i>	<i>18</i>	<i>2:00</i>	<i>15</i>	<i>2:27</i>	<i>12</i>	<i>2:15</i>	<i>13</i>
<i>Beyond JSB</i>	<i>0:36</i>	<i>20</i>	<i>0:40</i>	<i>18</i>	<i>0:47</i>	<i>15</i>	<i>0:48</i>	<i>15</i>

Notes: TT (Travel Time) is measured in minutes: seconds; Average Speed is measured in miles per hour (mph); JSP = Junipero Serra Boulevard

Existing Conditions: Measures of Effectiveness

A Performance Index analysis is typically incorporated as a method to compare project alternatives to one another, and it was applied in order to understand the impact of the Master Plan. A Performance Index is calculated for each alternative by combining multiple measures of effectiveness into a single score which allows practitioners to compare and contrast alternatives more easily. Measures of effectiveness can include control delay, the number of vehicle stops, fuel consumption, queue lengths, and operating costs. For the purposes of this study, the Performance Index takes the total delay into account in combination with the number of vehicle stops over the course of an hour along the corridor. A low Performance Index is good, and indicates a corridor with higher vehicle through put. For example, if the signalization of an intersection increases the calculated Performance Index of a corridor, the stop delay caused by the new signal would be the cause of the increase. Under Existing Conditions, Serramonte Boulevard has a Performance Index of 48.0 during the a.m. peak hour and 96.0 during the p.m. peak hour. A summary of the measures of effectiveness is shown in Table 7.

Table 7– Existing Weekday Serramonte Boulevard Measures of Effectiveness

Measure of Effectiveness	AM Peak	PM Peak
Total Delay (Hours)	35	76
Stops (Total Number of Stops)	4,571	7,375
Average Speed (mph)	18	14
Total Travel Time (Hours)	85	146
Distance Traveled (Miles)	1,489	2,118
Unserviced Vehicles (Total Number)	0	0
Performance Index	48.0	96.0

Notes: mph = Miles per Hour; Performance Index = $[(D * 1) + (St * 10)]/3600$ where D = Total Delay (in seconds) and St = Stops

Under Existing Conditions, Serramonte Boulevard has a Performance Index of 112.5 during the weekend midday peak hour and 105.0 during the weekend evening peak hour. A summary of the measures of effectiveness is shown in Table 8.

Table 8– Existing Weekend Serramonte Boulevard Measures of Effectiveness

Measure of Effectiveness	Weekend Midday Peak	Weekend Evening Peak
Total Delay (Hours)	90	83
Stops (Total Number of Stops)	8,091	7,888
Average Speed (mph)	13	14
Total Travel Time (Hours)	160	151
Distance Traveled (Miles)	2,102	2,050
Unserviced Vehicles (Total Number)	0	0
Performance Index	112.5	105.0

Notes: mph = Miles per Hour; Performance Index = $[(D * 1) + (St * 10)]/3600$ where D = Total Delay (in seconds) and St = Stops

Recommended Transportation Improvements

The transportation recommendations included in the Master Plan are summarized in this section. These recommendations are analyzed as part of the Master Plan Capacity Analysis section.

Pedestrian Facility Improvements

The Master Plan includes the following proposed generalized pedestrian facility improvements:

- Detectable warning ADA pavers;
- High-contrast striping;
- Sharks teeth markings (advanced yield lines);
- Shortened pedestrian crossing distances;
- Sidewalk gap closures;
- High visibility pedestrian crossing signs;
- Standard width sidewalks to fill in existing gaps;
- Additional mid-block crossing opportunities;
- Rapid rectangular flashing beacons (RRFB) at mid-block crossings;
- Improved wayfinding and monument signage;
- Specialty pavement treatments;
- High/low signature light fixtures;
- Signature pedestrian-scale light poles and fixtures;
- Signature seating elements; and
- Trees, shrubs, perennials, and grasses to beautify the pedestrian space.

Intersection Improvements

The Master Plan includes the following proposed improvements at the intersection of El Camino Real and Serramonte Boulevard:

- Convert the Eastbound and Westbound Serramonte Boulevard approaches to protected left-turn phasing from split phase.
- Reconfigure the Eastbound Approach as follows:
 - One left-turn lane
 - One shared through-right turn lane
- Reconfigure the Westbound Approach as follows:
 - One left-turn lane
 - One through lane
 - One shared-through right turn lane
- Update the signal infrastructure and timing in conjunction with the proposed change in phasing
- Construct pedestrian refuge median on El Camino Real with a raised “nose” with pedestrian push buttons.

The Master Plan includes the following proposed improvements at the intersection of Serramonte Boulevard and Hillside Boulevard:

- Update intersection bike lane tracking through intersection

The Master Plan includes the following proposed improvements at the intersection of El Camino Real and Collins Avenue:

- Install a traffic signal
- Construct pedestrian refuge median on El Camino Real with a raised “nose” to provide an area for pedestrians to wait

The Master Plan includes the following proposed improvements at the intersection of Serramonte Boulevard and Collins Avenue:

- Remove slip right-turn lane
- Construct raised pedestrian plaza or gateway feature in place of right turn lane
- Add marked crosswalk
- Install accessible curb ramps

The Master Plan includes the following proposed improvements at the intersection of Serramonte Boulevard and Junipero Serra Boulevard:

- Construct pedestrian refuge median on Serramonte Boulevard with a raised “nose” to provide an area for pedestrians similar to the refuge on Junipero Serra Boulevard
- Add bicycle markings through intersection along Junipero Serra Boulevard

The Master Plan includes the following proposed improvements at the intersection of Serramonte Boulevard and the Serra Center Driveway nearest to Target:

- Install a traffic signal with protected-permitted left-turn phasing on eastbound Serramonte Boulevard

Serramonte Boulevard (West) Improvements

The Master Plan includes the following proposed improvements for the western section of Serramonte Boulevard:

- A road diet between the Serra Center Driveway and El Camino Real. The road diet would convert the existing four lane roadway to one lane in each direction with a center two-way left turn lane. The remaining right-of-way would be used to expand the sidewalks and install landscaping. The road diet provides improved driveway access, increased pedestrian safety, and maintains sufficient vehicular capacity
- A push-button activated mid-block RRFB crossing with a pedestrian refuge island and pedestrian crossing beacon between the Chevrolet dealership and the former Babies R Us project site
- A push-button activated midblock RRFB crossing with a pedestrian refuge island and pedestrian crossing beacon at the location of the Water District easement
- Expanded sidewalk at Serramonte Boulevard/El Camino Real and add high-visibility crosswalk striping

Serramonte Boulevard (East) Improvements

The Master Plan includes the following proposed improvements for the eastern section of Serramonte Boulevard:

- No roadway configuration changes are proposed from El Camino Real to Hillside Avenue.
- Expanded sidewalk at Serramonte Boulevard/El Camino Real and add high-visibility crosswalk striping

Collins Avenue Improvements

The Master Plan includes the following proposed improvements for Collins Avenue:

- A reduction in the travel lane width to promote safety, decrease speeds, and increase parking capacity in response to stakeholder feedbacks
- Construct new on-street parking spaces
- Construct bulb-outs at existing utilities to maintain adequate sidewalk width
- Install cobra head street lighting
- Implement new planting areas
- Install black vinyl chain link fencing
- Designate two car hauler unloading zone locations
- A push-button activated midblock RRFB crossing with a pedestrian refuge island and pedestrian crossing beacon at the location of the Ford dealership lot

Master Plan Capacity Analysis

The Master Plan Conditions capacity analysis included intersection level of service, left-turn lane queuing, queuing changes at the Serra Center Driveway intersection, a simulation of the travel time on Serramonte Boulevard, and a review the corridor Performance Index. The Master Plan Conditions were compared to the Existing Conditions baselines. The Master Plan conditions include several changes to the existing roadway geometry including but not limited to the following:

- Protected left-turn phasing and signal timing update at the intersection of El Camino Real and Serramonte Boulevard;
- The installation of a traffic signal at the intersection located at El Camino Real and Collins Avenue;
- The removal of the existing slip right-turn at the intersection of Serramonte Boulevard and Collins Avenue;
- The installation of a traffic signal at the intersection of Serramonte Boulevard and the Serra Center driveway nearest to Target, including protected-permitted left-turn phasing on eastbound Serramonte Boulevard.
- A road diet between the Serra Center Driveway and El Camino Real to include one lane in each direction with a center two-way left turn lane;
- A reduction in the travel lane width along Collins Avenue and an increase parking capacity in response to stakeholder feedbacks

Master Plan Conditions: Intersection Level of Service

Upon the implementation of the Master Plan, the study intersections are expected to operate at the same or better level of service as compared to Existing Conditions. The installation of traffic signals at the Serramonte Boulevard/Serra Center Driveway and El Camino Real/Collins Avenue intersections reduced the overall delay at those intersections. The average delay increased slightly at the intersection of El Camino Real/Serramonte Boulevard due to a change in signal phasing. These results are summarized for the weekday peak periods in Table 9 and for the weekend peak periods in Table 10.

Table 9 –Weekday Existing and Master Plan Peak Hour Intersection Levels of Service

Study Intersection Approach	Existing Conditions				Master Plan Conditions			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Serramonte Blvd/I-280 Southbound Ramps	10.8	B	12.6	B	10.8	B	12.6	B
2. Serramonte Blvd/I-280 Northbound Ramps	1.6	A	3.7	A	1.6	A	3.7	A
3. Serramonte Boulevard/Junipero Serra Blvd	26.1	C	33.6	C	26.1	C	33.6	C
4. Serramonte Blvd/Collins Ave	0.7	A	1.1	A	0.7	A	1.1	A
<i>Northbound Approach</i>	<i>13.7</i>	<i>B</i>	<i>16.8</i>	<i>C</i>	<i>13.7</i>	<i>B</i>	<i>16.8</i>	<i>C</i>
5. Serramonte Blvd/Serra Center Driveway	16.6	C	40.7	E	4.7	A	7.5	A
6. El Camino Real/Serramonte Blvd	26.6	C	35.1	D	34.5	C	35.8	D
7. Serramonte Blvd/Hillside Blvd	27.5	C	28.0	C	27.5	C	28.0	C
8. El Camino Real/Collins Ave	2.7	A	1.7	A	10.4	B	8.7	A
<i>Eastbound Approach</i>	<i>10.3</i>	<i>B</i>	<i>11.3</i>	<i>B</i>	-	-	-	-
<i>Westbound Approach</i>	<i>12.3</i>	<i>B</i>	<i>11.4</i>	<i>B</i>	-	-	-	-
9. Junipero Serra Blvd / Serra Center Driveway	11.6	B	10.0	B	11.6	C	10.0	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

Table 10 – Weekend Existing and Master Plan Peak Hour Intersection Levels of Service

Study Intersection Approach	Existing Conditions				Master Plan Conditions			
	Weekend Midday		Weekend Evening		Weekend Midday		Weekend Evening	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Serramonte Blvd/I-280 Southbound Ramps	15.7	B	16.0	B	15.7	B	16.0	B
2. Serramonte Blvd/I-280 Northbound Ramps	3.7	A	4.4	A	3.7	A	4.4	A
3. Serramonte Boulevard/Junipero Serra Blvd	41.5	D	40.4	D	41.1	D	41.7	D
4. Serramonte Blvd/Collins Ave <i>Northbound Approach</i>	0.8 <i>17.3</i>	A <i>C</i>	0.6 <i>15.0</i>	A <i>B</i>	0.8 <i>13.3</i>	A <i>B</i>	0.6 <i>18.0</i>	A <i>C</i>
5. Serramonte Blvd/Serra Center Driveway	48.9	E	41.4	E	7.7	A	9.4	A
6. El Camino Real/Serramonte Blvd	34.4	C	33.9	C	33.7	C	34.0	C
7. Serramonte Blvd/Hillside Blvd	23.9	C	18.8	B	21.4	C	18.8	B
8. El Camino Real/Collins Ave <i>Eastbound Approach</i> <i>Westbound Approach</i>	1.6 <i>10.7</i> <i>29.4</i>	A <i>B</i> <i>D</i>	1.3 <i>10.1</i> <i>0.0</i>	A <i>B</i> <i>A</i>	9.0 - -	A - -	7.5 - -	A - -
9. Junipero Serra Blvd / Serra Center Driveway	10.7	B	10.6	B	10.6	B	11.9	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

Master Plan Conditions: Queuing Analysis

Under Master Plan Conditions, the projected maximum queues in left-turn lanes at the study intersections were determined using the SIMTRAFFIC application of Synchro and averaging the 95th percentile queues projected queue for each of ten runs. These queues were compared to the projected maximum queues under Existing Conditions. Summarized in Table 11 are the 95th percentile left turn queues at the study intersections where left-turn lanes are present, and the queue spillback has the potential to impede the flow of traffic in the adjacent travel lane.

Table 11 – 95th Percentile Left Turn Queues at Study Intersections with Left-Turn Lanes

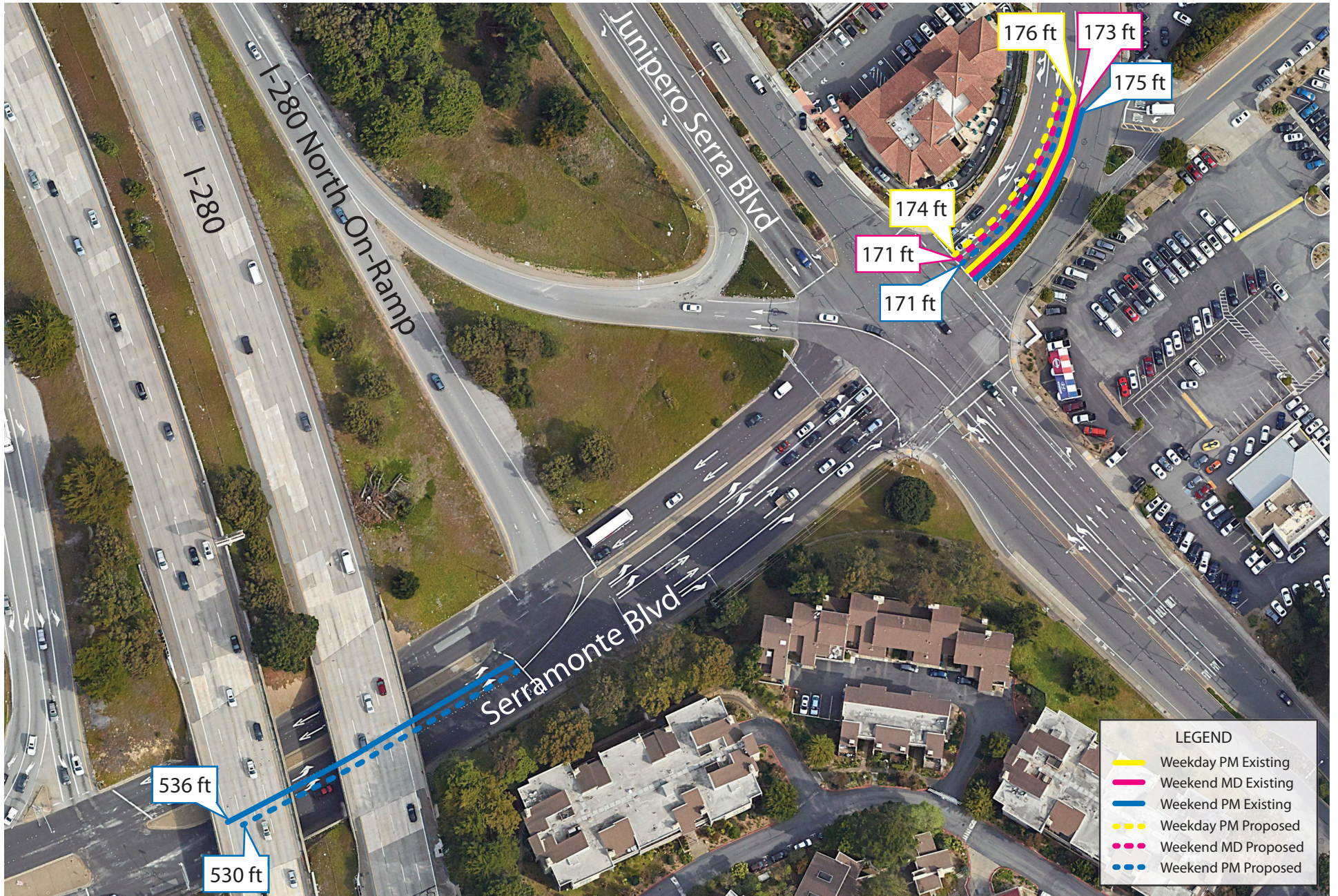
Study Intersection Approach	Available Storage	95 th Percentile Queues (Existing Conditions/Master Plan Conditions)			
		Weekday AM	Weekday PM	Weekend Mid	Weekend PM
2. Serramonte Blvd/I-280 Northbound Ramp Eastbound Left	400	74 / 72	195 / 249	318 / 295	536 / 530
3. Serramonte Blvd/Junipero Serra Blvd Northbound Left	590	267 / 290	389 / 405	404 / 412	373 / 368
Eastbound Left	532	141 / 148	326 / 315	512 / 501	452 / 460
Southbound Left	320	108 / 126	119 / 122	184 / 180	209 / 284
Westbound Left	145	112 / 110	176 / 174	173 / 171	175 / 171
6. El Camino Real/Serramonte Blvd Northbound Left	200	114 / 128	240 / 252	247 / 263	244 / 221
Southbound Left	300	139 / 243	123 / 122	93 / 108	101 / 98
7. Serramonte Blvd/Hillside Ave Northbound Left	300	236 / 198	300 / 297	196 / 189	157 / 163
Southbound Left	75	34 / 42	62 / 56	37 / 36	28 / 29
8. El Camino Real/Collins Ave Northbound Left	130	36 / 66	36 / 75	36 / 71	30 / 49
9. Junipero Serra Blvd / Serra Center Driveway Southbound Left	210	50 / 55	65 / 65	76 / 75	95 / 95

Notes: Maximum Queue based on the average of the maximum value from ten SIMTRAFFIC runs; all distances are measured in feet; **Bold text** = queue length exceeds available storage; Existing Conditions/Master Plan Conditions

Left-turn storage is expected to continue to exceed the storage capacity at three study intersections during at least one peak period. At the Serramonte Boulevard and I-280 Northbound Ramp intersection, the eastbound left-turn queue exceeds the capacity during the weekend p.m. peak period. The westbound left-turn queues at the Serramonte Boulevard and Junipero Serra Boulevard intersection extend through the Serramonte Boulevard and Collins Avenue intersection and could impede vehicles attempting to turn left off of Collins Avenue on to Serramonte Boulevard during all peak periods except for during the weekday a.m. peak period, as shown in Figure 7. The northbound left-turn queues at the El Camino Real and Serramonte Boulevard intersection exceed the storage capacity during all peak periods except for during the weekday a.m. peak period, as shown in Figure 8.

Under Master Plan Conditions, there is either a slight decrease or slight increase in queue length—the change is less-than-significant and can be attributed to the stochastic nature of the SIMTRAFFIC program; the Master Plan design itself is not expected to result in a measurable change to queue lengths on this movement. There is no change larger than 56 feet or approximately two vehicles.

The proposed traffic signal at the intersection of Serramonte Boulevard and the Serra Center Driveway, near Target, is expected to reduce the overall queuing impact along Serramonte Boulevard. With the installation of the traffic signal, removing the all-way stop control, the flow of traffic will be streamlined.



Serramonte Boulevard/Collins Avenue Master Plan
Figure 7 – Existing and Proposed Queuing for Study Intersections #2 and #3



Serramonte Boulevard/Collins Avenue Master Plan
Figure 8 – Existing and Proposed Queuing for Study Intersection #6

Under Existing Conditions, every vehicle has to make a complete stop at the intersection. During some of the peak periods, the queue length has the potential to increase slightly, but the overall reduction improves corridor operations. The queuing impacts are summarized in Figures 9 through 12.

Master Plan Conditions: Corridor Travel Time

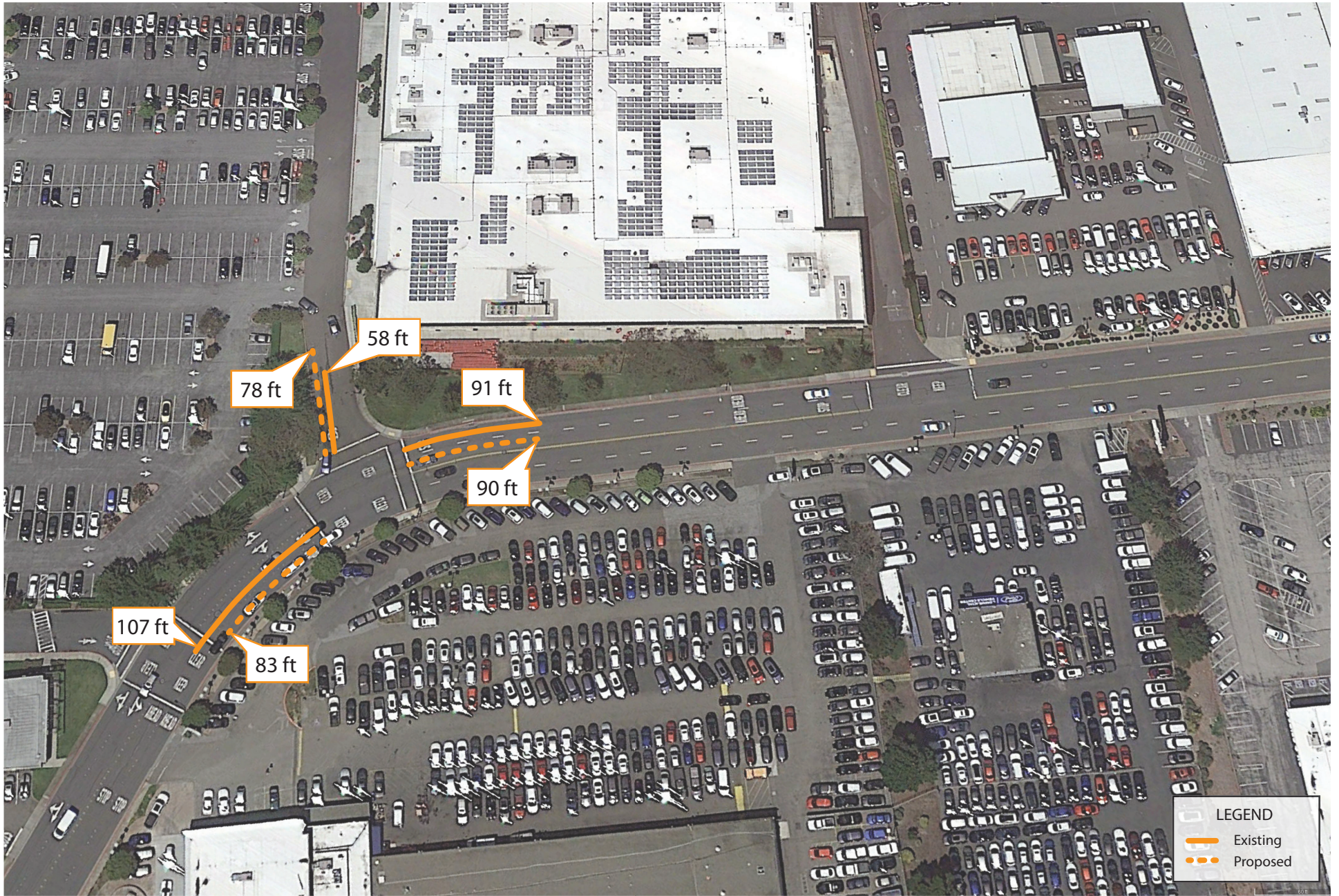
Under Master Plan Conditions, the average travel time along Serramonte Boulevard would be expected to decrease in the westbound direction and increase in the eastbound direction. These changes represent approximately a one mile per hour increase or decrease in the average speed. The Master Plan would not be expected to have a significant impact on the corridor travel time. The travel time summary is provided in Table 12.

Direction of Travel	Weekday AM Peak		Weekday PM Peak		Weekend Midday Peak		Weekend Evening Peak	
	Average TT	Average Speed	Average TT	Average Speed	Average TT	Average Speed	Average TT	Average Speed
EB Serramonte Blvd	4:06 / 4:08	20 / 20	4:33 / 4:58	18 / 17	4:32 / 4:53	18 / 17	4:51 / 4:49	17 / 17
<i>Approaching JSB</i>	1:21 / 1:21	17 / 17	1:30 / 1:34	16 / 15	1:42 / 1:41	14 / 14	1:58 / 1:52	12 / 13
<i>JSB to El Camino Real</i>	1:43 / 1:51	17 / 16	1:53 / 2:11	16 / 14	1:53 / 2:12	16 / 14	1:55 / 2:00	16 / 15
<i>El Camino Real to Hillside Blvd</i>	1:02 / 0:56	29 / 32	1:10 / 1:13	26 / 25	0:57 / 1:00	32 / 30	0:58 / 0:58	31 / 31
WB Serramonte Blvd	3:49 / 3:30	18 / 20	4:36 / 4:28	15 / 16	4:54 / 4:22	14 / 16	4:44 / 4:27	15 / 16
<i>Hillside Blvd to El Camino Real</i>	1:35 / 1:21	19 / 22	1:56 / 1:55	15 / 15	1:40 / 1:34	18 / 19	1:41 / 1:37	18 / 19
<i>El Camino Real to JSB</i>	1:38 / 1:34	18 / 19	2:00 / 1:50	15 / 16	2:27 / 2:01	12 / 15	2:15 / 2:03	13 / 15
<i>Beyond JSB</i>	0:36 / 0:35	20 / 21	0:40 / 0:43	18 / 17	0:47 / 0:47	15 / 15	0:48 / 0:47	15 / 15

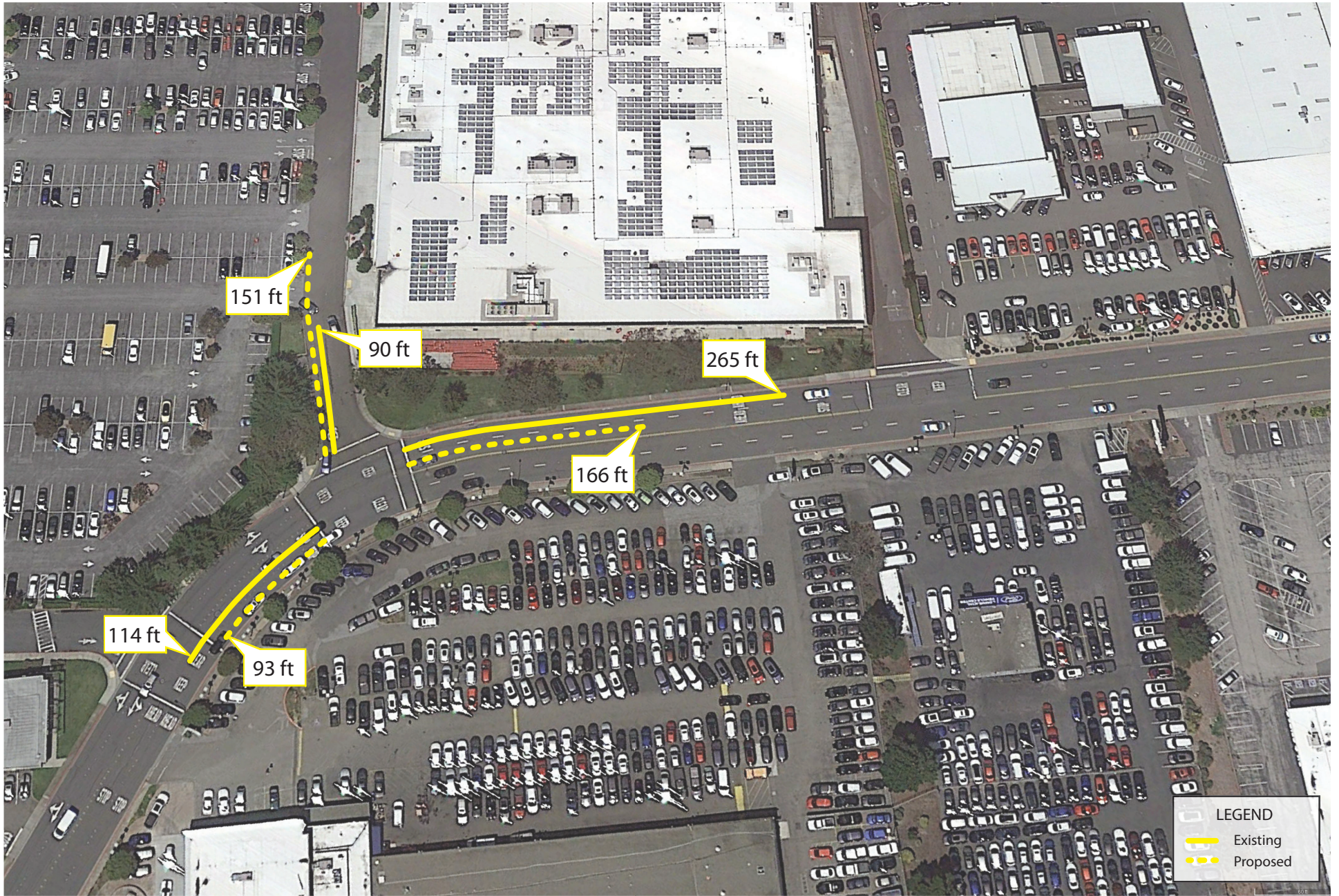
Notes: TT (Travel Time) is measured in minutes:seconds; Average Speed is measured in miles per hour (mph); **Bold** = increase in travel time; JSB = Junipero Serra Boulevard

Master Plan Conditions: Measures of Effectiveness

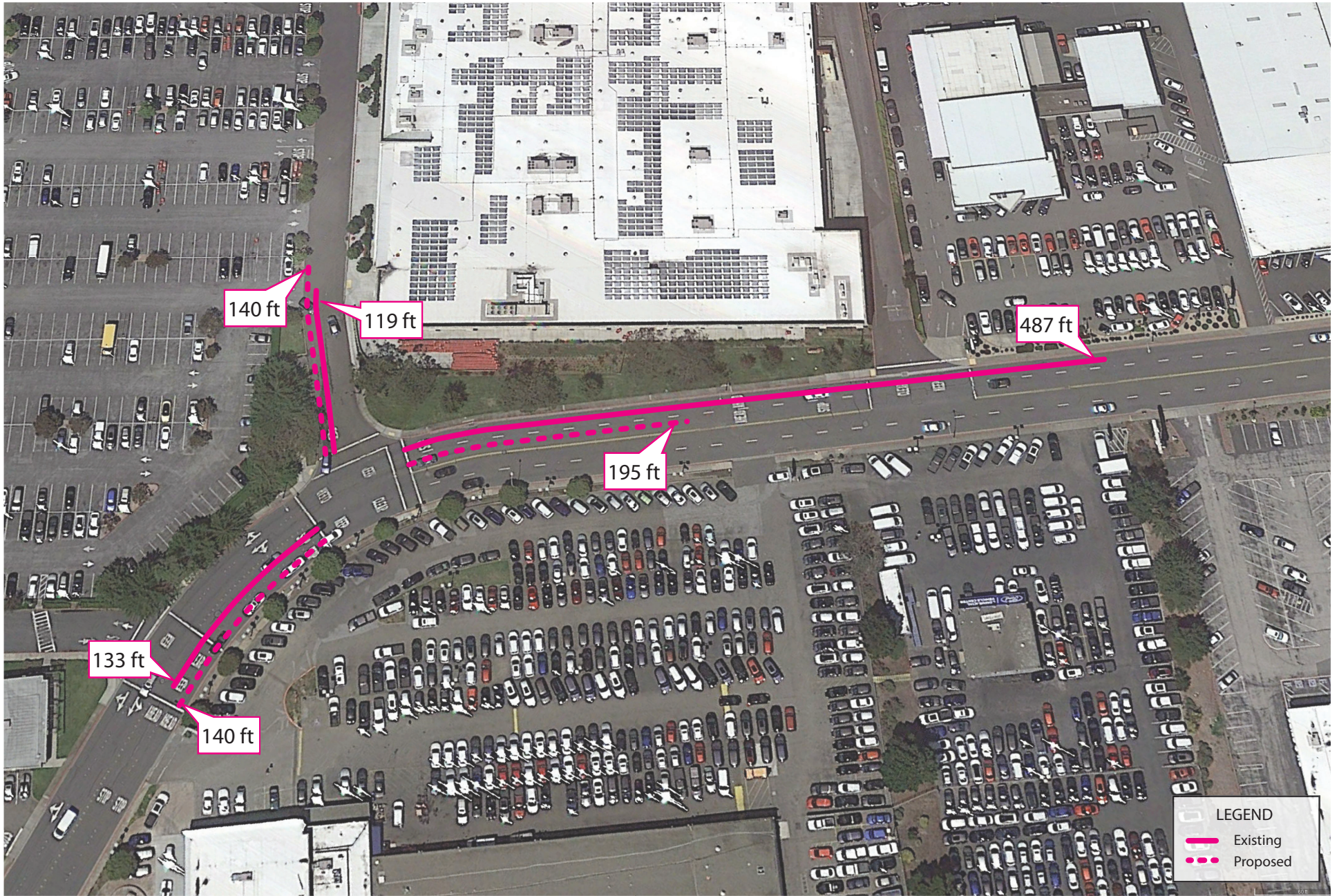
Under Master Plan Conditions, the corridor would be expected to operate more efficiently. The proposed improvements on Serramonte Boulevard would be expected to reduce the Performance Index. As indicated previously, a lower Performance Index is desirable and indicates a corridor with higher vehicle through put. The total delay, number of stops and total travel time have decreased while the total distance traveled has remained the same, indicating an increase in average travel speed. Serramonte Boulevard would be expected to operate with a Performance Index of 42.3, down from 48.0, during the a.m. peak period and 78.2, down from 96.0, during the p.m. peak period. A summary of these measures of effectiveness is shown in Table 13.



Serramonte Boulevard/Collins Avenue Master Plan
Figure 9 – Weekday AM Queuing Comparison for Study Intersection #5



Serramonte Boulevard/Collins Avenue Master Plan
Figure 10 – Weekday PM Queuing Comparison for Study Intersection #5



Serramonte Boulevard/Collins Avenue Master Plan
Figure 11 – Weekend Midday Queuing Comparison for Study Intersection #5



Serramonte Boulevard/Collins Avenue Master Plan
Figure 12 – Weekend PM Queuing Comparison for Study Intersection #5



Table 13 – Serramonte Boulevard Weekday Master Plan Conditions Measures of Effectiveness

Measure of Effectiveness	Existing Conditions		Master Plan Conditions	
	AM Peak	PM Peak	AM Peak	PM Peak
Total Delay (Hours)	35	76	32	60
Stops (Total Number of Stops)	4,571	7,375	3,771	6,505
Average Speed (mph)	18	14	18	16
Total Travel Time (Hours)	85	146	81	131
Distance Traveled (Miles)	1,489	2,118	1,489	2,115
Unserviced Vehicles (Total Number)	0	0	0	0
Performance Index	48.0	96.0	42.3	78.2

Notes: mph = Miles per Hour; Performance Index = $[(D * 1) + (St * 10)]/3600$ where D = Total Delay (in seconds) and St = Stops

Serramonte Boulevard would be expected to operate with a Performance Index of 89.3, down from 112.5, during the weekend midday peak period and 88.6, down from 105.0, during the weekend evening peak period. A summary of these measures of effectiveness is shown in Table 14.

Table 14 – Serramonte Boulevard Weekend Master Plan Conditions Measures of Effectiveness

Measure of Effectiveness	Existing Conditions		Master Plan Conditions	
	Weekend Midday Peak	Weekend Evening Peak	Weekend Midday Peak	Weekend Evening Peak
Total Delay (Hours)	90	83	69	69
Stops (Total Number of Stops)	8,091	7,888	7,143	7,050
Average Speed (mph)	13	14	15	15
Total Travel Time (Hours)	160	151	140	138
Distance Traveled (Miles)	2,102	2,050	2,101	2,070
Unserviced Vehicles (Total Number)	0	0	0	0
Performance Index	112.5	105.0	89.3	88.6

Notes: mph = Miles per Hour; Performance Index = $[(D * 1) + (St * 10)]/3600$ where D = Total Delay (in seconds) and St = Stops

Study Participants and Reference

Study Participants

Principal in Charge	Steve Weinberger, PE, PTOE
Associate	Nick Bleich, AICP, EIT
Assistant Engineer	Allison Woodworth, EIT
Assistant Planner	Andre Huff
Graphics	Hannah Yung-Boxdell
Editing/Formatting	Hannah Yung-Boxdell
Report Review	Mark E. Spencer, TE

References

- A Policy on Geometric Design of Highways and Streets*, 7th Edition, American Association of State Highway and Transportation Officials, 2018
- BART, <http://www.bart.gov/schedules/bystation>
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CLM002

Appendix A

Traffic Count Data





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Location: Junipero Serra Blvd/I-280 On Ramp -- Serramonte Blvd
 Start Date: 11/1/2017
 Start Time: 7:00:00 AM
 Site Code: 14552005

Start Time	Junipero Serra Blvd Southbound					Serramonte Blvd Westbound					Junipero Serra Blvd Northbound					Serramonte Blvd Eastbound					I-280 On Ramp Southwestbound				
	Right to I-280 On Ramp	Right	Thru	Left	U-Turns	Right	Thru to I-280 On Ramp	Thru	Left	U-Turns	Right	Thru	Left to I-280 On Ramp	Left	U-Turns	Right	Thru	Left	Left to I-280 On Ramp	U-Turns	Right to Serramonte Blvd	Right to Junipero Serra Blvd	Thru to Serramonte Blvd	Left to Junipero Serra Blvd	U-Turns
07:00 AM	5	2	9	5	2	0	15	4	8	0	2	12	21	5	0	29	28	9	0	0	0	0	0	0	0
07:05 AM	3	4	17	7	1	3	19	1	6	0	15	14	27	1	0	26	23	8	0	0	0	0	0	0	0
07:10 AM	5	3	15	5	3	2	15	2	9	0	9	22	53	2	0	28	24	5	0	0	0	0	0	0	0
07:15 AM	2	0	16	7	0	1	21	6	2	0	11	17	36	1	0	28	47	11	0	0	0	0	0	0	0
07:20 AM	6	1	18	8	2	2	15	3	4	0	10	16	41	1	0	29	38	6	0	0	0	0	0	0	0
07:25 AM	2	2	23	8	3	4	25	3	7	0	16	17	40	5	0	25	37	5	0	0	0	0	0	0	0
07:30 AM	3	7	19	5	0	1	17	6	8	0	9	18	38	3	0	40	47	6	0	0	0	0	0	0	0
07:35 AM	1	1	31	6	0	2	22	9	11	0	9	12	45	3	0	19	52	11	0	0	0	0	0	0	0
07:40 AM	5	2	42	6	2	1	22	6	10	0	8	25	45	0	0	34	51	7	0	0	0	0	0	0	0
07:45 AM	4	2	46	9	0	2	11	11	5	0	14	20	41	4	0	69	58	9	0	0	0	0	0	0	0
07:50 AM	4	5	50	11	0	1	13	6	3	0	15	17	24	1	0	54	56	9	0	0	0	0	0	0	0
07:55 AM	3	2	40	10	1	4	16	10	7	0	21	23	25	3	1	46	59	12	0	0	0	0	0	0	0
08:00 AM	5	2	30	6	1	4	18	16	11	0	9	28	34	5	0	55	51	14	0	0	0	0	0	0	0
08:05 AM	2	2	37	4	1	4	19	13	5	0	13	25	30	3	0	40	63	8	0	0	0	0	0	0	0
08:10 AM	3	3	34	13	0	1	19	17	5	0	9	33	33	4	1	49	59	11	0	0	0	0	0	0	0
08:15 AM	6	7	32	17	3	0	9	8	9	0	16	21	26	5	0	51	70	7	0	0	0	0	0	0	0
08:20 AM	2	6	27	14	0	5	16	16	4	0	11	17	32	3	1	46	79	14	0	0	0	0	0	0	0
08:25 AM	3	1	28	7	0	10	13	12	12	0	11	19	25	1	0	50	90	19	0	0	0	0	0	0	0
08:30 AM	7	4	22	4	0	2	24	12	9	0	22	17	24	3	1	58	71	14	0	0	0	0	0	0	0
08:35 AM	3	4	26	12	2	7	19	7	9	0	16	24	26	2	0	51	100	11	0	0	0	0	0	0	0
08:40 AM	6	7	22	11	1	3	14	14	9	0	11	24	24	3	0	50	76	15	0	0	0	0	0	0	0
08:45 AM	3	8	21	9	0	1	9	14	10	0	12	22	27	0	0	38	67	11	0	0	0	0	0	0	0
08:50 AM	2	4	26	13	2	2	21	16	7	0	18	20	17	2	1	67	78	8	0	0	0	0	0	0	0
08:55 AM	5	3	19	7	0	5	20	14	4	0	19	21	22	1	0	55	79	13	0	0	0	0	0	0	0
Total	90	82	650	204	24	67	412	226	174	0	306	484	756	61	5	1037	1403	243	0	0	0	0	0	0	0

Peak Hour: 7:45 AM - 8:45 AM
 Peak 15-Min: 8:25 AM - 8:40 AM
 PHF: 0.9554

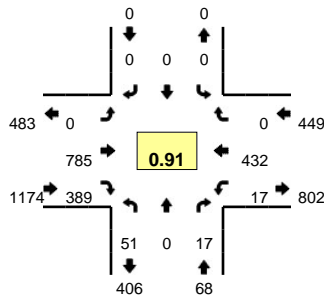


Location: Junipero Serra Blvd/I-280 On Ramp -- Serramonte Blvd
 Start Date: 11/1/2017
 Start Time: 7:00:00 AM
 Site Code: 14552005

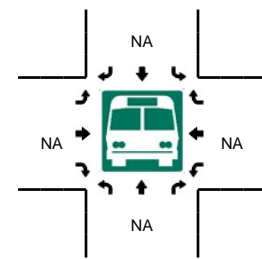
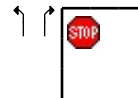
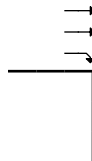
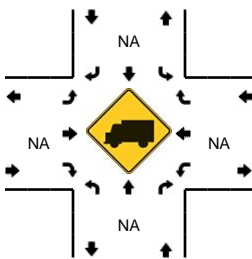
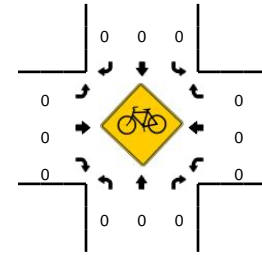
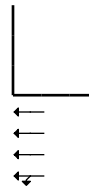
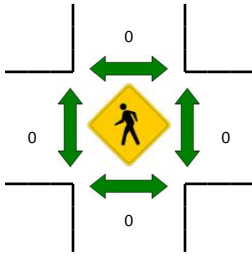
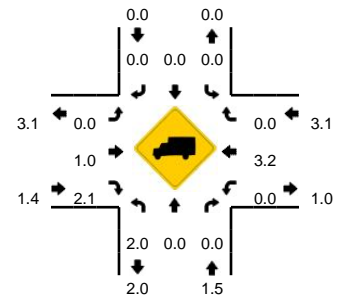
Start Time	Junipero Serra Blvd Southbound				Serramonte Blvd Westbound				Junipero Serra Blvd Northbound				Serramonte Blvd Eastbound				I-280 On Ramp Southwestbound			
	Right to I-280 On Ramp	Right	Thru	Left	Right	Thru to I-280 On Ramp	Thru	Left	Right	Thru	Left to I-280 On Ramp	Left	Right	Thru	Left	Left to I-280 On Ramp	Right to Serramonte Blvd	Right to Junipero Serra Blvd	Thru to Serramonte Blvd	Left to Junipero Serra Blvd
07:00 AM	0	1	0	0	0	0	1	1	0	2	0	0	0	0	2	0	0	0	0	0
07:05 AM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
07:10 AM	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
07:15 AM	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	0
07:20 AM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
07:25 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	1	2	0	0	0	0	0
07:30 AM	2	3	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
07:35 AM	0	0	0	0	0	0	0	1	0	1	1	0	0	2	1	0	0	0	0	0
07:40 AM	0	1	0	0	0	1	0	0	0	0	1	0	0	0	2	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0
07:50 AM	1	2	2	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0
07:55 AM	0	0	2	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
08:00 AM	1	0	1	0	0	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0
08:05 AM	0	1	1	0	0	1	0	0	0	0	2	0	0	2	1	0	0	0	0	0
08:10 AM	0	0	0	0	0	1	0	1	0	0	1	0	0	0	3	0	0	0	0	0
08:15 AM	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0
08:20 AM	0	1	0	0	0	0	0	1	0	1	0	0	1	1	1	0	0	0	0	0
08:25 AM	0	0	0	0	0	2	0	1	0	0	1	0	0	1	0	0	0	0	0	0
08:30 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
08:35 AM	0	2	0	1	0	0	0	1	1	0	0	0	0	2	0	0	0	0	0	0
08:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0
08:45 AM	0	2	0	0	0	0	0	0	0	2	2	0	0	1	0	0	0	0	0	0
08:50 AM	1	0	2	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0
08:55 AM	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Total	7	18	10	2	0	10	2	10	4	9	14	2	4	14	20	0	0	0	0	0

LOCATION: Collins Ave -- Serramonte Blvd
CITY/STATE: Colma, CA

QC JOB #: 1452007
DATE: Wed, Nov 01 2017



Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:25 AM -- 8:40 AM

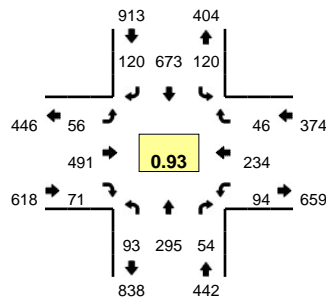


5-Min Count Period Beginning At	Collins Ave (Northbound)				Collins Ave (Southbound)				Serramonte Blvd (Eastbound)				Serramonte Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	7	0	1	0	0	0	0	0	0	23	12	0	1	17	0	0	61	
7:05 AM	8	0	0	0	0	0	0	0	0	34	15	0	0	26	0	0	83	
7:10 AM	3	0	0	0	0	0	0	0	0	26	11	1	0	22	0	0	63	
7:15 AM	7	0	1	0	0	0	0	0	0	38	24	0	0	20	0	0	90	
7:20 AM	4	0	0	0	0	0	0	0	0	32	29	0	2	21	0	0	88	
7:25 AM	10	0	1	0	0	0	0	0	0	41	22	0	1	30	0	0	105	
7:30 AM	9	0	0	0	0	0	0	0	0	46	17	0	2	22	0	0	96	
7:35 AM	6	0	4	0	0	0	0	0	0	43	25	0	1	37	0	0	116	
7:40 AM	4	0	1	0	0	0	0	0	0	42	15	0	0	38	0	0	100	
7:45 AM	5	0	4	0	0	0	0	0	0	63	28	0	4	20	0	0	124	
7:50 AM	5	0	1	0	0	0	0	0	0	52	31	0	1	26	0	0	116	
7:55 AM	6	0	0	0	0	0	0	0	0	57	31	0	1	26	0	0	121	1163
8:00 AM	6	0	2	0	0	0	0	0	0	41	30	0	0	39	0	0	118	1220
8:05 AM	4	0	2	0	0	0	0	0	0	48	32	0	1	36	0	0	123	1260
8:10 AM	10	0	1	0	0	0	0	0	0	51	23	0	1	31	0	0	117	1314
8:15 AM	3	0	1	0	0	0	0	0	0	71	42	0	4	28	0	0	149	1373
8:20 AM	3	0	1	0	0	0	0	0	0	69	37	0	0	38	0	0	148	1433
8:25 AM	1	0	4	0	0	0	0	0	0	79	26	0	4	40	0	0	154	1482
8:30 AM	7	0	0	0	0	0	0	0	0	71	18	0	2	38	0	0	136	1522
8:35 AM	5	0	3	0	0	0	0	0	0	95	34	0	0	36	0	0	173	1579
8:40 AM	2	0	0	0	0	0	0	0	0	58	39	0	1	37	0	0	137	1616
8:45 AM	2	0	2	0	0	0	0	0	0	47	42	0	2	33	0	0	128	1620
8:50 AM	6	0	1	0	0	0	0	0	0	78	34	0	2	36	0	0	157	1661
8:55 AM	2	0	0	0	0	0	0	0	0	77	32	0	0	40	0	0	151	1691
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	52	0	28	0	0	0	0	0	0	980	312	0	24	456	0	0	1852	
Heavy Trucks	0	0	0	0	0	0	0	0	0	12	8	0	0	20	0	0	40	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

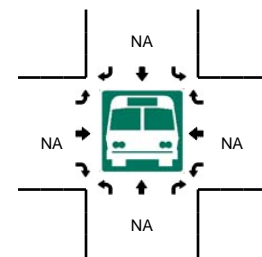
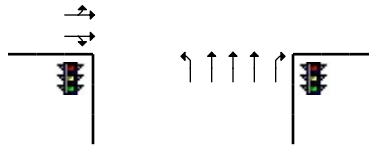
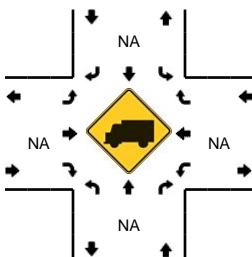
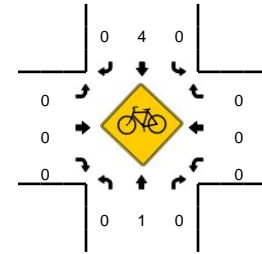
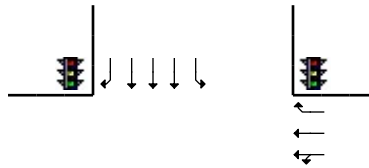
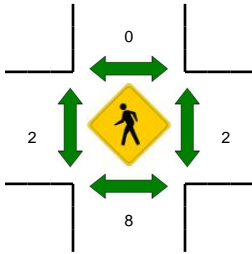
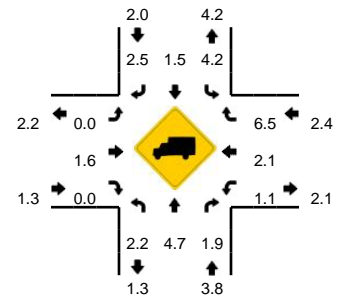
Comments:

LOCATION: El Camino Real -- Serramonte Blvd
CITY/STATE: Colma, CA

QC JOB #: 14552013
DATE: Wed, Nov 01 2017



Peak-Hour: 7:50 AM -- 8:50 AM
Peak 15-Min: 8:10 AM -- 8:25 AM



5-Min Count Period Beginning At	El Camino Real (Northbound)				El Camino Real (Southbound)				Serramonte Blvd (Eastbound)				Serramonte Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	9	2	0	5	27	5	0	2	19	2	0	2	12	5	0	93	
7:05 AM	6	14	4	0	5	25	8	0	5	14	5	0	5	5	4	0	100	
7:10 AM	6	18	5	0	3	30	4	0	3	15	4	0	4	12	1	0	105	
7:15 AM	7	12	3	0	8	32	4	0	0	16	2	0	5	10	2	0	101	
7:20 AM	4	20	6	0	5	47	4	0	3	27	2	0	4	15	2	0	139	
7:25 AM	8	12	4	0	6	37	10	0	0	27	5	0	6	12	6	0	133	
7:30 AM	6	24	4	0	5	42	9	0	6	23	4	0	5	20	5	0	153	
7:35 AM	7	24	2	0	8	48	14	0	4	21	4	0	8	9	4	0	153	
7:40 AM	7	21	3	0	9	56	13	0	2	34	3	0	5	10	6	0	169	
7:45 AM	4	20	7	0	8	48	6	0	3	42	6	0	4	11	7	0	166	
7:50 AM	13	28	7	0	10	56	10	0	6	34	4	0	11	15	1	0	195	
7:55 AM	4	30	6	0	6	61	13	0	6	45	7	0	8	25	2	0	213	1720
8:00 AM	9	15	3	0	7	62	8	1	2	28	2	0	4	17	4	0	162	1789
8:05 AM	6	23	2	0	5	58	10	1	5	27	5	0	11	24	4	0	181	1870
8:10 AM	8	21	7	0	7	73	11	0	4	30	4	0	10	21	5	0	201	1966
8:15 AM	5	35	5	0	14	62	5	0	2	49	6	0	4	20	2	0	209	2074
8:20 AM	6	30	2	0	11	71	10	1	6	41	4	0	6	25	9	0	222	2157
8:25 AM	8	22	4	1	8	47	15	1	5	51	9	0	4	16	5	1	197	2221
8:30 AM	12	19	4	0	10	48	7	1	5	42	6	0	13	19	5	0	191	2259
8:35 AM	11	32	5	0	10	37	15	1	3	59	13	0	2	18	2	0	208	2314
8:40 AM	8	25	5	0	12	49	5	0	8	49	5	0	10	19	3	0	198	2343
8:45 AM	2	15	4	0	13	49	11	1	4	36	6	0	10	15	4	0	170	2347
8:50 AM	9	25	3	0	11	49	9	1	7	34	14	0	12	15	4	0	193	2345
8:55 AM	9	13	3	0	4	38	9	0	6	37	5	0	1	22	7	0	154	2286
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	76	344	56	0	128	824	104	4	48	480	56	0	80	264	64	0	2528	
Heavy Trucks	4	16	0		4	16	4		0	8	0		4	12	0		68	
Pedestrians		4				0				4				4			12	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

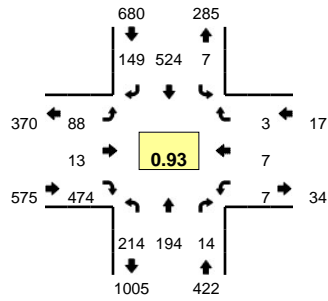
Comments:

Type of peak hour being reported: Intersection Peak

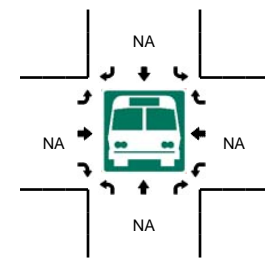
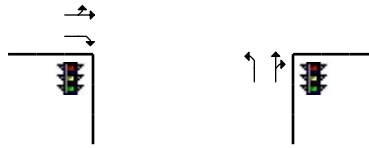
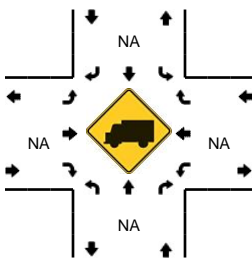
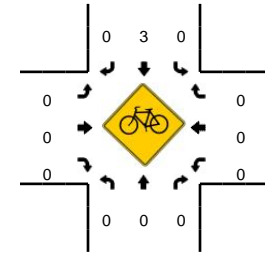
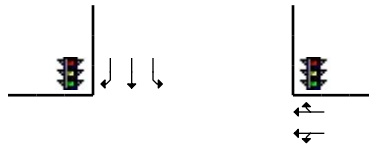
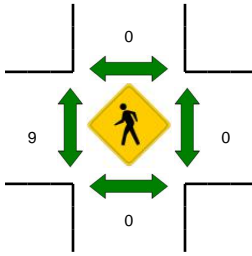
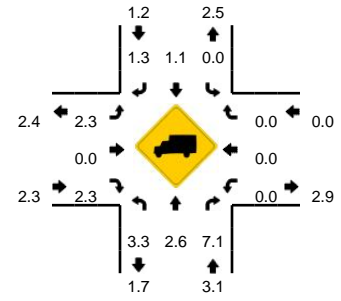
Method for determining peak hour: Total Entering Volume

LOCATION: Hillside Blvd -- Serramonte Blvd
CITY/STATE: Colma, CA

QC JOB #: 14552021
DATE: Wed, Nov 01 2017



Peak-Hour: 7:50 AM -- 8:50 AM
Peak 15-Min: 8:20 AM -- 8:35 AM

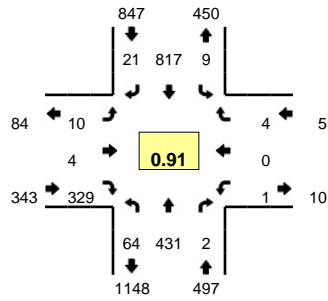


5-Min Count Period Beginning At	Hillside Blvd (Northbound)				Hillside Blvd (Southbound)				Serramonte Blvd (Eastbound)				Serramonte Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	6	11	0	0	1	25	6	0	3	0	24	0	0	0	0	0	76	
7:05 AM	7	14	0	0	0	30	4	0	6	0	12	0	1	0	0	0	74	
7:10 AM	7	8	0	0	0	42	7	0	5	0	15	0	0	0	0	0	84	
7:15 AM	9	10	0	0	0	33	7	0	4	0	22	0	0	0	0	0	85	
7:20 AM	17	13	0	0	0	46	7	0	6	1	24	0	0	0	0	0	114	
7:25 AM	14	18	0	0	0	43	17	0	7	0	30	0	1	0	0	0	130	
7:30 AM	12	17	1	0	0	52	9	0	3	0	20	0	0	0	0	0	114	
7:35 AM	14	17	1	0	0	49	7	0	6	0	28	0	0	1	0	0	123	
7:40 AM	14	11	0	0	0	60	9	0	7	1	31	0	0	0	0	0	133	
7:45 AM	7	16	0	0	0	53	13	0	13	0	42	0	1	0	0	0	145	
7:50 AM	20	28	1	0	0	48	13	0	3	0	31	0	0	0	0	0	144	
7:55 AM	21	21	0	0	0	44	10	0	12	0	43	0	0	1	0	0	152	1374
8:00 AM	15	15	1	0	1	51	17	0	5	0	34	0	1	0	0	0	140	1438
8:05 AM	11	15	4	0	1	34	14	0	5	2	15	0	0	0	1	0	102	1466
8:10 AM	21	19	4	0	0	30	16	0	7	2	30	0	1	0	0	0	130	1512
8:15 AM	19	16	1	0	0	54	5	0	11	0	26	0	1	2	0	0	135	1562
8:20 AM	27	17	0	0	2	34	12	0	7	1	59	0	0	1	0	0	160	1608
8:25 AM	17	9	1	0	1	53	9	0	10	2	40	0	1	2	0	0	145	1623
8:30 AM	13	19	1	0	0	43	11	0	11	1	49	0	0	1	1	0	150	1659
8:35 AM	15	13	1	0	1	37	12	0	5	0	42	0	1	0	0	0	127	1663
8:40 AM	14	8	0	0	0	55	14	0	5	0	53	0	1	0	0	0	150	1680
8:45 AM	21	14	0	0	1	41	16	0	7	5	52	0	1	0	1	0	159	1694
8:50 AM	13	16	0	0	0	61	11	0	4	1	34	0	2	0	1	0	143	1693
8:55 AM	21	11	1	0	0	46	10	0	4	0	44	0	0	2	1	0	140	1681
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	228	180	8	0	12	520	128	0	112	16	592	0	4	16	4	0	1820	
Heavy Trucks	0	8	0	0	0	4	4	0	4	0	12	0	0	0	0	0	32	
Pedestrians	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	
Bicycles	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	
Railroad																		
Stopped Buses																		

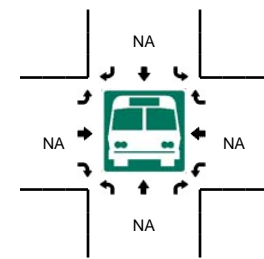
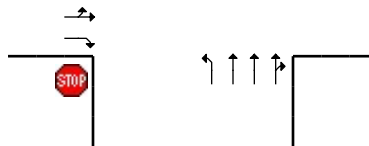
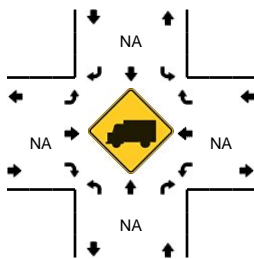
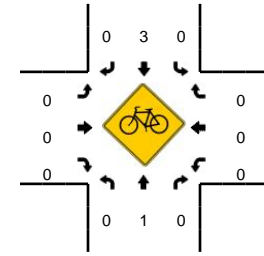
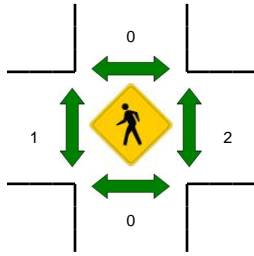
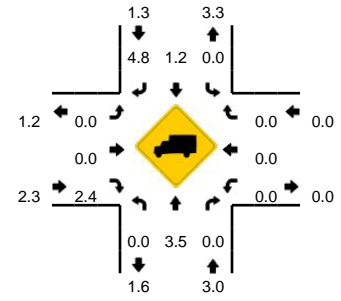
Comments:

LOCATION: El Camino Real -- Collins Ave
CITY/STATE: Colma, CA

QC JOB #: 14552015
DATE: Wed, Nov 01 2017



Peak-Hour: 7:55 AM -- 8:55 AM
Peak 15-Min: 8:10 AM -- 8:25 AM



5-Min Count Period Beginning At	El Camino Real (Northbound)				El Camino Real (Southbound)				Collins Ave (Eastbound)				Collins Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	9	15	0	0	0	33	2	0	2	0	8	0	0	0	0	0	69	
7:05 AM	5	29	0	0	0	32	2	2	1	0	9	0	0	0	0	0	80	
7:10 AM	5	23	0	0	0	32	2	0	0	0	8	0	0	0	0	0	70	
7:15 AM	6	20	0	0	1	35	3	3	1	0	17	0	0	0	1	0	87	
7:20 AM	6	35	0	0	1	45	4	0	2	0	24	0	0	0	0	0	117	
7:25 AM	13	25	1	0	0	44	2	0	0	0	12	0	0	0	0	0	97	
7:30 AM	8	35	1	0	0	54	0	0	1	0	15	0	0	0	0	0	114	
7:35 AM	5	39	0	1	0	55	5	2	0	0	18	0	0	0	0	0	125	
7:40 AM	7	26	1	0	1	59	4	0	1	0	20	0	0	0	0	0	119	
7:45 AM	1	35	0	0	1	57	0	1	2	1	18	0	0	0	1	0	117	
7:50 AM	3	42	2	0	0	64	1	0	2	1	19	0	0	0	0	0	134	
7:55 AM	5	42	1	0	1	79	0	0	1	1	22	0	0	0	0	0	152	1281
8:00 AM	7	31	0	0	0	66	0	1	0	0	28	0	0	0	1	0	134	1346
8:05 AM	5	25	0	0	0	71	2	0	1	1	28	0	1	0	1	0	135	1401
8:10 AM	6	35	0	0	1	83	1	0	0	0	19	0	0	0	0	0	145	1476
8:15 AM	2	39	0	0	0	67	2	1	2	0	27	0	0	0	0	0	140	1529
8:20 AM	2	50	0	0	0	89	1	0	0	1	39	0	0	0	0	0	182	1594
8:25 AM	11	29	0	0	0	54	2	0	1	0	23	0	0	0	1	0	121	1618
8:30 AM	7	41	0	0	1	67	2	1	0	1	19	0	0	0	0	0	139	1643
8:35 AM	2	52	0	0	0	46	4	0	2	0	26	0	0	0	0	0	132	1650
8:40 AM	4	28	0	0	0	62	2	1	0	0	36	0	0	0	1	0	134	1665
8:45 AM	7	26	0	1	0	64	2	1	1	0	35	0	0	0	0	0	137	1685
8:50 AM	5	33	1	0	1	69	3	0	2	0	27	0	0	0	0	0	141	1692
8:55 AM	5	32	0	0	0	48	0	1	2	0	28	0	0	1	0	0	117	1657
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	40	496	0	0	4	956	16	4	8	4	340	0	0	0	0	0	1868	
Heavy Trucks	0	20	0	0	0	16	4	0	0	0	4	0	0	0	0	0	44	
Pedestrians		0				0					0				0		0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:



Location: Junipero Serra Blvd/I-280 On Ramp -- Serramonte Blvd
 Start Date: 11/1/2017
 Start Time: 4:00:00 PM
 Site Code: 14552006

Start Time	Junipero Serra Blvd Southbound					Serramonte Blvd Westbound					Junipero Serra Blvd Northbound					Serramonte Blvd Eastbound					I-280 On Ramp Southwestbound				
	Right to I-280 On Ramp	Right	Thru	Left	U-Turns	Right	Thru to I-280 On Ramp	Thru	Left	U-Turns	Right	Thru	Left to I-280 On Ramp	Left	U-Turns	Right	Thru	Left	Left to I-280 On Ramp	U-Turns	Right to Serramonte Blvd	Right to Junipero Serra Blvd	Thru to Serramonte Blvd	Left to Junipero Serra Blvd	U-Turns
04:00 PM	16	15	37	10	3	8	28	23	19	0	12	38	31	11	0	17	46	32	1	0	0	0	0	0	0
04:05 PM	9	9	14	6	2	5	27	26	15	0	17	35	25	7	1	18	57	31	0	0	0	0	0	0	0
04:10 PM	20	10	34	6	1	6	23	21	9	0	21	38	41	5	2	26	54	24	0	0	0	0	0	0	0
04:15 PM	18	13	24	9	0	1	30	34	12	0	13	33	34	5	0	27	76	41	0	0	0	0	0	0	0
04:20 PM	15	12	43	11	2	4	23	21	9	0	11	41	30	15	0	22	45	25	0	0	0	0	0	0	0
04:25 PM	15	6	26	15	1	7	43	33	15	0	13	23	21	10	0	28	45	26	0	0	0	0	0	0	0
04:30 PM	13	5	19	6	1	5	32	22	18	0	18	56	41	15	1	28	51	37	1	0	0	0	0	0	0
04:35 PM	11	13	26	8	2	7	35	29	11	0	18	46	33	16	0	37	56	29	0	0	0	0	0	0	0
04:40 PM	17	9	23	8	1	5	29	26	21	0	10	56	29	10	0	24	47	31	0	0	0	0	0	0	0
04:45 PM	10	5	25	11	1	15	40	39	10	0	11	38	34	11	0	29	62	25	0	0	0	0	0	0	0
04:50 PM	21	3	20	6	1	10	32	42	17	0	15	40	18	7	2	31	54	35	0	0	0	0	0	0	0
04:55 PM	14	12	31	12	0	1	28	22	18	0	13	52	32	12	2	28	42	24	0	0	0	0	0	0	0
05:00 PM	14	10	35	15	0	3	36	25	12	0	8	37	25	8	0	27	44	27	0	0	0	0	0	0	0
05:05 PM	14	8	15	7	2	7	39	36	16	0	16	53	41	19	0	43	55	25	0	0	0	0	0	0	0
05:10 PM	13	8	23	9	0	9	27	24	12	0	13	55	33	11	0	29	55	23	0	0	0	0	0	0	0
05:15 PM	20	12	26	7	0	7	44	35	17	0	10	31	21	11	0	31	61	35	0	0	0	0	0	0	0
05:20 PM	12	17	22	8	0	10	27	31	17	0	12	62	50	12	1	31	48	33	0	0	0	0	0	0	0
05:25 PM	14	14	17	4	0	12	44	46	18	0	16	43	30	16	0	19	69	40	0	0	0	0	0	0	0
05:30 PM	15	14	38	10	3	8	28	34	12	0	12	65	30	15	1	30	40	21	0	0	0	0	0	0	0
05:35 PM	7	6	23	10	0	6	34	43	18	1	11	40	31	15	0	32	45	30	0	0	0	0	0	0	0
05:40 PM	15	15	26	13	1	6	22	35	19	0	11	50	44	16	0	27	38	26	0	0	0	0	0	0	0
05:45 PM	13	9	29	6	1	10	31	34	19	0	15	31	31	7	0	29	59	31	0	0	0	0	0	0	0
05:50 PM	17	15	38	13	1	7	24	32	11	0	4	61	51	13	0	34	53	33	0	0	0	0	0	0	0
05:55 PM	15	9	25	9	2	7	27	35	20	0	13	50	32	8	0	26	60	47	0	0	0	0	0	0	0
Total	348	249	639	219	25	166	753	748	365	1	313	1074	788	275	10	673	1262	731	2	0	0	0	0	0	0

Peak Hour: 5:00 PM - 6:00 PM
 Peak 15-Min: 5:20 PM - 5:35 PM
 PHF: 0.9539

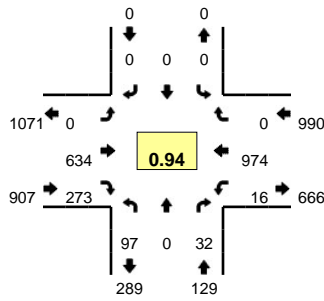


Location: Junipero Serra Blvd/I-280 On Ramp -- Serramonte Blvd
 Start Date: 11/1/2017
 Start Time: 4:00:00 PM
 Site Code: 14552006

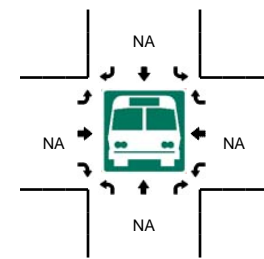
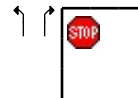
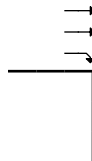
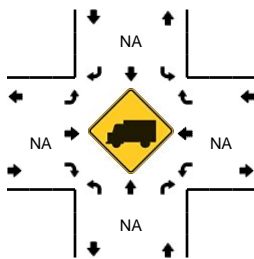
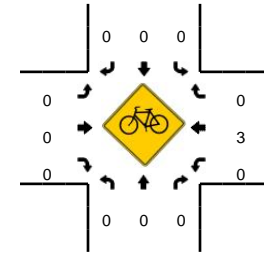
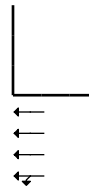
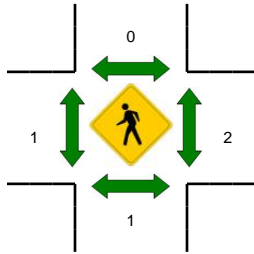
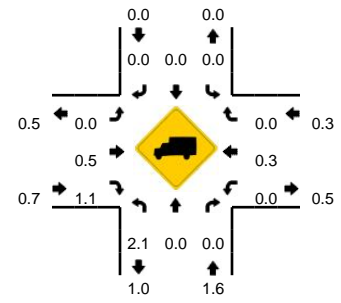
Start Time	Junipero Serra Blvd Southbound				Serramonte Blvd Westbound				Junipero Serra Blvd Northbound				Serramonte Blvd Eastbound				I-280 On Ramp Southwestbound			
	Right to I-280 On Ramp	Right	Thru	Left	Right	Thru to I-280 On Ramp	Thru	Left	Right	Thru	Left to I-280 On Ramp	Left	Right	Thru	Left	Left to I-280 On Ramp	Right to Serramonte Blvd	Right to Junipero Serra Blvd	Thru to Serramonte Blvd	Left to Junipero Serra Blvd
04:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
04:05 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0
04:10 PM	0	1	0	0	1	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	1	0	1	1	0	0	0	0	1	0	0	0	0	0
04:20 PM	0	3	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
04:25 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
04:30 PM	1	1	0	0	0	1	0	0	0	1	0	0	1	1	1	0	0	0	0	0
04:35 PM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0
04:40 PM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0
04:50 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:55 PM	0	0	1	0	0	0	0	1	0	0	0	0	1	0	2	0	0	0	0	0
05:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0
05:05 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0
05:10 PM	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	1	1	0	0	0	0	0
05:20 PM	0	2	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
05:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
05:30 PM	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:35 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
05:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
05:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
05:50 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	20	3	1	1	5	5	1	3	2	3	1	8	9	19	0	0	0	0	0

LOCATION: Collins Ave -- Serramonte Blvd
CITY/STATE: Colma, CA

QC JOB #: 1452008
DATE: Wed, Nov 01 2017



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

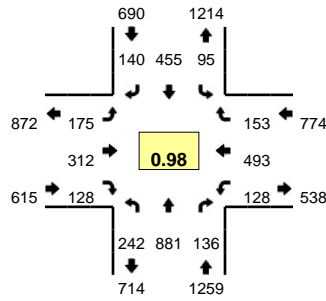


5-Min Count Period Beginning At	Collins Ave (Northbound)				Collins Ave (Southbound)				Serramonte Blvd (Eastbound)				Serramonte Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	13	0	3	0	0	0	0	0	0	49	22	0	2	73	0	0	162	
4:05 PM	16	0	0	0	0	0	0	0	0	58	18	0	0	48	0	0	140	
4:10 PM	6	0	1	0	0	0	0	0	0	54	30	0	0	65	0	0	156	
4:15 PM	8	0	5	0	0	0	0	0	0	71	23	0	1	56	0	0	164	
4:20 PM	6	0	2	0	0	0	0	0	0	52	16	0	2	69	0	0	147	
4:25 PM	9	0	1	0	0	0	0	0	0	45	24	0	2	77	0	0	158	
4:30 PM	9	0	1	0	0	0	0	0	0	52	17	0	0	73	0	0	152	
4:35 PM	10	0	5	0	0	0	0	0	0	58	29	0	2	72	0	0	176	
4:40 PM	8	0	2	0	0	0	0	0	0	44	16	0	1	80	0	0	151	
4:45 PM	11	0	2	0	0	0	0	0	0	54	40	0	0	88	0	0	195	
4:50 PM	5	0	1	0	0	0	0	0	0	55	18	0	0	84	0	0	163	
4:55 PM	5	0	3	0	0	0	0	0	0	47	16	0	1	74	0	0	146	1910
5:00 PM	9	0	4	0	0	0	0	0	0	51	24	0	1	68	0	0	157	1905
5:05 PM	10	0	1	0	0	0	0	0	0	60	19	0	0	74	0	0	164	1929
5:10 PM	5	0	4	0	0	0	0	0	0	57	20	0	0	91	0	0	177	1950
5:15 PM	11	0	0	0	0	0	0	0	0	55	24	0	2	82	0	0	174	1960
5:20 PM	11	0	4	0	0	0	0	0	0	49	17	0	2	79	0	0	162	1975
5:25 PM	7	0	5	0	0	0	0	0	0	64	26	0	4	96	0	0	202	2019
5:30 PM	5	0	1	0	0	0	0	0	0	40	24	0	3	86	0	0	159	2026
5:35 PM	10	0	1	0	0	0	0	0	0	44	21	0	1	89	0	0	166	2016
5:40 PM	7	0	3	0	0	0	0	0	0	43	19	0	4	81	0	0	157	2022
5:45 PM	8	0	2	0	0	0	0	0	0	55	23	0	2	76	0	0	166	1993
5:50 PM	12	0	1	0	0	0	0	0	0	50	25	0	1	76	0	0	165	1995
5:55 PM	8	0	1	0	0	0	0	0	0	47	22	0	2	78	0	0	158	2007
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	116	0	36	0	0	0	0	0	0	672	268	0	32	1028	0	0	2152	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	
Pedestrians		4				0				0				0			4	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

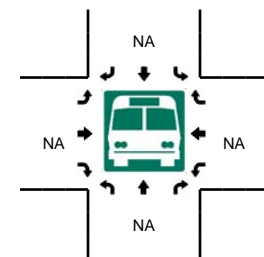
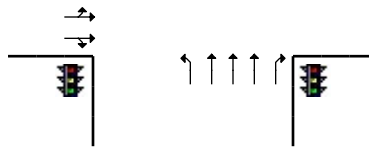
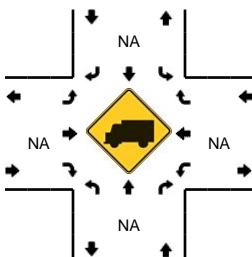
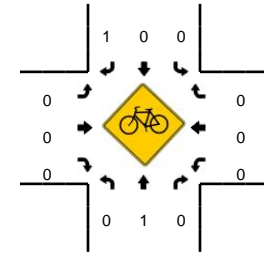
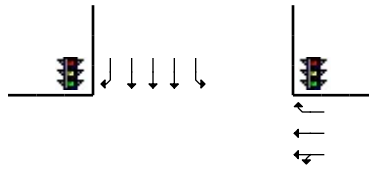
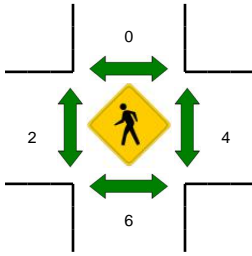
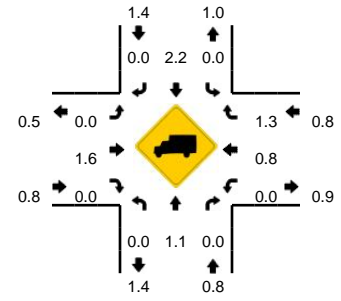
Comments:

LOCATION: El Camino Real -- Serramonte Blvd
CITY/STATE: Colma, CA

QC JOB #: 14552014
DATE: Wed, Nov 01 2017



Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 5:25 PM -- 5:40 PM

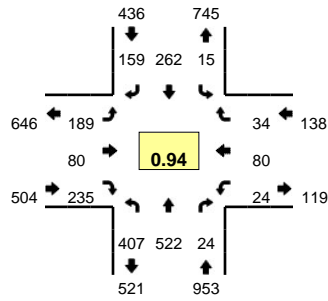


5-Min Count Period Beginning At	El Camino Real (Northbound)				El Camino Real (Southbound)				Serramonte Blvd (Eastbound)				Serramonte Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	20	61	6	0	9	47	9	0	12	15	5	0	11	27	10	0	232	
4:05 PM	15	49	15	1	7	58	9	0	11	29	7	0	5	16	7	0	229	
4:10 PM	18	61	9	0	10	57	16	0	10	22	7	0	14	27	2	0	253	
4:15 PM	14	56	13	1	7	35	9	0	16	21	13	0	11	35	13	0	244	
4:20 PM	14	70	11	0	9	44	14	2	16	36	9	0	7	27	7	0	266	
4:25 PM	15	53	11	2	6	26	15	0	16	24	14	0	4	42	9	0	237	
4:30 PM	22	48	13	2	6	46	6	0	20	24	10	0	7	32	13	0	249	
4:35 PM	26	66	11	1	11	37	7	1	6	19	15	0	10	26	12	0	248	
4:40 PM	17	40	7	0	7	35	10	1	17	15	5	0	16	44	9	0	223	
4:45 PM	31	60	14	1	9	34	16	1	19	28	13	0	14	33	13	0	286	
4:50 PM	13	47	7	0	6	56	11	0	11	24	13	1	14	46	12	0	261	
4:55 PM	18	53	17	0	12	40	9	0	19	31	15	0	10	45	16	0	285	3013
5:00 PM	11	80	13	1	7	30	13	1	10	27	15	0	6	34	14	0	262	3043
5:05 PM	28	71	10	0	8	40	7	0	15	23	8	0	11	34	13	0	268	3082
5:10 PM	22	68	13	0	10	47	5	0	13	22	17	0	11	45	17	0	290	3119
5:15 PM	30	82	15	1	6	38	12	0	12	35	11	0	8	30	12	0	292	3167
5:20 PM	26	44	10	0	6	34	11	0	16	23	11	0	15	58	8	0	262	3163
5:25 PM	16	91	11	0	4	36	13	1	13	23	4	0	17	44	16	0	289	3215
5:30 PM	20	54	8	0	7	27	14	0	19	30	14	0	12	38	16	0	259	3225
5:35 PM	13	94	7	0	9	57	16	1	14	20	9	0	11	49	7	0	307	3284
5:40 PM	21	79	9	1	10	40	9	1	12	30	5	0	7	37	14	0	275	3336
5:45 PM	17	67	8	0	5	17	16	1	20	25	9	0	11	35	9	0	240	3290
5:50 PM	17	98	15	0	6	49	15	0	12	23	10	0	9	44	11	0	309	3338
5:55 PM	27	62	10	0	7	27	16	0	13	32	12	0	8	36	15	0	265	3318
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	196	956	104	0	80	480	172	8	184	292	108	0	160	524	156	0	3420	
Heavy Trucks	0	12	0		0	8	0		0	4	0		0	4	4		32	
Pedestrians		12				0				0				4			16	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

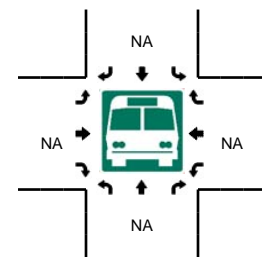
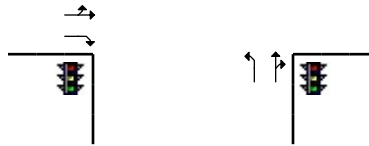
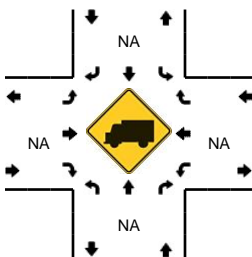
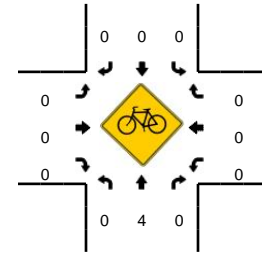
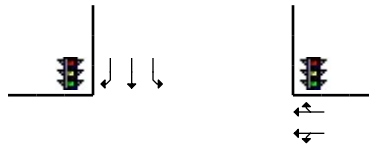
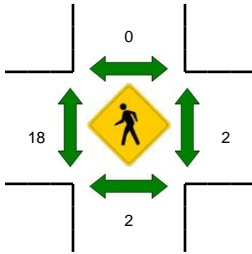
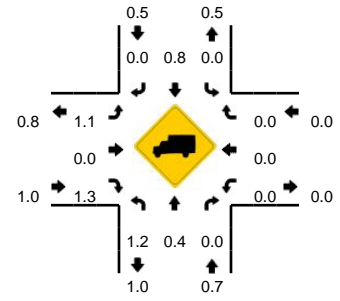
Comments:

LOCATION: Hillside Blvd -- Serramonte Blvd
CITY/STATE: Colma, CA

QC JOB #: 14552022
DATE: Wed, Nov 01 2017



Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

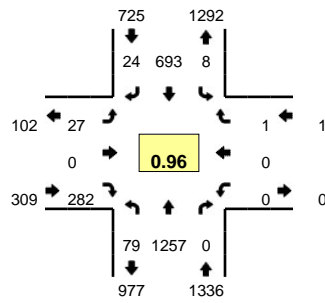


5-Min Count Period Beginning At	Hillside Blvd (Northbound)				Hillside Blvd (Southbound)				Serramonte Blvd (Eastbound)				Serramonte Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	11	30	2	0	3	20	16	0	10	4	13	0	0	9	2	0	120	
4:05 PM	18	28	0	0	0	22	9	0	13	10	22	0	0	4	2	0	128	
4:10 PM	25	29	1	0	1	20	5	0	10	10	15	0	1	6	3	0	126	
4:15 PM	35	37	2	0	3	21	14	0	22	7	25	0	0	1	2	0	169	
4:20 PM	21	36	1	0	2	25	6	0	13	5	20	0	1	3	0	0	133	
4:25 PM	31	32	3	0	1	23	12	0	26	7	23	0	1	4	3	0	166	
4:30 PM	29	35	3	0	2	26	11	0	14	6	11	0	1	6	3	0	147	
4:35 PM	27	41	2	0	6	21	12	0	13	11	27	0	2	4	1	0	167	
4:40 PM	31	28	2	0	4	26	16	0	14	3	10	0	0	12	3	0	149	
4:45 PM	36	50	0	0	2	29	17	0	13	8	19	0	2	1	0	0	177	
4:50 PM	35	34	2	0	3	24	14	0	14	2	18	0	6	12	5	0	169	
4:55 PM	29	32	1	0	0	16	14	0	21	8	30	0	4	7	4	0	166	1817
5:00 PM	41	42	2	0	3	21	7	0	20	7	19	0	0	6	2	0	170	1867
5:05 PM	29	42	2	0	0	25	15	0	16	6	23	0	3	4	2	0	167	1906
5:10 PM	33	37	2	0	4	13	13	0	16	3	12	0	2	6	6	0	147	1927
5:15 PM	38	32	2	0	2	20	17	0	25	10	32	0	1	5	3	0	187	1945
5:20 PM	39	47	5	0	0	19	14	0	14	9	12	0	0	11	5	0	175	1987
5:25 PM	31	49	2	0	1	32	19	0	13	5	11	0	3	9	2	0	177	1998
5:30 PM	32	38	1	0	2	24	9	0	17	8	23	0	2	14	5	0	175	2026
5:35 PM	29	46	2	0	0	19	14	0	17	8	20	0	2	4	0	0	161	2020
5:40 PM	38	45	1	0	0	12	12	0	10	3	27	0	2	4	1	0	155	2026
5:45 PM	34	53	1	0	0	27	19	0	13	3	18	0	1	7	3	0	179	2028
5:50 PM	32	52	3	0	1	24	9	0	12	5	14	0	4	4	2	0	162	2021
5:55 PM	31	39	1	0	2	26	11	0	16	13	24	0	4	6	3	0	176	2031
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	432	512	36	0	12	284	200	0	208	96	220	0	16	100	40	0	2156	
Heavy Trucks	4	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	12	
Pedestrians		0				0				20				0			20	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

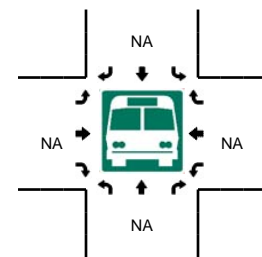
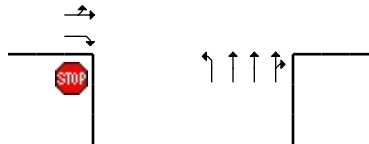
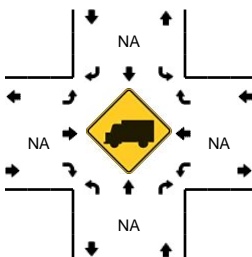
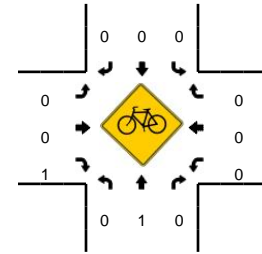
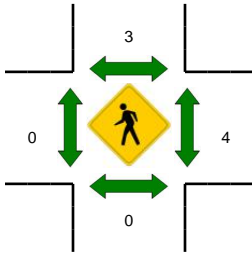
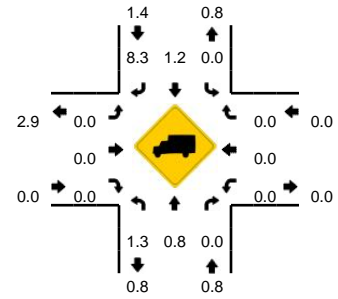
Comments:

LOCATION: El Camino Real -- Collins Ave
CITY/STATE: Colma, CA

QC JOB #: 14552016
DATE: Wed, Nov 01 2017



Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:05 PM -- 5:20 PM



5-Min Count Period Beginning At	El Camino Real (Northbound)				El Camino Real (Southbound)				Collins Ave (Eastbound)				Collins Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	67	0	0	0	61	2	2	1	0	25	0	0	1	0	0	166	
4:05 PM	7	89	0	0	0	67	2	1	4	0	21	0	0	0	0	0	191	
4:10 PM	3	77	0	1	0	70	0	1	2	0	26	0	0	0	0	0	180	
4:15 PM	0	89	0	0	0	67	3	0	5	1	21	0	0	0	0	0	186	
4:20 PM	5	84	0	1	2	63	1	0	4	0	22	0	1	0	0	0	183	
4:25 PM	4	82	0	0	0	45	4	0	4	0	24	0	2	2	3	0	170	
4:30 PM	2	98	0	0	0	59	3	2	3	0	22	0	3	1	1	0	194	
4:35 PM	4	87	1	0	0	57	2	2	2	0	23	0	0	0	0	0	178	
4:40 PM	4	72	0	0	0	69	3	1	3	0	26	0	0	0	0	0	178	
4:45 PM	7	92	0	0	0	67	2	0	2	1	30	0	0	0	1	0	202	
4:50 PM	2	70	0	0	0	81	2	0	1	0	22	0	0	0	0	0	178	
4:55 PM	3	95	0	0	0	59	5	1	2	0	14	0	0	0	0	0	179	2185
5:00 PM	9	117	0	0	0	49	3	0	2	0	25	0	0	0	0	0	205	2224
5:05 PM	2	104	0	0	0	60	3	1	3	0	26	0	0	0	1	0	200	2233
5:10 PM	4	107	0	0	0	69	4	0	4	0	18	0	0	0	0	0	206	2259
5:15 PM	9	109	0	1	0	60	3	1	2	0	27	0	0	0	0	0	212	2285
5:20 PM	8	87	0	0	0	56	1	0	2	0	20	0	0	0	0	0	174	2276
5:25 PM	5	109	0	0	0	56	3	2	2	0	25	0	0	0	0	0	202	2308
5:30 PM	5	89	0	1	0	56	1	1	2	0	24	0	0	0	0	0	179	2293
5:35 PM	6	101	0	0	0	77	0	0	1	0	23	0	0	0	0	0	208	2323
5:40 PM	10	107	0	0	0	55	2	0	1	0	22	1	0	0	0	0	198	2343
5:45 PM	5	103	0	0	0	39	1	2	6	0	21	0	0	0	0	0	177	2318
5:50 PM	9	120	0	0	0	67	3	1	0	0	26	0	0	0	0	0	226	2366
5:55 PM	5	104	0	0	0	49	0	0	1	0	25	0	0	0	0	0	184	2371
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	60	1280	0	4	0	756	40	8	36	0	284	0	0	0	4	0	2472	
Heavy Trucks	4	0	0		0	8	4		0	0	0		0	0	0		16	
Pedestrians		0				4				0				8			12	
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1	
Railroad																		
Stopped Buses																		

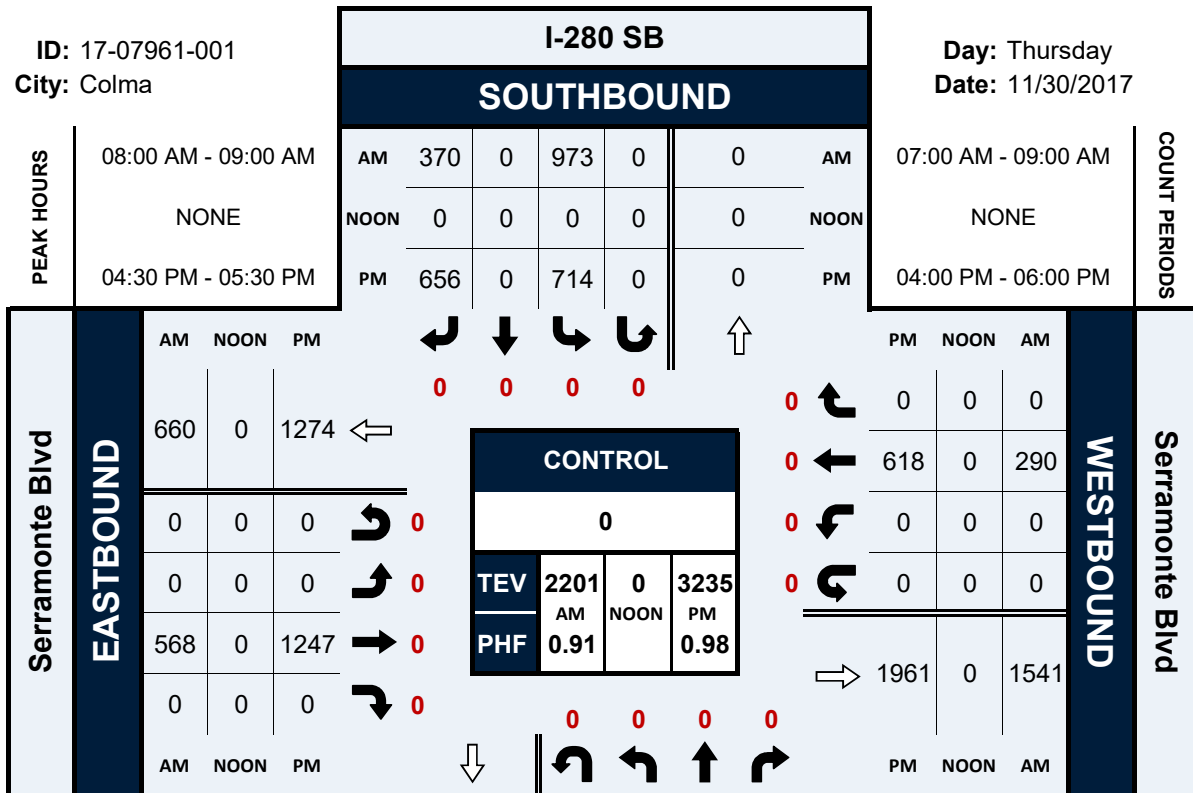
Comments:

I-280 SB & Serramonte Blvd

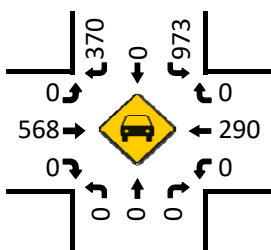
Peak Hour Turning Movement Count

ID: 17-07961-001
City: Colma

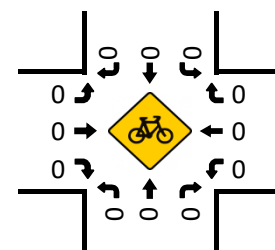
Day: Thursday
Date: 11/30/2017



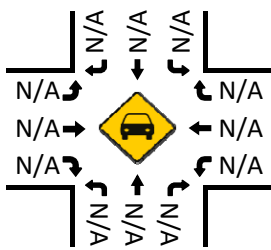
Total Vehicles (AM)



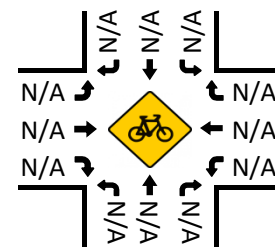
Bikes (AM)



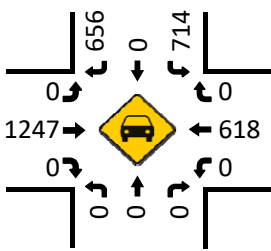
Total Vehicles (Noon)



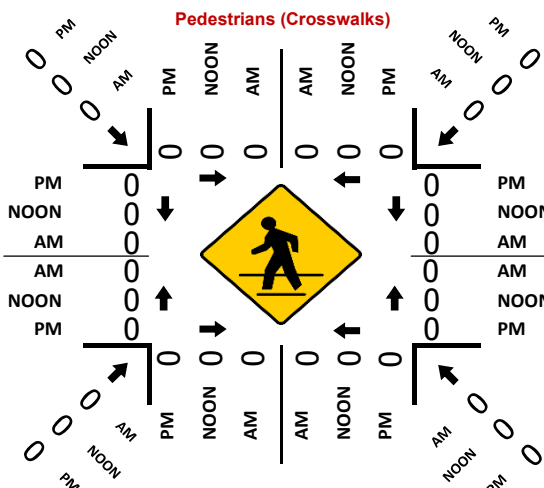
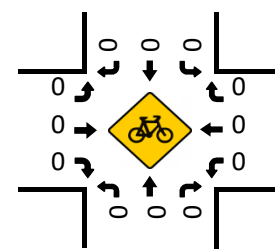
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)

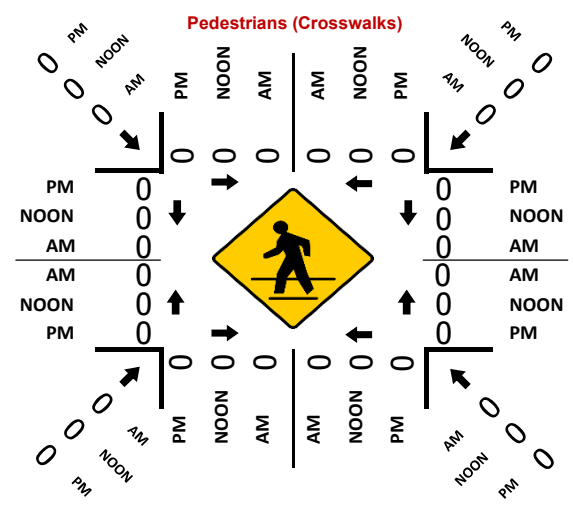
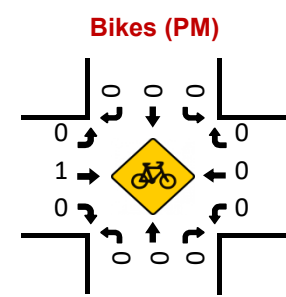
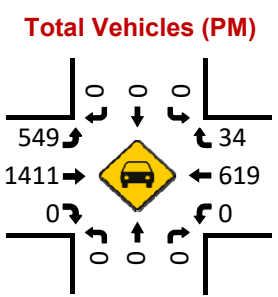
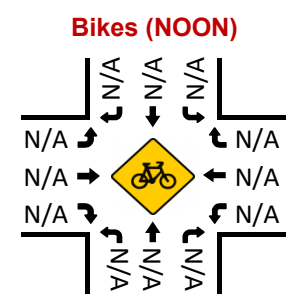
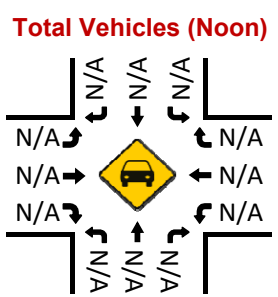
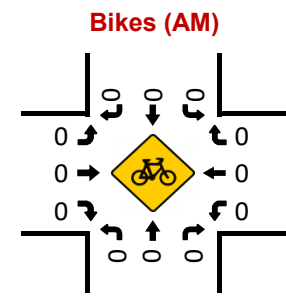
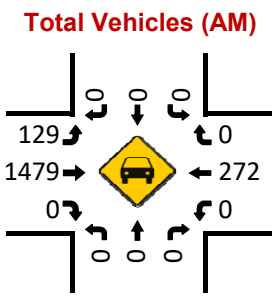
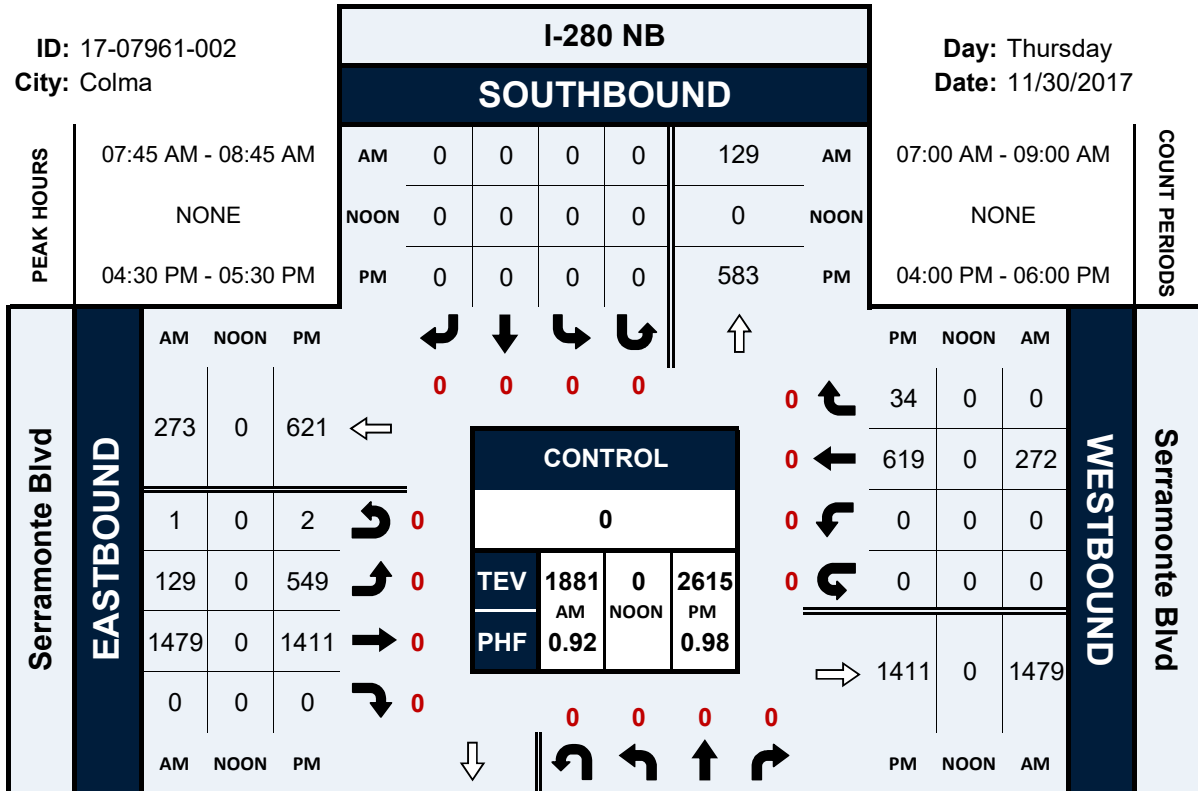


I-280 NB & Serramonte Blvd

Peak Hour Turning Movement Count

ID: 17-07961-002
City: Colma

Day: Thursday
Date: 11/30/2017

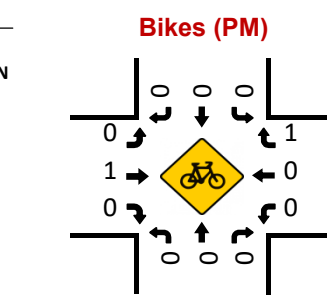
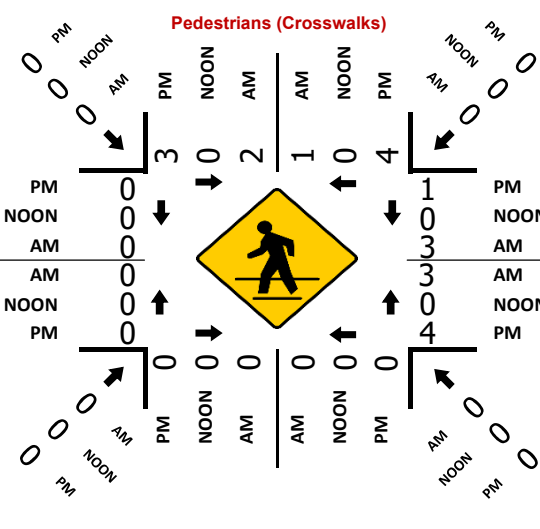
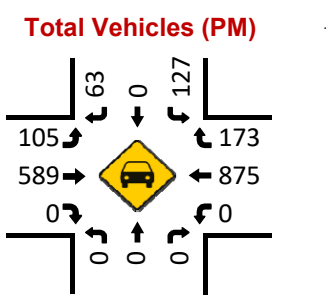
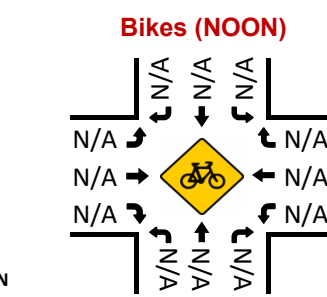
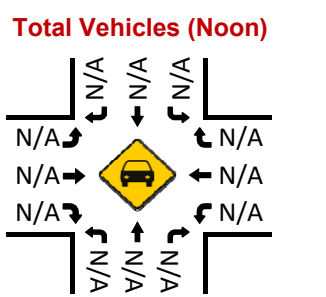
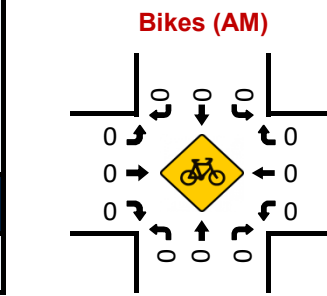
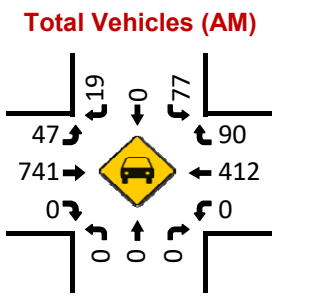
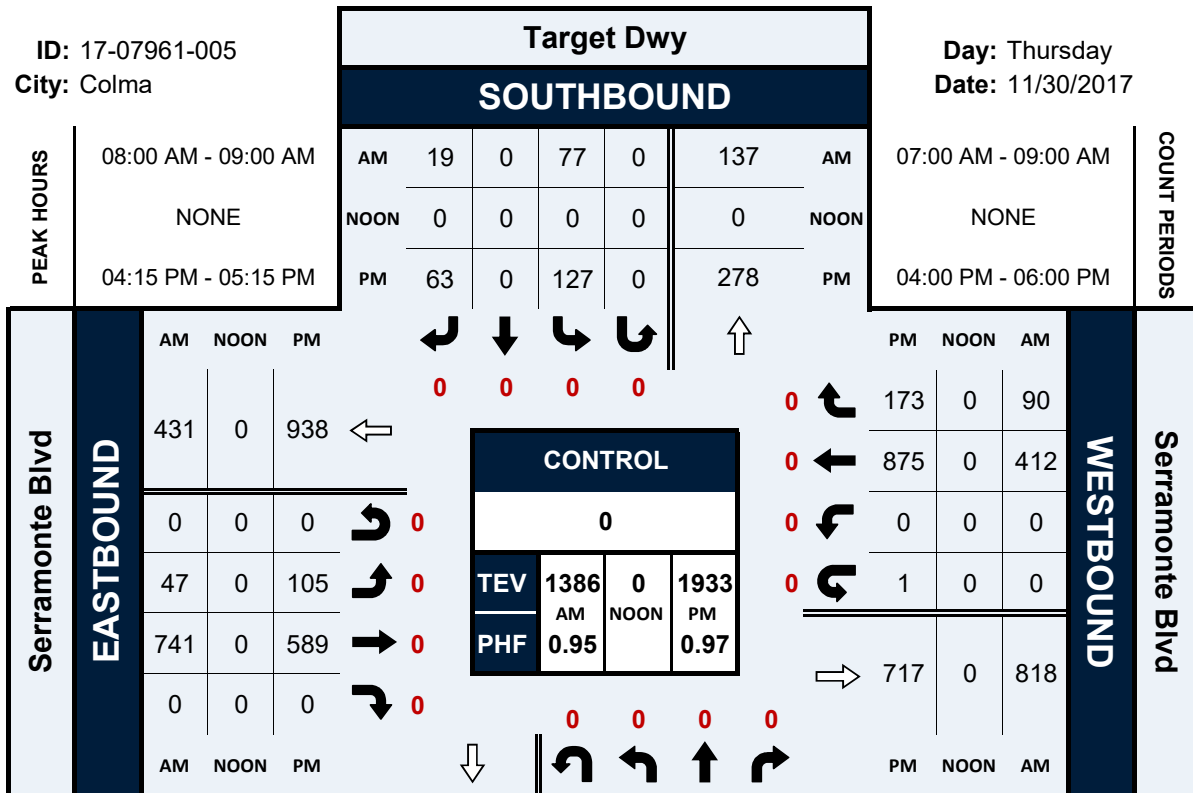


Target Dwy & Serramonte Blvd

Peak Hour Turning Movement Count

ID: 17-07961-005
City: Colma

Day: Thursday
Date: 11/30/2017

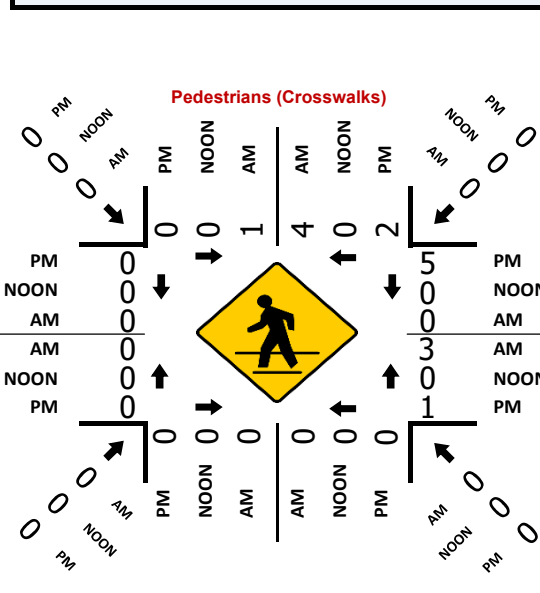
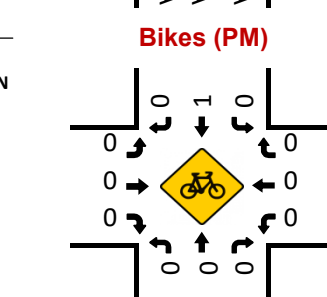
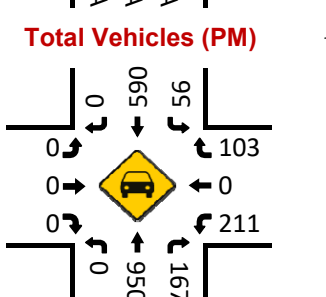
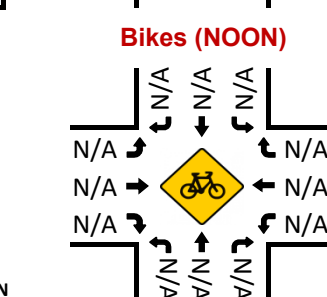
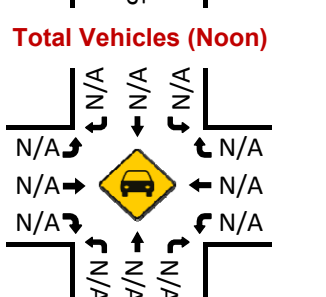
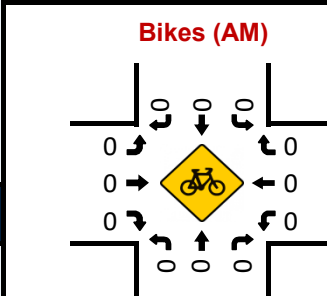
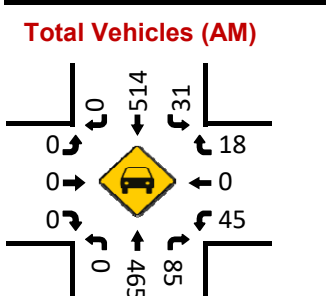
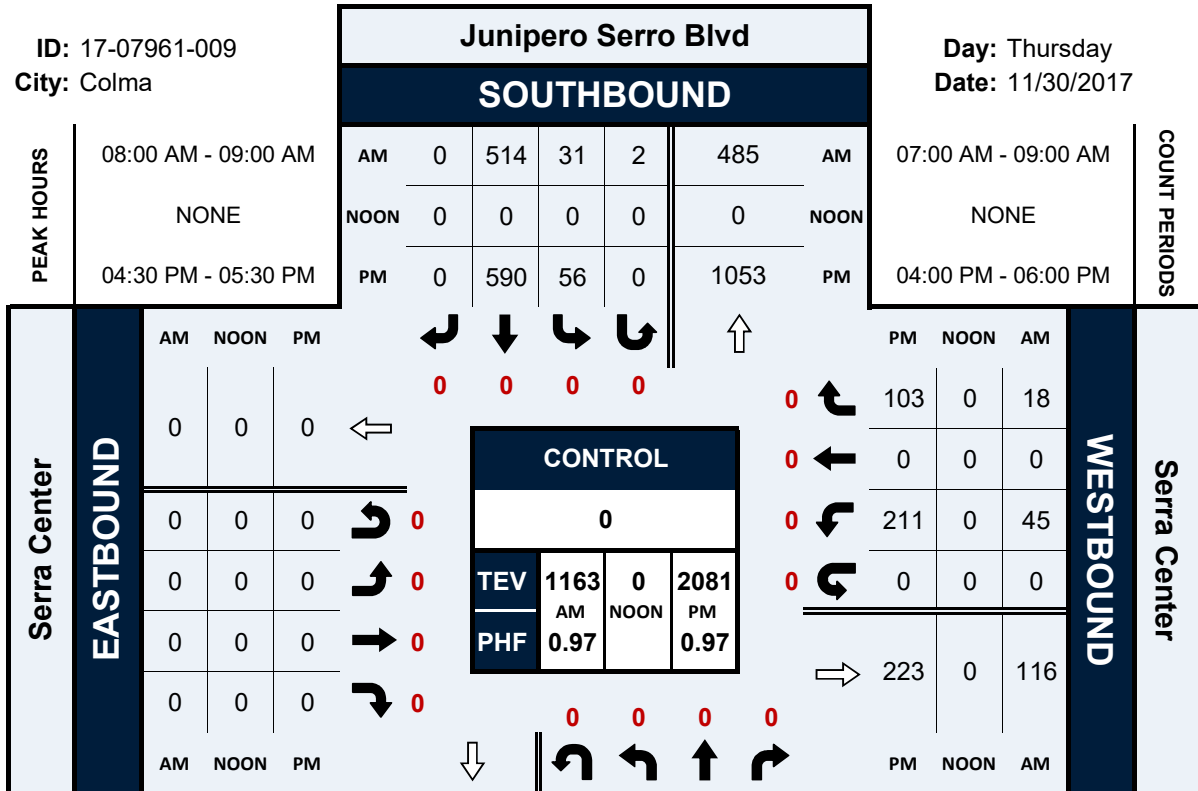


Junipero Serro Blvd & Serra Center

Peak Hour Turning Movement Count

ID: 17-07961-009
City: Colma

Day: Thursday
Date: 11/30/2017

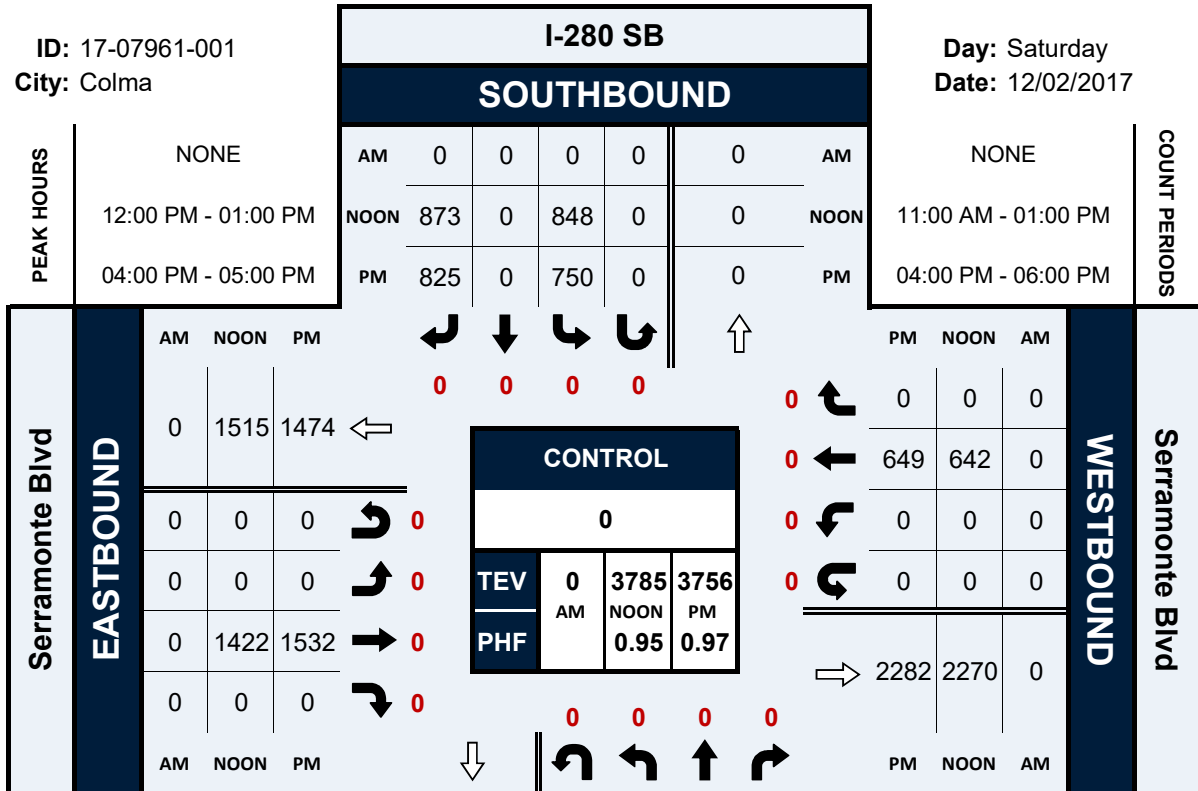


I-280 SB & Serramonte Blvd

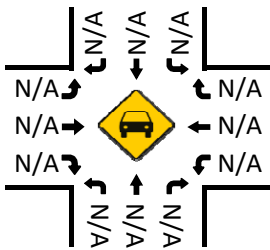
Peak Hour Turning Movement Count

ID: 17-07961-001
City: Colma

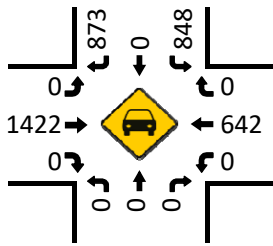
Day: Saturday
Date: 12/02/2017



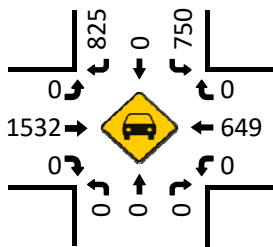
Total Vehicles (AM)



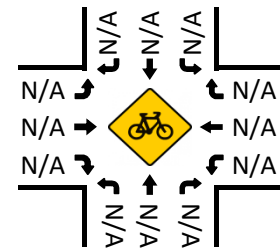
Total Vehicles (Noon)



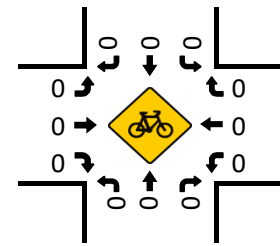
Total Vehicles (PM)



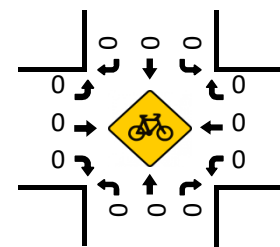
Bikes (AM)



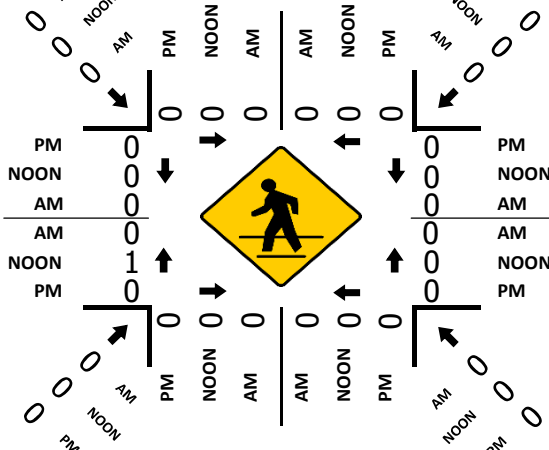
Bikes (NOON)



Bikes (PM)



Pedestrians (Crosswalks)

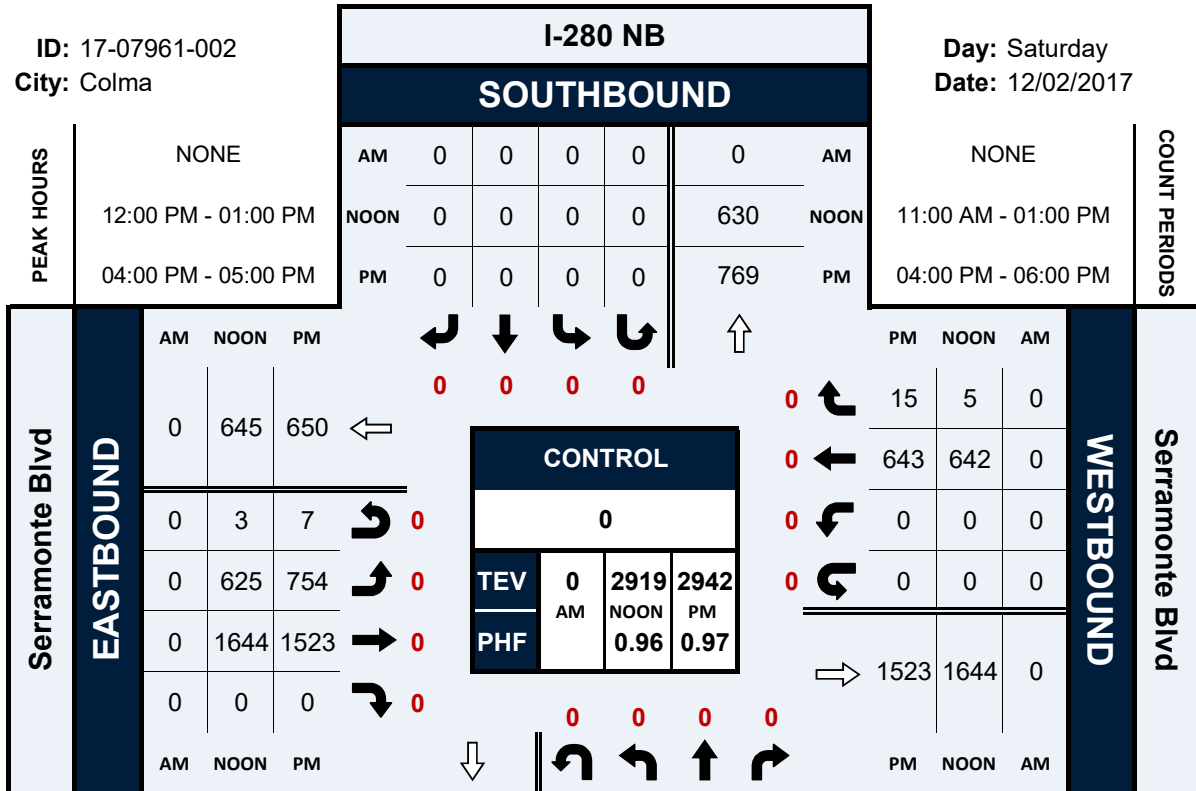


I-280 NB & Serramonte Blvd

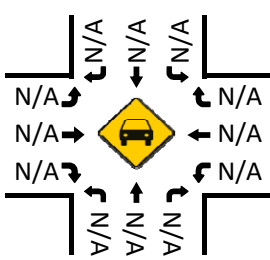
Peak Hour Turning Movement Count

ID: 17-07961-002
City: Colma

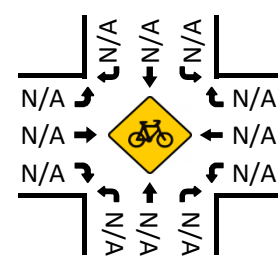
Day: Saturday
Date: 12/02/2017



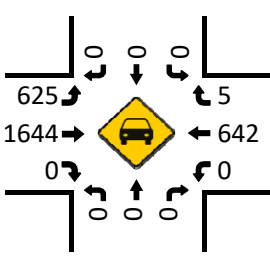
Total Vehicles (AM)



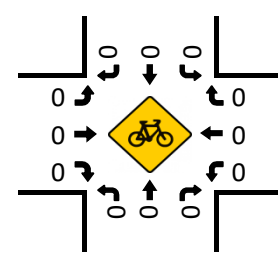
Bikes (AM)



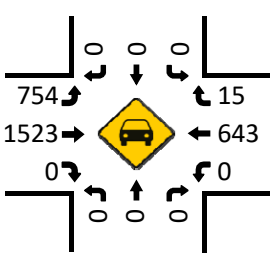
Total Vehicles (Noon)



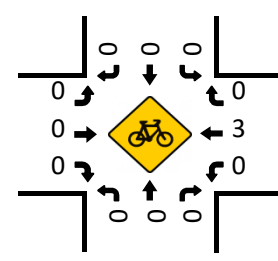
Bikes (NOON)



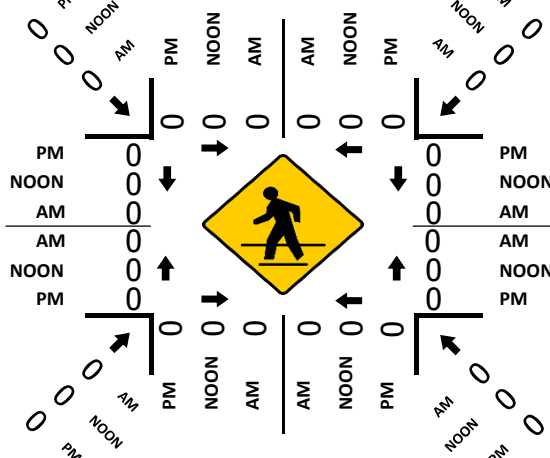
Total Vehicles (PM)



Bikes (PM)



Pedestrians (Crosswalks)

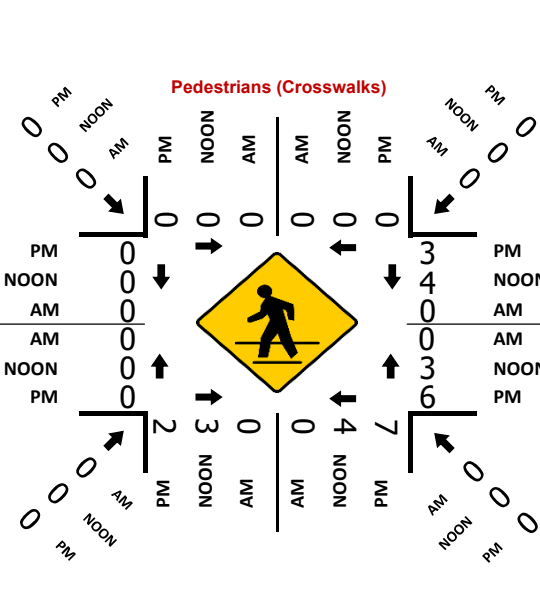
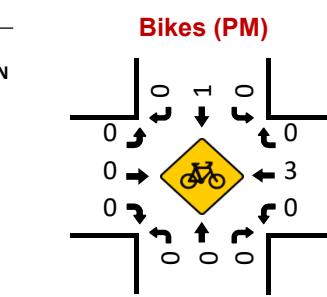
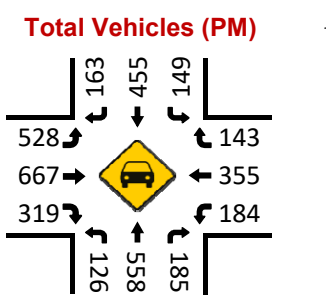
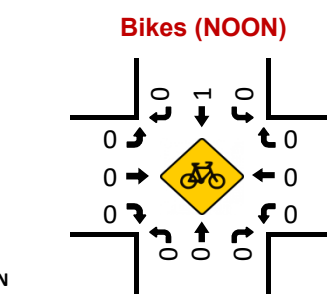
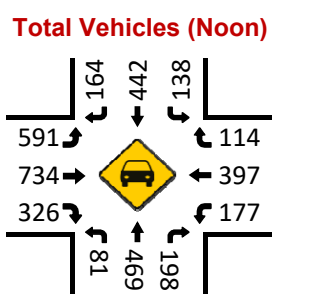
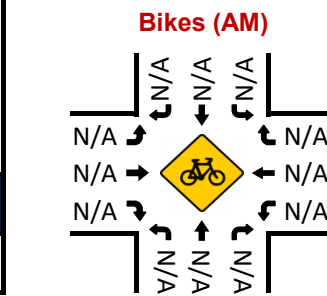
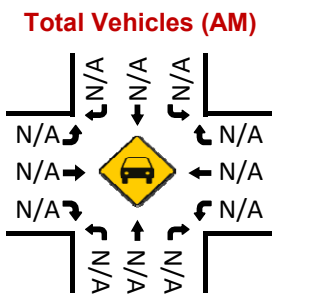
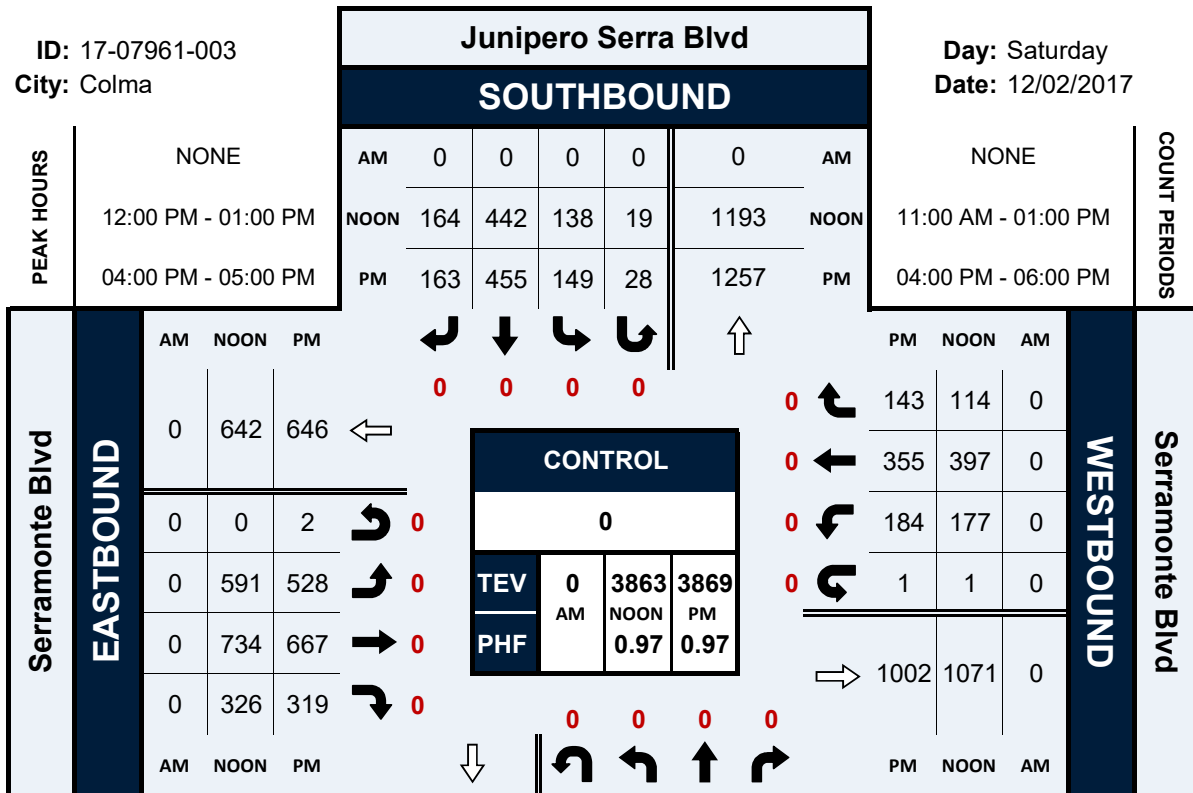


Junipero Serra Blvd & Serramonte Blvd

Peak Hour Turning Movement Count

ID: 17-07961-003
City: Colma

Day: Saturday
Date: 12/02/2017

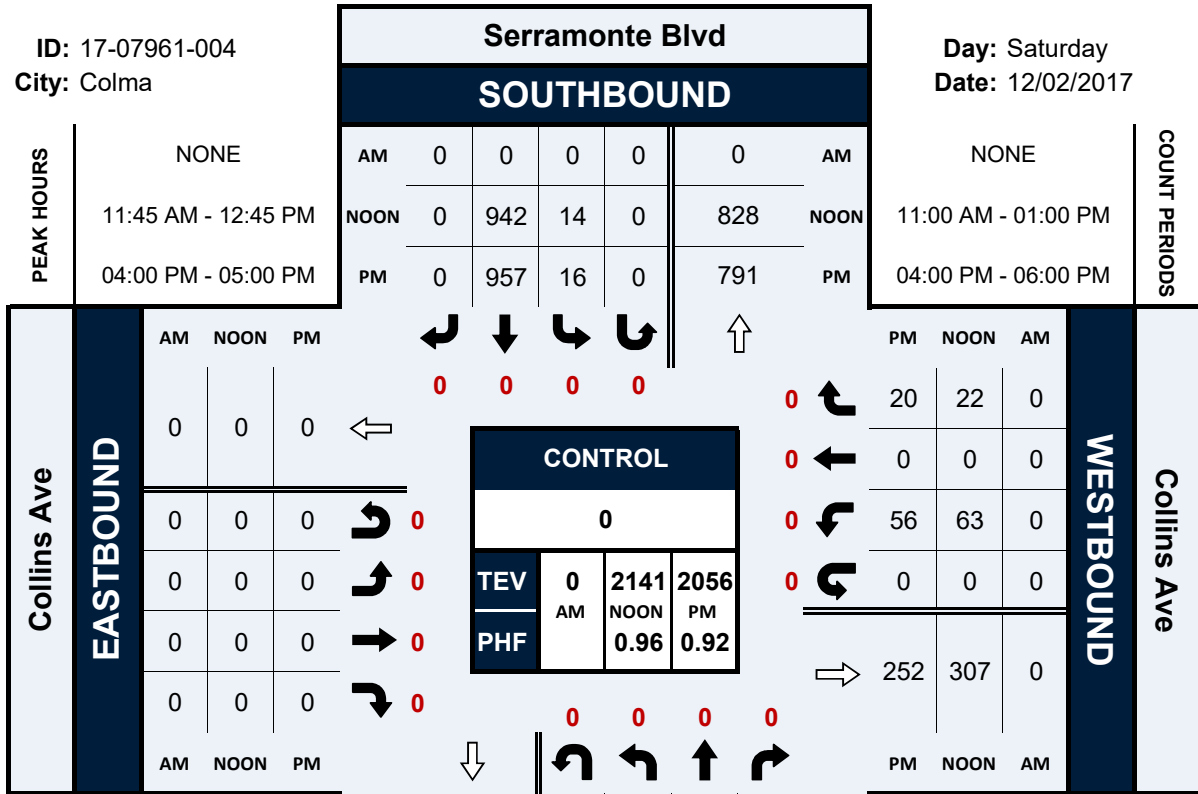


Serramonte Blvd & Collins Ave

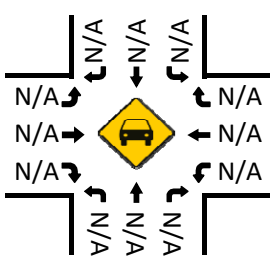
Peak Hour Turning Movement Count

ID: 17-07961-004
City: Colma

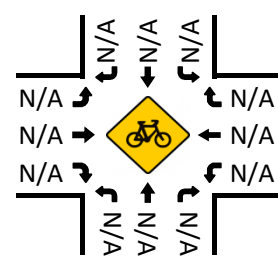
Day: Saturday
Date: 12/02/2017



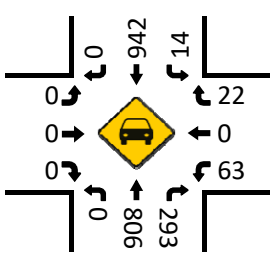
Total Vehicles (AM)



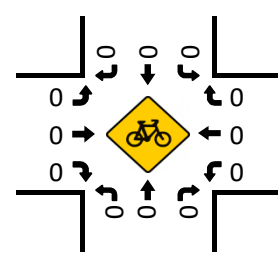
Bikes (AM)



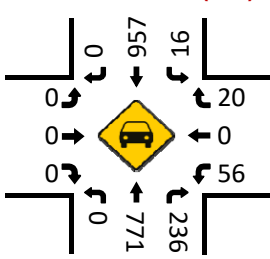
Total Vehicles (Noon)



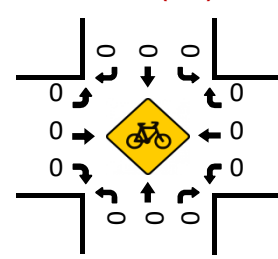
Bikes (NOON)



Total Vehicles (PM)



Bikes (PM)

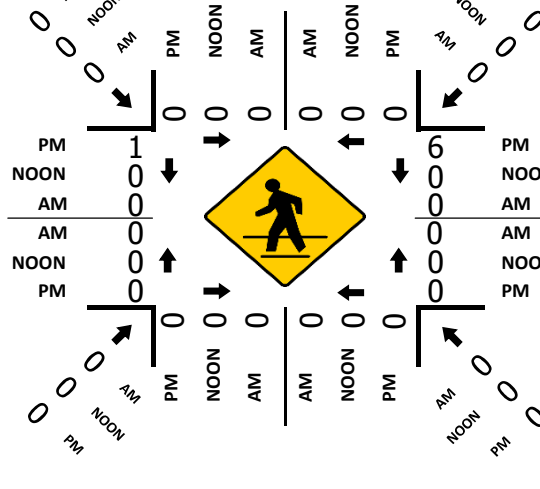


PM	1013	0	0	771	236	PM
NOON	1006	1	0	806	293	NOON
AM	0	0	0	0	0	AM

Serramonte Blvd

PM	0	0	0	0	PM
NOON	0	0	0	0	NOON
AM	0	0	0	0	AM

Pedestrians (Crosswalks)

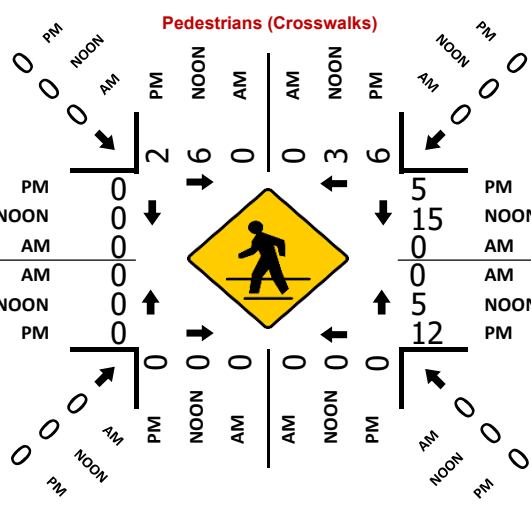
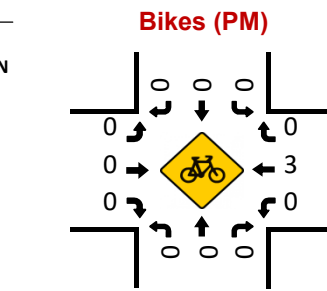
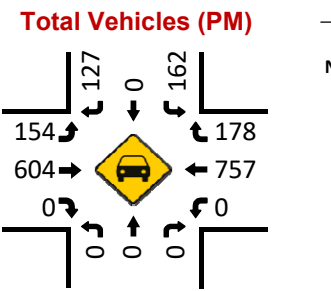
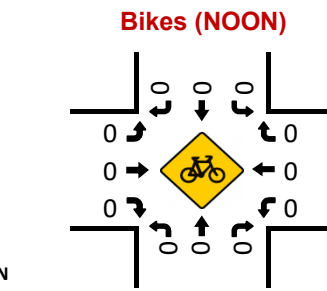
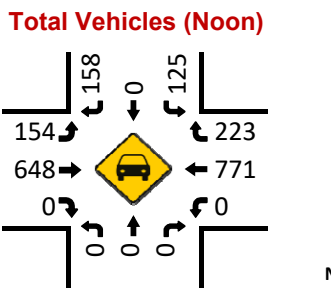
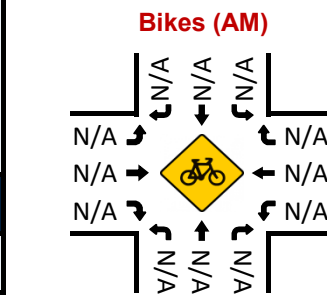
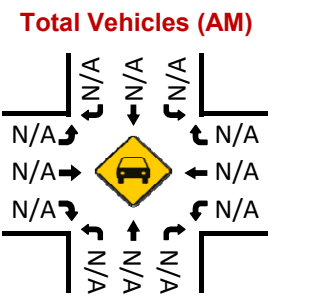
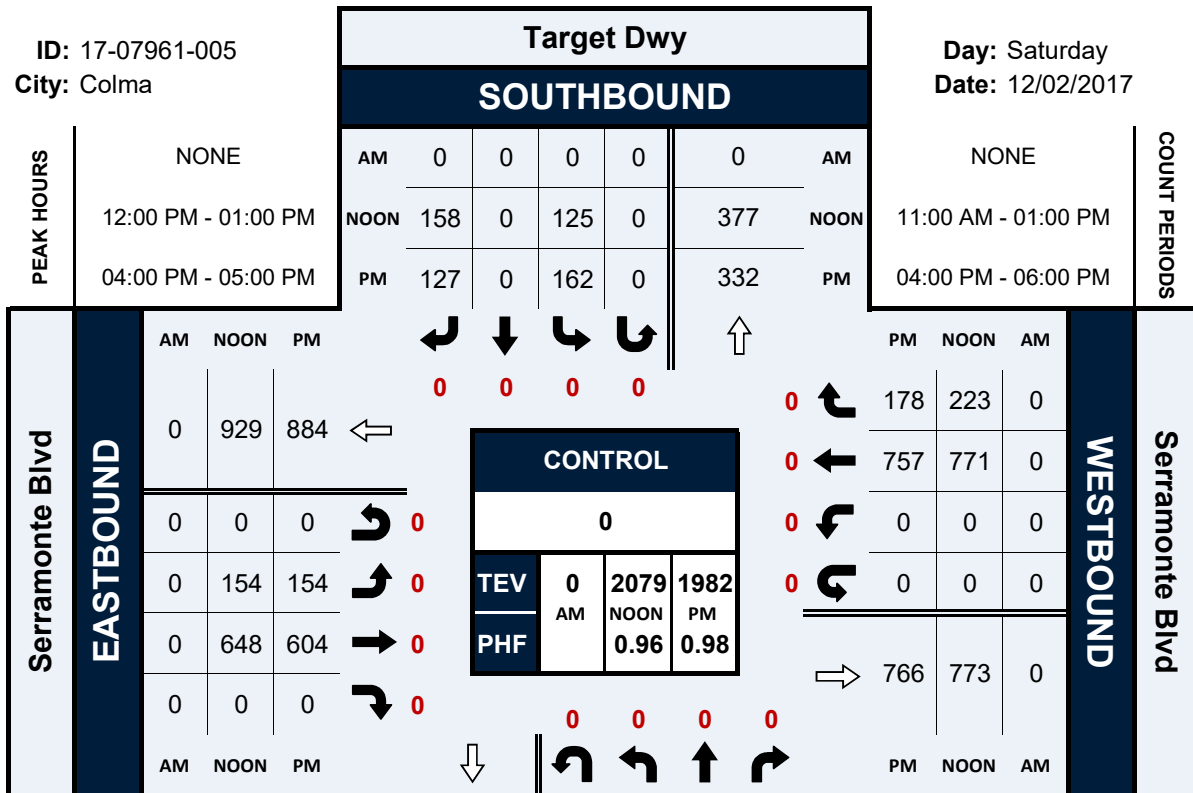


Target Dwy & Serramonte Blvd

Peak Hour Turning Movement Count

ID: 17-07961-005
City: Colma

Day: Saturday
Date: 12/02/2017

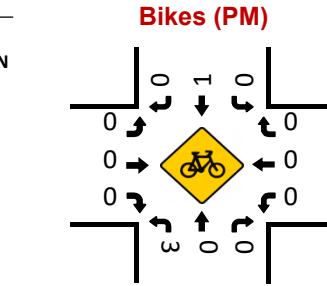
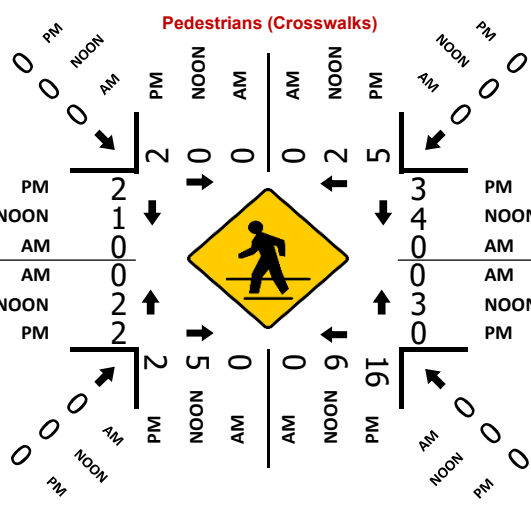
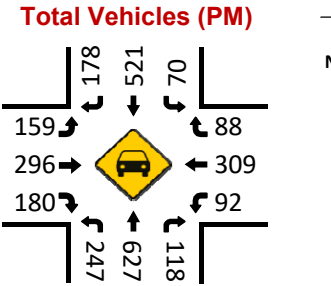
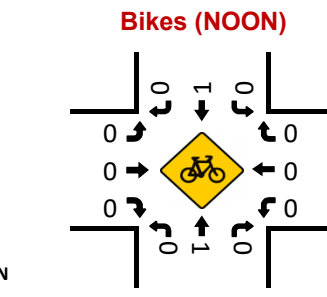
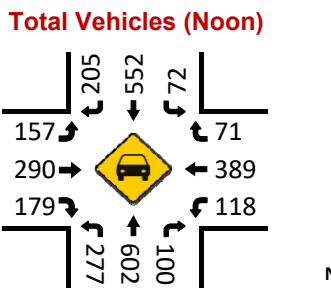
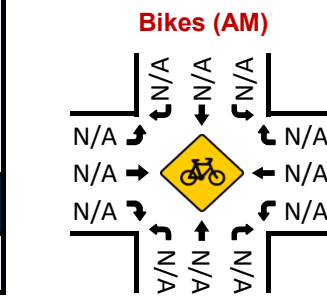
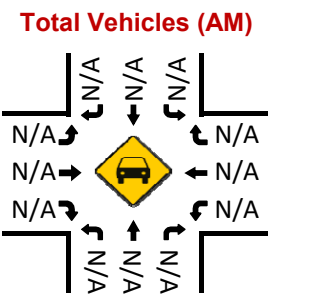
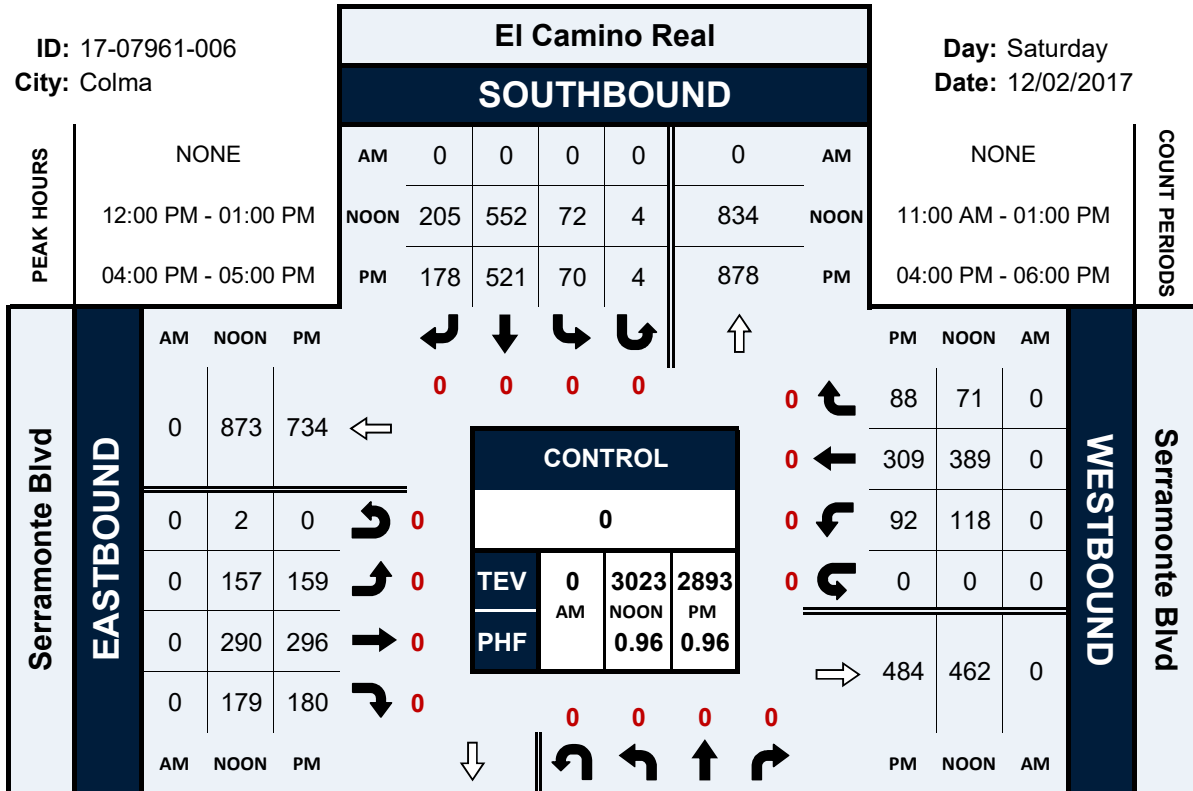


El Camino Real & Serramonte Blvd

Peak Hour Turning Movement Count

ID: 17-07961-006
City: Colma

Day: Saturday
Date: 12/02/2017

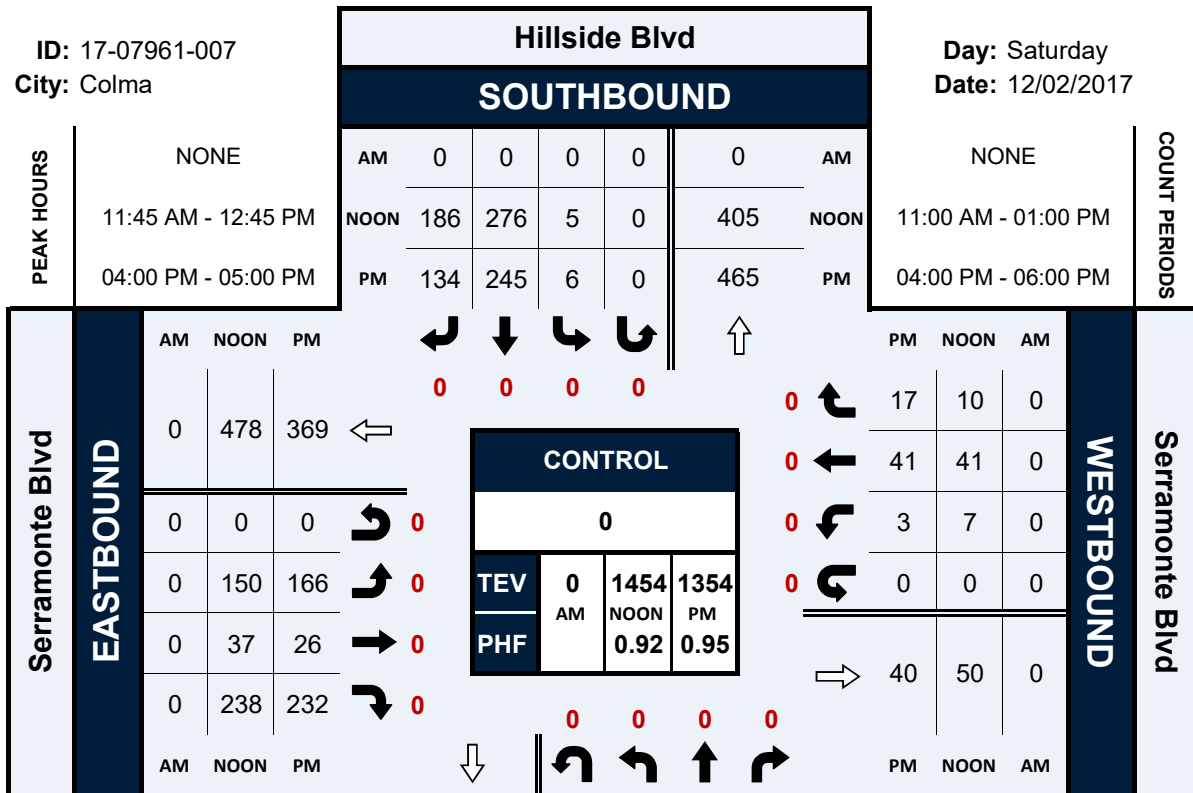


Hillside Blvd & Serramonte Blvd

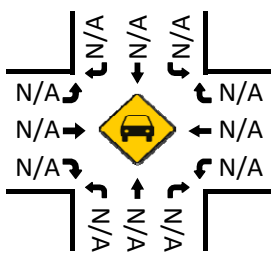
Peak Hour Turning Movement Count

ID: 17-07961-007
City: Colma

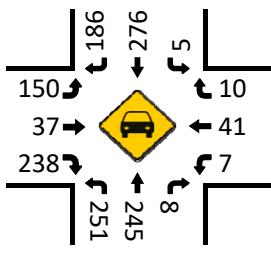
Day: Saturday
Date: 12/02/2017



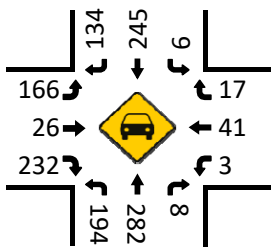
Total Vehicles (AM)



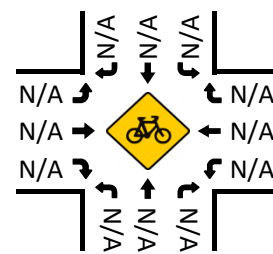
Total Vehicles (Noon)



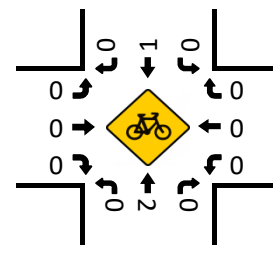
Total Vehicles (PM)



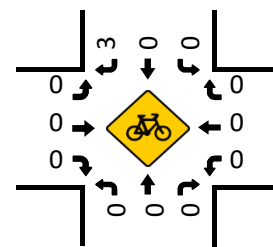
Bikes (AM)



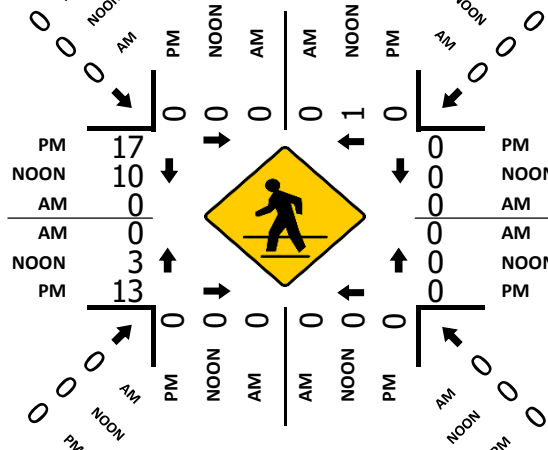
Bikes (NOON)



Bikes (PM)



Pedestrians (Crosswalks)

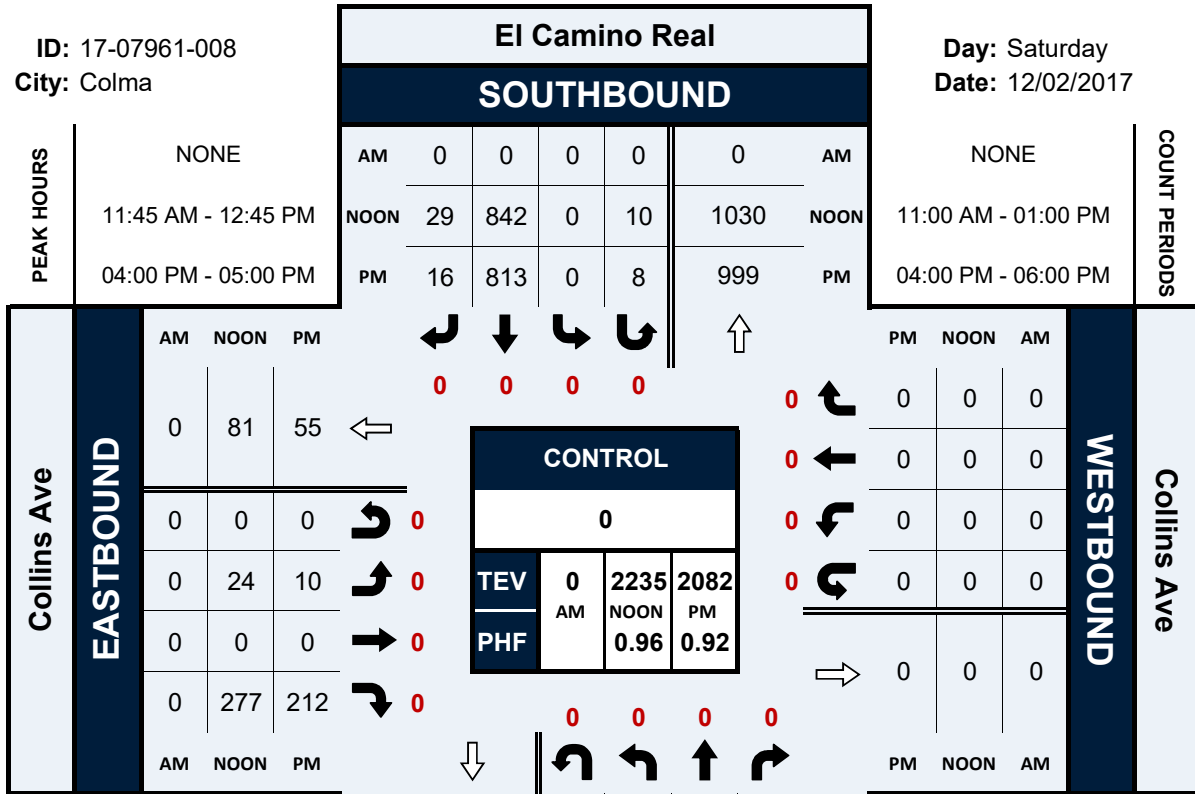


El Camino Real & Collins Ave

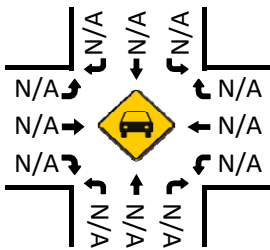
Peak Hour Turning Movement Count

ID: 17-07961-008
City: Colma

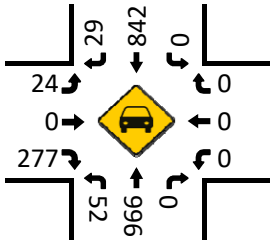
Day: Saturday
Date: 12/02/2017



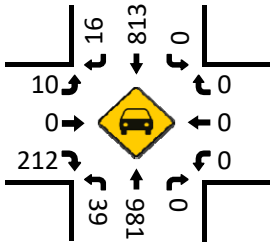
Total Vehicles (AM)



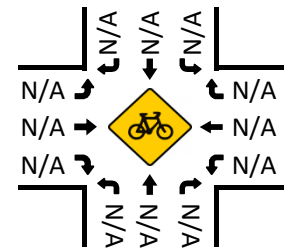
Total Vehicles (Noon)



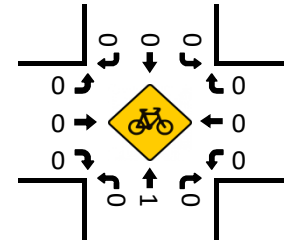
Total Vehicles (PM)



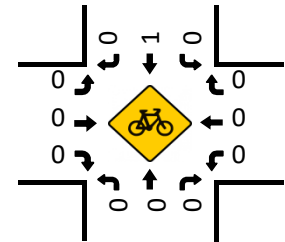
Bikes (AM)



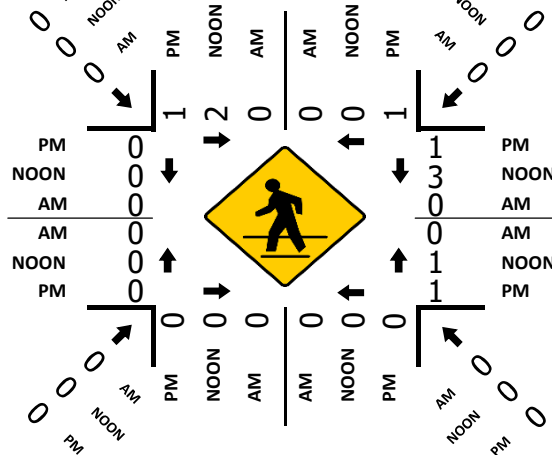
Bikes (NOON)



Bikes (PM)



Pedestrians (Crosswalks)

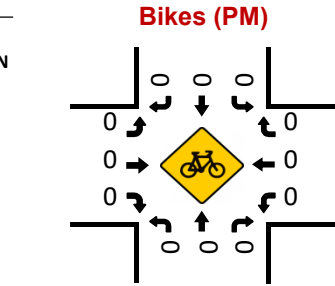
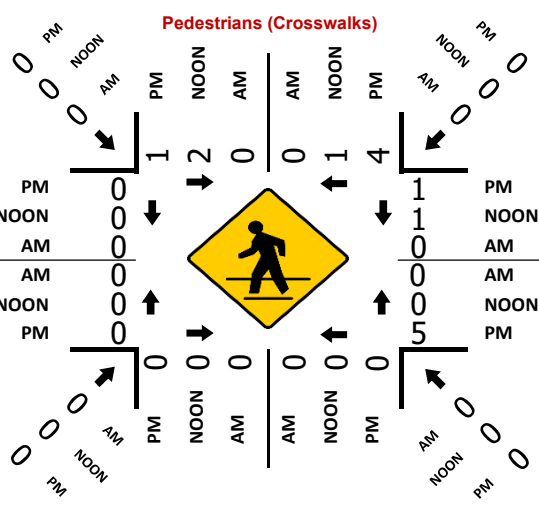
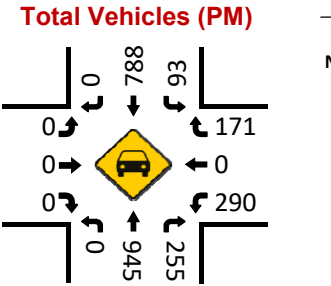
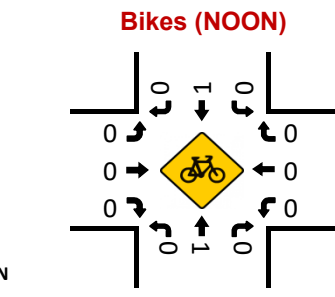
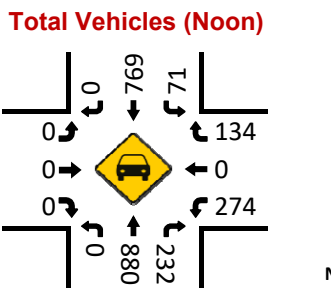
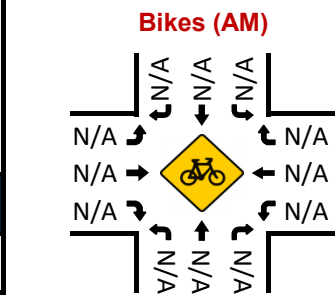
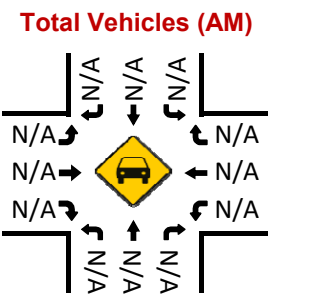
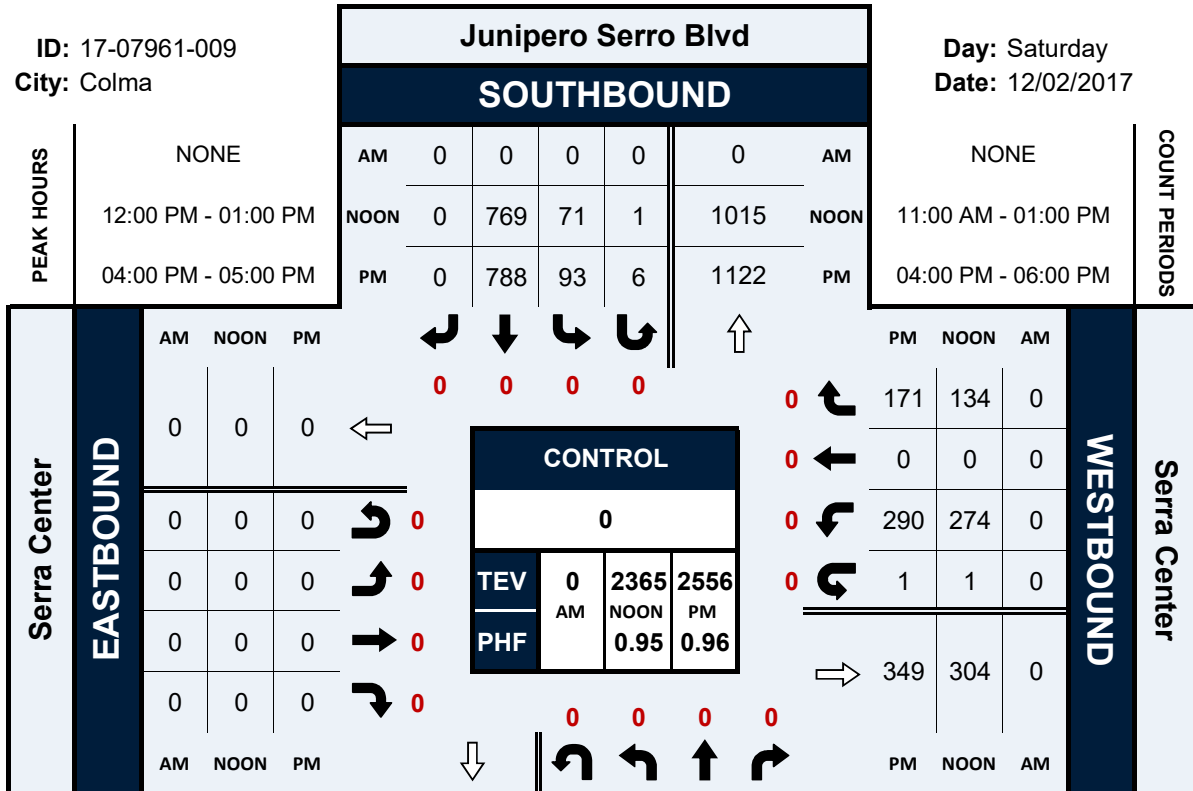


Junipero Serro Blvd & Serra Center

Peak Hour Turning Movement Count

ID: 17-07961-009
City: Colma

Day: Saturday
Date: 12/02/2017



Volume

City: Colma
Location: Hyundai Dwy Collins Ave

Date: 11/30/2017
Day: Thursday

Time	NT	ST
7:00	0	0
7:15	1	1
7:30	2	2
7:45	1	1
8:00	0	2
8:15	0	0
8:30	0	3
8:45	2	5
16:00	2	5
16:15	5	3
16:30	5	7
16:45	4	4
17:00	5	2
17:15	9	2
17:30	1	5
17:45	2	1

Totals	
NT	ST
39	43

Volume

City: Colma
Location: Hyundai Dwy Collins Ave

Date: 12/2/2017
Day: Saturday

Time	NT	ST
11:00	5	7
11:15	6	8
11:30	8	1
11:45	4	6
12:00	5	3
12:15	5	5
12:30	6	7
12:45	3	2
16:00	3	5
16:15	2	2
16:30	4	5
16:45	5	4
17:00	4	2
17:15	4	2
17:30	4	4
17:45	3	0

Totals	
NT	ST
71	63

Volume

City: Colma

Location: Serramonte Blvd Starbucks Dwy

Date: 11/30/2017

Day: Thursday

Time	ET	WT
7:00	26	10
7:15	26	9
7:30	26	7
7:45	34	12
8:00	32	14
8:15	29	9
8:30	23	18
8:45	20	14
16:00	25	17
16:15	24	13
16:30	22	13
16:45	22	11
17:00	23	14
17:15	25	16
17:30	23	18
17:45	18	12

Totals	
ET	WT
398	207

Volume

City: Colma

Location: Serramonte Blvd Starbucks Dwy

Date: 12/2/2017

Day: Saturday

Time	ET	WT
11:00	23	17
11:15	27	18
11:30	28	21
11:45	34	10
12:00	32	29
12:15	37	17
12:30	37	23
12:45	21	29
16:00	26	20
16:15	30	24
16:30	21	20
16:45	43	18
17:00	28	18
17:15	33	25
17:30	24	19
17:45	28	15

Totals	
ET	WT
472	323

Volume

City: Colma

Location: Serramonte Blvd Ford Dwy

Date: 11/30/2017

Day: Thursday

Time	ET	WT
7:00	2	3
7:15	7	0
7:30	3	3
7:45	7	4
8:00	7	1
8:15	6	6
8:30	4	7
8:45	6	5
16:00	4	6
16:15	5	6
16:30	9	10
16:45	4	11
17:00	5	3
17:15	0	3
17:30	4	5
17:45	2	4

Totals	
ET	WT
75	77

Volume

City: Colma

Location: Serramonte Blvd Ford Dwy

Date: 12/2/2017

Day: Saturday

Time	ET	WT
11:00	11	8
11:15	6	4
11:30	5	9
11:45	6	6
12:00	8	10
12:15	3	2
12:30	3	9
12:45	3	3
16:00	1	3
16:15	4	6
16:30	3	5
16:45	3	10
17:00	1	1
17:15	0	1
17:30	0	0
17:45	0	3

Totals	
ET	WT
57	80

Volume

City: Colma

Location: Serramonte Blvd Target Dwy

Date: 11/30/2017

Day: Thursday

Time	ET	WT
7:00	2	0
7:15	1	1
7:30	0	1
7:45	0	4
8:00	2	1
8:15	2	4
8:30	0	3
8:45	1	4
16:00	11	10
16:15	6	6
16:30	8	7
16:45	5	5
17:00	11	6
17:15	5	6
17:30	6	4
17:45	5	8

Totals	
ET	WT
65	70

Volume

City: Colma

Location: Serramonte Blvd Target Dwy

Date: 12/2/2017

Day: Saturday

Time	ET	WT
11:00	7	5
11:15	7	7
11:30	13	3
11:45	13	15
12:00	22	5
12:15	19	6
12:30	14	10
12:45	18	3
16:00	12	9
16:15	17	17
16:30	16	15
16:45	20	10
17:00	4	5
17:15	6	4
17:30	16	4
17:45	9	10

Totals	
ET	WT
213	128

Volume

City: Colma

Location: Chevrolet Dwy Serramonte Blvd

Date: 11/30/2017

Day: Thursday

Time	NT	ST
7:00	2	0
7:15	2	0
7:30	4	0
7:45	1	1
8:00	0	0
8:15	5	2
8:30	1	2
8:45	4	0
16:00	3	3
16:15	0	2
16:30	2	1
16:45	2	1
17:00	3	1
17:15	1	1
17:30	1	4
17:45	0	0

Totals	
NT	ST
31	18

Volume

City: Colma

Location: Chevrolet Dwy Serramonte Blvd

Date: 12/2/2017

Day: Saturday

Time	NT	ST
11:00	2	0
11:15	2	0
11:30	2	2
11:45	0	1
12:00	5	1
12:15	1	4
12:30	1	1
12:45	1	0
16:00	1	1
16:15	1	1
16:30	0	1
16:45	1	1
17:00	1	0
17:15	1	0
17:30	0	3
17:45	1	0

Totals	
NT	ST
20	16

Volume

City: Colma

Location: Volkswagen/Subaru Dwy Serramonte Blvd

Date: 11/30/2017

Day: Thursday

Time	NT	ST
7:00	0	0
7:15	0	4
7:30	2	6
7:45	3	3
8:00	4	3
8:15	0	1
8:30	3	9
8:45	6	7
16:00	10	14
16:15	23	13
16:30	10	8
16:45	10	5
17:00	10	6
17:15	9	2
17:30	8	6
17:45	3	2

Totals	
NT	ST
101	89

Volume

City: Colma

Location: Volkswagen/Subaru Dwy Serramonte Blvd

Date: 12/2/2017

Day: Saturday

Time	NT	ST
11:00	6	8
11:15	12	16
11:30	15	8
11:45	11	12
12:00	9	11
12:15	12	13
12:30	9	8
12:45	14	3
16:00	10	7
16:15	9	5
16:30	21	11
16:45	8	8
17:00	4	3
17:15	8	5
17:30	4	8
17:45	14	2

Totals	
NT	ST
166	128

Volume

City: Colma
Location: Kohl's Dwy Serramonte Blvd

Date: 11/30/2017
Day: Thursday

Time	NT	ST
7:00	0	7
7:15	3	13
7:30	2	16
7:45	8	12
8:00	9	13
8:15	8	25
8:30	15	20
8:45	12	22
16:00	34	27
16:15	34	26
16:30	33	29
16:45	33	20
17:00	23	21
17:15	39	20
17:30	29	15
17:45	18	14

Totals	
NT	ST
300	300

Volume

City: Colma

Location: Kohl's Dwy Serramonte Blvd

Date: 12/2/2017

Day: Saturday

Time	NT	ST
11:00	27	30
11:15	22	29
11:30	21	30
11:45	40	22
12:00	25	25
12:15	36	28
12:30	34	42
12:45	32	37
16:00	31	39
16:15	28	37
16:30	19	28
16:45	27	25
17:00	17	28
17:15	24	29
17:30	16	29
17:45	20	20

Totals	
NT	ST
419	478

Volume

City: Colma

Location: Honda Dwy Serramonte Blvd

Date: 11/30/2017

Day: Thursday

Time	NT	ST
7:00	2	4
7:15	2	5
7:30	1	7
7:45	3	7
8:00	4	5
8:15	6	8
8:30	7	9
8:45	7	14
16:00	8	14
16:15	15	13
16:30	19	7
16:45	16	10
17:00	9	14
17:15	14	17
17:30	18	16
17:45	17	10

Totals	
NT	ST
148	160

Volume

City: Colma
Location: Honda Dwy Serramonte Blvd

Date: 12/2/2017
Day: Saturday

Time	NT	ST
11:00	13	19
11:15	14	13
11:30	15	19
11:45	23	21
12:00	20	13
12:15	9	9
12:30	16	17
12:45	14	16
16:00	25	18
16:15	16	14
16:30	16	7
16:45	11	15
17:00	16	10
17:15	19	8
17:30	14	8
17:45	11	8

Totals	
NT	ST
252	215

Volume

City: Colma
Location: Acura Dwy Serramonte Blvd

Date: 11/30/2017
Day: Thursday

Time	NT	ST
7:00	0	3
7:15	3	10
7:30	0	9
7:45	1	4
8:00	2	2
8:15	3	5
8:30	2	5
8:45	3	8
16:00	10	9
16:15	7	3
16:30	12	7
16:45	6	7
17:00	10	4
17:15	11	7
17:30	7	4
17:45	6	3

Totals	
NT	ST
83	90

Volume

City: Colma
Location: Acura Dwy Serramonte Blvd

Date: 12/2/2017
Day: Saturday

Time	NT	ST
11:00	11	14
11:15	5	4
11:30	8	7
11:45	5	5
12:00	8	9
12:15	8	6
12:30	6	6
12:45	4	5
16:00	5	6
16:15	9	8
16:30	11	7
16:45	5	6
17:00	11	2
17:15	4	2
17:30	6	4
17:45	4	5

Totals	
NT	ST
110	96

Volume

City: Colma

Location: Carmax Dwy Serramonte Blvd

Date: 11/30/2017

Day: Thursday

Time	NT	ST
7:00	1	2
7:15	0	0
7:30	0	3
7:45	0	3
8:00	0	2
8:15	1	3
8:30	0	6
8:45	1	11
16:00	7	6
16:15	9	5
16:30	6	5
16:45	3	5
17:00	9	5
17:15	5	6
17:30	4	3
17:45	2	1

Totals	
NT	ST
48	66

Volume

City: Colma

Location: Carmax Dwy Serramonte Blvd

Date: 12/2/2017

Day: Saturday

Time	NT	ST
11:00	10	7
11:15	6	11
11:30	2	5
11:45	8	19
12:00	5	11
12:15	8	9
12:30	9	11
12:45	12	8
16:00	10	8
16:15	12	10
16:30	6	9
16:45	9	8
17:00	3	4
17:15	6	8
17:30	10	5
17:45	5	8

Totals	
NT	ST
121	141

Volume

City: Colma
Location: El Camino Real Kohl's Dwy

Date: 11/30/2017
Day: Thursday

Time	ET	WT
7:00	0	4
7:15	1	6
7:30	2	5
7:45	4	6
8:00	5	5
8:15	1	6
8:30	4	7
8:45	5	7
16:00	18	15
16:15	18	12
16:30	18	10
16:45	13	13
17:00	19	21
17:15	16	11
17:30	13	7
17:45	7	12

Totals	
ET	WT
144	147

Volume

City: Colma
Location: El Camino Real Kohl's Dwy

Date: 12/2/2017
Day: Saturday

Time	ET	WT
11:00	12	17
11:15	18	11
11:30	13	17
11:45	18	17
12:00	20	15
12:15	25	12
12:30	22	14
12:45	23	16
16:00	19	15
16:15	29	7
16:30	22	12
16:45	21	8
17:00	16	17
17:15	16	19
17:30	21	9
17:45	17	10

Totals	
ET	WT
312	216

Volume

City: Colma

Location: Junipero Serra Blvd Serra Center Driveway

Date: 11/30/2017

Day: Thursday

Time	ET	WT
7:00	6	9
7:15	8	5
7:30	16	4
7:45	17	8
8:00	17	11
8:15	24	9
8:30	26	12
8:45	34	11
16:00	51	58
16:15	46	49
16:30	57	51
16:45	57	58
17:00	61	52
17:15	57	38
17:30	51	58
17:45	47	56

Totals	
ET	WT
575	489

Volume

City: Colma

Location: Junipero Serra Blvd Serra Center Driveway

Date: 12/2/2017

Day: Saturday

Time	ET	WT
11:00	56	49
11:15	94	59
11:30	91	50
11:45	95	55
12:00	83	69
12:15	73	60
12:30	106	63
12:45	76	63
16:00	66	79
16:15	68	72
16:30	93	67
16:45	72	65
17:00	60	47
17:15	58	65
17:30	58	68
17:45	63	70

Totals	
ET	WT
1212	1001

Volume

City: Colma

Location: Serramonte Blvd Serramonte Ford Dwy

Date: 11/30/2017

Day: Thursday

Time	ET	WT
7:00	1	0
7:15	2	0
7:30	1	1
7:45	1	1
8:00	4	2
8:15	2	1
8:30	3	5
8:45	3	3
16:00	2	5
16:15	2	4
16:30	1	4
16:45	0	0
17:00	1	2
17:15	0	4
17:30	0	0
17:45	1	1

Totals	
ET	WT
24	33

Volume

City: Colma

Location: Serramonte Blvd Serramonte Ford Dwy

Date: 12/2/2017

Day: Saturday

Time	ET	WT
11:00	2	2
11:15	4	0
11:30	3	0
11:45	3	3
12:00	4	3
12:15	1	2
12:30	3	6
12:45	4	4
16:00	2	0
16:15	3	5
16:30	2	3
16:45	1	3
17:00	1	0
17:15	2	1
17:30	1	2
17:45	2	1

Totals	
ET	WT
38	35



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Appendix B

Synchro Analysis





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HCM Signalized Intersection Capacity Analysis
 1: Serramonte Blvd & I-280 SB Off-Ramp

04/09/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↑	↑↑
Traffic Volume (vph)	0	568	290	0	973	370
Future Volume (vph)	0	568	290	0	973	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	598	305	0	1024	389
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	598	305	0	1024	389
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		17.8	8.5		22.3	32.1
Effective Green, g (s)		17.8	8.5		22.3	32.1
Actuated g/C Ratio		0.37	0.18		0.46	0.66
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1301	893		1581	1848
v/s Ratio Prot		c0.17	0.06		c0.30	0.14
v/s Ratio Perm						
v/c Ratio		0.46	0.34		0.65	0.21
Uniform Delay, d1		11.6	17.5		10.0	3.2
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.2		0.9	0.1
Delay (s)		11.9	17.7		11.0	3.2
Level of Service		B	B		B	A
Approach Delay (s)		11.9	17.7		8.8	
Approach LOS		B	B		A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	11.5
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2: Serramonte Blvd & I-280 NB On-Ramp

04/09/2018



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑↑			
Traffic Volume (vph)	2	139	1426	290	0	0	0
Future Volume (vph)	2	139	1426	290	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.4	4.1			
Lane Util. Factor		0.97	0.95	0.95			
Frt		1.00	1.00	1.00			
Flt Protected		0.95	1.00	1.00			
Satd. Flow (prot)		3433	3539	3539			
Flt Permitted		0.95	1.00	1.00			
Satd. Flow (perm)		3433	3539	3539			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	146	1501	305	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	148	1501	305	0	0	0
Turn Type	Prot	Prot	NA	NA			
Protected Phases	5	5	2	6			
Permitted Phases							
Actuated Green, G (s)		5.9	36.6	23.1			
Effective Green, g (s)		5.9	36.6	23.1			
Actuated g/C Ratio		0.16	1.00	0.63			
Clearance Time (s)		3.5	4.4	4.1			
Vehicle Extension (s)		3.0	4.0	3.0			
Lane Grp Cap (vph)		553	3539	2233			
v/s Ratio Prot		0.04	c0.42	0.09			
v/s Ratio Perm							
v/c Ratio		0.27	0.42	0.14			
Uniform Delay, d1		13.5	0.0	2.7			
Progression Factor		1.00	1.00	1.00			
Incremental Delay, d2		0.3	0.1	0.0			
Delay (s)		13.7	0.1	2.8			
Level of Service		B	A	A			
Approach Delay (s)			1.3	2.8		0.0	
Approach LOS			A	A		A	

Intersection Summary			
HCM 2000 Control Delay	1.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	36.6	Sum of lost time (s)	7.6
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

04/09/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL	NBT	NBR
Lane Configurations	↔	↕	↔	↔	↕	↔				↔	↕	↔
Traffic Volume (vph)	126	769	531	94	191	201	44	4	38	320	271	167
Future Volume (vph)	126	769	531	94	191	201	44	4	38	320	271	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.6	4.6				4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91				0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00				1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1556	1770	3206	1441				3433	3539	1557
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1556	1770	3206	1441				3433	3539	1557
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	133	809	559	99	201	212	46	4	40	337	285	176
RTOR Reduction (vph)	0	0	379	0	0	79	0	0	0	0	0	140
Lane Group Flow (vph)	133	809	180	99	315	65	0	0	0	381	285	36
Confl. Peds. (#/hr)			7									6
Turn Type	Prot	NA	Perm	Prot	NA	Perm		Split	Split	Split	NA	Perm
Protected Phases	5	2		1	6			3	3	3		3
Permitted Phases			2			6						3
Actuated Green, G (s)	8.2	25.9	25.9	7.8	24.9	24.9				16.5	16.5	16.5
Effective Green, g (s)	8.2	25.9	25.9	7.8	24.9	24.9				16.5	16.5	16.5
Actuated g/C Ratio	0.10	0.32	0.32	0.10	0.31	0.31				0.21	0.21	0.21
Clearance Time (s)	3.0	4.0	4.0	3.0	4.6	4.6				4.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0				2.0	2.0	2.0
Lane Grp Cap (vph)	350	1140	501	171	992	446				704	726	319
v/s Ratio Prot	0.04	c0.23		c0.06	0.10					c0.11	0.08	
v/s Ratio Perm			0.12			0.05						0.02
v/c Ratio	0.38	0.71	0.36	0.58	0.32	0.15				0.54	0.39	0.11
Uniform Delay, d1	33.7	23.9	20.9	34.7	21.2	20.1				28.6	27.6	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.3	1.7	0.2	2.9	0.1	0.1				0.5	0.1	0.1
Delay (s)	34.0	25.6	21.1	37.7	21.3	20.1				29.0	27.7	26.1
Level of Service	C	C	C	D	C	C				C	C	C
Approach Delay (s)		24.7			23.9						28.0	
Approach LOS		C			C						C	

Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	16.2
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

04/09/2018



Movement	SBU	SBL	SBT	SBR	SBR2
Lane Configurations		↔	↕	↔	↕
Traffic Volume (vph)	10	117	324	61	47
Future Volume (vph)	10	117	324	61	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.0
Lane Util. Factor		1.00	0.95		1.00
Frbp, ped/bikes		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00
Frt		1.00	0.98		0.85
Flt Protected		0.95	1.00		1.00
Satd. Flow (prot)		1770	3455		1583
Flt Permitted		0.95	1.00		1.00
Satd. Flow (perm)		1770	3455		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	123	341	64	49
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	134	405	0	49
Confl. Peds. (#/hr)					
Turn Type	Split	Split	NA		Free
Protected Phases	4	4	4		
Permitted Phases					Free
Actuated Green, G (s)		14.6	14.6		80.4
Effective Green, g (s)		14.6	14.6		80.4
Actuated g/C Ratio		0.18	0.18		1.00
Clearance Time (s)		4.6	4.6		
Vehicle Extension (s)		2.0	2.0		
Lane Grp Cap (vph)		321	627		1583
v/s Ratio Prot		0.08	c0.12		
v/s Ratio Perm					c0.03
v/c Ratio		0.42	0.65		0.03
Uniform Delay, d1		29.1	30.5		0.0
Progression Factor		1.00	1.00		1.00
Incremental Delay, d2		0.3	1.7		0.0
Delay (s)		29.5	32.2		0.0
Level of Service		C	C		A
Approach Delay (s)			28.9		
Approach LOS			C		

Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	16.2
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Collins Avenue & Serramonte Blvd

04/09/2018

Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↑		↑↑↑	↑	↑			
Traffic Volume (veh/h)	704	349	17	474	56	17			
Future Volume (Veh/h)	704	349	17	474	56	17			
Sign Control	Free			Free	Stop				
Grade	0%			0%	0%				
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95			
Hourly flow rate (vph)	741	367	18	499	59	18			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)	2								
Median type	None	None							
Median storage (veh)									
Upstream signal (ft)	239								
pX, platoon unblocked			0.84		0.84	0.84			
vC, conflicting volume			741		902	370			
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol			301		493	0			
IC, single (s)			4.1		6.8	6.9			
IC, 2 stage (s)									
IF (s)			2.2		3.5	3.3			
p0 queue free. %			98		86	98			
cM capacity (veh/h)			1052		416	908			
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	
Volume Total	370	370	367	89	143	143	143	77	
Volume Left	0	0	0	18	0	0	0	59	
Volume Right	0	0	367	0	0	0	0	18	
cSH	1700	1700	1700	1052	1700	1700	1700	542	
Volume to Capacity	0.22	0.22	0.22	0.02	0.08	0.08	0.08	0.14	
Queue Length 95th (ft)	0	0	0	1	0	0	0	12	
Control Delay (s)	0.0	0.0	0.0	1.8	0.0	0.0	0.0	13.7	
Lane LOS				A	B				
Approach Delay (s)	0.0			0.3		13.7			
Approach LOS				B		B			
Intersection Summary									
Average Delay				0.7					
Intersection Capacity Utilization	35.4%			ICU Level of Service		A			
Analysis Period (min)	15								

HCM Unsignalized Intersection Capacity Analysis
5: Serramonte Blvd & Serra Center Driveway

04/09/2018

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑↑
Sign Control		Stop	Stop		Stop	Stop
Traffic Volume (vph)	47	741	412	90	77	19
Future Volume (vph)	47	741	412	90	77	19
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	49	780	434	95	81	20
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total (vph)	309	520	289	240	101	
Volume Left (vph)	49	0	0	0	81	
Volume Right (vph)	0	0	0	95	20	
Hadj (s)	0.11	0.03	0.03	-0.24	0.08	
Departure Headway (s)	5.6	5.5	5.9	5.6	6.5	
Degree Utilization, x	0.48	0.79	0.47	0.37	0.18	
Capacity (veh/h)	626	643	599	626	526	
Control Delay (s)	12.4	25.1	12.7	10.6	10.9	
Approach Delay (s)	20.4		11.8		10.9	
Approach LOS	C		B		B	
Intersection Summary						
Delay				16.6		
Level of Service				C		
Intersection Capacity Utilization	52.5%			ICU Level of Service		A
Analysis Period (min)	15					

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

04/09/2018

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations		↔				↔	↔			↔	↔	↔
Traffic Volume (vph)	57	483	79	1	87	231	54	1	93	275	47	8
Future Volume (vph)	57	483	79	1	87	231	54	1	93	275	47	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5				3.5	3.5			3.0	4.0	4.0
Lane Util. Factor		0.95				0.95	1.00			1.00	0.91	1.00
Frbp, ped/bikes		1.00				1.00	0.98			1.00	1.00	0.98
Flpb, ped/bikes		1.00				1.00	1.00			1.00	1.00	1.00
Frt		0.98				1.00	0.85			1.00	1.00	0.85
Flt Protected		1.00				0.99	1.00			0.95	1.00	1.00
Satd. Flow (prot)		3447				3491	1559			1770	5085	1558
Flt Permitted		1.00				0.99	1.00			0.95	1.00	1.00
Satd. Flow (perm)		3447				3491	1559			1770	5085	1558
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	60	508	83	1	92	243	57	1	98	289	49	8
RTOR Reduction (vph)	0	12	0	0	0	0	47	0	0	0	36	0
Lane Group Flow (vph)	0	639	0	0	0	336	10	0	99	289	13	0
Confl. Peds. (#/hr)			11				5					5
Turn Type	Split	NA		Split	Split	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	8	8		7	7	7		1	1	6		5
Permitted Phases							7					6
Actuated Green, G (s)		19.9				14.1	14.1			7.8	20.9	20.9
Effective Green, g (s)		19.9				14.1	14.1			7.8	20.9	20.9
Actuated g/C Ratio		0.26				0.18	0.18			0.10	0.27	0.27
Clearance Time (s)		3.5				3.5	3.5			3.0	4.0	4.0
Vehicle Extension (s)		2.0				2.0	2.0			2.0	4.0	4.0
Lane Grp Cap (vph)		886				635	284			178	1373	420
v/s Ratio Prot		c0.19				c0.10				0.06	0.06	
v/s Ratio Perm							0.01					0.01
v/c Ratio		0.72				0.53	0.04			0.56	0.21	0.03
Uniform Delay, d1		26.2				28.6	26.1			33.2	21.9	20.8
Progression Factor		1.00				1.00	1.00			1.00	1.00	1.00
Incremental Delay, d2		2.5				0.4	0.0			2.1	0.1	0.0
Delay (s)		28.7				29.0	26.1			35.3	22.0	20.8
Level of Service		C				C	C			D	C	C
Approach Delay (s)		28.7				28.6				24.9		
Approach LOS		C				C				C		
Intersection Summary												
HCM 2000 Control Delay		26.6				HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio		0.59										
Actuated Cycle Length (s)		77.4				Sum of lost time (s)				14.0		
Intersection Capacity Utilization		65.2%				ICU Level of Service				C		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

04/09/2018

Movement	SBL	SBT	SBR
Lane Configurations	↔	↔	↔
Traffic Volume (vph)	112	643	115
Future Volume (vph)	112	643	115
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)		3.0	4.0
Lane Util. Factor		1.00	0.91
Frbp, ped/bikes		1.00	1.00
Flpb, ped/bikes		1.00	1.00
Frt		1.00	1.00
Flt Protected		0.95	1.00
Satd. Flow (prot)		1770	5085
Flt Permitted		0.95	1.00
Satd. Flow (perm)		1770	5085
Peak-hour factor, PHF	0.95	0.95	0.95
Adj. Flow (vph)	118	677	121
RTOR Reduction (vph)	0	0	87
Lane Group Flow (vph)	126	677	34
Confl. Peds. (#/hr)			4
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	8.5	21.6	21.6
Effective Green, g (s)	8.5	21.6	21.6
Actuated g/C Ratio	0.11	0.28	0.28
Clearance Time (s)	3.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0
Lane Grp Cap (vph)	194	1419	434
v/s Ratio Prot	c0.07	c0.13	
v/s Ratio Perm			0.02
v/c Ratio	0.65	0.48	0.08
Uniform Delay, d1	33.0	23.2	20.6
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	5.5	0.3	0.1
Delay (s)	38.5	23.6	20.7
Level of Service	D	C	C
Approach Delay (s)		25.2	
Approach LOS		C	
Intersection Summary			

HCM Signalized Intersection Capacity Analysis
7: Hillside Blvd & Serramonte Blvd

04/09/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	↕
Traffic Volume (vph)	81	14	478	9	8	5	207	172	14	7	539	147
Future Volume (vph)	81	14	478	9	8	5	207	172	14	7	539	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		0.95	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		0.97	1.00		0.99	1.00		1.00	1.00	0.85
Flt Protected	0.96	1.00		0.98	0.95		1.00	0.95		1.00	1.00	1.00
Satd. Flow (prot)	1787	1549		3348	1770		1841	1770		1863	1540	1540
Flt Permitted	0.76	1.00		0.89	0.95		1.00	0.95		1.00	1.00	1.00
Satd. Flow (perm)	1422	1549		3035	1770		1841	1770		1863	1540	1540
Peak-hour factor, PHF	0.95	0.95		0.95	0.95		0.95	0.95		0.95	0.95	0.95
Adj. Flow (vph)	85	15	503	9	8	5	218	181	15	7	567	155
RTOR Reduction (vph)	0	0	206	0	4	0	0	4	0	0	0	63
Lane Group Flow (vph)	0	100	297	0	18	0	218	192	0	7	567	92
Confl. Peds. (#/hr)			1		1							14
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2			3	8		7		4
Permitted Phases	2		2	2								4
Actuated Green, G (s)		19.5		19.5			9.5	33.7		1.0		25.2
Effective Green, g (s)		19.5		19.5			9.5	33.7		1.0		25.2
Actuated g/C Ratio		0.29		0.29			0.14	0.50		0.01		0.37
Clearance Time (s)		4.5		4.5			4.5	4.5		4.5		4.5
Vehicle Extension (s)		3.0		3.0			3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		409		446			248	916		26		693
v/s Ratio Prot							c0.12	0.10		0.00		c0.30
v/s Ratio Perm		0.07		c0.19			0.01					0.06
v/c Ratio		0.24		0.66			0.88	0.21		0.27		0.82
Uniform Delay, d1		18.5		21.2			28.5	9.5		33.0		19.2
Progression Factor		1.00		1.00			1.00	1.00		1.00		1.00
Incremental Delay, d2		1.4		7.6			27.7	0.1		5.5		7.5
Delay (s)		19.9		28.8			56.2	9.6		38.5		26.6
Level of Service		B		C			E	A		D		C
Approach Delay (s)		27.4					17.3			34.2		24.1
Approach LOS		C					B			C		C
Intersection Summary												
HCM 2000 Control Delay		27.5					HCM 2000 Level of Service					C
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		67.7					Sum of lost time (s)				13.5	
Intersection Capacity Utilization		73.5%					ICU Level of Service				D	
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
8: El Camino Real & Collins Avenue/Cemetery Driveway

04/09/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations		↕	↕		↕	↕		↕	↕	↕		↕
Traffic Volume (veh/h)	11	3	335	1	1	4	1	63	421	1	6	3
Future Volume (Veh/h)	11	3	335	1	1	4	1	63	421	1	6	3
Sign Control	Stop			Stop			Free					
Grade	0%			0%			0%					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	3	353	1	1	4	0	66	443	1	0	3
Pedestrians		3			3				1			
Lane Width (ft)	12.0			12.0			12.0					
Walking Speed (ft/s)	3.5			3.5			3.5					
Percent Blockage	0			0			0					
Right turn flare (veh)	3											
Median type							Raised					
Median storage (veh)							1					
Upstream signal (ft)												
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.00	0.92			0.00	
vC, conflicting volume	1132	1426	291	1039	1436	152	0	852			0	447
vC1, stage 1 conf vol	847	847		578	578							
vC2, stage 2 conf vol	285	579		461	858							
vCu, unblocked vol	850	1168	0	749	1179	152	0	546			0	447
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
IC, 2 stage (s)	6.5	5.5		6.5	5.5							
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	0.0	2.2			0.0	2.2
p0 queue free %	96	99	65	100	100	100	0	93			0	100
cM capacity (veh/h)	337	288	997	277	270	863	0	938			0	1106
Direction, Lane #												
Volume Total	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Left	368	6	66	177	177	90	210	414	229			
Volume Right	12	1	66	0	0	0	3	0	0			
cSH	353	4	0	0	0	1	0	0	22			
Volume to Capacity	1039	502	938	1700	1700	1700	1106	1700	1700			
Queue Length 95th (ft)	0.35	0.01	0.07	0.10	0.10	0.05	0.00	0.24	0.13			
Control Delay (s)	40	1	6	0	0	0	0	0	0			
Lane LOS	10.8	12.3	9.1	0.0	0.0	0.0	0.1	0.0	0.0			
Approach Delay (s)	B	B	A				A					
Approach LOS	10.8	12.3	1.2				0.0					
Intersection Summary												
Average Delay				2.7								
Intersection Capacity Utilization	62.2%			ICU Level of Service			B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

04/09/2018

Movement	SBT	SBR
Lane Configurations	↑↑↑	
Traffic Volume (veh/h)	786	21
Future Volume (Veh/h)	786	21
Sign Control	Free	
Grade	0%	
Peak Hour Factor	0.95	0.95
Hourly flow rate (vph)	827	22
Pedestrians	1	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	3.5	
Percent Blockage	0	
Right turn flare (veh)		
Median type	Raised	
Median storage (veh)	1	
Upstream signal (ft)	919	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
tC, single (s)		
tC, 2 stage (s)		
tF (s)		
p0 queue free %		
cM capacity (veh/h)		
Direction, Lane #		

HCM Signalized Intersection Capacity Analysis
 9: Junipero Serra Blvd & Serra Center Driveway

04/09/2018

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↑↑	↑	↑↑↑			↑↑	↑↑
Traffic Volume (vph)	45	18	379	69	2	31	514
Future Volume (vph)	45	18	379	69	2	31	514
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5			4.5	4.5
Lane Util. Factor	0.97	1.00	0.91			1.00	0.95
Frpb, ped/bikes	1.00	0.98	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00
FrT	1.00	0.85	0.98			1.00	1.00
FlT Protected	0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)	3433	1557	4956			1770	3539
FlT Permitted	0.95	1.00	1.00			0.95	1.00
Satd. Flow (perm)	3433	1557	4956			1770	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	19	399	73	2	33	541
RTOR Reduction (vph)	0	17	26	0	0	0	0
Lane Group Flow (vph)	47	2	446	0	0	35	541
Confl. Peds. (#/hr)		5		3			
Turn Type	Prot	Perm	NA		Prot	Prot	NA
Protected Phases	8		2		1	1	6
Permitted Phases		8					
Actuated Green, G (s)	5.8	5.8	36.1			1.0	41.6
Effective Green, g (s)	5.8	5.8	36.1			1.0	41.6
Actuated g/C Ratio	0.10	0.10	0.64			0.02	0.74
Clearance Time (s)	4.5	4.5	4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	353	160	3172			31	2610
v/s Ratio Prot	c0.01		0.09			c0.02	c0.15
v/s Ratio Perm		0.00					
v/c Ratio	0.13	0.01	0.14			1.13	0.21
Uniform Delay, d1	23.0	22.7	4.0			27.7	2.3
Progression Factor	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.2	0.0	0.1			203.2	0.2
Delay (s)	23.2	22.8	4.1			230.9	2.5
Level of Service	C	C	A			F	A
Approach Delay (s)	23.1		4.1				16.4
Approach LOS	C		A				B
Intersection Summary							
HCM 2000 Control Delay			11.6			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.23				
Actuated Cycle Length (s)			56.4			Sum of lost time (s)	13.5
Intersection Capacity Utilization			36.2%			ICU Level of Service	A
Analysis Period (min)			15				
c Critical Lane Group							

SimTraffic Simulation Summary
AM Existing

02/01/2018

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:45	6:45	6:45	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	6429	6495	6362	6356	6462	6334	6437
Vehs Exited	6433	6473	6358	6401	6464	6344	6453
Starting Vehs	213	200	206	236	204	194	219
Ending Vehs	209	222	210	191	202	184	203
Travel Distance (mi)	4389	4328	4288	4307	4397	4271	4330
Travel Time (hr)	212.3	212.0	209.4	208.0	216.1	207.0	213.5
Total Delay (hr)	73.6	74.8	73.6	71.6	77.2	71.5	76.8
Total Stops	9305	9247	9182	9046	9511	9060	9360
Fuel Used (gal)	168.6	166.4	164.8	165.1	170.2	163.5	167.1

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	6434	6498	6427	6428
Vehs Exited	6459	6444	6469	6431
Starting Vehs	233	174	221	201
Ending Vehs	208	228	179	194
Travel Distance (mi)	4373	4394	4359	4344
Travel Time (hr)	215.2	218.6	210.5	212.3
Total Delay (hr)	77.0	79.5	72.8	74.8
Total Stops	9275	9620	9221	9285
Fuel Used (gal)	168.6	170.4	167.5	167.2

Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

SimTraffic Simulation Summary
AM Existing

02/01/2018

Interval #1 Information Recording

Start Time	7:00						
End Time	8:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	1	10	2	3	4	5	6
Vehs Entered	6429	6495	6362	6356	6462	6334	6437
Vehs Exited	6433	6473	6358	6401	6464	6344	6453
Starting Vehs	213	200	206	236	204	194	219
Ending Vehs	209	222	210	191	202	184	203
Travel Distance (mi)	4389	4328	4288	4307	4397	4271	4330
Travel Time (hr)	212.3	212.0	209.4	208.0	216.1	207.0	213.5
Total Delay (hr)	73.6	74.8	73.6	71.6	77.2	71.5	76.8
Total Stops	9305	9247	9182	9046	9511	9060	9360
Fuel Used (gal)	168.6	166.4	164.8	165.1	170.2	163.5	167.1

Interval #1 Information Recording

Start Time	7:00			
End Time	8:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	7	8	9	Avg
Vehs Entered	6434	6498	6427	6428
Vehs Exited	6459	6444	6469	6431
Starting Vehs	233	174	221	201
Ending Vehs	208	228	179	194
Travel Distance (mi)	4373	4394	4359	4344
Travel Time (hr)	215.2	218.6	210.5	212.3
Total Delay (hr)	77.0	79.5	72.8	74.8
Total Stops	9275	9620	9221	9285
Fuel Used (gal)	168.6	170.4	167.5	167.2

SimTraffic Performance Report
AM Existing

02/01/2018

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	566	305	964	372	2207
Vehicles Exited	566	305	964	373	2208
Hourly Exit Rate	566	305	964	373	2208
Input Volume	568	292	973	370	2203
% of Volume	100	104	99	101	100

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	WBT	All
Vehicles Entered	2	138	1414	303	1857
Vehicles Exited	2	138	1415	303	1858
Hourly Exit Rate	2	138	1415	303	1858
Input Volume	2	139	1426	290	1857
% of Volume	100	99	99	104	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL	NBT	NBR
Vehicles Entered	126	756	534	94	203	206	46	3	38	311	271	169
Vehicles Exited	126	757	532	94	203	206	46	3	38	312	271	169
Hourly Exit Rate	126	757	532	94	203	206	46	3	38	312	271	169
Input Volume	126	769	531	94	192	201	44	4	38	320	271	167
% of Volume	100	98	100	100	106	102	105	75	100	98	100	101

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	SBU	SBL	SBT	SBR	SBR2	All
Vehicles Entered	9	117	330	64	49	3326
Vehicles Exited	8	116	328	64	49	3322
Hourly Exit Rate	8	116	328	64	49	3322
Input Volume	10	117	326	61	47	3318
% of Volume	80	99	101	105	104	100

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Vehicles Entered	698	346	16	491	55	16	15	1637
Vehicles Exited	698	346	17	491	56	16	15	1639
Hourly Exit Rate	698	346	17	491	56	16	15	1639
Input Volume	705	349	17	474	56	12	17	1630
% of Volume	99	99	100	104	100	133	88	101

SimTraffic Performance Report
AM Existing

02/01/2018

5: Serramonte Blvd & Serra Center Driveway Performance by

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	44	762	424	94	78	21	1423
Vehicles Exited	44	763	425	93	78	21	1424
Hourly Exit Rate	44	763	425	93	78	21	1424
Input Volume	47	772	412	90	77	19	1417
% of Volume	94	99	103	103	101	111	100

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Vehicles Entered	53	555	80	0	85	239	57	0	96	282	48	7
Vehicles Exited	53	554	78	0	84	239	58	0	96	281	48	6
Hourly Exit Rate	53	554	78	0	84	239	58	0	96	281	48	6
Input Volume	57	553	79	1	87	231	54	1	93	285	47	8
% of Volume	93	100	99	0	97	103	107	0	103	99	102	75

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBL	SBT	SBR	All
Vehicles Entered	113	650	116	2381
Vehicles Exited	114	647	116	2374
Hourly Exit Rate	114	647	116	2374
Input Volume	112	643	115	2366
% of Volume	102	101	101	100

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	82	24	478	8	8	5	213	174	12	6	528	150
Vehicles Exited	82	24	479	7	8	5	212	175	13	6	528	149
Hourly Exit Rate	82	24	479	7	8	5	212	175	13	6	528	149
Input Volume	81	23	478	9	8	5	207	172	14	7	539	147
% of Volume	101	104	100	78	100	100	102	102	93	86	98	101

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	1688
Vehicles Exited	1688
Hourly Exit Rate	1688
Input Volume	1690
% of Volume	100

SimTraffic Performance Report

AM Existing

02/01/2018

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Vehicles Entered	11	23	329	0	2	4	1	62	422	2	6	5
Vehicles Exited	11	23	330	0	2	4	1	62	422	2	6	5
Hourly Exit Rate	11	23	330	0	2	4	1	62	422	2	6	5
Input Volume	11	20	335	1	1	4	1	63	421	1	6	3
% of Volume	100	115	99	0	200	100	100	98	100	200	100	167

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	SBT	SBR	All
Vehicles Entered	786	22	1675
Vehicles Exited	786	22	1676
Hourly Exit Rate	786	22	1676
Input Volume	786	21	1674
% of Volume	100	105	100

9: Junipero Serra Blvd & Serra Center Driveway Performance by movement

Movement	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT	All
Vehicles Entered	47	17	2	379	70	3	30	521	1069
Vehicles Exited	47	17	2	378	70	3	30	520	1067
Hourly Exit Rate	47	17	2	378	70	3	30	520	1067
Input Volume	45	18	2	380	69	2	31	514	1061
% of Volume	104	94	100	99	101	150	97	101	101

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	38	731	18	7	425	22	7	12	69	41	1370
Vehicles Exited	38	731	18	7	425	22	7	12	68	41	1369
Hourly Exit Rate	38	731	18	7	425	22	7	12	68	41	1369
Input Volume	35	745	15	8	411	20	7	12	67	37	1357
% of Volume	109	98	120	88	103	110	100	100	101	111	101

11: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	7	804	451	3	2	3	1270
Vehicles Exited	7	804	451	3	2	3	1270
Hourly Exit Rate	7	804	451	3	2	3	1270
Input Volume	8	816	436	4	3	2	1269
% of Volume	88	99	103	75	67	150	100

SimTraffic Performance Report

AM Existing

02/01/2018

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	6	802	464	3	1	3	1279
Vehicles Exited	6	802	464	3	1	3	1279
Hourly Exit Rate	6	802	464	3	1	3	1279
Input Volume	6	812	449	4	2	2	1275
% of Volume	100	99	103	75	50	150	100

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	700	10	8	464	5	10	1197
Vehicles Exited	700	10	8	463	5	10	1196
Hourly Exit Rate	700	10	8	463	5	10	1196
Input Volume	703	12	8	448	5	8	1184
% of Volume	100	83	100	103	100	125	101

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	660	49	31	452	18	28	1238
Vehicles Exited	662	49	30	454	18	28	1241
Hourly Exit Rate	662	49	30	454	18	28	1241
Input Volume	663	48	32	439	17	27	1226
% of Volume	100	102	94	103	106	104	101

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	4	10	8	434	798	16	1270
Vehicles Exited	4	10	8	434	799	16	1271
Hourly Exit Rate	4	10	8	434	799	16	1271
Input Volume	5	10	9	433	798	16	1271
% of Volume	80	100	89	100	100	100	100

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	624	23	13	355	8	17	1040
Vehicles Exited	622	23	13	355	8	17	1038
Hourly Exit Rate	622	23	13	355	8	17	1038
Input Volume	621	22	14	343	9	15	1024
% of Volume	100	105	93	103	89	113	101

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	592	13	6	362	4	6	983
Vehicles Exited	591	12	6	363	4	5	981
Hourly Exit Rate	591	12	6	363	4	5	981
Input Volume	589	12	8	352	4	6	971
% of Volume	100	100	75	103	100	83	101

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	580	16	8	368	1	1	974
Vehicles Exited	582	15	8	368	1	1	975
Hourly Exit Rate	582	15	8	368	1	1	975
Input Volume	581	14	8	359	1	1	964
% of Volume	100	107	100	103	100	100	101

26: Performance by movement

Movement	NBT	NWT	All
Vehicles Entered	138	566	704
Vehicles Exited	138	567	705
Hourly Exit Rate	138	567	705
Input Volume	139	568	707
% of Volume	99	100	100

Total Network Performance

Vehicles Entered	6428
Vehicles Exited	6431
Hourly Exit Rate	6431
Input Volume	38154
% of Volume	17

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
I-280 SB Off-Ramp	1	9.6	38.3	0.2	23	23	10.0
I-280 NB On-Ramp	2	2.4	12.3	0.1	25	24	2.8
Junipero Serra Blvd	3	23.0	30.2	0.1	8	8	24.0
Collins Avenue	4	2.5	8.6	0.0	19	19	2.4
	10	0.8	5.0	0.0	26	26	0.9
	11	1.3	5.7	0.0	25	24	1.4
Serra Center Driveway	5	7.6	11.6	0.0	9	8	7.9
	12	2.6	19.3	0.1	28	28	2.6
	13	0.3	10.5	0.1	30	30	0.3
	14	0.7	13.8	0.1	28	28	0.7
El Camino Real	6	21.9	28.9	0.1	8	8	23.5
	16	2.5	13.3	0.1	23	23	2.6
	17	0.6	9.0	0.1	28	28	0.6
	18	0.8	11.0	0.1	28	28	0.8
Hillside Blvd	7	11.1	28.5	0.2	22	24	7.8
Total		87.7	246.1	1.4	20	20	88.4

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 10 Speed	Run 10 Delay	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed
I-280 SB Off-Ramp	23	9.6	22	9.9	22	10.5	23
I-280 NB On-Ramp	25	2.2	25	2.1	24	2.6	24
Junipero Serra Blvd	9	21.2	8	23.0	8	23.6	8
Collins Avenue	19	2.3	19	2.5	19	2.4	19
	27	0.8	27	0.7	27	0.7	27
	24	1.4	25	1.2	26	1.1	26
Serra Center Driveway	9	7.5	9	7.5	9	7.3	9
	28	2.6	28	2.6	28	2.6	28
	30	0.2	30	0.3	30	0.2	30
	29	0.6	28	0.8	28	0.7	29
El Camino Real	9	19.2	9	20.9	9	21.4	8
	24	2.2	23	2.4	23	2.5	23
	28	0.5	28	0.6	28	0.7	28
	28	0.7	28	0.7	28	0.9	28
Hillside Blvd	22	11.7	18	15.5	22	9.7	22
Total	20	82.9	20	90.7	20	87.0	20

Arterial Level of Service
AM Existing

02/01/2018

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 4 Delay	Run 5 Speed	Run 5 Delay	Run 6 Speed	Run 6 Delay	Run 7 Speed	Run 7 Delay
I-280 SB Off-Ramp	10.1	23	8.9	23	8.7	22	10.0
I-280 NB On-Ramp	3.0	25	2.2	25	2.3	24	2.3
Junipero Serra Blvd	23.1	9	20.0	8	24.4	8	23.3
Collins Avenue	2.3	19	2.5	19	2.5	19	2.5
	0.7	26	0.8	25	0.9	27	0.8
	1.1	25	1.2	25	1.3	25	1.3
Serra Center Driveway	7.4	9	7.1	9	7.6	9	7.6
	2.5	28	2.5	27	2.7	28	2.6
	0.2	30	0.2	30	0.3	30	0.2
	0.6	29	0.6	28	0.7	28	0.7
El Camino Real	23.4	8	23.2	9	21.7	9	21.3
	2.7	23	2.4	22	2.9	23	2.5
	0.7	28	0.6	28	0.7	28	0.6
	0.7	27	0.9	28	0.8	27	1.0
Hillside Blvd	11.3	23	11.2	24	9.3	22	10.5
Total	90.1	20	84.4	20	86.8	20	87.0

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 8 Speed	Run 8 Delay	Run 9 Speed	Run 9 Delay
I-280 SB Off-Ramp	23	9.6	23	8.7
I-280 NB On-Ramp	25	2.3	25	2.2
Junipero Serra Blvd	8	23.8	8	22.9
Collins Avenue	19	2.6	19	2.5
	26	0.9	26	0.9
	25	1.4	25	1.4
Serra Center Driveway	9	7.8	9	7.7
	28	2.6	28	2.6
	30	0.2	30	0.3
	28	0.8	28	0.7
El Camino Real	8	23.1	9	21.7
	23	2.7	23	2.4
	28	0.6	28	0.7
	28	0.8	28	0.7
Hillside Blvd	21	12.3	24	10.6
Total	20	91.6	20	86.0

Arterial Level of Service
AM Existing

02/01/2018

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Hillside Blvd	7	17.5	23.2	0.0	7	5	25.4
	18	0.9	15.2	0.2	41	40	1.0
	17	0.3	10.4	0.1	29	29	0.2
	16	0.3	8.4	0.1	30	30	0.3
El Camino Real	6	28.3	37.3	0.1	8	8	27.7
	14	2.2	10.7	0.1	23	22	2.5
	13	0.5	13.6	0.1	29	29	0.4
	12	0.4	10.6	0.1	30	30	0.3
Serra Center Driveway	5	8.3	25.0	0.1	22	22	8.2
	11	2.3	6.1	0.0	17	17	2.3
	10	0.3	5.0	0.0	29	29	0.2
Collins Avenue	4	0.5	4.5	0.0	29	29	0.4
Junipero Serra Blvd	3	18.0	22.6	0.0	7	7	18.3
I-280 NB On-Ramp	2	3.7	12.2	0.1	20	21	3.2
I-280 SB Off-Ramp	1	14.0	24.2	0.1	12	13	13.0
Total		97.4	229.0	1.2	18	18	103.4

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 10 Speed	Run 10 Delay	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed
Hillside Blvd	9	11.6	8	13.3	10	10.8	6
	47	0.3	39	0.6	31	0.7	30
	29	0.2	29	0.2	30	0.2	29
	29	0.3	30	0.3	30	0.2	30
El Camino Real	8	29.6	8	27.6	8	27.7	8
	23	2.1	23	2.0	23	2.5	22
	29	0.4	29	0.4	29	0.5	29
	29	0.4	30	0.3	29	0.5	30
Serra Center Driveway	21	8.3	21	8.2	21	8.5	22
	17	2.3	17	2.3	17	2.4	17
	28	0.3	29	0.3	29	0.3	28
Collins Avenue	29	0.5	29	0.4	29	0.4	29
Junipero Serra Blvd	7	17.4	7	17.4	7	17.8	7
I-280 NB On-Ramp	21	3.4	20	3.6	20	3.9	20
I-280 SB Off-Ramp	13	13.0	12	14.7	13	13.8	13
Total	19	90.2	19	91.5	19	90.3	18

Arterial Level of Service
AM Existing

02/01/2018

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 4 Delay	Run 5 Speed	Run 5 Delay	Run 6 Speed	Run 6 Delay	Run 7 Speed	Run 7 Delay
Hillside Blvd	21.7	7	18.3	6	19.5	9	11.5
	2.2	45	0.9	58	1.0	32	1.3
	0.3	29	0.3	29	0.4	29	0.2
	0.3	29	0.3	29	0.4	30	0.3
El Camino Real	28.4	8	28.5	8	27.6	8	30.9
	2.4	23	2.1	23	2.1	23	2.1
	0.5	29	0.5	29	0.4	29	0.5
	0.4	30	0.4	30	0.3	30	0.4
Serra Center Driveway	8.3	22	8.2	21	8.5	22	7.9
	2.4	17	2.2	17	2.3	17	2.3
	0.5	29	0.2	28	0.3	30	0.2
Collins Avenue	0.6	29	0.5	29	0.4	29	0.4
Junipero Serra Blvd	17.7	7	19.0	7	17.5	7	19.9
I-280 NB On-Ramp	4.0	20	3.6	19	4.2	20	3.9
I-280 SB Off-Ramp	13.6	13	13.5	12	15.0	12	15.4
Total	103.0	18	98.5	19	100.0	18	97.3

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 8 Speed	Run 8 Delay	Run 9 Speed	Run 9 Delay
Hillside Blvd	7	18.6	10	10.4
	43	0.8	43	0.9
	29	0.3	29	0.2
	30	0.3	30	0.3
El Camino Real	8	29.4	9	25.9
	22	2.3	23	2.0
	29	0.5	29	0.4
	30	0.4	30	0.3
Serra Center Driveway	21	8.6	22	8.3
	17	2.3	17	2.3
	29	0.3	29	0.2
Collins Avenue	29	0.5	30	0.4
Junipero Serra Blvd	7	17.4	7	17.6
I-280 NB On-Ramp	20	3.4	19	4.1
I-280 SB Off-Ramp	12	13.8	12	13.9
Total	18	99.0	19	87.2

Queuing and Blocking Report
AM Existing

02/01/2018

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	T	L	L
Maximum Queue (ft)	129	165	102	113	75	184	227
Average Queue (ft)	66	84	49	56	27	99	129
95th Queue (ft)	111	136	88	97	77	158	200
Link Distance (ft)	1253	1253	384	384		498	498
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)						50	
Storage Blk Time (%)						13	1
Queuing Penalty (veh)						13	1

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	WB	WB
Directions Served	UL	L	T	T	T	T
Maximum Queue (ft)	78	5	44	116	67	85
Average Queue (ft)	45	0	2	8	20	24
95th Queue (ft)	69	5	29	60	54	63
Link Distance (ft)		384	384	384	246	246
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200					
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report
AM Existing

02/01/2018

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	R>	U<L	L	T
Maximum Queue (ft)	68	94	242	262	244	136	116	140	124	136	168	122
Average Queue (ft)	37	41	134	164	126	63	56	81	59	69	87	54
95th Queue (ft)	63	78	215	247	225	112	98	122	106	121	146	102
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)			0	1	0	0	0	0	0			
Queuing Penalty (veh)			0	2	0	0	0	0	0			
Storage Bay Dist (ft)					225					295	295	
Storage Blk Time (%)					1	0						
Queuing Penalty (veh)					6	1						

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	UL	T	TR
Maximum Queue (ft)	148	114	129	163	164
Average Queue (ft)	54	44	58	99	88
95th Queue (ft)	110	93	108	151	145
Link Distance (ft)	1147		676	676	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		90	320		
Storage Blk Time (%)	2	1			
Queuing Penalty (veh)	3	1			

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	22	73	40	10	10	6	85	56
Average Queue (ft)	1	9	8	1	0	0	35	14
95th Queue (ft)	13	45	31	8	8	5	68	44
Link Distance (ft)	146			111	111		1189	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		40	65			65	50	
Storage Blk Time (%)		0	0		0	0	4	0
Queuing Penalty (veh)		0	0		0	0	1	0

Queuing and Blocking Report
AM Existing

02/01/2018

Intersection: 5: Serramonte Blvd & Serra Center Driveway

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	120	124	88	147	66
Average Queue (ft)	70	76	45	70	35
95th Queue (ft)	105	109	71	110	58
Link Distance (ft)	110	110	726	726	247
Upstream Blk Time (%)	0	1			
Queuing Penalty (veh)	1	2			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	TR	ULT	T	R	UL	T	T	T	R	UL	T
Maximum Queue (ft)	214	246	163	137	58	141	110	110	72	71	167	194
Average Queue (ft)	119	141	86	71	22	63	57	47	16	22	72	114
95th Queue (ft)	191	224	141	119	47	114	95	94	49	54	139	182
Link Distance (ft)	258	258	334	334			330	330	330			1259
Upstream Blk Time (%)	0	0										
Queuing Penalty (veh)	0	1										
Storage Bay Dist (ft)					300	200				160	300	
Storage Blk Time (%)						0						
Queuing Penalty (veh)						0						

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	177	124	65
Average Queue (ft)	86	34	20
95th Queue (ft)	162	94	47
Link Distance (ft)	1259	1259	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		0	0

Queuing and Blocking Report
AM Existing

02/01/2018

Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	TR	L	T	R
Maximum Queue (ft)	122	325	40	33	236	140	60	656	100
Average Queue (ft)	47	167	11	4	116	53	7	340	76
95th Queue (ft)	99	286	36	20	202	105	34	614	132
Link Distance (ft)	850	850	192	192	908	908		900	
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)					75		75		
Storage Blk Time (%)							50		
Queuing Penalty (veh)							76		

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	T	ULT	T	TR
Maximum Queue (ft)	209	105	30	47	1	1	16	13	2
Average Queue (ft)	36	81	6	14	0	0	1	0	0
95th Queue (ft)	131	114	25	36	1	1	9	8	2
Link Distance (ft)	472		186		1262	1262	415	415	415
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	80		130						
Storage Blk Time (%)	0		9						
Queuing Penalty (veh)	0		1						

Intersection: 9: Junipero Serra Blvd & Serra Center Driveway

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	UT	T	TR	UL	T	T
Maximum Queue (ft)	63	37	35	73	83	86	54	94	60
Average Queue (ft)	23	7	12	20	20	22	22	27	14
95th Queue (ft)	51	27	36	58	60	61	50	71	46
Link Distance (ft)	196	196	196	676	676	676		591	591
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							210		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
AM Existing

02/01/2018

Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	62	53	49	1	48	100
Average Queue (ft)	11	3	4	0	16	45
95th Queue (ft)	39	25	24	1	43	83
Link Distance (ft)	111	111	129	129	208	158
Upstream Blk Time (%)	0					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 11: Serramonte Blvd

Movement	EB	EB	WB	SB
Directions Served	LT	T	T	LR
Maximum Queue (ft)	70	61	3	26
Average Queue (ft)	7	5	0	4
95th Queue (ft)	37	30	3	19
Link Distance (ft)	129	129	110	222
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 12: Serramonte Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	39	31
Average Queue (ft)	3	4
95th Queue (ft)	20	20
Link Distance (ft)	726	250
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
AM Existing

02/01/2018

Intersection: 13: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	38	37
Average Queue (ft)	4	12
95th Queue (ft)	24	38
Link Distance (ft)	518	337
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: Serramonte Blvd

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	LT	T	LR
Maximum Queue (ft)	5	16	80	24	60
Average Queue (ft)	0	1	17	1	27
95th Queue (ft)	5	8	54	14	54
Link Distance (ft)	518	518	258	258	418
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 15: El Camino Real

Movement	EB	NB	SB	SB
Directions Served	LR	L	T	T
Maximum Queue (ft)	24	31	2	2
Average Queue (ft)	8	4	0	0
95th Queue (ft)	26	21	2	2
Link Distance (ft)	203		330	330
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
AM Existing

02/01/2018

Intersection: 16: Serramonte Blvd

Movement	EB	WB	WB	NB	NB
Directions Served	T	LT	T	L	R
Maximum Queue (ft)	5	59	6	36	40
Average Queue (ft)	0	7	0	7	14
95th Queue (ft)	5	33	6	28	39
Link Distance (ft)	334	300	300	289	289
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	35	31
Average Queue (ft)	2	8
95th Queue (ft)	17	30
Link Distance (ft)	389	205
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	48	28
Average Queue (ft)	3	2
95th Queue (ft)	22	13
Link Distance (ft)	850	247
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
AM Existing

02/01/2018

Intersection: 26:

Movement	B36	B36
Directions Served	T	
Maximum Queue (ft)	79	50
Average Queue (ft)	9	5
95th Queue (ft)	45	29
Link Distance (ft)	175	175
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 113

HCM Signalized Intersection Capacity Analysis
1: Serramonte Blvd & I-280 SB Off-Ramp

04/09/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↑	↑↑
Traffic Volume (vph)	0	1252	622	0	664	626
Future Volume (vph)	0	1252	622	0	664	626
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Fr't		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1318	655	0	699	659
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1318	655	0	699	659
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		27.7	17.4		18.9	29.7
Effective Green, g (s)		27.7	17.4		18.9	29.7
Actuated g/C Ratio		0.50	0.32		0.34	0.54
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1785	1611		1181	1507
v/s Ratio Prot		c0.37	0.13		c0.20	0.24
v/s Ratio Perm						
v/c Ratio		0.74	0.41		0.59	0.44
Uniform Delay, d1		10.7	14.7		14.8	7.6
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.6	0.2		0.8	0.2
Delay (s)		12.4	14.9		15.6	7.8
Level of Service		B	B		B	A
Approach Delay (s)		12.4	14.9		11.8	
Approach LOS		B	B		B	

Intersection Summary

HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	54.9	Sum of lost time (s)	11.5
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Serramonte Blvd & I-280 NB On-Ramp

04/09/2018



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	2	556	1368	623	33	0	0
Future Volume (vph)	2	556	1368	623	33	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.4	4.1			
Lane Util. Factor		0.97	0.95	0.95			
Frt		1.00	1.00	0.99			
Flt Protected		0.95	1.00	1.00			
Satd. Flow (prot)		3433	3539	3512			
Flt Permitted		0.95	1.00	1.00			
Satd. Flow (perm)		3433	3539	3512			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	585	1440	656	35	0	0
RTOR Reduction (vph)	0	0	0	8	0	0	0
Lane Group Flow (vph)	0	587	1440	683	0	0	0
Turn Type	Prot	Prot	NA	NA			
Protected Phases	5	5	2	6			
Permitted Phases							
Actuated Green, G (s)		11.0	32.2	13.6			
Effective Green, g (s)		11.0	32.2	13.6			
Actuated g/C Ratio		0.34	1.00	0.42			
Clearance Time (s)		3.5	4.4	4.1			
Vehicle Extension (s)		3.0	4.0	3.0			
Lane Grp Cap (vph)		1172	3539	1483			
v/s Ratio Prot		0.17	c0.41	0.19			
v/s Ratio Perm							
v/c Ratio		0.50	0.41	0.46			
Uniform Delay, d1		8.4	0.0	6.7			
Progression Factor		1.00	1.00	1.00			
Incremental Delay, d2		0.3	0.1	0.2			
Delay (s)		8.8	0.1	6.9			
Level of Service		A	A	A			
Approach Delay (s)			2.6	6.9		0.0	
Approach LOS			A	A		A	
Intersection Summary							
HCM 2000 Control Delay			3.7		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.53				
Actuated Cycle Length (s)			32.2		Sum of lost time (s)		7.6
Intersection Capacity Utilization			60.7%		ICU Level of Service		B
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

04/09/2018



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL	NBT
Lane Configurations												
Traffic Volume (vph)	358	638	372	1	186	373	401	94	6	138	389	566
Future Volume (vph)	358	638	372	1	186	373	401	94	6	138	389	566
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0		3.0	4.6	4.6			4.0	4.0
Lane Util. Factor		0.97	0.95	1.00		1.00	0.91	0.91			0.97	0.95
Frbp, ped/bikes		1.00	1.00	0.98		1.00	1.00	1.00			1.00	1.00
Frlpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00
Frt		1.00	1.00	0.85		1.00	0.94	0.85			1.00	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)		3433	3539	1559		1770	3199	1441			3433	3539
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00			0.95	1.00
Satd. Flow (perm)		3433	3539	1559		1770	3199	1441			3433	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	377	672	392	1	196	393	422	99	6	145	409	596
RTOR Reduction (vph)	0	0	289	0	0	0	86	0	0	0	0	0
Lane Group Flow (vph)	377	672	103	0	197	629	199	0	0	0	560	596
Confl. Peds. (#/hr)			4									
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm		Split	Split	Split	NA
Protected Phases	5	2		1	1	6			3	3	3	3
Permitted Phases			2				6					
Actuated Green, G (s)	14.9	24.3	24.3		13.9	22.7	22.7				22.1	22.1
Effective Green, g (s)	14.9	24.3	24.3		13.9	22.7	22.7				22.1	22.1
Actuated g/C Ratio	0.16	0.26	0.26		0.15	0.25	0.25				0.24	0.24
Clearance Time (s)	3.0	4.0	4.0		3.0	4.6	4.6				4.0	4.0
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0				2.0	2.0
Lane Grp Cap (vph)	555	933	411		267	788	355				823	849
v/s Ratio Prot	0.11	0.19			c0.11	c0.20					0.16	c0.17
v/s Ratio Perm			0.07				0.14					
v/c Ratio	0.68	0.72	0.25		0.74	0.80	0.56				0.68	0.70
Uniform Delay, d1	36.3	30.8	26.7		37.4	32.6	30.3				31.8	32.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00				1.00	1.00
Incremental Delay, d2	2.6	2.3	0.1		8.8	5.3	1.2				1.9	2.2
Delay (s)	39.0	33.2	26.8		46.2	37.8	31.6				33.6	34.2
Level of Service	D	C	C		D	D	C				C	C
Approach Delay (s)			33.0			37.7						33.2
Approach LOS			C			D						C
Intersection Summary												
HCM 2000 Control Delay			33.6								C	
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			92.1								16.2	
Intersection Capacity Utilization			75.2%								D	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

04/09/2018

Movement	NBR	SBU	SBL	SBT	SBR	SBR2
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	148	8	112	301	112	169
Future Volume (vph)	148	8	112	301	112	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.6	4.6		4.0
Lane Util. Factor	1.00		1.00	0.95		1.00
Frbp, ped/bikes	0.98		1.00	1.00		1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00
Frt	0.85		1.00	0.96		0.85
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	1558		1770	3395		1583
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	1558		1770	3395		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	156	8	118	317	118	178
RTOR Reduction (vph)	91	0	0	0	0	0
Lane Group Flow (vph)	65	0	126	435	0	178
Confl. Peds. (#/hr)	5					
Turn Type	Perm	Split	Split	NA		Free
Protected Phases		4	4	4		
Permitted Phases	3					Free
Actuated Green, G (s)	22.1		16.2	16.2		92.1
Effective Green, g (s)	22.1		16.2	16.2		92.1
Actuated g/C Ratio	0.24		0.18	0.18		1.00
Clearance Time (s)	4.0		4.6	4.6		
Vehicle Extension (s)	2.0		2.0	2.0		
Lane Grp Cap (vph)	373		311	597		1583
v/s Ratio Prot			0.07	c0.13		
v/s Ratio Perm	0.04					c0.11
v/c Ratio	0.17		0.41	0.73		0.11
Uniform Delay, d1	27.8		33.7	35.9		0.0
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	0.1		0.3	3.8		0.1
Delay (s)	27.8		34.0	39.6		0.1
Level of Service	C		C	D		A
Approach Delay (s)				29.2		
Approach LOS				C		

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
 4: Collins Avenue & Serramonte Blvd

04/09/2018


Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↔	↔	↔	↔	↔	↔		
Traffic Volume (veh/h)	619	268	18	992	96	29		
Future Volume (Veh/h)	619	268	18	992	96	29		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	652	282	19	1044	101	31		
Pedestrians	2			3	3			
Lane Width (ft)	12.0			12.0	12.0			
Walking Speed (ft/s)	3.5			3.5	3.5			
Percent Blockage	0			0	0			
Right turn flare (veh)						2		
Median type	None			None				
Median storage (veh)								
Upstream signal (ft)	239							
pX, platoon unblocked			0.86		0.86	0.86		
vC, conflicting volume			655		956	332		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol			264		615	0		
IC, single (s)			4.1		6.8	6.9		
IC, 2 stage (s)								
IF (s)			2.2		3.5	3.3		
p0 queue free %			98		72	97		
cM capacity (veh/h)			1109		355	924		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	326	326	282	168	298	298	298	132
Volume Left	0	0	0	19	0	0	0	101
Volume Right	0	0	282	0	0	0	0	31
cSH	1700	1700	1700	1109	1700	1700	1700	463
Volume to Capacity	0.19	0.19	0.17	0.02	0.18	0.18	0.18	0.28
Queue Length 95th (ft)	0	0	0	1	0	0	0	29
Control Delay (s)	0.0	0.0	0.0	1.1	0.0	0.0	0.0	16.8
Lane LOS				A				C
Approach Delay (s)	0.0			0.2				16.8
Approach LOS								C

Intersection Summary

Average Delay	1.1
Intersection Capacity Utilization	39.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
5: Serramonte Blvd & Serra Center Driveway


04/09/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	90	537	867	199	116	77
Future Volume (vph)	90	537	867	199	116	77
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	95	565	913	209	122	81
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total (vph)	283	377	609	513	203	
Volume Left (vph)	95	0	0	0	122	
Volume Right (vph)	0	0	0	209	81	
Hadj (s)	0.20	0.03	0.03	-0.25	-0.09	
Departure Headway (s)	6.9	6.7	6.3	6.0	6.7	
Degree Utilization, x	0.54	0.70	1.06	0.85	0.38	
Capacity (veh/h)	513	524	566	594	525	
Control Delay (s)	16.5	22.7	78.5	33.1	13.7	
Approach Delay (s)	20.0		57.8		13.7	
Approach LOS	C		F		B	
Intersection Summary						
Delay			40.7			
Level of Service			E			
Intersection Capacity Utilization			69.6%		ICU Level of Service C	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

04/09/2018



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations			↑↑			↑↑	↑			↑↑↑		↑
Traffic Volume (vph)	1	173	316	135	136	493	158	4	249	823	134	5
Future Volume (vph)	1	173	316	135	136	493	158	4	249	823	134	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			3.5			3.5	3.5			3.0	4.0	4.0
Lane Util. Factor			0.95			0.95	1.00			1.00	0.91	1.00
Frpb, ped/bikes			1.00			1.00	0.98			1.00	1.00	0.98
Flpb, ped/bikes			1.00			1.00	1.00			1.00	1.00	1.00
Fr t			0.97			1.00	0.85			1.00	1.00	0.85
Fl t Protected			0.99			0.99	1.00			0.95	1.00	1.00
Satd. Flow (prot)			3365			3501	1558			1770	5085	1557
Fl t Permitted			0.99			0.99	1.00			0.95	1.00	1.00
Satd. Flow (perm)			3365			3501	1558			1770	5085	1557
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	182	333	142	143	519	166	4	262	866	141	5
RTOR Reduction (vph)	0	0	26	0	0	0	130	0	0	0	97	0
Lane Group Flow (vph)	0	0	632	0	0	662	36	0	266	866	44	0
Confl. Peds. (#/hr)			7			5				5		5
Turn Type	Split	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	8	8	8		7	7		1	1	6		5
Permitted Phases							7					6
Actuated Green, G (s)			21.3			19.3	19.3			16.0	27.4	27.4
Effective Green, g (s)			21.3			19.3	19.3			16.0	27.4	27.4
Actuated g/C Ratio			0.24			0.22	0.22			0.18	0.31	0.31
Clearance Time (s)			3.5			3.5	3.5			3.0	4.0	4.0
Vehicle Extension (s)			2.0			2.0	2.0			2.0	4.0	4.0
Lane Grp Cap (vph)			812			766	340			321	1579	483
v/s Ratio Prot			c0.19			c0.19				c0.15	c0.17	
v/s Ratio Perm							0.02					0.03
v/c Ratio			0.78			0.86	0.11			0.83	0.55	0.09
Uniform Delay, d1			31.2			33.2	27.6			34.8	25.3	21.6
Progression Factor			1.00			1.00	1.00			1.00	1.00	1.00
Incremental Delay, d2			4.3			9.7	0.1			15.3	0.5	0.1
Delay (s)			35.6			42.8	27.6			50.1	25.8	21.7
Level of Service			D			D	C			D	C	C
Approach Delay (s)			35.6			39.8				30.4		
Approach LOS			D			D				C		
Intersection Summary												
HCM 2000 Control Delay			35.1		HCM 2000 Level of Service		D					
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			88.2		Sum of lost time (s)		14.0					
Intersection Capacity Utilization			76.9%		ICU Level of Service		D					
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

04/09/2018

Movement	SBL	SBT	SBR
Lane Configurations	↖ ↗	↖ ↗ ↘	↖ ↗
Traffic Volume (vph)	94	479	136
Future Volume (vph)	94	479	136
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1563
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1563
Peak-hour factor, PHF	0.95	0.95	0.95
Adj. Flow (vph)	99	504	143
RTOR Reduction (vph)	0	0	114
Lane Group Flow (vph)	104	504	29
Confl. Peds. (#/hr)			1
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	6.2	17.6	17.6
Effective Green, g (s)	6.2	17.6	17.6
Actuated g/C Ratio	0.07	0.20	0.20
Clearance Time (s)	3.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0
Lane Grp Cap (vph)	124	1014	311
v/s Ratio Prot	0.06	0.10	
v/s Ratio Perm			0.02
v/c Ratio	0.84	0.50	0.09
Uniform Delay, d1	40.5	31.4	28.8
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	35.3	0.5	0.2
Delay (s)	75.8	31.9	29.0
Level of Service	E	C	C
Approach Delay (s)		37.4	
Approach LOS		D	

Intersection Summary		
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.77	C
Actuated Cycle Length (s)	73.8	Sum of lost time (s)
Intersection Capacity Utilization	69.6%	ICU Level of Service
Analysis Period (min)	15	C
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
7: Hillside Blvd & Serramonte Blvd

04/09/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗
Traffic Volume (vph)	196	77	246	27	83	35	410	494	22	17	254	165
Future Volume (vph)	196	77	246	27	83	35	410	494	22	17	254	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00	1.00		0.95		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1798	1548		3378		1770	1849		1770	1863	1534
Flt Permitted		0.69	1.00		0.87		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1283	1548		2978		1770	1849		1770	1863	1534
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	206	81	259	28	87	37	432	520	23	18	267	174
RTOR Reduction (vph)	0	0	181	0	26	0	0	2	0	0	0	124
Lane Group Flow (vph)	0	287	78	0	126	0	432	541	0	18	267	50
Confl. Peds. (#/hr)			1	1					2			16
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2	2		3	8		7	4	
Permitted Phases	2		2	2								4
Actuated Green, G (s)		22.2	22.2		22.2		19.9	37.2		0.9	18.2	18.2
Effective Green, g (s)		22.2	22.2		22.2		19.9	37.2		0.9	18.2	18.2
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.27	0.50	0.01	0.25	0.25			
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		385	465		895		477	932		21	459	378
v/s Ratio Prot							c0.24	c0.29		0.01	0.14	
v/s Ratio Perm		c0.22	0.05		0.04							0.03
v/c Ratio		0.75	0.17		0.14		0.91	0.58		0.86	0.58	0.13
Uniform Delay, d1		23.3	19.0		18.8		26.0	12.8		36.4	24.5	21.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		12.4	0.8		0.3		20.5	0.9		129.6	1.9	0.2
Delay (s)		35.6	19.8		19.2		46.6	13.8		166.0	26.3	21.8
Level of Service		D	B		B		D	B		F	C	C
Approach Delay (s)		28.1			19.2			28.3			30.1	
Approach LOS		C			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.77	C
Actuated Cycle Length (s)	73.8	Sum of lost time (s)
Intersection Capacity Utilization	69.6%	ICU Level of Service
Analysis Period (min)	15	C
c Critical Lane Group		

HCM Unsignalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

04/09/2018

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations			↔	↔		↔			↔	↔	↔	
Traffic Volume (veh/h)	1	24	1	276	0	0	2	2	70	1187	0	6
Future Volume (Veh/h)	1	24	1	276	0	0	2	2	70	1187	0	6
Sign Control			Stop		Stop				Free			
Grade			0%		0%				0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	25	1	291	0	0	2	0	74	1249	0	0
Pedestrians			6		9				3			
Lane Width (ft)			12.0		12.0				12.0			
Walking Speed (ft/s)			3.5		3.5				3.5			
Percent Blockage			1		1				0			
Right turn flare (veh)				3								
Median type									Raised			
Median storage (veh)									1			
Upstream signal (ft)												
pX, platoon unblocked	0.00	0.95	0.95	0.95	0.95	0.95		0.00	0.95			0.00
vC, conflicting volume	0	1375	2212	286	1816	2227	428	0	821			0
vC1, stage 1 conf vol		806	806		1406	1406						
vC2, stage 2 conf vol		569	1406		410	821						
vCu, unblocked vol	0	1196	2081	45	1663	2097	428	0	611			0
IC, single (s)	0.0	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0
IC, 2 stage (s)		6.5	5.5		6.5	5.5						
IF (s)	0.0	3.5	4.0	3.3	3.5	4.0	3.3	0.0	2.2			0.0
p0 queue free %	0	90	99	69	100	100	100	0	92			0
cM capacity (veh/h)	0	253	137	952	105	131	568	0	907			0
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	317	2	74	500	500	250	196	392	227			
Volume Left	25	0	74	0	0	0	0	0	0			
Volume Right	291	2	0	0	0	0	0	0	31			
cSH	1037	568	907	1700	1700	1700	544	1700	1700			
Volume to Capacity	0.31	0.00	0.08	0.29	0.29	0.15	0.00	0.23	0.13			
Queue Length 95th (ft)	33	0	7	0	0	0	0	0	0			
Control Delay (s)	11.3	11.4	9.3	0.0	0.0	0.0	0.0	0.0	0.0			
Lane LOS	B	B	A									
Approach Delay (s)	11.3	11.4	0.5				0.0					
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			72.8%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

04/09/2018

Movement	SBL	SBT	SBR
Lane Configurations	↔	↔	↔
Traffic Volume (veh/h)	0	745	29
Future Volume (Veh/h)	0	745	29
Sign Control		Free	
Grade		0%	
Peak Hour Factor	0.95	0.95	0.95
Hourly flow rate (vph)	0	784	31
Pedestrians		3	
Lane Width (ft)		12.0	
Walking Speed (ft/s)		3.5	
Percent Blockage		0	
Right turn flare (veh)			
Median type		Raised	
Median storage (veh)		1	
Upstream signal (ft)		919	
pX, platoon unblocked			
vC, conflicting volume		1258	
vC1, stage 1 conf vol			
vC2, stage 2 conf vol			
vCu, unblocked vol		1258	
IC, single (s)		4.1	
IC, 2 stage (s)			
IF (s)		2.2	
p0 queue free %		100	
cM capacity (veh/h)		544	
Direction, Lane #			

HCM Signalized Intersection Capacity Analysis
 9: Junipero Serra Blvd & Serra Center Driveway

04/09/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↔↔↔	↔	↔	↔↔
Traffic Volume (vph)	170	105	852	167	56	525
Future Volume (vph)	170	105	852	167	56	525
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.91	1.00	0.95	0.95
Flpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	0.98	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1563	4947	1770	3539	3539
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1563	4947	1770	3539	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	111	897	176	59	553
RTOR Reduction (vph)	0	94	36	0	0	0
Lane Group Flow (vph)	179	17	1037	0	59	553
Confl. Peds. (#/hr)		1		5		
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	7.9	7.9	27.4		2.1	34.0
Effective Green, g (s)	7.9	7.9	27.4		2.1	34.0
Actuated g/C Ratio	0.16	0.16	0.54		0.04	0.67
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	532	242	2663		73	2363
v/s Ratio Prot	c0.05		c0.21		c0.03	0.16
v/s Ratio Perm		0.01				
v/c Ratio	0.34	0.07	0.39		0.81	0.23
Uniform Delay, d1	19.2	18.4	6.9		24.2	3.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.1	0.4		46.1	0.2
Delay (s)	19.5	18.5	7.3		70.3	3.6
Level of Service	B	B	A		E	A
Approach Delay (s)	19.1		7.3			10.0
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	50.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

SimTraffic Simulation Summary
 PM Existing

02/01/2018

Summary of All Intervals							
Run Number	1	10	2	3	4	5	6
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	9125	9360	9221	9209	9235	9289	9230
Vehs Exited	9156	9388	9260	9178	9254	9320	9221
Starting Vehs	321	311	315	269	294	312	307
Ending Vehs	290	283	276	300	275	281	316
Travel Distance (mi)	5797	5971	5863	5879	5855	5929	5831
Travel Time (hr)	309.6	316.0	312.3	307.9	305.2	311.3	306.6
Total Delay (hr)	126.9	127.4	127.3	122.4	121.1	124.5	122.7
Total Stops	13600	13881	13509	13575	13450	13789	13464
Fuel Used (gal)	234.1	239.5	235.4	234.9	233.9	236.5	233.4

Summary of All Intervals				
Run Number	7	8	9	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	9155	9234	9269	9230
Vehs Exited	9183	9262	9216	9241
Starting Vehs	308	312	281	300
Ending Vehs	280	284	334	288
Travel Distance (mi)	5832	5850	5914	5872
Travel Time (hr)	303.5	307.3	312.5	309.2
Total Delay (hr)	119.6	122.9	126.2	124.1
Total Stops	13376	13535	13868	13606
Fuel Used (gal)	233.1	234.7	236.7	235.2

Interval #0 Information Seeding	
Start Time	4:45
End Time	5:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

SimTraffic Simulation Summary
PM Existing

02/01/2018

Interval #1 Information Recording

Start Time	5:00						
End Time	6:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	1	10	2	3	4	5	6
Vehs Entered	9125	9360	9221	9209	9235	9289	9230
Vehs Exited	9156	9388	9260	9178	9254	9320	9221
Starting Vehs	321	311	315	269	294	312	307
Ending Vehs	290	283	276	300	275	281	316
Travel Distance (mi)	5797	5971	5863	5879	5855	5929	5831
Travel Time (hr)	309.6	316.0	312.3	307.9	305.2	311.3	306.6
Total Delay (hr)	126.9	127.4	127.3	122.4	121.1	124.5	122.7
Total Stops	13600	13881	13509	13575	13450	13789	13464
Fuel Used (gal)	234.1	239.5	235.4	234.9	233.9	236.5	233.4

Interval #1 Information Recording

Start Time	5:00			
End Time	6:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	7	8	9	Avg
Vehs Entered	9155	9234	9269	9230
Vehs Exited	9183	9262	9216	9241
Starting Vehs	308	312	281	300
Ending Vehs	280	284	334	288
Travel Distance (mi)	5832	5850	5914	5872
Travel Time (hr)	303.5	307.3	312.5	309.2
Total Delay (hr)	119.6	122.9	126.2	124.1
Total Stops	13376	13535	13868	13606
Fuel Used (gal)	233.1	234.7	236.7	235.2

SimTraffic Performance Report
PM Existing

02/01/2018

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	1258	617	657	624	3156
Vehicles Exited	1259	614	660	624	3157
Hourly Exit Rate	1259	614	660	624	3157
Input Volume	1252	625	664	626	3167
% of Volume	101	98	99	100	100

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	WBR	All	
Vehicles Entered	2	555	1373	615	32	2577
Vehicles Exited	2	555	1374	615	32	2578
Hourly Exit Rate	2	555	1374	615	32	2578
Input Volume	2	556	1368	623	33	2582
% of Volume	100	100	100	99	97	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL	NBT
Vehicles Entered	368	627	379	0	185	405	395	94	6	136	385	563
Vehicles Exited	368	630	380	0	185	406	396	94	6	134	386	562
Hourly Exit Rate	368	630	380	0	185	406	396	94	6	134	386	562
Input Volume	358	638	372	1	186	406	401	94	6	138	389	566
% of Volume	103	99	102	0	99	100	99	100	100	97	99	99

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	NBR	SBU	SBL	SBT	SBR	SBR2	All
Vehicles Entered	146	8	112	300	110	169	4388
Vehicles Exited	146	7	112	300	110	169	4391
Hourly Exit Rate	146	7	112	300	110	169	4391
Input Volume	148	8	112	302	112	169	4406
% of Volume	99	88	100	99	98	100	100

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	625	262	17	989	92	30	2015
Vehicles Exited	624	263	17	989	90	30	2013
Hourly Exit Rate	624	263	17	989	90	30	2013
Input Volume	631	268	18	992	96	29	2034
% of Volume	99	98	94	100	94	103	99

SimTraffic Performance Report

PM Existing

02/01/2018

5: Serramonte Blvd & Serra Center Driveway Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	86	558	856	207	118	82	1907
Vehicles Exited	86	557	858	207	117	82	1907
Hourly Exit Rate	86	557	858	207	117	82	1907
Input Volume	90	567	867	199	116	77	1916
% of Volume	96	98	99	104	101	106	100

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Vehicles Entered	1	172	349	132	132	485	158	3	248	834	136	5
Vehicles Exited	1	173	350	132	132	484	157	3	250	832	135	5
Hourly Exit Rate	1	173	350	132	132	484	157	3	250	832	135	5
Input Volume	1	173	356	135	136	493	158	4	249	833	134	5
% of Volume	100	100	98	98	97	98	99	75	100	100	101	100

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBL	SBT	SBR	All
Vehicles Entered	88	483	135	3361
Vehicles Exited	88	484	135	3361
Hourly Exit Rate	88	484	135	3361
Input Volume	94	479	136	3386
% of Volume	94	101	99	99

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	185	98	240	25	83	37	396	503	20	17	250	162
Vehicles Exited	186	99	241	25	83	38	396	502	20	17	249	162
Hourly Exit Rate	186	99	241	25	83	38	396	502	20	17	249	162
Input Volume	196	96	246	27	83	35	410	494	22	17	254	165
% of Volume	95	103	98	93	100	109	97	102	91	100	98	98

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	2016
Vehicles Exited	2018
Hourly Exit Rate	2018
Input Volume	2045
% of Volume	99

SimTraffic Performance Report

PM Existing

02/01/2018

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBU	EBL	EBT	EBR	WBR	NBU	NBL	NBT	SBU	SBT	SBR	All
Vehicles Entered	0	25	1	270	3	2	70	1187	6	740	28	2332
Vehicles Exited	0	24	1	272	3	2	70	1187	6	740	28	2333
Hourly Exit Rate	0	24	1	272	3	2	70	1187	6	740	28	2333
Input Volume	1	24	1	276	2	2	70	1187	6	745	29	2343
% of Volume	0	100	100	99	150	100	100	100	100	99	97	100

9: Junipero Serra Blvd & Serra Center Driveway Performance by movement

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	All
Vehicles Entered	172	104	7	855	170	56	518	1882
Vehicles Exited	172	104	6	857	170	55	518	1882
Hourly Exit Rate	172	104	6	857	170	55	518	1882
Input Volume	170	105	7	852	167	56	525	1882
% of Volume	101	99	86	101	102	98	99	100

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	25	613	4	8	930	34	13	11	32	57	1727
Vehicles Exited	25	613	4	8	930	34	13	11	32	58	1728
Hourly Exit Rate	25	613	4	8	930	34	13	11	32	58	1728
Input Volume	23	620	5	8	937	36	13	9	37	56	1744
% of Volume	109	99	80	100	99	94	100	122	86	104	99

11: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	8	635	955	14	10	15	1637
Vehicles Exited	8	635	955	14	10	15	1637
Hourly Exit Rate	8	635	955	14	10	15	1637
Input Volume	8	647	964	13	11	16	1659
% of Volume	100	98	99	108	91	94	99

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	3	642	1001	3	3	4	1656
Vehicles Exited	3	641	1000	3	2	4	1653
Hourly Exit Rate	3	641	1000	3	2	4	1653
Input Volume	3	650	1008	4	3	4	1672
% of Volume	100	99	99	75	67	100	99

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	622	8	11	983	22	16	1662
Vehicles Exited	622	8	11	984	22	16	1663
Hourly Exit Rate	622	8	11	984	22	16	1663
Input Volume	631	8	11	991	22	15	1678
% of Volume	99	100	100	99	100	107	99

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	606	32	46	917	76	48	1725
Vehicles Exited	606	32	46	918	76	48	1726
Hourly Exit Rate	606	32	46	918	76	48	1726
Input Volume	616	30	46	927	75	49	1743
% of Volume	98	107	100	99	101	98	99

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	40	25	35	1187	743	20	2050
Vehicles Exited	40	25	35	1186	741	20	2047
Hourly Exit Rate	40	25	35	1186	741	20	2047
Input Volume	37	24	32	1188	748	20	2049
% of Volume	108	104	109	100	99	100	100

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	509	24	33	685	35	24	1310
Vehicles Exited	510	24	33	686	35	24	1312
Hourly Exit Rate	510	24	33	686	35	24	1312
Input Volume	520	24	33	699	33	24	1333
% of Volume	98	100	100	98	106	100	98

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	510	9	11	695	20	13	1258
Vehicles Exited	509	9	11	697	20	13	1259
Hourly Exit Rate	509	9	11	697	20	13	1259
Input Volume	522	9	13	711	20	14	1289
% of Volume	98	100	85	98	100	93	98

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	514	8	9	698	10	10	1249
Vehicles Exited	513	8	9	696	10	10	1246
Hourly Exit Rate	513	8	9	696	10	10	1246
Input Volume	529	8	11	712	12	9	1281
% of Volume	97	100	82	98	83	111	97

26: Performance by movement

Movement	NBT	NWT	All
Vehicles Entered	588	951	1539
Vehicles Exited	588	951	1539
Hourly Exit Rate	588	951	1539
Input Volume	589	959	1548
% of Volume	100	99	99

Total Network Performance

Movement	All
Vehicles Entered	9230
Vehicles Exited	9241
Hourly Exit Rate	9241
Input Volume	52135
% of Volume	18

Arterial Level of Service
PM Existing

02/01/2018

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
I-280 SB Off-Ramp	1	13.3	42.3	0.2	21
I-280 NB On-Ramp	2	2.1	12.2	0.1	25
Junipero Serra Blvd	3	28.7	35.9	0.1	7
Collins Avenue	4	2.6	8.8	0.0	19
	10	0.9	5.3	0.0	25
	11	1.4	5.8	0.0	25
Serra Center Driveway	5	8.5	12.6	0.0	8
	12	2.7	20.2	0.1	27
	13	0.3	10.5	0.1	30
	14	0.7	13.9	0.1	28
El Camino Real	6	28.7	35.7	0.1	7
	16	2.1	13.0	0.1	23
	17	0.3	8.8	0.1	29
	18	0.4	10.6	0.1	29
Hillside Blvd	7	19.8	38.4	0.2	16
Total		112.7	273.8	1.4	18

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hillside Blvd	7	17.6	23.0	0.0	7
	18	1.0	17.1	0.2	37
	17	0.5	10.6	0.1	29
	16	0.8	8.9	0.1	28
El Camino Real	6	47.6	56.7	0.1	5
	14	2.6	10.9	0.1	23
	13	0.8	13.9	0.1	28
	12	0.6	10.7	0.1	29
Serra Center Driveway	5	18.0	35.0	0.1	15
	11	2.6	6.3	0.0	16
	10	0.6	5.3	0.0	27
Collins Avenue	4	2.0	6.3	0.0	21
Junipero Serra Blvd	3	26.7	31.2	0.0	5
I-280 NB On-Ramp	2	5.8	13.8	0.1	18
I-280 SB Off-Ramp	1	16.1	26.3	0.1	11
Total		143.2	276.0	1.2	15

Queuing and Blocking Report
PM Existing

02/01/2018

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB	SB	SB	
Directions Served	T	T	T	T	T	L	L	R	R	
Maximum Queue (ft)	356	282	198	194	75	216	167	84	17	
Average Queue (ft)	191	138	97	107	43	128	81	3	1	
95th Queue (ft)	299	230	165	179	98	195	141	39	17	
Link Distance (ft)	1253	1253	384	384		498	498	498		
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)					50					381
Storage Blk Time (%)					27					1
Queuing Penalty (veh)					55					2

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	WB	WB
Directions Served	UL	L	T	T	T	TR
Maximum Queue (ft)	111	116	7	103	117	133
Average Queue (ft)	62	63	0	6	48	60
95th Queue (ft)	99	96	7	51	94	106
Link Distance (ft)		384	384	384	246	246
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200					
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report
PM Existing

02/01/2018

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	UL	T	TR	R>	U<L	L	T
Maximum Queue (ft)	190	198	235	259	231	187	166	177	170	232	225	225
Average Queue (ft)	99	112	133	163	89	113	123	148	135	121	127	119
95th Queue (ft)	157	169	212	246	184	176	177	178	178	189	200	198
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)	0	0	0	1	0	6	5	12	7			
Queuing Penalty (veh)	0	0	0	2	0	16	14	33	19			
Storage Bay Dist (ft)					225					295	295	
Storage Blk Time (%)				1	0						0	0
Queuing Penalty (veh)				4	0						0	0

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	UL	T	TR	>
Maximum Queue (ft)	274	115	153	183	192	17
Average Queue (ft)	151	73	63	109	116	1
95th Queue (ft)	247	146	119	166	175	17
Link Distance (ft)	1147		676	676		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		90	320		280	
Storage Blk Time (%)	21	0				
Queuing Penalty (veh)	32	1				

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	51	60	73	76	106	122	86	209	75
Average Queue (ft)	2	3	6	14	14	33	18	77	32
95th Queue (ft)	22	24	38	52	57	97	70	160	80
Link Distance (ft)	146	146			111	111		1189	
Upstream Blk Time (%)					0	1			
Queuing Penalty (veh)					1	3			
Storage Bay Dist (ft)			40	65			65	50	
Storage Blk Time (%)		0	0	0	0	3	1	34	1
Queuing Penalty (veh)		1	0	1	1	6	1	10	0

Queuing and Blocking Report
PM Existing

02/01/2018

Intersection: 5: Serramonte Blvd & Serra Center Driveway

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	124	118	301	330	106
Average Queue (ft)	75	73	129	179	53
95th Queue (ft)	116	111	243	287	90
Link Distance (ft)	110	110	726	726	247
Upstream Blk Time (%)	1	1			
Queuing Penalty (veh)	3	2			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	ULT	TR	LT	T	R	UL	T	T	T	R	UL	T
Maximum Queue (ft)	250	259	310	316	182	224	318	282	192	134	152	198
Average Queue (ft)	151	147	190	180	46	157	143	132	100	43	62	114
95th Queue (ft)	231	234	289	285	113	240	253	214	170	92	123	177
Link Distance (ft)	258	258	334	334			330	330	330			1259
Upstream Blk Time (%)	0	0	0	0	0		0	0				
Queuing Penalty (veh)	1	1	2	2	0		2	0				
Storage Bay Dist (ft)					300	200				160	300	
Storage Blk Time (%)				1	0	8	0		1	0		
Queuing Penalty (veh)				1	0	22	0		1	0		

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	178	127	76
Average Queue (ft)	79	28	25
95th Queue (ft)	153	81	54
Link Distance (ft)	1259	1259	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		0	0

Queuing and Blocking Report
PM Existing

02/01/2018

Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB	
Directions Served	LT	R	LT	TR	L	TR	L	T	R	
Maximum Queue (ft)	260	151	103	76	340	282	83	271	100	
Average Queue (ft)	121	69	46	27	180	142	20	134	72	
95th Queue (ft)	217	124	89	59	300	233	62	238	122	
Link Distance (ft)	850	850	192	192	908	908		900		
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)							75			75
Storage Blk Time (%)							0	26	1	
Queuing Penalty (veh)							0	47	3	

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	ULT	R	LTR	UL	T	T	TR	ULT	T	TR
Maximum Queue (ft)	184	105	30	48	34	13	7	44	23	9
Average Queue (ft)	39	73	3	15	2	1	0	4	1	0
95th Queue (ft)	119	111	17	36	18	7	4	23	14	5
Link Distance (ft)	472		186		1262	1262	1262	415	415	415
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			80				130			
Storage Blk Time (%)	0	6				0				
Queuing Penalty (veh)	1	1				0				

Intersection: 9: Junipero Serra Blvd & Serra Center Driveway

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	L	R	UT	T	TR	L	T	T	
Maximum Queue (ft)	89	78	70	142	166	168	73	93	83	
Average Queue (ft)	42	36	37	60	72	81	34	35	32	
95th Queue (ft)	75	67	64	117	134	144	65	72	71	
Link Distance (ft)	196	196	196	676	676	676		591	591	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)							210			
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report
PM Existing

02/01/2018

Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	114	88	63	77	59	138
Average Queue (ft)	18	5	5	6	20	56
95th Queue (ft)	64	40	33	40	51	115
Link Distance (ft)	111	111	129	129	208	158
Upstream Blk Time (%)	0	0	0	0	3	
Queuing Penalty (veh)	1	0	0	0	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 11: Serramonte Blvd

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	92	80	5	37	49
Average Queue (ft)	14	7	0	2	17
95th Queue (ft)	58	41	5	19	41
Link Distance (ft)	129	129	110	110	222
Upstream Blk Time (%)	0	0	0		
Queuing Penalty (veh)	0	0	0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Serramonte Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	38	36
Average Queue (ft)	2	6
95th Queue (ft)	18	26
Link Distance (ft)	726	250
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
PM Existing

02/01/2018

Intersection: 13: Serramonte Blvd

Movement	WB	WB	NB
Directions Served	LT	T	LR
Maximum Queue (ft)	50	9	58
Average Queue (ft)	6	0	24
95th Queue (ft)	30	10	51
Link Distance (ft)	518	518	337
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Serramonte Blvd

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	LT	T	LR
Maximum Queue (ft)	29	35	91	37	118
Average Queue (ft)	1	2	24	1	52
95th Queue (ft)	16	20	69	21	91
Link Distance (ft)	518	518	258	258	418
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 15: El Camino Real

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	R
Maximum Queue (ft)	94	42	34	2
Average Queue (ft)	31	13	2	0
95th Queue (ft)	69	39	22	2
Link Distance (ft)	203		415	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		100
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Queuing and Blocking Report
PM Existing

02/01/2018

Intersection: 16: Serramonte Blvd

Movement	EB	WB	WB	NB	NB
Directions Served	TR	LT	T	L	R
Maximum Queue (ft)	8	87	55	55	40
Average Queue (ft)	0	16	3	24	18
95th Queue (ft)	4	57	31	52	44
Link Distance (ft)	334	300	300	289	289
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: Serramonte Blvd

Movement	EB	WB	WB	NB
Directions Served	T	LT	T	LR
Maximum Queue (ft)	2	67	6	57
Average Queue (ft)	0	5	0	22
95th Queue (ft)	2	30	5	50
Link Distance (ft)	300	389	389	205
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Serramonte Blvd

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	2	51	42
Average Queue (ft)	0	5	15
95th Queue (ft)	2	28	42
Link Distance (ft)	389	850	247
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
PM Existing

02/01/2018

Intersection: 26:

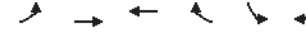
Movement	B29	B29	B36	B36
Directions Served	T		T	
Maximum Queue (ft)	88	42	160	141
Average Queue (ft)	9	3	45	30
95th Queue (ft)	46	21	111	93
Link Distance (ft)	169	169	175	175
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 295

HCM Signalized Intersection Capacity Analysis
1: Serramonte Blvd & I-280 SB Off-Ramp

04/09/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↑	↑↑
Traffic Volume (vph)	0	1422	642	0	848	873
Future Volume (vph)	0	1422	642	0	848	873
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1497	676	0	893	919
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1497	676	0	893	919
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		30.6	18.9		22.4	34.6
Effective Green, g (s)		30.6	18.9		22.4	34.6
Actuated g/C Ratio		0.50	0.31		0.37	0.56
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1766	1567		1254	1573
v/s Ratio Prot		c0.42	0.13		c0.26	0.33
v/s Ratio Perm						
v/c Ratio		0.85	0.43		0.71	0.58
Uniform Delay, d1		13.3	16.9		16.7	8.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		4.0	0.2		1.9	0.6
Delay (s)		17.3	17.1		18.6	9.2
Level of Service		B	B		B	A
Approach Delay (s)		17.3	17.1		13.9	
Approach LOS		B	B		B	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	11.5
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2: Serramonte Blvd & I-280 NB On-Ramp

04/09/2018



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔	↔			
Traffic Volume (vph)	3	625	1644	642	5	0	0
Future Volume (vph)	3	625	1644	642	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.4	4.1			
Lane Util. Factor		0.97	0.95	0.95			
Fr't		1.00	1.00	1.00			
Flt Protected		0.95	1.00	1.00			
Sat'd. Flow (prot)		3433	3539	3535			
Flt Permitted		0.95	1.00	1.00			
Sat'd. Flow (perm)		3433	3539	3535			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	658	1731	676	5	0	0
RTOR Reduction (vph)	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	661	1731	680	0	0	0
Turn Type	Prot	Prot	NA	NA			
Protected Phases	5	5	2	6			
Permitted Phases							
Actuated Green, G (s)		11.7	34.4	15.1			
Effective Green, g (s)		11.7	34.4	15.1			
Actuated g/C Ratio		0.34	1.00	0.44			
Clearance Time (s)		3.5	4.4	4.1			
Vehicle Extension (s)		3.0	4.0	3.0			
Lane Grp Cap (vph)		1167	3539	1551			
v/s Ratio Prot		0.19	c0.49	0.19			
v/s Ratio Perm							
v/c Ratio		0.57	0.49	0.44			
Uniform Delay, d1		9.3	0.0	6.7			
Progression Factor		1.00	1.00	1.00			
Incremental Delay, d2		0.6	0.1	0.2			
Delay (s)		9.9	0.1	6.9			
Level of Service		A	A	A			
Approach Delay (s)		2.8	6.9		0.0		
Approach LOS		A	A		A		
Intersection Summary							
HCM 2000 Control Delay		3.7		HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio		0.63					
Actuated Cycle Length (s)		34.4		Sum of lost time (s)		7.6	
Intersection Capacity Utilization		98.3%		ICU Level of Service		F	
Analysis Period (min)		15					
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

04/09/2018



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL
Lane Configurations		↔	↔	↔		↔	↔	↔				↔
Traffic Volume (vph)	4	591	734	326	1	177	397	362	114	12	81	407
Future Volume (vph)	4	591	734	326	1	177	397	362	114	12	81	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0		3.0	4.6	4.6				4.0
Lane Util. Factor		0.97	0.95	1.00		1.00	0.91	0.91				0.97
Frpb, ped/bikes		1.00	1.00	0.98		1.00	1.00	1.00				1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00				1.00
Fr't		1.00	1.00	0.85		1.00	0.95	0.85				1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00				0.95
Sat'd. Flow (prot)		3433	3539	1554		1770	3216	1441				3433
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00				0.95
Sat'd. Flow (perm)		3433	3539	1554		1770	3216	1441				3433
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	622	773	343	1	186	418	381	120	13	85	428
RTOR Reduction (vph)	0	0	0	242	0	0	0	89	0	0	0	0
Lane Group Flow (vph)	0	626	773	101	0	187	635	195	0	0	0	526
Confl. Peds. (#/hr)	7											
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm		Split	Split	Split
Protected Phases	5	5	2		1	1	6			3	3	3
Permitted Phases				2				6				
Actuated Green, G (s)		20.7	30.3	30.3		13.9	22.9	22.9				21.9
Effective Green, g (s)		20.7	30.3	30.3		13.9	22.9	22.9				21.9
Actuated g/C Ratio		0.20	0.29	0.29		0.14	0.22	0.22				0.21
Clearance Time (s)		3.0	4.0	4.0		3.0	4.6	4.6				4.0
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0	2.0				2.0
Lane Grp Cap (vph)		690	1042	457		239	715	320				730
v/s Ratio Prot		c0.18	0.22			0.11	c0.20					c0.15
v/s Ratio Perm				0.06				0.14				
v/c Ratio		0.91	0.74	0.22		0.78	0.89	0.61				0.72
Uniform Delay, d1		40.2	32.8	27.4		43.0	38.8	36.0				37.7
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00				1.00
Incremental Delay, d2		15.3	2.5	0.1		14.2	12.5	2.4				3.0
Delay (s)		55.5	35.3	27.5		57.2	51.3	38.4				40.6
Level of Service		E	D	C		E	D	D				D
Approach Delay (s)		41.0				49.0						
Approach LOS		D				D						
Intersection Summary												
HCM 2000 Control Delay		41.5		HCM 2000 Level of Service		D						
HCM 2000 Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		102.9		Sum of lost time (s)		16.2						
Intersection Capacity Utilization		82.7%		ICU Level of Service		E						
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

04/09/2018

Movement	NBT	NBR	SBU	SBL	SBT	SBR	SBR2
Lane Configurations	↑↑	↑		↓	↑↑		↑
Traffic Volume (vph)	469	198	19	138	442	164	282
Future Volume (vph)	469	198	19	138	442	164	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.6	4.6		4.0
Lane Util. Factor	0.95	1.00		1.00	0.95		1.00
Flpb, ped/bikes	1.00	0.98		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00
Frt	1.00	0.85		1.00	0.96		0.85
Flt Protected	1.00	1.00		0.95	1.00		1.00
Satd. Flow (prot)	3539	1554		1770	3395		1583
Flt Permitted	1.00	1.00		0.95	1.00		1.00
Satd. Flow (perm)	3539	1554		1770	3395		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	494	208	20	145	465	173	297
RTOR Reduction (vph)	0	124	0	0	0	0	0
Lane Group Flow (vph)	494	84	0	165	638	0	297
Confl. Peds. (#/hr)	7						
Turn Type	NA	Perm	Split	Split	NA		Free
Protected Phases	3		4	4	4		
Permitted Phases	3			Free			
Actuated Green, G (s)	21.9	21.9		21.2	21.2		102.9
Effective Green, g (s)	21.9	21.9		21.2	21.2		102.9
Actuated g/C Ratio	0.21	0.21		0.21	0.21		1.00
Clearance Time (s)	4.0	4.0		4.6	4.6		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		
Lane Grp Cap (vph)	753	330		364	699		1583
v/s Ratio Prot	0.14			0.09	0.19		
v/s Ratio Perm		0.05					0.19
v/c Ratio	0.66	0.26		0.45	0.91		0.19
Uniform Delay, d1	37.1	33.7		35.8	39.9		0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2	1.6	0.1		0.3	16.0		0.3
Delay (s)	38.6	33.9		36.1	56.0		0.3
Level of Service	D	C		D	E		A
Approach Delay (s)	38.7				38.0		
Approach LOS	D				D		

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
 4: Collins Avenue & Serramonte Blvd

04/09/2018


Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations		↑↑	↑		↓↑↑	↓	↑	
Traffic Volume (veh/h)	1	789	279	12	972	63	23	
Future Volume (Veh/h)	1	789	279	12	972	63	23	
Sign Control	Free			Free		Stop		
Grade	0%							
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	0	831	294	13	1023	66	24	
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)							2	
Median type	None			None				
Median storage (veh)								
Upstream signal (ft)	239							
pX, platoon unblocked	0.00			0.82		0.82	0.82	
vC, conflicting volume	0			831		1113	416	
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	0			363		706	0	
IC, single (s)	0.0			4.1		6.8	6.9	
IC, 2 stage (s)								
IF (s)	0.0			2.2		3.5	3.3	
p0 queue free %	0			99		78	97	
cM capacity (veh/h)	0			981		301	892	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	416	416	294	159	292	292	292	90
Volume Left	0	0	0	13	0	0	0	66
Volume Right	0	0	294	0	0	0	0	24
cSH	1700	1700	1700	981	1700	1700	1700	410
Volume to Capacity	0.24	0.24	0.17	0.01	0.17	0.17	0.17	0.22
Queue Length 95th (ft)	0	0	0	1	0	0	0	21
Control Delay (s)	0.0	0.0	0.0	0.8	0.0	0.0	0.0	17.3
Lane LOS	A			C				
Approach Delay (s)	0.0			0.1				
Approach LOS	D			C				

Intersection Summary

Average Delay	0.8
Intersection Capacity Utilization	38.2% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
5: Serramonte Blvd & Serra Center Driveway


04/09/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	154	648	771	223	125	158
Future Volume (vph)	154	648	771	223	125	158
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	682	812	235	132	166
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total (vph)	389	455	541	506	298	
Volume Left (vph)	162	0	0	0	132	
Volume Right (vph)	0	0	0	235	166	
Hadj (s)	0.24	0.03	0.03	-0.29	-0.21	
Departure Headway (s)	7.3	7.1	7.0	6.7	6.7	
Degree Utilization, x	0.79	0.90	1.06	0.94	0.55	
Capacity (veh/h)	489	504	516	529	530	
Control Delay (s)	31.3	43.9	81.6	50.5	17.7	
Approach Delay (s)	38.1		66.5		17.7	
Approach LOS	E		F		C	
Intersection Summary						
Delay			48.9			
Level of Service			E			
Intersection Capacity Utilization			78.6%		ICU Level of Service D	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd


04/09/2018



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations			↑↑			↑↑	↑		↑	↑↑↑	↑	↑
Traffic Volume (vph)	2	157	290	179	118	389	71	5	277	602	100	4
Future Volume (vph)	2	157	290	179	118	389	71	5	277	602	100	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			3.5			3.5	3.5			3.0	4.0	4.0
Lane Util. Factor			0.95			0.95	1.00			1.00	0.91	1.00
Frpb, ped/bikes			0.99			1.00	0.98			1.00	1.00	0.98
Flpb, ped/bikes			1.00			1.00	1.00			1.00	1.00	1.00
Frt			0.96			1.00	0.85			1.00	1.00	0.85
Flt Protected			0.99			0.99	1.00			0.95	1.00	1.00
Satd. Flow (prot)			3326			3499	1556			1770	5085	1553
Flt Permitted			0.99			0.99	1.00			0.95	1.00	1.00
Satd. Flow (perm)			3326			3499	1556			1770	5085	1553
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	165	305	188	124	409	75	5	292	634	105	4
RTOR Reduction (vph)	0	0	44	0	0	0	60	0	0	0	69	0
Lane Group Flow (vph)	0	0	616	0	0	533	15	0	297	634	36	0
Confl. Peds. (#/hr)				11			7					7
Turn Type	Split	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	8	8	8		7	7		1	1	6		5
Permitted Phases							7					6
Actuated Green, G (s)			21.3			18.3	18.3			17.3	30.9	30.9
Effective Green, g (s)			21.3			18.3	18.3			17.3	30.9	30.9
Actuated g/C Ratio			0.24			0.20	0.20			0.19	0.34	0.34
Clearance Time (s)			3.5			3.5	3.5			3.0	4.0	4.0
Vehicle Extension (s)			2.0			2.0	2.0			2.0	4.0	4.0
Lane Grp Cap (vph)			783			708	314			338	1738	530
v/s Ratio Prot			c0.19			c0.15				c0.17	0.12	
v/s Ratio Perm							0.01					0.02
v/c Ratio			0.79			0.75	0.05			0.88	0.36	0.07
Uniform Delay, d1			32.4			33.9	29.0			35.5	22.4	20.0
Progression Factor			1.00			1.00	1.00			1.00	1.00	1.00
Incremental Delay, d2			4.8			4.0	0.0			21.3	0.2	0.1
Delay (s)			37.2			38.0	29.1			56.8	22.5	20.1
Level of Service			D			D	C			E	C	C
Approach Delay (s)			37.2			36.9				32.1		
Approach LOS			D			D				C		
Intersection Summary												
HCM 2000 Control Delay			34.4		HCM 2000 Level of Service		C					
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			90.4		Sum of lost time (s)		14.0					
Intersection Capacity Utilization			81.8%		ICU Level of Service		D					
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

04/09/2018




Movement	SBL	SBT	SBR
Lane Configurations	↔	↑↑↑	↔
Traffic Volume (vph)	72	552	205
Future Volume (vph)	72	552	205
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1559
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1559
Peak-hour factor, PHF	0.95	0.95	0.95
Adj. Flow (vph)	76	581	216
RTOR Reduction (vph)	0	0	169
Lane Group Flow (vph)	80	581	47
Confl. Peds. (#/hr)			3
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	5.9	19.5	19.5
Effective Green, g (s)	5.9	19.5	19.5
Actuated g/C Ratio	0.07	0.22	0.22
Clearance Time (s)	3.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0
Lane Grp Cap (vph)	115	1096	336
v/s Ratio Prot	0.05	c0.11	
v/s Ratio Perm			0.03
v/c Ratio	0.70	0.53	0.14
Uniform Delay, d1	41.4	31.4	28.7
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	13.7	0.6	0.3
Delay (s)	55.1	32.0	28.9
Level of Service	E	C	C
Approach Delay (s)		33.4	
Approach LOS		C	

Intersection Summary

HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: Hillside Blvd & Serramonte Blvd

04/09/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔		↔	↔	↔	↔	↔
Traffic Volume (vph)	156	36	220	9	40	9	278	246	11	8	259	179
Future Volume (vph)	156	36	220	9	40	9	278	246	11	8	259	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	0.98	1.00	0.99	1.00	0.99	1.00	0.99	1.00	1.00	0.85
Flt Protected	0.96	1.00	0.99	0.99	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1788	1583	3423	1770	1850	1770	1850	1770	1850	1770	1863	1546
Flt Permitted	0.92	1.00	0.92	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1346	1583	3161	1770	1850	1770	1850	1770	1850	1770	1863	1546
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	164	38	232	9	42	9	293	259	12	8	273	188
RTOR Reduction (vph)	0	0	161	0	6	0	0	3	0	0	0	134
Lane Group Flow (vph)	0	202	71	0	54	0	293	268	0	8	273	54
Confl. Peds. (#/hr)	1					1						12
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2	2		3	8		7	4	
Permitted Phases	2		2	2								4
Actuated Green, G (s)	18.1	18.1		18.1			10.5	26.5		0.9	16.9	16.9
Effective Green, g (s)	18.1	18.1		18.1			10.5	26.5		0.9	16.9	16.9
Actuated g/C Ratio	0.31	0.31		0.31			0.18	0.45		0.02	0.29	0.29
Clearance Time (s)	4.5	4.5		4.5			4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0			3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	412	485		969			315	830		27	533	442
v/s Ratio Prot							c0.17	0.14		0.00	c0.15	
v/s Ratio Perm	c0.15	0.04		0.02								0.03
v/c Ratio	0.49	0.15		0.06			0.93	0.32		0.30	0.51	0.12
Uniform Delay, d1	16.7	14.8		14.4			23.9	10.5		28.7	17.6	15.6
Progression Factor	1.00	1.00		1.00			1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	0.6		0.1			33.0	0.2		6.1	0.8	0.1
Delay (s)	20.8	15.5		14.5			56.9	10.7		34.8	18.4	15.7
Level of Service	C	B		B			E	B		C	B	B
Approach Delay (s)	18.0			14.5			34.7				17.6	
Approach LOS	B			B			C				B	

Intersection Summary

HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

04/09/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations		↕	↕		↕			↕	↕	↕		
Traffic Volume (veh/h)	22	0	265	1	0	0	8	57	996	1	8	0
Future Volume (Veh/h)	22	0	265	1	0	0	8	57	996	1	8	0
Sign Control	Stop			Stop			Free					
Grade	0%			0%			0%					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	0	279	1	0	0	0	60	1048	1	0	0
Pedestrians	1			1								
Lane Width (ft)	12.0			12.0								
Walking Speed (ft/s)	3.5			3.5								
Percent Blockage	0			0								
Right turn flare (veh)	3											
Median type							Raised					
Median storage (veh)							1					
Upstream signal (ft)												
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.00	0.93			0.00	
vC, conflicting volume	1377	2078	314	1606	2094	351	0	924			0	1050
vC1, stage 1 conf vol	908	908		1170	1170							
vC2, stage 2 conf vol	469	1170		436	924							
vCu, unblocked vol	1146	1899	4	1392	1915	351	0	659			0	1050
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1
IC, 2 stage (s)	6.5	5.5		6.5	5.5							
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	0.0	2.2			0.0	2.2
p0 queue free %	91	100	72	99	100	100	0	93			0	100
cM capacity (veh/h)	264	168	1003	149	160	645	0	860			0	658
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3			
Volume Total	302	1	60	419	419	211	223	446	255			
Volume Left	23	1	60	0	0	0	0	0	0			
Volume Right	279	0	0	0	0	1	0	0	32			
cSH	1085	149	860	1700	1700	1700	658	1700	1700			
Volume to Capacity	0.28	0.01	0.07	0.25	0.25	0.12	0.00	0.26	0.15			
Queue Length 95th (ft)	29	1	6	0	0	0	0	0	0			
Control Delay (s)	10.7	29.4	9.5	0.0	0.0	0.0	0.0	0.0	0.0			
Lane LOS	B	D	A									
Approach Delay (s)	10.7	29.4	0.5				0.0					
Approach LOS	B	D										
Intersection Summary												
Average Delay	1.6											
Intersection Capacity Utilization	69.5%			ICU Level of Service			C					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

04/09/2018

Movement	SBT	SBR
Lane Configurations	↕	↕
Traffic Volume (veh/h)	846	30
Future Volume (Veh/h)	846	30
Sign Control	Free	
Grade	0%	
Peak Hour Factor	0.95	0.95
Hourly flow rate (vph)	891	32
Pedestrians		
Lane Width (ft)		
Walking Speed (ft/s)		
Percent Blockage		
Right turn flare (veh)		
Median type	Raised	
Median storage (veh)	1	
Upstream signal (ft)	919	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
IC, single (s)		
IC, 2 stage (s)		
IF (s)		
p0 queue free %		
cM capacity (veh/h)		
Direction, Lane #		

HCM Signalized Intersection Capacity Analysis
 9: Junipero Serra Blvd & Serra Center Driveway

04/09/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↔↔↔	↔	↔	↔↔
Traffic Volume (vph)	274	134	880	232	71	769
Future Volume (vph)	274	134	880	232	71	769
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.91	1.00	0.95	0.95
Flpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	0.97	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1560	4913	1770	3539	3539
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1560	4913	1770	3539	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	288	141	926	244	75	809
RTOR Reduction (vph)	0	112	69	0	0	0
Lane Group Flow (vph)	288	29	1101	0	75	809
Confl. Peds. (#/hr)		3		1		
Turn Type	Prot	Perm	NA	Prot	NA	
Protected Phases	8		2	1	6	
Permitted Phases		8				
Actuated Green, G (s)	10.3	10.3	23.5	3.3	31.3	
Effective Green, g (s)	10.3	10.3	23.5	3.3	31.3	
Actuated g/C Ratio	0.20	0.20	0.46	0.07	0.62	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	698	317	2281	115	2189	
v/s Ratio Prot	c0.08		c0.22	c0.04	0.23	
v/s Ratio Perm		0.02				
v/c Ratio	0.41	0.09	0.48	0.65	0.37	
Uniform Delay, d1	17.5	16.3	9.4	23.1	4.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1	0.7	12.5	0.5	
Delay (s)	17.9	16.5	10.1	35.6	5.3	
Level of Service	B	B	B	D	A	
Approach Delay (s)	17.4		10.1		7.8	
Approach LOS	B		B		A	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

SimTraffic Simulation Summary
 WKN MIDDAY

02/01/2018

Summary of All Intervals							
Run Number	1	10	2	3	4	5	6
Start Time	11:45	11:45	11:45	11:45	11:45	11:45	11:45
End Time	1:00	1:00	1:00	1:00	1:00	1:00	1:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	9755	9692	9642	9653	9831	9617	9594
Vehs Exited	9720	9680	9645	9659	9863	9592	9640
Starting Vehs	320	365	341	343	347	314	350
Ending Vehs	355	377	338	337	315	339	304
Travel Distance (mi)	6042	5948	5934	5905	6132	5961	5915
Travel Time (hr)	376.2	389.4	339.3	354.9	369.4	345.5	340.8
Total Delay (hr)	185.6	201.7	152.2	168.6	175.7	157.6	153.9
Total Stops	15636	15003	14813	15177	15739	15028	15129
Fuel Used (gal)	260.7	262.1	248.2	253.3	262.2	251.2	249.2

Summary of All Intervals				
Run Number	7	8	9	Avg
Start Time	11:45	11:45	11:45	11:45
End Time	1:00	1:00	1:00	1:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	9755	9698	9782	9702
Vehs Exited	9778	9682	9767	9704
Starting Vehs	361	320	329	330
Ending Vehs	338	336	344	331
Travel Distance (mi)	5996	5999	6020	5985
Travel Time (hr)	351.2	348.1	351.5	356.6
Total Delay (hr)	162.1	158.4	161.5	167.7
Total Stops	15507	15569	15278	15283
Fuel Used (gal)	254.1	251.9	255.2	254.8

Interval #0 Information Seeding	
Start Time	11:45
End Time	12:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

SimTraffic Simulation Summary
WKN Midday

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Interval #1 Information Recording

Start Time	12:00						
End Time	1:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	1	10	2	3	4	5	6
Vehs Entered	9755	9692	9642	9653	9831	9617	9594
Vehs Exited	9720	9680	9645	9659	9863	9592	9640
Starting Vehs	320	365	341	343	347	314	350
Ending Vehs	355	377	338	337	315	339	304
Travel Distance (mi)	6042	5948	5934	5905	6132	5961	5915
Travel Time (hr)	376.2	389.4	339.3	354.9	369.4	345.5	340.8
Total Delay (hr)	185.6	201.7	152.2	168.6	175.7	157.6	153.9
Total Stops	15636	15003	14813	15177	15739	15028	15129
Fuel Used (gal)	260.7	262.1	248.2	253.3	262.2	251.2	249.2

Interval #1 Information Recording

Start Time	12:00			
End Time	1:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	7	8	9	Avg
Vehs Entered	9755	9698	9782	9702
Vehs Exited	9778	9682	9767	9704
Starting Vehs	361	320	329	330
Ending Vehs	338	336	344	331
Travel Distance (mi)	5996	5999	6020	5985
Travel Time (hr)	351.2	348.1	351.5	356.6
Total Delay (hr)	162.1	158.4	161.5	167.7
Total Stops	15507	15569	15278	15283
Fuel Used (gal)	254.1	251.9	255.2	254.8

SimTraffic Performance Report
WKN Midday

02/01/2018

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	1428	641	840	855	3764
Vehicles Exited	1431	644	840	855	3770
Hourly Exit Rate	1431	644	840	855	3770
Input Volume	1422	645	848	873	3788
% of Volume	101	100	99	98	100

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	WBT	WBR	All
Vehicles Entered	3	619	1651	638	6	2917
Vehicles Exited	3	619	1651	638	6	2917
Hourly Exit Rate	3	619	1651	638	6	2917
Input Volume	3	625	1644	642	5	2919
% of Volume	100	99	100	99	120	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL
Vehicles Entered	4	599	731	328	0	175	392	353	114	13	81	408
Vehicles Exited	4	602	733	329	0	176	391	353	114	14	81	406
Hourly Exit Rate	4	602	733	329	0	176	391	353	114	14	81	406
Input Volume	4	591	734	326	1	177	397	362	114	12	81	407
% of Volume	100	102	100	101	0	99	98	98	100	117	100	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	NBT	NBR	SBU	SBL	SBT	SBR	SBR2	All
Vehicles Entered	472	204	19	139	452	166	282	4932
Vehicles Exited	471	204	20	138	451	166	283	4936
Hourly Exit Rate	471	204	20	138	451	166	283	4936
Input Volume	469	198	19	138	444	164	282	4920
% of Volume	100	103	105	100	102	101	100	100

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Vehicles Entered	1	788	287	10	980	63	1	24	2154
Vehicles Exited	1	788	287	10	979	61	1	24	2151
Hourly Exit Rate	1	788	287	10	979	61	1	24	2151
Input Volume	1	791	279	12	991	63	1	23	2161
% of Volume	100	100	103	83	99	97	100	104	100

SimTraffic Performance Report

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5: Serramonte Blvd & Serra Center Driveway Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	151	692	760	217	120	156	2096
Vehicles Exited	151	692	760	216	120	156	2095
Hourly Exit Rate	151	692	760	216	120	156	2095
Input Volume	154	691	771	223	125	158	2122
% of Volume	98	100	99	97	96	99	99

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Vehicles Entered	1	156	359	177	114	393	70	4	278	638	104	3
Vehicles Exited	1	156	360	176	115	393	70	4	277	639	104	3
Hourly Exit Rate	1	156	360	176	115	393	70	4	277	639	104	3
Input Volume	2	157	363	179	118	389	71	5	277	640	100	4
% of Volume	50	99	99	98	97	101	99	80	100	100	104	75

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBL	SBT	SBR	All
Vehicles Entered	71	543	198	3109
Vehicles Exited	70	544	198	3110
Hourly Exit Rate	70	544	198	3110
Input Volume	72	552	205	3134
% of Volume	97	99	97	99

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	156	61	219	8	40	9	273	256	12	8	266	182
Vehicles Exited	156	61	219	8	40	9	272	255	12	8	267	182
Hourly Exit Rate	156	61	219	8	40	9	272	255	12	8	267	182
Input Volume	156	60	220	9	40	9	278	246	11	8	259	179
% of Volume	100	102	100	89	100	100	98	104	109	100	103	102

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	1490
Vehicles Exited	1489
Hourly Exit Rate	1489
Input Volume	1475
% of Volume	101

SimTraffic Performance Report

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8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBT	EBR	WBL	NBU	NBL	NBT	NBR	SBU	SBT	SBR	All
Vehicles Entered	22	5	271	2	6	56	993	1	7	833	33	2229
Vehicles Exited	22	5	272	2	6	56	995	1	7	833	33	2232
Hourly Exit Rate	22	5	272	2	6	56	995	1	7	833	33	2232
Input Volume	22	4	265	1	8	57	996	1	8	847	30	2239
% of Volume	100	125	103	200	75	98	100	100	88	98	110	100

9: Junipero Serra Blvd & Serra Center Driveway Performance by movement

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT	All
Vehicles Entered	1	276	134	3	973	231	1	74	778	2471
Vehicles Exited	1	276	134	3	972	230	1	75	779	2471
Hourly Exit Rate	1	276	134	3	972	230	1	75	779	2471
Input Volume	1	274	134	3	958	232	1	71	769	2443
% of Volume	100	101	100	100	101	99	100	106	101	101

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	45	756	9	8	912	51	14	10	58	67	1930
Vehicles Exited	45	756	9	8	912	51	13	10	58	68	1930
Hourly Exit Rate	45	756	9	8	912	51	13	10	58	68	1930
Input Volume	45	759	8	9	922	53	13	11	58	69	1947
% of Volume	100	100	112	89	99	96	100	91	100	99	99

11: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	10	808	929	15	35	41	1838
Vehicles Exited	10	808	929	15	34	42	1838
Hourly Exit Rate	10	808	929	15	34	42	1838
Input Volume	11	812	943	13	33	40	1852
% of Volume	91	100	99	115	103	105	99

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	3	765	920	6	2	4	1700
Vehicles Exited	3	766	920	6	2	4	1701
Hourly Exit Rate	3	766	920	6	2	4	1701
Input Volume	3	770	931	5	3	3	1715
% of Volume	100	99	99	120	67	133	99

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	677	16	20	906	23	19	1661
Vehicles Exited	677	16	20	904	23	19	1659
Hourly Exit Rate	677	16	20	904	23	19	1659
Input Volume	685	15	20	911	25	19	1675
% of Volume	99	107	100	99	92	100	99

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	639	57	78	853	71	54	1752
Vehicles Exited	639	57	77	854	71	53	1751
Hourly Exit Rate	639	57	77	854	71	53	1751
Input Volume	647	57	75	858	73	54	1764
% of Volume	99	100	103	100	97	98	99

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	48	46	28	996	829	24	1971
Vehicles Exited	48	46	28	995	828	24	1969
Hourly Exit Rate	48	46	28	995	828	24	1969
Input Volume	48	42	31	995	843	26	1985
% of Volume	100	110	90	100	98	92	99

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	435	26	28	507	31	25	1052
Vehicles Exited	435	26	28	506	31	25	1051
Hourly Exit Rate	435	26	28	506	31	25	1051
Input Volume	437	25	30	505	33	26	1056
% of Volume	100	104	93	100	94	96	100

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	426	11	12	521	12	14	996
Vehicles Exited	427	10	12	522	12	14	997
Hourly Exit Rate	427	10	12	522	12	14	997
Input Volume	427	12	14	521	14	12	1000
% of Volume	100	83	86	100	86	117	100

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	422	18	22	516	18	15	1011
Vehicles Exited	422	18	22	516	19	15	1012
Hourly Exit Rate	422	18	22	516	19	15	1012
Input Volume	422	17	22	517	19	15	1012
% of Volume	100	106	100	100	100	100	100

26: Performance by movement

Movement	NBT	NWT	All
Vehicles Entered	624	1041	1665
Vehicles Exited	624	1041	1665
Hourly Exit Rate	624	1041	1665
Input Volume	630	1051	1681
% of Volume	99	99	99

Total Network Performance

Movement	All
Vehicles Entered	9702
Vehicles Exited	9704
Hourly Exit Rate	9704
Input Volume	54335
% of Volume	18

Arterial Level of Service
WKN Midday

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Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
I-280 SB Off-Ramp	1	20.6	49.4	0.2	18	19	16.0
I-280 NB On-Ramp	2	3.3	13.4	0.1	22	23	3.0
Junipero Serra Blvd	3	32.1	39.3	0.1	6	6	32.9
Collins Avenue	4	2.7	8.9	0.0	18	18	2.9
	10	1.3	5.7	0.0	23	23	1.3
	11	2.4	6.8	0.0	21	21	2.5
Serra Center Driveway	5	11.0	15.0	0.0	7	7	11.0
	12	2.8	19.6	0.1	27	28	2.7
	13	0.3	10.5	0.1	30	30	0.3
	14	0.8	13.8	0.1	28	29	0.7
El Camino Real	6	25.7	32.4	0.1	8	7	27.5
	16	2.1	12.8	0.1	24	23	2.2
	17	0.3	8.7	0.1	29	29	0.3
	18	0.4	10.5	0.1	29	29	0.4
Hillside Blvd	7	8.9	24.9	0.2	25	26	8.1
Total		114.6	271.9	1.4	18	18	112.0

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 10 Speed	Run 10 Delay	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed
I-280 SB Off-Ramp	17	22.7	17	21.6	19	18.1	16
I-280 NB On-Ramp	23	3.1	23	2.8	24	2.6	21
Junipero Serra Blvd	6	31.3	6	31.1	6	31.7	6
Collins Avenue	19	2.5	18	2.7	18	2.7	18
	24	1.1	22	1.6	23	1.3	22
	22	2.2	22	2.2	22	2.0	20
Serra Center Driveway	7	10.8	7	10.1	7	9.9	7
	27	2.8	27	2.7	28	2.7	27
	30	0.3	30	0.3	30	0.3	30
	28	0.8	28	0.8	29	0.7	28
El Camino Real	8	24.2	8	24.6	8	22.4	7
	23	2.3	24	2.0	24	2.0	24
	29	0.3	29	0.3	29	0.3	29
	29	0.3	29	0.4	29	0.4	29
Hillside Blvd	27	7.7	21	11.2	26	8.5	25
Total	18	112.4	18	114.4	19	105.5	18

Arterial Level of Service
WKN Midday

02/01/2018

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 4 Delay	Run 5 Speed	Run 5 Delay	Run 6 Speed	Run 6 Delay	Run 7 Speed	Run 7 Delay
I-280 SB Off-Ramp	26.3	18	19.4	19	18.2	18	19.2
I-280 NB On-Ramp	3.9	22	3.5	21	3.9	23	2.9
Junipero Serra Blvd	34.2	6	34.2	6	31.4	6	31.2
Collins Avenue	2.9	18	2.8	18	2.8	18	2.9
	1.5	24	1.0	23	1.2	23	1.4
	2.8	20	2.8	22	2.0	20	2.8
Serra Center Driveway	10.9	7	11.4	7	10.7	6	11.9
	2.7	27	2.8	28	2.8	27	2.8
	0.3	30	0.3	30	0.2	30	0.3
	0.7	28	0.8	29	0.7	28	0.7
El Camino Real	26.0	8	25.1	7	27.1	8	25.5
	2.1	23	2.1	24	2.2	24	2.2
	0.3	29	0.3	29	0.3	29	0.3
	0.3	29	0.3	29	0.5	29	0.4
Hillside Blvd	8.6	27	7.0	24	9.6	22	11.5
Total	123.5	18	113.9	18	113.7	18	116.0

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 8 Speed	Run 8 Delay	Run 9 Speed	Run 9 Delay
I-280 SB Off-Ramp	16	24.6	18	19.0
I-280 NB On-Ramp	21	3.9	22	3.5
Junipero Serra Blvd	6	30.9	6	32.2
Collins Avenue	19	2.5	19	2.5
	23	1.3	24	1.0
	20	2.7	22	2.0
Serra Center Driveway	6	11.8	7	11.3
	27	2.7	27	2.8
	30	0.2	30	0.3
	28	0.8	28	0.9
El Camino Real	7	26.9	7	27.1
	24	2.0	24	2.1
	29	0.4	29	0.3
	29	0.4	29	0.4
Hillside Blvd	24	10.0	27	7.6
Total	18	121.1	18	112.8

Arterial Level of Service
WKN Midday

02/01/2018

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Hillside Blvd	7	12.8	18.2	0.0	9	8	13.6
	18	0.9	16.0	0.2	39	40	1.0
	17	0.4	10.5	0.1	29	29	0.4
El Camino Real	16	0.5	8.6	0.1	29	29	0.4
	6	38.2	47.1	0.1	6	6	42.1
	14	2.8	11.2	0.1	22	22	2.8
Serra Center Driveway	13	0.8	13.9	0.1	28	28	0.7
	12	0.9	10.9	0.1	29	24	2.7
	5	31.4	51.3	0.1	11	8	53.7
Collins Avenue	11	2.6	6.3	0.0	16	16	2.6
	10	0.6	5.3	0.0	27	26	0.8
	4	2.9	7.2	0.0	18	15	4.8
Junipero Serra Blvd	3	36.2	40.9	0.0	4	4	38.1
I-280 NB On-Ramp	2	7.6	16.1	0.1	15	15	7.6
I-280 SB Off-Ramp	1	20.6	30.8	0.1	10	9	22.7
Total		159.1	294.3	1.2	14	13	194.0

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 10 Speed	Run 10 Delay	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed
Hillside Blvd	8	14.7	11	8.6	8	15.2	8
	36	1.4	38	0.7	45	0.6	37
	29	0.3	29	0.5	29	0.3	29
El Camino Real	30	0.4	29	0.5	29	0.5	29
	7	36.1	6	37.9	7	37.0	7
	23	2.5	21	2.9	22	2.6	21
Serra Center Driveway	28	0.8	28	0.8	28	0.8	28
	29	0.6	30	0.6	30	0.6	29
	13	24.6	15	19.5	13	24.7	11
Collins Avenue	16	2.6	16	2.6	16	2.6	16
	26	0.7	27	0.7	26	0.7	28
	17	3.4	18	2.9	17	3.3	20
Junipero Serra Blvd	4	36.8	4	35.9	4	35.4	4
I-280 NB On-Ramp	15	8.1	15	7.6	14	9.6	16
I-280 SB Off-Ramp	10	20.1	10	19.0	9	22.2	10
Total	15	153.1	15	140.7	15	156.2	15

Arterial Level of Service
WKN Midday

02/01/2018

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 4 Delay	Run 5 Speed	Run 5 Delay	Run 6 Speed	Run 6 Delay	Run 7 Speed	Run 7 Delay
Hillside Blvd	13.8	9	12.4	10	9.8	8	14.1
	1.1	40	0.7	41	0.8	39	1.0
	0.3	29	0.3	29	0.4	29	0.4
El Camino Real	0.4	29	0.5	28	0.7	29	0.6
	32.5	6	43.6	7	36.3	6	38.3
	2.8	22	2.7	22	2.8	22	2.7
Serra Center Driveway	0.8	28	0.8	28	0.8	28	0.9
	0.6	29	0.6	30	0.6	29	0.7
	32.1	12	28.4	12	27.6	10	39.7
Collins Avenue	2.6	16	2.6	16	2.6	16	2.6
	0.4	28	0.4	28	0.4	27	0.5
	2.5	20	2.2	21	1.9	19	2.8
Junipero Serra Blvd	36.0	4	35.6	4	38.2	4	33.7
I-280 NB On-Ramp	6.7	16	6.7	15	7.7	17	6.1
I-280 SB Off-Ramp	21.2	11	17.8	10	20.0	10	20.4
Total	153.9	15	155.4	15	150.9	14	164.5

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 8 Speed	Run 8 Delay	Run 9 Speed	Run 9 Delay
Hillside Blvd	9	12.2	8	14.8
	41	0.7	40	1.0
	29	0.6	29	0.4
El Camino Real	30	0.4	29	0.7
	6	38.1	6	40.1
	22	2.7	22	2.9
Serra Center Driveway	28	0.7	28	0.8
	29	0.6	29	0.7
	12	29.8	11	31.6
Collins Avenue	16	2.6	16	2.6
	28	0.4	28	0.5
	18	3.0	20	2.3
Junipero Serra Blvd	4	37.8	4	34.4
I-280 NB On-Ramp	15	7.9	15	7.9
I-280 SB Off-Ramp	10	20.4	9	22.4
Total	15	157.9	14	162.8

Queuing and Blocking Report
WKN Midday

02/01/2018

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB	SB	SB	
Directions Served	T	T	T	T	T	L	L	R	R	
Maximum Queue (ft)	537	456	229	237	75	317	234	119	46	
Average Queue (ft)	311	210	126	137	50	192	120	6	2	
95th Queue (ft)	493	387	205	220	103	281	202	53	27	
Link Distance (ft)	1253	1253	384	384		498	498	498		
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)					50					381
Storage Blk Time (%)					32					1
Queuing Penalty (veh)					68					3

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	WB	WB
Directions Served	UL	L	T	T	T	TR
Maximum Queue (ft)	221	190	229	194	175	174
Average Queue (ft)	138	17	22	26	69	83
95th Queue (ft)	211	107	120	115	134	141
Link Distance (ft)		384	384	384	246	246
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (ft)	200					
Storage Blk Time (%)	1					
Queuing Penalty (veh)	5					

Queuing and Blocking Report
WKN Midday

02/01/2018

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	
Directions Served	UL	L	T	T	R	UL	T	TR	R>	U<L	L	T	
Maximum Queue (ft)	257	272	264	272	245	161	164	173	170	214	246	229	
Average Queue (ft)	177	193	167	197	109	115	139	153	142	123	140	113	
95th Queue (ft)	249	263	251	280	234	173	178	174	180	189	215	190	
Link Distance (ft)	246	246	246	246		146	146	146	146			1147	
Upstream Blk Time (%)	2	3	1	3	0	7	10	19	12				
Queuing Penalty (veh)	7	12	5	11	0	17	25	50	30				
Storage Bay Dist (ft)						225						295	295
Storage Blk Time (%)						5						0	0
Queuing Penalty (veh)						15						1	1

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	UL	T	TR	>
Maximum Queue (ft)	298	115	223	324	362	299
Average Queue (ft)	150	85	96	195	207	38
95th Queue (ft)	253	146	184	297	328	200
Link Distance (ft)	1147			676	676	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		90	320			280
Storage Blk Time (%)	21	2		1	2	0
Queuing Penalty (veh)	41	5		1	6	0

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	UT	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	102	69	68	76	103	122	90	156	74
Average Queue (ft)	6	3	8	17	22	44	27	55	24
95th Queue (ft)	44	34	43	60	76	107	82	128	68
Link Distance (ft)	146	146			111	111		1189	
Upstream Blk Time (%)	0	0			0	1			
Queuing Penalty (veh)	0	0			2	5			
Storage Bay Dist (ft)			40	65			65	50	
Storage Blk Time (%)			0	1	1	3	1	23	0
Queuing Penalty (veh)			0	2	3	8	3	5	0

Queuing and Blocking Report

WKN Midday

02/01/2018

Intersection: 5: Serramonte Blvd & Serra Center Driveway

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	128	136	446	510	151
Average Queue (ft)	99	93	191	287	73
95th Queue (ft)	133	133	441	532	119
Link Distance (ft)	110	110	726	726	247
Upstream Blk Time (%)	5	3	0	1	
Queuing Penalty (veh)	20	12	0	4	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	NB	SB	SB
Directions Served	ULT	TR	LT	T	R	UL	T	T	T	R	UL	T
Maximum Queue (ft)	242	264	228	219	56	224	326	299	152	87	118	205
Average Queue (ft)	140	154	151	135	25	169	138	115	67	34	48	129
95th Queue (ft)	214	235	219	205	49	247	290	227	130	66	93	190
Link Distance (ft)	258	258	334	334			330	330	330			1259
Upstream Blk Time (%)	0	0					3	0				
Queuing Penalty (veh)	0	1					9	0				
Storage Bay Dist (ft)					300	200				160	300	
Storage Blk Time (%)						13	0		0			
Queuing Penalty (veh)						26	0		0			

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	194	146	105
Average Queue (ft)	93	39	37
95th Queue (ft)	170	104	78
Link Distance (ft)	1259	1259	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		1	1

Queuing and Blocking Report

WKN Midday

02/01/2018

Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	TR	L	T	R
Maximum Queue (ft)	174	147	68	37	219	148	61	230	100
Average Queue (ft)	79	63	22	9	124	67	9	110	68
95th Queue (ft)	144	113	57	32	196	121	37	194	117
Link Distance (ft)	850	850	192	192	908	908		900	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							75		75
Storage Blk Time (%)								17	1
Queuing Penalty (veh)								33	2

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	UL	TR	ULT	T
Maximum Queue (ft)	176	105	28	49	0	42	34
Average Queue (ft)	36	77	2	15	0	4	1
95th Queue (ft)	116	114	13	36	0	22	13
Link Distance (ft)	472		186		1262	415	415
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		80		130			
Storage Blk Time (%)	0	8					
Queuing Penalty (veh)	0	2					

Intersection: 9: Junipero Serra Blvd & Serra Center Driveway

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	UL	L	R	UT	T	TR	UL	T	T
Maximum Queue (ft)	111	108	99	142	161	191	96	114	138
Average Queue (ft)	56	53	42	71	86	98	43	54	56
95th Queue (ft)	97	92	75	127	142	167	76	95	108
Link Distance (ft)	196	196	196	676	676	676		591	591
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							210		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
WKN Midday

02/01/2018

Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	123	92	63	59	57	168
Average Queue (ft)	34	7	5	5	19	75
95th Queue (ft)	93	48	29	35	49	152
Link Distance (ft)	111	111	129	129	208	158
Upstream Blk Time (%)	0	0				7
Queuing Penalty (veh)	2	0				0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 11: Serramonte Blvd

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	125	118	14	26	118
Average Queue (ft)	32	20	0	1	45
95th Queue (ft)	90	74	7	12	97
Link Distance (ft)	129	129	110	110	222
Upstream Blk Time (%)	0	0			0
Queuing Penalty (veh)	1	1			0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Serramonte Blvd

Movement	EB	WB	WB	SB
Directions Served	LT	T	TR	LR
Maximum Queue (ft)	34	26	28	30
Average Queue (ft)	2	2	3	6
95th Queue (ft)	18	26	38	25
Link Distance (ft)	726	394	394	250
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
WKN Midday

02/01/2018

Intersection: 13: Serramonte Blvd

Movement	EB	EB	WB	NB
Directions Served	T	TR	LT	LR
Maximum Queue (ft)	2	2	57	71
Average Queue (ft)	0	0	11	28
95th Queue (ft)	2	2	40	56
Link Distance (ft)	394	394	518	337
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: Serramonte Blvd

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	LT	T	LR
Maximum Queue (ft)	14	39	95	33	120
Average Queue (ft)	1	2	38	1	55
95th Queue (ft)	9	18	81	18	98
Link Distance (ft)	518	518	258	258	418
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 15: El Camino Real

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	R
Maximum Queue (ft)	132	61	100	69	2	4
Average Queue (ft)	46	13	12	6	0	0
95th Queue (ft)	110	46	92	65	2	3
Link Distance (ft)	203		415	415	330	
Upstream Blk Time (%)	2					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)		100				100
Storage Blk Time (%)			2			
Queuing Penalty (veh)			0			

Queuing and Blocking Report
WKN Midday

02/01/2018

Intersection: 16: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	5	8	83	11	64	56
Average Queue (ft)	0	0	13	0	23	19
95th Queue (ft)	7	5	51	11	51	49
Link Distance (ft)	334	334	300	300	289	289
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 17: Serramonte Blvd

Movement	WB	WB	NB
Directions Served	LT	T	LR
Maximum Queue (ft)	60	10	42
Average Queue (ft)	6	0	19
95th Queue (ft)	32	10	44
Link Distance (ft)	389	389	205
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Serramonte Blvd

Movement	WB	WB	NB
Directions Served	LT	T	LR
Maximum Queue (ft)	49	3	54
Average Queue (ft)	9	0	23
95th Queue (ft)	35	3	50
Link Distance (ft)	850	850	247
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
WKN Midday

02/01/2018

Intersection: 26:

Movement	NW	B36	B36
Directions Served	R	T	
Maximum Queue (ft)	42	183	192
Average Queue (ft)	1	63	53
95th Queue (ft)	42	138	136
Link Distance (ft)	352	175	175
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	1	2	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 451

HCM Signalized Intersection Capacity Analysis
1: Serramonte Blvd & I-280 SB Off-Ramp

04/09/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↑	↑↑
Traffic Volume (vph)	0	1532	649	0	750	825
Future Volume (vph)	0	1532	649	0	750	825
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1613	683	0	789	868
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1613	683	0	789	868
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		31.6	20.1		21.0	33.0
Effective Green, g (s)		31.6	20.1		21.0	33.0
Actuated g/C Ratio		0.52	0.33		0.34	0.54
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1836	1678		1183	1510
v/s Ratio Prot		c0.46	0.13		c0.23	0.31
v/s Ratio Perm						
v/c Ratio		0.88	0.41		0.67	0.57
Uniform Delay, d1		13.0	15.8		17.0	9.3
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		5.1	0.2		1.4	0.5
Delay (s)		18.1	15.9		18.4	9.8
Level of Service		B	B		B	A
Approach Delay (s)		18.1	15.9		13.9	
Approach LOS		B	B		B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	11.5
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Serramonte Blvd & I-280 NB On-Ramp

04/09/2018



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑↑			
Traffic Volume (vph)	7	754	1523	643	15	0	0
Future Volume (vph)	7	754	1523	643	15	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.4	4.1			
Lane Util. Factor		0.97	0.95	0.95			
Frt		1.00	1.00	1.00			
Flt Protected		0.95	1.00	1.00			
Satd. Flow (prot)		3433	3539	3527			
Flt Permitted		0.95	1.00	1.00			
Satd. Flow (perm)		3433	3539	3527			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	794	1603	677	16	0	0
RTOR Reduction (vph)	0	0	0	4	0	0	0
Lane Group Flow (vph)	0	801	1603	689	0	0	0
Turn Type	Prot	Prot	NA	NA			
Protected Phases	5	5	2	6			
Permitted Phases							
Actuated Green, G (s)		13.4	35.6	14.6			
Effective Green, g (s)		13.4	35.6	14.6			
Actuated g/C Ratio		0.38	1.00	0.41			
Clearance Time (s)		3.5	4.4	4.1			
Vehicle Extension (s)		3.0	4.0	3.0			
Lane Grp Cap (vph)		1292	3539	1446			
v/s Ratio Prot		c0.23	c0.45	0.20			
v/s Ratio Perm							
v/c Ratio		0.62	0.45	0.48			
Uniform Delay, d1		9.0	0.0	7.7			
Progression Factor		1.00	1.00	1.00			
Incremental Delay, d2		0.9	0.1	0.2			
Delay (s)		9.9	0.1	7.9			
Level of Service		A	A	A			
Approach Delay (s)			3.4	7.9		0.0	
Approach LOS			A	A		A	

Intersection Summary			
HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	35.6	Sum of lost time (s)	7.6
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

04/09/2018

Movement	EBU	EBL2	EBL	EBT	EBR	WBU	WBL	WBT	WBR	WBR2	NBU	NBL2
Lane Configurations			↔↔	↔↔	↔			↔↔	↔			
Traffic Volume (vph)	1	2	528	667	319	1	184	355	346	143	6	126
Future Volume (vph)	1	2	528	667	319	1	184	355	346	143	6	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			3.0	4.0	4.0			3.0	4.6	4.6		
Lane Util. Factor			0.97	0.95	1.00			1.00	0.91	0.91		
Frbp. ped/bikes			1.00	1.00	0.98			1.00	1.00	1.00		
Flpb. ped/bikes			1.00	1.00	1.00			1.00	1.00	1.00		
Frt			1.00	1.00	0.85			1.00	0.94	0.85		
Flt Protected			0.95	1.00	1.00			0.95	1.00	1.00		
Satd. Flow (prot)			3433	3539	1551			1770	3193	1441		
Flt Permitted			0.95	1.00	1.00			0.95	1.00	1.00		
Satd. Flow (perm)			3433	3539	1551			1770	3193	1441		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	2	556	702	336	1	194	374	364	151	6	133
RTOR Reduction (vph)	0	0	0	0	243	0	0	0	89	0	0	0
Lane Group Flow (vph)	0	0	559	702	93	0	195	611	189	0	0	0
Confl. Peds. (#/hr)					9							
Turn Type	Prot	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm		Split	Split
Protected Phases	5	5	5	2		1	1	6			3	3
Permitted Phases					2				6			
Actuated Green, G (s)			19.3	28.0	28.0			14.1	22.2	22.2		
Effective Green, g (s)			19.3	28.0	28.0			14.1	22.2	22.2		
Actuated g/C Ratio			0.19	0.28	0.28			0.14	0.22	0.22		
Clearance Time (s)			3.0	4.0	4.0			3.0	4.6	4.6		
Vehicle Extension (s)			2.0	2.0	2.0			2.0	2.0	2.0		
Lane Grp Cap (vph)			653	977	428			246	699	315		
v/s Ratio Prot			c0.16	0.20				0.11	c0.19			
v/s Ratio Perm					0.06					0.13		
v/c Ratio			0.86	0.72	0.22			0.79	0.87	0.60		
Uniform Delay, d1			39.7	33.1	28.3			42.2	38.3	35.6		
Progression Factor			1.00	1.00	1.00			1.00	1.00	1.00		
Incremental Delay, d2			10.3	2.1	0.1			15.0	11.4	2.0		
Delay (s)			50.0	35.3	28.4			57.2	49.7	37.7		
Level of Service			D	D	C			E	D	D		
Approach Delay (s)				39.0				47.9				
Approach LOS				D				D				
Intersection Summary												
HCM 2000 Control Delay			40.4									
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			101.4									16.2
Intersection Capacity Utilization			80.6%									D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

04/09/2018

Movement	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SBR2
Lane Configurations	↔↔	↔↔	↔		↔	↔↔		↔
Traffic Volume (vph)	328	558	185	28	149	455	163	275
Future Volume (vph)	328	558	185	28	149	455	163	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	4.6	4.6	4.0
Lane Util. Factor			0.97	0.95	1.00	1.00	0.95	1.00
Frbp. ped/bikes			1.00	1.00	0.98	1.00	1.00	1.00
Flpb. ped/bikes			1.00	1.00	1.00	1.00	1.00	1.00
Frt			1.00	1.00	0.85	1.00	0.96	0.85
Flt Protected			0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)			3433	3539	1551	1770	3399	1583
Flt Permitted			0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)			3433	3539	1551	1770	3399	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	345	587	195	29	157	479	172	289
RTOR Reduction (vph)	0	0	96	0	0	0	0	0
Lane Group Flow (vph)	484	587	99	0	186	651	0	289
Confl. Peds. (#/hr)			9					
Turn Type	Split	NA	Perm	Split	Split	NA		Free
Protected Phases	3	3		4	4	4		
Permitted Phases			3					Free
Actuated Green, G (s)	22.5	22.5	22.5		21.2	21.2		101.4
Effective Green, g (s)	22.5	22.5	22.5		21.2	21.2		101.4
Actuated g/C Ratio	0.22	0.22	0.22		0.21	0.21		1.00
Clearance Time (s)	4.0	4.0	4.0		4.6	4.6		
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		
Lane Grp Cap (vph)	761	785	344		370	710		1583
v/s Ratio Prot	0.14	c0.17			0.11	c0.19		
v/s Ratio Perm			0.06					0.18
v/c Ratio	0.64	0.75	0.29		0.50	0.92		0.18
Uniform Delay, d1	35.7	36.8	32.8		35.4	39.2		0.0
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2	1.3	3.4	0.2		0.4	16.3		0.3
Delay (s)	37.0	40.2	32.9		35.8	55.6		0.3
Level of Service	D	D	C		D	E		A
Approach Delay (s)		37.9				38.1		
Approach LOS		D				D		
Intersection Summary								

HCM Unsignalized Intersection Capacity Analysis
4: Collins Avenue & Serramonte Blvd

04/09/2018

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		↑↑	↑		↑↑↑	↑	↑
Traffic Volume (veh/h)	2	631	199	9	801	51	8
Future Volume (Veh/h)	2	631	199	9	801	51	8
Sign Control		Free			Free	Stop	
Grade		0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	664	209	9	843	54	8
Pedestrians		6			6	6	
Lane Width (ft)		12.0			12.0	12.0	
Walking Speed (ft/s)		3.5			3.5	3.5	
Percent Blockage		1			1	1	
Right turn flare (veh)						2	
Median type		None			None		
Median storage (veh)							
Upstream signal (ft)		239					
pX, platoon unblocked	0.00			0.86		0.86	0.86
vC, conflicting volume	0			670		905	344
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	0			289		563	0
tC, single (s)	0.0			4.1		6.8	6.9
tC, 2 stage (s)							
tF (s)	0.0			2.2		3.5	3.3
p0 queue free. %	0			99		86	99
cM capacity (veh/h)	0			1085		385	921
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	332	332	209	129	241	241	62
Volume Left	0	0	0	9	0	0	54
Volume Right	0	0	209	0	0	0	8
cSH	1700	1700	1700	1085	1700	1700	442
Volume to Capacity	0.20	0.20	0.12	0.01	0.14	0.14	0.14
Queue Length 95th (ft)	0	0	0	1	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.6	0.0	0.0	15.0
Lane LOS				A			B
Approach Delay (s)	0.0			0.1			15.0
Approach LOS							B
Intersection Summary							
Average Delay			0.6				
Intersection Capacity Utilization			31.4%		ICU Level of Service		A
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis
5: Serramonte Blvd & Project Driveway 3

04/09/2018

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑↑
Sign Control		Stop	Stop		Stop	Stop
Traffic Volume (vph)	154	604	757	178	162	127
Future Volume (vph)	154	604	757	178	162	127
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	636	797	187	171	134
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total (vph)	374	424	531	453	305	
Volume Left (vph)	162	0	0	0	171	
Volume Right (vph)	0	0	0	187	134	
Hadj (s)	0.25	0.03	0.03	-0.26	-0.12	
Departure Headway (s)	7.3	7.1	7.0	6.7	6.8	
Degree Utilization, x	0.76	0.83	1.03	0.84	0.57	
Capacity (veh/h)	489	503	511	530	517	
Control Delay (s)	28.3	34.9	74.3	35.0	18.4	
Approach Delay (s)	31.8		56.2		18.4	
Approach LOS	D		F		C	
Intersection Summary						
Delay			41.4			
Level of Service			E			
Intersection Capacity Utilization			75.3%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

04/09/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations		↔			↔	↔		↔	↔	↔		↔
Traffic Volume (vph)	174	324	197	92	339	88	4	271	627	118	4	70
Future Volume (vph)	174	324	197	92	339	88	4	271	627	118	4	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5			3.5	3.5		3.0	4.0	4.0		3.0
Lane Util. Factor		0.95			0.95	1.00		1.00	0.91	1.00		1.00
Frpb, ped/bikes		0.99			1.00	0.99		1.00	1.00	0.99		1.00
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Frt		0.96			1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected		0.99			0.99	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		3323			3502	1561		1770	5085	1560		1770
Flt Permitted		0.99			0.99	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		3323			3502	1561		1770	5085	1560		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	341	207	97	357	93	4	285	660	124	4	74
RTOR Reduction (vph)	0	43	0	0	0	75	0	0	0	82	0	0
Lane Group Flow (vph)	0	688	0	0	454	18	0	289	660	42	0	78
Confl. Peds. (#/hr)			18			3				3		
Turn Type	Split	NA		Split	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	8	8		7	7		1	1	6		5	5
Permitted Phases						7				6		
Actuated Green, G (s)		22.7			17.1	17.1		16.9	30.1	30.1		5.9
Effective Green, g (s)		22.7			17.1	17.1		16.9	30.1	30.1		5.9
Actuated g/C Ratio		0.25			0.19	0.19		0.19	0.34	0.34		0.07
Clearance Time (s)		3.5			3.5	3.5		3.0	4.0	4.0		3.0
Vehicle Extension (s)		2.0			2.0	2.0		2.0	4.0	4.0		2.0
Lane Grp Cap (vph)		840			666	297		333	1704	522		116
v/s Ratio Prot		c0.21			c0.13			c0.16	0.13			0.04
v/s Ratio Perm						0.01				0.03		
v/c Ratio		0.82			0.68	0.06		0.87	0.39	0.08		0.67
Uniform Delay, d1		31.6			33.8	29.8		35.4	22.8	20.4		41.0
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		6.0			2.3	0.0		19.9	0.2	0.1		11.4
Delay (s)		37.6			36.1	29.8		55.3	23.0	20.5		52.4
Level of Service		D			D	C		E	C	C		D
Approach Delay (s)		37.6			35.0				31.4			
Approach LOS		D			D				C			
Intersection Summary												
HCM 2000 Control Delay		33.9			HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		89.8			Sum of lost time (s)				14.0			
Intersection Capacity Utilization		78.3%			ICU Level of Service				D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

04/09/2018

Movement	SBT	SBR
Lane Configurations	↔	↔
Traffic Volume (vph)	521	195
Future Volume (vph)	521	195
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	4.0
Lane Util. Factor	0.91	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5085	1557
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5085	1557
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	548	205
RTOR Reduction (vph)	0	161
Lane Group Flow (vph)	548	44
Confl. Peds. (#/hr)		4
Turn Type	NA	Perm
Protected Phases	2	
Permitted Phases		2
Actuated Green, G (s)	19.1	19.1
Effective Green, g (s)	19.1	19.1
Actuated g/C Ratio	0.21	0.21
Clearance Time (s)	4.0	4.0
Vehicle Extension (s)	4.0	4.0
Lane Grp Cap (vph)	1081	331
v/s Ratio Prot	c0.11	
v/s Ratio Perm		0.03
v/c Ratio	0.51	0.13
Uniform Delay, d1	31.2	28.6
Progression Factor	1.00	1.00
Incremental Delay, d2	0.5	0.2
Delay (s)	31.7	28.9
Level of Service	C	C
Approach Delay (s)	33.0	
Approach LOS	C	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
7: Hillside Blvd & Serramonte Blvd

04/09/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕	↕	↔	↕	↕	↕	↕	↕	↕	↕	↕	
Traffic Volume (vph)	183	29	255	3	47	17	223	282	8	6	245	154	
Future Volume (vph)	183	29	255	3	47	17	223	282	8	6	245	154	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		0.95	1.00		1.00	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.85		0.96	1.00		1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.96	1.00		1.00	0.95		1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1786	1583		3395	1770		1855	1770		1863	1519	1519	
Flt Permitted	0.70	1.00		0.95	0.95		1.00	0.95		1.00	1.00	1.00	
Satd. Flow (perm)	1312	1583		3216	1770		1855	1770		1863	1519	1519	
Peak-hour factor, PHF	0.95	0.95		0.95	0.95		0.95	0.95		0.95	0.95	0.95	
Adj. Flow (vph)	193	31	268	3	49	18	235	297	8	6	258	162	
RTOR Reduction (vph)	0	0	185	0	12	0	0	2	0	0	0	116	
Lane Group Flow (vph)	0	224	83	0	58	0	235	303	0	6	258	46	
Confl. Peds. (#/hr)												30	
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm	
Protected Phases		2		2			3	8		7		4	
Permitted Phases	2		2	2								4	
Actuated Green, G (s)	18.1	18.1		18.1			10.1	25.6		0.9	16.4	16.4	
Effective Green, g (s)	18.1	18.1		18.1			10.1	25.6		0.9	16.4	16.4	
Actuated g/C Ratio	0.31	0.31		0.31			0.17	0.44		0.02	0.28	0.28	
Clearance Time (s)	4.5	4.5		4.5			4.5	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0			3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	408	493		1001			307	817		27	525	428	
v/s Ratio Prot							c0.13	0.16		0.00	c0.14		
v/s Ratio Perm		c0.17	0.05		0.02							0.03	
v/c Ratio	0.55	0.17		0.06			0.77	0.37		0.22	0.49	0.11	
Uniform Delay, d1	16.6	14.5		14.0			22.9	10.9		28.3	17.4	15.4	
Progression Factor	1.00	1.00		1.00			1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	5.2	0.7		0.1			10.8	0.3		4.1	0.7	0.1	
Delay (s)	21.8	15.3		14.1			33.7	11.2		32.4	18.1	15.5	
Level of Service	C	B		B			C	B		C	B	B	
Approach Delay (s)	18.3			14.1			21.0			17.3			
Approach LOS	B			B			C			B			
Intersection Summary													
HCM 2000 Control Delay	18.8			HCM 2000 Level of Service				B					
HCM 2000 Volume to Capacity ratio	0.58												
Actuated Cycle Length (s)	58.1			Sum of lost time (s)				13.5					
Intersection Capacity Utilization	56.2%			ICU Level of Service				B					
Analysis Period (min)	15												
c Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis
8: El Camino Real & Collins Avenue/Cemetery Driveway

04/09/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	
Lane Configurations		↕	↕		↕			↕	↕	↕		↕	
Traffic Volume (veh/h)	10	0	212	0	0	0	3	39	981	0	8	0	
Future Volume (Veh/h)	10	0	212	0	0	0	3	39	981	0	8	0	
Sign Control	Stop			Stop			Free						
Grade	0%												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	11	0	223	0	0	0	0	41	1033	0	0	0	
Pedestrians	2			4			2						
Lane Width (ft)	12.0			12.0			12.0						
Walking Speed (ft/s)	3.5												
Percent Blockage	0			0			0						
Right turn flare (veh)	3												
Median type	Raised												
Median storage (veh)	1												
Upstream signal (ft)													
pX, platoon unblocked	0.94	0.94	0.94	0.94	0.94		0.00	0.94			0.00		
vC, conflicting volume	1295	1986	298	1518	1994	350	0	875			0	1037	
vC1, stage 1 conf vol	866	866		1119	1119								
vC2, stage 2 conf vol	428	1119		399	875								
vCu, unblocked vol	1075	1813	10	1314	1822	350	0	627			0	1037	
IC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	0.0	4.1			0.0	4.1	
IC, 2 stage (s)	6.5	5.5		6.5	5.5								
IF (s)	3.5	4.0	3.3	3.5	4.0	3.3	0.0	2.2			0.0	2.2	
p0 queue free %	96	100	78	100	100	100	0	95			0	100	
cM capacity (veh/h)	284	181	996	167	176	642	0	888			0	664	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3				
Volume Total	234	0	41	413	413	207	214	428	231				
Volume Left	11	0	41	0	0	0	0	0	0				
Volume Right	223	0	0	0	0	0	0	0	17				
cSH	1045	1700	888	1700	1700	1700	664	1700	1700				
Volume to Capacity	0.22	0.00	0.05	0.24	0.24	0.12	0.00	0.25	0.14				
Queue Length 95th (ft)	21	0	4	0	0	0	0	0	0				
Control Delay (s)	10.1	0.0	9.2	0.0	0.0	0.0	0.0	0.0	0.0				
Lane LOS	B	A	A										
Approach Delay (s)	10.1	0.0	0.4				0.0						
Approach LOS	B	A											
Intersection Summary													
Average Delay	1.3												
Intersection Capacity Utilization	54.7%			ICU Level of Service				A					
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

04/09/2018

Movement	SBT	SBR
Lane Configurations	↑↑↑	
Traffic Volume (veh/h)	813	16
Future Volume (Veh/h)	813	16
Sign Control	Free	
Grade	0%	
Peak Hour Factor	0.95	0.95
Hourly flow rate (vph)	856	17
Pedestrians	2	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	3.5	
Percent Blockage	0	
Right turn flare (veh)		
Median type	Raised	
Median storage (veh)	1	
Upstream signal (ft)	919	
pX, platoon unblocked		
vC, conflicting volume		
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol		
IC, single (s)		
IC, 2 stage (s)		
IF (s)		
p0 queue free. %		
cM capacity (veh/h)		
Direction, Lane #		

HCM Signalized Intersection Capacity Analysis
 9: Junipero Serra Blvd & Serra Center Driveway

04/09/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑↑	↑	↑↑↑		↑	↑↑
Traffic Volume (vph)	290	171	945	255	93	788
Future Volume (vph)	290	171	945	255	93	788
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	0.97	1.00	0.91		1.00	0.95
Frpb, ped/bikes	1.00	0.98	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
FrT	1.00	0.85	0.97		1.00	1.00
FlT Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	1558	4906		1770	3539
FlT Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	1558	4906		1770	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	180	995	268	98	829
RTOR Reduction (vph)	0	142	76	0	0	0
Lane Group Flow (vph)	305	38	1187	0	98	829
Confl. Peds. (#/hr)		5		6		
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	10.4	10.4	20.8		4.4	29.7
Effective Green, g (s)	10.4	10.4	20.8		4.4	29.7
Actuated g/C Ratio	0.21	0.21	0.42		0.09	0.60
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	727	330	2078		158	2140
v/s Ratio Prot	c0.09		c0.24		c0.06	0.23
v/s Ratio Perm		0.02				
v/c Ratio	0.42	0.12	0.57		0.62	0.39
Uniform Delay, d1	16.7	15.6	10.8		21.5	5.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.2	1.1		7.4	0.5
Delay (s)	17.1	15.8	11.9		28.9	5.5
Level of Service	B	B	B		C	A
Approach Delay (s)	16.6		11.9			8.0
Approach LOS	B		B			A
Intersection Summary						
HCM 2000 Control Delay		11.4			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.53				
Actuated Cycle Length (s)		49.1			Sum of lost time (s)	13.5
Intersection Capacity Utilization		49.8%			ICU Level of Service	A
Analysis Period (min)		15				
c	Critical Lane Group					

SimTraffic Simulation Summary
WKD PM Existing

02/01/2018

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	9958	9921	9825	9777	9933	9931	10057
Vehs Exited	9914	9933	9812	9799	9898	9949	10028
Starting Vehs	317	340	331	354	325	334	289
Ending Vehs	361	328	344	332	360	316	318
Travel Distance (mi)	5888	5884	5789	5775	5850	5879	5939
Travel Time (hr)	347.0	331.3	335.7	329.6	342.9	337.8	341.1
Total Delay (hr)	161.5	146.0	153.7	147.8	159.0	152.5	154.5
Total Stops	16036	15264	15110	15370	15964	15517	15411
Fuel Used (gal)	248.6	245.4	244.2	240.6	246.8	245.7	248.1

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	9791	9957	10055	9919
Vehs Exited	9808	9961	10047	9916
Starting Vehs	342	349	321	321
Ending Vehs	325	345	329	326
Travel Distance (mi)	5838	5894	5956	5869
Travel Time (hr)	339.3	336.3	343.1	338.4
Total Delay (hr)	155.4	150.4	156.2	153.7
Total Stops	15725	15714	15780	15587
Fuel Used (gal)	245.9	246.5	250.9	246.3

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

SimTraffic Simulation Summary
WKD PM Existing

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Interval #1 Information Recording

Start Time	5:00						
End Time	6:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	1	10	2	3	4	5	6
Vehs Entered	9958	9921	9825	9777	9933	9931	10057
Vehs Exited	9914	9933	9812	9799	9898	9949	10028
Starting Vehs	317	340	331	354	325	334	289
Ending Vehs	361	328	344	332	360	316	318
Travel Distance (mi)	5888	5884	5789	5775	5850	5879	5939
Travel Time (hr)	347.0	331.3	335.7	329.6	342.9	337.8	341.1
Total Delay (hr)	161.5	146.0	153.7	147.8	159.0	152.5	154.5
Total Stops	16036	15264	15110	15370	15964	15517	15411
Fuel Used (gal)	248.6	245.4	244.2	240.6	246.8	245.7	248.1

Interval #1 Information Recording

Start Time	5:00			
End Time	6:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	7	8	9	Avg
Vehs Entered	9791	9957	10055	9919
Vehs Exited	9808	9961	10047	9916
Starting Vehs	342	349	321	321
Ending Vehs	325	345	329	326
Travel Distance (mi)	5838	5894	5956	5869
Travel Time (hr)	339.3	336.3	343.1	338.4
Total Delay (hr)	155.4	150.4	156.2	153.7
Total Stops	15725	15714	15780	15587
Fuel Used (gal)	245.9	246.5	250.9	246.3

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	1548	659	745	829	3781
Vehicles Exited	1546	657	747	829	3779
Hourly Exit Rate	1546	657	747	829	3779
Input Volume	1532	650	750	825	3757
% of Volume	101	101	100	100	101

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	WBT	WBR	All
Vehicles Entered	8	756	1532	650	16	2962
Vehicles Exited	8	754	1531	651	16	2960
Hourly Exit Rate	8	754	1531	651	16	2960
Input Volume	7	754	1524	643	15	2943
% of Volume	114	100	100	101	107	101

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL2	EBL	EBT	EBR	WBU	WBL	WBT	WBR	WBR2	NBU	NBL2
Vehicles Entered	1	2	536	671	320	0	190	353	344	146	7	128
Vehicles Exited	1	2	537	672	320	0	190	352	344	146	7	129
Hourly Exit Rate	1	2	537	672	320	0	190	352	344	146	7	129
Input Volume	1	2	528	673	319	1	184	355	346	143	6	126
% of Volume	100	100	102	100	100	0	103	99	99	102	117	102

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SBR2	All
Vehicles Entered	335	563	181	27	152	466	170	272	4864
Vehicles Exited	336	564	181	28	151	467	171	272	4870
Hourly Exit Rate	336	564	181	28	151	467	171	272	4870
Input Volume	328	558	185	28	149	470	163	275	4840
% of Volume	102	101	98	100	101	99	105	99	101

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	2	795	202	10	874	49	9	1941
Vehicles Exited	2	794	201	10	873	49	10	1939
Hourly Exit Rate	2	794	201	10	873	49	10	1939
Input Volume	2	801	199	9	866	51	8	1936
% of Volume	100	99	101	111	101	96	125	100

5: Serramonte Blvd & Serra Center Driveway Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	144	598	758	177	163	134	1974
Vehicles Exited	145	598	758	178	163	134	1976
Hourly Exit Rate	145	598	758	178	163	134	1976
Input Volume	154	604	757	178	162	127	1982
% of Volume	94	99	100	100	101	106	100

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Vehicles Entered	169	353	195	97	333	85	4	268	624	117	3	72
Vehicles Exited	170	353	194	98	334	85	4	267	623	117	3	73
Hourly Exit Rate	170	353	194	98	334	85	4	267	623	117	3	73
Input Volume	174	350	197	92	339	88	4	271	627	118	4	70
% of Volume	98	101	98	107	99	97	100	99	99	99	75	104

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBT	SBR	All
Vehicles Entered	526	196	3042
Vehicles Exited	524	197	3042
Hourly Exit Rate	524	197	3042
Input Volume	521	195	3050
% of Volume	101	101	100

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	185	54	257	2	49	16	214	281	9	5	248	156
Vehicles Exited	185	54	256	2	49	16	216	280	9	5	248	155
Hourly Exit Rate	185	54	256	2	49	16	216	280	9	5	248	155
Input Volume	183	48	255	3	47	17	223	282	8	6	245	154
% of Volume	101	112	100	67	104	94	97	99	112	83	101	101

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	1476
Vehicles Exited	1475
Hourly Exit Rate	1475
Input Volume	1471
% of Volume	100

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR	All
Vehicles Entered	9	217	3	38	976	8	824	16	2091
Vehicles Exited	10	217	3	38	974	8	824	16	2090
Hourly Exit Rate	10	217	3	38	974	8	824	16	2090
Input Volume	10	212	3	39	981	8	814	16	2083
% of Volume	100	102	100	97	99	100	101	100	100

9: Junipero Serra Blvd & Serra Center Driveway Performance by movement

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT	All
Vehicles Entered	1	287	172	6	1007	262	6	93	792	2626
Vehicles Exited	0	288	172	6	1008	262	6	93	793	2628
Hourly Exit Rate	0	288	172	6	1008	262	6	93	793	2628
Input Volume	1	290	171	7	995	255	6	93	788	2606
% of Volume	0	99	101	86	101	103	100	100	101	101

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	25	657	10	11	812	33	16	15	39	55	1673
Vehicles Exited	25	657	10	12	813	33	16	14	39	55	1674
Hourly Exit Rate	25	657	10	12	813	33	16	14	39	55	1674
Input Volume	24	664	10	12	806	30	18	15	42	51	1672
% of Volume	104	99	100	100	101	110	89	93	93	108	100

11: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	14	696	877	16	10	18	1631
Vehicles Exited	13	696	877	15	10	18	1629
Hourly Exit Rate	13	696	877	15	10	18	1629
Input Volume	13	708	869	15	14	16	1635
% of Volume	100	98	101	100	71	112	100

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	2	759	852	4	2	5	1624
Vehicles Exited	2	759	854	4	2	5	1626
Hourly Exit Rate	2	759	854	4	2	5	1626
Input Volume	3	763	855	4	3	4	1632
% of Volume	67	99	100	100	67	125	100

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	678	18	21	825	30	24	1596
Vehicles Exited	678	19	21	826	30	24	1598
Hourly Exit Rate	678	19	21	826	30	24	1598
Input Volume	682	18	22	830	29	24	1605
% of Volume	99	106	95	100	103	100	100

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	655	48	54	771	76	62	1666
Vehicles Exited	655	48	54	771	76	62	1666
Hourly Exit Rate	655	48	54	771	76	62	1666
Input Volume	660	47	55	779	73	61	1675
% of Volume	99	102	98	99	104	102	99

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	37	35	25	966	798	25	1886
Vehicles Exited	36	35	25	967	799	24	1886
Hourly Exit Rate	36	35	25	967	799	24	1886
Input Volume	37	30	27	972	794	23	1883
% of Volume	97	117	93	99	101	104	100

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	490	26	21	449	35	33	1054
Vehicles Exited	491	26	21	449	35	33	1055
Hourly Exit Rate	491	26	21	449	35	33	1055
Input Volume	488	25	21	456	33	30	1053
% of Volume	101	104	100	98	106	110	100

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	496	12	14	440	19	21	1002
Vehicles Exited	495	12	14	439	19	21	1000
Hourly Exit Rate	495	12	14	439	19	21	1000
Input Volume	486	14	13	446	18	18	995
% of Volume	102	86	108	98	106	117	101

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	485	19	17	427	18	20	986
Vehicles Exited	484	19	17	426	18	20	984
Hourly Exit Rate	484	19	17	426	18	20	984
Input Volume	474	19	17	431	19	19	979
% of Volume	102	100	100	99	95	105	101

26: Performance by movement

Movement	NBT	NWT	All
Vehicles Entered	769	953	1722
Vehicles Exited	769	953	1722
Hourly Exit Rate	769	953	1722
Input Volume	769	951	1720
% of Volume	100	100	100

Total Network Performance

Vehicles Entered	9919
Vehicles Exited	9916
Hourly Exit Rate	9916
Input Volume	52515
% of Volume	19

Arterial Level of Service: EB Serramonte Blvd

	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Cross Street							
I-280 SB Off-Ramp	1	36.7	65.7	0.2	13	12	41.3
I-280 NB On-Ramp	2	2.6	12.7	0.1	24	24	2.3
Junipero Serra Blvd	3	32.2	39.4	0.1	6	6	32.9
Collins Avenue	4	2.5	8.5	0.0	19	19	2.6
	10	0.8	5.0	0.0	26	26	0.8
	11	1.9	6.3	0.0	23	21	2.3
Serra Center Driveway	5	11.2	15.2	0.0	7	6	11.9
	12	2.8	19.8	0.1	27	27	2.8
	13	0.3	10.6	0.1	30	30	0.3
	14	0.8	14.0	0.1	28	28	0.8
El Camino Real	6	28.6	35.7	0.1	7	7	29.4
	16	2.1	12.9	0.1	23	23	2.3
	17	0.3	8.7	0.1	29	29	0.3
	18	0.4	10.5	0.1	29	29	0.4
Hillside Blvd	7	9.7	26.1	0.2	24	22	12.3
Total		132.9	291.0	1.4	17	16	142.6

Arterial Level of Service: EB Serramonte Blvd

	Run 10 Speed	Run 10 Delay	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed
Cross Street							
I-280 SB Off-Ramp	15	29.2	15	28.4	14	34.4	12
I-280 NB On-Ramp	24	2.6	24	2.4	24	2.4	23
Junipero Serra Blvd	6	32.7	6	32.5	6	30.4	6
Collins Avenue	19	2.5	19	2.5	20	2.3	19
	27	0.7	26	0.9	26	0.9	26
	24	1.6	24	1.6	24	1.6	22
Serra Center Driveway	7	11.2	7	10.9	7	10.9	7
	27	2.8	27	2.7	27	2.8	27
	30	0.3	30	0.3	30	0.3	30
	28	0.8	29	0.6	27	1.1	28
El Camino Real	8	24.5	8	24.3	6	34.3	7
	24	2.0	24	1.8	24	2.0	23
	29	0.3	29	0.3	29	0.3	29
	29	0.5	29	0.3	29	0.3	29
Hillside Blvd	21	13.4	25	8.4	27	7.6	28
Total	17	124.9	18	118.1	17	131.7	17

Arterial Level of Service
WKD PM Existing

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Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 4 Delay	Run 5 Speed	Run 5 Delay	Run 6 Speed	Run 6 Delay	Run 7 Speed	Run 7 Delay
I-280 SB Off-Ramp	45.7	14	31.6	15	29.0	13	40.6
I-280 NB On-Ramp	3.0	22	3.4	24	2.7	24	2.4
Junipero Serra Blvd	32.5	6	35.1	6	32.3	6	30.9
Collins Avenue	2.7	19	2.8	19	2.5	19	2.6
	0.8	27	0.6	26	0.8	27	0.6
	2.0	22	2.2	22	2.0	23	1.7
Serra Center Driveway	11.2	7	10.7	6	12.1	7	11.0
	2.8	27	2.7	27	2.8	27	2.7
	0.3	30	0.2	30	0.3	29	0.3
	0.8	28	0.7	28	0.8	28	1.1
El Camino Real	25.5	7	27.6	7	29.5	7	28.0
	2.0	24	2.0	24	1.9	23	2.2
	0.3	29	0.3	29	0.3	29	0.4
	0.4	29	0.4	29	0.4	29	0.4
Hillside Blvd	6.8	25	9.1	23	9.5	24	9.3
Total	136.9	17	129.5	17	127.1	17	134.0

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 8 Speed	Run 8 Delay	Run 9 Speed	Run 9 Delay
I-280 SB Off-Ramp	12	42.5	12	43.3
I-280 NB On-Ramp	24	2.5	23	2.8
Junipero Serra Blvd	7	30.0	6	32.9
Collins Avenue	20	2.3	19	2.7
	26	0.8	25	1.0
	23	1.8	22	2.1
Serra Center Driveway	7	11.0	7	10.8
	27	2.7	27	2.7
	29	0.3	30	0.3
	28	0.8	28	0.8
El Camino Real	6	33.0	7	29.5
	23	2.2	23	2.1
	28	0.4	29	0.4
	29	0.4	29	0.4
Hillside Blvd	22	11.3	23	10.2
Total	16	142.1	16	141.9

Arterial Level of Service
WKD PM Existing

02/01/2018

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Hillside Blvd	7	12.5	17.9	0.0	9	9	11.7
	18	1.1	18.1	0.2	35	33	1.0
	17	0.3	10.3	0.1	29	29	0.4
	16	0.4	8.4	0.1	30	29	0.5
El Camino Real	6	37.6	46.5	0.1	6	6	37.9
	14	2.7	11.5	0.1	21	21	2.7
	13	0.7	13.8	0.1	28	28	0.7
	12	0.5	10.5	0.1	30	29	0.6
Serra Center Driveway	5	23.9	40.5	0.1	13	12	28.6
	11	2.6	6.4	0.0	16	16	2.6
	10	0.3	5.1	0.0	28	28	0.4
Collins Avenue	4	2.0	6.2	0.0	21	20	2.3
Junipero Serra Blvd	3	33.8	41.3	0.0	4	4	33.4
I-280 NB On-Ramp	2	9.3	17.6	0.1	14	13	10.4
I-280 SB Off-Ramp	1	19.7	29.9	0.1	10	10	19.7
Total		147.4	284.1	1.2	15	15	152.8

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 10 Speed	Run 10 Delay	Run 2 Speed	Run 2 Delay	Run 3 Speed	Run 3 Delay	Run 4 Speed
Hillside Blvd	8	13.8	7	16.6	8	13.2	9
	34	1.0	34	1.0	39	1.0	34
	29	0.3	30	0.3	29	0.4	30
	29	0.5	30	0.3	30	0.5	30
El Camino Real	7	36.4	7	36.8	7	37.3	7
	22	2.4	22	2.5	22	2.4	21
	29	0.6	28	0.7	28	0.7	29
	30	0.5	30	0.5	30	0.6	30
Serra Center Driveway	15	20.0	13	25.1	13	24.0	14
	16	2.6	16	2.6	16	2.6	16
	29	0.3	28	0.4	29	0.2	28
Collins Avenue	23	1.4	20	2.5	23	1.5	22
Junipero Serra Blvd	4	33.5	4	34.0	4	33.6	4
I-280 NB On-Ramp	13	10.0	14	8.7	15	7.9	13
I-280 SB Off-Ramp	9	21.5	10	21.2	10	19.5	10
Total	15	145.0	15	153.3	15	145.3	15

Arterial Level of Service
WKD PM Existing

02/01/2018

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 4 Delay	Run 5 Speed	Run 5 Delay	Run 6 Speed	Run 6 Delay	Run 7 Speed	Run 7 Delay
Hillside Blvd	11.4	10	11.0	10	11.1	8	13.7
	1.7	37	1.0	32	1.2	35	1.0
	0.2	29	0.4	29	0.3	30	0.3
	0.3	29	0.4	30	0.4	30	0.3
El Camino Real	36.3	6	41.3	7	37.1	7	34.8
	3.0	21	2.6	21	2.8	21	2.8
	0.6	28	0.7	28	0.8	28	0.8
	0.5	30	0.5	30	0.5	30	0.5
Serra Center Driveway	21.8	14	23.0	10	35.1	14	21.9
	2.6	16	2.6	16	2.6	16	2.7
	0.4	28	0.4	29	0.3	29	0.3
Collins Avenue	1.7	21	2.1	22	1.9	21	2.0
Junipero Serra Blvd	35.3	4	34.3	4	33.0	4	33.2
I-280 NB On-Ramp	10.6	14	9.1	14	8.7	13	10.1
I-280 SB Off-Ramp	20.7	10	18.8	10	19.2	11	18.0
Total	147.2	15	148.1	15	155.0	15	142.3

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 8 Speed	Run 8 Delay	Run 9 Speed	Run 9 Delay
Hillside Blvd	9	11.2	9	11.3
	33	1.0	33	1.0
	29	0.3	29	0.3
	30	0.4	30	0.4
El Camino Real	6	39.3	6	39.0
	21	2.7	21	2.6
	28	0.8	28	0.8
	30	0.5	30	0.5
Serra Center Driveway	15	19.6	15	19.4
	16	2.6	16	2.6
	28	0.3	28	0.4
Collins Avenue	22	1.8	19	2.6
Junipero Serra Blvd	4	33.7	4	34.1
I-280 NB On-Ramp	15	7.9	14	9.1
I-280 SB Off-Ramp	11	18.4	10	20.4
Total	15	140.4	15	144.6

Queuing and Blocking Report
WKD PM Existing

02/01/2018

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	T	T	L	L	R	R
Maximum Queue (ft)	866	813	220	221	75	309	266	152	64
Average Queue (ft)	522	408	120	129	47	186	113	14	3
95th Queue (ft)	864	793	194	202	102	276	212	85	36
Link Distance (ft)	1253	1253	384	384		498	498	498	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)					50				381
Storage Blk Time (%)					32	1			
Queuing Penalty (veh)					69	2			

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	WB	WB
Directions Served	UL	L	T	T	T	TR
Maximum Queue (ft)	224	366	92	161	184	195
Average Queue (ft)	183	73	6	15	82	95
95th Queue (ft)	252	284	48	82	151	159
Link Distance (ft)		384	384	384	246	246
Upstream Blk Time (%)		0			0	0
Queuing Penalty (veh)		1			0	0
Storage Bay Dist (ft)	200					
Storage Blk Time (%)	10	0				
Queuing Penalty (veh)	38	0				

Queuing and Blocking Report
WKD PM Existing

02/01/2018

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	U<L	L	T	T	R	UL	T	TR	R>	U<L	L	T
Maximum Queue (ft)	234	249	246	264	244	161	163	166	169	208	219	256
Average Queue (ft)	152	171	157	182	99	121	123	145	136	116	120	141
95th Queue (ft)	218	234	237	261	215	175	168	175	176	180	193	228
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)	0	1	0	2	0	9	4	12	9			
Queuing Penalty (veh)	1	2	2	6	0	19	9	27	19			
Storage Bay Dist (ft)					225					295	295	
Storage Blk Time (%)					3	0						0
Queuing Penalty (veh)					9	1						0

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	UL	T	TR	>
Maximum Queue (ft)	312	115	271	357	371	288
Average Queue (ft)	182	87	111	199	215	43
95th Queue (ft)	285	152	209	309	331	209
Link Distance (ft)	1147		676	676		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		90	320		280	
Storage Blk Time (%)	29	1	0	1	3	0
Queuing Penalty (veh)	54	4	0	1	8	1

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	UT	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	91	81	61	69	80	108	88	82	56
Average Queue (ft)	9	7	4	15	10	25	18	35	10
95th Queue (ft)	50	41	30	52	46	78	64	72	38
Link Distance (ft)	146	146			111	111			1189
Upstream Blk Time (%)	0	0			0	0			
Queuing Penalty (veh)	0	0			0	1			
Storage Bay Dist (ft)			40	65			65		50
Storage Blk Time (%)		0	0	1	0	1	0	8	0
Queuing Penalty (veh)		1	0	1	1	3	1	1	0

Queuing and Blocking Report
WKD PM Existing

02/01/2018

Intersection: 5: Serramonte Blvd & Serra Center Driveway

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	135	142	365	413	176
Average Queue (ft)	95	90	126	207	81
95th Queue (ft)	131	132	275	364	141
Link Distance (ft)	110	110	726	726	247
Upstream Blk Time (%)	3	2			0
Queuing Penalty (veh)	11	8			0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	TR	LT	T	R	UL	T	T	T	R	UL	T
Maximum Queue (ft)	254	263	222	214	66	224	316	289	152	89	118	220
Average Queue (ft)	151	166	133	113	28	166	140	120	69	35	52	124
95th Queue (ft)	237	260	200	180	53	244	287	233	133	68	101	188
Link Distance (ft)	258	258	334	334			330	330	330			1259
Upstream Blk Time (%)	0	1					2	0				
Queuing Penalty (veh)	1	4					7	0				
Storage Bay Dist (ft)					300	200					160	300
Storage Blk Time (%)							14	0		0		
Queuing Penalty (veh)							28	0		0		

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	188	123	94
Average Queue (ft)	90	32	35
95th Queue (ft)	165	90	72
Link Distance (ft)	1259	1259	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		1	0

Queuing and Blocking Report
WKD PM Existing

02/01/2018

Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	TR	L	T	R
Maximum Queue (ft)	183	169	72	47	181	170	44	237	100
Average Queue (ft)	89	71	23	11	97	72	6	106	63
95th Queue (ft)	157	129	56	38	157	131	28	195	115
Link Distance (ft)	850	850	192	192	908	908		900	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)					75		75		
Storage Blk Time (%)							16		
Queuing Penalty (veh)							25		

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	UL	T	T	TR	ULT	T	TR
Maximum Queue (ft)	130	104	41	14	5	4	31	18	4
Average Queue (ft)	15	65	10	1	0	0	3	1	0
95th Queue (ft)	67	101	30	8	4	4	17	11	3
Link Distance (ft)	472			1262	1262	1262	415	415	415
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			80	130					
Storage Blk Time (%)	0		3						
Queuing Penalty (veh)	0		0						

Intersection: 9: Junipero Serra Blvd & Serra Center Driveway

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	UL	L	R	UT	T	TR	UL	T	T
Maximum Queue (ft)	125	102	96	170	188	236	119	121	133
Average Queue (ft)	60	52	47	89	106	120	54	56	60
95th Queue (ft)	102	91	79	149	170	203	95	100	112
Link Distance (ft)	196	196	196	676	676	676		591	591
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							210		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
WKD PM Existing

02/01/2018

Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	69	32	55	30	53	121
Average Queue (ft)	14	1	6	1	22	46
95th Queue (ft)	48	18	30	16	49	94
Link Distance (ft)	111	111	129	129	208	158
Upstream Blk Time (%)	0	0	0			
Queuing Penalty (veh)	0	0	0			
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 11: Serramonte Blvd

Movement	EB	EB	WB	SB
Directions Served	LT	T	TR	LR
Maximum Queue (ft)	115	90	2	51
Average Queue (ft)	26	14	0	18
95th Queue (ft)	83	60	2	43
Link Distance (ft)	129	129	110	222
Upstream Blk Time (%)	0	0	0	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 12: Serramonte Blvd

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	27	36
Average Queue (ft)	2	7
95th Queue (ft)	13	28
Link Distance (ft)	726	250
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
WKD PM Existing

02/01/2018

Intersection: 13: Serramonte Blvd

Movement	WB	WB	NB
Directions Served	LT	T	LR
Maximum Queue (ft)	59	20	74
Average Queue (ft)	11	1	31
95th Queue (ft)	41	12	62
Link Distance (ft)	518	518	337
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Serramonte Blvd

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	LT	T	LR
Maximum Queue (ft)	25	50	84	14	162
Average Queue (ft)	2	3	29	0	62
95th Queue (ft)	21	26	71	10	119
Link Distance (ft)	518	518	258	258	418
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 15: El Camino Real

Movement	EB	NB	NB	NB	SB
Directions Served	LR	L	T	T	T
Maximum Queue (ft)	90	52	79	29	2
Average Queue (ft)	32	11	8	2	0
95th Queue (ft)	68	37	54	28	2
Link Distance (ft)	203		415	415	330
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		100			
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

Queuing and Blocking Report
WKD PM Existing

02/01/2018

Intersection: 16: Serramonte Blvd

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	2	70	56	56
Average Queue (ft)	0	11	23	22
95th Queue (ft)	2	43	50	50
Link Distance (ft)	334	300	289	289
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	42	51
Average Queue (ft)	4	24
95th Queue (ft)	23	50
Link Distance (ft)	389	205
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	55	49
Average Queue (ft)	7	23
95th Queue (ft)	34	48
Link Distance (ft)	850	247
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
WKD PM Existing

02/01/2018

Intersection: 26:

Movement	B36	B36
Directions Served	T	
Maximum Queue (ft)	161	174
Average Queue (ft)	50	44
95th Queue (ft)	119	121
Link Distance (ft)	175	175
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	1
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 370

HCM Signalized Intersection Capacity Analysis
1: Serramonte Blvd & I-280 SB Off-Ramp

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↑	↑↑
Traffic Volume (vph)	0	568	290	0	973	370
Future Volume (vph)	0	568	290	0	973	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Fr		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	598	305	0	1024	389
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	598	305	0	1024	389
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		17.8	8.5		22.3	32.1
Effective Green, g (s)		17.8	8.5		22.3	32.1
Actuated g/C Ratio		0.37	0.18		0.46	0.66
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1301	893		1581	1848
v/s Ratio Prot		c0.17	0.06		c0.30	0.14
v/s Ratio Perm						
v/c Ratio		0.46	0.34		0.65	0.21
Uniform Delay, d1		11.6	17.5		10.0	3.2
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.2		0.9	0.1
Delay (s)		11.9	17.7		11.0	3.2
Level of Service		B	B		B	A
Approach Delay (s)		11.9	17.7		8.8	
Approach LOS		B	B		A	

Intersection Summary

HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	11.5
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔	↔			
Traffic Volume (vph)	2	139	1426	290	0	0	0
Future Volume (vph)	2	139	1426	290	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.4	4.1			
Lane Util. Factor		0.97	0.95	0.95			
Frt		1.00	1.00	1.00			
Flt Protected		0.95	1.00	1.00			
Satd. Flow (prot)		3433	3539	3539			
Flt Permitted		0.95	1.00	1.00			
Satd. Flow (perm)		3433	3539	3539			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	146	1501	305	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	148	1501	305	0	0	0
Turn Type	Prot	Prot	NA	NA			
Protected Phases	5	5	2	6			
Permitted Phases							
Actuated Green, G (s)		5.9	36.6	23.1			
Effective Green, g (s)		5.9	36.6	23.1			
Actuated g/C Ratio		0.16	1.00	0.63			
Clearance Time (s)		3.5	4.4	4.1			
Vehicle Extension (s)		3.0	4.0	3.0			
Lane Grp Cap (vph)		553	3539	2233			
v/s Ratio Prot		0.04	c0.42	0.09			
v/s Ratio Perm							
v/c Ratio		0.27	0.42	0.14			
Uniform Delay, d1		13.5	0.0	2.7			
Progression Factor		1.00	1.00	1.00			
Incremental Delay, d2		0.3	0.1	0.0			
Delay (s)		13.7	0.1	2.8			
Level of Service		B	A	A			
Approach Delay (s)			1.3	2.8		0.0	
Approach LOS			A	A		A	
Intersection Summary							
HCM 2000 Control Delay		1.6			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.54					
Actuated Cycle Length (s)		36.6		Sum of lost time (s)		7.6	
Intersection Capacity Utilization		62.1%		ICU Level of Service		B	
Analysis Period (min)		15					

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL	NBT	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	126	769	531	94	191	201	44	4	38	320	271	167
Future Volume (vph)	126	769	531	94	191	201	44	4	38	320	271	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0	3.0	4.6	4.6			4.0	4.0	4.0
Lane Util. Factor		0.97	0.95	1.00	1.00	0.91	0.91			0.97	0.95	1.00
Frb, ped/bikes		1.00	1.00	0.98	1.00	1.00	1.00			1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.95	0.85			1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00			0.95	1.00	1.00
Satd. Flow (prot)		3433	3539	1556	1770	3206	1441			3433	3539	1557
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00			0.95	1.00	1.00
Satd. Flow (perm)		3433	3539	1556	1770	3206	1441			3433	3539	1557
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	133	809	559	99	201	212	46	4	40	337	285	176
RTOR Reduction (vph)	0	0	379	0	0	79	0	0	0	0	0	140
Lane Group Flow (vph)	133	809	180	99	315	65	0	0	0	381	285	36
Confl. Peds. (#/hr)			7									6
Turn Type	Prot	NA	Perm	Prot	NA	Perm		Split	Split	Split	NA	Perm
Protected Phases	5	2		1	6			3	3	3	3	
Permitted Phases			2			6						3
Actuated Green, G (s)	8.2	25.9	25.9	7.8	24.9	24.9				16.5	16.5	16.5
Effective Green, g (s)	8.2	25.9	25.9	7.8	24.9	24.9				16.5	16.5	16.5
Actuated g/C Ratio	0.10	0.32	0.32	0.10	0.31	0.31				0.21	0.21	0.21
Clearance Time (s)	3.0	4.0	4.0	3.0	4.6	4.6				4.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0				2.0	2.0	2.0
Lane Grp Cap (vph)	350	1140	501	171	992	446				704	726	319
v/s Ratio Prot	0.04	c0.23		c0.06	0.10					c0.11	0.08	
v/s Ratio Perm			0.12			0.05						0.02
v/c Ratio	0.38	0.71	0.36	0.58	0.32	0.15				0.54	0.39	0.11
Uniform Delay, d1	33.7	23.9	20.9	34.7	21.2	20.1				28.6	27.6	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.3	1.7	0.2	2.9	0.1	0.1				0.5	0.1	0.1
Delay (s)	34.0	25.6	21.1	37.7	21.3	20.1				29.0	27.7	26.1
Level of Service	C	C	C	D	C	C				C	C	C
Approach Delay (s)		24.7			23.9							28.0
Approach LOS		C			C							C
Intersection Summary												
HCM 2000 Control Delay		26.1										C
HCM 2000 Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		80.4		Sum of lost time (s)		16.2						
Intersection Capacity Utilization		73.9%		ICU Level of Service		D						
Analysis Period (min)		15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019

Movement	SBU	SBL	SBT	SBR	SBR2
Lane Configurations		↔	↔	↔	↔
Traffic Volume (vph)	10	117	324	61	47
Future Volume (vph)	10	117	324	61	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.0
Lane Util. Factor		1.00	0.95		1.00
Frpb, ped/bikes		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00
Frt		1.00	0.98		0.85
Flt Protected		0.95	1.00		1.00
Satd. Flow (prot)		1770	3455		1583
Flt Permitted		0.95	1.00		1.00
Satd. Flow (perm)		1770	3455		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	123	341	64	49
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	134	405	0	49
Confl. Peds. (#/hr)					
Turn Type	Split	Split	NA		Free
Protected Phases	4	4	4		
Permitted Phases					Free
Actuated Green, G (s)		14.6	14.6		80.4
Effective Green, g (s)		14.6	14.6		80.4
Actuated g/C Ratio		0.18	0.18		1.00
Clearance Time (s)		4.6	4.6		
Vehicle Extension (s)		2.0	2.0		
Lane Grp Cap (vph)		321	627		1583
v/s Ratio Prot		0.08	c0.12		
v/s Ratio Perm					c0.03
v/c Ratio		0.42	0.65		0.03
Uniform Delay, d1		29.1	30.5		0.0
Progression Factor		1.00	1.00		1.00
Incremental Delay, d2		0.3	1.7		0.0
Delay (s)		29.5	32.2		0.0
Level of Service		C	C		A
Approach Delay (s)			28.9		
Approach LOS			C		
Intersection Summary					

HCM Unsignalized Intersection Capacity Analysis
 4: Collins Avenue & Serramonte Blvd

03/25/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↔	↔	↔	↔	↔	↔		
Traffic Volume (veh/h)	704	349	17	474	56	17		
Future Volume (Veh/h)	704	349	17	474	56	17		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	741	367	18	499	59	18		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)						2		
Median type	None			None				
Median storage (veh)								
Upstream signal (ft)	239			552				
pX, platoon unblocked			0.84		0.84	0.84		
vC, conflicting volume			741		902	370		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol			301		493	0		
IC, single (s)			4.1		6.8	6.9		
IC, 2 stage (s)								
IF (s)			2.2		3.5	3.3		
p0 queue free %			98		86	98		
cM capacity (veh/h)			1052		416	908		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	370	370	367	89	143	143	143	77
Volume Left	0	0	0	18	0	0	0	59
Volume Right	0	0	367	0	0	0	0	18
cSH	1700	1700	1700	1052	1700	1700	1700	542
Volume to Capacity	0.22	0.22	0.22	0.02	0.08	0.08	0.08	0.14
Queue Length 95th (ft)	0	0	0	1	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	1.8	0.0	0.0	0.0	13.7
Lane LOS				A				B
Approach Delay (s)	0.0			0.3				13.7
Approach LOS								B
Intersection Summary								
Average Delay				0.7				
Intersection Capacity Utilization				35.4%			ICU Level of Service	A
Analysis Period (min)				15				

HCM Signalized Intersection Capacity Analysis
5: Serramonte Blvd & Project Driveway 3

03/25/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕	
Traffic Volume (vph)	47	741	412	90	77	19
Future Volume (vph)	47	741	412	90	77	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	
Lane Util. Factor		0.95	0.95		1.00	
Frbp, ped/bikes		1.00	0.99		1.00	
Flpb, ped/bikes		1.00	1.00		1.00	
Frt		1.00	0.97		0.97	
Flt Protected		1.00	1.00		0.96	
Satd. Flow (prot)		3528	3424		1738	
Flt Permitted		0.90	1.00		0.96	
Satd. Flow (perm)		3188	3424		1738	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	780	434	95	81	20
RTOR Reduction (vph)	0	0	10	0	13	0
Lane Group Flow (vph)	0	829	519	0	88	0
Confl. Peds. (#/hr)	3			9	9	3
Turn Type	Prot	NA	NA		Prot	
Protected Phases	5	2	6		8	
Permitted Phases						
Actuated Green, G (s)		44.4	44.4		8.2	
Effective Green, g (s)		44.4	44.4		8.2	
Actuated g/C Ratio		0.72	0.72		0.13	
Clearance Time (s)		4.5	4.5		4.5	
Vehicle Extension (s)		2.5	2.5		2.5	
Lane Grp Cap (vph)		2297	2467		231	
v/s Ratio Prot			0.15		c0.05	
v/s Ratio Perm		c0.26				
v/c Ratio		0.36	0.21		0.38	
Uniform Delay, d1		3.2	2.8		24.4	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		0.1	0.0		0.8	
Delay (s)		3.3	2.9		25.1	
Level of Service		A	A		C	
Approach Delay (s)		3.3	2.9		25.1	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay		4.7		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.40				
Actuated Cycle Length (s)		61.6		Sum of lost time (s)		13.5
Intersection Capacity Utilization		55.6%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations		↕	↕		↕	↕	↕		↕	↕↕↕	↕	
Traffic Volume (vph)	57	483	79	1	87	231	54	1	93	275	47	8
Future Volume (vph)	57	483	79	1	87	231	54	1	93	275	47	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5		3.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00		1.00	0.91	1.00	
Frbp, ped/bikes		1.00	1.00		1.00	1.00	0.99		1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Frt		1.00	0.98		1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00		0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1770	1819		1770	1863	1560		1770	5085	1559	
Flt Permitted		0.95	1.00		0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1770	1819		1770	1863	1560		1770	5085	1559	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	60	508	83	1	92	243	57	1	98	289	49	8
RTOR Reduction (vph)	0	7	0	0	0	0	33	0	0	0	36	0
Lane Group Flow (vph)	60	584	0	0	93	243	24	0	99	289	13	0
Confl. Peds. (#/hr)			11				5				5	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	3	8		7	7	4		1	1	6		5
Permitted Phases							4					6
Actuated Green, G (s)		3.1	26.9		4.1	27.9	27.9		4.1	18.4	18.4	
Effective Green, g (s)		3.1	26.9		4.1	27.9	27.9		4.1	18.4	18.4	
Actuated g/C Ratio		0.05	0.40		0.06	0.41	0.41		0.06	0.27	0.27	
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5		3.0	4.0	4.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0		2.0	4.0	4.0	
Lane Grp Cap (vph)		81	724		107	770	644		107	1386	424	
v/s Ratio Prot		0.03	c0.32		c0.05	0.13			0.06	0.06		
v/s Ratio Perm							0.02				0.01	
v/c Ratio		0.74	0.81		0.87	0.32	0.04		0.93	0.21	0.03	
Uniform Delay, d1		31.8	18.0		31.4	13.4	11.8		31.5	18.9	18.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		26.8	6.2		46.6	0.1	0.0		62.4	0.1	0.0	
Delay (s)		58.6	24.2		78.1	13.4	11.8		94.0	19.0	18.1	
Level of Service		E	C		E	B	B		F	B	B	
Approach Delay (s)		27.4			28.5					35.9		
Approach LOS		C			C					D		
Intersection Summary												
HCM 2000 Control Delay			34.5								C	
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			67.5							14.0		
Intersection Capacity Utilization			67.1%								C	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	SBL	SBT	SBR
Lane Configurations	↔	↑↑↑	↔
Traffic Volume (vph)	112	643	115
Future Volume (vph)	112	643	115
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1559
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1559
Peak-hour factor, PHF	0.95	0.95	0.95
Adj. Flow (vph)	118	677	121
RTOR Reduction (vph)	0	0	88
Lane Group Flow (vph)	126	677	33
Confl. Peds. (#/hr)		4	
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	4.1	18.4	18.4
Effective Green, g (s)	4.1	18.4	18.4
Actuated g/C Ratio	0.06	0.27	0.27
Clearance Time (s)	3.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0
Lane Grp Cap (vph)	107	1386	424
v/s Ratio Prot	c0.07	c0.13	
v/s Ratio Perm			0.02
v/c Ratio	1.18	0.49	0.08
Uniform Delay, d1	31.7	20.6	18.2
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	142.5	0.4	0.1
Delay (s)	174.2	21.0	18.4
Level of Service	F	C	B
Approach Delay (s)		41.5	
Approach LOS		D	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
7: Hillside Blvd & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔		↔	↔	↔	↔	↔
Traffic Volume (vph)	81	14	478	9	8	5	207	172	14	7	539	147
Future Volume (vph)	81	14	478	9	8	5	207	172	14	7	539	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor		1.00	1.00		0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1787	1549		3348		1770	1841		1770	1863	1540
Flt Permitted		0.76	1.00		0.89		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1422	1549		3035		1770	1841		1770	1863	1540
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	15	503	9	8	5	218	181	15	7	567	155
RTOR Reduction (vph)	0	0	206	0	4	0	0	4	0	0	0	63
Lane Group Flow (vph)	0	100	297	0	18	0	218	192	0	7	567	92
Confl. Peds. (#/hr)			1		1							14
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2	2		3	8		7	4	
Permitted Phases	2		2	2								4
Actuated Green, G (s)	19.5	19.5		19.5			9.5	33.7		1.0	25.2	25.2
Effective Green, g (s)	19.5	19.5		19.5			9.5	33.7		1.0	25.2	25.2
Actuated g/C Ratio	0.29	0.29		0.29			0.14	0.50		0.01	0.37	0.37
Clearance Time (s)	4.5	4.5		4.5			4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0			3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	409	446		874			248	916		26	693	573
v/s Ratio Prot							c0.12	0.10		0.00	c0.30	
v/s Ratio Perm	0.07	c0.19		0.01								0.06
v/c Ratio	0.24	0.66		0.02			0.88	0.21		0.27	0.82	0.16
Uniform Delay, d1	18.5	21.2		17.3			28.5	9.5		33.0	19.2	14.2
Progression Factor	1.00	1.00		1.00			1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	7.6		0.0			27.7	0.1		5.5	7.5	0.1
Delay (s)	19.9	28.8		17.3			56.2	9.6		38.5	26.6	14.3
Level of Service	B	C		B			E	A		D	C	B
Approach Delay (s)		27.4		17.3				34.2			24.1	
Approach LOS		C		B				C			C	

Intersection Summary

HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	67.7	Sum of lost time (s)	13.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↕		↕			↕	↕↕			↕↕
Traffic Volume (vph)	11	3	335	1	1	4	1	63	421	1	0	786
Future Volume (vph)	11	3	335	1	1	4	1	63	421	1	0	786
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5			4.5	4.5			4.5
Lane Util. Factor	1.00	1.00		1.00				1.00	0.91			0.91
Frpb, ped/bikes	1.00	0.99		0.99				1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00		1.00				1.00	1.00			1.00
Frt	1.00	0.85		0.91				1.00	1.00			1.00
Flt Protected	0.96	1.00		0.99				0.95	1.00			1.00
Satd. Flow (prot)	1790	1563		1667				1770	5083			5063
Flt Permitted	0.83	1.00		0.97				0.95	1.00			1.00
Satd. Flow (perm)	1549	1563		1625				1770	5083			5063
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	3	353	1	1	4	1	66	443	1	0	827
RTOR Reduction (vph)	0	0	221	0	3	0	0	0	0	0	0	4
Lane Group Flow (vph)	0	15	133	0	3	0	0	67	444	0	0	845
Confl. Peds. (#/hr)	1		1	1		1		1		2		2
Turn Type	Perm	NA	Perm	Perm	NA		Prot	Prot	NA			NA
Protected Phases		4			8		1	1	6			2
Permitted Phases	4		4	8								
Actuated Green, G (s)		9.5	9.5		9.5			3.2	30.9			23.2
Effective Green, g (s)		9.5	9.5		9.5			3.2	30.9			23.2
Actuated g/C Ratio		0.19	0.19		0.19			0.06	0.63			0.47
Clearance Time (s)		4.5	4.5		4.5			4.5	4.5			4.5
Vehicle Extension (s)		3.0	3.0		3.0			3.0	3.0			3.0
Lane Grp Cap (vph)		297	300		312			114	3179			2377
v/s Ratio Prot								c0.04	0.09			c0.17
v/s Ratio Perm		0.01	c0.08		0.00							
v/c Ratio		0.05	0.44		0.01			0.59	0.14			0.36
Uniform Delay, d1		16.3	17.6		16.1			22.5	3.8			8.3
Progression Factor		1.00	1.00		1.00			1.00	1.00			1.00
Incremental Delay, d2		0.1	1.0		0.0			7.5	0.1			0.4
Delay (s)		16.3	18.6		16.2			30.0	3.9			8.8
Level of Service		B	B		B			C	A			A
Approach Delay (s)		18.6			16.2				7.3			8.8
Approach LOS		B			B				A			A

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	49.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019



Movement	SBR
Lane Configurations	↕
Traffic Volume (vph)	21
Future Volume (vph)	21
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	1.00
Flt Protected	1.00
Satd. Flow (prot)	5063
Flt Permitted	1.00
Satd. Flow (perm)	5063
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	22
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary	

HCM Signalized Intersection Capacity Analysis
9: Junipero Serra Blvd & Project Driveway 2

03/25/2019

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↔	↔	↕↕	↕	↔	↔	↕↕
Traffic Volume (vph)	45	18	379	69	2	31	514
Future Volume (vph)	45	18	379	69	2	31	514
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	1.00	0.91		1.00	0.95	
Flpb, ped/bikes	1.00	0.98	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.85	0.98		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	3433	1557	4956		1770	3539	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	3433	1557	4956		1770	3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	19	399	73	2	33	541
RTOR Reduction (vph)	0	17	26	0	0	0	0
Lane Group Flow (vph)	47	2	446	0	0	35	541
Confl. Peds. (#/hr)		5		3			
Turn Type	Prot	Perm	NA		Prot	Prot	NA
Protected Phases	8		2		1	1	6
Permitted Phases		8					
Actuated Green, G (s)	5.8	5.8	36.1		1.0	41.6	
Effective Green, g (s)	5.8	5.8	36.1		1.0	41.6	
Actuated g/C Ratio	0.10	0.10	0.64		0.02	0.74	
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	353	160	3172		31	2610	
v/s Ratio Prot	c0.01		0.09		c0.02	c0.15	
v/s Ratio Perm		0.00					
v/c Ratio	0.13	0.01	0.14		1.13	0.21	
Uniform Delay, d1	23.0	22.7	4.0		27.7	2.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.0	0.1		203.2	0.2	
Delay (s)	23.2	22.8	4.1		230.9	2.5	
Level of Service	C	C	A		F	A	
Approach Delay (s)	23.1		4.1			16.4	
Approach LOS	C		A			B	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

SimTraffic Simulation Summary
Weekday AM Road Diet - Signal

03/25/2019

Summary of All Intervals							
Run Number	20	21	22	23	24	25	28
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	6377	6403	6330	6344	6369	6441	6566
Vehs Exited	6378	6427	6343	6324	6388	6420	6470
Starting Vehs	225	249	233	215	237	216	187
Ending Vehs	224	225	220	235	218	237	283
Travel Distance (mi)	4401	4383	4383	4388	4387	4455	4521
Travel Time (hr)	216.0	220.1	219.2	217.5	221.7	223.3	229.7
Total Delay (hr)	75.3	79.9	79.5	76.6	81.8	80.3	84.9
Total Stops	8212	8670	8532	8505	8643	8702	8934
Fuel Used (gal)	169.8	171.4	171.4	169.7	171.7	174.3	176.7

Summary of All Intervals				
Run Number	29	30	31	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	6455	6387	6479	6415
Vehs Exited	6433	6387	6457	6405
Starting Vehs	214	236	196	217
Ending Vehs	236	236	218	234
Travel Distance (mi)	4457	4415	4453	4424
Travel Time (hr)	221.8	218.6	231.6	222.0
Total Delay (hr)	79.2	77.7	89.0	80.4
Total Stops	8576	8591	8900	8628
Fuel Used (gal)	173.5	171.5	175.9	172.6

Interval #0 Information Seeding	
Start Time	4:45
End Time	5:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00						
End Time	6:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	20	21	22	23	24	25	28
Vehs Entered	6377	6403	6330	6344	6369	6441	6566
Vehs Exited	6378	6427	6343	6324	6388	6420	6470
Starting Vehs	225	249	233	215	237	216	187
Ending Vehs	224	225	220	235	218	237	283
Travel Distance (mi)	4401	4383	4383	4388	4387	4455	4521
Travel Time (hr)	216.0	220.1	219.2	217.5	221.7	223.3	229.7
Total Delay (hr)	75.3	79.9	79.5	76.6	81.8	80.3	84.9
Total Stops	8212	8670	8532	8505	8643	8702	8934
Fuel Used (gal)	169.8	171.4	171.4	169.7	171.7	174.3	176.7

Interval #1 Information Recording

Start Time	5:00			
End Time	6:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	29	30	31	Avg
Vehs Entered	6455	6387	6479	6415
Vehs Exited	6433	6387	6457	6405
Starting Vehs	214	236	196	217
Ending Vehs	236	236	218	234
Travel Distance (mi)	4457	4415	4453	4424
Travel Time (hr)	221.8	218.6	231.6	222.0
Total Delay (hr)	79.2	77.7	89.0	80.4
Total Stops	8576	8591	8900	8628
Fuel Used (gal)	173.5	171.5	175.9	172.6

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	567	292	966	372	2197
Vehicles Exited	568	291	966	371	2196
Hourly Exit Rate	568	291	966	371	2196
Input Volume	568	292	973	370	2203
% of Volume	100	100	99	100	100

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	WBT	All
Vehicles Entered	2	138	1418	289	1847
Vehicles Exited	2	138	1418	290	1848
Hourly Exit Rate	2	138	1418	290	1848
Input Volume	2	139	1426	290	1857
% of Volume	100	99	99	100	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL	NBT	NBR
Vehicles Entered	123	763	532	90	193	200	48	4	35	328	273	168
Vehicles Exited	123	760	532	92	192	199	47	4	35	329	272	168
Hourly Exit Rate	123	760	532	92	192	199	47	4	35	329	272	168
Input Volume	126	769	531	94	192	201	44	4	38	320	271	167
% of Volume	98	99	100	98	100	99	107	100	92	103	100	101

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	SBU	SBL	SBT	SBR	SBR2	All
Vehicles Entered	10	118	314	63	51	3313
Vehicles Exited	10	120	315	63	51	3312
Hourly Exit Rate	10	120	315	63	51	3312
Input Volume	10	117	325	61	47	3317
% of Volume	100	103	97	103	109	100

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Vehicles Entered	701	348	17	475	55	14	18	1628
Vehicles Exited	703	348	17	474	55	14	18	1629
Hourly Exit Rate	703	348	17	474	55	14	18	1629
Input Volume	705	349	17	474	56	12	17	1630
% of Volume	100	100	100	100	98	117	106	100

5: Serramonte Blvd & Project Driveway 3 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	47	772	412	93	77	21	1422
Vehicles Exited	47	772	412	93	77	21	1422
Hourly Exit Rate	47	772	412	93	77	21	1422
Input Volume	47	772	412	90	77	19	1417
% of Volume	100	100	100	103	100	111	100

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Vehicles Entered	56	551	79	0	91	235	56	0	93	287	46	8
Vehicles Exited	55	552	78	0	91	236	56	0	92	288	46	7
Hourly Exit Rate	55	552	78	0	91	236	56	0	92	288	46	7
Input Volume	57	553	79	1	87	231	54	1	93	285	47	8
% of Volume	96	100	99	0	105	102	104	0	99	101	98	88

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBL	SBT	SBR	All
Vehicles Entered	114	652	121	2389
Vehicles Exited	111	652	121	2385
Hourly Exit Rate	111	652	121	2385
Input Volume	112	643	115	2366
% of Volume	99	101	105	101

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	77	26	468	9	9	5	210	176	13	6	534	151
Vehicles Exited	76	26	466	9	9	5	210	176	13	7	531	150
Hourly Exit Rate	76	26	466	9	9	5	210	176	13	7	531	150
Input Volume	81	23	478	9	8	5	207	172	14	7	539	147
% of Volume	94	113	97	100	112	100	101	102	93	100	99	102

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	1684
Vehicles Exited	1678
Hourly Exit Rate	1678
Input Volume	1690
% of Volume	99

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBT	SBR
Vehicles Entered	11	19	334	0	1	4	1	63	422	2	792	23
Vehicles Exited	11	19	333	0	1	4	1	63	422	2	792	23
Hourly Exit Rate	11	19	333	0	1	4	1	63	422	2	792	23
Input Volume	11	20	335	1	1	4	1	63	421	1	786	21
% of Volume	100	95	99	0	100	100	100	100	100	200	101	110

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	All
Vehicles Entered	1672
Vehicles Exited	1671
Hourly Exit Rate	1671
Input Volume	1665
% of Volume	100

9: Junipero Serra Blvd & Project Driveway 2 Performance by movement

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT	All
Vehicles Entered	43	18	384	69	1	34	511	1060
Vehicles Exited	43	18	384	69	1	35	512	1062
Hourly Exit Rate	43	18	384	69	1	35	512	1062
Input Volume	45	18	382	69	2	31	514	1061
% of Volume	96	100	101	100	50	113	100	100

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	34	745	13	7	414	20	7	12	63	36	1351
Vehicles Exited	34	746	13	7	414	20	6	12	64	36	1352
Hourly Exit Rate	34	746	13	7	414	20	6	12	64	36	1352
Input Volume	35	745	15	8	411	20	7	12	67	37	1357
% of Volume	97	100	87	88	101	100	86	100	96	97	100

11: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	6	816	437	4	3	3	1269
Vehicles Exited	6	816	437	4	3	3	1269
Hourly Exit Rate	6	816	437	4	3	3	1269
Input Volume	8	816	436	4	3	2	1269
% of Volume	75	100	100	100	100	150	100

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	5	812	456	4	2	3	1282
Vehicles Exited	5	814	456	4	2	3	1284
Hourly Exit Rate	5	814	456	4	2	3	1284
Input Volume	6	812	449	4	2	2	1275
% of Volume	83	100	102	100	100	150	101

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	704	13	7	456	4	8	1192
Vehicles Exited	704	13	7	457	4	8	1193
Hourly Exit Rate	704	13	7	457	4	8	1193
Input Volume	703	12	8	448	5	8	1184
% of Volume	100	108	88	102	80	100	101

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	661	51	32	447	16	26	1233
Vehicles Exited	661	51	32	447	16	26	1233
Hourly Exit Rate	661	51	32	447	16	26	1233
Input Volume	663	48	32	439	17	27	1226
% of Volume	100	106	100	102	94	96	101

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	4	10	8	428	807	17	1274
Vehicles Exited	4	10	8	429	806	17	1274
Hourly Exit Rate	4	10	8	429	806	17	1274
Input Volume	5	10	9	427	798	16	1265
% of Volume	80	100	89	100	101	106	101

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	614	22	14	350	9	15	1024
Vehicles Exited	614	22	14	349	9	15	1023
Hourly Exit Rate	614	22	14	349	9	15	1023
Input Volume	621	22	14	343	9	15	1024
% of Volume	99	100	100	102	100	100	100

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	581	11	8	360	4	6	970
Vehicles Exited	580	11	8	359	4	6	968
Hourly Exit Rate	580	11	8	359	4	6	968
Input Volume	589	12	8	352	4	6	971
% of Volume	98	92	100	102	100	100	100

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	571	14	5	369	0	1	960
Vehicles Exited	570	14	5	368	0	1	958
Hourly Exit Rate	570	14	5	368	0	1	958
Input Volume	581	14	8	359	1	1	964
% of Volume	98	100	62	103	0	100	99

26: Performance by movement

Movement	NBT	NWR	All
Vehicles Entered	138	579	717
Vehicles Exited	138	577	715
Hourly Exit Rate	138	577	715
Input Volume	139	568	707
% of Volume	99	102	101

Total Network Performance

Vehicles Entered	6415
Vehicles Exited	6405
Hourly Exit Rate	6405
Input Volume	40101
% of Volume	16

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
I-280 SB Off-Ramp	1	9.5	38.1	0.2	23	23	9.3
I-280 NB On-Ramp	2	2.3	12.1	0.1	25	25	2.2
Junipero Serra Blvd	3	23.2	30.4	0.1	8	8	23.4
Collins Avenue	4	3.2	9.4	0.0	17	18	3.0
	10	2.2	6.4	0.0	21	22	1.8
	11	3.3	7.8	0.0	18	19	2.9
Project Driveway 3	5	4.8	8.8	0.0	12	12	4.3
	19	1.2	6.1	0.0	25	26	1.1
	12	0.8	13.1	0.1	29	29	0.8
	13	0.8	11.1	0.1	28	28	0.8
	14	4.7	17.7	0.1	22	24	3.4
El Camino Real	6	23.1	30.1	0.1	8	8	23.2
	16	2.0	12.7	0.1	24	24	1.9
	17	0.3	8.7	0.1	29	29	0.3
	18	0.5	10.6	0.1	29	29	0.5
Hillside Blvd	7	8.4	25.1	0.2	25	29	5.6
Total		90.3	248.1	1.4	20	20	84.6

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed
I-280 SB Off-Ramp	23	9.3	23	9.8	23	9.5	23
I-280 NB On-Ramp	25	2.3	25	2.3	25	2.1	26
Junipero Serra Blvd	8	23.4	8	24.6	9	21.4	8
Collins Avenue	18	3.0	17	3.4	18	3.1	17
	21	2.0	19	2.8	20	2.6	18
	19	3.1	16	4.4	18	3.5	15
Project Driveway 3	12	4.5	11	5.3	10	5.8	10
	26	1.1	25	1.3	25	1.3	25
	29	0.9	30	0.8	29	0.9	29
	28	0.9	29	0.7	28	0.9	28
	23	3.9	21	5.4	24	3.4	24
El Camino Real	8	22.6	8	24.2	8	22.5	8
	24	2.0	24	2.0	24	1.9	24
	29	0.2	29	0.2	29	0.3	29
	29	0.5	29	0.4	28	0.6	29
Hillside Blvd	25	8.3	31	4.5	26	8.1	27
Total	20	88.1	20	92.3	20	87.8	20

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 24 Delay	Run 25 Speed	Run 25 Delay	Run 28 Speed	Run 28 Delay	Run 29 Speed	Run 29 Delay
I-280 SB Off-Ramp	8.6	23	9.6	23	8.9	23	10.3
I-280 NB On-Ramp	2.1	25	2.4	25	2.1	25	2.3
Junipero Serra Blvd	25.2	8	22.1	8	23.3	8	22.9
Collins Avenue	3.2	18	2.9	17	3.3	18	3.0
	3.4	22	1.9	21	2.3	23	1.6
	4.8	20	2.7	18	3.3	21	2.2
Project Driveway 3	5.9	13	4.0	12	4.7	13	3.6
	1.4	26	1.2	25	1.2	26	1.1
	0.9	29	0.9	29	0.8	29	0.8
	0.9	28	0.8	29	0.8	28	0.8
	3.4	24	3.2	19	7.1	19	7.2
El Camino Real	23.2	9	20.5	8	24.6	7	25.6
	2.0	24	2.0	24	2.0	24	2.1
	0.3	29	0.3	29	0.3	29	0.3
	0.4	28	0.5	29	0.5	28	0.6
Hillside Blvd	7.2	21	12.9	21	10.5	27	6.1
Total	92.9	20	88.1	19	95.7	20	90.4

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 30 Speed	Run 30 Delay	Run 31 Speed	Run 31 Delay
I-280 SB Off-Ramp	23	10.1	23	9.2
I-280 NB On-Ramp	24	2.5	24	2.4
Junipero Serra Blvd	8	22.6	8	23.0
Collins Avenue	17	3.5	17	3.4
	22	1.9	22	1.9
	19	3.0	19	3.0
Project Driveway 3	11	5.3	12	4.3
	25	1.4	26	1.2
	29	0.9	29	0.8
	29	0.8	28	0.9
	24	3.4	21	5.9
El Camino Real	8	22.4	8	22.4
	24	2.0	24	2.0
	29	0.3	29	0.3
	29	0.4	28	0.5
Hillside Blvd	23	11.7	25	8.0
Total	20	92.3	20	89.2

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
Hillside Blvd	7	16.3	21.6	0.0	7	8	14.6
	18	0.8	14.5	0.2	43	35	1.3
	17	0.3	10.4	0.1	29	29	0.3
El Camino Real	16	0.3	8.4	0.1	30	30	0.3
	6	17.2	26.1	0.1	12	12	17.0
	14	1.7	10.3	0.1	24	24	1.6
Project Driveway 3	13	0.6	13.6	0.1	29	29	0.5
	12	0.6	10.7	0.1	29	29	0.5
	19	0.9	13.8	0.1	28	28	0.8
Collins Avenue	5	3.4	8.1	0.0	19	22	2.3
	11	0.7	4.5	0.0	23	23	0.6
	10	0.3	4.9	0.0	29	29	0.2
Junipero Serra Blvd	4	0.6	4.6	0.0	28	29	0.5
	3	18.6	23.2	0.0	7	6	20.5
	2	3.8	12.3	0.1	20	20	3.9
I-280 NB On-Ramp	1	13.0	23.1	0.1	13	13	13.6
	Total	78.9	210.2	1.2	20	20	78.5

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed
Hillside Blvd	11	8.2	6	21.4	7	16.6	9
	40	0.5	47	0.8	43	0.8	43
	29	0.3	29	0.3	29	0.3	30
El Camino Real	29	0.3	30	0.3	30	0.2	30
	12	17.0	12	17.0	12	16.3	12
	24	1.8	24	1.7	23	1.7	24
Project Driveway 3	29	0.5	29	0.6	29	0.5	29
	29	0.5	29	0.6	29	0.5	29
	28	0.8	28	1.0	28	0.9	28
Collins Avenue	20	3.3	19	3.7	17	4.6	17
	23	0.7	23	0.8	22	0.9	22
	29	0.2	29	0.4	29	0.3	29
Junipero Serra Blvd	28	0.7	28	0.6	29	0.6	29
	7	18.3	8	14.7	7	18.6	7
	19	4.4	19	4.3	19	4.4	21
I-280 SB Off-Ramp	13	13.0	13	12.9	14	11.0	14
	Total	21	70.4	20	81.1	20	78.3

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 24 Delay	Run 25 Speed	Run 25 Delay	Run 28 Speed	Run 28 Delay	Run 29 Speed	Run 29 Delay
Hillside Blvd	13.1	10	9.9	6	22.0	10	10.8
	0.9	42	0.4	41	0.8	36	0.8
	0.2	29	0.4	29	0.3	29	0.4
El Camino Real	0.3	30	0.3	30	0.4	30	0.3
	16.4	12	15.4	10	20.3	12	17.2
	1.7	24	1.6	24	1.7	24	1.9
Project Driveway 3	0.6	29	0.5	29	0.6	29	0.5
	0.6	29	0.5	29	0.5	29	0.6
	0.9	28	0.8	28	0.8	28	0.9
Collins Avenue	4.4	19	3.3	19	3.5	21	2.8
	0.9	23	0.6	23	0.7	23	0.7
	0.3	29	0.2	29	0.2	29	0.3
Junipero Serra Blvd	0.6	28	0.5	27	0.8	29	0.5
	18.9	7	19.7	7	18.2	7	19.6
	3.1	20	3.6	21	3.4	20	3.8
I-280 SB Off-Ramp	11.6	12	14.4	12	13.9	13	12.8
	Total	74.4	20	72.4	19	88.2	20

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 30 Speed	Run 30 Delay	Run 31 Speed	Run 31 Delay
Hillside Blvd	5	24.8	6	20.3
	44	0.9	50	0.7
	29	0.3	29	0.3
El Camino Real	30	0.3	30	0.3
	12	17.0	11	18.4
	24	1.6	24	1.7
Project Driveway 3	29	0.6	29	0.5
	29	0.6	30	0.5
	28	1.0	28	0.8
Collins Avenue	18	4.2	22	2.3
	23	0.8	24	0.6
	29	0.3	29	0.3
Junipero Serra Blvd	29	0.6	29	0.5
	6	20.5	8	17.0
	20	3.9	21	3.4
I-280 SB Off-Ramp	12	14.6	14	11.8
	Total	19	92.1	20

Queuing and Blocking Report
Weekday AM Road Diet - Signal

03/25/2019

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	T	L	L
Maximum Queue (ft)	140	153	102	122	74	193	221
Average Queue (ft)	68	81	50	56	19	104	122
95th Queue (ft)	115	133	89	99	64	166	191
Link Distance (ft)	1253	1253	384	384		498	498
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	50						
Storage Blk Time (%)	11 0						
Queuing Penalty (veh)	11 0						

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	WB	WB
Directions Served	UL	L	T	T	T
Maximum Queue (ft)	83	10	58	66	81
Average Queue (ft)	45	0	3	4	21
95th Queue (ft)	72	7	28	34	58
Link Distance (ft)		384	384	384	246
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report
Weekday AM Road Diet - Signal

03/25/2019

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	R>	U<L	L	T
Maximum Queue (ft)	87	82	258	258	236	132	116	136	124	155	186	116
Average Queue (ft)	39	39	163	149	112	63	57	77	59	74	94	52
95th Queue (ft)	72	76	242	240	201	110	100	119	106	132	158	99
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)	0 0 0 0 0 0 0 0											
Queuing Penalty (veh)	2 1 0 0 0 0 0 0											
Storage Bay Dist (ft)	225 295 295											
Storage Blk Time (%)	1 0											
Queuing Penalty (veh)	3 1											

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	UL	T	TR
Maximum Queue (ft)	129	110	157	174	168
Average Queue (ft)	54	41	66	99	90
95th Queue (ft)	102	89	126	157	147
Link Distance (ft)	1147		676	676	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	90 320				
Storage Blk Time (%)	1 1				
Queuing Penalty (veh)	2 1				

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	94	8	74	56	21	25	14	89	63
Average Queue (ft)	6	0	7	10	1	1	1	35	17
95th Queue (ft)	42	8	42	40	11	12	10	72	50
Link Distance (ft)	146	146			111	111		1189	
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)	40 65 65 50								
Storage Blk Time (%)	0 0 0 0 0 5 0								
Queuing Penalty (veh)	0 0 0 0 0 1 0								

Queuing and Blocking Report
Weekday AM Road Diet - Signal

03/25/2019

Intersection: 5: Serramonte Blvd & Project Driveway 3

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	150	16	92	131	100
Average Queue (ft)	99	1	29	51	42
95th Queue (ft)	156	9	71	109	78
Link Distance (ft)	110	110	162	162	249
Upstream Blk Time (%)	7		0	0	
Queuing Penalty (veh)	30		0	0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	UL	T	R	UL	T	T	T	R	UL	T
Maximum Queue (ft)	228	273	139	194	62	152	123	104	77	67	232	251
Average Queue (ft)	47	215	66	84	18	70	54	46	17	18	121	126
95th Queue (ft)	132	304	129	153	45	128	96	87	54	48	243	239
Link Distance (ft)	259	259	334	334			326	326	326			1268
Upstream Blk Time (%)	0	6										
Queuing Penalty (veh)	0	20										
Storage Bay Dist (ft)					300	200				160	300	
Storage Blk Time (%)					0	0					3	
Queuing Penalty (veh)					0	0					6	

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	235	163	90
Average Queue (ft)	97	39	32
95th Queue (ft)	211	103	65
Link Distance (ft)	1268	1268	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		0	0

Queuing and Blocking Report
Weekday AM Road Diet - Signal

03/25/2019

Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	TR	L	T	R
Maximum Queue (ft)	120	297	53	33	228	123	83	551	100
Average Queue (ft)	44	157	12	4	115	54	9	305	80
95th Queue (ft)	90	269	39	22	198	102	42	526	133
Link Distance (ft)	850	850	192	192	908	908		900	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							75		75
Storage Blk Time (%)								48	1
Queuing Penalty (veh)								73	4

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	T	TR	T	T	TR
Maximum Queue (ft)	174	105	32	89	100	47	34	136	129	114
Average Queue (ft)	40	79	4	31	29	8	4	41	44	32
95th Queue (ft)	135	118	20	66	72	29	18	107	112	92
Link Distance (ft)	472		186		1262	1262	1262	415	415	415
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		80		130						
Storage Blk Time (%)	0	9		0						
Queuing Penalty (veh)	0	1		0						

Intersection: 9: Junipero Serra Blvd & Project Driveway 2

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	TR	UL	T	T
Maximum Queue (ft)	59	34	37	72	76	88	66	76	69
Average Queue (ft)	22	7	13	20	19	24	24	26	14
95th Queue (ft)	51	27	38	57	59	64	55	65	49
Link Distance (ft)	196	196	196	676	676	676		591	591
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							210		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
Weekday AM Road Diet - Signal

03/25/2019

Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	NB	SB
Directions Served	LT	TR	LT	LTR	LTR
Maximum Queue (ft)	134	83	47	37	135
Average Queue (ft)	36	7	4	14	51
95th Queue (ft)	107	44	24	39	104
Link Distance (ft)	111	111	129	208	158
Upstream Blk Time (%)	1	0			0
Queuing Penalty (veh)	4	0			0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 11: Serramonte Blvd

Movement	EB	EB	SB
Directions Served	LT	T	LR
Maximum Queue (ft)	154	63	28
Average Queue (ft)	68	4	5
95th Queue (ft)	165	32	22
Link Distance (ft)	129	129	222
Upstream Blk Time (%)	3	0	
Queuing Penalty (veh)	13	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 12: Serramonte Blvd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	27	37
Average Queue (ft)	2	5
95th Queue (ft)	13	24
Link Distance (ft)		255
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Weekday AM Road Diet - Signal

03/25/2019

Intersection: 13: Serramonte Blvd

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	33	35
Average Queue (ft)	3	10
95th Queue (ft)	19	34
Link Distance (ft)		343
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: Serramonte Blvd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	272	54	70
Average Queue (ft)	52	16	27
95th Queue (ft)	189	45	57
Link Distance (ft)	518	259	411
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: El Camino Real

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	24	32
Average Queue (ft)	8	4
95th Queue (ft)	25	20
Link Distance (ft)		203
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Weekday AM Road Diet - Signal

03/25/2019

Intersection: 16: Serramonte Blvd

Movement	EB	EB	WB	NB	NB
Directions Served	T	TR	LT	L	R
Maximum Queue (ft)	4	4	50	34	36
Average Queue (ft)	0	0	6	8	12
95th Queue (ft)	4	3	29	29	37
Link Distance (ft)	334	334	300	289	289
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	35	37
Average Queue (ft)	4	9
95th Queue (ft)	21	32
Link Distance (ft)	389	205
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	36	21
Average Queue (ft)	3	1
95th Queue (ft)	19	11
Link Distance (ft)	850	247
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Weekday AM Road Diet - Signal

03/25/2019

Intersection: 26:

Movement	NW	B36	B36
Directions Served	R	T	
Maximum Queue (ft)	37	66	55
Average Queue (ft)	2	10	5
95th Queue (ft)	20	44	29
Link Distance (ft)	352	175	175
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 176

HCM Signalized Intersection Capacity Analysis
1: Serramonte Blvd & I-280 SB Off-Ramp

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↑	↑↑
Traffic Volume (vph)	0	568	290	0	973	370
Future Volume (vph)	0	568	290	0	973	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	598	305	0	1024	389
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	598	305	0	1024	389
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4 5
Permitted Phases						
Actuated Green, G (s)		17.8	8.5		22.3	32.1
Effective Green, g (s)		17.8	8.5		22.3	32.1
Actuated g/C Ratio		0.37	0.18		0.46	0.66
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1301	893		1581	1848
v/s Ratio Prot		c0.17	0.06		c0.30	0.14
v/s Ratio Perm						
v/c Ratio		0.46	0.34		0.65	0.21
Uniform Delay, d1		11.6	17.5		10.0	3.2
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.2		0.9	0.1
Delay (s)		11.9	17.7		11.0	3.2
Level of Service		B	B		B	A
Approach Delay (s)		11.9	17.7		8.8	
Approach LOS		B	B		A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	11.5
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑↑			
Traffic Volume (vph)	2	139	1426	290	0	0	0
Future Volume (vph)	2	139	1426	290	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.4	4.1			
Lane Util. Factor		0.97	0.95	0.95			
Frt		1.00	1.00	1.00			
Flt Protected		0.95	1.00	1.00			
Satd. Flow (prot)		3433	3539	3539			
Flt Permitted		0.95	1.00	1.00			
Satd. Flow (perm)		3433	3539	3539			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	146	1501	305	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	148	1501	305	0	0	0
Turn Type	Prot	Prot	NA	NA			
Protected Phases	5	5	2	6			
Permitted Phases							
Actuated Green, G (s)		5.9	36.6	23.1			
Effective Green, g (s)		5.9	36.6	23.1			
Actuated g/C Ratio		0.16	1.00	0.63			
Clearance Time (s)		3.5	4.4	4.1			
Vehicle Extension (s)		3.0	4.0	3.0			
Lane Grp Cap (vph)		553	3539	2233			
v/s Ratio Prot		0.04	c0.42	0.09			
v/s Ratio Perm							
v/c Ratio		0.27	0.42	0.14			
Uniform Delay, d1		13.5	0.0	2.7			
Progression Factor		1.00	1.00	1.00			
Incremental Delay, d2		0.3	0.1	0.0			
Delay (s)		13.7	0.1	2.8			
Level of Service		B	A	A			
Approach Delay (s)			1.3	2.8		0.0	
Approach LOS			A	A		A	

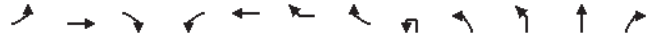
Intersection Summary			
HCM 2000 Control Delay	1.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	36.6	Sum of lost time (s)	7.6
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL	NBT	NBR
Lane Configurations	↔	↕	↘	↔	↕	↘				↔	↕	↘
Traffic Volume (vph)	126	769	531	94	191	201	44	4	38	320	271	167
Future Volume (vph)	126	769	531	94	191	201	44	4	38	320	271	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.6	4.6				4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91				0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00				1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1556	1770	3206	1441				3433	3539	1557
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1556	1770	3206	1441				3433	3539	1557
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	133	809	559	99	201	212	46	4	40	337	285	176
RTOR Reduction (vph)	0	0	379	0	0	79	0	0	0	0	0	140
Lane Group Flow (vph)	133	809	180	99	315	65	0	0	0	381	285	36
Confl. Peds. (#/hr)	7											
Turn Type	Prot	NA	Perm	Prot	NA	Perm		Split	Split	Split	NA	Perm
Protected Phases	5	2		1	6			3	3	3		3
Permitted Phases			2			6						3
Actuated Green, G (s)	8.2	25.9	25.9	7.8	24.9	24.9				16.5	16.5	16.5
Effective Green, g (s)	8.2	25.9	25.9	7.8	24.9	24.9				16.5	16.5	16.5
Actuated g/C Ratio	0.10	0.32	0.32	0.10	0.31	0.31				0.21	0.21	0.21
Clearance Time (s)	3.0	4.0	4.0	3.0	4.6	4.6				4.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0				2.0	2.0	2.0
Lane Grp Cap (vph)	350	1140	501	171	992	446				704	726	319
v/s Ratio Prot	0.04	c0.23		c0.06	0.10					c0.11	0.08	
v/s Ratio Perm			0.12			0.05						0.02
v/c Ratio	0.38	0.71	0.36	0.58	0.32	0.15				0.54	0.39	0.11
Uniform Delay, d1	33.7	23.9	20.9	34.7	21.2	20.1				28.6	27.6	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.3	1.7	0.2	2.9	0.1	0.1				0.5	0.1	0.1
Delay (s)	34.0	25.6	21.1	37.7	21.3	20.1				29.0	27.7	26.1
Level of Service	C	C	C	D	C	C				C	C	C
Approach Delay (s)	24.7				23.9						28.0	
Approach LOS	C				C						C	

Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	16.2
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	SBU	SBL	SBT	SBR	SBR2
Lane Configurations		↔	↕	↘	↘
Traffic Volume (vph)	10	117	324	61	47
Future Volume (vph)	10	117	324	61	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.0
Lane Util. Factor		1.00	0.95		1.00
Frbp, ped/bikes		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00
Frt		1.00	0.98		0.85
Flt Protected		0.95	1.00		1.00
Satd. Flow (prot)		1770	3455		1583
Flt Permitted		0.95	1.00		1.00
Satd. Flow (perm)		1770	3455		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	123	341	64	49
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	134	405	0	49
Confl. Peds. (#/hr)	7				
Turn Type	Split	Split	NA		Free
Protected Phases	4	4	4		
Permitted Phases					Free
Actuated Green, G (s)		14.6	14.6		80.4
Effective Green, g (s)		14.6	14.6		80.4
Actuated g/C Ratio		0.18	0.18		1.00
Clearance Time (s)		4.6	4.6		
Vehicle Extension (s)		2.0	2.0		
Lane Grp Cap (vph)		321	627		1583
v/s Ratio Prot		0.08	c0.12		
v/s Ratio Perm					c0.03
v/c Ratio		0.42	0.65		0.03
Uniform Delay, d1		29.1	30.5		0.0
Progression Factor		1.00	1.00		1.00
Incremental Delay, d2		0.3	1.7		0.0
Delay (s)		29.5	32.2		0.0
Level of Service		C	C		A
Approach Delay (s)	28.9				
Approach LOS	C				

Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	16.2
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Collins Avenue & Serramonte Blvd

03/25/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑		↑↑↑	↑	↑		
Traffic Volume (veh/h)	704	349	17	474	56	17		
Future Volume (Veh/h)	704	349	17	474	56	17		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	741	367	18	499	59	18		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)						2		
Median type	None		None					
Median storage (veh)								
Upstream signal (ft)	239		552					
pX, platoon unblocked			0.84		0.84	0.84		
vC, conflicting volume			741		902	370		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol			301		493	0		
tC, single (s)			4.1		6.8	6.9		
tC, 2 stage (s)								
tF (s)			2.2		3.5	3.3		
pD queue free %			98		86	98		
cM capacity (veh/h)			1052		416	908		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	370	370	367	89	143	143	143	77
Volume Left	0	0	0	18	0	0	0	59
Volume Right	0	0	367	0	0	0	0	18
cSH	1700	1700	1700	1052	1700	1700	1700	542
Volume to Capacity	0.22	0.22	0.22	0.02	0.08	0.08	0.08	0.14
Queue Length 95th (ft)	0	0	0	1	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	1.8	0.0	0.0	0.0	13.7
Lane LOS				A	B			
Approach Delay (s)	0.0		0.3				13.7	
Approach LOS			B				B	
Intersection Summary								
Average Delay			0.7					
Intersection Capacity Utilization			35.4%		ICU Level of Service			A
Analysis Period (min)	15							

HCM Unsignalized Intersection Capacity Analysis
5: Serramonte Blvd & Project Driveway 3

03/25/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		↑↑	↑↑		↑↑	↑↑	
Sign Control		Stop	Stop		Stop	Stop	
Traffic Volume (vph)	47	741	412	90	77	19	
Future Volume (vph)	47	741	412	90	77	19	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	49	780	434	95	81	20	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1		
Volume Total (vph)	309	520	289	240	101		
Volume Left (vph)	49	0	0	0	81		
Volume Right (vph)	0	0	0	95	20		
Hadj (s)	0.11	0.03	0.03	-0.24	0.08		
Departure Headway (s)	5.6	5.5	5.9	5.6	6.5		
Degree Utilization, x	0.48	0.79	0.47	0.37	0.18		
Capacity (veh/h)	626	643	599	626	526		
Control Delay (s)	12.4	25.1	12.7	10.6	10.9		
Approach Delay (s)	20.4		11.8		10.9		
Approach LOS	C		B		B		
Intersection Summary							
Delay	16.6						
Level of Service	C						
Intersection Capacity Utilization			52.5%		ICU Level of Service		A
Analysis Period (min)	15						

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	57	483	79	1	87	231	54	1	93	275	47	8
Future Volume (vph)	57	483	79	1	87	231	54	1	93	275	47	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5	3.5	3.5		3.0	4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00		1.00	0.91	1.00	
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.99		1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.98			1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1770	1819			1770	1863	1560		1770	5085	1559	
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1770	1819			1770	1863	1560		1770	5085	1559	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	60	508	83	1	92	243	57	1	98	289	49	8
RTOR Reduction (vph)	0	7	0	0	0	0	33	0	0	0	36	0
Lane Group Flow (vph)	60	584	0	0	93	243	24	0	99	289	13	0
Confl. Peds. (#/hr)			11				5				5	
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	3	8		7	7	4		1	1	6		5
Permitted Phases							4					6
Actuated Green, G (s)	3.1	26.9			4.1	27.9	27.9		4.1	18.4	18.4	
Effective Green, g (s)	3.1	26.9			4.1	27.9	27.9		4.1	18.4	18.4	
Actuated g/C Ratio	0.05	0.40			0.06	0.41	0.41		0.06	0.27	0.27	
Clearance Time (s)	3.5	3.5			3.5	3.5	3.5		3.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0		2.0	4.0	4.0	
Lane Grp Cap (vph)	81	724			107	770	644		107	1386	424	
v/s Ratio Prot	0.03	c0.32			c0.05	0.13			0.06	0.06		
v/s Ratio Perm							0.02					0.01
v/c Ratio	0.74	0.81			0.87	0.32	0.04		0.93	0.21	0.03	
Uniform Delay, d1	31.8	18.0			31.4	13.4	11.8		31.5	18.9	18.0	
Progression Factor	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	26.8	6.2			46.6	0.1	0.0		62.4	0.1	0.0	
Delay (s)	58.6	24.2			78.1	13.4	11.8		94.0	19.0	18.1	
Level of Service	E	C			E	B	B		F	B	B	
Approach Delay (s)		27.4				28.5				35.9		
Approach LOS		C				C				D		
Intersection Summary												
HCM 2000 Control Delay		34.5										C
HCM 2000 Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		67.5				Sum of lost time (s)			14.0			
Intersection Capacity Utilization		67.1%				ICU Level of Service			C			
Analysis Period (min)		15										
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	SBL	SBT	SBR
Lane Configurations	↔	↔	↔
Traffic Volume (vph)	112	643	115
Future Volume (vph)	112	643	115
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1559
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1559
Peak-hour factor, PHF	0.95	0.95	0.95
Adj. Flow (vph)	118	677	121
RTOR Reduction (vph)	0	0	88
Lane Group Flow (vph)	126	677	33
Confl. Peds. (#/hr)			4
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	4.1	18.4	18.4
Effective Green, g (s)	4.1	18.4	18.4
Actuated g/C Ratio	0.06	0.27	0.27
Clearance Time (s)	3.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0
Lane Grp Cap (vph)	107	1386	424
v/s Ratio Prot	c0.07	c0.13	
v/s Ratio Perm			0.02
v/c Ratio	1.18	0.49	0.08
Uniform Delay, d1	31.7	20.6	18.2
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	142.5	0.4	0.1
Delay (s)	174.2	21.0	18.4
Level of Service	F	C	B
Approach Delay (s)		41.5	
Approach LOS		D	
Intersection Summary			

HCM Signalized Intersection Capacity Analysis
 7: Hillside Blvd & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕↔	↕↔		↕	↕		↕	↕
Traffic Volume (vph)	81	14	478	9	8	5	207	172	14	7	539	147
Future Volume (vph)	81	14	478	9	8	5	207	172	14	7	539	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		0.95	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		0.97	1.00	0.99	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.96	1.00		0.98	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1549		3348	1770	1841	1770	1863		1770	1863	1540
Flt Permitted	0.76	1.00		0.89	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1422	1549		3035	1770	1841	1770	1863		1770	1863	1540
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	15	503	9	8	5	218	181	15	7	567	155
RTOR Reduction (vph)	0	0	206	0	4	0	0	4	0	0	0	63
Lane Group Flow (vph)	0	100	297	0	18	0	218	192	0	7	567	92
Confl. Peds. (#/hr)			1	1								14
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2	2		3	8		7	4	
Permitted Phases	2		2	2								4
Actuated Green, G (s)	19.5	19.5		19.5	9.5	33.7	1.0	25.2		25.2		25.2
Effective Green, g (s)	19.5	19.5		19.5	9.5	33.7	1.0	25.2		25.2		25.2
Actuated g/C Ratio	0.29	0.29		0.29	0.14	0.50	0.01	0.37		0.37		0.37
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	409	446		874	248	916	26	693		573		573
v/s Ratio Prot					c0.12	0.10		0.00		c0.30		
v/s Ratio Perm	0.07	c0.19		0.01								0.06
v/c Ratio	0.24	0.66		0.02	0.88	0.21	0.27	0.82		0.16		0.16
Uniform Delay, d1	18.5	21.2		17.3	28.5	9.5	33.0	19.2		14.2		14.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	7.6		0.0	27.7	0.1	5.5	7.5		0.1		0.1
Delay (s)	19.9	28.8		17.3	56.2	9.6	38.5	26.6		14.3		14.3
Level of Service	B	C		B	E	A	D	C		B		B
Approach Delay (s)	27.4			17.3		34.2		24.1				24.1
Approach LOS	C			B		C		C				C
Intersection Summary												
HCM 2000 Control Delay		27.5		HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		67.7		Sum of lost time (s)				13.5				
Intersection Capacity Utilization		73.5%		ICU Level of Service				D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↕		↕	↕		↕↔	↕↔	↕↔		↕↔
Traffic Volume (vph)	11	3	335	1	1	4	1	63	421	1	0	786
Future Volume (vph)	11	3	335	1	1	4	1	63	421	1	0	786
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	0.91
Frpb, ped/bikes	1.00	0.99		1.00	0.99	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		0.91	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flt Protected	0.96	1.00		0.99	0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1789	1563		1666	1770	5083	1770	5083		1770	5083	5063
Flt Permitted	0.81	1.00		0.96	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1507	1563		1618	1770	5083	1770	5083		1770	5083	5063
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	3	353	1	1	4	1	66	443	1	0	827
RTOR Reduction (vph)	0	0	292	0	3	0	0	0	0	0	0	2
Lane Group Flow (vph)	0	15	61	0	3	0	0	67	444	0	0	847
Confl. Peds. (#/hr)	1		1	1		1	1		2	2		2
Turn Type	Perm	NA	Perm	Perm	NA		Prot	Prot	NA		NA	NA
Protected Phases		4		8	8		1	1	6			2
Permitted Phases	4		4	8								
Actuated Green, G (s)	8.6	8.6		8.6	5.3	50.7		50.7		40.9		40.9
Effective Green, g (s)	8.6	8.6		8.6	5.3	50.7		50.7		40.9		40.9
Actuated g/C Ratio	0.13	0.13		0.13	0.08	0.74		0.60		0.60		0.60
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	189	196		203	137	3773		3031		3031		3031
v/s Ratio Prot					c0.04	0.09		c0.17				
v/s Ratio Perm	0.01	c0.04		0.00								
v/c Ratio	0.08	0.31		0.01	0.49	0.12		0.28		0.28		0.28
Uniform Delay, d1	26.4	27.2		26.1	30.2	2.5		6.6		6.6		6.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00		1.00
Incremental Delay, d2	0.2	0.9		0.0	2.7	0.1		0.2		0.2		0.2
Delay (s)	26.5	28.1		26.2	32.9	2.5		6.8		6.8		6.8
Level of Service	C	C		C	C	A		A		A		A
Approach Delay (s)	28.0			26.2		6.5		6.8		6.8		6.8
Approach LOS	C			C		A		A		A		A
Intersection Summary												
HCM 2000 Control Delay		11.3		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio		0.30										
Actuated Cycle Length (s)		68.3		Sum of lost time (s)				13.5				
Intersection Capacity Utilization		60.2%		ICU Level of Service				B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	21
Future Volume (vph)	21
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	22
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 9: Junipero Serra Blvd & Project Driveway 2

03/25/2019

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	45	18	379	69	2	31	514
Future Volume (vph)	45	18	379	69	2	31	514
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5			4.5	4.5
Lane Util. Factor	0.97	1.00	0.91			1.00	0.95
Frbp, ped/bikes	1.00	0.98	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.85	0.98			1.00	1.00
Flt Protected	0.95	1.00	1.00			0.95	1.00
Satd. Flow (prot)	3433	1557	4956			1770	3539
Flt Permitted	0.95	1.00	1.00			0.95	1.00
Satd. Flow (perm)	3433	1557	4956			1770	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	19	399	73	2	33	541
RTOR Reduction (vph)	0	17	26	0	0	0	0
Lane Group Flow (vph)	47	2	446	0	0	35	541
Confl. Peds. (#/hr)		5		3			
Turn Type	Prot	Perm	NA		Prot	Prot	NA
Protected Phases	8		2		1	1	6
Permitted Phases		8					
Actuated Green, G (s)	5.8	5.8	36.1			1.0	41.6
Effective Green, g (s)	5.8	5.8	36.1			1.0	41.6
Actuated g/C Ratio	0.10	0.10	0.64			0.02	0.74
Clearance Time (s)	4.5	4.5	4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	353	160	3172			31	2610
v/s Ratio Prot	c0.01		0.09			c0.02	c0.15
v/s Ratio Perm		0.00					
v/c Ratio	0.13	0.01	0.14			1.13	0.21
Uniform Delay, d1	23.0	22.7	4.0			27.7	2.3
Progression Factor	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.2	0.0	0.1			203.2	0.2
Delay (s)	23.2	22.8	4.1			230.9	2.5
Level of Service	C	C	A			F	A
Approach Delay (s)	23.1		4.1				16.4
Approach LOS	C		A				B

Intersection Summary

HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

SimTraffic Simulation Summary
Weekday AM Road Diet - Stop Sign

03/25/2019

Summary of All Intervals

Run Number	20	21	22	23	24	25	27
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	6386	6360	6322	6587	6397	6430	6470
Vehs Exited	6368	6336	6341	6576	6366	6439	6420
Starting Vehs	224	237	246	239	201	226	204
Ending Vehs	242	261	227	250	232	217	254
Travel Distance (mi)	4388	4380	4374	4505	4406	4412	4469
Travel Time (hr)	231.1	227.9	247.0	234.3	240.2	231.9	247.9
Total Delay (hr)	90.4	87.9	106.9	90.4	99.1	90.5	104.9
Total Stops	10441	10182	10653	10564	10852	10494	10585
Fuel Used (gal)	174.9	173.4	177.0	178.5	176.9	175.3	180.7

Summary of All Intervals

Run Number	29	30	31	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	6449	6433	6490	6427
Vehs Exited	6461	6447	6473	6423
Starting Vehs	232	222	235	225
Ending Vehs	220	208	252	226
Travel Distance (mi)	4464	4459	4439	4430
Travel Time (hr)	238.2	232.3	227.6	235.9
Total Delay (hr)	95.0	90.2	85.7	94.1
Total Stops	10299	10223	9967	10425
Fuel Used (gal)	178.1	176.3	175.3	176.6

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

SimTraffic Simulation Summary
Weekday AM Road Diet - Stop Sign

03/25/2019

Interval #1 Information Recording

Start Time	5:00						
End Time	6:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	20	21	22	23	24	25	27
Vehs Entered	6386	6360	6322	6587	6397	6430	6470
Vehs Exited	6368	6336	6341	6576	6366	6439	6420
Starting Vehs	224	237	246	239	201	226	204
Ending Vehs	242	261	227	250	232	217	254
Travel Distance (mi)	4388	4380	4374	4505	4406	4412	4469
Travel Time (hr)	231.1	227.9	247.0	234.3	240.2	231.9	247.9
Total Delay (hr)	90.4	87.9	106.9	90.4	99.1	90.5	104.9
Total Stops	10441	10182	10653	10564	10852	10494	10585
Fuel Used (gal)	174.9	173.4	177.0	178.5	176.9	175.3	180.7

Interval #1 Information Recording

Start Time	5:00			
End Time	6:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	29	30	31	Avg
Vehs Entered	6449	6433	6490	6427
Vehs Exited	6461	6447	6473	6423
Starting Vehs	232	222	235	225
Ending Vehs	220	208	252	226
Travel Distance (mi)	4464	4459	4439	4430
Travel Time (hr)	238.2	232.3	227.6	235.9
Total Delay (hr)	95.0	90.2	85.7	94.1
Total Stops	10299	10223	9967	10425
Fuel Used (gal)	178.1	176.3	175.3	176.6

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	568	290	972	372	2202
Vehicles Exited	568	291	971	372	2202
Hourly Exit Rate	568	291	971	372	2202
Input Volume	568	292	973	370	2203
% of Volume	100	100	100	101	100

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	WBT	All
Vehicles Entered	2	140	1425	288	1855
Vehicles Exited	2	140	1425	288	1855
Hourly Exit Rate	2	140	1425	288	1855
Input Volume	2	139	1426	290	1857
% of Volume	100	101	100	99	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL	NBT	NBR
Vehicles Entered	124	764	536	89	194	203	42	4	37	332	277	170
Vehicles Exited	124	762	534	89	194	202	42	4	36	333	277	170
Hourly Exit Rate	124	762	534	89	194	202	42	4	36	333	277	170
Input Volume	126	769	531	94	192	201	44	4	38	320	271	167
% of Volume	98	99	101	95	101	100	95	100	95	104	102	102

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	SBU	SBL	SBT	SBR	SBR2	All
Vehicles Entered	11	120	321	59	47	3330
Vehicles Exited	11	118	319	59	47	3321
Hourly Exit Rate	11	118	319	59	47	3321
Input Volume	10	117	325	61	47	3317
% of Volume	110	101	98	97	100	100

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Vehicles Entered	705	347	17	468	59	13	17	1626
Vehicles Exited	704	346	17	468	59	13	17	1624
Hourly Exit Rate	704	346	17	468	59	13	17	1624
Input Volume	705	349	17	474	56	12	17	1630
% of Volume	100	99	100	99	105	108	100	100

5: Serramonte Blvd & Project Driveway 3 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	47	769	402	96	72	20	1406
Vehicles Exited	47	769	403	96	72	20	1407
Hourly Exit Rate	47	769	403	96	72	20	1407
Input Volume	47	772	412	90	77	19	1417
% of Volume	100	100	98	107	94	105	99

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Vehicles Entered	55	553	82	0	88	235	52	0	90	289	47	9
Vehicles Exited	55	553	82	0	88	234	52	0	90	289	47	9
Hourly Exit Rate	55	553	82	0	88	234	52	0	90	289	47	9
Input Volume	57	553	79	1	87	231	54	1	93	285	47	8
% of Volume	96	100	104	0	101	101	96	0	97	101	100	112

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBL	SBT	SBR	All
Vehicles Entered	118	651	112	2381
Vehicles Exited	117	650	112	2378
Hourly Exit Rate	117	650	112	2378
Input Volume	112	643	115	2366
% of Volume	104	101	97	101

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	82	26	474	10	8	5	209	172	14	6	528	148
Vehicles Exited	81	26	475	10	8	5	209	172	14	6	529	147
Hourly Exit Rate	81	26	475	10	8	5	209	172	14	6	529	147
Input Volume	81	23	478	9	8	5	207	172	14	7	539	147
% of Volume	100	113	99	111	100	100	101	100	100	86	98	100

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	1682
Vehicles Exited	1682
Hourly Exit Rate	1682
Input Volume	1690
% of Volume	100

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBT	SBR
Vehicles Entered	11	21	333	0	1	5	0	65	420	1	795	22
Vehicles Exited	11	21	332	0	1	5	0	66	420	1	798	22
Hourly Exit Rate	11	21	332	0	1	5	0	66	420	1	798	22
Input Volume	11	20	335	1	1	4	1	63	421	1	786	21
% of Volume	100	105	99	0	100	125	0	105	100	100	102	105

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	All
Vehicles Entered	1674
Vehicles Exited	1677
Hourly Exit Rate	1677
Input Volume	1665
% of Volume	101

9: Junipero Serra Blvd & Project Driveway 2 Performance by movement

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT	All
Vehicles Entered	43	20	385	69	2	30	514	1063
Vehicles Exited	42	20	385	68	2	30	514	1061
Hourly Exit Rate	42	20	385	68	2	30	514	1061
Input Volume	45	18	382	69	2	31	514	1061
% of Volume	93	111	101	99	100	97	100	100

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	36	747	15	8	405	19	5	13	63	39	1350
Vehicles Exited	36	746	15	8	405	19	5	13	62	40	1349
Hourly Exit Rate	36	746	15	8	405	19	5	13	62	40	1349
Input Volume	35	745	15	8	411	20	7	12	67	37	1357
% of Volume	103	100	100	100	99	95	71	108	93	108	99

11: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	6	815	428	4	2	3	1258
Vehicles Exited	6	814	428	4	2	3	1257
Hourly Exit Rate	6	814	428	4	2	3	1257
Input Volume	8	816	436	4	3	2	1269
% of Volume	75	100	98	100	67	150	99

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	5	804	448	4	1	2	1264
Vehicles Exited	5	803	448	4	1	2	1263
Hourly Exit Rate	5	803	448	4	1	2	1263
Input Volume	6	812	449	4	2	2	1275
% of Volume	83	99	100	100	50	100	99

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	694	12	7	449	3	9	1174
Vehicles Exited	694	12	7	449	3	9	1174
Hourly Exit Rate	694	12	7	449	3	9	1174
Input Volume	703	12	8	448	5	8	1184
% of Volume	99	100	88	100	60	112	99

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	660	43	30	440	16	30	1219
Vehicles Exited	660	44	30	440	16	30	1220
Hourly Exit Rate	660	44	30	440	16	30	1220
Input Volume	663	48	32	439	17	27	1226
% of Volume	100	92	94	100	94	111	100

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	6	10	9	427	810	15	1277
Vehicles Exited	6	10	9	427	808	15	1275
Hourly Exit Rate	6	10	9	427	808	15	1275
Input Volume	5	10	9	427	798	16	1265
% of Volume	120	100	100	100	101	94	101

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	626	22	13	346	8	13	1028
Vehicles Exited	627	22	13	346	8	13	1029
Hourly Exit Rate	627	22	13	346	8	13	1029
Input Volume	621	22	14	343	9	15	1024
% of Volume	101	100	93	101	89	87	100

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	592	12	8	355	3	7	977
Vehicles Exited	592	12	8	355	3	7	977
Hourly Exit Rate	592	12	8	355	3	7	977
Input Volume	589	12	8	352	4	6	971
% of Volume	101	100	100	101	75	117	101

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	581	17	7	362	1	1	969
Vehicles Exited	581	17	7	361	1	1	968
Hourly Exit Rate	581	17	7	361	1	1	968
Input Volume	581	14	8	359	1	1	964
% of Volume	100	121	88	101	100	100	100

26: Performance by movement

Movement	NBT	NWR	All
Vehicles Entered	140	582	722
Vehicles Exited	140	582	722
Hourly Exit Rate	140	582	722
Input Volume	139	568	707
% of Volume	101	102	102

Total Network Performance

Vehicles Entered	6427
Vehicles Exited	6423
Hourly Exit Rate	6423
Input Volume	40101
% of Volume	16

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
I-280 SB Off-Ramp	1	9.8	38.5	0.2	23	23	9.4
I-280 NB On-Ramp	2	2.8	12.6	0.1	24	25	2.0
Junipero Serra Blvd	3	25.5	32.6	0.1	7	8	22.5
Collins Avenue	4	5.4	11.6	0.0	14	14	5.3
	10	6.7	11.0	0.0	12	13	6.2
	11	11.2	15.7	0.0	9	9	11.2
Project Driveway 3	5	12.7	16.7	0.0	6	6	12.8
	19	2.7	7.6	0.0	20	20	2.7
	12	0.2	12.4	0.1	31	31	0.2
	13	0.4	10.7	0.1	29	29	0.5
	14	2.1	15.2	0.1	26	27	1.7
El Camino Real	6	21.5	28.6	0.1	9	9	20.9
	16	2.0	12.7	0.1	24	24	1.9
	17	0.3	8.7	0.1	29	29	0.3
	18	0.5	10.7	0.1	29	28	0.5
Hillside Blvd	7	9.6	26.7	0.2	23	24	10.0
Total		113.4	272.0	1.4	18	19	108.4

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed
I-280 SB Off-Ramp	23	9.5	23	8.7	23	9.5	22
I-280 NB On-Ramp	23	3.1	25	2.0	25	2.3	19
Junipero Serra Blvd	7	28.7	8	23.8	8	24.5	6
Collins Avenue	14	5.5	15	4.5	14	5.5	11
	13	6.4	12	6.8	12	7.2	9
	9	11.2	9	12.0	9	11.4	8
Project Driveway 3	6	12.6	6	13.0	6	12.8	6
	20	2.7	20	2.7	20	2.7	20
	31	0.2	30	0.2	30	0.3	31
	29	0.4	29	0.4	29	0.4	29
	26	1.8	23	3.9	26	2.1	25
El Camino Real	9	19.4	8	24.8	9	21.3	9
	24	2.1	24	2.1	23	2.1	24
	29	0.3	29	0.3	29	0.3	29
	29	0.5	29	0.5	28	0.6	28
Hillside Blvd	21	10.9	20	13.5	26	7.5	27
Total	18	115.2	18	119.3	18	110.4	17

Arterial Level of Service
Weekday AM Road Diet - Stop Sign

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Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 24 Delay	Run 25 Speed	Run 25 Delay	Run 27 Speed	Run 27 Delay	Run 29 Speed	Run 29 Delay
I-280 SB Off-Ramp	11.6	23	9.9	22	10.1	23	9.9
I-280 NB On-Ramp	6.1	25	2.2	24	2.7	24	2.5
Junipero Serra Blvd	30.4	8	24.5	7	25.4	7	26.1
Collins Avenue	8.4	16	3.9	15	4.8	14	5.7
	10.7	14	5.2	13	6.4	11	7.3
	13.9	9	10.6	9	11.0	9	11.7
Project Driveway 3	13.4	6	12.7	6	12.7	6	12.3
	2.7	20	2.7	20	2.7	20	2.7
	0.2	31	0.2	31	0.2	31	0.2
	0.5	29	0.4	29	0.5	29	0.5
	2.5	25	2.4	26	1.8	27	1.5
El Camino Real	21.2	8	23.5	9	20.4	9	20.3
	2.0	24	1.9	24	2.0	24	2.0
	0.3	29	0.2	29	0.3	29	0.3
	0.5	29	0.5	29	0.6	29	0.4
Hillside Blvd	6.9	23	10.1	24	9.6	28	6.6
Total	131.3	18	110.9	18	111.3	18	110.0

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 30 Speed	Run 30 Delay	Run 31 Speed	Run 31 Delay
I-280 SB Off-Ramp	23	9.4	22	10.3
I-280 NB On-Ramp	24	2.7	25	2.1
Junipero Serra Blvd	7	26.8	8	21.7
Collins Avenue	13	6.0	16	3.8
	12	6.7	16	4.1
	9	11.0	12	7.7
Project Driveway 3	6	12.9	7	11.4
	20	2.7	20	2.7
	31	0.2	31	0.2
	29	0.4	30	0.4
	27	1.5	26	2.0
El Camino Real	9	19.8	8	23.7
	24	1.9	24	2.0
	29	0.3	29	0.3
	28	0.6	29	0.5
Hillside Blvd	26	7.6	21	10.8
Total	18	110.5	19	103.7

Arterial Level of Service
Weekday AM Road Diet - Stop Sign

03/25/2019

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
Hillside Blvd	7	18.1	23.9	0.0	7	7	18.7
	18	0.8	15.2	0.2	41	48	0.5
	17	0.3	10.4	0.1	29	29	0.4
	16	0.3	8.4	0.1	30	29	0.4
El Camino Real	6	17.7	26.7	0.1	11	12	17.2
	14	1.7	10.3	0.1	24	24	1.7
	13	0.6	13.6	0.1	29	29	0.6
	12	0.5	10.7	0.1	29	29	0.5
	19	1.1	14.1	0.1	27	27	1.1
Project Driveway 3	5	7.4	12.1	0.0	13	13	7.5
	11	2.3	6.0	0.0	17	17	2.3
	10	0.2	4.9	0.0	29	29	0.3
Collins Avenue	4	0.5	4.5	0.0	29	29	0.4
Junipero Serra Blvd	3	17.7	22.4	0.0	7	7	17.9
I-280 NB On-Ramp	2	3.8	12.3	0.1	20	19	4.3
I-280 SB Off-Ramp	1	13.4	23.5	0.1	13	13	13.4
Total		86.5	219.0	1.2	19	19	87.3

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed
Hillside Blvd	7	15.9	11	8.6	6	19.9	7
	47	0.8	41	0.3	41	0.8	40
	29	0.3	30	0.2	29	0.3	29
	30	0.3	29	0.4	29	0.3	30
El Camino Real	10	20.2	11	19.7	11	18.6	12
	24	1.7	25	1.6	24	1.7	24
	29	0.5	29	0.5	29	0.5	28
	30	0.5	30	0.5	29	0.5	29
	28	1.1	28	1.0	28	1.0	27
Project Driveway 3	13	7.7	13	7.2	13	7.2	12
	17	2.4	17	2.3	17	2.3	17
	30	0.2	29	0.4	30	0.2	29
Collins Avenue	29	0.6	29	0.5	30	0.4	30
Junipero Serra Blvd	7	18.0	9	14.2	8	16.4	7
I-280 NB On-Ramp	20	3.7	20	3.5	21	3.3	20
I-280 SB Off-Ramp	12	15.7	13	13.3	13	12.6	12
Total	19	89.5	20	74.1	19	86.1	19

Arterial Level of Service
Weekday AM Road Diet - Stop Sign

03/25/2019

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 24 Delay	Run 25 Speed	Run 25 Delay	Run 27 Speed	Run 27 Delay	Run 29 Speed	Run 29 Delay
Hillside Blvd	17.0	6	21.0	6	21.8	5	22.8
	0.9	43	0.6	43	0.9	37	1.3
	0.3	29	0.2	29	0.4	29	0.4
	0.3	30	0.1	30	0.3	30	0.3
El Camino Real	16.2	11	18.1	12	16.5	11	18.4
	1.7	24	1.8	23	1.8	24	1.7
	0.6	29	0.5	29	0.6	29	0.6
	0.6	29	0.6	29	0.6	29	0.7
	1.1	27	0.9	27	1.3	27	1.2
Project Driveway 3	7.7	13	7.0	12	8.2	13	7.4
	2.3	17	2.3	17	2.3	17	2.2
	0.2	29	0.1	29	0.2	29	0.2
Collins Avenue	0.4	29	0.5	29	0.4	29	0.4
Junipero Serra Blvd	18.1	7	17.7	7	20.5	7	17.8
I-280 NB On-Ramp	3.8	19	4.2	21	3.3	19	4.3
I-280 SB Off-Ramp	15.0	12	14.0	14	11.1	13	12.9
Total	86.4	19	89.6	19	90.2	19	92.6

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 30 Speed	Run 30 Delay	Run 31 Speed	Run 31 Delay
Hillside Blvd	9	12.4	9	11.3
	32	0.7	36	1.0
	29	0.3	29	0.2
	30	0.3	30	0.3
El Camino Real	12	16.5	12	17.0
	24	1.7	24	1.6
	29	0.6	29	0.6
	29	0.5	29	0.5
	27	1.1	27	1.1
Project Driveway 3	13	7.5	13	7.1
	17	2.3	17	2.2
	29	0.2	30	0.1
	29	0.5	29	0.5
Collins Avenue	7	19.3	8	17.0
Junipero Serra Blvd	20	4.0	20	3.5
I-280 NB On-Ramp	13	12.4	13	13.7
I-280 SB Off-Ramp	13	12.4	13	13.7
Total	19	80.2	20	77.7

Queuing and Blocking Report
Weekday AM Road Diet - Stop Sign

03/25/2019

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	T	L	L
Maximum Queue (ft)	144	159	103	116	70	194	247
Average Queue (ft)	71	82	50	55	21	104	126
95th Queue (ft)	120	138	86	98	66	166	203
Link Distance (ft)	1253	1253	384	384		498	498
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)					50		
Storage Blk Time (%)					12	0	
Queuing Penalty (veh)					11	0	

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	WB	WB
Directions Served	UL	T	T	T	T
Maximum Queue (ft)	82	88	110	68	82
Average Queue (ft)	46	7	11	19	24
95th Queue (ft)	72	66	82	53	64
Link Distance (ft)		384	384	246	246
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			1		
Storage Bay Dist (ft)	200				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report
Weekday AM Road Diet - Stop Sign

03/25/2019

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	R>	U<L	L	T
Maximum Queue (ft)	80	96	262	280	242	131	116	139	127	155	173	116
Average Queue (ft)	39	40	172	154	119	60	57	75	54	75	95	54
95th Queue (ft)	69	77	255	257	219	111	99	119	100	129	151	98
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)			2	1	0	0	0	0	0			
Queuing Penalty (veh)			6	4	0	0	0	0	0			
Storage Bay Dist (ft)					225					295	295	
Storage Blk Time (%)					1	1						
Queuing Penalty (veh)					8	2						

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	UL	T	TR
Maximum Queue (ft)	131	114	147	171	163
Average Queue (ft)	57	43	65	97	88
95th Queue (ft)	108	94	122	149	143
Link Distance (ft)	1147		676	676	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		90	320		
Storage Blk Time (%)	2	1			
Queuing Penalty (veh)	3	1			

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	178	154	84	50	15	9	5	102	70
Average Queue (ft)	44	17	10	9	1	0	0	39	15
95th Queue (ft)	142	90	50	35	8	6	5	79	47
Link Distance (ft)	146	146			111	111		1189	
Upstream Blk Time (%)	1	0							
Queuing Penalty (veh)	7	2							
Storage Bay Dist (ft)			40	65		65		50	
Storage Blk Time (%)		0	0	0		0	7	0	
Queuing Penalty (veh)		1	0	0		0	1	0	

Queuing and Blocking Report
Weekday AM Road Diet - Stop Sign

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Intersection: 5: Serramonte Blvd & Project Driveway 3

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	142	42	84	131	74
Average Queue (ft)	117	2	47	71	34
95th Queue (ft)	139	23	73	109	58
Link Distance (ft)	110	110	162	162	249
Upstream Blk Time (%)	11			0	
Queuing Penalty (veh)	44			0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	UL	T	R	UL	T	T	T	R	UL	T
Maximum Queue (ft)	174	268	163	182	52	148	115	97	69	58	241	233
Average Queue (ft)	39	205	70	89	16	71	53	47	17	21	137	123
95th Queue (ft)	98	288	146	156	41	137	97	87	51	48	258	213
Link Distance (ft)	259	259	334	334			326	326	326			1268
Upstream Blk Time (%)	0	3										
Queuing Penalty (veh)	0	10										
Storage Bay Dist (ft)					300	200				160	300	
Storage Blk Time (%)						0						2
Queuing Penalty (veh)						0						5

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	208	127	84
Average Queue (ft)	94	36	32
95th Queue (ft)	169	87	63
Link Distance (ft)	1268	1268	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		0	0

Queuing and Blocking Report
Weekday AM Road Diet - Stop Sign

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Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	TR	L	T	R
Maximum Queue (ft)	115	309	48	31	232	131	67	711	100
Average Queue (ft)	46	159	12	5	114	52	8	388	77
95th Queue (ft)	93	274	39	23	199	100	36	770	131
Link Distance (ft)	850	850	192	192	908	908		900	
Upstream Blk Time (%)	5								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)					75				75
Storage Blk Time (%)	49								
Queuing Penalty (veh)	76								

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	T	TR	T	TR
Maximum Queue (ft)	190	105	36	90	92	46	31	139	145
Average Queue (ft)	31	80	4	34	28	7	4	35	40
95th Queue (ft)	121	116	23	71	69	28	19	99	106
Link Distance (ft)	472		186		1262	1262	1262	415	415
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	80		130						
Storage Blk Time (%)	0	8	0						
Queuing Penalty (veh)	0	1	0						

Intersection: 9: Junipero Serra Blvd & Project Driveway 2

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	TR	UL	T	T
Maximum Queue (ft)	67	37	35	70	66	75	57	89	58
Average Queue (ft)	22	7	14	19	18	23	23	28	14
95th Queue (ft)	52	28	39	56	54	57	52	70	43
Link Distance (ft)	196	196	196	676	676	676		591	591
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	210								
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
Weekday AM Road Diet - Stop Sign

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Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	NB	SB
Directions Served	LT	TR	LT	LTR	LTR
Maximum Queue (ft)	146	114	50	42	178
Average Queue (ft)	77	27	5	15	97
95th Queue (ft)	162	91	28	41	194
Link Distance (ft)	111	111	129	208	158
Upstream Blk Time (%)	8	0	28		
Queuing Penalty (veh)	27	1	0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 11: Serramonte Blvd

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	174	109	3	3	28
Average Queue (ft)	125	21	0	0	5
95th Queue (ft)	187	72	3	3	21
Link Distance (ft)	129	129	110	110	222
Upstream Blk Time (%)	13	0			
Queuing Penalty (veh)	53	1			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Serramonte Blvd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	25	33
Average Queue (ft)	2	3
95th Queue (ft)	14	19
Link Distance (ft)		255
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
 Weekday AM Road Diet - Stop Sign

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Intersection: 13: Serramonte Blvd

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	31	33
Average Queue (ft)	4	10
95th Queue (ft)	21	34
Link Distance (ft)		343
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: Serramonte Blvd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	151	46	60
Average Queue (ft)	21	16	27
95th Queue (ft)	93	44	53
Link Distance (ft)	518	259	411
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: El Camino Real

Movement	EB	NB	SB
Directions Served	LR	L	R
Maximum Queue (ft)	24	28	4
Average Queue (ft)	9	4	0
95th Queue (ft)	26	20	3
Link Distance (ft)		203	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	100
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
 Weekday AM Road Diet - Stop Sign

03/25/2019

Intersection: 16: Serramonte Blvd

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	57	34	31
Average Queue (ft)	7	7	11
95th Queue (ft)	34	28	35
Link Distance (ft)	300	289	289
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	41	33
Average Queue (ft)	4	9
95th Queue (ft)	23	32
Link Distance (ft)	389	205
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	37	28
Average Queue (ft)	2	2
95th Queue (ft)	17	15
Link Distance (ft)	850	247
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
 Weekday AM Road Diet - Stop Sign

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Intersection: 26:

Movement	NW	B36	B36
Directions Served	R	T	
Maximum Queue (ft)	49	88	57
Average Queue (ft)	2	11	5
95th Queue (ft)	19	51	31
Link Distance (ft)	352	175	175
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 270

HCM Signalized Intersection Capacity Analysis
 1: Serramonte Blvd & I-280 SB Off-Ramp

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↑	↑↑
Traffic Volume (vph)	0	1252	622	0	664	626
Future Volume (vph)	0	1252	622	0	664	626
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1318	655	0	699	659
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1318	655	0	699	659
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		27.7	17.4		18.9	29.7
Effective Green, g (s)		27.7	17.4		18.9	29.7
Actuated g/C Ratio		0.50	0.32		0.34	0.54
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1785	1611		1181	1507
v/s Ratio Prot		c0.37	0.13		c0.20	0.24
v/s Ratio Perm						
v/c Ratio		0.74	0.41		0.59	0.44
Uniform Delay, d1		10.7	14.7		14.8	7.6
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.6	0.2		0.8	0.2
Delay (s)		12.4	14.9		15.6	7.8
Level of Service		B	B		B	A
Approach Delay (s)		12.4	14.9		11.8	
Approach LOS		B	B		B	

Intersection Summary

HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	54.9	Sum of lost time (s)	11.5
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2: Serramonte Blvd & I-280 NB On-Ramp

03/25/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	556	1368	623	0	0	0
Future Volume (vph)	556	1368	623	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.1			
Lane Util. Factor	0.97	0.95	0.95			
Frt	1.00	1.00	1.00			
Flt Protected	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539	3539			
Flt Permitted	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539	3539			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	585	1440	656	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	585	1440	656	0	0	0
Turn Type	Prot	NA	NA			
Protected Phases	5	2	6			
Permitted Phases						
Actuated Green, G (s)	10.8	31.6	13.2			
Effective Green, g (s)	10.8	31.6	13.2			
Actuated g/C Ratio	0.34	1.00	0.42			
Clearance Time (s)	3.5	4.4	4.1			
Vehicle Extension (s)	3.0	4.0	3.0			
Lane Grp Cap (vph)	1173	3539	1478			
v/s Ratio Prot	0.17	c0.41	0.19			
v/s Ratio Perm						
v/c Ratio	0.50	0.41	0.44			
Uniform Delay, d1	8.3	0.0	6.6			
Progression Factor	1.00	1.00	1.00			
Incremental Delay, d2	0.3	0.1	0.2			
Delay (s)	8.6	0.1	6.8			
Level of Service	A	A	A			
Approach Delay (s)		2.6	6.8		0.0	
Approach LOS		A	A		A	
Intersection Summary						
HCM 2000 Control Delay		3.6		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.54				
Actuated Cycle Length (s)		31.6		Sum of lost time (s)		7.6
Intersection Capacity Utilization		60.7%		ICU Level of Service		B
Analysis Period (min)		15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	358	638	372	186	373	401	94	144	389	566	148	8
Future Volume (vph)	358	638	372	186	373	401	94	144	389	566	148	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.6	4.6			4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91			0.97	0.95	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00			1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.94	0.85			1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			0.95	1.00	1.00	
Satd. Flow (prot)	3433	3539	1559	1770	3199	1441			3433	3539	1558	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			0.95	1.00	1.00	
Satd. Flow (perm)	3433	3539	1559	1770	3199	1441			3433	3539	1558	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	377	672	392	196	393	422	99	152	409	596	156	8
RTOR Reduction (vph)	0	0	289	0	0	86	0	0	0	0	91	0
Lane Group Flow (vph)	377	672	103	196	629	199	0	0	561	596	65	0
Confl. Peds. (#/hr)			4								5	
Turn Type	Prot	NA	Perm	Prot	NA	Perm		Split	Split	NA	Perm	Split
Protected Phases	5	2		1	6			3	3	3		4
Permitted Phases			2			6						3
Actuated Green, G (s)	14.9	24.3	24.3	13.9	22.7	22.7			22.1	22.1	22.1	
Effective Green, g (s)	14.9	24.3	24.3	13.9	22.7	22.7			22.1	22.1	22.1	
Actuated g/C Ratio	0.16	0.26	0.26	0.15	0.25	0.25			0.24	0.24	0.24	
Clearance Time (s)	3.0	4.0	4.0	3.0	4.6	4.6			4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0			2.0	2.0	2.0	
Lane Grp Cap (vph)	555	933	411	267	788	355			823	849	373	
v/s Ratio Prot	0.11	0.19		c0.11	c0.20				0.16	c0.17		
v/s Ratio Perm			0.07			0.14					0.04	
v/c Ratio	0.68	0.72	0.25	0.73	0.80	0.56			0.68	0.70	0.17	
Uniform Delay, d1	36.3	30.8	26.7	37.3	32.6	30.3			31.8	32.0	27.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2	2.6	2.3	0.1	8.7	5.3	1.2			1.9	2.2	0.1	
Delay (s)	39.0	33.2	26.8	46.0	37.8	31.6			33.7	34.2	27.8	
Level of Service	D	C	C	D	D	C			C	C	C	
Approach Delay (s)		33.0			37.7						33.2	
Approach LOS		C			D						C	
Intersection Summary												
HCM 2000 Control Delay		33.6									C	
HCM 2000 Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		92.1									16.2	
Intersection Capacity Utilization		72.1%									C	
Analysis Period (min)		15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019

Movement	SBL	SBT	SBR	SBR2
Lane Configurations	↔	↕	↔	↕
Traffic Volume (vph)	112	301	112	169
Future Volume (vph)	112	301	112	169
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.0
Lane Util. Factor	1.00	0.95		1.00
Frbp, ped/bikes	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00		1.00
Frt	1.00	0.96		0.85
Flt Protected	0.95	1.00		1.00
Satd. Flow (prot)	1770	3395		1583
Flt Permitted	0.95	1.00		1.00
Satd. Flow (perm)	1770	3395		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	317	118	178
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	126	435	0	178
Confl. Peds. (#/hr)				
Turn Type	Split	NA		Free
Protected Phases	4	4		
Permitted Phases				Free
Actuated Green, G (s)	16.2	16.2		92.1
Effective Green, g (s)	16.2	16.2		92.1
Actuated g/C Ratio	0.18	0.18		1.00
Clearance Time (s)	4.6	4.6		
Vehicle Extension (s)	2.0	2.0		
Lane Grp Cap (vph)	311	597		1583
v/s Ratio Prot	0.07	c0.13		
v/s Ratio Perm				c0.11
v/c Ratio	0.41	0.73		0.11
Uniform Delay, d1	33.7	35.9		0.0
Progression Factor	1.00	1.00		1.00
Incremental Delay, d2	0.3	3.8		0.1
Delay (s)	34.0	39.6		0.1
Level of Service	C	D		A
Approach Delay (s)		29.2		
Approach LOS		C		
Intersection Summary				


HCM Unsignalized Intersection Capacity Analysis
 4: Collins Avenue & Serramonte Blvd

03/25/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↔	↕	↔	↕	↔	↕		
Traffic Volume (veh/h)	619	268	18	992	96	29		
Future Volume (Veh/h)	619	268	18	992	96	29		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	652	282	19	1044	101	31		
Pedestrians	2			3	3			
Lane Width (ft)	12.0			12.0	12.0			
Walking Speed (ft/s)	3.5			3.5	3.5			
Percent Blockage	0			0	0			
Right turn flare (veh)						2		
Median type	None			None				
Median storage (veh)								
Upstream signal (ft)	239			552				
pX, platoon unblocked			0.86		0.86	0.86		
vC, conflicting volume			655		956	332		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol			263		615	0		
IC, single (s)			4.1		6.8	6.9		
IC, 2 stage (s)								
IF (s)			2.2		3.5	3.3		
p0 queue free %			98		72	97		
cM capacity (veh/h)			1109		355	924		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	326	326	282	168	298	298	298	132
Volume Left	0	0	0	19	0	0	0	101
Volume Right	0	0	282	0	0	0	0	31
cSH	1700	1700	1700	1109	1700	1700	1700	464
Volume to Capacity	0.19	0.19	0.17	0.02	0.18	0.18	0.18	0.28
Queue Length 95th (ft)	0	0	0	1	0	0	0	29
Control Delay (s)	0.0	0.0	0.0	1.1	0.0	0.0	0.0	16.8
Lane LOS				A				C
Approach Delay (s)	0.0			0.2				16.8
Approach LOS								C
Intersection Summary								
Average Delay				1.1				
Intersection Capacity Utilization			39.6%		ICU Level of Service			A
Analysis Period (min)			15					

HCM Signalized Intersection Capacity Analysis
5: Serramonte Blvd & Project Driveway 3


03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕	↕
Traffic Volume (vph)	90	537	867	199	116	77
Future Volume (vph)	90	537	867	199	116	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	
Lane Util. Factor		0.95	0.95		1.00	
Frpb, ped/bikes		1.00	0.99		0.99	
Flpb, ped/bikes		1.00	1.00		1.00	
Frt		1.00	0.97		0.95	
Flt Protected		0.99	1.00		0.97	
Satd. Flow (prot)		3514	3417		1701	
Flt Permitted		0.71	1.00		0.97	
Satd. Flow (perm)		2523	3417		1701	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	565	913	209	122	81
RTOR Reduction (vph)	0	0	20	0	27	0
Lane Group Flow (vph)	0	660	1102	0	176	0
Confl. Peds. (#/hr)	4			15	15	4
Turn Type	pm+pt	NA	NA		Prot	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Actuated Green, G (s)		26.5	26.5		11.3	
Effective Green, g (s)		26.5	26.5		11.3	
Actuated g/C Ratio		0.57	0.57		0.24	
Clearance Time (s)		4.5	4.5		4.5	
Vehicle Extension (s)		2.5	2.5		2.5	
Lane Grp Cap (vph)		1428	1934		410	
v/s Ratio Prot			c0.32		c0.10	
v/s Ratio Perm		0.26				
v/c Ratio		0.46	0.57		0.43	
Uniform Delay, d1		6.0	6.5		15.0	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		0.2	0.3		0.5	
Delay (s)		6.1	6.8		15.5	
Level of Service		A	A		B	
Approach Delay (s)		6.1	6.8		15.5	
Approach LOS		A	A		B	
Intersection Summary						
HCM 2000 Control Delay		7.5		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.60				
Actuated Cycle Length (s)		46.8		Sum of lost time (s)		13.5
Intersection Capacity Utilization		71.5%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations		↕	↕		↕	↕		↕	↕	↕	↕	↕
Traffic Volume (vph)	173	316	135	136	493	158	4	249	823	134	5	94
Future Volume (vph)	173	316	135	136	493	158	4	249	823	134	5	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5		3.0	4.0	4.0		3.0
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	0.91	1.00		1.00
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	1.00	0.98		1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Frt		1.00	0.96		1.00	1.00		1.00	1.00	0.85		1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		1770	1770		1770	1863		1770	5085	1556		1770
Flt Permitted		0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)		1770	1770		1770	1863		1770	5085	1556		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	182	333	142	143	519	166	4	262	866	141	5	99
RTOR Reduction (vph)	0	14	0	0	0	113	0	0	0	97	0	0
Lane Group Flow (vph)	182	461	0	143	519	53	0	266	866	44	0	104
Confl. Peds. (#/hr)			7			5				5		
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	3	8		7	4		1	1	6		5	5
Permitted Phases						4				6		
Actuated Green, G (s)	12.2	32.0		9.9	29.7	29.7			16.3	28.8		8.1
Effective Green, g (s)	12.2	32.0		9.9	29.7	29.7			16.3	28.8		8.1
Actuated g/C Ratio	0.13	0.34		0.11	0.32	0.32			0.18	0.31		0.09
Clearance Time (s)	3.5	3.5		3.5	3.5	3.5			3.0	4.0		3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0			2.0	4.0		2.0
Lane Grp Cap (vph)	232	610		188	596	498			310	1578		154
v/s Ratio Prot	c0.10	0.26		0.08	c0.28				c0.15	c0.17		0.06
v/s Ratio Perm						0.03						0.03
v/c Ratio	0.78	0.76		0.76	0.87	0.11			0.86	0.55		0.68
Uniform Delay, d1	39.0	26.9		40.3	29.7	22.2			37.1	26.6		41.1
Progression Factor	1.00	1.00		1.00	1.00	1.00			1.00	1.00		1.00
Incremental Delay, d2	14.7	4.7		15.0	12.8	0.0			19.6	0.5		8.8
Delay (s)	53.7	31.7		55.3	42.5	22.2			56.7	27.1		49.9
Level of Service	D	C		E	D	C			E	C		D
Approach Delay (s)		37.8			40.7				32.8			
Approach LOS		D			D				C			
Intersection Summary												
HCM 2000 Control Delay		35.8										D
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		92.8								14.0		
Intersection Capacity Utilization		72.8%										C
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	SBT	SBR
Lane Configurations	↑↑↑	↑
Traffic Volume (vph)	479	136
Future Volume (vph)	479	136
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	4.0
Lane Util. Factor	0.91	1.00
Frbp, ped/bikes	1.00	0.99
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5085	1562
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5085	1562
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	504	143
RTOR Reduction (vph)	0	111
Lane Group Flow (vph)	504	32
Confl. Peds. (#/hr)	1	
Turn Type	NA	Perm
Protected Phases	2	
Permitted Phases		2
Actuated Green, G (s)	20.6	20.6
Effective Green, g (s)	20.6	20.6
Actuated g/C Ratio	0.22	0.22
Clearance Time (s)	4.0	4.0
Vehicle Extension (s)	4.0	4.0
Lane Grp Cap (vph)	1128	346
v/s Ratio Prot	0.10	
v/s Ratio Perm		0.02
v/c Ratio	0.45	0.09
Uniform Delay, d1	31.2	28.7
Progression Factor	1.00	1.00
Incremental Delay, d2	0.4	0.2
Delay (s)	31.6	28.8
Level of Service	C	C
Approach Delay (s)	33.6	
Approach LOS	C	
Intersection Summary		
HCM 2000 Control Delay	28.0	
HCM 2000 Volume to Capacity ratio	0.77	
Actuated Cycle Length (s)	73.8	
Intersection Capacity Utilization	69.6%	
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
7: Hillside Blvd & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	↕
Traffic Volume (vph)	196	77	246	27	83	35	410	494	22	17	254	165
Future Volume (vph)	196	77	246	27	83	35	410	494	22	17	254	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5		4.5		4.5		4.5		4.5	
Lane Util. Factor	1.00	1.00		0.95	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		0.96	1.00	0.99	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.97	1.00		0.99	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1798	1548		3378	1770	1849	1770	1849		1770	1863	1534
Flt Permitted	0.69	1.00		0.87	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1283	1548		2978	1770	1849	1770	1849		1770	1863	1534
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	206	81	259	28	87	37	432	520	23	18	267	174
RTOR Reduction (vph)	0	0	181	0	26	0	0	2	0	0	0	124
Lane Group Flow (vph)	0	287	78	0	126	0	432	541	0	18	267	50
Confl. Peds. (#/hr)	1		1		2		2		2		16	
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2			3	8		7		4
Permitted Phases	2		2	2								4
Actuated Green, G (s)		22.2	22.2		22.2		19.9	37.2		0.9	18.2	18.2
Effective Green, g (s)		22.2	22.2		22.2		19.9	37.2		0.9	18.2	18.2
Actuated g/C Ratio	0.30	0.30		0.30			0.27	0.50		0.01	0.25	0.25
Clearance Time (s)	4.5	4.5		4.5			4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0			3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	385	465		895			477	932		21	459	378
v/s Ratio Prot							c0.24	c0.29		0.01	0.14	
v/s Ratio Perm	c0.22	0.05		0.04								0.03
v/c Ratio	0.75	0.17		0.14			0.91	0.58		0.86	0.58	0.13
Uniform Delay, d1	23.3	19.0		18.8			26.0	12.8		36.4	24.5	21.6
Progression Factor	1.00	1.00		1.00			1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.4	0.8		0.3			20.5	0.9		129.6	1.9	0.2
Delay (s)	35.6	19.8		19.2			46.6	13.8		166.0	26.3	21.8
Level of Service	D	B		B			D	B		F	C	C
Approach Delay (s)	28.1			19.2			28.3			30.1		
Approach LOS	C			B			C			C		
Intersection Summary												
HCM 2000 Control Delay	28.0			HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio	0.77											
Actuated Cycle Length (s)	73.8			Sum of lost time (s)				13.5				
Intersection Capacity Utilization	69.6%			ICU Level of Service				C				
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↕		↕			↕	↕	↕		↕
Traffic Volume (vph)	24	1	276	0	0	2	2	70	1187	0	0	745
Future Volume (vph)	24	1	276	0	0	2	2	70	1187	0	0	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5			4.5	4.5			4.5
Lane Util. Factor		1.00	1.00		1.00			1.00	0.91			0.91
Frpb, ped/bikes		1.00	1.00		0.98			1.00	1.00			1.00
Flpb, ped/bikes		1.00	1.00		1.00			1.00	1.00			1.00
Frt		1.00	0.85		0.86			1.00	1.00			0.99
Flt Protected		0.95	1.00		1.00			0.95	1.00			1.00
Satd. Flow (prot)		1771	1583		1586			1770	5085			5051
Flt Permitted		0.74	1.00		1.00			0.95	1.00			1.00
Satd. Flow (perm)		1367	1583		1586			1770	5085			5051
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	1	291	0	0	2	2	74	1249	0	0	784
RTOR Reduction (vph)	0	0	259	0	2	0	0	0	0	0	0	3
Lane Group Flow (vph)	0	26	32	0	0	0	0	76	1249	0	0	812
Confl. Peds. (#/hr)	3					3				6	9	
Turn Type	Perm	NA	Perm		NA		Prot	Prot	NA			NA
Protected Phases		4			8		1	1	6			2
Permitted Phases	4		4	8								
Actuated Green, G (s)		8.1	8.1		8.1			7.3	57.2			45.4
Effective Green, g (s)		8.1	8.1		8.1			7.3	57.2			45.4
Actuated g/C Ratio		0.11	0.11		0.11			0.10	0.77			0.61
Clearance Time (s)		4.5	4.5		4.5			4.5	4.5			4.5
Vehicle Extension (s)		3.0	3.0		3.0			3.0	3.0			3.0
Lane Grp Cap (vph)		149	172		172			173	3914			3086
v/s Ratio Prot					0.00			c0.04	c0.25			0.16
v/s Ratio Perm		0.02	c0.02									
v/c Ratio		0.17	0.18		0.00			0.44	0.32			0.26
Uniform Delay, d1		30.1	30.1		29.5			31.6	2.6			6.7
Progression Factor		1.00	1.00		1.00			1.00	1.00			1.00
Incremental Delay, d2		0.6	0.5		0.0			1.8	0.2			0.2
Delay (s)		30.6	30.6		29.5			33.4	2.8			6.9
Level of Service		C	C		C			C	A			A
Approach Delay (s)		30.6			29.5			4.6				6.9
Approach LOS		C			C			A				A
Intersection Summary												
HCM 2000 Control Delay		8.7							A			
HCM 2000 Volume to Capacity ratio		0.33										
Actuated Cycle Length (s)		74.3			Sum of lost time (s)			13.5				
Intersection Capacity Utilization		56.5%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	SBR
Lane Configurations	↕
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.99
Flt Protected	1.00
Satd. Flow (prot)	5051
Flt Permitted	1.00
Satd. Flow (perm)	5051
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	31
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Turn Type	NA
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 9: Junipero Serra Blvd & Project Driveway 2

03/25/2019

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	170	105	7	852	167	56	525
Future Volume (vph)	170	105	7	852	167	56	525
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5		4.5	4.5
Lane Util. Factor	0.97	1.00		0.91		1.00	0.95
Frbp, ped/bikes	1.00	0.99		1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00
Frt	1.00	0.85		0.98		1.00	1.00
Flt Protected	0.95	1.00		1.00		0.95	1.00
Satd. Flow (prot)	3433	1563		4946		1770	3539
Flt Permitted	0.95	1.00		0.94		0.95	1.00
Satd. Flow (perm)	3433	1563		4636		1770	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	111	7	897	176	59	553
RTOR Reduction (vph)	0	94	0	36	0	0	0
Lane Group Flow (vph)	179	17	0	1044	0	59	553
Confl. Peds. (#/hr)		1				5	
Turn Type	Prot	Perm	Perm	NA		Prot	NA
Protected Phases	8			2		1	6
Permitted Phases		8	2				
Actuated Green, G (s)	7.9	7.9		27.4		2.1	34.0
Effective Green, g (s)	7.9	7.9		27.4		2.1	34.0
Actuated g/C Ratio	0.16	0.16		0.54		0.04	0.67
Clearance Time (s)	4.5	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	532	242		2495		73	2363
v/s Ratio Prot	c0.05					c0.03	0.16
v/s Ratio Perm		0.01		c0.23			
v/c Ratio	0.34	0.07		0.42		0.81	0.23
Uniform Delay, d1	19.2	18.4		7.0		24.2	3.3
Progression Factor	1.00	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.4	0.1		0.5		46.1	0.2
Delay (s)	19.5	18.5		7.5		70.3	3.6
Level of Service	B	B		A		E	A
Approach Delay (s)	19.1			7.5			10.0
Approach LOS	B			A			A

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c	Critical Lane Group		

SimTraffic Simulation Summary
 Weekday PM Road Diet - Signal

03/25/2019

Summary of All Intervals							
Run Number	20	21	22	23	24	26	27
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	9262	9271	9136	9211	9290	9174	9272
Vehs Exited	9272	9291	9157	9204	9233	9144	9310
Starting Vehs	342	352	334	338	315	325	366
Ending Vehs	332	332	313	345	372	355	328
Travel Distance (mi)	6131	6077	6052	6097	6050	6044	6078
Travel Time (hr)	343.4	334.6	330.1	345.0	336.3	327.4	326.4
Total Delay (hr)	146.9	139.6	136.5	150.3	142.7	133.9	132.6
Total Stops	13872	13426	13228	13916	13453	13190	12956
Fuel Used (gal)	252.9	249.9	246.0	252.8	249.0	246.5	247.3

Summary of All Intervals				
Run Number	28	29	30	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	9307	9249	9140	9232
Vehs Exited	9352	9255	9150	9239
Starting Vehs	337	337	340	339
Ending Vehs	292	331	330	326
Travel Distance (mi)	6137	6125	6041	6083
Travel Time (hr)	331.7	342.0	327.4	334.4
Total Delay (hr)	135.8	145.9	133.9	139.8
Total Stops	13382	13768	13154	13429
Fuel Used (gal)	250.3	252.5	246.0	249.3

Interval #0 Information Seeding	
Start Time	4:45
End Time	5:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

SimTraffic Simulation Summary
Weekday PM Road Diet - Signal

03/25/2019

Interval #1 Information Recording

Start Time	5:00						
End Time	6:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	20	21	22	23	24	26	27
Vehs Entered	9262	9271	9136	9211	9290	9174	9272
Vehs Exited	9272	9291	9157	9204	9233	9144	9310
Starting Vehs	342	352	334	338	315	325	366
Ending Vehs	332	332	313	345	372	355	328
Travel Distance (mi)	6131	6077	6052	6097	6050	6044	6078
Travel Time (hr)	343.4	334.6	330.1	345.0	336.3	327.4	326.4
Total Delay (hr)	146.9	139.6	136.5	150.3	142.7	133.9	132.6
Total Stops	13872	13426	13228	13916	13453	13190	12956
Fuel Used (gal)	252.9	249.9	246.0	252.8	249.0	246.5	247.3

Interval #1 Information Recording

Start Time	5:00			
End Time	6:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	28	29	30	Avg
Vehs Entered	9307	9249	9140	9232
Vehs Exited	9352	9255	9150	9239
Starting Vehs	337	337	340	339
Ending Vehs	292	331	330	326
Travel Distance (mi)	6137	6125	6041	6083
Travel Time (hr)	331.7	342.0	327.4	334.4
Total Delay (hr)	135.8	145.9	133.9	139.8
Total Stops	13382	13768	13154	13429
Fuel Used (gal)	250.3	252.5	246.0	249.3

SimTraffic Performance Report
Weekday PM Road Diet - Signal

03/25/2019

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	1230	637	663	633	3163
Vehicles Exited	1232	639	663	633	3167
Hourly Exit Rate	1232	639	663	633	3167
Input Volume	1252	623	664	626	3165
% of Volume	98	103	100	101	100

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL	EBT	WBT	All
Vehicles Entered	556	1347	643	2546
Vehicles Exited	556	1348	642	2546
Hourly Exit Rate	556	1348	642	2546
Input Volume	556	1368	629	2553
% of Volume	100	99	102	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBU
Vehicles Entered	347	632	368	184	414	402	97	151	386	582	148	7
Vehicles Exited	348	631	369	185	416	403	97	150	388	579	148	7
Hourly Exit Rate	348	631	369	185	416	403	97	150	388	579	148	7
Input Volume	358	638	372	186	407	401	94	144	389	566	148	8
% of Volume	97	99	99	99	102	100	103	104	100	102	100	88

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	SBL	SBT	SBR	SBR2	All
Vehicles Entered	106	307	113	172	4416
Vehicles Exited	106	308	113	171	4419
Hourly Exit Rate	106	308	113	171	4419
Input Volume	112	302	112	169	4406
% of Volume	95	102	101	101	100

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	618	268	16	1003	94	29	2028
Vehicles Exited	619	268	16	1003	95	29	2030
Hourly Exit Rate	619	268	16	1003	95	29	2030
Input Volume	630	268	18	992	96	29	2033
% of Volume	98	100	89	101	99	100	100

SimTraffic Performance Report
Weekday PM Road Diet - Signal

03/25/2019

5: Serramonte Blvd & Project Driveway 3 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	88	558	870	203	114	81	1914
Vehicles Exited	88	559	869	203	114	82	1915
Hourly Exit Rate	88	559	869	203	114	82	1915
Input Volume	90	567	867	199	116	77	1916
% of Volume	98	99	100	102	98	106	100

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Vehicles Entered	175	348	132	137	494	157	4	246	825	136	4	92
Vehicles Exited	176	347	131	137	495	157	4	245	827	135	4	92
Hourly Exit Rate	176	347	131	137	495	157	4	245	827	135	4	92
Input Volume	173	357	135	136	493	158	4	249	833	134	5	94
% of Volume	102	97	97	101	100	99	100	98	99	101	80	98

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBT	SBR	All
Vehicles Entered	491	141	3382
Vehicles Exited	491	142	3383
Hourly Exit Rate	491	142	3383
Input Volume	479	136	3386
% of Volume	103	104	100

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	197	95	238	26	84	37	410	494	25	16	248	162
Vehicles Exited	197	95	240	26	84	37	410	495	25	16	250	163
Hourly Exit Rate	197	95	240	26	84	37	410	495	25	16	250	163
Input Volume	196	96	246	27	83	35	410	494	22	17	254	165
% of Volume	101	99	98	96	101	106	100	100	114	94	98	99

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	2032
Vehicles Exited	2038
Hourly Exit Rate	2038
Input Volume	2045
% of Volume	100

SimTraffic Performance Report
Weekday PM Road Diet - Signal

03/25/2019

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBT	EBR	WBR	NBU	NBL	NBT	SBT	SBR	All
Vehicles Entered	23	1	275	1	2	65	1176	750	33	2326
Vehicles Exited	23	1	275	1	2	65	1173	748	33	2321
Hourly Exit Rate	23	1	275	1	2	65	1173	748	33	2321
Input Volume	24	1	276	2	2	70	1187	745	29	2336
% of Volume	96	100	100	50	100	93	99	100	114	99

9: Junipero Serra Blvd & Project Driveway 2 Performance by movement

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	All
Vehicles Entered	174	110	6	856	168	52	523	1889
Vehicles Exited	173	110	6	860	168	52	522	1891
Hourly Exit Rate	173	110	6	860	168	52	522	1891
Input Volume	170	105	7	852	167	56	525	1882
% of Volume	102	105	86	101	101	93	99	100

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	24	608	5	9	944	34	14	9	33	58	1738
Vehicles Exited	24	609	5	9	943	34	14	9	34	58	1739
Hourly Exit Rate	24	609	5	9	943	34	14	9	34	58	1739
Input Volume	23	620	5	8	937	36	13	9	37	56	1744
% of Volume	104	98	100	112	101	94	108	100	92	104	100

11: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	8	635	969	14	11	16	1653
Vehicles Exited	8	636	969	14	11	16	1654
Hourly Exit Rate	8	636	969	14	11	16	1654
Input Volume	8	647	964	13	11	16	1659
% of Volume	100	98	101	108	100	100	100

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	2	638	1015	3	2	5	1665
Vehicles Exited	2	638	1016	3	2	5	1666
Hourly Exit Rate	2	638	1016	3	2	5	1666
Input Volume	3	650	1008	4	3	4	1672
% of Volume	67	98	101	75	67	125	100

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	619	9	13	998	21	18	1678
Vehicles Exited	619	9	13	999	21	19	1680
Hourly Exit Rate	619	9	13	999	21	19	1680
Input Volume	631	8	11	991	22	15	1678
% of Volume	98	112	118	101	95	127	100

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	608	30	45	936	76	47	1742
Vehicles Exited	608	29	46	936	75	46	1740
Hourly Exit Rate	608	29	46	936	75	46	1740
Input Volume	616	30	46	927	75	49	1743
% of Volume	99	97	100	101	100	94	100

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	37	24	28	1173	756	19	2037
Vehicles Exited	37	24	27	1172	757	19	2036
Hourly Exit Rate	37	24	27	1172	757	19	2036
Input Volume	37	24	32	1183	748	20	2044
% of Volume	100	100	84	99	101	95	100

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	510	25	32	700	34	24	1325
Vehicles Exited	510	25	31	699	35	24	1324
Hourly Exit Rate	510	25	31	699	35	24	1324
Input Volume	520	24	33	699	33	24	1333
% of Volume	98	104	94	100	106	100	99

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	514	8	13	710	21	15	1281
Vehicles Exited	514	8	13	709	21	16	1281
Hourly Exit Rate	514	8	13	709	21	16	1281
Input Volume	522	9	13	711	20	14	1289
% of Volume	98	89	100	100	105	114	99

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	522	8	10	711	10	8	1269
Vehicles Exited	522	8	11	712	11	8	1272
Hourly Exit Rate	522	8	11	712	11	8	1272
Input Volume	529	8	11	712	12	9	1281
% of Volume	99	100	100	100	92	89	99

26: Performance by movement

Movement	NBT	NWR	All
Vehicles Entered	557	960	1517
Vehicles Exited	556	960	1516
Hourly Exit Rate	556	960	1516
Input Volume	556	959	1515
% of Volume	100	100	100

Total Network Performance

Movement	All
Vehicles Entered	9232
Vehicles Exited	9239
Hourly Exit Rate	9239
Input Volume	55152
% of Volume	17

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
I-280 SB Off-Ramp	1	14.6	43.4	0.2	20	20	15.1
I-280 NB On-Ramp	2	2.2	12.2	0.1	25	25	2.0
Junipero Serra Blvd	3	31.0	38.2	0.1	6	6	31.2
Collins Avenue	4	4.4	10.5	0.0	15	14	5.6
	10	5.1	9.5	0.0	14	11	7.6
	11	9.4	13.9	0.0	10	9	10.6
Project Driveway 3	5	10.8	14.9	0.0	7	7	11.0
	19	1.5	6.9	0.0	25	24	1.6
	12	0.7	13.1	0.1	28	28	0.7
	13	0.8	11.1	0.1	28	28	0.7
	14	4.5	17.6	0.1	22	23	3.8
El Camino Real	6	26.3	33.4	0.1	7	7	26.1
	16	1.8	12.7	0.1	24	24	1.8
	17	0.3	8.7	0.1	29	29	0.2
	18	0.3	10.5	0.1	29	29	0.3
Hillside Blvd	7	22.5	41.2	0.2	15	14	23.9
Total		136.2	297.5	1.4	17	16	142.4

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed
I-280 SB Off-Ramp	20	14.5	22	11.5	20	15.7	21
I-280 NB On-Ramp	25	2.2	25	2.2	25	2.1	25
Junipero Serra Blvd	6	30.8	6	33.3	7	27.8	6
Collins Avenue	16	3.8	14	5.4	15	4.4	15
	13	5.5	11	8.2	14	5.4	13
	10	9.3	8	13.7	9	11.0	11
Project Driveway 3	7	10.7	6	12.9	6	12.9	7
	24	1.6	24	1.6	25	1.5	25
	28	0.7	28	0.7	28	0.7	28
	28	1.0	29	0.8	29	0.8	28
	16	11.1	25	2.4	25	2.4	23
El Camino Real	6	30.5	8	24.1	8	24.7	8
	24	1.9	24	1.8	24	1.8	24
	29	0.3	29	0.2	29	0.3	29
	29	0.4	29	0.3	29	0.3	29
Hillside Blvd	15	22.6	16	20.7	15	23.2	16
Total	16	146.9	16	139.8	17	135.0	17

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 24 Delay	Run 26 Speed	Run 26 Delay	Run 27 Speed	Run 27 Delay	Run 28 Speed	Run 28 Delay
I-280 SB Off-Ramp	13.7	19	16.3	20	15.7	20	14.8
I-280 NB On-Ramp	2.1	25	2.1	24	2.3	25	2.0
Junipero Serra Blvd	31.0	7	29.1	6	32.7	7	27.5
Collins Avenue	4.7	16	4.0	17	3.6	17	3.7
	5.7	17	3.3	18	3.0	17	3.6
	8.4	12	7.2	12	7.4	12	7.1
Project Driveway 3	11.0	8	9.2	7	9.8	7	10.0
	1.5	25	1.4	25	1.5	25	1.4
	0.7	28	0.8	28	0.7	28	0.6
	0.8	28	0.8	28	0.8	29	0.7
	4.0	21	5.6	26	2.0	23	3.8
El Camino Real	25.3	8	25.4	8	25.3	7	27.7
	1.8	24	1.7	24	1.9	24	1.9
	0.3	29	0.3	29	0.3	29	0.3
	0.3	29	0.4	29	0.4	29	0.4
Hillside Blvd	20.5	17	18.1	14	24.5	14	24.3
Total	131.8	17	125.6	17	131.8	17	129.7

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 29 Speed	Run 29 Delay	Run 30 Speed	Run 30 Delay
I-280 SB Off-Ramp	21	14.1	20	14.0
I-280 NB On-Ramp	24	2.7	25	2.0
Junipero Serra Blvd	6	34.6	6	31.4
Collins Avenue	15	4.8	17	3.6
	14	5.0	16	4.0
	10	10.0	10	9.2
Project Driveway 3	7	10.5	7	10.8
	24	1.8	25	1.5
	28	0.8	28	0.8
	28	0.8	28	0.8
	21	5.2	23	3.8
El Camino Real	7	26.3	7	27.1
	24	1.9	24	1.7
	29	0.2	29	0.2
	29	0.3	29	0.3
Hillside Blvd	14	24.4	15	23.3
Total	16	143.5	17	134.4

Arterial Level of Service
Weekday PM Road Diet - Signal

03/25/2019

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
Hillside Blvd	7	17.3	22.7	0.0	7	8	14.7
	18	1.1	17.5	0.2	36	35	1.0
	17	1.1	11.3	0.1	27	27	1.1
El Camino Real	16	4.0	12.1	0.1	21	18	5.9
	6	41.2	51.4	0.1	6	5	47.3
	14	2.6	11.0	0.1	23	23	2.6
Project Driveway 3	13	1.2	14.3	0.1	27	27	1.2
	12	1.0	11.0	0.1	28	28	1.0
	19	1.9	14.3	0.1	26	25	2.4
Collins Avenue	5	5.2	10.6	0.0	16	14	6.7
	11	1.1	4.7	0.0	21	21	1.2
	10	0.7	5.4	0.0	26	25	0.9
Junipero Serra Blvd	4	2.8	7.0	0.0	19	16	4.1
	3	26.6	31.1	0.0	5	5	29.2
	2	6.8	15.2	0.1	16	17	5.8
I-280 NB On-Ramp	1	17.6	27.8	0.1	11	10	18.5
Total		132.2	267.5	1.2	16	15	143.6

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed
Hillside Blvd	7	17.0	6	21.4	6	20.4	6
	37	1.0	36	1.3	37	1.1	37
	28	0.6	28	0.7	20	5.1	28
El Camino Real	26	1.7	27	1.3	9	19.0	26
	6	38.0	6	38.4	5	55.2	6
	23	2.4	23	2.7	22	2.7	23
Project Driveway 3	28	1.2	27	1.3	27	1.3	27
	28	1.0	28	1.0	29	1.0	28
	26	1.6	25	2.1	25	2.1	26
Collins Avenue	18	4.4	15	6.2	16	5.1	17
	22	1.0	21	1.1	22	1.0	21
	27	0.5	27	0.6	28	0.5	25
Junipero Serra Blvd	19	2.6	20	2.2	20	2.2	17
	5	26.9	6	23.5	5	26.2	5
	16	6.9	16	6.6	17	6.3	15
I-280 NB On-Ramp	11	18.3	11	16.8	11	17.0	11
Total	16	125.1	16	127.1	14	166.2	16

Arterial Level of Service
Weekday PM Road Diet - Signal

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Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 24 Delay	Run 26 Speed	Run 26 Delay	Run 27 Speed	Run 27 Delay	Run 28 Speed	Run 28 Delay
Hillside Blvd	18.8	8	14.2	8	14.1	7	16.5
	1.0	38	0.8	37	1.0	36	1.0
	0.5	28	0.7	28	0.7	28	0.6
El Camino Real	1.3	22	3.4	27	1.2	23	2.9
	37.7	6	41.7	6	38.8	6	38.7
	2.6	23	2.6	22	2.6	23	2.4
Project Driveway 3	1.3	27	1.2	28	1.2	28	1.2
	1.0	28	1.0	29	0.9	28	1.0
	1.9	26	1.8	26	1.6	26	1.8
Collins Avenue	4.9	17	4.6	17	4.6	16	5.3
	1.1	22	1.0	22	0.9	21	1.2
	1.1	26	0.7	27	0.5	25	1.0
Junipero Serra Blvd	3.6	20	2.3	19	2.7	18	3.1
	28.6	5	27.4	5	27.9	5	27.1
	7.4	16	6.8	16	7.1	16	6.6
I-280 SB Off-Ramp	17.3	11	18.2	11	16.7	11	16.9
Total	130.0	16	128.4	16	122.5	16	127.3

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 29 Speed	Run 29 Delay	Run 30 Speed	Run 30 Delay
Hillside Blvd	6	20.4	7	16.1
	34	1.3	35	1.2
	28	0.6	28	0.6
El Camino Real	27	1.0	27	1.1
	7	36.7	6	37.8
	23	2.6	23	2.5
Project Driveway 3	27	1.3	27	1.2
	29	0.9	28	1.0
	26	1.7	25	2.0
Collins Avenue	17	4.5	15	5.7
	22	0.9	22	1.0
	27	0.7	26	0.7
Junipero Serra Blvd	21	1.9	18	3.1
	6	23.9	6	25.1
	16	6.6	15	7.5
I-280 SB Off-Ramp	11	17.9	10	18.6
Total	16	122.8	16	125.3

Queuing and Blocking Report
Weekday PM Road Diet - Signal

03/25/2019

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	392	337	199	219	75	222	165	98
Average Queue (ft)	213	139	107	118	51	130	79	3
95th Queue (ft)	335	255	176	192	104	201	140	38
Link Distance (ft)	1253	1253	384	384		498	498	498
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	50							
Storage Blk Time (%)	31 1							
Queuing Penalty (veh)	64 3							

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	WB	WB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	236	62	95	69	146
Average Queue (ft)	133	4	6	4	57
95th Queue (ft)	210	39	46	37	110
Link Distance (ft)		384	384	384	246
Upstream Blk Time (%)	0				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)	200				
Storage Blk Time (%)	1				
Queuing Penalty (veh)	2				

Queuing and Blocking Report
Weekday PM Road Diet - Signal

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Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	R>	<L	L	T
Maximum Queue (ft)	177	177	266	260	238	162	167	171	172	218	236	227
Average Queue (ft)	96	110	168	145	86	117	126	148	137	127	131	127
95th Queue (ft)	151	164	251	233	174	174	176	178	181	196	209	206
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)	0		1	1	0	7	5	15	10			
Queuing Penalty (veh)	0		4	2	0	20	14	42	27			
Storage Bay Dist (ft)	225										295	295
Storage Blk Time (%)	1										0	0
Queuing Penalty (veh)	4										0	0

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	UL	T	TR	>
Maximum Queue (ft)	276	115	148	193	202	38
Average Queue (ft)	158	74	62	114	119	1
95th Queue (ft)	263	147	122	173	180	27
Link Distance (ft)	1147			676	676	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		90	320		280	
Storage Blk Time (%)		24	0			
Queuing Penalty (veh)		36	1			

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	160	130	68	84	106	121	90	222	75
Average Queue (ft)	29	10	6	21	16	39	27	84	33
95th Queue (ft)	108	65	37	67	68	105	83	177	84
Link Distance (ft)	146	146			111	111		1189	
Upstream Blk Time (%)	1	0			0	1			
Queuing Penalty (veh)	4	2			1	4			
Storage Bay Dist (ft)			40	65			65		50
Storage Blk Time (%)	0	0	2	1	4	1	37	1	
Queuing Penalty (veh)	0	0	4	2	9	2	11	1	

Queuing and Blocking Report
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Intersection: 5: Serramonte Blvd & Project Driveway 3

Movement	EB	EB	WB	WB	B19	SB
Directions Served	LT	T	T	TR	T	LR
Maximum Queue (ft)	155	57	162	231	57	182
Average Queue (ft)	118	5	63	116	2	85
95th Queue (ft)	152	34	123	209	27	151
Link Distance (ft)	110	110	184	184	488	249
Upstream Blk Time (%)	25	0	0	1		0
Queuing Penalty (veh)	81	0	0	7		0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	UL	T	T	T	R	UL	T
Maximum Queue (ft)	244	281	199	352	325	222	318	292	190	127	146	200
Average Queue (ft)	130	198	101	263	89	170	168	149	105	40	70	125
95th Queue (ft)	230	305	176	378	269	252	314	257	169	85	122	182
Link Distance (ft)	259	259	334	334			326	326	326			1268
Upstream Blk Time (%)	0	5		6	0		3	0				
Queuing Penalty (veh)	1	16		21	0		13	0				
Storage Bay Dist (ft)					300	200				160	300	
Storage Blk Time (%)				10	0	17	0		1	0		
Queuing Penalty (veh)				16	0	46	1		2	0		

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	168	154	115
Average Queue (ft)	89	42	57
95th Queue (ft)	158	105	107
Link Distance (ft)	1268	1268	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)		0	1
Queuing Penalty (veh)		0	2

Queuing and Blocking Report
Weekday PM Road Diet - Signal

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Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	TR	L	T	R
Maximum Queue (ft)	253	165	102	96	344	269	83	274	100
Average Queue (ft)	133	68	40	38	189	136	18	134	74
95th Queue (ft)	224	124	81	78	297	225	56	236	124
Link Distance (ft)	850	850	192	192	908	908		900	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							75		75
Storage Blk Time (%)							0	27	1
Queuing Penalty (veh)							0	48	4

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	T	TR	T	T	TR
Maximum Queue (ft)	192	105	29	99	145	107	88	112	129	112
Average Queue (ft)	41	76	1	36	58	26	15	28	36	27
95th Queue (ft)	133	115	11	75	122	72	50	83	97	78
Link Distance (ft)	472		186		1262	1262	1262	415	415	415
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		80		130						
Storage Blk Time (%)	0	7		0	0					
Queuing Penalty (veh)	0	2		0	0					

Intersection: 9: Junipero Serra Blvd & Project Driveway 2

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	UT	T	TR	L	T	T
Maximum Queue (ft)	87	86	72	128	137	154	80	85	84
Average Queue (ft)	42	37	37	60	70	77	33	36	33
95th Queue (ft)	74	73	62	112	124	136	65	74	69
Link Distance (ft)	196	196	196	676	676	676		591	591
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							210		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
 Weekday PM Road Diet - Signal

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Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	140	117	74	85	52	164
Average Queue (ft)	59	16	7	5	19	62
95th Queue (ft)	145	76	39	40	46	133
Link Distance (ft)	111	111	129	129	208	158
Upstream Blk Time (%)	5	0	0	0		5
Queuing Penalty (veh)	17	1	0	1		0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 11: Serramonte Blvd

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	162	107	13	38	71
Average Queue (ft)	104	11	0	2	25
95th Queue (ft)	186	56	8	20	62
Link Distance (ft)	129	129	110	110	222
Upstream Blk Time (%)	13	0		0	
Queuing Penalty (veh)	43	1		0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Serramonte Blvd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	21	31
Average Queue (ft)	2	7
95th Queue (ft)	12	28
Link Distance (ft)		255
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
 Weekday PM Road Diet - Signal

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Intersection: 13: Serramonte Blvd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	11	35	75
Average Queue (ft)	0	6	28
95th Queue (ft)	10	26	60
Link Distance (ft)	393		343
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		75	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Serramonte Blvd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	254	53	231
Average Queue (ft)	49	17	94
95th Queue (ft)	197	46	190
Link Distance (ft)	518	259	411
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: El Camino Real

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	T
Maximum Queue (ft)	86	57	74	56	2	2
Average Queue (ft)	29	12	11	5	0	0
95th Queue (ft)	63	42	69	42	2	2
Link Distance (ft)	203		415	415	326	326
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				
Storage Blk Time (%)		0	1			
Queuing Penalty (veh)		0	0			

Queuing and Blocking Report
 Weekday PM Road Diet - Signal

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Intersection: 16: Serramonte Blvd

Movement	EB	WB	WB	NB	NB
Directions Served	TR	LT	T	L	R
Maximum Queue (ft)	11	141	189	95	47
Average Queue (ft)	0	23	36	33	17
95th Queue (ft)	5	111	168	103	44
Link Distance (ft)	334	300	300	289	289
Upstream Blk Time (%)		0	1	0	
Queuing Penalty (veh)		1	5	0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: Serramonte Blvd

Movement	WB	WB	NB
Directions Served	LT	T	LR
Maximum Queue (ft)	71	53	62
Average Queue (ft)	8	5	25
95th Queue (ft)	46	54	54
Link Distance (ft)	389	389	205
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	42	53
Average Queue (ft)	5	16
95th Queue (ft)	26	43
Link Distance (ft)	850	247
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
 Weekday PM Road Diet - Signal

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Intersection: 26:

Movement	NW	B36	B36
Directions Served	R	T	
Maximum Queue (ft)	106	163	154
Average Queue (ft)	7	54	38
95th Queue (ft)	48	123	103
Link Distance (ft)	352	175	175
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 591

HCM Signalized Intersection Capacity Analysis
 1: Serramonte Blvd & I-280 SB Off-Ramp

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↑	↑↑
Traffic Volume (vph)	0	1252	622	0	664	626
Future Volume (vph)	0	1252	622	0	664	626
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1318	655	0	699	659
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1318	655	0	699	659
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		27.7	17.4		18.9	29.7
Effective Green, g (s)		27.7	17.4		18.9	29.7
Actuated g/C Ratio		0.50	0.32		0.34	0.54
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1785	1611		1181	1507
v/s Ratio Prot		c0.37	0.13		c0.20	0.24
v/s Ratio Perm						
v/c Ratio		0.74	0.41		0.59	0.44
Uniform Delay, d1		10.7	14.7		14.8	7.6
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.6	0.2		0.8	0.2
Delay (s)		12.4	14.9		15.6	7.8
Level of Service		B	B		B	A
Approach Delay (s)		12.4	14.9		11.8	
Approach LOS		B	B		B	
Intersection Summary						
HCM 2000 Control Delay		12.6		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.73				
Actuated Cycle Length (s)		54.9		Sum of lost time (s)		11.5
Intersection Capacity Utilization		60.7%		ICU Level of Service		B
Analysis Period (min)		15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2: Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑	↑↑	↑↑			
Traffic Volume (vph)	556	1368	623	0	0	0
Future Volume (vph)	556	1368	623	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.4		4.1	
Lane Util. Factor		0.97	0.95		0.95	
Frt		1.00	1.00		1.00	
Flt Protected		0.95	1.00		1.00	
Satd. Flow (prot)		3433	3539		3539	
Flt Permitted		0.95	1.00		1.00	
Satd. Flow (perm)		3433	3539		3539	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	585	1440	656	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	585	1440	656	0	0	0
Turn Type	Prot	NA	NA			
Protected Phases	5	2	6			
Permitted Phases						
Actuated Green, G (s)	10.8	31.6	13.2			
Effective Green, g (s)	10.8	31.6	13.2			
Actuated g/C Ratio	0.34	1.00	0.42			
Clearance Time (s)	3.5	4.4	4.1			
Vehicle Extension (s)	3.0	4.0	3.0			
Lane Grp Cap (vph)	1173	3539	1478			
v/s Ratio Prot	0.17	c0.41	0.19			
v/s Ratio Perm						
v/c Ratio	0.50	0.41	0.44			
Uniform Delay, d1	8.3	0.0	6.6			
Progression Factor	1.00	1.00	1.00			
Incremental Delay, d2	0.3	0.1	0.2			
Delay (s)	8.6	0.1	6.8			
Level of Service	A	A	A			
Approach Delay (s)		2.6	6.8		0.0	
Approach LOS		A	A		A	
Intersection Summary						
HCM 2000 Control Delay		3.6		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.54				
Actuated Cycle Length (s)		31.6		Sum of lost time (s)		7.6
Intersection Capacity Utilization		60.7%		ICU Level of Service		B
Analysis Period (min)		15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBU
Lane Configurations	↔	↕	↗	↗	↕	↖			↖	↖	↖	
Traffic Volume (vph)	358	638	372	186	373	401	94	144	389	566	148	8
Future Volume (vph)	358	638	372	186	373	401	94	144	389	566	148	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.6	4.6			4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91			0.97	0.95	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00			1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.94	0.85			1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			0.95	1.00	1.00	
Satd. Flow (prot)	3433	3539	1559	1770	3199	1441			3433	3539	1558	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			0.95	1.00	1.00	
Satd. Flow (perm)	3433	3539	1559	1770	3199	1441			3433	3539	1558	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	377	672	392	196	393	422	99	152	409	596	156	8
RTOR Reduction (vph)	0	0	289	0	0	86	0	0	0	0	91	0
Lane Group Flow (vph)	377	672	103	196	629	199	0	0	561	596	65	0
Confl. Peds. (#/hr)			4								5	
Turn Type	Prot	NA	Perm	Prot	NA	Perm		Split	Split	NA	Perm	Split
Protected Phases	5	2		1	6			3	3	3		4
Permitted Phases			2			6						3
Actuated Green, G (s)	14.9	24.3	24.3	13.9	22.7	22.7			22.1	22.1	22.1	
Effective Green, g (s)	14.9	24.3	24.3	13.9	22.7	22.7			22.1	22.1	22.1	
Actuated g/C Ratio	0.16	0.26	0.26	0.15	0.25	0.25			0.24	0.24	0.24	
Clearance Time (s)	3.0	4.0	4.0	3.0	4.6	4.6			4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0			2.0	2.0	2.0	
Lane Grp Cap (vph)	555	933	411	267	788	355			823	849	373	
v/s Ratio Prot	0.11	0.19		c0.11	c0.20				0.16	c0.17		
v/s Ratio Perm			0.07			0.14					0.04	
v/c Ratio	0.68	0.72	0.25	0.73	0.80	0.56			0.68	0.70	0.17	
Uniform Delay, d1	36.3	30.8	26.7	37.3	32.6	30.3			31.8	32.0	27.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2	2.6	2.3	0.1	8.7	5.3	1.2			1.9	2.2	0.1	
Delay (s)	39.0	33.2	26.8	46.0	37.8	31.6			33.7	34.2	27.8	
Level of Service	D	C	C	D	D	C			C	C	C	
Approach Delay (s)		33.0			37.7				33.2			
Approach LOS		C			D				C			

Intersection Summary

HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	92.1	Sum of lost time (s)	16.2
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	SBL	SBT	SBR	SBR2
Lane Configurations	↖	↕	↗	↖
Traffic Volume (vph)	112	301	112	169
Future Volume (vph)	112	301	112	169
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.0
Lane Util. Factor	1.00	0.95		1.00
Frbp, ped/bikes	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00		1.00
Frt	1.00	0.96		0.85
Flt Protected	0.95	1.00		1.00
Satd. Flow (prot)	1770	3395		1583
Flt Permitted	0.95	1.00		1.00
Satd. Flow (perm)	1770	3395		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	317	118	178
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	126	435	0	178
Confl. Peds. (#/hr)				
Turn Type	Split	NA		Free
Protected Phases	4	4		
Permitted Phases				Free
Actuated Green, G (s)	16.2	16.2		92.1
Effective Green, g (s)	16.2	16.2		92.1
Actuated g/C Ratio	0.18	0.18		1.00
Clearance Time (s)	4.6	4.6		
Vehicle Extension (s)	2.0	2.0		
Lane Grp Cap (vph)	311	597		1583
v/s Ratio Prot	0.07	c0.13		
v/s Ratio Perm				c0.11
v/c Ratio	0.41	0.73		0.11
Uniform Delay, d1	33.7	35.9		0.0
Progression Factor	1.00	1.00		1.00
Incremental Delay, d2	0.3	3.8		0.1
Delay (s)	34.0	39.6		0.1
Level of Service	C	D		A
Approach Delay (s)		29.2		
Approach LOS		C		

Intersection Summary

HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	92.1	Sum of lost time (s)	16.2
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Collins Avenue & Serramonte Blvd

03/25/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑		↑↑↑	↑	↑		
Traffic Volume (veh/h)	619	268	18	992	96	29		
Future Volume (Veh/h)	619	268	18	992	96	29		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	652	282	19	1044	101	31		
Pedestrians	2			3	3			
Lane Width (ft)	12.0			12.0	12.0			
Walking Speed (ft/s)	3.5			3.5	3.5			
Percent Blockage	0			0	0			
Right turn flare (veh)						2		
Median type	None			None				
Median storage (veh)								
Upstream signal (ft)	239			552				
pX, platoon unblocked			0.86		0.86	0.86		
vC, conflicting volume			655		956	332		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol			263		615	0		
IC, single (s)			4.1		6.8	6.9		
IC, 2 stage (s)								
IF (s)			2.2		3.5	3.3		
p0 queue free %			98		72	97		
cM capacity (veh/h)			1109		355	924		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	326	326	282	168	298	298	298	132
Volume Left	0	0	0	19	0	0	0	101
Volume Right	0	0	282	0	0	0	0	31
cSH	1700	1700	1700	1109	1700	1700	1700	464
Volume to Capacity	0.19	0.19	0.17	0.02	0.18	0.18	0.18	0.28
Queue Length 95th (ft)	0	0	0	1	0	0	0	29
Control Delay (s)	0.0	0.0	0.0	1.1	0.0	0.0	0.0	16.8
Lane LOS				A				C
Approach Delay (s)	0.0			0.2				16.8
Approach LOS								C
Intersection Summary								
Average Delay				1.1				
Intersection Capacity Utilization			39.6%		ICU Level of Service			A
Analysis Period (min)			15					

HCM Unsignalized Intersection Capacity Analysis
5: Serramonte Blvd & Project Driveway 3

03/25/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑↑
Sign Control		Stop	Stop		Stop	Stop
Traffic Volume (vph)	90	537	867	199	116	77
Future Volume (vph)	90	537	867	199	116	77
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	95	565	913	209	122	81
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total (vph)	283	377	609	513	203	
Volume Left (vph)	95	0	0	0	122	
Volume Right (vph)	0	0	0	209	81	
Hadj (s)	0.20	0.03	0.03	-0.25	-0.09	
Departure Headway (s)	6.9	6.7	6.3	6.0	6.7	
Degree Utilization, x	0.54	0.70	1.06	0.85	0.38	
Capacity (veh/h)	513	524	566	594	525	
Control Delay (s)	16.5	22.7	78.5	33.1	13.7	
Approach Delay (s)	20.0		57.8		13.7	
Approach LOS	C		F		B	
Intersection Summary						
Delay			40.7			
Level of Service			E			
Intersection Capacity Utilization			69.6%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	173	316	135	136	493	158	4	249	823	134	5	94
Future Volume (vph)	173	316	135	136	493	158	4	249	823	134	5	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5	3.5		3.0	4.0	4.0		3.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	0.91	1.00		1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98		1.00	1.00	0.98		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Frt	1.00	0.96		1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)	1770	1770		1770	1863	1558		1770	5085	1556		1770
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)	1770	1770		1770	1863	1558		1770	5085	1556		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	182	333	142	143	519	166	4	262	866	141	5	99
RTOR Reduction (vph)	0	14	0	0	0	113	0	0	0	97	0	0
Lane Group Flow (vph)	182	461	0	143	519	53	0	266	866	44	0	104
Confl. Peds. (#/hr)			7			5				5		
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	3	8		7	4		1	1	6		5	5
Permitted Phases						4				6		
Actuated Green, G (s)	12.2	32.0		9.9	29.7	29.7		16.3	28.8	28.8		8.1
Effective Green, g (s)	12.2	32.0		9.9	29.7	29.7		16.3	28.8	28.8		8.1
Actuated g/C Ratio	0.13	0.34		0.11	0.32	0.32		0.18	0.31	0.31		0.09
Clearance Time (s)	3.5	3.5		3.5	3.5	3.5		3.0	4.0	4.0		3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0	4.0	4.0		2.0
Lane Grp Cap (vph)	232	610		188	596	498		310	1578	482		154
v/s Ratio Prot	c0.10	0.26		0.08	c0.28			c0.15	c0.17			0.06
v/s Ratio Perm						0.03				0.03		
v/c Ratio	0.78	0.76		0.76	0.87	0.11		0.86	0.55	0.09		0.68
Uniform Delay, d1	39.0	26.9		40.3	29.7	22.2		37.1	26.6	22.7		41.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2	14.7	4.7		15.0	12.8	0.0		19.6	0.5	0.1		8.8
Delay (s)	53.7	31.7		55.3	42.5	22.2		56.7	27.1	22.8		49.9
Level of Service	D	C		E	D	C		E	C	C		D
Approach Delay (s)	37.8		40.7			32.8						
Approach LOS	D		D			C						
Intersection Summary												
HCM 2000 Control Delay	35.8		HCM 2000 Level of Service			D						
HCM 2000 Volume to Capacity ratio	0.77											
Actuated Cycle Length (s)	92.8		Sum of lost time (s)			14.0						
Intersection Capacity Utilization	72.8%		ICU Level of Service			C						
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	479	136
Future Volume (vph)	479	136
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	4.0
Lane Util. Factor	0.91	1.00
Frpb, ped/bikes	1.00	0.99
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5085	1562
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5085	1562
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	504	143
RTOR Reduction (vph)	0	111
Lane Group Flow (vph)	504	32
Confl. Peds. (#/hr)		1
Turn Type	NA	Perm
Protected Phases	2	
Permitted Phases		2
Actuated Green, G (s)	20.6	20.6
Effective Green, g (s)	20.6	20.6
Actuated g/C Ratio	0.22	0.22
Clearance Time (s)	4.0	4.0
Vehicle Extension (s)	4.0	4.0
Lane Grp Cap (vph)	1128	346
v/s Ratio Prot	0.10	
v/s Ratio Perm		0.02
v/c Ratio	0.45	0.09
Uniform Delay, d1	31.2	28.7
Progression Factor	1.00	1.00
Incremental Delay, d2	0.4	0.2
Delay (s)	31.6	28.8
Level of Service	C	C
Approach Delay (s)	33.6	
Approach LOS	C	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
 7: Hillside Blvd & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕↔	↕	↕	↕		↕	↕	↕
Traffic Volume (vph)	196	77	246	27	83	35	410	494	22	17	254	165
Future Volume (vph)	196	77	246	27	83	35	410	494	22	17	254	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		0.95	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frbp_ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.97
Flpb_ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		0.96	1.00	0.99	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.97	1.00		0.99	0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1798	1548		3378	1770	1849	1770	1863		1770	1863	1534
Flt Permitted	0.69	1.00		0.87	0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1283	1548		2978	1770	1849	1770	1863		1770	1863	1534
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	206	81	259	28	87	37	432	520	23	18	267	174
RTOR Reduction (vph)	0	0	181	0	26	0	0	2	0	0	0	124
Lane Group Flow (vph)	0	287	78	0	126	0	432	541	0	18	267	50
Confl. Peds. (#/hr)		1	1						2			16
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2	2		3	8		7	4	
Permitted Phases	2		2	2								4
Actuated Green, G (s)		22.2	22.2		22.2		19.9	37.2		0.9	18.2	18.2
Effective Green, g (s)		22.2	22.2		22.2		19.9	37.2		0.9	18.2	18.2
Actuated g/C Ratio		0.30	0.30		0.30		0.27	0.50		0.01	0.25	0.25
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		385	465		895		477	932		21	459	378
v/s Ratio Prot							c0.24	c0.29		0.01	0.14	
v/s Ratio Perm		c0.22	0.05		0.04							0.03
v/c Ratio		0.75	0.17		0.14		0.91	0.58		0.86	0.58	0.13
Uniform Delay, d1		23.3	19.0		18.8		26.0	12.8		36.4	24.5	21.6
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		12.4	0.8		0.3		20.5	0.9		129.6	1.9	0.2
Delay (s)		35.6	19.8		19.2		46.6	13.8		166.0	26.3	21.8
Level of Service		D	B		B		D	B		F	C	C
Approach Delay (s)		28.1			19.2		28.3			30.1		
Approach LOS		C			B		C			C		
Intersection Summary												
HCM 2000 Control Delay		28.0		HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		73.8		Sum of lost time (s)				13.5				
Intersection Capacity Utilization		69.6%		ICU Level of Service				C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↕		↕	↕		↕↔	↕↔	↕	↕	↕
Traffic Volume (vph)	24	1	276	0	0	2	2	70	1187	0	0	745
Future Volume (vph)	24	1	276	0	0	2	2	70	1187	0	0	745
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	0.91
Frbp_ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00		1.00	1.00	1.00
Flpb_ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		0.86	1.00		1.00	1.00		1.00	1.00	0.99
Flt Protected	0.95	1.00		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Satd. Flow (prot)	1771	1583		1586	1770		5085	5085		1770	1863	5051
Flt Permitted	0.74	1.00		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Satd. Flow (perm)	1367	1583		1586	1770		5085	5085		1770	1863	5051
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	1	291	0	0	2	2	74	1249	0	0	784
RTOR Reduction (vph)	0	0	259	0	2	0	0	0	0	0	0	3
Lane Group Flow (vph)	0	26	32	0	0	0	0	76	1249	0	0	812
Confl. Peds. (#/hr)		3					3			6		9
Turn Type	Perm	NA	Perm		NA		Prot	Prot	NA			NA
Protected Phases		4			8		1	1	6			2
Permitted Phases	4		4	8								
Actuated Green, G (s)		8.1	8.1		8.1		7.3	57.2		45.4		45.4
Effective Green, g (s)		8.1	8.1		8.1		7.3	57.2		45.4		45.4
Actuated g/C Ratio		0.11	0.11		0.11		0.10	0.77		0.61		0.61
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5		4.5		4.5
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		149	172		172		173	3914		3086		3086
v/s Ratio Prot					0.00		c0.04	c0.25				0.16
v/s Ratio Perm		0.02	c0.02									
v/c Ratio		0.17	0.18		0.00		0.44	0.32		0.26		0.26
Uniform Delay, d1		30.1	30.1		29.5		31.6	2.6		6.7		6.7
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2		0.6	0.5		0.0		1.8	0.2		0.2		0.2
Delay (s)		30.6	30.6		29.5		33.4	2.8		6.9		6.9
Level of Service		C	C		C		C	A		A		A
Approach Delay (s)		30.6			29.5		4.6			6.9		6.9
Approach LOS		C			C		A			A		A
Intersection Summary												
HCM 2000 Control Delay		8.7		HCM 2000 Level of Service				A				
HCM 2000 Volume to Capacity ratio		0.33										
Actuated Cycle Length (s)		74.3		Sum of lost time (s)				13.5				
Intersection Capacity Utilization		56.5%		ICU Level of Service				B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	31
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 9: Junipero Serra Blvd & Project Driveway 2

03/25/2019

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	170	105	7	852	167	56	525
Future Volume (vph)	170	105	7	852	167	56	525
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5		4.5	4.5
Lane Util. Factor	0.97	1.00		0.91		1.00	0.95
Frbp, ped/bikes	1.00	0.99		1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00
Frt	1.00	0.85		0.98		1.00	1.00
Flt Protected	0.95	1.00		1.00		0.95	1.00
Satd. Flow (prot)	3433	1563		4946		1770	3539
Flt Permitted	0.95	1.00		0.94		0.95	1.00
Satd. Flow (perm)	3433	1563		4636		1770	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	111	7	897	176	59	553
RTOR Reduction (vph)	0	94	0	36	0	0	0
Lane Group Flow (vph)	179	17	0	1044	0	59	553
Confl. Peds. (#/hr)		1				5	
Turn Type	Prot	Perm	Perm	NA		Prot	NA
Protected Phases	8			2		1	6
Permitted Phases		8	2				
Actuated Green, G (s)	7.9	7.9		27.4		2.1	34.0
Effective Green, g (s)	7.9	7.9		27.4		2.1	34.0
Actuated g/C Ratio	0.16	0.16		0.54		0.04	0.67
Clearance Time (s)	4.5	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	532	242		2495		73	2363
v/s Ratio Prot	c0.05					c0.03	0.16
v/s Ratio Perm		0.01		c0.23			
v/c Ratio	0.34	0.07		0.42		0.81	0.23
Uniform Delay, d1	19.2	18.4		7.0		24.2	3.3
Progression Factor	1.00	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.4	0.1		0.5		46.1	0.2
Delay (s)	19.5	18.5		7.5		70.3	3.6
Level of Service	B	B		A		E	A
Approach Delay (s)	19.1			7.5			10.0
Approach LOS	B			A			A
Intersection Summary							
HCM 2000 Control Delay			10.0			HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.42				
Actuated Cycle Length (s)			50.9			Sum of lost time (s)	13.5
Intersection Capacity Utilization			51.4%			ICU Level of Service	A
Analysis Period (min)			15				
c Critical Lane Group							

SimTraffic Simulation Summary
 Weekday PM Road Diet - Stop Sign

03/25/2019

Summary of All Intervals

Run Number	20	21	23	24	25	26	28
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	9391	9343	9273	9212	9235	9160	9230
Vehs Exited	9334	9427	9246	9200	9243	9170	9230
Starting Vehs	290	386	305	337	372	343	331
Ending Vehs	347	302	332	349	364	333	331
Travel Distance (mi)	6145	6187	6093	6036	6103	6056	6091
Travel Time (hr)	336.5	349.2	329.8	328.6	345.4	332.6	344.4
Total Delay (hr)	139.9	151.4	135.6	135.9	150.1	139.4	149.7
Total Stops	14549	15023	14219	14163	14647	14246	14972
Fuel Used (gal)	252.6	257.7	249.1	247.7	253.9	248.4	253.0

Summary of All Intervals

Run Number	29	30	31	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	9355	9269	9183	9263
Vehs Exited	9319	9293	9165	9267
Starting Vehs	322	357	319	330
Ending Vehs	358	333	337	336
Travel Distance (mi)	6189	6172	6092	6116
Travel Time (hr)	344.1	347.2	346.0	340.4
Total Delay (hr)	146.3	149.0	150.7	144.8
Total Stops	14899	14971	15023	14671
Fuel Used (gal)	254.7	254.2	252.5	252.4

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

SimTraffic Simulation Summary
 Weekday PM Road Diet - Stop Sign

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Interval #1 Information Recording

Start Time	5:00						
End Time	6:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	20	21	23	24	25	26	28
Vehs Entered	9391	9343	9273	9212	9235	9160	9230
Vehs Exited	9334	9427	9246	9200	9243	9170	9230
Starting Vehs	290	386	305	337	372	343	331
Ending Vehs	347	302	332	349	364	333	331
Travel Distance (mi)	6145	6187	6093	6036	6103	6056	6091
Travel Time (hr)	336.5	349.2	329.8	328.6	345.4	332.6	344.4
Total Delay (hr)	139.9	151.4	135.6	135.9	150.1	139.4	149.7
Total Stops	14549	15023	14219	14163	14647	14246	14972
Fuel Used (gal)	252.6	257.7	249.1	247.7	253.9	248.4	253.0

Interval #1 Information Recording

Start Time	5:00			
End Time	6:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	29	30	31	Avg
Vehs Entered	9355	9269	9183	9263
Vehs Exited	9319	9293	9165	9267
Starting Vehs	322	357	319	330
Ending Vehs	358	333	337	336
Travel Distance (mi)	6189	6172	6092	6116
Travel Time (hr)	344.1	347.2	346.0	340.4
Total Delay (hr)	146.3	149.0	150.7	144.8
Total Stops	14899	14971	15023	14671
Fuel Used (gal)	254.7	254.2	252.5	252.4

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	1246	640	677	626	3189
Vehicles Exited	1249	638	676	626	3189
Hourly Exit Rate	1249	638	676	626	3189
Input Volume	1252	623	664	626	3165
% of Volume	100	102	102	100	101

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL	EBT	WBT	All
Vehicles Entered	563	1372	645	2580
Vehicles Exited	562	1372	646	2580
Hourly Exit Rate	562	1372	646	2580
Input Volume	556	1368	629	2553
% of Volume	101	100	103	101

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBU
Vehicles Entered	353	642	378	187	415	387	97	151	399	572	147	8
Vehicles Exited	352	640	378	186	415	385	97	150	398	573	146	8
Hourly Exit Rate	352	640	378	186	415	385	97	150	398	573	146	8
Input Volume	358	638	372	186	407	401	94	144	389	566	148	8
% of Volume	98	100	102	100	102	96	103	104	102	101	99	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	SBL	SBT	SBR	SBR2	All
Vehicles Entered	115	305	116	157	4429
Vehicles Exited	113	304	117	157	4419
Hourly Exit Rate	113	304	117	157	4419
Input Volume	112	302	112	169	4406
% of Volume	101	101	104	93	100

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	628	271	18	990	97	33	2037
Vehicles Exited	629	271	18	989	97	32	2036
Hourly Exit Rate	629	271	18	989	97	32	2036
Input Volume	630	268	18	992	96	29	2033
% of Volume	100	101	100	100	101	110	100

5: Serramonte Blvd & Project Driveway 3 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	89	557	872	195	112	77	1902
Vehicles Exited	89	558	872	197	111	77	1904
Hourly Exit Rate	89	558	872	197	111	77	1904
Input Volume	90	567	867	199	116	77	1916
% of Volume	99	98	101	99	96	100	99

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBR
Vehicles Entered	167	349	135	137	486	156	3	257	853	143	4	94
Vehicles Exited	166	350	135	137	488	155	3	257	856	143	5	95
Hourly Exit Rate	166	350	135	137	488	155	3	257	856	143	5	95
Input Volume	173	357	135	136	493	158	4	249	833	134	5	94
% of Volume	96	98	100	101	99	98	75	103	103	107	100	101

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBT	SBR	All
Vehicles Entered	481	135	3406
Vehicles Exited	482	134	3406
Hourly Exit Rate	482	134	3406
Input Volume	479	136	3386
% of Volume	101	99	101

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	197	102	250	27	84	36	402	486	24	17	256	163
Vehicles Exited	196	102	250	27	84	36	403	486	24	17	256	164
Hourly Exit Rate	196	102	250	27	84	36	403	486	24	17	256	164
Input Volume	196	96	246	27	83	35	410	494	22	17	254	165
% of Volume	100	106	102	100	101	103	98	98	109	100	101	99

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	2044
Vehicles Exited	2045
Hourly Exit Rate	2045
Input Volume	2045
% of Volume	100

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8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBT	EBR	WBR	NBU	NBL	NBT	SBT	SBR	All
Vehicles Entered	25	1	277	2	2	73	1222	741	31	2374
Vehicles Exited	25	1	278	2	2	72	1223	740	31	2374
Hourly Exit Rate	25	1	278	2	2	72	1223	740	31	2374
Input Volume	24	1	276	2	2	70	1187	745	29	2336
% of Volume	104	100	101	100	100	103	103	99	107	102

9: Junipero Serra Blvd & Project Driveway 2 Performance by movement

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	All
Vehicles Entered	165	106	7	855	168	57	528	1886
Vehicles Exited	165	105	6	852	168	57	529	1882
Hourly Exit Rate	165	105	6	852	168	57	529	1882
Input Volume	170	105	7	852	167	56	525	1882
% of Volume	97	100	86	100	101	102	101	100

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	24	622	4	8	938	40	12	7	34	53	1742
Vehicles Exited	24	621	4	8	938	40	12	7	33	53	1740
Hourly Exit Rate	24	621	4	8	938	40	12	7	33	53	1740
Input Volume	23	620	5	8	937	36	13	9	37	56	1744
% of Volume	104	100	80	100	100	111	92	78	89	95	100

11: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	8	640	969	14	10	16	1657
Vehicles Exited	8	638	970	14	9	15	1654
Hourly Exit Rate	8	638	970	14	9	15	1654
Input Volume	8	647	964	13	11	16	1659
% of Volume	100	99	101	108	82	94	100

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	2	640	1005	4	2	5	1658
Vehicles Exited	2	641	1004	4	2	5	1658
Hourly Exit Rate	2	641	1004	4	2	5	1658
Input Volume	3	650	1008	4	3	4	1672
% of Volume	67	99	100	100	67	125	99

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13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	617	10	10	989	21	16	1663
Vehicles Exited	618	10	10	988	21	16	1663
Hourly Exit Rate	618	10	10	988	21	16	1663
Input Volume	631	8	11	991	22	15	1678
% of Volume	98	125	91	100	95	107	99

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	603	31	46	925	74	48	1727
Vehicles Exited	603	31	46	926	73	48	1727
Hourly Exit Rate	603	31	46	926	73	48	1727
Input Volume	616	30	46	927	75	49	1743
% of Volume	98	103	100	100	97	98	99

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	35	24	30	1222	748	22	2081
Vehicles Exited	34	24	30	1222	746	22	2078
Hourly Exit Rate	34	24	30	1222	746	22	2078
Input Volume	37	24	32	1183	748	20	2044
% of Volume	92	100	94	103	100	110	102

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	525	22	33	693	34	28	1335
Vehicles Exited	526	23	33	692	34	28	1336
Hourly Exit Rate	526	23	33	692	34	28	1336
Input Volume	520	24	33	699	33	24	1333
% of Volume	101	96	100	99	103	117	100

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	534	8	12	706	19	12	1291
Vehicles Exited	535	8	12	706	19	12	1292
Hourly Exit Rate	535	8	12	706	19	12	1292
Input Volume	522	9	13	711	20	14	1289
% of Volume	102	89	92	99	95	86	100

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	540	9	12	707	10	9	1287
Vehicles Exited	540	9	12	709	10	9	1289
Hourly Exit Rate	540	9	12	709	10	9	1289
Input Volume	529	8	11	712	12	9	1281
% of Volume	102	112	109	100	83	100	101

26: Performance by movement

Movement	NBT	NWR	All
Vehicles Entered	563	940	1503
Vehicles Exited	564	939	1503
Hourly Exit Rate	564	939	1503
Input Volume	556	959	1515
% of Volume	101	98	99

Total Network Performance

Vehicles Entered	9263
Vehicles Exited	9267
Hourly Exit Rate	9267
Input Volume	55152
% of Volume	17

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
I-280 SB Off-Ramp	1	14.5	43.3	0.2	20	21	13.6
I-280 NB On-Ramp	2	2.2	12.3	0.1	24	25	1.9
Junipero Serra Blvd	3	31.1	38.3	0.1	6	7	28.0
Collins Avenue	4	4.2	10.4	0.0	16	17	3.4
	10	4.5	8.9	0.0	15	18	2.8
	11	9.8	14.3	0.0	10	11	8.0
Project Driveway 3	5	14.0	18.0	0.0	6	6	13.5
	19	2.7	8.1	0.0	21	21	2.7
	12	0.2	12.5	0.1	29	29	0.2
	13	0.4	10.7	0.1	29	29	0.5
	14	2.2	15.3	0.1	26	27	1.5
El Camino Real	6	26.5	33.5	0.1	7	7	26.3
	16	1.8	12.6	0.1	24	24	1.9
	17	0.3	8.7	0.1	29	29	0.3
	18	0.4	10.5	0.1	29	29	0.4
Hillside Blvd	7	21.1	39.7	0.2	16	16	19.0
Total		135.9	297.2	1.4	17	17	123.9

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed	Run 24 Delay	Run 25 Speed
I-280 SB Off-Ramp	19	17.4	20	14.0	20	14.3	21
I-280 NB On-Ramp	24	2.4	25	2.1	25	1.9	24
Junipero Serra Blvd	6	31.4	7	30.1	7	29.4	6
Collins Avenue	16	3.8	17	3.2	18	3.1	13
	15	4.3	17	3.2	20	2.3	11
	10	9.3	11	8.9	12	7.2	8
Project Driveway 3	6	14.2	6	13.9	6	13.6	5
	21	2.7	21	2.7	21	2.7	21
	29	0.3	29	0.2	29	0.2	30
	29	0.5	29	0.5	29	0.4	30
	27	1.6	22	4.4	26	1.9	27
El Camino Real	8	24.9	7	30.4	8	24.2	8
	24	1.8	24	1.8	24	1.9	24
	29	0.2	29	0.3	29	0.3	29
	29	0.4	29	0.3	29	0.3	29
Hillside Blvd	15	22.6	16	19.3	17	18.0	15
Total	16	137.7	17	135.3	17	121.6	16

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 25 Delay	Run 26 Speed	Run 26 Delay	Run 28 Speed	Run 28 Delay	Run 29 Speed	Run 29 Delay
I-280 SB Off-Ramp	12.1	20	13.9	20	14.9	19	16.4
I-280 NB On-Ramp	2.3	25	2.0	24	2.5	24	2.6
Junipero Serra Blvd	32.6	7	29.7	6	34.5	6	32.3
Collins Avenue	6.6	16	3.8	13	5.9	16	4.0
	8.0	18	3.1	12	7.0	15	4.5
	13.2	12	7.4	9	11.4	10	10.3
Project Driveway 3	14.5	6	13.2	6	13.9	6	14.3
	2.8	21	2.7	21	2.7	21	2.8
	0.2	29	0.2	29	0.2	29	0.2
	0.4	30	0.4	29	0.4	29	0.5
	1.3	25	2.7	24	3.5	25	2.6
El Camino Real	24.8	7	27.4	7	30.1	7	27.1
	1.9	24	1.8	24	1.9	24	1.7
	0.3	29	0.3	29	0.3	29	0.2
	0.4	29	0.4	29	0.3	29	0.3
Hillside Blvd	22.5	15	22.2	15	22.7	16	21.0
Total	143.8	17	131.1	16	152.3	16	140.9

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 30 Speed	Run 30 Delay	Run 31 Speed	Run 31 Delay
I-280 SB Off-Ramp	20	14.4	21	13.3
I-280 NB On-Ramp	24	2.5	24	2.3
Junipero Serra Blvd	7	29.9	6	33.0
Collins Avenue	17	3.5	16	4.2
	16	3.8	13	5.5
	10	10.1	9	11.6
Project Driveway 3	6	14.4	6	14.1
	21	2.7	21	2.7
	30	0.2	29	0.2
	29	0.4	29	0.4
	27	1.4	27	1.4
El Camino Real	7	25.8	8	24.6
	24	1.8	24	1.8
	29	0.3	29	0.3
	29	0.4	29	0.3
Hillside Blvd	17	18.4	15	24.0
Total	17	130.1	16	139.6

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
Hillside Blvd	7	17.0	22.4	0.0	7	6	18.9
	18	1.1	17.4	0.2	36	39	0.9
	17	0.6	10.8	0.1	28	28	0.6
	16	2.3	10.4	0.1	24	27	1.1
El Camino Real	6	39.6	49.5	0.1	6	7	37.4
	14	2.6	11.1	0.1	22	22	2.7
	13	1.2	14.3	0.1	27	27	1.2
	12	1.0	11.1	0.1	28	28	1.0
	19	3.5	16.0	0.1	23	23	3.1
Project Driveway 3	5	14.7	21.2	0.0	9	9	14.5
	11	2.5	6.2	0.0	16	16	2.5
	10	0.4	5.1	0.0	28	28	0.4
Collins Avenue	4	1.8	6.1	0.0	22	22	1.7
Junipero Serra Blvd	3	26.6	31.1	0.0	5	5	27.7
I-280 NB On-Ramp	2	6.7	15.2	0.1	16	17	6.1
I-280 SB Off-Ramp	1	16.8	27.0	0.1	11	11	18.0
Total		138.5	275.1	1.2	15	16	137.7

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed	Run 24 Delay	Run 25 Speed
Hillside Blvd	7	16.5	7	17.8	8	14.1	7
	37	1.0	37	1.0	36	1.1	35
	28	0.7	28	0.6	28	0.6	28
	25	1.8	25	2.0	28	0.8	28
El Camino Real	6	39.7	6	38.7	7	35.6	8
	22	2.6	23	2.5	22	2.5	23
	27	1.2	27	1.2	28	1.1	27
	28	1.0	28	1.0	28	0.9	28
	24	3.0	23	3.3	24	3.0	24
Project Driveway 3	9	13.9	9	14.1	9	13.9	9
	16	2.5	16	2.5	16	2.5	16
	28	0.3	28	0.4	28	0.3	28
Collins Avenue	21	1.8	23	1.4	22	1.8	22
Junipero Serra Blvd	5	26.4	5	26.9	5	27.7	5
I-280 NB On-Ramp	15	7.4	16	6.8	16	6.8	16
I-280 SB Off-Ramp	11	17.1	11	17.4	11	17.4	11
Total	16	136.9	16	137.7	16	130.3	16

Arterial Level of Service
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Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 25 Delay	Run 26 Speed	Run 26 Delay	Run 28 Speed	Run 28 Delay	Run 29 Speed	Run 29 Delay
Hillside Blvd	18.5	7	18.1	7	16.4	7	15.8
	1.2	35	1.1	36	1.0	38	0.9
	0.7	28	0.6	28	0.5	28	0.6
	0.8	26	1.4	25	1.7	27	1.1
El Camino Real	30.4	6	39.5	7	37.7	7	37.2
	2.4	22	2.6	23	2.5	22	2.7
	1.2	28	1.2	27	1.1	27	1.2
	1.0	28	1.0	28	1.0	28	1.0
	3.0	23	3.7	22	3.9	23	3.3
Project Driveway 3	14.5	9	14.7	8	15.9	9	14.7
	2.5	16	2.5	16	2.5	16	2.5
	0.4	29	0.3	28	0.4	28	0.4
Collins Avenue	1.8	22	1.6	21	1.9	22	1.8
Junipero Serra Blvd	27.9	5	26.1	5	26.3	6	24.9
I-280 NB On-Ramp	6.9	16	6.5	16	7.0	16	7.2
I-280 SB Off-Ramp	18.0	11	16.4	11	16.9	12	15.7
Total	131.2	16	137.2	16	136.7	16	130.9

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 30 Speed	Run 30 Delay	Run 31 Speed	Run 31 Delay
Hillside Blvd	7	17.7	7	17.1
	35	1.1	34	1.2
	28	0.7	28	0.8
	22	3.5	15	8.2
El Camino Real	6	43.3	5	53.9
	22	2.8	22	2.6
	27	1.4	28	1.1
	28	1.1	28	1.0
	21	4.7	23	3.9
Project Driveway 3	8	16.0	8	15.0
	16	2.6	16	2.5
	27	0.5	27	0.6
Collins Avenue	21	1.9	20	2.5
Junipero Serra Blvd	5	25.7	5	26.3
I-280 NB On-Ramp	17	5.7	16	6.4
I-280 SB Off-Ramp	12	15.2	11	16.4
Total	15	143.9	14	159.6

Queuing and Blocking Report
Weekday PM Road Diet - Stop Sign

03/25/2019

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	362	304	187	199	75	231	184	76
Average Queue (ft)	210	138	103	114	51	135	87	4
95th Queue (ft)	319	243	168	181	103	209	153	45
Link Distance (ft)	1253	1253	384	384		498	498	498
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)					50			
Storage Blk Time (%)				30	1			
Queuing Penalty (veh)				61	3			

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	WB	WB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	233	74	72	82	148
Average Queue (ft)	131	5	5	5	59
95th Queue (ft)	204	42	43	43	112
Link Distance (ft)		384	384	384	246
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200				
Storage Blk Time (%)	1				
Queuing Penalty (veh)	2				

Queuing and Blocking Report
Weekday PM Road Diet - Stop Sign

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Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	R>	<L	L	T
Maximum Queue (ft)	185	192	259	257	237	162	161	173	168	228	253	236
Average Queue (ft)	99	112	172	152	87	116	122	147	133	129	133	124
95th Queue (ft)	162	173	247	242	177	171	174	178	178	200	216	201
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)			1	1	0	5	4	12	6			
Queuing Penalty (veh)			3	2	0	14	12	33	17			
Storage Bay Dist (ft)					225					295	295	
Storage Blk Time (%)				1	0					0	0	0
Queuing Penalty (veh)				4	0					0	0	0

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	UL	T	TR	>
Maximum Queue (ft)	292	115	152	188	204	18
Average Queue (ft)	152	72	64	113	118	1
95th Queue (ft)	251	145	122	171	181	18
Link Distance (ft)	1147		676	676		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		90	320		280	
Storage Blk Time (%)	23	0			0	
Queuing Penalty (veh)	34	1			0	

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	145	108	79	74	85	107	86	263	75
Average Queue (ft)	24	9	7	17	12	27	16	114	36
95th Queue (ft)	99	61	43	55	52	79	60	258	88
Link Distance (ft)	146	146			111	111		1189	
Upstream Blk Time (%)	1	0			0	0			
Queuing Penalty (veh)	3	1			1	1			
Storage Bay Dist (ft)			40	65			65	50	
Storage Blk Time (%)		0	0	1	0	1	0	46	1
Queuing Penalty (veh)		0	0	3	1	3	0	13	0

Queuing and Blocking Report
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Intersection: 5: Serramonte Blvd & Project Driveway 3

Movement	EB	EB	WB	WB	B19	SB
Directions Served	LT	T	T	TR	T	LR
Maximum Queue (ft)	143	77	178	258	172	102
Average Queue (ft)	118	4	90	165	13	53
95th Queue (ft)	140	32	144	248	84	85
Link Distance (ft)	110	110	184	184	488	249
Upstream Blk Time (%)	14	0	0	9		
Queuing Penalty (veh)	44	0	0	42		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	UL	T	T	T	R	UL
Maximum Queue (ft)	243	270	229	352	323	225	338	324	195	143	146
Average Queue (ft)	116	197	104	253	76	178	188	160	107	42	71
95th Queue (ft)	202	290	192	368	234	257	349	285	167	90	130
Link Distance (ft)	259	259	334	334			326	326	326		1268
Upstream Blk Time (%)	0	2	0	4	0		8	0			
Queuing Penalty (veh)	0	8	0	15	0		32	1			
Storage Bay Dist (ft)					300	200				160	300
Storage Blk Time (%)				8	0	25	0		1	0	
Queuing Penalty (veh)				12	0	69	1		1	0	

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	164	124	114
Average Queue (ft)	88	36	53
95th Queue (ft)	153	89	100
Link Distance (ft)	1268	1268	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)		0	1
Queuing Penalty (veh)		0	2

Queuing and Blocking Report
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Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB	
Directions Served	LT	R	LT	TR	L	TR	L	T	R	
Maximum Queue (ft)	272	160	98	96	338	270	94	324	100	
Average Queue (ft)	131	70	39	36	186	139	18	150	75	
95th Queue (ft)	223	125	78	74	292	230	59	282	124	
Link Distance (ft)	850	850	192	192	908	908		900		
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)							75			75
Storage Blk Time (%)							0	29	1	
Queuing Penalty (veh)							0	52	4	

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	T	TR	T	TR
Maximum Queue (ft)	197	105	24	108	162	127	88	113	120
Average Queue (ft)	42	77	2	40	65	31	17	27	31
95th Queue (ft)	134	116	12	84	133	83	57	81	89
Link Distance (ft)	472		186		1262	1262	1262	415	415
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			80	130					
Storage Blk Time (%)	0	8	0		1				
Queuing Penalty (veh)	0	2	0		0				

Intersection: 9: Junipero Serra Blvd & Project Driveway 2

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	L	R	UT	T	TR	L	T	T	
Maximum Queue (ft)	94	84	81	143	162	179	76	92	78	
Average Queue (ft)	44	33	38	64	72	82	37	36	35	
95th Queue (ft)	81	67	66	123	136	148	68	75	73	
Link Distance (ft)	196	196	196	676	676	676	591	591		
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)							210			
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report
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Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	144	100	58	22	56	168
Average Queue (ft)	56	11	6	1	16	71
95th Queue (ft)	137	61	35	14	46	147
Link Distance (ft)	111	111	129	129	208	158
Upstream Blk Time (%)	4	0	0	0	5	
Queuing Penalty (veh)	12	0	0	0	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 11: Serramonte Blvd

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	157	70	8	9	124
Average Queue (ft)	110	13	0	0	32
95th Queue (ft)	178	50	6	6	101
Link Distance (ft)	129	129	110	110	222
Upstream Blk Time (%)	9	0	1		
Queuing Penalty (veh)	28	0	0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Serramonte Blvd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	24	42
Average Queue (ft)	1	6
95th Queue (ft)	12	28
Link Distance (ft)	255	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
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Intersection: 13: Serramonte Blvd

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	31	78
Average Queue (ft)	5	28
95th Queue (ft)	24	61
Link Distance (ft)		343
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: Serramonte Blvd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	176	55	251
Average Queue (ft)	20	20	92
95th Queue (ft)	107	49	194
Link Distance (ft)	518	259	411
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: El Camino Real

Movement	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LR	L	T	T	T	T	T	R
Maximum Queue (ft)	103	85	202	151	2	2	2	4
Average Queue (ft)	31	14	31	16	0	0	0	0
95th Queue (ft)	77	51	142	100	2	2	2	3
Link Distance (ft)	203		415	415	326	326	326	
Upstream Blk Time (%)	0							
Queuing Penalty (veh)	0							
Storage Bay Dist (ft)		100						100
Storage Blk Time (%)		0	5					
Queuing Penalty (veh)		0	2					

Queuing and Blocking Report
Weekday PM Road Diet - Stop Sign

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Intersection: 16: Serramonte Blvd

Movement	EB	WB	WB	NB	NB
Directions Served	TR	LT	T	L	R
Maximum Queue (ft)	9	105	156	77	46
Average Queue (ft)	0	20	24	29	20
95th Queue (ft)	4	71	119	67	46
Link Distance (ft)	334	300	300	289	289
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: Serramonte Blvd

Movement	WB	WB	NB
Directions Served	LT	T	LR
Maximum Queue (ft)	48	14	52
Average Queue (ft)	5	0	22
95th Queue (ft)	28	10	48
Link Distance (ft)	389	389	205
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	41	42
Average Queue (ft)	5	16
95th Queue (ft)	25	43
Link Distance (ft)	850	247
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
 Weekday PM Road Diet - Stop Sign

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Intersection: 26:

Movement	NW	B36	B36
Directions Served	R	T	
Maximum Queue (ft)	116	185	132
Average Queue (ft)	7	49	32
95th Queue (ft)	52	121	92
Link Distance (ft)	352	175	175
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	1	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 545

HCM Signalized Intersection Capacity Analysis
 1: Serramonte Blvd & I-280 SB Off-Ramp

04/02/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↓	↑↓
Traffic Volume (vph)	0	1422	642	0	848	873
Future Volume (vph)	0	1422	642	0	848	873
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1497	676	0	893	919
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1497	676	0	893	919
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		30.6	18.9		22.4	34.6
Effective Green, g (s)		30.6	18.9		22.4	34.6
Actuated g/C Ratio		0.50	0.31		0.37	0.56
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1766	1567		1254	1573
v/s Ratio Prot		c0.42	0.13		c0.26	0.33
v/s Ratio Perm						
v/c Ratio		0.85	0.43		0.71	0.58
Uniform Delay, d1		13.3	16.9		16.7	8.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		4.0	0.2		1.9	0.6
Delay (s)		17.3	17.1		18.6	9.2
Level of Service		B	B		B	A
Approach Delay (s)		17.3	17.1		13.9	
Approach LOS		B	B		B	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	11.5
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2: Serramonte Blvd & I-280 NB On-Ramp

04/02/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	625	1644	642	5	0	0
Future Volume (vph)	625	1644	642	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.1			
Lane Util. Factor	0.97	0.95	0.95			
Frt	1.00	1.00	1.00			
Flt Protected	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539	3535			
Flt Permitted	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539	3535			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	658	1731	676	5	0	0
RTOR Reduction (vph)	0	0	1	0	0	0
Lane Group Flow (vph)	658	1731	680	0	0	0
Turn Type	Prot	NA	NA			
Protected Phases	5	2	6			
Permitted Phases						
Actuated Green, G (s)	11.7	34.4	15.1			
Effective Green, g (s)	11.7	34.4	15.1			
Actuated g/C Ratio	0.34	1.00	0.44			
Clearance Time (s)	3.5	4.4	4.1			
Vehicle Extension (s)	3.0	4.0	3.0			
Lane Grp Cap (vph)	1167	3539	1551			
v/s Ratio Prot	0.19	c0.49	0.19			
v/s Ratio Perm						
v/c Ratio	0.56	0.49	0.44			
Uniform Delay, d1	9.3	0.0	6.7			
Progression Factor	1.00	1.00	1.00			
Incremental Delay, d2	0.6	0.1	0.2			
Delay (s)	9.9	0.1	6.9			
Level of Service	A	A	A			
Approach Delay (s)		2.8	6.9		0.0	
Approach LOS		A	A		A	
Intersection Summary						
HCM 2000 Control Delay		3.7		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.63				
Actuated Cycle Length (s)		34.4		Sum of lost time (s)		7.6
Intersection Capacity Utilization		98.3%		ICU Level of Service		F
Analysis Period (min)		15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

04/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	591	734	326	177	397	362	114	81	407	469	198	138
Future Volume (vph)	591	734	326	177	397	362	114	81	407	469	198	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.6	4.6			4.0	4.0	4.0	4.6
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	0.91			0.97	0.95	1.00	1.00
Frb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00			1.00	1.00	0.98	1.00
Frlb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95	0.85			1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			0.95	1.00	1.00	0.95
Satd. Flow (prot)	3433	3539	1554	1770	3216	1441			3433	3539	1554	1770
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			0.95	1.00	1.00	0.95
Satd. Flow (perm)	3433	3539	1554	1770	3216	1441			3433	3539	1554	1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	622	773	343	186	418	381	120	85	428	494	208	145
RTOR Reduction (vph)	0	0	242	0	0	89	0	0	0	0	124	0
Lane Group Flow (vph)	622	773	101	186	635	195	0	0	513	494	84	145
Confl. Peds. (#/hr)			7								7	
Turn Type	Prot	NA	Perm	Prot	NA	Perm		Split	Split	NA	Perm	Split
Protected Phases	5	2		1	6			3	3	3		4
Permitted Phases			2			6						3
Actuated Green, G (s)	20.6	30.3	30.3	13.8	22.9	22.9			21.6	21.6	21.6	21.2
Effective Green, g (s)	20.6	30.3	30.3	13.8	22.9	22.9			21.6	21.6	21.6	21.2
Actuated g/C Ratio	0.20	0.30	0.30	0.13	0.22	0.22			0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	4.0	4.0	3.0	4.6	4.6			4.0	4.0	4.0	4.6
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0			2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	689	1046	459	238	718	321			723	745	327	366
v/s Ratio Prot	c0.18	0.22		0.11	c0.20				c0.15	0.14		0.08
v/s Ratio Perm			0.07			0.14					0.05	
v/c Ratio	0.90	0.74	0.22	0.78	0.88	0.61			0.71	0.66	0.26	0.40
Uniform Delay, d1	40.0	32.5	27.2	42.9	38.5	35.8			37.5	37.1	33.8	35.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	14.8	2.4	0.1	14.2	12.2	2.2			2.6	1.7	0.2	0.3
Delay (s)	54.8	34.9	27.3	57.1	50.7	38.0			40.2	38.8	33.9	35.4
Level of Service	D	C	C	E	D	D			D	D	C	D
Approach Delay (s)		40.5			48.5						38.6	
Approach LOS		D			D						D	
Intersection Summary												
HCM 2000 Control Delay		41.1									D	
HCM 2000 Volume to Capacity ratio		0.85										
Actuated Cycle Length (s)		102.5									16.2	
Intersection Capacity Utilization		82.2%									E	
Analysis Period (min)		15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

04/02/2019

Movement	SBT	SBR	SBR2
Lane Configurations	↑↑		↑
Traffic Volume (vph)	442	164	282
Future Volume (vph)	442	164	282
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.6		4.0
Lane Util. Factor	0.95		1.00
Frpb, ped/bikes	1.00		1.00
Flpb, ped/bikes	1.00		1.00
Frt	0.96		0.85
Flt Protected	1.00		1.00
Satd. Flow (prot)	3395		1583
Flt Permitted	1.00		1.00
Satd. Flow (perm)	3395		1583
Peak-hour factor, PHF	0.95	0.95	0.95
Adj. Flow (vph)	465	173	297
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	638	0	297
Confl. Peds. (#/hr)			
Turn Type	NA		Free
Protected Phases	4		
Permitted Phases			Free
Actuated Green, G (s)	21.2		102.5
Effective Green, g (s)	21.2		102.5
Actuated g/C Ratio	0.21		1.00
Clearance Time (s)	4.6		
Vehicle Extension (s)	2.0		
Lane Grp Cap (vph)	702		1583
v/s Ratio Prot	c0.19		
v/s Ratio Perm			0.19
v/c Ratio	0.91		0.19
Uniform Delay, d1	39.7		0.0
Progression Factor	1.00		1.00
Incremental Delay, d2	15.3		0.3
Delay (s)	55.0		0.3
Level of Service	D		A
Approach Delay (s)	37.3		
Approach LOS	D		
Intersection Summary			


HCM Unsignalized Intersection Capacity Analysis
 4: Collins Avenue & Serramonte Blvd

04/02/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑			↑↑↑	↑	↑	
Traffic Volume (veh/h)	789	279	12	972	63	23	
Future Volume (Veh/h)	789	279	12	972	63	23	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	831	294	13	1023	66	24	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)						2	
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)	239			552			
pX, platoon unblocked			0.80		0.80	0.80	
vC, conflicting volume			1125		1260	562	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			667		834	0	
IC, single (s)			4.1		*5.5	*5.5	
IC, 2 stage (s)							
IF (s)			2.2		*2.5	*2.5	
p0 queue free %			98		84	98	
cM capacity (veh/h)			738		419	1157	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	554	571	159	292	292	292	90
Volume Left	0	0	13	0	0	0	66
Volume Right	0	294	0	0	0	0	24
cSH	1700	1700	738	1700	1700	1700	571
Volume to Capacity	0.33	0.34	0.02	0.17	0.17	0.17	0.16
Queue Length 95th (ft)	0	0	1	0	0	0	14
Control Delay (s)	0.0	0.0	1.0	0.0	0.0	0.0	13.3
Lane LOS			A				B
Approach Delay (s)	0.0		0.2				13.3
Approach LOS							B
Intersection Summary							
Average Delay			0.6				
Intersection Capacity Utilization			40.9%		ICU Level of Service		A
Analysis Period (min)			15				
* User Entered Value							

HCM Signalized Intersection Capacity Analysis
5: Serramonte Blvd & Project Driveway 3


04/02/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕	↕
Traffic Volume (vph)	154	648	771	223	125	158
Future Volume (vph)	154	648	771	223	125	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.95	0.95		1.00	1.00
Frbp, ped/bikes		1.00	0.99		1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	0.97		1.00	0.85
Flt Protected		0.99	1.00		0.95	1.00
Satd. Flow (prot)		3504	3379		1770	1554
Flt Permitted		0.62	1.00		0.95	1.00
Satd. Flow (perm)		2207	3379		1770	1554
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	162	682	812	235	132	166
RTOR Reduction (vph)	0	0	17	0	0	132
Lane Group Flow (vph)	0	844	1030	0	132	34
Confl. Peds. (#/hr)	9			29	29	9
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases	2					8
Actuated Green, G (s)		32.9	32.9		10.9	10.9
Effective Green, g (s)		32.9	32.9		10.9	10.9
Actuated g/C Ratio		0.62	0.62		0.21	0.21
Clearance Time (s)		4.5	4.5		4.5	4.5
Vehicle Extension (s)		2.5	2.5		2.5	2.5
Lane Grp Cap (vph)		1375	2105		365	320
v/s Ratio Prot			0.30		c0.07	
v/s Ratio Perm		c0.38				0.02
v/c Ratio		0.61	0.49		0.36	0.11
Uniform Delay, d1		6.1	5.4		18.0	17.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.7	0.1		0.4	0.1
Delay (s)		6.8	5.5		18.4	17.1
Level of Service		A	A		B	B
Approach Delay (s)		6.8	5.5		17.7	
Approach LOS		A	A		B	
Intersection Summary						
HCM 2000 Control Delay		7.7		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.61				
Actuated Cycle Length (s)		52.8		Sum of lost time (s)		13.5
Intersection Capacity Utilization		72.5%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

04/02/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕↕↕	↕	↕	↕↕↕	↕
Traffic Volume (vph)	157	290	179	118	389	71	277	602	100	72	552	205
Future Volume (vph)	157	290	179	118	389	71	277	602	100	72	552	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	1743		1770	1863	1556	1770	5085	1554	1770	5085
Flt Permitted		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	1743		1770	1863	1556	1770	5085	1554	1770	5085
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	165	305	188	124	409	75	292	634	105	76	581	216
RTOR Reduction (vph)	0	21	0	0	0	53	0	0	70	0	0	167
Lane Group Flow (vph)	165	472	0	124	409	22	292	634	35	76	581	49
Confl. Peds. (#/hr)			11			7			7			3
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			6			2
Actuated Green, G (s)	11.5	27.7		9.4	25.6	25.6	16.4	29.4	29.4	7.0	20.0	20.0
Effective Green, g (s)	11.5	27.7		9.4	25.6	25.6	16.4	29.4	29.4	7.0	20.0	20.0
Actuated g/C Ratio	0.13	0.32		0.11	0.29	0.29	0.19	0.34	0.34	0.08	0.23	0.23
Clearance Time (s)	3.5	3.5		3.5	3.5	3.5	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	232	551		190	545	455	331	1708	522	141	1162	356
v/s Ratio Prot	c0.09	c0.27		0.07	0.22		c0.17	0.12		0.04	c0.11	
v/s Ratio Perm						0.01			0.02			0.03
v/c Ratio	0.71	0.86		0.65	0.75	0.05	0.88	0.37	0.07	0.54	0.50	0.14
Uniform Delay, d1	36.4	28.0		37.5	28.1	22.2	34.6	22.0	19.7	38.7	29.4	26.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.3	12.1		6.0	5.1	0.0	22.4	0.2	0.1	2.0	0.5	0.2
Delay (s)	44.7	40.1		43.5	33.2	22.2	57.0	22.2	19.8	40.7	29.9	27.1
Level of Service	D	D		D	C	C	E	C	B	D	C	C
Approach Delay (s)		41.3			33.9			31.8			30.1	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay		33.7								C		
HCM 2000 Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		87.5								14.0		
Intersection Capacity Utilization		73.8%								D		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
7: Hillside Blvd & Serramonte Blvd

04/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕↔	↕	↕	↕		↕	↕	↕
Traffic Volume (vph)	156	36	220	9	40	9	278	246	11	8	259	179
Future Volume (vph)	156	36	220	9	40	9	278	246	11	8	259	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		0.95		1.00	1.00		1.00	1.00		1.00
Frbp, ped/bikes	1.00	1.00		1.00		1.00	1.00		1.00	1.00		0.97
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00
Frt	1.00	0.85		0.98		1.00	0.99		1.00	1.00		0.85
Flt Protected	0.96	1.00		0.99		0.95	1.00		0.95	1.00		1.00
Satd. Flow (prot)	1788	1583		3423		1770	1850		1770	1863		1543
Flt Permitted	0.72	1.00		0.92		0.95	1.00		0.95	1.00		1.00
Satd. Flow (perm)	1345	1583		3167		1770	1850		1770	1863		1543
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	164	38	232	9	42	9	293	259	12	8	273	188
RTOR Reduction (vph)	0	0	157	0	6	0	0	2	0	0	0	129
Lane Group Flow (vph)	0	202	75	0	54	0	293	269	0	8	273	59
Confl. Peds. (#/hr)	1					1						12
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2		2	3	8		7	4	
Permitted Phases	2		2	2								4
Actuated Green, G (s)		22.3	22.3		22.3		15.7	32.7		0.9	17.9	17.9
Effective Green, g (s)		22.3	22.3		22.3		15.7	32.7		0.9	17.9	17.9
Actuated g/C Ratio		0.32	0.32		0.32		0.23	0.47		0.01	0.26	0.26
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		432	508		1017		400	871		22	480	397
v/s Ratio Prot							c0.17	0.15		0.00	c0.15	
v/s Ratio Perm		c0.15	0.05		0.02							0.04
v/c Ratio		0.47	0.15		0.05		0.73	0.31		0.36	0.57	0.15
Uniform Delay, d1		18.8	16.8		16.3		24.9	11.4		34.0	22.4	19.9
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		3.6	0.6		0.1		6.8	0.2		9.9	1.6	0.2
Delay (s)		22.4	17.4		16.4		31.7	11.6		43.9	23.9	20.0
Level of Service		C	B		B		C	B		D	C	C
Approach Delay (s)		19.7			16.4			22.0			22.7	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		21.4					HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		69.4				Sum of lost time (s)				13.5		
Intersection Capacity Utilization		57.9%				ICU Level of Service				B		
Analysis Period (min)		15										
c Critical Lane Group												


HCM Signalized Intersection Capacity Analysis
8: El Camino Real & Collins Avenue/Cemetery Driveway

04/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↕		↕↔	↕		↕↔	↕↔	↕	↕	↕
Traffic Volume (vph)	22	0	265	1	0	0	8	57	996	1	0	846
Future Volume (vph)	22	0	265	1	0	0	8	57	996	1	0	846
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.5	4.5	4.5	4.5		4.5
Lane Util. Factor	1.00	1.00		1.00		1.00	1.00	0.91		1.00		0.91
Frbp, ped/bikes	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85		1.00		1.00	1.00	1.00	1.00	1.00		0.99
Flt Protected	0.95	1.00		0.95		0.95	1.00	0.95	1.00	1.00		1.00
Satd. Flow (prot)	1770	1583		1770		1770	5084	1770	5084	5084		5059
Flt Permitted	0.76	1.00		0.74		0.95	1.00	0.95	1.00	1.00		1.00
Satd. Flow (perm)	1410	1583		1383		1770	5084	1770	5084	5059		5059
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	0	279	1	0	0	8	60	1048	1	0	891
RTOR Reduction (vph)	0	0	250	0	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	0	23	29	0	1	0	0	68	1049	0	0	920
Confl. Peds. (#/hr)								1	1		1	1
Turn Type	Perm	NA	Perm	Perm	NA		Prot	Prot	NA		NA	NA
Protected Phases		4		8		8	1	1	6			2
Permitted Phases	4		4	8								
Actuated Green, G (s)		8.1	8.1		8.1		7.2	60.5				48.8
Effective Green, g (s)		8.1	8.1		8.1		7.2	60.5				48.8
Actuated g/C Ratio		0.10	0.10		0.10		0.09	0.78				0.63
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5				4.5
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0				3.0
Lane Grp Cap (vph)		147	165		144		164	3963				3181
v/s Ratio Prot							c0.04	0.21				c0.18
v/s Ratio Perm		0.02	c0.02		0.00							
v/c Ratio		0.16	0.18		0.01		0.41	0.26				0.29
Uniform Delay, d1		31.6	31.7		31.1		33.2	2.4				6.5
Progression Factor		1.00	1.00		1.00		1.00	1.00				1.00
Incremental Delay, d2		0.5	0.5		0.0		1.7	0.2				0.2
Delay (s)		32.1	32.2		31.2		34.9	2.5				6.8
Level of Service		C	C		C		C	A				A
Approach Delay (s)		32.2			31.2			4.5				6.8
Approach LOS		C			C			A				A
Intersection Summary												
HCM 2000 Control Delay		9.0					HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio		0.29										
Actuated Cycle Length (s)		77.6				Sum of lost time (s)				13.5		
Intersection Capacity Utilization		56.8%				ICU Level of Service				B		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway


04/02/2019



Movement	SBR
Lane Configurations	
Traffic Volume (vph)	30
Future Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	32
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 9: Junipero Serra Blvd & Project Driveway 2

04/02/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	↔↔	↔↔	↔↔
Traffic Volume (vph)	274	134	880	232	71	769
Future Volume (vph)	274	134	880	232	71	769
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	0.97	1.00	0.91		1.00	0.95
Frbp, ped/bikes	1.00	0.99	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	1560	4913		1770	3539
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	1560	4913		1770	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	288	141	926	244	75	809
RTOR Reduction (vph)	0	112	69	0	0	0
Lane Group Flow (vph)	288	29	1101	0	75	809
Confl. Peds. (#/hr)		3		1		
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	10.3	10.3	23.5		3.3	31.3
Effective Green, g (s)	10.3	10.3	23.5		3.3	31.3
Actuated g/C Ratio	0.20	0.20	0.46		0.07	0.62
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	698	317	2281		115	2189
v/s Ratio Prot	c0.08		c0.22		c0.04	0.23
v/s Ratio Perm		0.02				
v/c Ratio	0.41	0.09	0.48		0.65	0.37
Uniform Delay, d1	17.5	16.3	9.4		23.1	4.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.1	0.7		12.5	0.5
Delay (s)	17.9	16.5	10.1		35.6	5.3
Level of Service	B	B	B		D	A
Approach Delay (s)	17.4		10.1			7.8
Approach LOS	B		B			A
Intersection Summary						

HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
10: Serramonte Blvd

04/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	45	754	8	9	921	53	13	0	11	58	0	69
Future Volume (Veh/h)	45	754	8	9	921	53	13	0	11	58	0	69
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	49	820	9	10	1001	58	17	0	15	77	0	92
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	432			359								
pX, platoon unblocked	0.89			0.84			0.89	0.89	0.84	0.89	0.89	0.89
vC, conflicting volume	1059			829			1535	2002	414	1573	1977	530
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	816			401			793	1317	0	836	1289	220
IC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			92	100	98	64	100	87
cM capacity (veh/h)	718			964			203	128	906	214	133	697
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	459	419	510	558	32	169						
Volume Left	49	0	10	0	17	77						
Volume Right	0	9	0	58	15	92						
cSH	718	1700	964	1700	319	344						
Volume to Capacity	0.07	0.25	0.01	0.33	0.10	0.49						
Queue Length 95th (ft)	5	0	1	0	8	65						
Control Delay (s)	1.9	0.0	0.3	0.0	17.5	25.2						
Lane LOS	A		A		C	D						
Approach Delay (s)	1.0		0.1		17.5	25.2						
Approach LOS					C	D						
Intersection Summary												
Average Delay	2.7											
Intersection Capacity Utilization	68.5%			ICU Level of Service			C					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
11: Serramonte Blvd

04/02/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Volume (veh/h)	11	812	943	13	33	40
Future Volume (Veh/h)	11	812	943	13	33	40
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	12	883	1025	14	44	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	642		149			
pX, platoon unblocked	0.86				0.92	0.86
vC, conflicting volume	1039				1498	520
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	707				728	100
IC, single (s)	4.1				6.8	6.9
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	98				86	93
cM capacity (veh/h)	759				325	801
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	306	589	683	356	97	
Volume Left	12	0	0	0	44	
Volume Right	0	0	0	14	53	
cSH	759	1700	1700	1700	481	
Volume to Capacity	0.02	0.35	0.40	0.21	0.20	
Queue Length 95th (ft)	1	0	0	0	19	
Control Delay (s)	0.6	0.0	0.0	0.0	14.4	
Lane LOS	A				B	
Approach Delay (s)	0.2		0.0		14.4	
Approach LOS					B	
Intersection Summary						
Average Delay	0.8					
Intersection Capacity Utilization	41.2%		ICU Level of Service		A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Serramonte Blvd

04/02/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↗	↖		↙	↘
Traffic Volume (veh/h)	3	697	881	5	3	3
Future Volume (Veh/h)	3	697	881	5	3	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	3	758	958	5	4	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage (veh)		2	2			
Upstream signal (ft)		787				
pX, platoon unblocked					0.81	
vC, conflicting volume	963				1724	960
vC1, stage 1 conf vol					960	
vC2, stage 2 conf vol					764	
vCu, unblocked vol	963				1777	960
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)					5.4	
IF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	715				286	311
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	3	758	963	8		
Volume Left	3	0	0	4		
Volume Right	0	0	5	4		
eSH	715	1700	1700	298		
Volume to Capacity	0.00	0.45	0.57	0.03		
Queue Length 95th (ft)	0	0	0	2		
Control Delay (s)	10.1	0.0	0.0	17.4		
Lane LOS	B			C		
Approach Delay (s)	0.0		0.0	17.4		
Approach LOS				C		
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			56.7%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
13: Serramonte Blvd

04/02/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↗	↖	↗	↖	↘
Traffic Volume (veh/h)	685	15	20	911	25	19
Future Volume (Veh/h)	685	15	20	911	25	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	745	16	22	990	33	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL		TWLTL		
Median storage (veh)		2		2		
Upstream signal (ft)		1247		934		
pX, platoon unblocked			0.84		0.90	0.84
vC, conflicting volume			761		1787	753
vC1, stage 1 conf vol					753	
vC2, stage 2 conf vol					1034	
vCu, unblocked vol			625		1430	615
IC, single (s)			4.1		6.4	6.2
IC, 2 stage (s)					5.4	
IF (s)			2.2		3.5	3.3
p0 queue free %			97		88	94
cM capacity (veh/h)			808		272	415
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	761	22	990	58		
Volume Left	0	22	0	33		
Volume Right	16	0	0	25		
eSH	1700	808	1700	319		
Volume to Capacity	0.45	0.03	0.58	0.18		
Queue Length 95th (ft)	0	2	0	16		
Control Delay (s)	0.0	9.6	0.0	18.8		
Lane LOS		A		C		
Approach Delay (s)	0.0	0.2		18.8		
Approach LOS				C		
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			57.9%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
14: Serramonte Blvd

04/02/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	647	57	75	858	73	54
Future Volume (Veh/h)	647	57	75	858	73	54
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	703	62	82	933	97	72
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				358		
pX, platoon unblocked					0.80	
vC, conflicting volume			765		1831	734
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			765		1911	734
IC, single (s)			4.1		*4.5	*4.5
IC, 2 stage (s)						
IF (s)			2.2		*2.0	*2.0
p0 queue free %			90		50	92
cM capacity (veh/h)			848		195	876
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	765	82	933	169		
Volume Left	0	82	0	97		
Volume Right	62	0	0	72		
eSH	1700	848	1700	291		
Volume to Capacity	0.45	0.10	0.55	0.58		
Queue Length 95th (ft)	0	8	0	85		
Control Delay (s)	0.0	9.7	0.0	33.1		
Lane LOS		A		D		
Approach Delay (s)	0.0	0.8		33.1		
Approach LOS				D		
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			59.2%		ICU Level of Service	B
Analysis Period (min)			15			
* User Entered Value						

HCM Unsignalized Intersection Capacity Analysis
15: El Camino Real

04/02/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	↔	↔	↔	↔	↔	↔			
Traffic Volume (veh/h)	48	42	31	974	843	26			
Future Volume (Veh/h)	48	42	31	974	843	26			
Sign Control	Stop			Free	Free				
Grade	0%			0%	0%				
Peak Hour Factor	0.75	0.75	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	64	56	34	1059	916	28			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type				Raised	Raised				
Median storage (veh)				1	1				
Upstream signal (ft)				509	410				
pX, platoon unblocked	0.93	0.91	0.91						
vC, conflicting volume	1337	305	944						
vC1, stage 1 conf vol	916								
vC2, stage 2 conf vol	421								
vCu, unblocked vol	820	0	594						
IC, single (s)	6.8	6.9	4.1						
IC, 2 stage (s)	5.8								
IF (s)	3.5	3.3	2.2						
p0 queue free %	83	94	96						
cM capacity (veh/h)	382	987	891						
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	120	34	353	353	353	305	305	305	28
Volume Left	64	34	0	0	0	0	0	0	0
Volume Right	56	0	0	0	0	0	0	0	28
eSH	535	891	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.04	0.21	0.21	0.21	0.18	0.18	0.18	0.02
Queue Length 95th (ft)	21	3	0	0	0	0	0	0	0
Control Delay (s)	13.7	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	A							
Approach Delay (s)	13.7	0.3				0.0			
Approach LOS	B								
Intersection Summary									
Average Delay				0.9					
Intersection Capacity Utilization				34.9%		ICU Level of Service			A
Analysis Period (min)				15					

HCM Unsignalized Intersection Capacity Analysis
16: Serramonte Blvd

04/02/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔		↔	↔	↔
Traffic Volume (veh/h)	412	25	30	504	33	26
Future Volume (Veh/h)	412	25	30	504	33	26
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	448	27	33	548	44	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		TWLTL			
Median storage (veh)	2					
Upstream signal (ft)	443					
pX, platoon unblocked						
vC, conflicting volume			475		802 238	
vC1, stage 1 conf vol	462					
vC2, stage 2 conf vol	340					
vCu, unblocked vol			475		802 238	
IC, single (s)			4.1		6.8 6.9	
IC, 2 stage (s)	5.8					
IF (s)			2.2		3.5 3.3	
p0 queue free %			97		91 95	
cM capacity (veh/h)			1083		512 764	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	299	176	216	365	44	35
Volume Left	0	0	33	0	44	0
Volume Right	0	27	0	0	0	35
eSH	1700	1700	1083	1700	512	764
Volume to Capacity	0.18	0.10	0.03	0.21	0.09	0.05
Queue Length 95th (ft)	0	0	2	0	7	4
Control Delay (s)	0.0	0.0	1.5	0.0	12.7	9.9
Lane LOS	A		B A			
Approach Delay (s)	0.0		0.6		11.5	
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			40.3%		ICU Level of Service A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
17: Serramonte Blvd

04/02/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔		↔	↔	↔
Traffic Volume (veh/h)	427	12	14	520	14	12
Future Volume (Veh/h)	427	12	14	520	14	12
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	464	13	15	565	19	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	811					
pX, platoon unblocked						
vC, conflicting volume			477		783 238	
vC1, stage 1 conf vol	470					
vC2, stage 2 conf vol	312					
vCu, unblocked vol			477		783 238	
IC, single (s)			4.1		6.8 6.9	
IC, 2 stage (s)	5.8					
IF (s)			2.2		3.5 3.3	
p0 queue free %			99		96 98	
cM capacity (veh/h)			1082		521 763	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	309	168	203	377	35	
Volume Left	0	0	15	0	19	
Volume Right	0	13	0	0	16	
eSH	1700	1700	1082	1700	609	
Volume to Capacity	0.18	0.10	0.01	0.22	0.06	
Queue Length 95th (ft)	0	0	1	0	5	
Control Delay (s)	0.0	0.0	0.7	0.0	11.3	
Lane LOS	A		B			
Approach Delay (s)	0.0		0.3		11.3	
Approach LOS			B			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			34.4%		ICU Level of Service A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
18: Serramonte Blvd

04/02/2019

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	↑↑
Traffic Volume (veh/h)	421	17	22	516	19	15
Future Volume (Veh/h)	421	17	22	516	19	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	458	18	24	561	25	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage (veh)	2			2		
Upstream signal (ft)	1257			915		
pX, platoon unblocked						
vC, conflicting volume			476		796	238
vC1, stage 1 conf vol					467	
vC2, stage 2 conf vol					328	
vCu, unblocked vol			476		796	238
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)					5.8	
IF (s)			2.2		3.5	3.3
p0 queue free. %			98		95	97
cM capacity (veh/h)			1082		516	763
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	305	171	211	374	45	
Volume Left	0	0	24	0	25	
Volume Right	0	18	0	0	20	
cSH	1700	1700	1082	1700	603	
Volume to Capacity	0.18	0.10	0.02	0.22	0.07	
Queue Length 95th (ft)	0	0	2	0	6	
Control Delay (s)	0.0	0.0	1.1	0.0	11.5	
Lane LOS			A		B	
Approach Delay (s)	0.0		0.4		11.5	
Approach LOS					B	
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			40.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
26:

04/02/2019

Intersection Sign configuration not allowed in HCM analysis.

SimTraffic Simulation Summary
Weekend Midday Road Diet - Signal

03/25/2019

Summary of All Intervals

Run Number	20	21	22	23	25	27	28
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	9683	9734	9765	9836	9627	9742	9615
Vehs Exited	9697	9774	9771	9812	9625	9742	9576
Starting Vehs	379	364	354	345	347	357	355
Ending Vehs	365	324	348	369	349	357	394
Travel Distance (mi)	6150	6247	6222	6279	6186	6216	6102
Travel Time (hr)	409.6	369.7	389.7	393.1	397.9	388.8	369.7
Total Delay (hr)	211.9	168.9	189.5	191.6	199.3	188.9	173.7
Total Stops	14122	15005	15065	15706	15017	14894	14793
Fuel Used (gal)	276.2	268.6	271.8	274.3	273.7	270.6	262.7

Summary of All Intervals

Run Number	29	30	31	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	9767	9728	9885	9735
Vehs Exited	9770	9696	9757	9725
Starting Vehs	363	357	295	350
Ending Vehs	360	389	423	360
Travel Distance (mi)	6225	6202	6305	6213
Travel Time (hr)	394.8	382.3	401.1	389.7
Total Delay (hr)	194.7	182.7	198.7	190.0
Total Stops	14860	14861	15560	14983
Fuel Used (gal)	273.5	270.3	278.8	272.1

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

SimTraffic Simulation Summary
Weekend Midday Road Diet - Signal

03/25/2019

Interval #1 Information Recording

Start Time	5:00						
End Time	6:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	20	21	22	23	25	27	28
Vehs Entered	9683	9734	9765	9836	9627	9742	9615
Vehs Exited	9697	9774	9771	9812	9625	9742	9576
Starting Vehs	379	364	354	345	347	357	355
Ending Vehs	365	324	348	369	349	357	394
Travel Distance (mi)	6150	6247	6222	6279	6186	6216	6102
Travel Time (hr)	409.6	369.7	389.7	393.1	397.9	388.8	369.7
Total Delay (hr)	211.9	168.9	189.5	191.6	199.3	188.9	173.7
Total Stops	14122	15005	15065	15706	15017	14894	14793
Fuel Used (gal)	276.2	268.6	271.8	274.3	273.7	270.6	262.7

Interval #1 Information Recording

Start Time	5:00			
End Time	6:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	29	30	31	Avg
Vehs Entered	9767	9728	9885	9735
Vehs Exited	9770	9696	9757	9725
Starting Vehs	363	357	295	350
Ending Vehs	360	389	423	360
Travel Distance (mi)	6225	6202	6305	6213
Travel Time (hr)	394.8	382.3	401.1	389.7
Total Delay (hr)	194.7	182.7	198.7	190.0
Total Stops	14860	14861	15560	14983
Fuel Used (gal)	273.5	270.3	278.8	272.1

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	1425	644	827	872	3768
Vehicles Exited	1427	642	826	872	3767
Hourly Exit Rate	1427	642	826	872	3767
Input Volume	1422	645	848	873	3788
% of Volume	100	100	97	100	99

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	WBT	WBR	All
Vehicles Entered	3	619	1633	640	6	2901
Vehicles Exited	3	620	1632	641	6	2902
Hourly Exit Rate	3	620	1632	641	6	2902
Input Volume	3	625	1644	642	5	2919
% of Volume	100	99	99	100	120	99

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL
Vehicles Entered	3	581	735	324	0	176	398	368	118	12	80	425
Vehicles Exited	3	581	736	324	0	175	396	366	117	12	80	426
Hourly Exit Rate	3	581	736	324	0	175	396	366	117	12	80	426
Input Volume	4	591	734	326	1	177	397	362	114	12	81	407
% of Volume	75	98	100	99	0	99	100	101	103	100	99	105

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	NBT	NBR	SBU	SBL	SBT	SBR	SBR2	All
Vehicles Entered	477	202	19	138	434	164	289	4943
Vehicles Exited	476	203	19	138	437	166	289	4944
Hourly Exit Rate	476	203	19	138	437	166	289	4944
Input Volume	469	198	19	138	442	164	282	4918
% of Volume	101	103	100	100	99	101	102	101

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Vehicles Entered	0	794	282	12	1001	59	1	24	2173
Vehicles Exited	0	796	282	12	1002	60	1	23	2176
Hourly Exit Rate	0	796	282	12	1002	60	1	23	2176
Input Volume	1	791	279	12	991	63	1	23	2161
% of Volume	0	101	101	100	101	95	100	100	101

5: Serramonte Blvd & Project Driveway 3 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	153	687	777	225	124	165	2131
Vehicles Exited	153	687	776	224	124	165	2129
Hourly Exit Rate	153	687	776	224	124	165	2129
Input Volume	154	691	771	223	125	158	2122
% of Volume	99	99	101	100	99	104	100

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Vehicles Entered	1	151	368	177	118	389	74	5	278	642	102	5
Vehicles Exited	1	151	369	177	116	389	74	5	277	641	102	5
Hourly Exit Rate	1	151	369	177	116	389	74	5	277	641	102	5
Input Volume	2	157	363	179	118	389	71	5	277	640	100	4
% of Volume	50	96	102	99	98	100	104	100	100	100	102	125

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBL	SBT	SBR	All
Vehicles Entered	72	560	212	3154
Vehicles Exited	72	557	212	3148
Hourly Exit Rate	72	557	212	3148
Input Volume	72	552	205	3134
% of Volume	100	101	103	100

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	160	55	224	8	39	10	281	247	12	7	252	184
Vehicles Exited	161	55	224	9	40	10	280	247	12	7	251	183
Hourly Exit Rate	161	55	224	9	40	10	280	247	12	7	251	183
Input Volume	156	60	220	9	40	9	278	246	11	8	259	179
% of Volume	103	92	102	100	100	111	101	100	109	88	97	102

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	1479
Vehicles Exited	1479
Hourly Exit Rate	1479
Input Volume	1475
% of Volume	100

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBT	EBR	WBL	NBU	NBL	NBT	NBR	SBT	SBR	All
Vehicles Entered	24	5	265	1	8	54	1005	2	854	29	2247
Vehicles Exited	24	5	265	1	8	54	1004	2	854	29	2246
Hourly Exit Rate	24	5	265	1	8	54	1004	2	854	29	2246
Input Volume	22	4	265	1	8	57	996	1	855	30	2239
% of Volume	109	125	100	100	100	95	101	200	100	97	100

9: Junipero Serra Blvd & Project Driveway 2 Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Vehicles Entered	280	134	961	232	72	761	2440
Vehicles Exited	280	133	960	233	72	762	2440
Hourly Exit Rate	280	133	960	233	72	762	2440
Input Volume	274	134	961	232	71	769	2441
% of Volume	102	99	100	100	101	99	100

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	43	763	9	8	936	52	15	12	55	65	1958
Vehicles Exited	43	763	9	7	936	52	15	12	55	65	1957
Hourly Exit Rate	43	763	9	7	936	52	15	12	55	65	1957
Input Volume	45	759	8	9	922	53	13	11	58	69	1947
% of Volume	96	101	112	78	102	98	115	109	95	94	101

11: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	11	813	953	12	30	42	1861
Vehicles Exited	11	811	953	12	29	41	1857
Hourly Exit Rate	11	811	953	12	29	41	1857
Input Volume	11	812	943	13	33	40	1852
% of Volume	100	100	101	92	88	102	100

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	2	767	938	4	2	3	1716
Vehicles Exited	2	766	939	4	3	3	1717
Hourly Exit Rate	2	766	939	4	3	3	1717
Input Volume	3	770	931	5	3	3	1715
% of Volume	67	99	101	80	100	100	100

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	684	16	20	920	22	20	1682
Vehicles Exited	685	16	20	920	22	20	1683
Hourly Exit Rate	685	16	20	920	22	20	1683
Input Volume	685	15	20	911	25	19	1675
% of Volume	100	107	100	101	88	105	100

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	645	59	75	866	75	54	1774
Vehicles Exited	645	59	74	866	74	53	1771
Hourly Exit Rate	645	59	74	866	74	53	1771
Input Volume	647	57	75	858	73	54	1764
% of Volume	100	104	99	101	101	98	100

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	45	42	30	998	842	28	1985
Vehicles Exited	44	41	30	998	842	28	1983
Hourly Exit Rate	44	41	30	998	842	28	1983
Input Volume	48	42	31	987	843	26	1977
% of Volume	92	98	97	101	100	108	100

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	445	27	29	506	34	24	1065
Vehicles Exited	445	27	29	505	33	24	1063
Hourly Exit Rate	445	27	29	505	33	24	1063
Input Volume	437	25	30	505	33	26	1056
% of Volume	102	108	97	100	100	92	101

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	434	13	13	524	13	12	1009
Vehicles Exited	434	14	13	523	13	12	1009
Hourly Exit Rate	434	14	13	523	13	12	1009
Input Volume	427	12	14	521	14	12	1000
% of Volume	102	117	93	100	93	100	101

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	427	19	23	521	15	14	1019
Vehicles Exited	426	19	23	523	15	14	1020
Hourly Exit Rate	426	19	23	523	15	14	1020
Input Volume	422	17	22	517	19	15	1012
% of Volume	101	112	105	101	79	93	101

26: Performance by movement

Movement	NBT	NWR	All
Vehicles Entered	624	1080	1704
Vehicles Exited	625	1080	1705
Hourly Exit Rate	625	1080	1705
Input Volume	630	1051	1681
% of Volume	99	103	101

Total Network Performance

Vehicles Entered	9735
Vehicles Exited	9725
Hourly Exit Rate	9725
Input Volume	57654
% of Volume	17

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
I-280 SB Off-Ramp	1	19.0	47.9	0.2	18	19	17.3
I-280 NB On-Ramp	2	2.9	13.0	0.1	23	23	2.7
Junipero Serra Blvd	3	32.6	39.8	0.1	6	7	29.3
Collins Avenue	4	3.5	9.7	0.0	17	17	3.1
	10	4.0	8.5	0.0	16	20	2.3
	11	9.5	14.0	0.0	10	16	4.7
Project Driveway 3	5	11.5	15.5	0.0	7	8	9.0
	19	2.5	7.5	0.0	21	22	2.3
	12	0.9	13.2	0.1	29	29	0.9
	13	0.7	11.0	0.1	29	29	0.7
	14	5.5	18.6	0.1	21	24	2.9
El Camino Real	6	27.9	34.7	0.1	7	8	24.1
	16	1.8	12.5	0.1	24	24	2.0
	17	0.2	8.6	0.1	29	29	0.2
	18	0.3	10.4	0.1	29	29	0.3
Hillside Blvd	7	11.4	28.1	0.2	22	22	10.0
Total		134.3	292.9	1.4	17	18	111.9

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 25 Speed
I-280 SB Off-Ramp	18	19.6	20	16.0	18	19.3	18
I-280 NB On-Ramp	24	2.7	23	3.2	23	3.2	22
Junipero Serra Blvd	6	33.0	6	32.3	6	34.4	6
Collins Avenue	17	3.4	16	4.1	17	3.6	16
	20	2.3	12	6.9	14	4.9	17
	13	6.2	9	12.1	10	10.4	9
Project Driveway 3	7	10.7	6	13.2	7	11.5	6
	21	2.6	21	2.6	22	2.4	21
	29	1.0	29	0.9	29	0.9	28
	29	0.8	29	0.7	28	0.8	28
	20	6.7	22	5.0	20	6.7	18
El Camino Real	7	27.8	7	28.7	7	29.3	7
	24	1.8	24	1.7	24	1.7	24
	29	0.3	29	0.2	29	0.2	29
	30	0.3	29	0.3	29	0.4	29
Hillside Blvd	25	8.7	22	11.8	24	9.2	23
Total	17	128.0	17	139.7	17	138.9	17

Arterial Level of Service
Weekend Midday Road Diet - Signal

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Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 25 Delay	Run 27 Speed	Run 27 Delay	Run 28 Speed	Run 28 Delay	Run 29 Speed	Run 29 Delay
I-280 SB Off-Ramp	19.5	19	16.8	18	20.8	18	19.0
I-280 NB On-Ramp	3.3	23	2.9	24	2.6	24	2.5
Junipero Serra Blvd	32.0	6	34.7	6	33.8	7	29.1
Collins Avenue	3.7	16	4.1	17	3.2	17	3.4
	3.4	11	7.2	22	1.6	17	3.5
	11.3	8	14.5	13	6.5	12	8.0
Project Driveway 3	11.8	6	13.9	7	10.9	7	10.1
	2.7	21	2.6	22	2.3	22	2.1
	0.9	29	1.0	29	0.8	29	0.8
	0.8	29	0.7	29	0.6	29	0.7
El Camino Real	8.1	21	5.8	24	3.2	23	4.0
	27.6	7	28.4	7	26.2	7	28.3
	1.7	24	1.9	24	1.7	24	1.9
	0.2	29	0.3	29	0.2	29	0.2
	0.3	29	0.3	29	0.2	29	0.4
Hillside Blvd	10.3	21	13.2	19	16.0	21	13.0
Total	137.9	16	148.2	17	130.7	17	126.9

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 30 Speed	Run 30 Delay	Run 31 Speed	Run 31 Delay
I-280 SB Off-Ramp	19	17.8	17	23.6
I-280 NB On-Ramp	23	2.8	22	3.3
Junipero Serra Blvd	6	33.5	6	33.8
Collins Avenue	17	3.1	17	3.5
	18	2.9	14	5.2
	11	8.7	8	12.4
Project Driveway 3	7	11.4	6	12.5
	21	2.5	21	2.8
	28	1.0	29	0.9
	28	0.7	28	0.8
	23	4.0	19	7.8
El Camino Real	7	26.5	6	31.4
	24	1.7	25	1.6
	29	0.2	29	0.2
	29	0.4	29	0.3
Hillside Blvd	23	11.0	22	11.7
Total	17	128.1	16	151.8

Arterial Level of Service
Weekend Midday Road Diet - Signal

03/25/2019

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
Hillside Blvd	7	13.0	18.3	0.0	9	8	14.1
	18	0.8	16.2	0.2	39	43	0.8
	17	0.4	10.6	0.1	29	29	0.4
	16	0.5	8.7	0.1	29	29	0.5
El Camino Real	6	31.4	40.5	0.1	8	9	26.6
	14	2.3	10.9	0.1	23	23	2.1
	13	1.1	14.1	0.1	28	28	1.0
	12	0.8	10.9	0.1	29	29	0.8
	19	1.8	14.6	0.1	26	26	1.8
Project Driveway 3	5	5.9	10.9	0.0	15	14	6.2
	11	1.1	4.8	0.0	21	21	1.2
	10	1.0	5.7	0.0	25	26	0.9
Collins Avenue	4	4.2	8.5	0.0	15	17	3.3
Junipero Serra Blvd	3	36.0	40.7	0.0	4	4	38.2
I-280 NB On-Ramp	2	7.6	16.1	0.1	15	15	7.4
I-280 SB Off-Ramp	1	20.1	30.3	0.1	10	10	20.7
Total		128.2	261.8	1.2	16	16	125.8

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 25 Speed
Hillside Blvd	9	12.6	10	10.9	7	16.8	9
	37	0.8	40	0.7	34	1.1	37
	29	0.5	29	0.5	29	0.3	29
	29	0.5	29	0.5	29	0.6	29
El Camino Real	7	32.7	8	30.2	8	31.3	7
	23	2.3	23	2.3	23	2.3	23
	28	1.0	28	1.1	28	1.2	27
	29	0.9	29	0.8	29	0.9	28
	26	1.7	26	2.0	25	2.0	26
Project Driveway 3	16	5.4	14	6.3	15	5.7	14
	21	1.1	21	1.2	21	1.2	21
	26	0.9	24	1.4	22	1.7	27
Collins Avenue	16	3.9	14	5.3	13	5.6	18
Junipero Serra Blvd	4	35.1	4	36.6	4	39.5	4
I-280 NB On-Ramp	14	9.0	16	7.1	14	8.5	15
I-280 SB Off-Ramp	10	20.4	10	21.4	9	21.6	10
Total	16	128.8	16	128.2	15	140.2	16

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 25 Delay	Run 27 Speed	Run 27 Delay	Run 28 Speed	Run 28 Delay	Run 29 Speed	Run 29 Delay
Hillside Blvd	12.6	10	10.8	8	14.0	9	12.3
	1.0	41	0.7	39	0.9	39	0.7
	0.5	29	0.4	29	0.5	29	0.5
	0.7	29	0.4	29	0.5	29	0.5
El Camino Real	34.0	7	31.5	8	29.8	7	32.9
	2.4	23	2.3	23	2.3	22	2.4
	1.2	28	1.0	28	0.9	28	1.1
	0.9	29	0.8	29	0.9	29	0.9
	1.8	26	1.7	26	1.6	26	1.7
Project Driveway 3	6.1	14	6.3	15	5.9	16	5.1
	1.1	22	1.0	21	1.1	22	1.0
	0.6	26	0.8	26	0.8	26	0.8
Collins Avenue	3.1	15	4.4	17	3.4	17	3.4
Junipero Serra Blvd	36.1	4	35.4	4	36.0	4	34.0
I-280 NB On-Ramp	7.5	16	7.1	16	6.6	15	7.7
I-280 SB Off-Ramp	19.3	10	19.7	10	19.3	10	19.9
Total	128.9	16	124.0	16	124.4	16	124.9

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 30 Speed	Run 30 Delay	Run 31 Speed	Run 31 Delay
Hillside Blvd	9	11.9	9	12.8
	39	0.8	40	0.9
	29	0.4	29	0.5
	29	0.6	29	0.6
El Camino Real	7	32.0	7	32.5
	23	2.2	23	2.3
	28	1.1	28	1.1
	29	0.9	29	0.8
	26	1.7	26	1.7
Project Driveway 3	14	6.1	14	6.3
	21	1.2	21	1.1
	23	1.4	24	1.2
Collins Avenue	13	5.8	15	4.3
Junipero Serra Blvd	4	34.0	4	35.3
I-280 NB On-Ramp	16	7.0	15	7.9
I-280 SB Off-Ramp	10	20.5	11	18.1
Total	16	127.6	16	127.4

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	T	L	L	R
Maximum Queue (ft)	580	443	238	242	75	308	241	112
Average Queue (ft)	290	191	127	136	50	187	120	9
95th Queue (ft)	483	358	210	219	103	271	198	65
Link Distance (ft)	1253	1253	384	384		498	498	498
Upstream Blk Time (%)	0							
Queuing Penalty (veh)	0							
Storage Bay Dist (ft)					50			
Storage Blk Time (%)					32	2		
Queuing Penalty (veh)					67	4		

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	WB	WB
Directions Served	UL	L	T	T	T	TR
Maximum Queue (ft)	256	154	172	184	166	168
Average Queue (ft)	145	7	15	25	69	80
95th Queue (ft)	226	69	88	110	133	138
Link Distance (ft)		384	384	384	246	246
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200					
Storage Blk Time (%)	2					
Queuing Penalty (veh)	5					

Queuing and Blocking Report
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Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	L	T	T	R	UL	T	TR	R>	U<L	L	T
Maximum Queue (ft)	251	259	258	266	233	161	162	174	171	207	243	242
Average Queue (ft)	174	186	167	197	105	117	136	155	148	128	147	114
95th Queue (ft)	246	255	252	275	232	171	178	172	182	193	219	195
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)	1	2	1	3	0	9	9	25	18			
Queuing Penalty (veh)	4	6	4	11	0	22	24	64	46			
Storage Bay Dist (ft)					225					295	295	
Storage Blk Time (%)				4	0							0
Queuing Penalty (veh)				15	1							0

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	UL	T	TR	>
Maximum Queue (ft)	288	115	238	324	307	250
Average Queue (ft)	154	84	95	190	201	17
95th Queue (ft)	262	147	180	293	298	127
Link Distance (ft)	1147		676	676		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		90	320		280	
Storage Blk Time (%)	21	2		1	2	0
Queuing Penalty (veh)	42	5		1	5	0

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	UT	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	130	100	67	88	112	128	90	157	75
Average Queue (ft)	15	8	6	23	26	59	40	61	24
95th Queue (ft)	73	53	39	73	87	129	102	134	69
Link Distance (ft)	146	146			111	111		1189	
Upstream Blk Time (%)	0	0			1	2			
Queuing Penalty (veh)	0	0			5	11			
Storage Bay Dist (ft)			40	65			65	50	
Storage Blk Time (%)		0	0	3	1	7	2	30	1
Queuing Penalty (veh)		1	0	6	3	17	5	7	0

Queuing and Blocking Report
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Intersection: 5: Serramonte Blvd & Project Driveway 3

Movement	EB	EB	WB	WB	B19	SB
Directions Served	LT	T	T	TR	T	LR
Maximum Queue (ft)	165	163	140	223	43	245
Average Queue (ft)	127	96	60	117	3	124
95th Queue (ft)	161	161	119	208	29	215
Link Distance (ft)	110	110	169	169	503	249
Upstream Blk Time (%)	29	7	0	2		1
Queuing Penalty (veh)	123	28	0	9		0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	NB	SB	SB
Directions Served	UL	TR	L	T	R	UL	T	T	T	R	UL	T
Maximum Queue (ft)	253	273	172	325	142	225	343	325	164	67	126	209
Average Queue (ft)	120	210	80	185	25	204	238	166	74	31	57	134
95th Queue (ft)	227	310	139	289	81	263	427	334	136	57	108	191
Link Distance (ft)	259	259	334	334			326	326	326			1268
Upstream Blk Time (%)	0	6		0	0		20	0				
Queuing Penalty (veh)	0	23		0	0		67	1				
Storage Bay Dist (ft)					300	200				160	300	
Storage Blk Time (%)				1		48	0		0			
Queuing Penalty (veh)				0		97	0		0			

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	178	164	122
Average Queue (ft)	102	50	71
95th Queue (ft)	170	122	120
Link Distance (ft)	1268	1268	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)		0	3
Queuing Penalty (veh)		1	6

Queuing and Blocking Report
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Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	TR	L	T	R
Maximum Queue (ft)	176	138	56	51	208	156	62	271	100
Average Queue (ft)	87	62	20	14	120	71	8	124	73
95th Queue (ft)	154	111	51	43	189	129	36	221	120
Link Distance (ft)	850	850	192	192	908	908		900	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)					75		75		
Storage Blk Time (%)							23		
Queuing Penalty (veh)							42		

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	T	TR	T	TR
Maximum Queue (ft)	168	105	12	90	160	94	49	127	132
Average Queue (ft)	34	76	1	32	53	17	9	29	38
95th Queue (ft)	112	116	8	71	124	64	31	88	100
Link Distance (ft)	472		186		1262	1262	1262	415	415
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	80		130						
Storage Blk Time (%)	0	7	0	1					
Queuing Penalty (veh)	0	2	0	1					

Intersection: 9: Junipero Serra Blvd & Project Driveway 2

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	TR	L	T	T
Maximum Queue (ft)	105	113	88	149	160	190	87	110	137
Average Queue (ft)	55	54	41	72	87	99	43	52	56
95th Queue (ft)	93	93	73	127	147	164	75	99	106
Link Distance (ft)	196	196	196	676	676	676		591	591
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							210		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
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Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	140	125	72	112	63	175
Average Queue (ft)	56	30	9	15	22	93
95th Queue (ft)	135	106	46	69	54	181
Link Distance (ft)	111	111	129	129	208	158
Upstream Blk Time (%)	3	1	0	0		17
Queuing Penalty (veh)	13	3	0	1		0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 11: Serramonte Blvd

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	180	173	18	51	212
Average Queue (ft)	104	71	1	3	81
95th Queue (ft)	187	181	12	25	192
Link Distance (ft)	129	129	110	110	222
Upstream Blk Time (%)	11	5		0	6
Queuing Penalty (veh)	46	21		0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Serramonte Blvd

Movement	EB	B19	B19	SB
Directions Served	L	T	T	LR
Maximum Queue (ft)	22	152	35	31
Average Queue (ft)	2	11	1	5
95th Queue (ft)	13	75	16	24
Link Distance (ft)		169	169	255
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	1			
Storage Bay Dist (ft)	75			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
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Intersection: 13: Serramonte Blvd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	5	39	77
Average Queue (ft)	0	9	29
95th Queue (ft)	5	33	61
Link Distance (ft)	393		343
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		75	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Serramonte Blvd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	356	95	246
Average Queue (ft)	67	31	109
95th Queue (ft)	247	72	239
Link Distance (ft)	518	259	411
Upstream Blk Time (%)	0		0
Queuing Penalty (veh)	0		0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: El Camino Real

Movement	EB	NB	NB	NB	SB
Directions Served	LR	L	T	T	T
Maximum Queue (ft)	176	101	247	185	2
Average Queue (ft)	67	20	71	41	0
95th Queue (ft)	172	72	237	174	2
Link Distance (ft)	203		415	415	326
Upstream Blk Time (%)	8		0	0	
Queuing Penalty (veh)	0		1	0	
Storage Bay Dist (ft)		100			
Storage Blk Time (%)				13	
Queuing Penalty (veh)				4	

Queuing and Blocking Report
Weekend MIDDAY Road Diet - Signal

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Intersection: 16: Serramonte Blvd

Movement	EB	WB	WB	NB	NB
Directions Served	TR	LT	T	L	R
Maximum Queue (ft)	4	59	16	58	60
Average Queue (ft)	0	10	1	23	18
95th Queue (ft)	3	39	10	51	49
Link Distance (ft)	334	300	300	289	289
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	45	40
Average Queue (ft)	5	18
95th Queue (ft)	25	44
Link Distance (ft)	389	205
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	54	53
Average Queue (ft)	8	20
95th Queue (ft)	34	47
Link Distance (ft)	850	247
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Weekend Midday Road Diet - Signal

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Intersection: 26:

Movement	NW	B36	B36
Directions Served	R	T	
Maximum Queue (ft)	235	196	214
Average Queue (ft)	20	70	71
95th Queue (ft)	119	152	168
Link Distance (ft)	352	175	175
Upstream Blk Time (%)	0	0	1
Queuing Penalty (veh)	0	2	5
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 882

HCM Signalized Intersection Capacity Analysis
1: Serramonte Blvd & I-280 SB Off-Ramp

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↓	↑↓
Traffic Volume (vph)	0	1422	642	0	848	873
Future Volume (vph)	0	1422	642	0	848	873
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Fr't		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1497	676	0	893	919
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1497	676	0	893	919
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		30.6	18.9		22.4	34.6
Effective Green, g (s)		30.6	18.9		22.4	34.6
Actuated g/C Ratio		0.50	0.31		0.37	0.56
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1766	1567		1254	1573
v/s Ratio Prot		c0.42	0.13		c0.26	0.33
v/s Ratio Perm						
v/c Ratio		0.85	0.43		0.71	0.58
Uniform Delay, d1		13.3	16.9		16.7	8.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		4.0	0.2		1.9	0.6
Delay (s)		17.3	17.1		18.6	9.2
Level of Service		B	B		B	A
Approach Delay (s)		17.3	17.1		13.9	
Approach LOS		B	B		B	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	11.5
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↔	↔↔	↔↔			
Traffic Volume (vph)	3	625	1644	642	5	0	0
Future Volume (vph)	3	625	1644	642	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.4	4.1			
Lane Util. Factor		0.97	0.95	0.95			
Flt		1.00	1.00	1.00			
Flt Protected		0.95	1.00	1.00			
Satd. Flow (prot)		3433	3539	3535			
Flt Permitted		0.20	1.00	1.00			
Satd. Flow (perm)		716	3539	3535			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	658	1731	676	5	0	0
RTOR Reduction (vph)	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	661	1731	680	0	0	0
Turn Type	custom	Prot	NA	NA			
Protected Phases		5	2	6			
Permitted Phases		5					
Actuated Green, G (s)		20.2	42.4	14.6			
Effective Green, g (s)		20.2	42.4	14.6			
Actuated g/C Ratio		0.48	1.00	0.34			
Clearance Time (s)		3.5	4.4	4.1			
Vehicle Extension (s)		3.0	4.0	3.0			
Lane Grp Cap (vph)		341	3539	1217			
v/s Ratio Prot			c0.49	0.19			
v/s Ratio Perm		c0.92					
v/c Ratio		1.94	0.49	0.56			
Uniform Delay, d1		11.1	0.0	11.3			
Progression Factor		1.00	1.00	1.00			
Incremental Delay, d2		432.9	0.1	0.6			
Delay (s)		444.0	0.1	11.8			
Level of Service		F	A	B			
Approach Delay (s)			122.8	11.8		0.0	
Approach LOS			F	B		A	
Intersection Summary							
HCM 2000 Control Delay			98.2		HCM 2000 Level of Service		F
HCM 2000 Volume to Capacity ratio			1.39				
Actuated Cycle Length (s)			42.4		Sum of lost time (s)		7.6
Intersection Capacity Utilization			98.3%		ICU Level of Service		F
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL
Lane Configurations		↔↔	↔↔	↔			↔↔	↔↔	↔			↔↔
Traffic Volume (vph)	4	591	734	326	1	177	397	362	114	12	81	407
Future Volume (vph)	4	591	734	326	1	177	397	362	114	12	81	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0		3.0	4.6	4.6				4.0
Lane Util. Factor		0.97	0.95	1.00		1.00	0.91	0.91				0.97
Fltp, ped/bikes		1.00	1.00	0.98		1.00	1.00	1.00				1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00				1.00
Flt		1.00	1.00	0.85		1.00	0.95	0.85				1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00				0.95
Satd. Flow (prot)		3433	3539	1554		1770	3216	1441				3433
Flt Permitted		0.19	1.00	1.00		0.25	1.00	1.00				0.95
Satd. Flow (perm)		685	3539	1554		463	3216	1441				3433
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	622	773	343	1	186	418	381	120	13	85	428
RTOR Reduction (vph)	0	0	0	248	0	0	0	89	0	0	0	0
Lane Group Flow (vph)	0	626	773	95	0	187	635	195	0	0	0	526
Confl. Peds. (#/hr)				7								
Turn Type	custom	Prot	NA	Perm	custom	Prot	NA	Perm		Perm	Split	Split
Protected Phases		5	2			1	6				3	3
Permitted Phases		5		2	1			6			3	
Actuated Green, G (s)		21.1	28.6	28.6		16.1	23.0	23.0				21.9
Effective Green, g (s)		21.1	28.6	28.6		16.1	23.0	23.0				21.9
Actuated g/C Ratio		0.20	0.28	0.28		0.16	0.22	0.22				0.21
Clearance Time (s)		3.0	4.0	4.0		3.0	4.6	4.6				4.0
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0	2.0				2.0
Lane Grp Cap (vph)		139	979	430		72	716	320				727
v/s Ratio Prot			c0.22				0.20					c0.15
v/s Ratio Perm		c0.91		0.06		0.40		0.14				
v/c Ratio		4.50	0.79	0.22		2.60	0.89	0.61				0.72
Uniform Delay, d1		41.1	34.6	28.8		43.6	38.9	36.1				37.9
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00				1.00
Incremental Delay, d2		1593.1	4.0	0.1		757.3	12.4	2.4				3.0
Delay (s)		1634.2	38.5	28.9		800.9	51.3	38.5				40.9
Level of Service		F	D	C		F	D	D				D
Approach Delay (s)			610.0				174.8					
Approach LOS			F				F					
Intersection Summary												
HCM 2000 Control Delay			260.2		HCM 2000 Level of Service			F				
HCM 2000 Volume to Capacity ratio			1.72									
Actuated Cycle Length (s)			103.3		Sum of lost time (s)			16.2				
Intersection Capacity Utilization			82.7%		ICU Level of Service			E				
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019

Movement	NBT	NBR	SBU	SBL	SBT	SBR	SBR2
Lane Configurations	↑↑	↑		↓	↑↑		↑
Traffic Volume (vph)	469	198	19	138	442	164	282
Future Volume (vph)	469	198	19	138	442	164	282
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.6	4.6		4.0
Lane Util. Factor	0.95	1.00		1.00	0.95		1.00
Flpb, ped/bikes	1.00	0.98		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00
Frt	1.00	0.85		1.00	0.96		0.85
Flt Protected	1.00	1.00		0.95	1.00		1.00
Satd. Flow (prot)	3539	1554		1770	3395		1583
Flt Permitted	1.00	1.00		0.95	1.00		1.00
Satd. Flow (perm)	3539	1554		1770	3395		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	494	208	20	145	465	173	297
RTOR Reduction (vph)	0	124	0	0	0	0	0
Lane Group Flow (vph)	494	84	0	165	638	0	297
Confl. Peds. (#/hr)	7						
Turn Type	NA	Perm	Split	Split	NA		Free
Protected Phases	3		4	4	4		
Permitted Phases	3			Free			
Actuated Green, G (s)	21.9	21.9		21.1	21.1		103.3
Effective Green, g (s)	21.9	21.9		21.1	21.1		103.3
Actuated g/C Ratio	0.21	0.21		0.20	0.20		1.00
Clearance Time (s)	4.0	4.0		4.6	4.6		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		
Lane Grp Cap (vph)	750	329		361	693		1583
v/s Ratio Prot	0.14			0.09	0.19		
v/s Ratio Perm		0.05			0.19		
v/c Ratio	0.66	0.26		0.46	0.92		0.19
Uniform Delay, d1	37.3	33.9		36.1	40.3		0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2	1.6	0.2		0.3	17.4		0.3
Delay (s)	38.9	34.1		36.4	57.6		0.3
Level of Service	D	C		D	E		A
Approach Delay (s)	38.9			39.0			
Approach LOS	D			D			

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
 4: Collins Avenue & Serramonte Blvd

03/25/2019


Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations		↑↑	↑		↓↑↑	↓	↑
Traffic Volume (veh/h)	1	789	279	12	972	63	23
Future Volume (Veh/h)	1	789	279	12	972	63	23
Sign Control	Free			Free Stop			
Grade	0%						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	831	294	13	1023	66	24
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							2
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)	239						
pX, platoon unblocked	0.00			0.82		0.82	0.82
vC, conflicting volume	0			831		1113	416
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	0			347		692	0
IC, single (s)	0.0			4.1		6.8	6.9
IC, 2 stage (s)							
IF (s)	0.0			2.2		3.5	3.3
p0 queue free %	0			99		78	97
cM capacity (veh/h)	0			988		305	886
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	416	416	294	159	292	292	90
Volume Left	0	0	0	13	0	0	66
Volume Right	0	0	294	0	0	0	24
cSH	1700	1700	1700	988	1700	1700	416
Volume to Capacity	0.24	0.24	0.17	0.01	0.17	0.17	0.22
Queue Length 95th (ft)	0	0	0	1	0	0	20
Control Delay (s)	0.0	0.0	0.0	0.8	0.0	0.0	17.1
Lane LOS	A			C			
Approach Delay (s)	0.0			0.1			
Approach LOS	D			C			

Intersection Summary

Average Delay	0.7
Intersection Capacity Utilization	38.2% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
5: Serramonte Blvd & Project Driveway 3


03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	154	648	771	223	125	158
Future Volume (vph)	154	648	771	223	125	158
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	682	812	235	132	166
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total (vph)	389	455	541	506	298	
Volume Left (vph)	162	0	0	0	132	
Volume Right (vph)	0	0	0	235	166	
Hadj (s)	0.24	0.03	0.03	-0.29	-0.21	
Departure Headway (s)	7.3	7.1	7.0	6.7	6.7	
Degree Utilization, x	0.79	0.90	1.06	0.94	0.55	
Capacity (veh/h)	489	504	516	529	530	
Control Delay (s)	31.3	43.9	81.6	50.5	17.7	
Approach Delay (s)	38.1		66.5		17.7	
Approach LOS	E		F		C	
Intersection Summary						
Delay			48.9			
Level of Service			E			
Intersection Capacity Utilization			78.6%		ICU Level of Service D	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations		↑	↑		↑	↑	↑		↑	↑	↑	↑
Traffic Volume (vph)	2	157	290	179	118	389	71	5	277	602	100	4
Future Volume (vph)	2	157	290	179	118	389	71	5	277	602	100	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5		3.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00		1.00	0.91	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00		1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1770	1743		1770	1863	1556	1770		1770	5085	1554	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95		0.95	1.00	1.00	
Satd. Flow (perm)	1770	1743		1770	1863	1556	1770		1770	5085	1554	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	165	305	188	124	409	75	5	292	634	105	4
RTOR Reduction (vph)	0	0	21	0	0	0	53	0	0	0	70	0
Lane Group Flow (vph)	0	167	472	0	124	409	22	0	297	634	35	0
Confl. Peds. (#/hr)				11			7				7	
Turn Type	custom	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	3	3	8		7	4		1	1	6		5
Permitted Phases	3						4				6	
Actuated Green, G (s)		11.6	27.7		9.4	25.5	25.5		16.4	29.2	29.2	
Effective Green, g (s)		11.6	27.7		9.4	25.5	25.5		16.4	29.2	29.2	
Actuated g/C Ratio		0.13	0.32		0.11	0.29	0.29		0.19	0.33	0.33	
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5		3.0	4.0	4.0	
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0		2.0	4.0	4.0	
Lane Grp Cap (vph)		234	551		190	542	453		331	1696	518	
v/s Ratio Prot		c0.09	c0.27		0.07	0.22			c0.17	0.12		
v/s Ratio Perm							0.01				0.02	
v/c Ratio		0.71	0.86		0.65	0.75	0.05		0.90	0.37	0.07	
Uniform Delay, d1		36.4	28.0		37.5	28.2	22.3		34.7	22.2	19.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		8.3	12.1		6.0	5.3	0.0		24.8	0.2	0.1	
Delay (s)		44.6	40.1		43.5	33.4	22.3		59.5	22.4	19.9	
Level of Service		D	D		D	C	C		E	C	B	
Approach Delay (s)				41.3			34.1				32.8	
Approach LOS				D			C				C	
Intersection Summary												
HCM 2000 Control Delay			34.1		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			87.5		Sum of lost time (s)				14.0			
Intersection Capacity Utilization			74.1%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	72	552	205
Future Volume (vph)	72	552	205
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1559
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1559
Peak-hour factor, PHF	0.95	0.95	0.95
Adj. Flow (vph)	76	581	216
RTOR Reduction (vph)	0	0	167
Lane Group Flow (vph)	80	581	49
Confl. Peds. (#/hr)			3
Turn Type	Prot	NA	Perm
Protected Phases	5	2	
Permitted Phases			2
Actuated Green, G (s)	7.2	20.0	20.0
Effective Green, g (s)	7.2	20.0	20.0
Actuated g/C Ratio	0.08	0.23	0.23
Clearance Time (s)	3.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0
Lane Grp Cap (vph)	145	1162	356
v/s Ratio Prot	0.05	c0.11	
v/s Ratio Perm			0.03
v/c Ratio	0.55	0.50	0.14
Uniform Delay, d1	38.6	29.4	26.9
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.5	0.2
Delay (s)	41.2	29.9	27.1
Level of Service	D	C	C
Approach Delay (s)		30.2	
Approach LOS		C	

Intersection Summary

HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: Hillside Blvd & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	36	220	9	40	9	278	246	11	8	259	179
Future Volume (vph)	156	36	220	9	40	9	278	246	11	8	259	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	0.98	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.96	1.00	0.99	0.99	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1788	1583	3423	1770	1850	1770	1850	1770	1850	1770	1863	1543
Flt Permitted	0.92	1.00	0.92	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1345	1583	3167	1770	1850	1770	1850	1770	1850	1770	1863	1543
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	164	38	232	9	42	9	293	259	12	8	273	188
RTOR Reduction (vph)	0	0	157	0	6	0	0	2	0	0	0	129
Lane Group Flow (vph)	0	202	75	0	54	0	293	269	0	8	273	59
Confl. Peds. (#/hr)	1					1						12
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2		2	3	8		7	4	
Permitted Phases	2		2	2								4
Actuated Green, G (s)		22.3	22.3		22.3		15.7	32.7		0.9	17.9	17.9
Effective Green, g (s)		22.3	22.3		22.3		15.7	32.7		0.9	17.9	17.9
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.23	0.47	0.01	0.26	0.26			
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	432	508	1017	400	871	22	480	397				
v/s Ratio Prot		c0.15	0.05		0.02		c0.17	0.15		0.00	c0.15	
v/s Ratio Perm												0.04
v/c Ratio	0.47	0.15	0.05	0.05	0.73	0.31	0.36	0.57	0.15			
Uniform Delay, d1	18.8	16.8	16.3	24.9	11.4	34.0	22.4	19.9				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	3.6	0.6	0.1	6.8	0.2	9.9	1.6	0.2				
Delay (s)	22.4	17.4	16.4	31.7	11.6	43.9	23.9	20.0				
Level of Service	C	B	B	C	B	D	C	C				
Approach Delay (s)	19.7		16.4	22.0		22.7						
Approach LOS	B		B	C		C						

Intersection Summary

HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↕		↕			↕	↕↕↕			↕↕↕
Traffic Volume (vph)	22	0	265	1	0	0	8	57	996	1	0	846
Future Volume (vph)	22	0	265	1	0	0	8	57	996	1	0	846
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5			4.5	4.5			4.5
Lane Util. Factor		1.00	1.00		1.00			1.00	0.91			0.91
Frpb, ped/bikes		1.00	1.00		1.00			1.00	1.00			1.00
Flpb, ped/bikes		1.00	1.00		1.00			1.00	1.00			1.00
Frt		1.00	0.85		1.00			1.00	1.00			0.99
Flt Protected		0.95	1.00		0.95			0.95	1.00			1.00
Satd. Flow (prot)		1770	1583		1770			1770	5084			5059
Flt Permitted		0.76	1.00		0.74			0.95	1.00			1.00
Satd. Flow (perm)		1410	1583		1383			1770	5084			5059
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	0	279	1	0	0	8	60	1048	1	0	891
RTOR Reduction (vph)	0	0	250	0	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	0	23	29	0	1	0	0	68	1049	0	0	920
Confl. Peds. (#/hr)										1	1	
Turn Type	Perm	NA	Perm	Perm	NA		Prot	Prot	NA			NA
Protected Phases		4			8		1	1	6			2
Permitted Phases	4		4	8								
Actuated Green, G (s)		8.1	8.1		8.1			7.2	60.5			48.8
Effective Green, g (s)		8.1	8.1		8.1			7.2	60.5			48.8
Actuated g/C Ratio		0.10	0.10		0.10			0.09	0.78			0.63
Clearance Time (s)		4.5	4.5		4.5			4.5	4.5			4.5
Vehicle Extension (s)		3.0	3.0		3.0			3.0	3.0			3.0
Lane Grp Cap (vph)		147	165		144			164	3963			3181
v/s Ratio Prot								c0.04	0.21			c0.18
v/s Ratio Perm		0.02	c0.02		0.00							
v/c Ratio		0.16	0.18		0.01			0.41	0.26			0.29
Uniform Delay, d1		31.6	31.7		31.1			33.2	2.4			6.5
Progression Factor		1.00	1.00		1.00			1.00	1.00			1.00
Incremental Delay, d2		0.5	0.5		0.0			1.7	0.2			0.2
Delay (s)		32.1	32.2		31.2			34.9	2.5			6.8
Level of Service		C	C		C			C	A			A
Approach Delay (s)		32.2			31.2			4.5				6.8
Approach LOS		C			C			A				A
Intersection Summary												
HCM 2000 Control Delay		9.0										A
HCM 2000 Volume to Capacity ratio		0.29										
Actuated Cycle Length (s)		77.6			Sum of lost time (s)			13.5				
Intersection Capacity Utilization		56.8%			ICU Level of Service							B
Analysis Period (min)		15										
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	SBR
Lane Configurations	↕
Traffic Volume (vph)	30
Future Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	1.00
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	32
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
9: Junipero Serra Blvd & Project Driveway 2

03/25/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↔↔↔	↔	↔	↔↔
Traffic Volume (vph)	274	134	880	232	71	769
Future Volume (vph)	274	134	880	232	71	769
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.91	1.00	0.95	0.95
Flpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	0.97	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1560	4913	1770	3539	3539
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1560	4913	1770	3539	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	288	141	926	244	75	809
RTOR Reduction (vph)	0	112	69	0	0	0
Lane Group Flow (vph)	288	29	1101	0	75	809
Confl. Peds. (#/hr)		3		1		
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	10.3	10.3	23.5		3.3	31.3
Effective Green, g (s)	10.3	10.3	23.5		3.3	31.3
Actuated g/C Ratio	0.20	0.20	0.46		0.07	0.62
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	698	317	2281		115	2189
v/s Ratio Prot	c0.08		c0.22		c0.04	0.23
v/s Ratio Perm		0.02				
v/c Ratio	0.41	0.09	0.48		0.65	0.37
Uniform Delay, d1	17.5	16.3	9.4		23.1	4.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.1	0.7		12.5	0.5
Delay (s)	17.9	16.5	10.1		35.6	5.3
Level of Service	B	B	B		D	A
Approach Delay (s)	17.4		10.1			7.8
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

SimTraffic Simulation Summary
Weekend Midday Road Diet - Stop Sign

03/25/2019

Summary of All Intervals							
Run Number	21	22	23	24	25	26	27
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	9929	9854	9704	9665	9592	9518	9831
Vehs Exited	9931	9864	9716	9588	9589	9489	9802
Starting Vehs	391	355	375	327	361	379	346
Ending Vehs	389	345	363	404	364	408	375
Travel Distance (mi)	6362	6275	6173	6131	6083	6069	6225
Travel Time (hr)	426.5	423.1	443.2	372.4	389.6	383.7	419.5
Total Delay (hr)	222.0	221.7	244.9	175.9	194.0	189.2	219.7
Total Stops	17060	15988	15329	15389	15723	15401	16194
Fuel Used (gal)	284.5	282.2	285.5	267.1	268.0	267.7	280.7

Summary of All Intervals				
Run Number	28	29	30	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	9729	9493	9696	9702
Vehs Exited	9710	9474	9624	9680
Starting Vehs	345	343	311	346
Ending Vehs	364	362	383	369
Travel Distance (mi)	6167	6041	6169	6170
Travel Time (hr)	376.2	367.3	365.8	396.7
Total Delay (hr)	178.5	173.1	167.9	198.7
Total Stops	15724	15607	15590	15796
Fuel Used (gal)	266.7	261.6	263.8	272.8

Interval #0 Information Seeding	
Start Time	4:45
End Time	5:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00						
End Time	6:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	21	22	23	24	25	26	27
Vehs Entered	9929	9854	9704	9665	9592	9518	9831
Vehs Exited	9931	9864	9716	9588	9589	9489	9802
Starting Vehs	391	355	375	327	361	379	346
Ending Vehs	389	345	363	404	364	408	375
Travel Distance (mi)	6362	6275	6173	6131	6083	6069	6225
Travel Time (hr)	426.5	423.1	443.2	372.4	389.6	383.7	419.5
Total Delay (hr)	222.0	221.7	244.9	175.9	194.0	189.2	219.7
Total Stops	17060	15988	15329	15389	15723	15401	16194
Fuel Used (gal)	284.5	282.2	285.5	267.1	268.0	267.7	280.7

Interval #1 Information Recording

Start Time	5:00			
End Time	6:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	28	29	30	Avg
Vehs Entered	9729	9493	9696	9702
Vehs Exited	9710	9474	9624	9680
Starting Vehs	345	343	311	346
Ending Vehs	364	362	383	369
Travel Distance (mi)	6167	6041	6169	6170
Travel Time (hr)	376.2	367.3	365.8	396.7
Total Delay (hr)	178.5	173.1	167.9	198.7
Total Stops	15724	15607	15590	15796
Fuel Used (gal)	266.7	261.6	263.8	272.8

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	1435	640	839	864	3778
Vehicles Exited	1438	640	835	864	3777
Hourly Exit Rate	1438	640	835	864	3777
Input Volume	1422	645	848	873	3788
% of Volume	101	99	98	99	100

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	WBT	WBR	All
Vehicles Entered	2	639	1634	638	5	2918
Vehicles Exited	2	638	1633	638	5	2916
Hourly Exit Rate	2	638	1633	638	5	2916
Input Volume	3	625	1644	642	5	2919
% of Volume	67	102	99	99	100	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	WBR2	NBU	NBL2	NBL
Vehicles Entered	4	577	732	331	0	176	388	367	114	11	81	407
Vehicles Exited	4	576	726	331	0	175	385	364	114	11	82	410
Hourly Exit Rate	4	576	726	331	0	175	385	364	114	11	82	410
Input Volume	4	591	734	326	1	177	397	362	114	12	81	407
% of Volume	100	97	99	102	0	99	97	101	100	92	101	101

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	NBT	NBR	SBU	SBL	SBT	SBR	SBR2	All
Vehicles Entered	469	193	23	131	442	172	290	4908
Vehicles Exited	472	193	23	130	443	172	289	4900
Hourly Exit Rate	472	193	23	130	443	172	289	4900
Input Volume	469	198	19	138	442	164	282	4918
% of Volume	101	97	121	94	100	105	102	100

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Vehicles Entered	1	772	277	13	987	60	1	23	2134
Vehicles Exited	1	772	276	13	986	60	1	23	2132
Hourly Exit Rate	1	772	276	13	986	60	1	23	2132
Input Volume	1	791	279	12	991	63	1	23	2161
% of Volume	100	98	99	108	99	95	100	100	99

5: Serramonte Blvd & Project Driveway 3 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	146	684	756	221	119	158	2084
Vehicles Exited	146	685	758	222	120	158	2089
Hourly Exit Rate	146	685	758	222	120	158	2089
Input Volume	154	691	771	223	125	158	2122
% of Volume	95	99	98	100	96	100	98

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Vehicles Entered	2	149	358	181	117	386	71	5	262	645	98	4
Vehicles Exited	2	147	355	180	117	386	71	5	261	647	97	4
Hourly Exit Rate	2	147	355	180	117	386	71	5	261	647	97	4
Input Volume	2	157	363	179	118	389	71	5	277	640	100	4
% of Volume	100	94	98	101	99	99	100	100	94	101	97	100

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBL	SBT	SBR	All
Vehicles Entered	72	564	204	3118
Vehicles Exited	72	565	204	3113
Hourly Exit Rate	72	565	204	3113
Input Volume	72	552	205	3134
% of Volume	100	102	100	99

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	150	59	223	8	42	11	274	246	11	8	253	178
Vehicles Exited	150	58	222	8	42	10	272	247	11	7	254	179
Hourly Exit Rate	150	58	222	8	42	10	272	247	11	7	254	179
Input Volume	156	60	220	9	40	9	278	246	11	8	259	179
% of Volume	96	97	101	89	105	111	98	100	100	88	98	100

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	1463
Vehicles Exited	1460
Hourly Exit Rate	1460
Input Volume	1475
% of Volume	99

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBT	EBR	WBL	NBU	NBL	NBT	NBR	SBT	SBR	All
Vehicles Entered	20	5	267	1	7	58	986	2	863	26	2235
Vehicles Exited	20	5	266	1	7	58	984	2	865	27	2235
Hourly Exit Rate	20	5	266	1	7	58	984	2	865	27	2235
Input Volume	22	4	265	1	8	57	996	1	855	30	2239
% of Volume	91	125	100	100	88	102	99	200	101	90	100

9: Junipero Serra Blvd & Project Driveway 2 Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Vehicles Entered	276	138	960	226	69	780	2449
Vehicles Exited	275	138	958	226	70	780	2447
Hourly Exit Rate	275	138	958	226	70	780	2447
Input Volume	274	134	961	232	71	769	2441
% of Volume	100	103	100	97	99	101	100

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	44	741	8	10	917	44	11	12	58	74	1919
Vehicles Exited	44	743	8	10	917	44	11	12	58	74	1921
Hourly Exit Rate	44	743	8	10	917	44	11	12	58	74	1921
Input Volume	45	759	8	9	922	53	13	11	58	69	1947
% of Volume	98	98	100	111	99	83	85	109	100	107	99

11: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	10	796	933	12	33	38	1822
Vehicles Exited	10	798	932	12	32	37	1821
Hourly Exit Rate	10	798	932	12	32	37	1821
Input Volume	11	812	943	13	33	40	1852
% of Volume	91	98	99	92	97	92	98

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	3	758	914	4	3	4	1686
Vehicles Exited	3	757	914	4	2	4	1684
Hourly Exit Rate	3	757	914	4	2	4	1684
Input Volume	3	770	931	5	3	3	1715
% of Volume	100	98	98	80	67	133	98

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	674	16	17	894	24	20	1645
Vehicles Exited	674	16	17	895	24	20	1646
Hourly Exit Rate	674	16	17	895	24	20	1646
Input Volume	685	15	20	911	25	19	1675
% of Volume	98	107	85	98	96	105	98

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	635	59	68	841	70	57	1730
Vehicles Exited	633	59	68	842	69	57	1728
Hourly Exit Rate	633	59	68	842	69	57	1728
Input Volume	647	57	75	858	73	54	1764
% of Volume	98	104	91	98	95	106	98

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	47	40	28	976	851	30	1972
Vehicles Exited	47	39	28	976	850	30	1970
Hourly Exit Rate	47	39	28	976	850	30	1970
Input Volume	48	42	31	987	843	26	1977
% of Volume	98	93	90	99	101	115	100

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	428	24	28	499	31	26	1036
Vehicles Exited	429	24	28	500	30	26	1037
Hourly Exit Rate	429	24	28	500	30	26	1037
Input Volume	437	25	30	505	33	26	1056
% of Volume	98	96	93	99	91	100	98

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	420	14	13	513	13	13	986
Vehicles Exited	421	14	13	514	13	13	988
Hourly Exit Rate	421	14	13	514	13	13	988
Input Volume	427	12	14	521	14	12	1000
% of Volume	99	117	93	99	93	108	99

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	417	16	23	510	17	16	999
Vehicles Exited	418	16	22	510	17	16	999
Hourly Exit Rate	418	16	22	510	17	16	999
Input Volume	422	17	22	517	19	15	1012
% of Volume	99	94	100	99	89	107	99

26: Performance by movement

Movement	NBT	NWR	All
Vehicles Entered	642	1063	1705
Vehicles Exited	642	1062	1704
Hourly Exit Rate	642	1062	1704
Input Volume	630	1051	1681
% of Volume	102	101	101

Total Network Performance

Movement	All
Vehicles Entered	9702
Vehicles Exited	9680
Hourly Exit Rate	9680
Input Volume	57654
% of Volume	17

Arterial Level of Service
Weekend Midday Road Diet - Stop Sign

03/25/2019

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 21 Speed	Run 21 Delay
I-280 SB Off-Ramp	1	21.0	49.9	0.2	18	17	23.9
I-280 NB On-Ramp	2	3.3	13.4	0.1	22	18	6.4
Junipero Serra Blvd	3	33.3	40.5	0.1	6	5	40.1
Collins Avenue	4	3.2	9.4	0.0	17	15	4.8
	10	2.3	6.8	0.0	19	15	4.1
	11	6.1	10.5	0.0	14	10	9.4
Project Driveway 3	5	12.8	16.8	0.0	6	6	14.2
	19	3.0	8.0	0.0	20	20	3.0
	12	0.5	12.8	0.1	30	29	0.6
	13	0.6	10.9	0.1	29	29	0.7
	14	4.5	17.5	0.1	22	17	9.4
El Camino Real	6	26.0	32.8	0.1	7	7	28.7
	16	1.8	12.5	0.1	24	24	1.9
	17	0.2	8.6	0.1	29	29	0.2
	18	0.3	10.5	0.1	29	29	0.3
Hillside Blvd	7	10.7	27.3	0.2	23	24	10.1
Total		129.8	288.3	1.4	17	16	157.7

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed	Run 24 Delay	Run 25 Speed
I-280 SB Off-Ramp	17	21.8	18	20.8	18	19.1	18
I-280 NB On-Ramp	22	3.9	24	2.6	23	2.9	23
Junipero Serra Blvd	6	33.1	6	31.3	6	32.2	6
Collins Avenue	18	2.9	18	2.8	18	3.1	17
	19	2.7	22	1.6	21	1.9	20
	14	6.0	16	4.5	15	5.3	13
Project Driveway 3	6	13.3	6	11.8	7	11.6	6
	20	3.0	20	3.0	20	3.1	20
	29	0.5	30	0.5	30	0.6	30
	29	0.6	29	0.7	29	0.6	29
	24	3.4	26	2.0	24	3.3	27
El Camino Real	8	25.5	8	25.4	7	26.0	8
	24	1.6	25	1.7	24	1.9	24
	29	0.2	29	0.3	29	0.3	29
	29	0.2	29	0.3	29	0.4	29
Hillside Blvd	25	8.4	22	10.9	21	13.3	22
Total	17	127.1	18	120.2	17	125.5	17

Arterial Level of Service
Weekend Midday Road Diet - Stop Sign

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Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 25 Delay	Run 26 Speed	Run 26 Delay	Run 27 Speed	Run 27 Delay	Run 28 Speed	Run 28 Delay
I-280 SB Off-Ramp	20.6	18	19.7	18	18.6	17	22.1
I-280 NB On-Ramp	2.8	23	2.9	23	2.8	23	3.0
Junipero Serra Blvd	33.2	6	32.1	7	29.2	6	35.4
Collins Avenue	3.1	18	3.1	18	3.1	17	3.1
	2.1	19	2.6	20	2.1	21	2.0
	6.3	14	5.7	14	5.4	16	4.7
Project Driveway 3	13.8	6	13.1	6	12.7	7	11.4
	3.0	20	3.0	20	2.9	20	3.0
	0.5	29	0.5	30	0.5	29	0.5
	0.5	29	0.6	29	0.6	29	0.6
	1.6	24	3.3	23	3.8	24	3.4
El Camino Real	22.9	8	25.1	7	29.2	7	26.3
	1.7	24	1.8	24	1.9	24	1.6
	0.2	29	0.2	29	0.3	29	0.2
	0.2	29	0.3	29	0.3	29	0.3
Hillside Blvd	10.4	21	12.0	23	10.9	24	9.9
Total	122.8	17	126.1	17	124.5	17	127.6

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 29 Speed	Run 29 Delay	Run 30 Speed	Run 30 Delay
I-280 SB Off-Ramp	17	22.7	18	20.5
I-280 NB On-Ramp	23	3.1	23	2.9
Junipero Serra Blvd	6	31.2	6	34.8
Collins Avenue	18	2.9	18	3.1
	21	1.8	19	2.6
	15	5.3	12	8.0
Project Driveway 3	6	12.7	6	13.4
	20	3.1	20	3.0
	29	0.6	29	0.6
	29	0.6	28	0.9
	26	2.3	16	11.5
El Camino Real	8	23.9	7	27.3
	24	1.9	24	1.7
	29	0.2	29	0.3
	29	0.2	29	0.3
Hillside Blvd	22	11.5	23	9.8
Total	17	123.9	16	140.8

Arterial Level of Service
Weekend Midday Road Diet - Stop Sign

03/25/2019

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 21 Speed	Run 21 Delay
Hillside Blvd	7	14.2	19.6	0.0	8	9	12.7
	18	0.9	16.5	0.2	38	41	0.7
	17	0.4	10.6	0.1	29	29	0.4
El Camino Real	16	0.6	8.7	0.1	29	29	0.5
	6	30.6	39.9	0.1	8	8	29.8
	14	2.3	10.9	0.1	23	22	2.5
Project Driveway 3	13	1.1	14.1	0.1	28	28	1.1
	12	0.9	11.0	0.1	29	29	0.9
	19	6.8	19.6	0.1	19	21	5.1
Collins Avenue	5	20.5	44.0	0.0	6	6	22.7
	11	2.7	6.4	0.0	16	16	2.7
	10	0.7	5.4	0.0	26	25	1.0
Junipero Serra Blvd	4	3.3	7.6	0.0	17	16	3.9
	3	35.9	40.7	0.0	4	4	36.0
	2	7.8	16.3	0.1	15	15	7.9
I-280 NB On-Ramp	1	19.7	29.9	0.1	10	10	19.7
Total		148.6	301.2	1.2	15	15	147.6

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed	Run 24 Delay	Run 25 Speed
Hillside Blvd	9	12.2	7	18.1	9	11.5	8
	36	1.1	40	0.9	39	0.7	42
	29	0.4	29	0.4	29	0.4	29
El Camino Real	29	0.4	28	0.7	29	0.4	28
	9	24.9	7	32.6	8	30.2	7
	23	2.2	23	2.2	23	2.1	22
Project Driveway 3	28	1.0	28	1.1	28	1.0	28
	29	0.9	28	1.0	29	0.8	28
	18	8.4	20	6.1	24	3.1	16
Collins Avenue	6	22.3	7	18.9	8	15.2	5
	16	2.6	16	2.6	16	2.6	16
	28	0.5	27	0.5	27	0.5	25
Junipero Serra Blvd	18	3.2	18	2.9	18	3.0	15
	4	39.0	4	34.2	4	35.7	4
	14	8.9	15	7.5	15	7.5	16
I-280 NB On-Ramp	10	19.7	10	21.1	10	19.5	10
Total	15	147.9	15	150.9	16	134.4	14

Arterial Level of Service
Weekend Midday Road Diet - Stop Sign

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Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 25 Delay	Run 26 Speed	Run 26 Delay	Run 27 Speed	Run 27 Delay	Run 28 Speed	Run 28 Delay
Hillside Blvd	14.6	7	15.6	9	12.9	7	17.2
	0.6	41	1.0	39	0.8	36	1.2
	0.4	28	0.6	29	0.4	29	0.5
El Camino Real	0.7	29	0.5	29	0.5	29	0.4
	32.3	8	31.4	7	31.8	8	31.1
	2.4	23	2.4	22	2.5	23	2.2
Project Driveway 3	1.0	28	1.1	28	1.1	28	1.1
	1.2	29	0.9	29	1.0	29	0.9
	11.1	23	3.8	16	10.2	22	4.2
Collins Avenue	24.4	7	17.7	6	22.8	7	16.4
	2.8	16	2.6	16	2.7	16	2.6
	1.1	27	0.5	26	0.9	26	0.7
Junipero Serra Blvd	4.5	21	2.1	16	4.0	15	4.5
	36.7	4	35.0	4	36.9	4	37.7
	6.7	14	8.3	16	7.1	15	7.6
I-280 SB Off-Ramp	18.5	10	19.3	10	19.8	10	18.6
Total	158.9	15	142.5	15	155.3	15	146.9

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 29 Speed	Run 29 Delay	Run 30 Speed	Run 30 Delay
Hillside Blvd	8	13.7	8	14.2
	35	0.8	36	1.3
	29	0.4	29	0.5
El Camino Real	29	0.5	28	0.8
	8	28.2	7	33.5
	22	2.4	23	2.3
Project Driveway 3	28	1.0	28	1.1
	28	1.0	29	0.9
	16	10.8	21	5.6
Collins Avenue	6	23.0	6	21.4
	16	2.6	16	2.6
	26	0.8	28	0.5
Junipero Serra Blvd	17	3.4	21	1.9
	4	36.5	5	30.9
	15	8.2	15	8.0
I-280 SB Off-Ramp	9	21.4	10	19.6
Total	15	155.0	15	145.2

Queuing and Blocking Report
Weekend Midday Road Diet - Stop Sign

03/25/2019

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	T	T	L	L	R	R
Maximum Queue (ft)	608	566	215	229	75	290	231	99	44
Average Queue (ft)	311	218	121	133	50	184	124	5	2
95th Queue (ft)	509	431	193	211	104	268	202	47	28
Link Distance (ft)	1253	1253	384	384		498	498	498	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)					50				381
Storage Blk Time (%)					32				2
Queuing Penalty (veh)					68				4

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	WB	WB
Directions Served	UL	L	T	T	T	TR
Maximum Queue (ft)	261	107	186	223	163	180
Average Queue (ft)	151	7	16	30	70	85
95th Queue (ft)	236	72	102	130	134	147
Link Distance (ft)		384	384	384	246	246
Upstream Blk Time (%)		0	0	0	0	0
Queuing Penalty (veh)		0	1	1	0	0
Storage Bay Dist (ft)	200					
Storage Blk Time (%)	2					
Queuing Penalty (veh)	6					

Queuing and Blocking Report
Weekend Midday Road Diet - Stop Sign

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Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	L	T	T	R	UL	T	TR	R>	U<L	L	T
Maximum Queue (ft)	263	270	252	268	245	162	167	181	170	219	238	216
Average Queue (ft)	171	185	169	199	116	116	135	153	144	123	141	109
95th Queue (ft)	249	259	249	276	249	170	178	177	181	190	216	185
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)	1	2	1	3	0	6	10	22	14			
Queuing Penalty (veh)	4	8	5	14	0	15	25	56	35			
Storage Bay Dist (ft)					225					295	295	
Storage Blk Time (%)					5				0			
Queuing Penalty (veh)					17				1			

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	UL	T	TR	>
Maximum Queue (ft)	281	115	254	360	378	280
Average Queue (ft)	144	85	94	202	215	42
95th Queue (ft)	241	146	195	328	345	222
Link Distance (ft)	1147			676	676	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		90	320			280
Storage Blk Time (%)	21	2	0	2	5	0
Queuing Penalty (veh)	42	5	0	3	14	1

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	UT	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	89	24	72	80	106	124	90	171	74
Average Queue (ft)	8	3	6	16	23	50	34	62	24
95th Queue (ft)	48	31	39	58	78	119	96	141	68
Link Distance (ft)	146	146			111	111		1189	
Upstream Blk Time (%)	0	0			0	2			
Queuing Penalty (veh)	0	1			1	9			
Storage Bay Dist (ft)			40	65			65		50
Storage Blk Time (%)		0	0	1	1	5	2	27	0
Queuing Penalty (veh)		0	0	2	3	12	4	6	0

Queuing and Blocking Report
Weekend Midday Road Diet - Stop Sign

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Intersection: 5: Serramonte Blvd & Project Driveway 3

Movement	EB	EB	WB	WB	B19	SB
Directions Served	LT	T	T	TR	T	LR
Maximum Queue (ft)	156	145	195	263	330	174
Average Queue (ft)	121	97	99	191	58	75
95th Queue (ft)	151	141	163	273	232	138
Link Distance (ft)	110	110	169	169	503	249
Upstream Blk Time (%)	15	3	1	31	0	0
Queuing Penalty (veh)	63	11	2	136	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	NB	SB	SB
Directions Served	UL	TR	L	T	R	UL	T	T	T	R	UL	T
Maximum Queue (ft)	258	276	178	316	113	224	340	318	130	70	127	202
Average Queue (ft)	112	207	83	183	26	179	173	131	66	29	57	130
95th Queue (ft)	218	306	153	285	73	259	360	273	122	57	104	187
Link Distance (ft)	259	259	334	334			326	326	326			1268
Upstream Blk Time (%)	0	5		0	0		9	0				
Queuing Penalty (veh)	0	18		1	0		30	0				
Storage Bay Dist (ft)					300	200				160	300	
Storage Blk Time (%)				1		27	0		0			
Queuing Penalty (veh)				1		53	0		0			

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	173	195	123
Average Queue (ft)	97	50	67
95th Queue (ft)	166	127	116
Link Distance (ft)	1268	1268	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)		0	3
Queuing Penalty (veh)		1	5

Queuing and Blocking Report
Weekend Midday Road Diet - Stop Sign

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Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	TR	L	T	R
Maximum Queue (ft)	167	131	68	53	207	161	56	252	100
Average Queue (ft)	79	63	20	15	118	71	8	125	74
95th Queue (ft)	141	108	53	44	185	130	34	214	122
Link Distance (ft)	850	850	192	192	908	908		900	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							75		75
Storage Blk Time (%)							0	23	1
Queuing Penalty (veh)							0	43	4

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	UL	T	T	TR	T	T	TR
Maximum Queue (ft)	172	105	20	91	148	82	67	120	131	112
Average Queue (ft)	34	74	1	35	50	18	9	28	36	28
95th Queue (ft)	118	113	9	75	112	55	34	85	99	83
Link Distance (ft)	472		186		1262	1262	1262	415	415	415
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		80		130						
Storage Blk Time (%)	0	7		0	0					
Queuing Penalty (veh)	0	2		0	0					

Intersection: 9: Junipero Serra Blvd & Project Driveway 2

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	TR	L	T	T
Maximum Queue (ft)	119	118	94	133	168	200	82	124	123
Average Queue (ft)	60	53	44	68	84	98	41	52	57
95th Queue (ft)	102	96	75	124	146	170	74	95	104
Link Distance (ft)	196	196	196	676	676	676		591	591
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							210		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
Weekend Midday Road Diet - Stop Sign

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Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	129	114	72	102	66	176
Average Queue (ft)	44	18	7	8	19	88
95th Queue (ft)	113	80	37	52	53	168
Link Distance (ft)	111	111	129	129	208	158
Upstream Blk Time (%)	1	0	0	0		11
Queuing Penalty (veh)	4	1	0	1		0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 11: Serramonte Blvd

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	163	166	7	45	168
Average Queue (ft)	82	45	0	3	77
95th Queue (ft)	165	142	5	25	178
Link Distance (ft)	129	129	110	110	222
Upstream Blk Time (%)	4	2		0	5
Queuing Penalty (veh)	18	7		0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Serramonte Blvd

Movement	EB	B19	B19	WB	SB
Directions Served	L	T	T	TR	LR
Maximum Queue (ft)	21	10	6	11	31
Average Queue (ft)	1	0	0	1	7
95th Queue (ft)	11	6	5	12	27
Link Distance (ft)		169	169	393	255
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report
Weekend Midday Road Diet - Stop Sign

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Intersection: 13: Serramonte Blvd

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	31	88
Average Queue (ft)	8	31
95th Queue (ft)	30	69
Link Distance (ft)		343
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: Serramonte Blvd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	281	81	179
Average Queue (ft)	45	30	79
95th Queue (ft)	199	64	147
Link Distance (ft)	518	259	411
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: El Camino Real

Movement	EB	NB	NB	NB	SB
Directions Served	LR	L	T	T	R
Maximum Queue (ft)	140	86	182	132	4
Average Queue (ft)	46	17	33	22	0
95th Queue (ft)	108	62	167	138	3
Link Distance (ft)	203		415	415	
Upstream Blk Time (%)	1		0		
Queuing Penalty (veh)	0		0		
Storage Bay Dist (ft)		100			100
Storage Blk Time (%)		0	6		
Queuing Penalty (veh)		0	2		

Queuing and Blocking Report
Weekend Midday Road Diet - Stop Sign

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Intersection: 16: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	2	2	65	36	63	53
Average Queue (ft)	0	0	11	2	22	19
95th Queue (ft)	2	2	41	21	50	47
Link Distance (ft)	334	334	300	300	289	289
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 17: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	40	42
Average Queue (ft)	5	20
95th Queue (ft)	26	45
Link Distance (ft)	389	205
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Serramonte Blvd

Movement	WB	WB	NB
Directions Served	LT	T	LR
Maximum Queue (ft)	60	20	47
Average Queue (ft)	9	1	23
95th Queue (ft)	38	12	48
Link Distance (ft)	850	850	247
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
Weekend Midday Road Diet - Stop Sign

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Intersection: 26:

Movement	NW	B36	B36
Directions Served	R	T	
Maximum Queue (ft)	122	194	185
Average Queue (ft)	9	69	59
95th Queue (ft)	62	144	143
Link Distance (ft)	352	175	175
Upstream Blk Time (%)	0	1	
Queuing Penalty (veh)	1	7	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 777

HCM Signalized Intersection Capacity Analysis
 1: Serramonte Blvd & I-280 SB Off-Ramp

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↑	↑↑
Traffic Volume (vph)	0	1532	649	0	750	825
Future Volume (vph)	0	1532	649	0	750	825
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1613	683	0	789	868
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1613	683	0	789	868
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		31.6	20.1		21.0	33.0
Effective Green, g (s)		31.6	20.1		21.0	33.0
Actuated g/C Ratio		0.52	0.33		0.34	0.54
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1836	1678		1183	1510
v/s Ratio Prot		c0.46	0.13		c0.23	0.31
v/s Ratio Perm						
v/c Ratio		0.88	0.41		0.67	0.57
Uniform Delay, d1		13.0	15.8		17.0	9.3
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		5.1	0.2		1.4	0.5
Delay (s)		18.1	15.9		18.4	9.8
Level of Service		B	B		B	A
Approach Delay (s)		18.1	15.9		13.9	
Approach LOS		B	B		B	
Intersection Summary						
HCM 2000 Control Delay		16.0		HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio		0.85				
Actuated Cycle Length (s)		60.9		Sum of lost time (s)	11.5	
Intersection Capacity Utilization		100.0%		ICU Level of Service	G	
Analysis Period (min)		15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2: Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑↑	↑↑	↑↑			
Traffic Volume (vph)	754	1523	643	15	0	0
Future Volume (vph)	754	1523	643	15	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.4		4.1	
Lane Util. Factor		0.97	0.95		0.95	
Frt		1.00	1.00		1.00	
Flt Protected		0.95	1.00		1.00	
Satd. Flow (prot)		3433	3539		3527	
Flt Permitted		0.95	1.00		1.00	
Satd. Flow (perm)		3433	3539		3527	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	794	1603	677	16	0	0
RTOR Reduction (vph)	0	0	4	0	0	0
Lane Group Flow (vph)	794	1603	689	0	0	0
Turn Type	Prot	NA	NA			
Protected Phases	5	2	6			
Permitted Phases						
Actuated Green, G (s)	13.4	35.5	14.5			
Effective Green, g (s)	13.4	35.5	14.5			
Actuated g/C Ratio	0.38	1.00	0.41			
Clearance Time (s)	3.5	4.4	4.1			
Vehicle Extension (s)	3.0	4.0	3.0			
Lane Grp Cap (vph)	1295	3539	1440			
v/s Ratio Prot	c0.23	c0.45	0.20			
v/s Ratio Perm						
v/c Ratio	0.61	0.45	0.48			
Uniform Delay, d1	9.0	0.0	7.7			
Progression Factor	1.00	1.00	1.00			
Incremental Delay, d2	0.9	0.1	0.3			
Delay (s)	9.8	0.1	8.0			
Level of Service	A	A	A			
Approach Delay (s)		3.3	8.0		0.0	
Approach LOS		A	A		A	
Intersection Summary						
HCM 2000 Control Delay		4.4		HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio		0.60				
Actuated Cycle Length (s)		35.5		Sum of lost time (s)	7.6	
Intersection Capacity Utilization		100.0%		ICU Level of Service	G	
Analysis Period (min)		15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations		↔	↔	↔	↔	↔	↔		↔	↔	↔	↔
Traffic Volume (vph)	2	528	667	319	184	355	386	143	126	328	558	185
Future Volume (vph)	2	528	667	319	184	355	386	143	126	328	558	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0	3.0	4.6	4.6		4.0	4.0	4.0	4.0
Lane Util. Factor		0.97	0.95	1.00	1.00	0.91	0.91		0.97	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.98	1.00	1.00	1.00		1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	0.94	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		3433	3539	1551	1770	3180	1441		3433	3539	1551	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		3433	3539	1551	1770	3180	1441		3433	3539	1551	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	556	702	336	194	374	406	151	133	345	587	195
RTOR Reduction (vph)	0	0	0	243	0	0	89	0	0	0	0	96
Lane Group Flow (vph)	0	558	702	93	194	638	204	0	0	478	587	99
Confl. Peds. (#/hr)				9								9
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm		Split	Split	NA	Perm
Protected Phases	5	5	2		1	6			3	3	3	
Permitted Phases				2			6					3
Actuated Green, G (s)		19.3	28.3	28.3	14.1	22.5	22.5		23.3	23.3	23.3	
Effective Green, g (s)		19.3	28.3	28.3	14.1	22.5	22.5		23.3	23.3	23.3	
Actuated g/C Ratio		0.19	0.28	0.28	0.14	0.22	0.22		0.23	0.23	0.23	
Clearance Time (s)		3.0	4.0	4.0	3.0	4.6	4.6		4.0	4.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	
Lane Grp Cap (vph)		646	977	428	243	698	316		780	804	352	
v/s Ratio Prot		c0.16	0.20		0.11	c0.20			0.14	c0.17		
v/s Ratio Perm				0.06			0.14					0.06
v/c Ratio		0.86	0.72	0.22	0.80	0.91	0.65		0.61	0.73	0.28	
Uniform Delay, d1		40.3	33.5	28.6	42.8	39.1	36.4		35.6	36.7	32.7	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		11.2	2.1	0.1	15.5	16.2	3.4		1.0	3.0	0.2	
Delay (s)		51.5	35.6	28.7	58.3	55.3	39.7		36.6	39.6	32.9	
Level of Service		D	D	C	E	E	D		D	D	C	
Approach Delay (s)			39.7			51.7				37.4		
Approach LOS			D			D				D		

Intersection Summary

HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	16.2
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	SBU	SBL	SBT	SBR	SBR2
Lane Configurations		↔	↔	↔	↔
Traffic Volume (vph)	28	149	455	163	275
Future Volume (vph)	28	149	455	163	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.0
Lane Util. Factor		1.00	0.95		1.00
Frpb, ped/bikes		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00
Frt		1.00	0.96		0.85
Flt Protected		0.95	1.00		1.00
Satd. Flow (prot)		1770	3399		1583
Flt Permitted		0.95	1.00		1.00
Satd. Flow (perm)		1770	3399		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	157	479	172	289
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	186	651	0	289
Confl. Peds. (#/hr)					
Turn Type	Split	Split	NA		Free
Protected Phases	4	4	4		
Permitted Phases					Free
Actuated Green, G (s)		21.2	21.2		102.5
Effective Green, g (s)		21.2	21.2		102.5
Actuated g/C Ratio		0.21	0.21		1.00
Clearance Time (s)		4.6	4.6		
Vehicle Extension (s)		2.0	2.0		
Lane Grp Cap (vph)		366	703		1583
v/s Ratio Prot		0.11	c0.19		
v/s Ratio Perm					0.18
v/c Ratio		0.51	0.93		0.18
Uniform Delay, d1		36.0	39.9		0.0
Progression Factor		1.00	1.00		1.00
Incremental Delay, d2		0.4	17.9		0.3
Delay (s)		36.4	57.7		0.3
Level of Service		D	E		A
Approach Delay (s)			39.5		
Approach LOS			D		

Intersection Summary

HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	16.2
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: Collins Avenue & Serramonte Blvd

03/25/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑		↑↑↑	↑	↑		
Traffic Volume (veh/h)	752	225	9	955	51	8		
Future Volume (Veh/h)	752	225	9	955	51	8		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	792	237	9	1005	54	8		
Pedestrians	6			6	6			
Lane Width (ft)	12.0			12.0	12.0			
Walking Speed (ft/s)	3.5			3.5	3.5			
Percent Blockage	1			1	1			
Right turn flare (veh)						2		
Median type	None			None				
Median storage (veh)								
Upstream signal (ft)	239			552				
pX, platoon unblocked			0.84		0.84	0.84		
vC, conflicting volume			798		1073	408		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol			377		705	0		
IC, single (s)			4.1		6.8	6.9		
IC, 2 stage (s)								
IF (s)			2.2		3.5	3.3		
p0 queue free %			99		82	99		
cM capacity (veh/h)			983		305	900		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	396	396	237	153	287	287	287	62
Volume Left	0	0	0	9	0	0	0	54
Volume Right	0	0	237	0	0	0	0	8
cSH	1700	1700	1700	983	1700	1700	1700	350
Volume to Capacity	0.23	0.23	0.14	0.01	0.17	0.17	0.17	0.18
Queue Length 95th (ft)	0	0	0	1	0	0	0	16
Control Delay (s)	0.0	0.0	0.0	0.6	0.0	0.0	0.0	18.0
Lane LOS				A				C
Approach Delay (s)	0.0			0.1				18.0
Approach LOS								C
Intersection Summary								
Average Delay			0.6					
Intersection Capacity Utilization			35.2%		ICU Level of Service			A
Analysis Period (min)			15					

HCM Signalized Intersection Capacity Analysis
5: Serramonte Blvd & Project Driveway 3

03/25/2019

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑↑
Traffic Volume (vph)	154	604	757	178	162	127
Future Volume (vph)	154	604	757	178	162	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.95	0.95		1.00	1.00
Frbp, ped/bikes		1.00	0.99		0.99	0.99
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	0.97		0.94	0.94
Flt Protected		0.99	1.00		0.97	0.97
Satd. Flow (prot)		3502	3406		1691	1691
Flt Permitted		0.62	1.00		0.97	0.97
Satd. Flow (perm)		2184	3406		1691	1691
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	162	636	797	187	171	134
RTOR Reduction (vph)	0	0	16	0	36	0
Lane Group Flow (vph)	0	798	968	0	269	0
Confl. Peds. (#/hr)	8			25	25	8
Turn Type	pm+pt	NA	NA		Prot	
Protected Phases	5	2	6		8	
Permitted Phases	2	2				
Actuated Green, G (s)		30.3	30.3		13.7	
Effective Green, g (s)		30.3	30.3		13.7	
Actuated g/C Ratio		0.57	0.57		0.26	
Clearance Time (s)		4.5	4.5		4.5	
Vehicle Extension (s)		2.5	2.5		2.5	
Lane Grp Cap (vph)		1248	1947		437	
v/s Ratio Prot			0.28		c0.16	
v/s Ratio Perm		c0.37				
v/c Ratio		0.64	0.50		0.61	
Uniform Delay, d1		7.7	6.8		17.3	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		1.0	0.1		2.2	
Delay (s)		8.6	6.9		19.5	
Level of Service		A	A		B	
Approach Delay (s)		8.6	6.9		19.5	
Approach LOS		A	A		B	
Intersection Summary						
HCM 2000 Control Delay		9.4			HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio		0.70				
Actuated Cycle Length (s)		53.0			Sum of lost time (s)	13.5
Intersection Capacity Utilization		76.9%			ICU Level of Service	D
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↔	↔		↔	↔	↔		↔	↔	↔		↔
Traffic Volume (vph)	174	324	197	92	339	88	4	271	627	118	4	70
Future Volume (vph)	174	324	197	92	339	88	4	271	627	118	4	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5	3.5		3.0	4.0	4.0		3.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	0.91	1.00		1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99		1.00	1.00	0.99		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Frt	1.00	0.94		1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)	1770	1741		1770	1863	1561		1770	5085	1560		1770
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)	1770	1741		1770	1863	1561		1770	5085	1560		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	341	207	97	357	93	4	285	660	124	4	74
RTOR Reduction (vph)	0	26	0	0	0	71	0	0	0	85	0	0
Lane Group Flow (vph)	183	522	0	97	357	22	0	289	660	39	0	78
Confl. Peds. (#/hr)			18			3				3		
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	4	8		7	3		1	1	6		5	5
Permitted Phases						3				6		
Actuated Green, G (s)	18.9	29.9		9.6	20.6	20.6		16.6	27.0	27.0		6.1
Effective Green, g (s)	18.9	29.9		9.6	20.6	20.6		16.6	27.0	27.0		6.1
Actuated g/C Ratio	0.22	0.35		0.11	0.24	0.24		0.19	0.31	0.31		0.07
Clearance Time (s)	3.5	3.5		3.5	3.5	3.5		3.0	4.0	4.0		3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0	4.0	4.0		2.0
Lane Grp Cap (vph)	386	601		196	443	371		339	1585	486		124
v/s Ratio Prot	0.10	c0.30		0.05	c0.19			c0.16	0.13			0.04
v/s Ratio Perm						0.01				0.02		
v/c Ratio	0.47	0.87		0.49	0.81	0.06		0.85	0.42	0.08		0.63
Uniform Delay, d1	29.5	26.5		36.2	31.1	25.5		33.8	23.6	21.0		39.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2	0.3	12.3		0.7	9.7	0.0		17.7	0.2	0.1		7.0
Delay (s)	29.9	38.8		36.9	40.8	25.5		51.5	23.8	21.1		46.1
Level of Service	C	D		D	D	C		D	C	C		D
Approach Delay (s)		36.6			37.5				31.0			
Approach LOS		D			D				C			
Intersection Summary												
HCM 2000 Control Delay		34.0										C
HCM 2000 Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		86.6			Sum of lost time (s)				14.0			
Intersection Capacity Utilization		74.7%			ICU Level of Service				D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	SBT	SBR
Lane Configurations	↔	↔
Traffic Volume (vph)	521	195
Future Volume (vph)	521	195
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	4.0
Lane Util. Factor	0.91	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5085	1557
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5085	1557
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	548	205
RTOR Reduction (vph)	0	166
Lane Group Flow (vph)	548	39
Confl. Peds. (#/hr)		4
Turn Type	NA	Perm
Protected Phases	2	
Permitted Phases		2
Actuated Green, G (s)	16.5	16.5
Effective Green, g (s)	16.5	16.5
Actuated g/C Ratio	0.19	0.19
Clearance Time (s)	4.0	4.0
Vehicle Extension (s)	4.0	4.0
Lane Grp Cap (vph)	968	296
v/s Ratio Prot	c0.11	
v/s Ratio Perm		0.03
v/c Ratio	0.57	0.13
Uniform Delay, d1	31.8	29.1
Progression Factor	1.00	1.00
Incremental Delay, d2	0.9	0.3
Delay (s)	32.7	29.4
Level of Service	C	C
Approach Delay (s)	33.2	
Approach LOS	C	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
7: Hillside Blvd & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↔	↔	↔	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	183	29	255	3	47	17	223	282	8	6	245	154
Future Volume (vph)	183	29	255	3	47	17	223	282	8	6	245	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		0.95	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		0.96	1.00		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.96	1.00		1.00	0.95		1.00	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1786	1583		3395	1770		1855	1770		1863	1519	1519
Flt Permitted	0.70	1.00		0.95	0.95		1.00	0.95		1.00	1.00	1.00
Satd. Flow (perm)	1312	1583		3216	1770		1855	1770		1863	1519	1519
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	193	31	268	3	49	18	235	297	8	6	258	162
RTOR Reduction (vph)	0	0	185	0	12	0	0	2	0	0	0	116
Lane Group Flow (vph)	0	224	83	0	58	0	235	303	0	6	258	46
Confl. Peds. (#/hr)												30
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2	2		3	8		7	4	
Permitted Phases	2		2	2								4
Actuated Green, G (s)	18.1	18.1		18.1	10.1		25.6	0.9		16.4	16.4	16.4
Effective Green, g (s)	18.1	18.1		18.1	10.1		25.6	0.9		16.4	16.4	16.4
Actuated g/C Ratio	0.31	0.31		0.31	0.17		0.44	0.02		0.28	0.28	0.28
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	408	493		1001	307		817	27		525	428	428
v/s Ratio Prot					c0.13		0.16	0.00		c0.14		
v/s Ratio Perm	c0.17	0.05		0.02								0.03
v/c Ratio	0.55	0.17		0.06	0.77		0.37	0.22		0.49	0.11	0.11
Uniform Delay, d1	16.6	14.5		14.0	22.9		10.9	28.3		17.4	15.4	15.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.2	0.7		0.1	10.8		0.3	4.1		0.7	0.1	0.1
Delay (s)	21.8	15.3		14.1	33.7		11.2	32.4		18.1	15.5	15.5
Level of Service	C	B		B	C		B	C		B	B	B
Approach Delay (s)	18.3			14.1			21.0			17.3		
Approach LOS	B			B			C			B		
Intersection Summary												
HCM 2000 Control Delay	18.8			HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio	0.58											
Actuated Cycle Length (s)	58.1			Sum of lost time (s)				13.5				
Intersection Capacity Utilization	56.2%			ICU Level of Service				B				
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↕		↕	↕		↕	↕	↕		↕
Traffic Volume (vph)	10	0	212	0	0	0	3	39	981	0	0	813
Future Volume (vph)	10	0	212	0	0	0	3	39	981	0	0	813
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	0.91		1.00	0.91		1.00	1.00	0.91
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flt Protected	0.95	1.00		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Satd. Flow (prot)	1765	1583		1770	5085		1770	5085		1770	5085	5068
Flt Permitted	0.76	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1407	1583		1770	5085		1770	5085		1770	5085	5068
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	0	223	0	0	0	3	41	1033	0	0	856
RTOR Reduction (vph)	0	0	202	0	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	0	11	21	0	0	0	0	44	1033	0	0	872
Confl. Peds. (#/hr)	2						2				2	4
Turn Type	Perm	NA	Perm				Prot	Prot	NA			NA
Protected Phases		4					8	1	1	6		2
Permitted Phases	4		4	8								
Actuated Green, G (s)		7.4	7.4					5.0	60.9			51.4
Effective Green, g (s)		7.4	7.4					5.0	60.9			51.4
Actuated g/C Ratio		0.10	0.10					0.06	0.79			0.66
Clearance Time (s)		4.5	4.5					4.5	4.5			4.5
Vehicle Extension (s)		3.0	3.0					3.0	3.0			3.0
Lane Grp Cap (vph)		134	151					114	4006			3369
v/s Ratio Prot								c0.02	c0.20			0.17
v/s Ratio Perm		0.01	c0.01									
v/c Ratio		0.08	0.14					0.39	0.26			0.26
Uniform Delay, d1		31.9	32.0					34.7	2.2			5.2
Progression Factor		1.00	1.00					1.00	1.00			1.00
Incremental Delay, d2		0.3	0.4					2.2	0.2			0.2
Delay (s)		32.1	32.5					36.8	2.3			5.4
Level of Service		C	C					D	A			A
Approach Delay (s)		32.5					0.0		3.7			5.4
Approach LOS		C					A		A			A
Intersection Summary												
HCM 2000 Control Delay	7.5			HCM 2000 Level of Service				A				
HCM 2000 Volume to Capacity ratio	0.26											
Actuated Cycle Length (s)	77.3			Sum of lost time (s)				13.5				
Intersection Capacity Utilization	44.6%			ICU Level of Service				A				
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	16
Future Volume (vph)	16
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	17
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 9: Junipero Serra Blvd & Project Driveway 2

03/25/2019

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	1	290	171	7	945	255	6	93	788
Future Volume (vph)	1	290	171	7	945	255	6	93	788
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5			4.5	4.5
Lane Util. Factor		0.97	1.00		0.91			1.00	0.95
Frbp, ped/bikes		1.00	0.98		1.00			1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00			1.00	1.00
Frt		1.00	0.85		0.97			1.00	1.00
Flt Protected		0.95	1.00		1.00			0.95	1.00
Satd. Flow (prot)		3433	1558		4906			1770	3539
Flt Permitted		0.95	1.00		0.94			0.91	1.00
Satd. Flow (perm)		3433	1558		4590			1693	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	305	180	7	995	268	6	98	829
RTOR Reduction (vph)	0	0	142	0	75	0	0	0	0
Lane Group Flow (vph)	0	306	38	0	1195	0	0	104	829
Confl. Peds. (#/hr)			5			6			
Turn Type	Perm	Prot	Perm	Perm	NA	custom	Prot	NA	
Protected Phases		8			2		1	6	
Permitted Phases	8		8	2			1		
Actuated Green, G (s)		10.4	10.4		20.7		4.4	29.6	
Effective Green, g (s)		10.4	10.4		20.7		4.4	29.6	
Actuated g/C Ratio		0.21	0.21		0.42		0.09	0.60	
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		728	330		1939		152	2137	
v/s Ratio Prot								0.23	
v/s Ratio Perm		0.09	0.02		c0.26			c0.06	
v/c Ratio		0.42	0.12		0.62			0.68	0.39
Uniform Delay, d1		16.7	15.6		11.0			21.6	5.0
Progression Factor		1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2		0.4	0.2		1.5			12.0	0.5
Delay (s)		17.1	15.7		12.5			33.6	5.5
Level of Service		B	B		B			C	A
Approach Delay (s)		16.6			12.5				8.7
Approach LOS		B			B				A
Intersection Summary									
HCM 2000 Control Delay					11.9			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio					0.57				
Actuated Cycle Length (s)					49.0			Sum of lost time (s)	13.5
Intersection Capacity Utilization					69.0%			ICU Level of Service	C
Analysis Period (min)					15				
c Critical Lane Group									

SimTraffic Simulation Summary
Weekend PM Road Diet - Signal

03/25/2019

Summary of All Intervals

Run Number	20	21	22	23	24	25	26
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	9678	9771	9751	9693	9913	9535	9715
Vehs Exited	9660	9800	9752	9682	9833	9528	9718
Starting Vehs	349	379	337	330	324	360	337
Ending Vehs	367	350	336	341	404	367	334
Travel Distance (mi)	6003	6105	6125	6062	6180	5982	6081
Travel Time (hr)	350.0	355.5	363.4	348.8	357.0	335.9	345.8
Total Delay (hr)	158.7	160.7	167.9	155.1	160.1	145.0	151.7
Total Stops	15158	15469	15922	14968	15426	14248	14617
Fuel Used (gal)	256.7	260.3	263.6	257.1	262.9	251.8	258.2

Summary of All Intervals

Run Number	27	28	30	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	9745	9816	9568	9716
Vehs Exited	9758	9794	9575	9711
Starting Vehs	375	345	356	345
Ending Vehs	362	367	349	346
Travel Distance (mi)	6096	6108	6019	6076
Travel Time (hr)	353.4	354.2	339.7	350.4
Total Delay (hr)	159.5	159.5	147.4	156.6
Total Stops	15151	15187	14497	15065
Fuel Used (gal)	261.1	259.6	253.3	258.5

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

SimTraffic Simulation Summary
Weekend PM Road Diet - Signal

03/25/2019

Interval #1 Information Recording

Start Time	5:00						
End Time	6:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	20	21	22	23	24	25	26
Vehs Entered	9678	9771	9751	9693	9913	9535	9715
Vehs Exited	9660	9800	9752	9682	9833	9528	9718
Starting Vehs	349	379	337	330	324	360	337
Ending Vehs	367	350	336	341	404	367	334
Travel Distance (mi)	6003	6105	6125	6062	6180	5982	6081
Travel Time (hr)	350.0	355.5	363.4	348.8	357.0	335.9	345.8
Total Delay (hr)	158.7	160.7	167.9	155.1	160.1	145.0	151.7
Total Stops	15158	15469	15922	14968	15426	14248	14617
Fuel Used (gal)	256.7	260.3	263.6	257.1	262.9	251.8	258.2

Interval #1 Information Recording

Start Time	5:00			
End Time	6:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	27	28	30	Avg
Vehs Entered	9745	9816	9568	9716
Vehs Exited	9758	9794	9575	9711
Starting Vehs	375	345	356	345
Ending Vehs	362	367	349	346
Travel Distance (mi)	6096	6108	6019	6076
Travel Time (hr)	353.4	354.2	339.7	350.4
Total Delay (hr)	159.5	159.5	147.4	156.6
Total Stops	15151	15187	14497	15065
Fuel Used (gal)	261.1	259.6	253.3	258.5

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	1533	636	754	818	3741
Vehicles Exited	1534	638	752	818	3742
Hourly Exit Rate	1534	638	752	818	3742
Input Volume	1532	649	750	825	3756
% of Volume	100	98	100	99	100

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	All
Vehicles Entered	749	1537	630	15	2931
Vehicles Exited	749	1536	630	15	2930
Hourly Exit Rate	749	1536	630	15	2930
Input Volume	754	1528	643	15	2940
% of Volume	99	101	98	100	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Vehicles Entered	2	524	677	328	179	344	392	144	122	322	577	187
Vehicles Exited	2	523	681	328	178	344	392	144	123	323	575	186
Hourly Exit Rate	2	523	681	328	178	344	392	144	123	323	575	186
Input Volume	2	528	674	319	184	355	386	143	126	328	558	185
% of Volume	100	99	101	103	97	102	101	98	98	103	101	101

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	SBU	SBL	SBT	SBR	SBR2	All
Vehicles Entered	29	145	479	164	275	4890
Vehicles Exited	29	146	478	163	275	4890
Hourly Exit Rate	29	146	478	163	275	4890
Input Volume	28	149	470	163	275	4873
% of Volume	104	98	102	100	100	100

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	775	230	8	954	50	8	2025
Vehicles Exited	775	230	8	951	49	8	2021
Hourly Exit Rate	775	230	8	951	49	8	2021
Input Volume	776	225	9	955	51	8	2024
% of Volume	100	102	89	100	96	100	100

5: Serramonte Blvd & Project Driveway 3 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	147	598	755	178	160	126	1964
Vehicles Exited	147	599	757	178	159	126	1966
Hourly Exit Rate	147	599	757	178	159	126	1966
Input Volume	154	604	757	178	162	127	1982
% of Volume	95	99	100	100	98	99	99

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Vehicles Entered	168	357	196	87	332	88	4	266	628	120	3	70
Vehicles Exited	168	358	196	87	332	89	4	265	629	120	3	70
Hourly Exit Rate	168	358	196	87	332	89	4	265	629	120	3	70
Input Volume	174	350	197	92	339	88	4	271	627	118	4	70
% of Volume	97	102	99	95	98	101	100	98	100	102	75	100

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBT	SBR	All
Vehicles Entered	522	199	3040
Vehicles Exited	522	200	3043
Hourly Exit Rate	522	200	3043
Input Volume	521	195	3050
% of Volume	100	103	100

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	178	47	251	2	45	18	222	291	9	6	247	148
Vehicles Exited	178	47	250	2	45	18	221	293	9	6	247	148
Hourly Exit Rate	178	47	250	2	45	18	221	293	9	6	247	148
Input Volume	183	48	255	3	47	17	223	282	8	6	245	154
% of Volume	97	98	98	67	96	106	99	104	112	100	101	96

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	1464
Vehicles Exited	1464
Hourly Exit Rate	1464
Input Volume	1471
% of Volume	100

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBT	EBR	NBU	NBL	NBT	SBT	SBR	All
Vehicles Entered	10	13	215	2	37	977	810	18	2082
Vehicles Exited	10	13	214	2	37	979	809	18	2082
Hourly Exit Rate	10	13	214	2	37	979	809	18	2082
Input Volume	10	12	212	3	39	981	814	16	2087
% of Volume	100	108	101	67	95	100	99	112	100

9: Junipero Serra Blvd & Project Driveway 2 Performance by movement

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT	All
Vehicles Entered	0	296	169	8	1010	254	5	93	788	2623
Vehicles Exited	0	297	168	8	1013	254	5	93	787	2625
Hourly Exit Rate	0	297	168	8	1013	254	5	93	787	2625
Input Volume	1	290	171	7	995	255	6	93	788	2606
% of Volume	0	102	98	114	102	100	83	100	100	101

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	26	716	16	12	867	30	19	14	39	53	1792
Vehicles Exited	26	714	16	12	867	29	19	14	38	52	1787
Hourly Exit Rate	26	714	16	12	867	29	19	14	38	52	1787
Input Volume	28	717	15	12	868	30	18	15	42	51	1796
% of Volume	93	100	107	100	100	97	106	93	90	102	99

11: Serramonte Blvd & z Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	13	740	884	15	12	25	1689
Vehicles Exited	13	739	885	15	12	25	1689
Hourly Exit Rate	13	739	885	15	12	25	1689
Input Volume	13	749	885	15	14	25	1701
% of Volume	100	99	100	100	86	100	99

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	2	756	849	4	3	4	1618
Vehicles Exited	2	757	848	4	3	4	1618
Hourly Exit Rate	2	757	848	4	3	4	1618
Input Volume	3	763	855	4	3	4	1632
% of Volume	67	99	99	100	100	100	99

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	678	19	21	825	29	25	1597
Vehicles Exited	678	19	21	824	29	25	1596
Hourly Exit Rate	678	19	21	824	29	25	1596
Input Volume	682	18	22	830	29	24	1605
% of Volume	99	106	95	99	100	104	99

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	658	46	52	775	72	64	1667
Vehicles Exited	658	46	52	774	72	64	1666
Hourly Exit Rate	658	46	52	774	72	64	1666
Input Volume	660	47	55	779	73	61	1675
% of Volume	100	98	95	99	99	105	99

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	35	30	26	969	791	21	1872
Vehicles Exited	35	30	26	969	791	21	1872
Hourly Exit Rate	35	30	26	969	791	21	1872
Input Volume	37	30	27	970	794	23	1881
% of Volume	95	100	96	100	100	91	100

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	489	30	17	446	32	32	1046
Vehicles Exited	488	30	17	446	32	32	1045
Hourly Exit Rate	488	30	17	446	32	32	1045
Input Volume	488	25	21	456	33	30	1053
% of Volume	100	120	81	98	97	107	99

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	483	18	12	433	18	18	982
Vehicles Exited	482	17	12	433	18	18	980
Hourly Exit Rate	482	17	12	433	18	18	980
Input Volume	486	14	13	446	18	18	995
% of Volume	99	121	92	97	100	100	98

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	468	20	18	419	18	19	962
Vehicles Exited	468	20	18	420	17	19	962
Hourly Exit Rate	468	20	18	420	17	19	962
Input Volume	474	19	17	431	19	19	979
% of Volume	99	105	106	97	89	100	98

26: Performance by movement

Movement	NBT	NWT	NWR	All
Vehicles Entered	764	42	950	1756
Vehicles Exited	763	42	950	1755
Hourly Exit Rate	763	42	950	1755
Input Volume	769	40	951	1760
% of Volume	99	105	100	100

Total Network Performance

Vehicles Entered	9716
Vehicles Exited	9711
Hourly Exit Rate	9711
Input Volume	56247
% of Volume	17

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
I-280 SB Off-Ramp	1	29.1	58.0	0.2	15	15	30.1
I-280 NB On-Ramp	2	2.7	12.8	0.1	23	23	2.9
Junipero Serra Blvd	3	32.8	39.9	0.1	6	6	31.1
Collins Avenue	4	3.1	9.3	0.0	17	17	3.3
	10	2.2	6.6	0.0	20	21	1.7
z	11	6.5	10.9	0.0	13	15	5.3
Project Driveway 3	5	11.4	15.5	0.0	7	7	11.3
	19	2.6	8.1	0.0	21	21	2.8
	12	0.9	12.7	0.1	29	28	0.9
	13	0.7	10.9	0.1	29	29	0.7
	14	2.9	16.0	0.1	24	26	2.2
El Camino Real	6	22.4	29.5	0.1	8	9	19.7
	16	1.8	12.5	0.1	24	24	1.9
	17	0.2	8.5	0.1	29	30	0.2
	18	0.3	10.4	0.1	29	29	0.3
Hillside Blvd	7	10.2	27.2	0.2	23	20	11.7
Total		129.9	288.9	1.4	17	17	126.1

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed
I-280 SB Off-Ramp	14	34.4	12	45.7	17	24.0	14
I-280 NB On-Ramp	23	3.1	23	2.7	22	3.7	23
Junipero Serra Blvd	6	34.4	6	33.2	6	34.9	6
Collins Avenue	18	2.9	18	3.0	17	3.3	18
	22	1.7	20	2.1	18	3.0	20
z	14	5.5	12	7.1	11	8.1	14
Project Driveway 3	7	11.1	6	12.1	7	11.4	6
	21	2.8	21	2.7	21	2.7	22
	29	0.9	28	0.9	29	0.9	29
	29	0.7	28	0.8	29	0.7	29
	24	3.2	24	2.9	24	3.3	24
El Camino Real	8	22.9	8	24.0	8	22.2	9
	24	1.8	24	1.8	24	1.7	24
	29	0.3	29	0.2	30	0.2	29
	30	0.3	29	0.3	30	0.3	29
Hillside Blvd	23	10.7	20	13.5	23	10.5	24
Total	17	136.7	16	152.8	17	130.8	17

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 24 Delay	Run 25 Speed	Run 25 Delay	Run 26 Speed	Run 26 Delay	Run 27 Speed	Run 27 Delay
I-280 SB Off-Ramp	34.8	17	24.3	17	22.3	16	24.4
I-280 NB On-Ramp	2.9	25	2.2	24	2.4	24	2.7
Junipero Serra Blvd	32.5	6	31.9	7	29.9	6	34.0
Collins Avenue	3.1	18	3.0	17	3.5	18	3.0
	2.1	22	1.7	20	2.0	16	3.9
z	5.6	14	5.7	12	7.4	11	8.8
Project Driveway 3	11.7	7	10.9	6	11.9	7	10.9
	2.3	21	2.8	22	2.4	22	2.5
	0.9	29	0.8	29	0.9	29	0.8
	0.7	29	0.6	29	0.8	29	0.6
	3.1	26	2.1	26	2.3	22	4.6
El Camino Real	21.3	9	20.8	9	19.9	7	26.8
	1.7	24	1.8	24	1.9	24	1.9
	0.2	29	0.2	29	0.2	29	0.2
	0.4	29	0.3	29	0.3	29	0.3
Hillside Blvd	9.6	21	12.2	24	9.6	26	7.2
Total	133.0	18	121.5	18	117.7	17	132.4

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 28 Speed	Run 28 Delay	Run 30 Speed	Run 30 Delay
I-280 SB Off-Ramp	15	28.6	17	21.6
I-280 NB On-Ramp	24	2.3	24	2.3
Junipero Serra Blvd	6	33.1	6	32.0
Collins Avenue	17	3.2	18	3.1
	22	1.6	22	1.6
z	13	6.3	15	5.4
Project Driveway 3	6	12.4	7	10.6
	21	2.9	22	2.6
	28	0.9	29	0.8
	29	0.7	29	0.7
	25	2.4	24	3.0
El Camino Real	8	21.8	8	24.4
	24	1.6	25	1.6
	29	0.3	29	0.2
	29	0.3	30	0.2
Hillside Blvd	25	9.2	25	8.0
Total	17	127.4	18	118.2

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
Hillside Blvd	7	12.9	18.3	0.0	9	10	10.5
	18	1.0	18.0	0.2	35	35	1.1
	17	0.4	10.4	0.1	29	29	0.4
	16	0.4	8.4	0.1	30	29	0.4
El Camino Real	6	32.4	41.5	0.1	7	8	31.3
	14	2.4	11.2	0.1	22	21	2.4
	13	1.0	14.0	0.1	28	28	1.0
	12	0.8	10.8	0.1	29	29	0.7
	19	1.3	13.6	0.1	27	27	1.3
Project Driveway 3	5	6.6	12.0	0.0	15	14	6.8
z	11	1.3	5.0	0.0	20	20	1.2
	10	1.1	5.8	0.0	25	25	1.0
Collins Avenue	4	4.8	9.0	0.0	15	17	3.5
Junipero Serra Blvd	3	36.6	41.8	0.0	4	4	32.6
I-280 NB On-Ramp	2	8.6	16.9	0.1	14	15	8.1
I-280 SB Off-Ramp	1	19.8	29.9	0.1	10	10	19.0
Total		131.4	266.5	1.2	16	16	121.4

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed
Hillside Blvd	8	13.5	8	15.1	8	13.9	8
	35	0.8	32	1.3	37	1.0	38
	29	0.4	29	0.4	29	0.3	29
	30	0.4	30	0.4	30	0.4	30
El Camino Real	7	32.3	7	35.1	7	32.1	8
	22	2.3	22	2.4	22	2.5	22
	28	1.0	28	1.0	28	0.9	28
	29	0.7	29	0.7	29	0.7	29
	27	1.3	27	1.3	27	1.3	27
Project Driveway 3	15	6.7	15	6.6	15	6.3	15
z	19	1.5	20	1.4	21	1.1	21
	23	1.6	24	1.4	27	0.7	24
Collins Avenue	14	5.1	15	4.8	16	4.1	14
Junipero Serra Blvd	4	36.7	4	36.7	4	35.7	4
I-280 NB On-Ramp	15	8.3	14	9.1	14	8.8	15
I-280 SB Off-Ramp	10	18.8	11	18.3	10	20.3	9
Total	16	131.6	15	136.1	16	130.1	16

Arterial Level of Service
Weekend PM Road Diet - Signal

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Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 24 Delay	Run 25 Speed	Run 25 Delay	Run 26 Speed	Run 26 Delay	Run 27 Speed	Run 27 Delay
Hillside Blvd	14.6	11	8.9	8	13.5	8	13.9
	0.9	39	0.8	34	1.1	35	1.2
	0.4	29	0.4	29	0.4	29	0.4
	0.4	29	0.4	29	0.5	30	0.4
El Camino Real	30.9	7	31.4	7	31.8	7	34.1
	2.2	22	2.3	22	2.4	22	2.4
	1.1	28	1.0	28	0.9	28	0.9
	0.8	29	0.7	29	0.8	29	0.7
	1.3	27	1.4	27	1.3	27	1.2
Project Driveway 3	6.2	15	6.5	15	6.4	15	6.5
Z	1.2	21	1.2	20	1.3	21	1.2
	1.3	23	1.5	26	0.8	25	0.9
Collins Avenue	5.5	12	6.5	17	3.4	14	4.9
Junipero Serra Blvd	36.8	4	40.2	4	36.2	4	39.4
I-280 NB On-Ramp	7.6	14	9.3	15	8.5	13	10.1
I-280 SB Off-Ramp	21.6	10	20.7	9	21.6	10	19.4
Total	132.6	16	133.1	16	130.9	15	137.6

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 28 Speed	Run 28 Delay	Run 30 Speed	Run 30 Delay
Hillside Blvd	8	13.2	9	11.7
	34	1.1	34	1.0
	29	0.4	29	0.4
	30	0.4	30	0.4
El Camino Real	7	31.5	7	33.3
	22	2.5	22	2.3
	28	1.0	28	1.0
	29	0.7	29	0.8
	27	1.3	27	1.4
Project Driveway 3	14	7.3	15	6.5
Z	20	1.3	20	1.3
	25	1.0	26	0.8
Collins Avenue	14	5.2	14	5.0
Junipero Serra Blvd	4	36.0	4	36.2
I-280 NB On-Ramp	14	9.0	15	7.8
I-280 SB Off-Ramp	11	18.4	10	20.3
Total	16	130.3	16	130.1

Queuing and Blocking Report
Weekend PM Road Diet - Signal

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Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	T	T	L	L	R	R
Maximum Queue (ft)	861	761	219	232	75	319	261	158	62
Average Queue (ft)	431	329	121	129	47	183	112	14	3
95th Queue (ft)	783	685	196	206	102	279	203	86	35
Link Distance (ft)	1253	1253	384	384		498	498	498	
Upstream Blk Time (%)	0	0							
Queuing Penalty (veh)	0	0							
Storage Bay Dist (ft)					50				381
Storage Blk Time (%)					32	1			
Queuing Penalty (veh)					68	2			

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	WB	WB
Directions Served	L	L	T	T	TR
Maximum Queue (ft)	224	363	132	125	149
Average Queue (ft)	180	71	11	16	74
95th Queue (ft)	250	280	71	82	129
Link Distance (ft)		384	384	384	246
Upstream Blk Time (%)		0		0	
Queuing Penalty (veh)		1		0	
Storage Bay Dist (ft)	200				
Storage Blk Time (%)	9	0			
Queuing Penalty (veh)	34	0			

Queuing and Blocking Report
Weekend PM Road Diet - Signal

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Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	<L	L	T	T	R	L	T	TR	R>	<L	L	T
Maximum Queue (ft)	247	251	251	270	244	162	166	171	175	199	207	267
Average Queue (ft)	154	169	163	192	103	117	133	153	148	116	119	140
95th Queue (ft)	226	234	244	271	226	171	177	173	180	181	187	228
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)	0	1	1	2	0	6	9	27	21			
Queuing Penalty (veh)	2	4	2	7	0	15	21	67	52			
Storage Bay Dist (ft)					225					295	295	
Storage Blk Time (%)				4	0							0
Queuing Penalty (veh)				11	1							0

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	UL	T	TR	>
Maximum Queue (ft)	313	115	327	437	471	305
Average Queue (ft)	184	86	135	247	264	88
95th Queue (ft)	290	151	284	411	441	312
Link Distance (ft)	1147		676	676		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		90	320		280	
Storage Blk Time (%)	29	1	0	5	11	1
Queuing Penalty (veh)	54	3	0	9	29	3

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	82	85	76	82	114	133	90	130	66
Average Queue (ft)	10	8	6	19	24	67	50	47	10
95th Queue (ft)	51	45	37	64	82	140	112	104	44
Link Distance (ft)	146	146			111	111		1189	
Upstream Blk Time (%)	0	0			0	3			
Queuing Penalty (veh)	0	0			1	16			
Storage Bay Dist (ft)			40	65			65	50	
Storage Blk Time (%)	0	0	1	1	10	4	22	0	
Queuing Penalty (veh)	1	0	2	3	24	9	2	0	

Queuing and Blocking Report
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Intersection: 5: Serramonte Blvd & Project Driveway 3

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	168	152	141	211	230
Average Queue (ft)	124	98	60	116	113
95th Queue (ft)	163	149	113	190	195
Link Distance (ft)	110	110	191	191	250
Upstream Blk Time (%)	21	5		1	0
Queuing Penalty (veh)	80	20		2	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	UL	T	T	T	R	UL	T
Maximum Queue (ft)	245	270	121	285	94	223	257	193	142	80	124	212
Average Queue (ft)	91	195	57	165	27	143	109	101	70	33	52	133
95th Queue (ft)	183	294	104	260	65	221	200	160	128	62	98	193
Link Distance (ft)	259	259	334	334			326	326	326			1268
Upstream Blk Time (%)	0	3		0	0		0	0				
Queuing Penalty (veh)	0	10		0	0		1	0				
Storage Bay Dist (ft)					300	200				160	300	
Storage Blk Time (%)				0	4	0		0	0	0		
Queuing Penalty (veh)				0	9	0		0	0	0		

Intersection: 6: El Camino Real & Serramonte Blvd

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	197	143	118
Average Queue (ft)	101	39	58
95th Queue (ft)	175	100	101
Link Distance (ft)	1268	1268	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)		0	1
Queuing Penalty (veh)		0	2

Queuing and Blocking Report
Weekend PM Road Diet - Signal

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Intersection: 7: Hillside Blvd & Serramonte Blvd

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	TR	L	TR	L	T	R
Maximum Queue (ft)	163	138	59	55	183	168	46	248	100
Average Queue (ft)	78	64	15	19	100	73	6	104	61
95th Queue (ft)	140	112	45	49	163	130	29	190	112
Link Distance (ft)	850	850	192	192	908	908		900	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)					75				75
Storage Blk Time (%)									15
Queuing Penalty (veh)									24

Intersection: 8: El Camino Real & Collins Avenue/Cemetery Driveway

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	UL	T	T	TR	T	T	TR
Maximum Queue (ft)	135	104	67	134	65	41	89	111	94
Average Queue (ft)	17	67	21	43	12	7	17	25	19
95th Queue (ft)	74	107	49	104	39	27	60	77	63
Link Distance (ft)	472			1262	1262	1262	415	415	415
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	80		130						
Storage Blk Time (%)	4		0						
Queuing Penalty (veh)	0		0						

Intersection: 9: Junipero Serra Blvd & Project Driveway 2

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	UL	L	R	UT	T	TR	UL	T	T
Maximum Queue (ft)	121	128	97	162	189	222	115	118	141
Average Queue (ft)	63	55	47	86	104	116	54	56	61
95th Queue (ft)	104	101	81	149	171	193	95	100	112
Link Distance (ft)	196	196	196	676	676	676		591	591
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)							210		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report
Weekend PM Road Diet - Signal

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Intersection: 10: Serramonte Blvd

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (ft)	129	120	68	108	65	141
Average Queue (ft)	30	16	8	16	25	50
95th Queue (ft)	94	75	41	70	54	103
Link Distance (ft)	111	111	129	129	208	158
Upstream Blk Time (%)	1	0	0	0		1
Queuing Penalty (veh)	3	2	0	1		0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 11: Serramonte Blvd & z

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	174	172	24	51	74
Average Queue (ft)	84	54	1	3	25
95th Queue (ft)	171	156	15	27	59
Link Distance (ft)	129	129	110	110	222
Upstream Blk Time (%)	5	3	0	0	
Queuing Penalty (veh)	20	11	0	0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: Serramonte Blvd

Movement	EB	B19	B19	SB
Directions Served	L	T		LR
Maximum Queue (ft)	18	126	37	31
Average Queue (ft)	1	7	1	7
95th Queue (ft)	12	61	22	27
Link Distance (ft)		191	191	255
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)	75			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
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Intersection: 13: Serramonte Blvd

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	35	78
Average Queue (ft)	10	33
95th Queue (ft)	34	65
Link Distance (ft)		343
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: Serramonte Blvd

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (ft)	223	62	238
Average Queue (ft)	29	22	91
95th Queue (ft)	129	53	193
Link Distance (ft)	518	259	411
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: El Camino Real

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	R
Maximum Queue (ft)	83	39	19	10	2	5
Average Queue (ft)	28	11	1	0	0	0
95th Queue (ft)	60	35	17	10	2	4
Link Distance (ft)	203		415	415	326	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		100				100
Storage Blk Time (%)			0			
Queuing Penalty (veh)			0			

Queuing and Blocking Report
Weekend PM Road Diet - Signal

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Intersection: 16: Serramonte Blvd

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	4	49	57	59
Average Queue (ft)	0	7	22	22
95th Queue (ft)	3	31	49	51
Link Distance (ft)	334	300	289	289
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	38	51
Average Queue (ft)	5	22
95th Queue (ft)	24	49
Link Distance (ft)	389	205
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: Serramonte Blvd

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	47	41
Average Queue (ft)	7	23
95th Queue (ft)	31	47
Link Distance (ft)	850	247
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Weekend PM Road Diet - Signal

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Intersection: 26:

Movement	NW	B36	B36
Directions Served	R	T	
Maximum Queue (ft)	111	192	166
Average Queue (ft)	7	63	51
95th Queue (ft)	56	135	126
Link Distance (ft)	352	175	175
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	1	1	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 634

HCM Signalized Intersection Capacity Analysis
1: Serramonte Blvd & I-280 SB Off-Ramp

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↑↓	↑↓
Traffic Volume (vph)	0	1532	649	0	750	825
Future Volume (vph)	0	1532	649	0	750	825
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		3.7	3.7
Lane Util. Factor		0.95	0.91		0.97	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	5085		3433	2787
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	5085		3433	2787
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1613	683	0	789	868
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1613	683	0	789	868
Turn Type		NA	NA		Prot	custom
Protected Phases		2	6		4	4
Permitted Phases						
Actuated Green, G (s)		31.6	20.1		21.0	33.0
Effective Green, g (s)		31.6	20.1		21.0	33.0
Actuated g/C Ratio		0.52	0.33		0.34	0.54
Clearance Time (s)		4.6	4.6		3.7	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1836	1678		1183	1510
v/s Ratio Prot		c0.46	0.13		c0.23	0.31
v/s Ratio Perm						
v/c Ratio		0.88	0.41		0.67	0.57
Uniform Delay, d1		13.0	15.8		17.0	9.3
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		5.1	0.2		1.4	0.5
Delay (s)		18.1	15.9		18.4	9.8
Level of Service		B	B		B	A
Approach Delay (s)		18.1	15.9		13.9	
Approach LOS		B	B		B	

Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	11.5
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2: Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕			
Traffic Volume (vph)	754	1523	643	15	0	0
Future Volume (vph)	754	1523	643	15	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.1			
Lane Util. Factor	0.97	0.95	0.95			
Frt	1.00	1.00	1.00			
Flt Protected	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539	3527			
Flt Permitted	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539	3527			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	794	1603	677	16	0	0
RTOR Reduction (vph)	0	0	4	0	0	0
Lane Group Flow (vph)	794	1603	689	0	0	0
Turn Type	Prot	NA	NA			
Protected Phases	5	2	6			
Permitted Phases						
Actuated Green, G (s)	13.4	35.5	14.5			
Effective Green, g (s)	13.4	35.5	14.5			
Actuated g/C Ratio	0.38	1.00	0.41			
Clearance Time (s)	3.5	4.4	4.1			
Vehicle Extension (s)	3.0	4.0	3.0			
Lane Grp Cap (vph)	1295	3539	1440			
v/s Ratio Prot	c0.23	c0.45	0.20			
v/s Ratio Perm						
v/c Ratio	0.61	0.45	0.48			
Uniform Delay, d1	9.0	0.0	7.7			
Progression Factor	1.00	1.00	1.00			
Incremental Delay, d2	0.9	0.1	0.3			
Delay (s)	9.8	0.1	8.0			
Level of Service	A	A	A			
Approach Delay (s)		3.3	8.0		0.0	
Approach LOS		A	A		A	
Intersection Summary						
HCM 2000 Control Delay		4.4		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.60				
Actuated Cycle Length (s)		35.5		Sum of lost time (s)		7.6
Intersection Capacity Utilization		100.0%		ICU Level of Service		G
Analysis Period (min)		15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019



Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations		↔	↕	↕	↔	↕	↕	↕		↔	↕	↕
Traffic Volume (vph)	2	528	667	319	184	355	386	143	126	328	558	185
Future Volume (vph)	2	528	667	319	184	355	386	143	126	328	558	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0	3.0	4.6	4.6			4.0	4.0	4.0
Lane Util. Factor		0.97	0.95	1.00	1.00	0.91	0.91			0.97	0.95	1.00
Frb, ped/bikes		1.00	1.00	0.98	1.00	1.00	1.00			1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.94	0.85			1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00			0.95	1.00	1.00
Satd. Flow (prot)		3433	3539	1551	1770	3180	1441			3433	3539	1551
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00			0.95	1.00	1.00
Satd. Flow (perm)		3433	3539	1551	1770	3180	1441			3433	3539	1551
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	556	702	336	194	374	406	151	133	345	587	195
RTOR Reduction (vph)	0	0	0	243	0	0	89	0	0	0	0	96
Lane Group Flow (vph)	0	558	702	93	194	638	204	0	0	478	587	99
Confl. Peds. (#/hr)				9								9
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm		Split	Split	NA	Perm
Protected Phases	5	5	2		1	6			3	3	3	
Permitted Phases				2			6					3
Actuated Green, G (s)		19.3	28.3	28.3	14.1	22.5	22.5			23.3	23.3	23.3
Effective Green, g (s)		19.3	28.3	28.3	14.1	22.5	22.5			23.3	23.3	23.3
Actuated g/C Ratio		0.19	0.28	0.28	0.14	0.22	0.22			0.23	0.23	0.23
Clearance Time (s)		3.0	4.0	4.0	3.0	4.6	4.6			4.0	4.0	4.0
Vehicle Extension (s)		2.0	2.0	2.0	2.0	2.0	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)		646	977	428	243	698	316			780	804	352
v/s Ratio Prot		c0.16	0.20		0.11	c0.20				0.14	c0.17	
v/s Ratio Perm				0.06			0.14					0.06
v/c Ratio		0.86	0.72	0.22	0.80	0.91	0.65			0.61	0.73	0.28
Uniform Delay, d1		40.3	33.5	28.6	42.8	39.1	36.4			35.6	36.7	32.7
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Incremental Delay, d2		11.2	2.1	0.1	15.5	16.2	3.4			1.0	3.0	0.2
Delay (s)		51.5	35.6	28.7	58.3	55.3	39.7			36.6	39.6	32.9
Level of Service		D	D	C	E	E	D			D	D	C
Approach Delay (s)			39.7			51.7					37.4	
Approach LOS			D			D					D	
Intersection Summary												
HCM 2000 Control Delay		41.7								D		
HCM 2000 Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		102.5								16.2		
Intersection Capacity Utilization		82.0%								E		
Analysis Period (min)		15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

03/25/2019

Movement	SBU	SBL	SBT	SBR	SBR2
Lane Configurations		0	↑↑		↑
Traffic Volume (vph)	28	149	455	163	275
Future Volume (vph)	28	149	455	163	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6		4.0
Lane Util. Factor		1.00	0.95		1.00
Frpb, ped/bikes		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00
Frt		1.00	0.96		0.85
Flt Protected		0.95	1.00		1.00
Satd. Flow (prot)		1770	3399		1583
Flt Permitted		0.95	1.00		1.00
Satd. Flow (perm)		1770	3399		1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	157	479	172	289
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	0	186	651	0	289
Confl. Peds. (#/hr)					
Turn Type	Split	Split	NA		Free
Protected Phases	4	4	4		
Permitted Phases					Free
Actuated Green, G (s)		21.2	21.2		102.5
Effective Green, g (s)		21.2	21.2		102.5
Actuated g/C Ratio		0.21	0.21		1.00
Clearance Time (s)		4.6	4.6		
Vehicle Extension (s)		2.0	2.0		
Lane Grp Cap (vph)		366	703		1583
v/s Ratio Prot		0.11	c0.19		
v/s Ratio Perm					0.18
v/c Ratio		0.51	0.93		0.18
Uniform Delay, d1		36.0	39.9		0.0
Progression Factor		1.00	1.00		1.00
Incremental Delay, d2		0.4	17.9		0.3
Delay (s)		36.4	57.7		0.3
Level of Service		D	E		A
Approach Delay (s)			39.5		
Approach LOS			D		

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis
 4: Collins Avenue & Serramonte Blvd

03/25/2019


Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑		↑↑↑	↑	↑		
Traffic Volume (veh/h)	752	225	9	955	51	8		
Future Volume (Veh/h)	752	225	9	955	51	8		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	792	237	9	1005	54	8		
Pedestrians	6			6	6			
Lane Width (ft)	12.0			12.0	12.0			
Walking Speed (ft/s)	3.5			3.5	3.5			
Percent Blockage	1			1	1			
Right turn flare (veh)						2		
Median type	None			None				
Median storage (veh)								
Upstream signal (ft)	239			552				
pX, platoon unblocked			0.84		0.84	0.84		
vC, conflicting volume			798		1073	408		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol			377		705	0		
tC, single (s)			4.1		6.8	6.9		
tC, 2 stage (s)								
tF (s)			2.2		3.5	3.3		
p0 queue free %			99		82	99		
cM capacity (veh/h)			983		305	900		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	396	396	237	153	287	287	287	62
Volume Left	0	0	0	9	0	0	0	54
Volume Right	0	0	237	0	0	0	0	8
cSH	1700	1700	1700	983	1700	1700	1700	350
Volume to Capacity	0.23	0.23	0.14	0.01	0.17	0.17	0.17	0.18
Queue Length 95th (ft)	0	0	0	1	0	0	0	16
Control Delay (s)	0.0	0.0	0.0	0.6	0.0	0.0	0.0	18.0
Lane LOS				A				C
Approach Delay (s)	0.0			0.1				18.0
Approach LOS								C

Intersection Summary

Average Delay	0.6
Intersection Capacity Utilization	35.2% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
5: Serramonte Blvd & Project Driveway 3


03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕	
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	154	604	757	178	162	127
Future Volume (vph)	154	604	757	178	162	127
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	162	636	797	187	171	134
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total (vph)	374	424	531	453	305	
Volume Left (vph)	162	0	0	0	171	
Volume Right (vph)	0	0	0	187	134	
Hadj (s)	0.25	0.03	0.03	-0.26	-0.12	
Departure Headway (s)	7.3	7.1	7.0	6.7	6.8	
Degree Utilization, x	0.76	0.83	1.03	0.84	0.57	
Capacity (veh/h)	489	503	511	530	517	
Control Delay (s)	28.3	34.9	74.3	35.0	18.4	
Approach Delay (s)	31.8		56.2		18.4	
Approach LOS	D		F		C	
Intersection Summary						
Delay			41.4			
Level of Service			E			
Intersection Capacity Utilization			75.3%		ICU Level of Service D	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↕	↕		↕	↕	↕		↕	↕↕	↕	↕	↕
Traffic Volume (vph)	174	324	197	92	339	88	4	271	627	118	4	70
Future Volume (vph)	174	324	197	92	339	88	4	271	627	118	4	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	3.5	3.5		3.0	4.0	4.0		3.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	0.91	1.00		1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.99		1.00	1.00	0.99		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Frt	1.00	0.94		1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)	1770	1741		1770	1863	1561		1770	5085	1560		1770
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)	1770	1741		1770	1863	1561		1770	5085	1560		1770
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	341	207	97	357	93	4	285	660	124	4	74
RTOR Reduction (vph)	0	26	0	0	0	71	0	0	0	85	0	0
Lane Group Flow (vph)	183	522	0	97	357	22	0	289	660	39	0	78
Confl. Peds. (#/hr)			18		3				3			
Turn Type	Prot	NA		Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	4	8		7	3		1	1	6		5	5
Permitted Phases					3				6			
Actuated Green, G (s)	18.9	29.9		9.6	20.6	20.6		16.6	27.0	27.0		6.1
Effective Green, g (s)	18.9	29.9		9.6	20.6	20.6		16.6	27.0	27.0		6.1
Actuated g/C Ratio	0.22	0.35		0.11	0.24	0.24		0.19	0.31	0.31		0.07
Clearance Time (s)	3.5	3.5		3.5	3.5	3.5		3.0	4.0	4.0		3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0	4.0	4.0		2.0
Lane Grp Cap (vph)	386	601		196	443	371		339	1585	486		124
v/s Ratio Prot	0.10	c0.30		0.05	c0.19			c0.16	0.13			0.04
v/s Ratio Perm					0.01				0.02			
v/c Ratio	0.47	0.87		0.49	0.81	0.06		0.85	0.42	0.08		0.63
Uniform Delay, d1	29.5	26.5		36.2	31.1	25.5		33.8	23.6	21.0		39.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2	0.3	12.3		0.7	9.7	0.0		17.7	0.2	0.1		7.0
Delay (s)	29.9	38.8		36.9	40.8	25.5		51.5	23.8	21.1		46.1
Level of Service	C	D		D	D	C		D	C	C		D
Approach Delay (s)	36.6				37.5				31.0			
Approach LOS	D				D				C			
Intersection Summary												
HCM 2000 Control Delay			34.0		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			86.6		Sum of lost time (s)				14.0			
Intersection Capacity Utilization			74.7%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: El Camino Real & Serramonte Blvd

03/25/2019

Movement	SBT	SBR
Lane Configurations	↑↑↑	↑
Traffic Volume (vph)	521	195
Future Volume (vph)	521	195
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	4.0
Lane Util. Factor	0.91	1.00
Frbp. ped/bikes	1.00	0.98
Flpb. ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5085	1557
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5085	1557
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	548	205
RTOR Reduction (vph)	0	166
Lane Group Flow (vph)	548	39
Confl. Peds. (#/hr)		4
Turn Type	NA	Perm
Protected Phases	2	
Permitted Phases		2
Actuated Green, G (s)	16.5	16.5
Effective Green, g (s)	16.5	16.5
Actuated g/C Ratio	0.19	0.19
Clearance Time (s)	4.0	4.0
Vehicle Extension (s)	4.0	4.0
Lane Grp Cap (vph)	968	296
v/s Ratio Prot	c0.11	
v/s Ratio Perm		0.03
v/c Ratio	0.57	0.13
Uniform Delay, d1	31.8	29.1
Progression Factor	1.00	1.00
Incremental Delay, d2	0.9	0.3
Delay (s)	32.7	29.4
Level of Service	C	C
Approach Delay (s)	33.2	
Approach LOS	C	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
7: Hillside Blvd & Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑	↑	↑	↑		↑	↑	↑
Traffic Volume (vph)	183	29	255	3	47	17	223	282	8	6	245	154
Future Volume (vph)	183	29	255	3	47	17	223	282	8	6	245	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.96
Flpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	0.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.96	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1786	1583	3395	1770	1855	1770	1855	1770	1855	1770	1863	1519
Flt Permitted	0.70	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1312	1583	3216	1770	1855	1770	1855	1770	1855	1770	1863	1519
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	193	31	268	3	49	18	235	297	8	6	258	162
RTOR Reduction (vph)	0	0	185	0	12	0	2	0	0	0	0	116
Lane Group Flow (vph)	0	224	83	0	58	0	235	303	0	6	258	46
Confl. Peds. (#/hr)												30
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		2		2			3	8		7		4
Permitted Phases	2		2	2								4
Actuated Green, G (s)		18.1	18.1		18.1		10.1	25.6		0.9	16.4	16.4
Effective Green, g (s)		18.1	18.1		18.1		10.1	25.6		0.9	16.4	16.4
Actuated g/C Ratio		0.31	0.31		0.31		0.17	0.44		0.02	0.28	0.28
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		408	493		1001		307	817		27	525	428
v/s Ratio Prot							c0.13	0.16		0.00	c0.14	
v/s Ratio Perm		c0.17	0.05		0.02							0.03
v/c Ratio		0.55	0.17		0.06		0.77	0.37		0.22	0.49	0.11
Uniform Delay, d1		16.6	14.5		14.0		22.9	10.9		28.3	17.4	15.4
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		5.2	0.7		0.1		10.8	0.3		4.1	0.7	0.1
Delay (s)		21.8	15.3		14.1		33.7	11.2		32.4	18.1	15.5
Level of Service		C	B		B		C	B		C	B	B
Approach Delay (s)		18.3			14.1		21.0				17.3	
Approach LOS		B			B		C				B	
Intersection Summary												
HCM 2000 Control Delay			18.8			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			58.1			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			56.2%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕	↕		↕			↕	↕	↕		↕
Traffic Volume (vph)	10	0	212	0	0	0	3	39	981	0	0	813
Future Volume (vph)	10	0	212	0	0	0	3	39	981	0	0	813
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5					4.5	4.5			
Lane Util. Factor		1.00	1.00					1.00	0.91			0.91
Frpb, ped/bikes		1.00	1.00					1.00	1.00			1.00
Flpb, ped/bikes		1.00	1.00					1.00	1.00			1.00
Frt		1.00	0.85					1.00	1.00			1.00
Flt Protected		0.95	1.00					0.95	1.00			1.00
Satd. Flow (prot)		1765	1583					1770	5085			5068
Flt Permitted		0.76	1.00					0.95	1.00			1.00
Satd. Flow (perm)		1407	1583					1770	5085			5068
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	0	223	0	0	0	3	41	1033	0	0	856
RTOR Reduction (vph)	0	0	202	0	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	0	11	21	0	0	0	0	44	1033	0	0	872
Confl. Peds. (#/hr)	2					2				2	4	
Turn Type	Perm	NA	Perm				Prot	Prot	NA			NA
Protected Phases		4			8		1	1	6			2
Permitted Phases	4		4	8								
Actuated Green, G (s)		7.4	7.4					5.0	60.9			51.4
Effective Green, g (s)		7.4	7.4					5.0	60.9			51.4
Actuated g/C Ratio		0.10	0.10					0.06	0.79			0.66
Clearance Time (s)		4.5	4.5					4.5	4.5			4.5
Vehicle Extension (s)		3.0	3.0					3.0	3.0			3.0
Lane Grp Cap (vph)		134	151					114	4006			3369
v/s Ratio Prot								c0.02	c0.20			0.17
v/s Ratio Perm		0.01	c0.01									
v/c Ratio		0.08	0.14					0.39	0.26			0.26
Uniform Delay, d1		31.9	32.0					34.7	2.2			5.2
Progression Factor		1.00	1.00					1.00	1.00			1.00
Incremental Delay, d2		0.3	0.4					2.2	0.2			0.2
Delay (s)		32.1	32.5					36.8	2.3			5.4
Level of Service		C	C					D	A			A
Approach Delay (s)		32.5			0.0				3.7			5.4
Approach LOS		C			A				A			A
Intersection Summary												
HCM 2000 Control Delay			7.5									A
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			77.3						13.5			
Intersection Capacity Utilization			44.6%									A
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 8: El Camino Real & Collins Avenue/Cemetery Driveway

03/25/2019

Movement	SBR
Lane Configurations	↕
Traffic Volume (vph)	16
Future Volume (vph)	16
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	1.00
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	17
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
9: Junipero Serra Blvd & Project Driveway 2

03/25/2019

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↔	↔		↔↔↔			↔	↔
Traffic Volume (vph)	1	290	171	7	945	255	6	93	788
Future Volume (vph)	1	290	171	7	945	255	6	93	788
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5			4.5	4.5
Lane Util. Factor		0.97	1.00		0.91			1.00	0.95
Frbp, ped/bikes		1.00	0.98		1.00			1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00			1.00	1.00
Frt		1.00	0.85		0.97			1.00	1.00
Flt Protected		0.95	1.00		1.00			0.95	1.00
Satd. Flow (prot)		3433	1558		4906			1770	3539
Flt Permitted		0.95	1.00		0.94			0.91	1.00
Satd. Flow (perm)		3433	1558		4590			1693	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	305	180	7	995	268	6	98	829
RTOR Reduction (vph)	0	0	142	0	75	0	0	0	0
Lane Group Flow (vph)	0	306	38	0	1195	0	0	104	829
Confl. Peds. (#/hr)			5			6			
Turn Type	Perm	Prot	Perm	Perm	NA	custom	Prot	NA	
Protected Phases		8			2		1	6	
Permitted Phases	8		8	2			1		
Actuated Green, G (s)		10.4	10.4		20.7			4.4	29.6
Effective Green, g (s)		10.4	10.4		20.7			4.4	29.6
Actuated g/C Ratio		0.21	0.21		0.42			0.09	0.60
Clearance Time (s)		4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)		728	330		1939			152	2137
v/s Ratio Prot									0.23
v/s Ratio Perm		0.09	0.02		c0.26			c0.06	
v/c Ratio		0.42	0.12		0.62			0.68	0.39
Uniform Delay, d1		16.7	15.6		11.0			21.6	5.0
Progression Factor		1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2		0.4	0.2		1.5			12.0	0.5
Delay (s)		17.1	15.7		12.5			33.6	5.5
Level of Service		B	B		B			C	A
Approach Delay (s)		16.6			12.5				8.7
Approach LOS		B			B				A
Intersection Summary									
HCM 2000 Control Delay		11.9			HCM 2000 Level of Service				B
HCM 2000 Volume to Capacity ratio		0.57							
Actuated Cycle Length (s)		49.0			Sum of lost time (s)				13.5
Intersection Capacity Utilization		69.0%			ICU Level of Service				C
Analysis Period (min)		15							

HCM Unsignalized Intersection Capacity Analysis
10: Serramonte Blvd

03/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	28	705	15	12	864	30	18	0	15	42	0	51
Future Volume (Veh/h)	28	705	15	12	864	30	18	0	15	42	0	51
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	30	766	16	13	939	33	24	0	20	56	0	68
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)		432			359							
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	972			782			1398	1832	391	1444	1824	486
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	972			394			1117	1628	0	1172	1618	486
IC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
IC, 2 stage (s)												
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			79	100	98	52	100	87
cM capacity (veh/h)	705			988			115	81	923	118	82	527
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	413	399	482	502	44	124						
Volume Left	30	0	13	0	24	56						
Volume Right	0	16	0	33	20	68						
cSH	705	1700	988	1700	191	205						
Volume to Capacity	0.04	0.23	0.01	0.30	0.23	0.61						
Queue Length 95th (ft)	3	0	1	0	21	86						
Control Delay (s)	1.3	0.0	0.4	0.0	29.4	46.3						
Lane LOS	A		A		D	E						
Approach Delay (s)	0.6		0.2		29.4	46.3						
Approach LOS					D	E						
Intersection Summary												
Average Delay		3.9										
Intersection Capacity Utilization		53.5%			ICU Level of Service					A		
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis
11: Serramonte Blvd & z

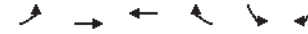
03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕	↕
Traffic Volume (veh/h)	13	735	885	15	14	25
Future Volume (Veh/h)	13	735	885	15	14	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	14	799	962	16	19	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		642	149			
pX, platoon unblocked					0.88	
vC, conflicting volume	978				1398	489
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	978				1187	489
IC, single (s)	4.1				6.8	6.9
IC, 2 stage (s)						
IF (s)	2.2				3.5	3.3
p0 queue free %	98				88	94
cM capacity (veh/h)	701				157	525
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	280	533	641	337	52	
Volume Left	14	0	0	0	19	
Volume Right	0	0	0	16	33	
eSH	701	1700	1700	1700	283	
Volume to Capacity	0.02	0.31	0.38	0.20	0.18	
Queue Length 95th (ft)	2	0	0	0	17	
Control Delay (s)	0.7	0.0	0.0	0.0	20.6	
Lane LOS	A				C	
Approach Delay (s)	0.3		0.0		20.6	
Approach LOS					C	
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			39.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
12: Serramonte Blvd

03/25/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕	↕	↕		↕	↕
Traffic Volume (veh/h)	3	697	798	4	3	4
Future Volume (Veh/h)	3	697	798	4	3	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	3	758	867	4	4	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TWLT			
Median storage (veh)		2	2			
Upstream signal (ft)		787				
pX, platoon unblocked						
vC, conflicting volume	871				1633	869
vC1, stage 1 conf vol						869
vC2, stage 2 conf vol						764
vCu, unblocked vol	871				1633	869
IC, single (s)	4.1				6.4	6.2
IC, 2 stage (s)					5.4	
IF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	774				317	351
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	3	758	871	9		
Volume Left	3	0	0	4		
Volume Right	0	0	4	5		
eSH	774	1700	1700	335		
Volume to Capacity	0.00	0.45	0.51	0.03		
Queue Length 95th (ft)	0	0	0	2		
Control Delay (s)	9.7	0.0	0.0	16.0		
Lane LOS	A			C		
Approach Delay (s)	0.0		0.0	16.0		
Approach LOS				C		
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			52.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
13: Serramonte Blvd

03/25/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	682	18	22	830	29	24
Future Volume (Veh/h)	682	18	22	830	29	24
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	741	20	24	902	39	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	1247		933			
pX, platoon unblocked					0.85	
vC, conflicting volume			761		1701 751	
vC1, stage 1 conf vol					751	
vC2, stage 2 conf vol					950	
vCu, unblocked vol			761		1737 751	
IC, single (s)			4.1		6.4 6.2	
IC, 2 stage (s)					5.4	
IF (s)			2.2		3.5 3.3	
p0 queue free %			97		86 92	
cM capacity (veh/h)			851		280 411	
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	761	24	902	71		
Volume Left	0	24	0	39		
Volume Right	20	0	0	32		
eSH	1700	851	1700	327		
Volume to Capacity	0.45	0.03	0.53	0.22		
Queue Length 95th (ft)	0	2	0	20		
Control Delay (s)	0.0	9.4	0.0	19.0		
Lane LOS	A		C			
Approach Delay (s)	0.0 0.2		19.0			
Approach LOS	C		C			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			53.7%		ICU Level of Service A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
14: Serramonte Blvd

03/25/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	660	47	55	779	73	61
Future Volume (Veh/h)	660	47	55	779	73	61
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	717	51	60	847	97	81
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		None			
Median storage (veh)	2					
Upstream signal (ft)			358			
pX, platoon unblocked					0.82	
vC, conflicting volume			768		1710 742	
vC1, stage 1 conf vol					742	
vC2, stage 2 conf vol					967	
vCu, unblocked vol			768		1755 742	
IC, single (s)			4.1		6.4 6.2	
IC, 2 stage (s)					5.4	
IF (s)			2.2		3.5 3.3	
p0 queue free %			93		63 80	
cM capacity (veh/h)			846		265 415	
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	768	60	847	178		
Volume Left	0	60	0	97		
Volume Right	51	0	0	81		
eSH	1700	846	1700	318		
Volume to Capacity	0.45	0.07	0.50	0.56		
Queue Length 95th (ft)	0	6	0	81		
Control Delay (s)	0.0	9.6	0.0	29.9		
Lane LOS	A		D			
Approach Delay (s)	0.0 0.6		29.9			
Approach LOS	C		D			
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			58.7%		ICU Level of Service B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
15: El Camino Real

03/25/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	↔	↔	↔	↕	↕	↕			
Traffic Volume (veh/h)	37	30	27	970	794	23			
Future Volume (Veh/h)	37	30	27	970	794	23			
Sign Control	Stop			Free	Free				
Grade	0%			0%	0%				
Peak Hour Factor	0.75	0.75	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	49	40	29	1054	863	25			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type				Raised	Raised				
Median storage (veh)				1	1				
Upstream signal (ft)				509	410				
pX, platoon unblocked	0.93	0.91	0.91						
vC, conflicting volume	1272	288	888						
vC1, stage 1 conf vol	863								
vC2, stage 2 conf vol	409								
vCu, unblocked vol	779	0	541						
IC, single (s)	6.8	6.9	4.1						
IC, 2 stage (s)	5.8								
IF (s)	3.5	3.3	2.2						
p0 queue free %	88	96	97						
cM capacity (veh/h)	402	989	934						
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	89	29	351	351	351	288	288	288	25
Volume Left	49	29	0	0	0	0	0	0	0
Volume Right	40	0	0	0	0	0	0	0	25
eSH	549	934	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.03	0.21	0.21	0.21	0.17	0.17	0.17	0.01
Queue Length 95th (ft)	14	2	0	0	0	0	0	0	0
Control Delay (s)	12.8	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	A							
Approach Delay (s)	12.8	0.2				0.0			
Approach LOS	B								
Intersection Summary									
Average Delay			0.7						
Intersection Capacity Utilization			32.6%		ICU Level of Service				A
Analysis Period (min)			15						

HCM Unsignalized Intersection Capacity Analysis
16: Serramonte Blvd

03/25/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↔	↕	↕	↕
Traffic Volume (veh/h)	470	25	21	456	33	30
Future Volume (Veh/h)	470	25	21	456	33	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	511	27	23	496	44	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			TWTLT		
Median storage (veh)				2		
Upstream signal (ft)	443					
pX, platoon unblocked						
vC, conflicting volume			538		818	269
vC1, stage 1 conf vol					524	
vC2, stage 2 conf vol					294	
vCu, unblocked vol			538		818	269
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)					5.8	
IF (s)			2.2		3.5	3.3
p0 queue free %			98		91	95
cM capacity (veh/h)			1026		498	729
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	341	197	188	331	44	40
Volume Left	0	0	23	0	44	0
Volume Right	0	27	0	0	0	40
eSH	1700	1700	1026	1700	498	729
Volume to Capacity	0.20	0.12	0.02	0.19	0.09	0.05
Queue Length 95th (ft)	0	0	2	0	7	4
Control Delay (s)	0.0	0.0	1.2	0.0	12.9	10.2
Lane LOS			A		B	B
Approach Delay (s)	0.0		0.4		11.6	
Approach LOS					B	
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			38.1%		ICU Level of Service	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
17: Serramonte Blvd

03/25/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	475	14	13	446	18	18
Future Volume (Veh/h)	475	14	13	446	18	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	516	15	14	485	24	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage (veh)	2			2		
Upstream signal (ft)	811					
pX, platoon unblocked						
vC, conflicting volume			531		794	266
vC1, stage 1 conf vol					524	
vC2, stage 2 conf vol					270	
vCu, unblocked vol			531		794	266
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)					5.8	
IF (s)			2.2		3.5	3.3
p0 queue free %			99		95	97
cM capacity (veh/h)			1033		506	733
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	344	187	176	323	48	
Volume Left	0	0	14	0	24	
Volume Right	0	15	0	0	24	
eSH	1700	1700	1033	1700	599	
Volume to Capacity	0.20	0.11	0.01	0.19	0.08	
Queue Length 95th (ft)	0	0	1	0	7	
Control Delay (s)	0.0	0.0	0.8	0.0	11.5	
Lane LOS	A			B		
Approach Delay (s)	0.0		0.3	11.5		
Approach LOS				B		
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			31.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
18: Serramonte Blvd

03/25/2019

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	466	19	17	431	19	19
Future Volume (Veh/h)	466	19	17	431	19	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	507	21	18	468	25	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage (veh)	2			2		
Upstream signal (ft)	1257			915		
pX, platoon unblocked						
vC, conflicting volume			528		788	264
vC1, stage 1 conf vol					518	
vC2, stage 2 conf vol					270	
vCu, unblocked vol			528		788	264
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)					5.8	
IF (s)			2.2		3.5	3.3
p0 queue free %			98		95	97
cM capacity (veh/h)			1035		509	734
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	338	190	174	312	50	
Volume Left	0	0	18	0	25	
Volume Right	0	21	0	0	25	
eSH	1700	1700	1035	1700	601	
Volume to Capacity	0.20	0.11	0.02	0.18	0.08	
Queue Length 95th (ft)	0	0	1	0	7	
Control Delay (s)	0.0	0.0	1.0	0.0	11.5	
Lane LOS	A			B		
Approach Delay (s)	0.0		0.4	11.5		
Approach LOS				B		
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			34.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Intersection Sign configuration not allowed in HCM analysis.

Summary of All Intervals

Run Number	20	21	22	23	24	26	27
Start Time	4:45	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	9839	9667	9509	9830	9840	9610	9648
Vehs Exited	9823	9620	9560	9781	9854	9603	9638
Starting Vehs	347	331	375	379	348	357	333
Ending Vehs	363	378	324	428	334	364	343
Travel Distance (mi)	6150	6014	5890	6080	6128	6014	6035
Travel Time (hr)	368.4	346.8	342.0	384.7	365.1	343.7	345.7
Total Delay (hr)	171.7	154.5	153.4	191.0	169.2	152.2	152.8
Total Stops	17125	15594	15498	17391	16221	15612	15359
Fuel Used (gal)	265.8	254.7	252.2	266.7	264.0	255.2	255.5

Summary of All Intervals

Run Number	28	29	31	Avg
Start Time	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	9892	9696	9676	9725
Vehs Exited	9855	9619	9682	9705
Starting Vehs	352	307	303	338
Ending Vehs	389	384	297	348
Travel Distance (mi)	6164	6075	6083	6063
Travel Time (hr)	352.7	354.9	349.1	355.3
Total Delay (hr)	156.3	160.6	155.2	161.7
Total Stops	16048	16428	15680	16102
Fuel Used (gal)	261.4	258.7	258.0	259.2

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00						
End Time	6:00						
Total Time (min)	60						
Volumes adjusted by Growth Factors.							
Run Number	20	21	22	23	24	26	27
Vehs Entered	9839	9667	9509	9830	9840	9610	9648
Vehs Exited	9823	9620	9560	9781	9854	9603	9638
Starting Vehs	347	331	375	379	348	357	333
Ending Vehs	363	378	324	428	334	364	343
Travel Distance (mi)	6150	6014	5890	6080	6128	6014	6035
Travel Time (hr)	368.4	346.8	342.0	384.7	365.1	343.7	345.7
Total Delay (hr)	171.7	154.5	153.4	191.0	169.2	152.2	152.8
Total Stops	17125	15594	15498	17391	16221	15612	15359
Fuel Used (gal)	265.8	254.7	252.2	266.7	264.0	255.2	255.5

Interval #1 Information Recording

Start Time	5:00			
End Time	6:00			
Total Time (min)	60			
Volumes adjusted by Growth Factors.				
Run Number	28	29	31	Avg
Vehs Entered	9892	9696	9676	9725
Vehs Exited	9855	9619	9682	9705
Starting Vehs	352	307	303	338
Ending Vehs	389	384	297	348
Travel Distance (mi)	6164	6075	6083	6063
Travel Time (hr)	352.7	354.9	349.1	355.3
Total Delay (hr)	156.3	160.6	155.2	161.7
Total Stops	16048	16428	15680	16102
Fuel Used (gal)	261.4	258.7	258.0	259.2

1: Serramonte Blvd & I-280 SB Off-Ramp Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Vehicles Entered	1556	648	744	811	3759
Vehicles Exited	1555	649	742	812	3758
Hourly Exit Rate	1555	649	742	812	3758
Input Volume	1532	649	750	825	3756
% of Volume	102	100	99	98	100

2: Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	All
Vehicles Entered	754	1543	640	16	2953
Vehicles Exited	755	1544	642	16	2957
Hourly Exit Rate	755	1544	642	16	2957
Input Volume	754	1528	643	15	2940
% of Volume	100	101	100	107	101

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Vehicles Entered	2	535	682	320	183	345	380	140	132	341	574	186
Vehicles Exited	2	536	681	319	184	346	380	140	132	339	570	185
Hourly Exit Rate	2	536	681	319	184	346	380	140	132	339	570	185
Input Volume	2	528	674	319	184	355	386	143	126	328	558	185
% of Volume	100	102	101	100	100	97	98	98	105	103	102	100

3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp Performance by movement

Movement	SBU	SBL	SBT	SBR	SBR2	All
Vehicles Entered	26	149	470	163	283	4911
Vehicles Exited	26	148	467	164	282	4901
Hourly Exit Rate	26	148	467	164	282	4901
Input Volume	28	149	470	163	275	4873
% of Volume	93	99	99	101	103	101

4: Collins Avenue & Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	778	227	7	942	46	9	2009
Vehicles Exited	777	227	7	941	45	9	2006
Hourly Exit Rate	777	227	7	941	45	9	2006
Input Volume	776	225	9	955	51	8	2024
% of Volume	100	101	78	99	88	112	99

5: Serramonte Blvd & Project Driveway 3 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	152	599	738	175	156	124	1944
Vehicles Exited	152	599	738	174	156	124	1943
Hourly Exit Rate	152	599	738	174	156	124	1943
Input Volume	154	604	757	178	162	127	1982
% of Volume	99	99	97	98	96	98	98

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Vehicles Entered	175	341	194	89	333	92	3	259	620	124	3	70
Vehicles Exited	174	339	194	88	333	92	4	260	619	124	3	70
Hourly Exit Rate	174	339	194	88	333	92	4	260	619	124	3	70
Input Volume	174	350	197	92	339	88	4	271	627	118	4	70
% of Volume	100	97	98	96	98	105	100	96	99	105	75	100

6: El Camino Real & Serramonte Blvd Performance by movement

Movement	SBT	SBR	All
Vehicles Entered	511	195	3009
Vehicles Exited	508	195	3003
Hourly Exit Rate	508	195	3003
Input Volume	521	195	3050
% of Volume	98	100	98

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	181	46	261	3	49	19	221	282	9	5	243	157
Vehicles Exited	180	45	260	3	49	19	220	280	9	5	243	157
Hourly Exit Rate	180	45	260	3	49	19	220	280	9	5	243	157
Input Volume	183	48	255	3	47	17	223	282	8	6	245	154
% of Volume	98	94	102	100	104	112	99	99	112	83	99	102

7: Hillside Blvd & Serramonte Blvd Performance by movement

Movement	All
Vehicles Entered	1476
Vehicles Exited	1470
Hourly Exit Rate	1470
Input Volume	1471
% of Volume	100

8: El Camino Real & Collins Avenue/Cemetery Driveway Performance by movement

Movement	EBL	EBT	EBR	NBU	NBL	NBT	SBT	SBR	All
Vehicles Entered	9	15	210	3	36	972	792	14	2051
Vehicles Exited	9	15	211	3	37	971	792	14	2052
Hourly Exit Rate	9	15	211	3	37	971	792	14	2052
Input Volume	10	12	212	3	39	981	814	16	2087
% of Volume	90	125	100	100	95	99	97	88	98

9: Junipero Serra Blvd & Project Driveway 2 Performance by movement

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT	All
Vehicles Entered	0	289	184	7	1010	257	5	90	794	2636
Vehicles Exited	0	290	184	7	1009	256	5	90	793	2634
Hourly Exit Rate	0	290	184	7	1009	256	5	90	793	2634
Input Volume	1	290	171	7	995	255	6	93	788	2606
% of Volume	0	100	108	100	101	100	83	97	101	101

10: Serramonte Blvd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	28	715	16	12	850	27	21	15	42	52	1778
Vehicles Exited	28	715	16	12	850	27	21	15	42	52	1778
Hourly Exit Rate	28	715	16	12	850	27	21	15	42	52	1778
Input Volume	28	717	15	12	868	30	18	15	42	51	1796
% of Volume	100	100	107	100	98	90	117	100	100	102	99

11: Serramonte Blvd & z Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	13	746	865	15	13	25	1677
Vehicles Exited	13	746	865	15	12	24	1675
Hourly Exit Rate	13	746	865	15	12	24	1675
Input Volume	13	749	885	15	14	25	1701
% of Volume	100	100	98	100	86	96	98

12: Serramonte Blvd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Vehicles Entered	2	754	837	4	2	4	1603
Vehicles Exited	2	754	836	4	2	4	1602
Hourly Exit Rate	2	754	836	4	2	4	1602
Input Volume	3	763	855	4	3	4	1632
% of Volume	67	99	98	100	67	100	98

13: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	674	17	22	812	29	24	1578
Vehicles Exited	674	17	22	811	30	24	1578
Hourly Exit Rate	674	17	22	811	30	24	1578
Input Volume	682	18	22	830	29	24	1605
% of Volume	99	94	100	98	103	100	98

14: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	651	47	54	762	72	58	1644
Vehicles Exited	651	47	53	762	71	58	1642
Hourly Exit Rate	651	47	53	762	71	58	1642
Input Volume	660	47	55	779	73	61	1675
% of Volume	99	100	96	98	97	95	98

15: El Camino Real Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	33	29	27	960	772	24	1845
Vehicles Exited	33	29	27	960	772	24	1845
Hourly Exit Rate	33	29	27	960	772	24	1845
Input Volume	37	30	27	970	794	23	1881
% of Volume	89	97	100	99	97	104	98

16: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	484	26	22	456	28	31	1047
Vehicles Exited	485	27	22	455	28	31	1048
Hourly Exit Rate	485	27	22	455	28	31	1048
Input Volume	488	25	21	456	33	30	1053
% of Volume	99	108	105	100	85	103	100

17: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	481	16	12	450	15	20	994
Vehicles Exited	483	15	12	448	15	20	993
Hourly Exit Rate	483	15	12	448	15	20	993
Input Volume	486	14	13	446	18	18	995
% of Volume	99	107	92	100	83	111	100

18: Serramonte Blvd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Vehicles Entered	474	17	16	434	18	20	979
Vehicles Exited	474	17	16	435	18	20	980
Hourly Exit Rate	474	17	16	435	18	20	980
Input Volume	474	19	17	431	19	19	979
% of Volume	100	89	94	101	95	105	100

26: Performance by movement

Movement	NBT	NWT	NWR	All
Vehicles Entered	771	40	962	1773
Vehicles Exited	771	41	962	1774
Hourly Exit Rate	771	41	962	1774
Input Volume	769	40	951	1760
% of Volume	100	102	101	101

Total Network Performance

Movement	All
Vehicles Entered	9725
Vehicles Exited	9705
Hourly Exit Rate	9705
Input Volume	56247
% of Volume	17

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
I-280 SB Off-Ramp	1	33.5	62.4	0.2	14	12	44.6
I-280 NB On-Ramp	2	2.9	13.0	0.1	23	24	2.6
Junipero Serra Blvd	3	33.9	41.1	0.1	6	6	34.8
Collins Avenue	4	3.1	9.3	0.0	18	17	3.2
	10	1.8	6.2	0.0	21	22	1.6
z	11	5.6	10.0	0.0	14	15	5.0
Project Driveway 3	5	13.6	17.7	0.0	6	6	12.9
	19	3.1	8.5	0.0	20	20	3.1
	12	0.5	12.3	0.1	29	29	0.5
	13	0.6	10.9	0.1	29	29	0.7
	14	2.4	15.6	0.1	25	26	2.3
El Camino Real	6	22.0	29.1	0.1	8	8	21.9
	16	1.8	12.4	0.1	24	24	1.8
	17	0.2	8.6	0.1	29	29	0.2
	18	0.3	10.4	0.1	29	29	0.3
Hillside Blvd	7	9.6	26.0	0.2	24	26	7.5
Total		134.8	293.4	1.4	17	16	143.0

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed
I-280 SB Off-Ramp	15	29.8	13	38.4	11	47.3	18
I-280 NB On-Ramp	24	2.3	24	2.7	21	4.3	23
Junipero Serra Blvd	6	31.7	6	34.2	6	33.0	6
Collins Avenue	17	3.2	18	3.1	18	3.0	18
	20	2.0	23	1.3	19	2.5	23
z	13	6.5	16	4.6	12	7.1	13
Project Driveway 3	6	13.9	6	13.7	6	14.2	5
	20	3.0	20	3.0	20	3.1	20
	29	0.6	30	0.5	29	0.5	29
	29	0.6	29	0.6	29	0.6	29
	24	2.9	25	2.6	26	2.1	25
El Camino Real	8	21.6	8	21.7	9	20.7	9
	24	1.7	24	1.7	24	1.8	24
	29	0.3	29	0.2	30	0.2	29
	29	0.3	29	0.3	30	0.3	29
Hillside Blvd	26	7.9	24	9.0	25	9.3	22
Total	17	128.4	17	137.7	16	149.9	17

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 24 Delay	Run 26 Speed	Run 26 Delay	Run 27 Speed	Run 27 Delay	Run 28 Speed	Run 28 Delay
I-280 SB Off-Ramp	21.3	15	28.3	16	26.1	14	33.3
I-280 NB On-Ramp	3.2	23	2.7	24	2.7	23	2.8
Junipero Serra Blvd	35.1	6	33.1	6	33.8	6	35.2
Collins Avenue	3.0	18	3.0	18	3.0	18	2.9
	1.5	19	2.6	23	1.2	21	1.8
z	6.9	13	6.2	17	4.1	15	4.9
Project Driveway 3	15.4	6	13.0	6	13.8	6	12.2
	3.2	20	3.1	21	2.9	20	3.0
	0.6	29	0.5	29	0.5	30	0.5
	0.7	29	0.6	29	0.6	29	0.6
	2.5	24	3.4	26	1.6	27	1.7
El Camino Real	20.6	8	22.5	9	20.4	9	21.1
	1.9	24	1.7	24	1.7	25	1.8
	0.2	29	0.3	29	0.2	30	0.2
	0.3	29	0.3	29	0.3	29	0.3
Hillside Blvd	11.4	22	11.5	21	13.3	28	7.7
Total	127.8	17	132.9	17	126.1	17	130.0

Arterial Level of Service: EB Serramonte Blvd

Cross Street	Run 29 Speed	Run 29 Delay	Run 31 Speed	Run 31 Delay
I-280 SB Off-Ramp	14	35.1	15	30.8
I-280 NB On-Ramp	23	2.8	23	2.8
Junipero Serra Blvd	6	33.9	6	34.6
Collins Avenue	17	3.3	17	3.1
	22	1.6	23	1.3
z	16	4.5	14	5.6
Project Driveway 3	6	12.6	6	13.9
	20	3.0	20	3.2
	29	0.5	29	0.6
	29	0.6	29	0.7
	26	2.2	24	3.0
El Camino Real	8	23.4	7	25.8
	24	1.7	24	1.8
	29	0.2	29	0.2
	29	0.3	29	0.3
Hillside Blvd	26	8.1	22	10.2
Total	17	133.8	17	137.8

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 20 Speed	Run 20 Delay
Hillside Blvd	7	12.1	17.5	0.0	9	8	14.6
	18	1.0	18.5	0.2	34	35	1.0
	17	0.3	10.4	0.1	29	29	0.3
El Camino Real	16	0.4	8.4	0.1	30	30	0.4
	6	32.0	41.1	0.1	7	6	38.3
	14	2.4	11.2	0.1	22	22	2.5
Project Driveway 3	13	1.0	14.1	0.1	28	28	1.0
	12	0.7	10.7	0.1	29	29	0.8
	19	2.7	15.0	0.1	24	24	2.6
Collins Avenue	5	18.9	31.8	0.0	7	7	18.7
	11	2.6	6.4	0.0	16	16	2.7
Junipero Serra Blvd	10	0.8	5.5	0.0	26	27	0.7
	4	4.2	8.4	0.0	16	16	3.8
I-280 NB On-Ramp	3	35.6	40.8	0.0	4	4	36.0
I-280 SB Off-Ramp	2	9.3	17.6	0.1	14	14	9.6
Total	1	18.9	29.0	0.1	10	11	16.2
		142.9	286.4	1.2	15	15	149.2

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 21 Speed	Run 21 Delay	Run 22 Speed	Run 22 Delay	Run 23 Speed	Run 23 Delay	Run 24 Speed
Hillside Blvd	9	11.9	10	9.7	9	11.2	9
	34	1.0	36	0.8	35	0.8	34
	29	0.3	29	0.3	29	0.3	29
El Camino Real	30	0.4	30	0.3	30	0.3	30
	7	32.0	8	28.6	8	29.3	7
	21	2.4	22	2.3	22	2.3	22
Project Driveway 3	28	0.9	28	0.8	28	0.9	28
	29	0.8	29	0.6	29	0.7	30
	25	2.4	25	2.3	22	4.2	25
Collins Avenue	7	19.0	7	19.9	7	20.7	6
	16	2.6	16	2.6	16	2.8	16
Junipero Serra Blvd	27	0.5	28	0.5	22	1.7	25
	18	3.3	16	3.8	12	6.5	13
I-280 NB On-Ramp	4	33.8	4	35.8	4	38.2	4
I-280 SB Off-Ramp	14	9.4	14	8.6	15	8.1	14
Total	10	19.4	10	20.1	10	19.3	10
		15	140.1	16	137.0	15	147.4

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 24 Delay	Run 26 Speed	Run 26 Delay	Run 27 Speed	Run 27 Delay	Run 28 Speed	Run 28 Delay
Hillside Blvd	12.5	8	13.4	9	11.6	9	12.8
	1.2	31	1.1	33	1.1	35	1.0
	0.4	29	0.4	30	0.3	29	0.4
El Camino Real	0.4	30	0.4	30	0.4	29	0.4
	32.1	8	31.1	8	30.8	7	31.7
	2.4	22	2.5	22	2.3	22	2.3
Project Driveway 3	0.9	28	1.0	28	1.0	28	1.0
	0.6	29	0.8	29	0.8	29	0.7
	2.4	25	2.0	23	3.4	25	2.1
Collins Avenue	22.7	8	16.5	7	19.0	8	17.2
	2.7	16	2.6	16	2.6	16	2.6
Junipero Serra Blvd	1.1	27	0.6	27	0.7	26	0.9
	5.9	18	3.1	15	4.5	16	4.2
I-280 NB On-Ramp	35.4	4	36.3	4	35.0	4	33.9
I-280 SB Off-Ramp	8.8	14	8.9	14	9.5	13	10.6
Total	21.4	10	19.7	11	17.9	11	16.8
		150.8	15	140.3	15	140.8	15

Arterial Level of Service: WB Serramonte Blvd

Cross Street	Run 29 Speed	Run 29 Delay	Run 31 Speed	Run 31 Delay
Hillside Blvd	10	9.5	9	13.0
	35	1.0	34	0.9
	29	0.3	30	0.3
El Camino Real	30	0.4	30	0.4
	7	33.7	7	32.3
	22	2.4	22	2.4
Project Driveway 3	28	1.1	28	1.0
	29	0.8	29	0.7
	24	2.8	24	2.8
Collins Avenue	8	16.1	7	19.1
	16	2.6	16	2.6
Junipero Serra Blvd	26	0.8	27	0.5
	16	4.0	18	3.0
I-280 NB On-Ramp	4	37.9	4	34.1
I-280 SB Off-Ramp	14	9.8	14	9.6
Total	10	21.2	11	16.9
		15	144.4	15

Queuing and Blocking Report
Weekend PM Road Diet - Sop Sign

03/25/2019

Intersection: 1: Serramonte Blvd & I-280 SB Off-Ramp

Movement	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	T	T	L	L	R	R
Maximum Queue (ft)	885	835	219	239	75	302	249	154	69
Average Queue (ft)	486	395	117	128	46	183	115	12	4
95th Queue (ft)	864	801	191	207	102	269	210	80	46
Link Distance (ft)	1253	1253	384	384		498	498	498	
Upstream Blk Time (%)	0	0							
Queuing Penalty (veh)	0	0							
Storage Bay Dist (ft)					50				381
Storage Blk Time (%)				30	1				
Queuing Penalty (veh)			65	1					

Intersection: 2: Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	WB	WB
Directions Served	L	L	T	T	TR
Maximum Queue (ft)	224	356	155	157	164
Average Queue (ft)	180	77	15	20	83
95th Queue (ft)	251	294	90	90	146
Link Distance (ft)		384	384	246	246
Upstream Blk Time (%)		0			
Queuing Penalty (veh)		1			
Storage Bay Dist (ft)	200				
Storage Blk Time (%)	9	0			
Queuing Penalty (veh)	34	0			

Queuing and Blocking Report
Weekend PM Road Diet - Sop Sign

03/25/2019

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	<L	L	T	T	R	L	T	TR	R>	<L	L	T
Maximum Queue (ft)	251	259	257	274	245	162	163	170	168	202	221	292
Average Queue (ft)	162	175	167	193	107	119	130	153	148	121	125	148
95th Queue (ft)	237	246	252	275	234	177	175	172	179	184	197	247
Link Distance (ft)	246	246	246	246		146	146	146	146			1147
Upstream Blk Time (%)	1	2	1	2	0	9	7	23	18			
Queuing Penalty (veh)	3	6	3	8	0	22	18	59	45			
Storage Bay Dist (ft)					225					295	295	
Storage Blk Time (%)				4	0							0
Queuing Penalty (veh)				13	1							0

Intersection: 3: Junipero Serra Blvd & Serramonte Blvd & I-280 NB On-Ramp

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	UL	T	TR	>
Maximum Queue (ft)	358	115	289	391	469	244
Average Queue (ft)	193	89	126	231	250	67
95th Queue (ft)	311	152	256	403	446	273
Link Distance (ft)	1147			676	676	
Upstream Blk Time (%)				0	0	
Queuing Penalty (veh)				0	2	
Storage Bay Dist (ft)		90	320			280
Storage Blk Time (%)	31	1	0	4	9	1
Queuing Penalty (veh)	58	3	0	7	23	2

Intersection: 4: Collins Avenue & Serramonte Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	R	LT	T	T	T	L	R
Maximum Queue (ft)	94	98	68	85	118	122	90	135	69
Average Queue (ft)	9	7	5	20	23	60	41	51	10
95th Queue (ft)	49	45	34	69	83	130	103	123	43
Link Distance (ft)	146	146			111	111			1189
Upstream Blk Time (%)	0	0			1	2			
Queuing Penalty (veh)	0	0			5	11			
Storage Bay Dist (ft)			40	65			65		50
Storage Blk Time (%)		0	0	2	1	7	3	23	0
Queuing Penalty (veh)		1	0	5	3	17	7	2	0

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Urban and Regional Planners