HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

To: Mr. Demetri Loukas, David J. Powers & Associates, Inc.

From: Robert Del Rio, T.E.

Date: June 27, 2016

Subject: Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment Project Traffic Analysis

Introduction

Hexagon Transportation Consultants, Inc. has completed a traffic operations report for the proposed Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project in Morgan Hill, California. This traffic analysis consists of a near-term (Year 2020) and long-term (Year 2035) evaluation of the potential traffic impacts due to the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project on surrounding roadways and intersections.

Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment Project Improvements

The Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project consists of the extension of Hale Avenue from its current termination point at its intersection with Main Avenue south to Spring Avenue. The project also includes the realignment of the southerly end of Dewitt Avenue at Edmundson Avenue and improvement of Sunnyside Road between Edmunson Avenue and Watsonville Road. The Hale Ave Extension and Santa Teresa Corridor Widening and Realignment project, as planned, consists of two construction phases consisting of the following:

- ***Phase 1*** consists of the extension of Hale Avenue as a two-lane roadway between Main Street and Spring Avenue with 5' bike lanes and a separated multi-use path along the east side of the new roadway. The existing Spring Avenue and Dewitt Avenue intersection will be modified to accommodate the connection of the Hale Avenue Extension along with the installation of a traffic signal at the existing unsignalized Hale Avenue intersection with Main Avenue.
- ***Phase 2*** consists of the realignment of the southerly end of Dewitt Avenue to serve as the north approach to a new single-lane roundabout at the location of the existing Edmunson Avenue intersection with Sunnyside Avenue. Dewitt Avenue will be improved as a two-lane roadway between with 5' bike lanes and a separated multi-use path along the east side of the new roadway. Sunnyside Avenue also will be improved to include bike lanes between Edmunson Avenue and Watsonville Road along with additional turn-lanes at its intersection with Watsonville Road.

Scope of Work

The purpose of the traffic operations analysis is to evaluate the effects of the proposed Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project on traffic patterns in the vicinity of the project area. The Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project will result in an adjustment of existing and future traffic patterns that may result in increases or decreases in traffic volumes on surrounding roadways that provide alternate routes to the Hale Avenue extension.

The analysis evaluates the existing and projected future operating conditions with and without the Hale Avenue Improvement project on the surrounding roadway network. The study includes an analysis of AM and PM peak-hour traffic conditions for 10 intersections. Additionally, the study also includes the analysis of average daily traffic volumes (ADT) on 23 roadway segments. The study intersections and roadway

segments are shown graphically in Figure 1. The key transportation facilities were evaluated for the following scenarios:

Existing Conditions: Existing conditions represent existing peak-hour and average daily traffic (ADT) volumes on the existing roadway network. Existing traffic volumes were obtained from new traffic counts collected in January 2016.

Existing Plus Project Conditions: Existing plus project conditions is comprised of the existing traffic volumes and existing transportation network with network adjustments associated with Phase 1 of the Hale Avenue improvement project. This scenario does not include the Phase 2 realignment of the southerly end of Dewitt Avenue at Edmundson Avenue. Existing plus project conditions are evaluated relative to existing conditions in order to determine potential impacts associated with the Hale Avenue improvement project.

Year 2020 No Project Conditions: Year 2020 No Project conditions represent future traffic volumes on the existing transportation network. The Year 2020 traffic volumes were developed via interpolation of forecasted Year 2035 General Plan Buildout traffic volumes.

Year 2020 Project Conditions: Year 2020 Project conditions is comprised of the Year 2020 traffic volumes and existing transportation network with network adjustments associated with Phase 1 of the Hale Avenue improvement project. This scenario does not include the Phase 2 realignment of the southerly end of Dewitt Avenue at Edmundson Avenue. Year 2020 Project conditions are evaluated relative to Year 2020 No Project conditions in order to determine potential impacts associated with the Hale Avenue improvement project.

Year 2035 General Plan No Project Conditions: Year 2035 General Plan No Project conditions represent future traffic volumes on the future transportation network. Year 2035 General Plan No Project conditions includes land use growth projections within the City of Morgan Hill through the year 2035 and the roadway network identified in the City's *2010 Circulation Element*.

Year 2035 General Plan Project Conditions: Year 2035 General Plan Project conditions consists of Year 2035 General Plan traffic volumes and future transportation network with the addition of the roadway network adjustments associated with the Hale Avenue Phase 1 and 2 improvement project, including the realignment of the southerly end of Dewitt Avenue at Edmundson Avenue. Year 2035 General Plan Project conditions are evaluated relative to Year 2035 General Plan No Project conditions in order to determine potential impacts associated with the Hale Avenue improvement project.

Existing Roadway Network

Hale Avenue/*Santa Teresa Boulevard* is a two-lane roadway that extends southward from San Jose into northern Morgan Hill. South of Scheller Avenue, the roadway changes designation to Hale Avenue. Hale Avenue terminates at Main Avenue. The project proposes to extend Hale Avenue south from Main Avenue to Spring Avenue.

Roadways surrounding Hale Avenue and their configurations in the area of the project are described below:

US 101 is an eight-lane freeway (three mixed-flow lanes and one high-occupancy vehicle (HOV) lane in each direction) north of Cochrane Road. South of Cochrane Road, it is a six-lane freeway with no HOV lanes. The freeway serves as the primary roadway connection between the City of Morgan Hill and Santa Clara County to the north and San Benito County to the south. Interchanges with Tennant Avenue, Dunne Avenue, and Cochrane Road provide access to the most of the City of Morgan Hill.

Monterey Road is generally a four-lane divided major arterial that runs directly through Downtown Morgan Hill. Monterey Road extends from Market Street in Downtown San Jose, through Downtown Morgan Hill, and to US 101, south of the City of Gilroy.

Butterfield Boulevard is a four-lane divided arterial with a separated Class I bikeway and pedestrian path that runs southward from Cochrane Road, past Tennant Avenue, to its new intersection with Watsonville Road/Monterey Road. Along with Monterey Road, Butterfield Boulevard serves as a primary north-south route within the City.

Peak Avenue is a two-lane roadway that runs southward from its intersection with Wright Avenue to Dunne Avenue.

Dewitt Avenue is a two-lane roadway that runs southward from its intersection with Dunne Avenue to its intersection with Edmunson Avenue.

Sunnyside Avenue is a two-lane north-south roadway that runs from Edmunson Avenue to Watsonville Road, where it transitions to Santa Teresa Boulevard into Gilroy.

Main Avenue is a two-lane roadway that runs eastward from its intersection with DeWitt Avenue to Coyote Road at the base of the eastern foothills. The roadway has an overcrossing of US 101, however no access to US 101 is provided.

Dunne Avenue is a four-lane arterial that runs eastward from its intersection with Peak Avenue to the eastern foothills. A full access interchange with US 101 is provided along Dunne Avenue.

Spring Avenue. Spring Avenue is a two-lane roadway that runs between Monterey Road and Dewitt Avenue.

Edmundson Avenue is a two-lane roadway that runs eastward from its intersection with Oak Glen Avenue to Monterey Road, at which point it transitions to Tennant Avenue.

Tennant Avenue is an east-west roadway that runs from Foothill Avenue, east of US 101, to Monterey Road. Tennant Avenue is a two-lane road between Foothill Avenue and US 101. West of US 101, Tennant Avenue widens to a four-lane divided roadway. West of Monterey Road, the roadway narrows to two lanes and changes designation to Edmunson Avenue. A full access interchange with US 101 is provided along Tennant Avenue.

Watsonville Road is a two-lane roadway that extends west from its intersection with Monterey Road to SR 152 at the base of the western foothills.

Analysis Methodologies and Level of Service Standards

Intersection Levels of Service Analysis

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

Signalized Intersections

Traffic conditions at each of the study intersections were analyzed for the weekday AM and PM peak hours of traffic. The weekday AM peak hour of traffic generally falls within the 7:00 to 9:00 AM period and the weekday PM peak hour is typically in the 4:00 to 6:00 PM period. It is during these times that the most congested traffic conditions occur on a typical weekday.

The City of Morgan Hill level of service methodology is TRAFFIX, which is based on the 2000 *Highway Capacity Manual* (HCM) method for signalized intersections. TRAFFIX evaluates signalized intersections operations based on average delay time for all vehicles at the intersection. Since TRAFFIX is also the CMP-designated intersections level of service methodology, the City of Morgan Hill methodology employs the CMP defaults values for the analysis parameters, which include adjusted saturation flow rates to reflect conditions in Santa Clara County. All intersections within the City of Morgan Hill are required to meet the City's LOS standard of LOS D, with the exception of the following:

- **LOS F** for Downtown intersections and segments including at Main/Monterey, along Monterey Road between Main and Fifth Street, and along Depot Street at First through Fifth Street;

- **LOS E** for the following intersections and freeway zones:
  - Main Avenue and Del Monte Avenue
  - Main Avenue and Depot Street
  - Dunne Avenue and Del Monte Avenue
  - Dunne Avenue and Monterey Avenue
  - Dunne Avenue and Church Street
  - Dunne Avenue and Depot Street
  - Cochrane Road and Monterey Road

- Tennant Avenue and Monterey Road
- Tennant Avenue and Butterfield Boulevard
- Cochrane Road Freeway Zone: from Madrone Parkway/Cochrane Plaza to Cochrane Road/DePaul Drive
- Dunne Avenue Freeway Zone: from Walnut Grove Drive/East Dunne Avenue to Condit Road/East Dunne Avenue
- Tennant Avenue Freeway Zone: from Butterfield Boulevard/Tennant Avenue to Condit Road/Tennant Avenue

The correlation between average delay and level of service for signalized intersections is shown in Table 1.

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

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

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

Definition of Significant Signalized Intersection Impacts

According to the City of Morgan Hill level of service guidelines, a project is said to create a significant adverse impact on traffic conditions at a signalized intersection if for either peak hour:

1. The level of service at the intersection degrades from an acceptable level (LOS D or LOS E as identified above) under existing conditions to an unacceptable level (LOS E or F) under project conditions, or
2. The level of service at the intersection is an unacceptable level (LOS E or F as identified above) under existing conditions and the addition of project trips causes the average critical delay to increase by four (4) or more seconds *and* the volume-to-capacity ratio (V/C) to increase by 0.01.

An exception to this rule applies when the addition of project traffic reduces the amount of average delay for critical movements (i.e., the change in average delay for critical movements is negative). In this case, the threshold of significance is an increase in the critical V/C value by 0.01 or more.

Unsignalized Intersections

The methodology used to determine the level of service for unsignalized intersections is also TRAFFIX and the *2000 HCM* methodology for unsignalized intersection analysis. This method is applicable for both two-way and all-way stop-controlled intersections. For the analysis of stop-controlled intersections, the *2000 HCM* methodology evaluates intersection operations on the basis of average control delay time for all vehicles on the stop-controlled approaches. For the purpose of reporting level of service for one- and two-way stop-controlled intersections, the delay and corresponding level of service for the stop-controlled minor street approach with the highest delay is reported. For all-way stop-controlled intersections, the reported average delay and corresponding level of service is the average for all approaches at the intersection. The City uses a minimum acceptable level of service standard of LOS D for unsignalized intersections, in accordance with its adopted threshold of significance in its Guidelines for Preparation of Transportation Impact Reports. The correlation between average delay and level of service for unsignalized intersections is shown in Table 2.

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

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Operations with vey low delays occurring with favorable progression.	Up to 10.0
B	Operations with low delays occurring with good progression.	10.1 to 15.0
C	Operations with average delays resulting from fair progression.	15.1 to 25.0
D	Operation with longer delays due to a combination of unfavorable progression and high V/C ratios.	25.1 to 35.0
E	Operation with high delay values indicating poor progression and high V/C ratios. This is considered to be the limited of acceptable delay.	35.1 to 50.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation and poor progression.	Greater than 50.0

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

Signal Warrants

The level of service analysis at unsignalized intersections is supplemented with an assessment of the need for signalization of the intersection. The need for signalization of unsignalized intersections is assessed based on the Peak Hour Volume Warrant (Warrant 3) described in the *California Manual on Uniform Traffic Control Devices for Streets and Highways (CA MUTCD)*, Part 4, Highway Traffic Signals, 2014. This method makes no evaluation of intersection level of service, but simply provides an indication whether vehicular peak hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. The decision to install a traffic signal should not be based purely on the warrants alone. Instead, the installation of a signal should be considered and further analysis performed when one or more of the warrants are met. Additionally, engineering judgment is exercised on a case-by-case basis to evaluate the effect a traffic signal will have on certain types of accidents and traffic conditions at the subject intersection as well as at adjacent intersections. Intersections that meet the peak hour warrant are subject to further analysis before determining that a traffic signal is necessary. Other options such as traffic control devices, signage, or geometric changes may be preferable based on existing field conditions.

Definition of Significant Unsignalized Intersection Impacts

Unsignalized intersections within the City of Morgan Hill have a minimum operating level of LOS D. According to the City of Morgan Hill level of service guidelines, a project is said to have a significant adverse impact on traffic conditions at an unsignalized intersection if for either peak hour the addition of project traffic causes the worst approach delay to degrade to LOS E or F ***and*** the traffic volumes at the intersection are sufficiently high to satisfy the peak hour volume warrant.

Roadway Segments Analysis

Traffic operations for local roadways were evaluated by comparing the average daily volumes (ADT) to the threshold capacities for various roadway types identified in the *Highway Capacity Manual, Transportation Research Board 2000 (HCM 2000)*. The HCM 2000 thresholds are based on the local roadway functional classification and these values provide a planning-level analysis of the relative traffic load and approximate capacity on a particular roadway. It is important to note that daily volume thresholds are used for planning purposes and traffic during the peak commute periods may result in worse operations than illustrated by the daily LOS. The City of Morgan Hill does not have a formally adopted roadway segment operating standard. Thus, for the purposes of this analysis, LOS D was used as a guideline for the evaluation of daily segment volumes. The relationship between roadway classifications and maximum ADT to achieve specific LOS levels is summarized on Table 3.

Definition of Significant Roadway Segment Impacts

The City of Morgan Hill does not have a formally adopted roadway segment operating standard. Thus, for the purposes of this analysis and to be consistent with planning efforts in Morgan Hill and other jurisdictions, LOS D was used as a guideline for the evaluation of the roadway segments. Any of the study roadway segments projected to operate below LOS D conditions will be considered deficient.

Traffic Projections

Traffic volume forecasts were completed by Hexagon using the City of Morgan Hill's travel demand forecasting (TDF) model. The TDF model has the ability to project the diversion of traffic and change in travel patterns due to roadway network changes such as the proposed project. Model volume forecasts were developed for Year 2015 baseline conditions and the Year 2035 General Plan conditions. These forecasts are considered "raw" model volume forecasts, which on their own do not represent future volume conditions, but are simply used to forecast growth and travel pattern changes expected in the future due to the land use changes associated with the Morgan Hill 2035 General Plan. To obtain the final traffic volume forecasts, adjustments are made to raw model volume forecasts and used in conjunction with existing count data. This process is further explained below.

Turn-Movement Adjustments

Adjustments were made to the raw forecasted volumes from the model to account for instances where the turn movements produced by the model are relatively coarse. The adjustment process begins by comparing and adjusting baseline model forecasts (Year 2015 forecasts representing existing conditions) with existing traffic counts. By adjusting the baseline model forecasts with existing volumes, model projections are calibrated with actual travel patterns on the existing roadway network. Once the base model forecasts are calibrated, future model forecasts are developed for Year 2035 General Plan conditions. These represent the "raw" model volume forecasts.

To obtain the final traffic volume forecasts, raw model volume forecasts in conjunction with existing count data are used. Final future traffic volume forecasts are developed by adding to the existing traffic count data the projected growth between the baseline (Year 2015) and the General Plan (Year 2035) raw model volume forecasts.

Table 3
Maximum ADT Thresholds by Roadway Classification

	Maximum Daily Volume (both directions except freeways)				
Roadway Type	LOS A	LOS B	LOS C	LOS D	LOS E
2-Lane Freeway[1]	11,100	20,100	28,800	35,700	40,100
2-Lane Freeway with Auxiliary Lane[1]	14,100	25,500	36,400	44,900	50,300
3-Lane Freeway[1]	17,000	30,800	44,000	54,100	60,600
3-Lane Freeway with Auxiliary Lane[1]	20,100	36,400	51,800	63,500	71,000
4-Lane Freeway[1]	23,200	42,000	59,500	72,800	81,400
4-Lane Freeway with Auxiliary Lane[1]	26,300	47,600	67,300	82,200	91,800
5-Lane Freeway[1]	32,800	53,700	75,500	91,700	102,300
2-Lane Highway	1,200	2,900	7,900	16,000	20,500
4-Lane Multilane Highway	21,400	35,200	50,600	65,600	73,000
6-Lane Multilane Highway	32,100	52,800	76,200	98,000	109,000
2-Lane Undivided Arterial[4]	N/A	N/A	9,100	16,700	17,700
2-Lane Divided Arterial[4]	N/A	N/A	9,700	17,600	18,700
3-Lane Arterial (2 in one direction)[4]	N/A	N/A	13,100	20,600	21,700
4-Lane Undivided Arterial[4]	N/A	N/A	17,500	27,400	28,900
4-Lane Divided Arterial[4]	N/A	N/A	19,200	35,400	37,400
5-Lane Divided Arterial (3 in one direction)[4]	N/A	N/A	22,600	44,300	46,700
6-Lane Divided Arterial[4]	N/A	N/A	27,100	53,200	56,000
8-Lane Divided Arterial[4]	N/A	N/A	37,200	71,100	74,700
1-Lane Ramp	5,000	7,500	10,500	13,000	15,000
2-Lane Rural Road	3,100	6,200	9,400	13,200	15,600
2-Lane Collector[5]	2,600	5,200	7,800	11,000	12,900
2-Lane Local Street[5]	1,900	3,900	5,800	8,200	9,600

Notes:
[1]LOS capacity thresholds based on one direction.
[2]The LOS capacity thresholds are based on HCM 2000 methodology and are generally appropriate for suburban and rural areas. All volumes are approximate and assume ideal roadway characteristics.
[4]LOS A and B are not achievable for arterial roadways using the HCM 2000 methods.
[5]For local and collector roadway segments, the capacity limitation is related to neighborhood quality of life rather than the physical carrying capacity of the road. This assumes a standard suburban neighborhood, 40-foot roadway width, and 25 mile per hour speed limit with normal speed violation rates.

Existing Traffic Conditions

Existing Intersection Levels of Service

The existing lane configurations at the study intersections were determined by observations in the field. Existing peak-hour traffic volumes were obtained from new manual turning-movement counts collected at each study intersection in January 2016. Intersection turning-movement counts conducted for this analysis are presented in Appendix A.

The results of the level of service analysis under existing conditions are summarized in Table 4. The results show that, measured against the City of Morgan Hill level of service standards, all the study intersections currently operate at an acceptable level of service under existing conditions during both the AM and PM peak hours. The level of service calculation sheets are included in Appendix C.

Existing Roadway Segment Analysis

Twenty-four hour tube counts were conducted in January 2016 along each of the 23 study roadway segments. The location of each of the 24-hour counts is shown in Figure 1. Peak hour volumes along each of the roadway segments were extracted from the twenty-four hour tube counts. Table F present peak hour

and ADT volumes on the selected study roadways under existing conditions. The ADT level of service analysis indicates that all the roadway segments evaluated currently have ADT volumes that fall below the HCM 2000 maximum ADT thresholds for operations of LOS E or worse.

Projected Traffic Volumes and Operations

Projected traffic volumes without and with the proposed Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project were reviewed for the purpose of determining the effect of the improvement project on surrounding roadways. It is anticipated that the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment will provide an alternate travel route through the City and reduce demand on the parallel routes of Monterey Road and Butterfield Boulevard. A comparison of roadway segment volumes can be used to identify shifts in traffic from the parallel roadways. Grouping of roadway segments, screenlines, and comparison of traffic volumes are used to identify any increase in traffic moving through the City as a result of the additional roadway capacity created by the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project.

Roadway Segment Volumes

The model runs show that extending Hale Avenue to Spring Avenue and thereby providing a direct route between the northern and southern ends of the City west of Monterey Road would result in a diversion of traffic to the proposed Hale Avenue extension from other parallel routes, including Monterey Road and Butterfield Boulevard. Traffic projections indicate that the Hale Avenue extension could serve approximately 800 peak hour trips and 8,200 trips per day under existing plus project conditions and approximately 1,000 peak hour trips and 12,400 trips per day under Year 2035 General Plan project conditions

With the Hale Avenue improvements, it is projected that traffic volumes along parallel streets would decrease, while traffic along streets providing access to Hale Avenue would increase. The Hale Avenue improvements would result in peak hour volume increases of approximately 100 vehicles along Hale Avenue north of Main Avenue and south of Edmunson Avenue under existing plus project and approximately 250 vehicles under Year 2035 conditions. Volumes along Dunne Avenue which will provide access to and from the Hale Avenue extension would in general have volume increases or decreases of less than 400 peak hour vehicles under each of the study scenarios.

The model runs show that the Hale Avenue Improvement project will result in a decrease in volumes, approximately 10-350 peak hour trips along the parallel routes of Monterey Road and Butterfield Boulevard under existing plus project conditions and Year 2035 conditions. The Hale Avenue Improvement project will minimally reduce traffic volumes on freeway segments along US 101.

Screenline Evaluation

Roadways that provide northerly/southerly and easterly/westerly travel routes and would be most affected by the Hale Avenue improvement project were grouped into screenlines. Figures 2-4 present the peak hour and ADT traffic volumes through each of the screenlines under each of the study scenarios. The screenline evaluation indicates that the Hale Avenue improvement project will result in only a minimal change to northerly/southerly travel through the immediate project area. Most screenline measurement points indicate less than a 5% change in volume with the Hale Avenue improvement project. The minimal change in screenline traffic volumes indicate that travel in the study area is local traffic originating and bound for destinations within Morgan Hill, and the Hale Avenue improvement project would not result in a significant increase in traffic travelling through the City that originates from outside the City boundaries.

Existing Plus Project Traffic Conditions

Intersection Level of Service Evaluation

The level of service results under existing plus project conditions are summarized in Table 4. The results show that one unsignalized intersection, Hale Avenue and Wright Avenue, would operate at LOS E conditions and meet peak hour signal warrants under Existing plus Project conditions during PM peak hour. Based on the City's impact criteria, the proposed Hale Avenue improvement project would result in a significant impact at the intersection.

All other study intersections are projected to operate at levels that meet the City's level of service standard under Existing plus Project conditions.

Existing plus Project Condition Impacts and Mitigation Measures

Described below is the intersection impact and recommended mitigation measure under Existing plus Project conditions.

9. Hale Avenue and Wright Avenue

Impact: This intersection currently operates at an acceptable level of service during both peak hours and the level of service is projected to deteriorate to an unacceptable LOS E during the PM peak hour under Existing plus Project conditions and traffic volumes are sufficiently high to satisfy the peak hour volume warrant. This constitutes a significant impact to the intersection based on City of Morgan Hill's impact criteria.

Mitigation: Peak-hour traffic signal warrant checks indicate that the traffic volumes at the Hale Avenue and Wright Avenue intersection are projected to meet thresholds that warrant signalization under Existing plus Project conditions. The City should consider signalization of the intersection or other measures to reduce delays at the intersection (e.g., traffic circle).

Roadway Segment Evaluation

The roadway segment capacity analysis under Existing plus Project conditions is summarized in Table 5. The evaluation of daily roadway segment volumes indicate that all study segments will operate at LOS C conditions under Existing plus Project conditions.

Year 2020 Project Traffic Conditions

Intersection Level of Service Evaluation

The level of service results under Year 2020 conditions are summarized in Table 6. The results show that one unsignalized intersection, Hale Avenue and Wright Avenue, would operate at LOS E or F conditions and meet peak hour signal warrants under Year 2020 General Plan conditions without and with the Hale Avenue extension during the PM peak hour. Based on the City's impact criteria, the proposed Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project would result in a significant impact at the intersection.

All other study intersections are projected to operate at levels that meet the City's level of service standard under Year 2020 conditions.

Year 2020 Conditions Impacts and Mitigation Measures

Described below is the intersection impact and recommended mitigation measure under Year 2020 Project conditions.

9. Hale Avenue and Wright Avenue

Impact: This intersection is projected to operate at an unacceptable LOS E or F and meet peak hour signal warrants during the PM peak hour under Year 2020 conditions without and with the proposed Hale Avenue extension. This constitutes a significant impact to the intersection based on City of Morgan Hill's impact criteria.

Mitigation: Peak-hour traffic signal warrant checks indicate that the traffic volumes at the Hale Avenue and Wright Avenue intersection are projected to meet thresholds that warrant signalization under Year 2020 conditions without and with the proposed Hale Avenue extension. The City should consider signalization of the intersection or other measures to reduce delays at the intersection (e.g., traffic circle).

Roadway Segment Evaluation

The roadway segment capacity analysis under Year 2020 conditions is summarized in Table 7. The evaluation of daily roadway segment volumes indicate that all study segments will operate at LOS D or better conditions under Year 2020 conditions without and with the project.

Year 2035 General Plan Project Traffic Conditions

Intersection Level of Service Evaluation

The level of service results under Year 2035 General Plan conditions are summarized in Table 8. The results show that the two unsignalized intersections would operate at LOS E or F conditions and meet peak hour signal warrants under Year 2035 General Plan conditions without and with the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment during the AM and PM peak hours:

9. Hale Avenue and Wright Avenue
10. Sunnyside Avenue and Watsonville Road

The Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment would include improvement of the Sunnyside Avenue and Watsonville Road intersection. The planned improvements would result in a reduction in intersection delay when compared to Year 2035 General Plan conditions without the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment. Therefore, based on the City's impact criteria, the proposed Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project would result in a significant impact at only the Hale Avenue and Wright Avenue intersection**.**

All other study intersections are projected to operate at levels that meet the City's level of service standard under Year 2035 General Plan conditions.

Year 2035 General Plan Impacts and Mitigation Measures

Described below are the intersection impacts and recommended mitigation measures under Year 2035 General Plan conditions.

9. Hale Avenue and Wright Avenue

Impact: This intersection is projected to operate at an unacceptable LOS F and meet the peak hour signal warrants during both peak hours under Year 2035 General Plan conditions without and with the proposed Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment. This constitutes a significant impact to the intersection based on City of Morgan Hill's impact criteria.

Mitigation: Peak-hour traffic signal warrant checks indicate that the traffic volumes at the Hale Avenue and Wright Avenue intersection are projected to meet thresholds that warrant signalization under Year 2035 General Plan conditions without and with the proposed Hale Avenue extension. The City should consider signalization of the intersection or other measures to reduce delays (e.g., traffic circle) at the intersection.

Roadway Segment Evaluation

The roadway segment capacity analysis under Year 2035 General Plan conditions is summarized in Table 9. The evaluation of daily roadway segment volumes indicate that all study segments will operate at LOS D or better conditions under Year 2035 General Plan conditions without and with the project.

Vehicle Miles Traveled

A comparison of Vehicle Miles Traveled (VMT) for each of the study scenarios with the proposed Hale Avenue improvement project versus the no project scenarios was made to determine the effects of the proposed improvement project on traffic patterns within the City. Vehicle miles traveled refers to daily Morgan Hill trips multiplied by the trip distances. Morgan Hill trips were defined as all trips that begin and/or

end in Morgan Hill. The VMT, VHT, and speed data provided in Table 10, were calculated using the City's travel demand forecasting model and represent only those trips within the City of Morgan Hill.

The VMT analysis shows that the proposed Hale Avenue improvement project would result in only a negligible increase (less than 1.0%) in daily VMT within the City. The slight increase in VMT is likely due to the sensitivity of the TDF model assignment to the roadway network change and is not necessarily reflective of increased trips and trip lengths due to the Hale Avenue improvement project.

For the purpose of comparison, Vehicle Hours Traveled (VHT) for each of the study scenarios with the proposed Hale Avenue improvement project also were compared to the no project scenarios. The VHT analysis indicates that the Hale Avenue improvement project will result in a reduction in VHT. The reduction in VHT indicates that the Hale Avenue improvement project would result in shorter travel times for trips within the City.

Conclusions

The Hale Avenue Improvement project will result in an adjustment of existing and future traffic patterns that may result in increases or decreases in traffic volumes on surrounding roadways that provide alternate routes to the Hale Avenue extension. The purpose of the traffic analysis was to evaluate the effects of the proposed Hale Avenue Improvement project on traffic patterns in the vicinity of the project area. The analysis evaluated the existing and projected future operating conditions with and without the Hale Avenue Improvement project on the surrounding roadway network. The study included the analysis of AM and PM peak-hour traffic conditions for 10 intersections as well as the analysis of average daily traffic volumes (ADT) on 23 roadway segments.

Projected Traffic Volumes and Operations

Traffic projections indicate that the Hale Avenue extension could serve approximately 800 peak hour trips and 8,200 trips per day under existing plus project conditions and approximately 1,000 peak hour trips and 12,400 trips per day under Year 2035 general Plan project conditions. The traffic projections also show that the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project will result in a decrease in volumes along the parallel routes of Monterey Road and Butterfield Boulevard under existing plus project conditions and Year 2035 conditions. The Hale Avenue Improvement project will minimally reduce traffic volumes on freeway segments along US 101.

Screenline Evaluation

Roadways that provide northerly/southerly and easterly/westerly travel routes and would be most affected by the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project were grouped into screenlines. The screenline evaluation indicates that the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project will result in only a minimal change to northerly/southerly travel through the immediate project area. Most screenline measurement points indicate less than a 5% change in volume with the Hale Avenue improvement project. The minimal change in screenline traffic volumes indicate that travel in the study area is local traffic originating and bound for destinations within Morgan Hill. And, the Hale Avenue improvement project would not result in a significant increase in traffic travelling through the City that originates from outside the City boundaries.

Intersection Level of Service Evaluation

The results of the intersection level of service analysis show that one unsignalized intersection, Hale Avenue and Wright Avenue, would operate at unacceptable level of service conditions and meet peak hour signal warrants with the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project under each study scenarios during at least one peak hour. Based on the City's impact criteria and signal warrant analysis, the proposed Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project would result in a significant impact at the intersection.

Described below is the intersection impact and recommended mitigation measure.

9. Hale Avenue and Wright Avenue

Mitigation: Peak-hour traffic signal warrant checks indicate that the traffic volumes at the Hale Avenue and Wright Avenue intersection are projected to meet thresholds that warrant signalization with the proposed Hale Avenue extension during each of the study scenarios. The City should consider signalization of the intersection or other measures to reduce delays at the intersection.

Roadway Segment Evaluation

The evaluation of daily roadway segment volumes indicate that all study segments will operate at LOS D or better conditions under each of the study scenarios without and with the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project.

Vehicle Miles Traveled

A comparison of Vehicle Miles Traveled (VMT) for each of the study scenarios with the proposed Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project versus the no project scenarios was made to determine the effects of the proposed improvement project on traffic patterns within the City. Vehicle miles traveled refers to daily Morgan Hill trips multiplied by the trip distances. Morgan Hill trips were defined as all trips that begin and/or end in Morgan Hill.

The VMT analysis shows that the proposed Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project would result in only a negligible increase (less than 1.0%) in daily VMT within the City. The slight increase in VMT is likely due to the sensitivity of the TDF model assignment to the roadway network change and is not necessarily reflective of increased trips and trip lengths due to the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project.

For the purpose of comparison, Vehicle Hours Traveled (VHT) for each of the study scenarios with the proposed Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project also were compared to the no project scenarios. The VHT analysis indicates that the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project will result in a reduction in VHT. The reduction in VHT indicates that the Hale Avenue Extension and Santa Teresa Corridor Widening and Realignment project would result in shorter travel times for trips within the City.

Figure 1
Study Area and Faculties

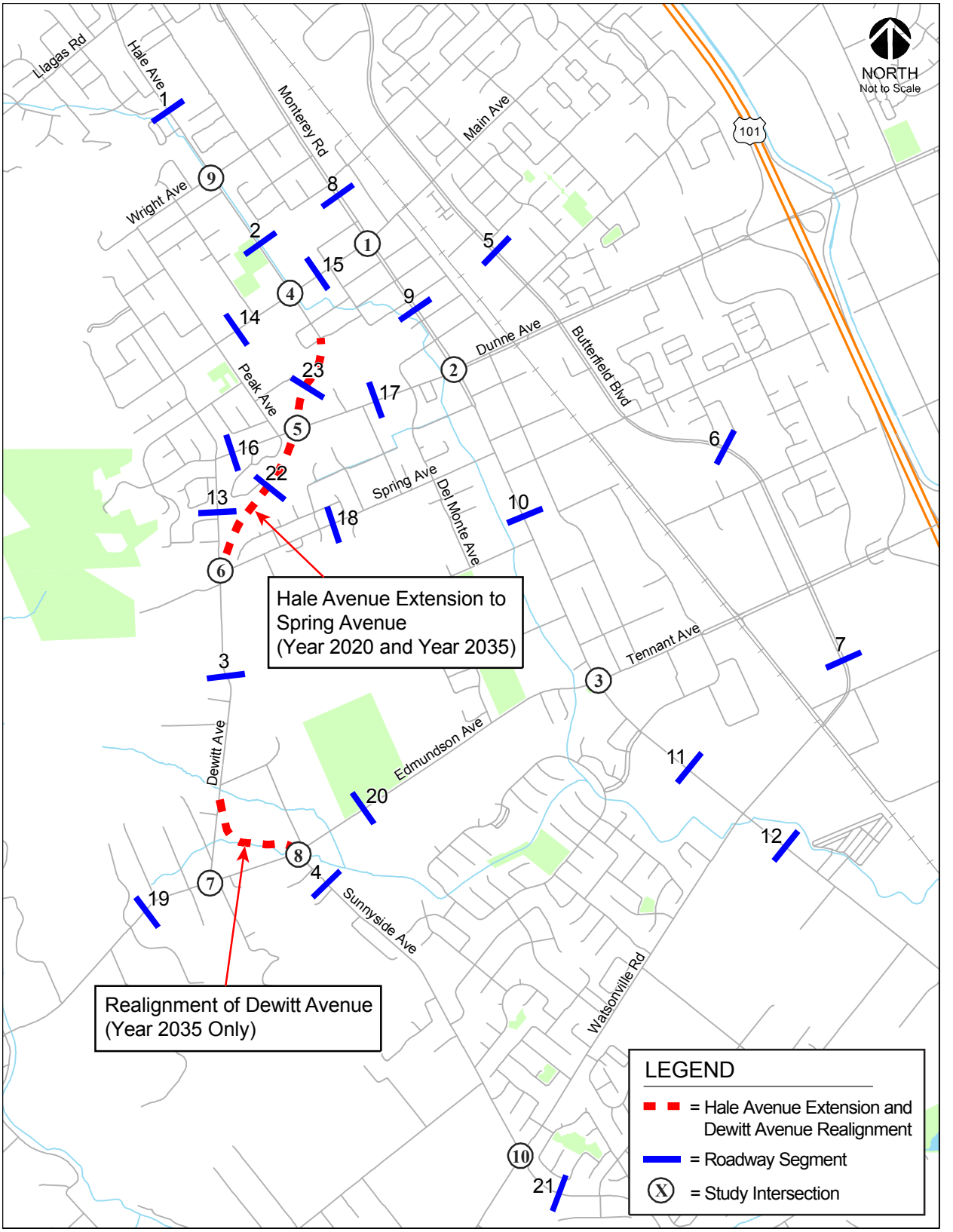


Figure 2
Existing Plus Project Screenline Evaluation

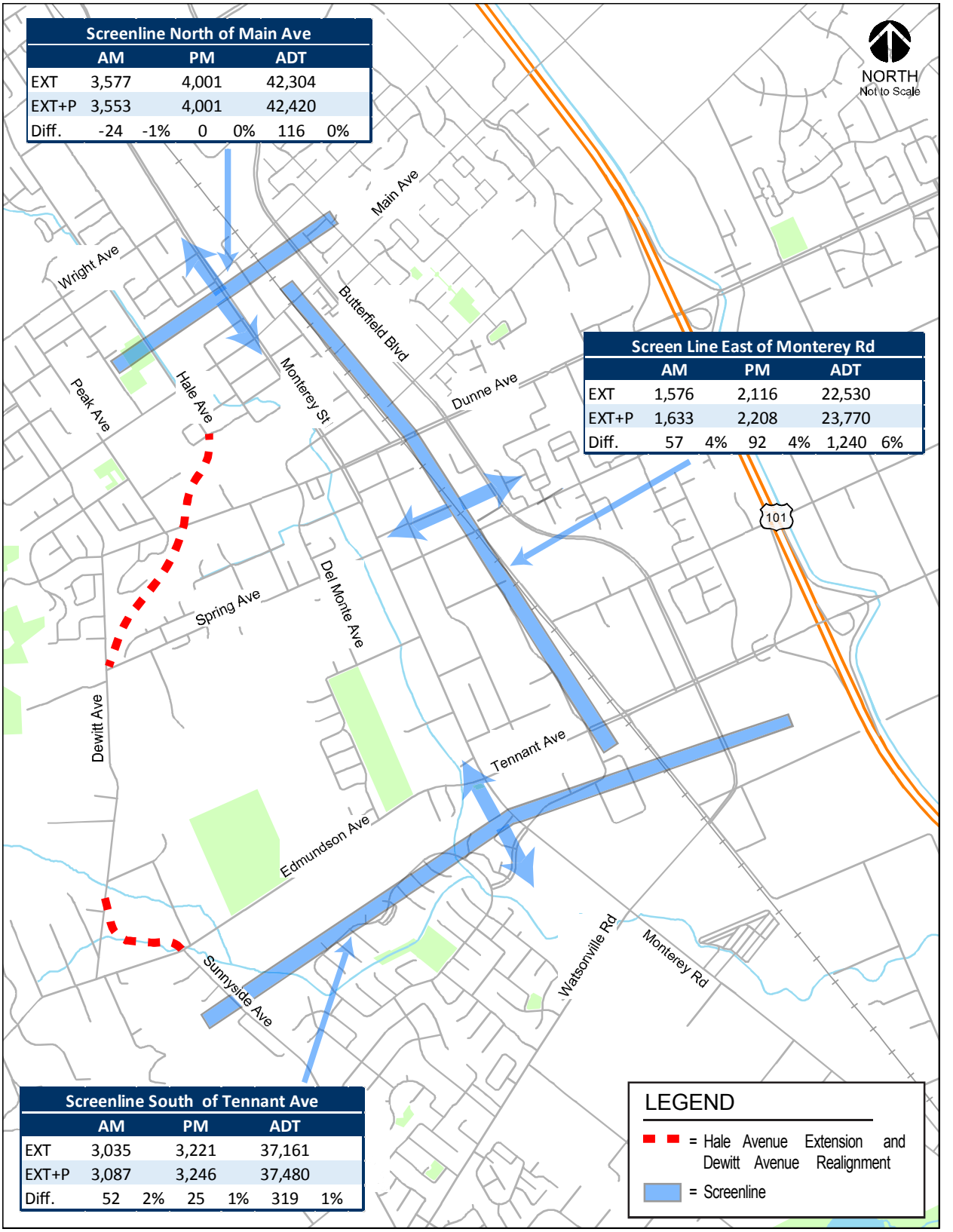


Figure 3
Year 2020 Screenline Evaluation

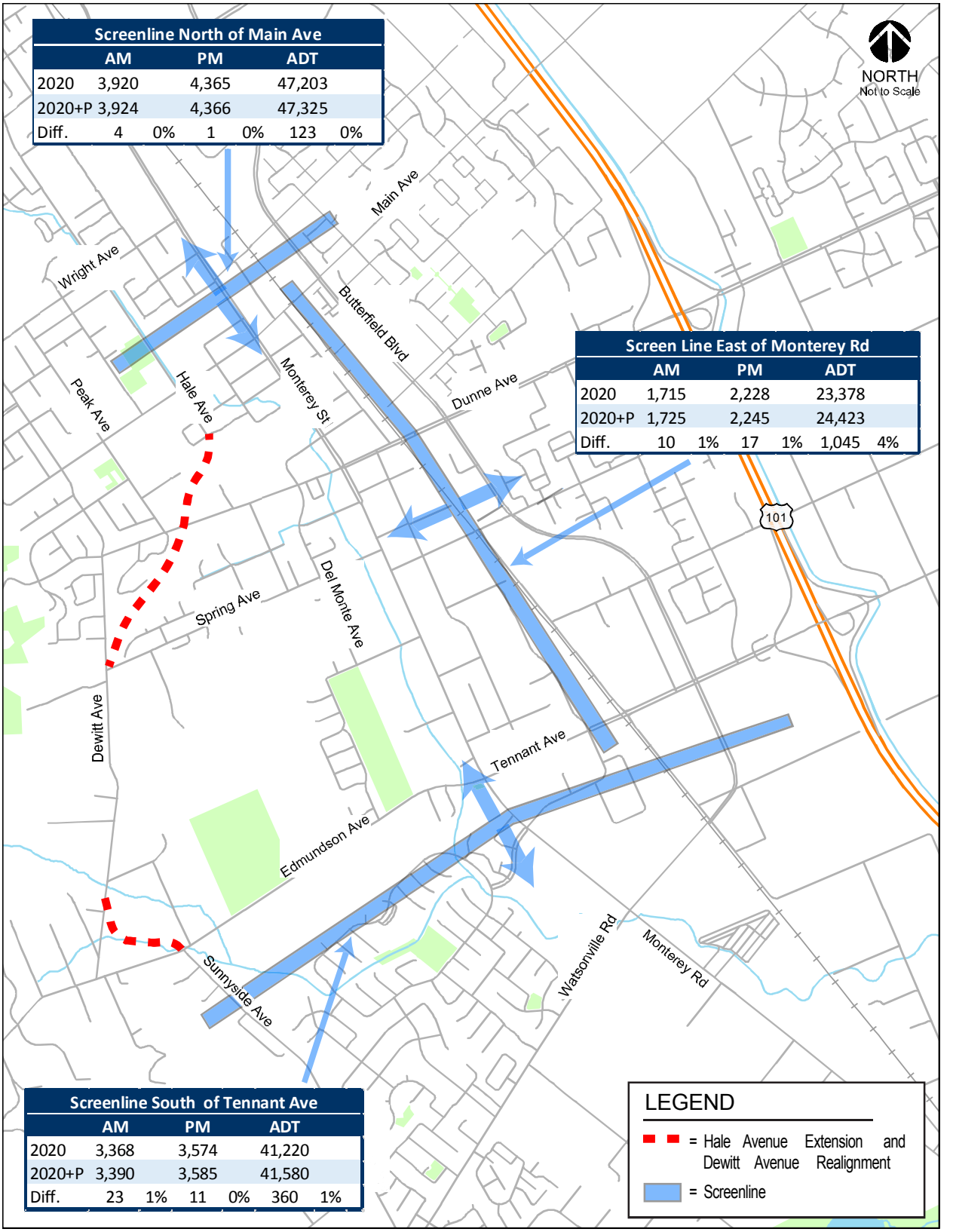


Figure 4
Year 2035 General PlanScreenline Evaluation

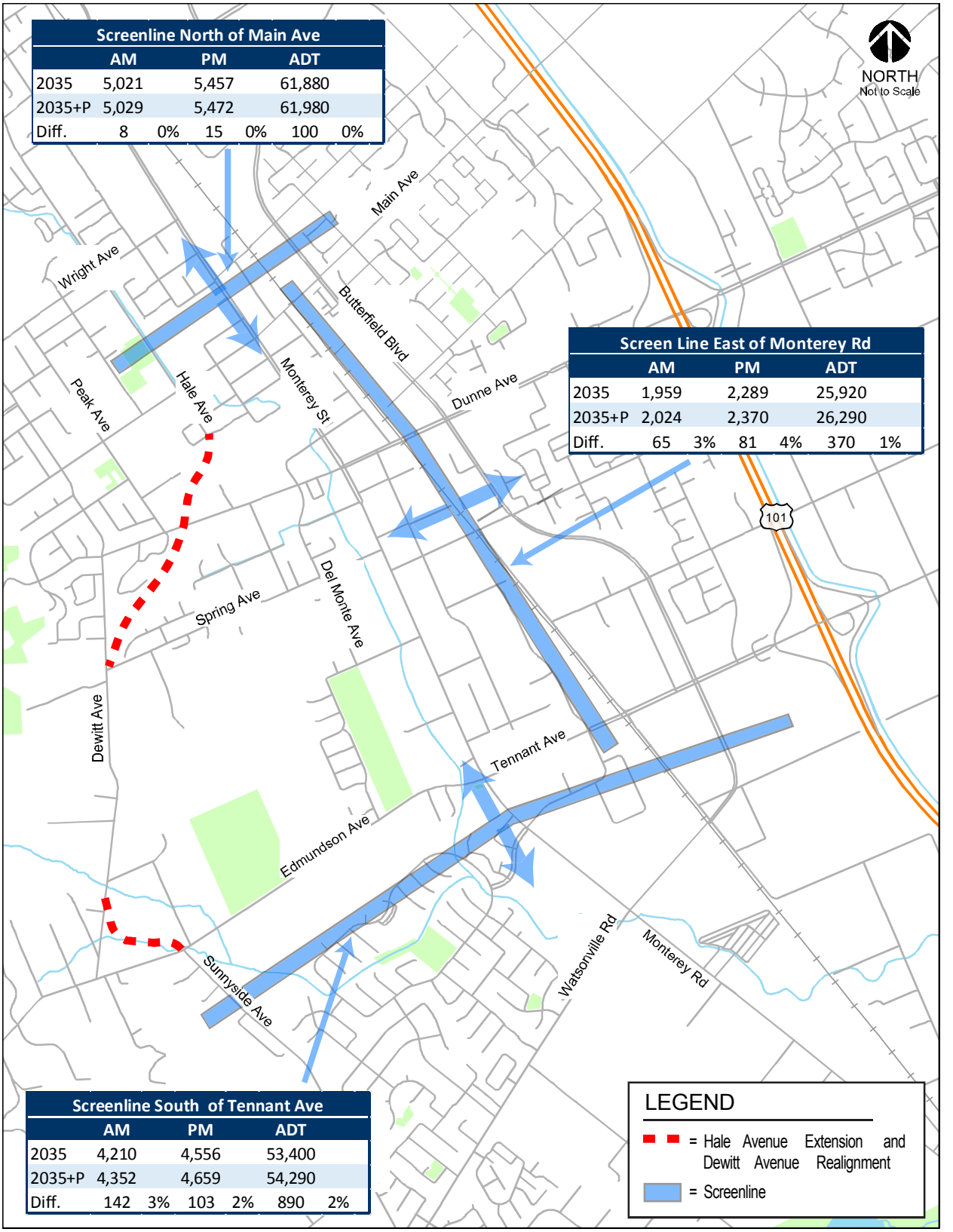
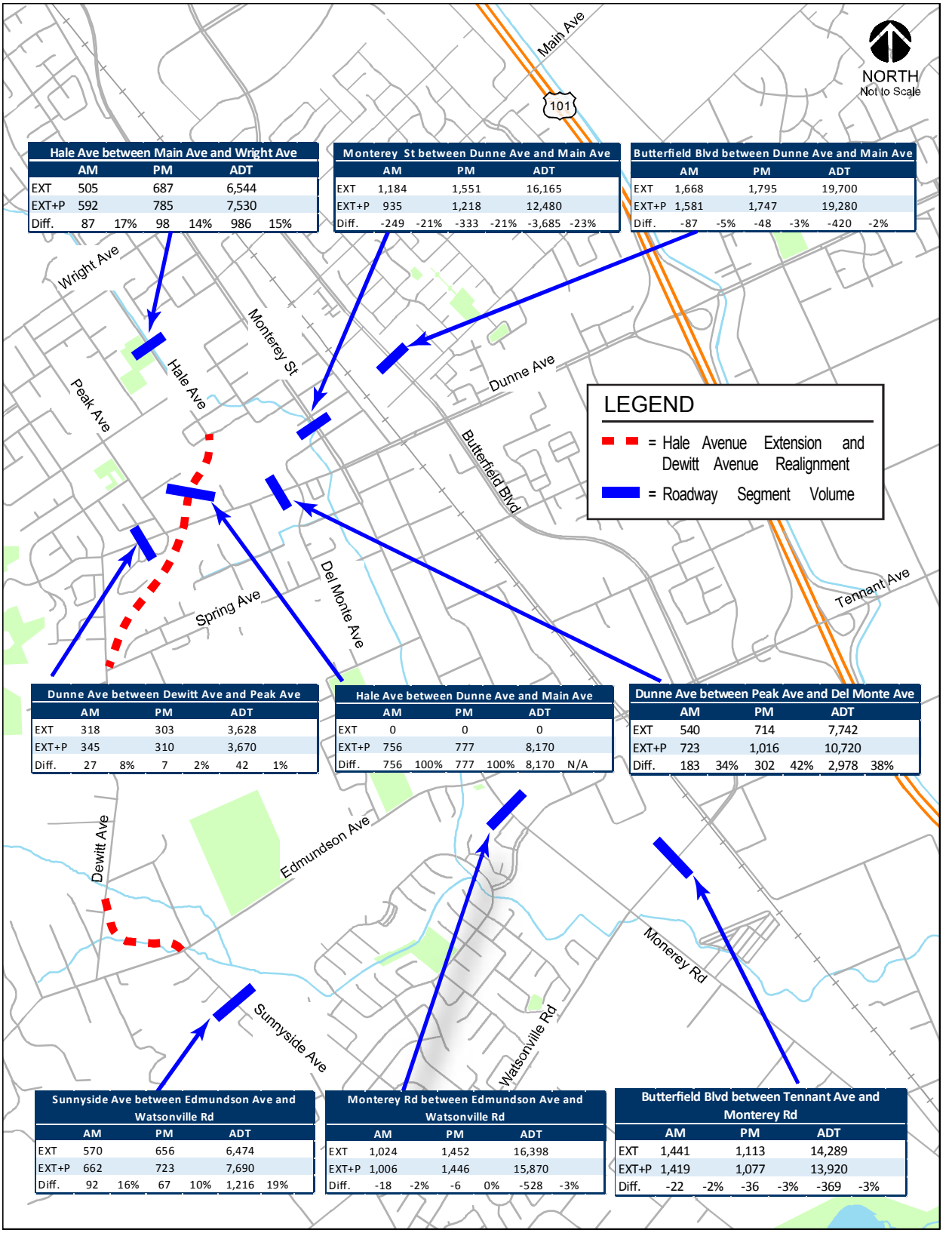


Figure 5
Existing Plus Project Traffic Volume Comparison



Hale Ave between Main Ave and Wright Ave						
	AM		PM		ADT	
EXT	505		687		6,544	
EXT+P	592		785		7,530	
Diff.	87	17%	98	14%	986	15%

Monterey St between Dunne Ave and Main Ave						
	AM		PM		ADT	
EXT	1,184		1,551		16,165	
EXT+P	935		1,218		12,480	
Diff.	-249	-21%	-333	-21%	-3,685	-23%

Butterfield Blvd between Dunne Ave and Main Ave						
	AM		PM		ADT	
EXT	1,668		1,795		19,700	
EXT+P	1,581		1,747		19,280	
Diff.	-87	-5%	-48	-3%	-420	-2%

Dunne Ave between Dewitt Ave and Peak Ave						
	AM		PM		ADT	
EXT	318		303		3,628	
EXT+P	345		310		3,670	
Diff.	27	8%	7	2%	42	1%

Hale Ave between Dunne Ave and Main Ave						
	AM		PM		ADT	
EXT	0		0		0	
EXT+P	756		777		8,170	
Diff.	756	100%	777	100%	8,170	N/A

Dunne Ave between Peak Ave and Del Monte Ave						
	AM		PM		ADT	
EXT	540		714		7,742	
EXT+P	723		1,016		10,720	
Diff.	183	34%	302	42%	2,978	38%

Sunnyside Ave between Edmundson Ave and Watsonville Rd						
	AM		PM		ADT	
EXT	570		656		6,474	
EXT+P	662		723		7,690	
Diff.	92	16%	67	10%	1,216	19%

Monterey Rd between Edmundson Ave and Watsonville Rd						
	AM		PM		ADT	
EXT	1,024		1,452		16,398	
EXT+P	1,006		1,446		15,870	
Diff.	-18	-2%	-6	0%	-528	-3%

Butterfield Blvd between Tennant Ave and Monterey Rd						
	AM		PM		ADT	
EXT	1,441		1,113		14,289	
EXT+P	1,419		1,077		13,920	
Diff.	-22	-2%	-36	-3%	-369	-3%

Table 4
Existing Plus Project Intersection Level of Service

Study Number	Intersection	Peak Hour	Count Date	Existing				Existing Plus Project			
				Intersection Control	Warrant Met?[2]	Delay[1]	LOS	Intersection Control	Warrant Met?[2]	Delay[1]	LOS
1	Monterey Road and Main Avenue	AM	01/27/16	Signal	--	44.0	D	Signal	--	45.2	D
		PM	01/27/16		--	44.5	D		--	42.9	D
2	Monterey Road and Dunne Avenue	AM	01/27/16	Signal	--	29.8	C	Signal	--	32.2	C
		PM	01/27/16		--	32.9	C		--	36.5	D
3	Monterey Road and Tennant Avenue	AM	01/27/16	Signal	--	25.0	C	Signal	--	24.4	C
		PM	01/27/16		--	26.6	C		--	26.7	C
4	Hale Avenue and Main Avenue	AM	01/27/16	AWSC	No	12.5	B	Signal	No	27.6	C
		PM	01/27/16		**Yes**	16.6	C		**Yes**	30.7	C
5	Hale Avenue and Dunne Avenue	AM	n/a	Future	n/a	n/a	n/a	roundabout	--	6.5	A
		PM	n/a		n/a	n/a	n/a		--	7.9	A
6	Dewitt Avenue and Spring Avenue	AM	01/27/16	OWSC	No	11.7	B	AWSC	No	13.2	B
		PM	01/27/16		No	10.7	B		No	11.7	B
7	Dewitt Avenue and Edmundson Avenue	AM	01/27/16	AWSC	No	9.9	A	AWSC	No	11.7	B
		PM	01/27/16		No	10.9	B		No	12.8	B
8	Sunnyside Avenue and Edmundson Avenue	AM	01/27/16	AWSC	No	12.3	B	roundabout	No	14.5	B
		PM	01/27/16		No	11.3	B		No	12.3	B
9	Hale Avenue and Wright Avenue	AM	01/27/16	AWSC	No	17.6	C	AWSC	**Yes**	20.7	C
		PM	01/27/16		No	29.1	D		**Yes**	**41.7**	**E**
10	Sunnyside Avenue and Watsonville Road	AM	01/27/16	AWSC	**Yes**	15.3	C	AWSC	**Yes**	16.6	C
		PM	01/27/16		**Yes**	18.7	C		**Yes**	20.0	C

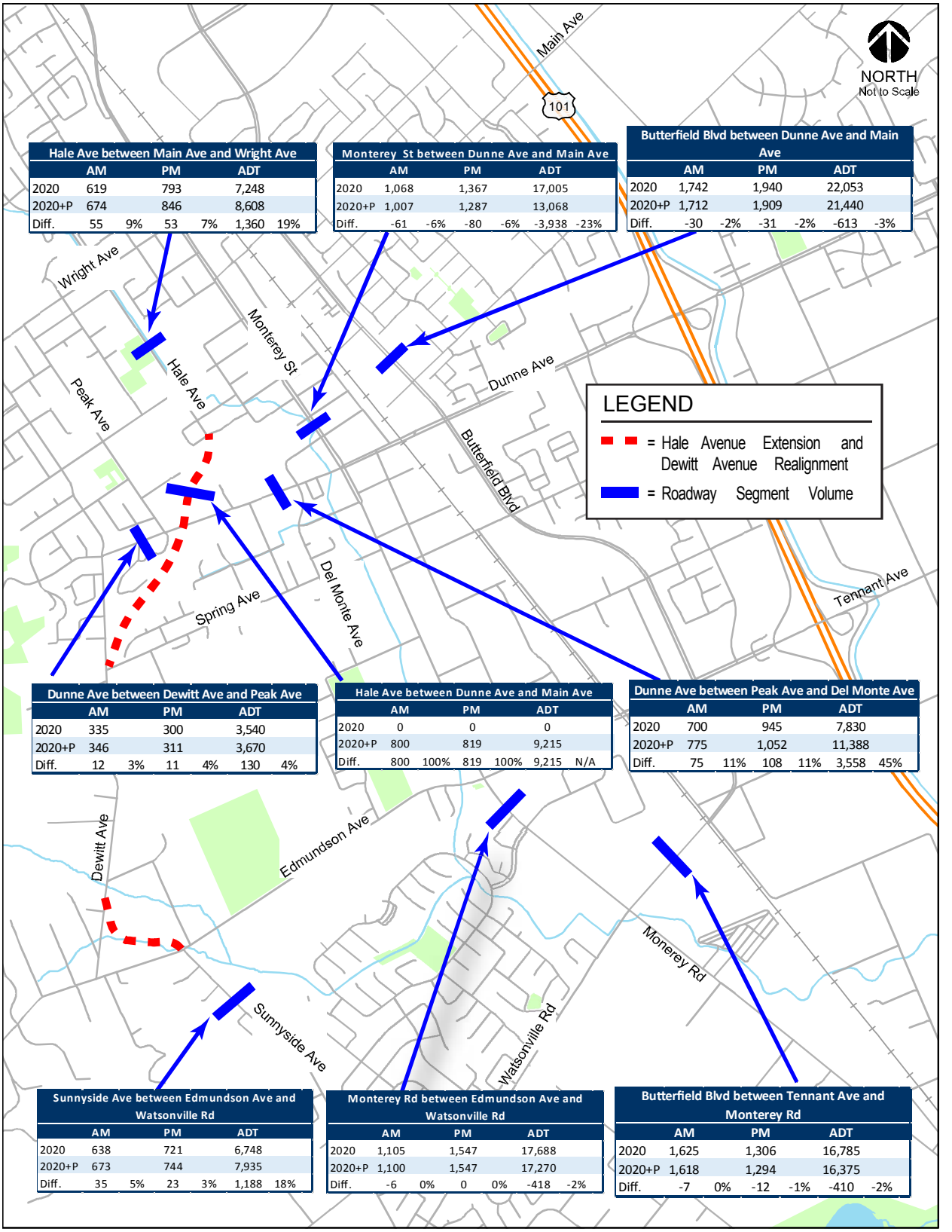
[1]The reported delay and corresponding level of service for signalized and all-way stop-controlled intersections represents the average delay for all approaches at the intersection. The reported delay and corresponding level of service for one- and two-way stop-controlled intersections are based on the stop-controlled approach with the highest delay.
[2]Signal warrant analysis does not apply for signalized intersection.
N/A = Not Applicable
Bold indicates unacceptable LOS.
Box indicates significant impact.

Table 5
Existing Plus Project Roadway Segment Volumes

#	Roadway Segment	Roadway Type	Existing				Existing Plus Project				
			AM	PM	ADT	LOS	AM	PM	ADT	% Inc.	LOS
1	Hale Avenue between Llagas Road and Wright Avenue	2-Lane Undivided Arterial	716	866	7,898	C	783	941	8,800	11%	C
2	Hale Avenue between Wright Avenue and Main Avenue	2-Lane Undivided Arterial	505	687	6,544	C	592	785	7,530	15%	C
3	Dewitt Avenue between Spring Avenue and Edmundson Avenue	2-Lane Undivided Arterial	521	529	5,018	C	720	669	6,820	36%	C
4	Sunnyside Avenue between Edmundson Avenue and Watsonville Road	2-Lane Undivided Arterial	570	656	6,474	C	662	723	7,690	19%	C
5	Butterfield Boulevard between Main Avenue and Dunne Avenue	4-Lane Divided Arterial	1,668	1,795	19,700	D	1,581	1,747	19,280	-2%	D
6	Butterfield Boulevard between San Pedro Avenue and Barrett Avenue	4-Lane Divided Arterial	1,434	1,424	15,387	C	1,375	1,409	15,290	-1%	C
7	Butterfield Boulevard between Tennent Avenue and Monterey Street	4-Lane Divided Arterial	1,441	1,113	14,289	C	1,419	1,077	13,920	-3%	C
8	Monterey Road between Wright Avenue and Main Avenue	4-Lane Divided Arterial	1,193	1,340	14,706	C	1,189	1,313	14,340	-2%	C
9	Monterey Rd between 3rd St and 4th St	4-Lane Divided Arterial	1,184	1,551	16,165	C	935	1,218	12,480	-23%	C
10	Monterey Road between San Pedro Avenue and Barrett Avenue	4-Lane Divided Arterial	1,253	1,862	20,994	D	1,175	1,805	20,210	-4%	D
11	Monterey Street between Tennent Avenue and Butterfield Boulevard	4-Lane Divided Arterial	1,024	1,452	16,398	C	1,006	1,446	15,870	-3%	C
12	Monterey Street between Butterfield Boulevard and Middle Avenue	4-Lane Divided Arterial	1,614	1,614	18,526	C	1,606	1,616	18,550	0%	C
13	Dewitt Avenue between Dunne Avenue and Spring Avenue	2-Lane Undivided Arterial	581	559	5,395	C	303	300	2,700	-50%	C
14	Main Avenue between Peak Avenue and Hale Avenue	2-Lane Undivided Arterial	669	726	7,587	C	363	434	4,570	-40%	C
15	West Main St between Hale Ave and Del Monte St	2-Lane Undivided Arterial	603	784	8,090	C	582	648	6,930	-14%	C
16	Dunne Avenue between Dewitt Avenue and Peak Avenue	2-Lane Undivided Arterial	318	303	3,628	C	345	310	3,670	1%	C
17	Dunne Avenue between Peak Avenue and Del Monte Avenue	2-Lane Divided Arterial	540	714	7,742	C	723	1,016	10,720	38%	D
18	Spring Avenue between Del Monte Avenue and Dewitt Avenue	2-Lane Undivided Arterial	93	127	1,381	C	75	113	1,210	-12%	C
19	Edmundson Avenue between Dewitt Avenue and Brewster Lane	2-Lane Undivided Arterial	232	281	3,123	C	246	291	3,270	5%	C
20	Edmundson Avenue between Sunnyside Avenue and Olympic Drive	2-Lane Undivided Arterial	340	491	5,317	C	253	431	4,910	-8%	C
21	Santa Teresa Boulevard between Watsonville Road and Native Dancer Drive	2-Lane Undivided Arterial	691	725	7,642	C	744	737	7,780	2%	C
22	Future Hale Avenue between Main Avenue and Dunne Avenue	2-Lane Divided Arterial	n/a	n/a	n/a	n/a	501	423	4,760	n/a	C
23	Future Hale Avenue between Dunne Avenue and Spring Avenue	2-Lane Divided Arterial	n/a	n/a	n/a	n/a	756	777	8,170	n/a	C

Notes:
ADT = Average two-way daily traffic.

Figure 6
Year 2020 Project Traffic Volume Comparison



Hale Ave between Main Ave and Wright Ave						
	AM		PM		ADT	
2020	619		793		7,248	
2020+P	674		846		8,608	
Diff.	55	9%	53	7%	1,360	19%

Monterey St between Dunne Ave and Main Ave						
	AM		PM		ADT	
2020	1,068		1,367		17,005	
2020+P	1,007		1,287		13,068	
Diff.	-61	-6%	-80	-6%	-3,938	-23%

Butterfield Blvd between Dunne Ave and Main Ave						
	AM		PM		ADT	
2020	1,742		1,940		22,053	
2020+P	1,712		1,909		21,440	
Diff.	-30	-2%	-31	-2%	-613	-3%

Dunne Ave between Dewitt Ave and Peak Ave						
	AM		PM		ADT	
2020	335		300		3,540	
2020+P	346		311		3,670	
Diff.	12	3%	11	4%	130	4%

Hale Ave between Dunne Ave and Main Ave						
	AM		PM		ADT	
2020	0		0		0	
2020+P	800		819		9,215	
Diff.	800	100%	819	100%	9,215	N/A

Dunne Ave between Peak Ave and Del Monte Ave						
	AM		PM		ADT	
2020	700		945		7,830	
2020+P	775		1,052		11,388	
Diff.	75	11%	108	11%	3,558	45%

Sunnyside Ave between Edmundson Ave and Watsonville Rd						
	AM		PM		ADT	
2020	638		721		6,748	
2020+P	673		744		7,935	
Diff.	35	5%	23	3%	1,188	18%

Monterey Rd between Edmundson Ave and Watsonville Rd						
	AM		PM		ADT	
2020	1,105		1,547		17,688	
2020+P	1,100		1,547		17,270	
Diff.	-6	0%	0	0%	-418	-2%

Butterfield Blvd between Tennant Ave and Monterey Rd						
	AM		PM		ADT	
2020	1,625		1,306		16,785	
2020+P	1,618		1,294		16,375	
Diff.	-7	0%	-12	-1%	-410	-2%

Table 6
Year 2020 Project Intersection Level of Service

Study Number	Intersection	Peak Hour	2020 Intersection Control	2020 Warrant Met?[2]	2020 Delay[1]	2020 LOS	2020 Plus Project Intersection Control	2020 Plus Project Warrant Met?[2]	2020 Plus Project Delay[1]	2020 Plus Project LOS
1	Monterey Road and Main Avenue	AM	Signal	--	44.7	D	Signal	--	45.7	D
		PM		--	45.0	D		--	43.1	D
2	Monterey Road and Dunne Avenue	AM	Signal	--	30.2	C	Signal	--	32.5	C
		PM		--	33.1	C		--	37.0	D
3	Monterey Road and Tennant Avenue	AM	Signal	--	25.2	C	Signal	--	24.7	C
		PM		--	26.6	C		--	26.5	C
4	Hale Avenue and Main Avenue	AM	AWSC	No	13.4	B	Signal	No	27.1	C
		PM		**Yes**	18.0	C		**Yes**	30.2	C
5	Hale Avenue and Dunne Avenue	AM	Future	--	n/a	n/a	roundabout	--	6.8	A
		PM		--	n/a	n/a		--	8.2	A
6	Dewitt Avenue and Spring Avenue	AM	OWSC	No	11.7	B	AWSC	No	13.3	B
		PM		No	10.7	B		No	11.6	B
7	Dewitt Avenue and Edmundson Avenue	AM	AWSC	No	10.1	B	AWSC	No	12.1	B
		PM		No	11.0	B		No	12.9	B
8	Sunnyside Avenue and Edmundson Avenue	AM	AWSC	No	12.6	B	roundabout	No	15.2	C
		PM		No	11.6	B		No	12.7	B
9	Hale Avenue and Wright Avenue	AM	AWSC	**Yes**	21.4	C	AWSC	**Yes**	27.0	D
		PM		No	**41.2**	**E**		**Yes**	**59.5**	**F**
10	Sunnyside Avenue and Watsonville Road	AM	AWSC	**Yes**	18.1	C	AWSC	**Yes**	19.3	C
		PM		**Yes**	22.0	C		**Yes**	23.5	C

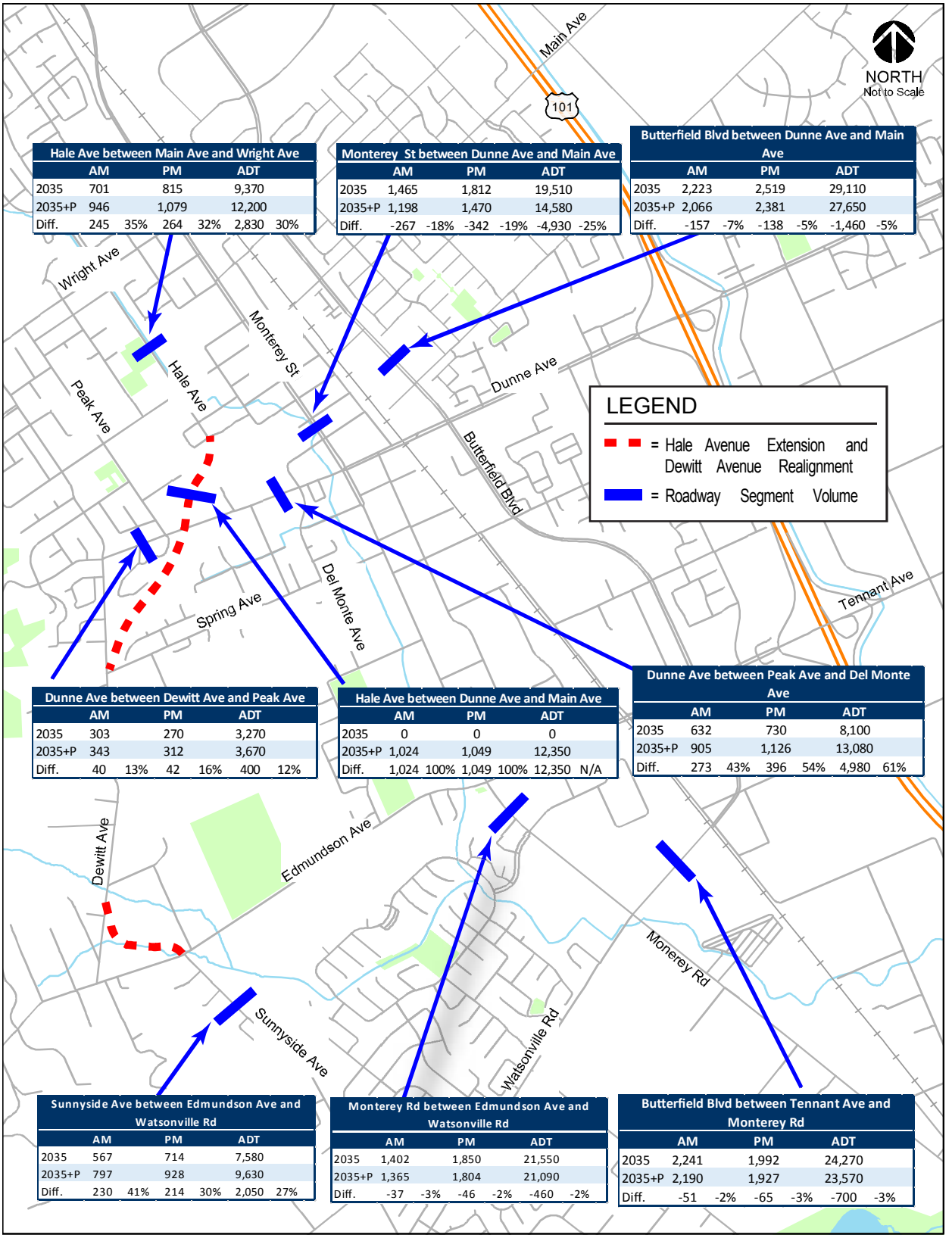
[1]The reported delay and corresponding level of service for signalized and all-way stop-controlled intersections represents the average delay for all approaches at the intersection. The reported delay and corresponding level of service for one- and two-way stop-controlled intersections are based on the stop-controlled approach with the highest delay.
[2]Signal warrant analysis does not apply for signalized intersection.
N/A = Not Applicable
Bold indicates unacceptable LOS.
Box indicates significant impact.

Table 7
Year 2020 Project Roadway Segment Volumes

			2020 No Project				2020 Plus Project				
#	Roadway Segment	Roadway Type	AM	PM	ADT	LOS	AM	PM	ADT	% Inc.	LOS
1	Hale Avenue between Llagas Road and Wright Avenue	2-Lane Undivided Arterial	856	993	9,100	D	901	1,041	10,325	13%	D
2	Hale Avenue between Wright Avenue and Main Avenue	2-Lane Undivided Arterial	619	793	7,248	C	674	846	8,608	19%	C
3	Dewitt Avenue between Spring Avenue and Edmundson Avenue	2-Lane Undivided Arterial	666	625	4,988	C	723	668	6,860	38%	C
4	Sunnyside Avenue between Edmundson Avenue and Watsonville Road	2-Lane Undivided Arterial	638	721	6,748	C	673	744	7,935	18%	C
5	Butterfield Boulevard between Main Avenue and Dunne Avenue	4-Lane Divided Arterial	1,742	1,940	22,053	D	1,712	1,909	21,440	-3%	D
6	Butterfield Boulevard between San Pedro Avenue and Barrett Avenue	4-Lane Divided Arterial	1,481	1,575	17,470	C	1,469	1,566	17,300	-1%	C
7	Butterfield Boulevard between Tennent Avenue and Monterey Street	4-Lane Divided Arterial	1,625	1,306	16,785	C	1,618	1,294	16,375	-2%	C
8	Monterey Road between Wright Avenue and Main Avenue	4-Lane Divided Arterial	1,322	1,432	16,050	C	1,312	1,416	15,560	-3%	C
9	Monterey Rd between 3rd St and 4th St	4-Lane Divided Arterial	1,068	1,367	17,005	C	1,007	1,287	13,068	-23%	C
10	Monterey Road between San Pedro Avenue and Barrett Avenue	4-Lane Divided Arterial	1,278	1,895	22,133	D	1,258	1,890	21,405	-3%	D
11	Monterey Street between Tennent Avenue and Butterfield Boulevard	4-Lane Divided Arterial	1,105	1,547	17,688	C	1,100	1,547	17,270	-2%	C
12	Monterey Street between Butterfield Boulevard and Middle Avenue	4-Lane Divided Arterial	1,731	1,786	20,698	D	1,734	1,793	20,760	0%	D
13	Dewitt Avenue between Dunne Avenue and Spring Avenue	2-Lane Undivided Arterial	366	354	5,360	C	304	301	2,708	-49%	C
14	Main Avenue between Peak Avenue and Hale Avenue	2-Lane Undivided Arterial	453	518	7,790	C	366	436	4,590	-41%	C
15	West Main St between Hale Ave and Del Monte St	2-Lane Undivided Arterial	582	659	7,975	C	542	593	6,183	-22%	C
16	Dunne Avenue between Dewitt Avenue and Peak Avenue	2-Lane Undivided Arterial	335	300	3,540	C	346	311	3,670	4%	C
17	Dunne Avenue between Peak Avenue and Del Monte Avenue	2-Lane Divided Arterial	700	945	7,830	C	775	1,052	11,388	45%	D
18	Spring Avenue between Del Monte Avenue and Dewitt Avenue	2-Lane Undivided Arterial	79	117	1,385	C	73	111	1,195	-14%	C
19	Edmundson Avenue between Dewitt Avenue and Brewster Lane	2-Lane Undivided Arterial	263	308	3,365	C	265	309	3,488	4%	C
20	Edmundson Avenue between Sunnyside Avenue and Olympic Drive	2-Lane Undivided Arterial	354	508	6,188	C	335	489	5,658	-9%	C
21	Santa Teresa Boulevard between Watsonville Road and Native Dancer Drive	2-Lane Undivided Arterial	748	765	7,893	C	767	769	8,055	2%	C
22	Future Hale Avenue between Main Avenue and Dunne Avenue	2-Lane Divided Arterial	n/a	n/a	n/a	n/a	505	424	4,815	n/a	C
23	Future Hale Avenue between Dunne Avenue and Spring Avenue	2-Lane Divided Arterial	n/a	n/a	n/a	n/a	800	819	9,215	n/a	C

Notes:
ADT = Average two-way daily traffic.

Figure 7
Year 2035 General Plan Project Traffic Volume Comparison



Hale Ave between Main Ave and Wright Ave

	AM		PM		ADT	
2035	701		815		9,370	
2035+P	946		1,079		12,200	
Diff.	245	35%	264	32%	2,830	30%

Monterey St between Dunne Ave and Main Ave

	AM		PM		ADT	
2035	1,465		1,812		19,510	
2035+P	1,198		1,470		14,580	
Diff.	-267	-18%	-342	-19%	-4,930	-25%

Butterfield Blvd between Dunne Ave and Main Ave

	AM		PM		ADT	
2035	2,223		2,519		29,110	
2035+P	2,066		2,381		27,650	
Diff.	-157	-7%	-138	-5%	-1,460	-5%

Dunne Ave between Dewitt Ave and Peak Ave

	AM		PM		ADT	
2035	303		270		3,270	
2035+P	343		312		3,670	
Diff.	40	13%	42	16%	400	12%

Hale Ave between Dunne Ave and Main Ave

	AM		PM		ADT	
2035	0		0		0	
2035+P	1,024		1,049		12,350	
Diff.	1,024	100%	1,049	100%	12,350	N/A

Dunne Ave between Peak Ave and Del Monte Ave

	AM		PM		ADT	
2035	632		730		8,100	
2035+P	905		1,126		13,080	
Diff.	273	43%	396	54%	4,980	61%

Sunnyside Ave between Edmundson Ave and Watsonville Rd

	AM		PM		ADT	
2035	567		714		7,580	
2035+P	797		928		9,630	
Diff.	230	41%	214	30%	2,050	27%

Monterey Rd between Edmundson Ave and Watsonville Rd

	AM		PM		ADT	
2035	1,402		1,850		21,550	
2035+P	1,365		1,804		21,090	
Diff.	-37	-3%	-46	-2%	-460	-2%

Butterfield Blvd between Tennant Ave and Monterey Rd

	AM		PM		ADT	
2035	2,241		1,992		24,270	
2035+P	2,190		1,927		23,570	
Diff.	-51	-2%	-65	-3%	-700	-3%

Table 8
Year 2035 General Plan Project Intersection Level of Service

Study Number	Intersection	Peak Hour	2035 Intersection Control	2035 Warrant Met?[2]	2035 Delay[1]	2035 LOS	2035 Plus Project Intersection Control	2035 Plus Project Warrant Met?[2]	2035 Plus Project Delay[1]	2035 Plus Project LOS
1	Monterey Road and Main Avenue	AM	Signal	--	48.9	D	Signal	--	50.1	D
		PM		--	45.5	D		--	42.7	D
2	Monterey Road and Dunne Avenue	AM	Signal	--	30.9	C	Signal	--	32.8	C
		PM		--	32.0	C		--	35.2	D
3	Monterey Road and Tennant Avenue	AM	Signal	--	26.0	C	Signal	--	25.4	C
		PM		--	27.0	C		--	26.4	C
4	Hale Avenue and Main Avenue	AM	AWSC	**Yes**	17.9	C	Signal	**Yes**	27.1	C
		PM		**Yes**	24.9	C		**Yes**	30.2	C
5	Hale Avenue and Dunne Avenue	AM	Future	--	n/a	n/a	roundabout	--	8.9	A
		PM		--	n/a	n/a		--	11.0	B
6	Dewitt Avenue and Spring Avenue	AM	OWSC	No	11.8	B	AWSC	No	20.1	C
		PM		No	10.7	B		No	14.8	B
7	Dewitt Avenue and Edmundson Avenue	AM	AWSC	No	11.0	B	AWSC	No	9.1	A
		PM		No	11.7	B		No	9.4	A
8	Sunnyside Avenue and Edmundson Avenue	AM	AWSC	No	13.7	B	roundabout	No	5.7	A
		PM		No	13.1	B		No	4.8	A
9	Hale Avenue and Wright Avenue	AM	AWSC	**Yes**	**65.0**	**F**	AWSC	**Yes**	**90.6**	**F**
		PM		**Yes**	**96.5**	**F**		**Yes**	**141.4**	**F**
10	Sunnyside Avenue and Watsonville Road	AM	AWSC	**Yes**	**44.5**	**E**	AWSC	**Yes**	**39.3**	**E**
		PM		**Yes**	**49.3**	**E**		**Yes**	**35.3**	**E**

[1]The reported delay and corresponding level of service for signalized and all-way stop-controlled intersections represents the average delay for all approaches at the intersection. The reported delay and corresponding level of service for one- and two-way stop-controlled intersections are based on the stop-controlled approach with the highest delay.
[2]Signal warrant analysis does not apply for signalized intersection.
N/A = Not Applicable
Bold indicates unacceptable LOS.
Box indicates significant impact.

Table 9
Year 2035 General Plan Project Roadway Segment Volumes

#	Roadway Segment	Roadway Type	2035 No Project				2035 With Project				
			AM	PM	ADT	LOS	AM	PM	ADT	% Inc.	LOS
1	Hale Avenue between Llagas Road and Wright Avenue	2-Lane Undivided Arterial	1,076	1,149	12,700	D	1,276	1,380	15,230	20%	D
2	Hale Avenue between Wright Avenue and Main Avenue	2-Lane Undivided Arterial	701	815	9,370	D	946	1,079	12,200	30%	D
3	Dewitt Avenue between Spring Avenue and Edmundson Avenue	2-Lane Undivided Arterial	504	491	4,890	C	912	825	8,270	69%	C
4	Sunnyside Avenue between Edmundson Avenue and Watsonville Road	2-Lane Undivided Arterial	567	714	7,580	C	797	928	9,630	27%	D
5	Butterfield Boulevard between Main Avenue and Dunne Avenue	4-Lane Divided Arterial	2,223	2,519	29,110	D	2,066	2,381	27,650	-5%	D
6	Butterfield Boulevard between San Pedro Avenue and Barrett Avenue	4-Lane Divided Arterial	1,799	2,073	23,710	D	1,735	2,015	23,190	-2%	D
7	Butterfield Boulevard between Tennent Avenue and Monterey Street	4-Lane Divided Arterial	2,241	1,992	24,270	D	2,190	1,927	23,570	-3%	D
8	Monterey Road between Wright Avenue and Main Avenue	4-Lane Divided Arterial	1,722	1,789	20,070	D	1,687	1,711	19,100	-5%	C
9	Monterey Rd between 3rd St and 4th St	4-Lane Divided Arterial	1,465	1,812	19,510	D	1,198	1,470	14,580	-25%	C
10	Monterey Road between San Pedro Avenue and Barrett Avenue	4-Lane Divided Arterial	1,588	2,164	25,560	D	1,437	2,068	24,500	-4%	D
11	Monterey Street between Tennent Avenue and Butterfield Boulevard	4-Lane Divided Arterial	1,402	1,850	21,550	D	1,365	1,804	21,090	-2%	D
12	Monterey Street between Butterfield Boulevard and Middle Avenue	4-Lane Divided Arterial	2,106	2,297	27,200	D	2,120	2,299	27,240	0%	D
13	Dewitt Avenue between Dunne Avenue and Spring Avenue	2-Lane Undivided Arterial	555	517	5,240	C	305	303	2,730	-48%	C
14	Main Avenue between Peak Avenue and Hale Avenue	2-Lane Undivided Arterial	724	768	8,390	C	397	442	4,650	-45%	C
15	West Main St between Hale Ave and Del Monte St	2-Lane Undivided Arterial	580	692	7,630	C	476	501	4,360	-43%	C
16	Dunne Avenue between Dewitt Avenue and Peak Avenue	2-Lane Undivided Arterial	303	270	3,270	C	343	312	3,670	12%	C
17	Dunne Avenue between Peak Avenue and Del Monte Avenue	2-Lane Divided Arterial	632	730	8,100	C	905	1,126	13,080	61%	D
18	Spring Avenue between Del Monte Avenue and Dewitt Avenue	2-Lane Undivided Arterial	91	130	1,400	C	70	105	1,150	-18%	C
19	Edmundson Avenue between Dewitt Avenue and Brewster Lane	2-Lane Undivided Arterial	315	359	4,100	C	326	361	4,140	1%	C
20	Edmundson Avenue between Sunnyside Avenue and Olympic Drive	2-Lane Undivided Arterial	656	737	8,790	C	573	638	7,700	-12%	C
21	Santa Teresa Boulevard between Watsonville Road and Native Dancer Drive	2-Lane Undivided Arterial	759	850	8,650	C	856	926	9,240	7%	D
22	Future Hale Avenue between Main Avenue and Dunne Avenue	2-Lane Divided Arterial	n/a	n/a	n/a	n/a	687	581	6210	n/a	C
23	Future Hale Avenue between Dunne Avenue and Spring Avenue	2-Lane Divided Arterial	n/a	n/a	n/a	n/a	1024	1049	12350	n/a	D

Notes:
ADT = Average two-way daily traffic.

Table 10
VMT Analysis

Study Scenario	VMT	VHT	Speed
Existing Conditions	972,247	1,323,479	44
Existing Plus Project Conditions	973,610	1,321,345	44
Difference	**1,363**	**-2,133**	**0**
Percent	**0.1%**	**-0.2%**	**0.3%**
Year 2020 Conditions	1,050,194	1,439,457	44
Year 2020 Plus Project Conditions	1,051,418	1,436,163	44
Difference	**1,225**	**-3,294**	**0**
Percent	**0.1%**	**-0.2%**	**0.3%**
Year 2035 General Plan No Project Conditions	1,284,034	1,787,392	43
Year 2035 General Plan Project Conditions	1,284,844	1,780,617	43
Difference	**810**	**-6,775**	**0**
Percent	**0.1%**	**-0.4%**	**0.4%**