

Appendix F

Trip Generation and Operations Analysis And VMT Assessment



Memorandum

Date: July 30, 2021
To: Nick Pappani, Raney Planning & Management, Inc.
From: Robert Del Rio, T.E.
Subject: Trip Generation and Operations Analysis for the Proposed Magnolias Affordable Housing Development in Morgan Hill, California

Hexagon Transportation Consultants, Inc. has completed a trip generation and operations analysis for the proposed affordable housing development at 17965 Monterey Road in Morgan Hill, California (see Figure 1). The project as proposed consists of the construction of 66 affordable apartment units on a site that is mostly undeveloped with some vacant structures (see Figure 2 for site plan). The project would provide 67 parking spaces on-site that would be accessible via one right-in and right-out only driveway along Monterey Road. The project will be required to construct a new median along Monterey Road that extends from the existing median south of the project site to Manresa Lane to restrict turn movement at the project driveway to right-turns only. Emergency vehicle access (EVA) would be provided via a second, EVA access-only driveway along Monterey Road. The methodology, results, and recommendations of the analysis are discussed below.

Scope of Study

The current General Plan, *Morgan Hill 2035 General Plan*, adopted in July 2016 uses Level of Service (LOS) as its primary metric for the evaluation of the projected operation of the City's roadway system. Therefore, this traffic operations analysis based upon peak hour intersection level of service analysis is included for consistency with the General Plan goals and policies. The traffic operations analysis supplements the CEQA required VMT analysis provided in a separate memorandum. However, the determination of project impacts per CEQA requirements is based solely on the VMT analysis.

The purposes of the trip generation and operations analysis are to evaluate the magnitude of traffic that would be added to the roadway system due to the proposed project and to determine whether a comprehensive traffic study is required for the proposed project. The analysis consists of an evaluation of trip generation and peak-hour intersection level of service analysis at intersections in the immediate vicinity of the project site. Traffic conditions were evaluated for the scenarios listed below.

Existing Conditions. Existing conditions represent the existing peak-hour traffic volumes on the existing roadway network. It is not possible to collect new traffic counts due to the current COVID-19 pandemic and its effects on normal traffic conditions. Therefore, existing traffic volumes were represented by traffic counts collected in March 2019 for the intersection of Monterey Road/Wright Avenue and May 2018 for the remaining study intersections.

Existing Plus Project Conditions. Existing plus project peak-hour traffic volumes were estimated by adding to the existing traffic volumes the additional traffic that would be generated by the proposed project. Existing plus project conditions were evaluated relative to existing conditions in order to determine the effects of the proposed project on existing traffic conditions.

Figure 1
Site Location and Study Intersections

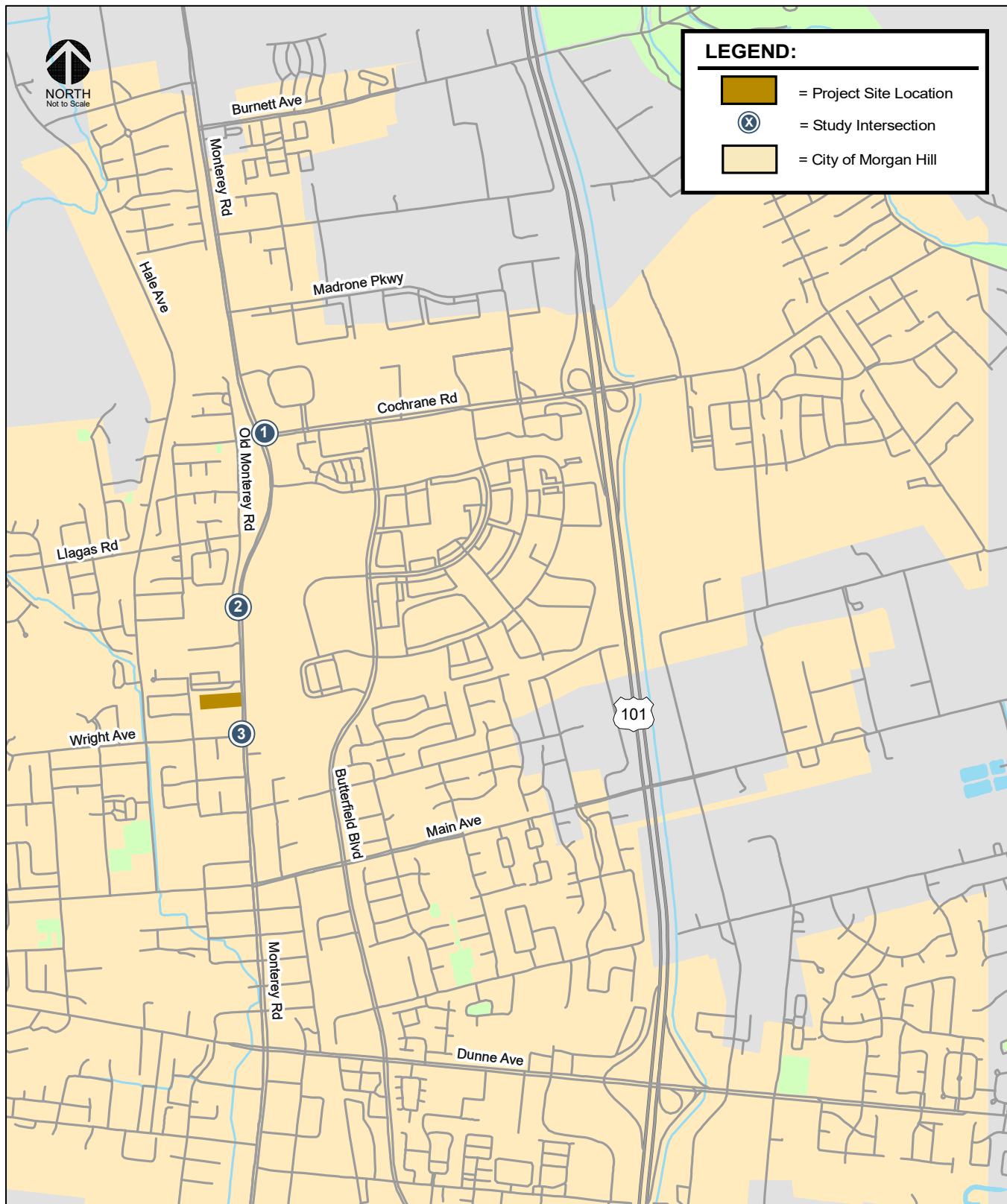
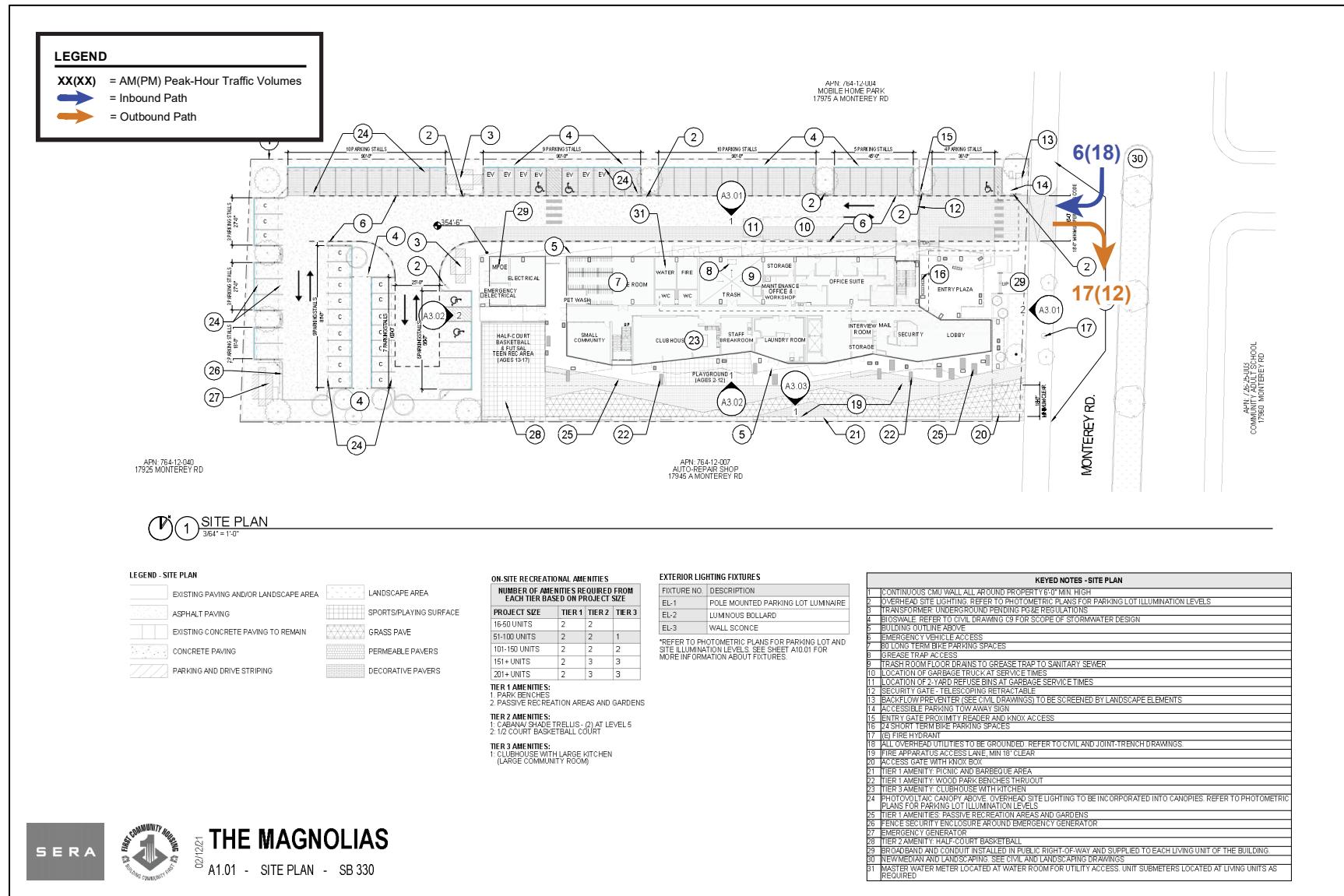


Figure 2 Site Plan and Project Trips at Driveways



Year 2025 Cumulative Conditions. Year 2025 Cumulative conditions represent future traffic volumes on the future transportation network. Year 2025 Cumulative conditions include traffic growth projected to occur in the Year 2025 without the proposed project.

Year 2025 Cumulative with Project Conditions. Year 2025 Cumulative with project consists of Year 2025 Cumulative traffic conditions with the addition of project traffic.

Project Trip Generation Estimates and Assignment

In determining the project trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM and PM peak hours. Through empirical research, data have been collected that quantify the amount of traffic produced by many types of land uses. The research is compiled in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 10th Edition* (2017). The standard trip generation rates can be applied to help predict the future traffic increases that would result from a new development. The rates published for "Multifamily Housing (Mid-Rise)" (ITE Land Use 221) were used to estimate the trips generated by the proposed project. ITE land use #221 includes apartment, townhouse, and condominium developments that have between three and ten levels. As proposed, the site would consist of a five-story apartment building.

After applying the ITE trip rates, it is estimated that the project would generate 23 vehicle trips (6 inbound and 17 outbound) during the AM peak hour and 30 vehicle trips (18 inbound and 12 outbound) during the PM peak hour (see Table 1).

Table 1
Trip Generation Summary

Land Use	ITE Land Use Code ¹	Size	AM Peak Hour			PM Peak Hour				
			Pk-Hr Rate	Trip In	Trip Out	Trip Total	Pk-Hr Rate	Trip In		
Proposed Land Use										
Multifamily Housing (Mid-Rise)	221	66 Dwelling Units	0.345	6	17	23	0.45	18	12	30
Notes:										
¹ Source: ITE <i>Trip Generation Manual</i> , 10th Edition 2017.										

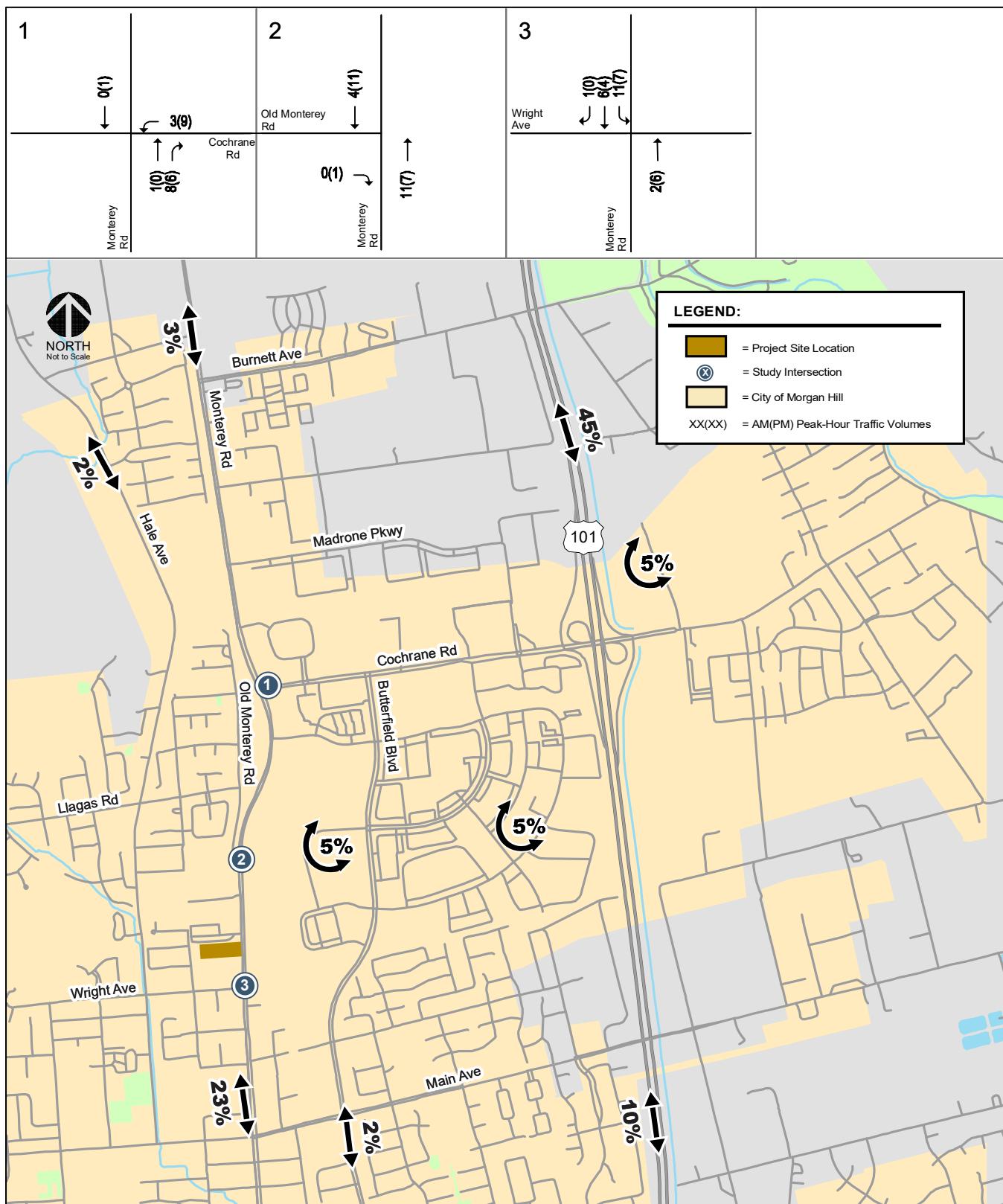
The directional distribution of site-generated traffic to and from the project site was estimated based on the existing travel patterns on the surrounding roadway network that reflect typical weekday AM and PM peak commute patterns, the location of the project driveway, freeway access points, and the locations of complimentary land uses. The peak-hour project trips associated with the proposed project were added to the transportation network in accordance with the distribution pattern. The project trip distribution pattern and assignment of project trips at the study intersections are shown on Figure 3.

Year 2025 Project Trip Generation Estimates

Year 2025 Cumulative traffic volumes were developed based on traffic forecasts produced for the City of Morgan Hill 2035 General Plan using the City's Traffic Demand Forecasting (TDF) model. The Year 2035 General Plan traffic forecasts include land use growth and transportation improvements associated with buildout of the City's General Plan.

The 2035 General Plan forecasts also include trips associated with the adopted General Plan land uses for the project site. Therefore, the trips associated with the adopted General Plan land uses for the project site were removed to develop Year 2025 Cumulative no project traffic volumes. Hexagon prepared trip estimates for the project site GP land uses which were estimated to consist of

Figure 3
Project Trip Distribution



approximately 11 multi-family dwelling units.

Hexagon prepared trip estimates for the project site land uses included in the City's General Plan traffic model and the proposed development plan. The trip estimates indicate that the proposed development plan is of greater intensity than that assumed in the General Plan traffic model for the project site. The proposed development plan would result in 19 more AM peak-hour trips and 25 more PM peak-hour trips at the project site when compared with the land uses included in the City's current General Plan traffic model. The comparison of trip generation per the General Plan traffic model and proposed project are presented in Table 2.

Table 2
General Plan Project Trip Generation Estimates Comparison

Land Use	ITE Land Use Code ¹	Size	AM Peak Hour			PM Peak Hour		
			Pk-Hr Rate	Trip In	Trip Out	Total	Pk-Hr Rate	Trip In
Proposed Land Use								
Multifamily Housing (Mid-Rise)	221	66 Dwelling Units	0.345	6	17	23	0.45	18
Approved Land Uses²								
Multifamily Housing (Mid-Rise)	221	11 Dwelling Units	0.345	1	3	4	0.45	3
Net Project Trips				5	14	19		15
Notes:								
¹ Source: ITE <i>Trip Generation Manual</i> , 10th Edition 2017.								
² Approved land uses for the project site were obtained from the 2035 General Plan Traffic Demand Forecasting (TDF) model.								

The Year 2025 Cumulative no project traffic volumes were then estimated using a growth method that involved adding a proportion (10 Years or 50%) of the 2035 projected growth, with removal of the trips associated with the adopted General Plan land uses for the project, to existing traffic counts at each of the study intersections.

Additionally, it should be noted that the 1.53-acre project site is currently zoned as Mixed-Use Flex (MU-F) per the City's General Plan Land Use Map. This land use designation supports a residential density between 7 units/acre and 24 units/acre. Per the maximum allowable development standards, the project site may support up to 37 dwelling units per the General Plan. However, Under the State Density Bonus Law (Section 65915) the project as 100% lower income households, defined by Section 50079.5 of the Health and Safety Code, qualifies for an 80% Density bonus over the maximum allowed by the development standards. Therefore, the project site is allowed to construct the proposed 67 units per the Density Bonus Law.

Intersection Level of Service Analysis

Traffic conditions at 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 AM to 9:00 AM period and the weekday PM peak hour is typically in the 4:00 PM to 6:00 PM period. It is during these times that the most congested traffic conditions occur on a typical weekday.

Signalized Intersection Analysis

Signalized study intersections are subject to the City of Morgan Hill's level of service standards. The City of Morgan Hill's 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 intersection 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

According to the City of Morgan Hill level of service guidelines, a development is said to create a significant adverse effect 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 no project 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 no project 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.

Level of Service Results

The results of the intersection level of service analysis show that all study intersections currently operate and are projected to continue to operate at an acceptable LOS C or better conditions under Year 2025 Cumulative conditions, and the addition of project traffic would not result in the degradation of the study intersection's levels of service during the AM and PM peak hours.

Based on the results of the intersection level of service analysis, the project would not have an adverse effect on operations at any of the study intersections. The results of level of service analysis are summarized in Table 3.

Table 3
Intersection Level of Service Summary

Int. #	Intersection	LOS Std	Peak Hour	Count Date	Existing			Existing Plus Project			Year 2025 Cumulative			Year 2025 Cumulative with Project			
					Delay ¹		LOS	Delay ¹		LOS	Crit. Delay	Incr. V/C	Delay ¹		LOS	Delay ¹	
					Incr.	In	Incr.	In	Incr.	In	Incr.	In	Incr.	In	Incr.	In	Incr.
1	Monterey Road and Cochrane Road	E	AM	05/08/18	28.1	C	28.1	C	0.0	0.001	29.2	C	29.2	C	0.1	0.001	
			PM	05/08/18	24.0	C	24.2	C	0.2	0.003	25.8	C	26.0	C	0.2	0.003	
2	Monterey Road and Old Monterey Road	D	AM	05/08/18	10.4	B	10.4	B	0.0	0.001	10.6	B	10.6	B	0.0	0.001	
			PM	05/08/18	13.0	B	13.0	B	0.0	0.003	15.1	B	15.1	B	0.0	0.003	
3	Monterey Road and Wright Avenue	D	AM	03/28/19	19.1	B	19.1	B	0.1	0.009	21.0	C	21.0	C	0.1	0.009	
			PM	03/28/19	20.4	C	20.4	C	0.0	0.001	21.9	C	21.9	C	0.0	0.001	

Notes:

¹The reported delay and corresponding level of service for signalized intersections represent the average delay for all approaches at the intersection.

Site Access

The evaluation of site access is based on the site plan prepared by Sera Architects dated February 12, 2021. Site access was evaluated to determine the adequacy of the site's access points with regard to the following: traffic volume, geometric design, and sight distance. Site access was evaluated in accordance with generally accepted traffic engineering standards and transportation planning principles.

The project site is proposed to be served by a right-in and right-out access only driveway along the southbound side of Monterey Road located approximately 600 feet north of Wright Avenue, as shown on Figure 2. The project also proposes a secondary EVA access only driveway along Monterey Road located approximately 500 feet north of Wright Avenue.

Driveway Design and Operations

The City of Morgan Hill Design Standards specify a minimum driveway width of 16 feet and a maximum width of 24 feet. The site plan indicates that the northerly driveway would be 26 feet wide and the southerly EVA access-only driveway would be 18 feet wide. The City will determine whether it is necessary to narrow the northerly driveway by 2 feet to meet the maximum driveway width standards.

Based on the project trip generation and trip assignment, it is estimated that a maximum of 18 inbound trips and 17 outbound trips would enter and exit the site during the peak hours. An existing median island located along Monterey Road, which extends 370 feet north of Wright Avenue, is proposed to be extended by the project past the proposed northerly project driveway to Manresa Lane. Therefore, all project traffic would make inbound and outbound right-turns at the proposed driveway. Outbound project trips bound for northbound Monterey Road would utilize the southbound left-turn pocket at Monterey Road and Wright Avenue to make a U-turn. Inbound project trips from northbound Monterey Road would make a U-turn from the median turn lane north of the extended median island. The estimated project trips at the project driveways are shown on Figure 2.

Sight Distance

The project driveway should be free and clear of any obstructions to provide adequate sight distance, thereby ensuring that exiting vehicles can see pedestrians on the sidewalk and other vehicles traveling on Monterey Road. Landscaping and signage should be located in such a way to ensure an unobstructed view for drivers exiting the site. Sight distance generally should be provided in accordance with Caltrans standards. The minimum acceptable sight distance is most often the stopping sight distance.

Southbound Monterey Road has a posted speed limit of 35 mph in the vicinity of the project site. For a design speed of 35 mph, the recommended Caltrans' stopping sight distance is 250 feet. Based on the project site plan and observations in the field, vehicles exiting the project site driveway would have sight distance of more than 250 feet to the north along southbound Monterey Road. Therefore, the proposed site driveway would have adequate sight distance along southbound Monterey Road.

Transit, Pedestrian, and Bicycle Facility Evaluation

The project site is served by VTA bus routes that run along Hale Avenue. Frequent Route 68 (Gilroy Transit Center to San Jose Diridon Transit Center) serves bus stops at the intersection of Hale Avenue and Wright Avenue, approximately 1/3-mile walking distance from the project site. Local Route 87 (Morgan Hill Civic Center to Burnett Avenue) serves bus stops at Main Avenue and Monterey Road, approximately 1/2-mile walking distance from the project site. A typical mode split in Morgan Hill would

be a three percent transit share. Assuming up to three percent transit mode share for the project equates to no more than one transit rider during each of the peak hours. The transit ridership demands of the proposed project can be accommodated by the existing transit facilities.

Pedestrian generators in the project vicinity include commercial uses along Monterey Road (including Downtown Morgan Hill), Morgan Hill Community Adult School, and bus stops discussed above. In the vicinity of the project site, there are sidewalks along both sides of Monterey Road and pedestrian crosswalk facilities at the adjacent nearby signalized intersections at Old Monterey Road and Wright Avenue.

Access to nearby pedestrian generators is described below:

- Downtown Morgan Hill – Continuous sidewalks provided along both sides of Monterey Road. An east-west crossing across Monterey Road is provided at Monterey Road/Wright Avenue.
- Morgan Hill Community Adult School – Continuous sidewalks provided along both sides of Monterey Road. An east-west crossing across Monterey Road is provided at Monterey Road/Wright Avenue.
- Route 68 Bus Stop at Hale Avenue/Wright Avenue - Continuous pedestrian route provided via sidewalks provided along Monterey Road and along both sides of Wright Avenue.
- Route 68 and 87 Bus Stop at Main Avenue/Monterey Road – Continuous sidewalks provided along both sides of Monterey Road. An east-west crossing across Monterey Road is provided at Monterey Road/Wright Avenue.

It should be noted that none of the curb ramps at the Monterey/Wright intersection are ADA-compliant. The City may require that the project contribute to construction of ADA-compliant ramps at the identified intersection.

In the project vicinity, there are bike lanes located along Monterey Road, Main Avenue, and Cochrane Road. The project is not expected to generate a significant amount of bicycle trips. The demand generated by the proposed project could be accommodated by the existing bicycle facilities in the vicinity of the project site.

Traffic Study Requirements

The need for the preparation of a comprehensive traffic impact analysis for a particular development is based on its estimated trip generation and its effect on surrounding transportation facilities. The City of Morgan Hill requires the completion of a full traffic impact analysis if one of the following criteria are met:

1. Generates 100 or more net new peak hour trips; except that projects located in the 14-block Downtown Core area are exempt from this requirement. Net new peak hour trips are defined as the number of trips generated by the proposed development minus trips generated by existing development on the project site. (This threshold is consistent with the Valley Transportation Authority (VTA) policy.)
2. Adds 50 to 99 net new peak hour trips to the roadway system where nearby intersections are currently operating at or below the City's LOS standard, or projected to operate at or below the City's LOS standard with traffic added by approved developments; except that projects located in the 14-block Downtown Core area are exempt from this requirement. Adjacent or nearby intersections are defined as intersections to which the proposed development or proposed land use change adds 10 or more vehicle peak hour trips per lane.

3. Creates a transportation issue that City staff requests to have analyzed.

The proposed project will result in the addition of 19 AM peak-hour trips and 25 PM peak-hour trips to the roadway system under existing plus project conditions.

A review of intersection levels of service at the selected study intersections indicates that all study intersections are projected to operate at acceptable conditions during each of the peak hours. The addition of project traffic at each of the study intersections would not result in an adverse effect on operations based on the City's intersection operations standards.

Therefore, the evaluation of trip generation and intersection operations concludes that the proposed project will not result in an adverse effect on operations to intersections in the project area and is consistent with the *Morgan Hill 2035 General Plan* goals and policies. However, City staff ultimately determines the need for traffic studies for new developments.



Memorandum

Date: July 30, 2021
To: Nick Pappani, Raney Planning & Management, Inc.
From: Robert Del Rio, T.E., Luis Descanzo
Subject: VMT Assessment for the Proposed Magnolias Residential Development in Morgan Hill, California

Hexagon Transportation Consultants, Inc. has completed a vehicle-miles traveled (VMT) assessment for the proposed affordable housing development at 17965 Monterey Road in Morgan Hill, California (APN: 764-12-006) (see Figure 1). The project as proposed consists of 66 affordable apartment units on a site that is mostly undeveloped with some vacant structures (see Figure 2 for site plan). The purpose of this memorandum is to provide an assessment of the project's effect on VMT. The VMT assessment methodology and results are discussed below.

VMT Assessment Methodology and Results

Pursuant to Senate Bill (SB) 743, the California Environmental Quality Act (CEQA) 2019 Update Guidelines Section 15064.3, subdivision (b) states that VMT will be the metric in analyzing transportation impacts for land use projects for CEQA purposes. VMT is the total miles of travel by personal motorized vehicles a project is expected to generate in a day. VMT measures the full distance of personal motorized vehicle-trips with one end within the project. Typically, development projects that are farther from other, complementary land uses (such as a business park far from housing) and in areas without transit or active transportation infrastructure (bike lanes, sidewalks, etc.) generate more driving than development near complementary land uses with more robust transportation options. Therefore, developments located in a central business district with high density and diversity of complementary land uses and frequent transit services are expected to internalize trips and generate shorter and fewer vehicle trips than developments located in a suburban area with low density of residential developments and no transit serve in the project vicinity.

The *Technical Advisory on Evaluating Transportation Impacts in CEQA* published by the Governor's Office of Planning and Research (OPR) in December 2018 provides recommendations regarding VMT evaluation methodology, significance thresholds, and screening thresholds for land use projects. The OPR screening thresholds recommendations are intended to identify when a project should be expected to cause a less-than-significant impact without conducting a detailed VMT evaluation. The OPR screening thresholds recommendations are based on project size, maps, transit availability, and provision of affordable housing. The OPR recommendations include the screening thresholds criteria listed below.

- OPR recommends that office or residential projects not exceeding a level of 15 percent below existing VMT per capita may indicate a less-than-significant impact on VMT.

- OPR recommends that projects (including office, residential, retail, and mixed-use developments) proposed within $\frac{1}{2}$ mile of an existing major transit stop or within $\frac{1}{4}$ mile of an existing stop along a high-quality transit corridor may be presumed to have a less-than-significant impact on VMT.
- OPR recommends that 100 percent affordable residential development in infill locations be presumed to have a less-than-significant impact on VMT.
- OPR recommends that projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant impact on VMT.

The City of Morgan Hill, at the time of this report, is undertaking a process of updating its General Plan policies to incorporate VMT methodologies and significance thresholds to be consistent with SB 743 but has not released draft thresholds. In the absence of an adopted, or even draft, City policy with numeric thresholds, this assessment relies on OPR guidelines in analyzing the project's effects on VMT.

The proposed project would consist of 66 affordable housing apartment units. According to the OPR recommendations, since the proposed project would be a 100 percent affordable residential development it may be presumed to have a less-than-significant impact on VMT. The OPR guidelines state that adding affordable housing to infill locations generally improves jobs-housing match, in turn shortening commutes and reducing VMT. In addition, the OPR guidelines state that in areas where existing jobs-housing match is closer to optimal, low-income housing nevertheless generates less VMT than market-rate housing.

Furthermore, the pedestrian generators near the project vicinity would help support a reduced project VMT. Pedestrian generators in the project vicinity (within $\frac{1}{4}$ to 1-mile radius) include commercial uses along Monterey Road, Morgan Hill Community Adult School, and bus stops along Hale Avenue and Main Avenue. These transit services would provide access to commercial uses (restaurant, retail, etc.) along Monterey Road and Downtown Morgan Hill, less than $\frac{1}{2}$ -mile south of the project site. There are also many existing employment uses (light industrial and manufacturing) within walking distance of the site. As a result of the project proposing 100 percent affordable units and due to pedestrian generators located less than a 1-mile radius, it can be presumed that the project would have a less-than-significant impact on VMT.

Figure 1
Site Location

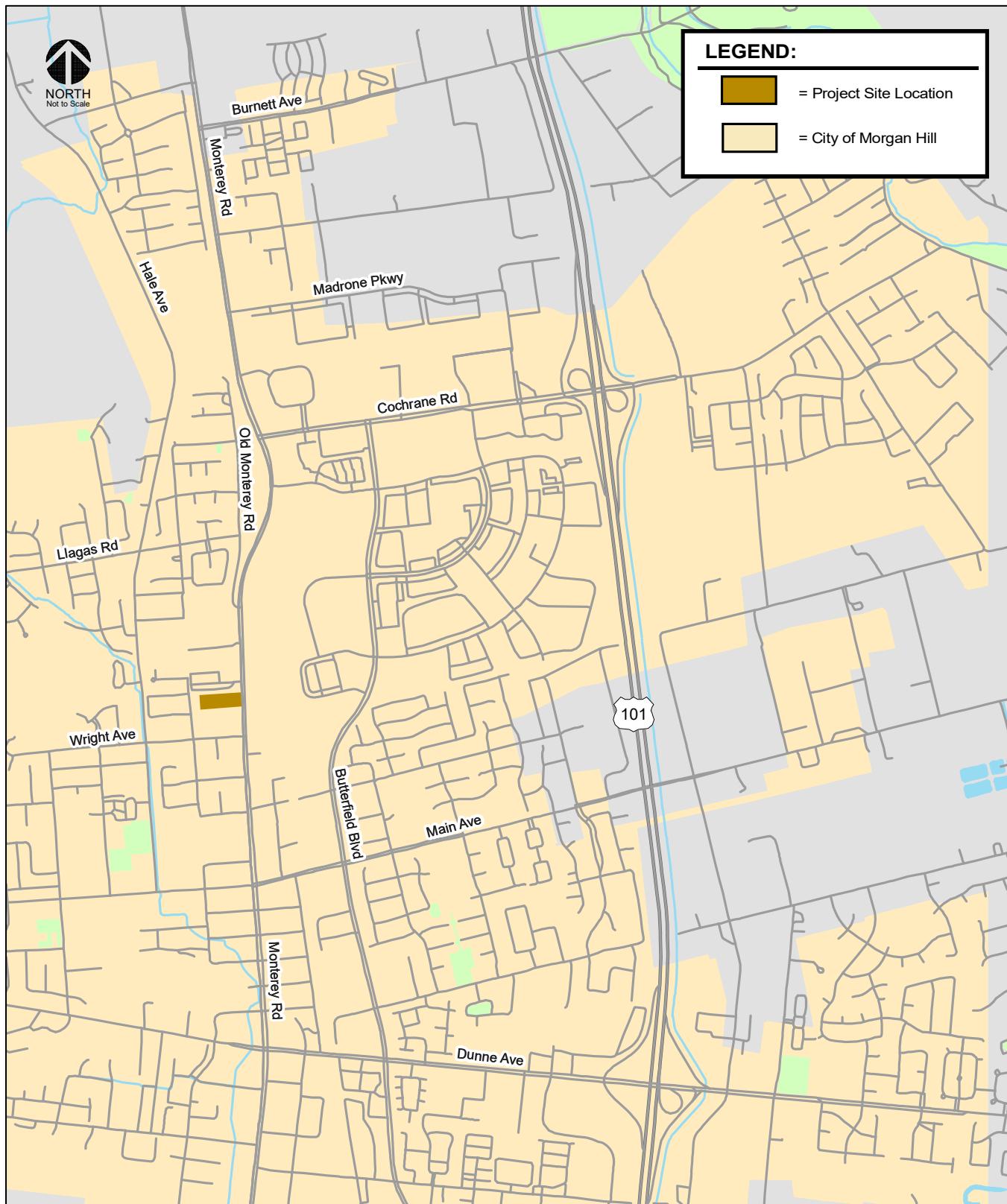


Figure 2
Site Plan

