Engineering & Traffic Surveys 2016

City of Millbrae, CA

July 11, 2016

Prepared by:
Traffic Patterns
PO BOX 25
Danville, CA 94526

TRAFFIC PATTERNS

July 11 ,2016

Khee Lim
City of Millbrae
621 Magnolia Avenue
Millbrae, CA 94030

Subject: Millbrae – Citywide Engineering & Traffic Survey 2016

Dear Khee,

Enclosed is the Millbrae – Citywide Engineering & Traffic Survey 2016 report. The report includes Engineering & Traffic Surveys for the following 13 speed zone segments:

1 .California Dr – City Limits to Linden Av
2. E Millbrae Av – El Camino Real to Old Bayshore Av
3. Helen Dr – Larkspur Dr to 600-FT E of Evergreen Wy
4. Larkspur Dr – Skyline Blvd to Helen Dr
5. Magnolia Av – Park Blvd to Millbrae Av
6. Millbrae Av – Skyline Blvd to El Camino Real
7. Murchison Dr – Fronter Wy to Marcella Wy
8. Old Bayshore Hwy – E City Limit to W City Limit
9. Richmond Dr – Tioga Dr to W City Limit
10. Rollins Rd – S City Limit to Camino Millenia
11. Skyline Blvd – Larkspur Dr to Millbrae Av
12. Taylor Blvd – Minorca Wy to Magnolia Av
13. Vallejo Dr – Frontera Wy to Millbrae Av

I, Jaime O. Rodriguez, do hereby certify that these Engineering & Traffic Surveys for the City of Millbrae were performed under my supervision. I certify, that I am experienced in performing Engineering & Traffic Surveys and that I am a registered Traffic Engineer, in good standing, with the State of California.

1. Introduction

This Engineering & Traffic Survey report is intended to serve as the basis for the establishment and enforcement of the following speed zone segments within the City of Millbrae, CA:

1. California Dr – City Limits to Millbrae Av
2. E Millbrae Av – El Camino Real to Old Bayshore Av
3. Helen Dr – Larkspur Dr to 600-FT E of Evergreen Wy
4. Larkspur Dr – Skyline Blvd to Helen Dr
5. Magnolia Av – Park Blvd to Millbrae Av
6. Millbrae Av – Skyline Blvd to El Camino Real
7. Murchison Dr – Fronter Wy to Marcella Wy
8. Old Bayshore Hwy – E City Limit to W City Limit
9. Richmond Dr – Tioga Dr to W City Limit
10. Rollins Rd – S City Limit to Camino Millenia
11. Skyline Blvd – Larkspur Dr to Millbrae Av
12. Taylor Blvd – Minorca Wy to Magnolia Av
13. Vallejo Dr – Frontera Wy to Millbrae Av

The development of the Engineering & Traffic Surveys was authorized by the City of Millbrae – Department of Public Works in efforts to ensure that valid surveys are provided to allow local law enforcement to use radar enforcement.

2. Methodology for Engineering & Traffic Surveys

California Vehicle Code (CVC)

Engineering & Traffic Surveys establish the advisory speeds for which motorists should travel on a particular roadway segment when that roadway segment does not satisfy the California Vehicle Codes (CVC) Section 22352 for Prima Facie Speed Limits, normally 25-MPH for local (residential) and business district streets.

Engineering & Traffic Surveys are conducted by a Registered Engineer as required by CVC Section 40802. Surveys should be current to within seven (7) years, preferably five (5) years to proactively measure changes in roadway conditions. The surveys may be extended an additional three (3) years, for a maximum of ten (10) years since the initial survey development, if a Registered Engineer finds that no significant changes in roadway or traffic conditions have occurred as specified by CVC Section 40802.

When conducting an Engineering & Traffic Survey, the preparer takes the following types of data into consideration: existing vehicle speeds during free-flowing conditions, roadway geometry, collision history, existing traffic controls, and other Contributing Factors that may not be readily apparent to motorists but that influence roadway safety. Factors not readily apparent to motorists can include adjacent land use, roadway improvements (i.e., curb & gutter, sidewalk facilities for pedestrian, and bicycle route facilities), extreme roadway geometry (i.e., horizontal and vertical curvature), and school/senior facilities.

Upon the completion of an Engineering & Traffic Survey, local law enforcement may use radar to enforce speed limits. Speed limits established without an Engineering & Traffic Survey may result in *Speed Traps*. CVC Section 40802 protects motorists against Speed Traps be identifying criteria that local jurisdictions must adhere here when preparing Engineering & Traffic Surveys.

2014 California MUTCD

The Federal Highway Administration (FHWA) maintains the Manual on Uniform Traffic Control Devices (MUTCD) to help establish uniformity in traffic control devices across the nation. Some states, including California, maintain additional standards above the federal MUTCD, to help establish consistency in the deployment of traffic control standards specific to their state. The California MUTCD was last updated in 2014.

Included within the 2014 California MUTCD – Section 2B.13 (Speed Limit Sign) is additional guidance that engineer must follow in the development of Engineering & Traffic Surveys:

> *Standard:*
> *When a speed limit is to be posted, it shall be established at the nearest 5-MPH increment to the 85-th percentile speed of free-flowing traffic, except in the two Options below.*

Option1: The posted speed limit may be reduced by 5-MPH from the nearest 5-MPH increment of the 85-th percentile speed, in compliance with CVC Sections 627 and 22358.5. See Standard below for documentation requirements.

Option 2: For cases in which the nearest 5 MPH increment of the 85th-th percentile speed would require a rounding up, then the speed limit may be rounded down to the nearest 5-MPH increment below the 85th percentile speed, if no further reduction is used. Refer to CVC Section 21400(b).

Standard:
If the speed limit to be posted has had the 5-MPH reduction applied, then an Engineering & Traffic Survey shall document in writing the conditions and justifications for the lower speed and be approved by a Registered Civil or Traffic Engineer. The reasons for the lower speed shall be in compliance with CVC Sections 627 and 22358.5.

Engineering & Traffic Survey Preparation

If roadway or adjacent land uses change significantly after the initial development of an Engineering & Traffic Survey, a new survey should be prepared within one year of the change. Examples of significant changes can include:

Roadway Geometry Changes:	Major roadway restriping to add or reduce lanes of travel, addition of bicycle lanes or pedestrian facilities, or addition of painted or landscaped median island facilities that channelize and redirect traffic.
Land Use Changes:	Major changes in land use activity that generate from private-sector led redevelopment or General Plan development.
Parking Modifications:	Changes in the roadway environment that are led by parking modifications including the addition or removal of parking, or modification of parking to angled parking.
Traffic Calming:	Addition of traffic calming measures such as roadway deflection devices, addition of dynamic vehicle speed feedback signs that advise motorists of their travel speeds to encourage vehicle speed reductions, or passive/active warning devices to bring driver awareness to bicycle/pedestrian activity.

3. Engineering & Traffic Survey Evaluations

13 Engineering & Traffic Surveys were prepared by Traffic Patterns as part of the City of Millbrae – Engineering & Traffic Survey 2016 project. The speed zone segments studied as part of this project are identified in Table 1 below.

Table 1
City of Millbrae – Engineering & Traffic Survey 2016
Speed Zone Segment

No.	Street	Limit 1	Limit 2
1	California Drive	City Limit	Millbrae Avenue
2	E Millbrae Avenue	El Camino Real	Old Bayshore Avenue
3	Helen Drive	Larkspur Drive	600-FT E of Evergreen Way
4	Larkspur Drive	Skyline Boulevard	Helen Drive
5	Magnolia Avenue	Park Boulevard	Millbrae Avenue
6	Millbrae Avenue	Skyline Boulevard	El Camino Real
7	Murchison Drive	Frontera Way	Marcella Way
8	Old Bayshore Hwy	East City Limit	West City Limit
9	Richmond Drive	Tioga Drive	Magnolia Drive
10	Rollins Road	South City Limit	Camino Millenia
11	Skyline Boulevard	Larkspur Drive	Millbrae Avenue
12	Taylor Boulevard	Minorca Way	Magnolia Avenue
13	Vallejo Drive	Frontera Way	Millbrae Avenue

As part of the development of the Engineering & Traffic Surveys for each speed zone segment, Traffic Patterns conducted the following tasks:

A. Field Survey Assessment

Weekday field assessments were conducted to identify the following elements:

- Condition of existing Speed Limit Signage and Roadway marking conditions
- Bicycle & Pedestrian Demand
- Bicycle & Pedestrian Facilities
- School-aged Pedestrian Demand
- Roadway Geometry (lane widths, curb-to-curb widths, horizontal/vertical curves)
- Land Use Activity

B. Traffic Data Collection

Traffic Data Services was subcontracted by Traffic Patterns to collect vehicle speed and occupancy data using mechanical counters. Traffic Data Services installed the counters at all the speed zone segments in Table 1 over a period of two days, Wednesday, April 20, 2016 or Tuesday, May 3, 2016.

The data was used to established both identify individual vehicle speed data for the Engineering & Traffic Surveys and to calculate the Average Daily Traffic (ADT) volumes per approach for each speed zone segment.

C. Engineering & Traffic Survey Development

Using the field observation data collected by Traffic Patterns and the traffic data collected by Traffic Data Services, the Engineering & Traffic Surveys contained within this report were prepared.

Traffic Patterns instructed Traffic Data Services to general three reports for each approach of each speed zone segment:

- 15-minute Increment Traffic Volume with ADT Summary Reports
- Raw Data Report Documenting Each Individual Vehicle Count with Speed and Time Stamp

The reports were analyzed by Traffic Patterns to manually calculate the 85-th percentile, Mean, and 10-MPH Pace calculations provided within this report. Traffic Patterns used a minimum 5-second headway between data points to ensure that free flow vehicle speeds were provided.

The following factors were calculated by Traffic Patterns and referenced within each Engineering & Traffic Survey.

10-MPH Pace:	The 10-MPH increment range in which the largest number of vehicles travel on the roadway. Speed limits should fall within the 10-MPH Pace to avoid Speed Trap conditions.
10-MPH Pace Percentage:	The percentage of vehicles of all the vehicles surveyed that travel within the 10-MPH Pace.
Mean Speed:	The mid-point speed of all the vehicles surveyed.

85-th Percentile Speed: The speed at which 85% of all vehicles surveyed travel at or below. This factor is the primary guiding speed at which recommended speed limits should be set, in compliance with CVC and 2014 CA MUTCD guidance.

Collision History: The City of Millbrae furnished collision data for this project including 12-month data for the period between July 1, 2015 and June 30 2016. Using the city-furnished data Traffic Patterns calculated the 1-Year Collision Rate using the following equation:

$$\text{Collision Factor} = \frac{\text{No. Collisions in 12 Months} \times 10^6}{\text{ADT} \times 365 \text{ Days} \times 1 \text{ Year} \times \text{Segment Miles}}$$

4. Engineering & Traffic Survey Format

Included within each Engineering & Traffic Survey is a one-page summary of the field conditions identified by Traffic Patterns. The actual Engineering & Traffic Survey follows the summary and includes the following elements:

- One-Page Detail with Segment Data by Direction of Travel and Diagram. This form includes the Traffic Engineer certification by Traffic Patterns and authorization by the City of Millbrae
- Two-Page Detail of Contributing Factors of the survey
- One-Page Speed Data Diagram with Speed Calculations
- One-Page 85-th Percentile S-Curve Calculations

City of Millbrae
Summary of Engineering Traffic Survey Study 2016

No.	Street Segment ----- Speed Zone Segment	Speed Limit (MPH)		85% Speed (MPH)		Median Speed (MPH)		10 MPH Pace Range % in Pace		Justification of Proposed Speed Limit
		Previous	Proposed	N-E	S-W	N-E	S-W	N-E	S-W	
1	California Drive ----- City Limit to Millbrae Avenue	35	30	31.3	35.2	28.5	26.4	23-32 75.7%	22-31 81.0%	Recommend reducing the posted speed limit from 35-MPH to 30-MPH to be consistent with the 85-th percentile and 10-MPH vehicle pace speeds calculated as part of this Engineering & Traffic Survey. California Drive has sharp horizontal curve near the north end of the speed zone segment and reduced speed limit will help to encourage slower vehicle speeds near the uncontrolled pedestrian crosswalk at S Irwin Place.
2	East Millbrae Avenue ----- El Camino Real to Old Bayshore Avenue	35	35	34.2	38.1	30.9	34.3	26-35 76.9%	31-40 65.1%	Recommend maintaining the existing 35-MPH posted speed limit. This includes a 5-MPH reduction in the rounded 85-th percentile calculation for the westbound E Millbrae Avenue approach to provide consistency in posted speed limits for the entire speed zone segment. The 35-MPH posted speed limit is also within and consistent with the observed 10-MPH pace of both street approaches.
3	Helen Drive ----- Larkspur Drive to 600-FT East of Evergreen Way	30	30	30.0	31.0	28.3	29.1	24-33 88.0%	24-33 84.5	Recommend maintaining existing 30-MPH posted speed limit as it is consistent with existing vehicle speeds of the roadway and the calculated 85-th percentile and 10-MPH pace speeds of this Engineering & Traffic Survey.
4	Larkspur Drive ----- Skyline Boulevard to Helen Drive	30	30	30.0	31.2	29.0	27.4	26-35 80.0%	22-31 79.2%	Recommend maintaining existing 30-MPH posted speed limit as it is consistent with existing vehicle speeds of the roadway and the calculated 85-th percentile and 10-MPH pace speed of this Engineering & Traffic Survey.

City of Millbrae
Summary of Engineering Traffic Survey Study 2016

No.	Street Segment ----- Speed Zone Segment	Speed Limit (MPH)		85% Speed (MPH)		Median Speed (MPH)		10 MPH Pace Range % in Pace		Justification of Proposed Speed Limit
		Previous	Proposed	N-E	S-W	N-E	S-W	N-E	S-W	
5	Magnolia Avenue ----- Park Boulevard to Millbrae Avenue	25	25	27.4	26.2	25.1	24.3	22-31 81.8%	20-29 83.2%	Recommend maintaining existing 25-MPH posted speed limit, this includes a 5-MPH reduction from the rounded 85-th percentile speeds to accommodate the high volume of pedestrian activity on Magnolia Avenue from the two adjacent high school at each end of the speed zone segment. In addition, Magnolia Avenue has a high number of all-way stop locations and horizontal curves in the roadway segment.
6	Millbrae Avenue ----- Skyline Boulevard to El Camino Real	25	25	30.2	30.8	28.6	28.7	24 - 33 94.3%	25-34 85.2%	Recommend maintaining the existing 25-MPH posted speed limit, which includes a 5-MPH reduction from the rounded 85-th percentile speeds due to the unusual horizontal and vertical curves in the roadway and uncontrolled pedestrian crossing adjacent to the Millbrae Spur Trail and High School which serve suggested route to school activities.
7	Murchison Drive ----- Frontera Way to Marcella Way	30	30	33.1	32.0	30.2	28.5	26-35 75.5%	24-33 78.2%	Recommend maintaining existing 30-MPH posted speed limit, this includes a 5-MPH reduction from the rounded 85-th percentile speed in the eastbound direction of Murchison Drive. The reduction will provide consistency in speed limits for the entire segment and accommodates the high pedestrian volume from Spring Valley Elementary School and the adjacent park space activities. The 30-MPH speed limit is consistent within and consistent with the 10-MPH pace of both approaches of Murchison Drive.
8	Old Bayshore Highway ----- East City Limit to West City Limit	35	35	34.2	32.2	30.3	26.4	22-31 59.8%	19-28 51.2%	Recommend maintaining existing 35-MPH posted speed limit as it is consistent with calculated 85-th percentile and 10-MPH pace speeds calculated as part of this Engineering & Traffic Survey.

City of Millbrae
Summary of Engineering Traffic Survey Study 2016

No.	Street Segment ----- Speed Zone Segment	Speed Limit (MPH)		85% Speed (MPH)		Median Speed (MPH)		10 MPH Pace Range % in Pace		Justification of Proposed Speed Limit
		Previous	Proposed	N-E	S-W	N-E	S-W	N-E	S-W	
9	Richmond Drive ----- Tioga Drive to Magnolia Drive	25	25	32.4	30.8	28.0	26.8	22-31 62.0%	23-32 65.8	Recommend retaining existing 25-MPH posted speed limit. The rounded 85-th percentile speeds are 30-MPH but a 5-MPH reduction is suggested due to the high amount of pedestrian activity generated from the adjacent Taylor Middle School, park land, and high-density residential land uses. A 25-MPH posted speed limit is within the 10-MPH calculated as part of this Engineering & Traffic Survey.
10	Rollins Road ----- South City Limit to Camino Millenia	35	25	24.5	25.1	22.4	22.6	26-35 80.5%	28-37 85.5%	Recommend reducing posted speed limit from 35-MPH to 25-MPH to be consistent with 85-th percentile and 10-MPH speed calculated as part this Engineering & Traffic Survey. Rollins Road terminates into the Millbrae BART Station parking lot north of Millbrae Avenue. South of Millbrae Avenue the portion of Rollins Road within the city limits is short with closely spaced traffic signal facilities resulting in lower vehicle speeds compared to the portion of Rollins Road south of the city limits as a result.
11	Skyline Boulevard ----- Larkspur Drive to Millbrae Avenue	40	35	36.5	32.8	33.1	32.8	39-48 70.3	39-48 85.6%	Recommend reducing posted speed limit from 40-MPH to 35-MPH to be consistent with 85-th percentile and 10-MPH statistics from this Engineering & Traffic Survey. Skyline Boulevard runs parallel to I-280 and has a high bicycle use during evening and weekend periods.

City of Millbrae
Summary of Engineering Traffic Survey Study 2016

No.	Street Segment ----- Speed Zone Segment	Speed Limit (MPH)		85% Speed (MPH)		Median Speed (MPH)		10 MPH Pace Range % in Pace		Justification of Proposed Speed Limit
		Previous	Proposed	N-E	S-W	N-E	S-W	N-E	S-W	
12	Taylor Boulevard ----- Minorca Way to Magnolia Avenue	25	25	27.2	27.4	24.6	25.0	30-39 81.0%	30-39 82.0%	Recommend maintaining existing 25-MPH speed limit as it is consistent with 85-th percentile and 10-MPH speeds calculated as part of this Engineering & Traffic Survey. Taylor Boulevard also experiences a high volume of pedestrian activity due to its residential nature and proximity to Taylor Middle School and the Millbrae Spur Trail.
13	Vallejo Drive ----- Frontera Way to Millbrae Avenue	30	30	31.0	30.0	25.6	26.7	31-40 62.3%	32-41 70.9%	Recommend maintaining existing 30-MPH speed limit as it is consistent with 85-th percentile and 10-MPH speeds calculated as part of this Engineering & Traffic Survey. Vallejo Drive is on a hillside with a consistent grade on its entire length.

City of Millbrae
Summary of Engineering Traffic Survey Study 2016

No.	Street Segment ----- Speed Zone Segment	Speed Limit (MPH)		85% Speed (MPH)		Median Speed (MPH)		10 MPH Pace Range % in Pace		Justification of Proposed Speed Limit
		Previous	Proposed	N-E	S-W	N-E	S-W	N-E	S-W	

CERTIFICATION:

The recommended speed limits for the above roadway segments were determined in accordance with the requirements for an Engineering & Traffic Survey set forth by the California Vehicle Code. Each Engineering & Traffic Survey was conducted by a Registered Traffic Engineer within the State of California and Approved and Authorized for release by the City of Millbrae.

Engineer's Stamp

7/11/16

Surveys Reviewed by: Khee Lim, City Engineer — Date

Engineering & Traffic Surveys - Prepared by:
Jaime O. Rodriguez, T.E. - Traffic Patterns

1. California Drive

South City Limits to Linden Avenue

Roadway Conditions

California Drive within the City of Millbrae city limits begins just north of Murchison Drive, continues underneath the Millbrae Avenue overpass, and ends to Linden Avenue. The entire segment is approximately 900-FT. South of Murchison Drive the segment continues into the City of Burlingame.

The existing posted speed limit, prior to this Engineering & Traffic Survey, is 35-MPH. The new proposed speed limit is 30 MPH to be consistent with the 85th percentile and 10-MPH vehicle pace speeds calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
California Drive	South City Limits to Linden Avenue	35	31.3 NB 35.2 SB	23-32 NB 22-31 SB	30

This speed zone segment is located adjacent to the BART and Caltrain stations resulting in high pedestrian activity and high volume driveway activity during the commute periods of the day. An uncontrolled crosswalk is located near mid-block of the speed zone segment at S Irwin Place. Land uses adjacent to the speed zone segment include predominantly office and industrial uses and the adjacent transit stations uses. The entire speed zone segment is improved with sidewalk, curb & gutter facilities and Sharrows for provided on both sides of the street. On-Street parking using is heavy due to the adjacent public transit stations.

City of Millbrae, CA

Engineering and Traffic Survey for:

California Drive

City Limit to Millbrae Avenue

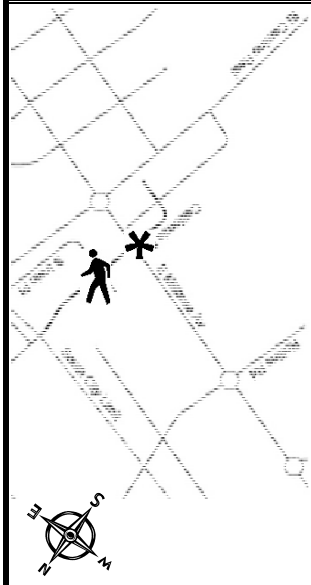
Segment Data by Direction of Travel	NB	SB
85th Percentile Speed (MPH)	31.3	35.2
Rounded 85th Percentile Speed (MPH)	30.0	35.0
Mean (Average) Speed (MPH)	28.5	26.4
10-MPH Pace / % of Vehicles in Pace	23–32/75.7%	22–31/81.0%
No. of Collisions in 12 Months / 1-Yr Collision Rate	1 / 3.144	
Survey Segment Length (Feet)/Avg. Daily Traffic	900-FT / 5,113 ADT	
Previous Speed Limit	35	35
Date of Previous Survey	7-18-2011	
Date of This Survey/Weather Conditions	4-20-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	2 / C	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Collector Street
	Land Use is Predominantly:	Commercial
	All-Way Stop Controls at:	None
	Traffic Signal Controls at:	None
	Uncontrolled Pedestrian Crossing Locations:	S Irwin Place

Diagram



Scale: None

Legend:
- Traffic Signal
- All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

ENTIRE SEGMENT
Recommended Speed Limit (MPH): 30

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae — Date: 7-11-2016

Engineer's Stamp
Survey Prepared by:

Traffic Patterns

City of Millbrae, CA

Engineering and Traffic Survey for:

California Drive
City Limit to Millbrae Avenue

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	Underneath Overpass
Date of Data Collection:	4-20-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

☐ Local ☑ Collector

☐ Arterial (Minor) ☐ Arterial (Major)

Average Daily Traffic (ADT) Volume: 5,113 Current Speed Limit: 35

Survey Segment Length (FT): 900 Street Width (curb to curb): 40-FT

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	1	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:	✓	Yes		No
Marked but Uncontrolled Crosswalks:	✓	Yes		No
Existing On-Street Parking Available:	✓	Yes		No
Approximate % of On-Street Parking Use:	80	%		
Segment part of a Suggested Route to School:		Yes	✓	No
Schools Served by Roadway Segment:	N/A			
Driveway Spacing (approximate):	300	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

California Drive
City Limit to Millbrae Avenue

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves	
Type	Location
☐ None	North End
☑ Sharp Turns	
☐ Large Radius	

Vertical Curves	
Type	Location
☐ None	
☐ Hills	
☐ Sag Curves	

Controls Summary	
Type	Location
☑ None	
☐ All-Way Stops	
☐ Traffic Signals	

Warning Devices	
Type	Location
☑ None	
☐ Ped. Beacons	
☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 /2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 1

1-Year Collision Rate (ACC/MVM): 3.144

VI. LAND USE SUMMARY

Predominant Land Use Type: Commercial

Other existing Land Use Types in Study Segment: Train Station

Schools in/near Study Segment: None

Parks or Senior Centers in/near Study Segment: None

VII. ADDITIONAL COMMENTS

Recommend reducing the posted speed limit from 35-MPH to 30-MPH to be consistent with the 85-th percentile and 10-MPH vehicle pace speeds calculated as part of this Engineering & Traffic Survey. California Drive has sharp horizontal curve near the north end of the speed zone segment and reduced speed limit will help to encourage slower vehicle speeds near the uncontrolled pedestrian crosswalk at S Irwin Place.

ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

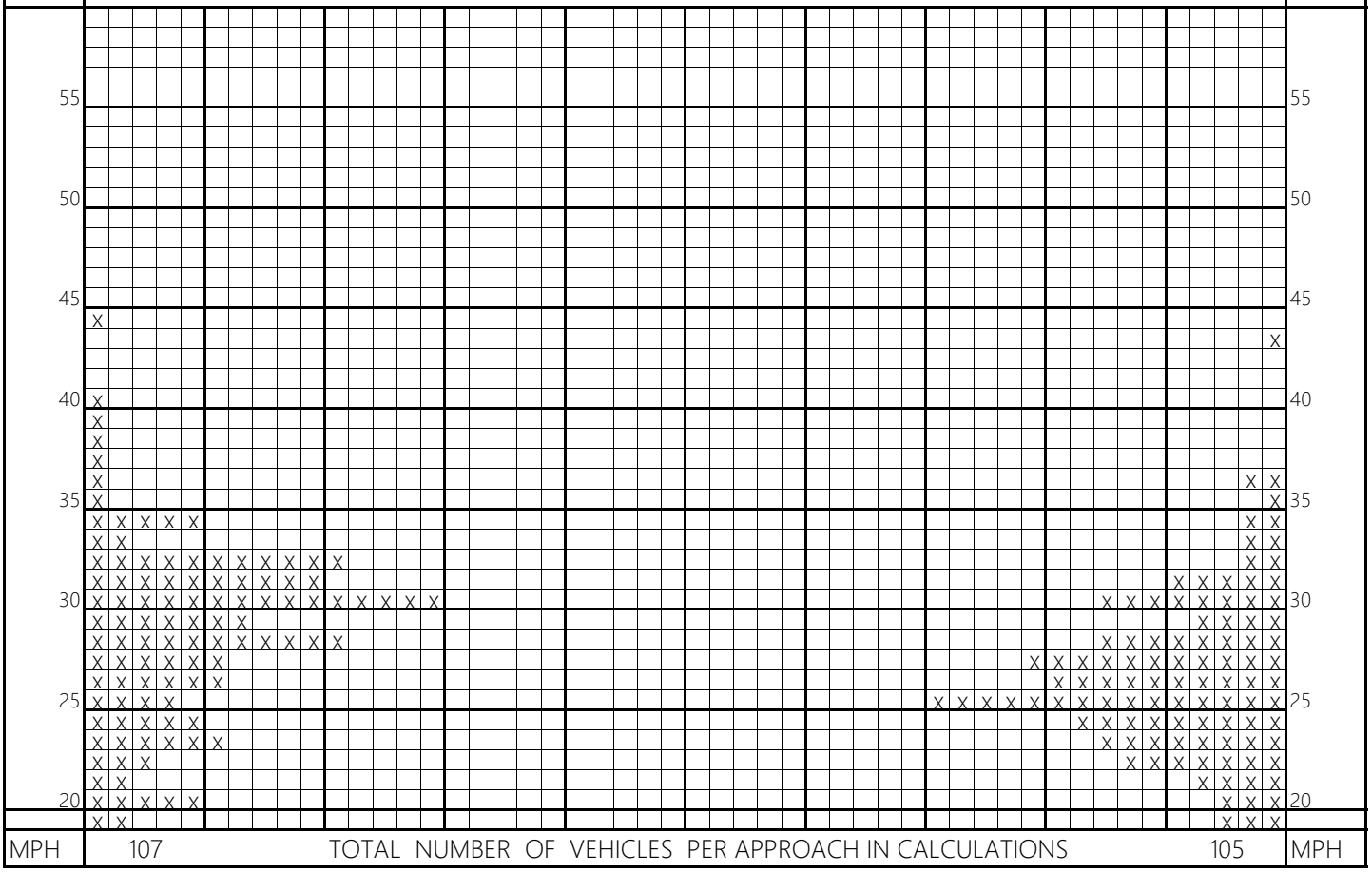
California Drive
City Limit to Millbrae Avenue

Date of Survey: 4/20/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: California Drive
Between: City Limit to Millbrae Avenue
Recorder: Traffic Data Service - Tube Counters

Direction: Northbound and Southbound
Location: Underneath Overpass

VEHICLE SPEED DATA



MPH 107 TOTAL NUMBER OF VEHICLES PER APPROACH IN CALCULATIONS 105 MPH

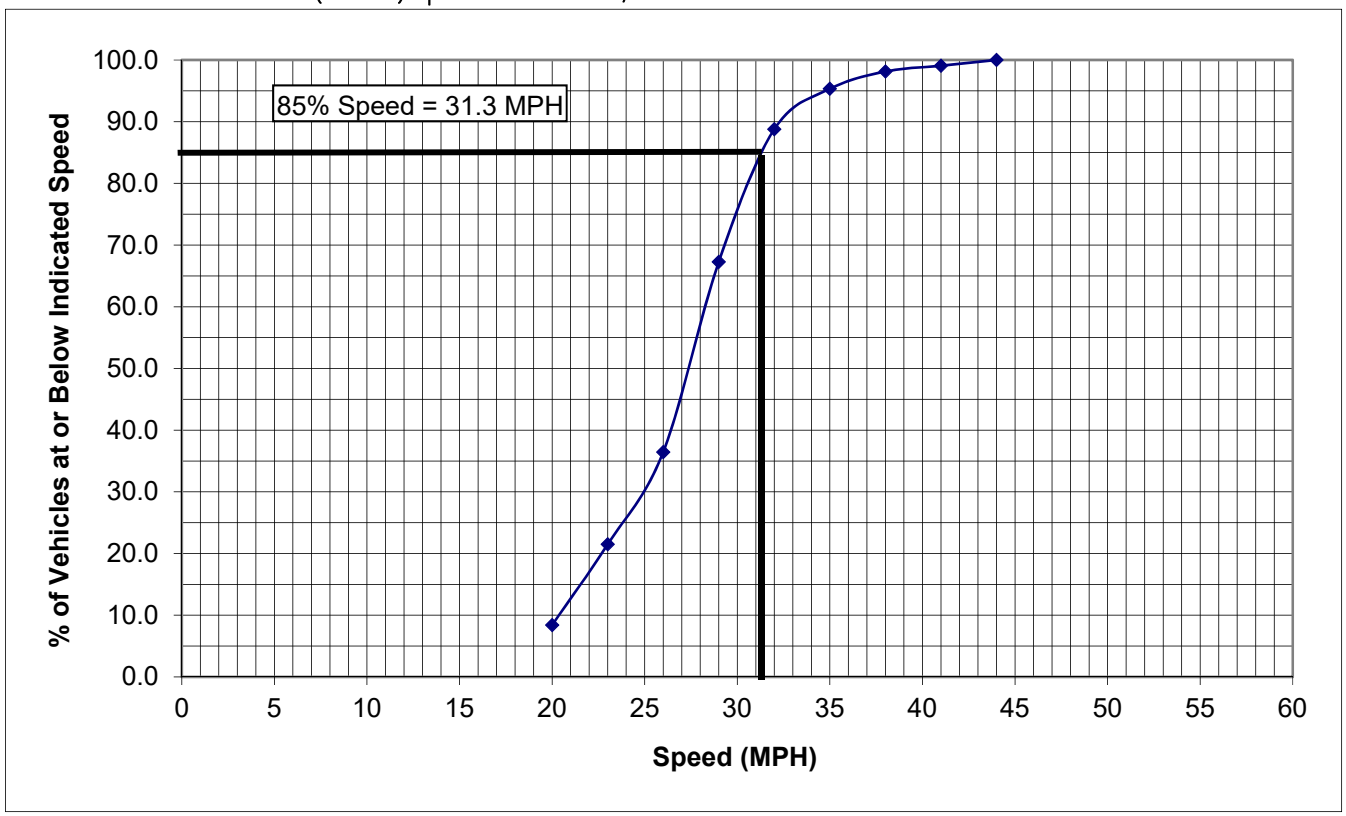
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
N/B	28.5	31.3	23 - 32	75.7%	4.8
S/B	26.4	35.2	22 - 31	81.0%	4.1

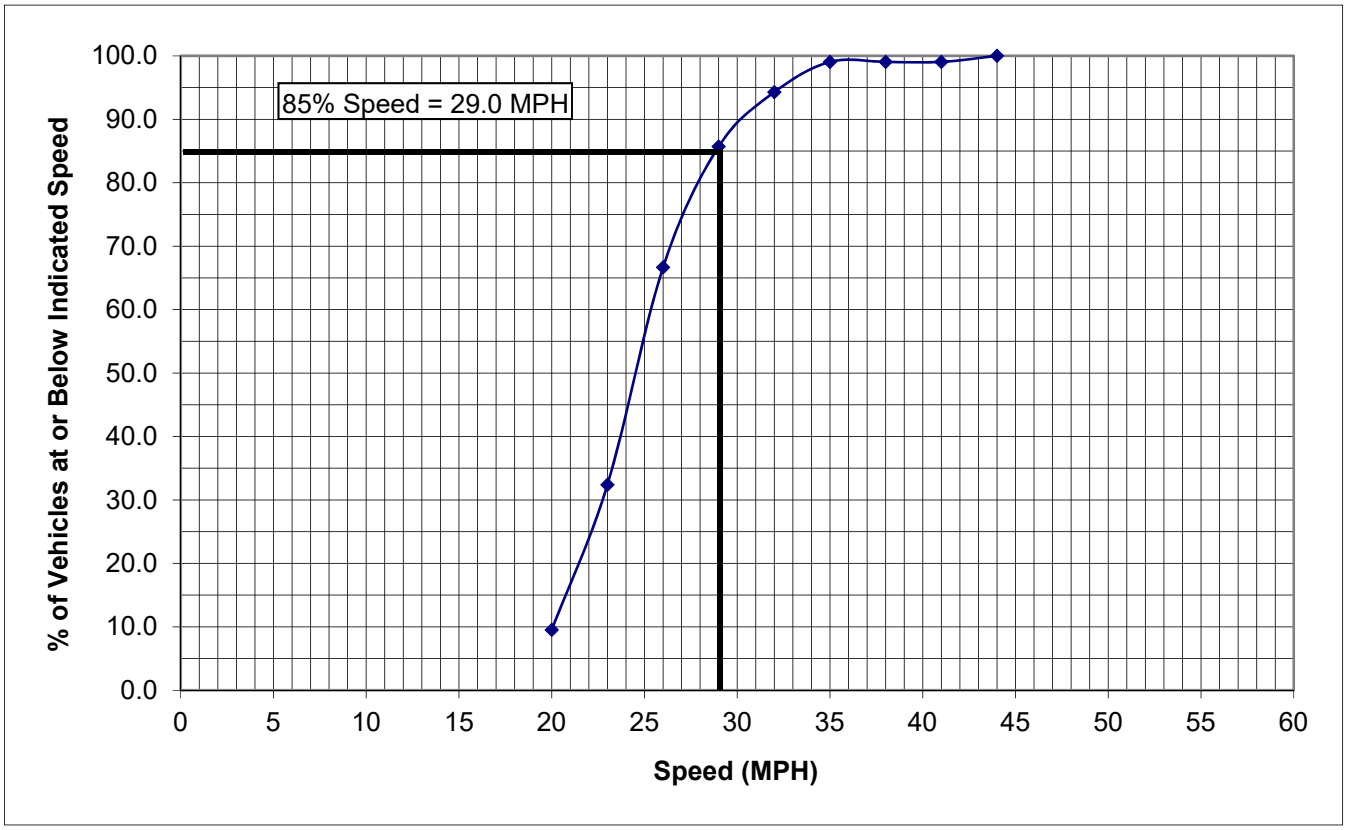
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

California Drive
City Limit to Millbrae Avenue

S-Curve Calculation - 85% (Critical) Speed - N/B



S-Curve Calculation - 85% (Critical) Speed - S/B



2. E Millbrae Avenue

El Camino Real to Old Bayshore Avenue

Roadway Conditions

E Millbrae Avenue is a major east-west arterial through the City of Millbrae with 2 to 3 travel lanes per approach depending on the block segment. Access ramps to Highway 101 bisect the corridor and the street is the primary access route to the adjacent Millbrae BART and Caltrain Station located north and south of E Millbrae Avenue respectively.

Retention of the existing posted speed limit of 35 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
E Millbrae Avenue	El Camino Real to Old Bayshore Avenue	35	34.2 EB 38.1 WB	26-35 EB 31-40 WB	35

The speed zone segment includes two overpasses that traverse over the Highway 101 and BART train tracks. Traffic signal controls are provided at multiple locations for the short 3,600-FT segment including at El Camino Real, Rollins Road, the two Highway 101 ramp intersections, and Old Bayshore Highway. Continuous curb & gutter and sidewalk facilities are provided along the south side. On the north side of the street sidewalks existing only west of the Southbound Highway 101 off-ramp. Land uses adjacent to the speed zone segment include service-oriented commercial uses including the public trans station uses.

City of Millbrae, CA

Engineering and Traffic Survey for:

E Millbrae Avenue

El Camino Real to Old Bayshore Avenue

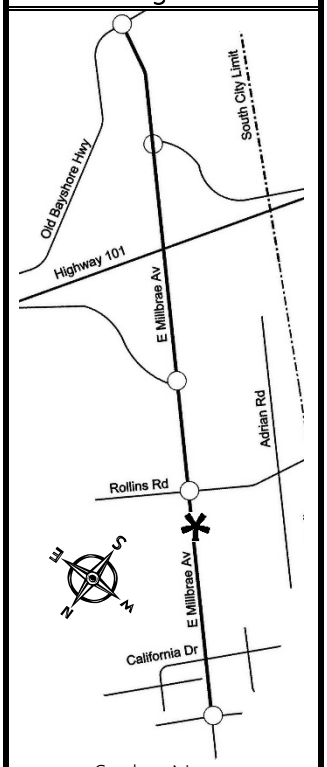
Segment Data by Direction of Travel	EB	WB
85th Percentile Speed (MPH)	34.2	38.1
Rounded 85th Percentile Speed (MPH)	35.0	40.0
Mean (Average) Speed (MPH)	30.9	34.3
10-MPH Pace / % of Vehicles in Pace	26–35/76.9%	31-40/65.1%
No. of Collisions in 12 Months / 1-Yr Collision Rate	27 / 3.915	
Survey Segment Length (Feet)/Avg. Daily Traffic	3,600-FT / 27,713 ADT	
Previous Speed Limit	35	35
Date of Previous Survey	7-6-2011	
Date of This Survey/Weather Conditions	5-3-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	4 / F	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Major Arterial
	Land Use is Predominantly:	Commercial
	All-Way Stop Controls at:	None
	Traffic Signal Controls at:	El Camino Real, Rollins Rd, Hwy 101 Ramps Old Bayshore Hwy
	Uncontrolled Pedestrian Crossing Locations:	None

Diagram



Scale: None

Legend:
- Traffic Signal
- All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

ENTIRE SEGMENT
Recommended Speed Limit (MPH): 35

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Engineer's Stamp
Survey Prepared by:

Traffic Patterns

7-11-2016

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae Date

City of Millbrae, CA

Engineering and Traffic Survey for:

E Millbrae Avenue
El Camino Real to Old Bayshore Avenue

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	West of Rollins Road
Date of Data Collection:	5-3-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

- ☐ Local
- ☐ Collector
- ☐ Arterial (Minor)
- ☑ Arterial (Major)

Average Daily Traffic (ADT) Volume: 27,713 Current Speed Limit: 35

Survey Segment Length (FT): 3,600 Street Width (curb to curb): 70' – 120'

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	2	Lane(s)		
Number of Travel Lanes in SB Direction:	2	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:		Yes	✓	No
Existing On-Street Parking Available:		Yes	✓	No
Approximate % of On-Street Parking Use:	N/A	%		
Segment part of a Suggested Route to School:		Yes	✓	No
Schools Served by Roadway Segment:	N/A			
Driveway Spacing (approximate):	500	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

E Millbrae Avenue
El Camino Real to Old Bayshore Avenue

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves	
Type	Location
☑ None	
☐ Sharp Turns	
☐ Large Radius	

Vertical Curves	
Type	Location
☐ None	Hwy 101 Overpass
☑ Hills	
☐ Sag Curves	

Controls Summary	
Type	Location
☐ None	El Camino Real, Rollins Rd, Hwy 101 Ramps, Old Bayshore Hwy
☐ All-Way Stops	
☑ Traffic Signals	

Warning Devices	
Type	Location
☑ None	
☐ Ped. Beacons	
☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2015

Total No. Collisions in 12 Months: 27

1-Year Collision Rate (ACC/MVM): 3.915

VI. LAND USE SUMMARY

Predominant Land Use Type: Commercial

Other existing Land Use Types in Study Segment: Millbrae BART Station

Schools in/near Study Segment: None

Parks or Senior Centers in/near Study Segment: None

VII. ADDITIONAL COMMENTS

Recommend maintaining the existing 35-MPH posted speed limit. This includes a 5-MPH reduction in the rounded 85-th percentile calculation for the westbound E Millbrae Avenue approach to provide consistency in posted speed limits for the entire speed zone segment. The 35-MPH posted speed limit is also within and consistent with the observed 10-MPH pace of both street approaches.

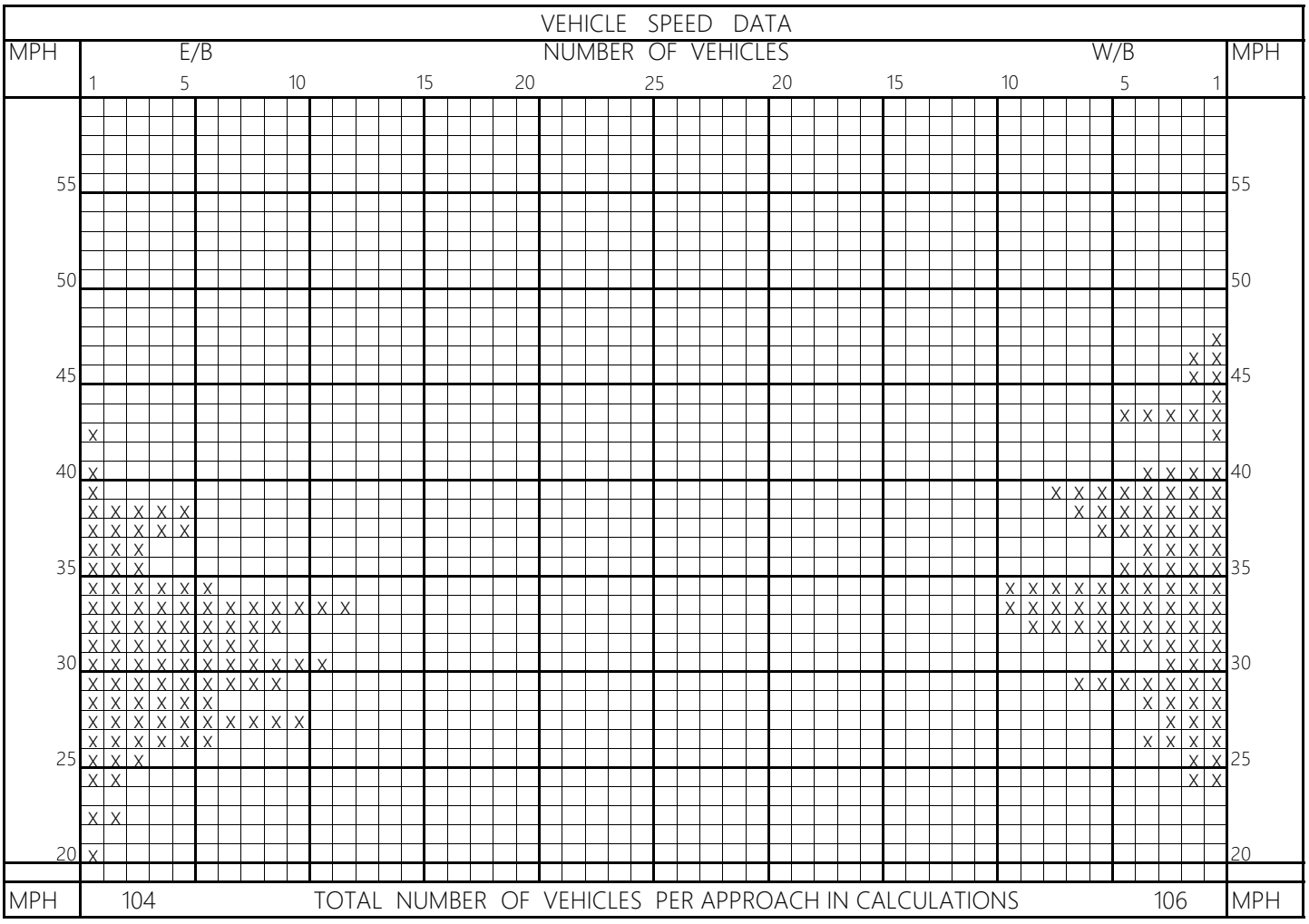
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

E Millbrae Av
El Camino Real to Old Bayshore Av

Date of Survey: 5/3/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 9:15 AM

Street: E Millbrae Av
Between: El Camino Real to Old Bayshore Av
Recorder: Traffic Data Service - Tube Counters

Direction: Eastbound and Westbound
Location: West of Rollins Rd



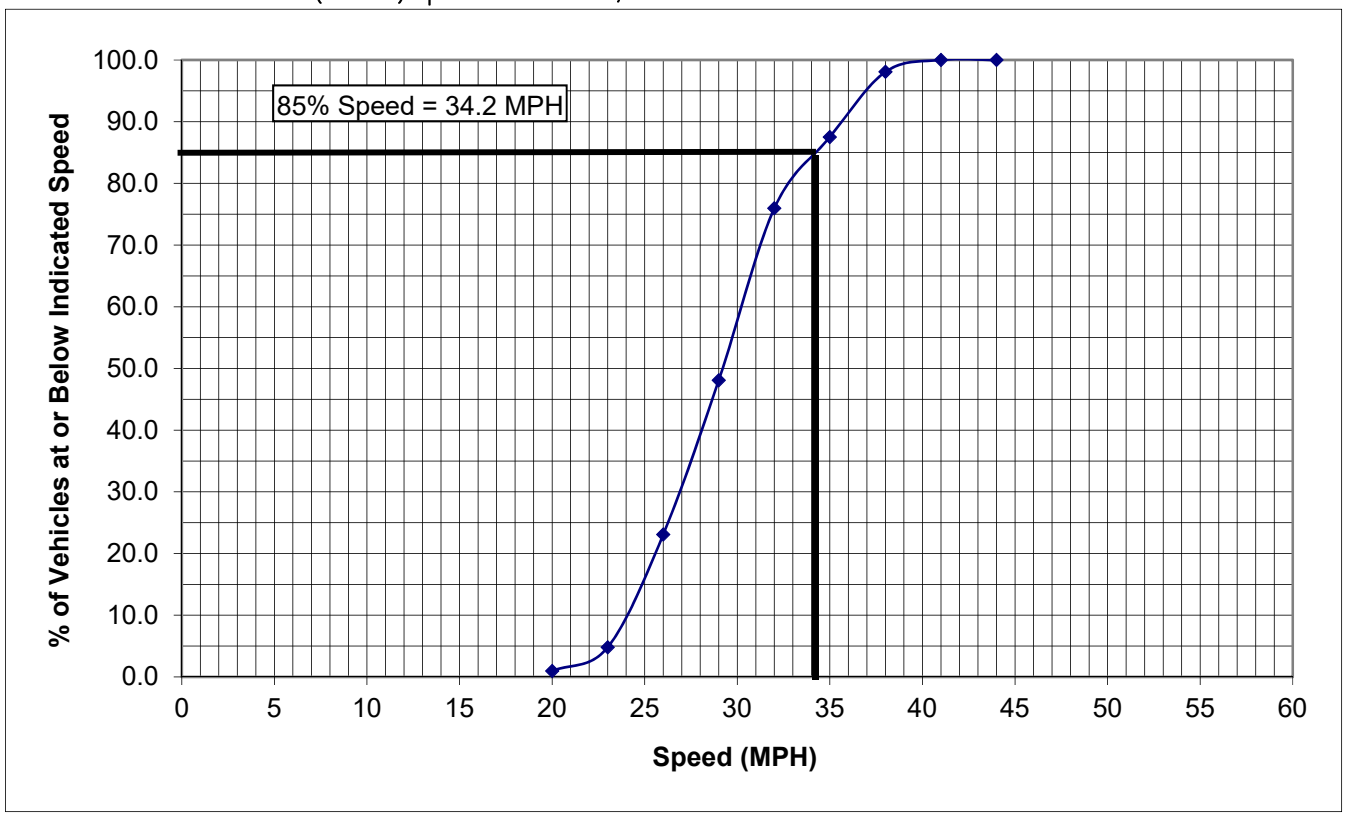
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
E/B	30.9	34.2	26 - 35	76.9%	4.3
W/B	34.3	38.1	31 - 40	65.1%	5.5

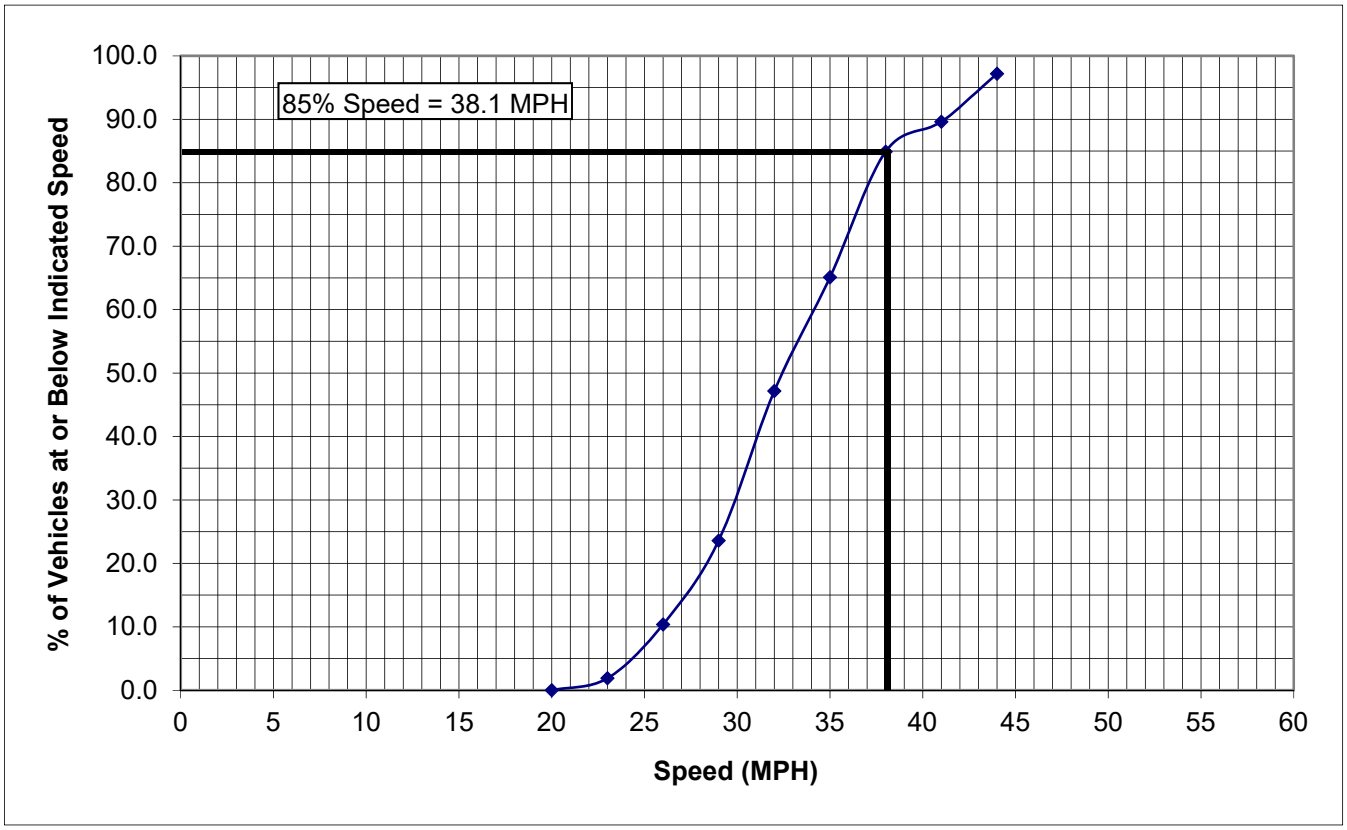
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

E Millbrae Av
El Camino Real to Old Bayshore Av

S-Curve Calculation - 85% (Critical) Speed - E/B



S-Curve Calculation - 85% (Critical) Speed - W/B



3. Helen Drive

Larkspur Drive to 600-FT East of Evergreen Way

Roadway Conditions

The portion of Helen Drive analyzed as part of this Engineering & Traffic Survey is located in the northwest portion of the City of Millbrae and is predominately single-family residential land use. Helen Drive is a 2-lane street with parking on both sides of the street.

Retention of the existing posted speed limit of 30 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Helen Drive	Larkspure Drive to 600-FT East of Evergreen Way	30	28.3 NB 29.1 SB	24-33 NB 24-33 SB	30

Helen Drive does provide east-west access between I-280 and the City of Millbrae with a connection at Larkspur Drive. The relatively short 1,900-FT surveyed speed zone segment has a large horizontal/vertical curve segment between the two Sleep Holly Lane intersections. East of the speed zone segment trail access to Loins Park is provided that results in moderate bicycle and pedestrian activity along Helen Drive.

City of Millbrae, CA

Engineering and Traffic Survey for:

Helen Drive

Larkspur Dr to 600-FT East of Evergreen Wy

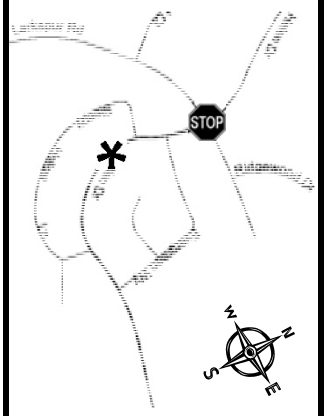
Segment Data by Direction of Travel	NB	SB
85th Percentile Speed (MPH)	30.0	31.0
Rounded 85th Percentile Speed (MPH)	30.0	30.0
Mean (Average) Speed (MPH)	28.3	29.1
10-MPH Pace / % of Vehicles in Pace	24–33/88.0%	24-33/84.5%
No. of Collisions in 12 Months / 1-Yr Collision Rate	4 / 5.235	
Survey Segment Length (Feet)/Avg. Daily Traffic	1,900-FT / 5,317 ADT	
Previous Speed Limit	30	30
Date of Previous Survey	7-14-2011	
Date of This Survey/Weather Conditions	4-20-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	2 / B	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Local
	Land Use is Predominantly:	Residential
	All-Way Stop Controls at:	Larkspur Dr
	Traffic Signal Controls at:	None
	Uncontrolled Pedestrian Crossing Locations:	None

Diagram



Scale: None

Legend:
- Traffic Signal
- All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

ENTIRE SEGMENT
30

Recommended Speed Limit (MPH):

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Engineer's Stamp
Survey Prepared by:

Traffic Patterns

7-11-2016

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae Date

City of Millbrae, CA

Engineering and Traffic Survey for:

Helen Drive
Larkspur Dr to 600-FT East of Evergreen Wy

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	South of Sleep Holly Lane (North)
Date of Data Collection:	4-20-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

- ☐ Local
- ☐ Collector
- ☐ Arterial (Minor)
- ☑ Arterial (Major)

Average Daily Traffic (ADT) Volume: 5,817 Current Speed Limit: 30

Survey Segment Length (FT): 1,900 Street Width (curb to curb): 40-FT

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	1	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:		Yes	✓	No
Existing On-Street Parking Available:	✓	Yes		No
Approximate % of On-Street Parking Use:	10	%		
Segment part of a Suggested Route to School:	✓	Yes		No
Schools Served by Roadway Segment:	Meadows Elementary School			
Driveway Spacing (approximate):	100	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

Helen Drive
Larkspur Dr to 600-FT East of Evergreen Wy

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves		Vertical Curves	
Type	Location	Type	Location
☐ None	Sleepy Hollow Lane	☐ None	Entire Length
☐ Sharp Turns		☑ Hills	
☑ Large Radius		☐ Sag Curves	

Controls Summary		Warning Devices	
Type	Location	Type	Location
☐ None	Larkspur Dr	☑ None	
☑ All-Way Stops		☐ Ped. Beacons	
☐ Traffic Signals		☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 4

1-Year Collision Rate (ACC/MVM): 5.235

VI. LAND USE SUMMARY

Predominant Land Use Type: Residential

Other existing Land Use Types in Study Segment: Parks East of Evergreen Wy

Schools in/near Study Segment: Meadows Elementary School

Parks or Senior Centers in/near Study Segment: Lions Park, Green Hills Country Club

VII. ADDITIONAL COMMENTS

Recommend maintaining existing 30-MPH posted speed limit as it is consistent with existing vehicle speeds of the roadway and the calculated 85-th percentile and 10-MPH pace speeds of this Engineering & Traffic Survey.

MILLBRAE

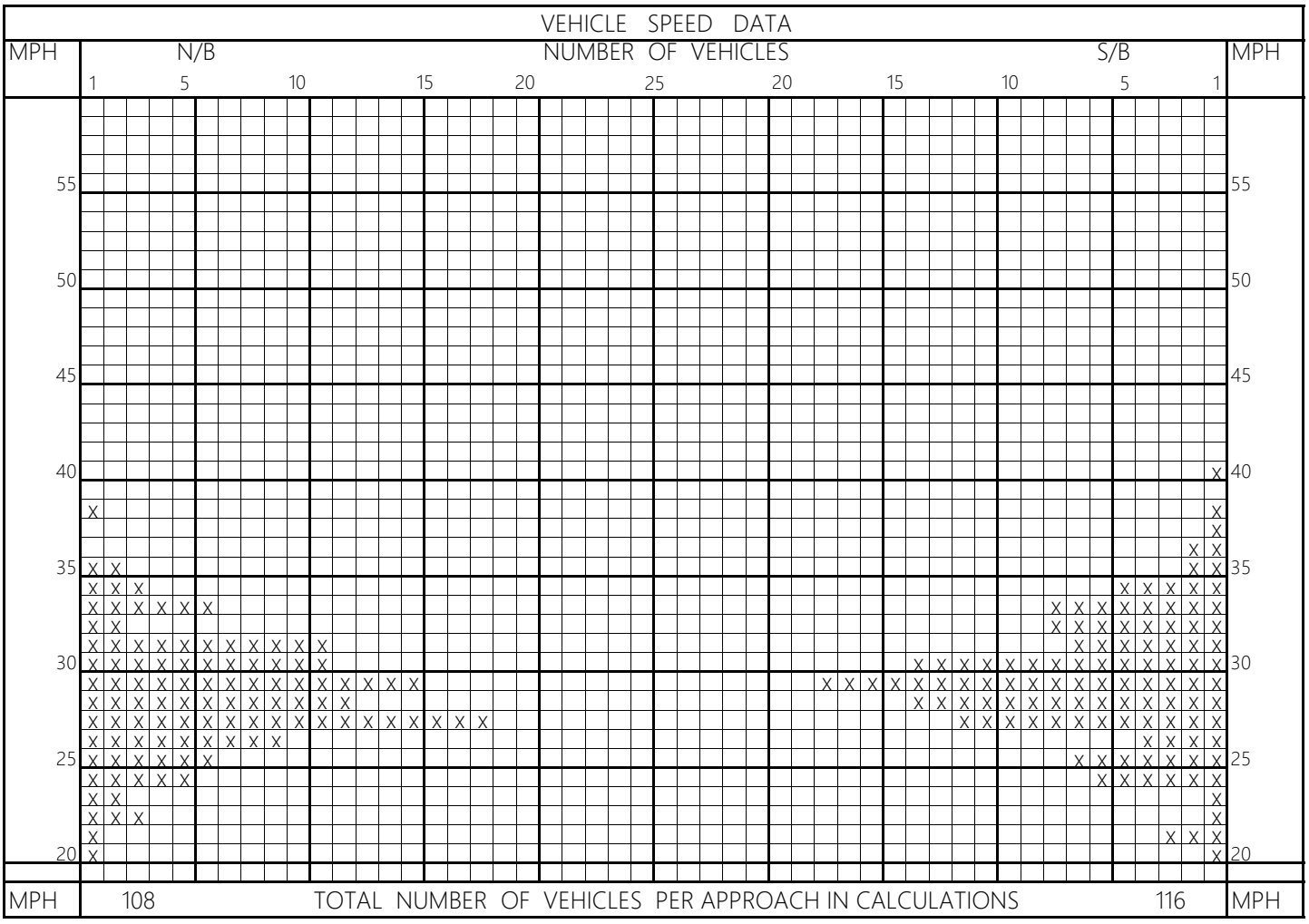
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Helen Drive
Larkspur Dr to 600-FT E of Evergreen Wy

Date of Survey: 4/20/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Helen Drive
Between: Larkspur Dr to 600-FT E of Evergreen \
Recorder: Traffic Data Service - Tube Counters

Direction: Northbound and Southbound
Location: Underneath Overpass



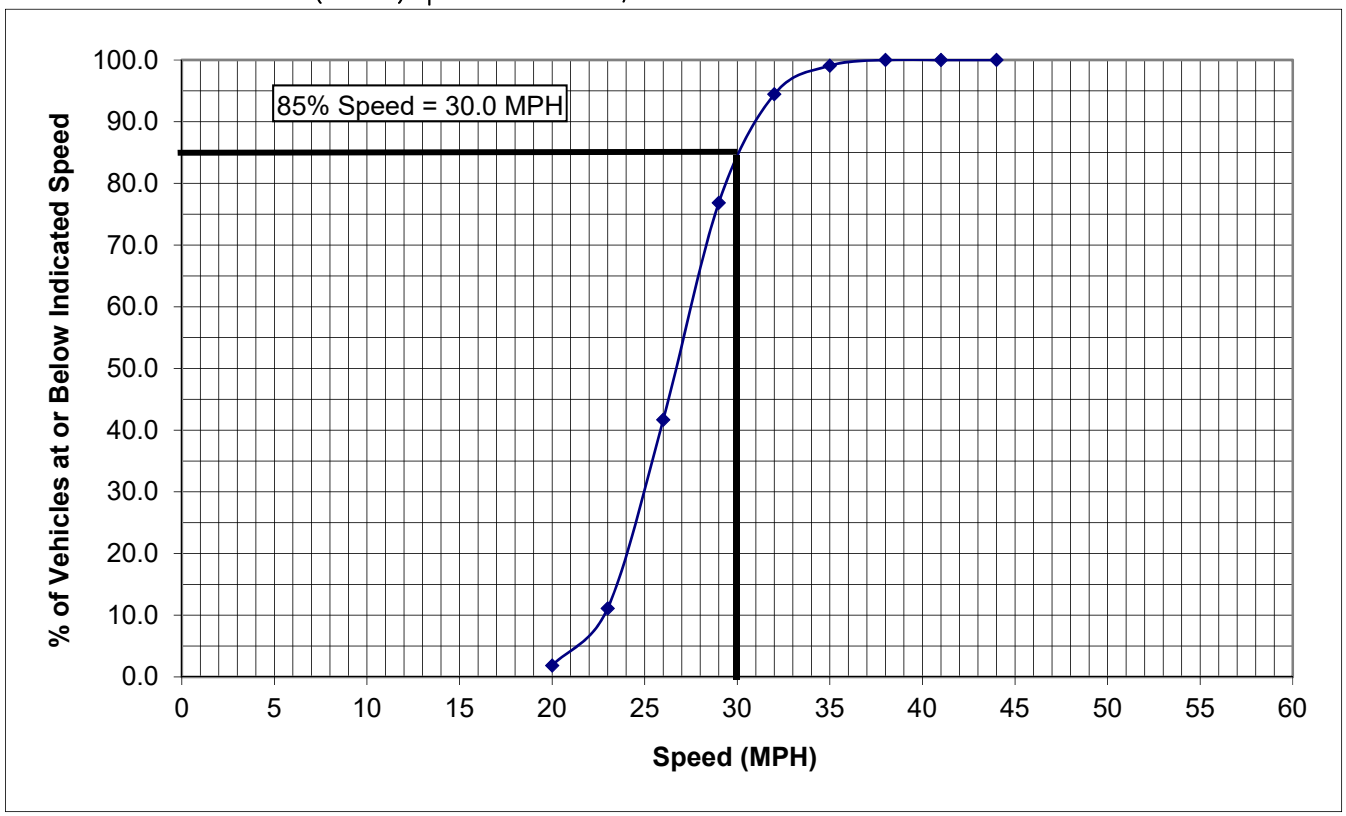
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
N/B	28.3	30.0	24 - 33	88.0%	3.3
S/B	29.1	31.0	24 - 33	84.5%	3.8

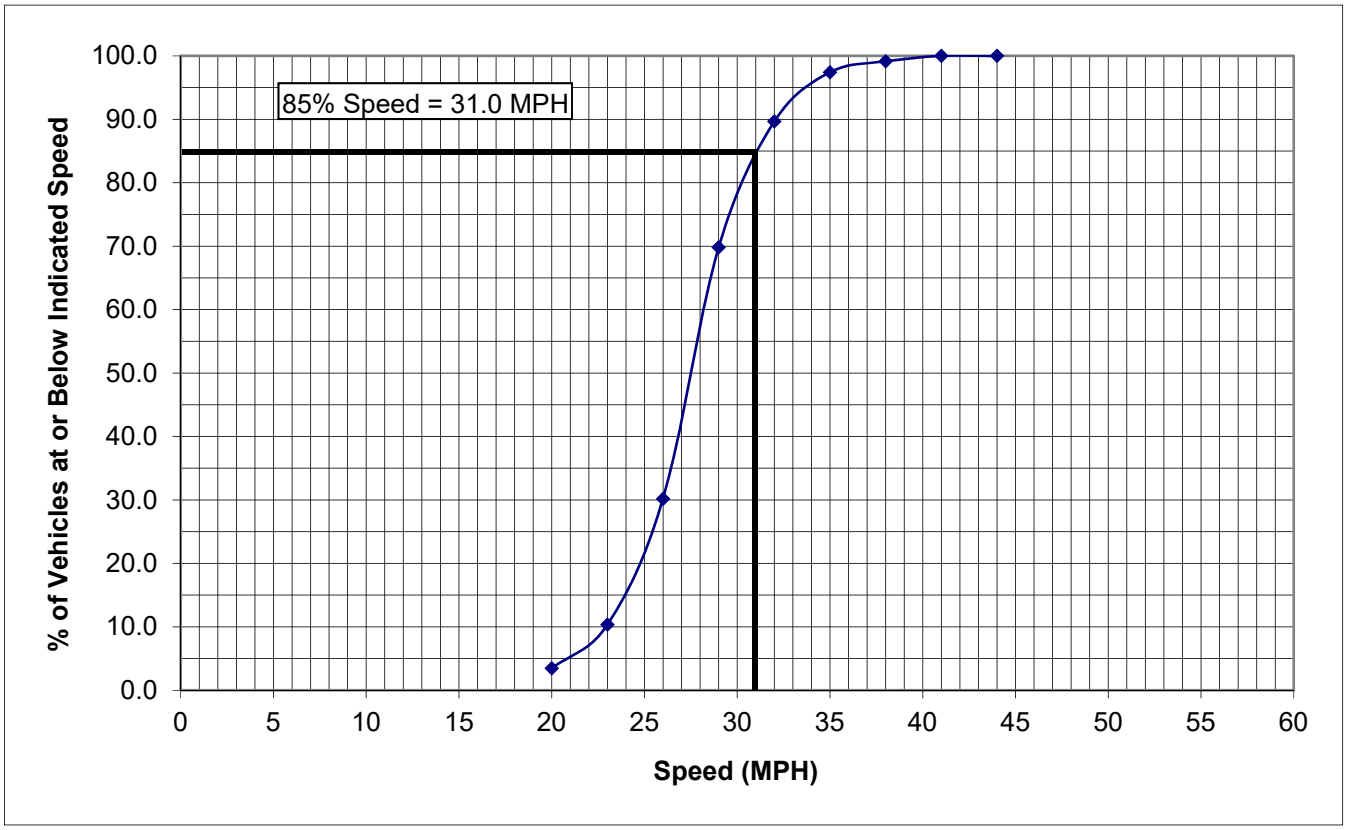
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Helen Drive
Larkspur Dr to 600-FT E of Evergreen Wy

S-Curve Calculation - 85% (Critical) Speed - N/B



S-Curve Calculation - 85% (Critical) Speed - S/B



4. Larkspur Drive

Skyline Boulevard to Helen Drive

Roadway Conditions

Larkspur Drive has direct ramp access to I-280 providing access to Downtown Millbrae via Helen Drive. The speed zone segment is short at 1,500-FT but is well traveled because of the freeway access. Larkspur Drive is predominantly residential land use with open space park access along the north side of the speed zone segment between Pinehurst Court and Crestview Drive

Retention of the existing posted speed limit of 30 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Larkspur Drive	Skyline Boulevard to Helen Drive	30	30.0 EB 31.2 WB	26-35 EB 22-31 WB	30

City of Millbrae, CA

Engineering and Traffic Survey for:

Larkspur Dr

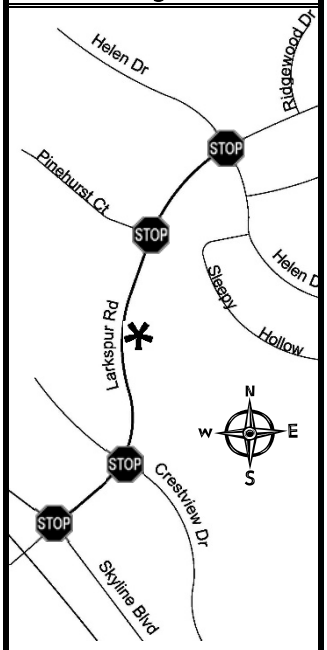
Skyline Boulevard to Helen Drive

Segment Data by Direction of Travel	EB	WB
85th Percentile Speed (MPH)	30.0	31.2
Rounded 85th Percentile Speed (MPH)	30.0	30.0
Mean (Average) Speed (MPH)	29.0	27.4
10-MPH Pace / % of Vehicles in Pace	26–35/80.0%	22-31/79.2%
No. of Collisions in 12 Months / 1-Yr Collision Rate	4 / 5.911	
Survey Segment Length (Feet)/Avg. Daily Traffic	6,526 ADT / 1,500-FT	
Previous Speed Limit	30	30
Date of Previous Survey	7-13-2011	
Date of This Survey/Weather Conditions	4-20-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	2 / C	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Diagram



Scale: None

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Local
	Land Use is Predominantly:	Residential
	All-Way Stop Controls at:	Skyline Blvd, Crestview Dr, Pinehurst Ct, and Helen Dr
	Traffic Signal Controls at:	None
	Uncontrolled Pedestrian Crossing Locations:	None

Legend:

- Traffic Signal
- All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

Recommended Speed Limit (MPH):	ENTIRE SEGMENT
	30

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae

7-11-2016
Date

Engineer's Stamp
Survey Prepared by:

Traffic Patterns

City of Millbrae, CA

Engineering and Traffic Survey for:

Larkspur Dr
Skyline Boulevard to Helen Drive

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	East of Substation
Date of Data Collection:	4-20-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

☑ Local ☐ Collector ☐ Arterial (Minor) ☐ Arterial (Major)

Average Daily Traffic (ADT) Volume: 6,526 Current Speed Limit: 30

Survey Segment Length (FT): 1,500 Street Width (curb to curb): 40-FT

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	1	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:		Yes	✓	No
Existing On-Street Parking Available:	✓	Yes		No
Approximate % of On-Street Parking Use:	20	%		
Segment part of a Suggested Route to School:	✓	Yes		No
Schools Served by Roadway Segment:	Meadows Elementary School			
Driveway Spacing (approximate):	100	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

Larkspur Dr
Skyline Boulevard to Helen Drive

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves		Vertical Curves	
Type	Location	Type	Location
☐ None	East of Crestview Dr	☐ None	Entire Length
☐ Sharp Turns		☑ Hills	
☑ Large Radius		☐ Sag Curves	

Controls Summary		Warning Devices	
Type	Location	Type	Location
☐ None	Skyline Blvd, Crestview Dr, Pinehurst Ct, and Helen Dr	☑ None	
☑ All-Way Stops		☐ Ped. Beacons	
☐ Traffic Signals		☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 216

Total No. Collisions in 12 Months: 4

1-Year Collision Rate (ACC/MVM): 5.911

VI. LAND USE SUMMARY

Predominant Land Use Type: Residential

Other existing Land Use Types in Study Segment: Open Space West of Pinehurst Ct

Schools in/near Study Segment: Meadow Elementary School

Parks or Senior Centers in/near Study Segment: Millbrae Meadows Park

VII. ADDITIONAL COMMENTS

Recommend maintaining existing 30-MPH posted speed limit as it is consistent with existing vehicle speeds of the roadway and the calculated 85-th percentile and 10-MPH pace speed of this Engineering & Traffic Survey.

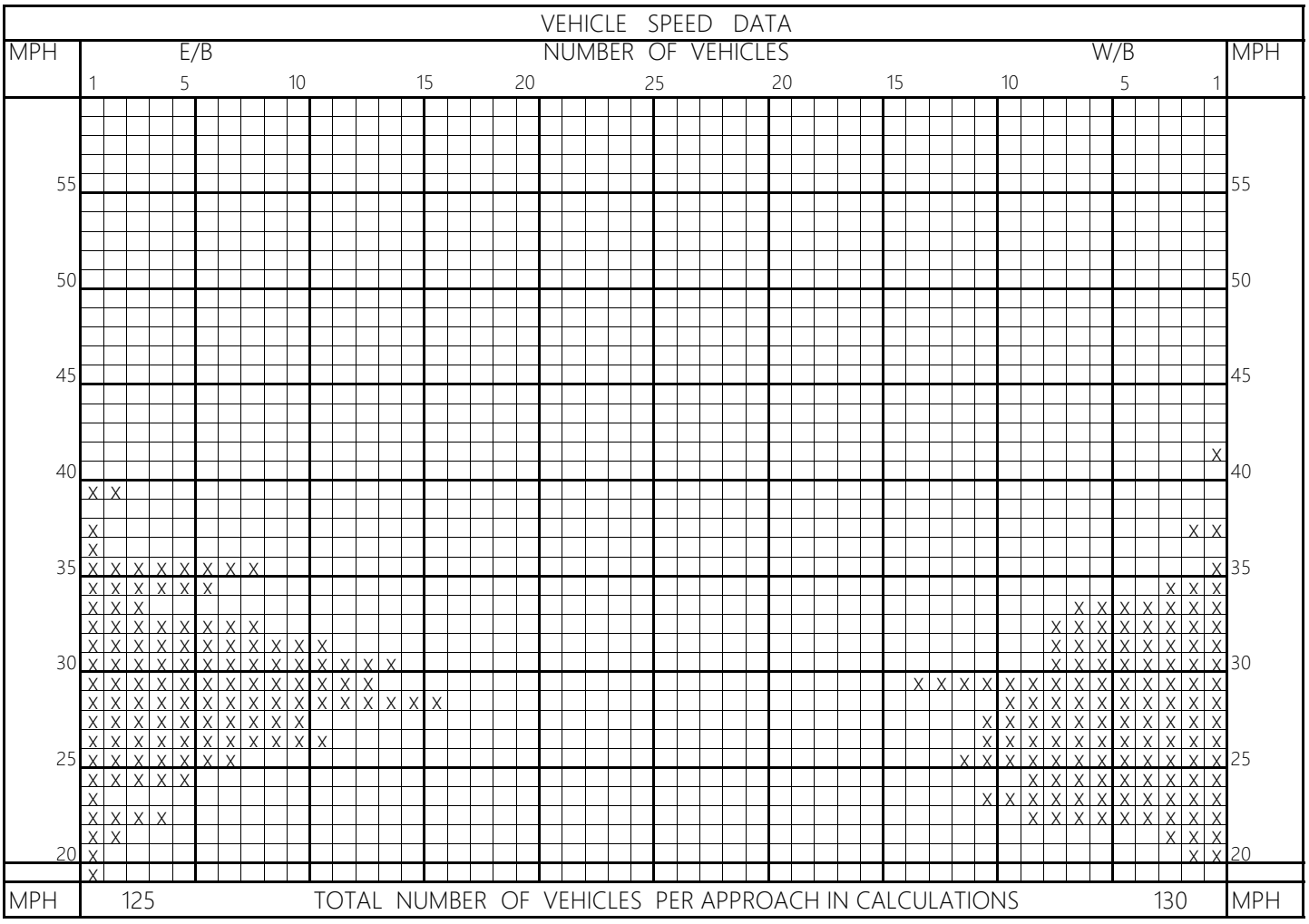
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Larkspur Drive
Skyline Boulevard to Helen Drive

Date of Survey: 4/20/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Larkspur Drive
Between: Skyline Boulevard to Helen Drive
Recorder: Traffic Data Service - Tube Counters

Direction: Eastbound and Westbound
Location: East side of Substation



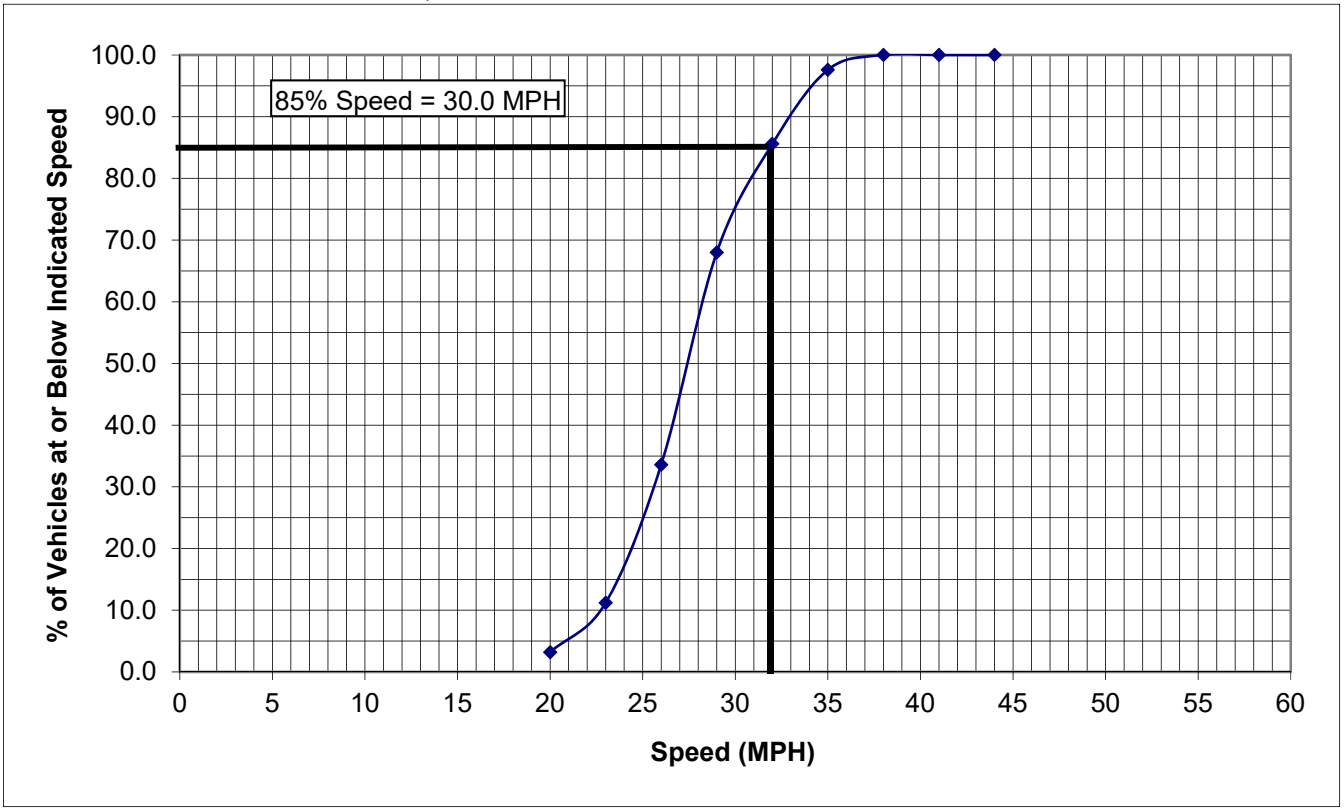
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
E/B	29.0	30.0	26 - 35	80.0%	3.9
W/B	27.4	31.2	22 - 31	79.2%	4.0

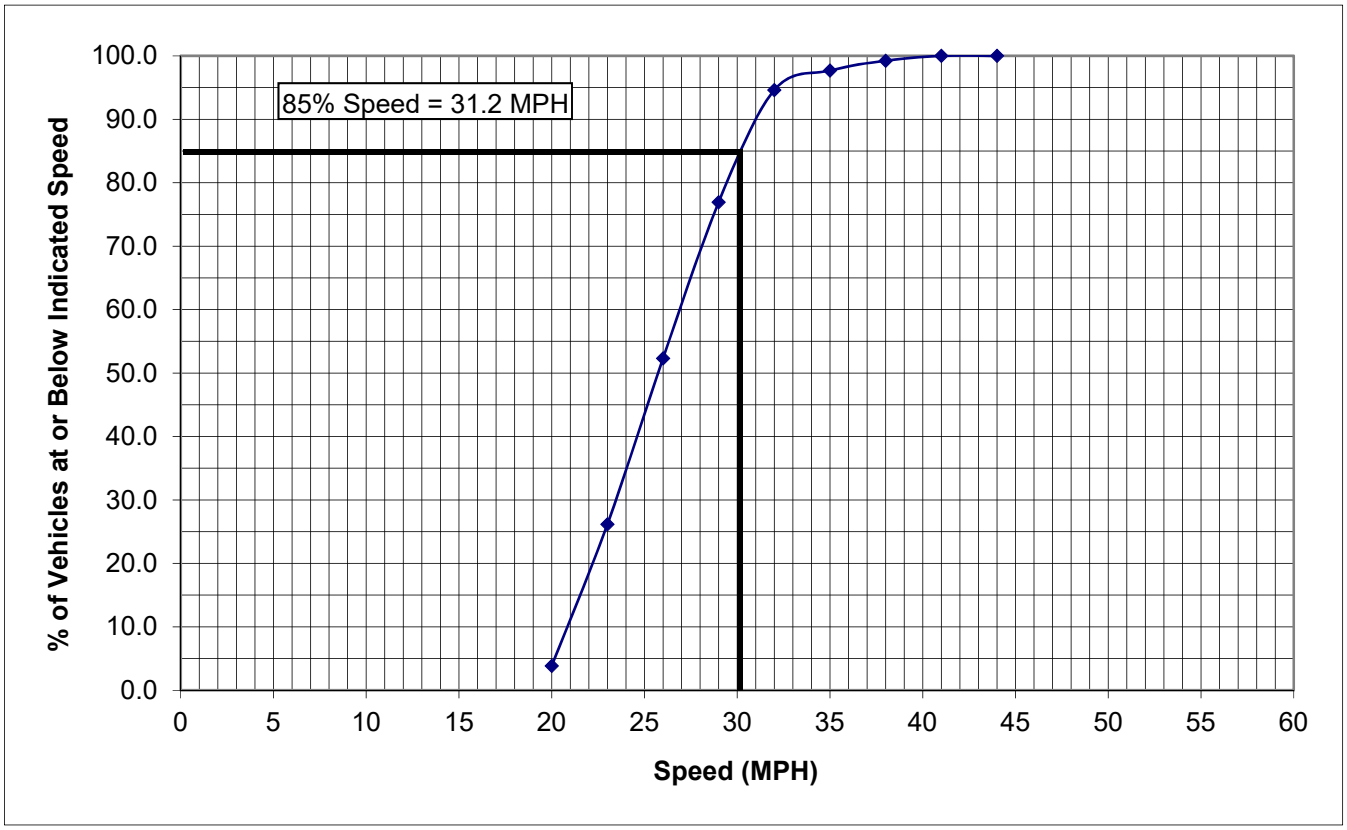
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Larkspur Drive
Skyline Boulevard to Helen Drive

S-Curve Calculation - 85% (Critical) Speed - E/B



S-Curve Calculation - 85% (Critical) Speed - W/B



5. Magnolia Avenue

Park Boulevard to Millbrae Avenue

Roadway Conditions

Magnolia Avenue is a north-south street traversing the length of the city. In the speed zone study segment the street is 2-lanes with predominantly residential land uses. The street also includes public facility land uses with Capuchino High School and Green Hills Park towards the north end and the Millbrae Civic Center/Library in the center of the segment.

Retention of the existing posted speed limit of 25 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Magnolia Avenue	Park Boulevard to Millbrae Avenue	25	27.4 NB 26.2 SB	22-31 NB 20-29 SB	25

Magnolia Avenue has multiple All-Way STOP controlled intersections throughout the speed zone segment helping to control speeds.

City of Millbrae, CA

Engineering and Traffic Survey for:

Magnolia Avenue

Park Boulevard to Millbrae Avenue

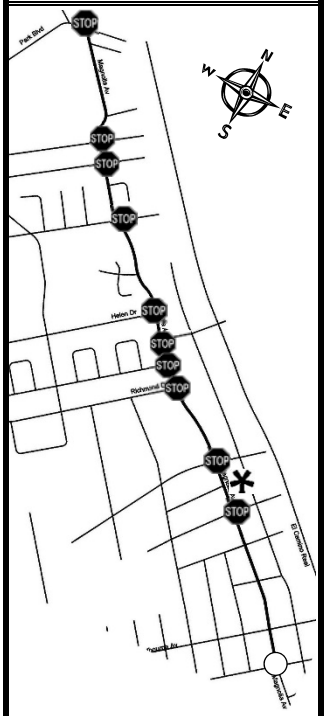
Segment Data by Direction of Travel	NB	SB
85th Percentile Speed (MPH)	27.4	26.2
Rounded 85th Percentile Speed (MPH)	30.0	25.0
Mean (Average) Speed (MPH)	25.1	24.3
10-MPH Pace / % of Vehicles in Pace	22–31/81.8%	20-29/83.2%
No. of Collisions in 12 Months / 1-Yr Collision Rate	8 / 2.265	
Survey Segment Length (Feet)/Avg. Daily Traffic	7,500-FT / 6,813 ADT	
Previous Speed Limit	25	25
Date of Previous Survey	7-13-2011	
Date of This Survey/Weather Conditions	4-20-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	2 / A	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Local
	Land Use is Predominantly:	Residential
	All-Way Stop Controls at:	Park Blvd, Millwood Dr, Paramount Dr, Ludeman Ln Helen Dr, Meadow Glen Av, Richmond Dr, Library Av, Taylor Blvd, Hillcrest Blvd, La Cruz Av, Victoria Av, and Chadbourn Av

Diagram



Scale: None

Legend:

- Traffic Signal
- STOP All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

Recommended Speed Limit (MPH): ENTIRE SEGMENT: 25

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae — Date: 7-11-2016

Engineer's Stamp
Survey Prepared by:

Traffic Patterns

City of Millbrae, CA

Engineering and Traffic Survey for:

Magnolia Avenue
Park Boulevard to Millbrae Avenue

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	South of Barclay Avenue
Date of Data Collection:	4-20-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

- ☑ Local
- ☐ Collector
- ☐ Arterial (Minor)
- ☐ Arterial (Major)

Average Daily Traffic (ADT) Volume: 6,813 Current Speed Limit: 25

Survey Segment Length (FT): 7,500 Street Width (curb to curb): 30' – 44'

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	1	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:		Yes	✓	No
Existing On-Street Parking Available:		Yes	✓	No
Approximate % of On-Street Parking Use:	30	%		
Segment part of a Suggested Route to School:	✓	Yes		No
Schools Served by Roadway Segment:	Capuchino and Mills High Schools			
Driveway Spacing (approximate):	100	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

Magnolia Avenue
Park Boulevard to Millbrae Avenue

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves		Vertical Curves	
Type	Location	Type	Location
☐ None	Green Hills Dr, and Library Av	☑ None	
☑ Sharp Turns		☐ Hills	
☐ Large Radius		☐ Sag Curves	

Controls Summary		Warning Devices	
Type	Location	Type	Location
☐ None	Multiple All-Way Stops.	☑ None	
☑ All-Way Stops		☐ Ped. Beacons	
☑ Traffic Signals	Millbrae Av	☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 8

1-Year Collision Rate (ACC/MVM): 2.265

VI. LAND USE SUMMARY

Predominant Land Use Type: Residential

Other existing Land Use Types in Study Segment: Civic Center Public Space

Schools in/near Study Segment: Capuchino and Mills High School

Parks or Senior Centers in/near Study Segment: Civic Center/Library, Green Hills Park

VII. ADDITIONAL COMMENTS

Recommend maintaining existing 25-MPH posted speed limit, this includes a 5-MPH reduction from the rounded 85-th percentile speeds to accommodate the high volume of pedestrian activity on Magnolia Avenue from the two adjacent high school at each end of the speed zone segment. In addition, Magnolia Avenue has a high number of all-way stop locations and horizontal curves in the roadway segment.

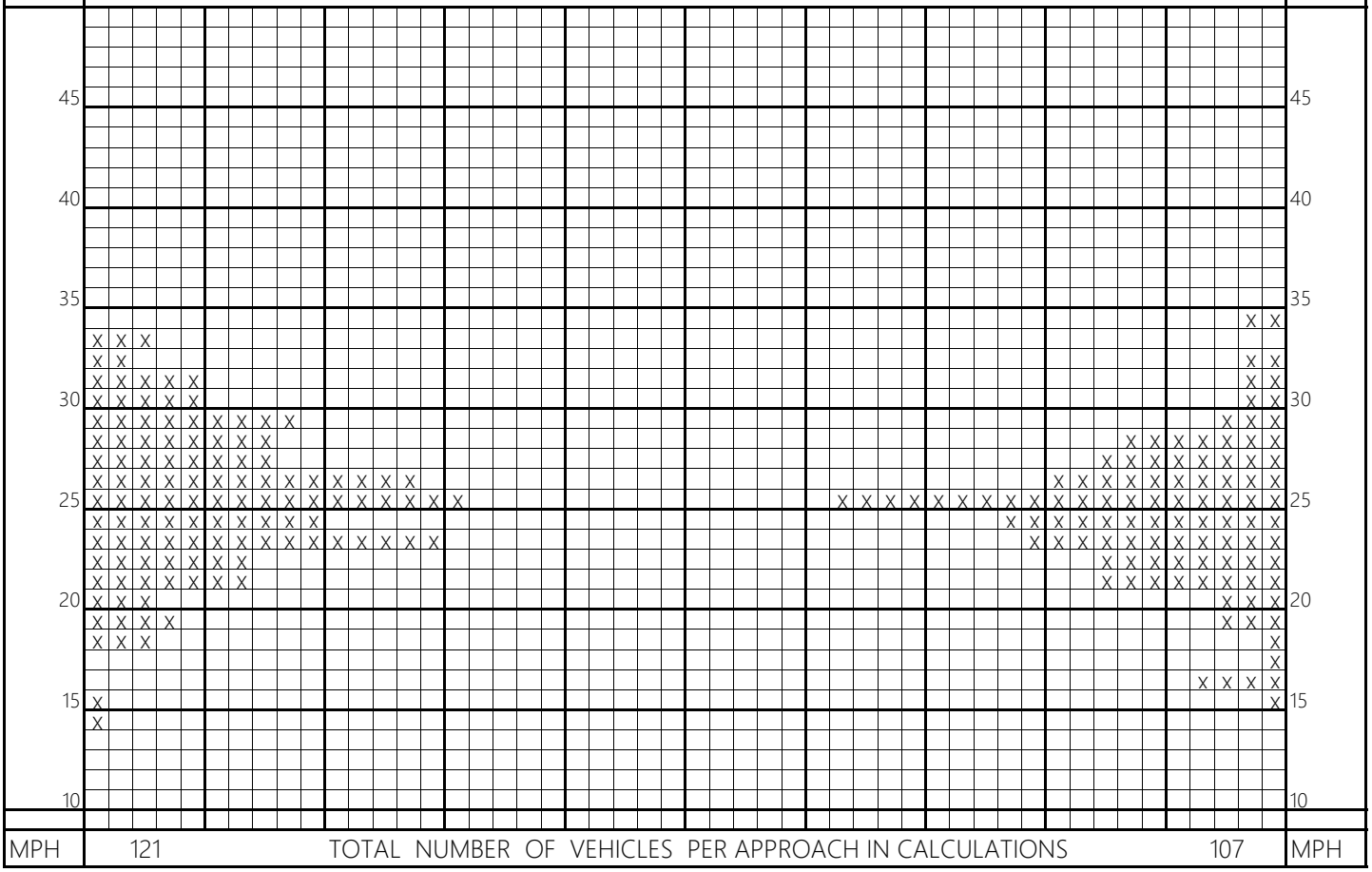
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Magnolia Avenue
Park Boulevard to Millbrae Avenue

Date of Survey: 4/20/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Magnolia Avenue
Direction: Northbound and Southbound
Between: Park Boulevard to Millbrae Avenue
Location: South of Barclay Avenue
Recorder: Traffic Data Service - Tube Counters

VEHICLE SPEED DATA



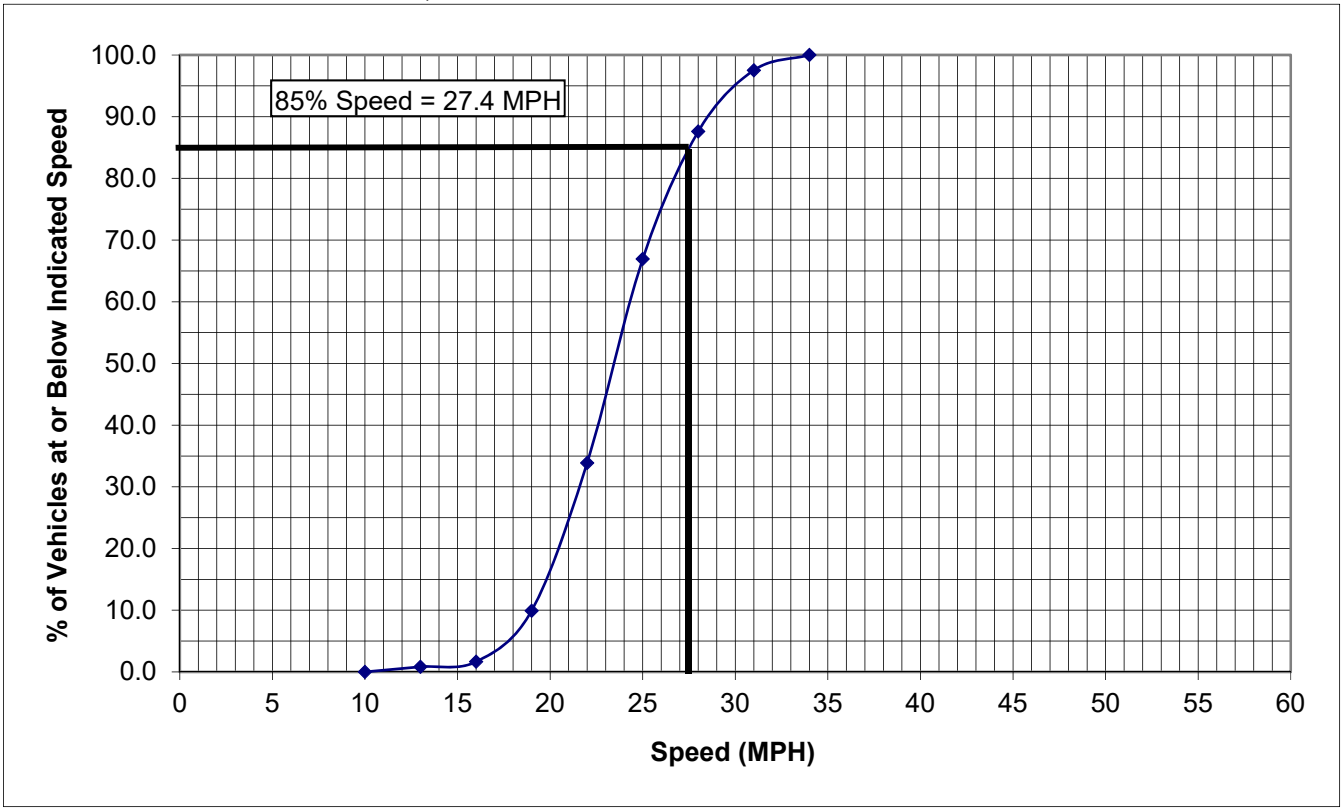
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
N/B	25.1	27.4	32 - 41	81.8%	3.8
S/B	24.3	26.2	30 - 39	83.2%	3.7

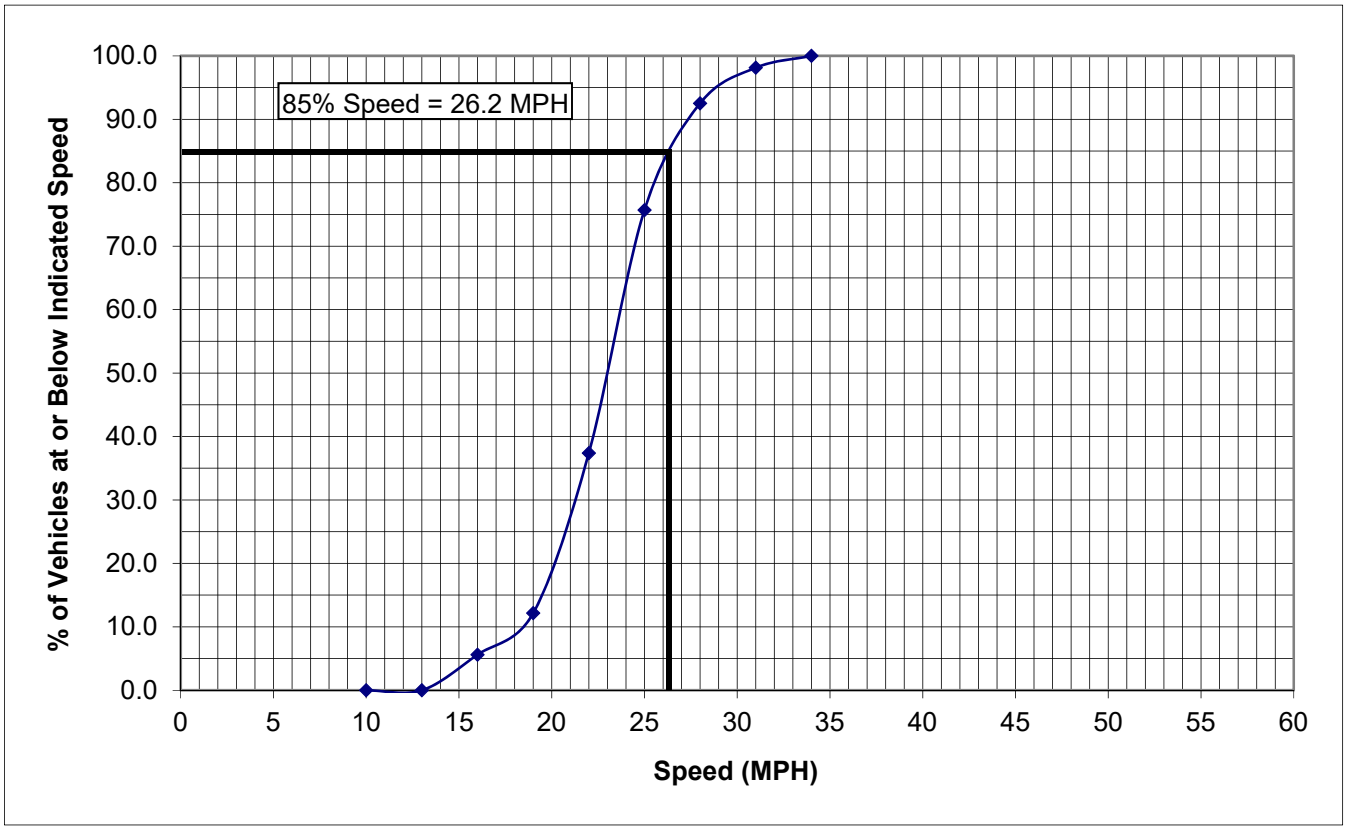
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Magnolia Avenue
Park Boulevard to Millbrae Avenue

S-Curve Calculation - 85% (Critical) Speed - N/B



S-Curve Calculation - 85% (Critical) Speed - S/B



6. Millbrae Avenue

Skyline Boulevard to El Camino Real

Roadway Conditions

Millbrae Avenue is the city's primary east-west corridor. This speed zone segment west of El Camino Real is predominantly 2-lanes with residential land uses. Public park facilities are located near the east with Mills High School on the south side of the street. West of Aston Avenue the street includes horizontal/vertical curves with narrower street sections.

Retention of the existing posted speed limit of 25 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Millbrae Avenue	Skyline Boulevard to El Camino Real	25	27.4 NB 26.2 SB	22-31 NB 20-29 SB	25

The 25-MPH speed limit will also better accommodates the high pedestrian-bicycle activity on the street from the adjacent public park/school land uses.

City of Millbrae, CA

Engineering and Traffic Survey for:

Millbrae Avenue

Skyline Boulevard to El Camino Real

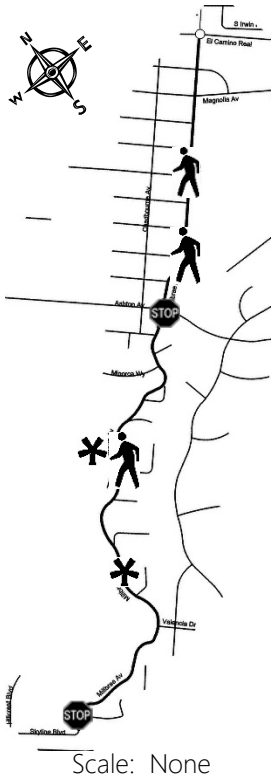
Segment Data by Direction of Travel	EB	WB
85th Percentile Speed (MPH)	30.2	30.8
Rounded 85th Percentile Speed (MPH)	30.0	30.0
Mean (Average) Speed (MPH)	28.6	28.7
10-MPH Pace / % of Vehicles in Pace	24–33/94.3%	25-34/85.2%
No. of Collisions in 12 Months / 1-Yr Collision Rate	5 / 2.129	
Survey Segment Length (Feet)/Avg. Daily Traffic	9,000-FT / 3,775 ADT	
Previous Speed Limit	25	25
Date of Previous Survey	7-6-2011	
Date of This Survey/Weather Conditions	4-20-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	2 / C	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Collector
	Land Use is Predominantly:	Residential
	All-Way Stop Controls at:	Vallejo Dr, Ashton Av
	Traffic Signals:	El Camino Real, Magnolia Av
	Uncontrolled Ped Xings:	Poplar Av, Palm Av, Loree Ln

Diagram



Scale: None

Legend:
- Traffic Signal
- STOP All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

ENTIRE SEGMENT
25

Recommended Speed Limit (MPH):

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

7-11-2016

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae Date

Engineer's Stamp
Survey Prepared by:

Traffic Patterns

City of Millbrae, CA

Engineering and Traffic Survey for:

Millbrae Avenue
Skyline Boulevard to El Camino Real

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	Midblock - Terra Lindo Ct and Spring Valley Ln
Date of Data Collection:	4-20-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

- ☐ Local
- ☑ Collector
- ☐ Arterial (Minor)
- ☐ Arterial (Major)

Average Daily Traffic (ADT) Volume: 3,775 Current Speed Limit: 25

Survey Segment Length (FT): 9,000 Street Width (curb to curb): 24' – 40'

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	1	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:	✓	Yes		No
Existing On-Street Parking Available:	✓	Yes		No
Approximate % of On-Street Parking Use:	50	%		
Segment part of a Suggested Route to School:	✓	Yes		No
Schools Served by Roadway Segment:	Mills High School			
Driveway Spacing (approximate):	250	Feet		

City of Millbrae, CA
Engineering and Traffic Survey for:

Millbrae Avenue
Skyline Boulevard to El Camino Real

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves	
Type	Location
☐ None	Skyline Blvd to Ashton Av
☑ Sharp Turns	
☐ Large Radius	

Vertical Curves	
Type	Location
☐ None	Skyline Blvd to Ashton Av
☑ Hills	
☐ Sag Curves	

Controls Summary	
Type	Location
☐ None	Vallejo Dr and Ashton Dr
☑ All-Way Stops	
☑ Traffic Signals	El Camino Real Magnolia Av

Warning Devices	
Type	Location
☑ None	
☐ Ped. Beacons	
☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 5

1-Year Collision Rate (ACC/MVM): 2.129

VI. LAND USE SUMMARY

Predominant Land Use Type: Residential

Other existing Land Use Types in Study Segment: Public Facility – High School

Schools in/near Study Segment: Mills High School

Parks or Senior Centers in/near Study Segment: Millbrae Spur Trail

VII. ADDITIONAL COMMENTS

Recommend maintaining the existing 25-MPH posted speed limit, which includes a 5-MPH reduction from the rounded 85-th percentile speeds due to the unusual horizontal and vertical curves in the roadway and uncontrolled pedestrian crossing adjacent to the Millbrae Spur Trail and High School which serve suggested route to school activities.

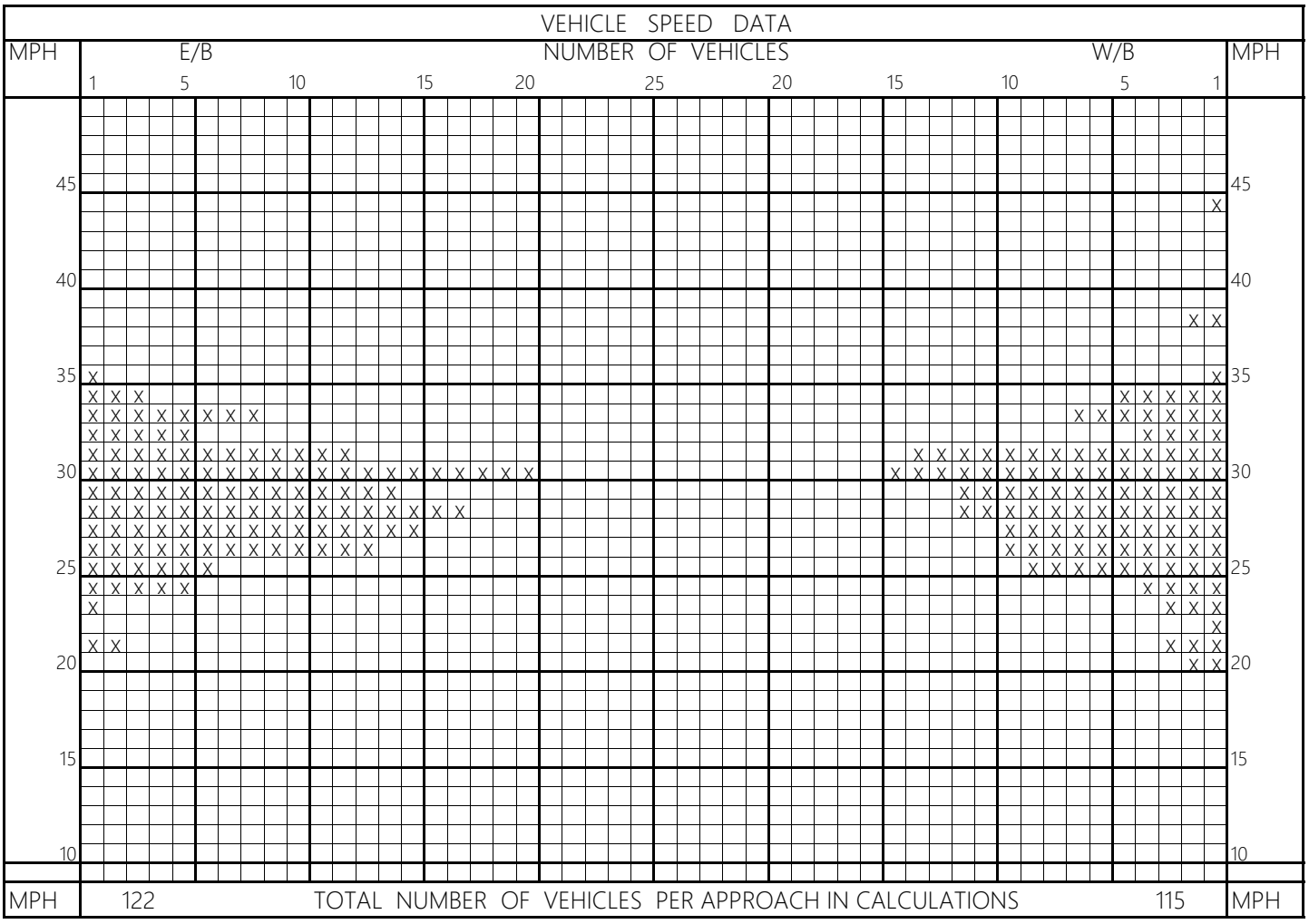
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Millbrae Avenue
Skyline Boulevard to El Camino Real

Date of Survey: 4/20/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Millbrae Avenue
Between: Skyline Boulevard to El Camino Real
Recorder: Traffic Data Service - Tube Counters

Direction: Eastbound and Westbound
Location: Midblock between Terra Lindo Court and Spring Valley Lane



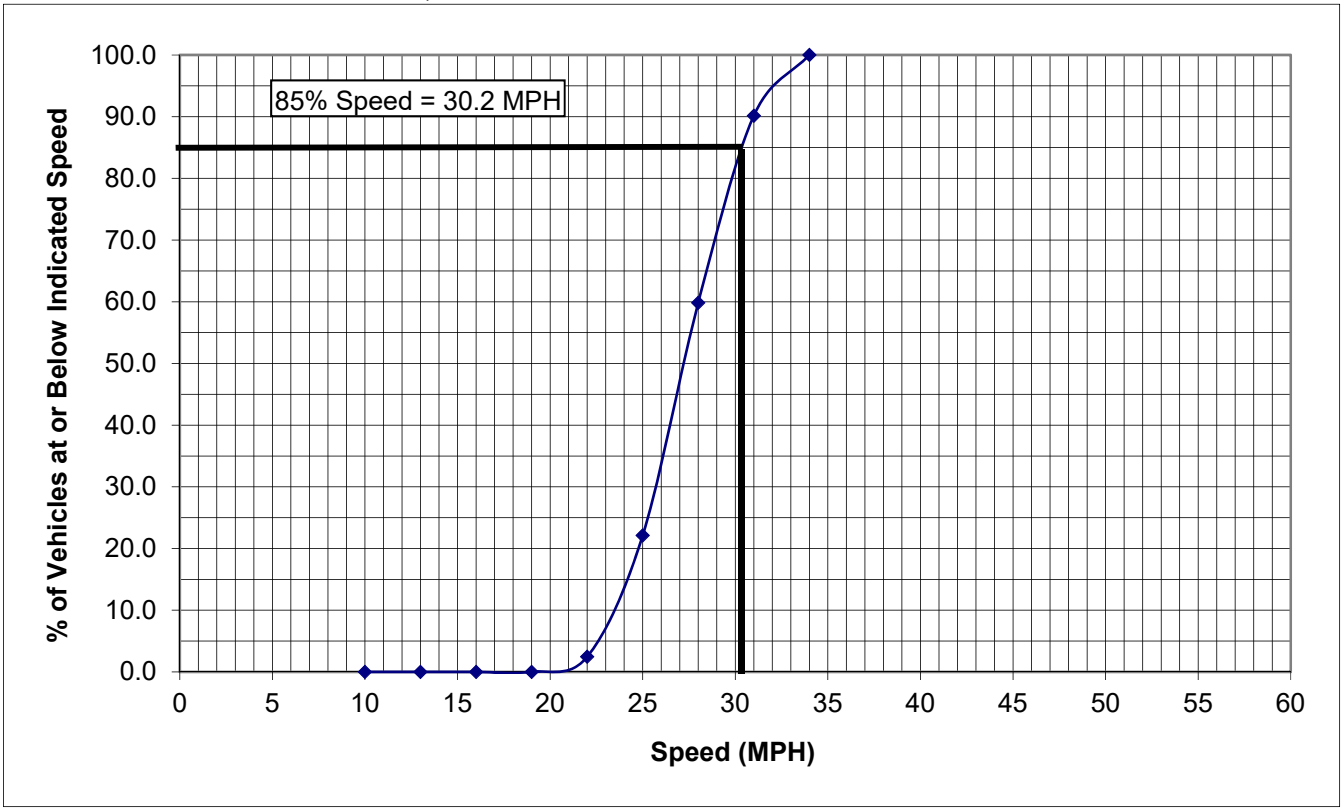
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
E/B	28.6	30.2	24 - 33	94.3%	2.9
W/B	28.7	30.8	25 - 34	85.2%	3.8

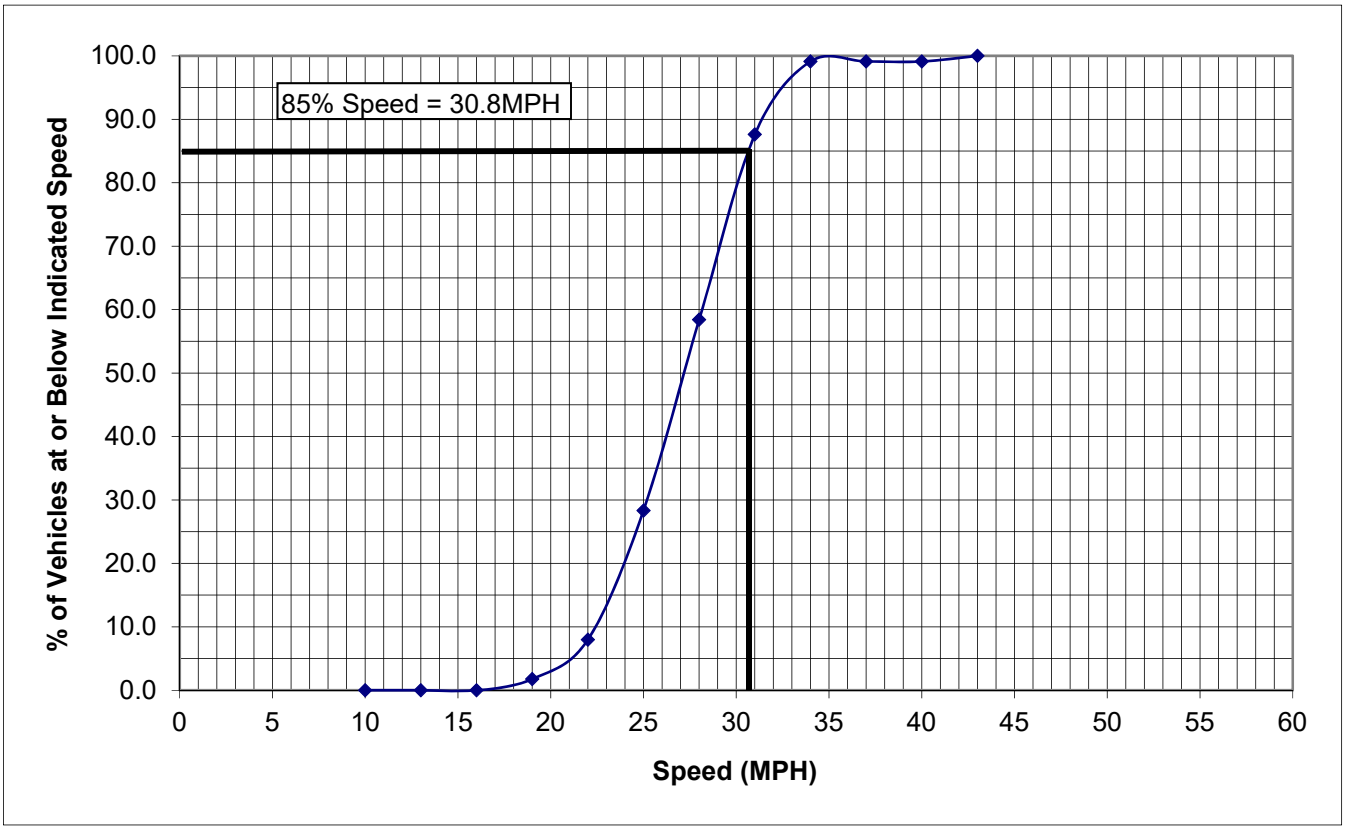
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Millbrae Avenue
Skyline Boulevard to El Camino Real

S-Curve Calculation - 85% (Critical) Speed - E/B



S-Curve Calculation - 85% (Critical) Speed - W/B



7. Murchison Drive

Frontera Way to Marcella Way

Roadway Conditions

Murchison Drive is a 2-lane residential collector street serving the southwest part of the City of Millbrae. The street is a hillside with multiple horizontal/vertical curves in the roadway.

Retention of the existing posted speed limit of 30 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Murchison Drive	Frontera Way to Marcella Way	30	33.1 EB 32.0 WB	26-35 EB 24-33 WB	30

City of Millbrae, CA

Engineering and Traffic Survey for:

Murchison Drive

Frontera Way to Marcella Way

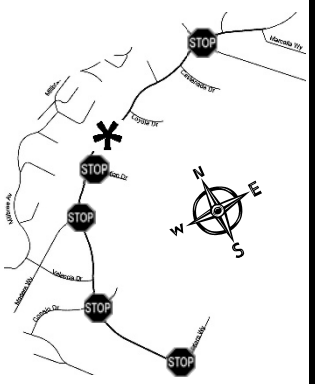
Segment Data by Direction of Travel	EB	WB
85th Percentile Speed (MPH)	33.1	32.0
Rounded 85th Percentile Speed (MPH)	35.0	30.0
Mean (Average) Speed (MPH)	30.2	28.5
10-MPH Pace / % of Vehicles in Pace	26–35/75.5%	24-33/78.2%
No. of Collisions in 12 Months / 1-Yr Collision Rate	4 / 3.603	
Survey Segment Length (Feet)/Avg. Daily Traffic	5,750-FT / 2,793 ADT	
Previous Speed Limit	30	30
Date of Previous Survey	7-7-2011	
Date of This Survey/Weather Conditions	4-20-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	2 / C	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Collector
	Land Use is Predominantly:	Residential
	All-Way Stop Controls at:	Frontera Wy, Conejo Dr,, Madera Wy, Sebastian Dr Ashton Av
	Traffic Signal Controls at:	None
	Uncontrolled Pedestrian Crossing Locations:	None

Diagram



Scale: None

Legend:

- Traffic Signal
- STOP All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

Recommended Speed Limit (MPH):

ENTIRE SEGMENT
30

CERTIFICATION:

The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae

7-11-2016

Date

Engineer's Stamp

Survey Prepared by:

Traffic Patterns

City of Millbrae, CA

Engineering and Traffic Survey for:

Murchison Drive

Frontera Way to Marcella Way

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	Midblock – Sebastian Drive and Loyola Drive
Date of Data Collection:	4/20/2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

☐ Local ☑ Collector

☐ Arterial (Minor) ☐ Arterial (Major)

Average Daily Traffic (ADT) Volume: 2,793 Current Speed Limit: 30

Survey Segment Length (FT): 5,750 Street Width (curb to curb): 40-FT

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	1	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:		Yes	✓	No
Existing On-Street Parking Available:	✓	Yes		No
Approximate % of On-Street Parking Use:	20	%		
Segment part of a Suggested Route to School:	✓	Yes		No
Schools Served by Roadway Segment:	Spring Valley Elementary School			
Driveway Spacing (approximate):	100	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

Murchison Drive
Frontera Way to Marcella Way

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves	
Type	Location
☐ None	Entire Length
☐ Sharp Turns	
☑ Large Radius	

Vertical Curves	
Type	Location
☐ None	Entire Length
☑ Hills	
☐ Sag Curves	

Controls Summary	
Type	Location
☐ None	Frontera Wy, Conejo Dr, Madera Wy, Sebastian Dr, Ashton Av
☑ All-Way Stops	
☐ Traffic Signals	

Warning Devices	
Type	Location
☑ None	
☐ Ped. Beacons	
☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 4

1-Year Collision Rate (ACC/MVM): 3.603

VI. LAND USE SUMMARY

Predominant Land Use Type: Residential

Other existing Land Use Types in Study Segment: Open Space West of Pinehurst Ct

Schools in/near Study Segment: Spring Valley Elementary School

Parks or Senior Centers in/near Study Segment: None

VII. ADDITIONAL COMMENTS

Recommend maintaining existing 30-MPH posted speed limit, this includes a 5-MPH reduction from the rounded 85-th percentile speed in the eastbound direction of Murchison Drive. The reduction will provide consistency in speed limits for the entire segment and accommodates the high pedestrian volume from Spring Valley Elementary School and the adjacent park space activities. The 30-MPH speed limit is consistent within and consistent with the 10-MPH pace of both approaches of Murchison Drive.

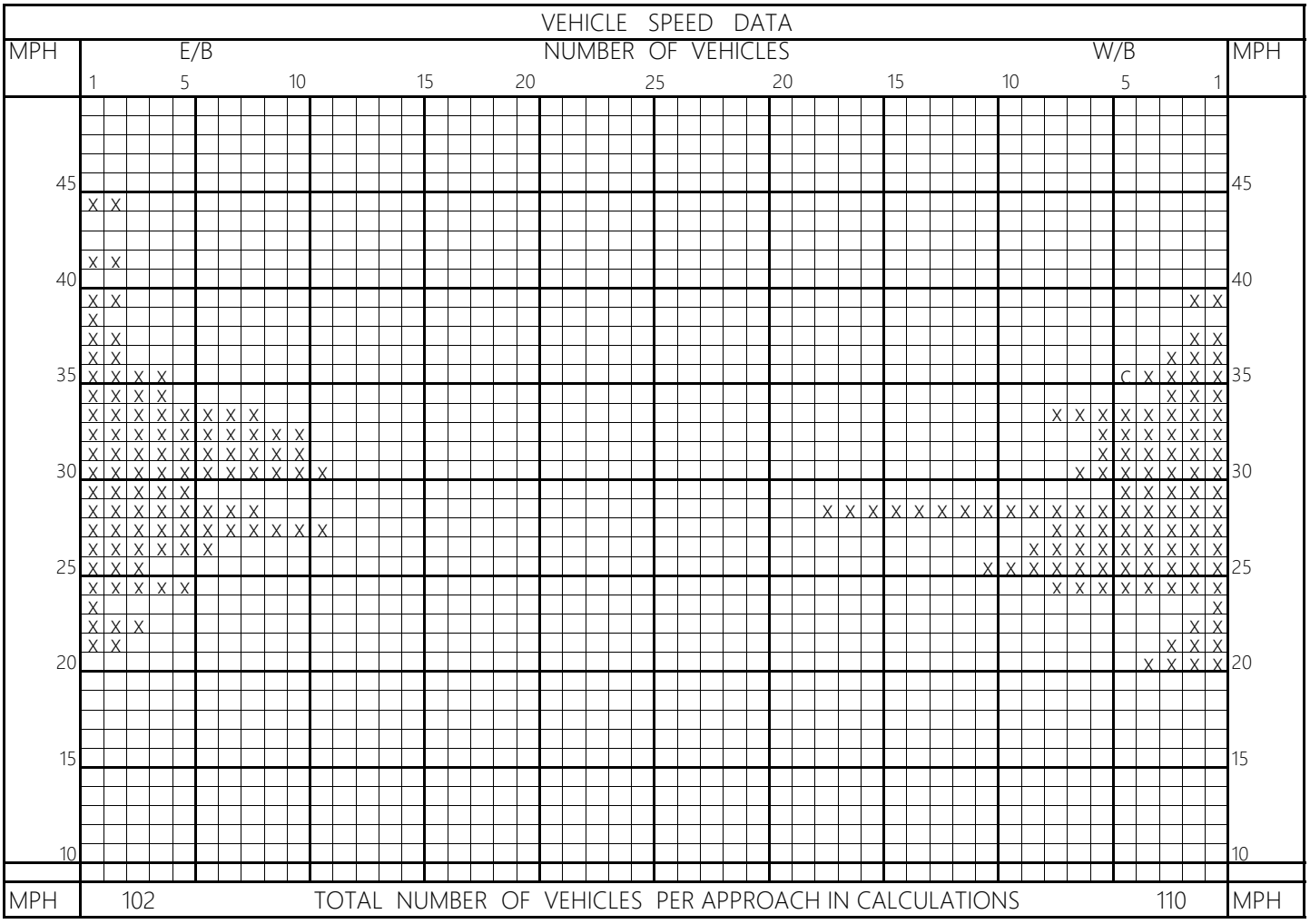
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Murchison Drive
Frontera Way to Marcella Way

Date of Survey: 4/20/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Murchison Drive
Between: Frontera Way to Marcella Way
Recorder: Traffic Data Service - Tube Counters

Direction: Eastbound and Westbound
Location: Midblock between Sebastian Drive and Loyola Drive



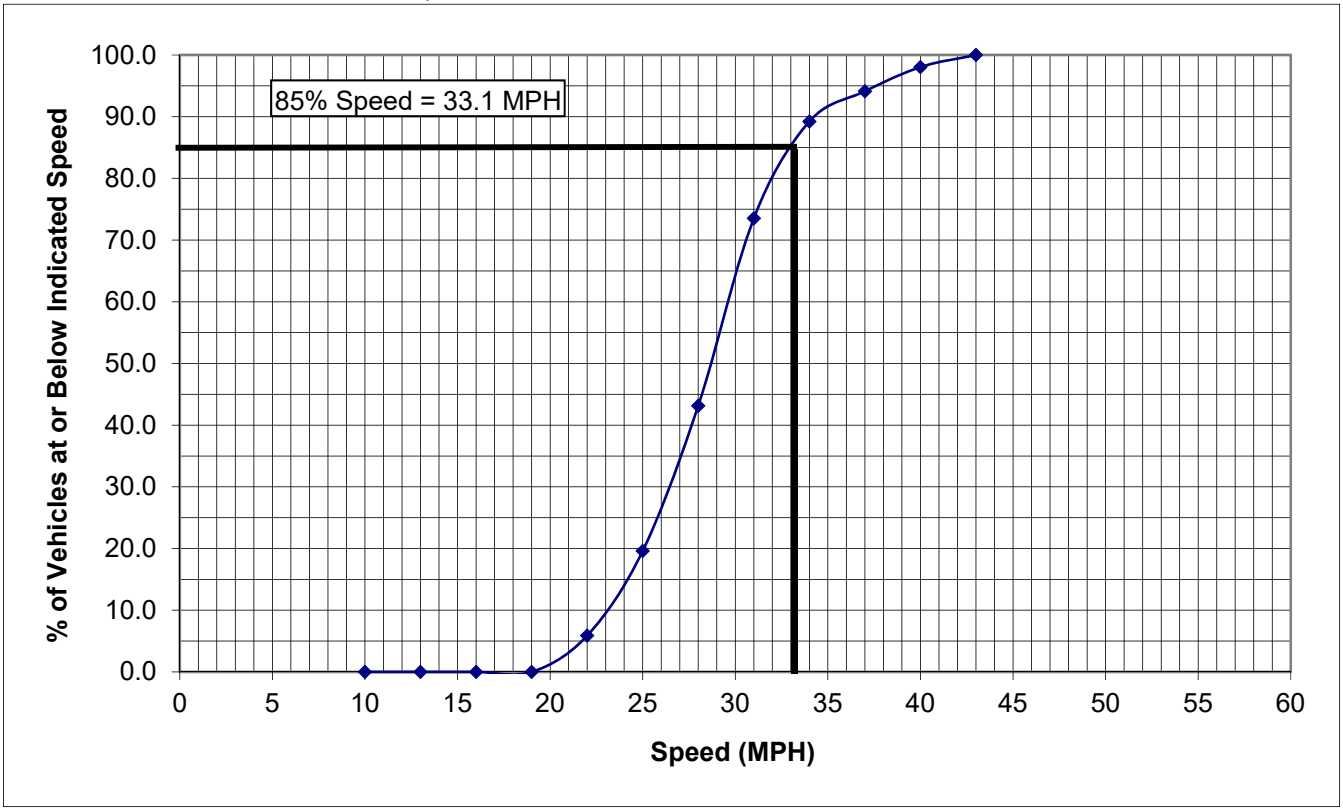
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
E/B	30.2	33.1	36 - 45	75.5%	4.6
W/B	28.5	32.0	34 - 43	78.2%	4.5

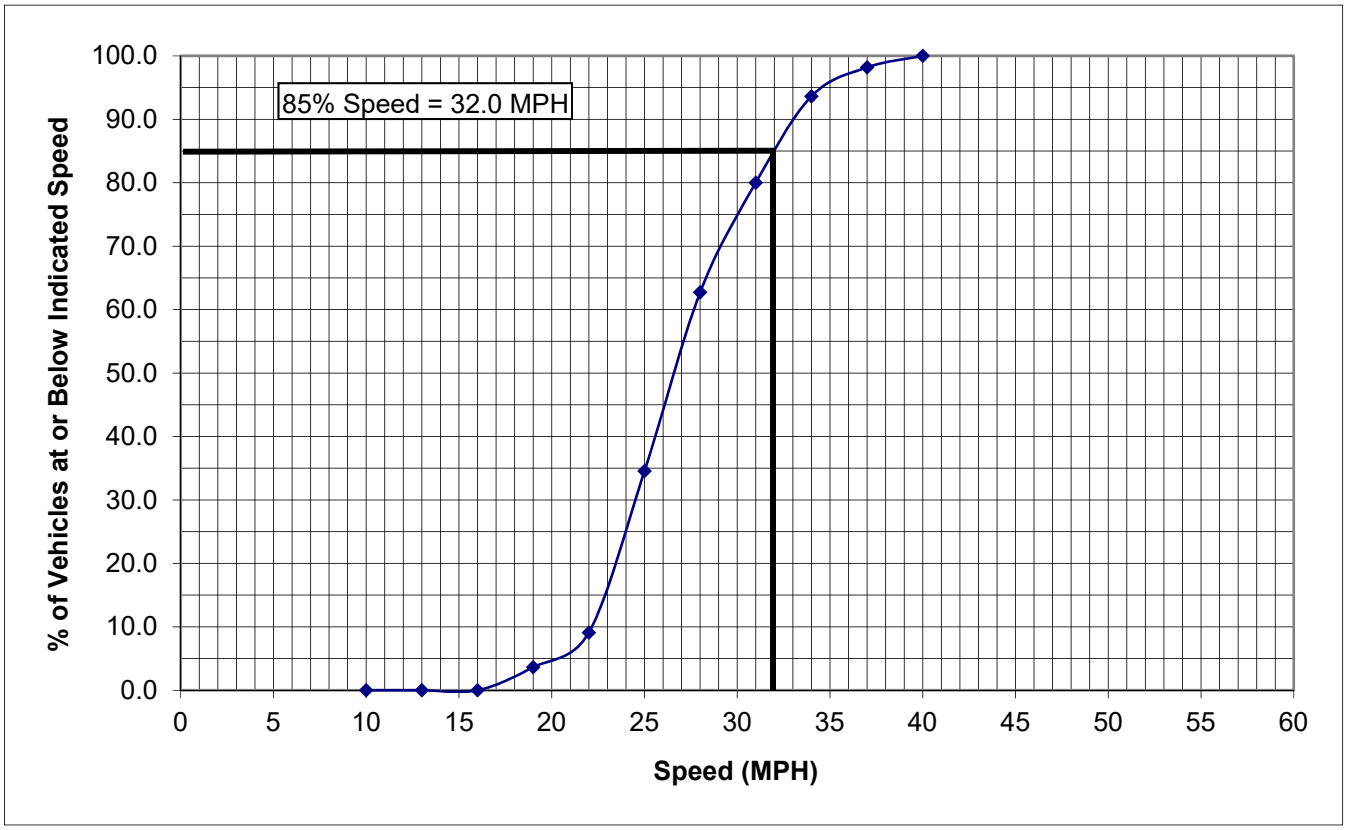
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Murchison Drive
Frontera Way to Marcella Way

S-Curve Calculation - 85% (Critical) Speed - E/B



S-Curve Calculation - 85% (Critical) Speed - W/B



8. Old Bayshore Highway

East City Limit to West City Limit

Roadway Conditions

Old Bayshore Highway is a major 4-lane north-south arterial street with predominantly industrial and commercial land uses. The street is adjacent to the San Francisco Bay resulting in high pedestrian and bicycle activity as trail users access the Bay Trail.

Retention of the existing posted speed limit of 35 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Old Bayshore Highway	East City Limit to West City Limit	35	34.2 NB 32.5 SB	22-31 NB 19-28 SB	35

City of Millbrae, CA

Engineering and Traffic Survey for:

Old Bayshore Highway

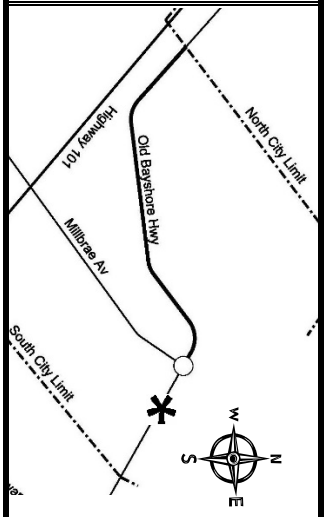
Entire Segment in City Limits

Segment Data by Direction of Travel	NB	SB
85th Percentile Speed (MPH)	34.2	32.5
Rounded 85th Percentile Speed (MPH)	35.0	35.0
Mean (Average) Speed (MPH)	30.3	26.4
10-MPH Pace / % of Vehicles in Pace	22–31/59.8%	19-28/51.2%
No. of Collisions in 12 Months / 1-Yr Collision Rate	1 / 0.257	
Survey Segment Length (Feet)/Avg. Daily Traffic	2,500-FT / 22,472 ADT	
Previous Speed Limit	35	35
Date of Previous Survey	7-19-2011	
Date of This Survey/Weather Conditions	4-20-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	3 / D	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Diagram



Scale: None

Legend:
- Traffic Signal
- All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Major Arterial
	Land Use is Predominantly:	Industrial
	All-Way Stop Controls at:	None
	Traffic Signal Controls at:	E Millbrae Ave
	Uncontrolled Pedestrian Crossing Locations:	None

Recommended Speed Limit (MPH):

ENTIRE SEGMENT
35

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae — Date: 7-11-2016

Engineer's Stamp
Survey Prepared by:

Traffic Patterns

City of Millbrae, CA

Engineering and Traffic Survey for:

Old Bayshore Highway
Entire Segment in City Limits

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	South of E Millbrae Avenue
Date of Data Collection:	4-20-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

☐ Local ☐ Collector

☐ Arterial (Minor) ☑ Arterial (Major)

Average Daily Traffic (ADT) Volume: 22,472 Current Speed Limit: 35

Survey Segment Length (FT): 12,500 Street Width (curb to curb): 68-FT

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	2	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:	✓	Yes		No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:		Yes	✓	No
Existing On-Street Parking Available:		Yes	✓	No
Approximate % of On-Street Parking Use:	N/A	%		
Segment part of a Suggested Route to School:		Yes	✓	No
Schools Served by Roadway Segment:				
Driveway Spacing (approximate):	500	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

Old Bayshore Highway
Entire Segment in City Limits

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves		Location
Type		
☐	None	North of Millbrae Av
☑	Sharp Turns	
☐	Large Radius	

Vertical Curves		Location
Type		
☐	None	
☐	Hills	
☐	Sag Curves	

Controls Summary		Location
Type		
☐	None	E Millbrae Ave
☐	All-Way Stops	
☑	Traffic Signals	

Warning Devices		Location
Type		
☑	None	
☐	Ped. Beacons	
☐	Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 1

1-Year Collision Rate (ACC/MVM): 0.257

VI. LAND USE SUMMARY

Predominant Land Use Type: Industrial

Other existing Land Use Types in Study Segment: Airport

Schools in/near Study Segment: None

Parks or Senior Centers in/near Study Segment: Bayside Manor Park

VII. ADDITIONAL COMMENTS

Recommend maintaining existing 35-MPH posted speed limit as it is consistent with calculated 85-th percentile and 10-MPH pace speeds calculated as part of this Engineering & Traffic Survey.

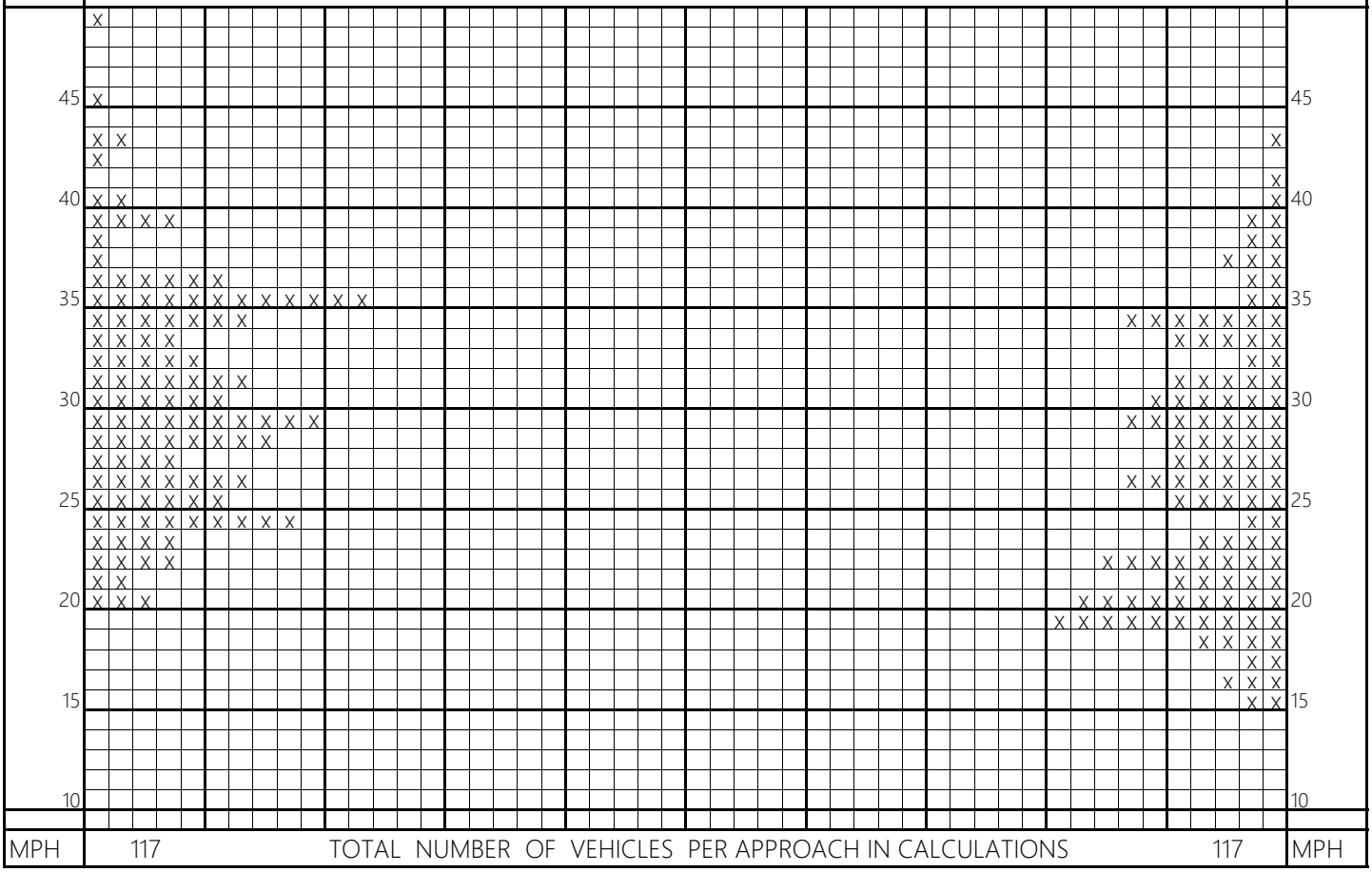
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Old Bayshore Highway
Entire Segment in City Limits

Date of Survey: 4/20/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Old Bayshore Highway
Direction: Northbound and Southbound
Between: Entire Segment in City Limits
Location: South of Millbrae Avenue
Recorder: Traffic Data Service - Tube Counters

VEHICLE SPEED DATA



MPH 117 TOTAL NUMBER OF VEHICLES PER APPROACH IN CALCULATIONS 117 MPH

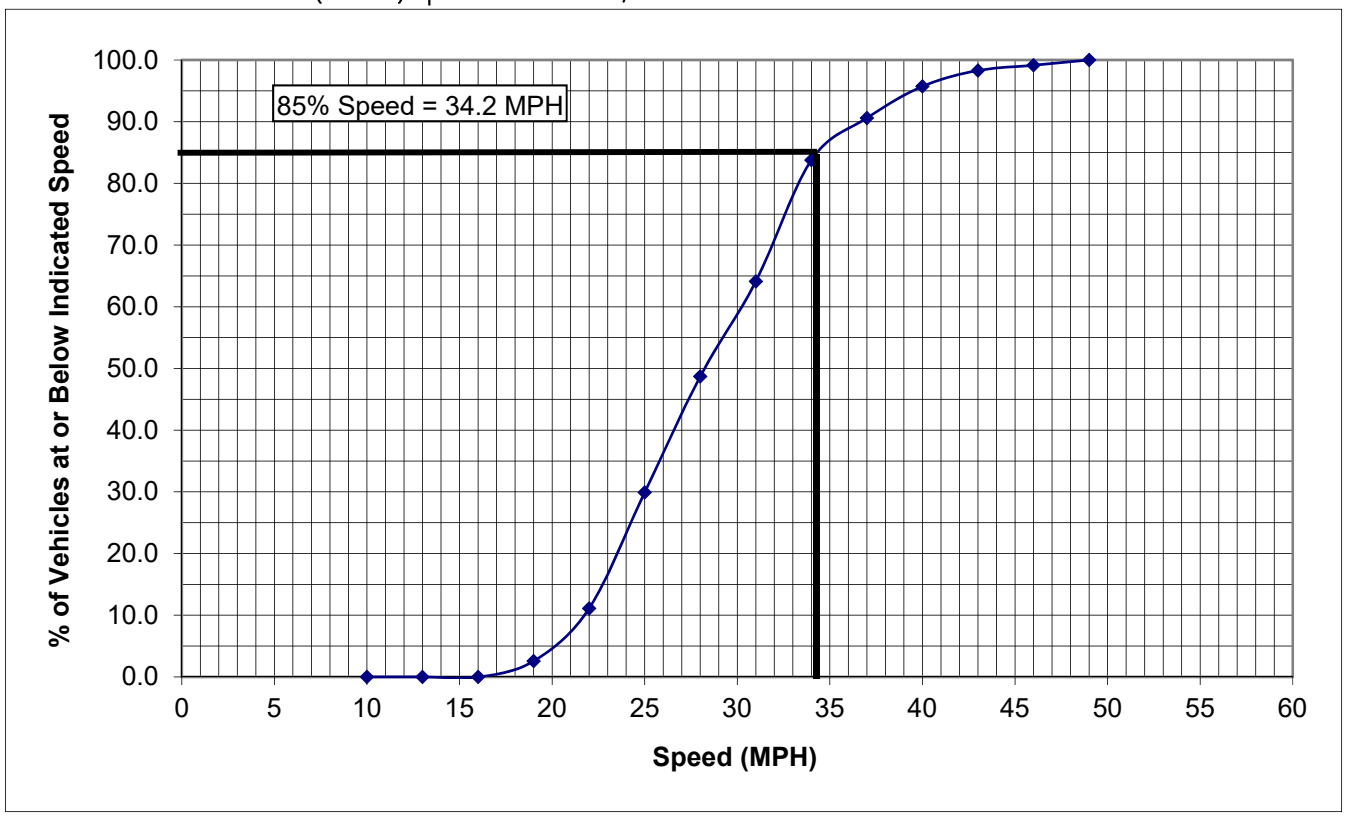
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
N/B	30.3	34.2	22 - 31	59.8%	6.0
S/B	26.4	32.5	19 - 28	51.2%	6.7

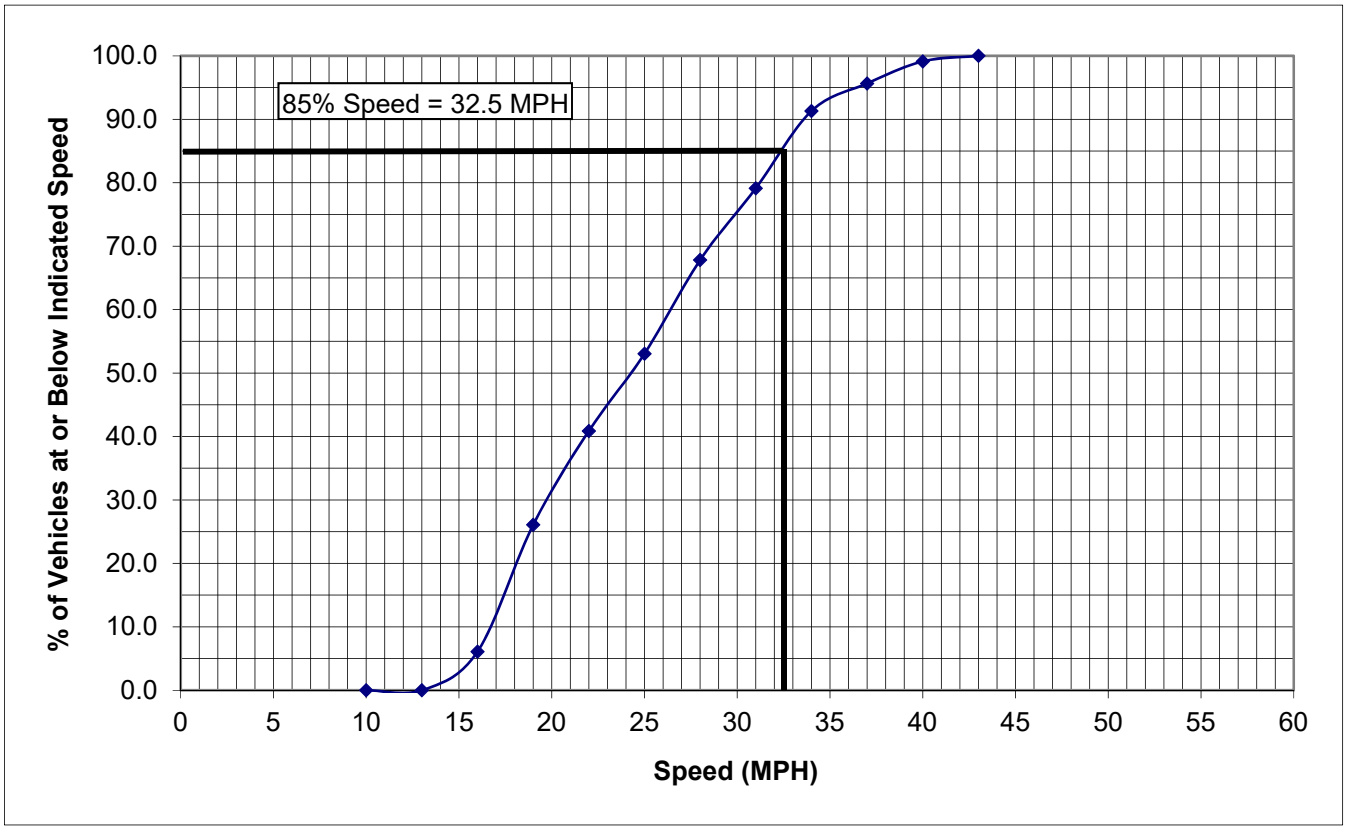
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Old Bayshore Highway
Entire Segment in City Limits

S-Curve Calculation - 85% (Critical) Speed - N/B



S-Curve Calculation - 85% (Critical) Speed - S/B



9. Richmond Drive

Tioga Drive to Magnolia Drive

Roadway Conditions

Richmond Drive is a 4-lane residential collector street that provides direct access to Downtown Millbrae and the Millbrae Civic Center/Library. Land use is predominantly high density residential housing with condominium and apartment complex uses. The street has high parking demand as a result and angled parking is provided along the south side of the street to increase parking capacity. Central Park is located south of Richmond Drive so there is high pedestrian volume as residents cross Richmond Drive to access the park and adjacent civic center/library uses.

Retention of the existing posted speed limit of 25 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Richmond Drive	Tioga Drive to Magnolia Drive	25	32.4 EB 30.8 WB	22-31 EB 23-32 WB	25

City of Millbrae, CA
Engineering and Traffic Survey for:

Richmond Drive
Tioga Drive to Magnolia Drive

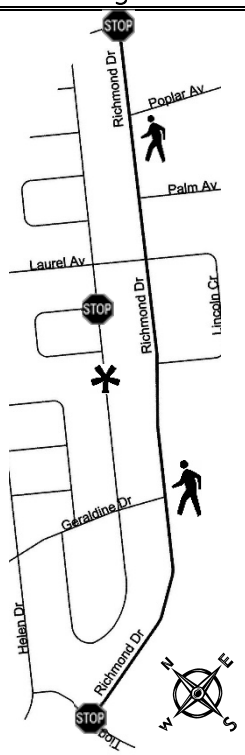
Segment Data by Direction of Travel	EB	WB
85th Percentile Speed (MPH)	32.4	30.8
Rounded 85th Percentile Speed (MPH)	30.0	30.0
Mean (Average) Speed (MPH)	27.7	26.8
10-MPH Pace / % of Vehicles in Pace	22–31/62.0%	23-32/65.8%
No. of Collisions in 12 Months / 1-Yr Collision Rate	0 / 0	
Survey Segment Length (Feet)/Avg. Daily Traffic	4,000 FT / 3,716 ADT	
Previous Speed Limit	25	25
Date of Previous Survey	7-6-2011	
Date of This Survey/Weather Conditions	4-20-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	2 / F	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Collector
	Land Use is Predominantly:	Residential
	All-Way Stop Controls at:	Tioga Dr, Lincoln Cir, Magnolia Dr
	Traffic Signal Controls at:	None
	Uncontrolled Pedestrian Crossing Locations:	Poplar Av, Geraldine Dr

Diagram



Scale: None

Legend:
- Traffic Signal
- STOP All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

Recommended Speed Limit (MPH):	ENTIRE SEGMENT
	25

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae

7-11-2016
Date

Engineer's Stamp
Survey Prepared by:

Traffic Patterns

City of Millbrae, CA

Engineering and Traffic Survey for:

Richmond Drive
Tioga Drive to Magnolia Drive

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	West of Lincoln Circle (West)
Date of Data Collection:	4-20-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

☐ Local ☑ Collector

☐ Arterial (Minor) ☐ Arterial (Major)

Average Daily Traffic (ADT) Volume: 3,716 Current Speed Limit: 25

Survey Segment Length (FT): 4,000 Street Width (curb to curb): 26' – 80'

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	1	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:	✓	Yes		No
Existing On-Street Parking Available:	✓	Yes		No
Approximate % of On-Street Parking Use:	70	%		
Segment part of a Suggested Route to School:		Yes	✓	No
Schools Served by Roadway Segment:	Taylor Middle School			
Driveway Spacing (approximate):	100	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

Richmond Drive
Tioga Drive to Magnolia Drive

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves		Vertical Curves	
Type	Location	Type	Location
☐ None	West of Geraldine Dr	☐ None	West of Geraldine Dr
☐ Sharp Turns		☑ Hills	
☑ Large Radius		☐ Sag Curves	

Controls Summary		Warning Devices	
Type	Location	Type	Location
☐ None	Tioga Dr, Lincoln Cir, Magnolia Dr	☑ None	
☑ All-Way Stops		☐ Ped. Beacons	
☐ Traffic Signals		☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 0

1-Year Collision Rate (ACC/MVM): 0

VI. LAND USE SUMMARY

Predominant Land Use Type: Residential (High-Use Apartments)

Other existing Land Use Types in Study Segment: Parks

Schools in/near Study Segment: Taylor Middle School

Parks or Senior Centers in/near Study Segment: Central Park

VII. ADDITIONAL COMMENTS

Recommend retaining existing 25-MPH posted speed limit. The rounded 85-th percentile speeds are 30-MPH but a 5-MPH reduction is suggested due to the high amount of pedestrian activity generated from the adjacent Taylor Middle School, park land, and high-density residential land uses. A 25-MPH posted speed limit is within the 10-MPH calculated as part of this Engineering & Traffic Survey.

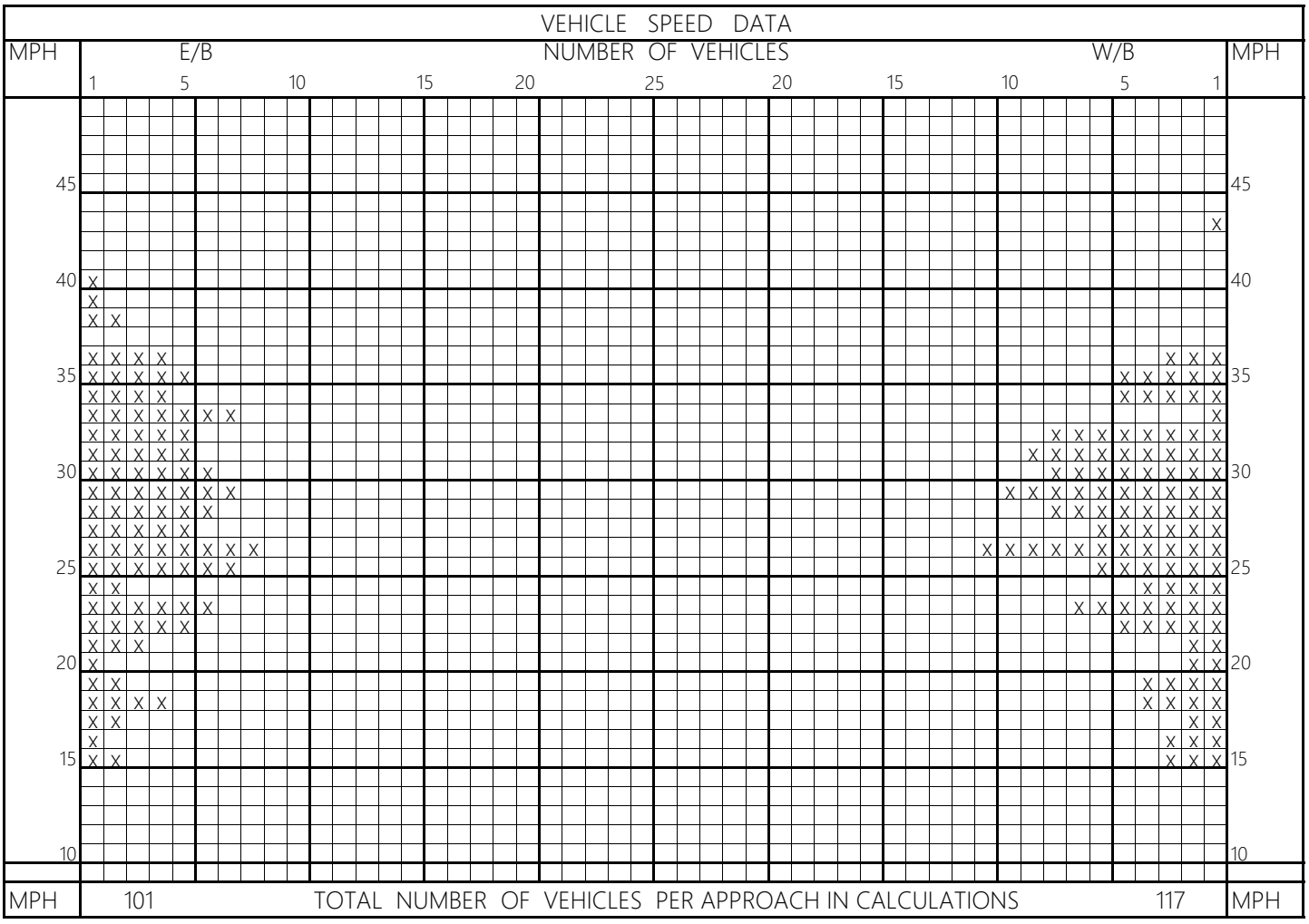
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Richmond Drive
Tioga Drive to Magnolia Avenue

Date of Survey: 4/20/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Richmond Drive
Between: Tioga Drive to Magnolia Avenue
Recorder: Traffic Data Service - Tube Counters

Direction: Eastbound and Westbound
Location: West of Lincoln Circle (West)



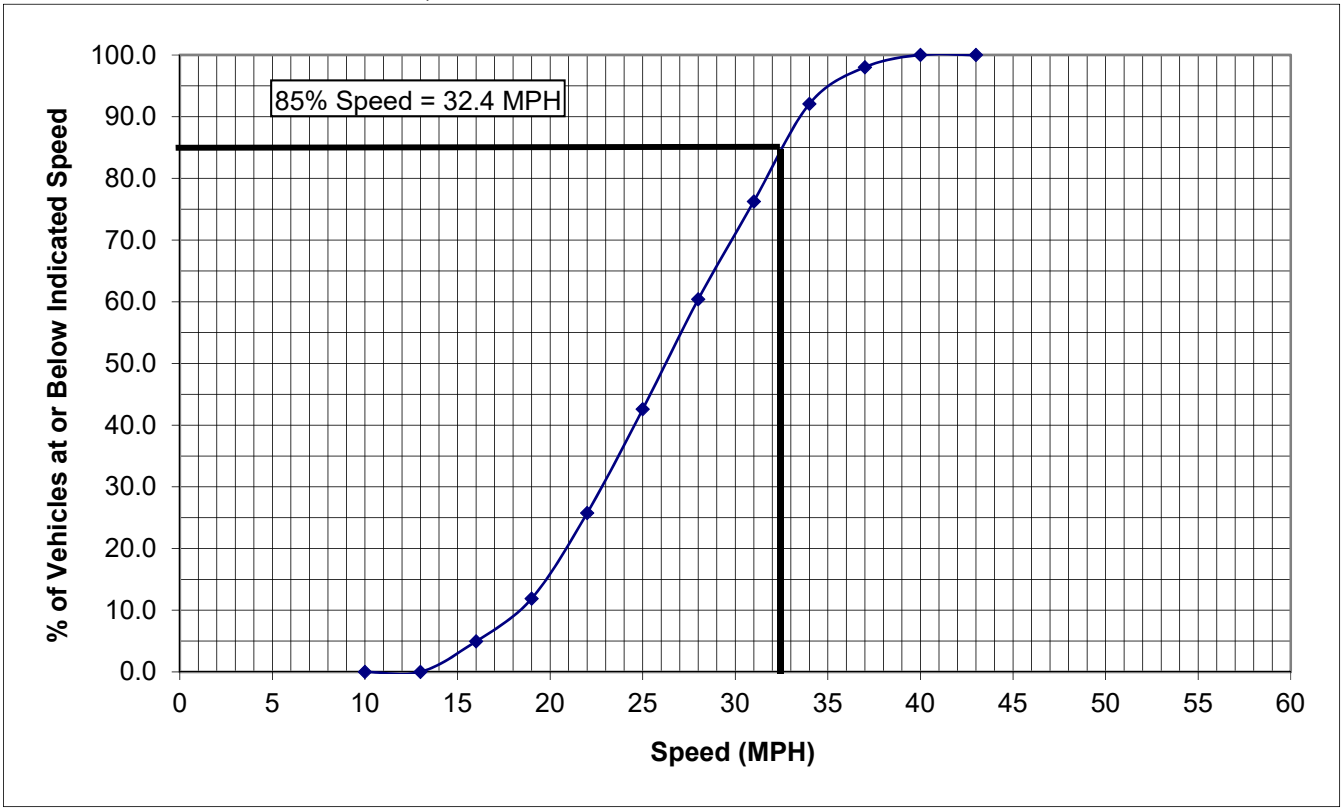
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
E/B	27.7	32.4	22 - 31	62.0%	5.9
W/B	26.8	30.8	23 - 32	65.8%	5.5

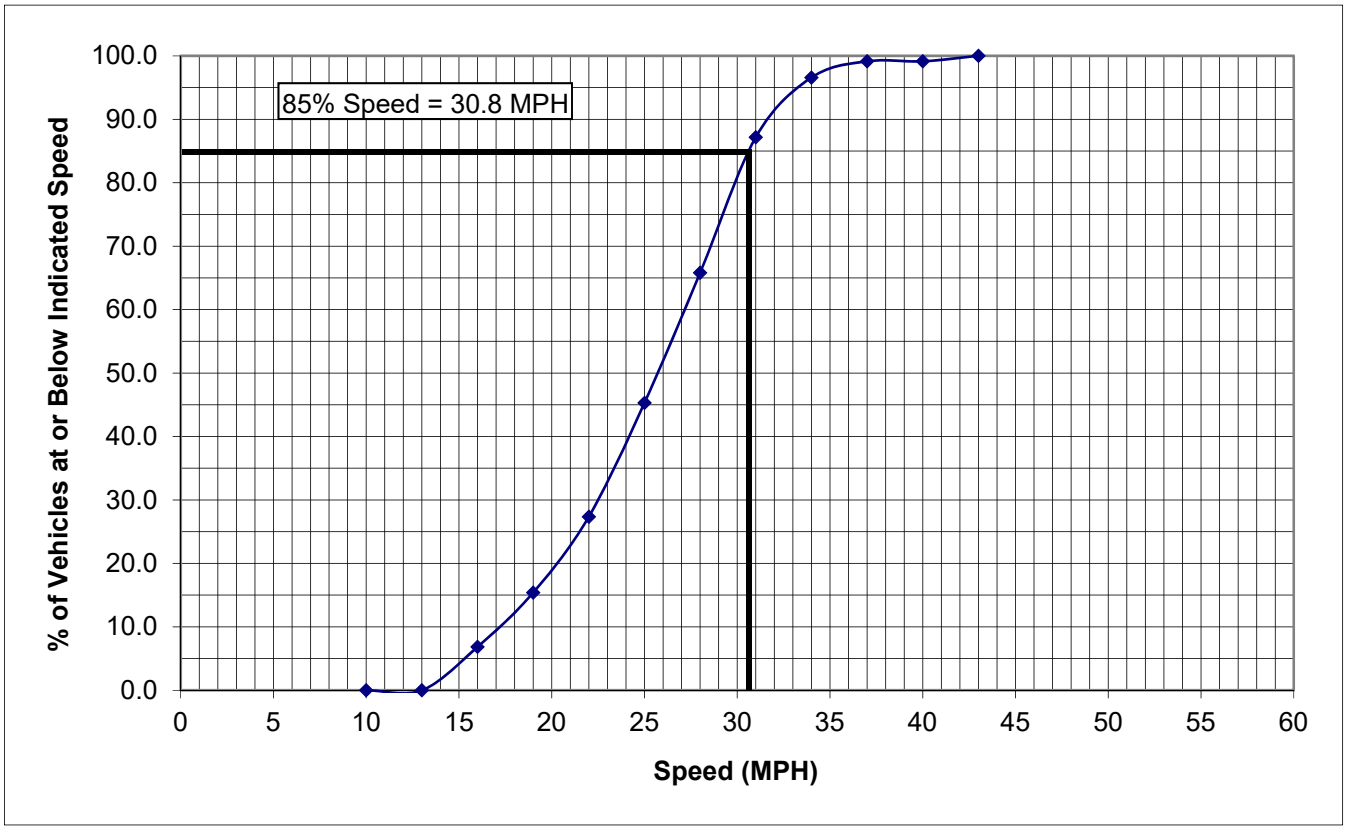
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Richmond Drive
Tioga Drive to Magnolia Avenue

S-Curve Calculation - 85% (Critical) Speed - E/B



S-Curve Calculation - 85% (Critical) Speed - W/B



10. Rollins Road

South City Limit to Camino Millenia

Roadway Conditions

Rollins Road provides direct access into the Millbrae BART Station. The 4-lane commercial and industrial use street without the City of Millbrae limits is only 1,250-FT. Rollins Road continues into the City of Burlingame but within the City of Millbrae the street is immediately traffic signal controlled resulting in reduced vehicle speeds south of Millbrae Avenue and north of Millbrae Avenue the street essential turns into an extension of the BART parking lot resulting in low vehicle speeds.

A reduction in the posted speed limit from 35 MPH to 25 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Rollins Road	South City Limit to Camino Millenia	35	24.5 NB 25.1 SB	16-25 NB 18-27 SB	25

City of Millbrae, CA
Engineering and Traffic Survey for:

Rollins Road
South City Limit to Camino Millenia

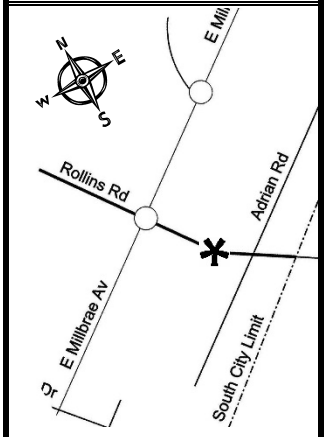
Segment Data by Direction of Travel	NB	SB
85th Percentile Speed (MPH)	24.5	25.1
Rounded 85th Percentile Speed (MPH)	25.0	25.0
Mean (Average) Speed (MPH)	22.4	22.6
10-MPH Pace / % of Vehicles in Pace	16-25/80.5%	18-27/85.5%
No. of Collisions in 24 Months / 2-Yr Collision Rate	4 / 3.162	
Survey Segment Length (Feet)/Avg. Daily Traffic	1,250 FT / 14,638 ADT	
Previous Speed Limit	35	35
Date of Previous Survey	7-5-2011	
Date of This Survey/Weather Conditions	5-3-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	4 / F	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Minor Arterial
	Land Use is Predominantly:	Industrial
	All-Way Stop Controls at:	None.
	Traffic Signal Controls at:	E Millbrae Avenue, and Adrian Road
	Uncontrolled Pedestrian Crossing Locations:	None.

Diagram



Scale: None

Legend:
- Traffic Signal
- All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

Recommended Speed Limit (MPH): ENTIRE SEGMENT: 25

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae — Date: 7-11-2016

Engineer's Stamp
Survey Prepared by:

Traffic Patterns

City of Millbrae, CA

Engineering and Traffic Survey for:

Rollins Road
South City Limit to Camino Millenia

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	North of Adrian Road
Date of Data Collection:	5-3-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

- ☐ Local
- ☐ Collector
- ☑ Arterial (Minor)
- ☐ Arterial (Major)

Average Daily Traffic (ADT) Volume: 14,638 Current Speed Limit: 35

Survey Segment Length (FT): 1,250 Street Width (curb to curb): 72' – 92'

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	2	Lane(s)		
Number of Travel Lanes in SB Direction:	2	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:		Yes	✓	No
Existing On-Street Parking Available:		Yes	✓	No
Approximate % of On-Street Parking Use:	N/A	%		
Segment part of a Suggested Route to School:		Yes	✓	No
Schools Served by Roadway Segment:				
Driveway Spacing (approximate):	100	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

Rollins Road
South City Limit to Camino Millenia

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves	
Type	Location
☑ None	
☐ Sharp Turns	
☐ Large Radius	

Vertical Curves	
Type	Location
☑ None	
☐ Hills	
☐ Sag Curves	

Controls Summary	
Type	Location
☑ None	
☐ All-Way Stops	
☐ Traffic Signals	Adrian Rd, and E Millbrae Av

Warning Devices	
Type	Location
☑ None	
☐ Ped. Beacons	
☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 4

1-Year Collision Rate (ACC/MVM): 3.162

VI. LAND USE SUMMARY

Predominant Land Use Type: Industrial

Other existing Land Use Types in Study Segment: Millbrae BART Station

Schools in/near Study Segment: None

Parks or Senior Centers in/near Study Segment: None

VII. ADDITIONAL COMMENTS

Recommend reducing posted speed limit from 35-MPH to 25-MPH to be consistent with 85-th percentile and 10-MPH speed calculated as part this Engineering & Traffic Survey. Rollins Road terminates into the Millbrae BART Station parking lot north of Millbrae Avenue. South of Millbrae Avenue the portion of Rollins Road within the city limits is short with closely spaced traffic signal facilities resulting in lower vehicle speeds compared to the portion of Rollins Road south of the city limits as a result.

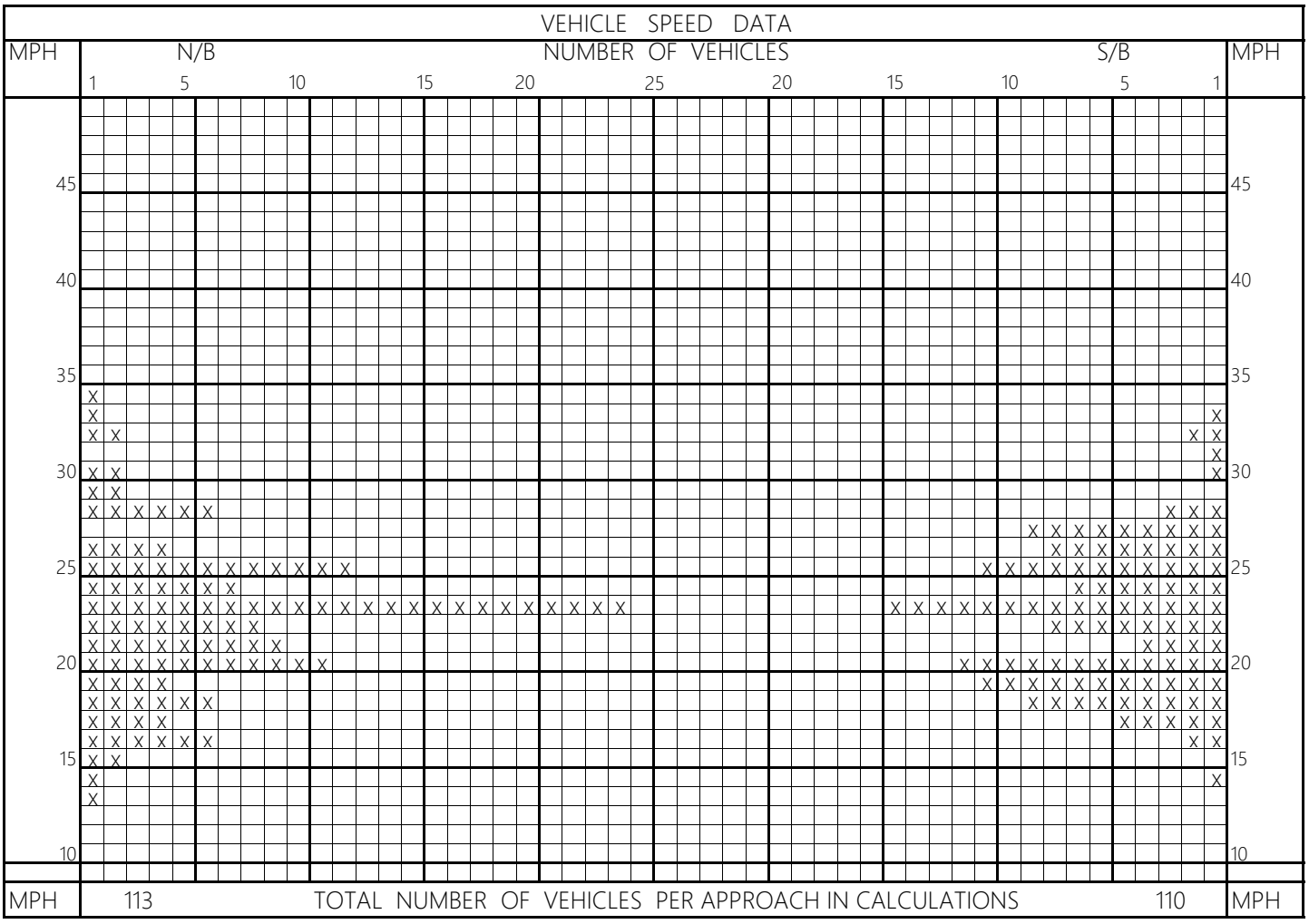
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Rollins Road
South City Limits to Camino Millenia

Date of Survey: 5/3/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Rollins Road
Between: South City Limits to Camino Millenia
Recorder: Traffic Data Service - Tube Counters

Direction: Northbound and Southbound
Location: North of Adrian Road



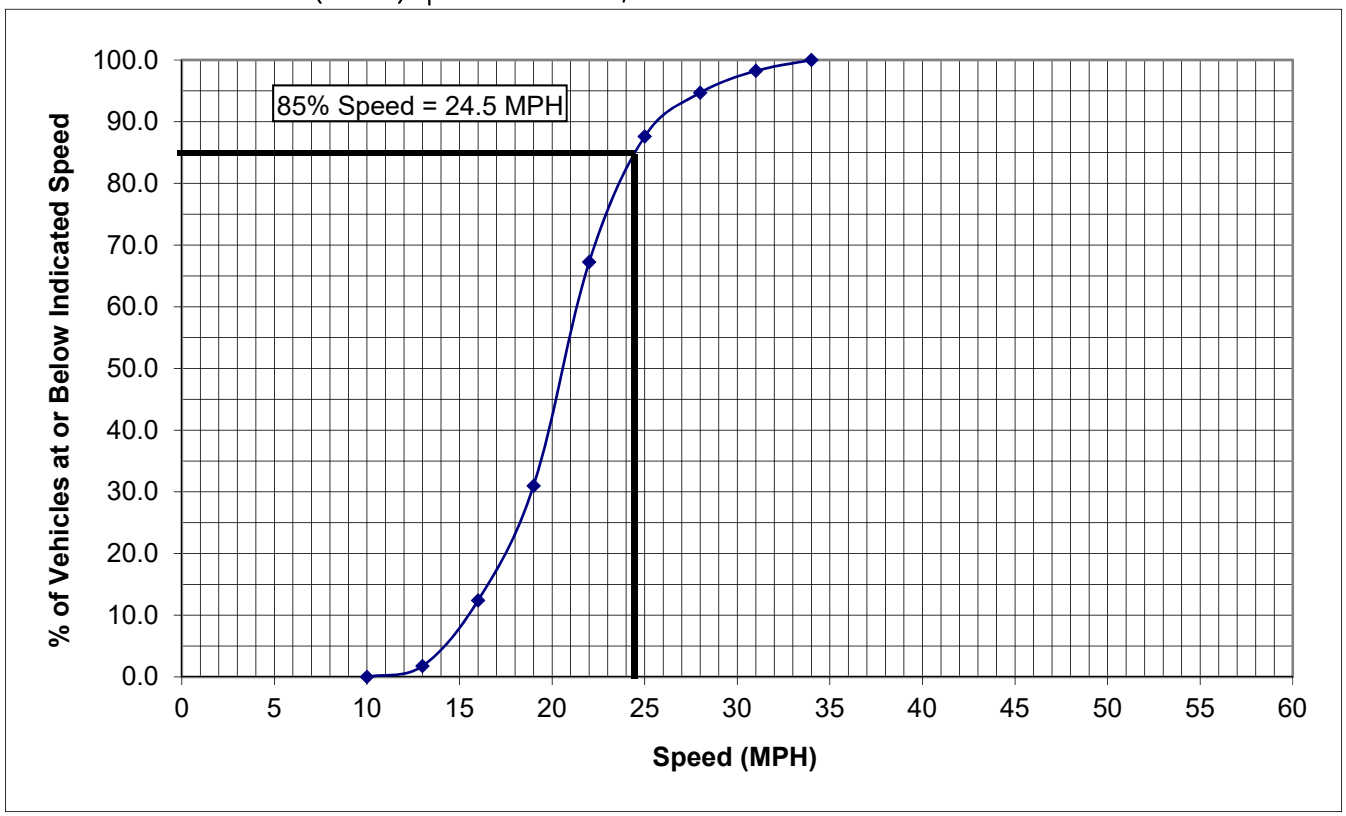
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
N/B	22.4	24.5	26 - 35	80.5%	4.1
S/B	22.6	25.1	28 - 37	85.5%	4.0

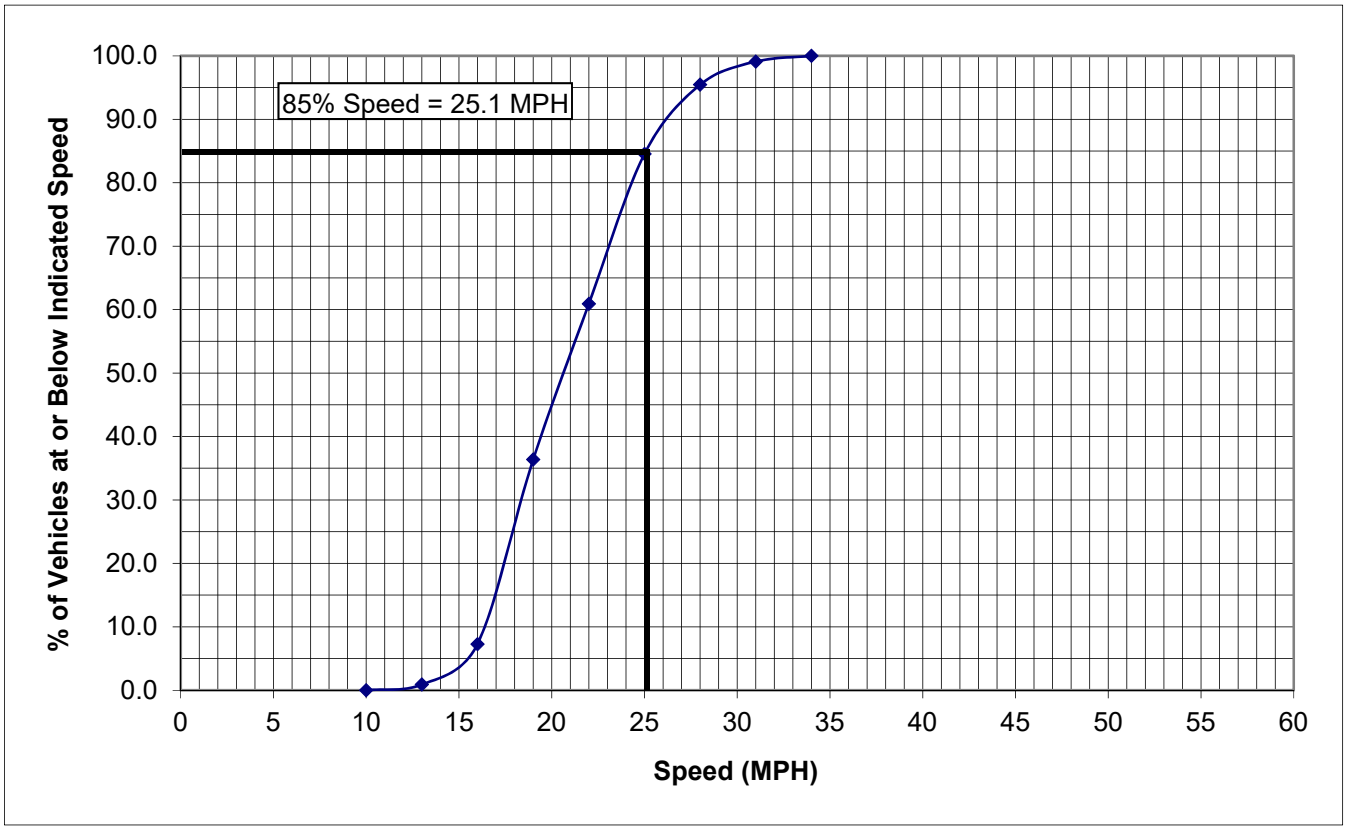
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Rollins Road
South City Limits to Camino Millenia

S-Curve Calculation - 85% (Critical) Speed - N/B



S-Curve Calculation - 85% (Critical) Speed - S/B



11. Skyline Boulevard

Larkspur Drive to Millbrae Avenue

Roadway Conditions

Skyline Boulevard is a 4-lane arterial street located parallel to I-280 along the city's western periphery. The back of residential land uses lines the streets east side while the west side of the street is adjacent to I-280. The street is 2-lanes with All-Way STOP controls at major intersection crossings. Bicycle activity on Skyline Boulevard is high during weekends with recreational

Retention of the existing posted speed limit of 30 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Skyline Boulevard	Larkspur Drive to Millbrae Avenue	40	36.5 NB 34.2 SB	29-38 NB 29-38 SB	35

City of Millbrae, CA
Engineering and Traffic Survey for:

Skyline Boulevard
Larkspur Drive to Millbrae Avenue

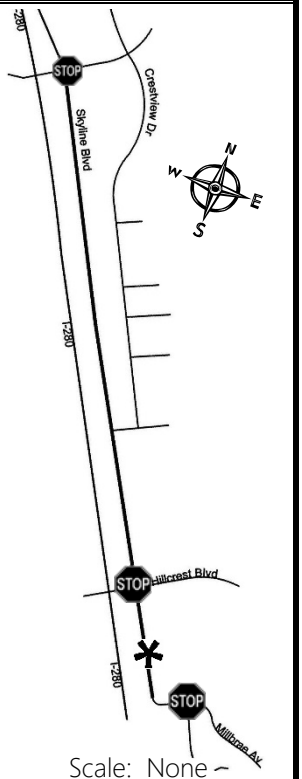
Segment Data by Direction of Travel	NB	SB
85th Percentile Speed (MPH)	36.5	34.2
Rounded 85th Percentile Speed (MPH)	35.0	35.0
Mean (Average) Speed (MPH)	33.1	32.8
10-MPH Pace / % of Vehicles in Pace	29-38/70.3%	29-38/85.6%
No. of Collisions in 12 Months / 1-Yr Collision Rate	1 / 0.426	
Survey Segment Length (Feet)/Avg. Daily Traffic	4,000 FT / 8,480 ADT	
Previous Speed Limit	40	40
Date of Previous Survey	7-6-2011	
Date of This Survey/Weather Conditions	5-3-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	2 / C	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Arterial (Minor)
	Land Use is Predominantly:	Residential
	All-Way Stop Controls at:	Larkspur Dr, Riverton Dr, Hillcrest Blvd, and Millbrae Ave
	Traffic Signal Controls at:	None.
	Uncontrolled Pedestrian Crossing Locations:	None.

Diagram



Scale: None

Legend:
- Traffic Signal
- STOP All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

ENTIRE SEGMENT
Recommended Speed Limit (MPH): 35

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Engineer's Stamp
Survey Prepared by:

REGISTERED PROFESSIONAL ENGINEER
JAIME O. RODRIGUEZ
TR2284
Exp: 6-30-18
TRAFFIC
STATE OF CALIFORNIA

7-11-2016

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae Date

Traffic Patterns

City of Millbrae, CA

Engineering and Traffic Survey for:

Skyline Boulevard
Larkspur Drive to Millbrae Avenue

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	Midblock – Hillcrest Blvd to Millbrae Ave
Date of Data Collection:	5-3-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

☐ Local ☐ Collector

☑ Arterial (Minor) ☐ Arterial (Major)

Average Daily Traffic (ADT) Volume: 8,480 Current Speed Limit: 40

Survey Segment Length (FT): 4,000 Street Width (curb to curb): 44-FT

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	1	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:	✓	Yes		No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:		Yes	✓	No
Existing On-Street Parking Available:		Yes	✓	No
Approximate % of On-Street Parking Use:	N/A	%		
Segment part of a Suggested Route to School:		Yes	✓	No
Schools Served by Roadway Segment:	None			
Driveway Spacing (approximate):	N/A	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

Skyline Boulevard
Larkspur Drive to Millbrae Avenue

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves	
Type	Location
☑ None	
☐ Sharp Turns	
☐ Large Radius	

Vertical Curves	
Type	Location
☑ None	
☑ Hills	Entire Segment
☐ Sag Curves	

Controls Summary	
Type	Location
☐ None	Larkspur Dr, Riverton Dr, Hillcrest Blvd, Millbrae Ave
☑ All-Way Stops	
☐ Traffic Signals	

Warning Devices	
Type	Location
☑ None	
☐ Ped. Beacons	
☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 1

1-Year Collision Rate (ACC/MVM): 0.426

VI. LAND USE SUMMARY

Predominant Land Use Type: Residential

Other existing Land Use Types in Study Segment: None

Schools in/near Study Segment: None

Parks or Senior Centers in/near Study Segment: None

VII. ADDITIONAL COMMENTS

Recommend reducing posted speed limit from 40-MPH to 35-MPH to be consistent with 85-th percentile and 10-MPH statistics from this Engineering & Traffic Survey. Skyline Boulevard runs parallel to I-280 and has a high bicycle use during evening and weekend periods.

ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

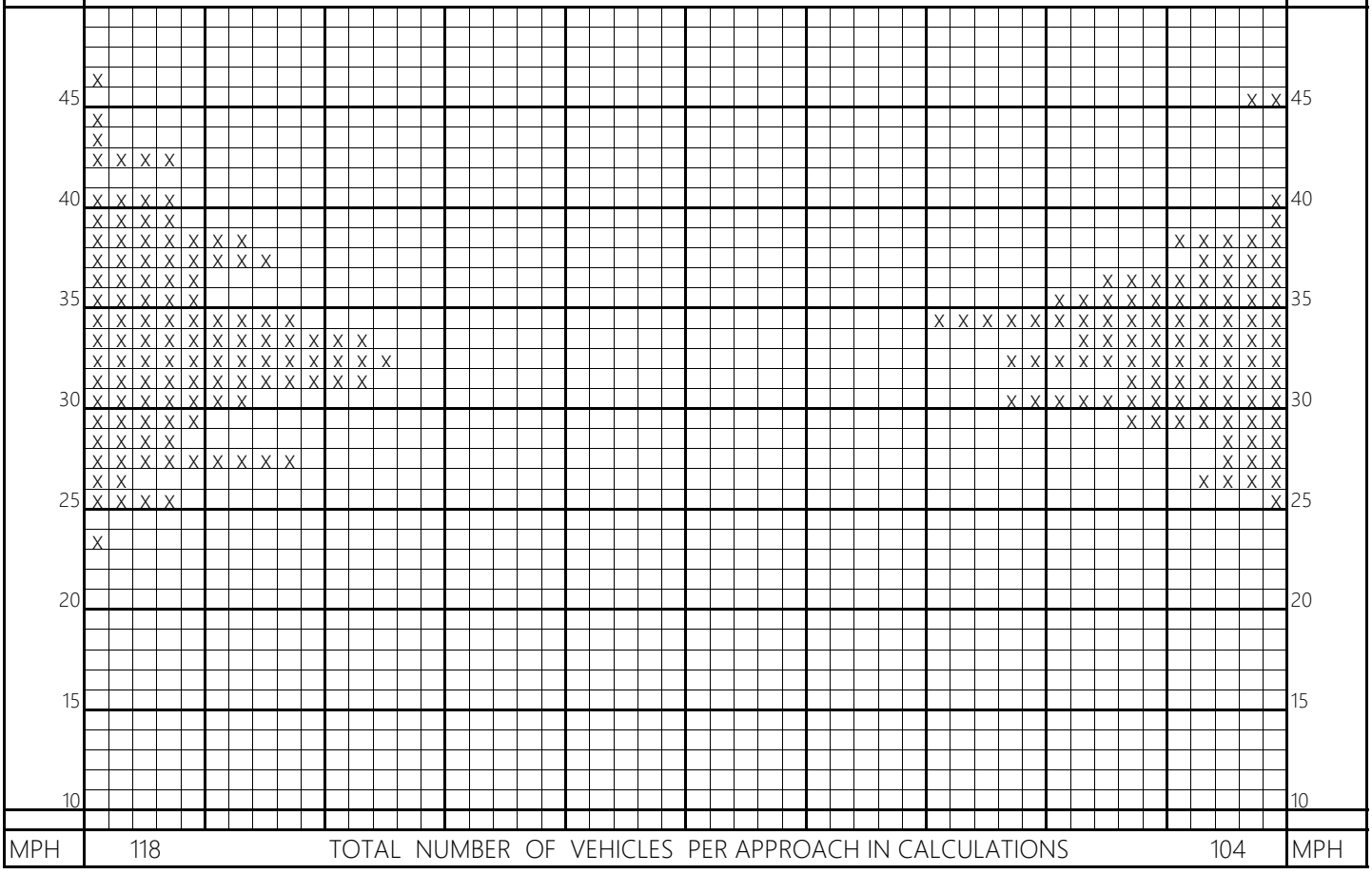
Skyline Boulevard
Larkspure Boulevard to Millbrae Avenue

Date of Survey: 5/3/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Skyline Boulevard
Between: Larkspure Boulevard to Millbrae Avenu
Recorder: Traffic Data Service - Tube Counters

Direction: Northbound and Southbound
Location: Midblock between Hillcrest Blvd and Millbrae Avenue

VEHICLE SPEED DATA



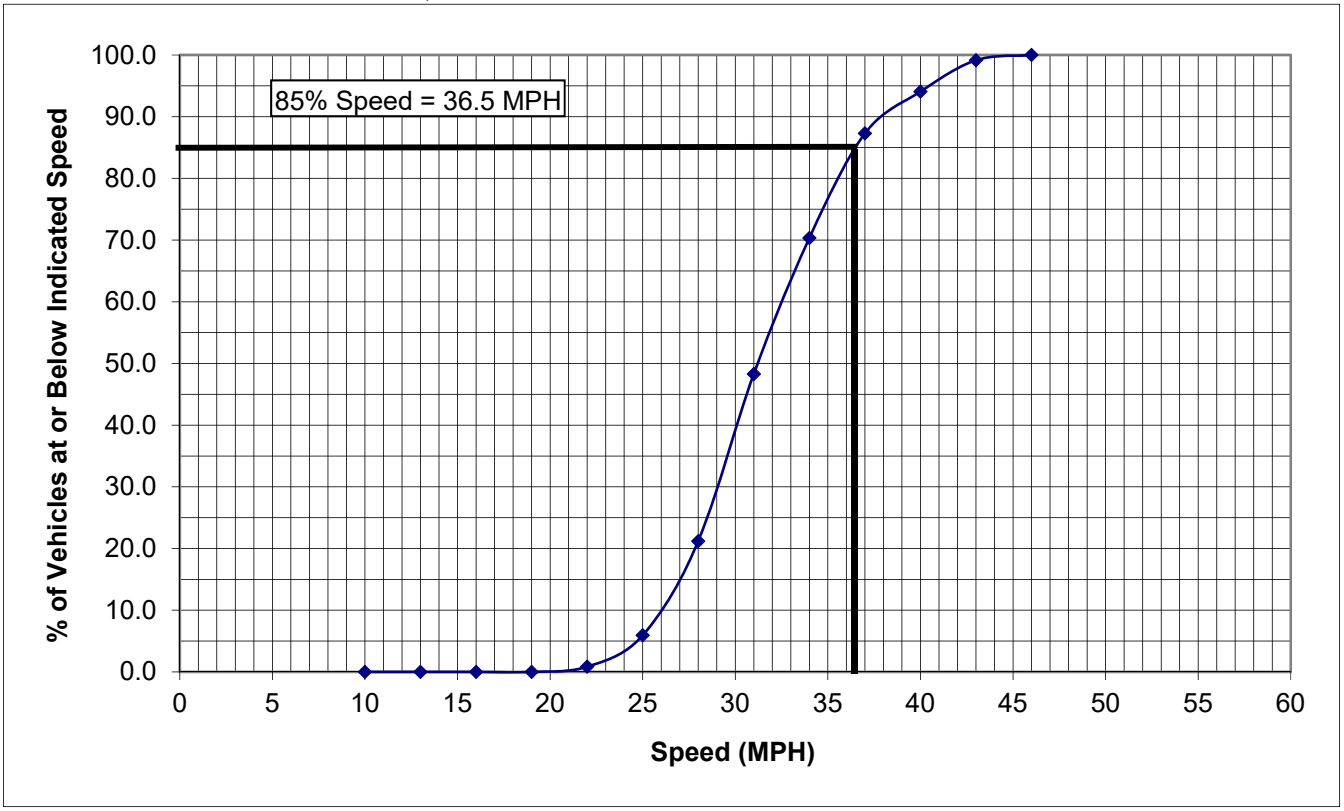
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
N/B	33.1	36.5	39 - 48	70.3%	4.7
S/B	32.8	34.2	39 - 48	85.6%	3.8

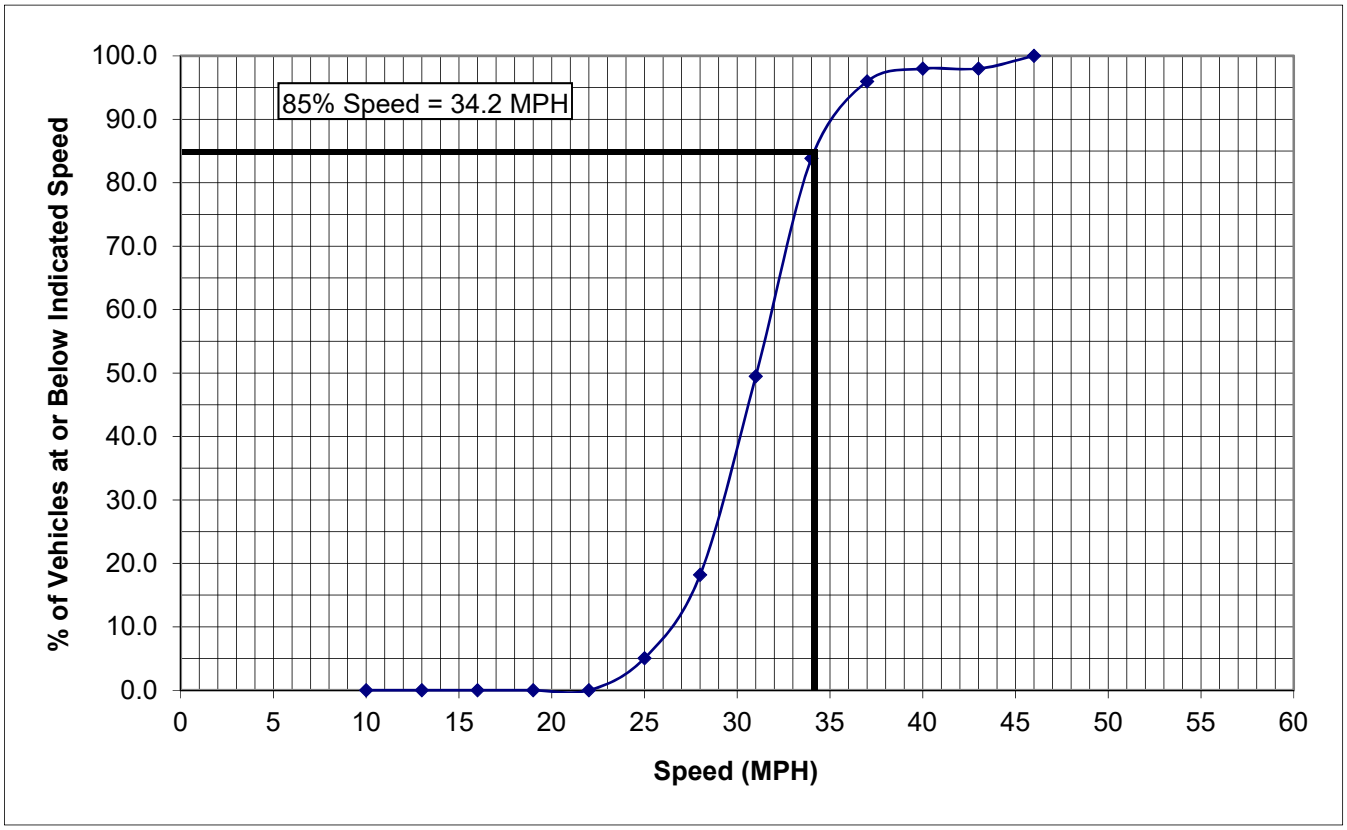
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Skyline Boulevard
Larkspure Boulevard to Millbrae Avenue

S-Curve Calculation - 85% (Critical) Speed - N/B



S-Curve Calculation - 85% (Critical) Speed - S/B



12. Taylor Boulevard

Minorca Way to Magnolia Avenue

Roadway Conditions

Taylor Boulevard is a 2-lane residential collector street between that provides direct access to Downtown Milbrae. The street has high pedestrian and bicycle activity during the school commute periods as it provides direct access to Taylor Middle School located near Minorca Way.

Retention of the existing posted speed limit of 25 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Taylor Boulevard	Minorca Way to Magnolia Avenue	25	27.2 EB 27.4 WB	21-30 EB 20-29 WB	25

City of Millbrae, CA
Engineering and Traffic Survey for:

Taylor Boulevard
Minorca Way to Magnolia Avenue

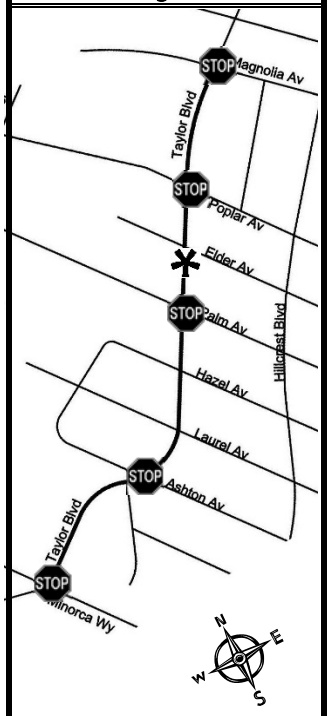
Segment Data by Direction of Travel	EB	WB
85th Percentile Speed (MPH)	27.2	27.4
Rounded 85th Percentile Speed (MPH)	25.0	25.0
Mean (Average) Speed (MPH)	24.6	25.0
10-MPH Pace / % of Vehicles in Pace	21-30/81.0%	20-29/82.0%
No. of Collisions in 12 Months / 1-Yr Collision Rate	0 / 0	
Survey Segment Length (Feet)/Avg. Daily Traffic	3,100 FT / 7,427 ADT	
Previous Speed Limit	25	25
Date of Previous Survey	7-19-2011	
Date of This Survey/Weather Conditions	4-20-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	2 / C	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Collector
	Land Use is Predominantly:	Residential
	All-Way Stop Controls at:	Magnolia Ave, Poplar Ave, Palm Ave, Ashton Ave, and Minorca Way
	Traffic Signal Controls at:	None.
	Uncontrolled Pedestrian Crossing Locations:	None.

Diagram



Scale: None

Legend:
- Traffic Signal
- All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

ENTIRE SEGMENT
25

Recommended Speed Limit (MPH):

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae — Date: 7-11-2016

Engineer's Stamp
Survey Prepared by:

REGISTERED PROFESSIONAL ENGINEER
JAIME O. RODRIGUEZ
TR2284
Exp: 6-30-18
TRAFFIC
STATE OF CALIFORNIA

Traffic Patterns

City of Millbrae, CA

Engineering and Traffic Survey for:

Taylor Boulevard
Minorca Way to Magnolia Avenue

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	West of Elder Avenue
Date of Data Collection:	4-20-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

☐ Local ☑ Collector

☐ Arterial (Minor) ☐ Arterial (Major)

Average Daily Traffic (ADT) Volume: 7,427 Current Speed Limit: 40

Survey Segment Length (FT): 3,100 Street Width (curb to curb): 34' – 40'

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	1	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:		Yes	✓	No
Existing On-Street Parking Available:	✓	Yes		No
Approximate % of On-Street Parking Use:	30	%		
Segment part of a Suggested Route to School:	✓	Yes		No
Schools Served by Roadway Segment:	Taylor Middle School			
Driveway Spacing (approximate):	100	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

Taylor Boulevard
Minorca Way to Magnolia Avenue

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves		Vertical Curves	
Type	Location	Type	Location
☐ None	West of Laurel Ave	☐ None	West of Laurel Ave
☐ Sharp Turns		☑ Hills	
☑ Large Radius		☐ Sag Curves	

Controls Summary		Warning Devices	
Type	Location	Type	Location
☐ None	Magnolia Av, Poplar Av, Palm Av, Ashton Av, Minorca Way	☑ None	
☑ All-Way Stops		☐ Ped. Beacons	
☐ Traffic Signals		☐ Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 0

1-Year Collision Rate (ACC/MVM): 0

VI. LAND USE SUMMARY

Predominant Land Use Type: Residential

Other existing Land Use Types in Study Segment: Public Facilities

Schools in/near Study Segment: Mill High School

Parks or Senior Centers in/near Study Segment: Millbrae Spur Trail

VII. ADDITIONAL COMMENTS

Recommend maintaining existing 25-MPH speed limit as it is consistent with 85-th percentile and 10-MPH speeds calculated as part of this Engineering & Traffic Survey. Taylor Boulevard also experiences a high volume of pedestrian activity due to its residential nature and proximity to Taylor Middle School and the Millbrae Spur Trail.

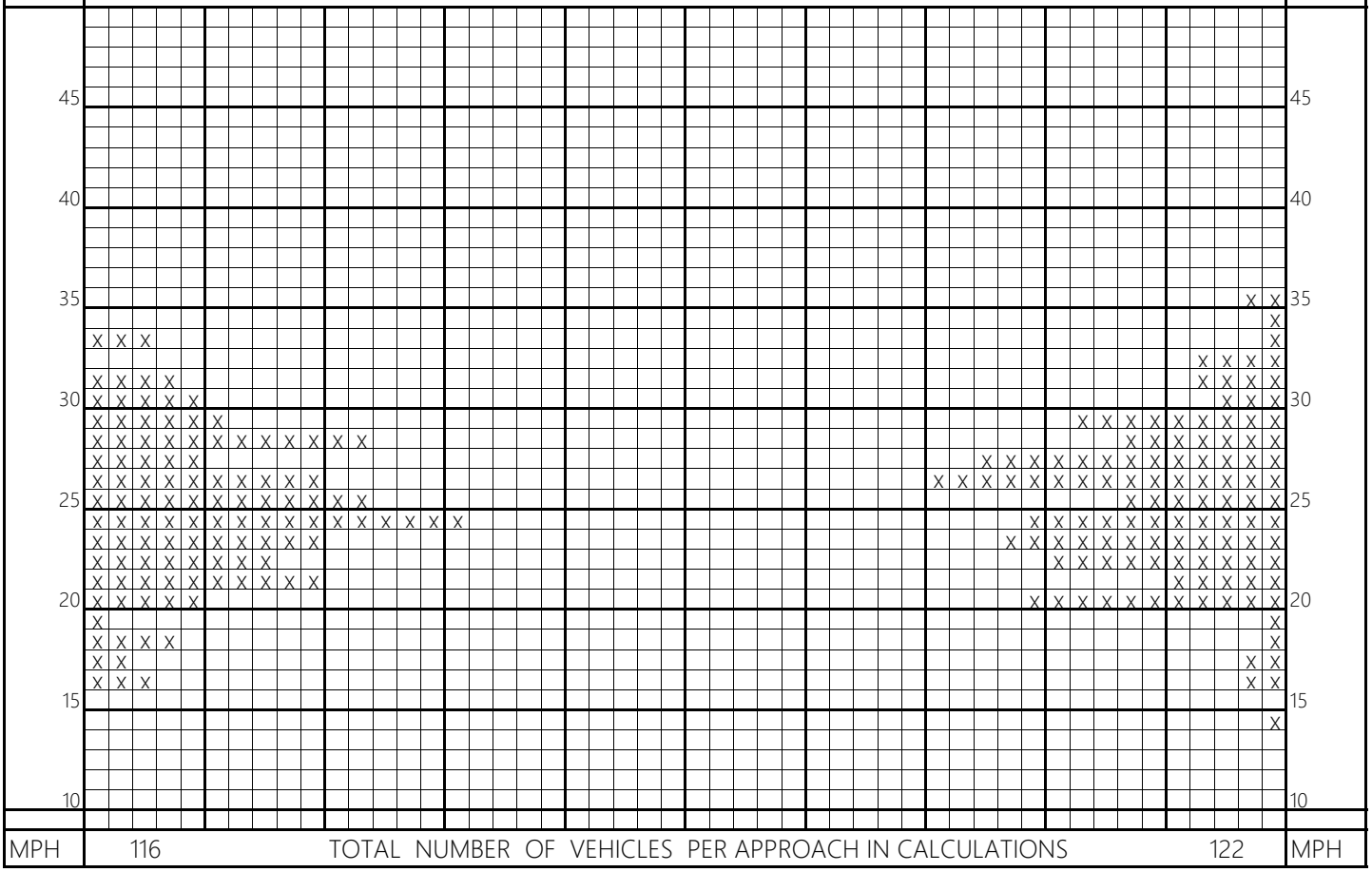
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Taylor Boulevard
Minorca Way to Magnolia Avenue

Date of Survey: 4/20/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Taylor Boulevard
Direction: Eastbound and Westbound
Between: Minorca Way to Magnolia Avenue
Location: West of Elder Avenue
Recorder: Traffic Data Service - Tube Counters

VEHICLE SPEED DATA



MPH 116 TOTAL NUMBER OF VEHICLES PER APPROACH IN CALCULATIONS 122 MPH

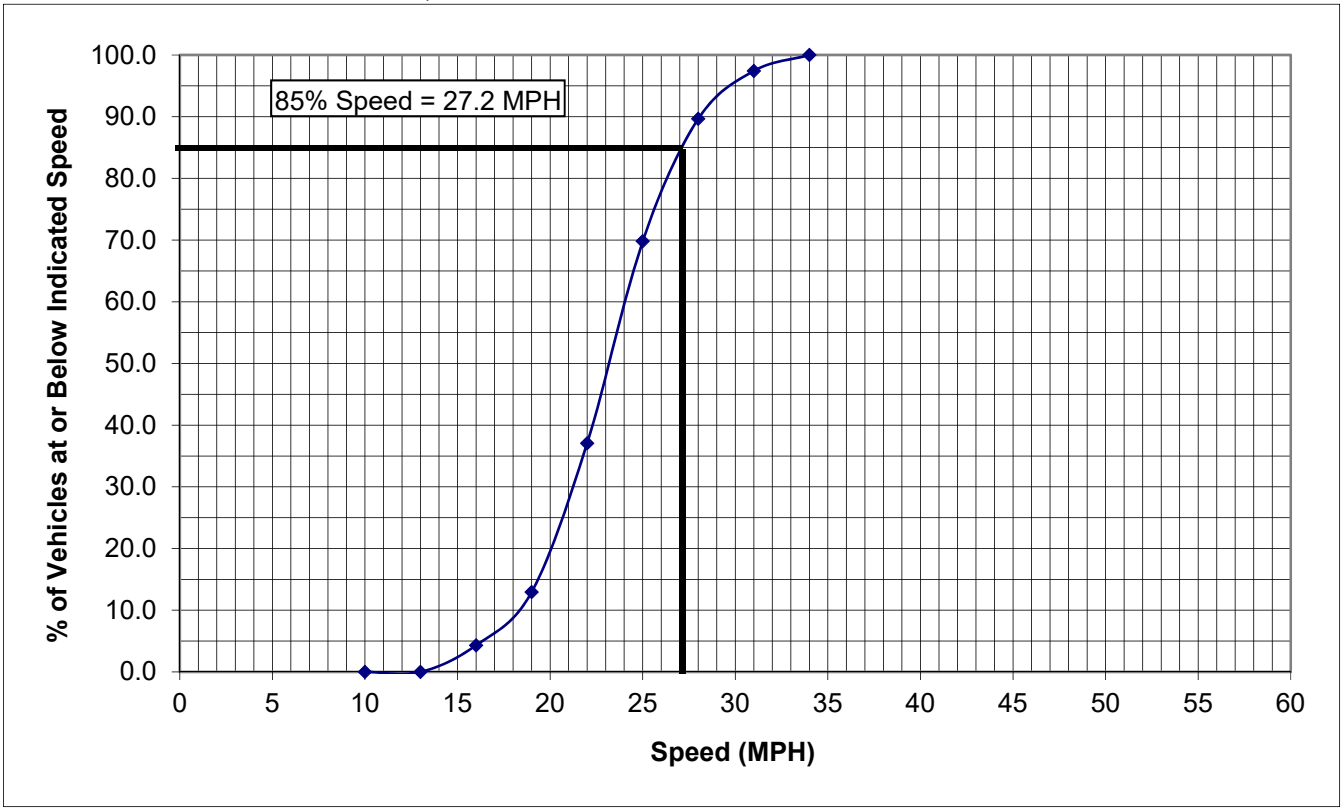
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
E/B	24.6	27.2	30 - 39	81.0%	3.9
W/B	25.0	27.7	30 - 39	82.0%	4.2

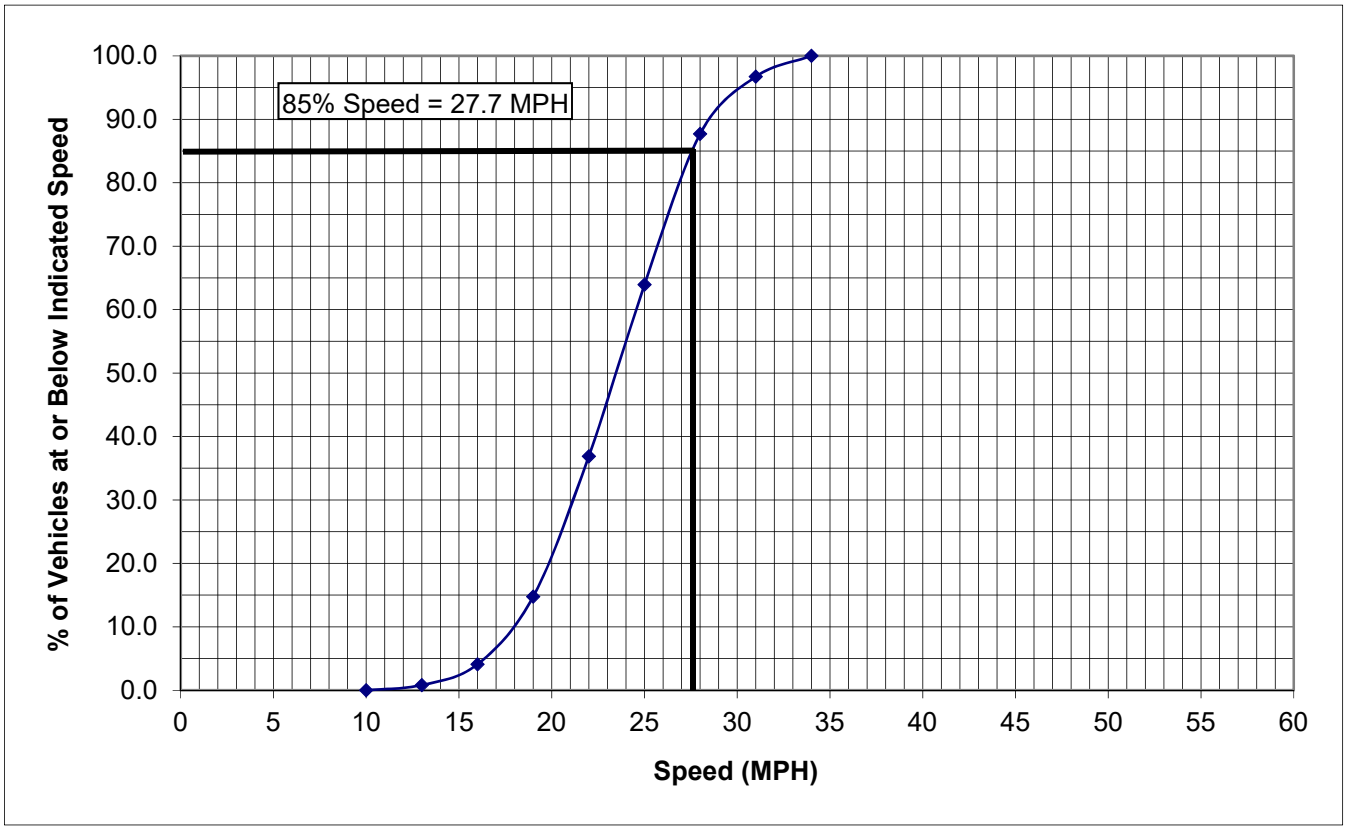
ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Taylor Boulevard
Minorca Way to Magnolia Avenue

S-Curve Calculation - 85% (Critical) Speed - E/B



S-Curve Calculation - 85% (Critical) Speed - W/B



13. Vallejo Drive

Frontera Way to Millbrae Avenue

Roadway Conditions

Vallejo Drive is located in the southwest area of the City of Millbrae is the extension of Skyline Boulevard south of Millbrae Avenue. The street is predominantly residential and multi-dwelling land use from apartments south of Conejo Drive. Like Skyline Boulevard Vallejo Drive receives regular recreational bicycle use.

Retention of the existing posted speed limit of 30 MPH is recommended to be consistent with 85th percentile and 10-MPH pace speed calculated as part of this Engineering & Traffic Survey.

Street	Speed Zone Segment	Existing Speed Limit (MPH)	Surveyed 85% Speed (MPH)	Surveyed 10-MPH Pace	Proposed Speed Limit (MPH)
Vallejo Drive	Frontera Way to Millbrae Avenue	30	31.0 NB 30.0 SB	21-30 NB 22-31 SB	30

City of Millbrae, CA

Engineering and Traffic Survey for:

Vallejo Drive

Frontera Way to Millbrae Avenue

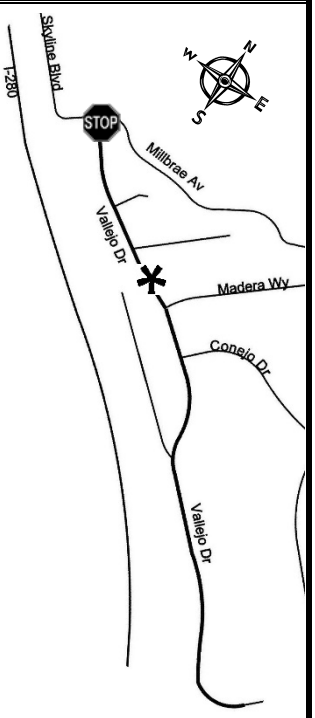
Segment Data by Direction of Travel	NB	SB
85th Percentile Speed (MPH)	31.0	30.0
Rounded 85th Percentile Speed (MPH)	30.0	30.0
Mean (Average) Speed (MPH)	25.6	26.7
10-MPH Pace / % of Vehicles in Pace	21-30/62.3%	22-31/70.9%
No. of Collisions in 12 Months / 1-Yr Collision Rate	0 / 0	
Survey Segment Length (Feet)/Avg. Daily Traffic	3,000 FT / 1,278 ADT	
Previous Speed Limit	30	30
Date of Previous Survey	7-7-2011	
Date of This Survey/Weather Conditions	4-20-2016 / Overcast	
Segment Roadway Markings/No. of Through Lanes	2 / B	

Types of Roadway Markings

A = no roadway markings
B = single yellow center line
C = double yellow center line w/o left turn lanes
D = double yellow center lines w left turn lanes
E = Two-Way Left Turn Lane
F = Raised or Painted Median Islands

Segments	Summary of Contributing Factors	
ENTIRE	Surveyed Street Classification:	Collector
	Land Use is Predominantly:	Residential
	All-Way Stop Controls at:	Millbrae Ave
	Traffic Signal Controls at:	None.
	Uncontrolled Pedestrian Crossing Locations:	None.

Diagram



Scale: None

Legend:
- Traffic Signal
- STOP All-Way STOP
- Uncontrolled Pedestrian Crossing
- Location of Survey

Recommended Speed Limit (MPH):	ENTIRE SEGMENT
	30

CERTIFICATION:
The speed limit for this roadway segment was determined in accordance with the requirements for an Engineering and Traffic Survey set forth by the California Vehicle Code. Approved and Authorized for release by the City of Millbrae.

Engineer's Stamp
Survey Prepared by:

Traffic Patterns

7-11-2016

Survey Reviewed by: Khee Lim, PE, City Engineer – City of Millbrae Date

City of Millbrae, CA

Engineering and Traffic Survey for:

Vallejo Drive
Frontera Way to Millbrae Avenue

I. DETAIL OF CONTRIBUTING FACTORS – ENGINEERING AND TRAFFIC SURVEY

Engineering and Traffic Survey performed by:	Jaime O. Rodriguez, TE, Traffic Patterns
Location of Speed Data Collection:	Midblock – Chadwick Ct to Madera Wy
Date of Data Collection:	4-20-2016
Data Collection Performed by:	Traffic Data Services – Tube Counters

II. GENERAL INFORMATION

Functional Classification of Roadway:

☐ Local ☑ Collector

☐ Arterial (Minor) ☐ Arterial (Major)

Average Daily Traffic (ADT) Volume: 1,278 Current Speed Limit: 30

Survey Segment Length (FT): 3,000 Street Width (curb to curb): 42-FT

III. ROADWAY CHARACTERISTICS

Number of Travel Lanes in NB Direction:	1	Lane(s)		
Number of Travel Lanes in SB Direction:	1	Lane(s)		
Two-Way Left Turn Lanes:		Yes	✓	No
Bicycle Lanes:		Yes	✓	No
Shared the Roadway (Sharrow) Bike Markings:		Yes	✓	No
Marked but Uncontrolled Crosswalks:		Yes	✓	No
Existing On-Street Parking Available:	✓	Yes		No
Approximate % of On-Street Parking Use:	30	%		
Segment part of a Suggested Route to School:		Yes	✓	No
Schools Served by Roadway Segment:	N/A			
Driveway Spacing (approximate):	100	Feet		

City of Millbrae, CA

Engineering and Traffic Survey for:

Vallejo Drive
Frontera Way to Millbrae Avenue

IV. ROADWAY GEOMETRY & EXISTING CONTROLS

Horizontal Curves		Location
Type		
☐	None	Frontera Way
☑	Sharp Turns	
☐	Large Radius	

Vertical Curves		Location
Type		
☐	None	Entire Segment
☑	Hills	
☐	Sag Curves	

Controls Summary		Location
Type		
☐	None	Millbrae Ave
☑	All-Way Stops	
☐	Traffic Signals	

Warning Devices		Location
Type		
☑	None	
☐	Ped. Beacons	
☐	Vehicle Speed Feedback Signs	

V. COLLISION HISTORY 7 / 1 / 2015 TO 6 / 30 / 2016

Total No. Collisions in 12 Months: 0

1-Year Collision Rate (ACC/MVM): 0

VI. LAND USE SUMMARY

Predominant Land Use Type: Residential

Other existing Land Use Types in Study Segment: Multi-Family Apartments

Schools in/near Study Segment: N/A

Parks or Senior Centers in/near Study Segment: N/A

VII. ADDITIONAL COMMENTS

Recommend maintaining existing 30-MPH speed limit as it is consistent with 85-th percentile and 10-MPH speeds calculated as part of this Engineering & Traffic Survey. Vallejo Drive is on a hillside with a consistent grade on its entire length.

ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

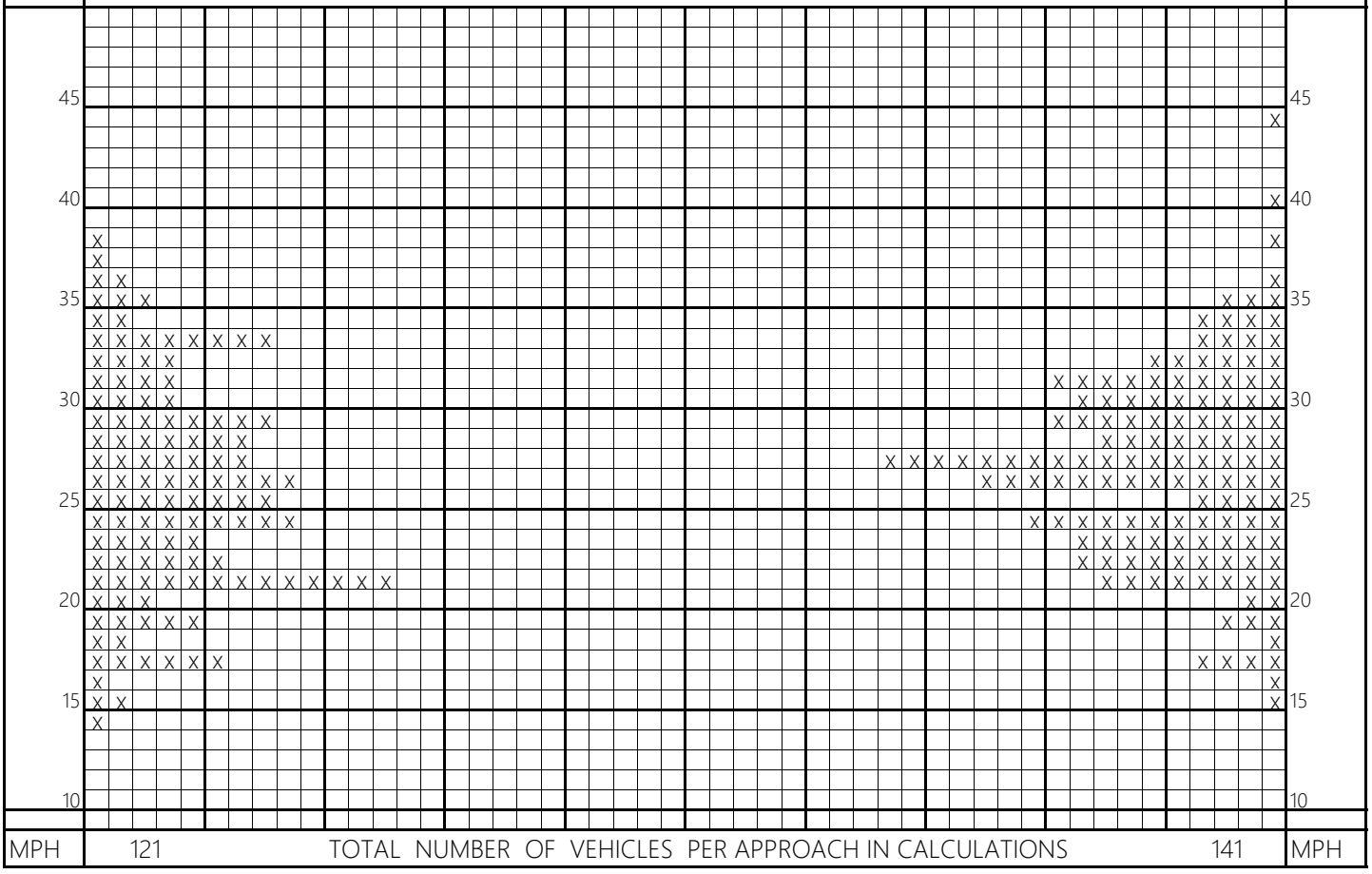
Vallejo Drive
Frontera Way to Millbrae Avenue

Date of Survey: 4/20/2016
Weather Conditions: Overcast with Dry Roads
Start Time: 10:30AM

Street: Vallejo Drive
Between: Frontera Way to Millbrae Avenue
Recorder: Traffic Data Service - Tube Counters

Direction: Northbound and Southbound
Location: Midblock between Chadwick Court and Madera Way

VEHICLE SPEED DATA



MPH 121 TOTAL NUMBER OF VEHICLES PER APPROACH IN CALCULATIONS 141 MPH

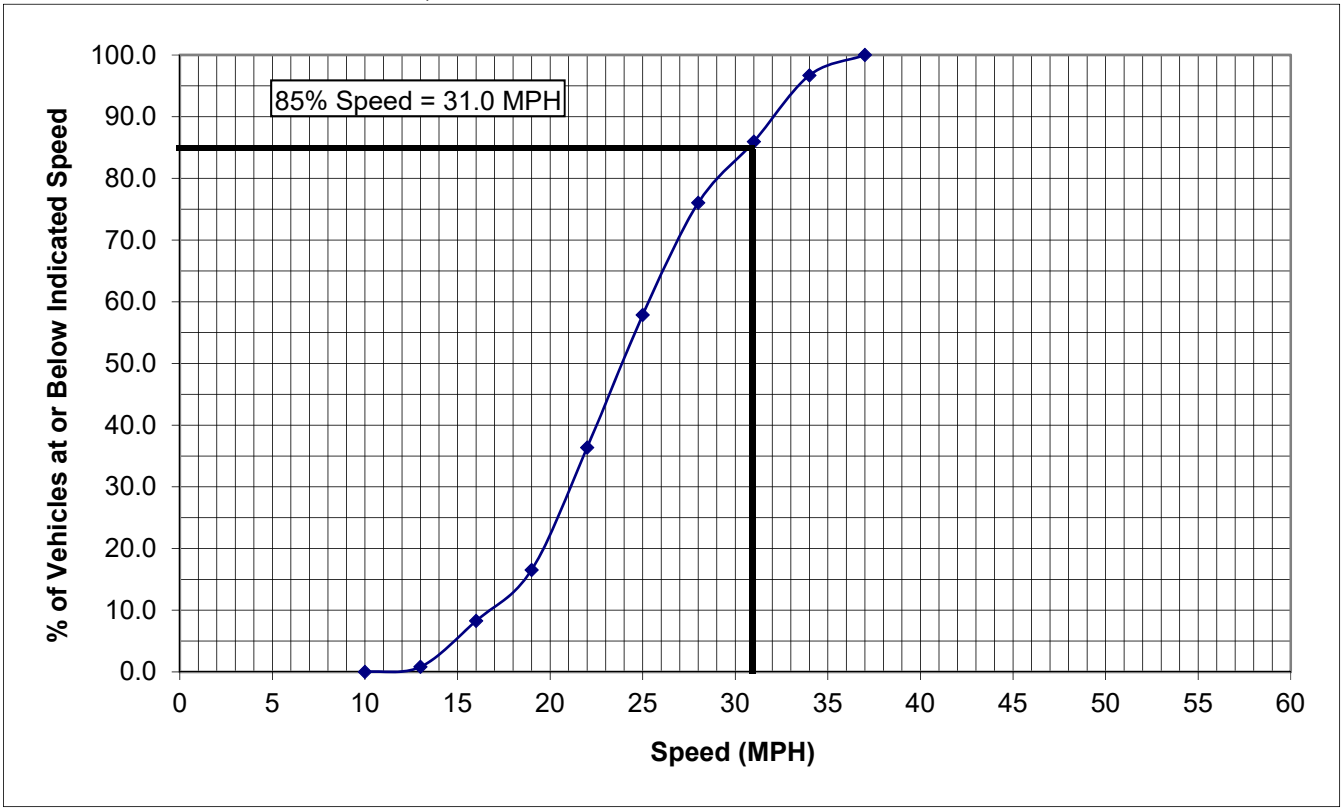
Calculations:

Direction	Mean (Avg.) Speed	85% (Critical) Speed	10-MPH Pace	% in Pace	Std. Dev.
N/B	25.6	31.0	31 - 40	62.3%	5.5
S/B	26.7	30.0	32 - 41	70.9%	4.9

ENGINEERING & TRAFFIC SURVEY
SPEED DATA CALCULATION FORM

Vallejo Drive
Frontera Way to Millbrae Avenue

S-Curve Calculation - 85% (Critical) Speed - N/B



S-Curve Calculation - 85% (Critical) Speed - S/B