

LAKELAND DIVISION 15  
TRAFFIC IMPACT ANALYSIS

*Mason County, WA*



08/15/2022

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LAKELAND DIVISION 15  
TRAFFIC IMPACT ANALYSIS

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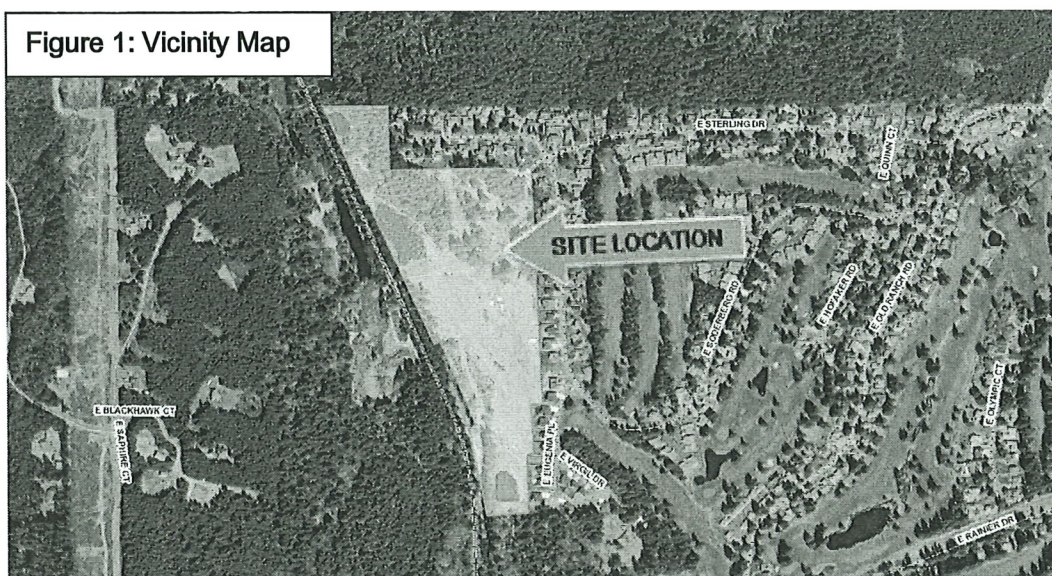
LAKELAND DIVISION 15  
TRAFFIC IMPACT ANALYSIS

1. INTRODUCTION

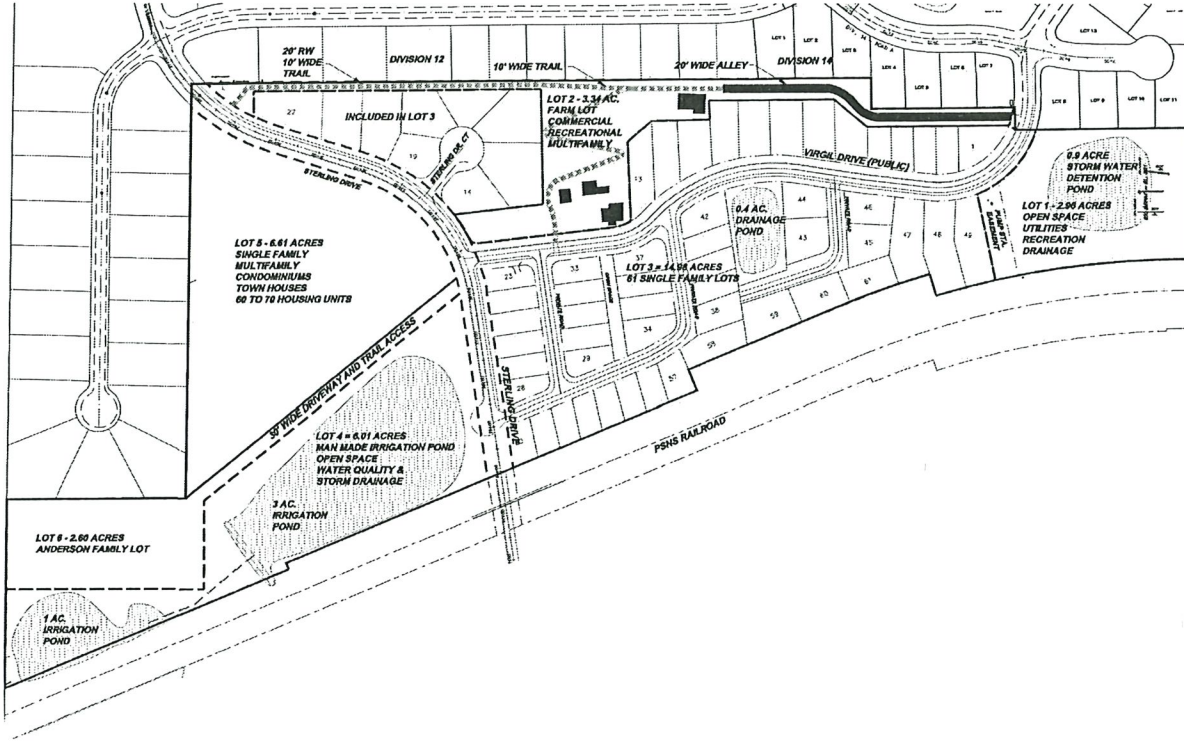
The main goals of this study focuses on the assessment of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the adjacent streets serving the subject site and gathering existing vehicular volumes within a defined study area. Forecasts of future traffic and dispersion patterns on the street system are then determined using established trip generation and distribution techniques. As a final step, appropriate conclusions and mitigation measures are defined, if needed.

2. PROJECT DESCRIPTION

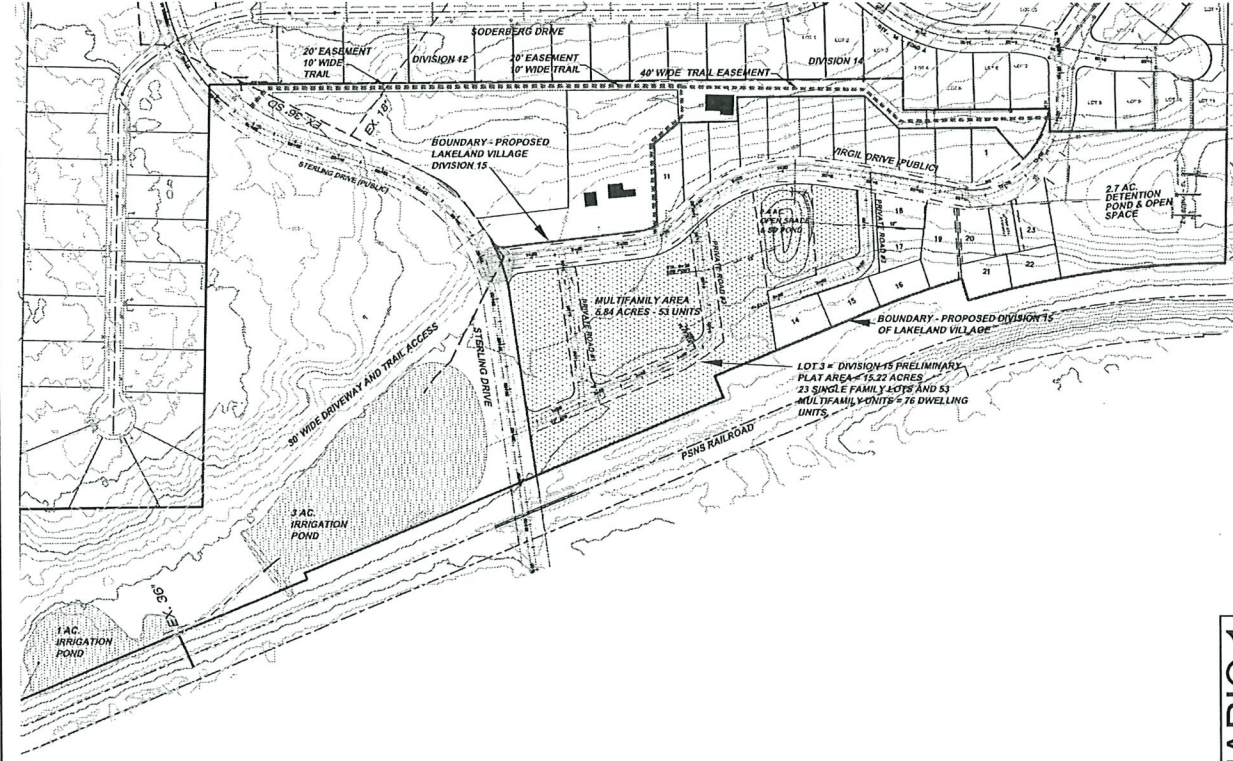
The Lakeland Division 15 project is proposed residential development to construct either, scenario one which includes 21 single-family dwelling units and 56 multifamily dwelling units or scenario two which includes 61 single family lots. The subject site is located north of Allyn within the Allyn Urban Growth Area (UGA) of Mason County, situated on tax parcel #: 122184000000. The subject site is comprised of 83.20-acres bordered to the west by the Burlington Northern Santa Fe railroad tracks and located west of E Soderberg Road. All existing on-site structures are to be demolished prior to new construction. Site access is proposed via a northerly extension of the existing E Virgil Drive and a southwest extension of the existing E Sterling Drive. Figure 1 below is a vicinity map which illustrates the nearby roadway network with the subject site highlighted in blue. Figure 2 on the following page displays the conceptual site plan.







**SCENARIO 2**



**SCENARIO 1**



### 3. EXISTING CONDITIONS

#### 3.1 Existing Roadway Characteristics

The street network serving the proposed project consists of a variety of roadways. The roadways and arterials defined in the study area are listed and described in the table below.

**Table 1: Roadway Network**

Functional Classification	Roadway	Speed Limit	Lanes	Street Parking	Sidewalk	Bike Facilities
Principal Arterial / State Route	SR-3	50 mph	2	No	No	No
	E Homestead Dr	25 mph	2	No	No	No
Local	E Old Ranch Rd	25 mph	2	No	No	No
	E Sterling Dr	25 mph	2	No	No	No
	E Soderberg Rd	25 mph	2	No	No	No

#### 3.2 Existing Peak Hour Volumes

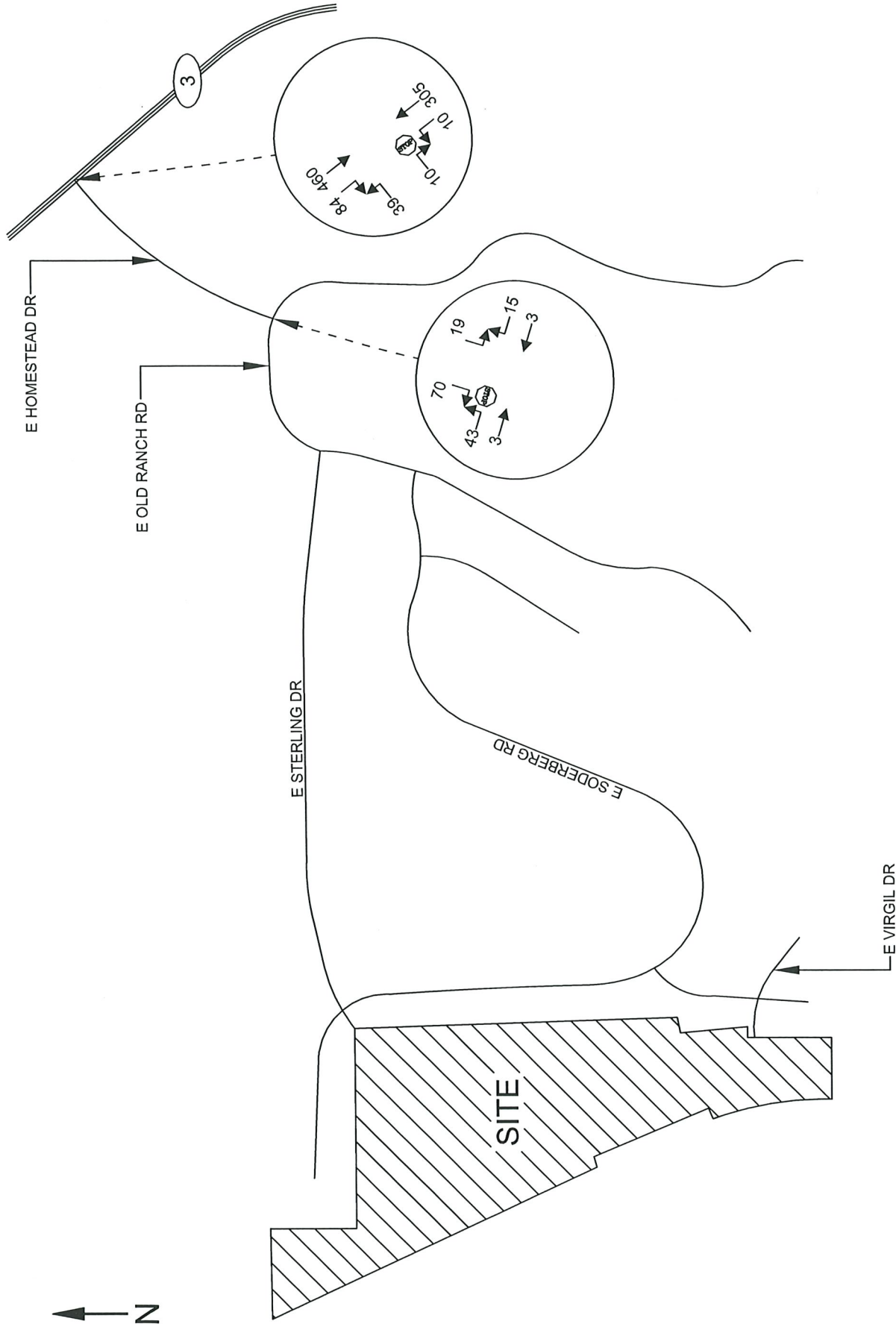
Field data for this study was obtained and collected in June of 2022 to identify baseline conditions with respect to the surrounding vicinity. Traffic counts were performed at the study intersections listed below. Data for the intersections of study were collected between the hours of 4:00 PM to 6:00 PM as this timeframe usually captures the highest overall vehicular volumes in a given 24-hour period. The single hour with the highest vehicular volumes, known as the peak hour, is then used for analysis to represent worst case conditions for the PM peak hour.

- State Route (SR) 3 & E Homestead Drive (Peak Hour: 4:15-5:15 PM)
- E Old Ranch Road & E Homestead Drive (Peak Hour: 4:00-5:00 PM)

Existing PM peak hour volumes are illustrated in Figure 3. Full count sheets have been attached to the appendix for reference.

#### 3.3 Non-Motorist Traffic

Observations for pedestrian and bicycle activity were made during the PM peak hour turning movement counts conducted at the study intersections of SR-3 & E Homestead Drive and E Old Ranch Road & E Homestead Drive. During the PM peak hour, no pedestrians were observed traversing either intersection.



**LAKELAND DIVISION 15**  
**EXISTING PM PEAK HOUR VOLUMES**  
**FIGURE 3**

**HEATH & ASSOCIATES**  
**TRAFFIC AND CIVIL ENGINEERING**



### 3.4 Level of Service

Peak hour delays were determined through the use of the *Highway Capacity Manual* 6th Edition. Capacity analysis is used to determine level of service (LOS) which is an established measure of congestion for transportation facilities. The range<sup>1</sup> for intersection level of service is LOS A to LOS F with the former indicating the best operating conditions with low control delays and the latter indicating the worst conditions with heavy control delays. Detailed descriptions of intersection LOS are given in the 2016 Highway Capacity Manual. Level of service calculations were made through the use of the *Synchro 11* analysis program. For side-street stop-controlled intersections, LOS is determined by the approach with the highest delay. Table 2 below summarizes existing PM peak hour calculated delays at the outlying study intersections.

**Table 2: Existing PM Peak Hour Level of Service**

*Delays given in seconds per vehicle*

Intersection	Control	LOS	Delay
SR-3 & E Homestead Dr	Stop	C	16.6
E Old Ranch Rd & E Homestead Dr	Stop	A	9.0

Existing PM peak hour LOS is shown to operate at LOS C conditions or better at the outlying study intersections. According to the Mason County Comprehensive Plan, intersections should maintain LOS D<sup>2</sup> for county arterials within the UGA. Moreover, WSDOT level of service standards should maintain LOS C<sup>3</sup> conditions or better for SR-3. No intersection deficiencies are identified under existing conditions.

<sup>1</sup> *Signalized Intersections - Level of Service*

Level of Service	Control Delay per Vehicle (sec)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Highway Capacity Manual, 6th Edition

<sup>2</sup> Mason County Comprehensive Plan, Chapter 2, page 23.

<sup>3</sup> WSDOT Level of Service Standards, ArcGIS Map

*Stop Controlled Intersections – Level of Service*

Level of Service	Control Delay per Vehicle (sec)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

### 3.5 Transit Service

A review of the Mason County Transit service system indicated that no transit is available in the immediate vicinity of the proposed project (under a mile walking distance). However, at the intersection of SR-3 & E Drum Street located southeast of the project, Route 1 – Shelton/Belfair and Route 21 – Shelton/Belfair are available. Please refer to the Mason County Transit website for more detailed information.

### 3.6 Roadway Improvements

A review of the most recent Mason County Six-Year Transportation Improvement Program (2021-2026) indicates one improvement project planned in the vicinity of the proposed Lakeland Division 15 project. A description and summary of the project is provided below.

*Allyn Access, Circulation Easement Acquisition (Priority # 27):* This project entails right-of-way acquisition on E Wheelwright Street, E Wade Street and E Masterson Street. The project has a total estimated cost of ~\$3,000,000.

### 3.7 Site Access

Access to and from the subject plat is proposed via extensions of two existing public roadways: Virgil Drive (north/south) and Sterling Drive (east/west). From the extended public roadways, private road connections would be provided for lot access as illustrated in the site plans (see Figure 2). All new roadways and intersections shall be designed to County and AASHTO standards for geometrics and sight distance.



## 4. FUTURE TRAFFIC CONDITIONS

### 4.1 Trip Generation

Trip generation is used to determine the magnitude of project impacts on the surrounding street system. This is usually denoted by the quantity or specific number of new trips that enter and exit a project during a designated time period, such as a specific peak hour (AM or PM) or an entire day. Data presented in this report was taken from the Institute of Transportation Engineer's publication *Trip Generation*, 11th Edition.

Two project scenarios are proposed, the first will include 21 single family units and 60 multifamily units and scenario two will include 61 single family units.

The proposed land uses are identified under ITE's Land Use Code (LUC) Multi-Family (Low-Rise) – LUC 220, and Single-Family Detached Housing – LUC 210. Table 3 below summarizes the estimated project trip generation for scenario one and Table 4 summarizes project trip generation for scenario two. Both scenarios used ITE average rates with dwelling units as the input variable. Included are the average weekday daily traffic (AWDT), AM peak hours trips and PM peak hours trips for the proposed use. Refer to the appendix for trip generation output.

**Table 3: Project Trip Generation (Scenario 1)**

Land Use	Dwelling Units	ADT	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
Multi-Family – LUC 220	60	360	5	17	22	18	11	29
Single Family – LUC 210	21	198	4	11	15	12	8	20
	<b>Total Trips</b>	<b>558</b>	<b>9</b>	<b>28</b>	<b>37</b>	<b>30</b>	<b>19</b>	<b>49</b>

Based on scenario one, the project would be estimated to generate a site total of 535 average weekday daily trips with 37 trips (9 inbound / 28 outbound) occurring during the AM peak hour and 49 trips (30 inbound / 19 outbound) in the PM peak hour.

**Table 4: Project Trip Generation (Scenario 2)**

Land Use	Dwelling Units	ADT	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
Single Family – LUC 210	61	575	11	32	43	36	21	57

Based on scenario two, the project would be estimated to generate a site total of 575 average weekday daily trips with 43 trips (11 inbound / 32 outbound) occurring during the AM peak hour and 57 trips (36 inbound / 21 outbound) in the PM peak hour.

Scenario two, shown to produce more trips when compared to scenario one, will be utilized for this assessment. However, the actual scenario is undetermined at the time of this report. Therefore, using the higher estimates would model and evaluate worst case conditions.

#### 4.2 Trip Distribution and Assignment

Trip distribution describes the process by which project generated trips are dispersed on the street network surrounding the site. Trips generated by the project during the PM peak hour are expected to follow the general trip pattern as shown in Figure 4. Percentages were derived based on existing travel patterns identified from the field count and the subject site's proximity to nearby arterials. The majority (~85%) of traffic is anticipated to travel to/from the north by way of SR-3. While some traffic may use local roads south of the site (e.g., E County Club Drive, E Lakeland Drive, etc.) all traffic has been assigned to E Homestead Drive to remain conservative and this being the most direct route into and out of the subject site.

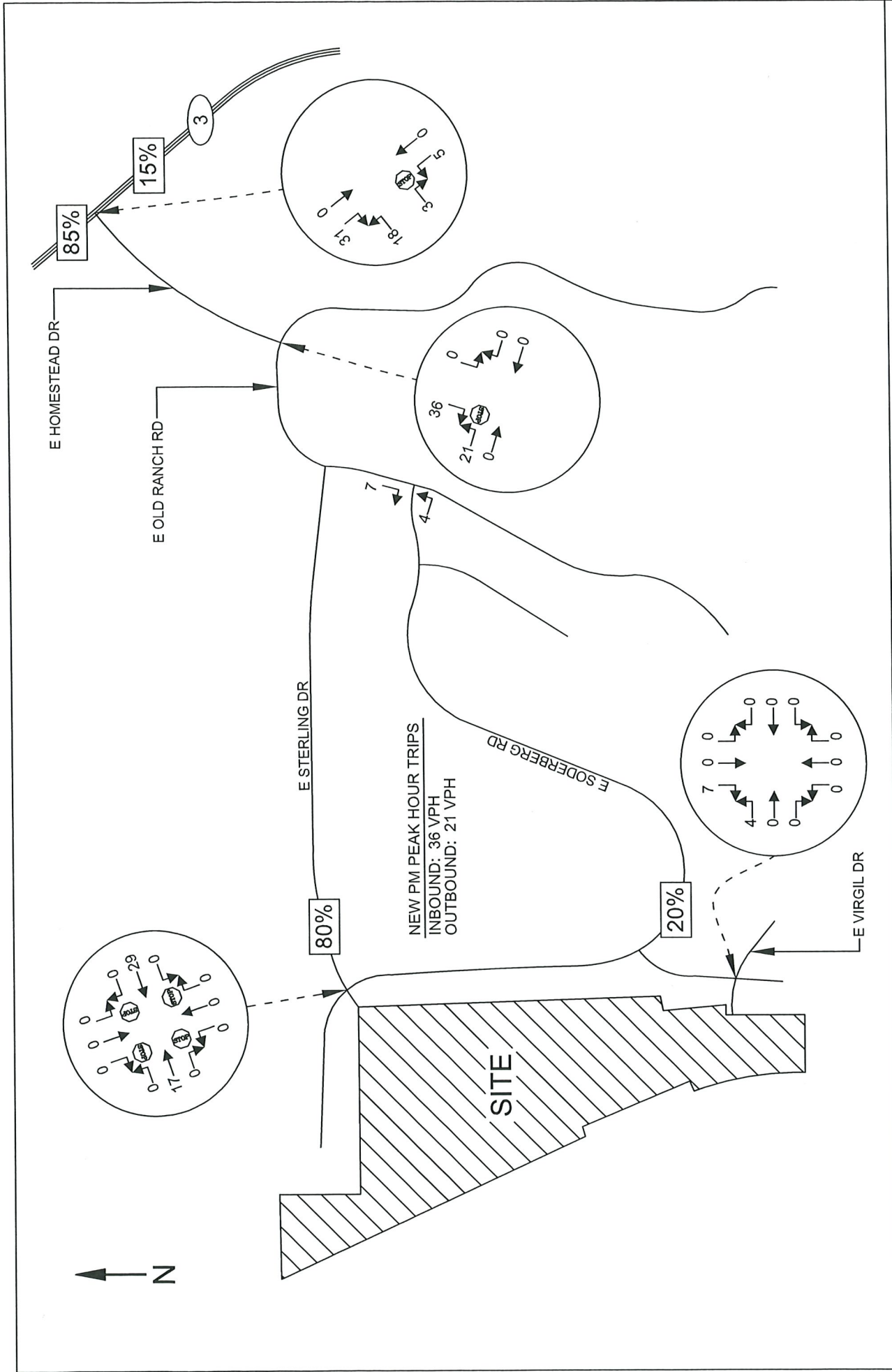
#### 4.3 Future Peak Hour Volumes

A five-year horizon of 2027 was used for future traffic delay analysis. According to the Mason County Comprehensive Plan, the Allyn UGA is forecasted to grow ~2.3% per year<sup>4</sup>. Additionally from 2017 to 2019 traffic volumes along SR-3 have grown three percent per year according to WSDOT traffic volumes. To remain conservative in analysis, a 3.0 percent compound annual growth rate has been applied to the existing volumes shown in Figure 3. Forecast 2027 PM peak hour background volumes are shown in Figure 5 while Figure 6 includes the addition of project-generated traffic.

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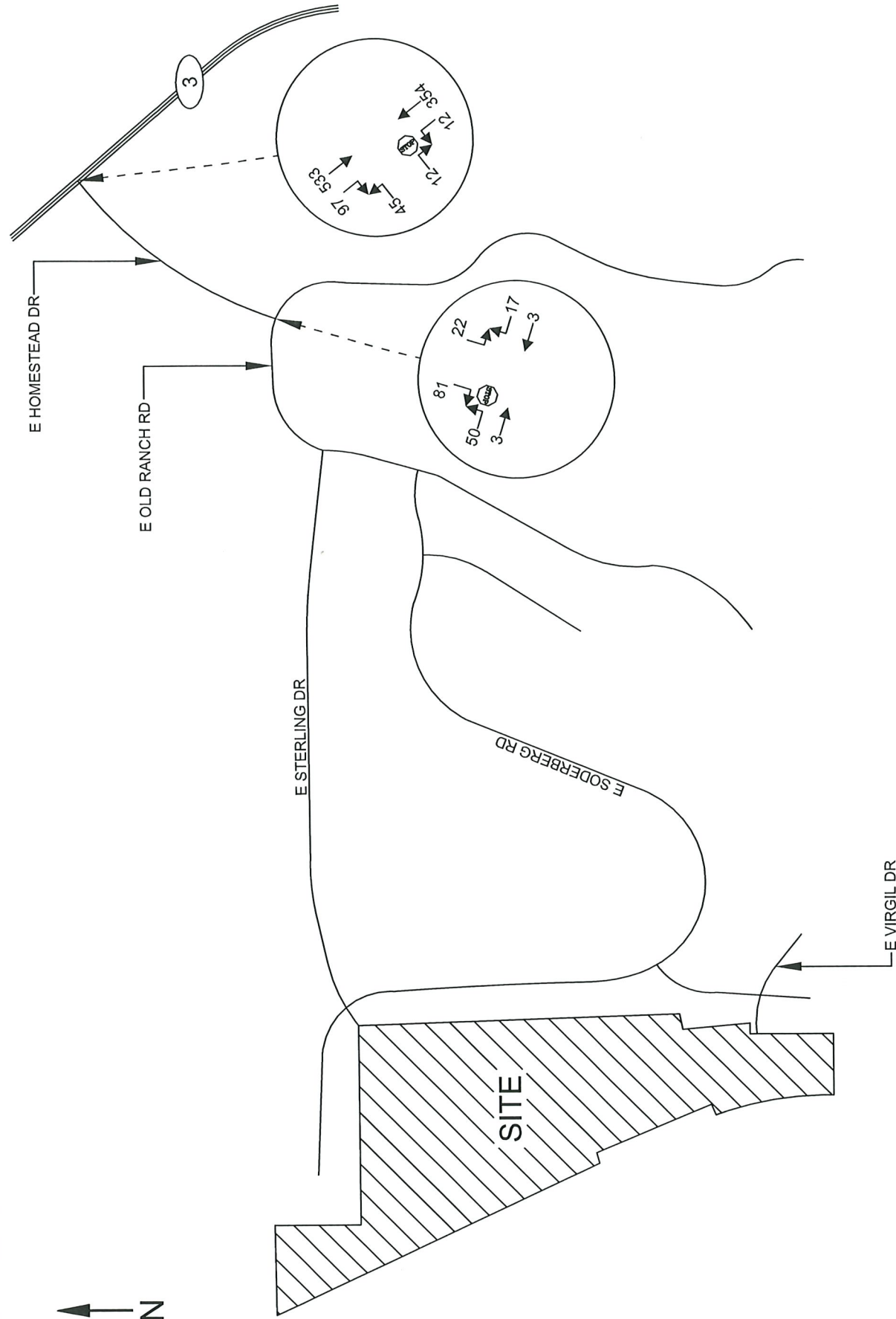
<sup>4</sup> Mason County Comprehensive Plan, Chapter 3, Page 6, Table 1.





**LAKELAND DIVISION 15**  
 PM PEAK HOUR TRIP GENERATION & ASSIGNMENT (SCENARIO 2)  
 FIGURE 4

**HEATH & ASSOCIATES**  
 TRAFFIC AND CIVIL ENGINEERING



**LAKELAND DIVISION 15**  
FORECAST 2027 PM PEAK HOUR VOLUMES WITHOUT PROJECT  
FIGURE 5

**HEATH & ASSOCIATES**  
TRAFFIC AND CIVIL ENGINEERING





#### 4.4 Future Level of Service

Level of service analyses were made of the future PM peak hour volumes without (background) and with project related trips added to the key roadways and intersections. This analysis once again involved the use of the *Synchro 11* analysis program. Delays for the intersections of study under future conditions are shown below in Table 5.

**Table 5: Forecast 2027 PM Peak Hour Level of Service**

*Delays given in seconds per vehicle*

Intersection	Control	<i>Without Project</i>		<i>With Project</i>	
		LOS	Delay	LOS	Delay
SR-3 & E Homestead Dr	Stop	C	19.8	C	21.8
E Old Ranch Rd & E Homestead Dr	Stop	A	9.1	A	9.4

Forecast PM peak hour delays are shown to continue operating with LOS C conditions or better for the two outlying study intersections. Moreover, the study intersections are shown to meet county LOS D or better standards and WSDOT (State Route 3) LOS C or better standards. No deficiencies are identified as a result of the proposed development.

#### 4.5 Left-Turn Warrant

Left-turn lanes are a means of providing necessary storage space for left turning vehicles at intersections. For this impact study, procedures prescribed by the WSDOT Design Manual Exhibit 1310-7a were used to ascertain storage requirements at the study intersection of SR-3 & E Homestead Drive. Based on forecast 2027 PM peak hour volumes with project traffic – a left-turn lane would not be warranted at the intersection of SR-3 & E Homestead Drive. Refer to the appendix for the warrant nomograph.

## 5. SUMMARY

Lakeland Division 15 is a proposed residential development comprising of either, scenario one which includes 21 single-family dwelling units and 56 multifamily dwelling units or scenario 2 which includes 61 single family lots. The subject site is located within the Allyn Urban Growth Area (UGA) of Mason County situated at tax parcel #: 122184000000. All existing structures on-site are to be demolished prior to new construction. Site ingress/egress is proposed via two new roadway extensions. The first is a northern extension of the existing E Virgil Drive and the second is a southwest extension of the existing E Sterling Drive. All new intersections shall be designed so as to allow sufficient entering sight distance and adhere to county and AASHTO engineering standards. Refer to Figure 2 which highlights the access configuration.

Existing level of service at the study intersections of SR-3 & E Homestead Drive and E Old Ranch Rd & E Homestead Drive are shown to operate with LOS C conditions or better during the critical PM peak hour. Scenario two for the incoming project is anticipated to generate approximately 575 average weekday daily trips with 43 trips (11 inbound / 32 outbound) occurring during the AM peak hour and 57 trips (36 inbound / 21 outbound) occurring during the PM peak hour. As scenario two yields a higher number of trips to and from the site when compared to scenario one, forecast 2027 volumes are based on scenario two, which would be the worst case scenario in terms of traffic. Future delay analysis consisted of a five-year horizon of 2027 which includes the scenario two trip generation and a background growth rate of three percent per year to the existing volumes shown in Figure 3. Table 5 summarizes forecast 2027 PM peak hour delays at the outlying study intersections, which are shown to operate with LOS C conditions or better with the addition of project generated traffic, meeting WSDOT and county level of service standards. A left-turn lane was analyzed at the study intersection of SR-3 & E Homestead Drive with the addition of project generated traffic and was found not warranted.

Based on the analysis above, no mitigation is recommended at this time.

LAKELAND DIVISION 15  
TRAFFIC IMPACT ANALYSIS

*APPENDIX*



# Heath & Associates

PO Box 397  
Puyallup, WA 98371

File Name : 4933b  
Site Code : 00004933  
Start Date : 6/8/2022  
Page No : 1

Groups Printed- Passenger + - Heavy

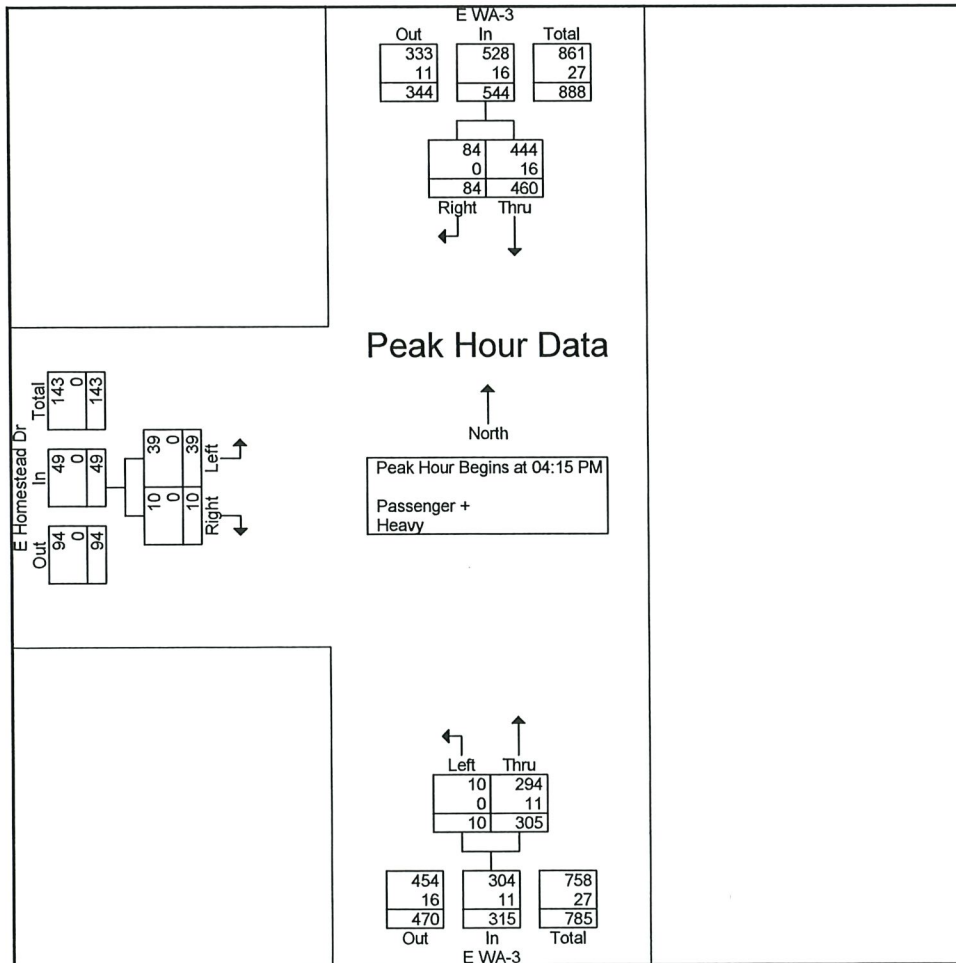
Start Time	E WA-3 Southbound			E WA-3 Northbound			E Homestead Dr Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
04:00 PM	22	105	127	74	1	75	1	13	14	216
04:15 PM	21	117	138	61	2	63	2	9	11	212
04:30 PM	15	124	139	75	5	80	2	8	10	229
04:45 PM	24	120	144	82	2	84	4	10	14	242
Total	82	466	548	292	10	302	9	40	49	899
05:00 PM	24	99	123	87	1	88	2	12	14	225
05:15 PM	11	107	118	79	3	82	3	9	12	212
05:30 PM	17	109	126	62	1	63	3	10	13	202
05:45 PM	11	88	99	57	1	58	2	8	10	167
Total	63	403	466	285	6	291	10	39	49	806
Grand Total	145	869	1014	577	16	593	19	79	98	1705
Apprch %	14.3	85.7		97.3	2.7		19.4	80.6		
Total %	8.5	51	59.5	33.8	0.9	34.8	1.1	4.6	5.7	
Passenger +	145	848	993	556	16	572	19	79	98	1663
% Passenger +	100	97.6	97.9	96.4	100	96.5	100	100	100	97.5
Heavy	0	21	21	21	0	21	0	0	0	42
% Heavy	0	2.4	2.1	3.6	0	3.5	0	0	0	2.5

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PO Box 397  
Puyallup, WA 98371

File Name : 4933b  
Site Code : 00004933  
Start Date : 6/8/2022  
Page No : 2

Start Time	E WA-3 Southbound			E WA-3 Northbound			E Homestead Dr Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	21	117	138	61	2	63	2	9	11	212
04:30 PM	15	124	139	75	5	80	2	8	10	229
04:45 PM	24	120	144	82	2	84	4	10	14	242
05:00 PM	24	99	123	87	1	88	2	12	14	225
Total Volume	84	460	544	305	10	315	10	39	49	908
% App. Total	15.4	84.6		96.8	3.2		20.4	79.6		
PHF	.875	.927	.944	.876	.500	.895	.625	.813	.875	.938
Passenger +	84	444	528	294	10	304	10	39	49	881
% Passenger +	100	96.5	97.1	96.4	100	96.5	100	100	100	97.0
Heavy	0	16	16	11	0	11	0	0	0	27
% Heavy	0	3.5	2.9	3.6	0	3.5	0	0	0	3.0



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PO Box 397  
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File Name : 4933a  
Site Code : 00004933  
Start Date : 6/8/2022  
Page No : 1

Groups Printed- Passenger + - Heavy

Start Time	E Homestead Dr Southbound			E Old Ranch Rd Westbound			E Old Ranch Rd Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
04:00 PM	18	2	20	8	1	9	1	17	18	47
04:15 PM	21	3	24	3	2	5	1	7	8	37
04:30 PM	15	8	23	1	0	1	0	9	9	33
04:45 PM	16	6	22	3	0	3	1	10	11	36
Total	70	19	89	15	3	18	3	43	46	153
05:00 PM	13	11	24	5	1	6	0	10	10	40
05:15 PM	13	3	16	2	2	4	0	10	10	30
05:30 PM	13	5	18	6	0	6	0	8	8	32
05:45 PM	8	4	12	1	0	1	2	8	10	23
Total	47	23	70	14	3	17	2	36	38	125
Grand Total	117	42	159	29	6	35	5	79	84	278
Apprch %	73.6	26.4		82.9	17.1		6	94		
Total %	42.1	15.1	57.2	10.4	2.2	12.6	1.8	28.4	30.2	
Passenger +	117	42	159	29	6	35	5	79	84	278
% Passenger +	100	100	100	100	100	100	100	100	100	100
Heavy	0	0	0	0	0	0	0	0	0	0
% Heavy	0	0	0	0	0	0	0	0	0	0

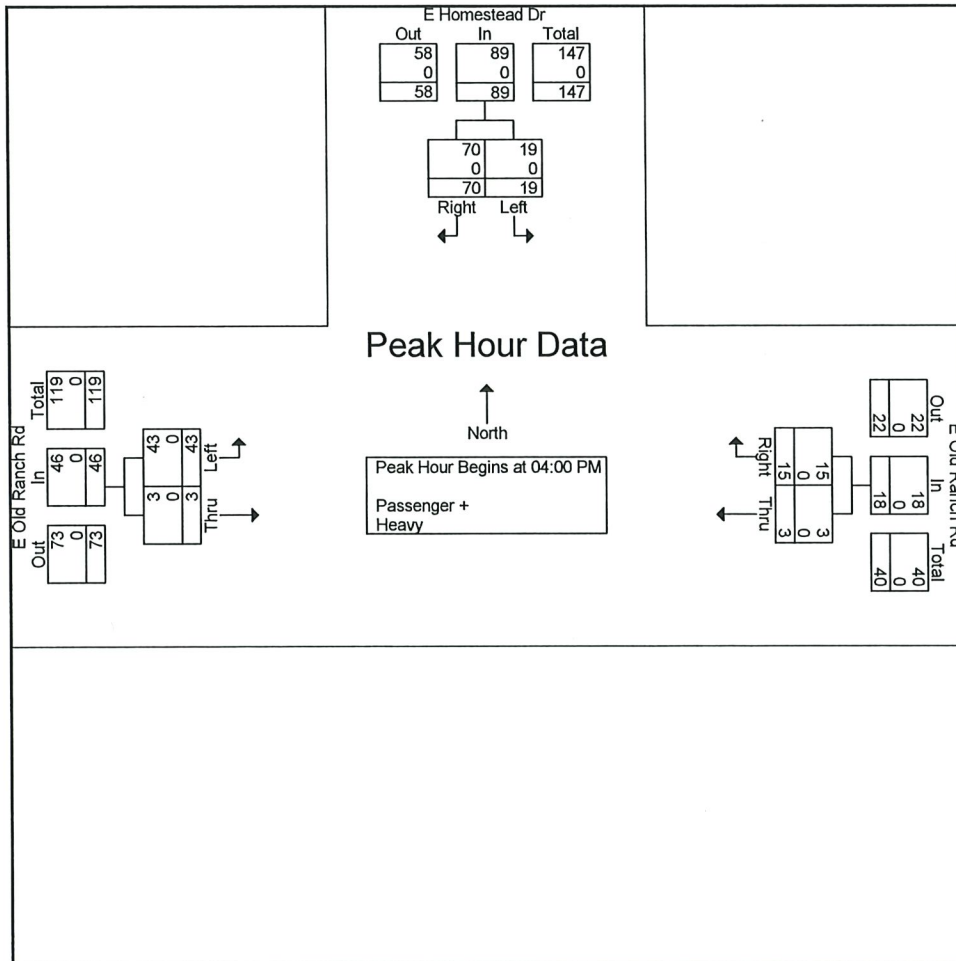


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PO Box 397  
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File Name : 4933a  
Site Code : 00004933  
Start Date : 6/8/2022  
Page No : 2

Start Time	E Homestead Dr Southbound			E Old Ranch Rd Westbound			E Old Ranch Rd Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	18	2	20	8	1	9	1	17	18	47
04:15 PM	21	3	24	3	2	5	1	7	8	37
04:30 PM	15	8	23	1	0	1	0	9	9	33
04:45 PM	16	6	22	3	0	3	1	10	11	36
Total Volume	70	19	89	15	3	18	3	43	46	153
% App. Total	78.7	21.3		83.3	16.7		6.5	93.5		
PHF	.833	.594	.927	.469	.375	.500	.750	.632	.639	.814
Passenger +	70	19	89	15	3	18	3	43	46	153
% Passenger +	100	100	100	100	100	100	100	100	100	100
Heavy	0	0	0	0	0	0	0	0	0	0
% Heavy	0	0	0	0	0	0	0	0	0	0



# Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

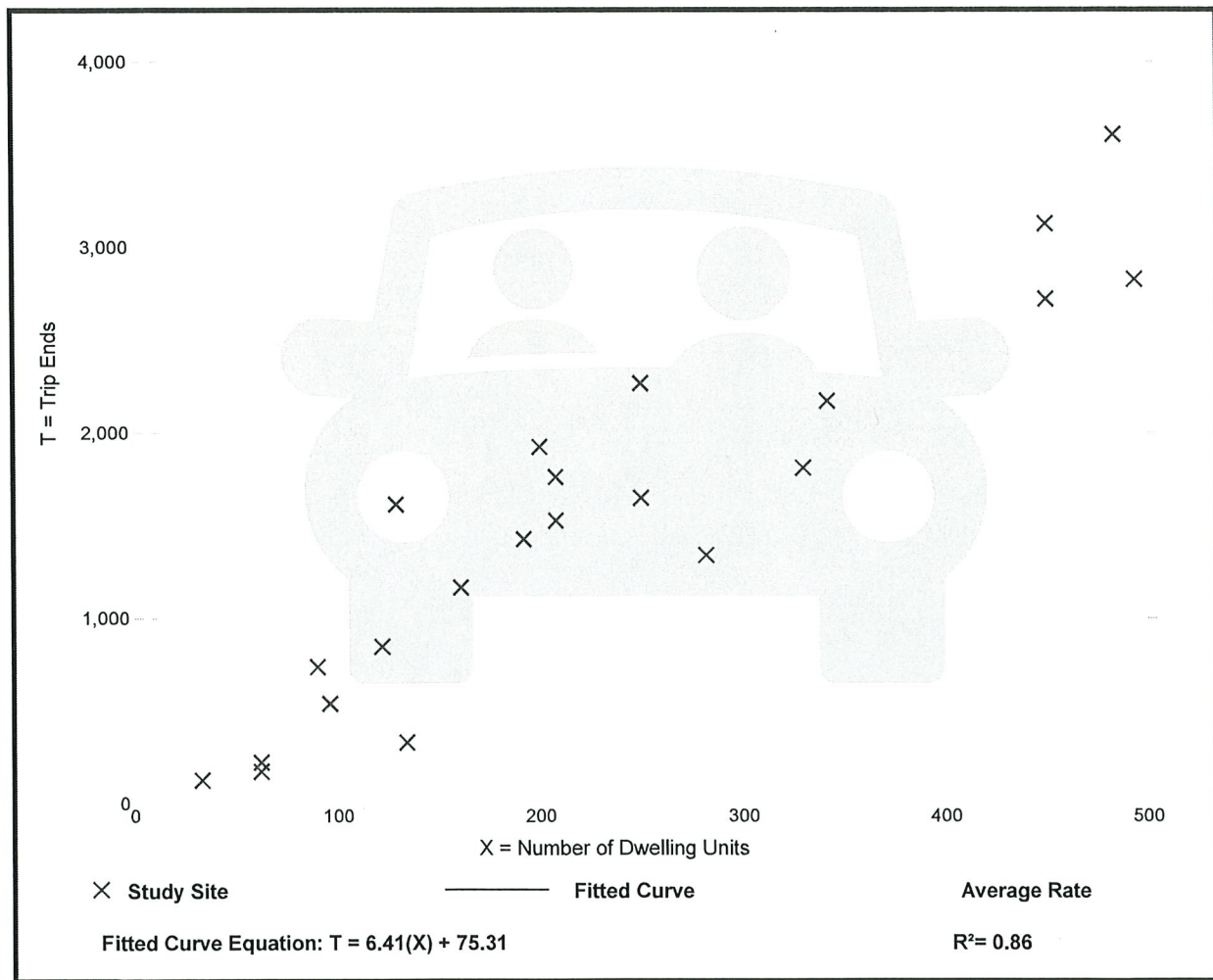
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 22  
Avg. Num. of Dwelling Units: 229  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

## Data Plot and Equation



Trip Gen Manual, 11th Edition

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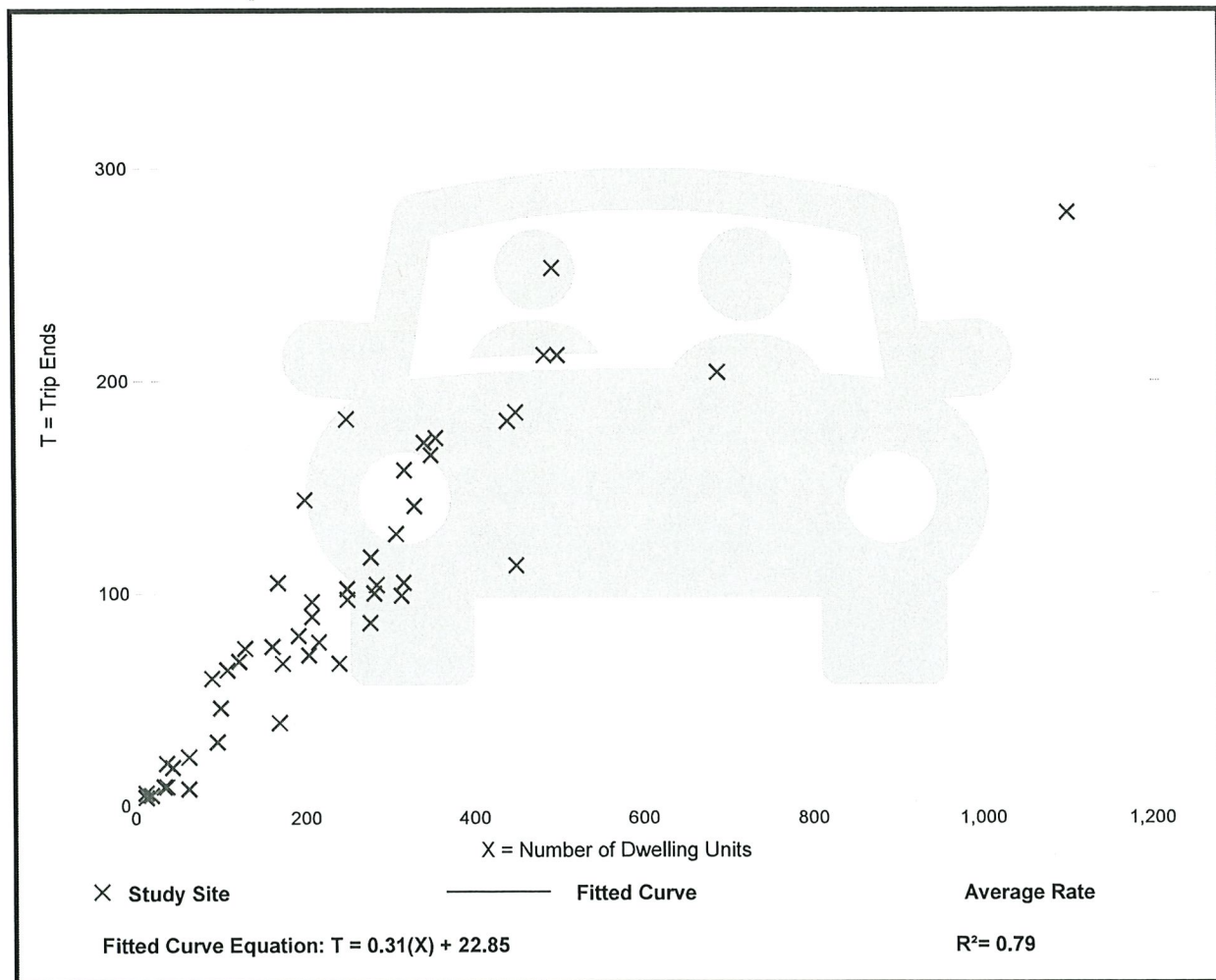
## Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 49  
 Avg. Num. of Dwelling Units: 249  
 Directional Distribution: 24% entering, 76% exiting

### Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

### Data Plot and Equation



Trip Gen Manual, 11th Edition

• Institute of Transportation Engineers

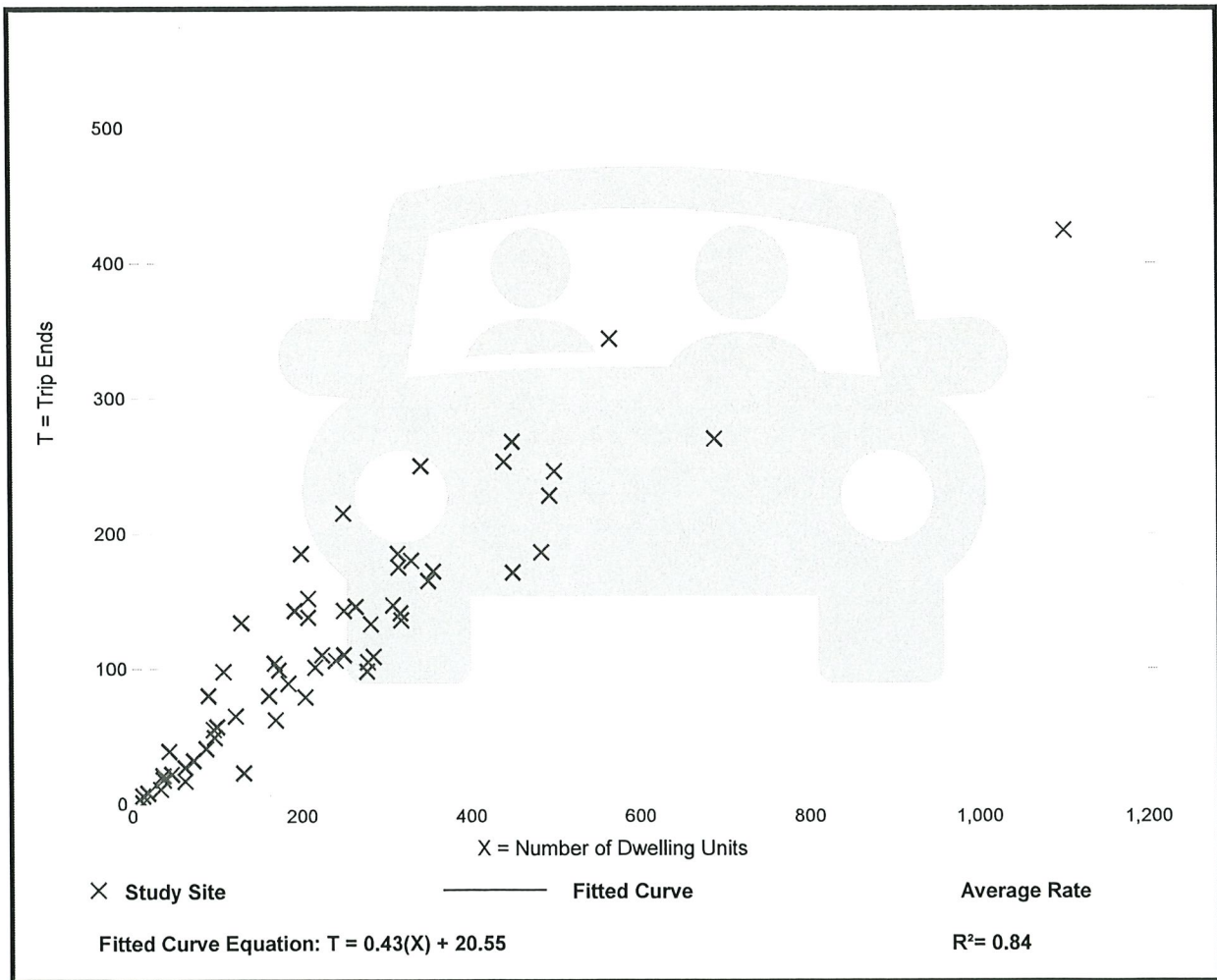
## Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 59  
 Avg. Num. of Dwelling Units: 241  
 Directional Distribution: 63% entering, 37% exiting

### Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

### Data Plot and Equation



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● Institute of Transportation Engineers



# Single-Family Detached Housing (210)

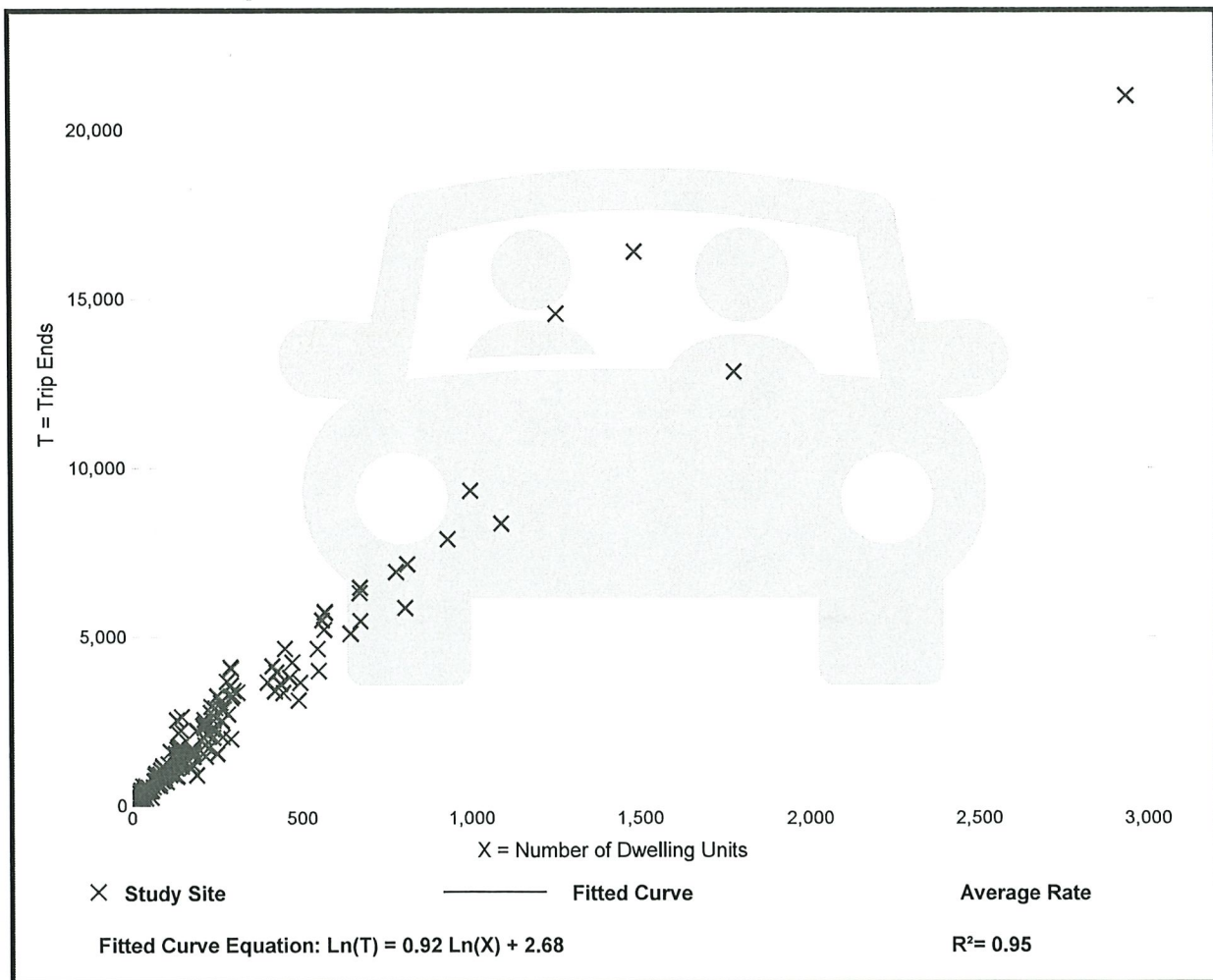
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 174  
Avg. Num. of Dwelling Units: 246  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

## Data Plot and Equation



Trip Gen Manual, 11th Edition

Institute of Transportation Engineers

# Single-Family Detached Housing (210)

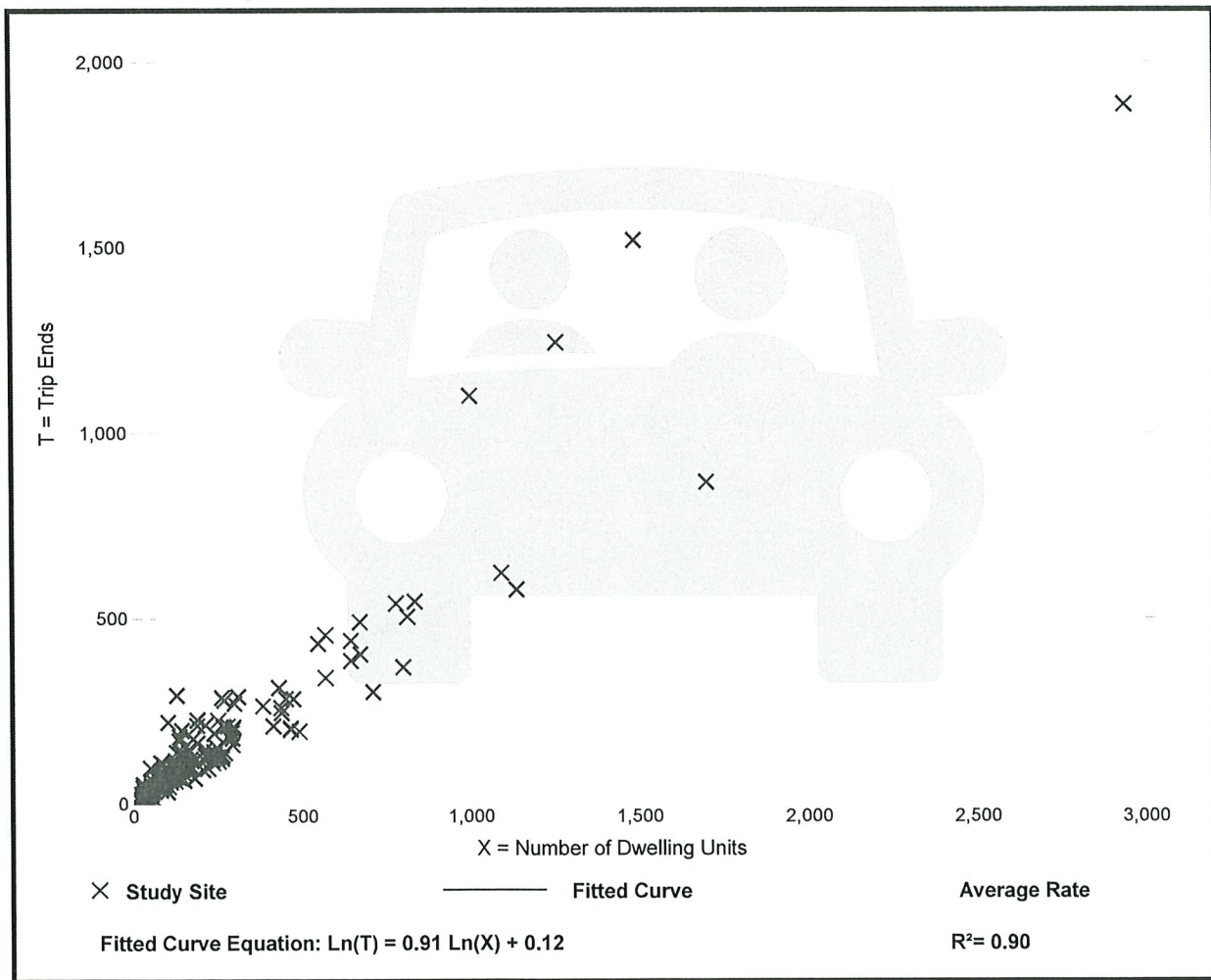
**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**

**Setting/Location: General Urban/Suburban**  
 Number of Studies: 192  
 Avg. Num. of Dwelling Units: 226  
 Directional Distribution: 26% entering, 74% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

## Data Plot and Equation



Trip Gen Manual, 11th Edition

● Institute of Transportation Engineers

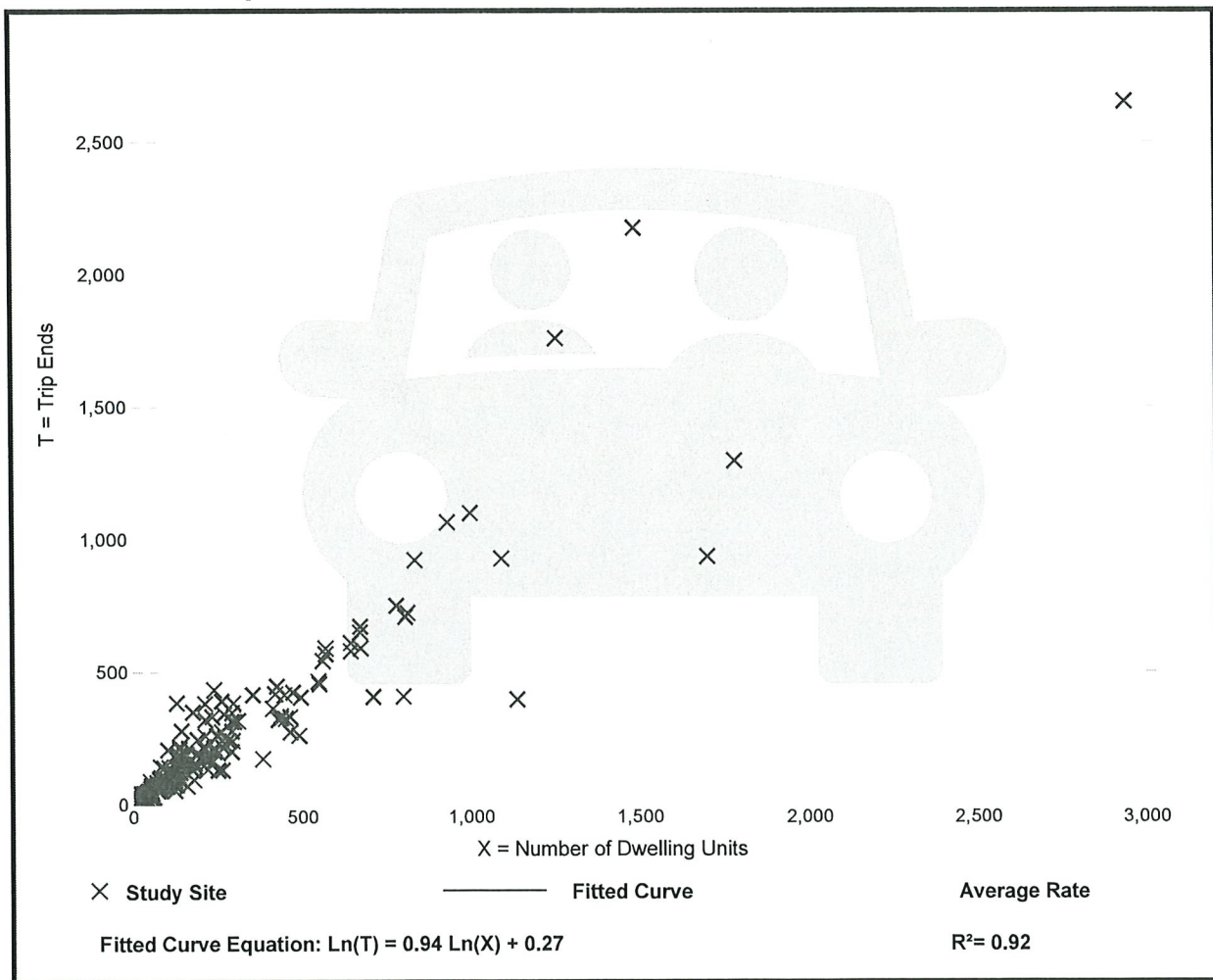
# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 208  
 Avg. Num. of Dwelling Units: 248  
 Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

## Data Plot and Equation



Trip Gen Manual, 11th Edition

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**PM Peak Hour Forecast Intersection Volumes**

Annual Growth Rate: 3 % 2027  
 # of Years to Horizon: 5

**1. SR-3 & E Homestead Dr**

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Existing	84	460	0	0	0	0	0	305	10	10	0	39
Project Trips	31	0	0	0	0	0	0	0	5	3	0	18
Pipeline	0	0	0	0	0	0	0	0	0	0	0	0
Without	97	533	0	0	0	0	0	354	12	12	0	45
With	128	533	0	0	0	0	0	354	17	15	0	63

**2. E Old Ranch Rd & E Homestead Dr**

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Existing	70	0	19	15	3	0	0	0	0	0	3	43
Project Trips	36	0	0	0	0	0	0	0	0	0	0	21
Pipeline	0	0	0	0	0	0	0	0	0	0	0	0
Without	81	0	22	17	3	0	0	0	0	0	3	50
With	117	0	22	17	3	0	0	0	0	0	3	71



Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W*			W	W	W
Traffic Vol, veh/h	39	10	10	305	460	84
Future Vol, veh/h	39	10	10	305	460	84
Conflicting Peds, #/hr	1	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	140
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	4	4	2
Mvmt Flow	41	11	11	324	489	89

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	837	491	579	0	-	0
Stage 1	490	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	337	578	995	-	-	-
Stage 1	616	-	-	-	-	-
Stage 2	716	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	332	577	994	-	-	-
Mov Cap-2 Maneuver	332	-	-	-	-	-
Stage 1	607	-	-	-	-	-
Stage 2	715	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	994	-	363	-	-
HCM Lane V/C Ratio	0.011	-	0.144	-	-
HCM Control Delay (s)	8.7	0	16.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-



Intersection						
Int Delay, s/veh	7.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	43	3	3	15	19	70
Future Vol, veh/h	43	3	3	15	19	70
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	4	4	19	23	86

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	24	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1591	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1589	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	6.9	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1589	-	-	-	1004
HCM Lane V/C Ratio	0.033	-	-	-	0.109
HCM Control Delay (s)	7.3	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4



Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	TT			TT	TT	TT
Traffic Vol, veh/h	45	12	12	354	533	97
Future Vol, veh/h	45	12	12	354	533	97
Conflicting Peds, #/hr	1	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	140
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	4	4	2
Mvmt Flow	48	13	13	377	567	103

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	972	569	671	0	-	0
Stage 1	568	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	280	522	919	-	-	-
Stage 1	567	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	274	521	918	-	-	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	556	-	-	-	-	-
Stage 2	673	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.8	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	918	-	304	-	-
HCM Lane V/C Ratio	0.014	-	0.199	-	-
HCM Control Delay (s)	9	0	19.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-



Intersection						
Int Delay, s/veh	7.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	50	3	3	17	22	81
Future Vol, veh/h	50	3	3	17	22	81
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	62	4	4	21	27	100

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	26	0	0 145 17
Stage 1	-	-	- 16 -
Stage 2	-	-	- 129 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1588	-	- 847 1062
Stage 1	-	-	- 1007 -
Stage 2	-	-	- 897 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1586	-	- 812 1060
Mov Cap-2 Maneuver	-	-	- 812 -
Stage 1	-	-	- 967 -
Stage 2	-	-	- 896 -

Approach	EB	WB	SB
HCM Control Delay, s	6.9	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1586	-	-	-	995
HCM Lane V/C Ratio	0.039	-	-	-	0.128
HCM Control Delay (s)	7.4	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4



Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y*			4	↑	↑
Traffic Vol, veh/h	63	15	17	354	533	128
Future Vol, veh/h	63	15	17	354	533	128
Conflicting Peds, #/hr	1	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	140
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	4	4	2
Mvmt Flow	67	16	18	377	567	136

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	982	569	704	0	0
Stage 1	568	-	-	-	-
Stage 2	414	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	276	522	894	-	-
Stage 1	567	-	-	-	-
Stage 2	667	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	269	521	893	-	-
Mov Cap-2 Maneuver	269	-	-	-	-
Stage 1	552	-	-	-	-
Stage 2	666	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.8	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	893	-	297	-	-
HCM Lane V/C Ratio	0.02	-	0.279	-	-
HCM Control Delay (s)	9.1	0	21.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-



Intersection						
Int Delay, s/veh	7.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	71	3	3	17	22	117
Future Vol, veh/h	71	3	3	17	22	117
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	88	4	4	21	27	144

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	26	0	-	0	197
Stage 1	-	-	-	-	16
Stage 2	-	-	-	-	181
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1588	-	-	-	792
Stage 1	-	-	-	-	1007
Stage 2	-	-	-	-	850
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1586	-	-	-	746
Mov Cap-2 Maneuver	-	-	-	-	746
Stage 1	-	-	-	-	950
Stage 2	-	-	-	-	849

Approach	EB	WB	SB
HCM Control Delay, s	7.1	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1586	-	-	-	994
HCM Lane V/C Ratio	0.055	-	-	-	0.173
HCM Control Delay (s)	7.4	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6

and treating stormwater runoff, regularly sweeping streets to reduce runoff of waterway pollutants, and decreasing toxics and herbicides used in road maintenance.

56. Support electric vehicle charging infrastructure at park-and-ride lots and other local locations, and work with local, regional, private, and state partners to establish a robust electric vehicle charging network for the US 101 Olympic Peninsula loop.

57. Promote travel demand management and Commute Trip Reduction measures that reduce vehicle trips necessary to meet basic daily needs.

58. Improve the ability of children to walk or bike to and from school with investments and policies that promote 'Safe Routes to School.'

59. Work to accommodate LOS 'C' for peak hour congestion on all County arterials outside designated urban growth areas and LOS D for local arterials lying inside designated urban growth areas. LOS is defined in the AASHTO Greenbook.

60. Support WSDOT LOS 'C' for state highways outside of urban growth areas and LOS 'D' for state highways inside of designated urban growth areas. LOS is defined in the AASHTO Greenbook.

61. Identify and implement meaningful system performance measures that reflect the values and priorities of Mason County residents and businesses to evaluate the effectiveness of transportation policies and investments over time.

62. Work with PRTP, Mason Transit Authority, and other affected transportation partners to monitor and implement federally required performance measures and targets.

63. Foster partnership and cooperation between tribal and non-tribal providers of public transit services.

64. Collaborate with the Squaxin and Skokomish Indian Tribes to improve access, safety, and mobility to and from tribal lands and where appropriate, within tribal lands.

65. Coordinate with school districts to enhance safe and efficient school transportation such as school bus routes, student walking routes, and crossings.

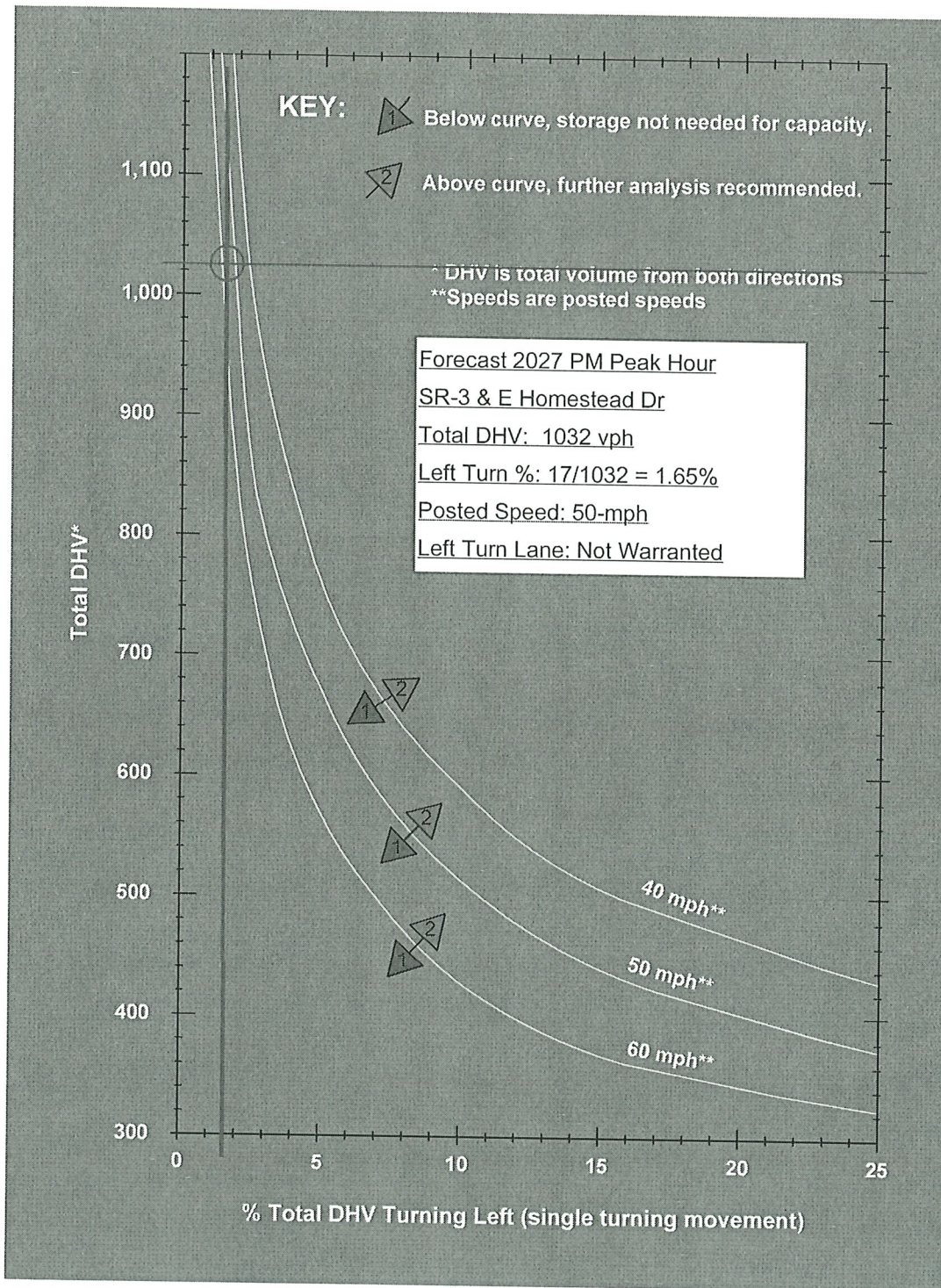
#### **4. HOUSING**

**Objective: Mason County will provide opportunities for housing that are within the financial means of all of its residents, which include persons with physical and mental disabilities, and providing a reasonable opportunity to live and work in their community.**

66. Support a continuum of housing and related services for homeless people and forestall growth in homelessness through prevention and intervention. This continuum of housing may include, but not be limited to Housing First programs; year-round shelters; and sanctioned tent encampments which, at a minimum, provide adequate toilet facilities, garbage collection, and access to public transportation. Services will be of sufficient number to distribute units throughout the County without overburdening any particular part of the County.

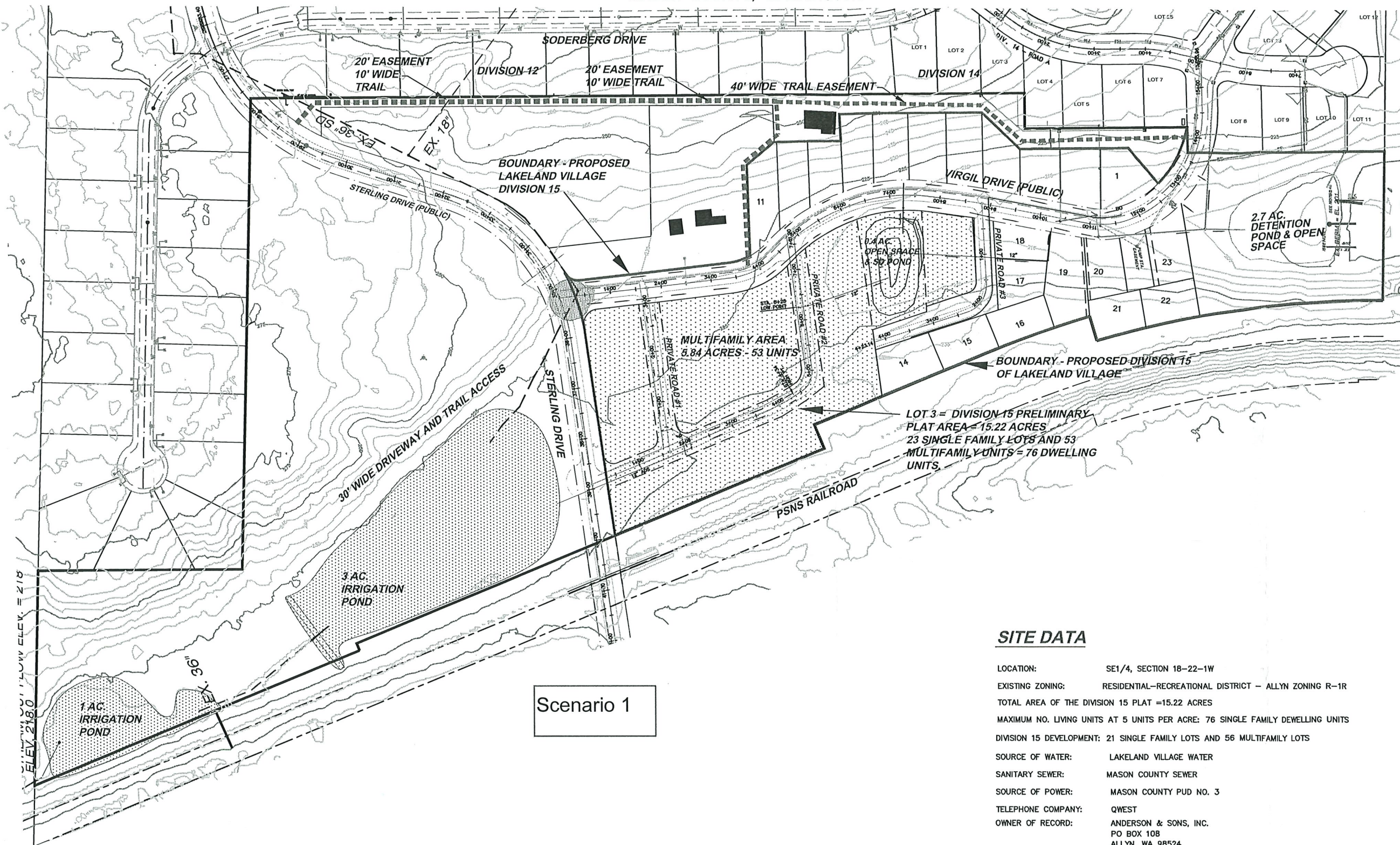


Exhibit 1310-7a Left-Turn Storage Guidelines: Two-Lane, Unsignalized





PRELIMINARY PLAT OF LAKELAND VILLAGE DIVISION 15  
 IN A PORTION OF THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 22 NORTH, RANGE 1 WEST, W.M.  
 MASON COUNTY, WASHINGTON



SCALE: 1" = 100' FULL MAP  
 1" = 200' ON 11X17 MAP  
 5' CONTOURS

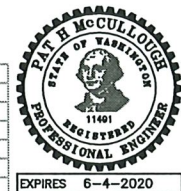
LOT 3 = DIVISION 15 PRELIMINARY  
 PLAT AREA = 15.22 ACRES  
 23 SINGLE FAMILY LOTS AND 53  
 MULTIFAMILY UNITS = 76 DWELLING  
 UNITS.

Scenario 1

**SITE DATA**

LOCATION: SE1/4, SECTION 18-22-1W  
 EXISTING ZONING: RESIDENTIAL-RECREATIONAL DISTRICT - ALLYN ZONING R-1R  
 TOTAL AREA OF THE DIVISION 15 PLAT = 15.22 ACRES  
 MAXIMUM NO. LIVING UNITS AT 5 UNITS PER ACRE: 76 SINGLE FAMILY DWELLING UNITS  
 DIVISION 15 DEVELOPMENT: 21 SINGLE FAMILY LOTS AND 56 MULTIFAMILY LOTS  
 SOURCE OF WATER: LAKELAND VILLAGE WATER  
 SANITARY SEWER: MASON COUNTY SEWER  
 SOURCE OF POWER: MASON COUNTY PUD NO. 3  
 TELEPHONE COMPANY: QWEST  
 OWNER OF RECORD: ANDERSON & SONS, INC.  
 PO BOX 108  
 ALLYN, WA 98524

No.	Date	By	Ckd.	Appr.	Revision



Approved By: \_\_\_\_\_  
 Drawn By: PHM Date: 4-21-22  
 Designed By: PHM Date: 4-21-22  
 Checked By: PHM Date: 4-21-22  
 Approved By: \_\_\_\_\_  
 Expires 6-4-2020

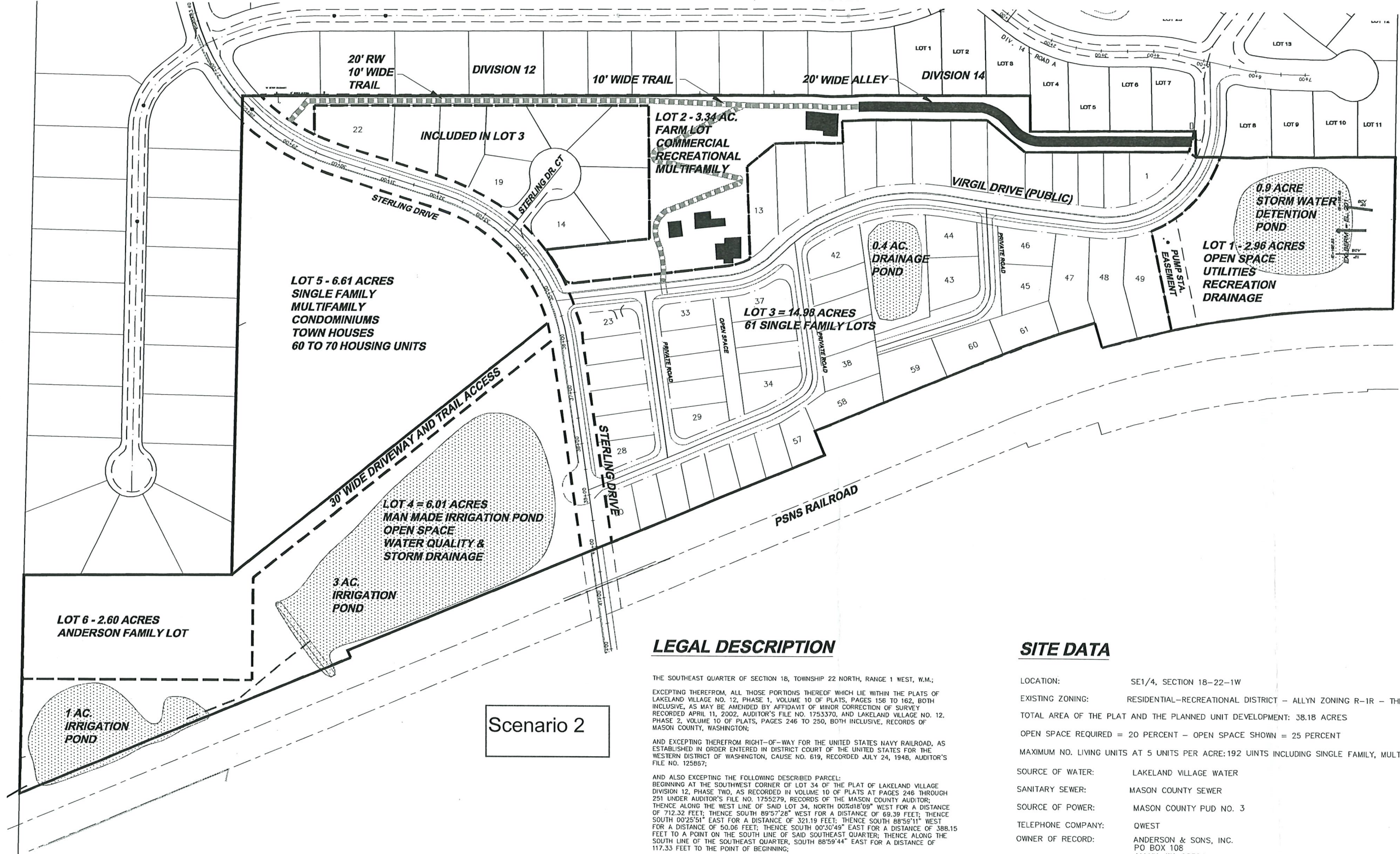
**ESA** Engineering Services Associates  
 Located on Beautiful Hood Canal  
 N.E. 210 Cherokee Beach Road  
 Belfair, Wa. 98528 (360) 276-7384  
 PO Box 397 Puyallup, WA 98371 (253) 770 1401 healthtraffic.com

Scale:  
 Horiz. 1"=100'  
 Vert. AS SHOWN  
 Job No.

ANDERSON & SONS, INC  
**LAKELAND VILLAGE**  
 DIVISION 15 PRELIMINARY PLAT of 1  
 CONCEPTUAL PLAN 36/37



PRELIMINARY PLAT OF LAKELAND VILLAGE DIVISION 15  
 IN A PORTION OF THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 22 NORTH, RANGE 1 WEST, W.M.  
 MASON COUNTY, WASHINGTON



LOT 5 - 6.61 ACRES  
 SINGLE FAMILY  
 MULTIFAMILY  
 CONDOMINIUMS  
 TOWN HOUSES  
 60 TO 70 HOUSING UNITS

LOT 2 - 3.34 AC.  
 FARM LOT  
 COMMERCIAL  
 RECREATIONAL  
 MULTIFAMILY

LOT 3 = 14.98 ACRES  
 61 SINGLE FAMILY LOTS

LOT 4 = 6.01 ACRES  
 MAN MADE IRRIGATION POND  
 OPEN SPACE  
 WATER QUALITY &  
 STORM DRAINAGE

0.9 ACRE  
 STORM WATER  
 DETENTION  
 POND

LOT 1 - 2.96 ACRES  
 OPEN SPACE  
 UTILITIES  
 RECREATION  
 DRAINAGE

LOT 6 - 2.60 ACRES  
 ANDERSON FAMILY LOT

1 AC.  
 IRRIGATION  
 POND

Scenario 2

**LEGAL DESCRIPTION**

THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 22 NORTH, RANGE 1 WEST, W.M.;  
 EXCEPTING THEREFROM, ALL THOSE PORTIONS THEREOF WHICH LIE WITHIN THE PLATS OF  
 LAKELAND VILLAGE NO. 12, PHASE 1, VOLUME 10 OF PLATS, PAGES 158 TO 162, BOTH  
 INCLUSIVE, AS MAY BE AMENDED BY AFFIDAVIT OF MINOR CORRECTION OF SURVEY  
 RECORDED APRIL 11, 2002, AUDITOR'S FILE NO. 1753370, AND LAKELAND VILLAGE NO. 12,  
 PHASE 2, VOLUME 10 OF PLATS, PAGES 246 TO 250, BOTH INCLUSIVE, RECORDS OF  
 MASON COUNTY, WASHINGTON;  
 AND EXCEPTING THEREFROM RIGHT-OF-WAY FOR THE UNITED STATES NAVY RAILROAD, AS  
 ESTABLISHED IN ORDER ENTERED IN DISTRICT COURT OF THE UNITED STATES FOR THE  
 WESTERN DISTRICT OF WASHINGTON, CAUSE NO. 619, RECORDED JULY 24, 1948, AUDITOR'S  
 FILE NO. 1258657;  
 AND ALSO EXCEPTING THE FOLLOWING DESCRIBED PARCEL:  
 BEGINNING AT THE SOUTHWEST CORNER OF LOT 34 OF THE PLAT OF LAKELAND VILLAGE  
 DIVISION 12, PHASE TWO, AS RECORDED IN VOLUME 10 OF PLATS AT PAGES 248 THROUGH  
 251 UNDER AUDITOR'S FILE NO. 1755279, RECORDS OF THE MASON COUNTY AUDITOR;  
 THENCE ALONG THE WEST LINE OF SAID LOT 34, NORTH 00°01'09" WEST FOR A DISTANCE  
 OF 712.32 FEET; THENCE SOUTH 89°57'28" WEST FOR A DISTANCE OF 69.39 FEET; THENCE  
 SOUTH 00°25'51" EAST FOR A DISTANCE OF 321.19 FEET; THENCE SOUTH 88°59'11" WEST  
 FOR A DISTANCE OF 50.06 FEET; THENCE SOUTH 00°30'49" EAST FOR A DISTANCE OF 388.15  
 FEET TO A POINT ON THE SOUTH LINE OF SAID SOUTHEAST QUARTER; THENCE ALONG THE  
 SOUTH LINE OF THE SOUTHEAST QUARTER, SOUTH 88°59'44" EAST FOR A DISTANCE OF  
 117.33 FEET TO THE POINT OF BEGINNING;  
 AND ALSO EXCEPTING THAT PORTION LYING WESTERLY OF THE U.S. NAVY RAILROAD;  
 SUBJECT TO AND TOGETHER WITH EASEMENTS, CONDITIONS AND/OR RESTRICTIONS OF RECORD;  
 SITUATE IN THE COUNTY OF MASON, STATE OF WASHINGTON.

**SITE DATA**

LOCATION: SE1/4, SECTION 18-22-1W  
 EXISTING ZONING: RESIDENTIAL-RECREATIONAL DISTRICT - ALLYN ZONING R-1R - THE PROPOSED DEVELOPMENT WILL BE A PUD.  
 TOTAL AREA OF THE PLAT AND THE PLANNED UNIT DEVELOPMENT: 38.18 ACRES  
 OPEN SPACE REQUIRED = 20 PERCENT - OPEN SPACE SHOWN = 25 PERCENT  
 MAXIMUM NO. LIVING UNITS AT 5 UNITS PER ACRE: 192 UNITS INCLUDING SINGLE FAMILY, MULTI FAMILY, TOWNHOUSES, CONDOMINIUMS  
 SOURCE OF WATER: LAKELAND VILLAGE WATER  
 SANITARY SEWER: MASON COUNTY SEWER  
 SOURCE OF POWER: MASON COUNTY PUD NO. 3  
 TELEPHONE COMPANY: QWEST  
 OWNER OF RECORD: ANDERSON & SONS, INC.  
 PO BOX 108  
 ALLYN, WA 98524



No.	Date	By	Ckd.	Appr.	Revision

Approved By: \_\_\_\_\_  
 Drawn By: PHM Date: 1-8-20  
 Designed By: PHM Date: 1-8-20  
 Checked By: \_\_\_\_\_  
 PO Box 397 Puyallup, WA 98371 (253) 770 1401 heathtraffic.com

**ESA** Engineering Services Associates  
 Located on Beautiful Hood Canal  
 N.E. 210 Cherokee Beach Road  
 Belfair, Wa. 98528 (360) 275-7384

Scale: 1"=100'  
 Horiz. AS SHOWN  
 Vert. AS SHOWN  
 Job No. \_\_\_\_\_

ANDERSON & SONS, INC  
 LAKELAND VILLAGE OVERLAY PUD  
 LAKELAND VILLAGE DIVISION 15

Sheet 1 of 1  
 3737