Pinewood Manor
Section I
A 10-Unit Residential Subdivision
Essex, VT

Traffic Evaluation

September 2025

Applicant:
Pinewood Manor Inc.
57 River Road, Suite 1003
Essex, VT 05452

Project Engineer:
O'Leary-Burke Civil Associates
13 Corporate Drive
Essex, VT 05452

1. Project Description

Pinewood Manor is an existing residential subdivision consisting of approximately 266 single-family homes in Essex, VT. Pinewood Manor, Inc. is proposing to construct the next phase of the project, Section I, which consists of an additional 10 single-family homes. Primary access to the subdivision is by River Road (Route 117) from either Valleyview Drive or Pinewood Drive. Public roads serve all of Pinewood Manor, however, only private drives are proposed within Section I, as part of a planned unit development designed to minimize its footprint.

2. Existing Conditions

River Road (VT-117) is a major commuter route that connects the Essex Five Corners to Route 2 and I-89 in Richmond. Traffic along the Pinewood section of River Road has decreased since the developments previous traffic impact assessment was completed in 2021 for a previous version of Section I at 49-units. The 2021 TIA utilized count data from station D382 showing an AADT (Average Annual Daily Trips) of 6,132 vehicles per day in 2019. Count data from 2020 was available from station D382, however, it was not used due to the COVID-19 Pandemic. The 2019 AADT data was projected to 2021 utilizing a growth factor a 1% per year as published in the 2019 version of the VTrans Redbook, for a total of 6,255 trips. The most recent data for station D382 is now from 2024 and shows an AADT of 5,853 trips. The most recent version of the Redbook was published in 2023. The growth factor to project the 2024 AADT trips to 2025 AADT trips is 0.3% for a total of 5,870 tips. As the projected 2021 AADT trips, from the 2021 study is 385 (6,255-5,870=385) trips more than the current projected 2025 AADT, the background traffic used from the 2021 study was utilized for this updated 2025 study to maintain a conservative approach of the traffic impacts of the proposed project.

Valleyview Drive and Pinewood Drive, both of which intersect with River Road, serve the existing and proposed single-family homes in Pinewood Manor. The roads are interconnected within Pinewood so either entrance is accessible to all the homes within the development. To evaluate the impact of Section I on the existing traffic patterns, turning movement counts were performed at the intersections of Valleyview Drive/River Road (VT-117) and Pinewood Drive/River Road (VT-117). To predict which intersection the proposed homes in Section I will utilize, a turning movement count at Valleyview and Pinewood Drive was also completed during the peak PM hour.

3. Project Generated Traffic

Using the Institute of Transportation Engineers Trip Generation manual, 11th Edition, the projected trip generation for the proposed 10 homes is as follows:

PM Peak Hour – 49 single-family homes:

ITE Category 210 Single-family Housing	Average Daily VTE	PM Peak Hour VTE (Entering)	PM Peak Hour VTE (Exiting)	Total PM Peak Hour VTE
10 Units	94	6	3	**9**

4. Intersection Capacity Analysis

The potential traffic impact of this project was determined by performing an intersection capacity analyses for the proposed project at the intersections of Valleyview Drive / River Road (VT-117) and Pinewood Drive / River Road (VT-117). The directional splits for the project traffic were based on the turning movement counts. The observed turning movement counts were adjusted to a Design Hourly Volume (DHV_{30}) using 2019 Agency of Transportation AADT count data from station D382, located between the two intersections. Procedures used to perform the capacity analyses were obtained from the *Highway Capacity Manual* (*HCM*). The *HCM* uses "level of service" to define differing levels of traffic congestion. There are six levels of service, ranging from *A* to *F*. The criteria for each level of service at unsignalized intersections are outlined in the table below.

Level of Service Criteria

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC.) UNSIGNALIZED	EXPECTED TRAFFIC DELAY
A	0-10	Little or no delay
B	10-15	Short traffic delays
C	15-25	Average traffic delays
D	25-35	Long traffic delays
E	35-50	Very long traffic delays
F	> 50	Failure-extreme congestion

At unsignalized intersections, the minor approach movements, particularly left-turns, typically experience lower levels of service due to their having to yield to other traffic. Consequently, traffic congestion conditions encountered by traffic exiting roads located on high-volume collectors and arterials often fall into the level of service E range.

The following tables present the levels of service and corresponding vehicular delays (seconds/vehicle) for the existing and proposed development/design year scenarios for the intersections of Valleyview Drive / River Road (VT-117) and Pinewood Drive / River Road (VT-117). The levels of service calculations are included in the attachments. The development has a negligible impact on the LOS of the existing neighborhood access roads to River Rd (VT-117)

Valleyview Drive / River Road (VT 117) Level of Service Analysis

Condition	2025 Existing LOS (Delay s/veh)	2025 Existing + Project LOS (Delay s/veh)	2030 Existing LOS (Delay s/veh)	2030 Existing + Project LOS (Delay s/veh)
Eastbound (left) Southbound (left & right)	A (7.9) B (12.7)	A (7.9) B (12.7)	A (7.9) B (12.9)	A (8.0) B (12.9)

Pinewood Drive / River Road (VT 117) Level of Service Analysis

Condition	2025 Existing LOS (Delay s/veh)	2025 Existing + Project LOS (Delay s/veh)	2030 Existing LOS (Delay s/veh)	2030 Existing + Project LOS (Delay s/veh)
Eastbound (left) Southbound (left & right)	A (7.9) C (15.2)	A (7.9) C (15.3)	A (7.9) C (15.6)	A (7.9) C (15.7)

5. VTrans Crash Data

VTrans crash data shows there was only 1 recorded crash at the Valleyview / River Road (VT-117) intersection back in 2015. The crash was a rear end collision that resulted in property damage. No recent crash information, within the last 5 years, was available on the VTrans Public Crash Data Portal.

6. Summary & Conclusions

This evaluation has determined the potential traffic congestion and traffic safety impacts related to the proposed 10 single-family homes to be built in Pinewood Manor as part of Section I are minimal. The following outlines our conclusions relating to this project's potential impact on traffic conditions.

- The project will generate approximately 9 PM Peak Hour vehicle trip ends;

- The current level of traffic and congestion at Pinewood's two intersections with River Road (VT-117) are at acceptable levels and is expected to remain at the same level of service after the project is constructed in 2025 through 2030.

- Overall, this project will not have an adverse effect on traffic patterns or safety in the vicinity of the project.

State of Vermont Count Data

VERMONT
AGENCY OF TRANSPORTATION

MS2
Transportation Data Management System

Home | TMC | TCLS | TTDS | PMS | PMDS | RSMS | NMDS | WQTS | RTTV

Login | Locate | Locate All | Email This

Auto-Locate OFF

List View | All Dirs

Record 1 of 1 Goto Record go

Location ID	D382	MPO ID	
Type	SPOT	NPMS ID	V117001709
On NHS		On NPMS	Yes
LRS ID	V117-0406	LRS Loc Pt	1.78
SF Group	3	Route Type	
AF Group	U3	Route	VT117
GF Group	2	Active	Yes
Class Dist Grp	Non-Interstate	Category	
Seas Class Grp	U3		
WIM Group			
QC Group	Default		
Fnct'l Class	Other Principal Arterial	Milepost	
Located On	River Rd		
Loc On Alias	VT117		
More Detail			

STATION DATA

Directions: 2-WAY | EB | WB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2020	5,047[3]						Grown from 2019
2019	6,132[3]						Grown from 2018
2018	6,181[3]		14	56	5,690 (92%)	490 (8%)	Grown from 2017
2017	6,200[3]		14	56	5,707 (92%)	492 (8%)	Grown from 2016
2016	6,206	889	14	56	5,713 (92%)	492 (8%)	

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Travel Demand Model

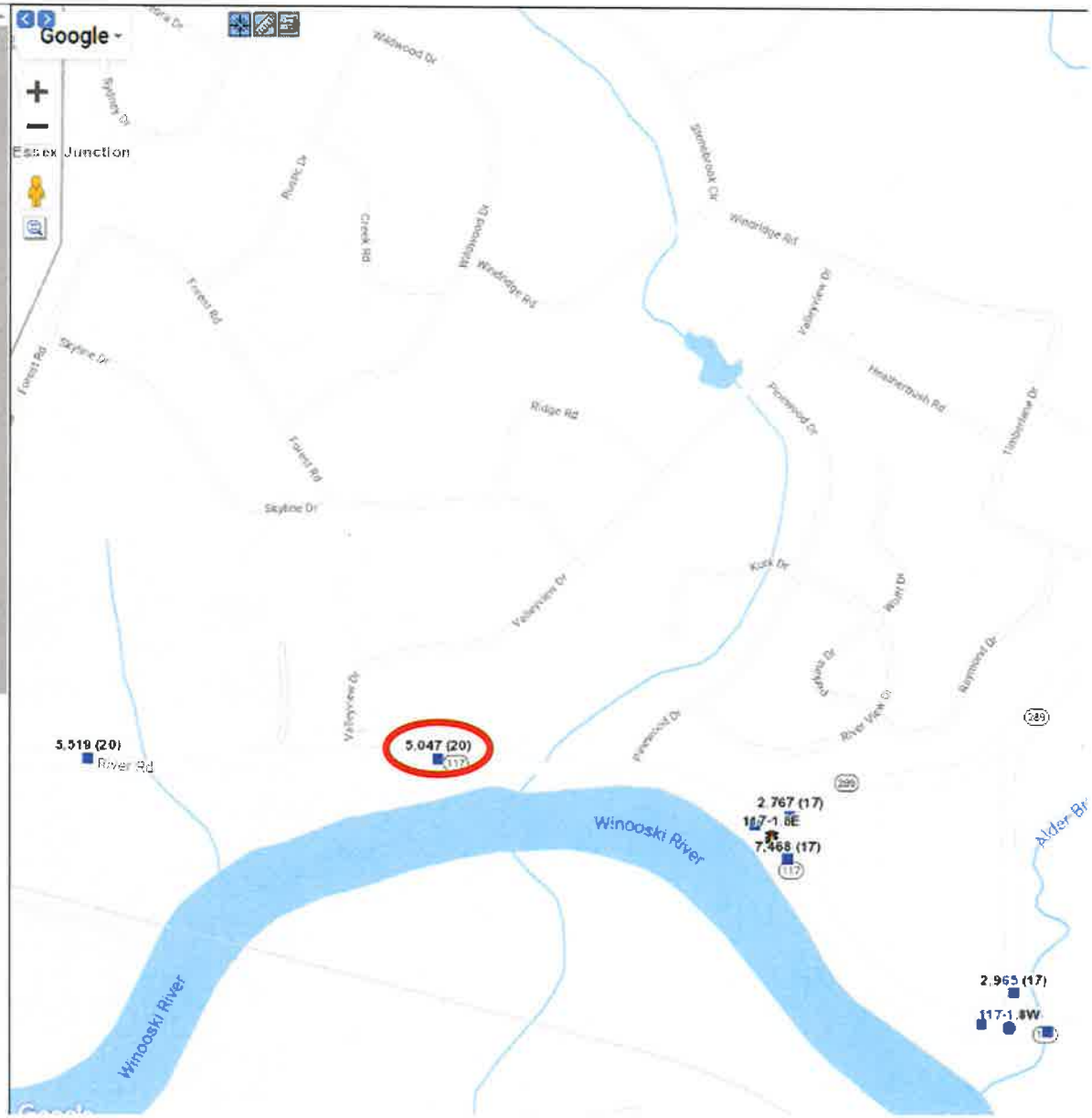
Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Wed 8/17/2016	15	7,894
	Tue 8/16/2016	15	7,582
	Mon 8/15/2016	15	7,437
	Sun 8/14/2016	15	4,479

VOLUME TREND

Year	Annual Growth
2020	-18%
2019	-1%
2018	0%
2017	0%



20-YEAR AADT GROWTH FACTORS

The factors in the table below may be used to project current year AADTs to a future year. They are applicable on all routes statewide.

The 2020 pandemic has resulted in lower traffic volumes statewide. Until traffic stabilizes, VTrans will continue to use the 10% growth over 20-years from the 2018 Redbook.

	FROM CURRENT YEAR		
TO FUTURE YEAR	2019	2020	2021
2019	1.00		
2020	1.01	1.00	
2021	1.01	1.01	1.00
2022	1.02	1.01	1.01
2023	1.02	1.02	1.01
2024	1.03	1.02	1.02
2025	1.03	1.03	1.02
2026	1.04	1.03	1.03
2027	1.04	1.04	1.03
2028	1.05	1.04	1.04
2029	1.05	1.05	1.04
2030	1.06	1.05	1.05
2031	1.06	1.06	1.05
2032	1.07	1.06	1.06
2033	1.07	1.07	1.06
2034	1.08	1.07	1.07
2035	1.08	1.08	1.07
2036	1.09	1.08	1.08
2037	1.09	1.09	1.08
2038	1.10	1.09	1.09
2039	1.10	1.10	1.09
2040	1.11	1.10	1.10
2041	1.11	1.11	1.10
2042	1.12	1.11	1.11
2043	1.12	1.12	1.11
2044	1.13	1.12	1.12
2045	1.13	1.13	1.12

2019 DHV_{30} = 750

2021 DHV_{30} = 758

2026 DHV_{30} = 780

ESTIMATING DESIGN HOUR VOLUMES

To determine the Design Hour Volume (DHV), normally the 30th highest hourly volume of the year, consider using one of the methods described below. No one method fits every location, so it can be helpful to estimate the DHV using several methods and then compare the results with each other and with any available raw hourly data to gauge whether the value is likely in the neighborhood of the 30th highest hour of the year.

1. If the project is located in the vicinity of a VTrans Continuous Traffic Counter (CTC), apply the %K value from a VTrans Continuous Traffic Counter to the AADT. The %K values are listed on the CTC Summary page of the Redbook.

2. For projects not located near a CTC site, use the DHV Chart on the following pages to select the predicted DHV from an AADT based on the seasonal factor group. The seasonal factor groups are defined at the beginning of the Redbook. For any particular traffic counter, the seasonal factor group (SF Group) is shown in the VTrans Traffic Data Management System. Refer to the VTrans Traffic Data webpage for a link to the system and guidance on navigating the system.

3. If VTrans has conducted a short-term count in the project area, consider using the #1 high hour of the count as the DHV. This is the value that appears in the VTrans Traffic Data Management System's DHV-30 field for count locations not designated as permanent. (This value is only shown for counts done since 2015.) The highest hour may or may not be a reasonable DHV estimate depending on when the short-count was done.

   For Locations designated as Permanent (Continuous Traffic Counters), the DHV-30 value is the 30th highest hourly volume recorded for the year. This should agree with the DHV listed in the Redbook. However, if the counter did not run for most of an entire year, the DHV will not be in the Redbook and the DHV-30 value may or may not be a good DHV estimate, depending on when the counter was running.

4. Depending on when the count was done, the peak hour volume from a turning movement count may be a reasonable DHV estimate.

2019 Redbook DHV Chart

	Predicted DHV by Seasonal Factor Group by AADT					
AADT	Rural Interstate SF1	Rural Non-Interstate SF2	Urban SF3	Summer Recreational SF4	Summer/Winter Recreational SF5	Summer/Winter Recreational TH SF6
2600	370	300	320	390	420	730
2700	380	310	330	400	430	750
2800	400	320	350	410	440	770
2900	410	340	360	420	440	790
3000	420	350	370	430	450	810
3100	440	360	380	440	460	820
3200	450	380	390	450	470	840
3300	470	390	410	460	480	850
3400	480	400	420	480	490	860
3500	500	410	430	490	510	860
3600	510	420	440	510	520	870
3700	520	440	460	530	540	870
3800	540	450	470	550	550	880
3900	550	460	480	570	570	880
4000	570	470	490	580	590	880
4100	580	480	500	600	600	890
4200	590	490	520	600	620	890
4300	590	500	530	610	630	900
4400	600	510	540	620	650	900
4500	610	520	550	630	670	910
4600	620	530	560	640	690	920
4700	630	540	580	650	710	930
4800	640	550	590	660	730	950
4900	650	560	600	670	750	960
5000	660	570	610	690	770	980
5100	670	590	620	700	790	990
5200	680	600	630	720	810	1000
5300	690	610	650	740	820	1000
5400	700	630	660	760	830	1100
5500	710	640	670	780	850	1100
5600	720	650	680	790	860	1100
5700	720	660	690	810	870	1100
5800	730	670	700	830	890	1100
5900	740	680	710	850	900	1200
6000	750	690	720	870	920	1200
6100	760	700	730	890	940	1200
6200	770	710	750	900	960	1200
6300	780	710	760	920	980	1200
6400	790	720	770	930	990	1300
6500	800	730	780	940	1000	1300
6600	810	740	790	940	1000	1300
6700	820	740	800	950	1000	1300

VERMONT
AGENCY OF TRANSPORTATION

Traffic Count (TCDS)

Home | Locate | Locate All | Email This | Auto-Locate: ☐

List View | All DIRs

Record ⏮ ◀ 7676 ▶ ⏭ of 13784 Goto Record [ ] go

Location ID	D382	MPO ID	
Type	SPOT	HPMS ID	V117001.709
On NHS		On HPMS	Yes
LRS ID	V117	LRS Loc Pt.	1.78
SF Group	3 (2025)	Route Type	
AF Group	U3 (2025)	Route	VT117
GF Group	2 (2025)	Active	Yes
Class Dist Grp	Non-Interstate (2016)	Category	
Seas Clss Grp	U3 (2017)		
WIM Group			
QC Group	Default		
Fnct'l Class	Other Principal Arterial - 3	Milepost	
Located On	River Rd		
Loc On Alias	VT117		

More Detail ▶

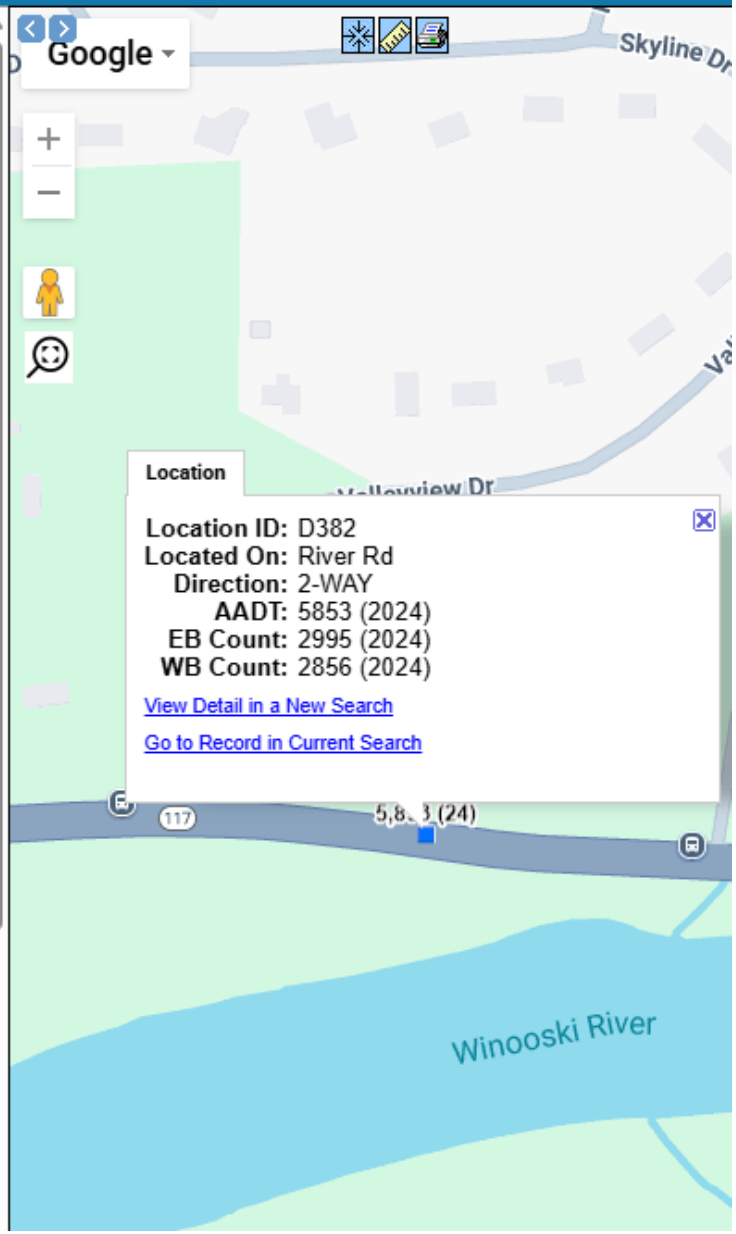
STATION DATA

Directions: 2-WAY | EB | WB

AADT

	Year	AADT	DHV-30	K %	D %	PA	BC	Src
	2024	5,853[3]		14	66	5,387 (92%)	464 (8%)	Grown from 2023
	2023	5,755[3]		14	66	5,297 (92%)	456 (8%)	Grown from 2022
	2022	5,709[3]		14	66	5,255 (92%)	452 (8%)	Grown from 2021
	2021	5,658[3]		14	66	5,208 (92%)	448 (8%)	Grown from 2020
	2020	5,047[3]		14	66	4,646 (92%)	400 (8%)	Grown from 2019

|<< | < | > | >>| 1-5 of 25



Vermont Agency of Transportation
Traffic Research
20-YEAR Growth Factor Table

The 2023 to 2043 AADT growth factor is 1.07 for all Vermont locations.

For projecting current year AADTs to a future year, use the table below:

	FROM CURRENT YEAR	
TO FUTURE YEAR	2023	2024
2023	1.000	
2024	1.003	1.000
2025	1.007	1.003
2026	1.010	1.007
2027	1.013	1.010
2028	1.016	1.013
2029	1.020	1.016
2030	1.023	1.020
2031	1.026	1.023
2032	1.029	1.026
2033	1.033	1.029
2034	1.036	1.033
2035	1.039	1.036
2036	1.042	1.039
2037	1.046	1.042
2038	1.049	1.046
2039	1.052	1.049
2040	1.055	1.052
2041	1.059	1.055
2042	1.062	1.059
2043	1.065	1.062
2044	1.068	1.065
2045	1.072	1.068
2046	1.075	1.072
2047	1.078	1.075

ITE Trip Generation

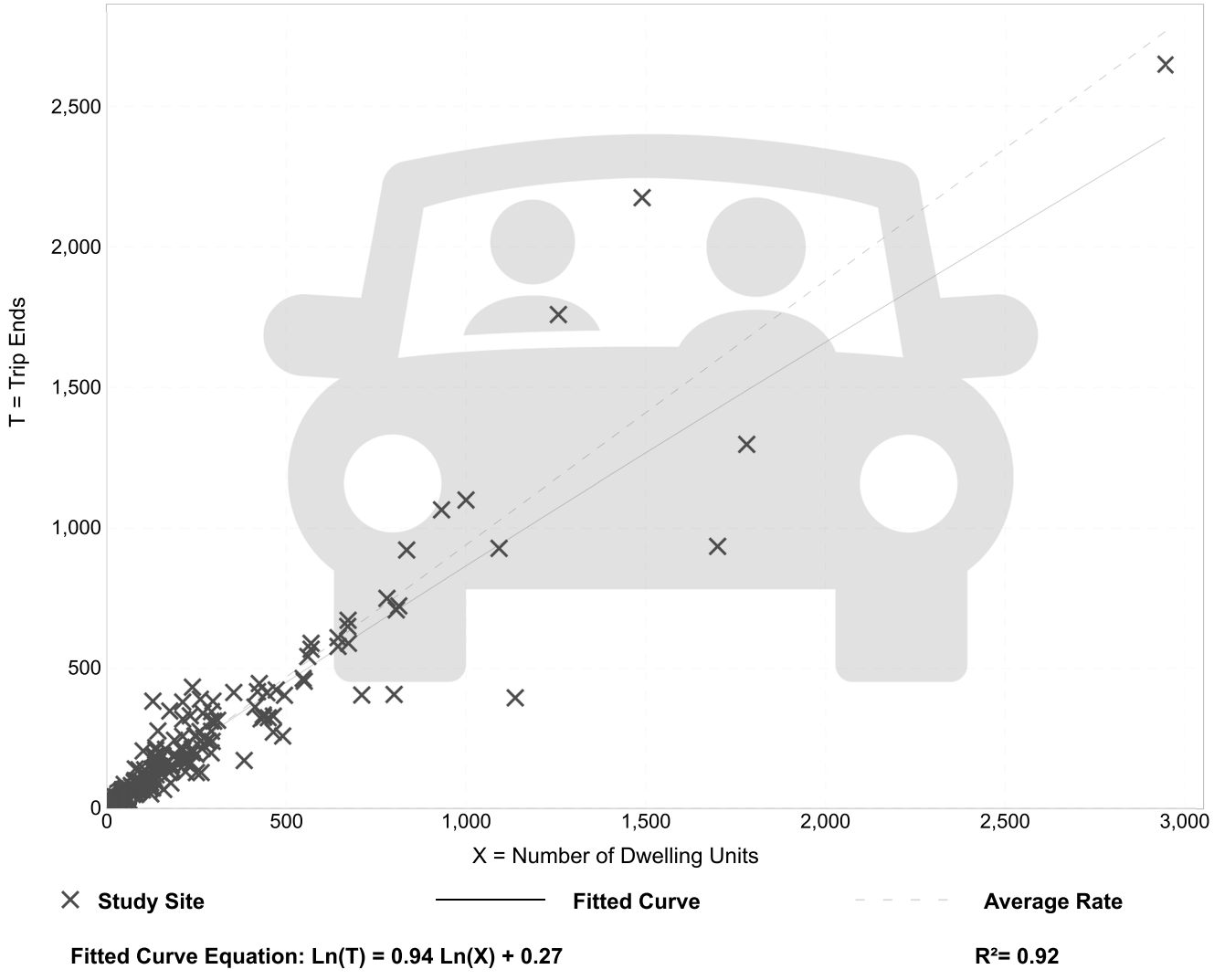
Single-Family Detached Housing
(210)

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



Fitted Curve Equation: Ln(T) = 0.94 Ln(X) + 0.27 **R^2= 0.92**

Turning Movement Counts

EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION Pinewood Drive / River Road OBSERVER RMO

TOWN Essex DATE 4/21/21 DAY Wednesday

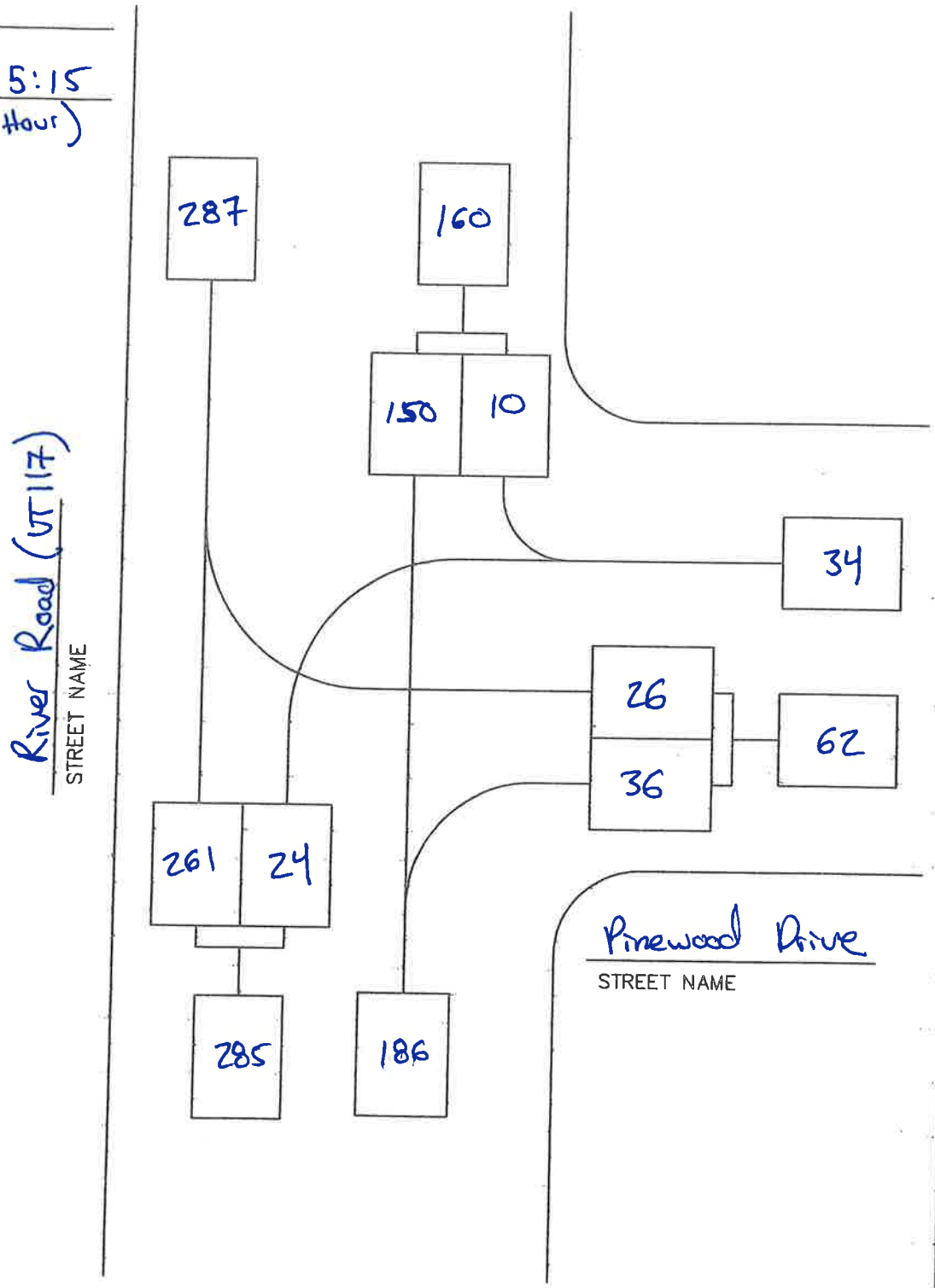
PROJECT No. 2020-05 PROJECT Pinewood Section I

TIME

AM

(PM) 4:15 - 5:15

(PM Peak Hour)



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION Pinewood Drive OBSERVER RMO

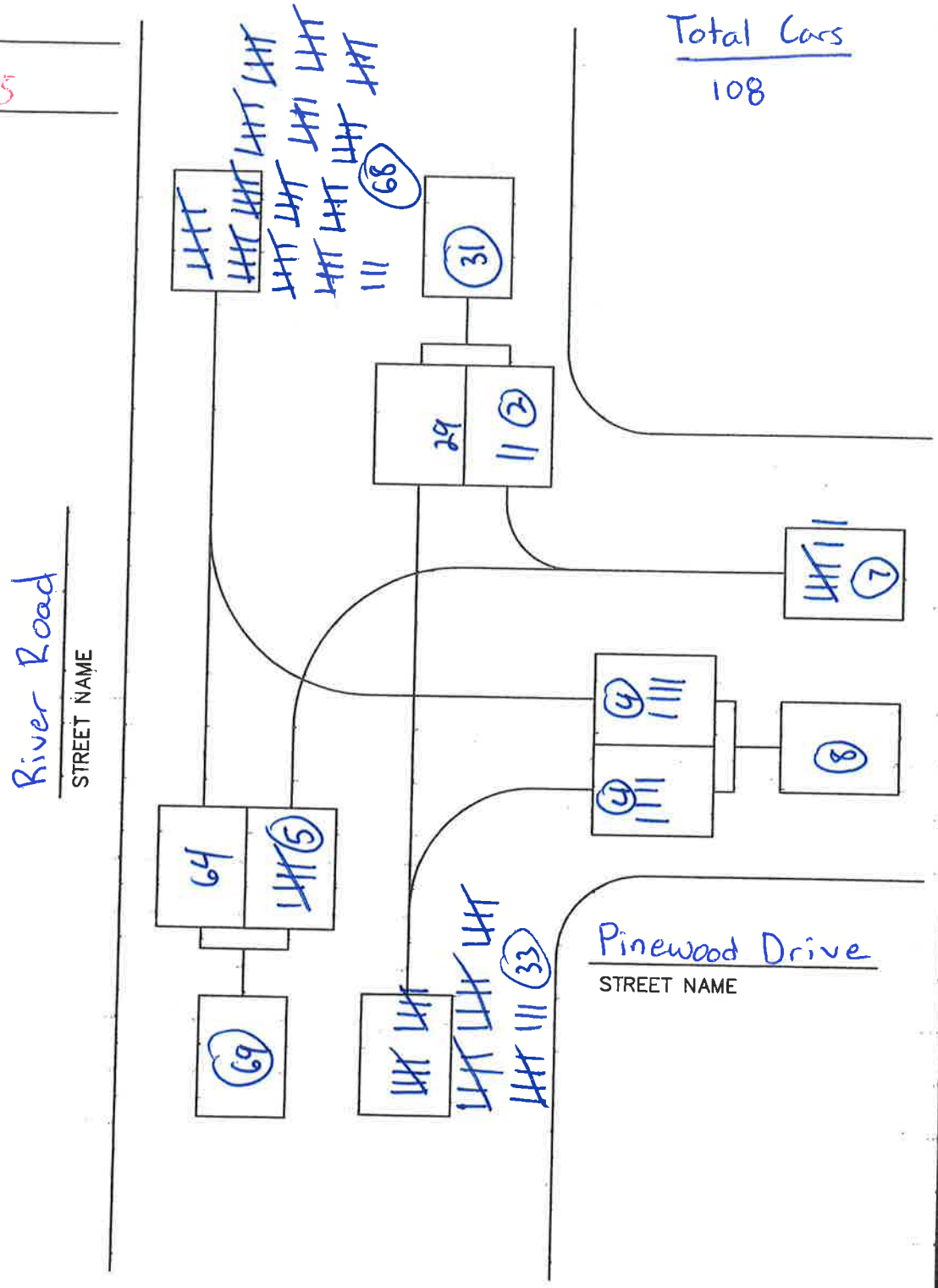
TOWN ESSEX DATE 4/21/21 DAY Wednesday

PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 4-4:15



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RMO

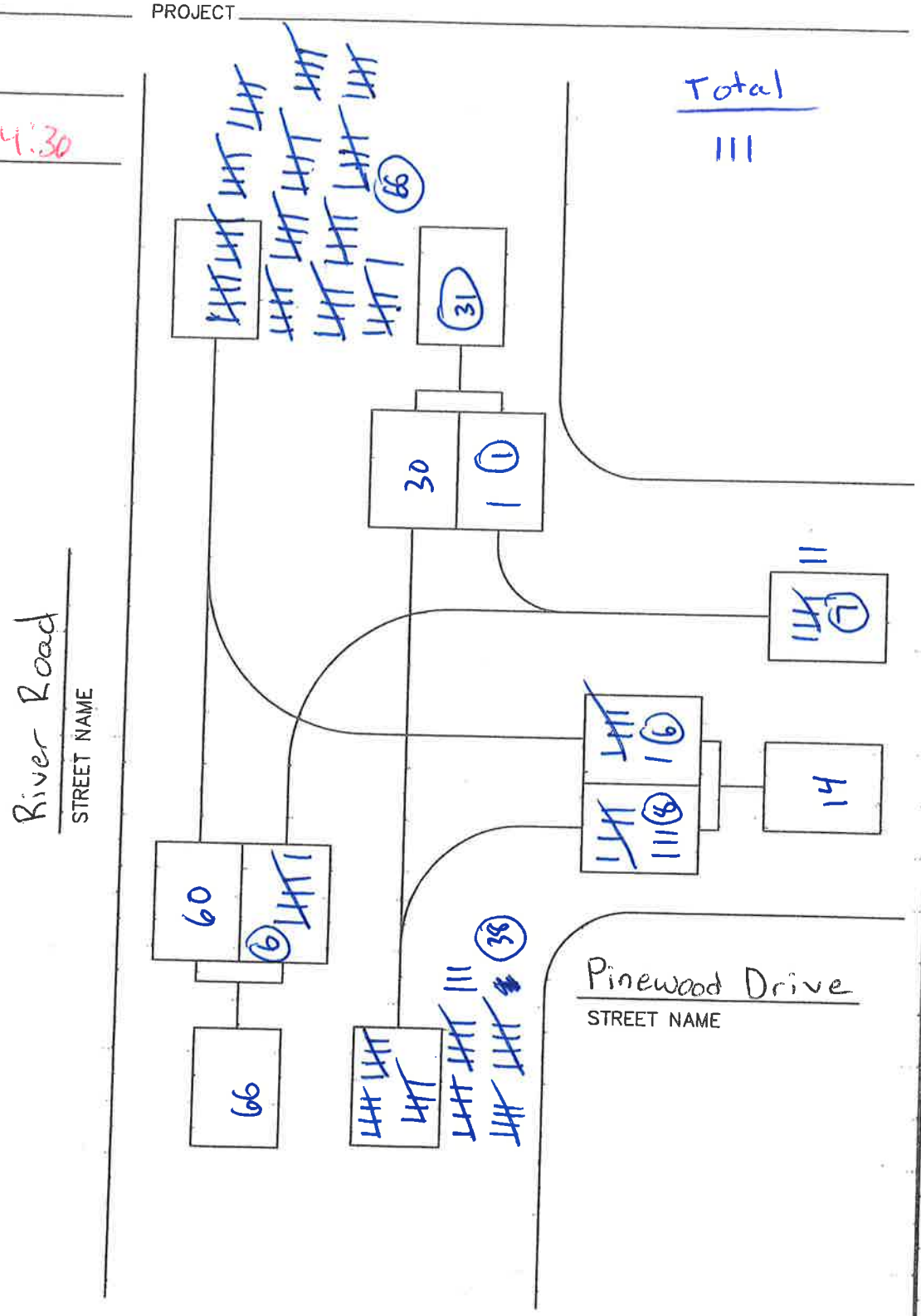
TOWN ESSEX DATE 4/21/21 DAY Wednesday

PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 4:15 - 4:30



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RMO

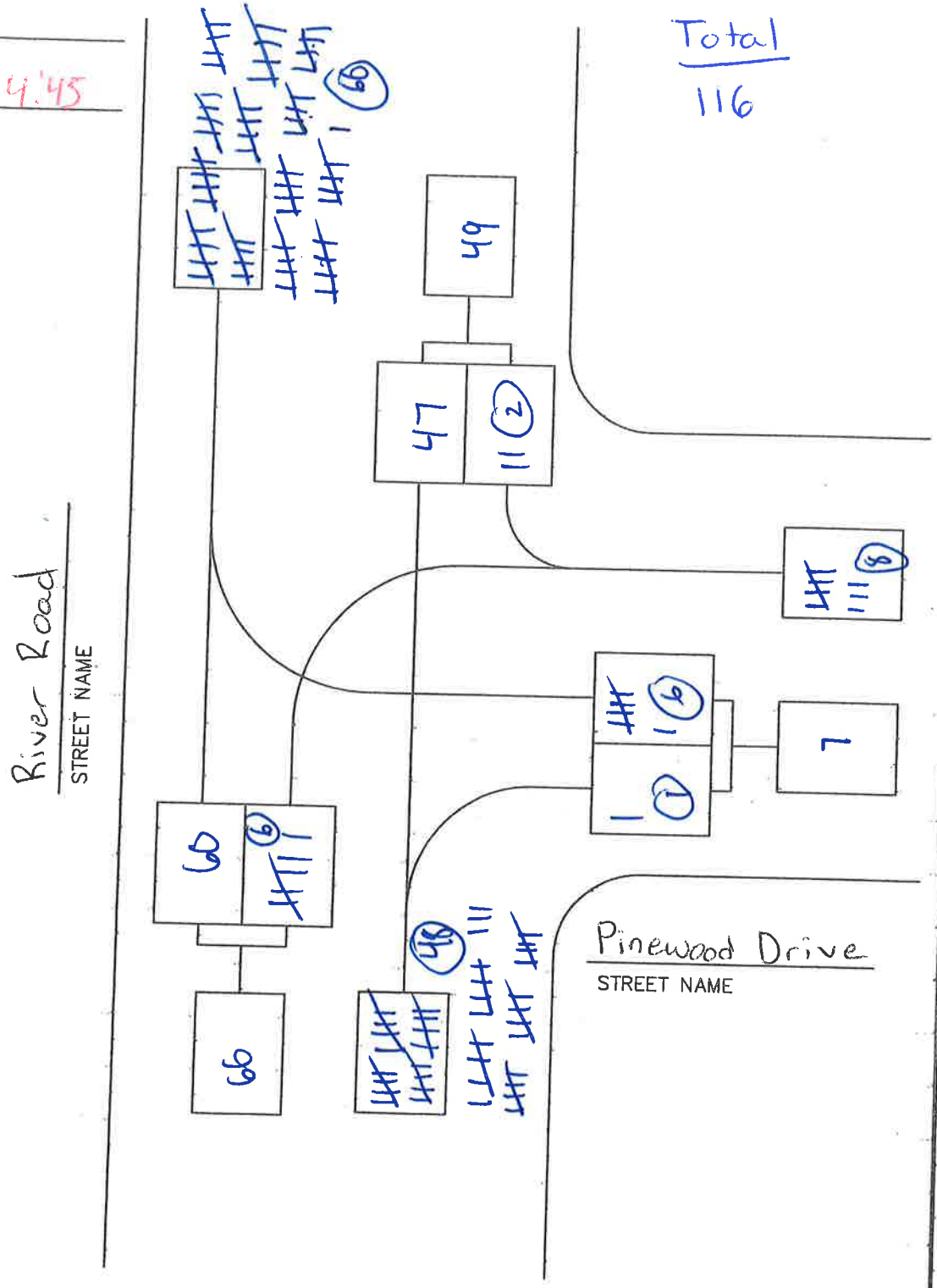
TOWN ESSEX DATE 4/21/21 DAY Wednesday

PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 4:30 - 4:45



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RMO

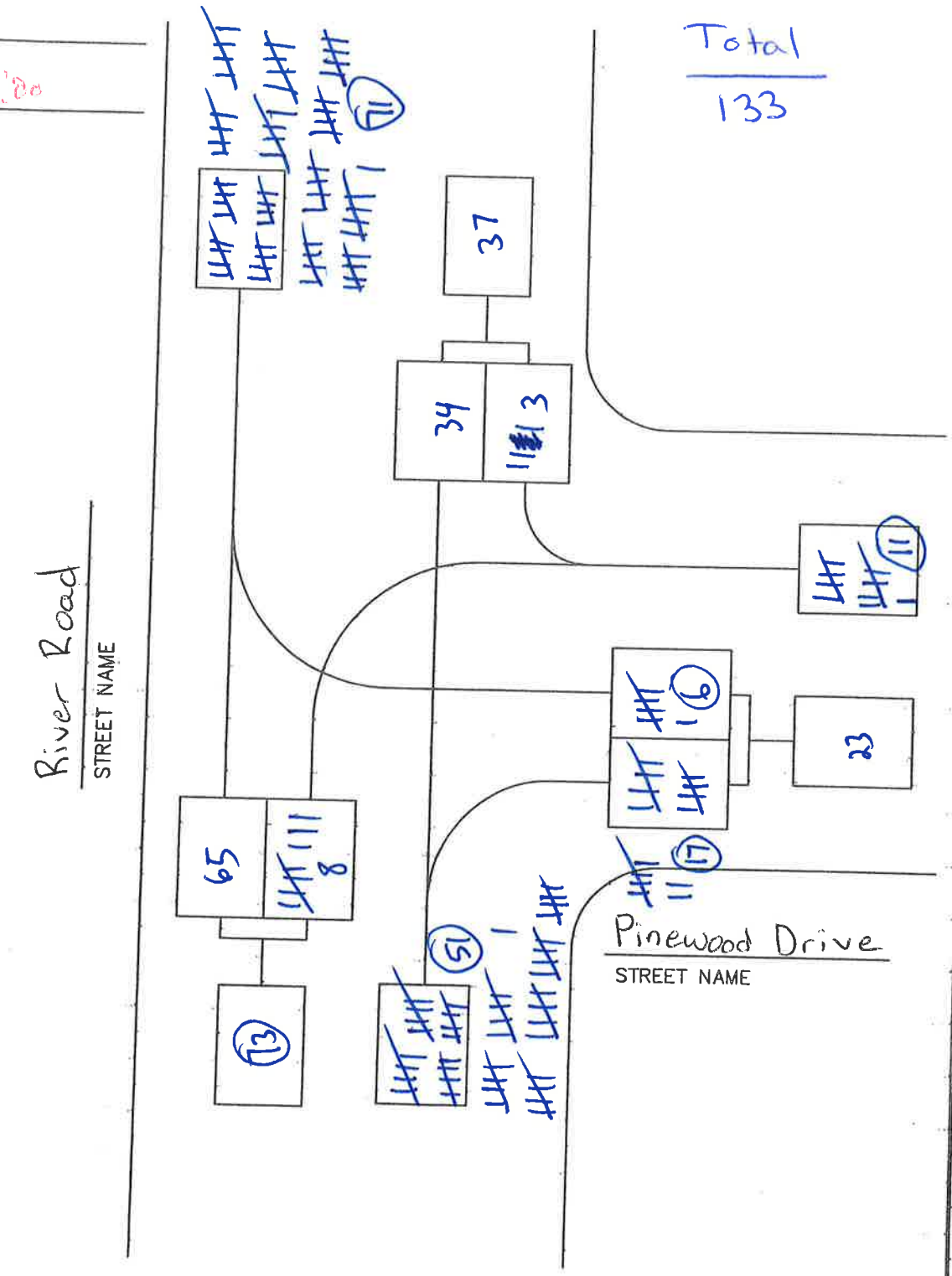
TOWN ESSEX DATE 4/21/21 DAY Wednesday

PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 4:45 - 5:00



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RMO

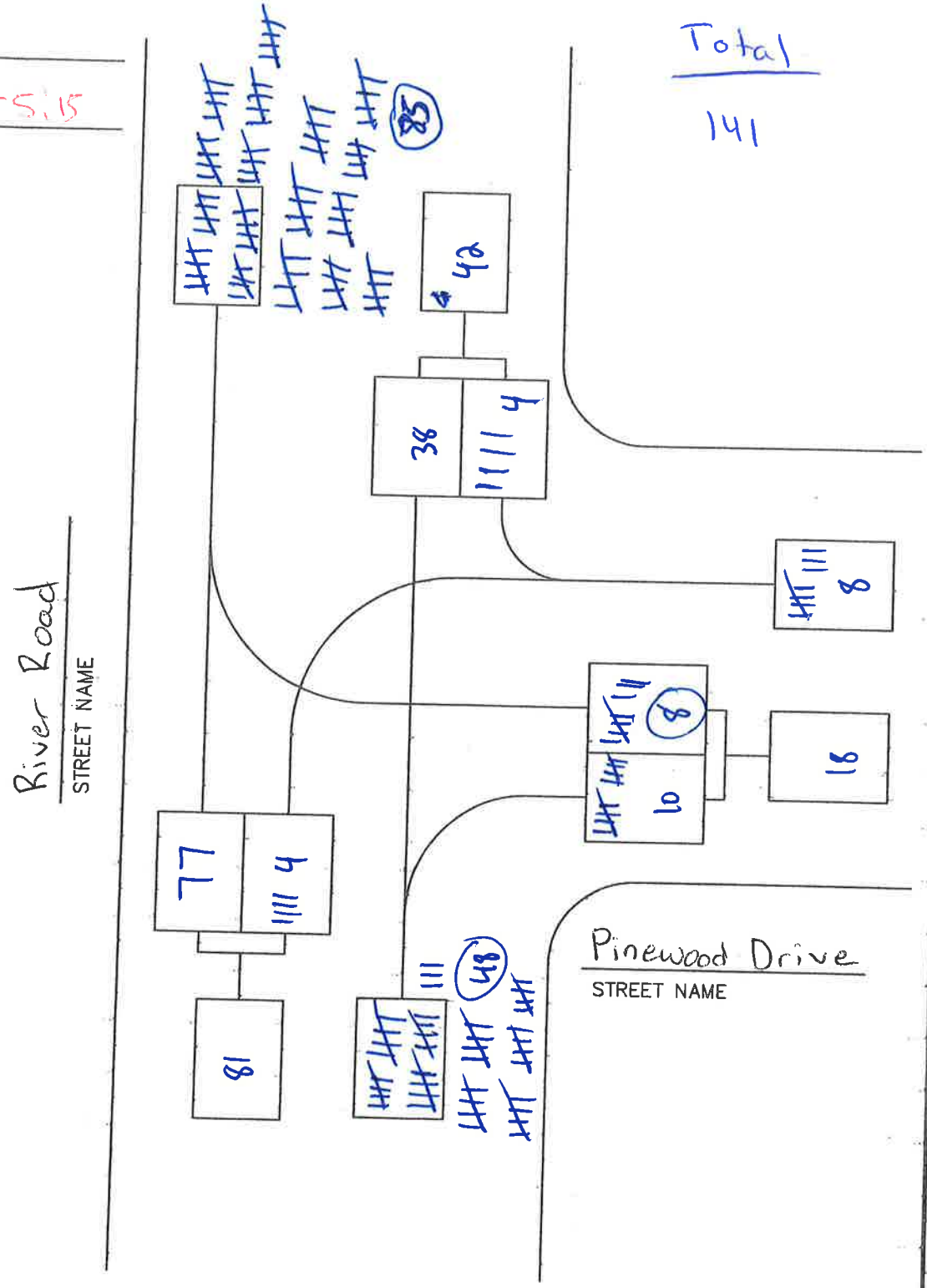
TOWN ESSEX DATE 4/21/21 DAY Wednesday

PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 5:00-5:15



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RMD

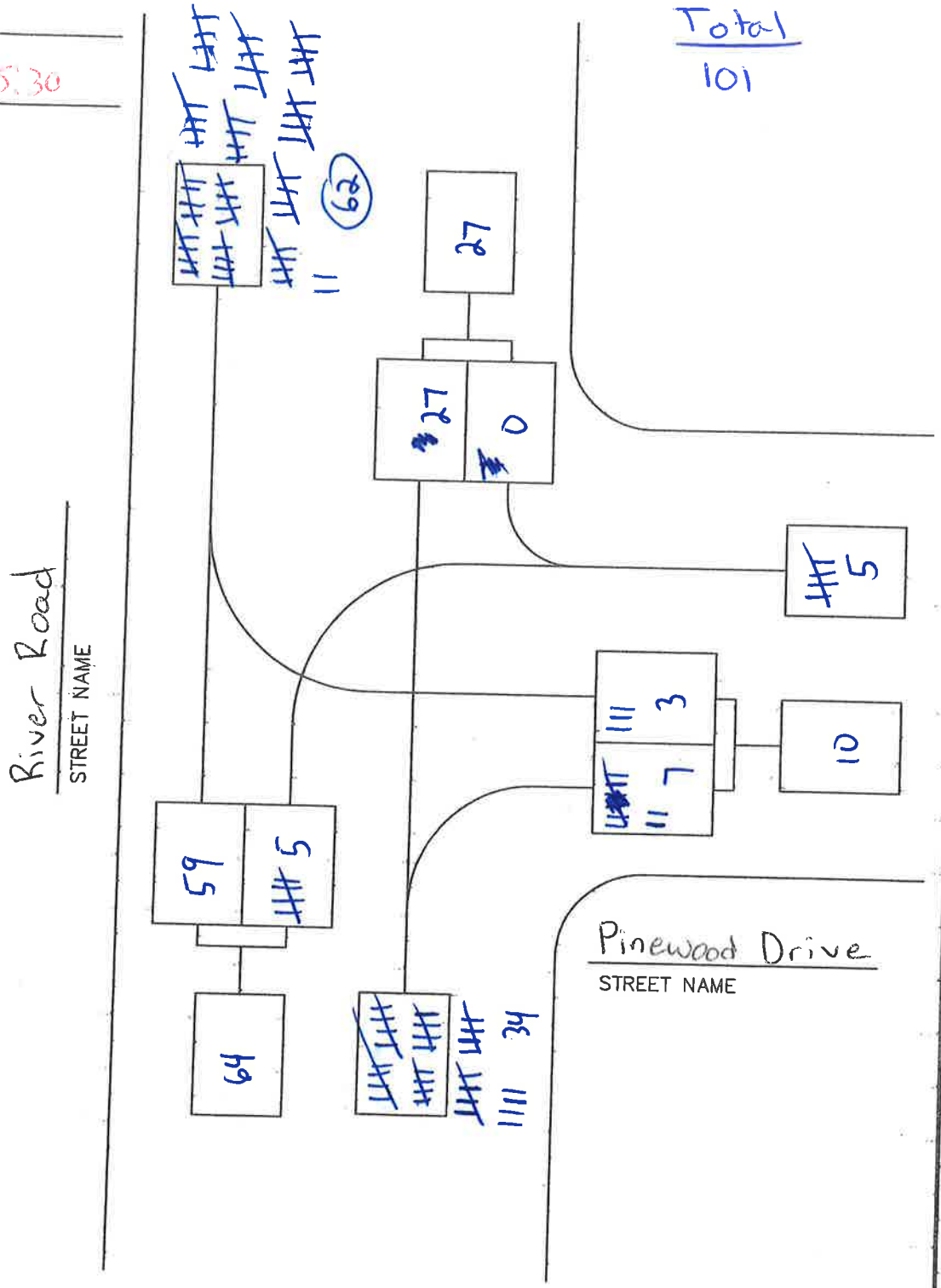
TOWN ESSEX DATE 4/21/21 DAY Wednesday

PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 5:15-5:30



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RMO

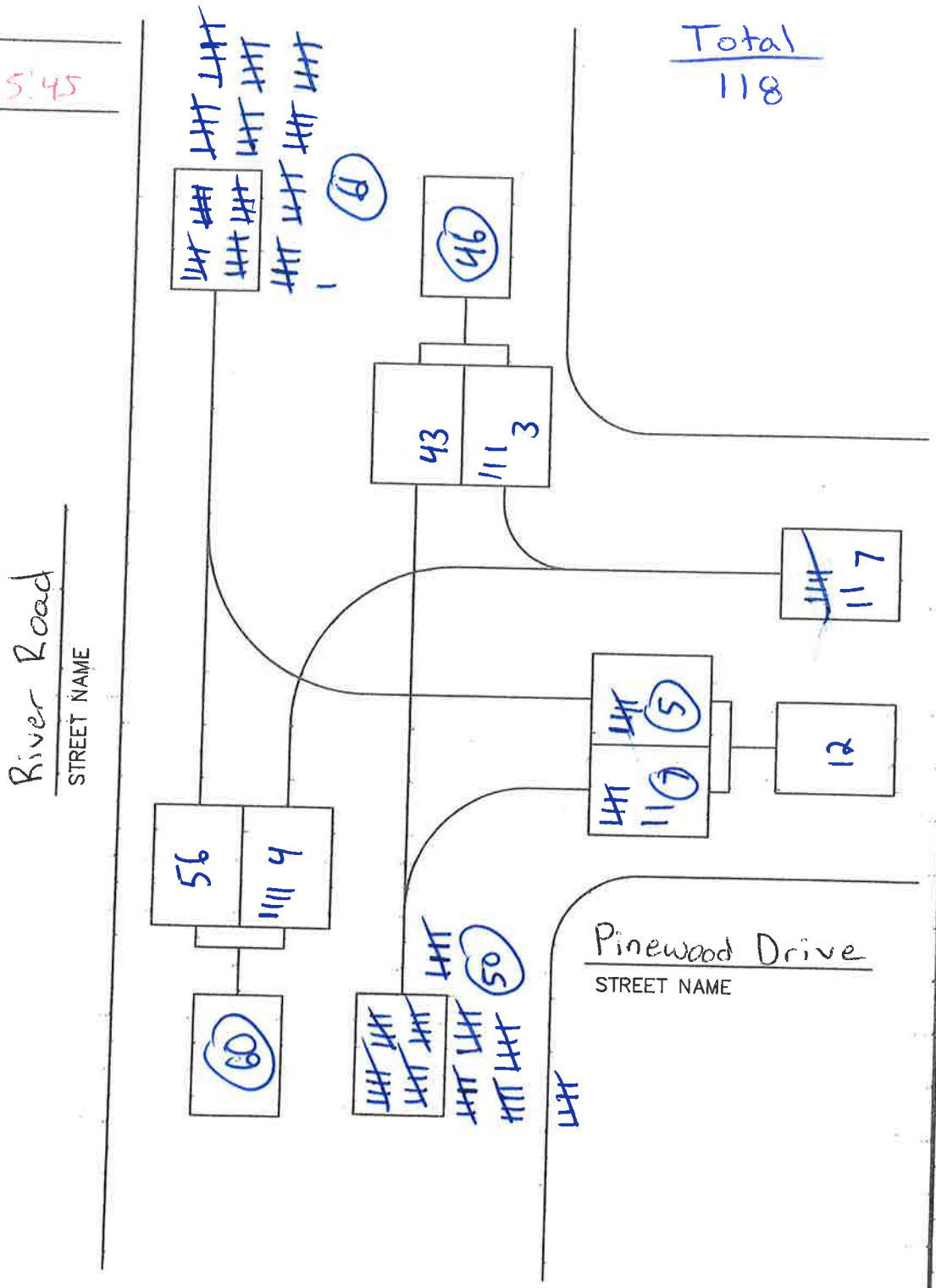
TOWN ESSEX DATE 4/21/21 DAY Wednesday

PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 5:30 - 5:45



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RMO

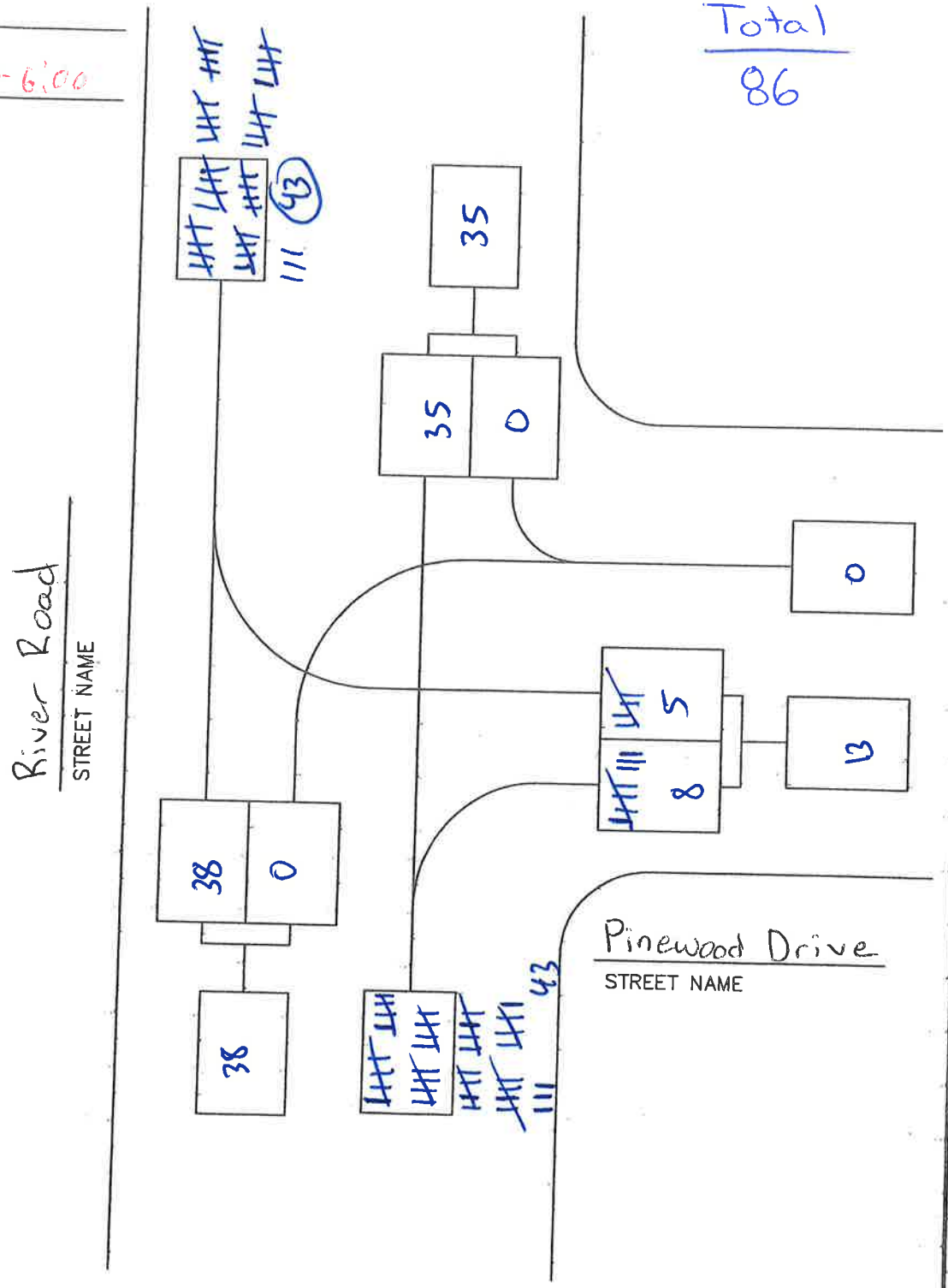
TOWN ESSEX DATE 4/21/21 DAY Wednesday

PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 5:45-6:00



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RMO

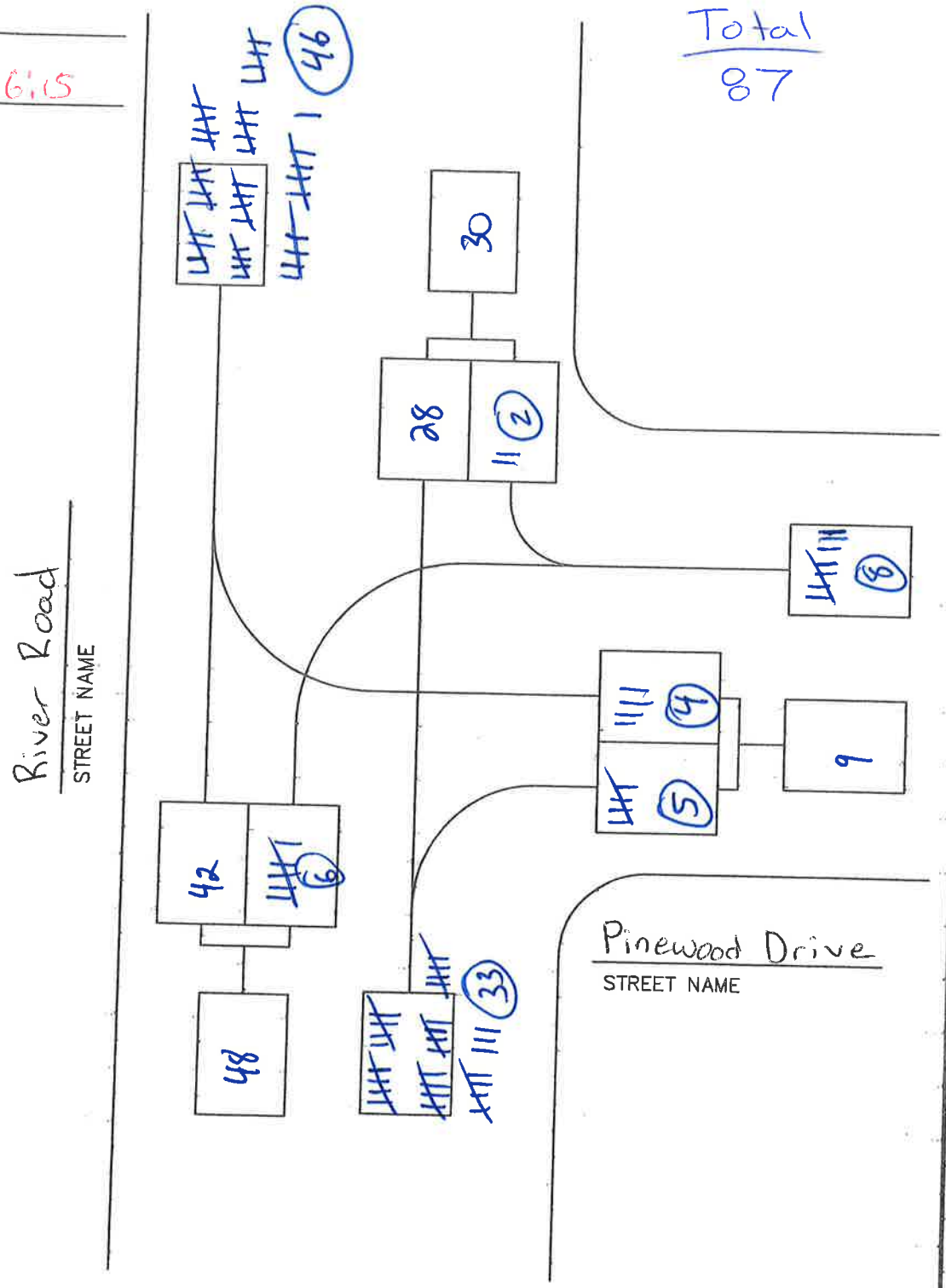
TOWN ESSEX DATE 4/21/21 DAY Wednesday

PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 6:00 - 6:15



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION Valleyview Drive/River Road OBSERVER RCM

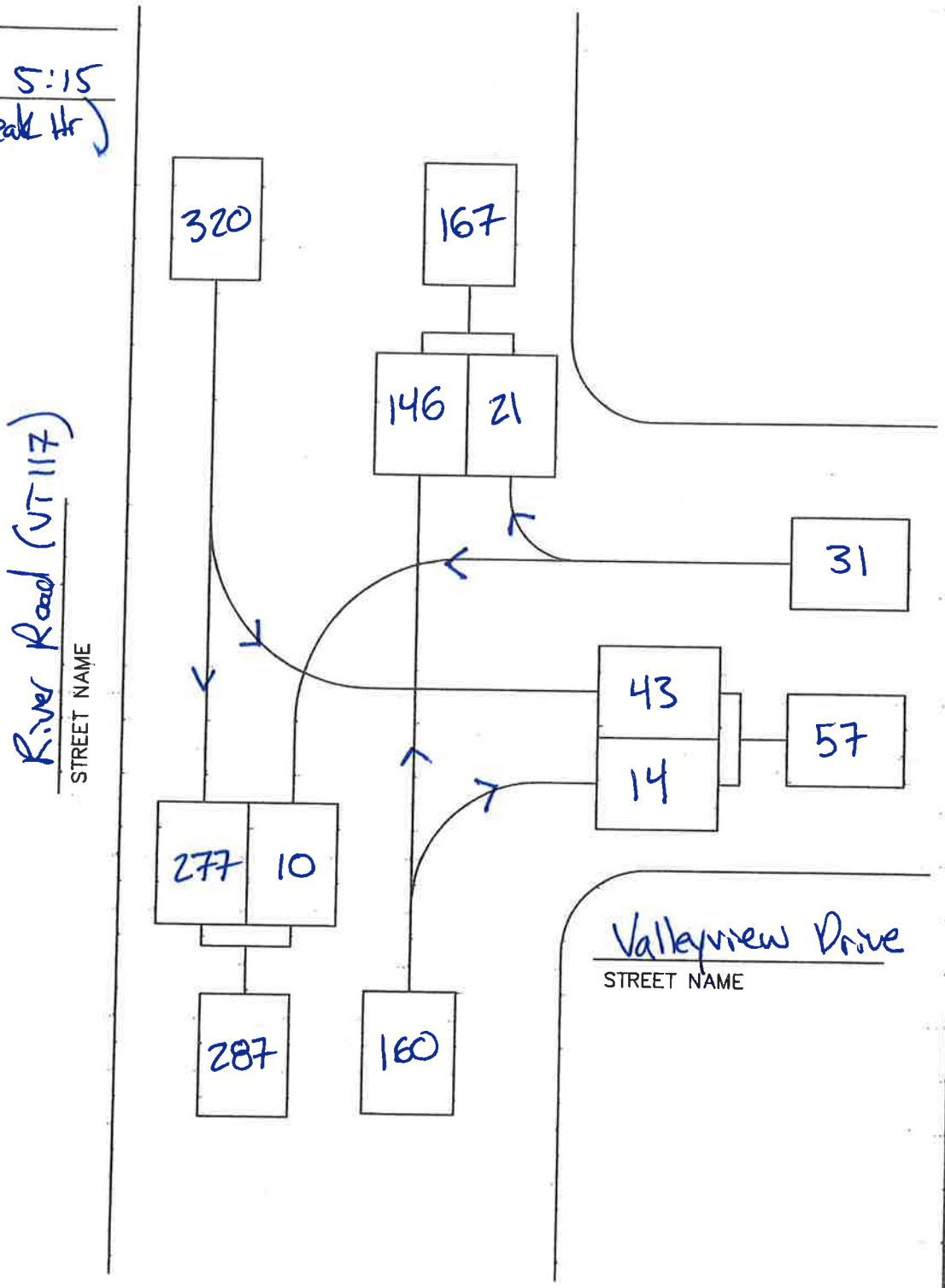
TOWN Essex DATE 4/21/21 DAY Wednesday

PROJECT No. 2020-05 PROJECT Pinewood Section I

TIME

AM

(PM) 4:15 - 5:15 (PM Peak Hr)



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION Valleyview Drive OBSERVER RCM

TOWN Essex DATE 4/21/21 DAY Wednesday

PROJECT No. _____ PROJECT _____

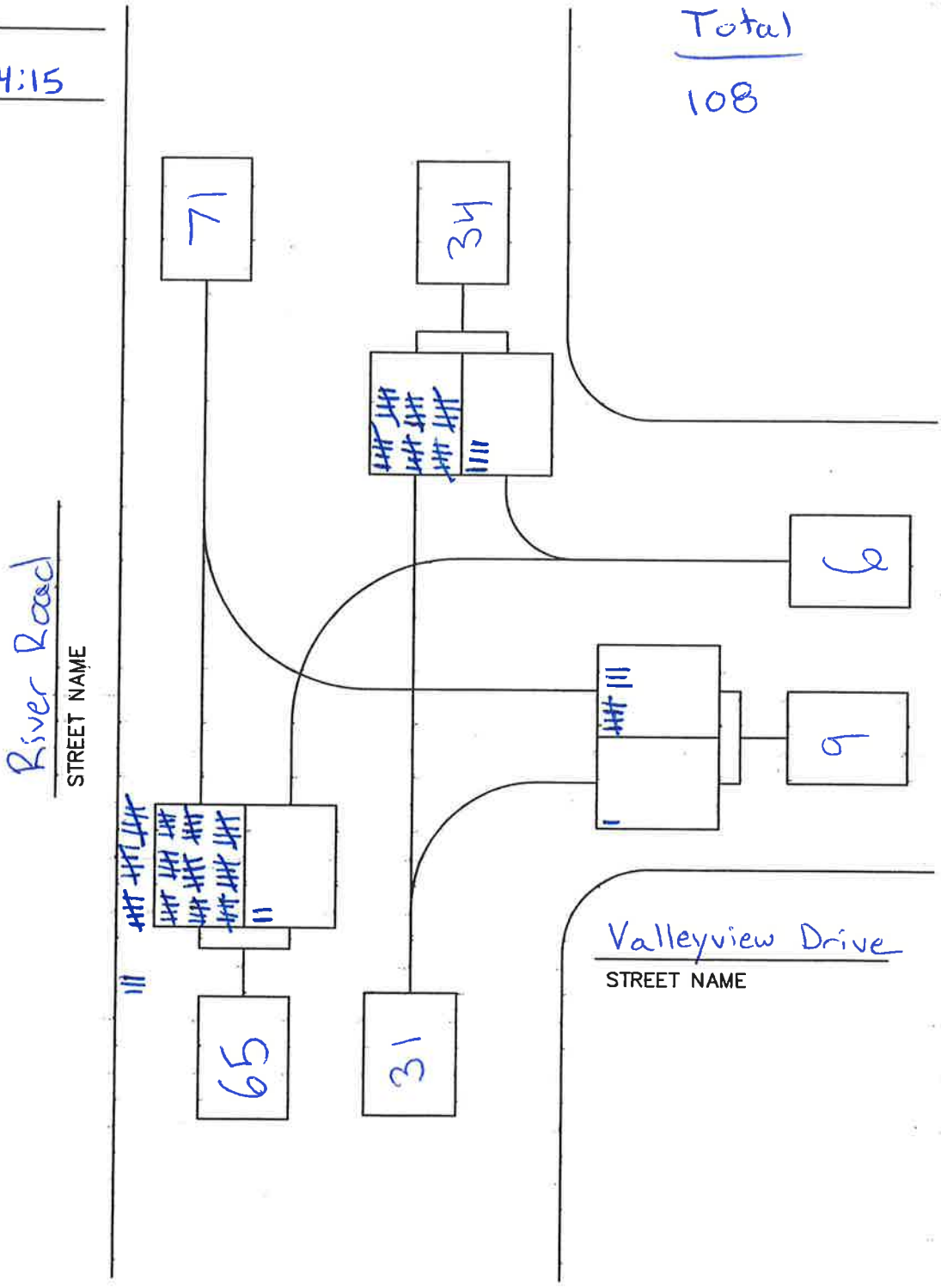
TIME

AM _____

(PM) 4:00 – 4:15

Total

108



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RCM

TOWN Essex DATE 4/21/21 DAY Wednesday

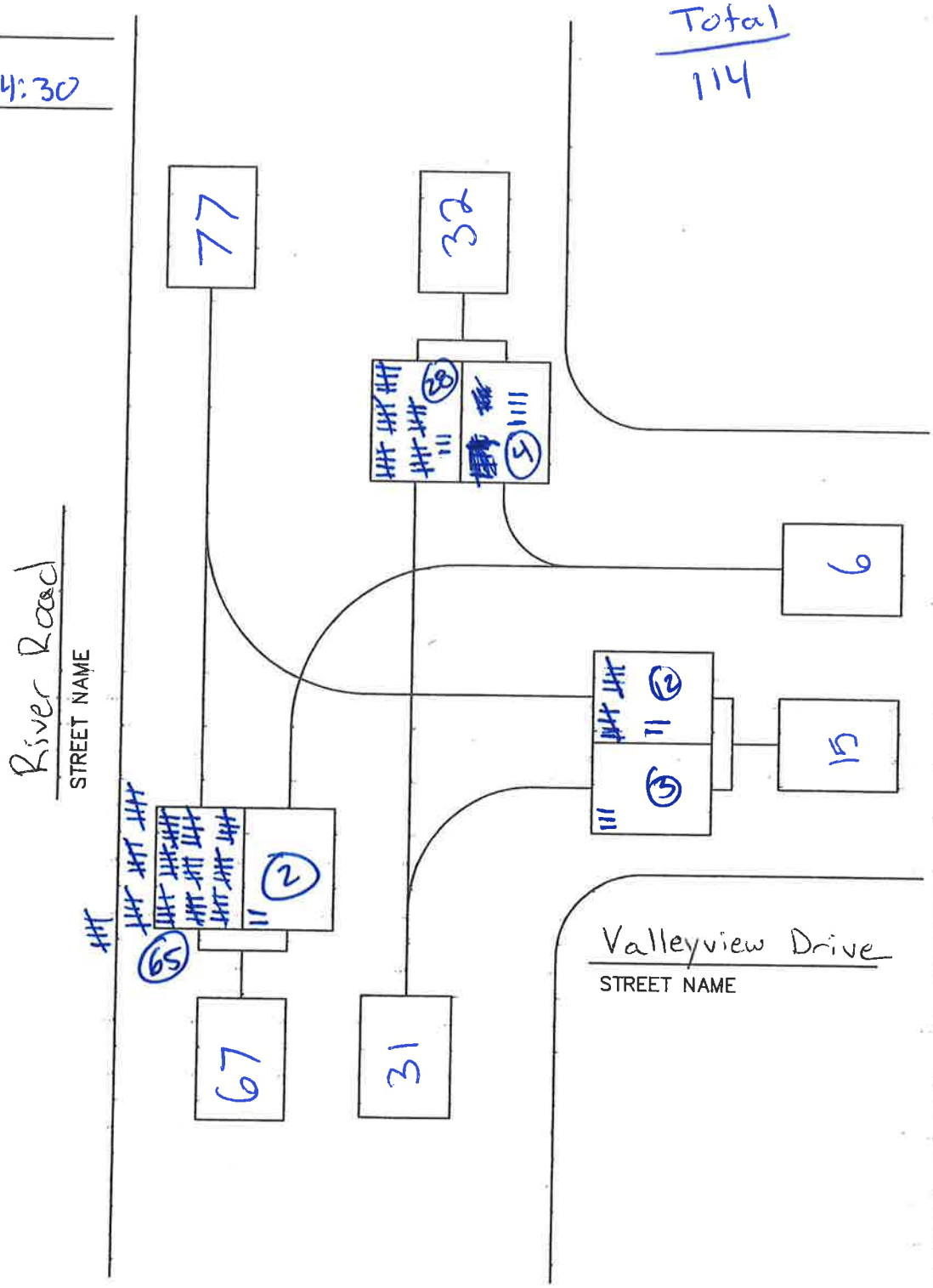
PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 4:15 – 4:30

Total
114



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RCM

TOWN Essex DATE 4/21/21 DAY Wednesday

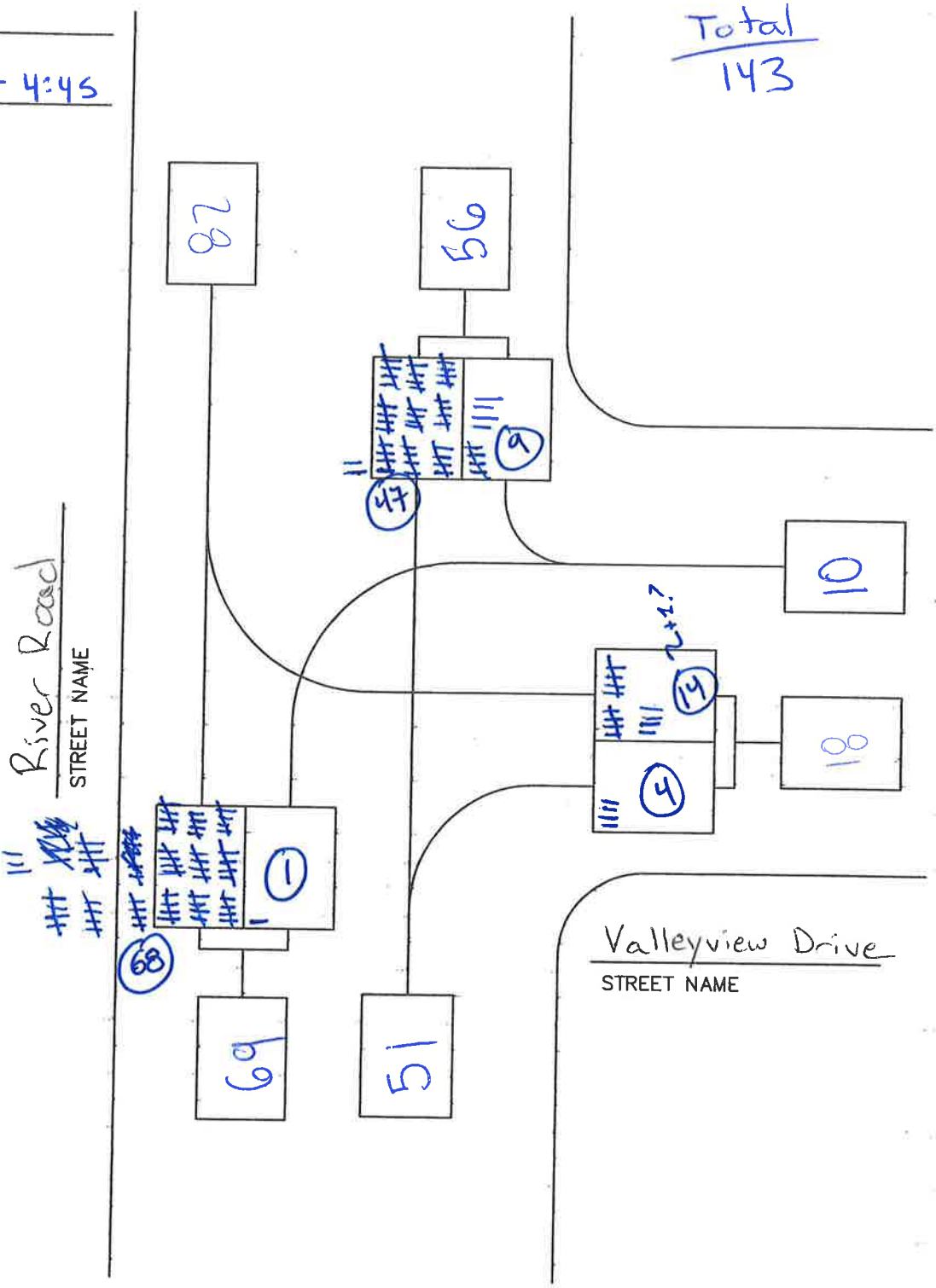
PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 4:30 - 4:45

Total
143



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RCM

TOWN Essex DATE 4/21/21 DAY Wednesday

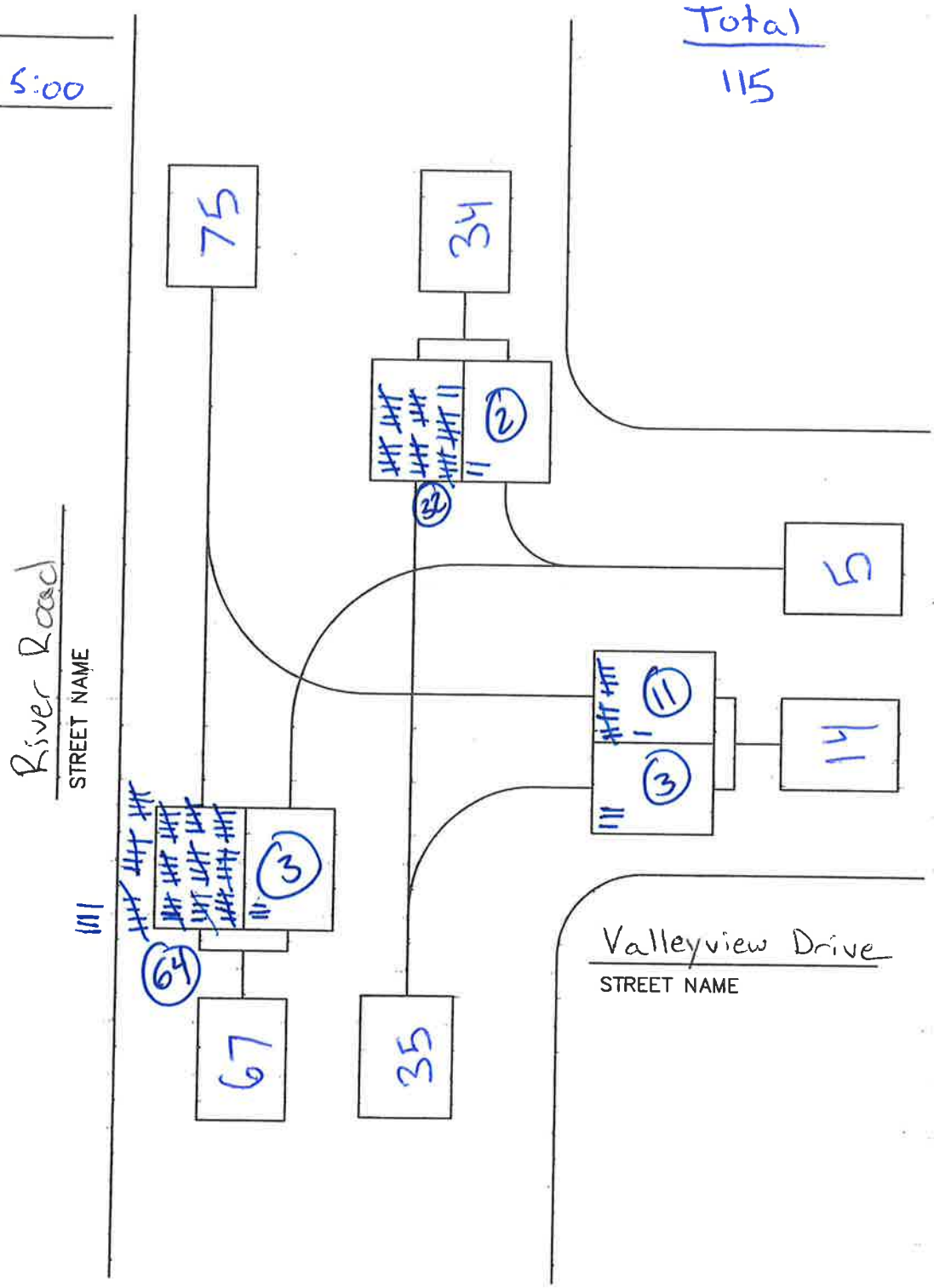
PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 4:45 - 5:00

Total
115



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RCM

TOWN Essex DATE 4/21/21 DAY Wednesday

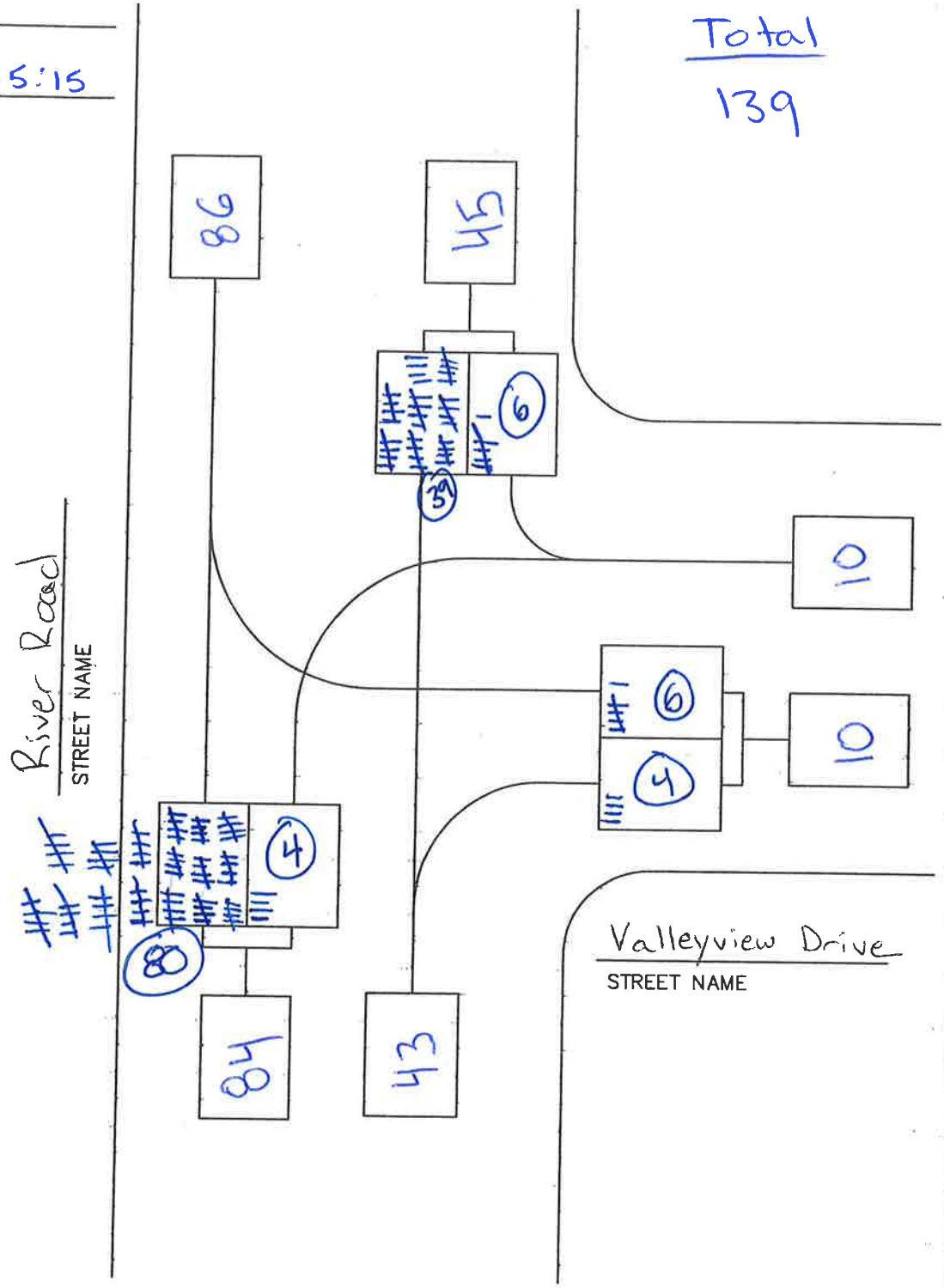
PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 5:00 – 5:15

Total
139



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RCM

TOWN Essex DATE 4/21/21 DAY Wednesday

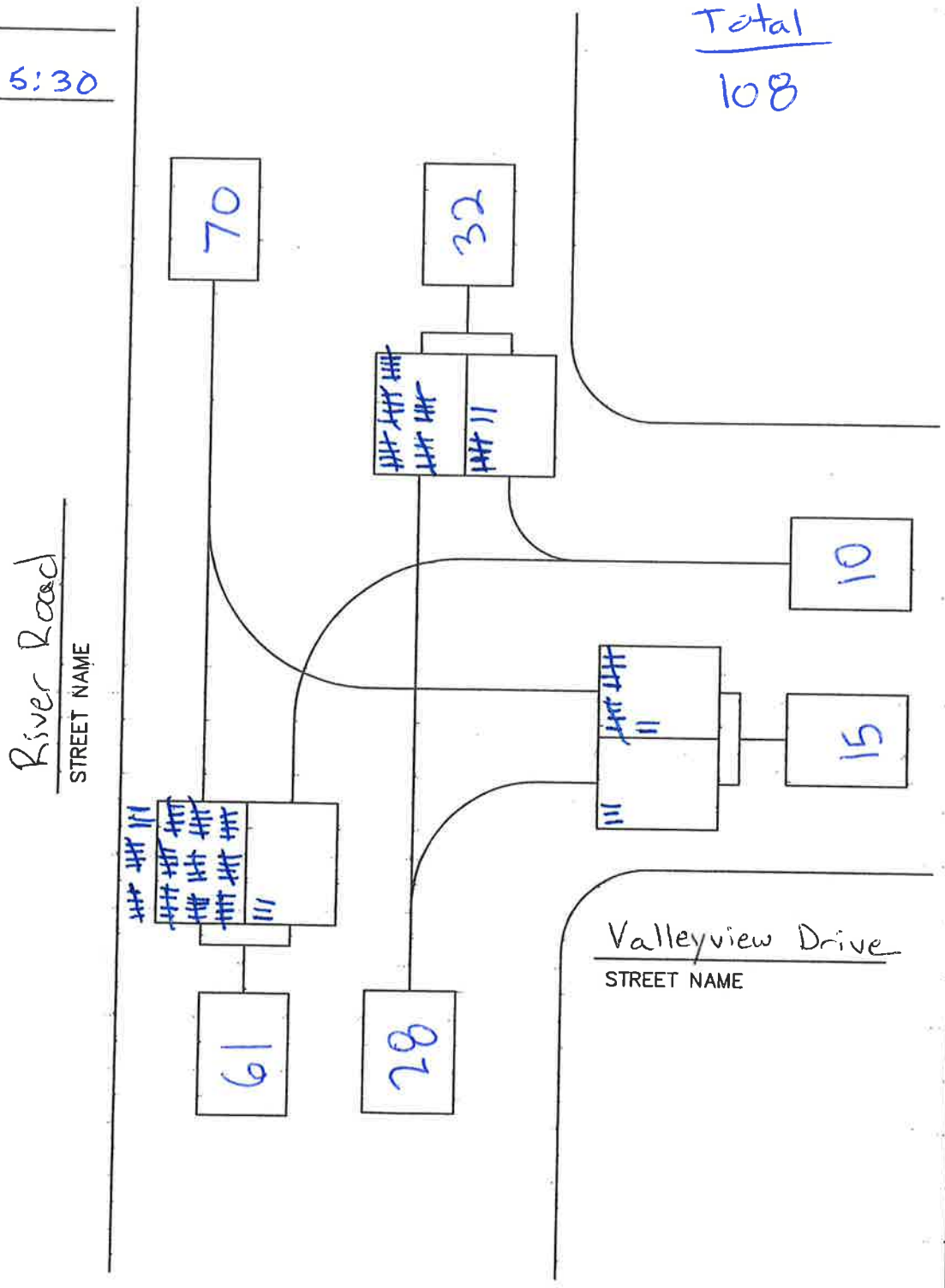
PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 5:15 - 5:30

Total
108



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RCM

TOWN Essex DATE 4/21/21 DAY Wednesday

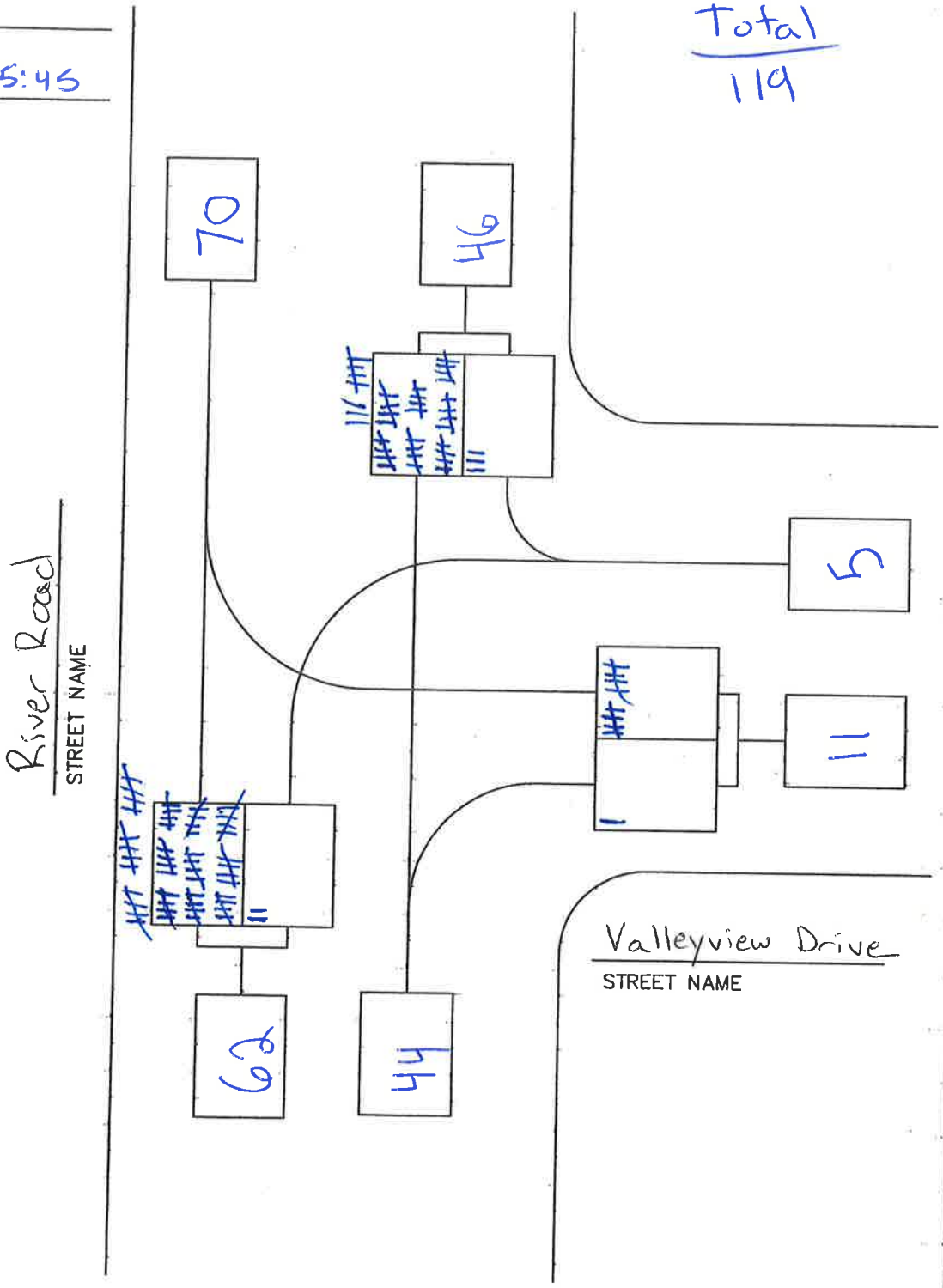
PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 5:30-5:45

Total
119



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RCM

TOWN Essex DATE 4/21/21 DAY Wednesday

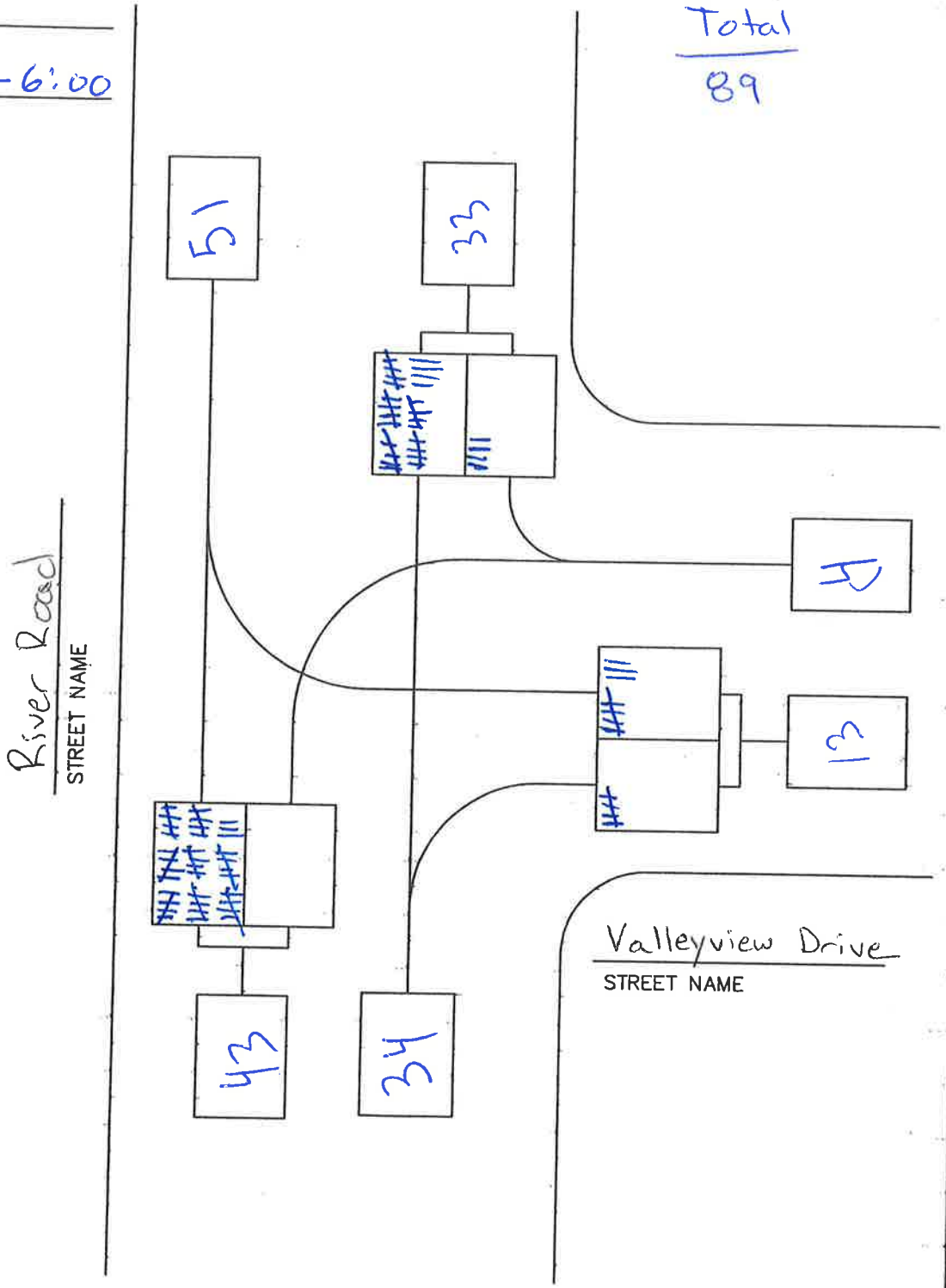
PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 5:45-6:00

Total
89



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION _____ OBSERVER RCM

TOWN Essex DATE 4/21/21 DAY Wednesday

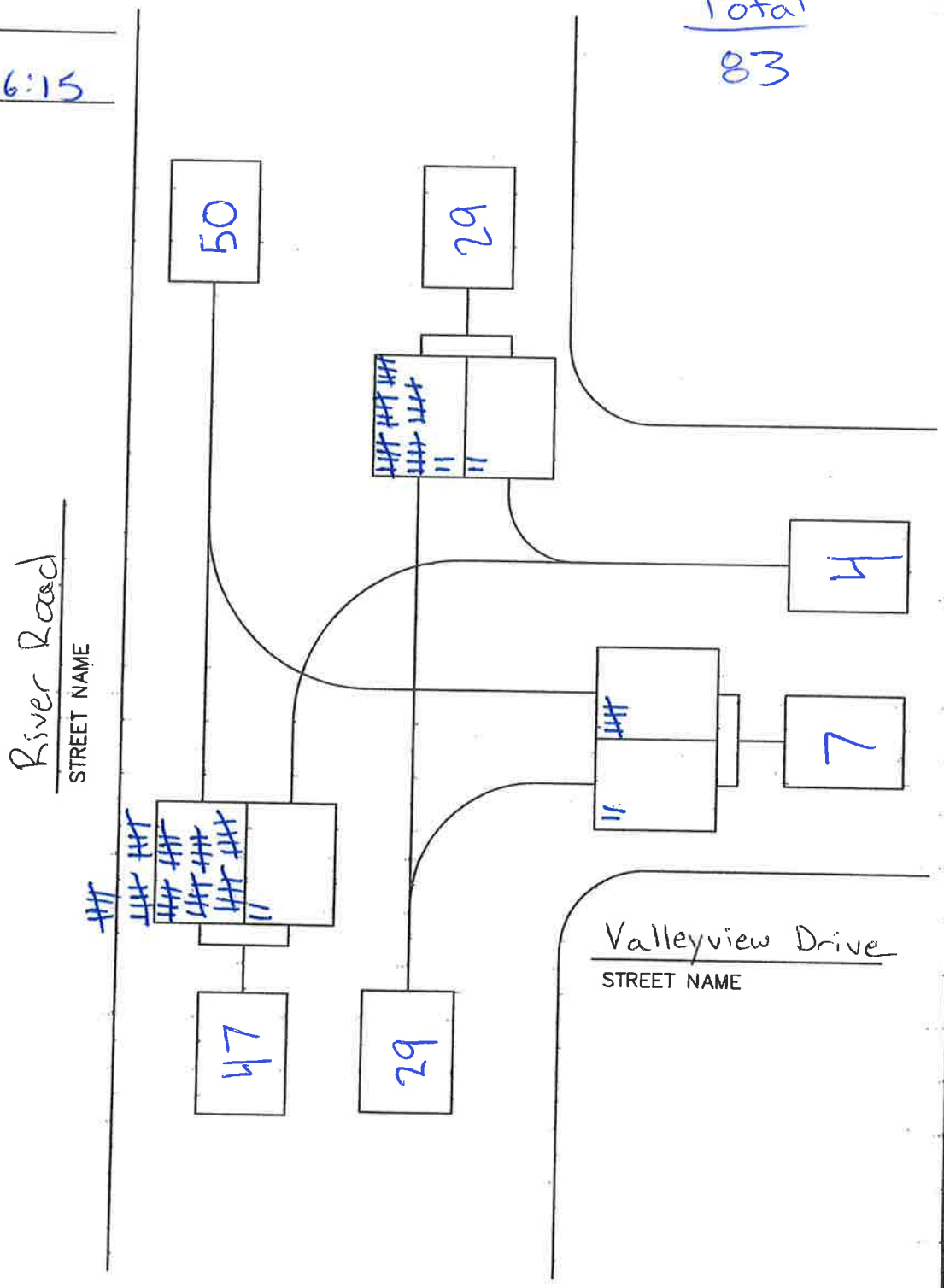
PROJECT No. _____ PROJECT _____

TIME

AM _____

(PM) 6:00-6:15

Total
83



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION Pinewood Drive / Valleyview Drive OBSERVER RCM

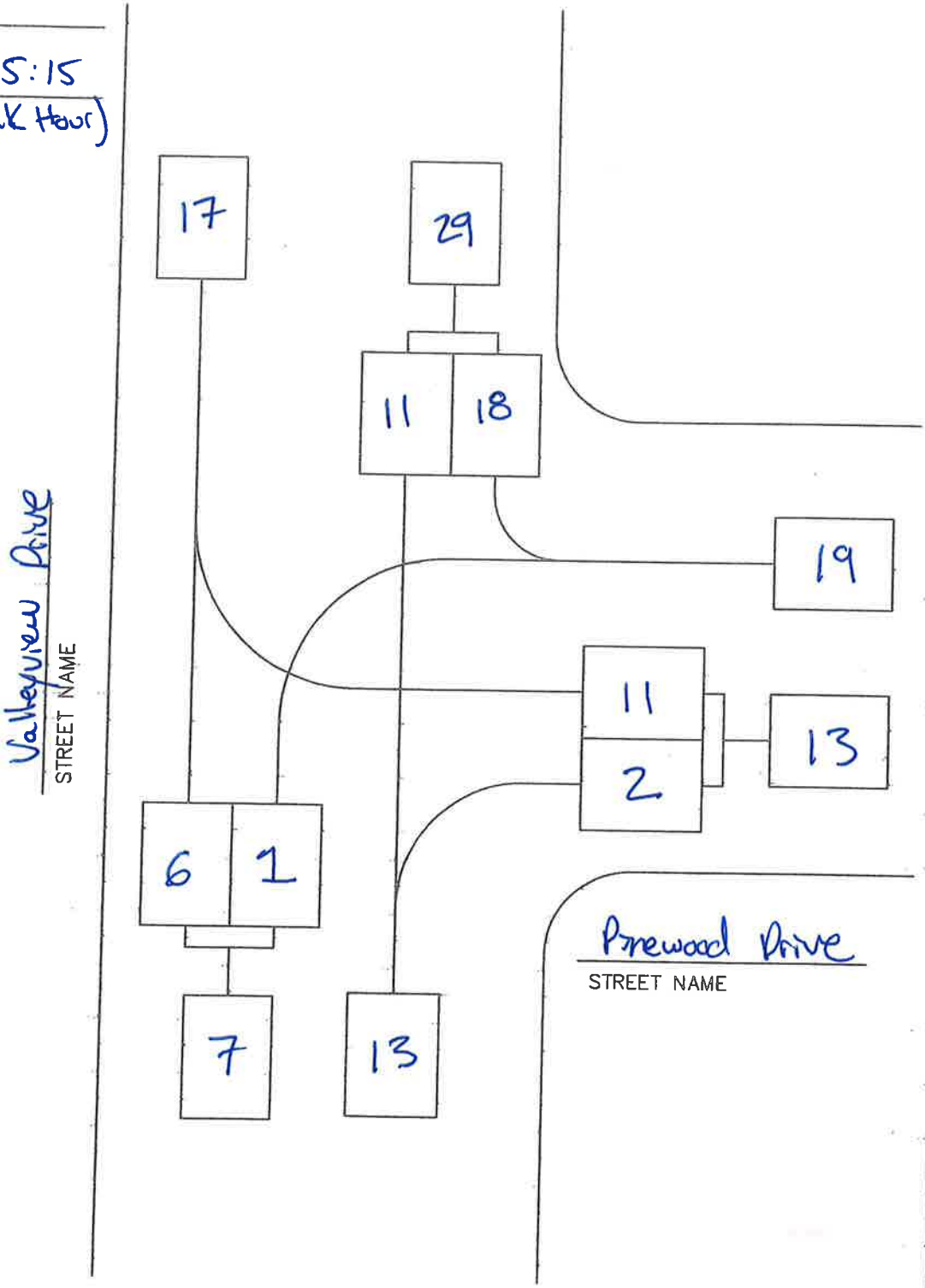
TOWN Essex DATE 4/22/21 DAY Thursday

PROJECT No. 2020-05 PROJECT Pinewood Section I

TIME

AM

(PM) 4:15 - 5:15 (PM Peak Hour)



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION Pinewood x Valleyview OBSERVER RCM

TOWN Essex DATE 4/22/21 DAY Thursday

PROJECT No. 2020-05 PROJECT

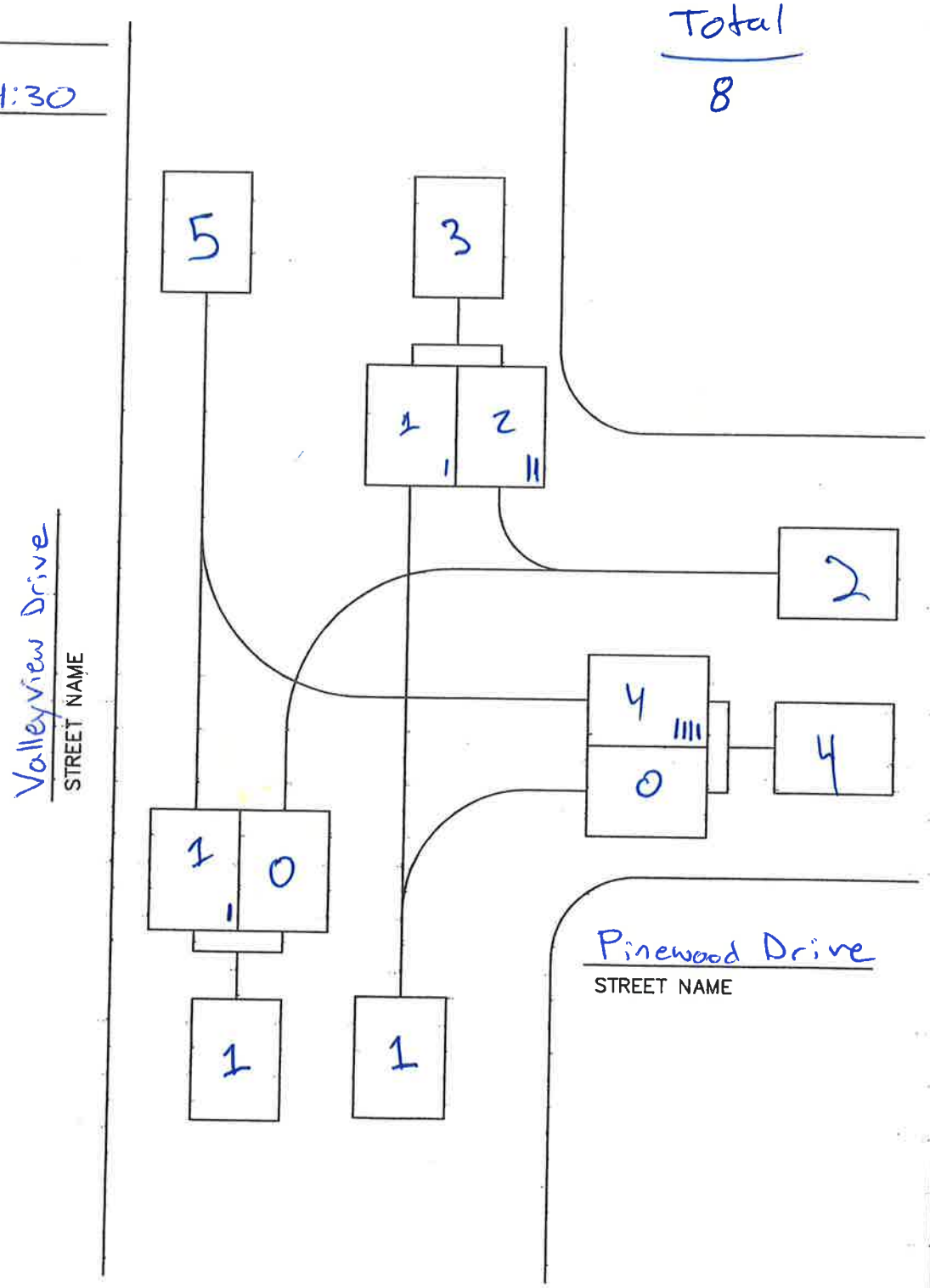
TIME

AM 8

(PM) 4:15 - 4:30

Total

8



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION Pinewood x Valleyview OBSERVER RCM

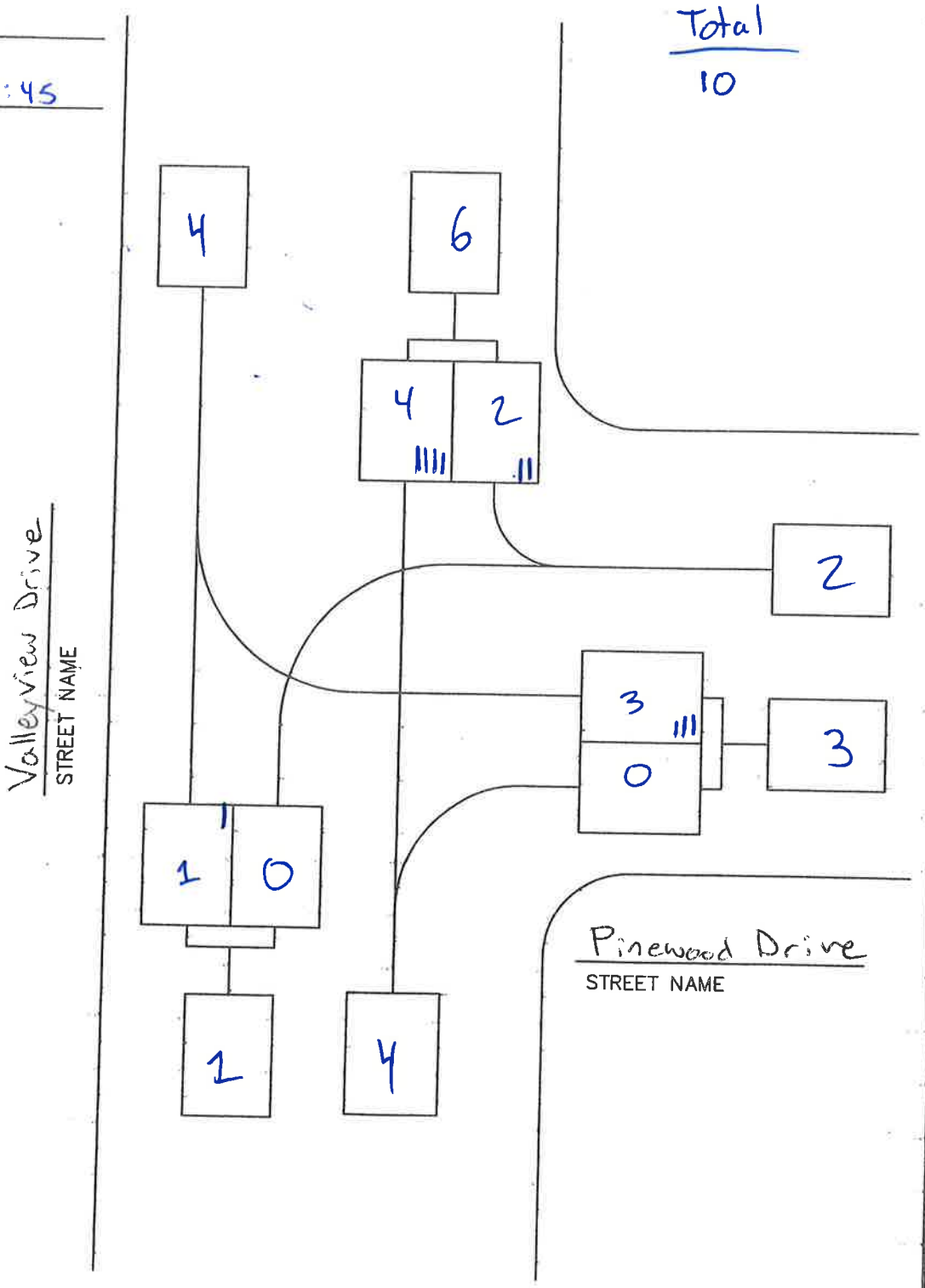
TOWN Essex DATE 4/22/21 DAY Thursday

PROJECT No. 2020-05 PROJECT

TIME

AM

(PM) 4:30 - 4:45



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION Pinewood x Valleyview OBSERVER RCM

TOWN Essex DATE 4/22/21 DAY Thursday

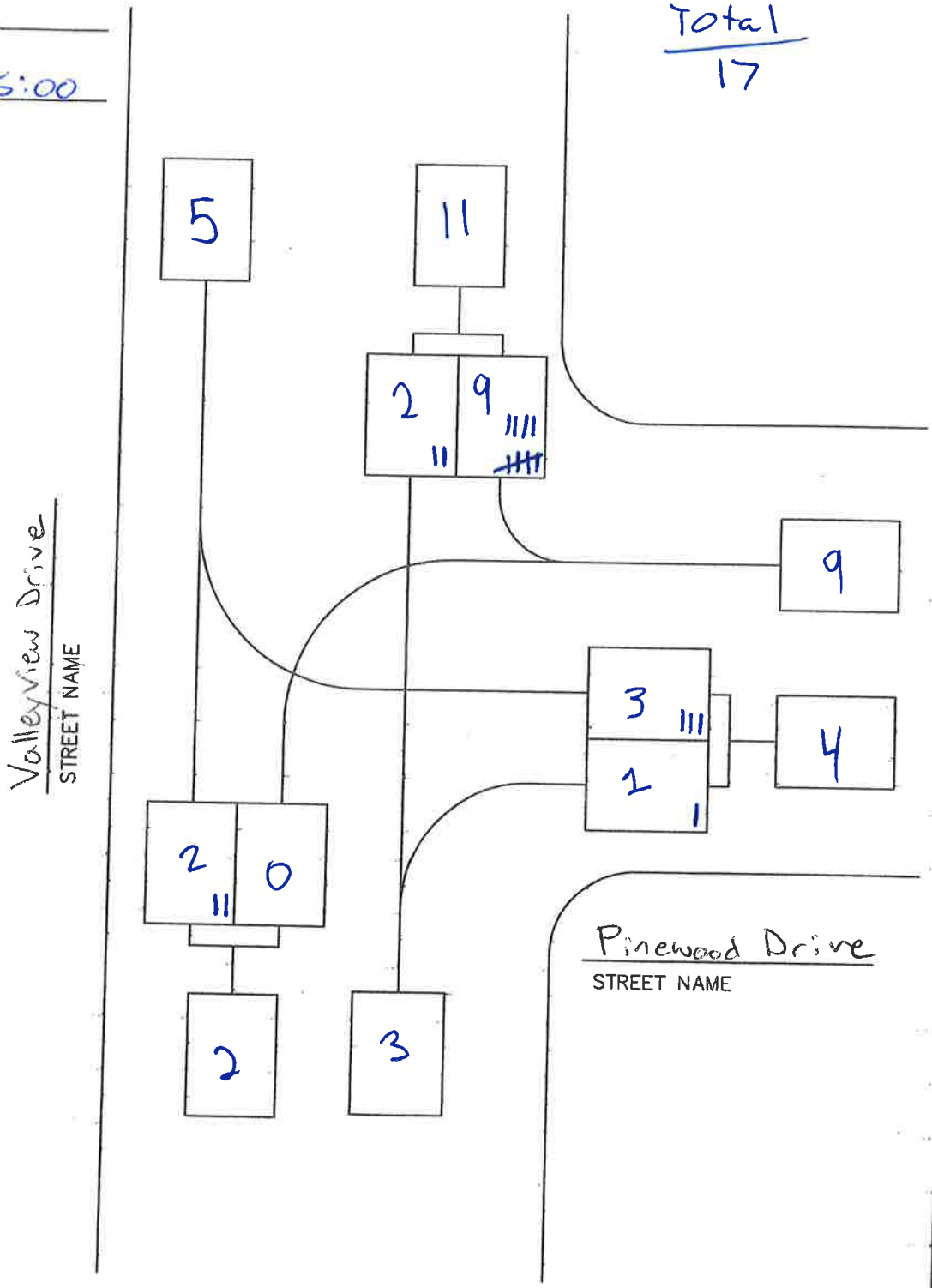
PROJECT No. 2020-05 PROJECT

TIME

AM

(PM) 4:45-5:00

Total
17



EXISTING TRAFFIC

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

INTERSECTION Pinewood x Valleyview OBSERVER RCM

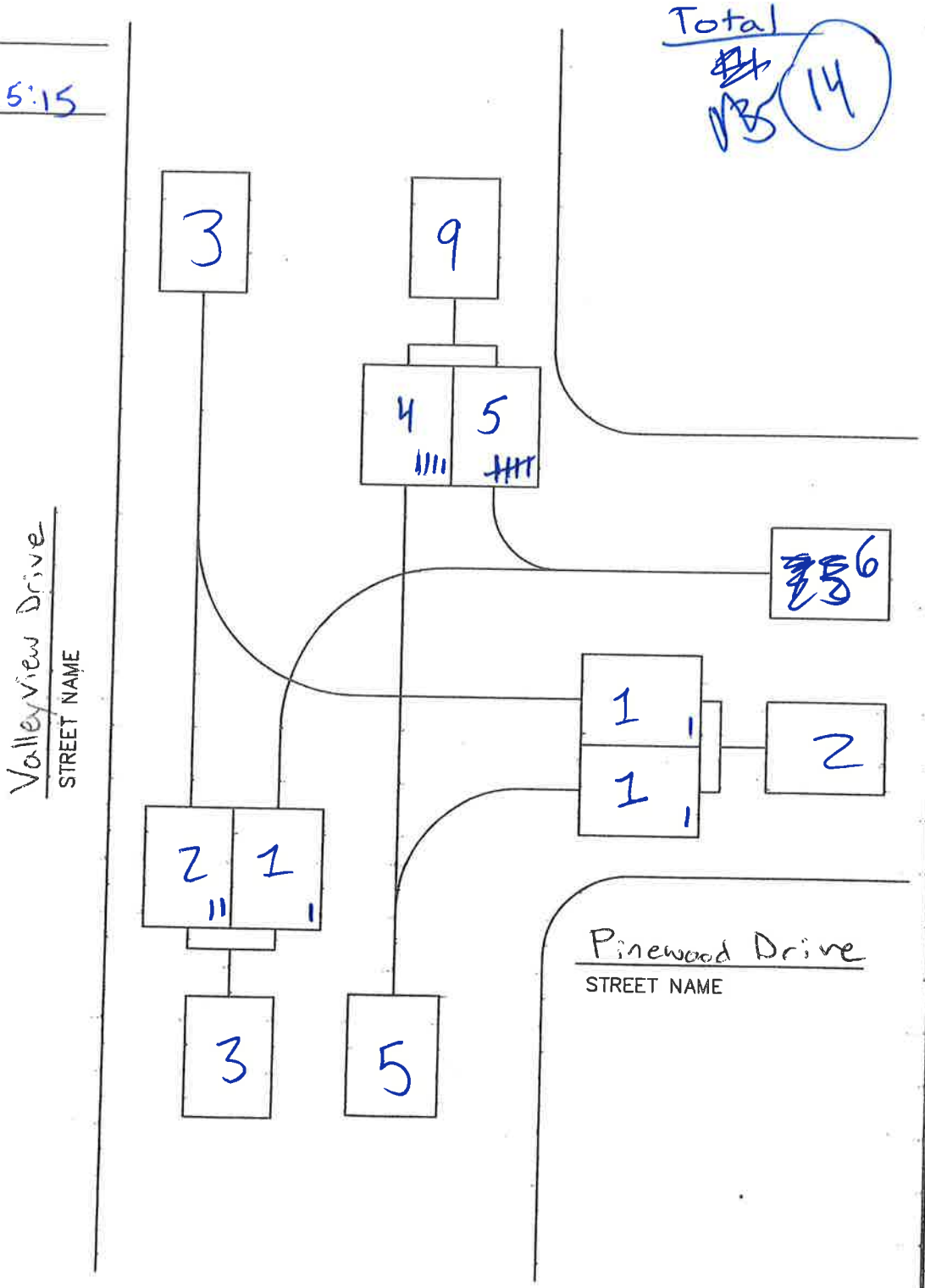
TOWN Essex DATE 4/22/21 DAY Thursday

PROJECT No. 2020-05 PROJECT

TIME

AM

(PM) 5:00 - 5:15



Graphic Summary of Vehicular Movements

GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

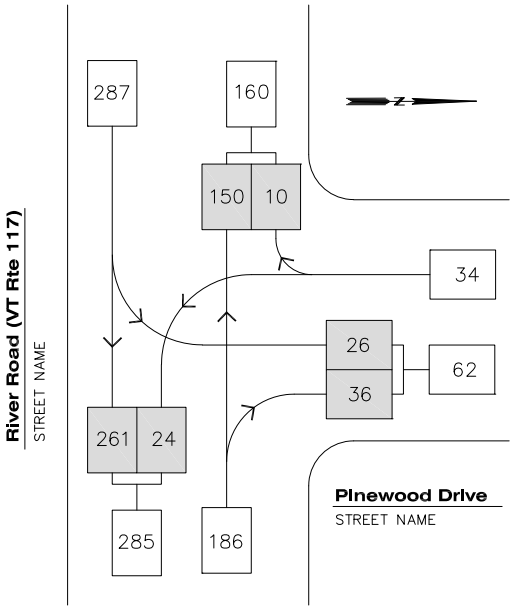
INTERSECTION **Pinewood Drive / River Road (VT Rte 117)** OBSERVER **OBCA**

TOWN **Essex** DATE **4/21/21** DAY **Wednesday**

PROJECT No. _____ PROJECT **Pinewood Section I - 2025**

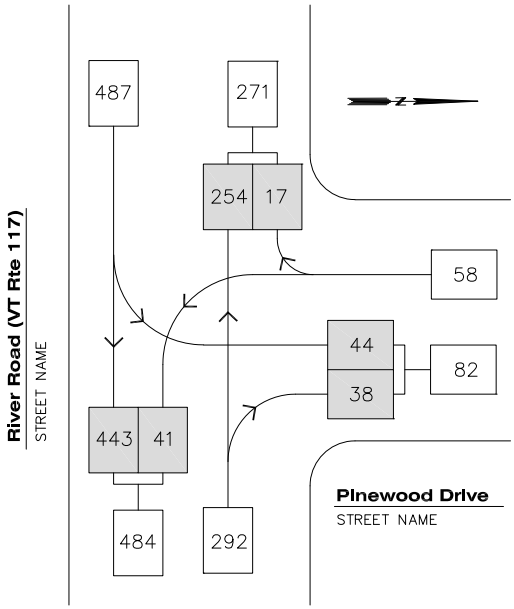
EXISTING OBSERVED 2021

TIME PM PEAK (4:15–5:15)



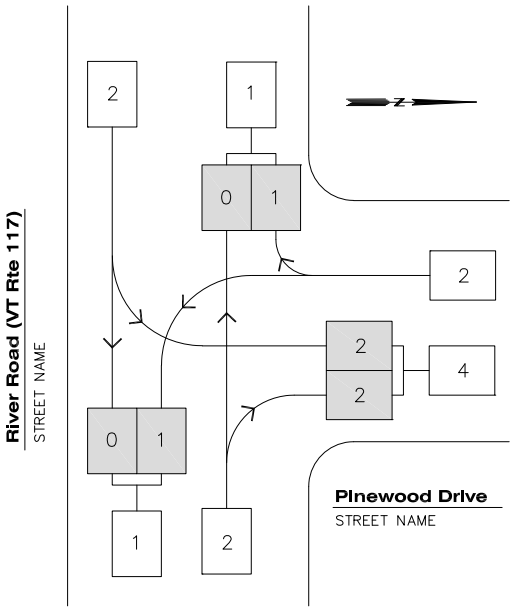
ADJUSTED OBSERVED 2025

TIME PM PEAK (4:15–5:15)



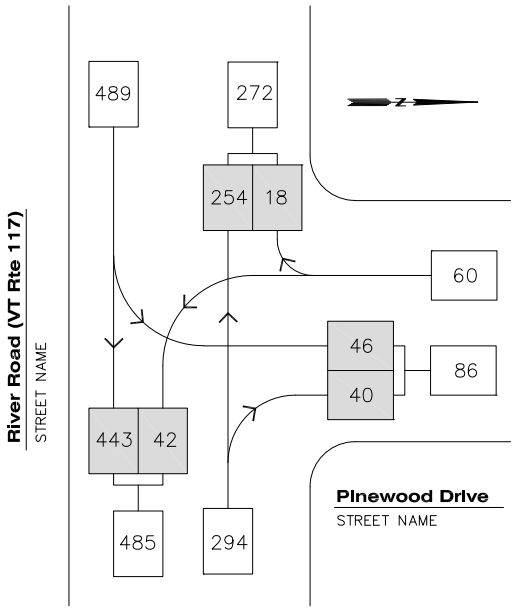
PROJECT ESTIMATE 2025

TIME PM PEAK (4:15–5:15)



ADJUSTED OBSERVED
+ PROJECT 2025

TIME PM PEAK (4:15–5:15)



GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

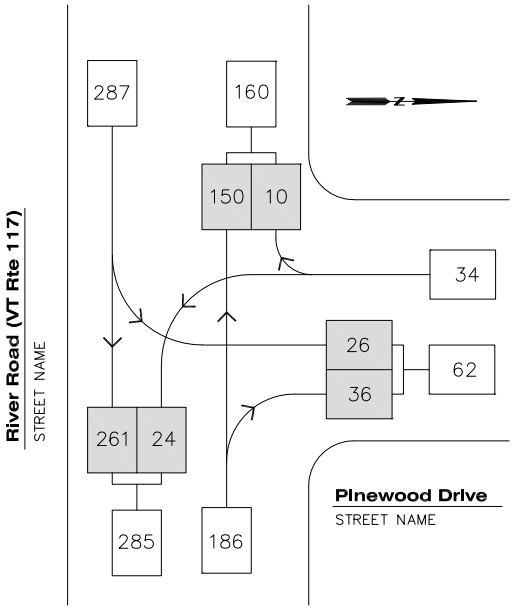
INTERSECTION **Pinewood Drive / River Road (VT Rte 117)** OBSERVER **OBCA**

TOWN **Essex** DATE **4/21/21** DAY **Wednesday**

PROJECT No. _____ PROJECT **Pinewood Section I - 2030**

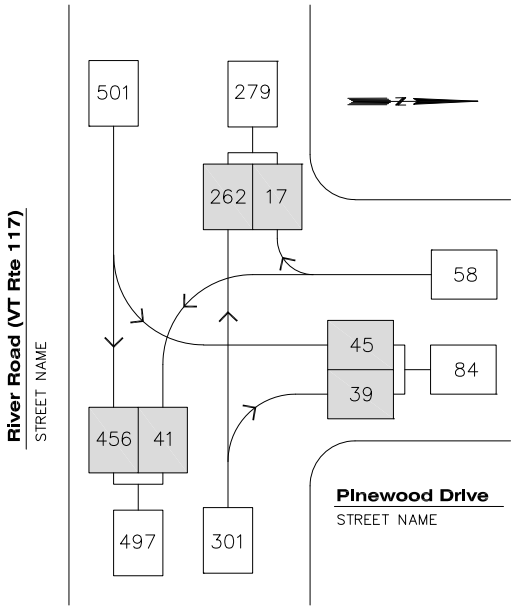
EXISTING OBSERVED 2021

TIME PM PEAK (4:15–5:15)



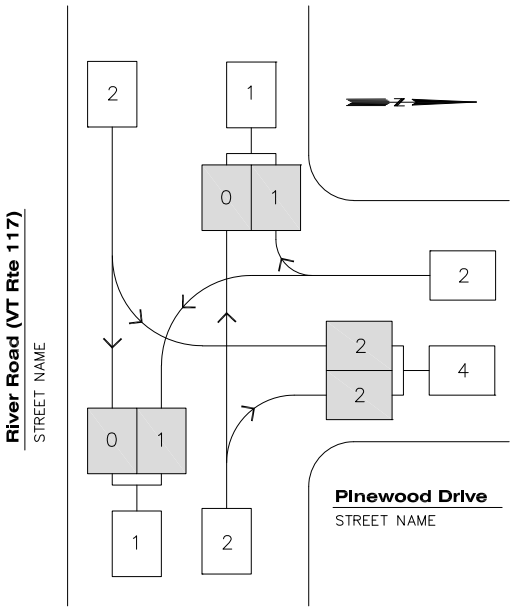
ADJUSTED OBSERVED 2030

TIME PM PEAK (4:15–5:15)



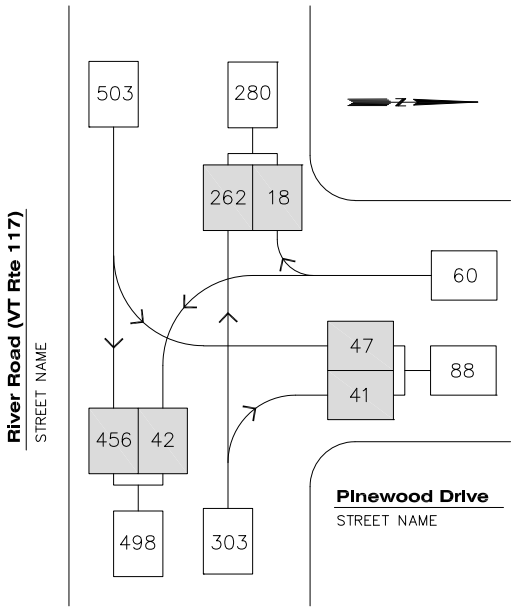
PROJECT ESTIMATE 2030

TIME PM PEAK (4:15–5:15)



ADJUSTED OBSERVED
+ PROJECT 2030

TIME PM PEAK (4:15–5:15)



GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

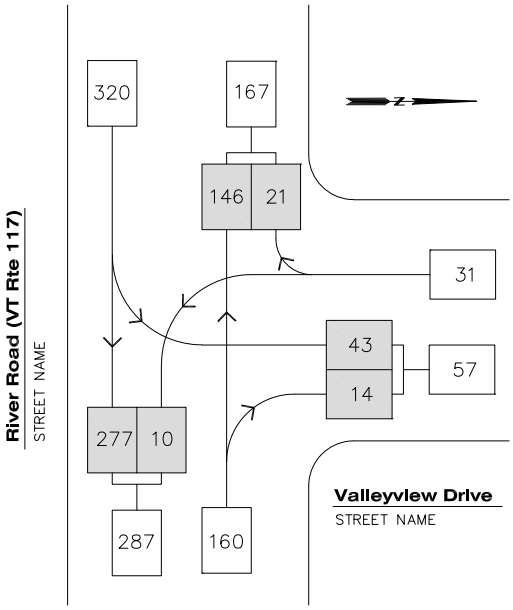
INTERSECTION **Valleyview Drive / River Road (VT Rte 117)** OBSERVER **OBCA**

TOWN **Essex** DATE **4/21/21** DAY **Wednesday**

PROJECT No. _____ PROJECT **Pinewood Section I - 2025**

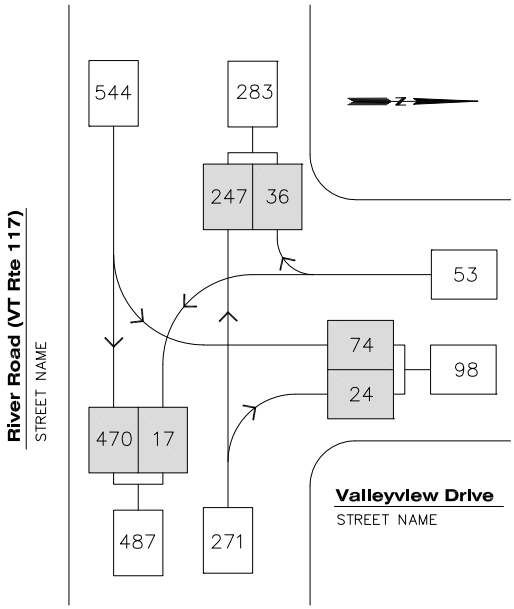
EXISTING OBSERVED 2021

TIME PM PEAK (4:15–5:15)



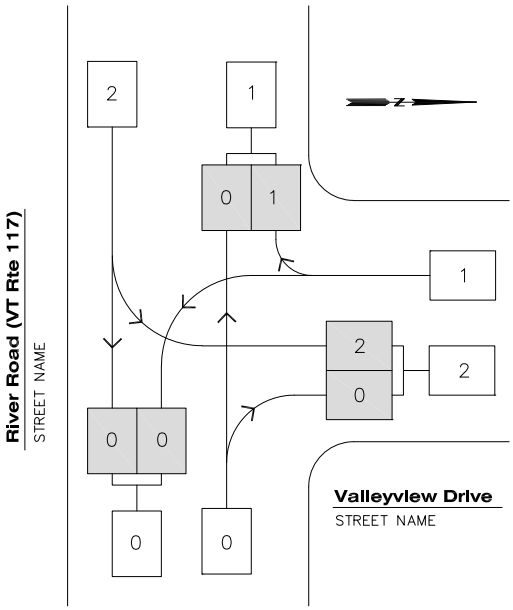
ADJUSTED OBSERVED 2025

TIME PM PEAK (4:15–5:15)



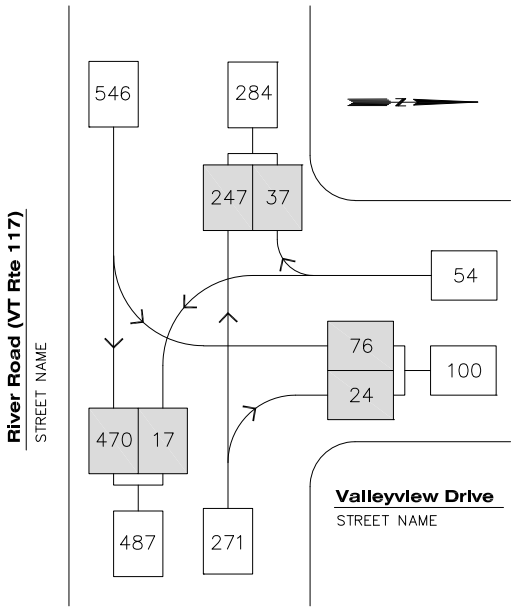
PROJECT ESTIMATE 2025

TIME PM PEAK (4:15–5:15)



ADJUSTED OBSERVED
+ PROJECT 2025

TIME PM PEAK (4:15–5:15)



GRAPHIC SUMMARY OF VEHICLE MOVEMENTS

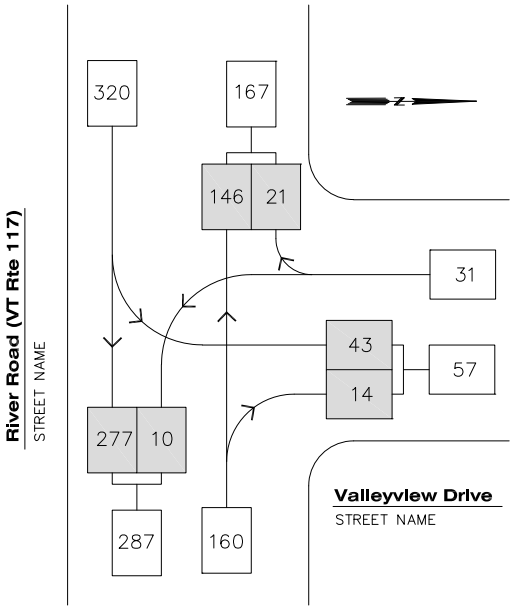
INTERSECTION **Valleyview Drive / River Road (VT Rte 117)** OBSERVER **OBCA**

TOWN **Essex** DATE **4/21/21** DAY **Wednesday**

PROJECT No. _____ PROJECT **Pinewood Section I - 2030**

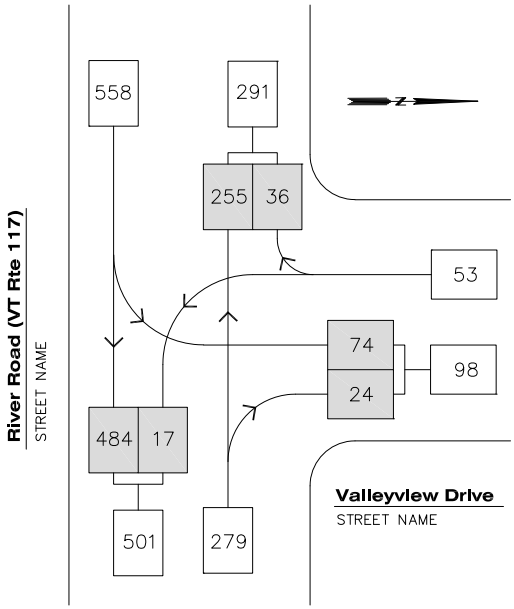
EXISTING OBSERVED 2021

TIME PM PEAK (4:15–5:15)



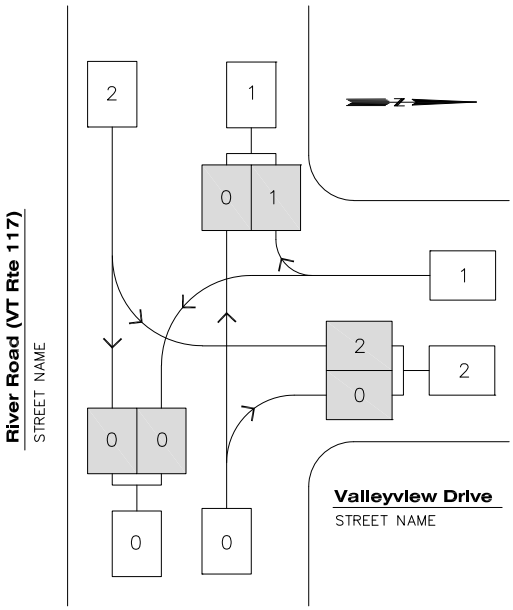
ADJUSTED OBSERVED 2030

TIME PM PEAK (4:15–5:15)



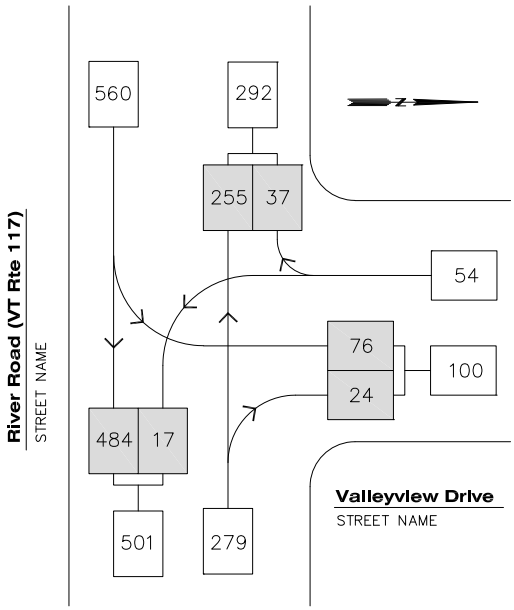
PROJECT ESTIMATE 2030

TIME PM PEAK (4:15–5:15)



ADJUSTED OBSERVED
+ PROJECT 2030

TIME PM PEAK (4:15–5:15)



Level of Service Analysis

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BWC*
Agency/Co.	*OBCA*
Date Performed	*4/21/21*
Analysis Time Period	*Wednesday*

Site Information

Intersection	*Valleyview Dr/River Rd*
Jurisdiction	*Essex*
Analysis Year	*2025*
Project ID	*Adjusted Observed PM 2025*

East/West Street: *River Road (VT 117)* | North/South Street: *Valleyview Drive*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*74*	*470*	*0*	*0*	*247*	*24*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*74*	*470*	*0*	*0*	*247*	*24*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*	*0*	*17*	*0*	*36*
Peak-Hour Factor, PHF		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*17*	*0*	*36*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*74*						*53*	
C (m) (vph)	*1304*						*521*	
v/c	*0.06*						*0.10*	
95% queue length	*0.18*						*0.34*	
Control Delay	*7.9*						*12.7*	
LOS	*A*						*B*	
Approach Delay	--	--				*12.7*		
Approach LOS	--	--				*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BWC*
Agency/Co.	*OBCA*
Date Performed	*4/21/21*
Analysis Time Period	*Wednesday*

Site Information

Intersection	*Valleyview Dr/River Rd*
Jurisdiction	*Essex*
Analysis Year	*2025*
Project ID	*Adjusted Observed + Project PM 2025*

East/West Street: *River Road (VT 117)*	North/South Street: *Valleyview Drive*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*76*	*470*	*0*	*0*	*247*	*24*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*76*	*470*	*0*	*0*	*247*	*24*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*	*0*	*17*	*0*	*37*
Peak-Hour Factor, PHF		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*17*	*0*	*37*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*76*						*54*	
C (m) (vph)	*1304*						*521*	
v/c	*0.06*						*0.10*	
95% queue length	*0.19*						*0.35*	
Control Delay	*7.9*						*12.7*	
LOS	*A*						*B*	
Approach Delay	--	--				*12.7*		
Approach LOS	--	--				*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BWC*
Agency/Co.	*OBCA*
Date Performed	*4/21/21*
Analysis Time Period	*Wednesday*

Site Information

Intersection	*Valleyview Dr/River Rd*
Jurisdiction	*Essex*
Analysis Year	*2030*
Project ID	*Adjusted Observed PM 2030*

East/West Street: *River Road (VT 117)* | North/South Street: *Valleyview Drive*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*74*	*484*	*0*	*0*	*255*	*24*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*74*	*484*	*0*	*0*	*255*	*24*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*	*0*	*17*	*0*	*36*
Peak-Hour Factor, PHF		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*17*	*0*	*36*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*74*						*53*	
C (m) (vph)	*1295*						*509*	
v/c	*0.06*						*0.10*	
95% queue length	*0.18*						*0.35*	
Control Delay	*7.9*						*12.9*	
LOS	*A*						*B*	
Approach Delay	--	--				*12.9*		
Approach LOS	--	--				*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BWC*
Agency/Co.	*OBCA*
Date Performed	*4/21/21*
Analysis Time Period	*Wednesday*

Site Information

Intersection	*Valleyview Dr/River Rd*
Jurisdiction	*Essex*
Analysis Year	*2030*
Project ID	*Adjusted Observed + Project PM 2030*

East/West Street: *River Road (VT 117)* North/South Street: *Valleyview Drive*

Intersection Orientation: *East-West* Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*76*	*484*	*0*	*0*	*255*	*24*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*76*	*484*	*0*	*0*	*255*	*24*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*	*0*	*17*	*0*	*37*
Peak-Hour Factor, PHF		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*17*	*0*	*37*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*76*						*54*	
C (m) (vph)	*1295*						*510*	
v/c	*0.06*						*0.11*	
95% queue length	*0.19*						*0.35*	
Control Delay	*8.0*						*12.9*	
LOS	*A*						*B*	
Approach Delay	--	--				*12.9*		
Approach LOS	--	--				*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BWC*
Agency/Co.	*OBCA*
Date Performed	*4/21/21*
Analysis Time Period	*Wednesday*

Site Information

Intersection	*Pinewood Dr/River Rd*
Jurisdiction	*Essex*
Analysis Year	*2025*
Project ID	*Adjusted Observed PM 2025*

East/West Street: *River Road (VT 117)*	North/South Street: *Pinewood Drive*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*44*	*443*	*0*	*0*	*254*	*38*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*44*	*443*	*0*	*0*	*254*	*38*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*	*0*	*41*	*0*	*17*
Peak-Hour Factor, PHF		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*41*	*0*	*17*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*44*						*58*	
C (m) (vph)	*1281*						*410*	
v/c	*0.03*						*0.14*	
95% queue length	*0.11*						*0.49*	
Control Delay	*7.9*						*15.2*	
LOS	*A*						*C*	
Approach Delay	--	--				*15.2*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BWC*
Agency/Co.	*OBCA*
Date Performed	*4/21/21*
Analysis Time Period	*Wednesday*

Site Information

Intersection	*Pinewood Dr/River Rd*
Jurisdiction	*Essex*
Analysis Year	*2025*
Project ID	*Adjusted Observed + Project PM 2025*

East/West Street: *River Road (VT 117)*	North/South Street: *Pinewood Drive*
Intersection Orientation: *East-West*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*46*	*443*	*0*	*0*	*254*	*40*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*46*	*443*	*0*	*0*	*254*	*40*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*	*0*	*42*	*0*	*18*
Peak-Hour Factor, PHF		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*42*	*0*	*18*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*46*						*60*	
C (m) (vph)	*1279*						*408*	
v/c	*0.04*						*0.15*	
95% queue length	*0.11*						*0.52*	
Control Delay	*7.9*						*15.3*	
LOS	*A*						*C*	
Approach Delay	--	--				*15.3*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BWC*
Agency/Co.	*OBCA*
Date Performed	*4/21/21*
Analysis Time Period	*Wednesday*

Site Information

Intersection	*Pinewood Dr/River Rd*
Jurisdiction	*Essex*
Analysis Year	*2030*
Project ID	*Adjusted Observed PM 2030*

East/West Street: *River Road (VT 117)* | North/South Street: *Pinewood Drive*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*45*	*456*	*0*	*0*	*262*	*39*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*45*	*456*	*0*	*0*	*262*	*39*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*	*0*	*41*	*0*	*17*
Peak-Hour Factor, PHF		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*41*	*0*	*17*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*45*						*58*	
C (m) (vph)	*1272*						*398*	
v/c	*0.04*						*0.15*	
95% queue length	*0.11*						*0.51*	
Control Delay	*7.9*						*15.6*	
LOS	*A*						*C*	
Approach Delay	--	--				*15.6*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BWC*
Agency/Co.	*OBCA*
Date Performed	*4/21/21*
Analysis Time Period	*Wednesday*

Site Information

Intersection	*Pinewood Dr/River Rd*
Jurisdiction	*Essex*
Analysis Year	*2030*
Project ID	*Adjusted Observed + Project PM 2030*

East/West Street: *River Road (VT 117)* | North/South Street: *Pinewood Drive*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*47*	*456*	*0*	*0*	*262*	*41*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*47*	*456*	*0*	*0*	*262*	*41*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*	*0*	*42*	*0*	*18*
Peak-Hour Factor, PHF		*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*42*	*0*	*18*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*47*						*60*	
C (m) (vph)	*1269*						*397*	
v/c	*0.04*						*0.15*	
95% queue length	*0.12*						*0.53*	
Control Delay	*7.9*						*15.7*	
LOS	*A*						*C*	
Approach Delay	--	--					*15.7*	
Approach LOS	--	--					*C*	