



WILMINGTON POLICE DEPARTMENT

Box 217, 2 E. Main Street
Wilmington, VT 05363
802-464-8593

September 18, 2020

Wilmington Selectboard
PO Box 217
Wilmington, VT 05363

Subject: Traffic Engineering and Safety Study for Determining Safe Speed Limit and Addressing Parking Concerns on Fairview Ave.

Dear Board Members:

As requested, the Wilmington Police Department has conducted a study of the town roadway, Fairview Avenue, for the purposes of addressing traffic safety and parking concerns.

State law and the Manual on Uniform Traffic Control Devices (MUTCD) regulate the procedures for establishing effective and enforceable speed limits. Title 23 V.S.A. Section 1007 authorizes the local governing body to establish effective and enforceable speed limits on town highways at not more than 50 MPH or less than 25 MPH and to do so on the basis of a traffic engineering investigation or study. This provision mandates that any speed limit must be justified and reasonable, based on the conditions that prevail on the particular road or street being considered.¹

Fairview Avenue is a local road of approximately 1.23 miles in length. Road surface is made up of approximately .90 miles of pavement and .33 miles of gravel. The paved portion of the roadway starts at the beginning of the road at the intersection with Castle Hill Road and travels west approximately .90 miles before turning into a gravel roadway surface for the remaining .33 miles. Terminus of the road is at the access road to the Great River Hydro recreation area known as Mountain Mills East. The road serves approximately 40 primarily residential properties which is a mix of full time and seasonal residents.

¹ Setting Speed Limits-A Guide For Vermont Towns (2016) by VTrans Learning Center



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Figure 1 Fairview Ave at Castle Hill Rd

Road surface of the paved section is in very good condition and was repaved during the summer of 2020. Paved road width is on average 22'6 wide (travel portion.) Gravel section of roadway is in good condition with minor isolated areas of corrugating gravel. The gravel section of roadway has average width of approximately 17'6 (travel portion.) The roadway does not have shoulders or sidewalks. Only the travel portions of the roadway (both paved and gravel section) are useable for roadway users including pedestrians and bicycles.

Traffic patterns are seasonal on Fairview Avenue as it is dead-end, non-throughway road. From Memorial Day weekend to Indigenous People's Day (Columbus Day) weekend the Mountain Mills East recreation is open for public use. During this time the seasonal traffic increases traffic volumes significantly.



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Day of Week	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
Sun	0	0	0	0	0	0	0	10	27	47	98	79	96	88	41	35	35	26	13	12	3	1	2	0	613
Mon	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Tue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Wed	1	0	0	0	1	0	0	3	6	9	6	19	16	5	4	15	22	8	2	10	1	1	1	0	130
Thu	0	0	0	1	0	0	0	2	9	5	7	10	16	8	6	16	6	8	2	1	1	2	3	0	103
Fri	0	0	0	0	0	1	1	2	3	1	6	12	6	11	9	12	9	11	31	11	9	6	1	2	139
Sat	0	0	0	0	0	2	6	15	19	32	46	53	64	53	52	59	39	28	24	10	10	11	5	1	529
Avg #	0	0	0	0	0	0	1	5	9	13	23	25	28	24	16	20	16	12	10	7	3	3	2	0	217

Figure 2 Traffic Counts for Westbound 8/21/20 to 8/30/20²

Fairview Avenue is currently posted as a 30 MPH zone for its entire length (to terminus at Great River Hydro's gate.)

A vehicle traveling at 30 MPH on the paved section of roadway would require approximately 42.85 feet to stop³. A vehicle traveling at 25 MPH in the same situation would require approximately 29.76 feet to stop⁴. A vehicle traveling at 30 MPH on the gravel section of Fairview Avenue would require approximately 50

² Traffic counts are by pole mounted radar speed feedback device counting westbound vehicles on Fairview Ave between 8/21/20 and 8/31/20. Outliers of data of Mon and Tue should not be considered as it is suspected the battery died in the counting device.

³ Stopping distance determined using a co-efficient of friction for paved dry road surface of .70. $D = S^2/30f$

⁴ Stopping distance determined using a co-efficient of friction for paved dry road surface of .70. $D = S^2/30f$



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feet to stop⁵. A vehicle traveling 25 MPH in the same situation would require approximately 34.72 feet to stop⁶. A vehicle abiding by the proposed 25 MPH speed on pavement would require 13.09 less feet to stop and on the gravel section would require 15.28 less feet to come to a stop. This is a significant reduction in stopping distance and does not take into account vehicles which are towing trailers.

It should be noted that a vehicle towing a boat of roughly half the weight of the tow vehicle would require more than twice the stopping distance as given in the aforementioned calculations. A significant percentage of the seasonal traffic is towing watercraft on Fairview Avenue to the boat ramp at Mountain Mills East.

Wilmington Police Department conducted speed surveys using stationary cruisers with officers employing Radar and/or Ladar speed measurement systems. During these surveys average vehicle speeds were approximately 29.2 MPH with an 85th percentile speed of 35 MPH⁷.

Wilmington Police Department also positioned a Radar Speed Feedback Sign (RSFS) which monitors vehicles from a fixed location and collects speed data (see figure #3.)

Dates: 8/21/2020 to 8/30/2020

Overall Summary

Total Days of Data: 10

Speed Limit: 30

Average Speed: 26.83

50th Percentile Speed: 26.45

85th Percentile Speed: 30.04

Pace Speed Range: 23.0-33.0

Minimum Speed: 10.0

Maximum Speed: 45.0

Display Status: Speed Display

Average Volume per Day: 165.6

Total Volume: 1656.0

Figure 3 Data Collected from RSFS

⁵ Stopping distance determined using a co-efficient of friction for a dry gravel road surface of .60 .
 $D = S^2/30f$

⁶ Stopping distance determined using a co-efficient of friction for paved dry road surface of .70 . $D = S^2/30f$

⁷ 85 th percentile is generally defined as the speed at or below which 85 percent of all vehicles are travelling in free-flowing conditions past the location of measurement. This can also be considered as the speed at which only 15% of traffic is travelling faster then.



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Average speed from the RSFS data was 26.83 MPH and had a 85th percentile of 30.04 MPH. (*Variance of vehicle speeds between Officer surveys and RSFS data is likely due to the Officer surveys being conducted at different locations on the roadway where the RSFS was in a fixed position.*)

The surveys indicated that the 85th percentile speed was between 30-35 MPH which indicates that 15% of vehicle traffic was travelling in excess of 30 MPH.

Based on the surveys and enforcement of speeding violations there is not a significant number of violators of the 30 MPH speed limit. However road safety is not only impacted by speeding violators but also the roadway characteristics and the volume of roadway users. Fairview Avenue during the summer is the only access route for the Mountain Mills Recreation Area and is used by pedestrians, joggers, cyclists and other non-vehicular roadway users. This high volume of traffic, combined with a significant amount of vehicles towing trailers and the lack of shoulders or sidewalks presents a safety risk to users.



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Figure 4 Paved Section Road Width

Figure #4 shows Fairview Avenue at an area on the paved section with two vehicles in opposing travel lanes. There is not enough shoulder or travel portion of the roadway to safely allow non-vehicle roadway users to share the road when two vehicles are passing in opposite directions. *Roadway width narrows on the gravel portion*. The roadway width is approximately 22'6 (on average) for the paved section, reducing to on average 17'6 for the gravel section of roadway with areas as narrow as 16' and entering the gate at the end of Fairview Avenue to access the Mountain Mills Recreation area the road (private section) further reduces to 15' wide.

Currently there are no dead-end roadways in the Town of Wilmington with a speed limit above 25 MPH other than Fairview Avenue⁸. This is important to consider as reducing posted speed limits can cause negative impacts on area traffic patterns. In

⁸ Traffic Ordinance Town of Wilmington Article IV Speed Regulations



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this case as Fairview Avenue is not a through road there would be little to no impact to traffic patterns outside this roadway if the speed limit is reduced from 30 MPH to 25 MPH.

It is recommended that the speed limit for Fairview Avenue be reduced from 30 MPH to 25 MPH given the conditions outlined in this study.

It is recommended that cautionary SLOW signs, combination pedestrian/bicycle sign or similar type warning signs be installed.



Recommend exploring the possibility of installing a trail connector from near the east end of Fairview Avenue to the Hoot, Toot and Whistle Trail which may reduce pedestrian and bicycle traffic. This would allow alternative road users to access the safer more appropriate route (trail) to the recreation area.

Currently there are three 30 MPH signs for the westbound traffic and one 30 MPH sign for the eastbound traffic on Fairview Avenue. To avoid sign proliferation which can reduce effectiveness of signage it is recommended that the same number (3) of westbound speed limit signs be installed and that one additional speed limit sign be installed for the eastbound traffic (total of 2.)

Centerline Marking Wilmington Highway Department Supervisor Sheldon Brassor has suggested the painting of a centerline on the paved portion of Fairview Ave. According to the MUTCD Part #3 Markings⁹ it is recommended that roads 18' wide or more and with greater than 3,000 vehicles per day in traffic be marked

⁹ MUTCD Manual on Uniform Traffic Control Devices Part #3 Markings Dec. 2000



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with centerlines. Fairview Ave does not have the traffic count to support the need for centerline striping however striping has been shown to provide a marginal impact on traffic. Centerline striping according to MUTCD standards is of two parallel yellow centerlines each approximately 4" wide with a discernable space in-between (2"+). Painting centerlines on Fairview Ave will reduce the roadway width by approximately 10". This will result in an approximate single travel lane width of 10'10 which is adequate for safe travel on a local roadway. *A cost vs. benefit analysis of the centerline striping should be a factor in the decision to apply it to Fairview Ave as the impact will be minimal on traffic.*

Parking /Standing Vehicles-

To address complaints about the parking issues outside of the Mountain Mills Recreation Area gates along the town right of way at the end of Fairview Avenue the following is recommended;

- Placement of additional permanent "No Parking" and "No Standing" signs along both sides of the roadway from the driveway at #257 Fairview Avenue west to the gated access to the recreation area.
- Placement of additional "DO NOT BLOCK" gate signs at end of Fairview Avenue.
- Request that Great River Hydro open the gates to the recreation area at 7:00 AM instead of 8:00 AM which will help alleviate the traffic waiting to enter.
- For the above recommendations no amendment is required to modify the Wilmington Traffic Ordinance as Article VI, Section 19(1)(g) states; No person may stop; stand or park a vehicle; "At any place where official signs prohibit stopping".¹⁰

¹⁰ Traffic Ordinance Town of Wilmington Article IV Speed Regulations

Speed Survey Field Sheet

[illegible]

Speed Survey Field Sheet

[illegible]

Speed Survey Field Sheet

[illegible]

Speed Survey Field Sheet

[illegible]

Speed Survey Field Sheet

Speed Limit: 30 Name: 451
 Direction: West + East Bound Address: 105 Fairview Ave
 Time: 0800 - 0900 Area of Roadway Studied: ↖
 Date: 7/26/2020
 Weather: clear/sunny

Speed	Number of Vehicles																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
75																									
70																									
65																									
60																									
55																									
50																									
45																									
40	✓																								
35	✓																								
30	✓																								
25	✓	✓	✓																						
20																									
15																									

VWL →

✓ = E
 / = W

Speed Survey Field Sheet

Speed Limit: 30 MPH Name: Hammours
 Direction: East Address: _____
 Time: 12:44 PM Area of Roadway Studied: 59 Fairview Ave
 Date: 7/30/20
 Weather: Clear / Sunny

Speed	Number of Vehicles																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
75																									
70																									
65																									
60																									
55																									
50																									
45																									
40																									
35																									
30																									
25																									
20																									
15																									

Handwritten notes on grid:
 Channel Location
 Facing West
 Ditch
 Turn around
 138
 1356

Keelyn
 914-319-3798

Red with white
 10/31/50

12:00 PM

Name: Flannery O'Neil

Address: Fairview Ave

Area of Roadway Studied: New Pavement @

Turn around

Number of Vehicles

[illegible]

Speed Survey Field Sheet

Speed Limit: 30

Name: J. Darrich

Direction: Both

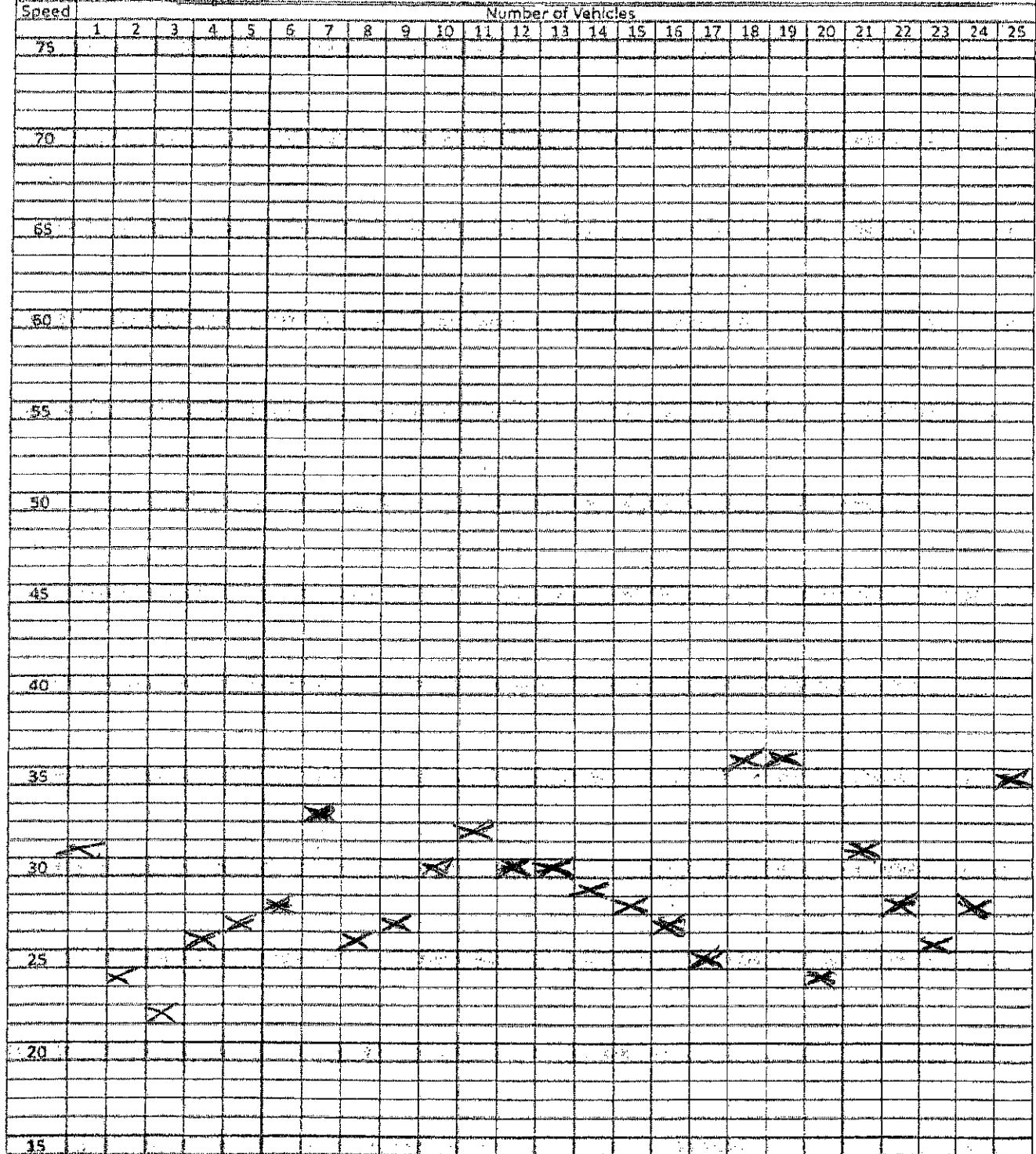
Address: 98 Fairview Dr

Time: 1245

Area of Roadway Studied: Shoulder/Left Paved

Date: 8/15/20

Weather: Clear



Speed Survey Field Sheet

[illegible]

Speed Survey Field Sheet

[illegible]



Generated by Shawn Hammond from Town of Wilmington on Aug 31, 2020 at 2:26:46 PM

Time of Day: 0:00 to 23:59

Site: West Main across from Inn, NB

Dates: 8/21/2020 to 8/30/2020

Overall Summary

Total Days of Data: 10

Speed Limit: 30

Average Speed: 26.83

50th Percentile Speed: 26.45

85th Percentile Speed: 30.04

Pace Speed Range: 23.0-33.0

Minimum Speed: 10.0

Maximum Speed: 45.0

Display Status: Speed Display

Average Volume per Day: 165.6

Total Volume: 1656.0

Generated by Shawn Hammond from Town of Wilmington on Aug 31, 2020 at 2:27:29 PM

Time View: By Hour (Avg Volumes)
Speed Bins: Size 5, Range 1 to 100
Site: West Main across from Inn, NB

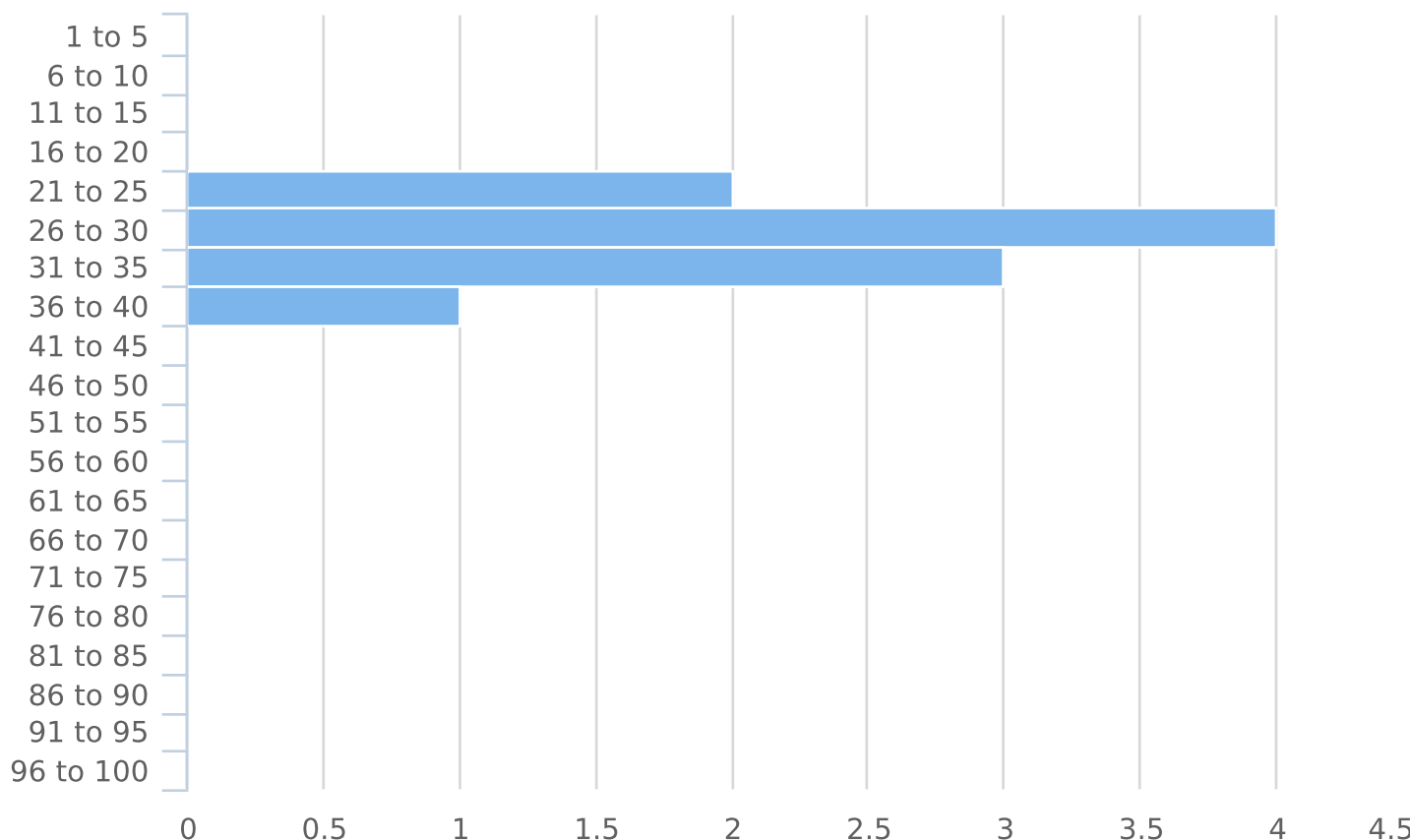
Hour	Spd Lim	1 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50	51 to 55	56 to 60	61 to 65	66 to 70	71 to 75	76 to 80	81 to 85	86 to 90	91 to 95	96 to 100	Avg Spd	Avg #
0:00	30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.0	1
1:00	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0
2:00	30	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	30.0	2
3:00	30	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30.0	1
4:00	30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	31.0	1
5:00	30	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	33.3	1
6:00	30	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.0	2
7:00	30	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	27.6	5
8:00	30	0	1	0	1	2	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	26.3	10
9:00	30	0	1	1	0	2	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	27.4	13
10:00	30	0	2	1	1	3	8	6	2	0	0	0	0	0	0	0	0	0	0	0	0	27.3	24
11:00	30	0	1	0	1	6	10	7	2	0	0	0	0	0	0	0	0	0	0	0	0	27.9	26
12:00	30	0	0	0	1	5	12	8	3	0	0	0	0	0	0	0	0	0	0	0	0	28.3	29
13:00	30	0	1	0	1	4	10	6	2	0	0	0	0	0	0	0	0	0	0	0	0	27.1	25
14:00	30	0	0	0	1	4	5	5	2	0	0	0	0	0	0	0	0	0	0	0	0	28.1	17
15:00	30	0	1	0	1	3	7	6	2	0	0	0	0	0	0	0	0	0	0	0	0	27.4	21
16:00	30	0	0	0	1	4	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	27.7	17
17:00	30	0	0	0	1	3	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	28.3	13
18:00	29	0	0	0	1	2	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	28.4	13
19:00	30	0	0	0	0	1	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	27.9	6
20:00	30	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.9	4
21:00	30	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	30.3	4
22:00	30	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25.2	2
23:00	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21.7	1
Avg #		0	0	0	0	2	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	25.7	10



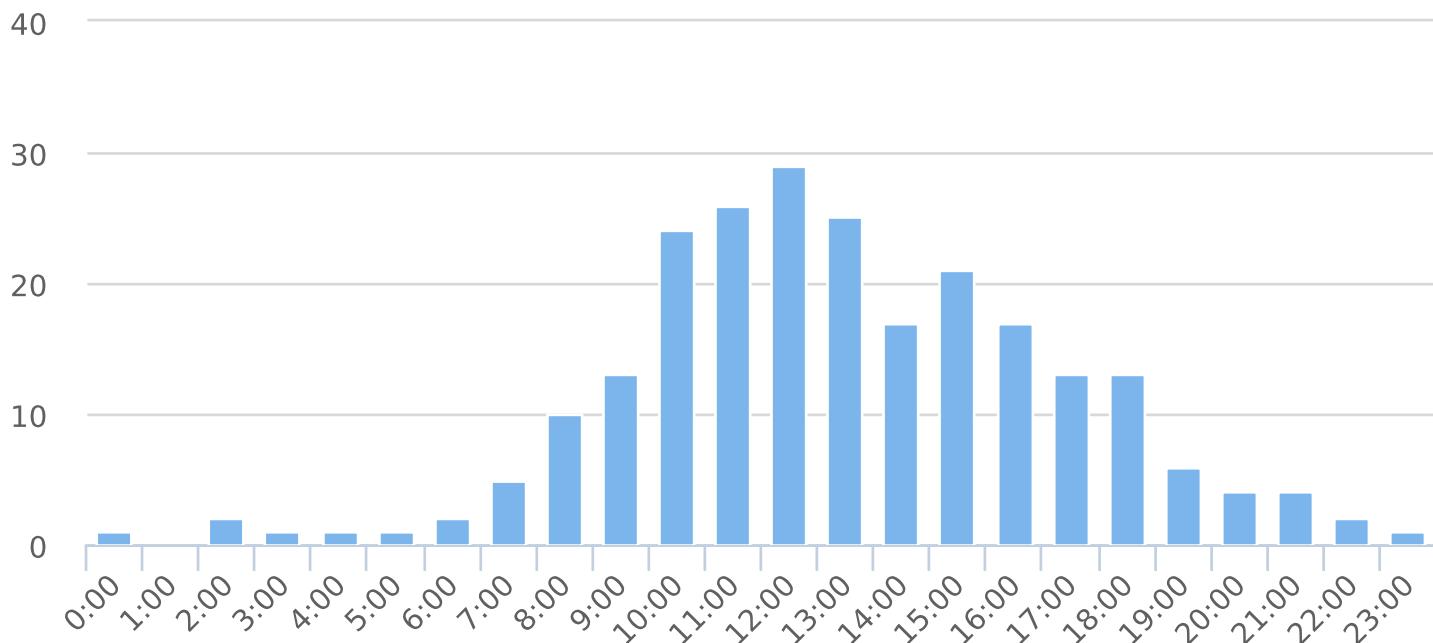
Time of Day: 0:00 to 23:59
Dates: 8/21/2020 to 8/30/2020

Time View: By Hour (Avg Volumes)
Speed Bins: Size 5, Range 1 to 100
Site: West Main across from Inn, NB

Average Vehicles by Speed Bin



Average Volume by Hour





Volume By Time Report

Generated by Shawn Hammond from Town of Wilmington on Aug 31, 2020 at 2:28:12 PM

Time View: By Day of Week (Avg Volumes)

Speed Bins: Size 5, Range 1 to 100

Site: West Main across from Inn, NB

Time of Day: 0:00 to 23:59

Dates: 8/21/2020 to 8/30/2020

Day of Week	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Total
Sun	0	0	0	0	0	0	0	10	27	47	98	79	96	88	41	35	35	26	13	12	3	1	2	0	613
Mon	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Tue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Wed	1	0	0	0	1	0	0	3	6	9	6	19	16	5	4	15	22	8	2	10	1	1	1	0	130
Thu	0	0	0	1	0	0	0	2	9	5	7	10	16	8	6	16	6	8	2	1	1	2	3	0	103
Fri	0	0	0	0	0	1	1	2	3	1	6	12	6	11	9	12	9	11	31	11	9	6	1	2	139
Sat	0	0	0	0	0	2	6	15	19	32	46	53	64	53	52	59	39	28	24	10	10	11	5	1	529
Avg #	0	0	0	0	0	0	1	5	9	13	23	25	28	24	16	20	16	12	10	7	3	3	2	0	217



Generated by Shawn Hammond from Town of Wilmington on Aug 31, 2020 at 2:28:12 PM

Time of Day: 0:00 to 23:59
Dates: 8/21/2020 to 8/30/2020

Time View: By Day of Week (Avg Volumes)
Speed Bins: Size 5, Range 1 to 100
Site: West Main across from Inn, NB

Volume by Day

