

Steps on How to Calculate Noise Levels

Step 1. Go to the most recent Automatic Vehicle Classification Report, currently 2013 and can be found [here](#).

2013 Automatic Vehicle Classification Report



Vermont Agency of Transportation
Policy, Planning & Intermodal Development
Traffic Research Unit
March 2014



Step 2. Use the Find feature and search for the major road that is closest to your Project. If there are too many hits, search for the Town/City instead.

Shelburne 2 of 24

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Daily Averages

2013 Automatic Vehicle Classification Report - Day Averages

% of Traffic Stream - Daily

Site ID	Town	Route	Location	FC	Year	AADT	ACF	Cycles	PC	2A-4T	BUS	2A-6T	3A-SU	4A-SU	4A-ST	5A-ST	6A-ST	5A-MT	6A-MT	7A-MT	Trucks		
																					All	Medium	Heavy
S6D264	Essex	VT117	VT 117 - btw School Dr & Rivendell	14	2011	6500	0.988	0.87	78.76	16.62	0.29	2.35	0.27	0.04	0.46	0.25	0.04	0.00	0.00	0.04	3.74	2.95	0.79
S6D277	Shelburne	US7	US7 between Webster Rd jcts	14	2013	17800	0.941	0.21	80.34	11.52	1.00	2.47	0.42	0.11	0.85	2.54	0.35	0.01	0.02	0.16	7.93	4.00	3.93
S6D382	Essex	VT117	VT117 0.1 mi E of Valley View Dr-TH88	14	2013	6600	0.990	0.95	79.02	15.91	0.50	2.36	0.60	0.07	0.40	0.12	0.02	0.00	0.00	0.04	4.11	3.53	0.58
S6D411	Burlington	ALTUS7	SoWinooski Ave betw King/Maple	14	2010	4000	0.996	0.76	83.96	12.41	0.61	1.93	0.20	0.00	0.09	0.05	0.00	0.00	0.00	0.00	2.87	2.74	0.13
S6D525	South Burlington	VT116	VT116 0.85mi N of Cheese Fcty	14	2011	5900	0.987	1.30	79.90	14.95	0.15	2.35	0.53	0.34	0.29	0.14	0.06	0.00	0.00	0.00	3.86	3.37	0.49
S6D537	Essex	VT15	VT15	14	2011	16400	0.977	0.81	78.74	17.84	0.38	2.29	0.53	0.07	0.65	0.34	0.25	0.01	0.01	0.08	4.81	3.27	1.34
S6D547	Shelburne	US7	US7 betw Longmead/Winter Haven	14	2013	19300	0.940	0.93	74.17	14.29	1.08	4.63	0.53	0.03	1.95	1.75	0.33	0.08	0.05	0.17	10.60	6.27	4.33
S6P189	Newport City	US5	US5 -1m S of VT191	14	2011	9900	0.962	1.02	71.82	20.99	0.37	3.08	0.35	0.07	1.07	0.36	0.30	0.02	0.02	0.52	6.16	3.87	2.29
S6P214	Newport City	VT191	VT191 0.4m E of Western Ave	14	2011	3800	0.973	1.12	68.77	23.74	0.48	3.71	0.25	0.04	0.87	0.80	0.18	0.01	0.01	0.02	6.37	4.48	1.89
S6P222	Newport City	US5	US5 betw RR Sq/Gardner Pk Rd	14	2011	10700	0.983	1.51	72.59	21.51	0.23	2.66	0.29	0.01	0.66	0.31	0.18	0.01	0.00	0.03	4.38	3.19	1.19
S6R080	Rutland Town	BRUS4	BRUS4 .05mi W of VT 3	14	2011	11100	0.969	1.68	68.14	22.97	0.51	3.71	0.86	0.11	1.17	0.61	0.15	0.04	0.01	0.03	7.20	5.19	2.01
S6R081	Rutland Town	US4	US4 200 ft W of Post Rd	14	2010	10800	0.946	0.31	65.09	22.86	1.32	5.75	1.05	0.38	1.16	1.73	0.32	0.02	0.00	0.02	11.74	8.50	3.24
S6R094	Rutland City	BRUS4	BRUS4 0.3 mi E of VTS	14	2012	13600	0.962	1.09	72.22	21.99	0.36	2.67	0.45	0.09	0.44	0.31	0.12	0.00	0.00	0.26	4.70	3.57	1.13
S6R096	Rutland Town	US7	US7 betw Post Rd & EPPittsford Rd	14	2012	13200	0.944	1.13	68.45	21.83	0.52	3.18	0.76	0.27	2.05	1.15	0.33	0.08	0.09	0.17	8.60	4.73	3.87
S6R207	Rutland City	BRUS4	BRUS4 betw Nichols & Court	14	2010	13800	0.983	0.68	71.61	21.19	0.49	4.53	0.33	0.03	0.65	0.35	0.10	0.02	0.01	0.01	6.52	5.38	1.15
S6R224	Rutland City	BRUS4	BRUS4 just E of Ripley Rd	14	2012	14400	0.966	1.09	71.28	23.29	0.37	2.76	0.35	0.05	0.44	0.27	0.06	0.00	0.00	0.03	4.33	3.53	0.80
S6W006	Berlin	US302	US302 0.2 mi w of Benjamin Falls	14	2011	8600	0.982	1.37	72.15	21.63	0.32	2.90	0.45	0.11	0.51	0.41	0.12	0.00	0.00	0.02	4.84	3.78	1.06
S6W016	Berlin	US2	US2 at Montpelier City Line	14	2012	9300	0.962	0.58	70.79	21.16	0.94	3.42	0.77	0.05	0.64	1.32	0.32	0.00	0.00	0.01	7.47	5.18	2.29
S6W037	Berlin	US302	US302 S of Partridge Rd	14	2010	13100	0.984	0.96	73.14	19.26	0.31	4.74	0.47	0.04	0.69	0.28	0.07	0.02	0.01	0.01	6.64	5.56	1.08
S6W038	Barre City	US302	US302 betw 3rd/4th Sts	14	2011	11400	0.963	0.32	73.20	19.62	0.30	5.06	0.38	0.08	0.58	0.29	0.13	0.02	0.01	0.01	6.66	5.82	1.04
S6W040	Barre City	US302	US302 betw Nelson/Patterson	14	2010	7100	0.978	2.11	66.54	25.42	0.54	3.29	0.71	0.04	0.75	0.44	0.15	0.01	0.01	0.00	5.94	4.57	1.36

Step 3. Scroll through all hits for the major street you are searching for until you find the one in the correct Town/City that represents a similar location as the Project (compare with Google Maps if you are unsure). It helps to highlight the entire row so that you can accurately collect the right data.

2013 Automatic Vehicle Classification Report - Day Averages

% of Traffic Stream - Daily

Site ID	Town	Route	Location	FC	Year	AADT	ACF	Cycles	PC	2A-4T	BUS	2A-6T	3A-SU	4A-SU	4A-ST	5A-ST	6A-ST	5A-MT	6A-MT	7A-MT	Trucks		
																					All	Medium	Heavy
S6D264	Essex	VT117	VT 117 - btw School Dr & Rivendell	14	2011	6500	0.988	0.87	78.76	16.62	0.29	2.35	0.27	0.04	0.46	0.25	0.04	0.00	0.00	0.04	3.74	2.95	0.79
S6D277	Shelburne	US7	US7 between Webster Rd jcts	14	2013	17800	0.941	0.21	80.34	11.52	1.00	2.47	0.42	0.11	0.85	2.54	0.35	0.01	0.02	0.16	7.93	4.00	3.93
S6D382	Essex	VT117	VT117 0.1 mi E of Valley View Dr-TH88	14	2013	6600	0.990	0.95	79.02	15.91	0.50	2.36	0.60	0.07	0.40	0.12	0.02	0.00	0.00	0.04	4.11	3.53	0.58
S6D411	Burlington	ALTUS7	SoWinooski Ave betw King/Maple	14	2010	4000	0.996	0.76	83.96	12.41	0.61	1.93	0.20	0.00	0.09	0.05	0.00	0.00	0.00	0.00	2.87	2.74	0.13
S6D525	South Burlington	VT116	VT116 0.85mi N of Cheese Fcty	14	2011	5900	0.987	1.30	79.90	14.95	0.15	2.35	0.53	0.34	0.29	0.14	0.06	0.00	0.00	0.00	3.86	3.37	0.49
S6D537	Essex	VT15	VT15	14	2011	16400	0.977	0.81	78.74	17.84	0.38	2.29	0.53	0.07	0.65	0.34	0.25	0.01	0.01	0.08	4.81	3.27	1.34
S6D547	Shelburne	US7	US7 betw Longmead/Winter Haven	14	2013	19300	0.940	0.93	74.17	14.29	1.08	4.63	0.53	0.03	1.95	1.75	0.33	0.08	0.05	0.17	10.60	6.27	4.33
S6P189	Newport City	US5	US5 -1m S of VT191	14	2011	9900	0.962	1.02	71.82	20.99	0.37	3.08	0.35	0.07	1.07	0.36	0.30	0.02	0.02	0.52	6.16	3.87	2.29
S6P214	Newport City	VT191	VT191 0.4m E of Western Ave	14	2011	3800	0.973	1.12	68.77	23.74	0.48	3.71	0.25	0.04	0.87	0.80	0.18	0.01	0.01	0.02	6.37	4.48	1.89
S6P222	Newport City	US5	US5 betw RR Sq/Gardner Pk Rd	14	2011	10700	0.983	1.51	72.59	21.51	0.23	2.66	0.29	0.01	0.66	0.31	0.18	0.01	0.00	0.03	4.38	3.19	1.19
S6R080	Rutland Town	BRUS4	BRUS4 .05mi W of VT 3	14	2011	11100	0.969	1.68	68.14	22.97	0.51	3.71	0.86	0.11	1.17	0.61	0.15	0.04	0.01	0.03	7.20	5.19	2.01
S6R081	Rutland Town	US4	US4 200 ft W of Post Rd	14	2010	10800	0.946	0.31	65.09	22.86	1.32	5.75	1.05	0.38	1.16	1.73	0.32	0.02	0.00	0.02	11.74	8.50	3.24
S6R094	Rutland City	BRUS4	BRUS4 0.3 mi E of VTS	14	2012	13600	0.962	1.09	72.22	21.99	0.36	2.67	0.45	0.09	0.44	0.31	0.12	0.00	0.00	0.26	4.70	3.57	1.13
S6R096	Rutland Town	US7	US7 betw Post Rd & EPPittsford Rd	14	2012	13200	0.944	1.13	68.45	21.83	0.52	3.18	0.76	0.27	2.05	1.15	0.33	0.08	0.09	0.17	8.60	4.73	3.87

Step 4. Identify the Annual Average Daily Traffic (AADT). In this example, it is 19,300.

% of Traffic Stream - Daily

FC	Year	AADT	ACF	Cycles	PC	2A-4T	BUS	2A-6T	3A-SU	4A-SU	4A-ST	5A-ST	6A-ST
14	2011	6500	0.988	0.87	78.76	16.62	0.29	2.35	0.27	0.04	0.46	0.25	0.04
14	2013	17800	0.941	0.21	80.34	11.52	1.00	2.47	0.42	0.11	0.85	2.54	0.35
14	2013	6600	0.990	0.95	79.02	15.91	0.50	2.36	0.60	0.07	0.40	0.12	0.02
14	2010	4000	0.996	0.76	83.96	12.41	0.61	1.93	0.20	0.00	0.09	0.05	0.00
14	2011	5900	0.987	1.30	79.90	14.95	0.15	2.35	0.53	0.34	0.29	0.14	0.06
14	2011	16400	0.977	0.81	76.74	17.84	0.38	2.29	0.53	0.07	0.65	0.34	0.25
14	2013	19300	0.940	0.93	74.17	14.29	1.08	4.63	0.53	0.03	1.95	1.75	0.33
14	2011	9900	0.962	1.02	71.82	20.99	0.37	3.08	0.35	0.07	1.07	0.36	0.30
14	2011	3800	0.973	1.12	68.77	23.74	0.48	3.71	0.25	0.04	0.87	0.80	0.18
14	2011	10700	0.983	1.51	72.59	21.51	0.23	2.66	0.29	0.01	0.66	0.31	0.18
14	2011	11100	0.969	1.68	68.14	22.97	0.51	3.71	0.86	0.11	1.17	0.61	0.15

Step 5. Identify the percentage of passenger cars (PC). In this case 74.17%.

% of Traffic Stream - Daily

FC	Year	AADT	ACF	Cycles	PC	2A-4T	BUS	2A-6T	3A-SU	4A-SU	4A-ST	5A-ST	6A-ST
14	2011	6500	0.988	0.87	78.76	16.62	0.29	2.35	0.27	0.04	0.46	0.25	0.04
14	2013	17800	0.941	0.21	80.34	11.52	1.00	2.47	0.42	0.11	0.85	2.54	0.35
14	2013	6600	0.990	0.95	79.02	15.91	0.50	2.36	0.60	0.07	0.40	0.12	0.02
14	2010	4000	0.996	0.76	83.96	12.41	0.61	1.93	0.20	0.00	0.09	0.05	0.00
14	2011	5900	0.987	1.30	79.90	14.95	0.15	2.35	0.53	0.34	0.29	0.14	0.06
14	2011	16400	0.977	0.81	76.74	17.84	0.38	2.29	0.53	0.07	0.65	0.34	0.25
14	2013	19300	0.940	0.93	74.17	14.29	1.08	4.63	0.53	0.03	1.95	1.75	0.33
14	2011	9900	0.962	1.02	71.82	20.99	0.37	3.08	0.35	0.07	1.07	0.36	0.30
14	2011	3800	0.973	1.12	68.77	23.74	0.48	3.71	0.25	0.04	0.87	0.80	0.18
14	2011	10700	0.983	1.51	72.59	21.51	0.23	2.66	0.29	0.01	0.66	0.31	0.18
14	2011	11100	0.969	1.68	68.14	22.97	0.51	3.71	0.86	0.11	1.17	0.61	0.15

Step 6. Identify the percentage of medium and heavy trucks, which can be found on the right side of the chart. In this case, the percentage for medium trucks is 6.27% and 4.33% for heavy trucks.

% of Traffic Stream - Daily

	6T	3A-SU	4A-SU	4A-ST	5A-ST	6A-ST	5A-MT	6A-MT	7A-MT	Trucks		
										All	Medium	Heavy
35	0.27	0.04	0.46	0.25	0.04	0.00	0.00	0.00	0.04	3.74	2.95	0.79
47	0.42	0.11	0.85	2.54	0.35	0.01	0.02	0.16		7.93	4.00	3.93
36	0.60	0.07	0.40	0.12	0.02	0.00	0.00	0.04		4.11	3.53	0.58
93	0.20	0.00	0.09	0.05	0.00	0.00	0.00	0.00		2.87	2.74	0.13
35	0.53	0.34	0.29	0.14	0.06	0.00	0.00	0.00		3.86	3.37	0.49
29	0.53	0.07	0.65	0.34	0.25	0.01	0.01	0.08		4.61	3.27	1.34
63	0.53	0.03	1.95	1.75	0.33	0.08	0.05	0.17		10.60	6.27	4.33
08	0.35	0.07	1.07	0.36	0.30	0.02	0.02	0.52		6.16	3.37	2.79
71	0.25	0.04	0.87	0.80	0.18	0.01	0.01	0.02		6.37	4.48	1.89
66	0.29	0.01	0.66	0.31	0.18	0.01	0.00	0.03		4.38	3.19	1.19
71	0.86	0.11	1.17	0.61	0.15	0.04	0.01	0.03		7.20	5.19	2.01
75	1.05	0.38	1.16	1.73	0.32	0.02	0.00	0.02		11.74	8.50	3.24
67	0.45	0.09	0.44	0.31	0.12	0.00	0.00	0.26		4.70	3.57	1.13
18	0.76	0.27	2.05	1.15	0.33	0.08	0.09	0.17		8.60	4.73	3.87

Step 7. Calculate the noise levels for passenger cars. For this example, the AADT is 19,300. The percentage of PCs is 74.17. Therefore, multiply 0.7417 by 19300, which is 14,315. This is the number that will be used to calculate the Day/Night Noise Levels or DNL.

Step 8. Calculate the noise levels for medium and heavy trucks. 19,300 multiplied by 0.0627 = 1,210; and (19,300 * 0.0433) 837 for heavy trucks.

Step 9. Go to the HUD's DNL Calculator [here](#). Enter in the Project Name, the date, and the ER Preparer's name as requested below. Select Add Road Source.

DNL Calculator

Site ID

Record Date

mm/dd/yyyy

User's Name

Add Road Source

Add Rail Source

Airport Noise Level

Loud Impulse Sounds?

Yes No

Combined DNL for all
Road and Rail sources

0

Combined DNL including Airport

Site DNL with Loud Impulse Sound

Calculate

Step 10. Select cars, medium trucks, and heavy trucks, as indicated below.

DNL Calculator

Site ID	<input type="text" value="Sample Project"/>		
Record Date	<input type="text" value="05/17/2015"/>		
User's Name	<input type="text" value="Kate Fournier"/>		
Road # 1 Name:	<input type="text" value="US7"/>		
Road #1			
Vehicle Type	Cars <input checked="" type="checkbox"/>	Medium Trucks <input checked="" type="checkbox"/>	Heavy Trucks <input checked="" type="checkbox"/>
Effective Distance	<input type="text"/>	<input type="text"/>	<input type="text"/>
Distance to Stop Sign	<input type="text"/>	<input type="text"/>	<input type="text"/>
Average Speed	<input type="text"/>	<input type="text"/>	<input type="text"/>
Average Daily Trips (ADT)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Night Fraction of ADT	<input type="text"/>	<input type="text"/>	<input type="text"/>
Road Gradient (%)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Vehicle DNL	<input type="text"/>	<input type="text"/>	<input type="text"/>

Step 11. Fill out the Effective Distance. This is in feet and should be the distance from the front of the structure, if there is one, to the road. For our example, we'll use 100 feet.

Step 12. Fill out the Distance to Stop Sign. This is in feet and should be from the Project Area to the nearest stop sign, if there is one within 600 feet. For this example, we'll use 145 feet.

Step 13. Fill out the Average Speed. This should be the road speed limit. For this example, we'll use 45mph.

Step 14. Complete the Average Daily Trips for Cars, Medium Trucks, and Heavy Trucks. Remember this requires computing the percentage per vehicle type of the Average Annual Daily Traffic.

Step 15. Fill out the Night Fraction of ADT. This is usually 15.

Step 16. Fill out the Road Gradient. This refers to the uphill road gradient and is usually 2.

Step 17. Select Calculate Road #1 DNL. The DNL will populate as shown below.

DNL Calculator

Site ID

Record Date

User's Name

Road # 1 Name:

Road #1

Vehicle Type	Cars <input checked="" type="checkbox"/>	Medium Trucks <input checked="" type="checkbox"/>	Heavy Trucks <input checked="" type="checkbox"/>
Effective Distance	<input type="text" value="100"/>	<input type="text" value="100"/>	<input type="text" value="100"/>
Distance to Stop Sign	<input type="text" value="145"/>	<input type="text" value="145"/>	<input type="text" value="145"/>
Average Speed	<input type="text" value="45"/>	<input type="text" value="45"/>	<input type="text" value="45"/>
Average Daily Trips (ADT)	<input type="text" value="14315"/>	<input type="text" value="1210"/>	<input type="text" value="837"/>
Night Fraction of ADT	<input type="text" value="15"/>	<input type="text" value="15"/>	<input type="text" value="15"/>
Road Gradient (%)	<input type="text"/>	<input type="text"/>	<input type="text" value="2"/>
Vehicle DNL	<input type="text" value="58.6"/>	<input type="text" value="57.8"/>	<input type="text" value="72"/>
Calculate Road #1 DNL	<input type="text" value="72.4"/>	<input type="button" value="Reset"/>	

Step 18. Calculate a second road source, rail source, or airport noise by selecting appropriate Add buttons, if present. If more than one noise source, select Combined DNL. Take a screenshot of the DNL calculations, save as a pdf file, and upload to the Supporting Documentation page in IntelliGrants. Determine if the DNL meets HUD's requirements and discuss in the checklist. Review HUD's noise requirements [here](#).