Test Location Information

Test Location:	Snowroad Conditions:	Date:	Time:
7-mile Bridge	Packed, groomed powder	December 11, 2013	12:45 PM

OSV Information

OSV Year, Make, and Model (engine year, if different):	Front (ski or track + make & model):	Rear (make & model):	OSV Nickname & Photo
2007 Chevy Suburban 6 Liter V6	Mattrack 150	Mattrack 150	Snow Yacht #6
Fuel Type: Gasoline	Speed Determined By: GPS, driver reported	Noise Abatement Modifications, if any: None known	
Company Name: Buffalo Bus Touring Company	Contract Number: CC-YELL306-04, 307-04, 308-04		

Environmental Variables

Ambient Sound Level:	Berm (absent or present and height):	Barometric Pressure:
	No berm	
Air Temperature:	Wind Direction & Average Speed:	Humidity:

OSV Noise Emission Variables

Trial	Time	Speed	Side	L_{max} (dBA)	Comments
1	12:50	20	Driver	73.1	Speed reported as 20, but questionable
2	12:52	26	Passenger	73.0	
3	12:55	25	Driver	71.2	
4	12:57	25	Passenger	72.4	
5	12:58	25	Driver	71.3	
6	13:00	24	Passenger	71.7	
7	13:01	25	Driver	71.3	
8		Idle	Passenger	35.0	
9		Idle	Driver	33.8	

SAE 1161 Test Result
(pass, fail, E-BAT complaint)

72 dBA
Pass
BAT compliant for noise emissions

Idle Noise Level (30 second L_{eq})

33.8 dBA (driver side)
35.0 dBA (passenger side)

Equipment and Testing

Sound Level Meter Type:	Preamplifier Type and Serial Number:	Microphone Type and Serial Number:	Calibrator Type and Serial Number:
Larson Davis 824 (#824A2987)	Larson Davis PRM902 (#3116)	GRAS 40AE (#34425)	B&K 4231 (#2459960)

Test Conducted By: Shan Burson

Additional Staff: Alicia Murphy, Rebecca Garvoille

Additional Comments or Notes:

Conditions met SAE standards. No snow berm blockage from road surface to microphone.
Speed at first pass (trial 1) was questionable and was not used in the calculations.

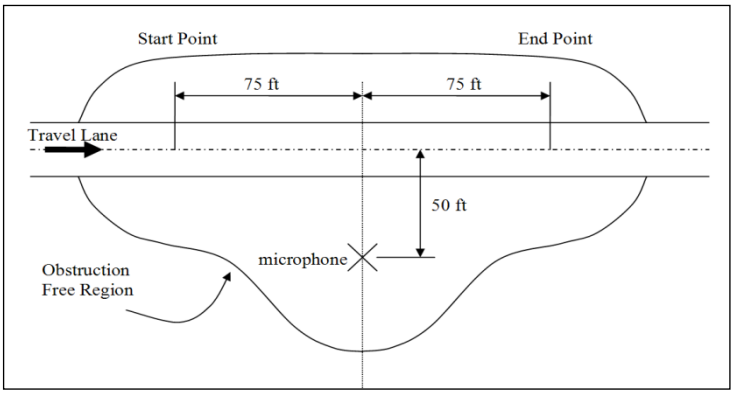
Background: One goal of Yellowstone National Park's Winter Use Plan and final Rule is to create a cleaner and quieter winter-time park experience. As a means of achieving this goal, the final Rule specifies new noise (acoustic) standards for all oversnow vehicles (OSVs) traveling in the park (see table below). All OSVs must operate at or below these standards by the dates listed. In addition, if vehicles meet Enhanced Best Available Technology (E-BAT) emission levels operators will be able to take advantage of market incentives. Snowmobiles will continue to be tested by individual manufacturers. Snowcoaches will be tested and certified by the National Park Service.

Noise Emission Standards & Timelines: Emission requirements for snowmobiles continue unchanged until the 2015-2016 winter season when all snowmobiles are required to meet the new air and noise emission standards (New BAT noise standard of a maximum decibel level of 67 dBA). Starting in the 2014-2015 winter season, all new snowcoaches brought into service are required to meet the new air and noise emissions standards (BAT noise standard of a maximum decibel level of 75 dBA). All snowcoaches (new and existing) must meet the noise and air emission requirements (75 dBA) by the 2016-2017 winter season or be removed from service. As of December 15, 2014, commercial tour operators may voluntarily upgrade their fleets to meet enhanced air and noise emission standards (described as "Enhanced BAT" or E-BAT with a decibel level of 71 dBA). If these voluntary, enhanced standards are met, the size of a transportation event may increase from a seasonal average of 7 to 8 snowmobiles per event and from 1 to 2 snowcoaches per event, not to exceed a seasonal average of 1.5 snowcoaches per event.

	BAT (speed)	E-BAT
Snowmobiles	67 dBA @ 35 MPH	65 dBA @ 35 MPH
Snowcoaches	75 dBA @ 25 MPH*	71 dBA @ 25 MPH*

* Or the average cruising speed of the vehicle if less than 25 MPH

Noise Emission Testing Methodology (Modified SAE J1161): SAE J1161 describes a methodology for the measurement of operational sound levels for OSVs. SAE J1161 specifies that the measurement area is required to be an open region of packed snow at least 2 inches deep that is free of reflecting surfaces, and with no more than 3 inches of loose snow on top of the packed snow. An illustration of the measurement area is provided in the Figure below. The OSV approaches the measurement area at its typical cruising speed or 35 MPH (snowmobiles) or 25 MPH (snowcoaches or their average cruising speed, if lower) and maintains this speed while traveling through the test area. The microphone / sound level meter is required to be positioned 50 feet from the center of the travel lane and 4 feet above the snow cover. The sound level meter should be set to measure the maximum A-weighted sound pressure level with slow time weighting (L_{ASmx}) as the vehicle passes at its constant speed. Measurements are repeated until three L_{ASmx} values are within 2 dB. These L_{ASmx} values are then arithmetically averaged and rounded to the nearest integer. Because noise emissions of OSVs are not the same for each side of the vehicle, measurements are conducted for the vehicle traveling in both directions and the side of the vehicle with the highest average is reported as the sound level for the OSV. During the measurements, the standard specifies that atmospheric temperature, pressure, relative humidity, wind speed and direction be measured at recorded intervals of not less than 1 hour. Yellowstone's approach to the measurement of OSV noise emissions closely follows the Standards of American Engineers (SAE) J1161 (November 2013) protocol with two key deviations: 1) the pass-by speed for snowmobiles is 35 MPH and the pass-by speed for snowcoaches is 25 MPH or the typical cruising speed of the snowcoach, if lower, and 2) the relative barometric pressure is not limited to the range specified in SAE J1161 test. Generally about 30 minutes is the minimum time for the SAE J1161 test for each snowcoach, slightly less per snowmobile.



Disclaimer: Noise emission testing of snowmobiles and providing those certified test results to the NPS remains the responsibility of the various snowmobile manufacturers. Yellowstone will continue to review manufacturer provided certified test results as part of our (New) BAT certification process for snowmobiles. If snowmobile noise emissions are reported here, they are strictly for informational purposes only.