Operations & Technology Working Group
Conference Call #1 Meeting Notes (FINAL V2)

TOPIC: SCOPING & GENERAL DISUSSION REGARDING ISSUES OF CONCERN

Call Date & Time: March 10, 2014, 3-4:30 PM MDT
Phone: 1 (877) 638-1989 Passcode: 8955346#

Participation:

Present:
Bruce Austin, Public
Don Bachman, Public
Scott Carsley, Alpen Guides
Bill Howell, Yellowstone Arctic Cat Yamaha
Ed Klim, ISMA
Bart Melton, NPCA
Alicia Murphy, NPS
Molly Nelson, NPS
Kim Raap, Trails Work Consulting
Randy Roberson, Buffalo Bus
Clyde Seely, Three Bear/See Yellowstone
Wade Vagias, NPS
Jack Welch, Blue Ribbon Coalition

Not Present:
Jason Howell, Yellowstone Arctic Cat Yamaha
David McCray, Two Top
Jamie McCray, Two Top
Kennedy McCray, Two Top
Dan Stusek, Steve Daines' Office
Travis Watt, Three Bear/See Yellowstone

Welcome and Introductions:

Wade welcomed everyone to the meeting and attendees briefly introduced themselves and stated their affiliation.

Review of Working Group Operating Principles:

Wade briefly reviewed the Working Group Operating Principles (see Agenda for list of principles).

Acknowledgement of Working Group Operating Guidelines:

Wade acknowledged the Winter Use Adaptive Management Working Operating Guidelines.

Review of the Description of the Operations and Technology Working Group:

…make recommendations to the NPS on the design of an updated monitoring strategy that measures and evaluates how winter use operations, under the transportation event concept, and oversnow vehicle technologies, can be improved or modified to create a cleaner and quieter park experience, to facilitate cleaner-running vehicles and to generally reduce impacts to park resources.

Action(s):

1. *By COB Friday, March 21, 2014, please contact Wade and Alicia (alicia_murphy@nps.gov) with changes or questions about the working group description.*

Goals of the working group by June 2014:

Goal	Status
Develop an ordered list, by priority, of topics this group would like the NPS to begin exploring via the WINU Adaptive Management Program;	Done. See page 9 of these notes.
Identify knowledge gaps or uncertainties for each topic identified;	To be discussed on future conference calls of this working group.
Using the knowledge gaps or uncertainties identified, determine priority research questions around which to focus future monitoring or research efforts;	To be discussed on future conference calls of this working group.
Develop a draft monitoring strategy for the top three (3) priorities as determined by the working group.	To be discussed on future conference calls of this working group.

Discussion Topic: OSV Speed Limits

1. The following overview was provided by Wade:
    a. Previously, all oversnow vehicles (OSVs) had a 45 mph speed limit; however, based on observations, most snowcoaches cruised at 20-25 mph and most snowmobiles cruised at 30-35 mph. Based on this information and other considerations, the NPS used 25mph and 35 mph respectively to do air and noise emissions analysis.
    b. Per the new winter use regulation, the speed limits will be 35 mph for snowmobiles and 25 mph for snowcoaches
    c. The speed limit could be changed through it would necessitate a change to the final rule with appropriate analyses of the effects on impact topics from the final Winter Use Plan/SEIS.
2. Members of the group suggested that there could be different speed limits based on the snowcoach type, load, or road segment. This could help operators who run snowcoaches that easily go faster or who have longer routes.
3. Several members of the group mentioned that 35 mph was a good speed for snowmobiles
4. Bart Melton asked how speed affects emissions
    a. Wade said the park has done noise emission testing at 35 mph for Bombardiers and they have come in at 69-72 dba. In general, OSVs get louder as they go faster.
    b. All modeling for the Supplemental Impact Statement (SEIS) was done at 35 mph and 25 mph.
5. Don Bachmann asked for a timetable of entrances to popular locations (Old Faithful, Canyon, Norris, Mammoth, etc.) at different speeds. The timetable should also take into account the variablity of random stops for viewing wildlife and thermal activity.
6. Scott Carsley mentioned that operators from the South entrance are not represented in this group and that those operators are likely to be interested in faster speed limits since they have further to travel. Likewise, Xanterra is not represented on this group.
7. Bruce Austin pointed out that there may be an increased impact to snowroads if speeds are higher due to more snow displacement. However, it may be that different snowcoach times have different floatation rates, and so could impact displacement differently.
8. Scott Carsley mentioned that speed was a major concern for his business because his snowcoaches can cruise very comfortably at 30 mph. Because many of his trips are either

photography or deadheads to the south entrance, the slower limits will cut into visitor walks and opportunities. It will also be too much for the drivers, making scheduling trips difficult.

a. Also in question, if one snowcoach is equal to seven snowcoaches, why aren't the speed limits also equal?

9. Randy Roberson affirmed that most mattrax machines can't go much over 22 mph, but that Bombardiers and Bigfoots can. Therefore, perhaps we should have different speed limits for them versus mattrax.

Additional comments received after the call regarding speed limits:

Kim Raap: This is an extremely important topic for the two Wyoming entrances and groups entering from the South and East Entrances since their travel time to prime destinations in the park are typically much greater than those entering from the West or North Entrances. At the same time, I recognize that increasing speed limits could be a double-edged sword since more speed clearly increases soundscape impacts. I look forward to the table which Molly will prepare since I had thought during the call that I would do the same to help make some of my points – but will now wait to see her table first. I would say though that we should be cautious about introducing any variables into the table regarding 'stopping to view attractions' since this is highly variable on various park road segments and is also quite variable between various groups. So please provide at least one version that is purely based upon raw travel times (miles between junctions or destinations divided by a range of travel speeds). The second point I would add regarding speed limits is that, perhaps, this is an issue which could be considered based upon spatial zoning of park roads. From the very beginning (the 1997 Fund for Animals lawsuit over road grooming) I've always felt it was/is wrong to treat all issues the same generically across the entire park. My observations have always been that the number and degree of 'impacts' was and is different between 'West Yellowstone to Old Faithful' compared to everywhere else in the park – yet conflicts in that corridor have continually driven park-wide policies. I look at the park road segments in respect to 'impacts and conflicts' somewhat like a color-coded danger scale: 'West to Old Faithful' has always been in the 'orange to red' zone, 'Mammoth to Madison' typically floated in a 'yellow' or better zone, while the 'backside' of the Grand Loop as well as East and South Entrance roads were all typically somewhere between 'minimally yellow to mostly green' due to lower visitor numbers, fewer 'primary' visitor destinations/congregation areas, and generally low wildlife numbers along the roadways. Consequently there may absolutely be room to increase some vehicles' speeds in zones coming from the south and east – but we also need to be extremely cautious to ensure these efforts don't become misguided to the benefit of only a few operators.

Randy Roberson: Next I would list speed limits, again, because of visitor safety, this is an important category that I think should be focused on sooner than later. An interesting comment from Bruce Austin, about the speed of coaches (Mattracks) and displaced snow. I agree, that displaced snow creates ruts and pointed out some of that "displaced" snow in the images I sent you last week. However, in the case of Mattracks, they continue to "toss out" snow until you are down to about 10 mph or less. While in theory, a speed limit could reduce ruts by minimizing snow splash, the speeds you would need to see improvement would not be practical. My experience has been the only time track systems are not "splashing out" snow, is when you can see the tread pattern left in the snow. Example… you can see the tread pattern left on the snow from GripTracs at most any speed,

(and you see very little if any "splash"). Mattracks have to be in the 0 to 10 mile per hour area to be able to see the tread pattern. We are seeing very little displacement of snow from the tires we have tested, including minimal "snow dust" on the rear and sides of the coach.

Clyde Seeley: I believe the 25 mph snowcoach recommendation is fine in most cases. However, I think that for some vehicles i.e. the Bombardiers, our new Yellowstone Grizz, and the low pressure tires, if they are safe at a higher speed, an increased speed limit could be acceptable in areas with sparse traffic.

Action(s) on Speed Limits:

1. *Molly Nelson will develop a table of travel times to accompany the meeting's FINAL notes the week of March 24, 2014.*

Table of Travel Times in Minutes by Popular Route (assumes no stops)

Possible Trips	Miles	Travel minutes @ 25 mph	Travel minutes @ 35 mph	Travel minutes @ 45 mph
West Entrance to OF to West Entrance	60	144	103	80
West Entrance to Canyon to West Entrance	80	192	137	107
West to Canyon to Lake to West Thumb to OF to West	124	298	213	165
South to Old Faithful to Norris to Canyon to Lake to South	140	336	240	187
South to Old Faithful to South	78	187	134	104
Mammoth to OF to Mammoth (via Norris, Madison)	102	245	175	136
Mammoth to Canyon to Mammoth	66	158	113	88
Mammoth to Canyon to Lake to West Thumb to OF to Mammoth	138	331	237	184
East to OF to East	130	312	223	173
East to OF to Norris to Canyon to East	150	360	257	200

Discussion Topic: Performance-based Exhaust (Air) Emission Standards for Snowcoaches

1. The following overview was provided by Wade:
    a. It has proven difficult to develop performance-based standards for snowcoach exhaust emissions because of the many variables and different types of snowcoaches. Exhaust emissions are affected by slope, snowfall, rolling resistance, horsepower, torque, gearing, etc.
    b. Wade just returned from MI, where he talked to engineers about emission standards—there have been many changes in the last 7 years in terms of measuring in-use exhaust emissions from oversnow vehicles.
    c. We are currently using technical standards (based on model year) although the park remains interested in learning more about performance-based standards; doing so would require working with either industry or universities.
    d. It is expensive to undertake exhaust emission testing (it cost approximately $40,000 to test five snowcoaches and two snowmobiles in March 2012) but it is also expensive to refurbish machines if they are still performing adequately.

2. Scott noted that Bombardiers would be at the top of the list for performance testing—they are the cleanest running but he'll still have to replace five engines before 2015 because of the technical standards. He relayed that Gary Bishop has said that we could test easier and cheaper.
    a. Randy agreed that there are ways to do cheaper testing. He's willing to look into options for tailpipe emissions testing for H, NO_x, PM, and CO_2.
3. Ed Klim asked if we've developed or test or use cycle?
    a. Use cycle tests the vehicle in the way it is used to get accurate data
    b. Wade said we do have a use cycle: West Yellowstone to the Firehole Hill
4. Ed asked if we have set vehicle size limits
    a. Wade: No, because there are so many variables in snowcoaches. The goal is to have the cleanest and quietest while respecting the investment of concessioners. Wade is considering asking engineer Scott Miers from Michigan Technology University to participate in a call and ask him to outline how to set up performance based standards for the different types of snowcoaches.
        i. Bruce reminded the group that outside conditions are complex while Tier 2 tests have set parameters.
        ii. Randy acknowledged this but wants to make sure that mandating changes at 10 years isn't arbitrary.

Additional comments received after the call regarding exhaust emissions:
Kim Raap: I believe this is the top issue since snowcoaches have skated along for a lot of years without proper emissions regulations. With the final rule depending heavily on this transportation mode it is now imperative that this vehicle type be sufficiently and properly monitored to ensure 'modeled impacts' are not exceeded. I agree with the concern expressed that 'mandated upgrade/equipment replacement' thresholds should be based upon real data and not be arbitrary benchmarks. However, this should apply to both snowcoaches and snowmobiles – so that commercial operators are not forced into expensive upgrades due solely to arbitrary dates for either vehicle type. I also continue to be concerned about basing snowcoach engine technology solely on Tier 2 engine technology when the current marketplace has already moved into Tier 3 and Tier 4 engine classifications. If the goal is to truly facilitate cleaner-running vehicles and continue to reduce impacts to park resources – then this discussion should be broadened.

Randy Roberson: Not a time critical issue…yet. But soon could become a costly prospect if left alone. In a previous mail I have stated my concerns about the sunset clause on engines, as well as the scope of retrofitting a vehicle with a "new engine long block" instead of needed the emission devices to bring a powertrain to tier two. I would like to see more flexibility in accomplishing the goals of tier two, or 2010 diesel certifications. Another game changer, will be Bigfoot. I suspect, a Tier one coach on balloon tires would have a fraction of tailpipe emissions as a tier two vehicle on Mattracks.

Action(s) on Performance-based Exhaust Emission Standards:

1. *None at this time*

Discussion Topic: Rutting of Snowroads & Bigfoot Low-pressure Tire Experiment

1. Overview provided by Wade
    a. The park has increased grooming to try to alleviate the formation of ruts.
    b. The park also contemplated "PSI" restrictions for snowcoaches in 2010 & 2011 but ultimately abandoned that effort via the EIS process because of the large number of unexplained variables.
    c. The NPS has done a study with 3 locations to determine road rut changes over the day and the season. This is a complex data set and it is being analyzed.
    d. The NPS also conducted a pilot study of single vehicle impacts (repeated passbys from a single vehicle)
    e. Regarding the "Bigfoot" low pressure tire experiment specifically, the park will evaluate the success or failure of this pilot project based upon the following criteria:
        i. Safety
        ii. Impact to park resources, include snowroads (the vehicle(s) can be no more impactful than a comparably equipped vehicle on tracks)
        iii. Aesthetics/Appearance of a unique vehicle
        iv. Operate in all conditions
2. Jack asked if there has been any study of the impacts to roads in the sections between South and Old Faithful areas?
    a. Wade: since there are far more snowmobiles than snowcoaches coming in from the South Entrance, the NPS has focused testing at Madison, Gibbon, and the Firehole where the majority of snowcoaches are concentrated.
3. Low Pressure Tires
    a. Randy has had good innovations in this area, which is several years in the making. Others are welcome to join in the experimentation.
    b. Randy: He is happy to talk to or show the tires to anyone—just give him a call. He wants a big enough tire to get around without major modifications to the vehicle body.
        i. Snow conditions are the most important factor
        ii. He's using 1/3 of the fuel with the big foot tires
        iii. He's conducting guest surveys to see what visitors think of them
        iv. Less driver fatigue
        v. He wants to try other tire and wheel configurations in the future
        vi. Jack asked about the load on wheel bearings and Randy said that it's less than that of mattrax. Also, gas shock absorbers have reduced the bounciness of the ride.
    c. Wade appreciates Randy's work and knowledge sharing. This is at least a 2-year pilot study and is open to other operators.

Additional comments received after the call regarding Rutting/Bigfoot:
Kim Raap: I believe addressing rutting of the groomed roads by snowcoaches is potentially one of the greatest visitor safety issues going forward, so therefore support sound research and monitoring in order to improve upon the existing condition. In respect to Bigfoot, while it sounds like a great new solution, I do have some concerns as to how it fits into the historical perspective of the Yellowstone

winter experience. I believe this was also briefly mentioned by Wade, but I don't see it captured in the meeting notes.

Randy Roberson: Because of visitor safety concerns, I would list rutting, the Bigfoot program and grooming at the top. I too believe as you stated yesterday, that grooming, track or tire systems all play a role in the rutting process. One cannot ignore that the different technologies will overlap onto the OSV noise, tailpipe emissions and OSV speed limit categories. By improving the drive system, whether with better Mattracks, GripTracs or Bigfoot tires, there could be improvements in several categories.

Clyde Seeley: During the last telephone call, Wade stated that two main concerns regarding Low Pressure tires were (I paraphrase) A) that they not cause deterioration of the roads, B) that they look the part, like a vehicle that was meant to travel in Yellowstone (aesthetically appropriate). I visited with Wade after the call and suggested that the most important priority should be C) **Safety**. This cannot be overlooked. I also suggested that D) should be that the low pressure tires must work in all conditions. They cannot be just "fair weather friends".

While I am not opposed to the two year pilot program for trying to develop "low pressure" tire experimentation (who knows, I may also want to participate) I am very concerned about the following goal stated in the March 10, Agenda (the third bullet from the bottom) where it says **" Low –pressure tires in lieu of tracks on snowcoaches**". If we are in fact talking about 'in lieu of' then I cannot support this concept at all. We are already hearing, 'if they are going to use tires, why not just plow the roads"? Perception sometimes becomes reality, we should not even crack that door open again. Perhaps a better term would be "**in addition to tracks"** or some other word smithing.

The words "In lieu of tracks", jeopardizes the project that I just introduced this year, the Yellowstone Grizz. Perhaps it would be appropriate to explain to this group the project I have been working on for the last three years and have unveiled this winter.

Before the definition changed that allowed tires, I had been developing, in conjunction with SnoBear USA, a single purpose-built snowcoach. This is not a retrofitted snowcoach, but is built from the ground up for operation in Yellowstone. It is similar to the Bombardiers (such as Alpen Guides) that have provided dependable oversnow transportation for many years. Superintendent Wenk and Wade have been aware of its development. The Yellowstone Grizz, built specifically for Yellowstone was featured in this week's issue of the West Yellowstone News. www.westyellowstonenews.com (This site may only remain active one week.) Click on "Local Pursues Innovations in Snowcoach Travel ". I have not mentioned this in the past to this group as it has been a prototype. It will be a very safe vehicle with a low center of gravity, huge surface to snow contact with about 2.0 psi and will cause minimal ruts, a viable snowcoach alternative.

Like "Snowmobiling in Yellowstone" implies cross country snowmobiling, I think "Bigfoot tires" also sends the wrong message implying going over obstacle courses and running over trees and rough terrain. I am wondering if, to avoid wrong impressions from the get go, if it would be better staying with just "Low pressure tires" ?

I would like to suggest rutting of snowroads and the Bigfoot tire experiment be separated. The direction taken to determine either may not be related nor take parallel paths, nor finish with this "experiment".

Rutting is a big problem that we did not used to have. In the past we had to contend with moguls, caused by too many snowmobiles and the current snowcoaches. With the reduction of snowmobiles and the introduction of the larger snowcoaches (over 15 passengers) the moguls have been replaced with ruts. These are a safety concern for snowmobilers which sometimes tip over and smaller snowcoaches which causes the guest discomfort with bouncing around and mechanical problems for the operator. While this is difficult to measure as Wade points out, the fact remains that this was not a problem with compatible track systems on snowmobiles and smaller snowcoaches. There are many days when the larger coaches do not cause ruts because of snow conditions but as stated above, along with the low pressure tires, they must also work in all conditions.

Action(s) on Rutting/Bigfoot Project:

1. *Wade will distribute a copy of the "vehicle by vehicle" draft rutting report to the group along with the final copy of the first meeting's notes the week of March 24, 2014.*

Discussion Topic: Sylvan Pass

1. Overview provided by Wade
    a. Sylvan is managed with concern to the safety of visitors and staff and the impact to the environment
    b. The pass is managed under the guidance of two previous ORMAs (Operational Risk Management Assessments)
2. Don is a retired avalanche forecaster and served on the SPWG
    a. Public safety, staff safety, and use patterns are important factors
    b. The park has a cautious mitigation program, which equals uncertainty and less visitor access.
    c. The monetary cost and personnel commitment is a concern.
3. Bart appreciates that this is still a topic of discussion
    a. Suggests a 5 or 10 year cost-benefit analysis because it's important to know how much the park spends to keep the pass open in today's fiscal climate
        i. Don suggested The Teton Pass, Going to the Sun Road, or the North Cascades may have CBAs

Additional comments received after the call regarding Sylvan Pass:
Kim Raap: I believe the 2 ORMAs which are referenced provide a good baseline for management, so consequently see it as a low priority for this group. The one thing that concerned me as I listened to the discussion about 'use patterns' is that changes in park management policies have absolutely driven current use at the East entrance to very low levels – so hopefully I misinterpreted some of the vibes revolving around cost-benefit. Before any judgments are made about cost-benefit, there must first be genuine efforts to make the new winter use plan work for Sylvan Pass and the East Entrance.

Action(s) on Sylvan Pass:

1. *Don will resubmit his monitoring concerns paper to Wade for consideration during a future call.*
2. *Bart will look for examples of cost/benefit analyses that could be applied to furthering our understanding of Sylvan Pass*

Discussion Topic: OSV Noise Abatement (interior and exterior)

1. Overview provided by Wade
    a. This topic is not addressed in the rule but it would be good for visitors and staff to lessen the interior noise of snowcoaches and the exterior noises of snowmobiles and snowcoaches
2. Randy mentioned that new technologies such as Bigfoot tires have reduced interior noise and those guests and drivers are very interested in this topic.

Additional comments received after the call regarding OSV Noise Abatement:
Kim Raap: While I understand the desire to quiet the inside of a snowcoach, I don't know that that is the role of NPS – and certainly is not a 'top 3' priority for monitoring the new winter use plan.

Randy Roberson: I realize exterior noise is and has been an important topic during the creation of the new winter use plan, we sometime lose track, that for humans, most of the day, is spent inside a coach, or inside a helmet. Track systems, and or tires have a direct effect on noise, as well as indirect (engine roar, fan clutch noise). There are techniques that can be used inside of snowcoaches (and snowmobiles) that help to mitigate interior and exterior noise. I worked with a sound engineer this winter that provided great low cost ideas to help with OSV noise. He provided several "sound deadening products" that we have used this winter with encouraging results. I would be happy to give some of these to you next time you are here.

Action(s) on Noise Abatement:

1. *None at this time*

General Actions (in Addition to Topic-Specific Actions Above):

1. *By COB Friday March 14, 2014, working group members must complete the doodle poll for our next conference call: http://doodle.com/bwzedmqgyufuvbyy (discussion order of topics TBD based on rankings)*
2. *By COB Friday, March 21, 2014, group member's comments are due back on these draft notes. Late comments will not be accepted.*

3. *By COB Friday March 21, 2014, group members must submit to Wade and Alicia, in priority order, the following topic areas. If you have other topic areas, please send them by 3/21/2014 as well. Late comments on priority topics will not be accepted.*
   *The individuals/rows shaded in **GREEN** have already provided their rankings:*

	Speed Limits	SC Air Emission Performance Specification	Rutting & Bigfoot	Sylvan Pass	OSV Noise Abatement	OSV Visitation Level Adjustments
Bruce Austin	4	2	1	5	3	
Don Bachman	4	3	1	2	5	
Scott Carsley	2	1	3	5	4	
Bill Howell	1	5	3	4	3	
Jason Howell						
Ed Klim	1	4	2	5	3	
David McCray						
Jamie McCray						
Kennedy McCray						
Bart Melton						
Kim Rapp	2	1	3	5	4	
Randy Roberson	2	4	1	5	3	
Clyde Seely	4	5	1	6	2	3 (suggested by Clyde Seely)
Dan Stusek						
Travis Watt	4	3	2	1	5	
Jack Welch	2	4	1	5	3	
****AVERAGE**	**2.6**	**3.2**	**1.8**	**4.3**	**3.5**	
** lower mean score for the topic area reflects higher importance at the aggregate level * Clyde Seely would like to see Rutting & Bigfoot discussed separately						

Additional Notes from Group Members:

Clyde Seeley: It states in The Winter Use Adaptive Management Program Working group guidelines under Adaptive Management Program. The winter use Adaptive Management Program has three central objectives: (I refer to one) **To evaluate impacts of OSV use and help managers implement actions that keep impacts within the range predicted under the Selected Alternative**. It would appear to be prudent to encourage newer and better technology but at the same time reward the public with greater access, while not exceeding the current carrying capacity. For example, if a hybrid snowcoach or electric snowmobile were to be developed, with much less emissions impact, shan't there be more OSV's visitors allowed as long as impacts remain in the acceptable range? If not we will be allowing fewer visitors to experience Yellowstone while also tightening and lowering the carrying capacity. Do we need to go further? I would hope that adaptive management would work both ways. In the appropriate area and with the proper working, I suggest that adjusting visitation levels to be commensurate with technological improvement and carrying capacities be another topic area to be discussed.