

***NEW PERSPECTIVES CONCERNING PUBLIC HEALTH
AND ECONOMIC ASPECTS OF SNOWMOBILING FOR THE
STATE OF MICHIGAN***

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INTRODUCTION

Although the Michigan DNR is “obliged by law to establish and operate recreational trails on behalf of Michigan citizens”, a more basic mandate also exists for all State agencies and public officials to protect and maintain the public well being, and, safety of the people they are empowered to oversee and lead. The MI DNR must always be vigilant to maintain tight consistency between their specific obligations and this larger mandate. Unfortunately, in recent years the MI DNR has drifted far away from their public health mandate with regards to snowmobiling recreation. The truth, and balanced decision making have been eclipsed by the idea of winning a recreational popularity contest and the one-sided misinformation and boisterous notions of snowmobile groups and their interests. Wise public policy and government leadership concerning snowmobiling must be based on reality, and the big economic and public health / safety picture for our citizens.

Specifically, this last winter, the MI DNR aggressively attempted to establish a linking snowmobile trail through a densely populated residential area of Chocolay Township in the Upper Peninsula. They tried to avoid public hearings, and set up an advisory committee stacked with snowmobile interests to make recommendations to the Natural Resources Commission. This snowmobile trail would have funneled very large numbers of snowmobile riders through this residential area, and was vigorously opposed by residents of the Township and their elected officials. The DNR argued that there was a compelling economic need for a linking snowmobile trail and no other alternative possible, that a “multiuse” winter trail, would be safe for all users, and that in their “extensive experience” snowmobile trails are compatible with quiet residential areas and do not adversely impact adjacent property owners quality of life, or property values. This recent history demonstrates just how out of touch the MI DNR has become with their larger mandate to protect the well being of Michigan communities and families. The following factual discussion presented to the Natural Recourse Commission, will hopefully be used to inject a dose of reality back into the MI DNR as they consider snowmobile recreational issues and motorized trail locations.

ECONOMIC JUSTIFICATION FOR SNOWMOBILING: MORE APPARENT THAN REAL

The only comprehensive MI study cited by the DNR on the economics of snowmobiling in the state was done by Nelson at MSU Dept of Tourism Resources in 1998 for the FY97 snowmobiling season (1). This study is seriously flawed with high side bias on snowmobiling's economic impact because data was generated by asking snowmobilers in a survey they knew was part of an economic study about their sport, to remember how many days they spent snowmobiling the prior season and to report how much money they remembered spending. No proof of spending or hard data was analyzed. Given this, the bottom line showed a statewide "economic impact" (profit, or new money) from snowmobiling of 48 million dollars for FY 97 (pg. 16). Not documented in the study however, is the 66 million dollar cost to society, of the conservatively estimated 830 injuries occurring as a result of the Michigan FY 97 snowmobiling season. This latter figure is obtained by using the MDNR Snowmobile Report, MSP Crash Facts, and National Safety Council data, all from 1997 (a walk thru of this calculation with sources can be provided to anyone on request). This cost figure includes hospital costs, disability, rehabilitation and loss of productivity. Much of this is either not covered by insurance (an economic blow to struggling hospitals) or if covered, results in increased health insurance premiums the state, businesses and employers must pay. This does not include the huge extra cost of law enforcement, which must be created just to police snowmobilers on over 5000 miles of State trails. The Nelson study does mention that the jobs created in the UP directly related to snowmobiling are mainly low paying and of low quality. So the economic drag on society from the trauma and injuries alone, more than cancels out the positive statewide economic impact.

SNOWMOBILE TRAILS AND AMBIENT AIR QUALITY: THE LOS ANGELEZATION OF NEIGHBORING PROPERTIES

Snowmobiles in Michigan burn between 15 and 20 million gallons of gasoline per season and emit high levels of carbon monoxide and sub micron particulate matter (1,2). Hydrocarbon emissions can also be significant and contribute to the organic carbon fraction of particulates and creation of decreased visibility and haze (2). Each snowmobile is up to 20 to 100 times more polluting per vehicle per unit of time than a single automobile, depending on ambient temperature (cold is worse) and the pollutant being measured (2). There is strong correlation between snowmobile numbers and pollution levels (Chocoley Township police recorded heavy traffic, 100 snowmobiles per hour along the eastern legal segment of the old rail grade this last winter). Cold dense high pressure air masses typically seen during snowmobiling season also tend to trap and concentrate pollution near it's source along the trail. Thus, those persons living along the trail are exposed to high levels of pollutants for many hours of the day and night. In addition, snowmobile riders who typically travel in groups in single file, are exposed to high levels of toxic air pollutants for prolonged periods of time as they travel within the exhaust plume of the machines in front.

A report released March 2003 by Sarah Janssen, MD, PhD & Ted Schettler, MD, MPH "Health Implications of Snowmobile Use in Yellowstone National Park", revealed specific measurements of air quality degradation directly related to snowmobiles in rural areas. The reported amount of snowmobile traffic is comparable to that found in northern Michigan.

Carbon monoxide (CO). With the onset of snowmobiling season the measured 8 hour average carbon monoxide ambient concentration near park trails, rose from less than 1 part per million (ppm) to 8.86 ppm, which is right at the National Ambient Air Quality Standards (NAAQS) maximum allowable of 9ppm. A CO of 8.86 ppm would represent a higher than average ambient big city level. Although NAAQS are intended to protect the general public from harmful effects of air contaminants, some subsets of the general public will be much more prone to toxicity from this degree of CO pollution. These include: those with angina or prior myocardial infarction, congestive heart failure, heart

arrhythmias, asthma, emphysema, anemia, pregnancy, or children. Additional measurements were made of the air riders were breathing at speeds up to 40 mph and 25 to 125 feet behind another snowmobile, a second sled test if you will. These measurements revealed a profound degradation in air quality with a 1 hour continuous average of up to 45 ppm of CO. This exceeds the 1 hr. NAAQS of 35 ppm. Since this type of chronic CO exposure will interfere with the cognitive function of the rider, occult carbon monoxide poisoning may indeed be a contributing factor in the inordinately high crash rate seen with snowmobiling.

Particulate matter (PM 2.5). Trailside measurements of PM 2.5 showed an 8 hour average concentration of 62.1 micrograms/ cubic meter of air. These levels along the trail exceed those measured along a busy Los Angeles freeway, and often exceeded the NAAQS and violated Clean Air Act Standards. PM 2.5 is the worst form of particulates because they are able, due to their small diameter, to penetrate deep into the lung, all the way down to the air sacs. Epidemiologic studies have shown that people living along a trail with this degree of chronic exposure would be at higher risk of premature death, development of chronic lung disease, cardiac instability, and possibly cancer (2). In healthy snowmobilers, these levels cause respiratory irritation and cough. For those with existing heart or lung conditions, these levels place them at increased risk for cardiac arrhythmias, heart attack, and acute worsening of lung disease possibly resulting in hospitalization or death. Children with asthma would experience more frequent attacks while riding.

Hydrocarbons. Yearly hydrocarbon emissions (benzene, toluene, ethyl benzene, and xylenes) in Yellowstone National Park from snowmobiles exceed those of all automobiles, RVs and busses combined. Benzene levels along the snowmobile trail ranged from 0.067 to 0.60 milligram/ cubic meter. This was 2 to 30 times higher than on an LA freeway and often exceeded the Agency for Toxic Substance and Disease Registry (ATSDR) and the National Institute for Occupational Safety and Health (NIOSH) exposure limits. Persons living near a trail with this degree of chronic exposure could experience increased cancer risk, as well as potential neurologic disease and immunologic deficiencies. A "second sled test" was also done for benzene, with levels of 0.120 to 1.40 milligrams/ cubic meter recorded. These levels were double those recorded

trailside. Breathing benzene can also cause acute cognitive impairment. Ethyl benzene, toluene, and xylene levels were also recorded trailside and were often much higher than ambient exposure in big city environments.

Aldehydes. Trailside measurement of formaldehyde and acetaldehyde (26 to 73 micrograms / cubic meter & 17 to 42 micrograms/ cubic meter, respectively) both exceeded the minimum risk level established by the ATSDR. At the levels measured normal people would be at increased risk of mild respiratory irritation and those with asthma could expect increased frequency of attacks.

Summary. The air quality along existing snowmobile trails suffers dramatic degradation as the snowmobile season begins and is worse than many big city freeway environments. While each of the above mentioned pollutants from snowmobiles carries it's own independent health risk for residents along a trail, the additive or more likely synergistic effects of the mix would most certainly be worse. And of course, the greater the snowmobile traffic, the worse the pollution becomes. A linking trail like the one advocated by the MI DNR last winter through a large residential area in Chocoley Township, could be expected to funnel large numbers of snowmobiles down a narrow rail grade. The MI DNR is simply wrong to claim that adjacent property owners would suffer no adverse impacts.

There are many feasibility and implementation problems with snowmobile industry claims of "soon to be available" cleaner (4 stroke engines). First, 4 stroke technology does not guarantee cleaner emissions. Second, since most snowmobilers want a high performance 2-stroke machine that emphasizes high speed and quick acceleration, there is currently a very small market (currently around 10%) for low horsepower, 4-stroke touring snowmobiles. Third, 4-stroke snowmobiles currently cost \$2000 to \$5000 more than a standard 2-stroke model. Given the small demand, it is very doubtful that the market would sustain production of these machines.

SNOWMOBILE TRAIL NOISE TRESPASS & RESIDENTIAL NOISE POLLUTION

Motorized recreational trails through residential areas create significant noise trespass onto private property adjacent to these trails. One snowmobile operates at a level of 78 decibels or the equivalent of loud shouting (2). A group of ten snowmobiles traveling together would raise the ambient noise level near the trailside to around 90 decibels (2). This is the equivalent to the noise experienced by someone using a hair dryer or mowing a lawn with a gas-powered mower. Because of the nature of snowmobile trail use, this noise trespass occurs frequently, night and day, and in an irregular pattern. Since our work force now increasingly operates on a 24x7 basis, many shift workers now must even sleep during the daytime to recharge for their work. Contrary to popular belief, many people in the UP actually sleep with their windows cracked open to create a more comfortable sleeping environment. There is no doubt that this degree and pattern of chronic noise trespass in residential areas will cause disrupted sleep, varying degrees of chronic sleep deprivation, and direct negative effects on children's long-term memory and ability to learn (4,5,6,7,8). The science is becoming clear on the harmful effects of excess noise in the environment as well as the intimately related partial sleep deprivation to both the individual and their work.

Diabetes. Just 6 days of modest sleep deprivation and interrupted sleep in healthy men in their 20s, resulted in development of Type II diabetes. For older individuals who are pre diabetic, this degree of sleep deprivation may trigger the need for insulin shots 10 years sooner than would otherwise be the case.

Obesity. The same study showed small degrees of sleep deprivation caused marked changes in hormones regulating appetite, which would trigger inappropriate overeating by over 1000 calories per day.

Heart Attacks, Hypertension, & Stroke. Modest sleep deprivation and poor sleep triggered a generalized inflammatory response throughout the bodies of young men and women in their 20s. These same generalized blood vessel inflammatory responses have been linked to increased risk for heart attack, high blood pressure, and stroke.

Decreased School Performance. A complete, uninterrupted sleep cycle immediately following study of information is essential for learning, memory retention and consolidation of learning. At least two dozen recent studies now all confirm that excess noise in the environment directly interferes with children's motivation, reading ability, memory, and language and speech acquisition (8). Since interruption of sleep cycles or poor sleep also blocks the learning process, school children living along a snowmobile trail will very likely have poorer school performance during snowmobiling season, than if that same residential trail were designated for a silent sport like XC skiing. Ditto for professionals trying to learn who live along a motorized trail.

Decreased Job Performance and Productivity. Physicians and other health care workers with partial sleep deprivation are definitely compromised at work. This adversely affects their patient's safety. Homeowners living along a snowmobile trail who work in other fields would likewise be compromised on the job and more prone to mistakes, inattention, and accidents.

Specifically related to the MI DNR's push for a snowmobile trail through a residential area in Chocolay Township, it should be understood by the Natural Resource Commission, that the creators of Township zoning laws intuitively understood what science has only recently documented: that excess noise in places where humans retreat for rest and relaxation is very detrimental and harmful to the health and well being of the individual and of society at large.

THE OBESITY EPIDEMIC & THE MI DNR ADVOCACY OF THE MOTORIZED COUCH

Study after study in recent years have chronicled the epidemic of obesity in the United States and it's dramatic cost (9,10,11,12,13). In fact, we are the fattest nation on the Earth (65% of the population) with Michigan near the top as the most unfit of all the states. An overweight (10 to 30 pounds above ideal weight) and obese (30 pounds or more above ideal weight) population carries a much higher risk of diabetes, heart disease, cancer, chronic arthritis, depression, and in children, hostile and defiant behavior (9,10,11,12,13). Alarmingly, the Center for Disease Control reported in June 2003 that 1 in 3 children born in the year 2000 will become diabetic as young adults unless they are encouraged by society to increase their physical activity and lose weight. Since diabetes leads to kidney failure, blindness, amputations, and heart disease the economic implications are frightening, as these kinds of numbers would easily overwhelm our entire US health care system treating this one disease. Our nation's ability to effectively compete on the world stage will be at risk in a few short years if Americans are not encouraged to become more physically active. Currently America's obesity epidemic is costing 93 billion annually, with the government (actually the taxpayers) paying for half of this. This is currently a greater public health problem than smoking.

In May 2003, the MI Governor's Council of Physical Fitness and Sports released a report documenting that the majority of our State's population is physically inactive and does not get even a minimal amount of aerobic exercise. The report also documented the staggering cost of this physical inactivity to our State of 8.9 billion per year, projected to jump to 12.6 billion yearly by 2007. As a remedy, the report noted that for every 5% of the population that could be encouraged to start a daily aerobic exercise program, the state could save 575 million dollars annually. The bottom line here is that strong state advocacy and encouragement of aerobic recreational activities could put hundreds of millions, perhaps billions of dollars back into our Michigan economy annually. This is money that would otherwise have been dragged off into a fat oblivion.

A study reported via Science News in April of 2003 noted that most obesity in both adults and children is now thought to be caused by insufficient physical activity rather than by overeating. This is encouraging, because it is much easier for governments to exert responsible leadership by strongly encouraging, advocating and facilitating exercise intensive recreational venues than by becoming the food police.

Michigan has underdeveloped its non-motorized winter recreation options compared to other states like Minnesota, which actually have much less total acreage of state owned property. In fact, Minnesota has 3 to 4 times the number of miles of state groomed and owned XC ski trails as Michigan and Minnesotans are not nearly as fat as Michigan citizens (3). When Chocolay Township offered to groom the segment of the rail grade for XC skiing through the residential area which was declared off limits for snowmobiling by the court, the idea was rejected by local DNR officials at the January 2003 rails to trails meeting as "setting a bad precedent". This would have cost the state nothing, and would have linked our residential neighborhood with existing XC ski pathways in Chocolay Township. This would have facilitated wintertime aerobic exercise for Township residents. Chocolay Township, the Noquemanon Trails organization and the MI DNR could have begun a collaborative effort to build this residential portion of the grade into a world-class XC speeds and sprint workout area. Nationally advertised XC sprint races could be held the weekend before the Noquemanon Ski Marathon, creating a unique week long XC ski event with two different styles of race using different trail formats.

Unfortunately, our current Michigan DNR has placed their advocacy for motorized recreational activities like snowmobiling, much too high on their priority list in recent years. Riding around on a sled that's doing all the work does not qualify as aerobic exercise. State agencies that encourage and attempt to facilitate this type of recreation, only fan the flames of the costly obesity epidemic. This type of policy slant that the MI DNR has assumed is unwise, irresponsible, and economically reckless.

CONCLUSION

Snowmobiling is the most unsafe form of winter recreation, with an inordinately frequent, expensive, and serious injury rate compared to muscle powered sports. Snowmobiling consumes large quantities of fossil fuel and yields damaging amounts of air pollutants, which adversely impact the health of non-participants living along a designated trail as well as the riders themselves. Snowmobiling creates significant noise trespass onto private property disrupting the ability of those living nearby to rest and recharge for their work. Reversing the alarming epidemic of obesity and it's staggering cost for our State, can be achieved if people are strongly encouraged to get off their motorized sleds and begin to snowshoe, walk, ski etc. during the winter. The additive costs to society of all the above adverse impacts of snowmobiling dwarfs any positive economic attributes from the activity.

The MI DNR is currently out of touch with reality on the snowmobile recreation issue because they have believed some fuzzy, made up, economic numbers provided by snowmobiling interests and the snowmobile manufacturers. The MI DNR officials make unsupported statements that a multi-use trail linking the eastern and western UP is urgently needed to improve the UP and Marquette economy. Significantly, they have no objective data to support a positive economic impact theory, just made up numbers, anecdotes, and conjecture. Likewise, there is no data to support the idea of adverse economic impact if a new snowmobile trail is not opened. In fact, economic benefit might just as likely occur in the Eastern UP if no escape route is created for the snowmobilers. Why should state money be used so that snowmobilers can easily leave to go spend money in Wisconsin? I can also assure the Commission, that the idea of "a multi-use trail" with snowmobiling, snow shoeing, and XC skiing all on the same narrow trail (only 20 feet wide in many places) is pure fantasy and would be a liability nightmare for the state.

Actions.

- 1. The MI Natural Resources Commission needs to tell the MI DNR to take these issues seriously, and to decrease their advocacy and facilitation of motorized recreation. In addition, the creation and promotion of non-motorized trails and activities must now assume the highest priority.**

- 2. MI DNR must follow the official recommendation (enclosed) of Chocolay Township for their segment of the rail grade, and in compliance with wise local zoning, declare the section of the Marquette to Munising rails to trails through the residential zones as non-motorized year round.**

- 3. The MI DNR should be directed to use their energy to work collaboratively with the Township and Noquemanon Trails to develop a non-motorized winter recreation alternative on the rail grade through the residential zones.**

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