Inside… Everything you need to know about slope lighting!

SNOW-BRIGHT™

- **Don't use LEDs. They are not designed for lighting snow!**
- **SAVE up to 85% in electricity compared with metal halide and sodium**
- **Reduce demand charges by dropping in-rush current**
- **Save 600% or more on Maintenance**
- **Increase safety with improved visual acuity**
- **Gain Dark Sky compliance by reducing light pollution**
- **Eliminate dangerous flicker that causes "strobe effect"**
- **Flexibility to *up-light* slopes with proprietary light diffusion technology!**

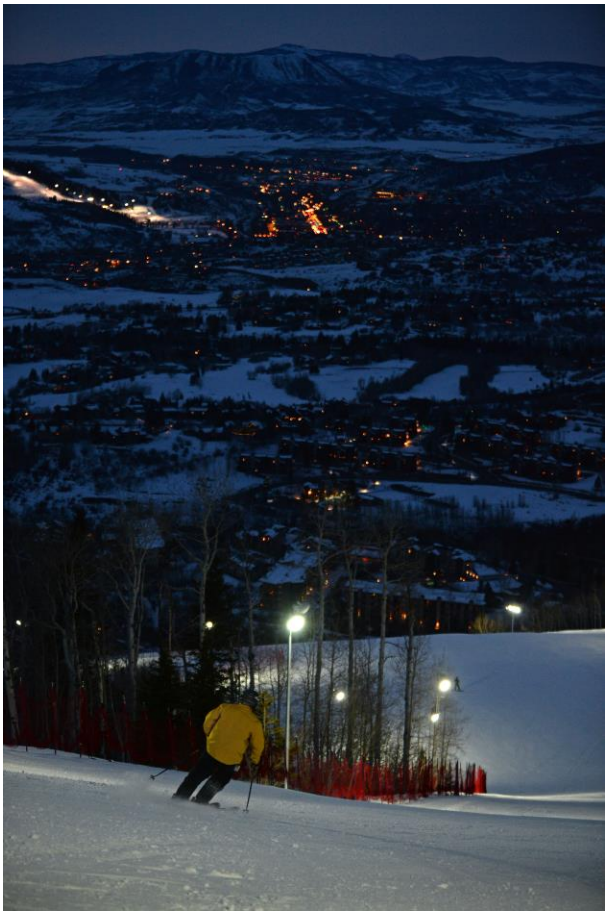
"The Evolution in *Energy-Saving* Slope Lighting Technology!"

INSIDE: How new Magnetic Induction slope lighting can improve your bottom line…

(Payback can be less than a season!)

LEARN MORE →

TABLE OF CONTENTS:



1 – The Science of Lighting Snow

Examine the picture on the front cover. What's missing? You don't see forward shadowing like conventional metal halide, sodium, or even new LEDs. What you ***do see*** is smooth uniform illumination you can only get with Snow-Bright™ lighting. It's the only technology specifically designed for snow-sports venues and it is ***safe to use for up-lighting***.

When Steamboat Ski Resort was deciding upon slope lighting, **Dark Sky compliance** was a **BIG** issue. The town was dead set against adding any light pollution to the environment. That's why Snow-Bright™ was the only choice. Snow-Bright™ uses unique rapid light dispersion and dissipation specifically designed to meet most light pollution guidelines or ordinances.

Let's face it. You wouldn't use a garden hose to make snow and you wouldn't groom slopes with a lawn tractor. Why would you degrade your customer's experience with inferior lighting after spending so much on all your other capital projects and equipment? When you rely on nighttime activities to generate revenue, ***lighting is the most important capital expenditure***… ***it defines the entire experience.***

When you run a ski resort or winter recreation area you're in the business of ***selling snow***. Snow is your number one product, and our goal is to present your product in the ***best light***… literally. That's why Tesla Induction Lighting ™ developed a comprehensive line of **magnetic induction lighting (MIL)** specifically designed to address the complexities and unique requirements of illuminating snow in all its varieties.

No other lighting company has spent as much time or resources perfecting ***the science of lighting snow***™. Until now, snow resort operators have had to use generalized industrial lighting like metal halide (MH) or high pressure sodium (HPS) lamps for night skiing/riding, tubing parks, cross country ski areas, parking lots, snow mobile tracks, and facility lighting. Unfortunately, ***none of these lamps are specifically designed to provide the appropriate spectrum and intensity required for proper snow illumination***. From your own experience, you know HPS lighting has a monochromatic *orange* hue that makes color rendition virtually impossible and does not provide adequate contour resolution. Black ice becomes even more invisible under HPS and MH lamps. By the same measure, the blue bias of MH and LED lamps tends to make all surfaces appear *flat*. This obscures contours, making night skiing more difficult and stressful. Snow-Bright™ lighting solves these problems with unique LUMENTEC® spectral tuning while using up to ***85% less power***.

What's so *Special* About Snow?

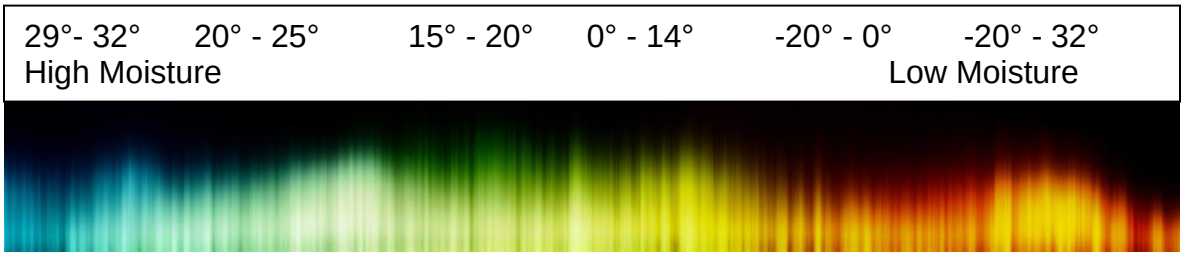
Snow professionals know there is no such thing as generic snow. Physics and chemistry of frozen water are very complex and fascinating. Photo-reflective properties vary depending upon formation temperature, humidity, and even sunlight exposure. Manmade snow is sensitive to pressure, droplet formation and size, blow angle, latent freeze time, additives, and grooming. Natural snow ranges from "Champagne powder" and dust, to "Sierra cement" and slush. There is everything in between.

Safety should be your Number 1 issue. New LEDs are *dangerous to look at* and have *too much glare* for snow venues. Snow-Bright™ lighting is kind to your eyes and can be mounted to *up-light slopes, eliminating forward shadowing*.

What Your Snow-Makers Already Know…

Moisture content impacts consistency and reflective properties. High moisture correlates with high freezing temperatures. Of course, moisture is the component of all snow, however high and low moisture is associated with density. A cubic yard of powder snow formed below 0°F can weigh 30 times less than snow formed at or near freezing. Powder exhibits different "settling patterns" that will form different reflective surfaces. Mixed snow on a bump run will shadow troughs in accordance with opposing faces such as ice, hard pack, and powder.

Believe it or not, snow's light absorption and reflectivity is highly variable based upon its specific properties and how it was formed. For example, natural snow that is formed within three degrees of freezing becomes "blue hue." You have probably noticed how this snow actually appears sky blue. When blue hue is illuminated with blue bias lamps like HID or LED, the low end of the spectrum becomes dominant. The result is a flattening effect that prevents the eye from resolving contours. Bumps, troughs, and texture blend together. Thus, the snow may appear to be well lighted, but the human eye is unable to actually ***see*** the snow's features.



When illuminating snow, the objective is to create the greatest intensity within the visually perceivable range (violet, indigo, blue, green, yellow, orange, and red). This is referred to as "visually effective lumens (VEL)." Given snow's unique reflective properties and enormous terrain variability, the science of maximizing visual acuity requires a delicate balance of spectrum, intensity, and lighting angle.

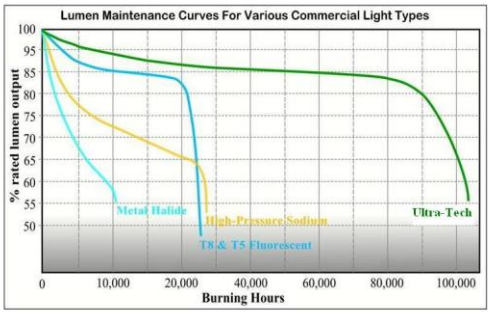
The Snow-Bright™ Difference!

4Instant on/instant off.
4No waiting to warm up
4No waiting to cool down

Snow-Bright™ lamps start with a "full spectrum" light using LUMENTEC® coatings that recreate visually effective lumens in the same proportions as sunlight. Using correct geometry, you can achieve optimal lighting with significant economies. For example, one 300W Snow-Bright™ slope fixture can produce 20% to 40% more visually effective lumens than a 1,000W HID lamp, saving 85% in electricity including ballast overhead. With the right strategic lighting plan, you can reduce the electric load by up to 65% or even 85%.

Snow-Bright™ fixtures are less affected by temperature. Metal halide (MH) and HPS lighting is very hot and can lose 20% or more in luminosity in temperatures below freezing (32°F/0°C). On extremely cold nights, up to 40% of the light output of MH and HPS can be lost. Snow-Bright™ fixtures have an operating range from -40°F to 120°F with little impact upon output.

Snow-Bright™ gives you an exceptionally white light with color rendering index (CRI) exceeding .85. The high scotopic/photopic (S/P) ratio improves visual acuity and color rendition, reducing eye fatigue while improving perception. Equally important, Snow-Bright™ bulbs ***do not use electrodes***. A magnet stimulates the high energy circulation of electrons to produce light. This gives Snow-Bright fixtures an extraordinary **100,000 hour life-cycle rating; the equivalent of 11 years running 24 hours a day, 365 days per year.** Since night skiing is generally less than four hours an evening for approximately 4 to 6 months per year, Snow-Bright lamps can last more than half a century! This translates into more than ***600% in maintenance savings*** compared with conventional ski slope lighting.



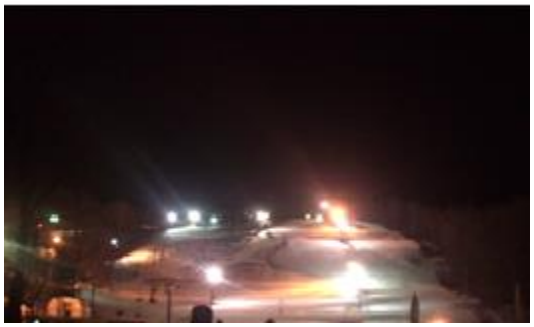
Snow-Bright™ fixtures maintain more than 90% of their luminosity over their life-cycle. When compared with other lighting, Snow-Bright™ offers unparalleled performance. Consider that conventional MH can lose 25% of their light output within the first season! HPS is not significantly better. LED lighting lacks the photometric properties required for slope lighting. The choice is clear. Nothing beats MIL, and no other MIL comes close to Snow-Bright™ fixtures.

Technical Considerations for Minimizing "Light Pollution"

Light pollution has become a major environmental consideration for ski slope managers as we learn more about the adverse effects of artificial light on nocturnal wildlife. In addition, brightly lit slopes can be disturbing to residential areas such as slope-side housing and neighboring villages. In the natural world, the brightest light we experience at night is the full moon which is

approximately 0.2 lux at sea level. Even under such extraordinarily low light, the healthy human eye can clearly resolve objects and features. However, moonlight is not sufficient in intensity or spectrum to provide color perception or to resolve writing on the page of a book. Although it is impossible to read a book under moonlight, cross-country skiers frequently venture out under a full moon for an evening trek. This raises the important question, "How much light do you *really* need for effective slope illumination?"

Traditionally, ski facility managers have believed that the more light you can have on the slope, the better the experience. In reality, more light can create more visual problems than it may solve. Equally important, increasing environmental considerations challenge the traditional view of slope lighting. Responsible night lighting must balance external impacts against desired objectives. Lighting a ski slope as you would a sports arena may seem like a good idea, but it is not cost effective and can have serious negative effects upon nocturnal wildlife and neighbors. In addition, excessive night lighting may actually be dangerous if it acts as a visual distraction for pedestrians and motorists.



High intensity lighting creates light pollution. Slopes stand out against surrounding areas. Mixing orange high pressure sodium decreases visual acuity. Terrain appears flat. High glare can be dangerous for customers. Snow-Bright™ provides maximum visual acuity with less light intensity and less energy.

The "snow-specific" spectrum of Snow-Bright™ lamps provides the ability to lower overall lumen levels by concentrating light within the visual range of the human eye. This is particularly important when considering sensitivities of night predator birds like owls which have fixed frontal eyes and rely upon vision derived from rods rather than cones. This vision is monochromatic since rods do not resolve color. A very bright slope illuminated by 1000W or greater metal halide or high pressure sodium may act like oncoming headlights that can obscure an owl's forward vision. High intensity lamps like metal halide and sodium disturb the natural cycle of insects and have been known to interrupt hibernation in some mammals.

When compared side-by-side, the Snow-Bright™ difference becomes obvious. Metal halide and LED lamps produce a very bright white glare upon the snow. Skiers are effectively blinded by the contrast between the reflected light and their forward vision. Terrain appears "flat" and without contrast much the way an overcast day causes "flat light." At the same time, the entire surrounding area is subject to the intense reflected glare from the slope… **light is wasted**. Orange light from sodium lamps is concentrated in a narrow visible spectrum, making colors muted and indistinguishable. Snow contour is lost and moguls can appear flat. Snow-Bright™ lighting can be configured to provide a more uniform light across the snow without the intense "spotting" produced by conventional generic outdoor lighting and LEDs.

Ideally, slope lighting should blend into the environment rather than contrast against it. Snow-Bright™ lamps are designed to focus light onto the snow where it is needed rather than into the sky where it causes light pollution. In many cases, local ordinances actually foreclose night lighting. In Europe, lumen restrictions are as low as "5 x moonlight;" the equivalent of just 1.0 lux. Some communities require "full cut-off" lamps that prevent extraneous light from

"bleeding" away from the source. All of these issues can be addressed using Snow-Bright™ lighting.

Snow-Bright™ lamps come in a variety of configurations that can produce the correct reflective pattern for particular terrain. Consider the unique aspects of a slope's vertical geometry in comparison with roads and fields. With few exceptions, the maximum grade (incline) for a U.S. road is only 8% which is less than 10°. Fields are level at 0° pitch. By comparison, a slalom ski course can exhibit more than a 30° pitch. Thus, the typical high intensity lamps used to light roads and fields do not lend themselves to efficiently illuminating ski slopes. This is because the reflective pattern and "throw" is designed for "down-lighting." Yet, virtually all ski areas have been forced to use standard fixtures because that was all that was available. Some areas have resorted to high-mast configurations that are designed for roadways and fields. These lights can be mounted on poles ranging from 60-feet to more than 100-feet high. They produce an enormous amount of extraneous light that can be seen for miles.

For the first time, ski facility managers can actually design a lighting plan that matches the particular application. From a gentle incline in a beginner area to a race course or half-pipe… Snow-Bright™ lighting will maximize the resolution on the snow while minimizing light pollution. Intense blotches of round light are replaced with smooth spreads of uniform and non-obtrusive usable slope illumination.

Snow-Bright™ round wide-area flood uses a tubular circular light source for dispersion across the slope. Skiers and riders can actually look directly at a Snow-Bright™ fixture without being blinded.

A typical metal halide bulb offers a single intense point of light.

In order to have a metal halide or sodium fixture spread its light along an angular slope surface, the lamps must be directed along the slope's vertical. This means the light will be pointing downhill, putting light into the eyes of those below the beam. Pointing lamps uphill shines light directly into the eyes of descending skiers. The geometry of a conventional high intensity lamp uses a single concentrated source that is dispersed from a reflector. Snow-Bright™ fixtures use elongated bulbs that disperse light in accordance with slope angles and contours. A Snow-Bright™ 300W round flood lamp can frequently cover more area than a 1,000W sodium fixture. This is because the reflector works with the bulb geometry to spread light over a wider surface area. This means the lamp can be directed more toward the snow surface and less into the sky. The result is better performance without excessive light pollution.

Economies of Scale

When considering a new night-lighting project, infrastructure and economies play as important a role as light selection. Since Snow-Bright™ fixtures are specifically designed for mountain terrain, they are wind resistant, moisture resistant, light weight, and multi-directional. This usually means mounting pole heights can be lowered to 20 or 30 feet for most projects. Multiple

light-weight lamps can be mounted on a single pole. The "throw" of the light can reduce the number of required poles and associated electrical infrastructure. Economies of scale come into play when reducing pole counts, wiring, power, mounting casings, and engineering.

In most cases, two 300W Snow-Bright™ floods can perform better than a single 1,500W metal halide lamp, yielding over 50% in operational savings while generating better lighting performance. Ski facility managers who want to minimize light pollution can actually use lower wattage ratios while maintaining safe and comfortable night skiing or tubing experiences.

Environmentally Friendly, Too!

Magnetic induction lights are totally recyclable. This is because bulbs do not use dispersed mercury. Instead, MIL has a solid mercury amalgam "slug" that can be clipped from the lamp for recycling. The remaining glass is disposable like any other glass container. Even the magnetic rings can be recycled as metal, or returned to Tesla Induction Lighting Co.™ for reprocessing. Mercury lamps, CFLs, HID, and even LED lighting must be handled as "hazardous waste" which requires Class 3 disposal. Fees for disposing of hazardous waste are being imposed in many districts and can amount to large overheads.

In our new era of "sustainability," Snow-Bright™ addresses all the most important goals:

- Extraordinary life-cycle
- Fully recyclable
- Low energy consumption

With fewer and fewer landfills for hazardous waste, disposal is an important consideration. Although the need to dispose of MIL bulbs is not likely to occur for at least a decade, the fact that Snow-Bright bulbs are not likely to carry a disposal fee is part of creating a "sustainable" plan for the future.

Snow-Bright™ lighting addresses carbon footprint issues as well. When you use Snow-Bright™ lamps, you are lowering your lighting-related carbon footprint by as much as 60% to 80%. This, too, is an important aspect of maintaining a sustainable business that is more "Green" and more efficient. For companies that have issued carbon footprint guidelines, retrofitting to Snow-Bright™ lights can help meet carbon reduction goals.

We invite you to consider the full line of Snow-Bright™ lighting and urge you to call your representative today to set up an evaluation and lighting audit. See what Snow-Bright™ can do to improve your bottom line while solving all your outdoor lighting needs.

2 - Snow-Bright™ versus LED

Snow-Bright™ lighting is the ***only technology*** specifically designed to illuminate snow while reducing energy consumption by 75% to 85% over conventional metal halide and sodium fixtures. However, many ski area managers are considering using generic LED lighting for

slopes, tubing parks, and other snow recreation venues. There is ***no LED technology specifically designed to match the reflective properties of snow.*** An LED that is measured to emit 30,000 lumens at a color temperature of 5,000K will be <u>less effective</u> than a Snow-Bright™ lamp at 10,000 lumens. Moreover, the higher intensity of LED and the blue spectral bias will actually flatten the snow's appearance while creating a high glare level. LEDs are inherently ***more expensive*** and do not offer the same level of performance. Snow-Bright™ lighting has a 100,000 hour lifecycle rating which is more than double the best LEDs.

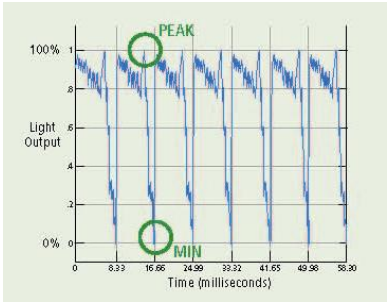
FACTS YOU SHOULD KNOW –

1) Cold Temperature Performance

Snow-Bright™ bulbs and ballasts are designed to operate at the same levels down to negative 40°F and generate enough heat to shed snow and ice. LEDs do not generate heat at the light source and can become snow-bound. This problem has plagued LED traffic lights that become obscured by snow accumulation. Many ski area managers are uncomfortably surprised when their slope lighting ***fails to work properly in snow and ice.***

2) Flicker

High speed skiing under LED lighting ***can be dangerous due to flicker*** (strobe) between 60 and 120 cycles per second. High frequency flicker is associated with significant health hazards including strobe epilepsy, migraine headaches, nausea, impaired visual acuity, poor concentration, sleep disorders, mood swings, eye strain, and a lack of eye/hand coordination. The problem is serious enough for the IEEE Standards Working Group, IEEE PAR1789, to take up "Recommending practices for modulating current in High Brightness LEDs for mitigating health risks to viewers."

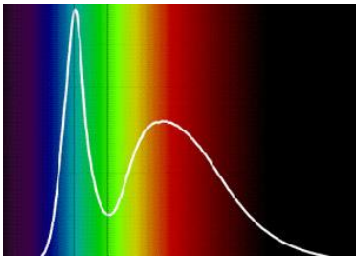


A skier traveling at 30mph covers 44 feet per second. A 60 cycle strobe will generally ***remove 0.7333 feet per second*** from a static object at a viewer's conscience acuity of 60 frames per second. At 45mph, the conversion is 66 feet per second causing a ***loss of 1 foot***. Unfortunately, most ski area managers and lighting engineers do not take this into consideration. LED salespeople never mention flicker. ***The results can literally be disastrous***. Even on an easy practice race course or beginner slope, LEDs can cause ***visual inaccuracies and accidents***.

Snow-Bright™ lights have absolutely <u>no flicker</u>. There is no strobe effect. None of the dangers associated with LEDs exist with Snow-Bright™ technology.

3) Glare/Intensity

The LED spectrum and intensity causes excessive glare off the snow surface. The lights may register well on a light meter and look great from the base area, but ***they create significant visual inaccuracies*** that can lead to discomfort and eye fatigue as well as misjudgment on



distance, contours, and terrain. ***LEDs cannot be pointed uphill, making lighting plans difficult.***

LEDs have high localized intensity that has fooled many lighting specialists into believing they can use fewer LEDs to achieve the same result as metal halide and sodium. ***This is <u>wrong</u> and can lead to very big mistakes in lighting design and implementation.***

Only Snow-Bright™ lighting refracts <u>through the snow</u> to reduce intensity and glare while increasing visually acuity. A 300-watt Snow-Bright™ fixture will easily replace a 1,000-watt metal halide and 1,200-watt sodium. When using LEDs for the same substitution, a 30% <u>increase</u> in intensity (foot candles on the ground) is required.

4) Eye Damage

In the May 13, 2013 edition of *Live Science*, Assistant Editor Marc Lallanilla reported on the research of Dr. Celia Sánchez-Ramos of Complutense University (Madrid, Spain) regarding ***<u>potential dangers</u> of directly viewing unshielded LED lighting***. Simply put, the intense concentrated light of LEDs can permanently damage the retina, causing blind spots and color de-sensitivity. Ski area managers who use LED lighting are open to ***<u>legal liability</u> for eye damage claims*** since ski lighting is likely to be directly viewable.

Don't Make a Mistake!

Snow Bright™ was developed to address snow area lighting. It is the most cost effective and safest lighting you can buy for your applications. Find out more.

3 –Tax Law and the Impacts

Under new tax provisions capital equipment can be **100% expensed** in the first year instead of deducted over several years. With the decrease in business tax rates from 35% to 21%, many ski areas are already bringing an extra (newly found) 14% to the bottom line. In combination with utility incentives, state and federal grants, and energy efficiency grants, retrofitting with Snow-Bright™ technology can yield a profit within your first season. If you run a for-profit operation, there's never been a better tax environment for upgrading to Snow-Bright™ snow venue lighting.

4 – 5% *Cash*-Back Adaptive Sports and Non-Profit Grant

A **5% *cash-back*** grant is still available for 2018 for areas that have affiliated Adaptive Sports Programs (handicapped and disabled), or run non-profit organizations. A simple 2-page grant is all it takes to get on the program. Here's how it works… You must file your application *before you order and pay.* Once you're approved, you place your order. The grant is *not an offset* against you bill. Once your invoice is fully paid, you receive a check back equal to 5% of your order, exclusive of any shipping or tax. It makes a difference.

Utility Incentives –

Most electric utilities are still offering incentives for energy efficiency. Since Snow-Bright™ can save more than 85% of your operating electricity over using conventional metal halide or high pressure sodium lighting, you can qualify for major incentive rebates… more than 50% in some cases!

Customers from NGrid, Excel Energy, Rocky Mountain Power, Orange & Rockland Power, Efficiency Vermont, NYSERDA, Efficiency Maine, PSE&G, and more have impressive rebates that may apply to your entire installation costs; lamps, poles, wiring, and more.

U.S.D.A. Rural Development Grants (REAP) –

Many ski areas qualify for REAP Grants from the U.S. Department of Agriculture. These grants are mutually exclusive of any other grants or incentives. Applications are available through the U.S.D.A. web site… or, simply look up REAP Grants.

Parks Grants –

Federal, state, and even local municipalities offer grants for "park improvements." In one case, a ski area received a grant for "trail lighting improvement" under a local program for enhancing trails. All they needed was to submit their trail map and the lighting upgrade proposal. Keep in mind that the Federal agency is The National Parks Service. State "Park Service" grants usually include trail safety, maintenance, and upgrades. Dark Sky compliance plays a major role in applying for many Park Service grants. Towns often have programs for energy savings and Dark Sky compliance. Often grants are mutually exclusive, meaning that receiving a Federal Grant does not exclude receiving a state or local grant.

4 – Continued…

National Forest Service Grants –

The National Forest Service is another Federal agency *separate from* the National Parks Service. If your winter recreation area is on or near National Forest Service land, you may be eligible for urban and/or community "forestry grants." Never leave a grant opportunity on the table. It never hurts to ask!

Corporate and Private Grants –

There are literally thousands of private sponsorships for recreational area improvements that include corporate, personal, or even public/private programs. Do you run a ski school? Do you provide lessons at night? Do you want to provide nighttime lessons and programs? You could qualify for education grants. Environmental groups may provide funding to become Dark Sky Compliant.

5 – *Now* is the Right Time to Upgrade Lighting (or Add night lighting)

There is no reason to waste money using old metal halide or high pressure sodium fixtures when you can easily upgrade to Snow-Bright™ technology. Reductions in maintenance of 600% combined with up to 90% less "in-rush current" can translate into payback within your first season! Snow-Bright™ illumination passes most Dark Sky guidelines and is safer than LEDs. So, what are you waiting for? And, consider the business proposition, too.

Have you been following the Kottkee Reports? We have all this information about attendance and demographics, but who is doing the marketing research? How do you capture Millennials and their upcoming children? How do keep Baby Boomers engaged? What's the best way to maximize mountain resources? What are the issues with nighttime events?

Number 1 – Visual acuity is the most important issue for skiers and riders. They want to feel comfortable and safe. That means this is the Number 1 goal for you. Snow-Bright™ lighting is the only illumination that can provide visual clarity with the least amount of glare, light, and energy. In fact, Snow-Bright™ lighting is the *only technology* that can be safely pointed *uphill.*

Number 2 – Sustainability is important for *your bottom line;* but it's also a key concern for customers. Concerns about climate change, saving energy, reducing carbon emissions, and light pollution are at the top of the list for environmentally conscience people. Surveys show a majority of skiers and riders want to know they are attending a responsibly run area.

Number 3 – Customers are *not happy* when prime slopes are taken out of service for race training or events. They pay good money and want full access. So, if your race or freestyle program takes out areas during prime time, you're not maximizing utility. Night programs offload traffic and smooth out the utilization curve. You gain more goodwill from ticket holders while increasing potential top line revenue.

6 – New Revenue Models

It's 4:30pm and busses are just beginning to arrive for "Singles Night" at the mountain. For this carefully choreographed event, lift lines are set up for the ladies to enter from the right side and the gents come in from the left. The "Singles Package" includes lift ticket, a drink ticket, and ten cards with the customer's name and contact information. This can even be enhanced with a quick digital photo. The object is to meet on the lift, ski down, and determine compatibility; a form of "ski dating."

Obviously, it is not feasible to run such a singles event during the day when general customers dominate the mountain. A nighttime event… even on a weekend presents a more flexible opportunity. Match-making has grown into a multi-billion dollar industry with well known internet names including eHarmony.com, Match.com, ChristianMingle.com, Zoosk.com, OkCupid.com, Jdate.com, OurTime.com… just to name a few. Singles events are now the number one social focus because Millennials represent the largest youth population in human history. At the same time, many Baby Boomers are seeking new companionship as they near senior citizenship while GenX may have a second relationship in mind. Opportunities for ski areas are enormous and hardly touched as of the 2017/18 season.

Large paying sponsors for singles events range from beverages and alcohol to cars and even real estate. Equipment suppliers and clothing manufacturers are interested in selling to this demographic. Event planners are ready to work with ski areas to create synergistic packages that can accelerate in popularity. In fact, some popular dating sites sponsor events.

Aside from obvious benefits, singles events can drive repeat business and increase new skier participation. Revenue can pour in from every corner of operations; from lessons to food service to accommodations. If properly executed, targeting the singles market can have a huge impact on the bottom line. The singles demographic can be exceptionally profitable and it is a population that can be cultivated from initial dating through marriage and family development.

Ski area managers need to ask the question, "Am I maximizing the effectiveness of nighttime programming?" Too often, we rely upon what appears to be tried and true without advancing revenue generating models. The singles demographic packs a huge punch because it takes advantage of those who already ski or ride while also providing an opportunity to recruit new participants. Focus groups encompassing young singles reflected on the concept of "Meet & Learn" ski lessons. Like the boy/girl lift line, beginner lessons would have dual objectives; 1) to meet someone who is also learning the sport and 2) to learn the sport.

Adjunct programs can include:

- Introduction to ski and snowboard equipment
- How to get the complete outfit
- Understanding lift tickets and passes
- Safety programs
- Après Ski (if applicable)

- Lodging (if applicable)
- Summer activities (if available)

Such presentations provide additional revenue streams from equipment sales, season rentals, lift ticket or pass packages, lesson packages, lodging, meals, and entertainment. The objective is to lock in new customers and keep them coming back. Solid planning is essential and the nighttime experience needs to be optimized. All too often ideas are introduced as "let's give it a try." This can lead to a casual attempt without the proper staff in place or a follow-up plan. Are you capturing names, addresses, emails, Facebook, Instagram, Twitter, and other social media access to your potential new patrons? Are you tracking what they buy and how much they spend? Do you already have "thank you" emails and literature prepared? What is your next offer? How will you track customers as they age?

Infrastructure and service are also major considerations. Do you have sufficient age-appropriate ambassadors ready to help? Are there facial tissues conveniently available? Are activity breaks planned and manned? Trips to the retail shop? Food & beverage ready? Sponsors lined up? Do you have the best slope lighting available to make the experience safe and pleasant? What about incentive programs, contests, and prizes? What are you doing to continue the excitement after the initial visit?

Follow the demographics! There are four "current generations" ranging from Baby Boomers to Gen-X, Gen-Y, and Millennials. While there is some debate about the differentiation between Gen-Y and Millennials, from the ski industry perspective Millennials range from 18 to 27 years old while Gen-Y takes over from 27 to the trailing edge of Gen-X. A featured presentation at the National Ski Area Association Convention covered the emergence of the "Mosaic Population." The term describes how the U.S. has become a more integrated and homogenous demographic. Yet, the 2016 presidential election would have us believe otherwise, drawing sharp distinctions between race, income, religion, and political persuasion. Unfortunately, there was very little analysis provided to explain how the alleged Mosaic Population relates to the ski industry revenue model. The reality is that skiing is an expensive sport that begins as young as 3 years old and ends when physical capacity ebbs.

Millennials are critical to ski industry health. The majority who ski are children of reasonably affluent Baby Boomers. Within 2 to 5 years of marriage the average couple begins a family. We need to get everyone on skis as quickly as possible. Once we have a handle on the demographic profile for your particular ski area, the long term plan can coalesce.

It is 4:30pm and busses are just beginning to arrive for "Bump-O-Rama"… a nighttime mogul competition with sponsors and prizes. Freestyle skiing is rapidly growing in popularity with the greatest appeal in the 8 to 17 year old range. As of the last Olympics, moguls and half pipe registered spectacularly high viewer ratings and X-Games competitions are showcasing freestyle events to further increase exposure and appeal. Polartec® saw the potential when it sponsored the Big Air competition at Fenway Park Stadium in Boston,

Massachusetts. This nationally televised extravaganza involved constructing a huge multi-million dollar venue, trucking in snow, and packing the famous sports stadium with enthusiastic fans… ages 7 through 30!

Given the freestyle demographic, an entirely new marketing channel is accelerating that includes *Freeskier Magazine*, *Powder Magazine*, blogs, Twitter®, Instagram, and more. Twin-tip ski sales are accelerating to indicate that this is a frontier that can become as big as snowboarding. *Rapaport® Magazine* reports that 2012 teen spending (12 to 19 years old) topped $117 billion with more than 60% allocated to clothing and food. According to the Rand Youth Poll, *Seventeen Magazine*, Marketingvox, and Packaged Facts, the 2014 teen demographic represented 23,873,000 consumers spending $257.8 billion. This is not a market to be ignored.

Today's teens are more interested in extreme sports and personal or "individualized" activities. Skiing ranks high among such sports because it does not require team participation. Here's something most mountain shops are just learning. Young skiers who consider themselves freestyle practitioners outspend ski racers on clothing by more than 3-to-1. Racers outspend freestyle skiers on equipment (pairs of skis). However, the trend toward more equipment may be shifting toward freestyle as more participants buy center-mounts in addition to traditional mounts.

Who is after the freestyle demographic? Generally considered "adrenaline junkies," caffeine and "energy" beverages are large event sponsors. Equipment vendors and clothing/accessories manufacturers look for opportunities to address a specific concentration of freestyle customers. Nighttime mogul events bring the youth crowd along with parents. **Keep in mind that new slope lighting technology expands event scheduling without impacting daytime operations for the general skiing and riding public.**

The nighttime is increasingly becoming the right time to build top line performance that drops more to the bottom line because it is incremental. Unfortunately, many mountains fail to recognize the revenue potential because they rely upon old perceptions and data.
Although Sherman Poppen is credited with inventing snowboarding in 1965, the sport's popularity did not accelerate until the 1990s. Snowboarding was only introduced as an Olympic sport in 1998. Freestyle skiing was a demonstration sport at the 1988 Winter Olympics, becoming a medal event at the following games in 1992. Aerial events were added in 1994.

Much has been written about expanding the customer base, yet very little has been done to broaden the scope of the customer experience. Yes, all categories represent snow sports. Still, the audiences for racing, riding, freestyle, and cross-country have specific distinct needs. For each of these categories there are target participants from the youth market to the singles demographic to families and seniors. Every marketing study reveals the same fundamental requirement. The customer needs to feel as though he or she is the focus. Differentiation is distinction. "I am special..." Because the customer is a racer or a snow boarder or a recreational skier or a freestyle skier, marketing needs to be exact.

Why do new customers abandon the sport? The reason is summed up in a single word, "Fun." The experience needs to be sufficiently enjoyable to justify their financial and time commitment. Consider the concept of "**Operation Let's Ski**." This is a program that packages everything from mountain transportation to equipment to lessons to food & beverage to follow-up in a series

of evening programs. The terrain must be well groomed, **well lit**, and totally dedicated to the targeted consumer. The usual beginner offering is nothing more than a bundled package rather than a comprehensive program. Beginning customers stand on lines along with the general mountain population to get their skis, boots, poles, lift tickets, and lesson vouchers. How is that special?

Thus, a well-organized nighttime program provides the ideal venue for target marketing without adversely affecting general daytime customers. Incremental costs of nighttime operations are fractional compared with prospective revenues. **The only infrastructure requirement for effective nighttime events is lighting.** Areas that have existing lighting infrastructure can lower operating budgets by upgrading to energy-efficient technology that is specifically designed for illuminating snow. Areas that do not have lighting can justify the cost by evaluating their local markets and the availability of a potential nighttime customer base. This is true of local ski areas and destination resorts.

To be sure, grooming, snow-making, and scheduling come into play when adding or expanding nighttime programs and events. There may also be questions of resource allocation if lighting electrical circuits are shared with snow-making. The good news is that old 1,000-watt metal halide and sodium fixtures can be replaced with 300-watt fixtures like newly developed Snow-Bright™ lights that can cut lighting overheads by as much as 85%.

Marketing studies increasingly reveal the power of soliciting targets like singles, beginners, and even seniors. In every instance, customers prefer *focused attention* that forecloses mixing with the general daytime session. This is why nighttime hours are becoming more and more valuable. In addition, slope real estate is exclusively marketable to ski clubs, schools, and race teams. Using night scheduling maximizes slope utility while further supporting other revenue infrastructure that includes apparel, gear, food & beverage, and lodging. Indeed, the nighttime is the right time to add revenues to the top line.

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