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Design and Planning for Winter Sport Resorts

Spotlight: Paul Mathews, World's greatest ski resort designer



Paul Mathews

Since 1975 Paul Mathews has been designing ski resorts all over the world, numbering in the 400s by 2015. In the course of his work he has met many world leaders including the Prime Minister of the Russian Federation, President of Montenegro and the King of Spain, Juan Carlos, who offered to trade jobs with him for a winter season. "I declined saying that being a King was really too hard work; shaking hands and smiling at people you did not know and did not particularly care for," says Mathews. "To which he laughed and said my job was definitely better than his."

Having grown up skiing in Colorado, early in his career he designed a brand new resort on Vancouver Island, Mount Washington Ski Resort, which opened in 1978. With his academic background in forest ecology and landscape architecture, he was able to satisfy environmental

prerequisites at Mount Washington, preserving soil, water and forests while creating a viable resort. "It was critically acclaimed and it quickly became the second most visited ski resort in British Columbia," says Mathews. "Word of mouth led to jobs down in Washington, Idaho, Montana and Oregon."

In 1975 Mathews became Chairman of the initial Resort Municipality of Whistler Planning Commission with some oversight of the design of the new Whistler Village. He also commenced planning for Whistler Mountain ski area with responsibility for the extensive system of lifts and slopes. From his Whistler-based company, Ecosign, Mathews has gone on to design over 400 resorts in 38 countries, always with an eye to creating an Alpine flavor, looking at the resort as a holistic picture, and centralizing services. This is not an easy task, but Ecosign has researched how far the average skier will willingly walk around a resort and how much uphill walking they will tolerate. Moreover, Mathews does not allow stairs in an Ecosign resort, favoring ramps instead. Slope capacity is also taken into account as well as the difficulty level of runs and the carrying capacity of lifts. Ecosign is now able to use a software program detecting the best snow on the mountain and the warmest spots to construct restaurant patios.

With annual revenues around \$3 million, Ecosign remains a relatively small company with 20 employees. Their modus operandi is to identify terrain for the ski area and base village, bearing in mind climate – especially snowfall, sun and wind. Next they map out the best slopes and send in foresters and surveyors to fine-tune the layout to match the natural topography. Lifts, ski runs, and base areas are then penciled in. "A greenfield project could take four years," says Mathews. "An addition or renovation to an existing project could perhaps take just one year." The team travels extensively, dealing with different cultures, languages and international media and attends trade shows in America, Canada, Europe and China on an annual basis.

The name Ecosign is actually a contraction of 'ecological design', a new concept back in the 1970s. "Needless to say, I was very optimistic when I started Ecosign and frankly, would have been happy just working in British Columbia and Alberta in western Canada and indeed I did start with Whistler Mountain and Hemlock Valley in British Columbia," says Mathews. Forty years later, the forward-thinking company has become a worldwide reputable brand for international mountain resort design.

Mathews' innovative ideas were honed by negative experiences in his youth, skiing at badly executed ski areas in Washington State: "That led to interest later in life to undertake university studies in forest ecology and landscape architecture at the University of Washington in Seattle as the educational foundation needed to design good mountain resorts."

Ecosign was responsible for identifying possible sites in readiness for the 1988 Calgary Winter Olympics. This job was a big break for the company, launching it into Olympic limelight, and also giving employment to the staff for several years during an economic downturn. "We ended up identifying seventeen different potential areas, narrowed that down to approximately three and, finally, the Government of Alberta chose development of Nakiska at Mount Allan to host the Olympic Alpine Skiing events, the legacy training site and a commercially viable recreational ski area," Mathews explains. "Nakiska at Mount Allan filled all of those goals and was built for \$23 million and continues to host about 200,000 skier visits annually." This work led the Austrian lift company, Doppelmayr to recommend to Nippon Cable, Japan that

they hire 'Olympic Planners' which resulted in Ecosign's first job in Mount Zao, Japan in 1984. "We have since made plans for 34 areas in Japan including 13 new greenfield projects," Mathews adds.

Next followed work preparing master plans for Swiss resorts in Laax, Arosa and Savognin which in turn led to assignments in Austria, Spain and France. "The company's reputation and breadth of projects just grew organically, averaging about ten new projects per year plus of course taking care of a lot of existing customers," says Mathews.

A career coup was getting the contract in 2010 to re-design the ski lift system at Courchevel, one of France's ritziest resorts. The same year Mathews redesigned Canyons Resort in Park City, Utah. He was also responsible for choosing the location and designing the resort of Rosa Khutor as well as mapping out the competitive courses for the 2014 Sochi Winter Olympics. This job proved to be one of the most difficult of his career. It began as a project for the Russian Federation looking at tourism potential in the North Caucasus. "Once we identified Rosa Khutor and the Gazprom Laura projects we designed them for commercial ventures and then later we were asked if these resorts could host Olympic Winter Games," Mathews explains. "We put the snow cluster venue Master Plan together for the Russian Olympic Committee and I personally presented the venues to the International Olympic Committee in February 2007." When Sochi won the right to host the 2014 Olympic Winter Games in July 2007, Ecosign was immediately hired to re-design the Rosa Khutor Ski Area.

After this high profile endeavor, Ecosign was chosen to plan PyeongChang, Korea for the Free-style Skiing and Snowboarding venues for the 2018 Winter Olympics. The company also won an international competition to design the Snow Cluster competition venues for the Beijing bid to host the Olympic Winter Games in 2022.

During Mathews' long career he has noticed three important technological improvements which have assisted ski area planning. "Detachable grip chairlifts, snowmaking systems and winch cats for grooming ski slopes have very substantially changed how we design ski resorts," he explains. "In fact, I was considered the first 'early adopter' in seeing the tremendous potential benefits of detachable grip chairlifts and gondolas. Given rope speeds two to three times faster than conventional fixed grip lifts allows us to go two or three times longer distances for equivalent travel times and due to the carrier spacing allows us to go much higher verticals up to 800 or even 1,000 meters with existing wire rope construction methods. Winch cats allow grooming of steep slopes and snowmaking has improved tenfold from when I started in the business, in efficiency and quality and quantity of snow."

And the future for Ecosign when Mathews retires? There's a transition plan in place whereby several senior VPs will team up with Mathews' son and daughter to continue the lasting legacy.

Sources: Interview with Paul Mathews February 2015; Ebner (2010)

Design and planning

As mentioned already in this book, the ski industry has experienced considerable consolidation in the last few decades, particularly in North America, as larger operators buy up individual ski resorts or send small operators out of business. The industry is also highly vulnerable to climate change, which can have a devastating economic impact on ski resorts, requiring them to diversify their products and services and focus on alleviating the negative consequences of seasonality. If we factor in demographic shifts which are also dramatically affecting the ski industry landscape, then we have an environment of increasing uncertainty – where ski resort planning and development takes on a greater significance.

The key stages in the design of ski resorts are gaining development approval, analyzing site feasibility, deciding on design guidelines, and choosing development styles. Each of these is examined in turn.

Development approval

After the initial concept has been created, general design guidelines are established and the ski and base area capacities are determined. The ski runs will dictate the layout and size of the ski lift network, which will, in turn, influence the layout of the base area. Usually an environmental statement is then drafted, a profitability or pro-forma analysis made, and final design approval sought. This approval can sometimes take many years. The final approval for the Jumbo Glacier Resort in British Columbia, Canada, for example, completed an unprecedented 21-year long approval process that included four major public reviews of the proposal.

Many ski areas in North America are partially or completely located on public lands; over 90 per cent of ski areas in the Rocky Mountains and Pacific West, for example, operate under U.S. Forest Service permits. In addition to a use fee, ski areas are asked to prepare Master Development Plans (MDPs) that identify the existing and desired conditions for the ski area and the proposed improvements on the National Forest System lands within the permit boundary. These plans help the ski areas articulate their long-range vision for the use of public lands, and they help the Forest Service anticipate future use. A similar system is in place within the National Parks of Canada. Ski resorts will often employ specialist consultants to create such master plans, companies like International Alpine Design (IAD), Brent Harley & Associates (BHA), and Ecosign (profiled in this chapter).

Development approval is different in other parts of the world. In France, the Environmental Protection Act of 1976 requires an impact study to be conducted for any project where the costs exceed six million francs (updated to 12 million in 1993). In Germany, the political acceptability of the project is a major factor in determining whether or not it will be approved. Politics was clearly the driver at Sochi, home of the 2014 Winter Olympics. Russian President, Vladimir Putin pushed development of the mountain area near Sochi with two agendas: to prepare for the Olympics and to foster in Russia the kind of world-class ski area