The funicular and the crisis at CairnGorm Mountain

Description

Cracks in concrete have already resulted in reductions to services on CairnGorm

Beam problems could put future of funicular at risk

By Gavin Musgrove

SERIOUS concerns have been raised about the lifespan of the £20 million Cairngorm funicular following shock findings in a safety report on the attraction.

One of the concrete beams that carries the 2km of track has been found to have a worrying crack in it.

The damage is thought to have been caused by a defect in the manufacturing process and it is feared that all of the 94 pairs of beams could be affected by the same problem.

Inspectors first identified the problem in 2016 and it has since deteriorated.

But they have stressed there is no imminent danger of the beams collapsing.

However, safety measures have been put in place including reducing the number of passengers that the two carriages can carry, speed limits and weather conditions they can run in.

"The ongoing costs of maintenance will certainly have a significant impact on the hill business and its ability to be financially self sustaining.

Alan Brattey

One of the concrete beams that carries the 2km funicular track has been found to have a crack in it, with fears that all 94 pairs on the route could be affected.

Operator CairnGorm Mountain announced last week that there would be disruption to the funicular service but declined to comment further.

Since then the train has not operated at all with Natural Retreats warning online services could be intermittent because of new restrictions.

It has been out of action for most of the month.

But two reports by Laggan-based ADACS Structures dating from 2017 revealed after Freedom of Information requests and seen exclusively by the Strathy have discovered the true extent of the problems.

In them inspectors reveal concerns over the general condition of the funicular given its "relatively young age" having started operation in December 2001.

The concrete beam between the mid station and loop has a longitudinal crack in its top flange on both sides over the same length and height 3m above head level.

Detailed investigations were carried out in July last year by ADACS which said it is concerned that it is a "project wide problem with the beams... leading to cracking which will ultimately reduce the design life of the structure".

The second report after the probe states the observed crack is a "developing situation" and continues: "It is thought that the problem is a latent defect within the original fabrication of the beams, most likely due to a cold joint within the concrete pour.

"It was concluded that there is no imminent danger of the beams collapsing. If left the beams will continue to deteriorate and stability issues would arise."

Amongst the recommendations are that during this summer's shut down the affected beam should be repaired by removing the entire top flange.

It is not clear at this stage if this work has been carried out.

Inspectors said at the time of the report last summer the train could resume operating but under a reduced scope until remedial action was taken.

This included reducing by half the weight to 5000kg or 60 people that could be carried and passengers should be evenly distributed through the compartments. The speed limit of 4m/s should not be exceeded.

Alan Brattey, Save the Ciste campaign spokesman, said he was confident of the safety inspections put in place but said too much downtime is leading to a loss of customer confidence in the funicular.

He commented: "In the absence of any information from HIE or their tenant, we are being left to wonder if

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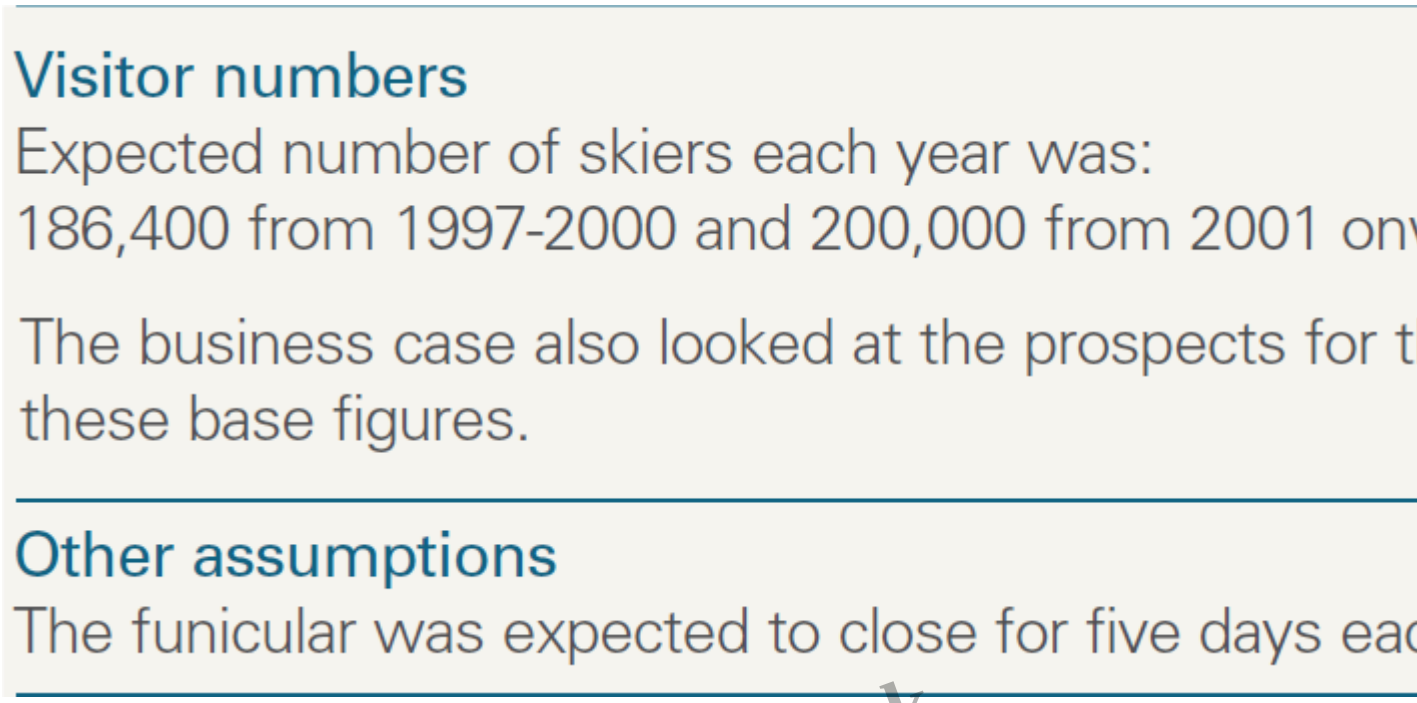
The Strathy yesterday gave prominent coverage to the funicular which has now not been functioning for over two weeks.

Alan Brattey here explains the background to the current crisis at Cairngorm and his comments as reported in the Strathy.

The CairnGorm Mountain Funicular Railway was constructed as a replacement for the ageing Carpark and White Lady Chairlifts, at a cost of £19.54m in public funding and EU funding. Add non-construction costs to that and Audit Scotland estimated (see here) that by the time of their report in 2009 over £23m of public funding had been invested in the funicular of which £19.4m of which came from Highlands and Islands Enterprise. The funicular came into service in 2001 and was forecast to eventually carry 200,000 skiers and 165,000 non-skiing passengers every year.



Source: Audit Scotland Report 2009

In the first 5 year of operation the non-skiing passenger numbers were good at: 180,000. 182,000. 177,226. 164,046 and 171,404. which is an average of 174,935. In the 5 year period up to 2015 the non-skiing numbers were: 117,313. 127,813. 129,311. 119,585 and 127,092 which is an average of 124,222. It's evident therefore that the funicular is now carrying over 50,000 non-skiing passengers fewer than it did in the first few years of its operation. That reduction of almost 30% in passenger numbers has come at a time when the Strathspey tourist business has been booming. It is a well known fact that tourists do not make repeat visits to CairnGorm Mountain, year after year, because there is nothing there to attract them to visit again and it's likely that tourist passenger numbers will fall further. Notably, the construction grant funding that came from the EU led directly to the imposition of a closed system that prevents tourists from exiting the Ptarmigan building. That is something that has a direct and constraining impact on the potential for repeat visits by summer tourists who cannot get out to walk on the mountain.

By contrast, snowsports customers will make repeat visits within each year and return year after year if they are provided with a good product and service.

The Funicular Railway has been beset by operational inefficiencies due to design flaws. During the summer, the uphill passengers are disembarked at the Ptarmigan station, at a point which has not enabled the downhill carriage to enter the Daylodge station. The downhill passengers have to wait until the uphill passengers have disembarked before their carriage can fully enter the station and they can get off. During winter operations the inefficiencies can be much more significant.

A fundamental design flaw – the midstation should be at where the two carriages meet

When passengers are embarking and disembarking at the mid-station then the Funicular has to make 2 stops because the uphill and downhill carriages are not simultaneously at the mid-station. That is something that occurs when there is no snow below mid station and snowsports customers cannot get up to the middle using surface ski lifts which are rendered inoperable due to the absence of snow. Similarly, those skiing/boarding downhill have to board the train at mid-station to get down to the Cas carpark. It's an inexplicable design flaw that very considerably reduces the Funicular carrying capacity leading to customer dissatisfaction because of the resultant queues when there are no other mechanized means of getting up the hill.

Photo credits google images

Additionally, the Funicular Track can become snowed in when drifts build up and cover the track as has happened on many occasions, most notably in 2010, 2014 & 2018.

 There are also days during most seasons when the Funicular tunnel mouth has been drifted in and up to 7m of snow has to be cleared, by hand. This has been a problem since the funicular was being constructed (see left). The labour costs involved since the Funicular went into service can only be guessed at but it's an operational inefficiency that leads to late opening and customer dissatisfaction as well as unproductive costs.

The depth of the drifts can be seen in this picture and it all has to be cleared by staff with shovels before the Funicular can open

Since the Funicular was commissioned in 2001 the other snowsports uplift infrastructure has been significantly reduced. The core lift policy led to the closure and ultimately the removal of the Fiacaill T-Bar, the White Lady T-Bar, the Aonach Poma and the Coire na Ciste & West Wall Chairlifts. This strategy reduced uplift capacity by over 40% and the collapsing snowsports market share indicates that it was a monumental failure. Notably, only Cairngorm of the 5 Scottish snowsports areas employed this strategy and only CairnGorm is failing. Catering capacity has also been reduced with the loss of the Sheiling & Coire na Ciste base station cafes.

It is notable that the Funicular represents the only uplift on the mountain by which customers can reach the Ptarmigan building during the summer and the only way up to that level in winter if there is no snow below mid station. Even when there is good snow lie, only the M1 Poma reaches the Ptarmigan from the Coire Cas side of the hill.

The long-term strategy that has focused on the Funicular to the detriment of other uplift has left the mountain business extremely vulnerable whenever the Funicular is inoperable. This situation has been highlighted during 2018 when it was closed throughout the month of May. Recent FOI requests have revealed that a consultant's' report [Funicular Railway Beam Report; 17 July 2017] had identified that a concrete beam was cracked and had to be replaced:

1.*2 During the annual inspection of the Funicular Railway concrete components one beam was noted to have a longitudinal crack in its top flange"* (from Introduction)

6.3 *During the summer 2018 shutdown, beam 51/R should be repaired by removing the entire top flange which will necessitate the removal of all the rail supports & re-cast using a suitable product* (from recommendations).

As a consequence of this a number of things happened:

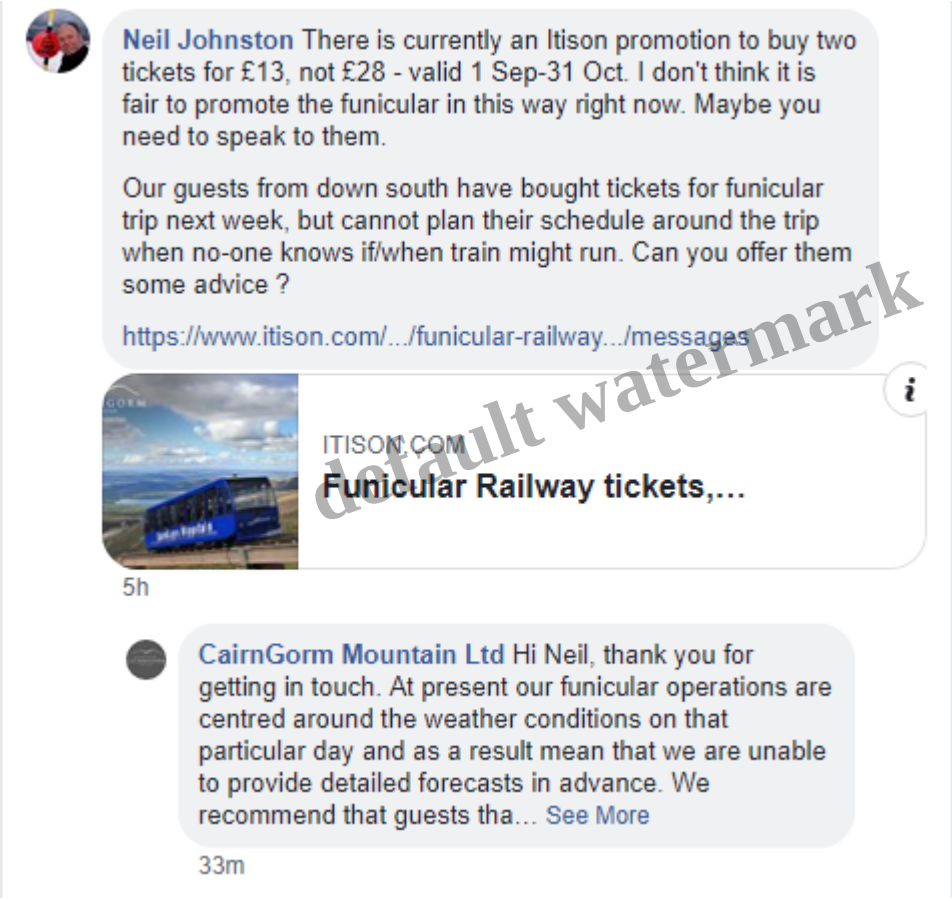
- scaffolding was erected to support the beam and another FOI has revealed this has so far cost HIE £4,255
- the Funicular had to be operated at no more than summer speed over last winter, and
- the consultants recommended that carriage capacity should be reduced to 60 from the design level of 120.

The maximum speed is 10m/sec but the reduced parameters required that it did not exceed 4m/sec…effectively reducing the uplift carrying capacity by more than half. If you add in the carriage capacity reduction from 120 to 60 then it can be seen that the Funicular was a very inefficient means of uplift, last winter.

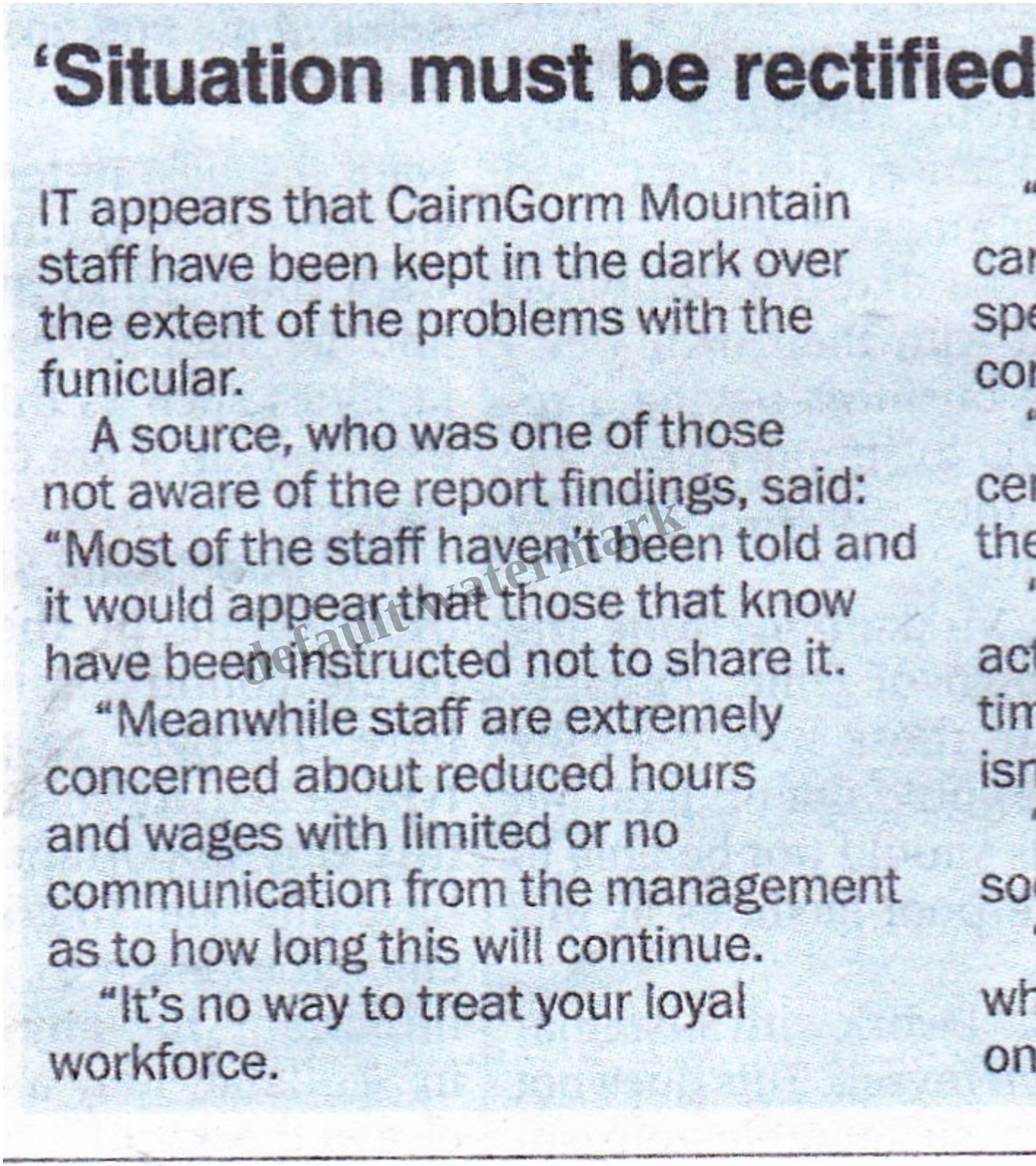
Recently the Funicular has once again been operating within reduced parameters as publicized by the operator, Natural Retreats:

''Following on from observations made during our annual Funicular Inspection, engineers who specialize in structures like ours have been brought in to carry out further inspection, analysis and investigation. To allow this scope of works to progress we have been instructed to restrict the parameters of our normal operating procedures. These restrictions involve us monitoring the weather, windspeed and carriage capacity & are likely, at times, to restrict the opening of the Funicular over the next few weeks''

In fact, during the week commencing Saturday 15 September the Funicular was closed on most days. The business interruption and consequential loss of revenue will be notable and the consequences for staff and customer satisfaction already apparent:



Customer satisfaction – recent screenshot from Cairngorm Mountain Facebook Page following the closure



'Situation must be rectified

IT appears that CairnGorm Mountain staff have been kept in the dark over the extent of the problems with the funicular.

A source, who was one of those not aware of the report findings, said: "Most of the staff haven't been told and it would appear that those that know have been instructed not to share it.

"Meanwhile staff are extremely concerned about reduced hours and wages with limited or no communication from the management as to how long this will continue.

"It's no way to treat your loyal workforce.

Extract from Strathy. The funicular was intended to provide more secure employment at Cairngorm

There is real concern now about the future reliable operability of the Funicular railway:

The Executive summary from the consultants' report had this to say:

1. *In broad terms, the writer was concerned by the general condition of the Funicular Railway, given its relatively young age.*
2. *There are numerous items of a maintenance nature that should be undertaken, it is likely that this will be required on an annual and ongoing basis.*
3. *There are a number of more substantial repairs. This should not be a recurrent problem.*
4. *There is concern that there is a project wide problem with the beams manifesting itself to a greater or lesser extent at different positions along the track. The problem manifests itself as excessive deflections, leading to cracking which will ultimately reduce the design life of the structure. At this stage it is not known if this is a design or a construction related problem and further detailed investigations would be required to identify the source of the problem.*

Customer confidence in the Funicular is being eroded by the frequency of closures and HIE would be well advised to make what they are doing about its condition publicly known. It's very clear that the maintenance costs, into the future, are likely to be significantly in excess of original forecasts.

The current problems would appear to be a direct consequence of HIE's flawed decision to commission the funicular. First HIE accepted a consultant's evaluation of the options to upgrade uplift at Cairngorm which made the funicular look far better than the other options of chairlifts or gondolas:

Exhibit 5

Outcome of the consultants' assessment of optic

The consultants assessed performance against six

	Option 1: Existing chairlift
Weather protection: protect skiers and other users from wind and rain	1
Performance in the wind: operates in a wide range of wind conditions	1
Accessibility: be accessible to most customers directly from the car park level	1
Flexibility: transport sufficient numbers of skiers to the upper slopes to cope with peak demand loads	1
Ride: incorporate the ride as part of the experience	1
Marketability: to be able to be marketed as a unique attraction, to maximise draw	1
Quality total	6
	[1]

From Audit Scotland Report 2009 – flexibility, performance etc, all were greatly overestimated while

Then, in Audit Scotland's words: ,

HIE agreed to changes to the project specification to reduce costs and stay within the budget of £14.6 million (Appendix 1). The combined bid from Morrisons offered overall savings of £1.4 million against its original cost. Morrisons reduced the cost of the civil engineering work by £500,000 by, for example, changing the tunnel design and excavation method. They identified further general savings of £300,000 and savings of £545,000 from the design of the bottom and top stations. Some elements, such as installing a goods lift in the bottom station and removing the existing chairlifts, were excluded from the tender, giving a saving of £100,000. Other elements were respecified, for example, Morrisons proposed using less expensive finishes internally and externally.

Questions now need to be answered about whether the current problems with the funicular stem from those attempts to reduce costs.

The folly of HIE's long term strategy at Cairngorm is now being fully exposed. If the Funicular cannot operate continuously and efficiently over the winter months, then there is insufficient uplift capacity to encourage snowsports customers to come to CairnGorm. The unnecessary destruction of the Coire na Ciste and West Wall Chairlifts led directly to customers abandoning CairnGorm in favour of other areas. In fact, the 4 lowest ever shares of the Scottish Snowsports market have come in the last 5 seasons with 2017/18, following the destruction of the chairlifts, being the worst ever, at less than 25% of the market. Snowsports customers have forsaken CairnGorm because they do not find the product/service to be acceptable and HIE's claims that the weather was responsible for the market share collapse in the 2017/18 season are risible. With the business now fully reliant on the Funicular there is nothing the operator can do when the train cannot operate.

HIE appears to have been hoping that the construction of a new Ptarmigan building will reverse the drop in visitor numbers which in turn might bring in sufficient people to pay for the maintenance of the funicular. The current problems at the funicular show that strategy won't work. HIE's proposed £4m loan to Natural Retreats to pay for the new Ptarmigan will need to be paid off first before any additional money becomes available for essential maintenance. The maintenance cannot wait. In addition the Ptarmigan Plan relies on projections of future summer visitor numbers which past history shows are unlikely to materialise while doing nothing to address the fundamental issue in terms of visitor numbers and income, which is how should CairnGorm Mountain cater for snowsports.

The ineptitude of HIE management of the Cairngorm Estate and the assets thereon, made worse by the appointment of Natural Retreats who it was claimed would bring new investment to the mountain, is now beyond critical. Government intervention is required to sort out this ongoing shambles, re-think what infrastructure is appropriate at Cairngorm and how it should be best managed and funded.

Category

1. Cairngorms

Tags

1. Freedom of Information
2. HIE

3. natural retreats
4. planning
5. Tourism

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