



December 2016

You would even say it glows? Rudolph's Nose is Losing Brightness

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You know Dasher and Dancer and Prancer and Vixen, but do you recall the most famous reindeer of all? We've all heard the refrain and we know that the answer is unquestionably Rudolph. Since the mid-twentieth century, this luminous-nosed ungulate has been guiding Santa's sleigh to help bring gifts to the masses.

But new research from Northern Policy Institute has uncovered that as Rudolph ages, his nose is becoming less bright. Using documents obtained from Santa's workshop and other secondary source material, this briefing note highlights how Rudolph's nose has lost 79% of its brightness over the last sixty years.

While this may not affect Santa's deliveries this coming holiday season, the data indicates that there will soon be a day when Rudolph's shining snout won't be able to light the way on Christmas Eve. As a result, Northern Policy Institute has put forward three recommendations to mitigate this trend.

- 1) Santa Claus should partner with one of Northern Ontario's colleges in order to develop an applied research project that will focus on creating an artificial lighting and harnessing system that can be affixed to Rudolph
- 2) In order to reduce disruptions with Christmas deliveries in Northern Ontario, it is suggested that the provincial government should seek to enhance the region's infrastructure, particularly when it comes to municipal lighting
- 3) Individuals celebrating Christmas should elevate their levels of holiday spirit. The reduction of vibrancy in Rudolph's nose may not be the result of any physical issues, therefore it is recommended that increased Christmas cheer could have a psychologically uplifting effect on the red-nosed reindeer

When Rudolph was born in the late 1930s, he had an extraordinarily bright nose (May, 1939). Researchers later discovered that a genetic mutation in utero was responsible for causing the variation. They believed that while Rudolph was developing in the womb, an unusually large arterial system began taking shape in his nasal cavity. By the time he was born, this network of arteries had grown so large that when an influx of highly oxygenated blood passed through his sinuses, his nose would shine like a lightbulb (McCallister, 1990).

While his parents were very supportive, Rudolph struggled to fit in with his peers. Reportedly subjected to bullying, all of the other reindeer used to laugh and call him names. All that changed, however, when he was recruited to

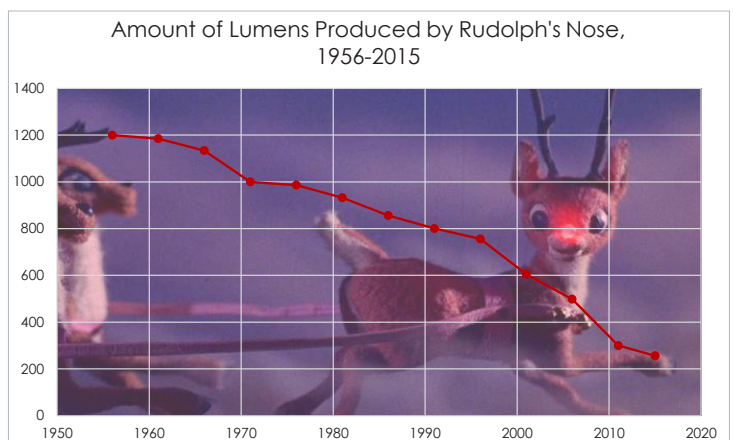
light Santa's way on Christmas Eve in 1946 (Bailey, 1946). Since then he has been the lead reindeer for the sleigh and has been integral to helping Santa Claus safely navigate his way around the world every December 24th.

But after more than 70 years of faithful service, there have been creeping doubts about Rudolph's ability to perform his duties. In 1989, a news report surfaced that faithful Christmas Eve observers noted that Santa's sleigh was less visible and, at times, "appeared to be off course" (Griswold, 1989). More recently, other outlets have also questioned whether Rudolph was still up to snuff (Hobbs, 2003).

To assess the viability of these claims, Northern Policy Institute conducted research at Santa's workshop in the North Pole. Claus began taking comprehensive diagnostics during and following each Christmas Eve run since 1956. As a result, the organization had a robust data set to work with to run our analysis.

NPI's findings support much of the skepticism surrounding Rudolph's illumination. As Figure 1 shows, Rudolph's nose has been steadily losing brightness over the last sixty years. Measured in lumens, the standard unit of luminous power, the chart shows that since 1956 Rudolph is producing 79% less lumens.

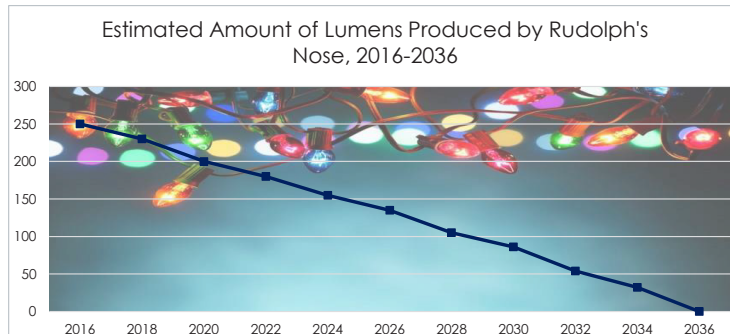
Figure 1



Source: Author's calculations based on datasets gleaned at Santa's workshop, 2016.

To put these numbers in perspective, a standard LED lamp produces 470 lumens. In 1956, Rudolph was emitting nearly three times this amount at peak performance. Last Christmas Eve, this number was down to 256 lumens of light, roughly the same power as a tactical flashlight. This is not only unsafe, but with this type of regression, we can expect that Rudolph's nose will no longer be producing light by the year 2036 (figure 2).

Figure 2



Source: Regression calculated by Northern Policy Institute data analyst Jose-Karl Noiseux

It is unclear what is causing this condition. It's likely that Rudolph's advanced age could be the culprit. We know that ordinary reindeer can live up to fifteen years in the wild, but we have very limited knowledge on the lifespan of magical North Pole reindeer. Rudolph is likely approaching 80 years, but we have little way of knowing what this age means in the context of his extremely rare subspecies, *Rangifer tarandus Santa Clausus*.

While possible, it is unlikely that the reduction in brightness is being caused by psychological issues. Given the significant regression that has been underway over the better part of the century, it is doubtful that Rudolph's troubles are the result of a change in attitude or mental condition. That being said, we should not rule out this possibility, even if it is highly unlikely.

Consequently, without knowing what the driving force behind this reduction is, we cannot implement measures to remedy it. Instead, we can put forth recommendations that will serve to mitigate the issue, while we work towards a long-term solution or more viable alternative.

Recommendations

Given the advanced drop-off in the brightness of Rudolph's nose, Santa Claus should approach one of Northern Ontario's colleges to devise an artificial lighting and harnessing system through that institution's applied research arm. . Applied research focuses on applying the latest knowledge and technologies towards solving a practical problem by creating or improving products and services. As a result, Santa's dilemma would fall right into this wheelhouse. While all of Northern Ontario's six colleges offer applied research services, Cambrian Innovates at Cambrian College is ideally placed to address Santa's challenge. The institution has been

consistently been ranked in the Top 50 among Canada's research colleges and is the only college from the North to crack the list (Research Infosource Inc., 2016). In the past, Cambrian has worked with industry partners like Rock Tech to develop a custom-built grizzly screen to be used as part of an automated rock breaking system for underground mining. Given Cambrian Innovates experience and track record, it would be an ideal candidate to create an artificial lighting system for the reindeer. However, given what is at stake, the better option might be for Santa Claus to work collaboratively with the applied research departments at Confederation, Northern, Boréal, Canadore, Sault, and Cambrian. This type of dynamic partnership would not only enhance the experience of students and faculty at these institutions across Northern Ontario, but could very well save Christmas.

If provincial and municipal governments want to help maintain the spirit of Christmas in Ontario, they will need to provide invest in infrastructure. Lighting needs to be a top priority if we hope to help safely guide Kris Kringle from house to house. This type of initiative would be a significant departure from the provincial government's current focus on transportation network infrastructure. In her throne speech in September 2016, the Premier announced funding for building and repairing roads and bridges across the province over the next five years. Of this, 2,400 km of highways will be built or repaved in Northern Ontario, while 200 bridges will be built, repaired or rebuilt in the region (CBC News, 2016). These notable infrastructure investments notwithstanding, the fact of the matter is that Santa Claus soars far above our roadways and bridges when flying from rooftop to rooftop. If government and communities want to go down in Christmas history, they will need to do more to help guide Santa's sleigh.

While it is unlikely that Rudolph's reduction in vibrancy is a psychological problem, we cannot rule out the possibility that Santa's most famous ungulate just needs his spirits lifted. Northern Policy recommends that, in light of Rudolph's recent sinus woes, we should all endeavor to be more positive this holiday season in the hope this could inspire Rudolph on his upcoming flight. In particular, it has been suggested that the best way to spread Christmas cheer is singing loud for all to hear.

*Policy is all around us, even on Christmas Eve!
We hope that you and your family have a
safe and joyous holiday season.*

***Happy holidays from
Northern Policy Institute!***





About the Author

Mike Commito

Mike Commito is the Applied Research Developer at Cambrian College. Before starting at Cambrian, he was at Northern Policy Institute where he served as the organization's Senior Policy Analyst and Research Coordinator.

References

- Bailey, George. 1946. "Christmas saved thanks to red-nosed reindeer." Chicago Tribune, 26 December, 1.
- Cambrian College. 2016. "Cambrian third in Canada for hiring student researchers." 4 November 2016. Available online at <http://cambriancollege.ca/news/2016/11/cambrian-hires-student-researchers/>
- CBC News. 2016. "Liberal throne speech promises hydro relief, infrastructure investment in the north." CBC News, September 12. Available online at <http://www.cbc.ca/news/canada/sudbury/throne-speech-for-ontarians-1.3758634>
- Griswold, Clark. 1989. "Is Rudolph losing his way?" Chicago Sun-Times, December 26, 1.
- Hobbs, Buddy. 2003. "Questions about Rudolph's nose worries Christmas patrons." New York Times, December 25, 2.
- May, Robert L. 1939. Rudolph the Red-Nosed Reindeer. Chicago: Maxton Publishers.
- McCallister, Kevin. 1990. "The Science Behind Rudolph's Red Nose." Nature 321 (December): 12-25.
- Research Infosource Inc. 2016. "Canada's Top 50 Research Colleges 2016." Available online at <http://www.researchinfosource.com/pdf/Top%2050%20Colleges%20List%20-%202016.pdf>

