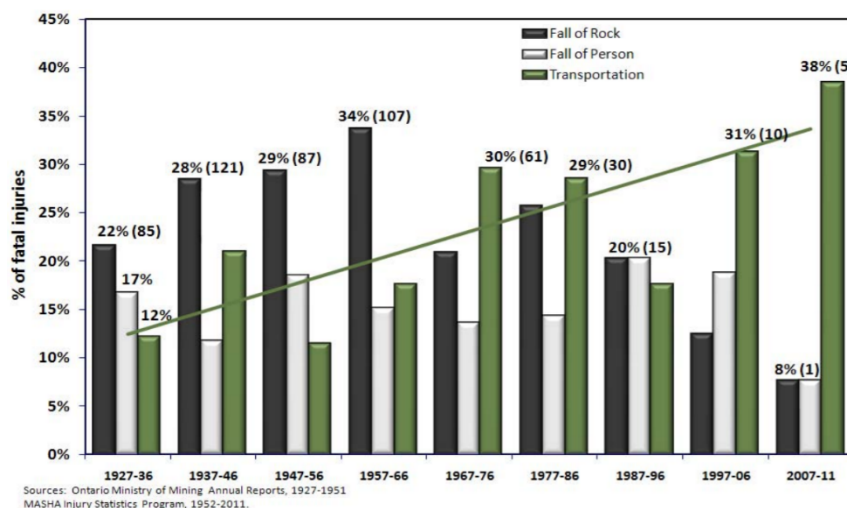


SYSTEMATIC GROUND SUPPORT – THE ONTARIO EXAMPLE

The pursuit of zero harm is at the top of the agenda for all members of the global mining community. A safe mine brings many benefits including higher productivity, reduced down time, fewer accidents, a stronger social license to operate, and a better overall reputation for a mining company. Mining companies strive for safety for their workers, and follow the principle that the most important thing to come out of a mine is the miners.

Ontario's mine safety record has improved dramatically over the last 50 years. According to the Ontario Ministry of Labour, the total fatalities have decreased from 152 in the 1970's to 45 in the period from 2000 to 2014, for reasons including increased safety training for workers and supervisors as well as regulatory and cultural changes throughout the industry. In the same time period, the number of fatalities caused by falls of ground, one of the top causes of total fatalities, decreased from 33 in the 1970's to 8 in 2000-2014. According to data from Workplace Safety North, this improvement outpaced the overall decline in total fatalities: from 1977-1986 falls of rock accounted for about 25% of fatalities, and they steadily decreased to 8% of total fatalities in 2007-2011. This decline is demonstrated in the graph below from Workplace Safety North.

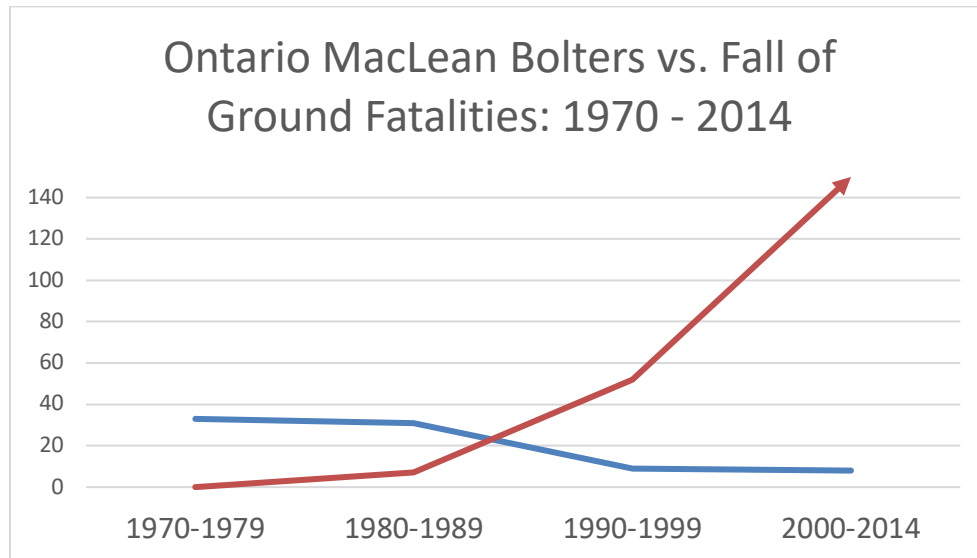
Top Three Types of Fatal Incidents 1927 to 2011



The cause for the large drop in fall-of-ground fatalities can be attributed to a variety of factors including increased regulation, better engineering and ground support practices, and the buildup of a stronger culture of safety in mines.

MacLean Engineering of Collingwood, Ontario, Canada is a strong proponent of systematic bolting, screening, and always working under supported ground, as is standard operating procedure in underground mining in Canada. Our signature product, the 975 Omnia Bolter, is an integral ground support tool used in many Canadian mines to install quality ground support productively while always

keeping operators under supported ground. The graph below shows the number of MacLean bolters in Ontario as well as the number of fatalities caused by falls of ground, and supports our contention that the MacLean bolter was one of the tools used by mines to achieve a significant increase in the safety of their operations over the past decades.



MacLean is proud to have played a role in Ontario’s transition to a safer mining jurisdiction. The “MacLean”, as it is known in its country of origin, remains a cornerstone of ground support installation in the Canadian underground mining industry and increasingly in other hard rock mining hubs around the world.

Other mining jurisdictions have had less success in preventing fall-of-ground fatalities. For example, one southern jurisdiction saw 870 fatalities from 2000 to 2014. Approximately 30% of these were due to falls of ground, which translates to approximately 260 fall-of-ground fatalities over that time period. Although there are many factors that contribute to the differences in fall-of-ground fatalities between mining regions, one of the significant factors is the ground support practices that are typically used. Compared to Ontario, it is much more common in some regions for miners to work in areas that have not been systematically bolted and screened. Other ground support methods such as timber sets and shotcrete are often used, but systematic bolting is not always done, and workers are not always under fully supported ground. One of the main functions of the MacLean bolter is to allow systematic bolting and screening to be done with ease, while preventing miners from ever being under unsupported ground. A key strength of the MacLean bolter is to be able to install a wide variety of rock bolt types, which allow engineers and miners to select and install the right type of ground support for the job. And the MacLean’s unique scissor bolter configuration puts miners in an optimal position with a clear line of sight to ensure quality installation, while remaining in a safe area on the machine’s deck.

Some mines in other jurisdictions have begun adopting more stringent ground support practices - with continued adoption of safe, semi-mechanized ground support installation, would these mining regions

achieve a dramatic decrease in fall-of-ground fatalities similar to the decrease Ontario experienced in the 1990s? Could the MacLean bolter again play a role in a decrease of fall-of-ground fatalities in a mining region? Time will tell, but we believe the Ontario experience could be replicated around the world with the appropriate training program and safety culture backdrop.

With the first MacLean bolter entering the market in 1984, and over 60 MacLean bolters operating in Ontario by the end of the 1990s, we contend that “the MacLean” has played an important role in Ontario’s improved fall-of-ground safety over these years. Some 500 bolters built to date means literally millions of bolts and screen installed in Canadian and international underground mining operations, to make the extraction of ore safer for miners. This legacy is one we continue to evolve with the advent of face bolting on the MacLean bolter and other product development efforts such as emissions-free battery electric drive units that will fuel the next wave of safety and productivity improvements in the global underground mining industry.

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