

# COLLISION PREVENTION – THE MOBILEYE SYSTEM

Dr. Yair Babad, FILAA<sup>1</sup>

Prevention is considered the best cure, and the driving experience of my wife and me is a testimony to that. We have driven for many years all over the world and in major metropolitan areas, and often participated in “almost accidents” with vehicles ahead of us. Few months ago we were exposed to a forward collision prevention system from Mobileye, and were surprised how fast it reduced the frequency of these “almost accidents”. The system changed our driving habits for the better, made us keep safe distances from the vehicles ahead of us and avoid unintended lane changes, and overall more alert drivers.

As a professional actuary who for many years was involved in car insurance, I was intrigued to learn whether our experience has evidential support. Yes, I read the Crash Avoidance Technology studies of the Highway Loss Data Institute<sup>2</sup>, including their latest June 2011 study. I studied the “Accident Prevention Systems for Lorries” final report of a large-scale field operational test of active driver assistance systems in the Netherlands<sup>3</sup>, the “Benefit-Cost Analysis of Onboard Safety Systems” 2009 study of the Federal Motor Carrier Safety Administration<sup>4</sup>, and other research reports. But I always was eager to verify the results for myself with real, significant, comparative data.

The opportunity for such a comparative data just presented itself, with data regarding a group of very large commercial truck fleets. The fleets consisted of almost 5,000 trucks that drove nearly 1 billion miles over the period from December 2009 to June 2011. The fleets started using Mobileye in the third quarter of 2008, had nearly 2,000 Mobileye-equipped trucks in December 2009, and reached nearly 3,000 Mobileye-equipped trucks in June 2011. The data was statistically significant, with between 14 and 30 million miles driven each month by each of the two groups of trucks – those with the Mobileye system and those without it.

The fleets’ operators provided me with comparative monthly data for these 19 months. It included – separately for Mobileye-equipped trucks (“M trucks” in the sequel) and for trucks that were not so equipped (“NM trucks”) – the monthly mileage, the number of accidents, and the overall payments associated with these accidents. I disregarded information that was not available for all the fleets (such as US-DOT charged accidents information). Being effectively self-insured, these payments reflected the total cost to the fleets’ operators, as premiums were not involved.

To gauge the effectiveness of the forward collision prevention technology of Mobileye, I converted the monthly number of accidents and the monthly payments to values per million miles driven, thus eliminating the dependency on the number of vehicles involved and the mileage driven. M-Accidents (i.e., Accidents per million miles of Mobileye-equipped trucks), NM-Accidents, M-Payments and NM-Payments series, each for the 19 months. The results are presented below:

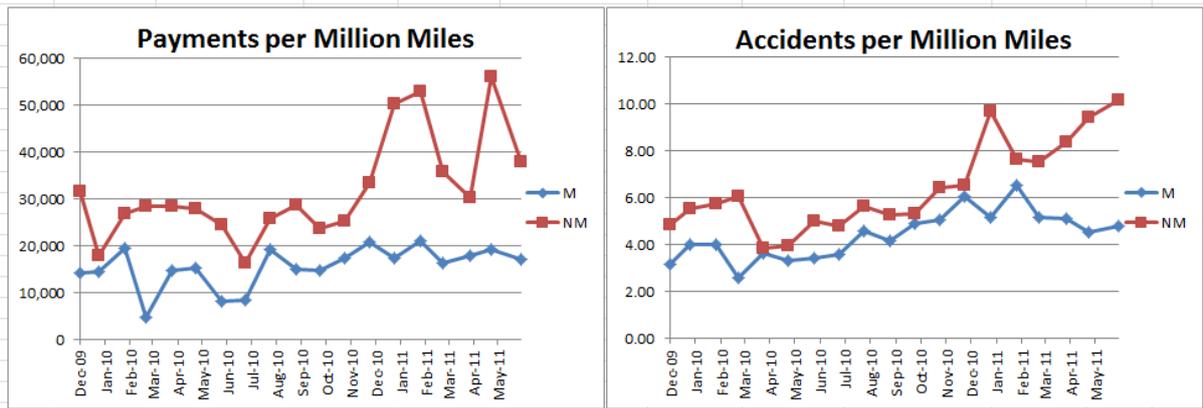
---

<sup>1</sup> Emeritus Professor, Information and Decision Sciences Dept., College of Business Administration, University of Illinois Chicago, [ybabad@uic.edu](mailto:ybabad@uic.edu), <http://tigger.uic.edu/~ybabad/res-frml.pdf>

<sup>2</sup> [http://www.iihs.org/research/topics/crash\\_avoidance.html](http://www.iihs.org/research/topics/crash_avoidance.html)

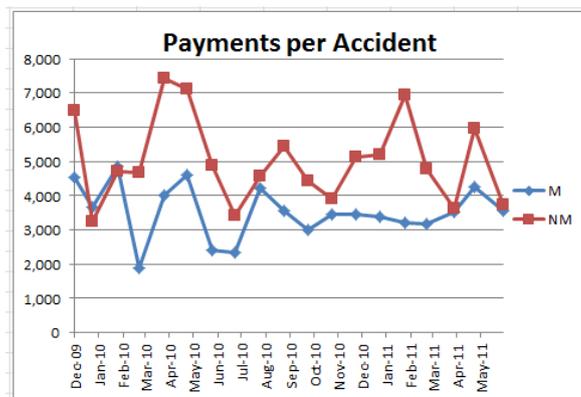
<sup>3</sup> <http://www.mobileye.com/de/consumer-products/independent-research#TNOFINAL>

<sup>4</sup> <http://www.fmcsa.dot.gov/facts-research/research-technology/tech/09-023-TB-Onboard-Safety-Systems-508.pdf>

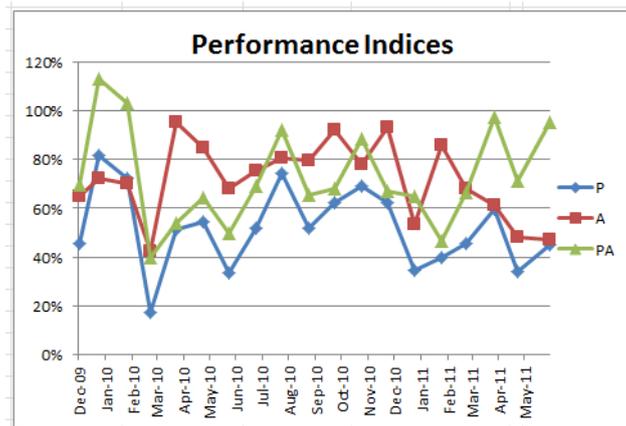


Both of these charts demonstrate the impressive effectiveness of the Mobileye Collision Prevention system. In each of the months of the study the M-series values were, and often significantly, below the values of the NM-series. Based on my experience, I associate these results with the increased alertness level of the M-drivers, due to the audio and visual warnings that the system gives them in real time, and the change in their driving patterns.

The next issue that intrigued me was whether the collision preventing system, in addition to reducing the frequency of accidents, also reduced the severity of the accidents. A surrogate measure for the severity is of course the payment per accident. I thus computed the corresponding two series M-PayAccdt and NM-PayAccdt for the two classes of vehicles. It is evident from the chart below that the system indeed reduces the severity of accidents. This is probably because the system provides the driver with early warning of the imminent accident, thus enabling taking some preventive measures that reduces the accident's severity.



To further gauge the level of effectiveness of the Mobileye system, I divided the monthly values of the M-series by the respective ones of the NM-series, thus getting Payments-Index ("P" in the chart below), Accidents-Index ("A"), and Payment-per-Accident-Index ("PA"). A value of 1 in any month for any of these indices implies that in this month the M-equipped and the NM equipped performed at the same level. On the other hand, the lower each of the indices is, the more pronounced is the impact of the collision prevention system and its effectiveness.



The values of all three indices, for all months (except for January-February 2010 for the PA index) are below 1, and the P index is for most of the time below the 60% level. These results emphasize the effectiveness of the Collision Preventing system.

This analysis, of real, significant amount of data, demonstrated to me that the collision prevention system is very effective, significantly reducing both the frequency and severity of car accidents. I can now allow myself to professionally encourage the use of a collision prevention system, and to try and convince all my acquaintances and those I love to use it for their protection.