



SmartSign

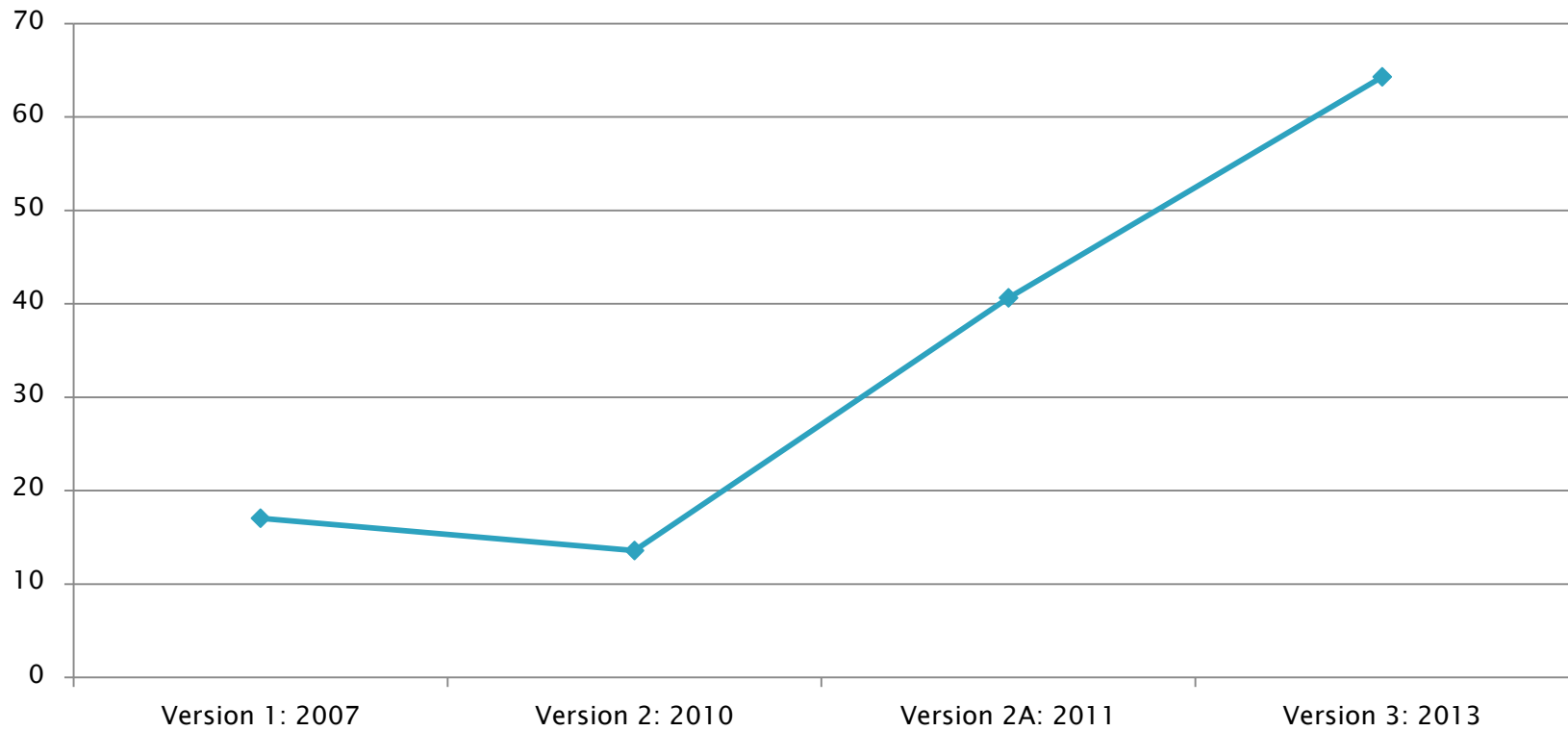
The electro-mechanical solution

Company Information

- ▶ 1997: TM Safety Signs incorporated
- ▶ 2001: SmartBlind HA Type Approved
- ▶ 2001: SmartSign HA Type Approved
- ▶ 2013: SmartFrame HA Type Approved
- ▶ 2013: In excess of 600 SmartBlinds in use
- ▶ 2013: 190 permanent SmartSigns in use
- ▶ 2013: 97 SmartSigns on order for M25
- ▶ 2010 to 2013: Turnover growth 105%
- ▶ 2013: Projected turnover 38% growth

6 Years of Experience

SmartSign Mean Time Between Failures (Years)

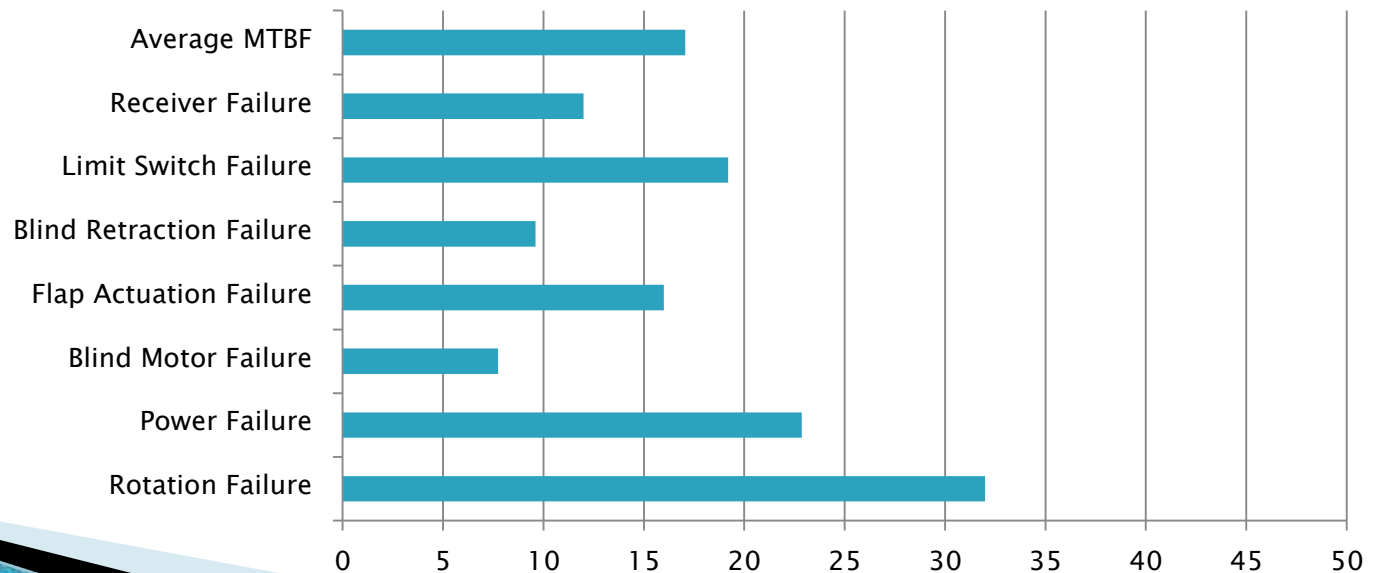


SmartSign Evolution



MTBF: 1 in 887

Mean Time Between Failures (Years)

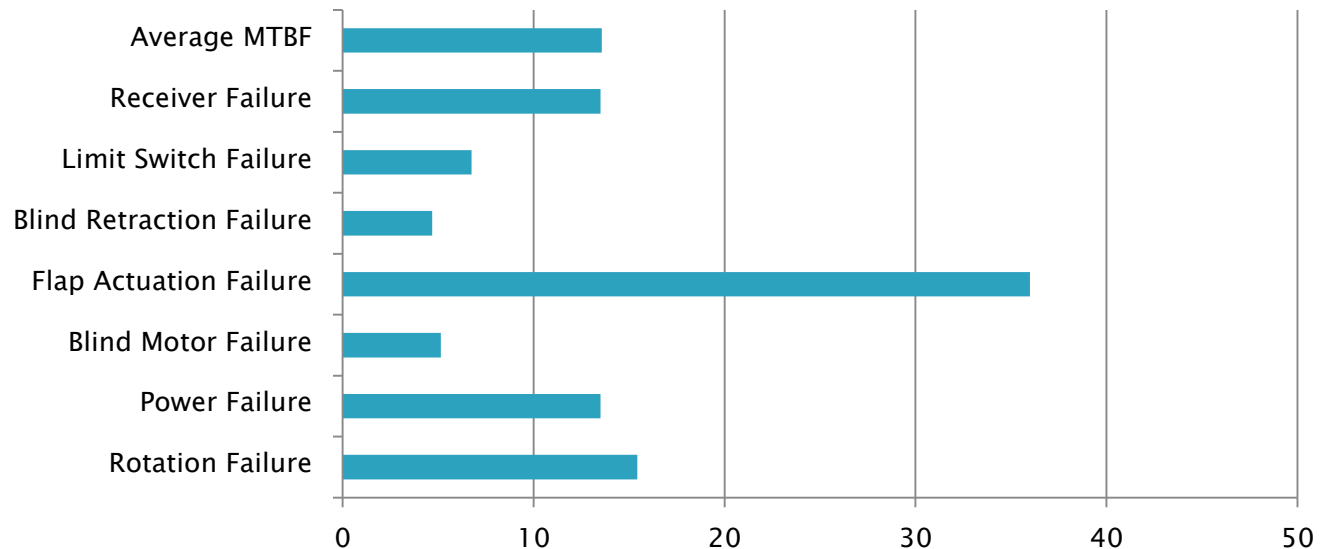


SmartSign Evolution



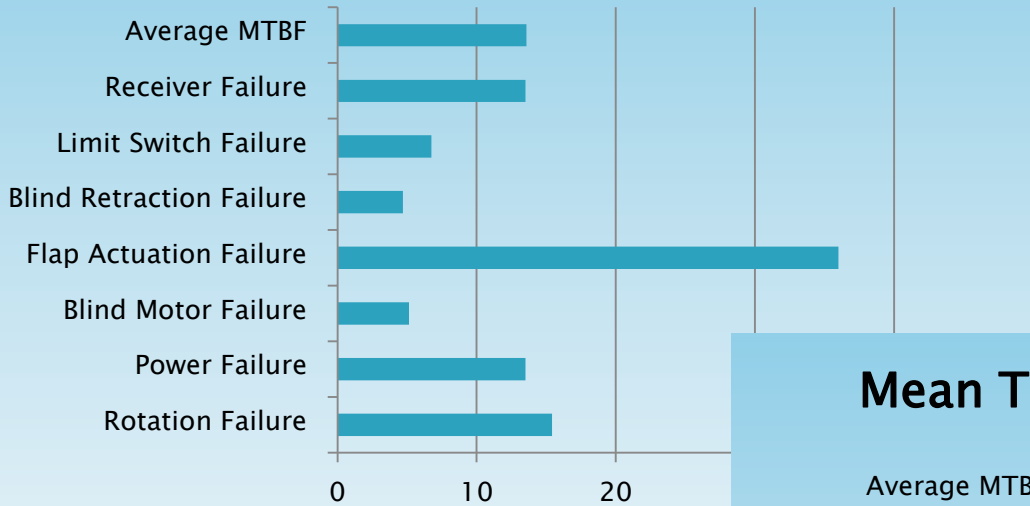
MTBF: 1 in 706

Mean Time Between Failures (Years)



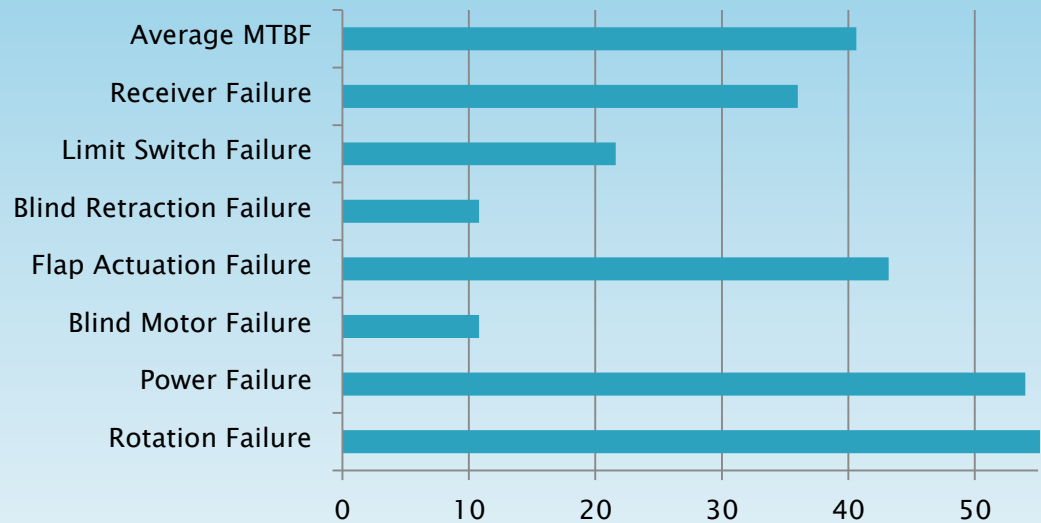
SmartSign Evolution

Mean Time Between Failures (Years)



MTBF: 1 in 2112

Mean Time Between Failures (Years)

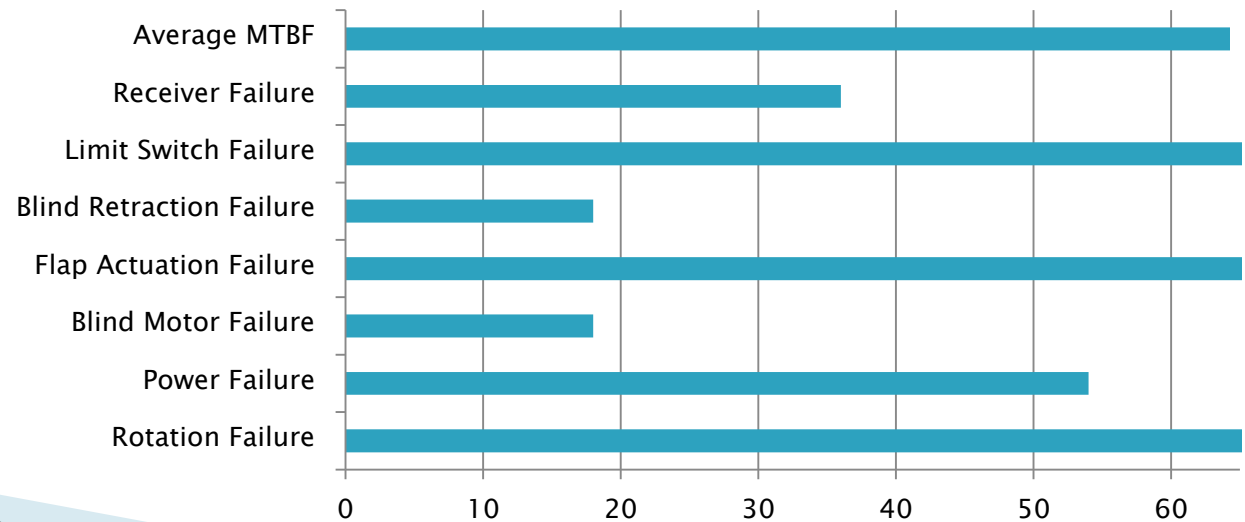


SmartSign NG



MTBF: 1 in 3343

Projected Mean Time Between Failures (Years)



Key System Features

- ▶ Safety
- ▶ Fail Safe
- ▶ Simplicity
- ▶ Power Requirements
- ▶ Compliance to Chapter 8
- ▶ Modular Design
- ▶ Proven Reliability
- ▶ Costs
- ▶ Design for Manufacture



Safety

- ▶ The travelling public are familiar with retro-reflective Chapter 8 style closure signs.
- ▶ SmartSigns have proven passive safe impact properties
- ▶ SmartSigns can be fitted with the SmartFrame rotation system to prevent carriageway obstruction when not in use.



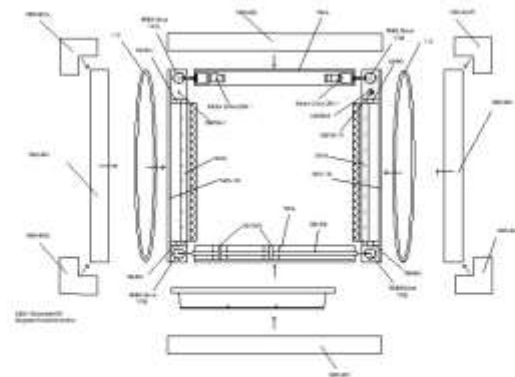
Fail Safe

- ▶ SmartSigns are retro-reflective
- ▶ SmartSigns are capable of being manually positioned and actuated, even with a total system failure.
- ▶ SmartSigns are simply standard road signs modified and improved.



Simplicity

- ▶ Our next generation signs have a 24% reduction in part count.
- ▶ Each component (whether it is a motor or an LED) offers a potential failure point.
- ▶ Simplicity is the key to reliability and cost reduction.



All dimensions are in millimeters unless specified. IF IN DDVEI ASK				Issue: 10A
Drawn: SJA	Description: Sign/Box/Frame/Assembly	Date: 12/11/2012	Drawn By: M. Connel	
<small>TM Safety Signs is a registered trademark of TM Safety Signs. All rights reserved. TM Safety Signs is a registered trademark of TM Safety Signs. All rights reserved. TM Safety Signs is a registered trademark of TM Safety Signs. All rights reserved.</small>				

Power Requirements

- ▶ A SmartSign has an average current draw of 5mA.
- ▶ A single LED draws four times this power, and there are in excess of 600 LED's on a four lane wicket sign.
- ▶ SmartSign is able to use small internal batteries and a solar panel that is integrated into the sign.



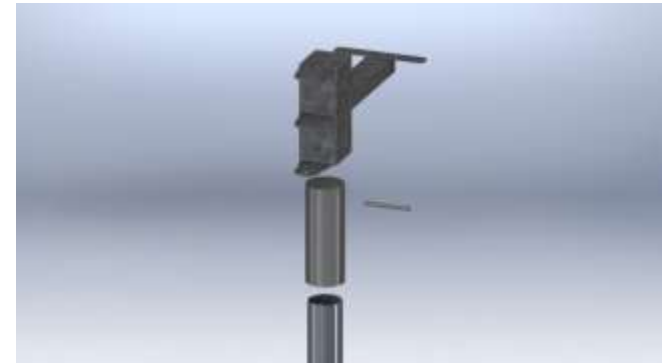
Compliance to Chapter 8

- ▶ All sign plates conform to TSRGD and Chapter 8.
- ▶ For ease of handling and limited overhang, sign scale is typically reduced.
- ▶ The reflectivity performance of the covering material is increased to compensate for the smaller size.



Modular Design

- ▶ Building the signs in modular form allows sub-components to be replaced in the field or at the depot.
- ▶ This significantly reduces down time and allows product improvements to be incorporated with minimal disruption.



Proven Reliability

- ▶ Continuous use of the SmartSign, SmartBlind and SmartFrame system since 2007 has provided us with unparalleled real world reliability data.
- ▶ An LED sign is predicted to have lost more than 12% of its light emitting diodes (the most reliable element of its design) in the calculated mean time before failure of the latest generation of SmartSign.



Costs

- ▶ SmartSigns do not require bespoke vehicles to transport or install them.
- ▶ Regular maintenance tasks may be conducted by the clients' personnel.
- ▶ Routine maintenance can be conducted on site in less than 15 minutes per unit.
- ▶ Overhaul after 5 years of use typically costs 20% of the purchase price (£1,010 in the case of a 4 lane wicket SmartSign with SmartBlind).
- ▶ The reflective material is guaranteed for 12 years.



Design for Manufacture

- ▶ The next generation of SmartSign supports pre-fabricated manufacture.
- ▶ Sub-assemblies are manufactured from industry standard stock materials.
- ▶ The factory is optimised towards assembly and testing.
- ▶ Quoted capacity is 10 units per week, but we already have capacity for a 300% increase.
- ▶ We retain a skilled core workforce.

