



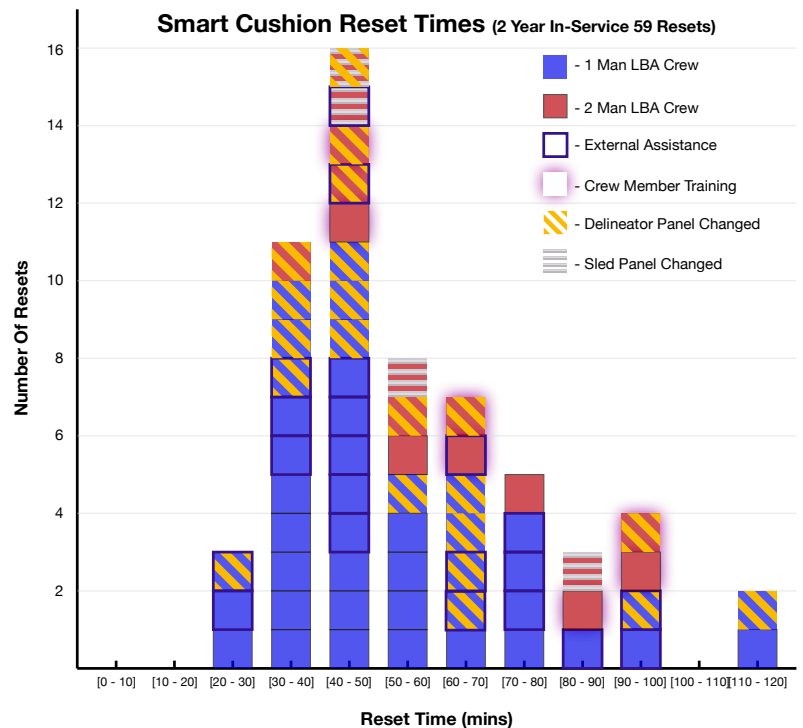
# Smart Cushion 2 Year In-Service Summary Report

## Smart Cushions In-Service

- 44 Smart Cushions have been deployed during the 2 years of this study
- The majority were used on the WestConnex M4 Widening and M4 East projects in NSW, as well as on the VicRoads projects at Laverton and Calder Hwy/Tullamarine Fwy intersection
- The Smart Cushions used in work zones are moved and stored as required, the number of active units at any given time cannot be ascertained
- At least 17 relocations of Smart Cushions were performed
- 31 of the Smart Cushions have required a reset or repair, these were all on WestConnex

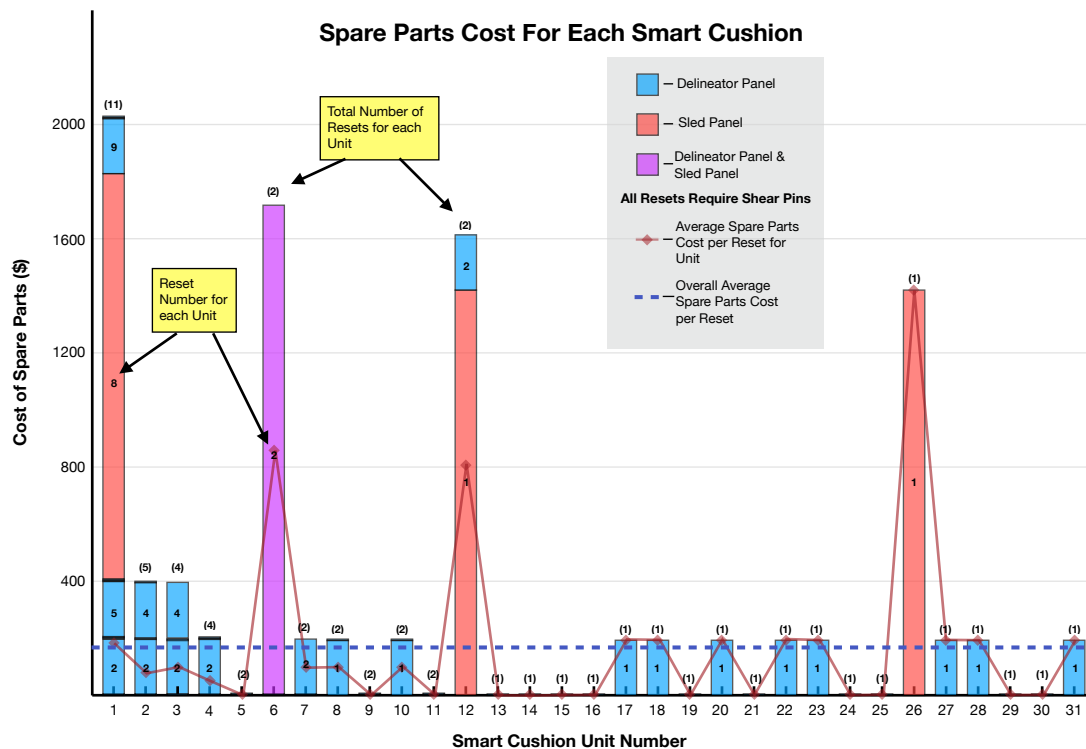
## Smart Cushion Resets

- LBA crew performed all 59 required resets in this period
- All resets were due to frontal impacts
- There was evidence of side impacts (eg. paint transfer, tyre marks etc.) however no damage was reported for repair
- Reset times were recorded from the moment inspection of the Smart Cushion started, to the time that the reset was completed and tools were packed away ready to leave site
- The average reset time was 55 minutes, and the median time was 49 minutes
- 25 resets were performed by a 1 man crew
- 18 resets were performed by a 1 man crew with assistance from a 3rd party vehicle for the pullout of the frame and mobile sheaves
- 2 or more men were used when one was being trained, a sled panel was being replaced or other work was conducted on the same night e.g. relocate a different Smart Cushion



## Smart Cushion Replacement Parts Costs

- 3 main types of components were replaced over the 59 resets
- Shear Pins (2 x \$2 = \$4) required for every reset
- Delineator Panel (\$190) required for 21 resets
- Sled Panel (\$1416) required for 4 resets
- The total cost of replacement parts over the 59 resets was \$9,994
- The average cost for each reset was \$169



## Durability and Robustness

- 31 different Smart Cushion units required 1 or more resets
- 8 Smart Cushions were reset twice
- 2 Smart Cushions were reset 4 times
- 1 Smart Cushion was reset 5 times
- 1 Smart Cushion was reset 11 times
- All Smart Cushions were reset fit for service after an impact
- 2 Smart Cushions were irreparably damaged during removal by untrained workers. (Some anchor bolts were not removed prior to removal, crane continued to lift despite indicated load exceeding weight of Smart Cushion. Base frame was bent)
- One of these cushions never required a reset, the other is referenced as Unit 8 in the data

- During resets, Smart Cushions with up to 18 anchor pins missing or installed incorrectly were identified. Despite this, these Smart Cushions still functioned successfully. (Installation defects were due to untrained labour hire and minimal oversight by contractor. LBA's understanding is all defects were rectified within 24hrs of identification)
- During resets, it was noted that some Smart Cushions had been inundated with rubbish and debris. Despite this, these Smart cushions still functioned successfully. (Example photo supplied in sample photos, date of reset: 12/7/16)