The Margam accident

Trackworker Thematic Investigation

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Thematic Investigation

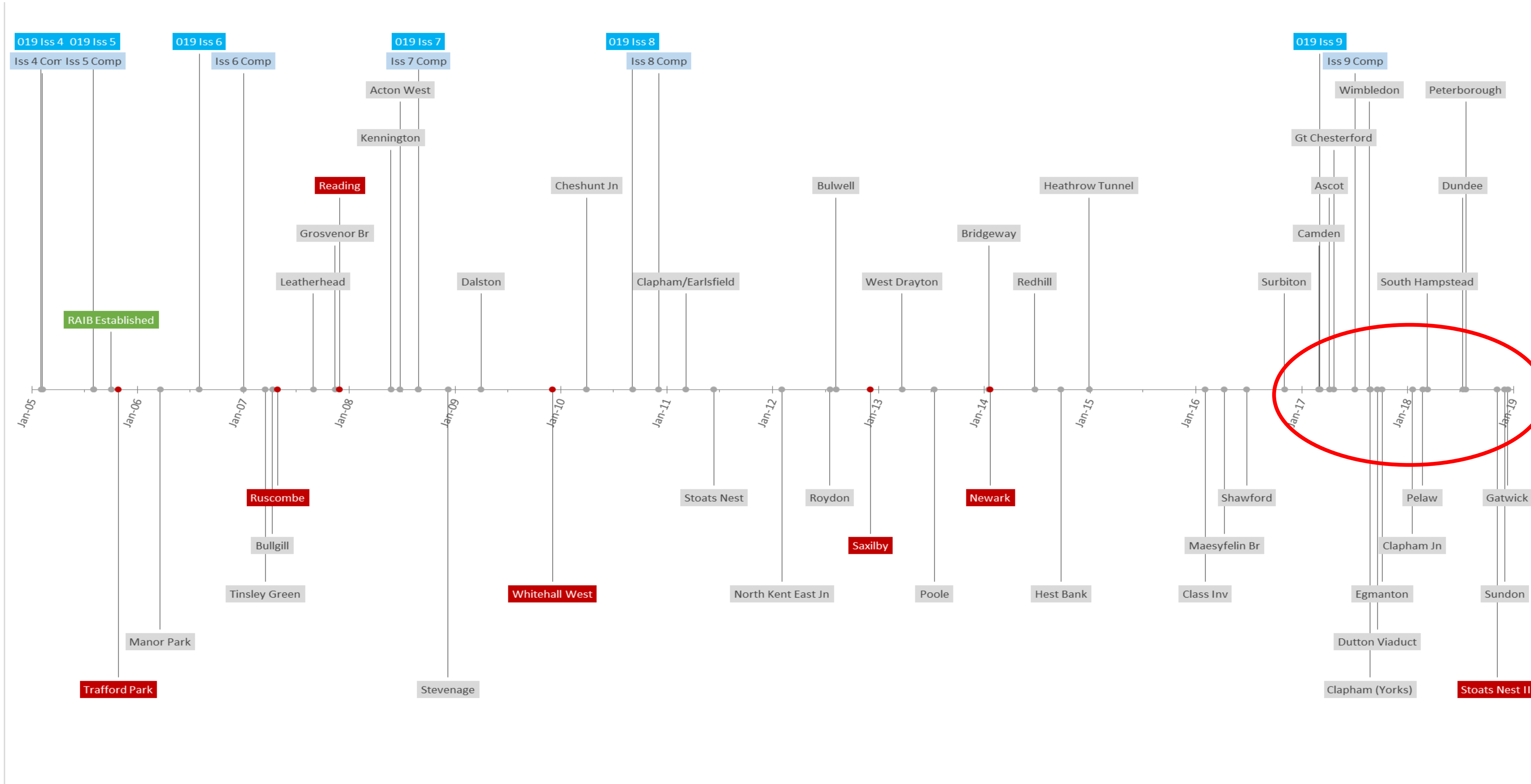
- A Thematic Investigation?
  - An investigation on a theme, rather than a particular event.
  - In RAIB terms, it is similar to a class investigation, but in this case over a longer timeframe.
  - Can have a fairly open remit

RAIB

Thematic Investigation - Reasons for starting

- Initiated prior to Margam and the fatality at Stoats Nest.
- We felt that had been no noticeable drop in near-misses
- Too many incidents of trackworkers 'almost' being struck
- Are there any underlying themes?
- Can RAIB offer any wider learning or insight to industry?

Egmanton (Report 11/2018). Image from Virgin Trains EC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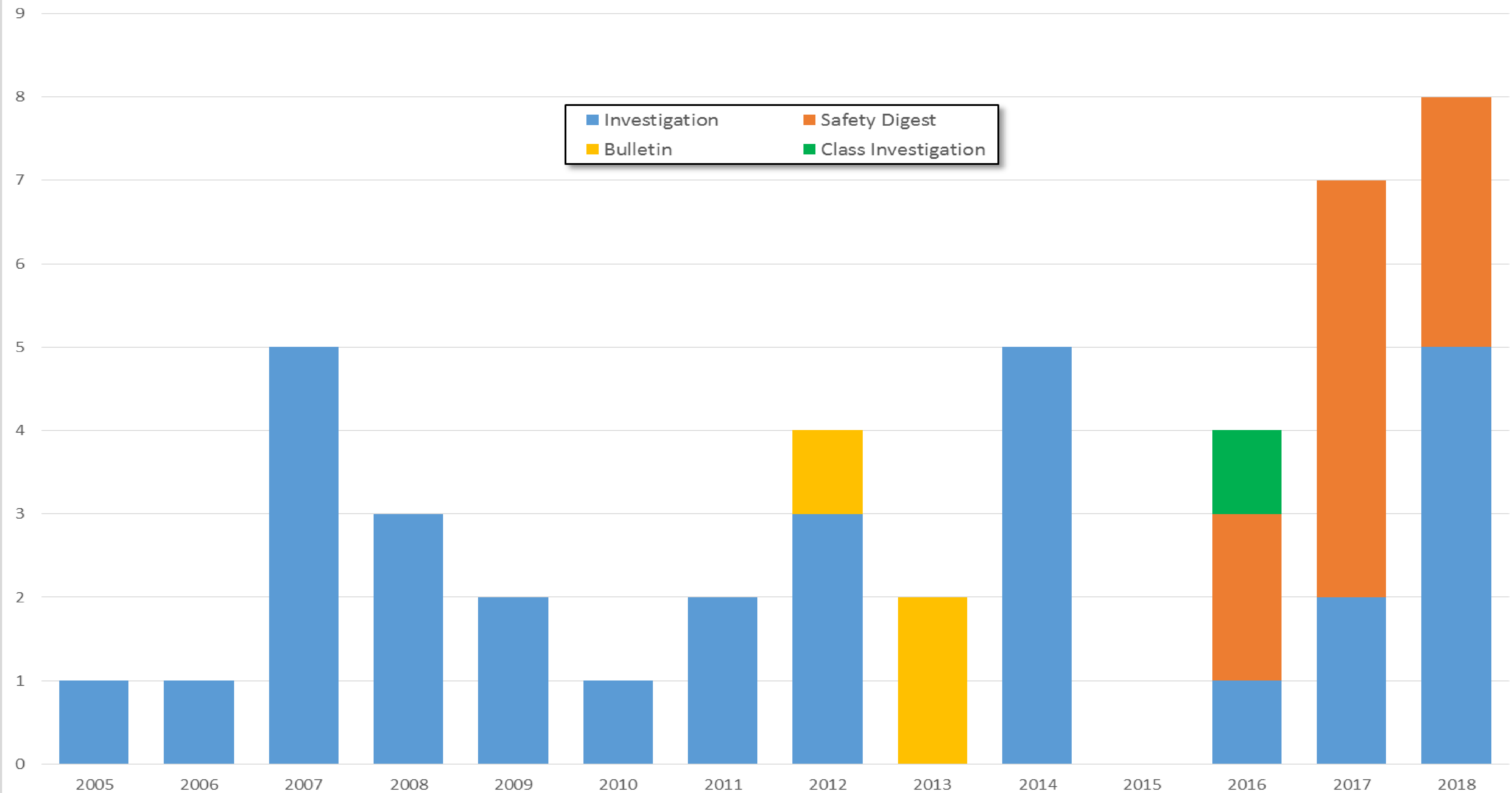
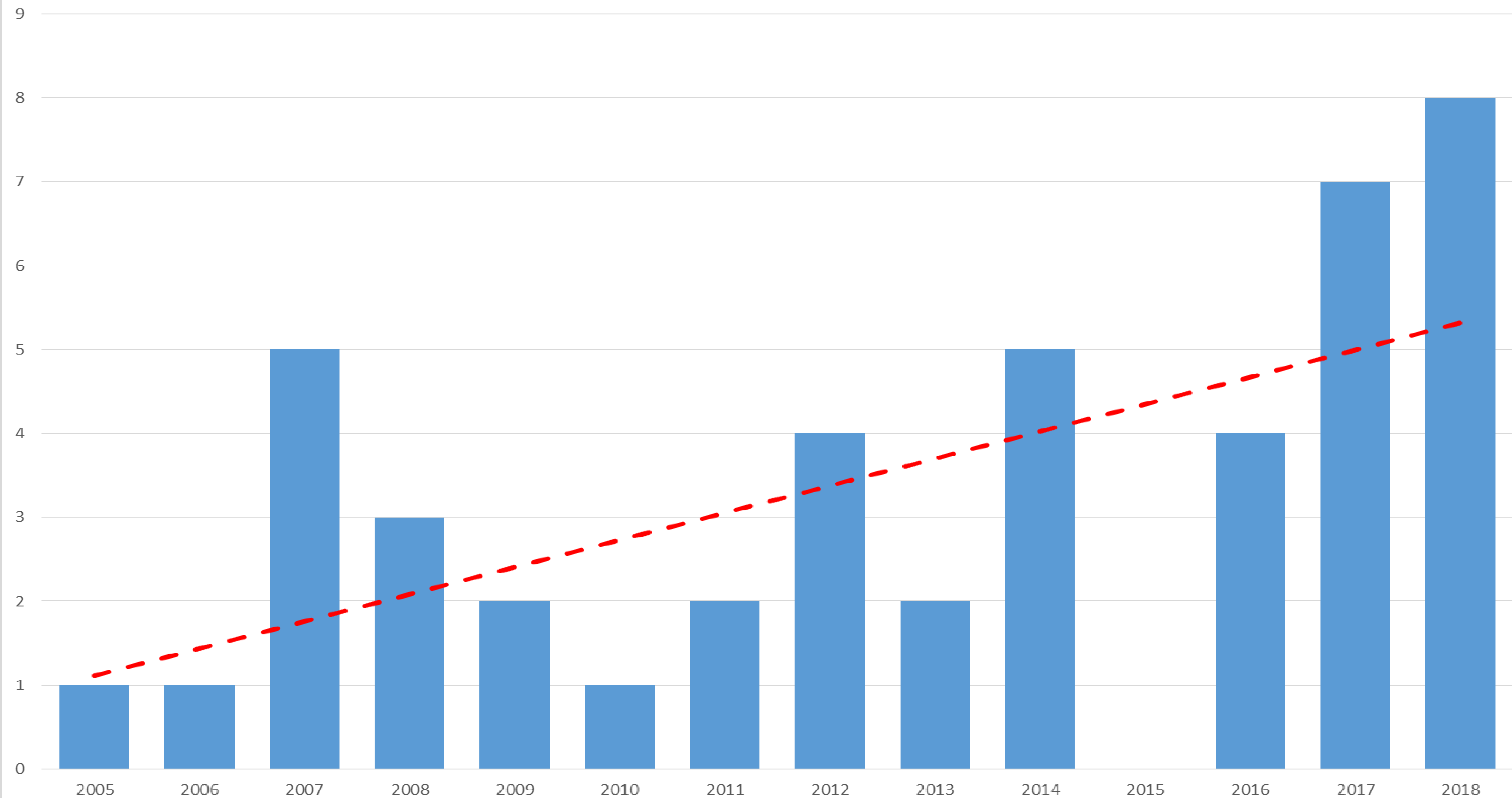
Acton West
Wimbledon
Peterborough
Kennington
Gt Chesterford
Reading
Cheshunt Jn
Bulwell
Heathrow Tunnel
Ascot
Dundee
Grosvenor Br
Bridgeway
Camden
Leatherhead
Dalston
Clapham/Earlsfield
West Drayton
Redhill
Surbiton
South Hampstead
RAIB Established
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Ruscombe
Stoats Nest
Roydon
Newark
Shawford
Pelaw
Gatwick
Bullgill
Saxilby
Maesyfelin Br
Clapham Jn
Tinsley Green
Whitehall West
North Kent East Jn
Poole
Hest Bank
Class Inv
Egmanton
Sundon
Manor Park
Dutton Viaduct
Trafford Park
Stevenage
Clapham (Yorks)
Stoats Nest II
RAIB



Number of each type of RAIB report by incident year
Investigation
Safety Digest
Bulletin
Class Investigation
0
1
2
3
4
5
6
7
8
9
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018


Number of RAIB reports by incident year (combined) with linear regression line
9
8
7
6
5
4
3
2
1
0
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

Remit

- Focus on RAIB Investigations and Digests
- Build on RAIB’s previous Class Investigation, and some of the work done for the Egmanton investigation
- Look at timeline of incidents
- Look for any trends

- Output
  - Master Matrix (Basic database)
    - Details of incident
    - Causal Factors
    - Recommendations
    - Potential Fixes
  - Timeline of Incidents and key safety initiatives
  - Visualisation of Results

Use of multiple taxonomies.

Fixes	Do Recs Address?	Comparison

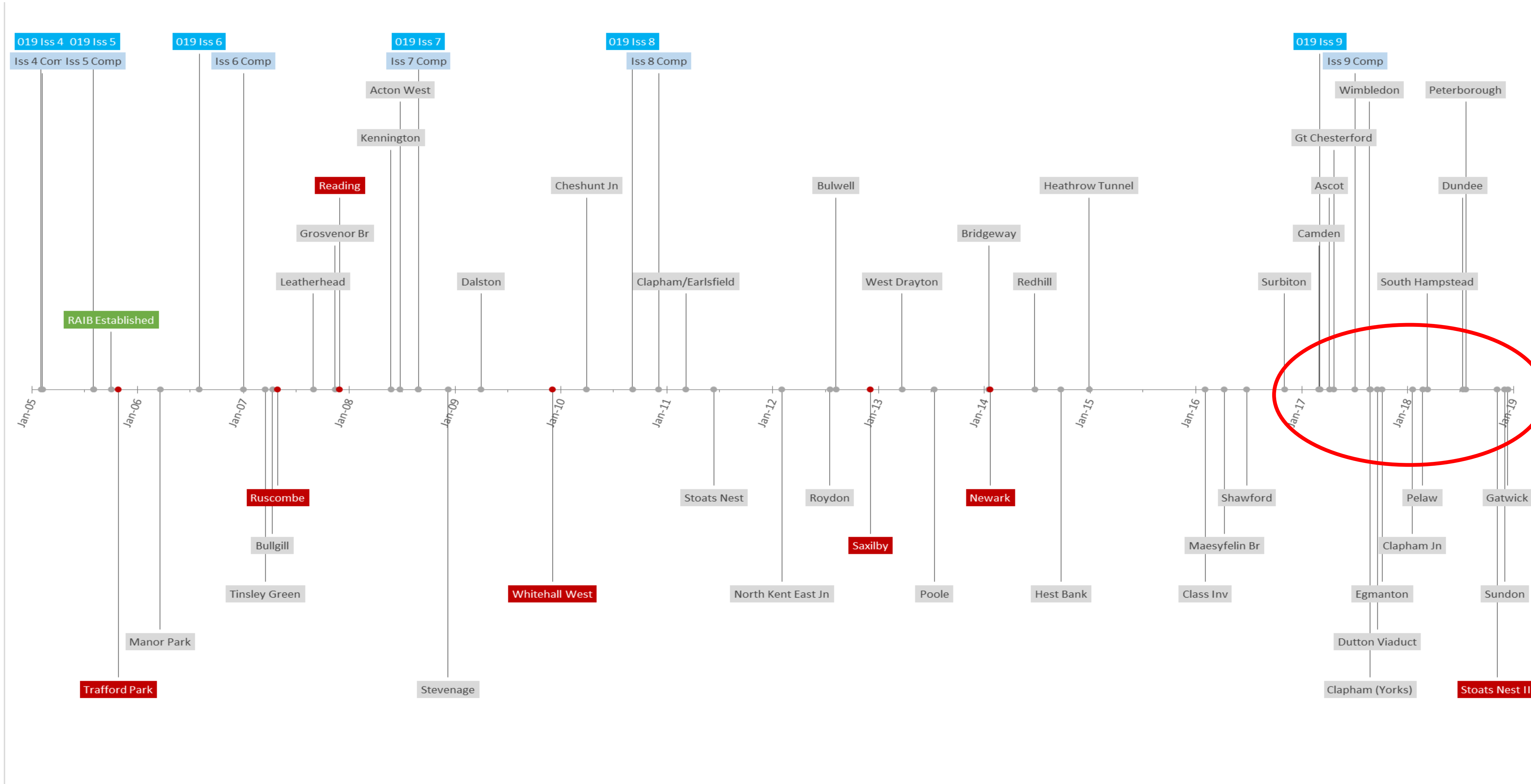
RAIB

Matrix Headings Include…

- Incident details
  - Operator
  - Violation/error
  - Main ‘actor’
  - Fatality?
  - NR or agency
  - Protection arrangements
  - Route
- RAIB Response
  - High level cause
  - Common Factors (from Class Inv)
  - Do our recommendations address these?
  - Where are the recommendations aimed?
  - Recommendation implementation
- Could the incident have been avoided with PDSW initiatives?

Timeline

- Are things getting better, worse or steady?
- Do fatalities make a difference?
- Have the introduction of key initiatives (i.e. 019/PDSW updates) made a difference?
- Remember that RAIB's interest may have changed over the years
  - Do the Duty Coordinators look at more or fewer incidents?
  - Are we older and wiser?
  - We now have the option of safety digests (or bulletins)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Gatwick
Sundon
Stoats Nest II
RAIB

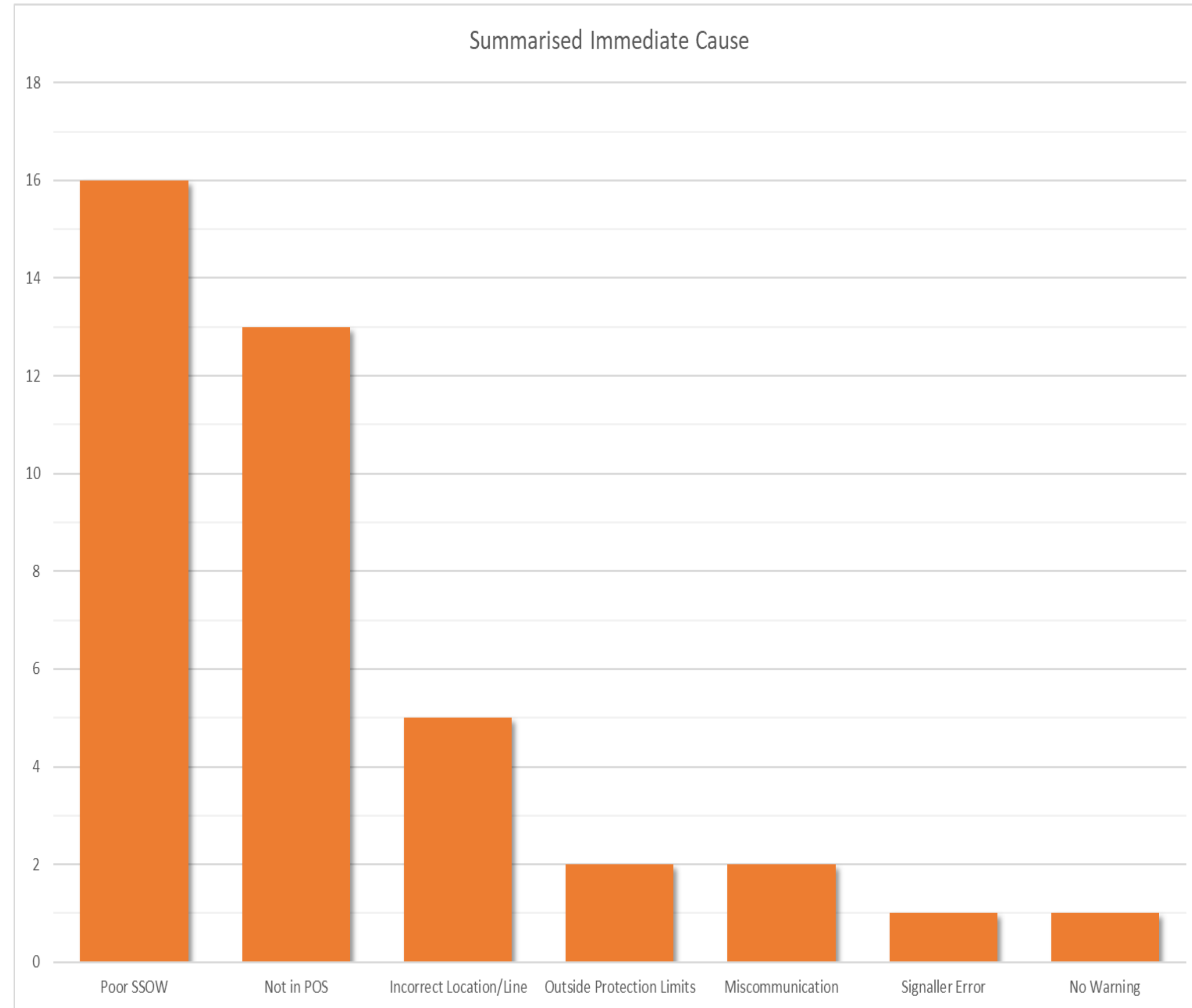
Margam

- While this work was ongoing, the accident at Margam occurred.
- It made sense to incorporate this work into the wider findings from Margam, as they are so interlinked.

RAIB

High Level Cause

- Poor SSoW
- Not being in a Position of Safety
- Incorrect Location/Line
- Outside limits of protection
- Miscommunication
- Signaller Error
- No lookout warning given

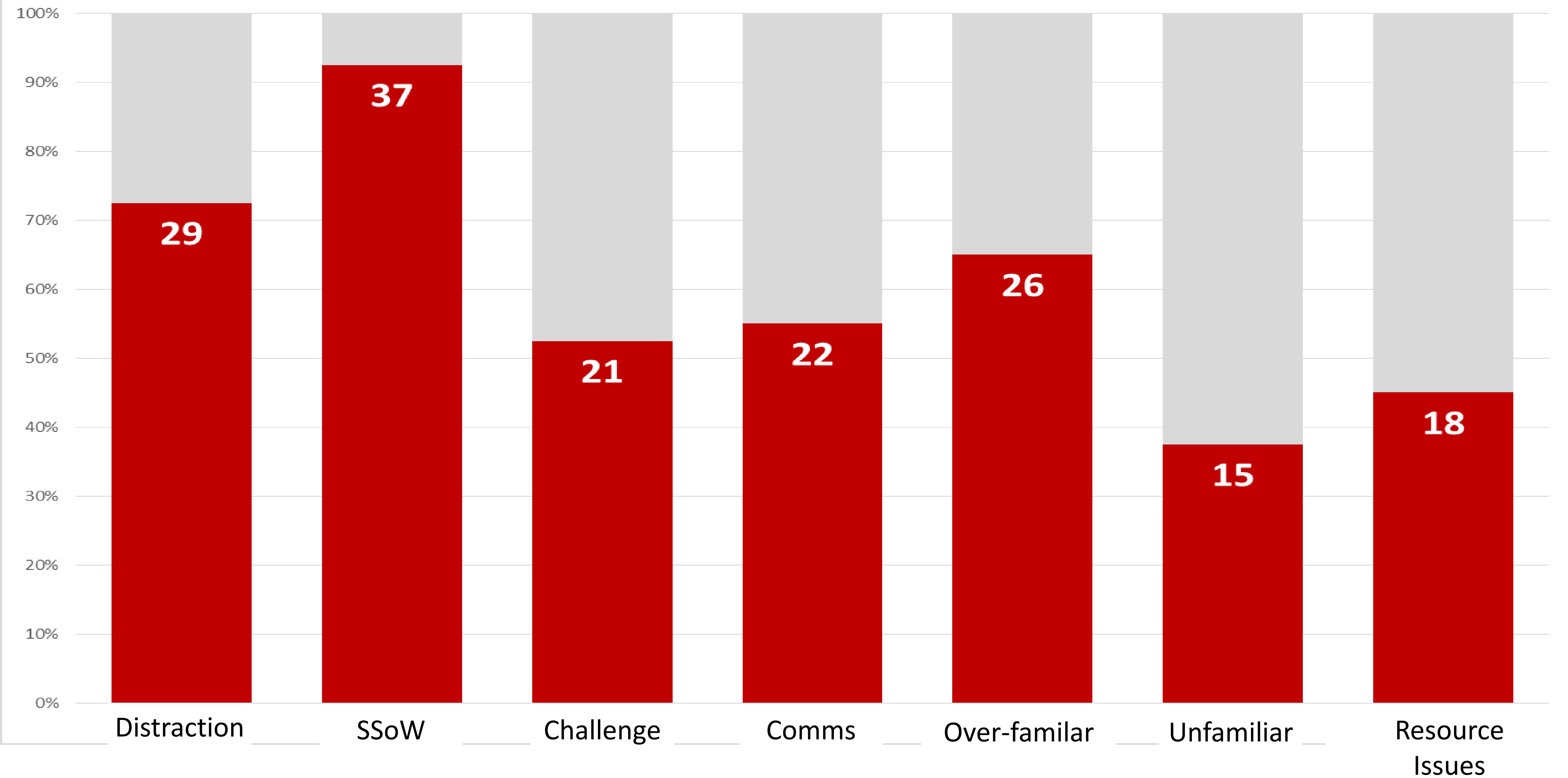


RAIB

Common Factors

- Used taxonomy of common factors from the 2017 Class Investigation (App G)
- Then condensed to 7 groups (for easier comparison)
- No taxonomy will fit all the incidents perfectly

a	COSS distraction (e.g. work priority over SSoW)
b	SSOW covering multiple worksites or moving worksite
c	Lack of Challenge / Cultural Issues
d	Poor Communication
e	Complacency / Over familiarity
f	Unfamiliarity / inexperience
g	Circumstances changed from planned SSoW
h	Unauthorised downgrading of SSoW / protection
i	Use of unofficial / informal method of working
j	Resourcing Issues
k	Unclear SSOW
l	Other staff distraction


PERCENTAGE OF 40 PUBLISHED REPORTS (INVESTIGATIONS, BULLETINS AND SAFETY DIGESTS) WITH SELECTED COMMON FACTORS
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
29
37
21
22
26
15
18
Distraction
SSoW
Challenge
Comms
Over-familar
Unfamiliar
Resource Issues

Recommendations

- Looked at:
  - Number of Recommendations made
  - Who they were directed at?
  - Did they address the common factors?
  - Have they been implemented?
  - Have things changed over time?

- Considerations
  - Causal factors are often focussed close to the incident
  - Recommendations are often aimed at addressing things at an organisational level
  - There is an amount of ‘engineering judgement’ applied to this.

% of Recommendations that Address Common Factors Identified in Investigations
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
COSS distraction (e.g. work priority over SSoW)
SSOW covering multiple worksites or moving worksite
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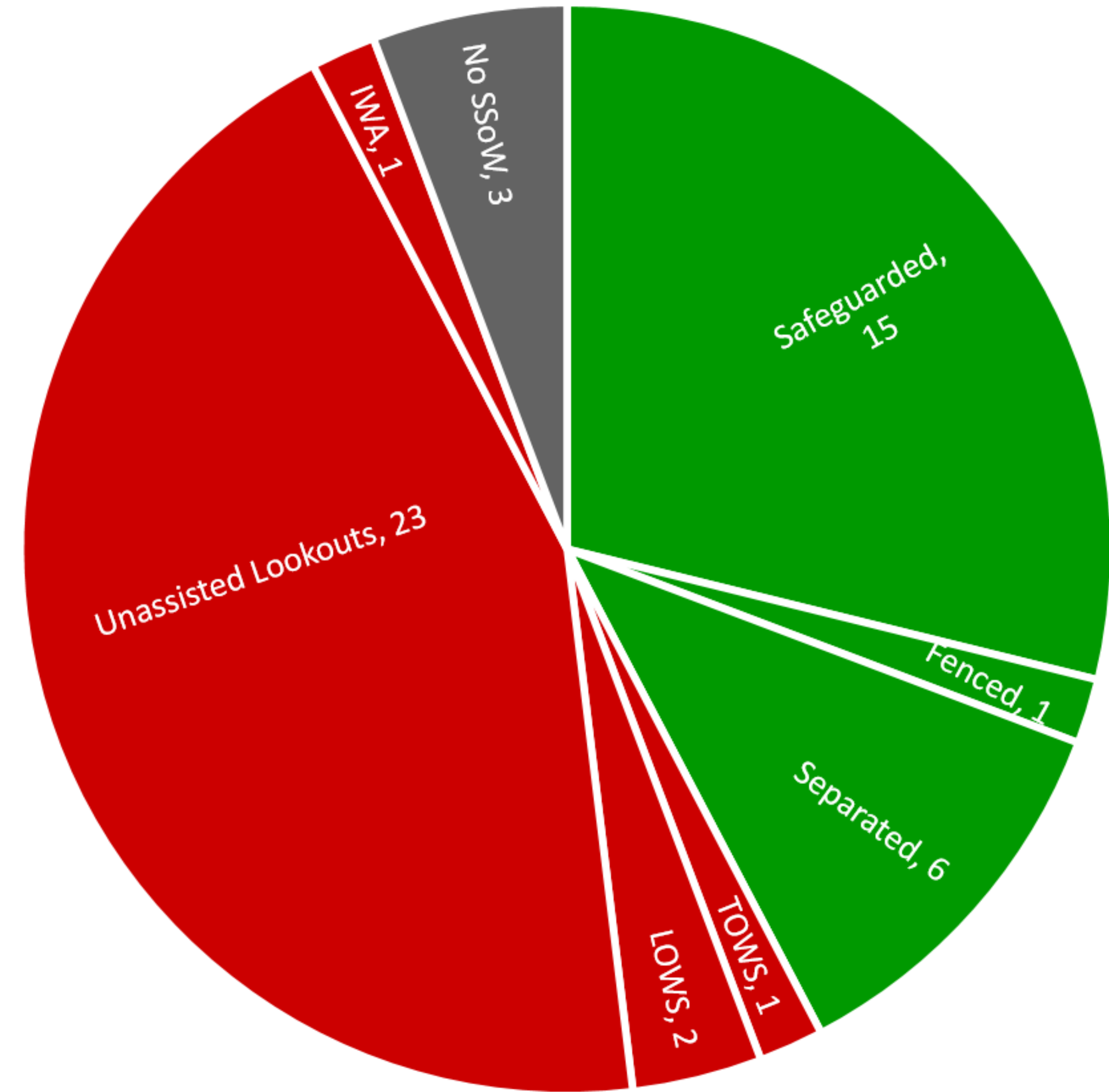
Unclear SSOW
Other staff distraction

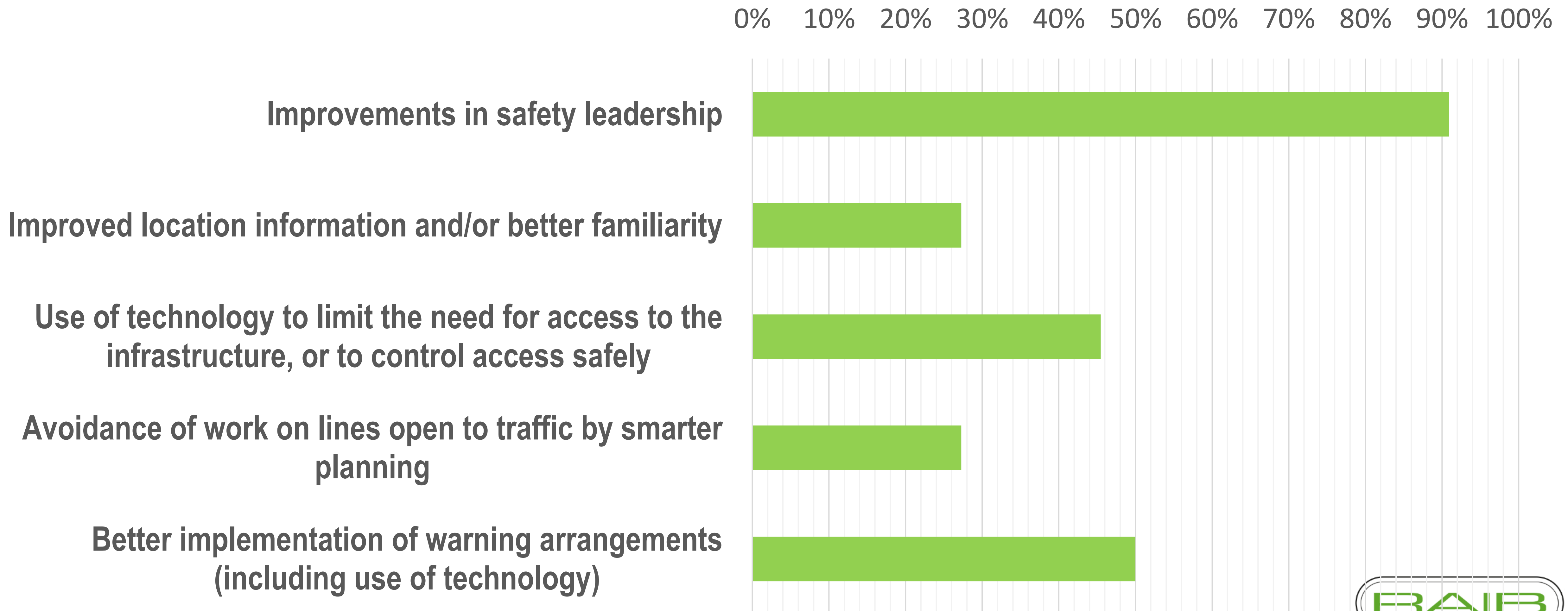
Protection

- Unassisted lookout warning areas dominate
- Warning methods only account for ~50%
- 22 incidents where trains and people should not be in the same place at the same time!



RAIB

Key Future Safety Initiatives



Conclusions and thoughts

- Poor establishment of SSoW and staff not moving to a PoS are the biggest issues.
- Data suggests that experienced staff tolerating or underestimating risk is a bigger problem than lack of experience or familiarity
- Unofficially downgrading the SSoW is a lesser issue, but you can't downgrade from lookouts!
- It's not all lookouts, in fact that only accounts for around half
- The COSS/PIC is the key role. But they are our last line of defence.