

Are train accidents on Britain's railway actually rising?

Twenty years of Rail Accident Investigation Branch output, and eight years of Office of Rail and Road statistics, tested against the impression that railway-caused incidents have become more frequent.

Normalised for traffic, 2024–25 lands within a rounding error of the pre-pandemic rate. The rebound out of the pandemic trough is real. The alarm is not yet supported — and at this level of aggregation the data cannot support it either way.

COMMISSIONED BY

John Band

Research question and scope set by the commissioner: railway-internal causes, excluding level-crossing misuse and track-worker safety.

RESEARCHED, ANALYSED AND WRITTEN BY

Claude, an AI model made by Anthropic

Session model identifier: **claude-opus-5**

Compiled 2 September 2026 from public sources

AUTHORSHIP AND STATUS

This report was commissioned by **John Band**, who set the research question and its scope. Everything in it — the retrieval of the source data, the coding of 601 RAIB publications into cause families, the statistical work, the charts and the prose — was produced by **Claude, an AI model made by Anthropic**. This session was configured as `claude-opus-5`; the model actually serving any individual turn of the work may have differed.

No human subject-matter expert has reviewed the analysis. Figures taken from Office of Rail and Road publications were read out of published PDFs rather than from the underlying statistical data tables. This is not an official statistic and should not be cited as one. The limitations set out in section 6 are not boilerplate: several of them bear directly on the conclusions, and one of them — the width of the confidence intervals — is itself a finding.

METHOD

The question was whether incidents arising from the railway's own operation — derailments, collisions between trains, signalling and infrastructure failures, overspeeds — have become more frequent over roughly the last two years than over the preceding two decades. Level-crossing misuse by pedestrians and road vehicles, and track-worker safety, were excluded by the commissioner at the outset.

Three independent lines of evidence were assembled. First, the complete RAIB corpus: all 601 items published on GOV.UK since the branch opened on 17 October 2005 — investigation reports, safety digests, bulletins, interim reports and discontinuation reports — retrieved through the GOV.UK search API and coded to the year the accident occurred rather than the year of publication.

Interim reports and report updates were removed so that no accident is counted twice, leaving 588 distinct investigated events.

Second, the Office of Rail and Road's series of *potentially higher-risk train accidents*, which is the closest published measure to the commissioner's question: it excludes striking animals and small objects, and excludes workforce-safety events, but includes level-crossing collisions with road vehicles, which are separated out here where ORR publishes the split.

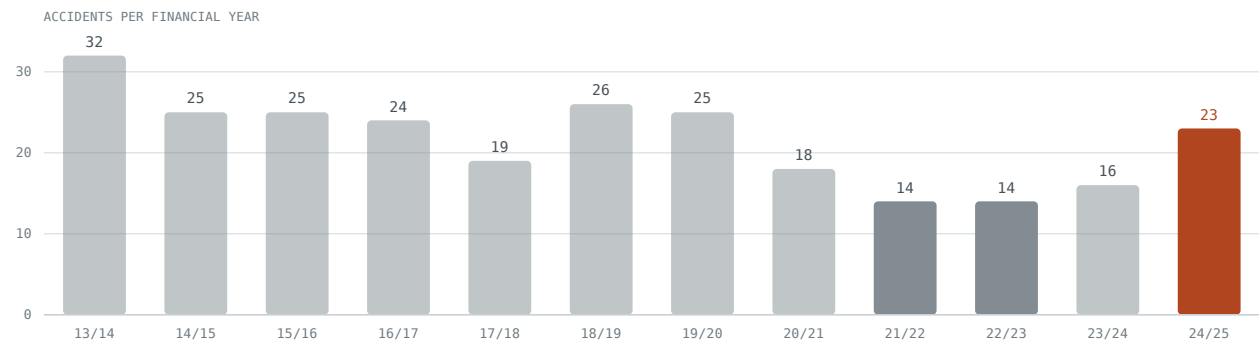
Third, exposure. ORR's passenger train kilometres for 2017–18 to 2025–26 were used as the denominator, and 95% intervals were computed on the assumption that annual accident counts are Poisson-distributed.

The one number designed for this question

Higher-risk train accidents fell to a series low of 14 in 2021–22 and 2022–23, then rose to 16 and 23. The three-year rise is real. So is the fact that it lands back where the mid-2010s sat, and below 2013–14.

Potentially higher-risk train accidents, GB mainline

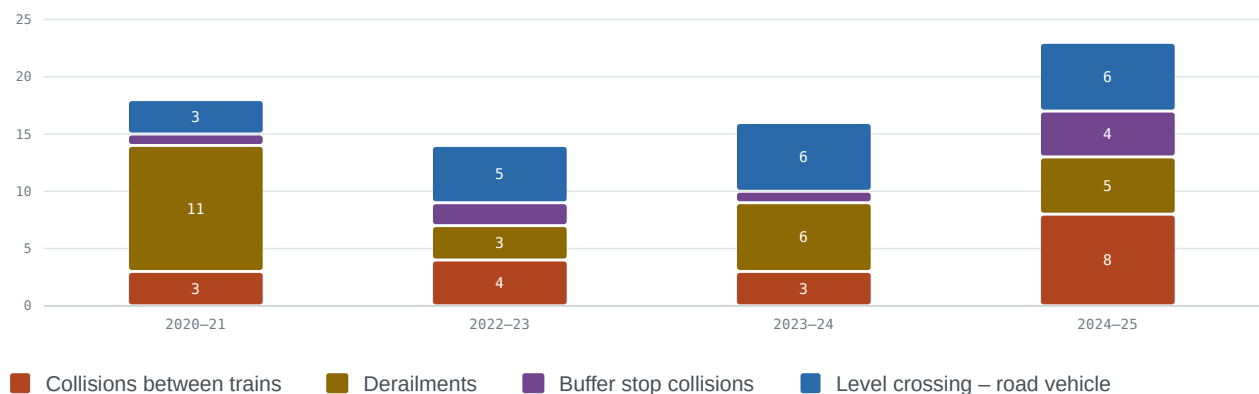
Financial years, absolute counts.



Source: ORR rail safety statistical releases, 2019–20 to 2024–25. 2020–21 shown as first published (18); later releases restate it as 19.

What those accidents were

The rise is not spread evenly. Collisions between trains went from three or four a year to eight, and buffer-stop collisions quadrupled, while level-crossing collisions with road vehicles stayed flat at five or six.



ORR does not publish the type split for 2021–22, so that year is omitted. Excluding the level-crossing column, the railway's own share runs 15 → 9 → 10 → 17.

Normalising removes both explanations at once

The obvious objection to a raw count is exposure. The railway ran 419 million passenger train kilometres in 2020–21 and 544 million in 2025–26, a swing of 30%. Dividing through changes less than expected, and what it changes is not what either side of the argument would want.

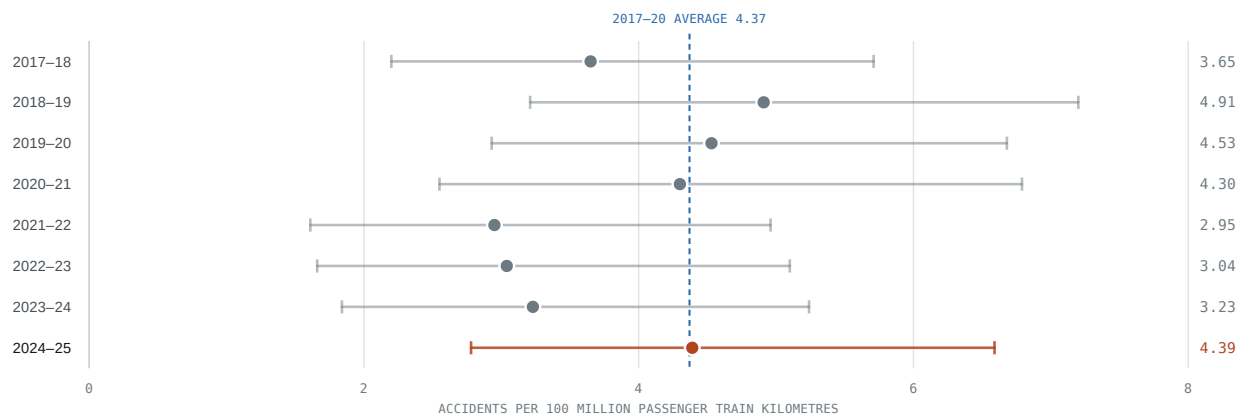
It does not rescue the reassuring explanation that the recent rise is simply more trains. At the 2017–20 average rate of 4.37 accidents per 100 million train kilometres, the traffic operated in 2024–25 would have produced 22.9 higher-risk train accidents. It produced 23.

Nor does it rescue the alarming one. Traffic in 2021–22 had already recovered to 86% of the pre-pandemic level while accidents fell to a record low, so the trough was a genuine improvement rather than an artefact of empty timetables — an improvement that has since been given back in full.

Tested formally, the move from the 2021–24 trough rate to 2024–25 gives a one-sided Poisson p of 0.061: suggestive, not significant, and not corrected for the several categories examined along the way.

Higher-risk train accidents per 100 million passenger train kilometres

Point estimate with its 95% Poisson interval. The dashed line is the 2017–18 to 2019–20 average of 4.37.



Passenger train kilometres only; ORR does not publish freight train kilometres on a comparable basis, so freight-only accidents sit in the numerator without matching exposure.

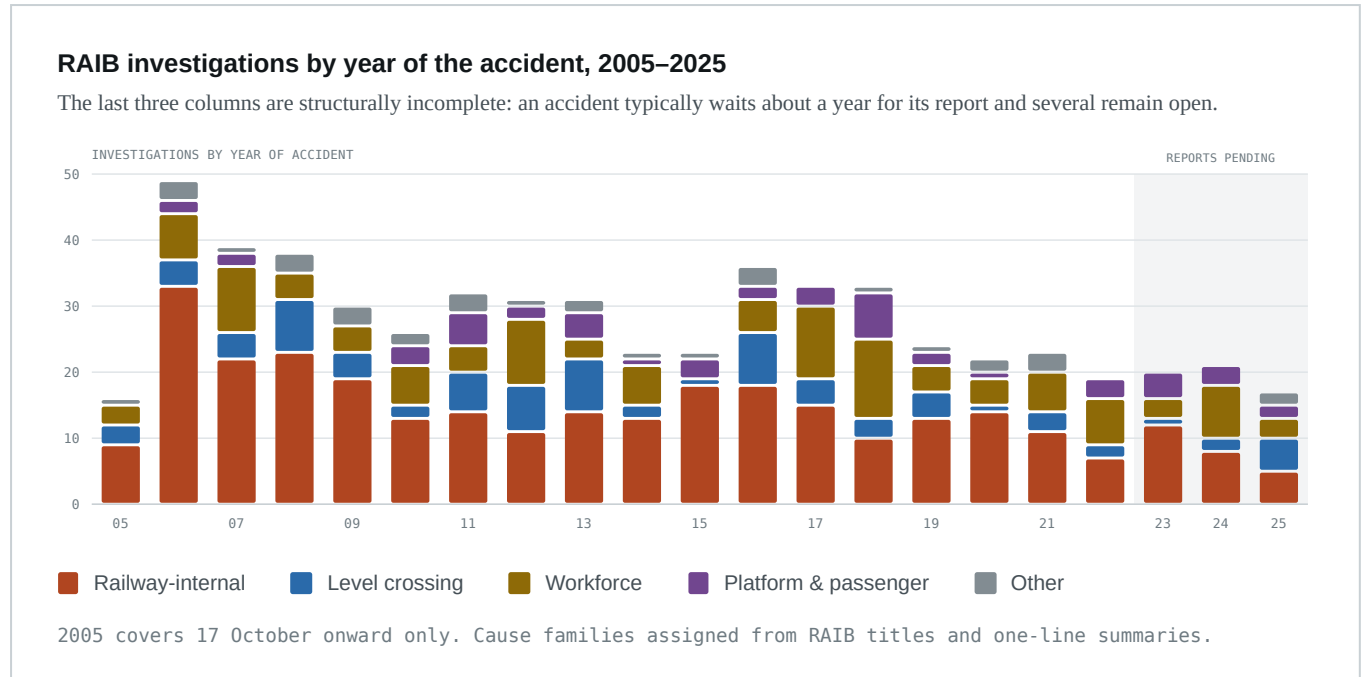
Exposure-adjusted series, 2017–18 to 2025–26

FINANCIAL YEAR	PASSENGER TRAIN-KM (M)	HIGHER-RISK ACCIDENTS	PER 100M TRAIN-KM	95% INTERVAL
2017–18	520	19	3.65	2.20 – 5.71
2018–19	529	26	4.91	3.21 – 7.20
2019–20	552	25	4.53	2.93 – 6.68
2020–21	419	18	4.30	2.55 – 6.79
2021–22	474	14	2.95	1.61 – 4.96
2022–23	461	14	3.04	1.66 – 5.10
2023–24	496	16	3.23	1.84 – 5.24
2024–25	524	23	4.39	2.78 – 6.59
2025–26	544	–	–	release due autumn 2026

Every interval in the table overlaps every other. With fourteen to twenty-six events a year, the series cannot distinguish any year from any other with confidence, and a genuine change in train accident frequency of the size being argued about would not be detectable in it. This is the central methodological finding of the report: the question has to be pursued through precursors, not through accidents.

The investigator's own record shows no surge

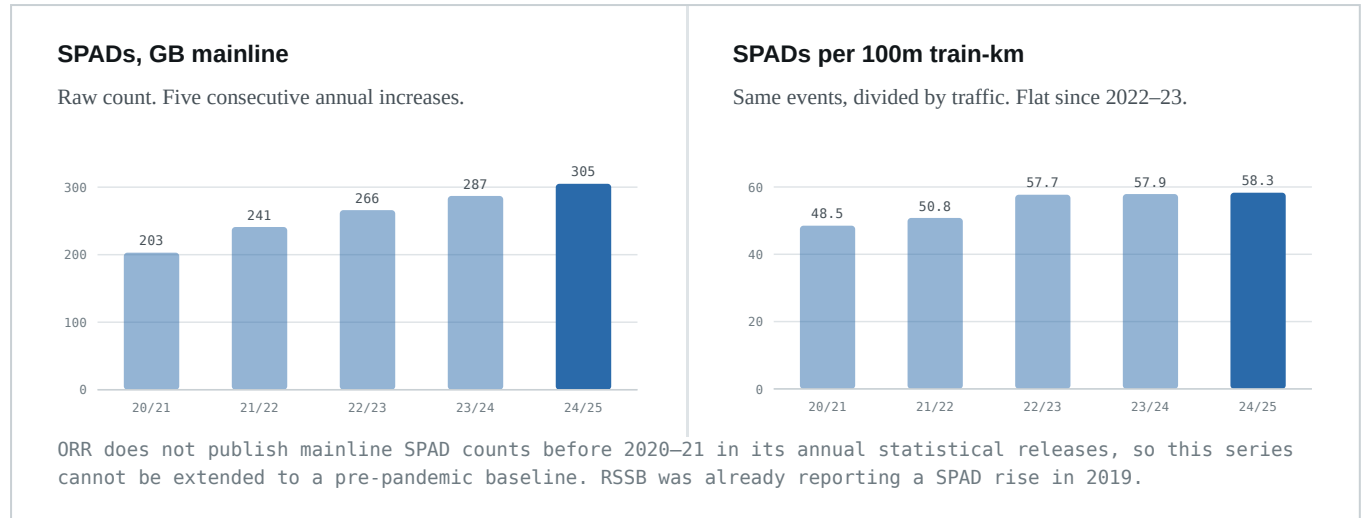
Coded to the year of the accident and stripped of duplicates, RAIB's railway-internal caseload peaks in the branch's first three years and settles into a long, gently declining plateau. Nothing in 2022–2025 resembles a spike.



This measures RAIB's output rather than the railway's behaviour, and the distinction matters. Total RAIB publications fell from 33–36 a year in 2016–2018 to around 20 now, so a flat line is equally consistent with a flat accident rate and with a rising one filtered through a narrower investigation funnel. What the series does establish is that RAIB is not itself generating more work about railway-caused accidents than it used to. Against that, RAIB notifications rose from 431 in 2024 to 488 in 2025, and full investigations opened rose from 11 to 16 while safety digests fell from 12 to 8 — a shift toward deeper investigation of a similar total.

The precursor that moved, and then stopped moving

SPADs are the classic leading indicator, and the headline is a 50% rise from 203 in 2020–21 to 305 in 2024–25. Normalised, the shape changes: the rate rose 19% to 2022–23 and has been flat for three years since.



Why the rise happened

A SPAD count is not a pure measure of driver error. It is error multiplied by opportunity, and opportunity is set by how many red signals trains approach — which rises with service density and falls with punctuality. RSSB made this point in 2019, before the pandemic interrupted the series: congestion and declining punctuality mean drivers meet more reds, which raises SPAD counts arithmetically before any change in behaviour. Layered on that, the causal account the industry itself reports:

- **Slips and lapses, not recklessness.** Of 125 SPADs RSSB analysed, roughly 70% were slip or lapse errors. RSSB's standing position is that most SPADs are multi-causal and not attributable to individual error.
- **The post-pandemic competence cycle.** RSSB's own campaign named the mechanism: skills fade during the period of reduced service, the pressure of restoring full timetables, stress and anxiety, and distraction. A large cohort of drivers recruited into the recovery has less route mileage behind it than the cohort it replaced.
- **Heat.** RSSB finds that in spring and summer each 1°C rise is associated with roughly a 2.5% increase in the underlying SPAD rate, visible as a spike in summer 2022. That is a slow structural upward pressure rather than a one-off.
- **Cab environment and fatigue.** Industry risk groups have flagged inconsistent cab air-conditioning provision between operators; ORR describes fatigue management as operating reactively rather than proactively.
- **The evidence base is thin.** ORR recorded cause forms completed for only 44% of SPADs in 2024–25. RSSB's subgroup now reports 62%, described as the highest ever. The industry's account of why SPADs happen rests on a minority of cases.
- **Protection mitigates, it does not prevent.** TPWS is designed to stop a train approaching a signal at up to about 75 mph, higher only where the enhanced TPWS+ layout is installed. ETCS removes the SPAD class of risk outright but is so far an East Coast Main Line project on the national network.

CASE · ELSTOW, 19 JUNE 2026

1	162	76 mph	9 s	49 mph
driver killed	injured, 102 hospitalised	at brake application	braking before impact	at impact

Train 1B67, a five-car Class 810 running from Nottingham to St Pancras, came to an unexpected stand on the Up Fast south of Bedford after a fault developed in its Automatic Warning System and applied the brakes. Signal WH154 behind it correctly displayed red. Train 1H46, the 16:40 Corby to St Pancras, had crossed from the Up Slow at Bedford South Junction and, on its own forward-facing CCTV, passed that signal at danger. Line speed at the location is 100–125 mph.

The most diagnostic figure RAIB has released is the braking: a full brake application at 76 mph, nine seconds and roughly 250 metres before impact. That is consistent either with a driver reacting very late or with automatic protection intervening at the signal and being unable to stop the train within the available overlap — the known limit of TPWS above its design speed. **RAIB has not said which, and the second reading is this report’s inference from the published speed and time figures, not a finding.** RAIB has listed “the effectiveness of measures to mitigate the risk of signal overruns at this location” among the matters it will examine.

This is where the argument moves from frequency to consequence. Approximately 300 SPADs a year is not new. A SPAD at 76 mph into the rear of a stationary train, killing the driver, is what happens when the protection layer is at the edge of its design envelope.

The change is in the type, not the count

Through the 2010s RAIB’s railway-internal caseload was mostly freight derailments, engineering-train runaways and single SPADs. The rarest events on the network were the two that alarm passengers most: a passenger train leaving the rails, and two trains meeting. Both have become noticeably less rare.

ACCIDENT DATE	EVENT	TYPE	STATUS
6 Feb 2024	Roudham Heath, Norfolk	PAX DERAILMENT	Report 03/2025
4 Mar 2024	Walton-on-Thames, Surrey	PAX DERAILMENT	Report 04/2025
22 Mar 2024	Grange-over-Sands, Cumbria	PAX DERAILMENT	Report 02/2025
6 Sep 2024	Audenshaw, Greater Manchester	FREIGHT DERAILMENT	Report 10/2025
21 Oct 2024	Talerddig, Powys — one passenger killed	TRAIN-TRAIN	Report 08/2026
13 Dec 2024	London Bridge station	BUFFER STOP	Report 09/2025
26 Jun 2025	Denbigh Hall South Junction, Bletchley	DERAILMENT	Report 04/2026
3 Nov 2025	Shap, Cumbria	PAX DERAILMENT	Under investigation
11 Dec 2025	Cambridge Junction, Hertfordshire	OVERSPEED	Safety digest 02/2026
31 Jan 2026	Hopetown Junction, Darlington	DERAILMENT	Safety digest 03/2026
15 Mar 2026	Radlett, Hertfordshire — trackworker killed	WORKFORCE	Under investigation
19 May 2026	Redbridge, Hampshire — train and rail grinder	COLLISION	Under investigation
19 Jun 2026	Elstow, Bedfordshire — one driver killed	TRAIN-TRAIN	Under investigation
13 Aug 2026	Lewes, East Sussex	PAX DERAILMENT	Under investigation
14 Aug 2026	Wickford, Essex	PAX DERAILMENT	Under investigation

Two passenger trains derailing on consecutive days in August 2026, at Lewes and Wickford, is the kind of coincidence that shapes a perception more than a decade of statistics does — and it is a coincidence, not a pattern. The derailment column as a whole is not nothing, though, and ORR has now placed a possible mechanism on the record: Network Rail’s financial pressures have affected renewals and planned work delivery, and the regulator is requiring documented risk assessment wherever activity is

deferred or reduced. RAIB’s 2025 annual report names asset integrity and overspeeding among its five recurring themes.

ORR’s 2025–26 annual health and safety report singles out overspeeding rather than SPADs as “one of the most significant risks that remains insufficiently controlled”, with the industry relying on administrative rather than technical solutions. ORR intervened across the industry in

December 2025 following a run of East Coast Main Line junction overspeeds; a further overspeed at Cambridge Junction followed.

One caution against reading the whole picture as railway-internal: the sharpest deterioration on the network at present is external. Level-crossing fatalities rose from one in 2023–24 to five in 2024–25 and to eleven in 2025–26, the worst since 2014–15. That is precisely the category the commissioning question set aside.

ASSESSMENT

Findings

- **Normalising settles the headline question against the perception.** At the 2017–20 rate, the traffic operated in 2024–25 would have produced 22.9 higher-risk train accidents; it produced 23. There is no exposure-adjusted deterioration relative to the pre-pandemic railway.
- **What was real was the improvement, and it has been given back.** The 2021–24 rate of about 3.07 per 100 million train kilometres was roughly 30% better than 2017–20, on traffic that had substantially recovered. Whatever produced that gain has stopped producing it, which is a more interesting question than the one originally asked.
- **At this granularity the data cannot answer the question.** The 95% interval on the 2024–25 rate runs from 2.78 to 6.59, wide enough to contain every year in the series.
- **The SPAD story is weaker than the headline and stranger than expected.** The raw 50% rise is substantially a traffic-recovery artefact; the rate rose 19% to 2022–23 and has been flat since. The industry’s causal account rests on cause forms completed for well under two-thirds of events.
- **Elstow moves the argument from frequency to consequence.** If there is a systemic case to answer over the next two years, the evidence points toward the adequacy of TPWS at modern line speeds and the pace of ETCS deployment, rather than toward a deterioration in driver performance.
- **Passenger-train derailments remain the anomaly worth watching** — eight since early 2024 against a 2010s rate closer to one or two a year — and ORR’s language about deferred renewals is the first regulatory acknowledgement of a plausible mechanism.

What this analysis cannot support

The following are ordered roughly by how much they bear on the conclusions. The first four are material.

1. **The counts are too small for the question.** Annual higher-risk train accident totals of 14–26 produce 95% intervals that overlap across every year in the series. No conclusion in this report about a change in accident *frequency* is statistically established; the strongest defensible statements are about where the central estimate sits relative to a historical average.
2. **The Poisson model assumes independence, which accidents do not obey.** Events sharing a systemic cause — a fleet defect, a maintenance regime, a season of extreme weather — cluster. Clustering makes the true intervals wider than those quoted, so the intervals here are optimistic rather than conservative.
3. **Multiple comparisons are uncorrected.** Several categories, periods and indicators were examined in the course of the work. The single p-value quoted (0.061) is not adjusted for that search, and should be treated as descriptive rather than inferential.
4. **The exposure denominator is incomplete.** Passenger train kilometres are used throughout because ORR does not publish freight train kilometres on a comparable basis. Freight-only accidents therefore appear in the numerator with no matching exposure. Freight volumes fell over the period, so the true all-traffic rate has probably fallen slightly more than shown. The 2024–25 figure of 523.5 million includes Elizabeth line services (511.6 million without), a definitional change absent from the 2019–20 comparator. Train kilometres also do not capture punctuality or congestion, which govern how many red signals and junction conflicts a given kilometre contains.
5. **The RAIB cause coding is single-pass, automated and unvalidated.** All 601 items were assigned to cause families from their titles and one-line summaries, not from reading the reports. A derailment caused by a track defect and one caused by a wagon defect fall into the same bucket. A number of ambiguous near-miss safety digests could sit in either the workforce or the railway-internal column, and were assigned on judgement. There is no second coder and no inter-rater reliability measure. Accident dates for thematic and class investigations are nominal.
6. **RAIB output is not a measure of accident frequency.** RAIB investigates a selected subset of notified events, and that selection policy has changed — most visibly with the introduction of safety digests from 2016, which is why the 2016–18 totals step up. Publication lag makes the 2023–2025 columns structurally incomplete, and the branch’s total annual output has fallen by around a third since 2018.
7. **Source figures were extracted from published PDFs by automated reading, not from data tables.** Where ORR presents a value only in a chart, it could not always be recovered; the 2021–22 accident type split and all pre-2020–21 SPAD counts are missing for this reason, and the SPAD series consequently has no pre-pandemic baseline. ORR restates figures between vintages — 2020–21 appears as both 18 and 19 higher-risk accidents — and one ORR web page could not be retrieved at all.
8. **The most recent period rests on announcements, not findings.** ORR’s 2025–26 statistical release is not yet published, so there is no rate for 2025–26. Several 2025 and 2026 events in this report are open investigations whose causes are unknown and may prove to lie outside the categories assigned to them here.
9. **No causal inference is offered or supported.** The association drawn between deferred renewals and derailments is a hypothesis attributed to ORR’s own commentary, not a demonstrated relationship. The reading of the Elstow braking data as possibly indicating a TPWS envelope limitation is explicitly this report’s inference and not a RAIB finding.
10. **Scope exclusions shape the picture.** Level-crossing and track-worker events were excluded at the commissioner’s request. Since level-crossing fatalities are currently rising sharply, a reader should not take this report as a statement about the safety of the railway as a whole.

RAIB investigations by accident year and cause family

Derived from all 601 RAIB publications on GOV.UK; 13 interim reports and report updates removed as duplicates. “Other” comprises trespass and pedestrian events away from crossings, road-vehicle incursions, and thematic or class investigations. 2005 covers 17 October onward; 2023–2025 are incomplete.

ACCIDENT YEAR	RAILWAY- INTERNAL	LEVEL CROSSING	WORKFORCE	PLATFORM & PASSENGER	OTHER	TOTAL
2005	9	3	3	0	1	16
2006	33	4	7	2	3	49
2007	22	4	10	2	1	39
2008	23	8	4	0	3	38
2009	19	4	4	0	3	30
2010	13	2	6	3	2	26
2011	14	6	4	5	3	32
2012	11	7	10	2	1	31
2013	14	8	3	4	2	31
2014	13	2	6	1	1	23
2015	18	1	0	3	1	23
2016	18	8	5	2	3	36
2017	15	4	11	3	0	33
2018	10	3	12	7	1	33
2019	13	4	4	2	1	24
2020	14	1	4	1	2	22
2021	11	3	6	0	3	23
2022	7	2	7	3	0	19
2023	12	1	3	4	0	20
2024	8	2	8	3	0	21
2025	5	5	3	2	2	17

Primary sources

1. Rail Accident Investigation Branch, reports, safety digests and bulletins — gov.uk/raib-reports (complete set of 601 publications, retrieved 2 September 2026 via the GOV.UK search API).
2. RAIB, *Annual Report 2025* (published 2026) — notifications, preliminary examinations and investigations opened.
3. RAIB, investigation update: collision between two passenger trains near Elstow, 24 June 2026.
4. Office of Rail and Road, *Rail safety* statistical releases for April 2019 – March 2020, 2020–21, 2021–22, 2022–23, 2023–24 and 2024–25 — higher-risk train accident counts, type splits and SPADs.
5. ORR, *Annual report of health and safety on Britain's railways*, 2024–25 and 2025–26.
6. ORR, *Passenger rail usage* quarterly releases (Jan–Mar 2024, Oct–Dec 2024, Jan–Mar 2026) and *Rail statistics compendium* 2020–21 and 2021–22 — passenger train kilometres.
7. Department for Transport, *Rail Trends 2025* — passenger train kilometres, 2019–20 and 2024–25.
8. RSSB, *Signals Passed at Danger — Graphic Insights; Rise in Signals Passed at Danger* (2019); *Key messages from risk groups*.
9. RSSB, *Annual Health and Safety Report* 2024/25.

Prepared for John Band by Claude (Anthropic), 2 September 2026. Where this report quotes a figure, the figure is the source's; where it draws an inference, the inference is the author's and is marked as such.