

JULY 2023

# Finding solutions that balance low-tech and high-tech for improved safety performance

Mark Davis  
General Manager, London Trams

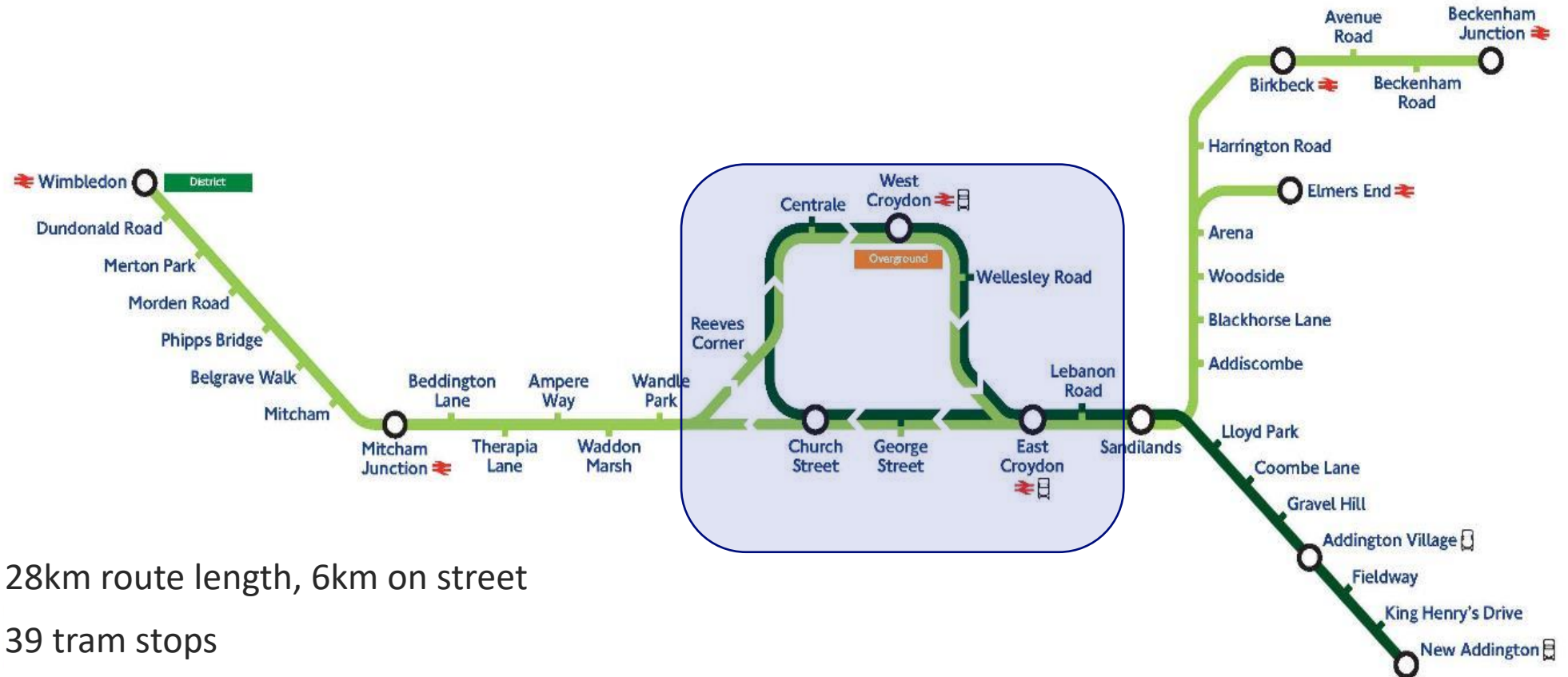




# London Trams – History and context



## The London Trams network



- 28km route length, 6km on street
- 39 tram stops
- 35 trams
- Serves 7 National Rail stations & more than 50 different bus routes





## Sandilands Accident

- Accident occurred at 0607 on 9<sup>th</sup> November 2016;
- 7 fatalities and 62 injured;
- No services for 9 days
- Multiple investigations undertaken
  - RAIB;
  - BTP;
  - ORR; and
  - TfL.

## RAIB Recommendations (summary) – **for industry**

1. Effective UK wide **co-operation on safety matters**;
2. Systematic **Review of operational risk** and controls;
3. Install suitable measures to **reduce tram speeds at high risk locations**;
4. Evaluate system to **detect driver attention**;
5. Review **signage, lighting and visual cues** at high risk locations;
6. Consider **glazing options** on windows and doors;
7. Modify **emergency lighting** so it cannot be unintentionally disconnected;
8. Review options for **enabling rapid evacuation of tram** which is lying on its side;
9. ORR to review how it **regulates the Tram industry**;



## RAIB Recommendations – for London Tram system

10. Carry out review of process for **risk assessments**;
11. Operator to improve the **management of fatigue**;
12. Operator to review the way it learns from **operational experience**;
13. Improve the way **reports of safety related incidents** from employees and members of the public are dealt with;
14. Improve processes for inspection and maintenance of **on-tram CCTV equipment**; and
15. Review and revise **tram maintenance and testing documentation**.



How have we made  
the tramway safer?



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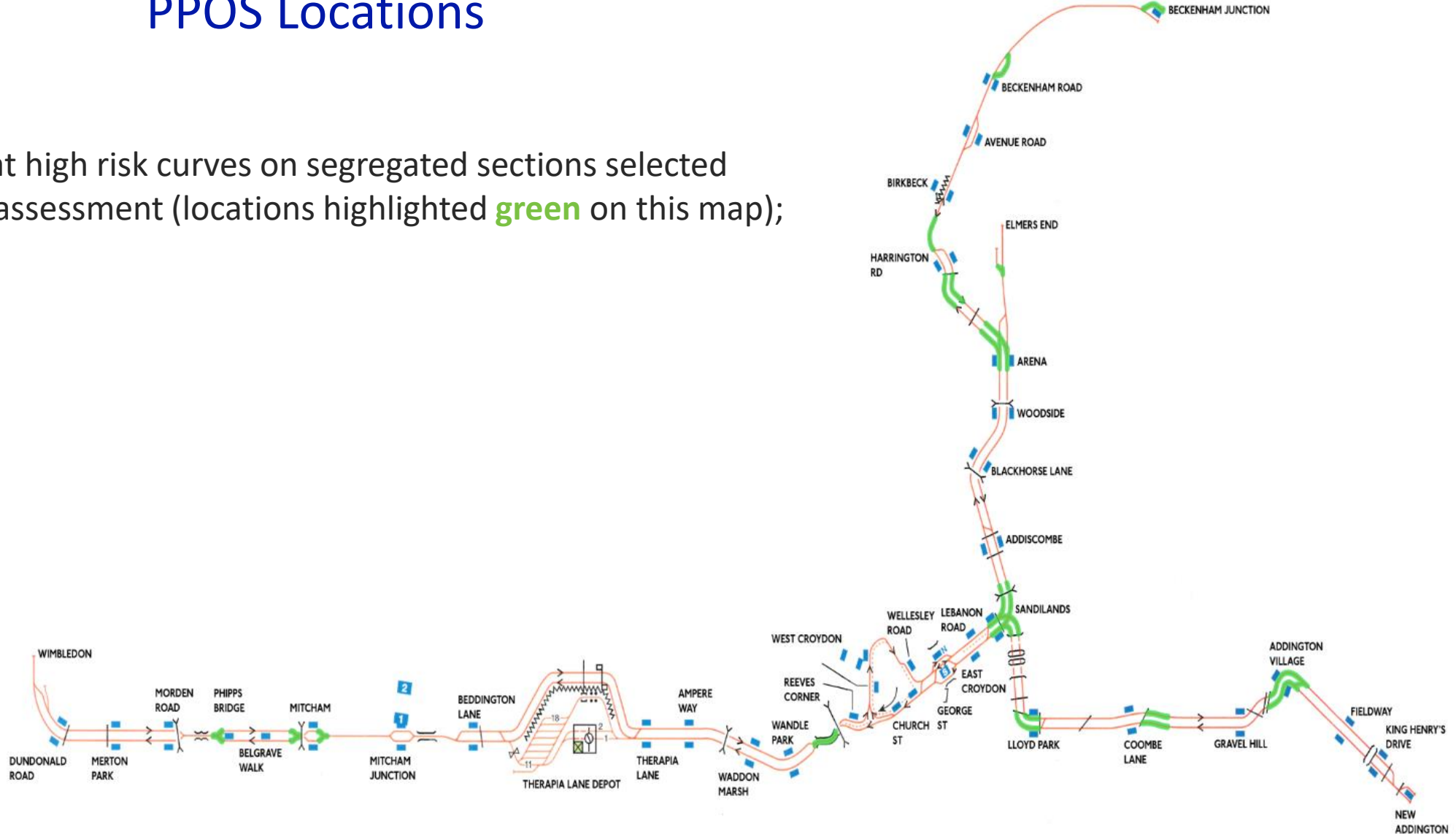
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## PPOS Locations

Installed at high risk curves on segregated sections selected after risk assessment (locations highlighted **green** on this map);



# Physical Prevention of Overspeed (PPOS)



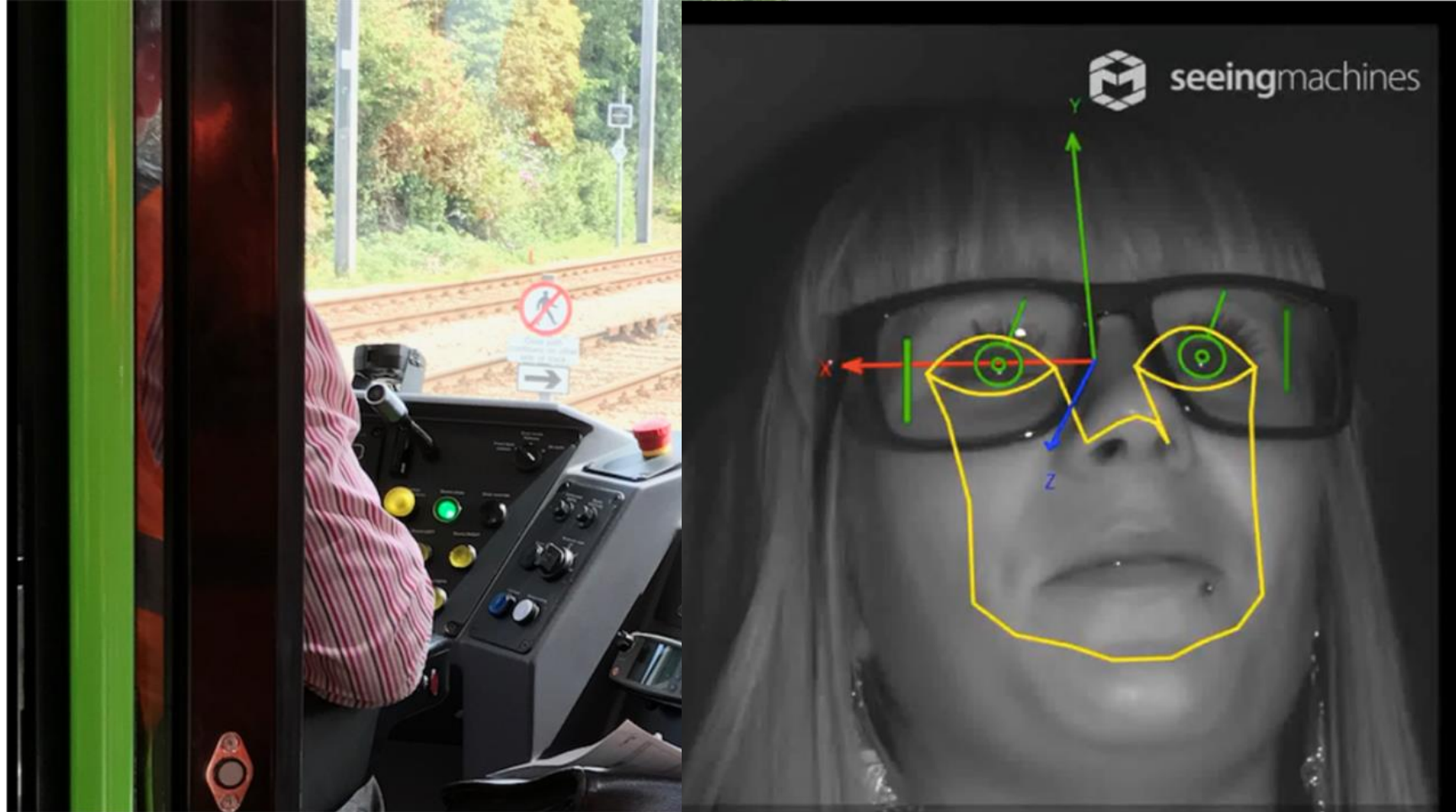
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# Guardian Device



# Guardian Device

| Real-time In-Cab Alerts  | Human Intervention  | Ongoing Safety  |
|--|---|---|
|  <b>Vehicle Driver</b>                    |  <b>24/7 SafeGuard Center Dispatch</b> |  <b>Corporate HR / Safety / Operations</b> |
|  <b>Fatigue and Distraction Detection</b> |  <b>Event Analysis</b>                  |  <b>Data Reporting</b>                     |
|  <b>Seat Vibration &amp; Audio Alert</b>  |  <b>Fatigue Management Plan</b>        |  <b>Process / Policy Optimisation</b>      |
|  <b>Complete Visibility</b>             |  <b>Notify Manager</b>               |  <b>Black Box</b>                        |

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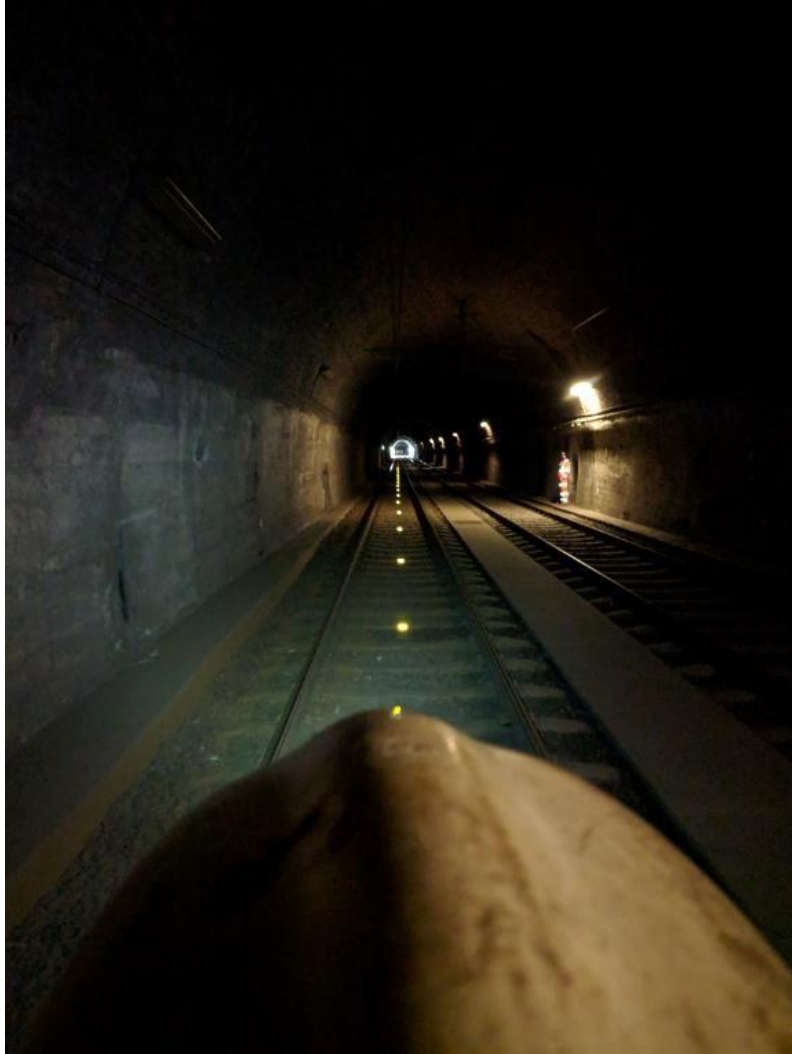




# Signage Changes



# Cats Eyes



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# Contacts from customers and stakeholders



**CCO Daily Customer Feedback**
Review completed by Sheila Gill, Tuesday 26 October 2021 at 04:28

Rail & Sponsored Services: Cycle Hire | DLR | Emirates Air Line | London Overground | River Services | Trams

## Monday 25 October 2021

12 noteworthy contacts received today, of which 2 relate to today

| London Trams   |              |         |                       |                       |                              |  | <a href="#">TOP</a> |                |
|--|--------------|---------|-----------------------|-----------------------|------------------------------|--|---------------------|----------------|
| 1 contact received today about services on other/unspecified dates |              |         |                       |                       |                              |  |                     |                |
| Date / Time of Incident  | Contact type | Ref     | Classification        | Station of Incident   | Journey                      | Summary  | Reported to CCO     | Contact Status |
| 21 Oct 2021<br>15:45   | Complaint    | 1.6E+07 | • Service performance | Gravel Hill Tram Stop | To East Croydon Rail Station | <span style="color: red;">△△△△△△△△ SAFETY / SECURITY-RELATED △△△△△△△△</span><br><MANUALLY REDACTED: Customer name> Was very surprised that the driver was eating his lunch as he drove and he kept stretching across to the right hand shelf to get things from his open lunchbox have photos as he didn't seem to be at all bothered or to be concentrating on looking after his passengers This was tram no 2534 Your comments and action would be appreciated Date of Travel: 21/10/2021 Time of Travel: 15:45 Station: Gravel Hill Tram Stop Staff Description: Travel Mode: tram Travelling From: Travelling To: East Croydon Rail Station Line: <MANUALLY REDACTED: Extraneous text> | 18:45               | Open           |



## Has this reduced risk on the Tramway?

Driver Error

95%

Tram Overturning

76%

Source: London Trams Safety Risk Model Annual Review 2021



Using Social Media  
to improve Safety.





## What was the issue?

- **Problem** - Hazard break applications across network but particular issue with high speed crossing points leading to KSIs for crossers and trips/falls by those in car not holding the handrail when breaks are applied
- **Audience** - All tramways crossers (customers and non customers) with a bullseye of 16-30 year old non-customers using high speed crossings
- **Behaviours** - Overreliance on hearing to detect a tram, inattention to surroundings & distraction (town centre). Compounded by lack of awareness that trams are quiet and take longer to stop

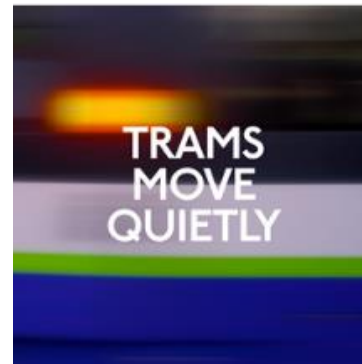


# Social Media Video



## Social Media Video

- Geo-targeted to within 2km of tramway;
- Impressions 5,723,716;
- Facebook performed better than Instagram platform in terms of reach (501k vs 374k);
- Facebook mobile app drove highest volume of impressions (3.1m)





## Digital Vans

- Six Digi-Vans mapped to tight routes (parking and moving locations) were positioned near the 6 high speed crossings
- Impressions: 3.7 million approx. (all adult impacts)



## CRM Activity

- Safety banner added to planned customer information emails;
- Approx. 70k emails sent of which ~ 50% were opened;
- 10% clicked on the banner to view the additional information

Home Plan a journey Status updates

**TRAMS**

### Trams

Dear Jon,

From Friday 7 April until Saturday 15 April, there will be no service between Reeves Corner and East Croydon via Church Street and West Croydon. This is so essential engineering works can be carried out to improve the tramway.

Trams will run between the following stops:

- Wimbledon and Reeves Corner
- East Croydon and New Addington
- East Croydon and Beckenham Junction
- East Croydon and Elmers End (except morning and evenings)

Tram replacement buses will not be available during the closure. Please [check before you travel](#), allow more time for your journey and where possible consider using alternative rail services, local buses, walking, or cycling.

Our [Journey Planner](#) and [Tfl Go app](#) can help you plan your journey as required.

If you are planning travel over Easter, the majority of TfL services will be running but there are some planned works on TfL and national rail services. Visit [www.tfl.gov.uk/easter](http://www.tfl.gov.uk/easter) to find out more on services to help you plan ahead.

Yours sincerely,

Mark Davis  
General Manager, London Trams

**STOP  
LOOK  
LISTEN**

STAY SAFE  
BE TRAM AWARE

WATCH OUR VIDEO



## Has this reduced risk on the Tramway?

- Watch this space.....





## Summary

- You do not have to spend large amounts of money to improve safety;
- Don't be afraid to look to other sectors for ideas;
- Try other 21<sup>st</sup> century media;
- Listen to (and act on) safety reports wherever they come from; and
- Use comprehensive risk modelling to help identify the areas you need to improve.



