

Oliver Stewart
RAIB Recommendation Handling Manager



22 December 2023

Mr Andy Lewis
Deputy Chief Inspector of Rail Accidents

Dear Andy,

RAIB Report: Collision between a tram and a child cyclist near to Audenshaw tram stop on 1 September 2021

I write to provide an update¹ on the action taken in respect of recommendations 1, 2 & 5 addressed to ORR in the above report, published on 25 August 2022.

The annex to this letter provides details of actions taken in response to the recommendations and the status decided by ORR. The status of recommendations 1 & 2 is '**Closed**'. The status of recommendation 5 is '**Open**'.

ORR will advise RAIB when further information is available regarding actions being taken to address these recommendations.

We will publish this response on the ORR website.

Yours sincerely,

Initial consideration by ORR

¹ In accordance with Regulation 12(2)(b) of the Railways (Accident Investigation and Reporting) Regulations 2005

Recommendation 1

The intent of this recommendation is that safety at the crossing involved in the accident is improved.

Transport for Greater Manchester and Tameside Metropolitan Borough Council, working as necessary with Keolis Amey Metrolink, should undertake a revised risk assessment of the crossing where the accident occurred. This assessment should be conducted in line with current industry good practice and should specifically consider both the circumstances in which this accident occurred and the nature of the crossing layout.

Transport for Greater Manchester and Tameside Metropolitan Borough Council should identify measures which will reduce the risk to users of the crossing so far as is reasonably practicable, based on the findings of this assessment. Any identified improvements should be implemented. As part of this process, Transport for Greater Manchester and Tameside Metropolitan Borough Council should consider what actions should be adopted to control the risks identified during the period in which any longer-term actions are being implemented.

ORR decision

1. Transport for Greater Manchester (TfGM) in conjunction with Tameside Metropolitan Borough Council and Keolis Amey Metrolink (KAM) have carried out a revised risk assessment for the crossing at the junction of Droylsdon Road and Kershaw Lane, where the accident RAIB investigated occurred. The risk assessment considered 11 risk control measures for the crossing, including closure, relocation, remodelling and operational controls. Two main changes were recommended: installation of additional ground marking and lowering or removal of the raised kerb on the Manchester side of the refuge. TfGM have reported that these changes have now been implemented.
2. The risk assessment did consider installing wig-wag signs, but concluded they would not be appropriate as they could potentially cause confusion with the existing red/green man indicators. However, as there may be a benefit from installing wig-wags at other locations, TfGM will raise the issue with the LRSSB to discuss with the DfT.
3. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, TfGM has:
 - taken the recommendation into consideration; and
 - have taken action to close it

Status: Closed

Information in support of ORR decision

4. On 25 November 2022 Transport for Greater Manchester provided the following initial response:

TfGM are working with Tameside Metropolitan Borough Council, and Keolis Amey Metrolink (KAM) to review and undertake a revised risk assessment of the crossing where the accident occurred. This risk assessment will be conducted in line with current industry good practice and will consider the salient points with respect to the circumstances in which this accident occurred (with reference to the RAIB - Rail Accident Report - Collision between a tram and a cyclist, near Audenshaw tram stop) and the nature of the crossing layout as it presently exists today. We expect to conclude this activity within 6 months.

5. On 15 August 2023 Transport for Greater Manchester provided the following update:

TfGM, Tameside, and Keolis Amey Metrolink have undertaken a revised risk assessment of the crossing. In addition to this an independent stage 4 road safety audit has been completed. The recommendations from the risk assessment have now been implemented, namely additional signage, and the lowering of a kerb on the island.

6. On 22 September 2023 TfGM provided a copy of the revised risk assessment



Crossing Risk
Assessment v4.pdf

Recommendation 2

The intent of this recommendation is to ensure that risks are appropriately managed during future Metrolink development projects.

Transport for Greater Manchester should review its safety management system to ensure that the systems and processes used to identify hazards and control risks:

- a) are implemented at a point in project lifecycles which will allow risks to be addressed in a timely fashion, such that better mitigations can be achieved at proportionate cost.
- b) correctly apply the requirements of 'The Railways and Other Guided Transport Systems (Safety) Regulations 2006', including those relating to Safety Verification and the application of the risk and difference test at an appropriate point within a project.
- c) include processes to ensure that risk assessments produced by suppliers meet the requirements of the safety management system and that the results of assessments prepared by other relevant third parties are accounted for.

ORR decision

7. TfGM has reviewed its safety management system and made a number of improvements. TfGM have provided the findings of the review, the guidance issued to projects to help assess hazards and have clearly set out how the action taken addresses each part of the recommendation. Actions taken include, rebriefing existing staff and revision to the TfGM induction process that covers relevant safety procedures and regulations.

8. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, TfGM has:

- taken the recommendation into consideration; and
- has taken action to close it

Status: Closed

Information in support of ORR decision

9. On 25 November 2022 Transport for Greater Manchester provided the following initial response:

I can confirm that TfGM have already reviewed our safety management system to ensure that the systems and processes used to identify hazards and control risks are implemented at the correct points in each individual project lifecycle. We believe that our management system allows for hazards to be addressed in a timely fashion, and for such mitigations to be identified at the correct time within a project lifecycle. We also believe our management system follows the correct application of the requirements of 'The Railways and Other Guided Transport Systems (Safety) Regulations 2006'. This includes those relating to safety verification and the application of the risk and difference test.

Our review has identified that an internal reminder should now be issued by our Head of Health, Safety and Environment to ensure that all Metrolink Projects follow our safety management system at all appropriate points within the project lifecycle.

TfGM further confirm that we shall continue to review processes to ensure that risk assessments produced by suppliers also meet the requirements of our safety management system and that the results of such assessments, and those prepared by other relevant third parties are accounted for to ensure the appropriate content is documented within each project health and safety file.

10. On 15 August 2023 Transport for Greater Manchester provided the following update:

Following recommendations (2a and 2b), TfGM have reviewed our safety management system and we believe that we now have a robust system in place to identify hazards and control risks through the design lifecycle of Metrolink projects. TfGM now has a process of challenge at our Safety Review Committee so that all

Metrolink Projects carry out risk and difference testing (satisfying ROG's 2006) at the appropriate time in the design lifecycle. The Safety Review Committee also includes representation from the operator of the Metrolink Network to help support the decision-making process.

Underpinning the safety review committee, we have clear guidance for projects to follow, which includes templates and risk assessment tools to help assess hazards, so that a project can evaluate the risk profile of the project if there is a change in circumstances that may require the reapplication of the risk and difference test. Transport for Greater Manchester is an executive body of the Greater Manchester Combined Authority. Since the recommendation, TfGM have issued a safety alert to all Metrolink Delivery Teams to ensure that they are aware of the preparation of risk and difference challenge to Metrolink Projects (and the requirements of our management system) to ensure a safety verification challenge is carried out within the early stages of a project's design life cycle and adequately documented and evidenced within the Health and Safety File for each Project. TfGM have also sought to include these safety requirements in the relevant project boards, which has included a series of presentations by the Head of HSE. To ensure that all future persons working on Metrolink projects are aware of our Safety Management of Changes Procedures, we have introduced into the TfGM induction process a familiarisation with the relevant procedures, which we believe will ensure that there are no gaps in the awareness in the future.

In relation to recommendation 2C, TfGM have an Engineering Assurance Process which documents the standards of assurance, reporting and recording of project related engineering activities. This includes designers risk assessment and the acceptance of outline designs by TfGM. This is now linked into our safety management system.

On 22 September 2023 Transport for Greater Manchester provided the following update:

TfGM have considered your question and have completed a report that provides an overview of the findings of the review that we have undertaken, the rationale that underpins the findings and the status of those actions. A copy of this report is attached for your reference.



TfGM
Report..Recommendations

Recommendation 5

The intent of this recommendation is to ensure that, as far as is reasonably practicable, systems on Metrolink trams are serviceable.

TfGM (as asset owner) and KAM (as equipment maintainer) should review the reliability, operation and maintenance of sanding equipment and CCTV on M5000 trams to ensure that they are fit for purpose.

This review should identify appropriate improvements in the maintenance regime or the equipment design which will improve their reliability. These improvements should be applied both to the current fleet of M5000 trams and for any vehicles procured for the Metrolink network in the future.

ORR decision

11. Initially the root cause of the reliability issues of the FFCCTV equipment on the Metrolink M5000 tram fleet was thought to be the hard drives. TfGM had agreed to fund new hard drives for the M5000 tram fleet, together with a software upgrade which should have increased the overall reliability of the FFCCTV system. However, the manufacturer of the equipment has not yet been able to identify the root cause of the reliability issue.

12. TfGM are continuing to work with the equipment manufacturer to develop a solution, but are also considering fitting a new system if a fix to improve reliability is not possible. In parallel, KAM have been investigating a modification to the CCTV using a 3rd party solution. Initial testing has been positive, but is at an early stage of development.

13. To reduce the risk of the sanders on the M5000 tram fleet from becoming blocked, KAM ran a trial using a different grade of sand with a lower clay content. The trial was successful, and the new sand is being introduced across the tram fleet.

14. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, KAM has:

- taken the recommendation into consideration; and
- is taking action to close it

Status: Open

Information in support of ORR decision

15. On 25 November 2022 Transport for Greater Manchester provided the following initial response:

TfGM have previously written to the maintainer (KAM) of the M5000 asking them to conduct a review into the reliability and availability of the forward-facing CCTV system to help us to understand if the system remains fit-for-purpose. As part of this review, we have committed to work with KAM to establish if any control measures may be required to mitigate against any repeat failures.

So far, KAM have advised that there are multiple areas including software and hard drives that may require renewal. KAM are currently trialling a potential solution and we await the outcome of this trial. If any technical improvements are necessary, TfGM will work with KAM to implement these.

In relation to the M5000 sanding system, TfGM do not believe that there are modifications required to the equipment. However, TfGM are working with KAM to understand if the monitoring arrangements and planned maintenance activities are

suitable to satisfy ourselves that there is a timely identification of any failures and to also ensure any required interventions are undertaken before vehicles are put into service. As part of this work, KAM have advised that they are conducting a trial into an alternative sand that they hope will prevent blockage in the sanders due to clay build up. This is expected to be completed by the end of April 2023.

16. On 15 August 2023 Transport for Greater Manchester provided the following update:

TfGM asked the maintainer (KAM) of the M5000 fleet to examine the use of the sanding equipment of the vehicles. Through a subsequent review KAM identified that by using a different grade of sand that the M5000's was less susceptible to sand blockages. A trial was conducted over a 6-week period which confirmed during the trial period the trams used ejected consistently more sand without hose blocks. An engineering change has been made and KAM are currently implementing the change in sand across the fleet.

We have also followed a similar review process for the reliability of the forward-facing CCTV. TfGM have accepted a renewal proposal from KAM to replace the hard drives in the trams to improve reliability and to then upgrade the software to the latest version. However, we have raised a defect with the manufacturer regarding our concern over the reliability of the most recently supplied trams and whilst this has been accepted, it is still currently subject to ongoing diagnostic checks by their engineers. A fix will be applied to the whole fleet once the defect has been resolved on the new trams. TfGM are committed to resolving this issue and we continue to seek a timely resolution to the issue. TfGM will in due course set out a timeline for how this will be resolved.

17. On 21 November 2022 Keolis Amey Metrolink provided the following initial response:

Tram Front Facing Close Circuit Television (CCTV) System

KAM has identified the main cause of the M5000 CCTV unreliability in tram batches 1-6 (vehicle numbers 1-120) as being the disc array hard drives. In collaboration with our client and network owner, Transport for Greater Manchester (TfGM), we have agreed that a renewal of these components is now required.

*For batch 7 trams (vehicle numbers 121-147), a software fault has been identified that is causing CCTV reliability issues. A solution has been identified and is currently being trialled. Following successful rectification of the software fault the disc array hard drives will be renewed across the fleet. **We expect this to be completed by the end of September 2023.***

In recognition of the importance of CCTV footage in supporting incident investigations, as an interim measure KAM has requested additional assistance from TfGM to access highways CCTV recordings (where available) via the TfGM Control Centre and the wider Greater Manchester Combined Authority (GMCA) community (i.e. local authority CCTV teams).

Sanding system

The root cause of the tram sanders becoming blocked has been identified as the clay content of the currently used grade of sand used being susceptible to clumping. This type of sand has been used by Metrolink since the T68 fleet was in operation and is used on other light rail fleets within the UK.

KAM has found an alternative grade of sand with a lower clay content. We are now in the process of commencing a trial of this on the network which is expected to be completed by the end of April 2023. The trial period will provide will be used to establish how the new sand is performing especially during winter period. If there are no significant issues detected during the trial, we will roll out the new sand across the fleet pending application of our change control processes.

18. On 15 August 2023 Keolis Amey Metrolink provided the following update:

Tram Front Facing Close Circuit Television (CCTV) System

After thorough investigation of CCTV reliability issues, it has been determined that a full renewal of the systems hard disks is required. Transport for Greater Manchester (TfGM) has accepted this renewal proposal and has included it within their renewals and enhancements programme. KAM continues to work closely with TfGM on this resolve this matter.

Sanding system

KAM has successfully trialled an alternative grade of sand with a lower clay content to that which has been found to have caused reliability issues due to being prone to blocking within the system.

We are now in the process of completing the necessary engineering change control process before we commence with the rollout of the alternative sand across the fleet of 147 vehicles. The new sand will be installed during planned rolling stock examinations and will take approximately six months to complete.

19. On 22 September 2023, TfGM provided the following update:

TfGM are taking this matter extremely seriously and are pushing hard for a resolution to the forward-facing CCTV reliability issue. Unfortunately, resolving the problem has not been straightforward and having previously escalated our frustration and concern with the Original Equipment Manufacturer (OEM) we are now holding weekly escalation calls with the OEM to seek a satisfactory outcome.

To provide some assurance to you, on these calls we have been documenting the minutes of our meetings with the OEM, and we are able to supply this to you on request, to evidence the complexity of the issue and our commitment to progressing matters.

At this current time, the OEM has not been able to pinpoint the root cause of the issue, despite them sending resources over from Germany in August for a week. Following this visit, the OEM have reported that they have been able to understand more about the problem and have been able to implement some initial changes to assist with identifying the cause, but it is still too early to establish when the issues will be found.

In tandem, KAM have been investigating a modification to the CCTV using a 3rd party solution. This has very initial testing within the depot and the results look positive but is at an early stage of development.

Therefore, at this time TfGM are not able to provide a timebound plan, although we acknowledge that we are now approaching a point where we may need to agree when we stop investigations and to explore looking at an entirely new CCTV system. This would be a significant decision to undertake, particularly as TfGM is a public body and the cost of this level of investment would be considerable, therefore we feel that progressing the investigative route is not only the most cost-effective route but may be the quickest method of resolving the issue, as any procurement process to purchase a new CCTV system will add time into the process. Nevertheless, we are starting to explore funding options in preparation.

We welcome the opportunity to discuss this with you further through our regular liaison meetings, but at this stage we feel that we will only be able to issue a timebound plan when either of the two options comes to fruition:

Option 1 - the OEM identifies the cause and proposes a fix, then a plan can be made to introduce this fix to the entire fleet.

Option 2 - TfGM determine that the OEM cannot resolve the defect and a plan is developed to renew the entire CCTV system. We would wish to discuss with you a proportionate cut off point for this situation, but we hope that the end of December 2023 would be a reasonable point.

Previously reported to RAIB

Recommendation 1

The intent of this recommendation is that safety at the crossing involved in the accident is improved.

Transport for Greater Manchester and Tameside Metropolitan Borough Council, working as necessary with Keolis Amey Metrolink, should undertake a revised risk assessment of the crossing where the accident occurred. This assessment should be conducted in line with current industry good practice and should specifically consider both the circumstances in which this accident occurred and the nature of the crossing layout.

Transport for Greater Manchester and Tameside Metropolitan Borough Council should identify measures which will reduce the risk to users of the crossing so far as is reasonably practicable, based on the findings of this assessment. Any identified improvements should be implemented. As part of this process, Transport for Greater Manchester and Tameside Metropolitan Borough Council should consider what actions should be adopted to control the risks identified during the period in which any longer-term actions are being implemented.

ORR decision

1. Transport for Greater Manchester (TfGM) in conjunction with Tameside Metropolitan Borough Council and Keolis Amey Metrolink (KAM) have undertaken a revised risk assessment for the crossing at the junction of Droylsdon Road and Kershaw Lane, where the accident occurred. We have asked TfGM for a copy of the risk assessment to review before we can consider closing the recommendation.

2. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, TfGM has:

- taken the recommendation into consideration; and
- is taking action to close it

Status: Open

Information in support of ORR decision

3. On 25 November 2022 Transport for Greater Manchester provided the following initial response:

TfGM are working with Tameside Metropolitan Borough Council, and Keolis Amey Metrolink (KAM) to review and undertake a revised risk assessment of the crossing where the accident occurred. This risk assessment will be conducted in line with current industry good practice and will consider the salient points with respect to the circumstances in which this accident occurred (with reference to the RAIB - Rail Accident Report - Collision between a tram and a cyclist, near

Audenshaw tram stop) and the nature of the crossing layout as it presently exists today. We expect to conclude this activity within 6 months.

4. On 15 August 2023 Transport for Greater Manchester provided the following update:

TfGM, Tameside, and Keolis Amey Metrolink have undertaken a revised risk assessment of the crossing. In addition to this an independent stage 4 road safety audit has been completed. The recommendations from the risk assessment have now been implemented, namely additional signage, and the lowering of a kerb on the island.

Recommendation 2

The intent of this recommendation is to ensure that risks are appropriately managed during future Metrolink development projects.

Transport for Greater Manchester should review its safety management system to ensure that the systems and processes used to identify hazards and control risks:

- a) are implemented at a point in project lifecycles which will allow risks to be addressed in a timely fashion, such that better mitigations can be achieved at proportionate cost.
- b) correctly apply the requirements of 'The Railways and Other Guided Transport Systems (Safety) Regulations 2006', including those relating to Safety Verification and the application of the risk and difference test at an appropriate point within a project.
- c) include processes to ensure that risk assessments produced by suppliers meet the requirements of the safety management system and that the results of assessments prepared by other relevant third parties are accounted for.

ORR decision

5. TfGM has carried out a review of its safety management system. We have asked TfGM for the findings of the review and how each part of the recommendation has been addressed. We have also asked TfGM for a copy of the guidance issued to projects to help assess hazards.

6. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, TfGM has:

- taken the recommendation into consideration; and
- is taking action to close it

Status: Open

Information in support of ORR decision

7. On 25 November 2022 Transport for Greater Manchester provided the following initial response:

I can confirm that TfGM have already reviewed our safety management system to ensure that the systems and processes used to identify hazards and control risks are implemented at the correct points in each individual project lifecycle. We believe that our management system allows for hazards to be addressed in a timely fashion, and for such mitigations to be identified at the correct time within a project lifecycle. We also believe our management system follows the correct application of the requirements of 'The Railways and Other Guided Transport Systems (Safety) Regulations 2006'. This includes those relating to safety verification and the application of the risk and difference test.

Our review has identified that an internal reminder should now be issued by our Head of Health, Safety and Environment to ensure that all Metrolink Projects follow our safety management system at all appropriate points within the project lifecycle.

TfGM further confirm that we shall continue to review processes to ensure that risk assessments produced by suppliers also meet the requirements of our safety management system and that the results of such assessments, and those prepared by other relevant third parties are accounted for to ensure the appropriate content is documented within each project health and safety file.

8. On 15 August 2023 Transport for Greater Manchester provided the following update:

Following recommendations (2a and 2b), TfGM have reviewed our safety management system and we believe that we now have a robust system in place to identify hazards and control risks through the design lifecycle of Metrolink projects. TfGM now has a process of challenge at our Safety Review Committee so that all Metrolink Projects carry out risk and difference testing (satisfying ROG's 2006) at the appropriate time in the design lifecycle. The Safety Review Committee also includes representation from the operator of the Metrolink Network to help support the decision-making process.

Underpinning the safety review committee, we have clear guidance for projects to follow, which includes templates and risk assessment tools to help assess hazards, so that a project can evaluate the risk profile of the project if there is a change in circumstances that may require the reapplication of the risk and difference test. Transport for Greater Manchester is an executive body of the Greater Manchester Combined Authority. Since the recommendation, TfGM have issued a safety alert to all Metrolink Delivery Teams to ensure that they are aware of the preparation of risk and difference challenge to Metrolink Projects (and the requirements of our management system) to ensure a safety verification challenge is carried out within the early stages of a project's design life cycle and adequately documented and evidenced within the Health and Safety File for each Project. TfGM have also sought to include these safety requirements in the relevant project boards, which has included a series of presentations by the Head of HSE. To ensure that all future persons working on Metrolink projects are aware of our Safety Management of Changes Procedures, we have introduced into the TfGM induction process a

familiarisation with the relevant procedures, which we believe will ensure that there are no gaps in the awareness in the future.

In relation to recommendation 2C, TfGM have an Engineering Assurance Process which documents the standards of assurance, reporting and recording of project related engineering activities. This includes designers risk assessment and the acceptance of outline designs by TfGM. This is now linked into our safety management system.

Recommendation 5

The intent of this recommendation is to ensure that, as far as is reasonably practicable, systems on Metrolink trams are serviceable.

TfGM (as asset owner) and KAM (as equipment maintainer) should review the reliability, operation and maintenance of sanding equipment and CCTV on M5000 trams to ensure that they are fit for purpose.

This review should identify appropriate improvements in the maintenance regime or the equipment design which will improve their reliability. These improvements should be applied both to the current fleet of M5000 trams and for any vehicles procured for the Metrolink network in the future.

ORR decision

9. In terms of CCTV equipment, TfGM have agreed to fund new hard drives for the M5000 tram fleet. This action, together with a software upgrade, should increase the reliability and availability of CCTV across the fleet. We have asked TfGM and KAM for a timebound plan for this work.

10. To reduce the risk of the sanders on the M5000 tram fleet from becoming blocked, KAM ran a trial using a different grade of sand with a lower clay content. The trial was successful, and the new sand is being introduced across the tram fleet.

11. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, KAM has:

- taken the recommendation into consideration; and
- is taking action to close it

Status: Open

Information in support of ORR decision

12. On 25 November 2022 Transport for Greater Manchester provided the following initial response:

TfGM have previously written to the maintainer (KAM) of the M5000 asking them to conduct a review into the reliability and availability of the forward-facing CCTV system to help us to understand if the system remains fit-for-purpose. As part of this review, we have committed to work with KAM to establish if any control measures may be required to mitigate against any repeat failures.

So far, KAM have advised that there are multiple areas including software and hard drives that may require renewal. KAM are currently trialling a potential solution and we await the outcome of this trial. If any technical improvements are necessary, TfGM will work with KAM to implement these.

In relation to the M5000 sanding system, TfGM do not believe that there are modifications required to the equipment. However, TfGM are working with KAM to understand if the monitoring arrangements and planned maintenance activities are suitable to satisfy ourselves that there is a timely identification of any failures and to also ensure any required interventions are undertaken before vehicles are put into service. As part of this work, KAM have advised that they are conducting a trial into an alternative sand that they hope will prevent blockage in the sanders due to clay build up. This is expected to be completed by the end of April 2023.

13. On 15 August 2023 Transport for Greater Manchester provided the following update:

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We have also followed a similar review process for the reliability of the forward-facing CCTV. TfGM have accepted a renewal proposal from KAM to replace the hard drives in the trams to improve reliability and to then upgrade the software to the latest version. However, we have raised a defect with the manufacturer regarding our concern over the reliability of the most recently supplied trams and whilst this has been accepted, it is still currently subject to ongoing diagnostic checks by their engineers. A fix will be applied to the whole fleet once the defect has been resolved on the new trams. TfGM are committed to resolving this issue and we continue to seek a timely resolution to the issue. TfGM will in due course set out a timeline for how this will be resolved.

14. On 21 November 2022 Keolis Amey Metrolink provided the following initial response:

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KAM has identified the main cause of the M5000 CCTV unreliability in tram batches 1-6 (vehicle numbers 1-120) as being the disc array hard drives. In collaboration with our client and network owner, Transport for Greater Manchester (TfGM), we have agreed that a renewal of these components is now required.

*For batch 7 trams (vehicle numbers 121-147), a software fault has been identified that is causing CCTV reliability issues. A solution has been identified and is currently being trialled. Following successful rectification of the software fault the disc array hard drives will be renewed across the fleet. **We expect this to be completed by the end of September 2023.***

In recognition of the importance of CCTV footage in supporting incident investigations, as an interim measure KAM has requested additional assistance from TfGM to access highways CCTV recordings (where available) via the TfGM Control Centre and the wider Greater Manchester Combined Authority (GMCA) community (i.e. local authority CCTV teams).

Sanding system

The root cause of the tram sanders becoming blocked has been identified as the clay content of the currently used grade of sand used being susceptible to clumping. This type of sand has been used by Metrolink since the T68 fleet was in operation and is used on other light rail fleets within the UK.

KAM has found an alternative grade of sand with a lower clay content. We are now in the process of commencing a trial of this on the network which is expected to be completed by the end of April 2023. The trial period will provide will be used to establish how the new sand is performing especially during winter period. If there are no significant issues detected during the trial, we will roll out the new sand across the fleet pending application of our change control processes.

15. On 15 August 2023 Keolis Amey Metrolink provided the following update:

Tram Front Facing Close Circuit Television (CCTV) System

After thorough investigation of CCTV reliability issues, it has been determined that a full renewal of the systems hard disks is required. Transport for Greater Manchester (TfGM) has accepted this renewal proposal and has included it within their renewals and enhancements programme. KAM continues to work closely with TfGM on this resolve this matter.

Sanding system

KAM has successfully trialled an alternative grade of sand with a lower clay content to that which has been found to have caused reliability issues due to being prone to blocking within the system.

We are now in the process of completing the necessary engineering change control process before we commence with the rollout of the alternative sand across the fleet of 147 vehicles. The new sand will be installed during planned rolling stock examinations and will take approximately six months to complete.