

Light Rail Engineers Group Meeting Minutes

Meeting held at the The National Tramway Museum, Crich Tramway Village, Nr
Matlock, Derbyshire, DE4 5DP
Thursday 9th May 2019

Present:

Craig O'Brien (COB) – Stagecoach Supertram	Lorraine George (LG) UKTram
Ian Middlemiss (IM) – Blackpool Trams – Chair	Chris Hopkinson (CH) – SYPTE
Alex Barry - (AB) TfL	Laura Bartram (LB) - Nottingham
Ian Hale (IH) – London Trams	Ian Ambrose (IA) – Network Rail
Mike Crabtree (MC) – NTM Crich	Michael Hancock (MH) – Midland Metro
Anna Chang (AC)	Graham Thornton (GT) Manchester Metrolink
Darren Cole (DC) – British Steel	Phil Terry (PT) – Nottingham
Des Coulson (DC) – Midland Metro	Lindsey Smith (LS) – British Steel
Donald Thompson (DT) – ABB	Matthew Hack (MH) – Midland Metro
Michael Doughty (MD) – Manchester	Sandra Fetwell Smith (SFS) British Steel
Dan Hill (DH) UKTram	

Apologies for absence:

Chris Jackson (CJ)	Mike Szender (MS) – Isle Of Man
Brian Wilson (BW)	Paul Jarman (PJ) – Beamish
Gail Blyth (GB) - Siemens	David Keay (DK) – UKTram
Cathal Dwane (CD) - Siemens	Eoghan Sweeney (ES) – Luas Dublin
Ankur Ankur (AA) – Addleshaw	Paul Ankers (PA)
Colin Kerr (CK) – Edinburgh Trams	Lee Joyce (LJ) – SYPTE
David Mee (DM) – Nexus	

ITEM	NOTE	ACTION
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WELCOME TO CRICH

1.

1.1 IM welcomed everyone to the meeting and thanked MC and Crich for hosting the meeting. The group were then given a presentation from Sandra Fetwell Smith, British Steel and Mike Dougherty, Manchester Metrolink provided a presentation on Rail breaks and Laura Waters, Crich on provided a presentation on conserving the 2nd Generation.

IM went on to thank COB for his time, support and hard work as Chair as of the LREG group and hoped that in his new role as Engineering manager, UKTram that he will continue to support the group and continue to push the group in the right direction..

2. INTRODUCTIONS AND APOLOGIES FOR ABSENCE

2.1 All attendees introduced themselves around the table and COB advised of apologies received (listed above).

3. REVIEW OF LAST MEETING

3.1 Review of Previous Meeting Notes

The notes from the previous meeting were accepted as an accurate reflection of the meeting.

IM reminded the group to raise any mistakes before the actual meeting to allow LG to make any changes and re-issue a correct set of minutes before the meeting.

3:2

Review of Previous Meeting Actions

Item 2 - Action: LG to email members to ask for their nominations and a vote will be held at the next LREG meeting - Completed

Item 6.1 - Action: LG to contact Andy Wallace on behalf of CK - CK to look at the regulations – Update – LG contacted AW and meeting planned on 23rd March which CK has been invited to - Completed

AOB - Action: LG to forward to LRSSSB. – Update – LG forwarded document, the LRSSB have passed it on to David Keay to update and give feedback to LREG. - Completed

AOB - Action: SF to forward information on signage to LG to forward to group. – Completed

Actions from this meeting

Enquire with James Hammett as to whether he thinks there is a benefit to Laura Waters presenting at UK Tram executive – **Action LG**

Item 5 - Produce a working document for capturing data relating to all Rail breaks on Light Rail Systems – **Action COB/UKTram**

Item 5 - Submit all existing data and procedures relating to Rail Breaks & how these are currently managed – **Action all**

Item 5 - Submit all existing OLE terminology to Des Coulson – **Action all**

Item 5 - Recommend volunteers and get firm commitment for existing working groups and put forward to Craig O'Brien – **Action all**

Item 5 - Find out availability of running the “Understanding derailments” course and gather names of interested parties – **Action COB**

3.3 Vice Chair Vote

IM reminded the group that at the previous meeting COB stepped down as chair and IM took on the role as Chair. This left the group with a Vice Chair position and the group were asked for nominations. UKTram received three nominations, but two of the nominees withdraw their nominations leaving Cathal Dwane as the only nomination.

IM went on to ask the group to vote on whether they would like CD to take on the Vice chair role. The group vote overwhelming in CD's favour and IM asked LG to Inform JH and CD of the result.

4. UKTRAM UPDATE

4.1 Update on UKTram – LG/DH

LRSSB The Board has now been appointed with Jonathan Fox (TfL) and Bob Morris (TfGM) representing Owners & Authorities, Carl Williams (MML) and David Nichols (KAM) representing Operators and is currently being chaired by Phil Hewitt

Following the announcement from the Minister in February, we have now been awarded funding for the first year of operation of the LRSSB. The LRSSB were under the impression that we would receive the full amount as one lump sum, which has not been the case and the Board have now written to the Minister to ask for an explanation.

Industry Consultation: The DfT have recently released a call for evidence on how to better use and implement Light Rail and other rapid transit solutions in cities and towns. UKTram held an Industry Consultation meeting on the 8th of May to discuss and formalise an industry response.

TGP – David Keay and UKTram held a standards review of TPG on the 8th of May. Following the meeting the document will be formatted and released.
Risk Model – The Industry Risk Model work being undertaken by Atkins is progressing well with the trial system KAM.

If anyone needs any information please contact Mark Ashmore who is leading on this project.

TAIR - All operators had submitted the requested information in relation common indexes to enable population of the database relevant to individual system requirements.

Additionally further development and modification to database design was also progressing following feedback received from individual operators, allowing TAIR to be modified to suit individual system asset reference and data collection requirements in addition to the adding of the near miss module to the system.

Two training days have also been held on the 26th and 28th of March in Birmingham.

RM3 – UKTram hosted the Risk Maturity Model RM3: 2019 launch workshop on the 10th of April that will be facilitated by the ORR. The aim of RM3: 2019 launch workshop is to inform the light rail industry of the updated RM3 model and to allow the ORR and duty holders to explore the best ways to use the model to drive excellence in risk management within the industry.

Recruitment –We have now successfully interviewed and appointed our Engineering Manager Craig O'Brien, Operations Manager, Steve Duckering and Commercial/Marketing, Jamie Swift. Julia Whittaker from The Big Solution will also be leading on training and careers for UKTram

Geoff Inskip will also be standing down as Chair, once a new chair has been found and UKTram are in the process of recruiting a new chair

Relocation - UKTram and LRSSB have now relocated into our own office area within 16 Summer Lane and with the move into our new office we have procured and set up video conferencing facilities.

Training and apprenticeships – Midland Metro Alliance Construction operative apprenticeship (supported by UKTram) successfully through submission stage and is now in its funding phase. Our Driver apprenticeship is now ready and available and awaiting sign ups to the course.

Mainspring look out for further dates for Excellence days which will be tailored for operators/engineers which will take place later in the year

Events – UKTram sent Mark Ashmore to the Annual Yarra Tram conference in Australia in February and will be sending Steve Duckering to the Light Rail and Tramcar conference in New Jersey in April so that we are able to start sharing international best practise.

UKTram Summit – The summit will be held on the 10th of September, Invites and more information to follow shortly and we are looking for ideas on topics or speaker that you would like showcased at the event.

5. LREG – 2016 DELIVERABLES UPDATE

IM and COB advised the group that going forward there would be changes to Best Practise days and to the way the group delivers it's objectives/deliverables. Therefore it was agreed that a small number of working groups would be formed to deliver the required guidance and standards to members which would be brought to best practice.

The group agreed to the follow working groups

Rail Breaks

- Working Group Chair – Craig O'Brien (UK Tram Engineering Manager)
- Group Members – Sandra Fretwell-Smith (British Steel) 2 more TBC

Deliverables – A standard and guidance procedure would be drafted on how to manage the risk of rail breaks and what process and safety measures should be implemented when they occur. Once complete this will be circulated to the industry for comment then issued through LRSSB as a recognised working document with a review date of an agreed time frame.

OLE terminology & Competency

- Working Group Chair – Des Coulson (Midland Metro)
- Group Members – Mike Crabtree (Crich) 2 more TBC

Deliverables – A working document would be produced on agreed terminology for all OLE and associated assets. The intention is clear up any confusion within the industry on terms of reference, this piece of work is already part way complete but required further input from member organisations. In addition it was suggested that LREG could agree on a recognised training and competency certification for all OLE staff, at this stage this has not been agreed but is worth further discussion.

Under Run Protection

- Working Group Chair – Colin Kerr (Edinburg Tram)
- Group Members – Suggested – Dave Skirrow (formerly Manchester Metrolink) Glin Stanford (Sheffield Supertram) 1 more all TBC

Deliverables – There is still some confusion over the actual recommendation surrounding this topic and what the most appropriate and safest solution is. A large body of work has already taken place.

A number of actions for the group can be found in item 3.2.

The group were also asked to suggest future deliverables and agreed that signage would be the next topic

6. ORR/RAIB/USAN'S

6.1

ORR – No updates

RAIB/USAN – Please find a copy of the report attached to the minutes.

7. SYSTEM UPDATE

IM reminded the group to forward their system updates to LG two weeks before the meeting so that they can be shared within the group prior to the meeting.

Croydon – IH

Incidents

Another period of good learning opportunities.

We had a tram roof panel rise up in service and short out on the OLE stopping services at the Wimbledon end of the line. Unfortunately this was in a difficult location which meant a safe system of work had to be devised to get up onto the roof to close the lid and restore power which eventually required the building of a temporary scaffold before the tram could be moved and the OLR repaired.

Services were lost for most of the day at the west end of the system raising all sorts of questions. Unfortunately similar organisational issues were again realised when a tram failed on a step part of the network, taking several hours to recover and move out of the way. Lessons will be learnt.

Regrettably Croydon Trams has experienced a couple of driver strikes in the last month or so, with another two announced later in May. These are an issue between the operator and the drivers.

Sandilands

Works continue in implementing improvements in response to the Sandilands incident particularly focusing on the design and implementation of the Positive Prevention of Over speed System, the improvements to the lighting within Sandilands tunnel and the provision of iTram in the fleet. Although not directly connected to Sandilands, the team is also working towards a system to prevent wrongside door opening on the trams.

The driving simulator is now produced and the geographic coverage is to be extended to cover the whole network.

Projects

It has been a very busy period for projects.

Works continue at Blackhorse Lane Bridge with ground anchors all installed, the demolition of the old deck and the installation of 2/3 of the beams for the new deck. The plan is now to move the utilities across to the new deck beams and then to finish the remaining beams.

The works at Ampere Way replacing the retaining wall have commenced with around 250 out of the 350 sheet piles now installed. Traffic has continued to run alongside the works without issue.

Installation works on the communications infrastructure replacement system is now fully underway with works across the network every night. Planned changeover to the new system commences in September.

Track renewals have also been carried out on a series of weekend closures in the Addiscombe to Woodside section although doing lots of small lengths and handing back each Monday has proved challenging with works having to be descoped during the weekends to meet the end times.

We await news on the planned Sutton extension as funding has proved to be an issue and on the Westfield plans for Croydon as these appear to have been delayed currently.

Maintenance

Analysis of the data from the maintenance staff fatigue study continues.

Following complaints from drivers last year, we continue to investigate ways to improve the cooling in the cabs in the CR4000 fleet; this is proving difficult due to space constraints.

Blackpool – IM

Extension

The extension to Blackpool North Train Station has been put back for some time. The track is laid and connected to the main line but there is still an issue at the Wilko end with no real end date.

Maintenance

Bombardier have commissioned Dorlec to replace 68 traction motor bearings that were damaged during delivery. The damaged have caused noise from the bearing as well as some dropping all their oil.

We have had a tram centre bogie split the points and derail in the depot. No cause for splitting the points was found. The bogie derailed some 2 metres from the correct line. This caused damage to the overhead and the tram pantograph. The rerailing of the tram took 4 hours due to the fact we have not had a derailment of an LRT for a number of years and we only train rerailing the front bogie. The training is currently being changed.

We have also had an incident where a pantograph and the overhead were damaged on the main line. The pantograph was ripped from the tram and the overhead bell insulator was damaged. We have not been able to identify what the cause was.

We continue to have a fault with the SCADA system as it does not automatically change over from fibre connection to GMS when there is a fault. Austin Lenika are working on a solution.

We also have continuing issue with our multicar overhead vehicle. The vehicle continues to go into limp mode which results in a max rev count of 2000rpm.

Lost Mileage

Period 8 (14/10/18 – 10/11/18) saw a loss of 163km this equates to 0.2% of overall journeys. The main problems were tram faults.

Sheffield - COB

Embedded Rail Replacement 2019

The program for 2019 started on the Easter weekend where a full diamond crossing was replaced at Hillsborough. The entire project will focus around the Yellow Route with no service running on what effectively represents approximately a 3rd of the system. This will continue to be the case for most of the project until September with a short break in between to accommodate the Tramlines Festival.

Once again Volker are the principle contractor and Aecom the designer and on site handback engineer.

Infrastructure

Tamping – Supertram has just completed 8km of tamping works along the Meadowhall leg of the system. The principle contractor for this was Volker Rail using the Beaver Tamper.

Grinding – After carrying out a corrugation survey of the entire system Mecno produced a program for grinding based on the priority areas. As the previous no track was ground the corrugation is worse than seen in previous years and will require additional shifts on top of the 36 we have commissioned. Mecno has provided a more powerful machine than in recent years which is far more efficient and covers a greater distance per shift. Mecno & Voestalpine are going to provide a 5 year program based on the corrugation survey.

Rail Breaks – 3 more break have occurred since the last LREG which is 19 in total with some rail as newly installed as 2014. All these breaks are almost identical in nature and have propagated from the heat affected zone at a Thermit weld.

Reorganisation – The department is currently in consultation following a proposal to remove all 12 hour shift patterns and revert back to an 8 hour 3 shift pattern with on call at weekends. This is a similar pattern to what was in place between 1994-2014. This proposal is based on a number of factors one of which is fatigue and an overall fall in production and increasing demands.

One interesting aspect among many is the lack of firm information about “on call” and the affects this has on fatigue and grey around it constituting as working hours.

Sleeper replacement - 160 sleepers were replaced over a 3 week period around two major curves due to degradation of the wooden sleepers going beyond maintenance.

Low speed Section Insulators – After recent yearly inspections it is apparent that the rubber insulation is breaking down and allowing water ingress to take place which is causing current to escape. Sheffield is currently running a trial on a replacement as the original part is not manufactured anymore. There are currently 28 of these on the on the system so this will have to be factored into what is already a tight schedule.

Rolling Stock

Axles – Ultra sonic testing will commence on the entire fleet w/c 29th April this will determine what the level of cracking the axles is likely to be if present.

Bogies & Articulation – 16 of the 25 have now been overhauled and completed

Pantograph Overhaul – 16 of the 25 have now been overhauled and completed

Air Cylinders – The point has now been reached where the 24 year recommendation for testing is due on cylinders. There may be corrosion present but of the 5 inspected only 1 is showing any level of corrosion.

Battery Boxes – The entire Fleet needs the casing replacing and the original equipment reinstalling

Door Ball joints – 16 of the 25 tension Ball joints are to be replaced with Rose joints

Air receiver's - 24 year inspection is due with 10 of the 25 done to date

MDBF – Fleet is still well below its target of 9000 and is performing around 6000

City Link Vehicle – Tram Train

MDBF – Currently performing well below the original target of 25,000 set by Stadler and is at 3000

Bogie skirt bracket – The fleet was grounded due to the fact that one bracket failed leading to the skirt coming away in service. Subsequently the fleet was checked and found all the trailer bogies were defective and so were removed so the fleet could be put back into service.

Carbon Pans – Stadler are currently trialling 5 different pans to determine which model offers the best life cycle in terms of wear. This was after discovering the original pan had completely worn out in a month of running on the system. The original Siemens pan lasts approximately 5 months so there is a significant difference in asset life. There are concerns that the various carbons will have a detrimental effect on the OLE wire.

Software changes - are taking place to allow Tram to return in degraded mode when they encounter hydraulic breaking issues.

Towing - The procedure for City Links being able to recover a Siemens vehicle has still not been finalised and agreed.

204 – The vehicle which was damaged is scheduled to return to Sheffield in October 2019 ahead of the original estimate of mid-2020.

Midland Metro – MD

Please find attached.

Crich – MC

The Tramway re-opened on Saturday 16th March 2019 and will run every day until Sunday 3rd November 2019

This year the The Tramway Museum Society is celebrating that it is 60 years since the Society acquired the site at Crich and commenced to build The National Tramway Museum.

Catering Facilities:

The project to build a new hospitality/catering centre has received planning permission.

Engineering staff recruitment:

Recruitment of a mechanical technician for rolling stock work in the Museum's Workshop is on going

Rolling stock developments:

London Transport 1622 is undergoing a periodic 'lift and inspection' pre planned maintenance event. The traction motors have been found to be in a far poorer condition that was originally anticipated requiring a new armature shaft, commutator re-build, 8 field coils and 6 interpole coils requiring rewind.

The part life restoration of Newcastle 102 is proceeding well with the new tyres having been delivered and the motor overhaul progressing well.

The major restoration project on London County Council No 1 is on going

PW Developments:

The relaying of the Museum line's northern terminus has been completed in so far as one side of the newly laid loop can now be used for tramcars to reverse, currently passengers are not permitted to alight at this location.

Traverser overhaul:

The traverser that is used to enable tramcars to access the Exhibition Hall and the depot roads used to store non-operational tramcars has been returned from contractor, installed, commissioned and operators trained to use the new 'wifi' hand held pendant control system..

Manchester Metrolink – GT

Trafford Park line build continues and is running on time at present.

27 new vehicles are now "in production" with the first underframes being constructed at present in Poland.

Metrolink Capacity Enhancement Program (MCIP) has an agreed scope for the enhancement of both depots and power supply (OHLE substation) upgrades.

Anti-surfing working group has been set up to investigate more mitigation for this issue.

Metrolink Renewals and Enhancements Program (MREP) has kicked off with many submissions put to TfGM for funding.

Replacement for the original Queens Road depot shunter in the form of a battery type vehicle has been submitted to MREP as a renewals item.

Due to the above a need will arise for a network capable infrastructure vehicle (Unimog) and initial developments have seen working groups to internally spec a vehicle plus a visit to Nottingham to view the vehicle currently in use there.

One issue affecting the M5000 fleet is the identification of cracks on the roof mounted structure (Raft) which carries various pieces of equipment. The largest being the pantograph. Four vehicles have been identified and withdrawn from service due to this issue. Material supply from Bombardier has been slow (14 Weeks) and when delivered failed incoming inspections. Replacement structures are now on hand and repairs commencing. RTC has also seen a spike with three vehicles out of use due to collisions.

Crumpsall crossover and lead into the bay platform were installed over the Easter Bank Holiday weekend. This stop will form the terminus of the Trafford Park line service.

Nexus – DM

South Shields Training centre – Construction of new training centre steel work due to commence imminently. Track, OHL and signalling work feeding the sidings and cable runs are underway. Internal works started. Awaiting commissioning. Training Centre expected completion by May 2020. – Currently on target.

South Shields Station – The new station has been built and internal fitment all most complete. The existing station is still being used. All new track, signalling and OHL has been fitted for the new station lay out. Work continues on the shopping centre/bus interchange which is part of the new station. Expected completion August 2019. Must be completed in readiness for the Great North Run scheduled for Sunday 8th September 2019. – Currently on target.

New Depot - Five prospective bids are being evaluated. Expected to be reduced to three by end of May. With contract award expected November 2019.

Temporary Satellite depot – To enable the demolition of the old depot in stages, a separate satellite depot is to be built at Percy Main. Planning permission has been approved, this will allow up to 10 trains to be out stabled overnight.

Asset Renewal Plan – This covers track, signalling, drainage, Overhead Line, structures, stations, and ticket machines renewals across the system. We are in year 9 of a 10 year Asset Renewal Plan which is on target and budget to date. Two 100 + year old bridges at the coast were renewed during March and April (Burnside Road and Beach Road) – final snagging works in hand.
Train Fleet:

New Fleet - As per New Depot above.

Tetra Radio system – Has been installed on all Metro cars and has now been configured to the RTMS (Rail Traffic Management System) signalling system in the Control centre. A few minor bugs in the system are being ironed out, but generally speaking is starting to work well.

Existing Fleet – Continues to run, but it is showing its 40+ years of age, suffering from obsolescence of components in many systems,

Network Rail – IA

IA provided the group with a video presentation on Sheffield Tram Train

Isle of Man – MS

Douglas Bay Horse Tram

Passenger traffic has not yet commenced on the DBHT, but traffic is expected over the summer period, over a limited length of re-laid line.

Construction of the temporary Tram Shed to house the running fleet of the Douglas Bay Horse Tram is proceeding.

The temp Shed will have storage space for the running fleet, during the season.

Track relaying is running a little behind expectations, and is accelerating as the weather has improved.

We are soon to return tram 21 to serviceable conditions and have commenced the rebuild of tram 28.

Manx Electric Railway

The season start has been a busy time and is working well, with improved reliability, but problems persist with component supply and the lack of available spares is constraining maintenance and rebuild programmes.

Particular problems have been experienced with Brill bogies and much effort is being expended to overhaul and refurbish these bogies. A fleet-wide overhaul programme is being developed. We have been working with Alstom in searching their records and systems for all details relating to a range of equipment formerly supplied by GEC, AEI, Met-Vic and BTH. In one instance 85% of the manufacturing information is extant.

We are looking to agree a manufacturing licence with Alstom for this equipment. The last set of tramway equipment supplied by GEC was in the mid-1980s to Calcutta Trams, hence certain materials, such as asbestos, cadmium plating and the like were replaced and the documents and drawings were updated and scanned.

Within this agreement, we are also considering some of the designs that were previously deposited with the National Railway Museum at York, where we have had some retired colleagues collating the archives.

Snaefell Mountain Railway

The SMR has been the focus of most of our engineering efforts over the winter period. The season start has been a particularly busy time with limited stock available. The winter work has involved substantial heavy maintenance, but with limited stock, any equipment failure is disproportionate in its impact. We have had a number of minor reliability issues, but the situation is now improving.

Over the winter we have designed and installed electro-magnetic track brakes onto 3 of the 4 trams we have. The trams now have four independent braking systems. These trams have been released to traffic, following testing and approval and operate. Material for the 4th tram is en-route from Germany.

Following the incidents we experienced, as a result of the work performed last winter (to raise a Prohibition Notice) coupled with work done this year, the Improvement Notice has been lifted and the railway is fully operational.

We are designing a new steel framework for the rebuild of trams 6 and 3 and are looking to re-equip the traction system. The initial work looking to purchasing of new trams for future traffic growth continues.

Steam Railway

The Steam Railway has had a successful season start and is in a better position than previous years, with improved loco availability, but there is still much work to be done to achieve a sound footing.

The rebuild of loco 11 chassis at Alan Keef continues; with new and repaired boilers coming available from Severn Valley Railway Engineering.

The loco DE21 has been tested and is now on engineering duties pending further re-commissioning.

The rebuild of the all-wood body-work of F15 coach on Island is progressing well and return to the railways is expected with a month, for completion with fitting out and painting within our own workshops.

The rebuild of the 'pairs' F62 coach in the UK is progressing, but this is a full rebuild, including bogie refurbishment and return to the railways expected later summer, for testing and commissioning before returning to traffic.

The supply of fittings and fixtures such as door furniture is a significant concern.

Edinburgh – CK

Driver Innovation Safety Challenge

The DISC project is progressing well and we have now engaged 3 academic and medical professionals to support the validation process.

The ITT documentation will be launched by end of May and there are currently around 30 notes of interest to deliver the solution.

We will be seeking to formalise the various offers of assistance that were agreed in principle during the UKTram DISC tour.

Maintenance Contract Management

City of Edinburgh Council (CEC) and Edinburgh Trams (ET) have commenced discussions with our Maintainers to deliver handover to ET of the maintenance contracts.

We have also commenced discussions with SSG [Agility CMMS] to understand how their cloud based CMMS solution will facilitate integration of our CMMS and the various maintainer CMMS into that single platform. We will also explore this with other providers to ensure we get the most competitive solution

Saughton Pedestrian Crossing Incident

We are still working with RAIB for their report into the Saughton Ped Crossing incident.

In the interim we are rolling out a program to replace our current tram horn with a Hella horn having higher sound pressure.

The sound pressure levels for the new horn will be tested against the emerging light rail standard EN 15153-4:2019 and the UKTram best practice guidance Tramway Audible Warning Acoustic Test (Test Plan).

Sandilands RAIB Actions

ET has provided support to LRSSB with the following documentation:

UK Tram Self Certification Process for the Management of EMC (Guidance)
Tramway Audible Warning Acoustic Test (Test Plan)
Input to Tramway Principles & Guidance.
Underrun Protection calculations and rationale in support of forthcoming workshop

Nottingham – PT

Track

A cracked transition rail required replacement (18 hr possession); the cause was incorrect positioning (gauge too wide) during repairs c.2010.

A lightning strike on 25th April caused considerable damage to equipment controllers

Rollingstock

Citadis – a full fleet replacement of suspension springs is underway after it was found that the springs were breaking after less than 4 years in service. The break is in the first coil and the springs remain contained within the spring cups. Motor bogie springs are more affected than trailer bogies.

General

Nottingham celebrated 15 years since opening in 2004.

ANY OTHER BUSINESS

No other Business.

8.

FUTURE MEETING DATES

19th and 20th September – Isle of Man
21st and 22nd November - TBC

