



4<sup>th</sup> May 2018

Re: FOI request, Granting request [Reference number: FOI180404]

I refer to your request dated 4<sup>th</sup> April 2018 made under the Freedom of Information Act 2014, which was received on 4<sup>th</sup> April 2018, for records held by Commission for Railway Regulation (CRR). Your request sought:

*'Correspondence between the CRR and Transdev which relates to safety concerns raised by the Commission and/or any safety reports, as well as any memos/briefings from the quarterly meetings between the agency and the commission. This request covers the period 01 June 2017 and 04 April 2018'.*

In addition to the request above, the CRR sought a further clarification on the 30<sup>th</sup> April 2018 when you confirmed to the CRR that personal information of third parties is not requested, i.e. names, job titles, email addresses etc., and will therefore be redacted in the documents associated with your FOI request.

I have now made a final decision to Grant your request. A schedule of records and the records are attached.

All non-personal FOI requests will be recorded on an FOI disclosure log which will be published on the CRR website in due course.

Should you wish to discuss the above, please contact me at 01-2068110.

Yours sincerely,

Shane O'Duffy  
Decision Maker  
Commission for Railway Regulation

## Schedule of Records: Summary of Decision Making

| Record No. | Brief description  | File Ref. | No. of pages | Decision: Grant / Part-grant / Refuse | Basis of refusal: section of FOI Act | Public interest considerations | Reason for decision |
|------------|--|-----------|--------------|---------------------------------------|--------------------------------------|--------------------------------|---------------------|
| 1          | 180125.TDV159NRSA-T01 & I01                                  |           | 3            | Grant                                 |                                      |                                |                     |
| 2          | 171009.CRR to Transdev.Obligations for Consultation          |           | 3            | Grant                                 |                                      |                                |                     |
| 3          | 171027.Transdev to CRR                                       |           | 2            | Grant                                 |                                      |                                |                     |
| 4          | 171123.CRR to Transdev to CRR                                |           | 3            | Grant                                 |                                      |                                |                     |
| 5          | 180130.Transdev to CRR                                       |           | 5            | Grant                                 |                                      |                                |                     |
| 6          | 180131.Transdev to CRR                                       |           | 4            | Grant                                 |                                      |                                |                     |
| 7          | 180329.CRR to Transdev                                       |           | 1            | Grant                                 |                                      |                                |                     |
| 8          | 180329.CRR to Transdev                                       |           | 2            | Grant                                 |                                      |                                |                     |
| 9          | 171128.Representations made to the CRR in relation to LCC    |           | 1            | Grant                                 |                                      |                                |                     |
| 10         | 171201.RE Representations made to the CRR in relation to LCC |           | 7            | Grant                                 |                                      |                                |                     |
| 11         | Quarterly meeting 2 of 2017 – Meeting minutes.               |           | 3            | Grant                                 |                                      |                                |                     |
| 12         | Quarterly meeting 3 of 2017 – Meeting agenda and minutes     |           | 3            | Grant                                 |                                      |                                |                     |
| 13         | Quarterly meeting 2 of 2018 – Meeting agenda and minutes     |           | 5            | Grant                                 |                                      |                                |                     |

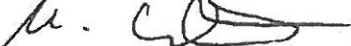



|    |  |  |    |       |  |  |  |  |
|----|--|--|----|-------|--|--|--|--|
| 14 | 170505 RTA Cheeverstown Road Saggart                                   |  | 5  | Grant |  |  |  |  |
| 15 | Email (trail) following Luas Systems Failure on the 12th February 2018 |  | 5  | Grant |  |  |  |  |
| 16 | Audit report - Managing Safety critical Information                    |  | 29 | Grant |  |  |  |  |
| 17 | Inspection report -Event Management at The Point                       |  | 3  | Grant |  |  |  |  |
| 18 | Inspection report -Trackwalk - Heuston to the Point                    |  | 6  | Grant |  |  |  |  |
| 19 | 170908.1 RB - NM Letter of Acceptance S4                               |  | 4  | Grant |  |  |  |  |
| 20 | 171117.1 RB - NM APIS Submission for Luas Cross City                   |  | 1  | Grant |  |  |  |  |
| 21 | 171205.1 RB - NM,BF Luas CC Stage 5 APIS Comments                      |  | 2  | Grant |  |  |  |  |
| 22 | 171206.1 NM - RB APIS Submission Stage 5                               |  | 3  | Grant |  |  |  |  |
| 23 | 171208 RB - NM,BF LCC Stage 5 APIS Letter of Acceptance                |  | 4  | Grant |  |  |  |  |
| 24 | 171208.1 NM - RB APIS Letter of Acceptance S5                          |  | 2  | Grant |  |  |  |  |
| 25 | 171208.3 NM - RB APIS Letter of Acceptance S5                          |  | 2  | Grant |  |  |  |  |
| 26 | 180131.1 NM - RB APIS S5 LoA Conditions of Acceptance Update           |  | 1  | Grant |  |  |  |  |
| 27 | 180219.2 RB - NM Extension of Condition LCC APIS                       |  | 1  | Grant |  |  |  |  |
| 28 | 180306.1 RB - NM,BF LoA S5 Extension                                   |  | 4  | Grant |  |  |  |  |

**Letter of Acceptance  
New Rolling Stock Assessment  
TDV159NRS-A-T01&I01**

|   |  |                    |                                   |
|---|--|--------------------|-----------------------------------|
| <b>Acceptance Type</b>                          | Testing & Interim Operation combined (Stages 4&5)  | <b>Expiry Date</b> | Several, starting from 28.02.2018 |
| <b>Name of Railway Organisation - Applicant</b> | Transdev Dublin Light Rail Limited, LUAS Depot, Red Cow Roundabout, Clondalkin, Dublin 22  |                    |                                   |
| <b>Type of Rolling Stock</b>                    | (CRR project TII/TDV159)<br>Alstom 54.7m long Dublin Citadis 502 LRV (new build)   |                    |                                   |
| <b>Context</b>                                  | This Letter of Acceptance is issued to confirm that the Applicant has provided relevant evidence on the project SMS activities. This is by the CRR considered as suitable to authorise the Applicant to proceed to testing and, pending the fulfilment of certain conditions, also to interim operation.   |                    |                                   |
| <b>Basis of Acceptance</b>                      | <p>This Letter of Acceptance is issued in accordance with:</p> <ul style="list-style-type: none"> <li>- Section 43 of the Railway Safety Act 2005</li> <li>- Guidelines developed and published by the CRR under section 39 of the Railway Safety Act. In particular: <ul style="list-style-type: none"> <li>1. CRR-G-016-B, "Guideline for the Safety Assessment of New Light Rail Rolling Stock", and</li> <li>2. RSC-G-032-A, "Guideline for the Process of Authorisation for Placing in Service (APS) of Light Railway Subsystems.</li> </ul> </li> </ul> <p>The following documentation has been subject to review by the CRR and provides the basis for this Letter of Acceptance:</p> <p>[001] Citadis 502 – Project Safety Plan, Rev03, TII, 25.10.2016<br/> [003] Project Safety Plan New CITADIS 502 Light Rail Vehicles, RSA-APS-NRS Stages 1-3, RSD-RSW-5021-04, TII, 21.11.2017<br/> [006] Project Hazard Record, RSA-APS-NRS Stages 1-5, RSD-RSW-5022-04, TII&amp;Transdev, 24.01.2018<br/> [007] Project Safety &amp; Compliance Matrix, RSA-APS-NRS Stages 1-5, RSD-RSW-5023-05, TII&amp;Transdev, 24.01.2018 and associated suite of documents<br/> [008] Project Safety Case, New CITADIS 502 Light Rail Vehicles, RSA-APS-NRS Stages 1-5, RA108 Vers.0.3, Transdev, 24.01.2018<br/> [009] IPR Report RST: NEW CITADIS 502 LIGHT RAIL VEHICLES INDEPENDENT PROFESSIONAL REVIEW – IPR, Bureau Veritas Exploitation SAS, Reference: CB722/6411049/17/R/5, 15.01.2018 in connection with [010]<br/> [010] TII professional statement: RSD5025-06, 24.01.2018<br/> [011] IPR Report CCO: OPD-RSW-5026-02, Independent Professional Review (IPR), On-Board Radio and AVLS, CITADIS 502 LRVs, Rev2.0, TII, 24.01.2018<br/> [012] Letter TDLR Luas 12-18, Transdev, 24.01.2018 in connection with [013]<br/> [013] E-mail:RE: Stage 4 &amp; 5 Submission - New 502 LRV,TII, I.Gourley &gt; W.Wuttke, 25.01.2018-10:38</p> |                    |                                   |
| <b>Conditions</b>                               | <p>This Letter of Acceptance is subject to the following conditions:</p> <p><b>Permanent Conditions:</b></p> <ol style="list-style-type: none"> <li>1. Based on [008] section 9.1, once project stages 5 and 6 are reached, operation in passenger service is authorised over the entirety of the LUAS Green Line from Brides Glen through Dublin City Centre to Broombridge and in non-passenger service over the entirety of the LUAS Red Line.</li> <li>2. Based on [008] section 9.1, once all necessary enhancements to stop, depot and power supply system infrastructure have been undertaken, and all requirements regarding electromagnetic compatibility (EMC) have been fulfilled, operation is</li> </ol>  |                    |                                   |

**Letter of Acceptance  
New Rolling Stock Assessment  
TDV159NRSA-T01&I01**

|                      |  |
|----------------------|--|
|                      | <p>authorised in passenger service over the entirety of the LUAS network, and any future section of this that is constructed in accordance with the infrastructure interface specification reference (3) of [008] and the power supply interface specification reference (4) of [008].</p> <p>3. Based on [008] section 9.1, all conditions for operation and maintenance as contained in [006], [007], [008], [009], [011] or subsequent revisions of these documents must be adhered to.</p> <p><b>Time Based Conditions:</b></p> <p>4. The IPR Report RST [009] is considered to be incomplete and was only in combination with [010] accepted as provisional evidence for commencing stage 4. CRR must be provided with an improved and updated version of [010] at the earliest opportunity, at the latest on 28.02.2018. Transdev may commence stage 5 only after the related evidence is provided to CRR.</p> <p>5. Based on [011] section 5, evidence of conformity of the Motorola MTM-5000 series equipment with EN45545 (OC1N) must be provided before 31.07.2018.</p> <p>6. Based on [008] section 9.2, confirmation that the chosen limits for the adjustable parameters within the Door Control Unit (DCU) software are functionally correct must be provided. Transdev may commence stage 5 only after such confirmation is provided to CRR.</p> <p>7. Based on [008] section 9.2, confirmation from ATSA that the FIP interface associated with the DCU is being used correctly and safely with respect to the whole safety concept of the LRV must be provided. Transdev may commence stage 5 only after such confirmation is provided to CRR.</p> <p>8. Based on [008] section 9.2, confirmation from ATSA that validation tests, which must include the data transfer via FIP interface, have been performed on the LRV (and not solely on a simulation rack) and demonstrate that the DCU software requirements are met in the completely integrated system and in the target environment. Transdev may commence stage 5 only after such confirmation is provided to CRR.</p> <p>9. Based on [008] section 9.2, the listed stop&amp;platform assessments, platform door clearance assessments, platform visibility assessments, speed assessments, junction assessments must be concluded with positive results. Evidence on this must be provided until 28.02.2018. Transdev may commence stage 5 only after the related evidence is provided to CRR.</p> <p>10. Based on [008] section 9.2, the outstanding information on bonding according to section 4.5 must be supplied before 31.07.2018.</p> <p>11. Based on [008] section 9.2, the outstanding information on legal requirements according to 5.7.3 must be supplied before 28.02.2018. Based on [008] section 9.2, evidence on acceptable EMC compatibility with IÉ must be provided before 15.02.2018.</p> |
| <b>Notes</b>         | 1. none  |
| <b>Prepared by</b>   | Maik Wuttke, Inspector   |
| <b>Signature</b>     | <div style="display: flex; justify-content: space-between;"> <div></div> <div><b>Date</b> 25.01.2018</div> </div>   |
| <b>Authorised by</b> | Mary Molloy, Deputy Commissioner   |
| <b>Signature</b>     | <div style="display: flex; justify-content: space-between;"> <div></div> <div><b>Date</b> 25.01.2018<br/>25</div> </div>  |

**Letter of Acceptance  
New Rolling Stock Assessment  
TDV159NRSA-T01&I01**

**Annex – List of Letters of Acceptance**

| Letter of Acceptance Ref. | Issued Date | Expiry Date               | Acceptance Type  |
|---------------------------|-------------|---------------------------|--|
| TII159NRSA-C01            | 16.12.2016  | none                      | Concept (Stage1)   |
| TII159NRSA-D01            | 23.11.2017  | none                      | Preliminary Design & Overall Design combined (Stages2&3) |
| TDV159NRSA-T01&I01        | 25.01.2018  | Staggered from 28.02.2018 | Testing & Interim Operation combined (Stages4&5)         |

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**From:** Mary Molloy  
**Sent:** Monday 9 October 2017 13:46  
**To:** Peter.LundenWeldon  
**Cc:** Anthony Byrne; Ruth Baldwin  
**Subject:** Transdev - Obligations for Consultation  
**Attachments:** 171009.Mr Peter Lunden-Weldon.pdf

Dear Peter

Please see letter attached following our meeting this morning.

Regards  
Mary



Mr Peter Lundon-Weldon,  
 Managing Director,  
 Transdev Dublin Light Rail Ltd.,  
 LUAS Depot,  
 Red Cow Roundabout,  
 Clondalkin,  
 Dublin 22.

9<sup>th</sup> October 2017

#### Transdev – Obligations for Consultation

Dear Peter

I acknowledge our meeting this morning.

Transdev (railway undertaking/*railway organization*) have a legal requirement to consult with its staff and staff representatives in the preparation of a safety case/*safety management document* (Railway Safety Act 2005 s39(6) – *SI 444 of 2013 amendments in italics*).

CRR safety management system assessment criteria for involving staff require as follows:

- H1 - There are procedures in place ensure that staff and staff representatives are adequately represented and consulted in defining, proposing, reviewing and developing the safety aspects of operational procedures that may involve staff
- H2 - Staff involvement and consultation arrangements are documented.

The most recent safety management certificate issued by CRR to Transdev was in March 2015. With regard to consultation requirements it was on the basis of section 8.3.2 of the Transdev SMS manual Issue 2 that the certificate was issued. These requirements are:

1. By participating in the regular Health and Safety meetings organised by the Safety and Assurance department. As part of these Health and Safety meetings, staff are encouraged to discuss current issues on the operation, recent safety events and current campaigns.
2. By participating in the bi annual safety forums organised by the Service Delivery department
3. By encouraging open feedback following training

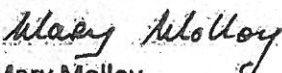


4. By participating in safety investigations following SPADs or other incident.
5. In addition, the Safety and Assurance department encourage all staff to bring and discuss any subject in the interest of safety and improvement.
6. A consultation process has been put in place for the safety case whereby staff were invited to comment on the document.
7. For the review of the TSI, a committee was created involving staff to review and improve the documents to ensure that readability is optimum and clear understanding will be achieved by all
8. Line extension, employee feedback is encouraged and collected during training as a valued comment and is included in the risk assessment process.

I am of the opinion that Transdev have failed to implement section 39(6) of the Railway Safety Act 2005. The purpose of this letter is to inform Transdev of the CRR's intention to serve an improvement notice, pursuant to section 77 of the Railway Safety Act 2005, and in advance thereto, to afford Transdev an opportunity to make representations to the CRR, within twenty one (21) days of the date hereof, i.e. on or before the 31<sup>st</sup> October 2017.

Please note that the submission of representation by Transdev does not prevent the service of an Improvement Notice pursuant to section 77 of the Railway Safety Act 2005.

Yours Sincerely,

  
Mary Molloy  
Acting Commissioner

Email: Anthony Byrne, Ruth Baldwin



(3)



Mary Molloy  
Acting Commissioner  
Commission for Railway Regulation  
Temple House  
Temple Road  
Blackrock  
Co. Dublin

27<sup>th</sup> October 2017

**Transdev - Obligations for Consultation**

Dear Ms. Molloy

I refer to our meeting of 9 October 2017 and to your letter of the same date.

I note the CRR's opinion that Transdev has failed to implement section 39(6) of the Railway Safety Act, 2005 (the **2005 Act**) and its intention to serve an improvement notice on Transdev pursuant to section 77 of the 2005 Act.

No  
htg-  
We are surprised and disappointed at your stated intention to issue an improvement notice as referred to in your letter most particularly as we indicated our intention and desire to cooperate with CRR and to address any concerns you may have.

When we met with you on 9 October to discuss this matter, we confirmed to you that Transdev has complied with the requirements in its SMS and offered to provide you with documentation evidencing this. In the circumstances, we are surprised that you would form an opinion as to Transdev's non-compliance with s.39(6) of the 2005 Act without having taken into account, or even had sight of, documentation to support Transdev's position.

As you are aware, Transdev put in place a robust structure pursuant to the requirements outlined in s.8.3.2 of the Transdev SMS Manual (Issue 2), on foot of which a decision to grant the safety management certificate was approved.

Transdev has at all times cooperated, and remains willing to cooperate fully, with the CRR.

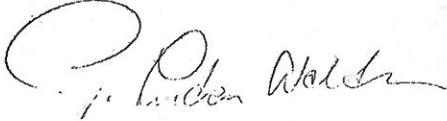
In response to your letter, we believe that Transdev has complied with the requirements of its SMS through the implementation of safety meetings, safety forums, participation in safety investigations, a dedicated feedback system to encourage employee feedback and safety concerns, a consultation process on the safety case and collection of feedback on line extension. We attach herewith tables outlining our compliance with respect to each of the requirements set out in the SMS, together with sample minutes/action plans evidencing the details and follow-up recorded.



(3)

We believe that the documentation attached demonstrates Transdev's implementation of, and compliance with, all of its requirements. If there is a specific requirement that the CRR believes Transdev has not complied with please specify the relevant alleged infraction we will be happy to deal with that and to provide evidence or undertake any action advised by the CRR.

Yours Sincerely,



Peter Lunden Welden  
Managing Director  
Transdev Dublin Light Rail

(4)

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**From:** Mary Molloy  
**Sent:** Thursday 23 November 2017 14:35  
**To:** Peter.LundenWelden  
**Cc:** ; Ruth Baldwin; Anthony Byrne  
**Subject:** Improvement Notice CRR - L - 77/006  
**Attachments:** 171123 Improvement Notice CRR-L-77-006.pdf

Dear Peter

Please see attached Improvement Notice. A hard copy will follow by post.

Regards  
Mary  
Acting Commissioner.



Reference No: CRR – L – 77/006

**RAILWAY SAFETY ACT 2005, IMPROVEMENT NOTICE (SECTION 77)****Served on:**

TRANSDEV  
Luas Depot  
Red Cow  
Clondalkin  
Dublin 22  
D22 CSP3

**Provision**

In accordance with *section 77* of the Railway Safety Act 2005, an Inspector (Mary Molloy) of the Commission for Railway Regulation (CRR) is of the opinion that Transdev have failed to comply with legal requirements to consult with their employees.

**Particulars**

The CRR are of the opinion that Transdev are not consulting with employees as required by the Railway Safety Act 2005 section 39(6) and the Safety, Health & Welfare at Work Act of 2005 section 26.

Transdev did supply the CRR with evidence in support of their belief that they were fulfilling their obligations for consultation. The CRR reviewed this evidence and our response is detailed below in points 1 to 7.

1. The WRC process was a dispute between management and staff. This cannot be considered consultation as required by legislation and CRR guidelines.
2. The safety forum is a good means of consulting with staff, it is important that all staff grades attend this forum. It is of particular importance that a sufficient number of drivers attend.
3. Open feedback following training forms part of consultation
4. The commencement of the disciplinary process following a SPAD is not consultation.
5. Evidence of attendance at an Induction course is not consultation. New employees to the LUAS system in Dublin would generally not be in a position to engage in consultation.
6. Sign-off forms that staff attended training is not consultation.
7. The Committee set up to review the TSI manual in 2011 does not appear to include drivers or CCR staff

**Direction**

For the year 2018, and annually thereafter, Transdev must facilitate a consultation programme for employees. The consultation programme must:

- Be sufficient to allow all employees, including drivers, to participate fully and effectively.
- Include mechanisms for employees to identify safety issues and concerns on a routine and on-going basis and be provided with feedback. These safety issues and concerns must feed into the risk assessment process.
- Include staff involvement, including drivers, in the drawing up and implementation of the SMS.

(4)

Consulting employees involves listening to their views and taking these into account in the decision making process.

Transdev shall submit their consultation programme which must describe how the above requirements will be met to the CRR on or before **31<sup>st</sup> January 2018**.

Name & Title

Mary Molloy, Acting Commissioner

Signature

*Mary Molloy*

Date 23<sup>rd</sup> November 2017

**From:**  
**Sent:** Tuesday 30 January 2018 14:15  
**To:** Mary Molloy  
**Subject:** Improvement Notice  
**Attachments:** Letter to Mary Molloy re Imp Notice JA 30 Jan 2018.docx; Copy of Meeting Planner 2018.xlsx; Safety Consultation letter to SIPTU and Saf Cttee Issue 1 to M Molloy 30 Jan 2018.docx

Hi Mary,

It was good to meet you today and I look forward to working with you.

I have attached the requested documentation in Issue format, as requested.

Regards,



TRANSDEV  
LUAS DEPOT, REDCOW, CLONDALKIN, DUBLIN.22  
Tel: +353 1 4614910 - [www.transdevireland.ie](http://www.transdevireland.ie)



Transdev Ireland has been awarded the Business Working Responsibly Mark at the Annual CEO Breakfast Forum 2016, recognising it as a leader in sustainable public transport operations and Corporate Social Responsibility.

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**Response to CRR in Respect of Improvement Notice, Ref: CRR – L – 77/006**

Dear Mary,

Please note Transdev Dublin Light Rail's response to your letter dated 23/11/2017 regarding the Improvement Notice relating to consultation with employees.

Transdev Dublin Light Rail is committed to continuing to build positive relationships with its employees in the spirit of working collaboratively. An essential element of such collaborative working is consultation with all our employees and, as such, we are in the process of agreeing a Safety Consultation Protocol with SIPTU to formalise arrangements, the contents of which are appended to this communication, along with the proposed 2018 consultation programme.

The next meeting of the Safety Committee is planned for 13<sup>th</sup> February 2018 and invitations are currently being sent out. The main agenda items for this meeting are to collectively agree the content and emphasis of the Safety Consultation Protocol and set Terms of Reference for the meeting that will be applied within Transdev Dublin Light Rail going forwards. These Terms of Reference will include those items detailed in the "Direction" section of your letter dated 23<sup>rd</sup> November 2017.

We are also planning to have two safety forums in 2018 and I will advise you of the dates and agendas for these when they have been set up.

In future our safety reps will be consulted regarding changes to our Safety Management System to ensure that all applicable subject experts are involved in this process.

We will ensure that any safety concerns raised will be dealt with as they are raised. This will include ensuring that they are reviewed as part of our risk assessment and risk control processes.

To further promote collaborative working and effective consultation with our staff we will also be inviting our safety reps to undertake joint safety tours and site visits with the management team. Again, I will advise you when these have been set up.

To ensure that all of the above is undertaken as planned and effectively we will conduct planned audits of our business and share the findings (both good practice and issues of concern) with our people.

I trust this information is sufficient for you but please do not hesitate to contact me should you require further information or have any queries. I look forward to meeting you in person on 21<sup>st</sup> February.

Yours Sincerely,

Janet Aitken  
General Manager  
Dublin Light Rail



### **Commitment to Health and Safety**

The safety of our employees, customers and the general public is an overriding priority for Transdev Dublin Light Rail, our employees and SIPTU. This agreement is made:

- (a) to supplement the provisions of the existing company/union agreement that relate to health and safety
- (b) and, in particular, to develop and improve the process of consultation between Transdev Dublin Light Rail and our employees in relation to health and safety

Safety is a fundamental responsibility of every employee, including every member of management. The safety consultation arrangements made between Transdev Dublin Light Rail and SIPTU do not replace the company's, or any employee's, existing duties in respect of health and safety.

### **Safety Committee**

The management participants at the bi-monthly safety committee meetings will include the Safety Director, the Safety and Assurance Manager, the Service Delivery Manager, the Revenue and Security Manager and the Security and Compliance Manager and other relevant members of management.

In addition to the existing complement of safety representatives for drivers (two) and revenue protection officers (one), one additional safety representative will be appointed to represent other staff.

### **Management Responsibilities**

Management will provide one day's release every two months for each safety representative in order for each safety representative to discharge his or her duties and to receive appropriate training as a safety representative. This day's release will be on the same day on which safety committee meetings are scheduled to be held, the proposed programme of which being appended to this document.

The Safety Investigator is the contact person with whom safety representatives can raise safety concerns (other than immediately urgent safety concerns, which should always be raised directly with the Central Control Room by the employee who notes the safety concerns). The Safety Investigator will coordinate the company's consultation with the safety representatives.

### **Employee responsibilities**

The functions of safety representatives are as set out in legislation and are summarised as follows:

- To inspect the place of work at appropriate times;
- To investigate accidents and dangerous occurrences in an appropriate manner;
- To investigate relevant employees' complaints relating to safety;
- To accompany statutory inspectors on their inspections;

- To accompany employees who are interviewed by statutory inspectors;
- To make representations to the employer regarding safety;
- To receive advice and information from statutory inspectors on matters relating to safety;
- To consult and liaise with other relevant safety representatives.

Safety representatives will arrange to discharge their functions (insofar as practical) on the days on which they receive paid release.

### **Collective Responsibility of the Safety Committee**

The safety committee will agree a format for its agenda and will agree which items are to be discussed at every meeting and which items are to be discussed from time to time (eg annually).

The agenda will be broad enough to encompass all statutory consultation requirements.

There will be an appropriate division of responsibilities between the safety committee and the separate procedures that are established to facilitate good industrial relations between the company and its employees. It is recognised that many industrial relations discussions can have a safety element, and that many safety issues can have an industrial relations consequence. However, for the effective management of the respective issues the company and the union will ensure that issues that are primarily of an industrial relations character will be addressed only through the established industrial relations mechanisms and matters that are primarily of a safety character will be addressed only through the established safety consultation process.

### **Selection of Safety Representatives**

Having regard to the range of responsibilities of shop stewards/section committee members and safety representatives and the amount of paid release time that the company provides to both categories of workers to discharge their respective functions, no employee shall have a dual mandate to serve as both a shop stewards/section committee member and as a safety representative. A person selected to multiple roles will decide which of the roles he or she will carry out and (if he or she does not choose) will be considered to have resigned from the position that he or she held earliest.

### **Escalation Process for Raising Safety Concerns**

Safety concerns should be raised within the following escalation process. Employees and safety representatives are obliged to follow the following process and to refrain from skipping steps in the process.

- (a) Any and all safety issues that pose an immediate safety risk for any member of staff or the public should be reported immediately to the Central Control Room by the employee who becomes aware of the issue.
- (b) Any ongoing safety concerns (other than those that pose an immediate safety risk) should be raised by employees or safety representatives with the Safety Investigator who will seek to have the concern addressed through the

company's structures. Appropriate responses may include: appropriate management action, discussion of the concern at the bi-monthly safety committee meeting or (where the matter is primarily an industrial relations matter) reference of the matter to the established industrial relations process. A safety representative may also raise the concern at a meeting of the safety committee.

- (c) If a concern has been raised with the Safety Investigator but a safety representative is not satisfied with the outcome, the safety representative may escalate the concern to the Safety Director, who will consider the concern and take any appropriate action. A safety representative may also raise the concern at a meeting of the safety committee.
- (d) If a concern has been raised with the Safety Director but a safety representative is not satisfied with the outcome, the safety representative may escalate the concern to appropriate statutory authority, such as the Commission for Railway Regulation or the Health and Safety Authority.

(6)

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**From:** [redacted]  
**Sent:** Wednesday 31 January 2018 15:46  
**To:** Mary Molloy  
**Subject:** RE: Improvement Notice  
**Attachments:** Scanned MMolloy letter.pdf

Hi Mary,

Scanned, signed, copy attached.

Regards,



TRANSDEV  
LUAS DEPOT, REDCOW, CLONDALKIN, DUBLIN.22  
Tel: +353 1 4614910 - [www.transdevireland.ie](http://www.transdevireland.ie)



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---

**From:** Mary Molloy [redacted]  
**Sent:** Wednesday 31 January 2018 14:35  
**To:** [redacted]  
**Subject:** RE: Improvement Notice

Thank you for the email and attachments. However, the documentation is not signed. As this is a response to a legal notice I need a signed version.

Mary

---

**From:** [redacted]  
**Sent:** Tuesday 30 January 2018 14:15  
**To:** Mary Molloy  
**Subject:** Improvement Notice

Hi Mary,

(6)

It was good to meet you today and I look forward to working with you.

I have attached the requested documentation in Issue format, as requested.

Regards,



TRANSDDEV  
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Tel: +353 1 4614910 - [www.transdevireland.ie](http://www.transdevireland.ie)



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\*\*\*\*\*



Mary Molloy,  
Acting Commissioner,  
RSC,  
Trident House,  
Rockhill,  
Blackrock,  
County Dublin

31/01/2018

Dear Mary,

Please note Transdev Dublin Light Rail's response to your letter dated 23/11/2017 regarding the Improvement Notice relating to consultation with employees.

Transdev Dublin Light Rail is committed to continuing to build positive relationships with its employees in the spirit of working collaboratively. An essential element of such collaborative working is consultation with all our employees and, as such, we are in the process of agreeing a Safety Consultation Protocol with SIPTU to formalise arrangements, the draft contents of which are appended to this communication, along with the proposed 2018 consultation programme.

The next meeting of the Safety Committee is planned for 13<sup>th</sup> February 2018 and invitations are currently being sent out. The main agenda items for this meeting are to collectively agree the content and emphasis of the Safety Consultation Protocol and set Terms of Reference for the meeting that will be applied within Transdev Dublin Light Rail going forwards. These Terms of Reference will include those items detailed in the "Direction" section of your letter dated 23<sup>rd</sup> November 2017.

We are also planning to have two safety forums in 2018 and I will advise you of the dates and agendas for these when they have been set up.

In future our safety reps will be consulted regarding changes to our Safety Management System to ensure that all applicable subject experts are involved in this process.

We will ensure that any safety concerns raised will be dealt with as they are raised. This will include ensuring that they are reviewed as part of our risk assessment and risk control processes.

To further promote collaborative working and effective consultation with our staff we will also be inviting our safety reps to undertake joint safety tours and site visits with the management team. Again, I will advise you when these have been set up.

To ensure that all of the above is undertaken as planned and effectively we will conduct planned audits of our business and share the findings (both good practice and issues of concern) with our people.

#### TRANSDEV

Luas Depot, Red Cow,  
Clondalkin, Dublin 22, D22 C5P3  
Tel: (+353) 1 461 4910 Fax: (+353) 1461 4992  
Registered office: Riverside One, Sir John Rogerson's Quay, Dublin 2  
Registered in Ireland No. 354252  
Email: [info@transdevireland.ie](mailto:info@transdevireland.ie) Website: [www.transdevireland.ie](http://www.transdevireland.ie)  
Directors: B. Schmeink; N. Stevens (Chairman); M. Morrell;



(6)



I trust this information is sufficient for you but please do not hesitate to contact me should you require further information or have any queries. I look forward to meeting you in person on 21<sup>st</sup> February.

I will also send you a hard copy of this communication.

**TRANSDEV**

Luas Depot, Red Cow,  
Clondalkin, Dublin 22, D22 C5P3  
Tel: (+353) 1 461 4910 Fax: (+353) 1461 4992  
Registered office: Riverside One, Sir John Rogerson's Quay, Dublin 2  
Registered in Ireland No. 354252  
Email: [info@transdevireland.ie](mailto:info@transdevireland.ie) Website: [www.transdevireland.ie](http://www.transdevireland.ie)  
Directors: B. Schmeink; N. Stevens (Chairman); M. Morrell;





---

**From:** Mary Molloy  
**Sent:** Thursday 29 March 2018 12:08  
**To:**  
**Subject:** Meeting with Transdev - 27th Feb 2018 - Consultation issues

Dear ,

When we met on 27<sup>th</sup> Feb we discussed your letter in relation to CRR – L – 77/006. There were a number of document you were to forward to us when finalised. These are:

1. Final version of the Safety Consultation Protocol with SIPTU
2. Terms of Reference for the Safety Committee Meetings
3. Details of how all staff, including Safety Reps are consulted regarding changes to the SMS
4. Details of how safety reps undertake joint safety tours

Regards  
Mary

(2)

**From:**  
**Sent:** Thursday 29 March 2018 14:53  
**To:** Mary Molloy  
**Subject:** RE: Meeting with Transdev - 27th Feb 2018 - Consultation issues  
**Attachments:** ToR D1 JA 19 Feb 2018.docx; Copy of Copy of Safety Rep Track Walks and Safety Tours Schedule 2018 2019 DRAFT.xlsx; SMS Consultation Workshop 23 03 2018.pdf; Safety Committee meeting minutes March 2018.docx; Safety consultation letter to SIPTU and Saf Cttee 2018 Programme JA 30 Jan 2018 issue.docx

Hi Mary,

Unfortunately some of the documents we discussed at our February meeting have still not been finalised for the following reasons:

#### **TERMS OF REFERENCE**

**Email sent out to all committee members 12/03/18**

*Dear All,*

*I'd be grateful for an update on the following (apologies to those of you who have already responded):*

- Feedback on Terms of Reference*
- Feedback on draft minutes of the Safety Committee meeting that took place on Tuesday 13<sup>th</sup> February*
- Feedback on status of agreed actions to be undertaken by members of the Safety Committee (I have attached the draft minutes for ease of reference)*

*Please come back to me by close of Play Friday 16<sup>th</sup> March as this will be a month since the meeting took place. I will circulate action status feedback.*

*Regards,*

**Email received from [redacted] 16/03/2018**

*Unfortunately we are not in a position to discuss the terms of reference until [redacted] is available.*

*I suggest you agree a time a date that suits John to be in attendance.*

*Given myself and [redacted] lack of training in regard to Safety it would not be in our best interests to agree or discuss terms of reference without expert advice.*

*Please liaise with our official on his future availability on this issue.*

*Regards*

*We have still not been able to set up a date with [redacted] ' will be receiving training re the role of safety rep in April (organised by SIPTU).*

#### **SMS CONSULTATION**

We set up and ran a successful SMS review workshop on Friday 23/03/2018 and agreed a lot of collaborative actions. Owing to personal reasons I had to return to the UK so could not attend but I... facilitated the event very successfully. I have attached a copy of the minutes from the workshop FYI. These were also provided to the safety reps. However, the reps declined to accept the workshop for the following reasons:

Email received from 12/03/2018

Workshop??

*There is no agreement between reps regarding consultation by way of "workshops"*

*Drivers reps have consistently reported to the company and CRR that there has never been ANY consultation with regard to ALL aspects of the SMS and the entire SMS needs to be reviewed by the Safety Reps.*

*We do not recognise the SMS in its entirety as the company have breached the Railway Safety Act 2005 by failing to consult with its Safety Reps as they were legally obliged to do.*

*The driver Safety Reps do not agree to "workshops" to plaster over the cracks.*

*Secondly who decides on the attendees to the workshop?*

*I don't believe trainer drivers form part of the Safety Committee.*

*We will discuss the issue of the SMS at our next Safety Forum with the Safety Committee Members.*

Regards

#### JOINT SAFETY TOURS

A joint programme of tours and other collaborative events has been created and implemented. I attach a copy FYI.

We have our next Safety Committee on 10/04/2018 and we will continue to promote effective consultation and collaborative working with all members.

Please don't hesitate to contact me if you require any further information.

Regards,



TRANSDEV  
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---

**From:** Mary Molloy  
**Sent:** Tuesday 28 November 2017 15:00  
**To:**  
**Cc:** Peter.LundenWelden  
Anthony Byrne; Ruth Baldwin  
**Subject:** Representations made to the CRR in relation to LCC  
**Attachments:** 171128.Questions.docx

We have had a number of safety representations about the new LCC route including driver training and other safety issues. Please see attached table.

Can Transdev please respond to these issues.

Regards  
Mary

**From:** [Redacted]  
**Sent:** Friday 1 December 2017 16:52  
**To:** Mary Molloy  
**Cc:** Peter Lunden-Welden; [Redacted] Anthony Byrne;  
 Ruth Baldwin  
**Subject:** RE: Representations made to the CRR in relation to LCC  
**Attachments:** TDLR LUAS 266-17 Letter CRR - Representations Made to the CRR in Relation to LCC.pdf

Hi Mary,

Please find attached Transdev's response to the issues outlined in your email below.

I hope that the responses outlined are to your satisfaction. If you require any further clarifications please let me know?

Regards,



TRANSDEV  
 LUAS DEPOT, REDCOW, CLONDALKIN, DUBLIN.22  
 Tel: +353 1 461 4910 - [www.transdevireland.ie](http://www.transdevireland.ie)



Before you print this email, please consider the planet and your environmental responsibility. Thank you!



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---

**From:** Mary Molloy  
**Sent:** 28 November 2017 15:00  
**To:** [Redacted]  
**Cc:** Peter Lunden-Welden; [Redacted] Anthony Byrne; Ruth Baldwin  
**Subject:** Representations made to the CRR in relation to LCC

Neil

We have had a number of safety representations about the new LCC route including driver training and other safety issues. Please see attached table.

Can Transdev please respond to these issues.

Regards  
 Mary



Mrs Mary Molloy  
Commission for Railway Regulation  
Temple House  
Temple Road  
Blackrock  
Co. Dublin

Date: 01/12/2017  
Our Ref: TDLR LUAS 266-17

**Re: Representations Made to the CRR in Relation to LUAS Cross City**

Dear Ms Molloy,

In relation to your email "*Representations made to the CRR in relation to LCC*" dated the 28<sup>th</sup> November 2017, please find below Transdev's responses to CRR's queries regarding driver training and other safety issues.

**DRIVER TRAINING**

**1. How many drivers in total will be trained on the LCC route?**

All available rostered drivers will be trained on LCC. As of today 199 drivers out of the 199 available rostered drivers have received the full training programme on LCC.

The drivers who are on long term sick leave will undertake training on LCC as part of their return-to-work assessment.

**2. How many hours training did each driver get?**

Upon completion of training, each driver will have received 17 hours of training, split across 3 phases of training. The hours allocated to each phase were as follows:

- Phase 1 - 8 hours simulator based
- Phase 2A - 4.5 hours driving with trainer on the line
- Phase 2B - 4.5 hours driving with trainer including assessment

**3. How many times did each driver drive the route - SSG to Broombridge during their training?**

Upon completion of training, each driver will have completed a minimum of 7 trips on LUAS Cross City split as follows:

- 4 return trips from Broombridge to St Stephens Green and back to Broombridge
- 3 return trips from St Stephens Green to Parnell and back to St Stephens Green





This number of trips is double that undertaken for the extension A1, B1 and C1 when only 3 return trips were made.

**4. Was all the training conducted during daylight hours? If so, what about driving during hours of dark?**

Training was completed mainly between the hours of 07:00 and 20:00 which include day light and darkness driving. In addition, testing was conducted between the hours of 00:00 and 24:00 hours, the majority of which was during the hours of darkness.

**5. Do all drivers get training in both the Northbound route AND the Southbound route?**

Yes, all drivers completed journeys in a Southbound and Northbound direction during training. Please see response to question 3 above for details of trips completed. St Stephens Green to Broombridge is a northbound trip and Broombridge to St Stephens Green is the southbound trip.

**6. How many drivers have signed off that they are satisfied with their training?**

At the end of the LCC training session the drivers are presented by the trainer to the assessor if deemed ready. The presentation form is countersigned by the driver.

To date, no driver has not countersigned the trainer assessment form.

As per question 1, on the 29<sup>th</sup> of November 2017, 199 drivers have been signed by their assessor as being competent to drive LUAS Cross City, of which 1 driver, having failed the first time, was subsequently retrained and succeeded on the second assessment.

**7. How many drivers have requested more training?**

Of the 199 drivers who have completed training on LCC, there have been 43 various requests from drivers which can be broken down into:

- 20 requesting more exposure to the line
- 10 requesting to be accompanied on their first In-service trip
- 5 requesting additional training
- 8 various other requests (e.g. night driving, walk through of Broombridge depot etc.)

**8. When drivers request more training, how is this being managed?**

If a driver requests more training on LUAS Cross City, an assessment of their needs is performed to define what level of additional training is required.

Where drivers can have their requests facilitated during testing of the system prior to opening of the new line this is being facilitated. Where drivers have requested to be





accompanied during their first in-service trip, this will be facilitated as they are rostered to drive the new line from December 9<sup>th</sup> 2017 onwards.

The training and planning departments are facilitating these requests.

Of the 43 requests, it is expected that the majority of requests will be facilitated by the 9<sup>th</sup> December, with the remainder being facilitated through accompaniment in passenger service. As of today 24 driver requests have been provided for.

#### 9. How many drivers have refused to sign that they are adequately trained?

Please see question 6 above, at the end of the LCC training session the drivers are presented by the trainer to the assessor if deemed ready. The presentation form is countersigned by the driver. To date, no driver has not countersigned the trainer assessment form.

As per question 1, on the 29<sup>th</sup> of November 2017, 199 drivers have been signed by their assessor as being competent to drive LUAS Cross City.

#### **DRIVERS TAKING POSSESSION OF JUNCTIONS**

#### 10. With regard to drivers taking possession of junctions, please forward to us a copy of the existing procedures and a copy of the new procedures? Can we please have any other information relevant to this issue?

It is not Transdev's policy to request drivers to take possession of junctions. Driving of both the Red and Green lines is based on the Line-of-Sight principle and drivers should only enter junctions when given a proceed signal and it is safe to do.

During TTR and driver training, Transdev issued a notice at each depot detailing processes for key LCC Junctions for all staff to comment on. This notice is included as an Appendix to this letter.

It has to be noted that LCC does not create new processes but increases shared running junctions. For example Stephens Lane/St James Street junction is a shared running junction in operation since 2004. LCC increases the number of shared running junctions of that type. The notice issued to all staff was to clarify the matter.

#### **TSI MANUAL**

#### 11. When will the TSI manual be updated to include the new LCC route and Broombridge Depot?

Transdev will fully integrate the LUAS Cross City into the SMS documentation within 3 Months of passenger service commencing.

This is on line with the previous extension (A1, B1 and C1).and was part of previous correspondence with the CRR.

Within this three month period it will be possible to test the new procedures further, to assess the residual risks and new risks that may become apparent (e.g. impact of



passenger route, potential for desire line, reinstatement of statues on O'Connell Street for example) and to further develop the operational processes based on staff feedback.

This update will include:

- Updating the training program in place for drivers and CCR staff
- Updating the TSI
- Updating the CCR manual
- Updating the summary of the SMS

Updates will be made in consultation with the staff Health and Safety representatives over the three month period.

**In the interim how will Transdev ensure that Drivers have all the information they need in relation to LCC and Broombridge Depot?**

From the 9<sup>th</sup> December 2017, all drivers on their first in-service trip will receive a briefing from the Transdev team-leaders in relation to LUAS Cross City and the Broombridge depot.

In addition, safety notices will be used for specific areas that require addressing on the 9<sup>th</sup> December and any other areas that become apparent between opening and re-publishing of the new TSI.

This has been the process used for previous LUAS extensions (A1, B1 and C1) and is the process to introduce significant change on the system.

## **OTHER STAFF TRAINING**

### **12. How many CRR employees have been trained in the new LCC route and any related issues?**

Transdev assume that you are referring to the Central Control Room (CCR) staff in this question and the response below is based on this assumption.

All CCR employees (16 full time traffic supervisors plus 2 panel members) have received three phases of training on LUAS Cross City (including Broombridge Depot)

All 16 full time Traffic Supervisors as well as the 2 panel members have been fully trained on LCC operations.

This involved:

- Phase 1 – Track walk covering key areas of LUAS Cross City
- Phase 2 – Visit to Broombridge Depot and walk of all facilities and introduction to the system upgrades associated to LUAS Cross City
- Phase 3 – First hand training on live LUAS Cross City systems and procedures



In addition, each Traffic Supervisor has been accompanied during their first time operating LCC during Test and Trial running. This support will continue into normal passenger service.

Part of the CCR training process included gathering feedback from the traffic supervisors. Based on this feedback, the following operational and environmental changes:

- New video wall showing greater visibility of the system.
- New AVLS screens to show a larger representation of the system and trams approaching each line.
- Increase in the number of the monitors to view LSS and DCS systems.
- Reduced the use of the St Stephens Green siding to emergency use and not timetable use based on feedback from CCR track walks.

Transdev hope that the responses outlined above are to your satisfaction. If you require any further clarifications else please let me know?

Yours Sincerely,

Transdev Dublin Light Rail Limited

#### TRANSDEV

Luas Depot, Red Cow,  
Clondalkin, Dublin 22, D22 C5P3  
Tel: (+353) 1 461 4910 Fax: (+353) 1461 4992  
Registered office: Riverside One, Sir John Rogerson's Quay, Dublin 4  
Registered in Ireland No. 354252  
Email: [info@transdevireland.ie](mailto:info@transdevireland.ie) Website: [www.transdevireland.ie](http://www.transdevireland.ie)  
Directors: B. Schmeink; N. Stevens (Chairman); M. Morrell;



## Proposed Luas Cross City Operating Procedures

### Road Junctions

#### *Top of O'Connell Street / Parnell Street Northbound*

Always proceed into this junction on receipt of the tram proceed signal and when safe to do so. Any traffic that is in this junction when you approach normally moves quickly with the traffic sequence/lights on Parnell Street allowing traffic to flow.

#### *Westmoreland Street to O'Connell Street*

Always proceed onto O'Connell Bridge from Westmoreland street stop on receipt of the tram proceed signal and when safe to do so. Any traffic that is in this junction when you approach normally moves quickly with the traffic sequence/lights on O'Connell Bridge going green allowing traffic to flow.

#### *Hawkins Street / Townsend Street*

On receipt of the proceed signal at Hawkins Street / Townsend Street (D) continue into the junction even if a bus is ahead of you at the next signal. The next signal at (D) will go to a green light for traffic and a proceed signal for trams very quickly allowing traffic and trams through this area.

#### *Red LED indicator at signal at O'Connell Upper for trams heading to Parnell stop*

There is a red LED indicator at the tram signal at O'Connell Upper. When this indicator turns red it is indicating a tram is still located at the Parnell platform and will not give a proceed signal for a tram that is at O'Connell Upper heading towards Parnell stop until the platform at Parnell is cleared.

#### *Parnell Street Junction Southbound (outside Ambassador Theatre)*

If the yellow box is blocked by road traffic at this junction (D) when you get a tram proceed signal and it doesn't look like it will clear enough for the tram to pass through safely then do not proceed past this signal, contact CCR to advise them of the delay and wait until the next rotation.

### Broombridge Depot Exit

From the storage lane request permission to move to the depot gate. When CCR confirm permission continue to the loop that is situated at the end of each storage lane. When you are on the loop request permission from CCR to exit the depot. CCR will give you permission to exit the Broombridge depot out to the platforms. Input your RTS to open the depot gate, when the gate has opened continue to the tram signal outside of the depot on your left hand side and input the RTS to give you a proceed signal to the Broombridge platform.

### Broombridge Depot Entry

From the platform request permission from CCR to enter the Broombridge depot. When CCR confirm the move input the point position Indicator to the right. This will change your points towards the depot and will also open the depot gate. Continue when safe to do so and follow the route onto the service lane through the sand and wash and continue to the depot gate at the south end of Broombridge depot. When you have changed ends request permission from CCR to move from the south end of the depot onto a storage lane. CCR will then direct you onto Storage 1 or 2.

### Engineering Routes from Red Line to Green and Vice Versa

Any move involving a tram being moved from the Red line to the Green line or vice versa will normally be carried out in engineering hours (after service has ended) and will be done under the control of a Team Leader who will always be on the scene for these moves following CCR or Gardaí instruction.

### Cyclists (Trinity/Dawson)

The new line will see a lot more interface with not only road traffic vehicles but also cyclists. Be always aware of cyclists on Luas Cross City especially in areas around Trinity College and Dawson Street.

### Broombridge Platforms Procedure

There is no hatched area procedure in place at Broombridge platforms therefore Trams entering or exiting Broombridge platforms to and from mainline will do so under signal control. Once your route is set and it is safe to do continue into or out of Broombridge platforms when you get the tram proceed.

\*Note – Northbound trams must stop at the first tram signal approaching Broombridge platforms, check route is clear and then proceed on signal (signage will be in place at this location to remind drivers)

### Signals

The tram signal priority levels vary throughout the day therefore you should never expect any signal behaving the same way as when you previously seen it. As with all signals on the Luas system never anticipate signals and always double check to make sure you have the proceed signal and that it is safe to continue. There are more pedestrian crossing areas and shared running with cars on the new line than what we have experienced before so be extra vigilant for pedestrian crossings.

### Feedback Welcomed

The above procedures have been developed over the last three months experiencing the new line and have been established following feedback from trainers and drivers. There will be a sheet left in the planning office should anybody have any additional comments or feedback on any area of the new line e.g. Signal's / Speeds / Platforms that they feel could be improved etc. or alternatively email Barry O'Hanlon at [Barry.ohanlon@transdev.ie](mailto:Barry.ohanlon@transdev.ie) with any issues or feedback. All feedback welcome.



| Meeting Minutes |  | Subject         | RSC Safety Performance Review Meeting with Transdev           |
|-----------------|--|-----------------|---|
|                 |  | Time/Date/Venue | 1300-1500 : 25 <sup>th</sup> May 2017, at the Red Cow Depot   |
|                 |  | Attendance      | Transdev:<br>CRR:<br>Anthony Byrne (TB), Aidan Langlely (ARL) |

| No | Item                                       | Comment   | Action |
|----|--|---|--------|
| 1. | Presentation on RSC update and Annual Plan | No update needed                                    |        |
| 2. | Previous Minutes                           | All actions from previous meeting minutes reviewed. |        |

|                       |   |   |
|-----------------------|---|---|
| 3. Safety Performance | <p>It was discussed that in Q1 17 there was a lower number of Vehicle Contacts 4, vs 11 in 2016. However Q2 is much higher than in 2016. It was noted that the vehicular activity is increasing in the city, as economic growth picks up, particularly cyclists as the weather has improved. Another difference is as part of the LCC introduction, 29 additional drivers are needed. These have largely been recruited and trained, and they are appearing in the SPAD and other stats, as they 'bed in'. 45 new Drivers have been introduced in Aug 2016.</p> <p>Below is a summary of the statistics:</p> <ul style="list-style-type: none"> <li>• Contact Vehicle: Number of contacts significantly down on previous years. 4 in 2017 YTD, 11 for same period 2016.</li> <li>• Contact person / cycle: reduction on previous year figures, 1 in 2016, 1 for same period 2015.</li> <li>• Of the incidents in 2016, no significant issues recorded.</li> <li>• There have been 2 attempted suicides in 2017 to date.</li> <li>• SPADs: 4 SPADs in Q1 vs 3 in Q3 2016. They are doing a review of SPADs internally for better investigation of SPADs.</li> <li>• Ebs 153 in Q1 2016, slightly down on 2015. An analysis by location is being done, and will be sent separately.</li> <li>• Reports Open / Ongoing: <ul style="list-style-type: none"> <li>○ Scutting – letter was sent, and a number of mods ongoing with ALSTOM. Modification being planned to put Perspex on the 'step' at the nose of the trams.</li> <li>○ OCS Milltown incident – final report has been issued, Tri-party meeting (Transdev, Alstom, TII), RSC to be invited, sending shed cameras upgraded.</li> <li>○ Recent RTAs with 1 open investigations.</li> </ul> </li> <li>• Incident Reports Completed: Q1 = (TBC), Joe to send on after meeting</li> <li>• Infractions: None.</li> <li>• Risk Assessment / Reports: <ul style="list-style-type: none"> <li>○ Tram yellow threshold strip on 402 single leaf door – under assessment by TII.</li> <li>○ Radio – will be more use on the system when LCC opens</li> <li>○ Tie in Works on O'Connell Street.</li> <li>○ Continuous assessment programme for the drivers.</li> <li>○ TDC (trackside distribution controlbox) location and protection.</li> </ul> </li> <li>• D&amp;A Analysis: Several D&amp;A tests done YTD. So zero positive in Q1.</li> <li>• One driver failed the D&amp;A test after a routine medical, second sample being tested.</li> <li>• Transdev are proposing to change the test type being done, to use the same "Swab" method the Gardaí use. The Unions are being consulted on the proposal.</li> </ul> | <p>Bf to provide # of D&amp;As completed.</p> |
|-----------------------|---|---|

(11)

|               |                                   |  |              |
|---------------|-----------------------------------|--|--------------|
| 4.            | Accident / Incident Investigation | <p>BF explained that any instances being investigated discussed above:</p> <ul style="list-style-type: none"> <li>• Speeding online</li> <li>• Speeding in sanding shed</li> <li>• Contact with person</li> <li>• RTA</li> </ul> <p>Alstom Remits (PSTs):</p> <ul style="list-style-type: none"> <li>• No new remits issued (See PST meeting review from Thursday)</li> </ul> <p>Recently Completed:</p> <ul style="list-style-type: none"> <li>• JC to seen on latest batch of reports</li> </ul> |              |
| 5.            | Internal Monitoring               | Already covered above.   |              |
| 6.            | Engineering Change                | <p>Refer to Transdev Safety Working Group Mins</p> <p>Continuous Assessment of drivers, the software app is in the final stages of being developed. First 15 drivers have been assessed in April 2016.</p> <p>BF provided the TII Luas Change management request log, for review. (a long list is the total list, the short list is the ones still open).</p> <p>900k overhaul has now started,</p>  |              |
| 7.            | RAIU Recommendations              | AB to confirm status of last one. From a report in 2008.   | AB           |
| 8.            | RSC outcomes                      | AL/BF to arrange a second meeting on outcomes. Good start made.  | AL/BF        |
| 9.            | AOB                               | New  | AB to action |
| Next Meeting: |                                   | 1 <sup>st</sup> week July 2016,  |              |



## **CRR Safety Performance Review Meeting with Transdev**

**Red Cow, 20<sup>th</sup> July 2017**

**10.00 – 12.00**

### **Agenda**

1. Transdev (Alstom) Accident / Incident Investigations
  - Recently completed investigations & recommendations
2. Engineering & Operational Changes
  - Transdev (Alstom) to provide list of all changes considered/introduced in last quarter)
3. Review of Transdev Internal Monitoring (Audits/checks undertaken)
  - D&A Random Testing
  - Safety tours / inspections / audits
4. Safety Performance / Accident data – Transdev YTD
5. RAIU Safety Recommendations Update
6. RSC Audit Outcomes - Progress by Transdev
7. AOB
  - a. Fatality / effectiveness of body catcher (if not already covered)
8. Date of Next Meeting





Meeting  
Minutes

Subject

RSC Safety Performance Review Meeting with Transdev

Time/Date/Venue

0930 – 1200 : 20<sup>th</sup> July 2017, at the Red Cow Depot

Attendance

Transdev:

CRR: Aidan Langley (ARL), Anthony Byrne (AB),

AN COMISIÚN UM RIALÁIL IARNRÓID  
COMMISSION FOR RAILWAY REGULATION

| No | Item                             | Comment  | Action |
|----|----------------------------------|--|--------|
| 1. | Transdev Incident Investigations | Verbally reviewed the recent RTC and other serious incidents. Investigation into fatality ongoing.   |        |
| 2. | Safety Performance               | <p>Transdev transit c.1million kilometres per quarter, running more km per month year-to-date, than previously. Passenger numbers are also rising substantially, as is pedestrian, and vehicular traffic in the city. Data below should be considered in that perspective.</p> <p>Below is a summary of the statistics:</p> <ul style="list-style-type: none"><li>• Contact Vehicle: 14 between Q1 and Q2 2017, the same on averages as in Q1 and Q2 2016.</li><li>• Contact person / cycle: Q1 and Q2 2017, 3, versus 1 in Q1/Q2 of 2016..</li><li>• Of the incidents in 2017, two of these have been assumed self-harm.</li><li>• SPADs: 13 SPADs in Q1 and Q2 2017. This an increase of 6 on the same period 2016 however 12 of these have been by new drivers (53 new drivers have been hired in the build up to LCC).</li><li>• EBS 393 in Q1/Q2 2017, up on 257 in the same period in 2016. The background to this is that it is the second phase of a programme to reduce incidents. Previously it was felt that drivers were too often using the EB, and a programme was put in place to consider the consequence to passengers on the tram of the rapid deceleration, having more than halved the number of EBS from &gt;370 per million km run (2006), to ~100 per million km run, 'the pendulum has swung' and the risk is now considered to be that drivers are too hesitant to use the EB. Data suggests that the time that was being used to consider the consequence of an EB may be worsening incident outcomes. In addition the new intake of drivers are felt to EB more than their more experienced predecessors, during their first few months of driving, causing a recent uptick to ~160 per million km run.</li><li>• Infractions: None.</li><li>• Risk Assessment / Reports:<ul style="list-style-type: none"><li>○ Tram yellow threshold strip on 402 single leaf door – under assessment by TII.</li><li>○ Continuous assessment programme for the drivers.</li></ul></li><li>• D&amp;A Analysis: no tests failed YTD.</li></ul> |        |

(12)

|    |                                   |  |    |
|----|-----------------------------------|--|----|
| 3. | Accident / Incident Investigation | <p>BF explained that any instances being investigated discussed above:</p> <ul style="list-style-type: none"> <li>• Contact with person</li> <li>• There was some discussion of the recent Fatality, however the investigation of this is still ongoing.</li> </ul> <p>Alstom Remits (PSTs):</p> <ul style="list-style-type: none"> <li>• No new remits issued (See PST meeting review from ALSTOM)</li> </ul> |    |
| 4. | Internal Monitoring               | Already covered above.   |    |
| 5. | Engineering Change                | <p>A number of initiatives are being progressed. Including:</p> <p>Harmonising the door selection buttons in the cabs between the 401 and 402 fleet (to be like the 402s).</p> <p>Tip up seat modification (remove pinching risk)</p> <p>Scutting wiper modification</p> <p>402 door threshold modification (to match 401 design)</p>  |    |
| 6. | RAIU Recommendations              | AL/BF to arrange a second meeting on outcomes. Good start made.  |    |
| 7. | RSC outcomes                      | AL/BF to arrange a second meeting on outcomes. Good start made.  | AL |
| 8. | AOB                               | Date of next meeting to be agreed with BF, likely to be 12 <sup>th</sup> or 19 <sup>th</sup> October   | BF |
| 9. |                                   |  |    |
|    |                                   |  |    |

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## **CRR Safety Performance Review Meeting with Transdev**

**Red Cow, 13<sup>th</sup> April 2018**

**10.00 – 12.00**

### **Agenda**

1. Review of previous meeting minutes
2. Transdev Safety Plan 2018 – Transdev to provide an overview of safety targets/initiatives for the year
3. Safety Performance / Accident data – Transdev YTD
  - Leading indicators
  - Lagging indicators
4. Transdev (Alstom) Accident / Incident Investigations
  - Recently completed investigations & recommendations
  - In progress investigations
5. Engineering & Operational Changes  
Transdev (Alstom) to provide list of all changes considered/introduced in last quarter)
6. Review of Transdev Internal Monitoring (Audits/checks undertaken)
  - D&A Random Testing
  - Management Safety Tours / inspections / audits
7. Public / other representations
  - Employee/employer relationship (Update on progress)
8. RAIU Safety Recommendations / CRR Outcomes Update
9. AOB
  - a. Luas Cross City Broombridge interface risk & bridge construction update
10. Date of Next Meeting

| Meeting Minutes | Subject  |  |
|-----------------|--|--|
|                 | Time/Date/Venue  | Attendance   |
|                 | CRR Safety Performance Review Meeting with Transdev<br>1300-1500 : 13 <sup>th</sup> April 2018, at the Red Cow Depot | Transdev:<br><br>CRR:<br>Anthony Byrne (TB), Aidan Langley (ARL) |

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| No | Item                                       | Comment  | Action    |
|----|--|--|-----------|
| 1. | Presentation on CRR update and Annual Plan | AB presented to Transdev on 16 <sup>th</sup> March.  |           |
| 2. | Transdev Safety Plan                       | Due to be ratified in the next fortnight, will be issued to CRR then.  |           |
| 3. | Overview of revised organisation           | There have been a number of changes to the Transdev Management structure.<br><br>This has been taking effect over the past couple of months. I volunteered to give a briefing to a CRR in the next couple of weeks, date TBC. This will include the revised lagging and leading indicators which are going to be used. | Action JA |

|    |                    |   |  |
|----|--------------------|---|--|
| 4. | Safety Performance | <p>It was discussed that the 2017 figures show increases compared to (2016) in the areas of:</p> <ul style="list-style-type: none"> <li>• Contact with Vehicles: 29 (23)</li> <li>• Contact with Persons (including cyclists) 6 (5)</li> <li>• Emergency Brake Applications: 797 (527)</li> <li>• SPADs: 28 (21)</li> <li>• There were 3 attempted suicides in 2017, including one fatality and two serious injuries.</li> </ul> <p>Whilst no specific reason was given for the increases in 2017, the obvious factor is that the city centre is busier again in 2017 than 2016.</p> <p>With regards, to 2018 Q1, compared to (Q1 2017) figures:</p> <ul style="list-style-type: none"> <li>• Contact with Vehicles 4 (4)</li> <li>• Contact with Person Cyclist 2 (0)</li> <li>• SPADs 6 (4) all interviews completed on those</li> <li>• Emergency Brakes 242 (181)</li> <li>• D&amp;A Analysis: No random tests YTD, a number following incidents, zero positive.</li> </ul> <p>Again, no specific reasons have been identified for the increases.</p> |  |
|----|--------------------|---|--|

|    |                                   |  |  |
|----|-----------------------------------|--|--|
| 5. | Accident / Incident Investigation | <p>Discussed the Safety Reps and Safety Committee Meetings, the Driver Safety Rep and RPO Safety Rep are now doing track walks and attending meetings with Senior Management Team.</p> <p>The monitoring plan for the year includes VMC and IMC Audits, Junction monitoring, Driver Monitoring, and the Safety Audits that Joe does. There are also now going to be SMS audits of Alstom (maybe 2-3 times per year).</p> <p>is now a Safety Investigator and will also be trained on Accident Investigation.</p> <p>Two of the 6 SPADs YTD have been on the same signal at Broombridge (Depot environs).</p> <p>JC explained the data on the following</p> <ul style="list-style-type: none"> <li>• 4 x RTC (minor)</li> <li>• 2 x Contact with person incl 1 cyclist (Museum inbound cyclist ran red light) and 1 pedestrian (near Geokstown happened at ~0130) no reports of injuries.</li> <li>• 1 parafit failure in Q1</li> <li>• 1 derailment (Sandyford) - Efecec.</li> <li>• 2 derailment (Red Cow) – snow related.</li> <li>• 7 brush contacts with vehicles (eg wing mirrors touching).</li> <li>• 1 reported event of someone holding the windscreen wiper and being towed along.</li> <li>• 1 door enabling of doors at O'Connell Street, at the signal rather than at Abbey Stop. 3 passengers alighted.</li> <li>• 1 event at Harcourt with WSD and passenger were able to alight onto the road.</li> <li>• 1 signal conflict at O'Connell Street / Abbey Street Jct where a Northbound train was delayed by traffic, and an Eastbound train was given a proceed signal with the path blocked. There was no issue as line-of-sight driving, and the driver did not proceed.</li> </ul> <p>will be leading the reporting of investigations going forward.</p> <p>Alstom Remits (PSTs):</p> <ul style="list-style-type: none"> <li>• No new remits issued (See PST meeting review from Thursday)</li> </ul> <p>Recently Completed:</p> <ul style="list-style-type: none"> <li>• JC to send on latest batch of reports</li> </ul> |  |
| 6. | Internal Monitoring               | <p>Already covered above.</p> <p>(Management Safety Tours (of Depots), Junction Monitoring, Track Walks and others as arising).</p> <p>Driver training was not compromised by the recent bad weather.</p> <p>VMC and IMC maintenance (carried out by Alstom) had stayed within the (relaxed) tolerances over the bad weather.</p>  |  |
| 7. | Engineering Change                | <p>Transdev Safety Working Group Mins were reviewed no issues were raised.</p> <p>It was noted that the 502 trams are now back in service. Transdev had advised that they were being taken out of service, but not that they had been returned.</p>  |  |

(13)

|               |                      |  |       |
|---------------|----------------------|--|-------|
| 8.            | Reps                 | AB ran through the current list of Reps <ul style="list-style-type: none"><li>• Westmorland to O'Connell St Northbound</li><li>• Signal conflict at Ambassador</li><li>• Parnel Street and O'Connell St Jct</li><li>• D002 signal SSG Southbound</li></ul> Tram 5005 in-cab noise<br>Broombridge Tram-wash<br>Bohemians Vs Rovers security arrangements<br>Harcourt Street – Operations and risk associated with Rickshaw Cyclists.<br>Red Cow depot PPI signal and motorised points not being operational<br>Speed signs – compliance with TSIs<br>Body Catcher restraint and CRR approval<br>Four Courts Crossover – and wrong directional moves without Gardai support. |       |
| 9.            | RAIU Recommendations | AB confirmed status of 6-2011 as of 18 <sup>th</sup> April 2018  | AB    |
| 10.           | CRR outcomes         |  | AL/BF |
| 11.           | AOB                  | Following Storm Emma – the driver monitoring and assessment was maintained. Tram and IMC maintenance was maintained within relaxed tolerances.<br>Tram from Stephens Green SPADed and ended up in the siding on the north side of Stephen's Green.<br>OCS failure at Cookstown Interchange – appears to be due to wear and tear. IMC isolated it, and de-energised the trams.  |       |
| Next Meeting: |                      | 13 July 2018 2pm.  |       |

|   |  |   |
|---|--|---|
|  | <b><u>Post Incident Inspection</u></b> |   |
|   | Accident/ Incident:                    | Tram struck by truck - Cheeverstown Road, Tallaght. |
|   | Supervision Activity No.:              | <b>28/17-PII</b>                                    |

**Incident Background**

On Friday 5<sup>th</sup> May about 06:15, a tram inbound from Saggart was crossing the Cheeverstown Road when it was struck by a truck. One passenger and tram driver injured and brought to hospital.

- Tram 3024 inbound from Saggart was crossing the Dublin Outer Ring Road (R136) in ENE direction when it was struck on the left hand side by a rigid delivery truck travelling in SE direction.
- Conditions were dry and overcast, with an ENE cold strong breeze, temperature about 10 celsius.
- The tram is fitted with forward facing CCTV. The truck apparently has three CCTV cameras fitted.
- Gardaí will obtain CCTV and tachograph records from truck owner and from TransDev.

**Summary of action/s undertaken;**

CRR Inspector mobilised to site to undertake inspection of accident scene

- The front of the truck hit the panel ahead of the first set of double doors, and was dragged along for about 20 metres until it crashed into a set of pedestrian barriers.
- The side of the 40 metre long tram was damaged from the point of impact to a point midway along the tram (see photo 1). The tram did not derail.
- It seems that at impact the truck had not veered to the left or to the right (see wheels in photo 3).
- One passenger was attended to by Dublin Fire Brigade ambulance, which brought them to Tallaght hospital as precaution against possible spinal injury.
- The tram driver was also hospitalised as precaution against possible neck injury.
- The truck driver was tested by Gardaí for drugs and alcohol. No indication of intoxication. Apparently he reported being sleepy and did not see the tram. The CRR Inspector did not meet the truck driver.

**Findings / Outcomes & Inspector Recommendation**

The following was noted:

- There was dull light and sky conditions on the day in question, with low grey clouds moving noticeably from ENE and in direction of travel of tram.
- From the approach position of the truck, the tram roof may have appeared silver-grey and merged with the sky colour (see photo 4, taken 1½ hours after the accident occurred)
- This complex and busy crossroad junction which intersects the tramway is controlled by road traffic lights and slipways (see photo 5), whereas the preceding junctions are un-signalled YIELD roundabouts.

Given the above findings, the following outcomes are made.



**28/17-P11-AR 1:**

TII, Transdev and the relevant roads authority must carry out the following tasks:

- (A) undertake a junction risk assessment to determine immediate improvement measures –
- (B) implement the improvement measures identified

The R136 is a 60km/h open highway (dual-carriageway) so the presence of a crossing tram would be a surprise to motorists. TII & Transdev should undertake a junction risk assessment, and improved advance warning and traffic calming measures should be considered.

PCD: 2 months for Task A and a further 2 months for Task B.

**28/17-P11-Sf1 1:**

TII, Transdev and the relevant roads authority should consider undertaking a comprehensive junction risk assessment to determine if capital improvement measures are needed-

The area around the junction is already reserved for expansion, so all change options, including grade separation or controlled roundabout, should be considered on the basis of a risk assessment and full-life cost-benefit analysis.

**28/17-P11-Sf1 2:**

TII should review the colour pattern for trams to improve conspicuity and consolidate the outline - The colour pattern for trams should be reconsidered, particularly in regard to conspicuousness and contrast of the outline against an open sky under various lighting conditions.

To minimise camouflage effects, TII should consider consolidating the longitudinal outline of the tram against an open sky, perhaps by accentuating the parallel yellow and black horizontal strips at cant-rail level.

**28/17-P11-Sf1 3:**

In particular regard to **28/17-P11-AR 1**, TII, Transdev and the relevant roads authority should review road signage in the light of the CRR's GDRIRS on Level Crossings, which refers to countdown signage and repeater Level Crossing signs. The appropriateness of the size of the Level Crossing signs should also be reviewed.

**Based on the information obtained and reviewed is a Post Incident Inspection (Stage 2) warranted Yes or No? No**

**Signatories**

Prepared By:

Donal Casey

Signed

Donal Casey

Dated

13<sup>th</sup> April 2018

Reviewed By:

Signed

Dated

Authorised By:

Anthony Byrne

Signed

Anthony Byrne

esig 22/2018

Dated

16<sup>th</sup> April 2018



*Figure 1 Front of tram 3024 showing damage at left side*



*Figure 2 Rear of tram 3024, showing absorbent material spread over oil spillage from truck, 05/05/2017 @ 07:31*



*Figure 3 Left side of truck 07D51542 with front-wheel steered slightly to the right, 05/05/2017 @ 07:34*



*Figure 4 Junction approach from truck driver's point of view, 05/05/2017 @ 07:47*

(14)

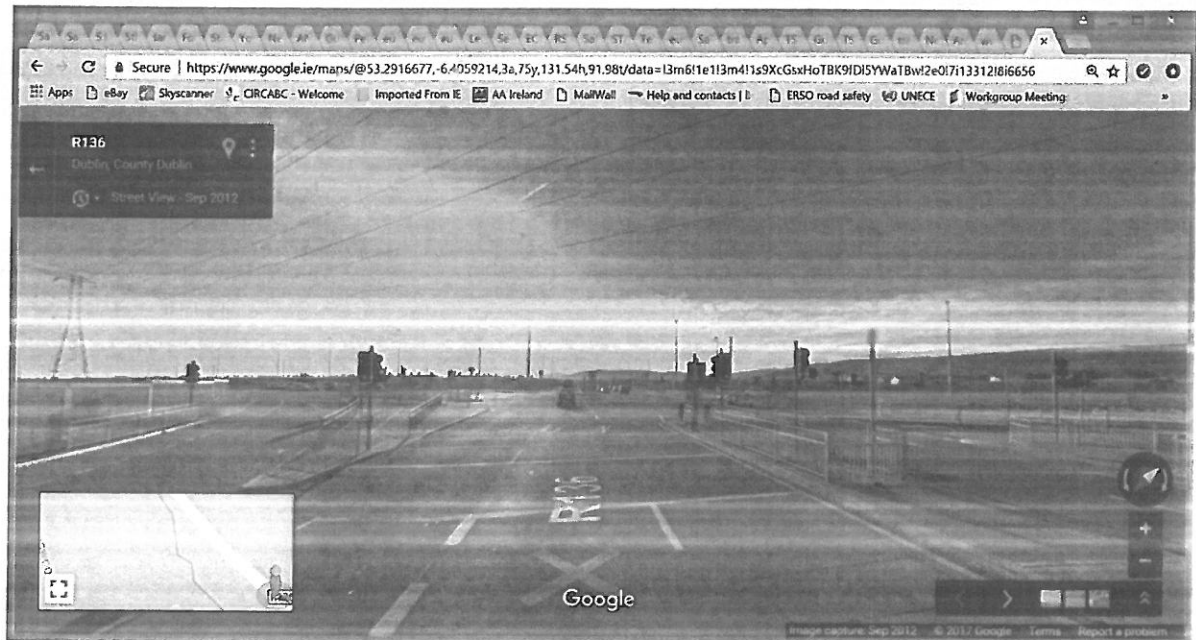


Figure 5 Google street-view - truck driver's view of junction, showing solar glare from ESE

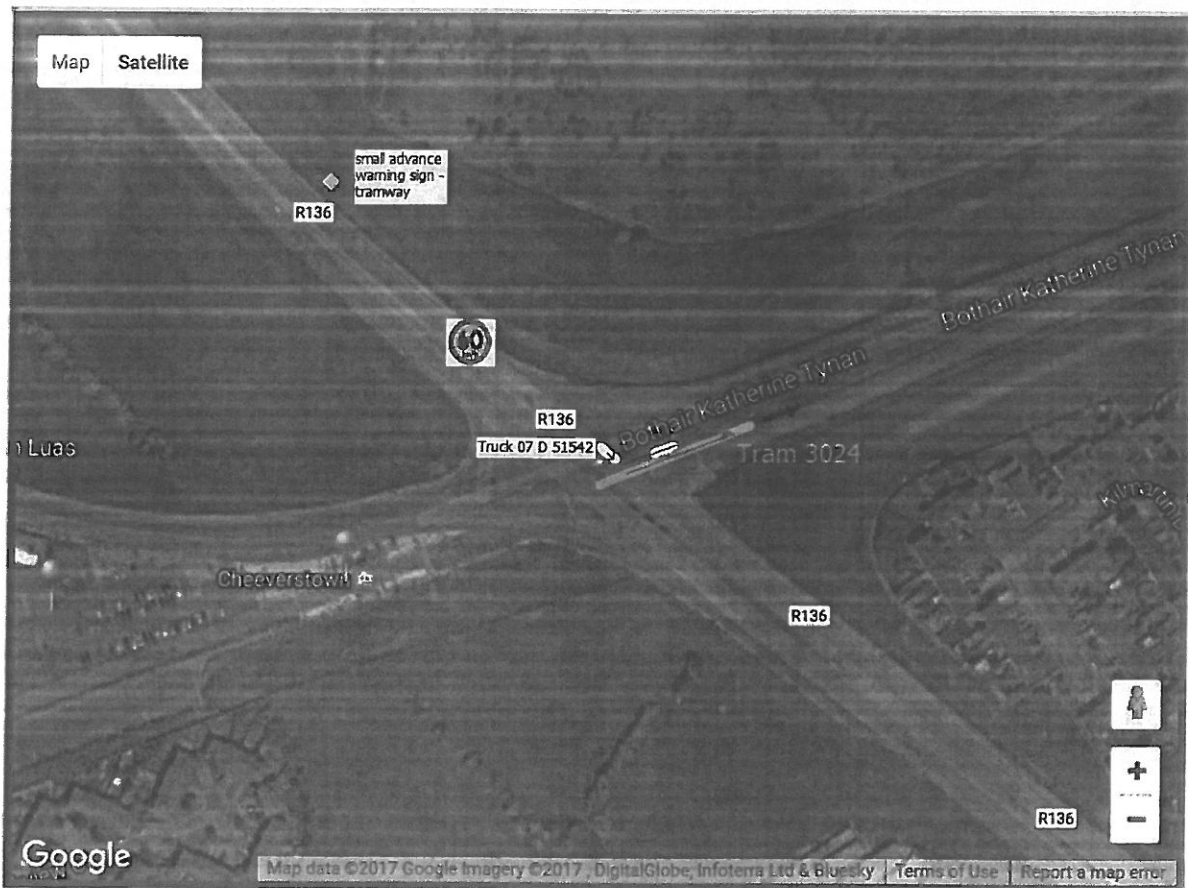


Figure 6 Google satellite view, showing points of impact and position of truck on impact and position of truck and tram at rest

**From:** [REDACTED]  
**Sent:** Wednesday 28 March 2018 14:32  
**To:** Anthony Byrne  
**Subject:** FW: RE: 180306 TB18-047 Transdev - Luas Systems Failure on the 12th February 2018

Hi Anthony,

Please see detail of system failure below. This is just correspondence between [REDACTED] and Alstom. There is no specific report and no root cause identified.

Regards,



TRANSDEV  
 LUAS DEPOT, REDCOW, CLONDALKIN, DUBLIN.22  
 Tel: +353 1 461 4910 - [www.transdevireland.ie](http://www.transdevireland.ie)



Before you print this email, please consider the planet and your environmental responsibility. Thank you!



**From:** Colin McDermott  
**Sent:** 28 March 2018 12:25  
**To:** [REDACTED]  
**Subject:** RE: RE: 180306 TB18-047 Transdev - Luas Systems Failure on the 12th February 2018

I have not received a report as such. IMC were keeping Transdev in the loop with findings and Transdev were conducting meetings throughout the incident.  
 The basic summary is as follows;



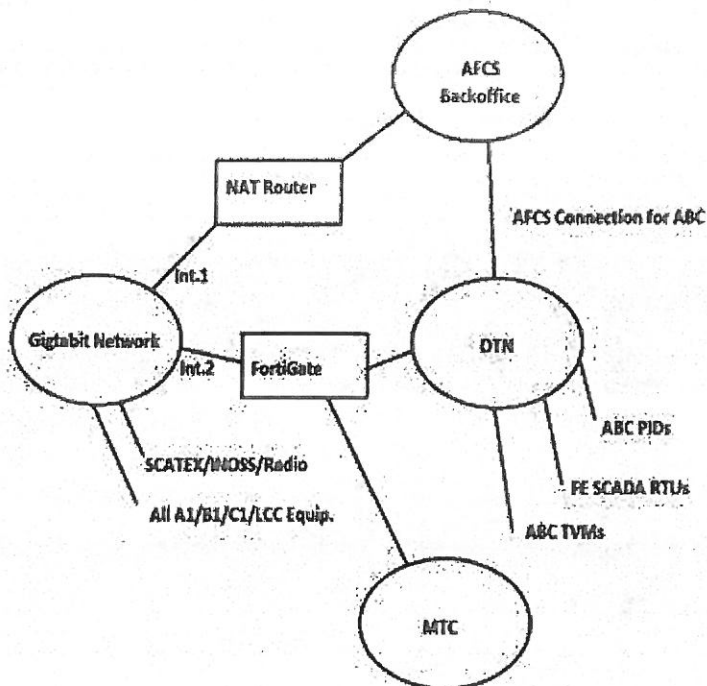
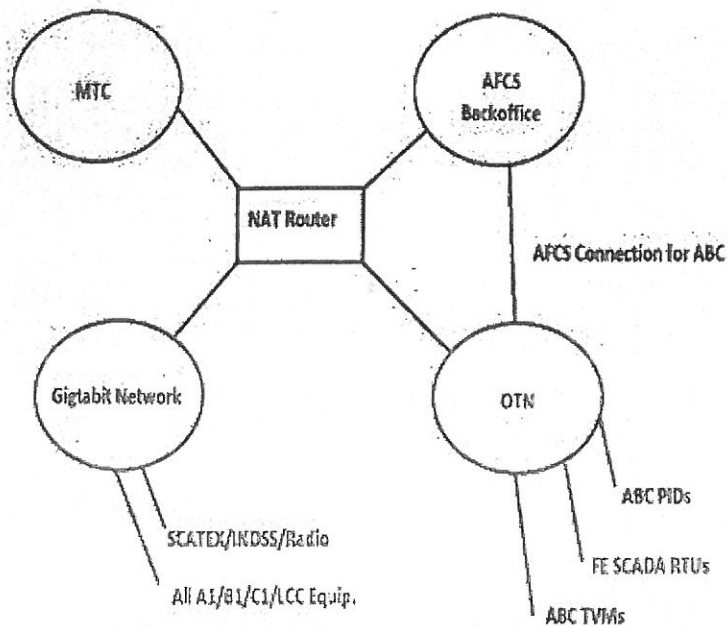
On the 7<sup>th</sup> of Feb. IMC were notified of an issue with the PIDs. On investigation it was discovered that the equipment that goes out over the OTN IP network was faulty and not communicating back to Red Cow Server room. This included the AFL payments connection from the TVM's, the F.E. SCADA (remote control of the lifts – stopping and restarting/resets, etc.) and PID's. The OTN is a communication network that was installed nearly 16 years ago on the existing Green and Red line. The newer system for the A1, B1 C1 and LCC lines seem to be unaffected.

IMC with TII carried out diagnostics on the OTN into engineering hours and continued fault finding. In order to locate the issue IMC brought half the OTN offline by breaking the connection at two points. The hope was that if the faulty OTN node, OTN ET100 Card or faulty device was on the side of the network that was offline the other half would work properly. IMC initially brought down the red line and left the green line operational. This seemed to work at first - IP communications worked on the Green line. The NAT router was reconnected and the PIDs on the green line worked fine. After about 30 minutes however it failed. IMC retried with the other half of the network and got the same result, it stayed up for 30 minutes but then failed. They then tested both halves again without connecting to the NAT router with the same result.

IMC did not find the root cause of the fault to date and had contacted "OTN Systems" who are supporting the investigation. OTN Systems requested logs and a copy of the database to further diagnose and have also gave some further fault finding steps for the technicians on the ground to follow. All the systems (AVLS, F.E. SCADA and AFL) were reconnected to the OTN and all operated as normal for a number of hours before the issues re-occurred. IMC requested OTN System send an engineer to Dublin to assist who, on arrival tested the OTN fully. OTN systems confirmed the OTN was not in fault and suggested the system may have been overloaded with comm.'s from something in field. IMC and TII continued to test the systems with the OTN tech in site but could not recreate the fault.

There was an alteration to the network configuration which removed all traffic through the NAT route (all but the TVM) - see below diagrams. Old on the left.

(15)



The ABC lines PID's and SCADA is still connected through the OTN via the Fort iGATE switch now. The systems is stable and will remain in this configuration until Transdev/IMC/TII review options of possibly transferring the ABC equipment to the CTN Gigabit Network.

Regards



From:  
Sent: 26 March 2018 19:59

(15)

**To:**

**Subject:** Fwd: RE: 180306 TB18-047 Transdev - Luas Systems Failure on the 12th February 2018

Can you please send through this report so I can close with anthony?

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---

**From:** Anthony Byrne

**Sent:** Monday, March 26, 2018 1:08:39 PM

**To:**

**Cc:** I

**Subject:** RE: 180306 TB18-047 Transdev - Luas Systems Failure on the 12th February 2018

Good afternoon

Any update on the investigation report?

Kind Regards,

Anthony Byrne

Head of Supervision & Enforcement

Commission for Railway Regulation, Temple House, Blackrock, Co. Dublin, A94 Y5W5

Tel: +353 1 2068145 - Mob:+353 87 9149 425 - Email: [anthonybyrne@crr.ie](mailto:anthonybyrne@crr.ie)

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Thank You.

---

**From:**

**Sent:** 12 March 2018 17:31

**To:** Anthony Byrne <

**Cc:**

**Subject:** Re: 180306 TB18-047 Transdev - Luas Systems Failure on the 12th February 2018

hi Anthony,

Apologies for not getting back to you last week as I was out of the country in business.

I have requested a report from imc and once I have it i will send it on. As far as I am aware, no root cause has been established to date.

Regards,

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(15)

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**From:** Anthony Byrne <[anthonybyrne@crr.ie](mailto:anthonybyrne@crr.ie)>  
**Sent:** Tuesday, March 6, 2018 4:03:31 PM  
**To:** [info@transdev.ie](mailto:info@transdev.ie)  
**Cc:** [info@transdev.ie](mailto:info@transdev.ie)  
**Subject:** 180306 TB18-047 Transdev - Luas Systems Failure on the 12th February 2018

Good afternoon  
Might you advise by way of update and/or furnish a copy of the investigation report following the above referenced occurrence.  
More specifically was a root cause ever determined?

Kind Regards,  
**Anthony Byrne**  
Head of Supervision & Enforcement

Commission for Railway Regulation, Temple House, Blackrock, Co. Dublin, A94 Y5W5  
  
Tel: +353 1 2068145 - Mob:+353 87 9149 425 - Email: [anthonybyrne@crr.ie](mailto:anthonybyrne@crr.ie)

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\*\*\*\*\*



**CRR Audit No. 02/17**

***Transdev***

***Managing Safety Critical Information***

**Audit Conducted February 2017**

## Revision History:

|                      |                  |            |
|----------------------|------------------|------------|
| <b>Issue: Final</b>  |                  |            |
| <b>Prepared By</b>   | Aidan Langley    | 20/02/2017 |
| <b>Reviewed By</b>   | Aidan O'Sullivan | 27/07/2017 |
| <b>Authorised By</b> | Anthony Byrne    | 18/12/2017 |

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## **Executive Summary**

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The Commission for Railway Regulation (CRR) is the National Safety Authority (in respect of railways) in the Republic of Ireland. In accordance with Directive 2004/49/EC of the European parliament, the CRR is required to supervise Railway Undertakings' and Infrastructure Managers' continued application of their safety management systems once they have been granted certificates and authorisations. Transdev Ireland Ltd, having received safety (management) certification from the CRR to operate the Luas, is subject to CRR supervision.

The CRR has undertaken an audit of Transdev's Safety Management System (SMS) focusing on Commission Regulation (EU) No 1158/2010, Annex II, Criteria O & P. The audit plan [Ref: B.00.00], supplied to the RO Safety Manager (ROSM) et al. prior to the audit, describes the purpose and scope to be assessed.

The audit was undertaken to fulfil the following principal objectives of identifying:

- Transdev compliance with the provisions of its Safety Management System (SMS), as identified in the audit scope;
- the effectiveness, suitability, and sufficiency of the SMS to demonstrate compliance with the Common Safety Methods in respect of Annex II Criterion O & P (as equated in CRR Guidance RSC-G-028-A for non RUs and IMs);
- the effectiveness, suitability, and sufficiency of the SMS to demonstrate compliance with the CRR Guideline Documents;
- the application of competency management within the business unit;
- areas for potential improvement to the management system including advising on good practice.

A summary of findings from the audit is as follows;

- 0 Major Non Compliance
- 0 minor Non Compliance
- 2 Action Required
- 4 Scope for Improvements
- 3 Good Practice
- 1 Audit Trail

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### Glossary of Terms

| Term    | Meaning / Definition   |
|---------|--|
| AR      | Action Required  |
| CRR     | Commission for Railway Regulation (the NSA for Ireland) formally the Railway Safety Commission |
| CSM     | Common Safety Method   |
| DFB     | Dublin Fire Brigade  |
| ECM     | Entity in Charge of Maintenance  |
| ICF     | Isolation Control Form   |
| IMC     | Infrastructure Maintenance Contract (operated by ALSTOM)                                       |
| LCC     | Luas Cross City  |
| JD      | Job description  |
| LPS     | Luas Possession Supervisor   |
| NC      | Non compliance   |
| NSA     | National Safety Authority  |
| PCD     | Planned Completion Date  |
| RO      | Railway Organisation   |
| RTC/RTA | Road Traffic Accident / Collision  |
| SMS     | Safety Management System   |
| TED     | Tram Event Database  |
| TSI     | Tramway Safety Instruction manual  |
| TSR     | Temporary Speed Restriction  |
| VMC     | Vehicle Maintenance Contract (operated by ALSTOM)  |



## **1 Introduction**

In April 2015, the Commission for Railway Regulation (CRR), formerly the Railway Safety Commission (RSC), issued Transdev Dublin Light Rail Limited ("Transdev") with a 'safety management certificate' for the operation of the Luas (Dublin) light rail network. Under the Railway Safety Act 2005, the Commission for Railway Regulation (CRR) is empowered to carry out periodic inspections, to ensure compliance with the SMS.

### **1.1 Stakeholders**

There have recently been some name changes to the key stakeholders connected to the Luas network. Below is a summary of the key stakeholder organisations, the relationship is also shown in Figure 1.

#### **1.1.1 Transport Infrastructure Ireland (TII) – Infrastructure Asset and Rolling Stock Owner**

TII are the owner of the Infrastructure Asset and Rolling Stock. Formerly the Railway Procurement Agency (RPA) they have been merged with the National Roads Authority (NRA) as of 1<sup>st</sup> August 2015. The RPA was established as an independent statutory body in 2001 after the enactment of the Transport (Railway Infrastructure) Act of the same year. Part of their remit is to *"Secure the provision of, or to provide, such light railway and metro infrastructure as may be determined from time to time by the Minister for Transport"* (RPA, 2013). Therefore in the context of this audit they are the asset owners with regard to infrastructure and rolling stock. They have contracts with stakeholders with regards to the operation of the system, namely Transdev, and for maintenance of the system, namely Alstom and Veolia.

#### **1.1.2 Transdev – Railway Undertaking and Infrastructure Management**

Transdev (formerly Veolia Transport, and prior to that, Connex) is a Railway Organisation (as defined by the Railway Safety Act 2005, as amended by S.I. No. 444 of 2013) and operate tram services on the red and green lines. They also manage the infrastructure and rolling stock maintenance contracts on behalf of TII. Transdev are the SMS holder approved by the CRR which explains at a high level how safety on the LUAS is managed. Through the SMS Transdev are ultimately accountable for ensuring safety of the LUAS infrastructure and Rolling Stock. In the context of this report Transdev are responsible for ensuring that the various stakeholders' processes interact effectively.

#### **1.1.3 Alstom**

Alstom are the maintenance contractor for both LUAS infrastructure and light rail vehicles. Alstom are contracted to provide vehicle maintenance to the Citadis 401 fleet out of the Red Cow Depot through Vehicle Maintenance Contract 1 (VMC1), to the Citadis 402 fleet out of the Sandyford Depot through Vehicle Maintenance Contract 2 (VMC2) and the maintenance of the infrastructure of the Luas network (excluding certain structures) through the Infrastructure Maintenance Contract (IMC) with their partner Veolia.

#### 1.1.4 Veolia

Veolia (formerly Dalkia) are in partnership with Alstom IMC for the maintenance of the infrastructure of the network (excluding certain structures).

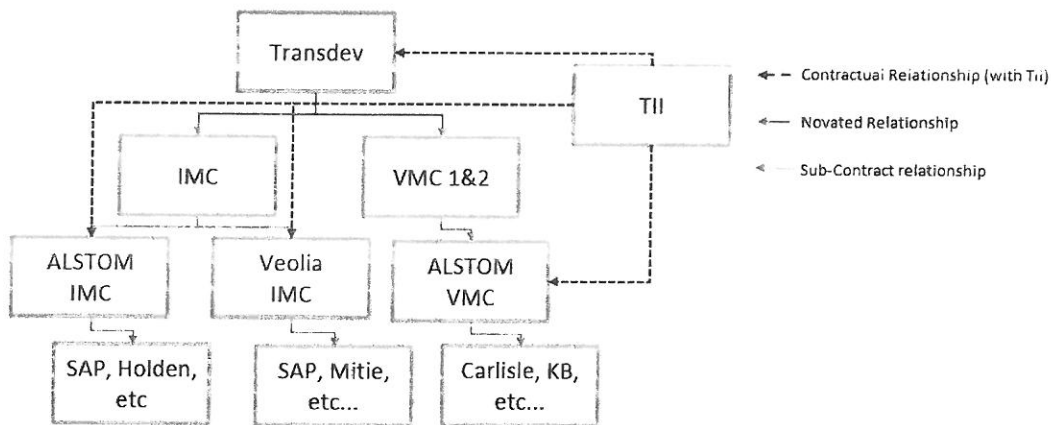


Figure 1 - high level relationship between stakeholders

#### 1.2 Railway Safety Act 2005

The Railway Safety Act 2005 (as amended) ("the Act") requires railway organisations to implement a safety management system and prepare a document ("safety management document") describing the components of this safety management system.

The Act states that a safety management document shall achieve the following two objectives —

- a) "it shall demonstrate that the railway organisation has the ability to properly assess and effectively control risk to the safety of persons and the supply of material and contracting of services in compliance with its general duty under section 36," and
- b) "it shall provide a working document by which the railway organisation and the Commission can ensure that the safety systems described in the safety management document are being properly implemented and continue to be maintained".

The CRR issues a safety management certificate to a railway organisation (other than an infrastructure manager or a railway undertaking), as defined by European Railway Safety Directive 2004/49/EC, once it is satisfied that the safety management document submitted by a railway organisation satisfies the requirements set out by the Act and CRR guidance (RSC-G-028-A).

### **1.3 Audit objectives and scope**

The audit was undertaken to fulfil the following principal objectives, identifying:

- Transdev's compliance with the provisions of its SMS in respect to managing Safety Critical Information;
- the effectiveness, suitability, and sufficiency of the SMS to demonstrate compliance with the CSM in respect of Annex II Criterion O and P;
- the effectiveness, suitability, and sufficiency of the SMS to demonstrate compliance with CRR Guidelines.
- areas for potential improvement to the management system including advising on good practice.

### **1.4 Audit Details**

The audit 'on-site' activity took place between January and February 2017 at various dates and locations. The audit team consisted of two auditors from the CRR, Aidan Langley (Lead Auditor) and at different times Aidan O' Sullivan (Auditor) and Ruth Baldwin (Auditor). The audit schedule of activities is given in O.

### **1.5 Methodology**

#### **1.5.1 The Audit Process**

The audit included:

- 1 A review and examination of Transdev Ireland and Alstom Ireland and their safety management standards as applicable to the scope of this audit, namely, Criterion O and P. References are in Appendix B - Evidence References List of this report).
- 2 Interviews with staff identified by the CRR as relevant to the audit or staff identified in the safety management standards.
- 3 A review of documentation (evidence) seen and/or collected by the auditors. The list of evidence is recorded in Appendix A and, where specific observations refer to evidence, the numbered evidence item is included in the text.

An audit plan was produced by the CRR [Ref B.00.00] and key elements of this were presented to Transdev Ireland and Alstom Ireland personnel in advance of the audit to allow suitable preparation and agreement on the audit schedule.

### **1.6 Criterion O – Arrangements for the provision of sufficient information within the organisation and where appropriate, between organisation operating on the same infrastructure.**

Organisations cannot operate without communication. Communication can take various forms but all forms involve the transfer of information from one party to others.

Communication processes in place within the organisation allow the SMS to function effectively. The exchange of relevant safety information is crucial within and among organisations. It is therefore important that defined reporting channels and interfaces exist, within a structured process, to ensure that knowledge and understanding of the SMS is ensured and all safety relevant information [ref. Element P] is conveyed to or available for the right person/role/function in a prompt and clear way. Internal communication refers to all levels of an organisation, for instance;

- staff involved in SMS design, implementation and delivery,
- staff involved in operational and organisational arrangements and changes,
- operational staff.

External communication refers to safety aspects that may be relevant, but not limited, to other companies operating on the same infrastructure, for example ALSTOM, Transdev and Veolia in their respective roles as maintenance providers. Other parties with whom Transdev may communicate include suppliers, contractors, customers, and other important stakeholders such as neighbours and local authorities.

Information may especially pertain to known hazards that need to be controlled by others. Good two way communication is also essential because it supports the development of a positive safety culture which can have significant positive benefit to a company.

Criterion O is further split as follows:

**O1** – There are procedures to ensure that:

- a) Staff have knowledge and understanding of the safety management system and information is easily accessible; and
- b) Appropriate documentation on the safety management system is given to relevant safety personnel.

**O2** – There are procedures to ensure that:

- a) Key operational information is relevant and valid
- b) Staff are aware of its existence before it is applied
- c) It is available to staff and where required copies are formally given to them.

**O3** – There are arrangements in place for sharing of information between railway companies

### **1.7      Criterion P – Procedures and formats for documenting safety information and designation of a procedure for configuration control of vital safety information.**

Measures to control vital safety information (configuration control) are important to maintain and improve safety performance within an organisation. The availability of correct information enables awareness and allows for corrective actions to be taken promptly and efficiently.

There are several types of information to be managed, with a different degree of criticality for operations, that might include;

- operational urgent information concerning tram movements, such as emergency speed restrictions, third party works adjacent to the tramway
- operational safety information/documentation, such as rules books (TSI), route books, internal standards and procedures
- more general SMS information (feedback of experience, staff involvement, minutes of meetings, etc.).

The explanation, transmission, archiving requirement and processes within a railway organisation may be different for the listed types of information. However, as a general principle, organisations should ensure that key operational information is:

- relevant and valid, -
- accurate, complete and consistent,
- appropriately updated, and
- easy to understand (e.g., in plain English)

**P1** – There are procedures to ensure that all relevant safety information is accurate, complete, consistent, easy to understand, appropriately updated, and duly documented.

**P2** – There are procedures to:

- a) Format, generate, distribute and manage control of changes to all relevant safety documentation
- b) Receive, collect and store all relevant documentation/information on paper or by other registration systems

**P3** – There is a procedure for configuration control of vital safety information

### 1.7.1 Audit Outcomes

Contained within the main body of CRR audit reports, action required (AR) items are identified. In addition, areas where there is 'scope for improvement' are high-lighted. Where possible, they are made specific, measurable, achievable, realistic and time-bound (SMART). Where particular good practice (GP) is noticed, or further consideration of the topic is identified through an audit trail (AT) these are also recorded. The audit outcomes are classified as follows;

**Major Non Compliance (MaNC):** an area of non-compliance with an SMS internal standard, an applicable external standard, or legislation that is evidence of a system failure.

**Minor Non Compliance (miNC):** an area of non-compliance with an SMS internal standard, an applicable external standard, or legislation that is evidence of a sporadic lapse in implementation of a system or deviation from a system.

**Action Required (AR):** an area where potential exists for a non-compliance to occur unless remedial action is taken or improvement is made, an isolated error that requires correction, or some other issue where, in the opinion of the auditor action is necessary.

**Scope for improvement (SFI):** an area highlighted where, in the opinion of the Auditor, system or business improvement can be achieved by the company. Typically this is phrased as a recommendation, the merits and implementation of which should be decided by audited organisation.

**Good Practice (GP):** an area highlighted which, in the opinion of the Auditor, is good practice within the industry.

**Audit Trail (AT):** an area that the auditor feels should have further attention, either by inclusion in the programme for future audits (but not necessarily an external audit item) or by some other means.

The format in which they may be given is shown below.

92/15-A-AR X - Title

Detail as required

PCD: Planned completion date only specified for 'Action Required' items.

Figure 2: Outcome Format

#### 1.7.2 Evidence references

As is common practice when auditing, auditors are expected to seek evidence whenever possible to verify statements made by interviewees, to confirm that an activity has taken place or to demonstrate a procedure/standard exists. This is no different for CRR Inspectors when conducting an audit.

## **2            Audit Findings & Outcomes**

This audit focused on the satisfaction of Transdev's SMS with regards to Elements O and P as provided for in CRR guideline, RSC-G-028-A, which has EU equivalence to that contained in Commission Regulation (EU) No. 1158/2010 and its sub-clauses. The findings are presented under headings précisising the sub-clauses of Criterion O and P and of the CSM for monitoring.

To address the two Criteria question sets were devised focusing in on nine main areas:

- I.     Understanding of the SMS and an individual's role within it.
- II.    Temporary Speed Restrictions and an individual's role relating to them.
- III.   Emergency Speed Restrictions and an individual's role relating to them.
- IV.    Electrical Isolations and an individual's role relating to them.
- V.     Possessions and an individual's role relating to them.
- VI.    How to communicate in an emergency/incident, an individual's responsibility.
- VII.   Tram safety critical defects, and an individual's role relating to them.
- VIII.  Tram Defect concessions and an individual's role relating to them.
- IX.    Issues surrounding the communication, an individual's examples of what has worked well and what has not.

These question sets were tailored to the interviewee, which included both Transdev, Alstom VMC and Alstom IMC staff. Taking each in turn.



**2.1 O1(a) Staff have knowledge and understanding of the Safety Management System and information is easily accessible.**

The Transdev staff, demonstrated that they had a relevant knowledge of the SMS. The Tramway Safety Instruction manual (TSI) is the most pertinent SMS document for the drivers and they demonstrated a good knowledge of the TSI manual and systems operated.

Interviewees were asked if they needed/wanted anything further and all stated that they believed they had been provided with what was necessary for them to undertake their duties. While this is the case, criterion O1(a) requires that staff have knowledge and understanding of the SMS and information is readily accessible.

**02/17-A AT 1 Wider availability of SMS documents**

While the principal SMS document relevant to drivers, (the TSI) is provided to them and appears to be understood, it is not evident that other SMS documents are made readily available to staff. It is suggested that an activity to review Transdev's compliance with O1(a) but specifically targeted.

Examples of the knowledge of the SMS and information included:

**2.1.1 Emergency Speed Restrictions (ESRs)**

For the notification of Emergency Speed Restrictions (ESRs) drivers knew that Transdev CCR will co-ordinate the flow of information, and per TSI Section 6.11 notify the Drivers over the open radio system. Drivers interviewed understood that they would be informed of ESRs over the radio, and of the requirement to respond individually back to the CCR to confirm they have heard the communication and understand it, per Section 6.11 of the TSI. In addition to understanding the process, each of the drivers was able to give an example of an occasion in their experience when it had occurred.

Transdev Drivers also stated that information such as Emergency Speed Restrictions would be passed down from driver-to-driver on crew change, for example as might happen to facilitate a comfort-break or shift change at Sandyford or Red Cow, where the relief driver was taking over mid-way through their shift.

As with TSRs, the removal of an ESR is co-ordinated by Transdev CCR, so that ALSTOM IMC Operations and Transdev drivers are kept informed of events.

Alstom Staff were very familiar with their roles in this scenario, as were Transdev staff, with numerous examples of where it has worked, there was no specific documentation provided on the process, except that provided in the TSI.

**02/17-A-AR 1 Review if Alstom need a process to define their portion of the ESR process.**

The TSI is currently the only method of defining this process, and although all the actors in the process were found to understand their roles, in the event of a change in personnel, how would Transdev, the SMS holder, ensure that the incoming IM staff were familiar with the process?



### 2.1.2 Temporary Speed Restrictions (TSRs)

From a Drivers' perspective the interviewees were able to either direct the Inspector to Section 5.1 of the TSI manual or describe the process effectively. Talking through the 'Reporting for Duty' process, this is where a driver would become aware of a planned Speed Restriction (Temporary Speed Restrictions/TSR), and sign, to record that they have read the notices.

With regards to the control of Temporary Speed Restrictions, the various actors in the process knew that there would be a separate Driver Notice and would typically take place during Engineering Hours with the sign removal and notification to the drivers being co-ordinated by CCR, in liaison with ALSTOM IMC. All the staff questioned from both companies (Transdev and Alstom) were familiar with the processes required to make this work, and no inconsistencies were identified between the staff of either company. This is an instance where Transdev operate in co-operation with ALSTOM staff to an ALSTOM policy [B00.02] so the ALSTOM policy contributes to the Transdev SMS.

Therefore the Inspector concluded that that the Transdev staff were familiar with the appropriate SMS documentation to their job roles (e.g. Drivers with the overall concept of the SMS, and specific knowledge of the TSI the most relevant part of the SMS to them). Similarly the standards co-ordinator had a very good understanding of the SMS, as would be appropriate for that role in the organisation.

The Alstom understanding of the SMS, particularly in the non-management grades was less confident, more senior staff knew it existed and crucially all staff understood their roles related to it, but it was a "Transdev" owned process, there did not seem to be engagement with the SMS process, other than the extent to which it drives procedures which must be followed. Therefore in the Inspectors' opinion this is "an area where potential exists for a non-compliance to occur unless remedial action is taken or improvement is made". As a result an Action Required is generated.

**02/17-A-AR2** Review if a Transdev owned SMS is the most effective way to control and develop Safety on the Luas network.

The Stakeholders should consider if a Transdev Owned SMS is the effective way to implement the process for the whole Luas system. Note the Inspector recognises that a solution may be an alternate model such as a TII owned SMS, or an IM/ECM SMS for Alstom, to go with an RU SMS for Transdev, or if there was a different contractual arrangement an integrated SMS with an integrated Operation and Maintenance Contract may be appropriate.

**Based on the three examples shown above, there was evidence that the requirements for Criterion O1(a) are met.**

### 2.2 O1(b) Appropriate documentation on the safety management system is given to relevant safety personnel

As mentioned in section 2.1, for drivers (the largest group of employees) the most relevant part of the SMS is the Tramway Safety Instruction (TSI) manual. All of the drivers questioned had the latest copy of the TSI and were familiar with the sections. Note that the drivers were selected by who happened to be in per the roster, rather than Transdev selecting the

drivers to be questioned. A previous audit recommendation (40/15-A-AR2) from 2015 had highlighted that drivers did not appear to always have a TSI or the latest version. Transdev have since focused on addressing that and introduced a new rolling programme of competency management, where assessment on different modules takes place on a quarterly basis, rather than the previous method of an assessment every two years.

With regard to Alstom controlled documents (e.g. Temporary Speed Restriction form [B00.03]), controlled documents are managed through the Alstom Document Control System, and accessible to all Alstom staff as required.

**Based on these examples and responses to questions regarding the availability of documentation by interviewees, the Inspector felt that the appropriate documentation is available to relevant safety personnel and Criteria 01(b) is met.**

### **2.3 O2(a) There are procedures to insure that information is relevant and valid**

Two areas were examined to satisfy this criteria. The generation and approval of VMC Concessions and the request and implementation of a Temporary Speed Restriction (TSR).

#### **2.3.1 The generation and approval of a concession.**

A concession is the permission to run a tram in service when it is beyond the stated guideline kilometres since the last maintenance intervention. This is governed by the Defect and Concession Management Process [B00.14]. An example of this might be a Damaged weld on a bogie, (service order 539782224) [B00.08]. Service orders will normally be raised in response to one of two scenarios, an internal defect or request for work identified within Alstom, or from a Tram Event Database (TED) event generated in Operations by Transdev. In each case the Service Order is created in Railsys as a P1 (priority 1) service order as described in 2.7.3. The Service Order is then downgraded, per Figure 3 as appropriate by a competent person. If the tram is needed for service (for availability) and the defect is considered safe to run, a Concession may be requested by Alstom Operations staff, from Alstom Engineering staff. Sharepoint is the web based tool which is used to ensure that this happens in a controlled manner, with traceability of who requested the Concession, and who approved it. In this manner trams may be safely released to be put on the DSS for service in a controlled way, with due Engineering judgement having been used to assess the task. Concessions are reviewed each morning at the 0900 VMC Operations meeting by Engineering and Operations staff, (on the day of the audit interview there were four in place), so that all stakeholders who may be relevant, including Supply Chain staff, understand why the concession was requested, what the impact is, and have an opportunity to see if there is a trend (e.g. is the requirement for a concession caused by parts shortages). The request and implementation of a Temporary Speed Restriction (TSR)

The TSR process is defined by Alstom Process MTN-TGDUB-WMS-004 [B00.02] and during the course of the audit all the main actors in the process from initiator to tram driver were interviewed. The process is bespoke for Dublin Luas operations in the Alstom QMS and includes signature boxes for Transdev on appropriate forms (e.g. MTN-TGDUB-FRM-008) [B00.03]. All respondents knew their part in the process, and were familiar with their roles in it. Previously CRR recommendation 44/14-A-AR3 had highlighted that in some joint processes, roles were not clearly defined, but in this instance both the documentation and

various parties actual knowledge of the process demonstrated good understanding of the steps in the process, with examples of where they have either witnessed or carried out those actions in practice.

**Based on these examples and responses to questions regarding the availability of documentation by interviewees, the Inspector felt that there are procedures to insure that information is relevant and valid and Criteria 02(a) is met.**

**2.4        02(b) Staff are aware key operational information's existence before it is applied.**

Using the two examples from section 2.3 it was also demonstrated to the Inspector's satisfaction that without a concession a tram cannot be placed on the Daily Service Sheet (DSS), this is documented and demonstrated in DSS Compiling incl Management of TED Events [B00.15]. If there is an open Service Order which does not permit the tram to enter service per the Defect and Concessions Matrix [B00.14].

Referring to the TSR request form [B00.03], there are boxes from both Alstom IMC Operations, Alstom Engineering and Transdev Operations that respectively, Request, Authorise and Approve the TSR to be placed. On the same form there is a place for Transdev Operations, to approve the removal and Alstom Operations to sign to declare the TSR removed. Work will not proceed until the appropriate previous step has been completed.

**Based on these examples and responses to questions regarding the availability of documentation by interviewees, the Inspector felt that staff are aware key operational information's existence before it is applied and Criteria 02(b) is met.**

**2.5        02(c) It is available to staff and where required copies are formally given to them.**

As identified in 2.2, the Tramway Safety Instruction manual is formally issued to drivers, on induction, and re-issued when requested or a new issue is issued.

For other job scopes covered by the audit, work instruction MTN-TGDUB-WMS-004 governs the implementation of a Temporary Speed Restriction, though form MTN-TGDUB-FRM-008 and is accessible for Alstom Staff (who are the people who need to use it) through their Prisma document management system.

**Based on the information presented and the responses from interviewees who use the documents, the Inspector felt that the appropriate documentation is formally given to relevant staff and Criteria 01(c) is met.**

**2.6        03 There are arrangements in place for sharing of information between railway companies.**

The example of Temporary and Emergency Speed Restrictions (TSRs and ESRs) demonstrates that where required there are effective processes in place for transfer of safety critical information between the Transdev and Alstom. Note that there had been concerns raised in previous audits (e.g., 14/13-A-AR5). The evidence gathered on this occasion demonstrated to the Inspectors satisfaction that the interface between Transdev

and Alstom is working effectively for the transfer of safety critical information. Additional examples included:

#### **2.6.1 Electrical Isolations and Possessions.**

The process for planned Electrical Isolations (as opposed to Emergency Isolations performed by Dublin Fire Brigade (DFB)), is governed by the Luas Possession Supervision (LPS) training.

This is a robust process where planned isolations are notified from ALSTOM IMC to Transdev 4 months in advance using the ICF (Isolation Control Form). As the isolation is put in place, it is co-ordinated between ALSTOM IMC and Transdev CCR, again per the LPS process (known as the Switching Order Pad). Removal of the Isolation is done per the LPS process, and co-ordinated between ALSTOM IMC and Transdev CCR over a recorded telephone. As Isolations would normally occur during Engineering hours, there is no need to communicate with drivers. Information within ALSTOM IMC e.g. Track and OCS, is handled by a briefing at the start of shift, and during the isolation the LPS is the responsible person at site.

Note that Isolations which happen during tram operation hours, are briefed out to drivers through driver notices displayed at the signing-on points, and signed for. Other safety critical stakeholders (e.g. IMC) are also alerted as required in the run-up to the isolation. These would be much rarer and examples include the re-alignment of the line across the Red Cow Junction, the inclusion of the Delta at Connolly, the tie in of Green Line extension to Brides Glen at Sandyford, and most recently the Luas Cross City (LCC) work to extend the Green Line across the Red Line.

#### **2.6.2 Temporary Speed Restrictions.**

Referring back to section II, form MTN-TGDUB-FRM-008 for Temporary Speed Restriction Request Form, although an Alstom owned document, it has Alstom and Transdev portions to the form, so demonstrating how the two companies have integrated their quality and safety management systems to correspond for planned work with Safety Critical Information.

#### **02/17-A GP1 – Demonstration of continuous improvement**

The Transdev and ALSTOM staff were able to demonstrate specific examples of where the communication had been found to be weak in the past, and had been improved, so demonstrating continuous improvement.

**Based on the information presented and the responses from interviewees who use the documents, the Inspector felt that there are arrangements in place for sharing information between railway companies, and therefore Criteria O3 is met.**

#### **2.7 P1 - There are procedures to ensure that all relevant safety information is accurate, complete, consistent, easy to understand, appropriately updated, and duly documented.**

There are several processes and protocols in place to ensure that relevant safety information meets the requirements of P1. For example:

### **2.7.1 Tram Event Database/Railsys/DSS**

The Tram Event Database (TED) report is issued by the CCR to relevant parties at various times throughout the day. One version of the report informs Alstom VMC of any tram defects that have been reported during to that time during the day. These are then raised as service orders in Alstom's Railsys system, by a Production Planner. At this point the service orders are raised at the highest priority level, until a technically competent member of staff (Shift Leader, Depot Manager, Engineer etc.) is able to classify the defect to ensure it is dealt with in a timely manner.

Information on the trams to be made available for the next 'peak' is provided by Alstom to Transdev through the Daily Service Sheet (DSS) [B00.09]. This is issued twice a day, in the morning and early afternoon, and is put together by the Alstom Production Planner or Shift Leader based on the distance left on each tram until its next service intervention [B00.10], and the defects listed on the tram (i.e. is there a defect which would not meet the Minimum Operating Requirements (MOR), in the event that the tram has a defect it may be acceptable to run if a concession is in place [B00.08]). Again this is validated by someone technically competent to do so before it is issued to Transdev, who assign drivers to trams based on this information.

### **2.7.2 Emergency Communication between CCR and Trams**

In non-degraded mode situations, communication would normally be over the open channel radio system. Drivers and CCR staff interviewed were familiar with Section 2.2 of the TSI "Communications to and from CCR".

Reference was made to a previous audit outcome 51/13-A-AR-4, and to the suitability of the tram radio system, and how drivers deal with 'black spots' where radio coverage may be limited.

All the drivers knew the protocol, that in the event of an incident where there was radio failure, the next option was to use a platform Emergency Help Point (EHP) to contact CCR, and failing this, in extremes, that the use of personal mobile phone was acceptable if the tram was stationary. This is what is proscribed in Section 2.2 of the TSI.

The drivers, interviewed as part of this audit, were aware that as an open radio system, sometimes chatter can cause messages to be talked over, particularly in non-standard situations. They were all able to advise the Inspector of the protocol in Section 2.2, that irrespective of who initiates a call, CCR will always finish it, and if a call is not acknowledged, it must be repeated.

Previously there was an "Emergency Message" which drivers were supposed to be able to recite in the case of an incident. This was identified in CRR outcome 40/15-A-AR6. In fact practice is that CCR (who have prompt sheets on the desk for various scenarios) are better placed to ensure that all the relevant information is requested, and recorded in TED. As a backup all voice transmissions both telephone and radio from the CCR are recorded.

Examples were given by drivers of where Gardaí and emergency services had responded effectively to incidents such as instances of anti-social behaviour on-board a tram, or how to deal with signal failure (where, typically, rules of the road apply), or where the portable



radio has got low on charge and a fresh radio is provided the next time the tram passes Sandyford or Red Cow.

None of the drivers felt there was a significant issue with communication with the CCR.

### 2.7.3 Vehicle Safety Critical Defects

Safety Critical Defects would primarily be identified during maintenance where the main stakeholders in this process are ALSTOM VMC, or in the case of issues identified on the mainline (e.g. at RTCs) Transdev Drivers and CCR.

All defects identified during a tram exam are raised as Priority 1 (P1) the highest priority, by the Production Controller, which prevents the tram being placed in service, until they are reviewed and downgraded, if this is considered acceptable, by a competent person.

The downgrading of known/routine defects is governed by a defect matrix, which guides the categorisation. If there were any concern over a defect, the Engineering team will be informed and included in the process. The same process was described by the Production Planner, Depot Manager and Engineering staff, the only caveat was that sometimes when downgrading a defect, staff err too much on the side of caution, for example dropping the defect from a P1 to a P2 when it could have been made a P3.

| Category | Action   |
|----------|--|
| P1       | To be addressed before the tram enters service   |
| P2       | May enter service with an Engineering Concession (for a set time), after that time reverts to a P1 |
| P3       | Defect to be addressed on next Exam  |
| P4       | Defect Open, to be addressed at next major intervention  |

Figure 3 - Service Order Categories

#### 02/17-A GP2 – Preoccupation with Failure, deference to expertise.

The default assumption is that a defect is a P1, and therefore will need to be rectified before the tram re-enters service. It is only downgraded once the defect has been categorised with a lower priority, and only by a competent person. Defects are automatically generated from TED. Therefore for any event identified out on the line, which is vehicle related, will either be fixed or have been vetted by a competent person, before the tram runs in revenue service again.

ALSTOM staff were noted to err on the side of caution when it came to categorising and reviewing / changing the categorisation of identified defects. This is a positive trait evident in high reliability organisations and should be encouraged. Similarly, deferring to the Engineering Team should concerns be had over any defect/issue is cited as good practice. The Inspectors were advised that the Defect Matrix was being revised at present to include an expanded list, as if a defect was not on the Defect Matrix, it automatically stays a P1 until the Engineering Team can be consulted.

The Production Planner and Depot Manager interviewed were able, from memory, to provide accurate information on the current number of outstanding defects, and safety

critical defects, which was subsequently confirmed by checking the IT system (SAP). This affirmed that the system is being used as part of daily business.

**02/17-A GP3– Demonstration of the system in use**

The Production Planner and Depot Manager were both able to demonstrate the use of the system, not only were they able to describe the system, but by being able to recall from memory the approximate numbers of defects and concessions

Relating to how “long-term-stoppers” are prevented from being placed in service, they have a P1 service order placed against them, and so can’t be assigned a route on the DSS (Daily Service Sheet). This will only be lifted once a ‘super-exam’ has been completed.

Tram maintenance is carried out on a kilometre based regime. The maintenance ‘star chart’ is based on trams running 60,000 km per year. Components with a time-based dimension to their maintenance are scheduled based on the 60,000 km per year assumption. The spread of tram kilometres across the fleet is now significant. Maintenance cannot be done late, so some maintenance exams are inevitably done significantly early to allow for capacity constraints and other operational reasons. Consideration of the maintenance required for these trams is by exception.

**02/17-A-SFI 1 - Return to service process for ‘long term stoppers’.**

Alstom might wish to consider developing a documented procedure for determining the return to service requirements for trams which have been out of service for an extended (>4 week) period of time.

**02/17-A-SFI 2 - Maintenance of low mileage trams**

Alstom might wish to consider developing a list of components which although given a distance based maintenance interval, should be checked, if a tram is out of service for an extended period, e.g. rubber components, or components with installed batteries.

**2.7.4 Temporary Speed Restriction Request Process.**

All relevant staff (from Alstom initiator, to Transdev drivers) were familiar with the process for issuing a Temporary Speed Restriction (TSR), and how it was requested, the form [B00.03] used, and approved.

Based on the three examples shown above, there was good evidence that the requirements for Criterion P1 are met.

**2.8 P2 – There are procedures to:**

- a) Format, generate, distribute and manage control of changes to all relevant safety documentation
- b) Receive, collect and store all relevant documentation/information on paper or by other registration systems.

With regard to criterion P2-a, there are numerous ways in which information is formatted, distributed and managed in the safety documentation.

**2.8.1 Tramway Safety Instruction.**

Referring to the primary SMS document for drivers (as the largest cohort), the TSI is re-distributed to drivers as and when requested by drivers, and whenever a new issue is released, for example the current version is Revision 3, with a new one due for circulation/distribution following the opening of the Luas Cross City (LCC) line.

**2.8.2 Line Possession Supervisor.**

Processes such as the Luas Possessions Supervisor (LPS) process, are provided by training to internal staff and third parties, the card issued on completion has a time limited validity, so any changes will be caught at the next training cycled. In the inspector's opinion this is adequate for a stable process like this.

**2.8.3 Temporary Speed Restriction Request Form (MTN-TGDUB-FRM-008)**

As discussed in I, this form is an Alstom controlled document, and like other IMC documents used for transferring information between Alstom and Transdev, as the name implies. It is controlled through the Prisma document control system, and is currently at Revision 003, issued on 23/8/16.

**Citing the three examples above the Inspector was satisfied that P2-a is met.**

With regards to P2-b, an example of the Tram Event Database is the primary method of recording information generated by the operation of the tram:

**2.8.4 Tram Event Database**

The primary method of collection of live operational data is through the CCR TED (Tram Event Database) [B00.12 and B00.13] record system. This is updated throughout the day by CCR traffic supervisors to record any events relevant to the tramway. It is a searchable database from the start of operation on the Luas. It logs significant events, such as Road Traffic Collisions, with the driver details, time, date, place, number of injuries (if any) and any other pertinent information. It also records incidental information, such as activation of the SOS communications from tramstops by members of the public, and defects noted with the infrastructure and vehicles. As such it is an ongoing record of anything which in the future may be considered relevant to the Luas operations.

**On the basis of the examples above, in the Inspector's opinion there was good evidence that the Criteria of P2 are met.**

**2.9 P3 – There is a procedure for configuration control of vital safety information.**

There were multiple examples of safety critical information and it's



### **2.9.1 Tram Event Database**

The primary record that Transdev have for day-to-day operations is the TED database [B00.12]. It is updated with any relevant information coming to the CCR during operations. As a database there are a number of fields, which over time have been modified, but the fields are required to be filled in to avoid information being missed. The nature of the database is that there is a "free text" field for describing the other relevant detail of the incident.

### **2.9.2 Passdown at Incidents**

Alstom IMC staff were generally satisfied with the effectiveness of communication. A possible area of concern was if an incident has happened, and occurs over a shift change, the communication may be flawed, no specific example was mentioned. It was stated that a defined method of passing down information either at the depot or at the incident scene would make for clearer lines of communication.

**02/17-A-SFI 3** – Alstom may wish to consider developing a process for 'incident passdown', from shift to shift, either at an incident scene, or at the depot, for when an unplanned incident has occurred.

### **2.9.3 Tram Defect Concessions**

ALSTOM VMC staff were asked about the concessions process for allowing trams to operate. It was advised that a Defect and Concession Matrix is operational and staff refer to this routinely. Sharepoint, a web-based platform that integrates with Microsoft Office and is primarily used as a document management and storage system, has been configured in such a way that the Engineering Team receive an automatically generated email when a concession is sought. They can then use the email to approve/decline the concession, which is traceable, and auditable.

VMC concessions are reviewed at the morning meeting [see B00.08]. The VMC system was developed from an existing tool. All the ALSTOM stakeholders asked were familiar with how it worked, and could demonstrate examples of concessions.

**02/17-A-SFI 4** – Alstom might wish to consider developing a Concession Management system similar to the VMC for IMC.

**Based on the information presented and the responses from interviewees who use the documents, the Inspector felt that there is some scope for improvement on configuration control of vital safety information but there are no non-conformities in how Criteria P3 is met.**

### **3 Conclusions & Next Steps**

The CRR's audit of Transdev was performed in accordance with the plan [Ref: B.00.00]. The level of co-operation and openness of the staff involved allowed the Inspectors to address effectively the objectives of the audit.

The audit of Transdev and ALSTOM demonstrates that, in the main, systems are in place and are followed. Continuous improvement and use of the systems developed was evident as has been noted in the Good Practices.

#### **3.1 Findings**

A summary of findings from the audit is as follows

- 0 Major Non Compliance
- 0 minor Non Compliances
- 2 Action Required
- 4 Scope for Improvements
- 3 Good Practice
- 1 Audit Trails

#### **3.2 Next steps**

As no Non-Compliances were found, the follow up will be on the Actions Required, Scope for Improvements and Good Practices through the normal quarterly Safety Review Meetings with the relevant Railway Organisations.

#### 4 Summary of Findings

##### 4.1 Major Non Compliance

None raised.

##### 4.2 minor Non Compliance

None raised.

##### 4.3 Action Required

| Number       | Area  |
|--------------|---|
| 02-17-A-AR 1 | <p>Review if Alstom need a process to define their portion of the ESR process.</p> <p>PCD: 3 months</p>   |
| 02-17-A-AR 2 | <p>Review if a Transdev owned SMS is the most effective way to control and develop Safety on the Luas network.</p> <p>The Stakeholders should consider if a Transdev Owned SMS is the effective way to implement the process for the whole Luas system. Note the Inspector recognises that a solution may be an alternate model such as a TII owned SMS, or an IM/ECM SMS for Alstom, to go with an RU SMS for Transdev, or if there was a different contractual arrangement an integrated SMS with an integrated Operation and Maintenance Contract may be appropriate.</p> <p>PCD: 6 months</p> |

##### 4.4 Scope for Improvement

| Number        | Area   |
|---------------|--|
| 02-17-A-Sfl 1 | <p><b>Return to service process for 'long term stoppers'</b></p> <p>Alstom might wish to consider developing a documented procedure for determining the return to service requirements for trams which have been out of service for an extended (&gt;4 week) period of time.</p>                                       |
| 02-17-A-Sfl 2 | <p><b>Maintenance of low mileage trams</b></p> <p>Alstom might wish to consider developing a list of components which although given a distance based maintenance interval, should be checked, if a tram is out of service for an extended period, e.g. rubber components, or components with installed batteries.</p> |

|                      |   |
|----------------------|---|
| <b>02-17-A-Sfl 3</b> | Alstom may wish to consider developing a process for 'incident passdown', from shift to shift, either at an incident scene, or at the depot, for when an unplanned incident has occurred. |
| <b>02-17-A-Sfl 4</b> | Alstom might wish to consider developing a Concession Management system similar to the VMC for IMC.   |

Table 1: Scope for Improvement Items

#### 4.5 Good Practice

| Number             | Area   |
|--------------------|--|
| <b>02-17-A-GP1</b> | The Transdev and ALSTOM staff were able to demonstrate some examples of where the TSR system had been found to be weak in the past, and had been improved, so demonstrating continuous improvement                                       |
| <b>02-17-A-GP2</b> | Preoccupation with Failure, deference to expertise   |
| <b>02-17-A-GP3</b> | The Production Planner and Depot Manager were both able to demonstrate the use of the system, not only were they able to describe the system, but by being able to recall from memory the approximate numbers of defects and concessions |

Table 2: Good Practice areas

#### 4.6 Audit Trail

| Number             | Area   |
|--------------------|--|
| <b>02-17-A-AT1</b> | Wider availability of SMS documents<br>While the principal SMS document relevant to drivers, (the TSI) is provided to them and appears to be understood, it is not evident that other SMS documents are made readily available to staff. It is suggested that an activity to review Transdev's compliance with O1(a) but specifically targeted |

Table 3: Audit Trail areas

## *FINAL AUDIT SCHEDULE*

---

| Date       | Audittee | Role/Position             |
|------------|----------|---------------------------|
| 03/02/2017 |          | Transdev Staff Interviews |
| 10/02/2017 |          | Alstom Staff Interviews   |

Table 4: Audit Interview Schedule

| Date       | Time        | Name      | Audit activity  |
|------------|-------------|-----------|-----------------|
| 20/01/2017 | 14.30-15.30 | Attendees | Opening Meeting |
| 10/02/2017 | 14.00-15.00 | Attendees | Closing Meeting |

Table 5: Audit activity

## *Appendix A*      *EVIDENCE REFERENCES LIST*

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Through the course of this audit several individuals had a semi-structured interview. Each one of these has been assigned a unique number. For example the CME Safety Manager (SM) might be number 3. Thus evidence supplied by the CME SM would be numbered B.03.01, B.03.02 etc. with each individual piece of evidence having its own unique number.

The following is a list of all items of evidence supplied to the CRR Inspectors during the course of this audit.

- B00.00 CRR Audit Plan
- B00.01 RU-SMS-011 Auditing the SMS
- B00.02 MTN-TGDUB-WMS-004 Raising a Temporary Speed Restriction
- B00.03 MTN-TGDUB-FRM-008 Temporary Speed Restriction Request Form
- B00.04 TTI LUAS SM 014 Traffic Supervisor Training Coaching and Briefing
- B00.05 TB15-093 Driver Signing on Points & SN10 memo to CRR 24 July 2015
- B00.06 TTI LUAS SM 005 ISS4 Competency Assessment for Drivers
- B00.07 Traffic Supervisor Briefing #TS 106
- B00.08 Screenshot of VMC Concessions Board 10/02/17
- B00.09 Screenshot of VMC DSS (Daily Service Sheet) 10/02/17
- B00.10 Screenshot of VMC Exam remaining km by Tram 10/02/17
- B00.11 Tramway Safety Instruction (Drivers') Manual
- B00.12 Tram Event Database (TED) report from 26/3/17
- B00.13 Tram Event Database (TED) report from 29/4/17
- B00.14 MTN-IE-WMS-002 Defect and Concession Management
- B00.15 MTN-IE-WMS-005 DSS Compiling Process Incl Management of TED Events.



AN COMISIUN UM RIALAIL IARNRÓID  
COMMISSION FOR RAILWAY REGULATION

## Report of Inspection – Passenger Loading

| Supervision Activity Number | Station Name        | Platform No./s | Date     | Time | Personnel present   |
|-----------------------------|---------------------|----------------|----------|------|---------------------|
| 29/27-1                     | The Point Luas Stop |                | 24/05/17 | 2230 | Aidan Langley (CRR) |

| Comments Section |  |  |                               |  |  |
|------------------|--|--|-------------------------------|--|--|
| Item             | Comment  | Action Required  | Railway Organisation Response |  |  |
| 1                | Following the Prof Brian Cox lecture at the 3 Arena an inspections was carried out of the tram loading operation at the 3 platforms of the The Point tram stop (Figure 1). The 3 Arena is to the South East of the image.<br>Note that on the way into the venue there had been increase security (bag searches) following the Manchester Arena incident the previous Sunday night, it was not clear that there was any additional security exiting the venue.<br>There was a crowd of around 6800 at the venue, an almost full house for the all-seater layout. |  |                               |  |  |
| 2                | As the event ended all three platforms had trams in situ waiting for loading. Temporary Barriers (see Figure 2 and Figure 3) were laid out in an orderly manner, and there were sufficient staff, including staff at the ticket machines to assist with purchase of tickets.   |  |                               |  |  |
| 3                | There is a known area of concern (marked yellow in Figure 1) where trams departing the northern two platforms are travelling against the direction of traffic of taxis. In this case there did not appear to be anyone or anything controlling the taxi movements, and the tram drivers had to sound their horn to move taxis out of the way (Figure 5). The normal situation may have been exacerbated by construction work immediately west of the Gibson hotel, and north of the tram line, causing the footpath to be closed (Figure 4).                     | Is there any plan to re-align taxi routes, or enforce better control of the taxis/3 <sup>rd</sup> Party drivers. |                               |  |  |
| 4                | Regarding the physical boarding of trams, there were staff at the first 3/4 "Event end" doors of each tram. The purpose of these staff was to assist PRM passenger and advise other passengers to board further down the length of the tram, in this way the trams were more evenly loaded.  |  |                               |  |  |
|                  | Overall there were sufficient platform staff available to answer any questions by people unfamiliar with the operation (and given the demographic, it probably was not a typical "concert" crowd.  |  |                               |  |  |



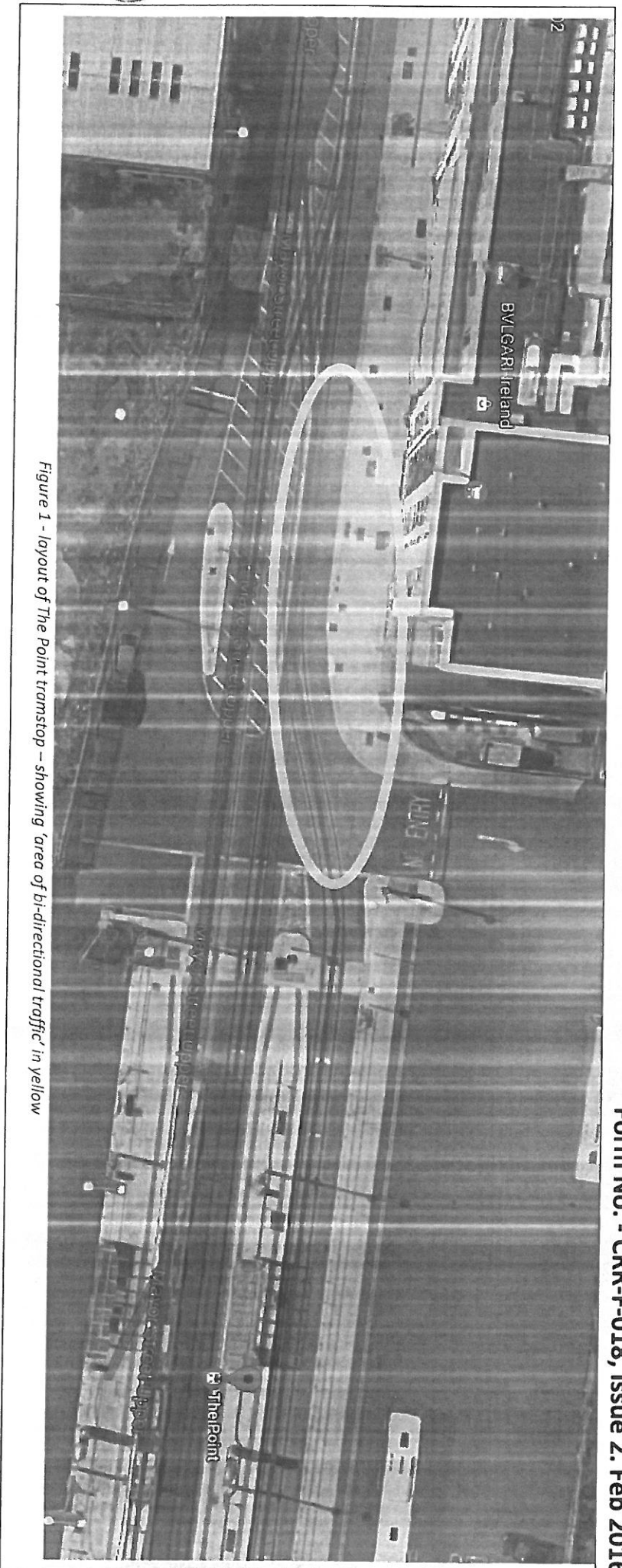


Figure 1 - layout of The Point transtop - showing 'area of bi-directional traffic' in yellow



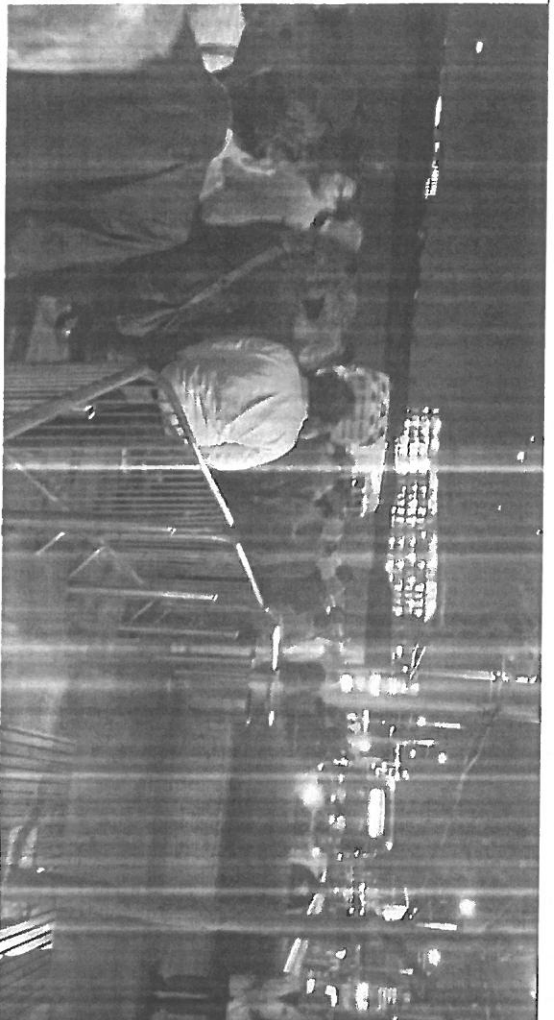


Figure 2 – barriers and staff funnelled the passengers onto the platforms in a controlled manner

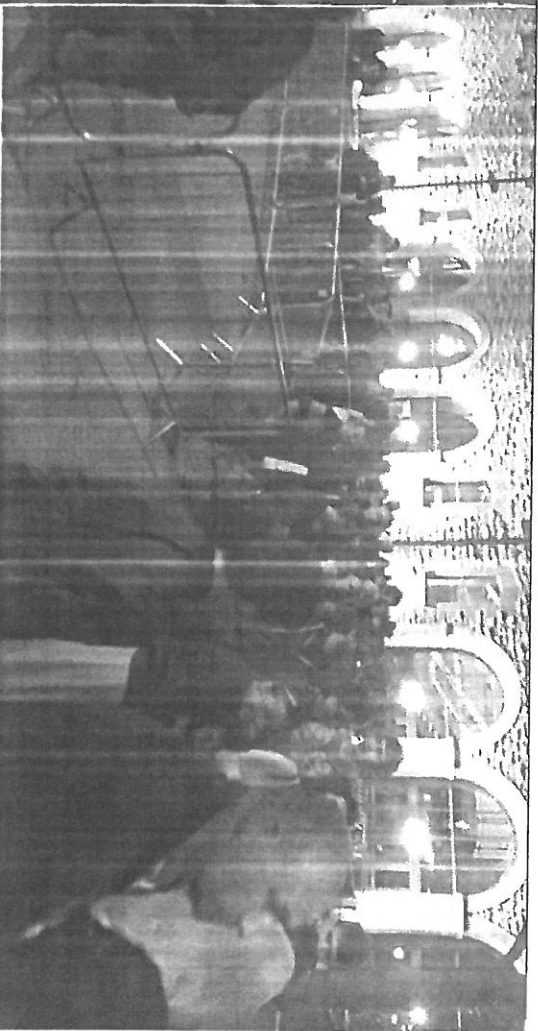


Figure 3 - the queue moved at a reasonable rate. Several thousand passengers were embarked within 15 minutes.

(17)

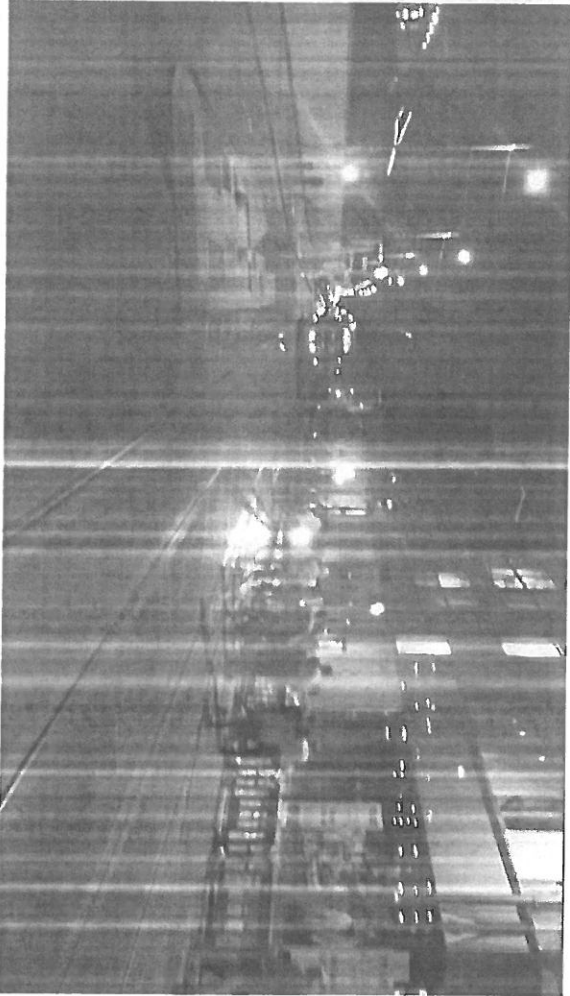


Figure 4 - ongoing construction work adjacent to line.



Figure 5 - area of bi-directional traffic

**CRR**AN COMISIÚN UM RIALAILL IARNRÓID  
COMMISSION FOR RAILWAY REGULATION**Report of Inspection – Trackwalk**

| Supervision Activity Number | Section Walked       | Date       | Time           | Personnel present  |
|-----------------------------|----------------------|------------|----------------|--|
| 115/16-1                    | Heuston to The Point | 07/10/2016 | 08:30 – 11.:30 | Caoimhe Boland (CRR),<br>additional representatives from Alstom VMC, IMC and Mitte |

| Item No. | Comment / Observation  | Action Required            | Railway Organisation Response |
|----------|--|----------------------------|-------------------------------|
| 1        | General<br>Overall the track and stops were in good condition. Issues noted by staff during trackwalk were noted or actioned during the walk.  | N/A                        |                               |
| 2        | It was noted that a new bollard/lane marker is being trialled on Mary's Abbey before the junction with Capel Street. See Photo 1.<br><br>Yellow box in bound of Heuston stop before Sean Heuston Bridge is faded. See Photo 2.   | Transdev to action         |                               |
| 3        | Bridge Strike Notification Signs - George's Dock and Spencer Dock<br>Phone number (01 461 4810) on signs does not connect through to CCR, this has been raised by the CRR/RSC previously. Informed that the number was intended to be forwarded through to CCR as a means of keeping the CCR number out of the public domain.<br>See Photo 3.<br><i>Previously raised by the CRR in June 2015.</i> | Transdev and TII to action |                               |
| 4        | SOS Points<br>Majority of points had an SOS sticker present. However most did not indicate the channel for hearing aid users, see example in use at Abbey Street Stop in Photo 4.<br><i>Previously raised by CRR in October 2014.</i>  | TII and Transdev to review |                               |
| 5        | Pedestrian Crossing Paths<br>It is noted that some stops have pedestrian crossing paths/routes identified by a change in colour or paving. Should this be consistent throughout the network? See Photos 5 & 6 for examples.  | TII and Transdev to review |                               |

|            |                |                               |  |
|------------|----------------|-------------------------------|--|
| Print Name | Caoimhe Boland | Signed<br>(Digital Signature) |  |
|------------|----------------|-------------------------------|--|

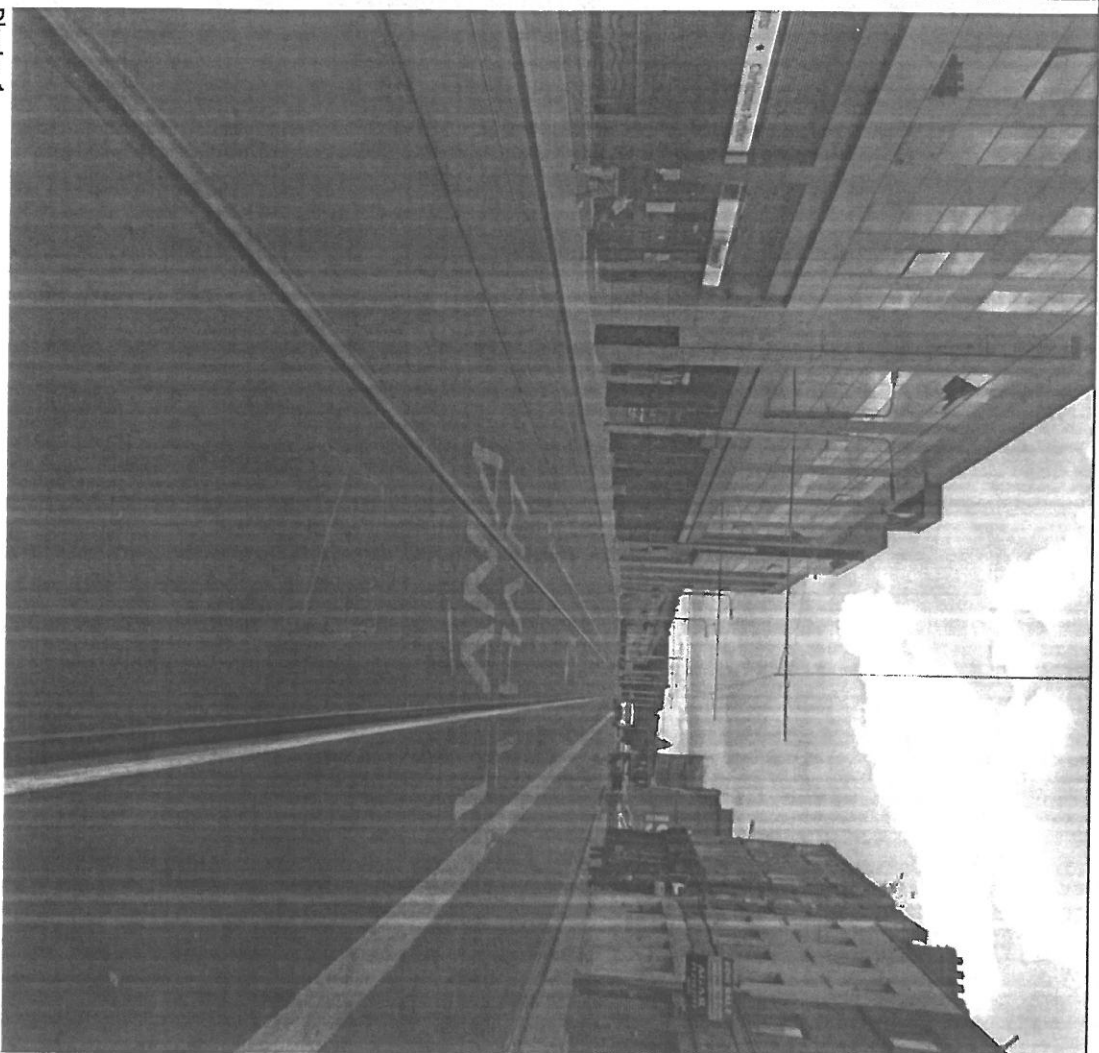


Photo 1

(10)

(18)

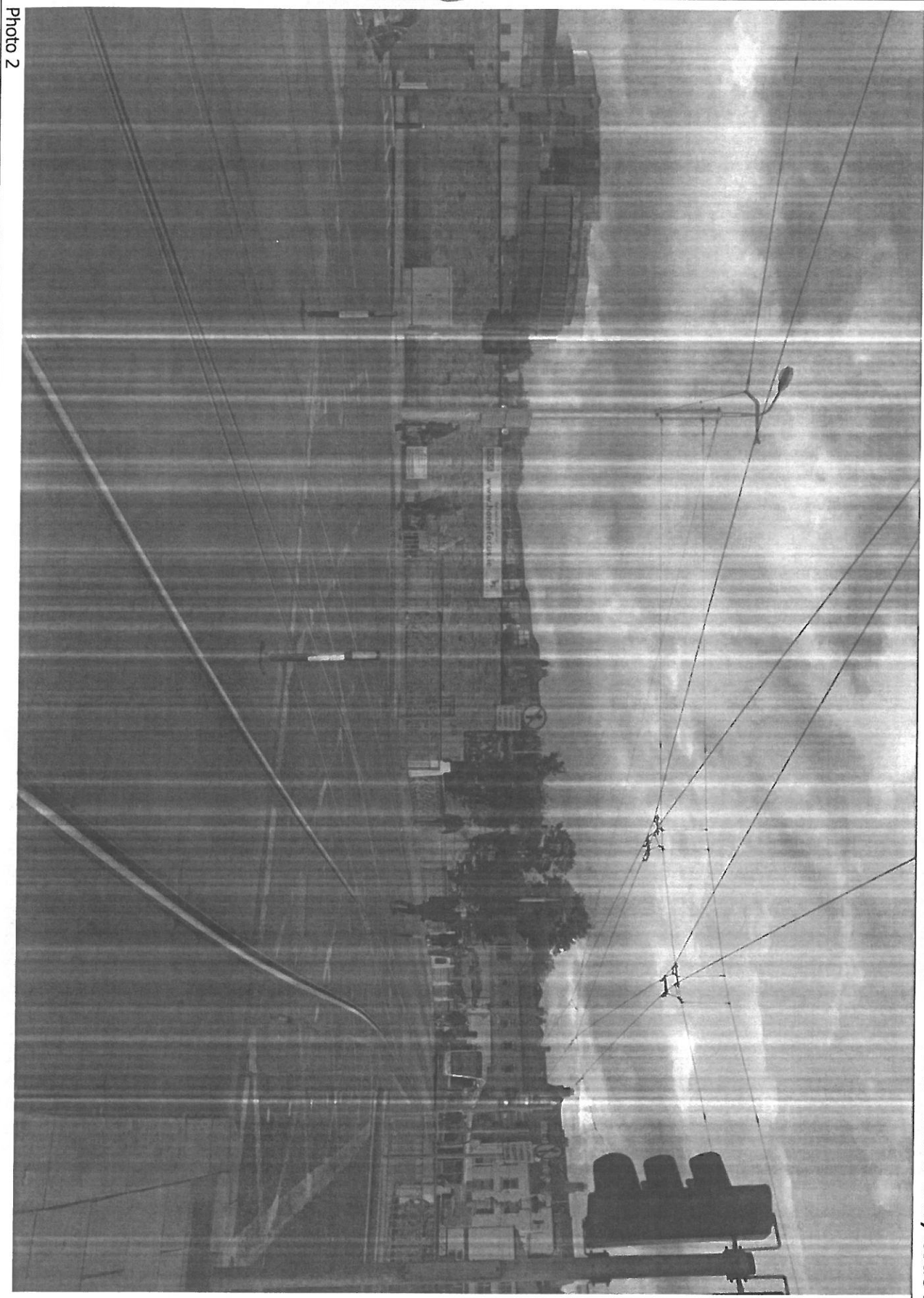


Photo 2



(18)



Photo 3



Photo 4

(18)



Photo 5

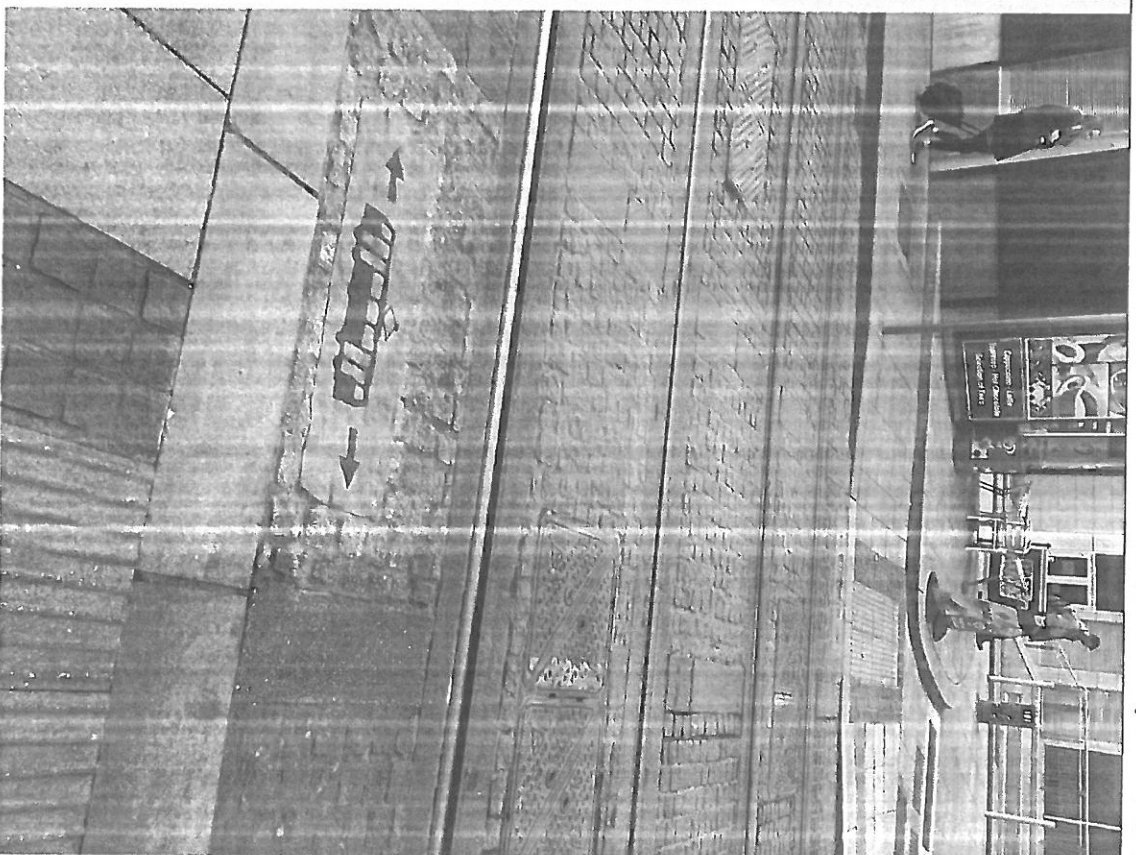


Photo 6

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**From:** Ruth Baldwin  
**Sent:** Friday 8 September 2017 14:59  
**To:**  
**Cc:** Mary Molloy; Peter Lunden-Welden; Morley Reddy; Browne Ciarán  
**Subject:** Letter of Acceptance 170908.Transdev146NWA-T03.LoA  
**Attachments:** 170908.Transdev146NWA-T03 LoA - LCC TTR.pdf

Following the CRR's review of the submissions made by Transdev on the 1<sup>st</sup> of September and on the 7<sup>th</sup> of September, the CRR issue the attached Letter of Acceptance (Reference: 170908.Transdev146NWA-T03.LoA) for the Testing and Trial Running of the Luas Cross City infrastructure.

Please note the condition contained therein.

Kind regards,  
Ruth Baldwin CEng MIEI  
Inspector

Commission for Railway Regulation,  
Temple House,  
57 Temple Road,  
Blackrock,  
Co. Dublin,  
A94 Y5W5

Tel: +353 1 454 4545  
Fax: +353 1 454 4545  
Email: [info@crr.ie](mailto:info@crr.ie)

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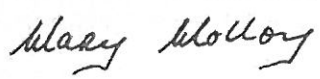
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Thank You.




(19)

**New Works Assessment  
Letter of Acceptance  
170908.Transdev146NWA-T03**

|                                     |  |                    |                     |
|-------------------------------------|--|--------------------|---------------------|
| <b>Acceptance Type</b>              | Stage 4 – Testing  | <b>Expiry Date</b> | Stage 6 - Operation |
| <b>Name of Railway Organisation</b> | Transdev Dublin Light Rail Limited, LUAS Depot, Red Cow Roundabout, Clondalkin, Dublin 22  |                    |                     |
| <b>Type of Infrastructure</b>       | Luas Cross City ("LCC") – Luas extension BxD as described in Safety Plan Luas Cross City Authorisation for Placing in Service (APIS) stage 4 Rev 1.  |                    |                     |
| <b>Context</b>                      | Transdev Dublin Light Rail Limited ("Transdev"), applicant for Authorisation to Place in Service (APIS), are seeking authority to conduct Testing and Trial Running ("TTR") of the Luas Cross City (BxD) infrastructure in order to validate the operation of that infrastructure.   |                    |                     |
| <b>Basis of Acceptance</b>          | <p>This Letter of Acceptance is issued in accordance with:</p> <ul style="list-style-type: none"> <li>• Section 42 of the Railway Safety Act 2005,</li> <li>• Guidelines developed and published by the CRR under section 39 of the Railway Safety Act 2005. In particular; <ul style="list-style-type: none"> <li>1. RSC-G-032-A, "Guideline for the Process of Authorisation for Placing in Service (APS) of Light Railway Subsystems", and</li> <li>2. RSC-G-033-B, "Guideline providing List of Parameters and Requirements for Authorisation for Placing in Service (APS) Light Rail Infrastructure, Energy and Command-Control Subsystems".</li> </ul> </li> </ul> <p>The Acceptance of the CRR is based on the following submissions from Transdev:</p> <ol style="list-style-type: none"> <li>1. Email correspondence from Transdev to The CRR on 01/09/2017 containing the following documents: <ol style="list-style-type: none"> <li>i. Safety Plan Luas Cross City, Authorisation for Placing in Service (APIS) stage 4, Rev 1, and</li> <li>ii. Risk Evaluation RA103 Luas Cross City Test and Trial Running, Rev 1;</li> </ol> </li> <li>2. Email correspondence from Transdev to The CRR on 07/09/2017 containing the following documents: <ol style="list-style-type: none"> <li>i. LCC Infrastructure Handover Letter from TII to Transdev confirming that the Luas Cross City infrastructure has been designed, constructed, tested and commissioned so that it is safe and ready for the commencement of Transdev's testing and trial running,</li> <li>ii. Operation of Broombridge Depot V2 (to be validated during TTR),</li> <li>iii. Procedure for the use of SSG (St Stephen's Green) North siding (to be validated during TTR),</li> <li>iv. Procedure for Operating the Dominick Street Emergency Crossover, 07/09/2017 (to be validated during TTR)</li> <li>v. Tram transfer procedure using engineering links at O'Connell and Marlborough V2 (to be validated during TTR),</li> <li>vi. TII Stage 3 Route Hazard Log 06/09/2017 - Residual Risks Transdev</li> <li>vii. TDLR Luas RA 103 Iss1 LCC TTR – Appendix 1 Iss1</li> <li>viii. TII Stage 3 Route Hazard Log 06/09/2017 – Residual Risks Non Transdev</li> </ol> </li> </ol> |                    |                     |
| <b>Conditions</b>                   | The operational speed of trams must not exceed 10 km/h on O'Connell Street through the GPO Plaza, north of O'Connell stop.   |                    |                     |
| <b>Prepared by</b>                  | Mary Molloy, Principal Inspector   |                    |                     |
| <b>Signature</b>                    |   | <b>Date</b>        | 8 Sept 2017         |



**New Works Assessment  
Letter of Acceptance  
170908.Transdev146NWA-T03**

|                      |   |             |                |
|----------------------|---|-------------|----------------|
| <b>Authorised by</b> | <b>Ruth Baldwin, Inspector</b>  |             |                |
| <b>Signature</b>     |  | <b>Date</b> | 8th Sept. 2017 |

**New Works Assessment  
Letter of Acceptance  
170908.Transdev146NWA-T03**

**Annex – List of Letters of Acceptance**

| Letter of Acceptance Ref. | Issued Date | Expiry Date                         | Purpose   |
|---------------------------|-------------|-------------------------------------|---|
| 150106.RPA146NWA-D01      | 06/01/2015  | None                                | Luas network extension LCC (BxD):<br>Fassaugh Road Overbridge Stage 2 & 3 –<br>Detailed Design  |
| 150216.RPA146NWA-C01      | 16/02/2015  | Detailed Design                     | Luas network extension LCC (BxD):<br>Stage 1 - Concept  |
| 160701.TII146NWA-S01      | 01/07/2016  | N/A                                 | Luas network extension LCC (BxD):<br>Luas Red Line operation following the<br>construction of new infrastructure at the<br>crossing point of the existing Luas Red Line<br>and the Luas Cross City Project (extension of<br>the Luas Green Line). |
| 170531.TII146NWA-D02      | 31/05/2017  | Stage 4 –<br>P1 P2 P3 P4            | Luas network extension LCC (BxD):<br>Detailed Design in compliance with<br>Parameters 1, 2, 3 and 4 of the Annex to<br>RSC-G-032-B.   |
| 170531.TII146NWA-D03      | 31/05/2017  | Stage 4 –<br>P5 P6                  | Luas network extension LCC (BxD):<br>Detailed Design in compliance with<br>Parameters 5 and 6 of the Annex to RSC-G-<br>032-B.  |
| 170607.TII146NWA-D04      | 07/06/2017  | Stage 4 – P12<br>P14 P15 P16<br>P20 | Luas network extension LCC (BxD):<br>Detailed Design in compliance with<br>Parameters 12, 14, 15, 16 and 20 of the<br>Annex to RSC-G-032-B  |
| 170615.TII146NWA-S02      | 15/06/2017  | N/A                                 | Luas network extension LCC (BxD):<br>Luas Red Line operation following the works<br>required for Luas Cross City to the OCS at<br>Abbey Street.   |
| 170616.TII146NWA-T01      | 16/06/2017  | 30/06/2017                          | Luas network extension LCC (BxD):<br>Gauge run and dynamic testing excluding<br>signalling system.  |
| 170707.TII146NWA-D05      | 07/07/2017  | Testing                             | Luas network extension LCC (BxD):<br>Detailed Design in compliance with<br>Parameters 11, 13, 17, 18 and 19 of the<br>Annex to RSC-G-032-B.   |
| 170710.TII146NWA-T02      | 10/07/2017  | 20/09/2017                          | Luas network extension LCC (BxD):<br>Testing of systems including AVLS, LSS and<br>DCS.   |

**From:** Ruth Baldwin  
**Sent:** Friday 17 November 2017 16:50  
**To:** [redacted]  
**Cc:** Mary Molloy  
**Subject:** APIS Submission for Luas Cross City

In preparation for Transdev's upcoming submission to the CRR for APIS of Luas Cross City, please note the following:

1. Hazard Records / Hazard Logs will have to be updated, particularly where there are safety requirements that Transdev need to put in place.
2. The Safety Plan and ASPSC will need to detail how outstanding issues will be closed.

While the TSI may not be updated in advance of the 9<sup>th</sup> of December, Transdev must demonstrate how outstanding issues (originating from, inter alia, Hazard Records and Safety and Compliance Matrices) will be managed and communicated to staff.

Should you have any queries, please do not hesitate to contact me.

Kind regards,  
**Ruth Baldwin CEng MIEI**  
Inspector

Commission for Railway Regulation,  
Temple House,  
57 Temple Road,  
Blackrock,  
Co. Dublin,  
A94 Y5W5

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**Thank You.**

**From:** Ruth Baldwin  
**Sent:** Tuesday 5 December 2017 15:41  
**To:**  
**Cc:** Mary Molloy; Caoimhe Boland  
**Subject:** FW: Luas CC Stage 5 APIS

Please see email below from Richard.

Kind regards,

Ruth

**From:** Richard Popplestone  
**Sent:** Tuesday 5 December 2017 12:27  
**To:** Ruth Baldwin  
**Cc:** Jennifer Dowson  
**Subject:** Luas CC Stage 5 APIS

Ruth

As per our phone conversation here are our main concerns over the current documentation / safety argument.

1. The Safety Case, when it arrives, needs to demonstrate that junction/location specific hazards have been identified and adequately mitigated. In many instances this may be by reference to existing protective measures and comparison with the operational sections of the network. The "Signalling Hazards Addressed" (no reference number) document provides a very good basis for this analysis but has some omissions e.g. risk of a driver failing to comply with a stop signal, particularly in areas of restricted line of sight.
2. Where the mitigation of any of these hazards leads to a requirement for SIL rated equipment/safety functions this must be stated in accordance with the Safety Plan (Section 5.18), the selected SIL must be justified and evidence provided of the independent verification.
3. The identified hazards and their associated mitigations must be reflected by entries in the Transdev RP40 Hazard Record. As it stands, the Hazard Record has extremely limited coverage of signalling hazards in general and tram/tram conflicts in particular.
4. Subject to clarification by [redacted] of the derivation of permitted speeds in the vicinity of the South access to Broombridge depot, it is not clear that the risk of head-on conflict between a tram departing from the depot and a northbound service tram has been adequately assessed/mitigated. Line of sight is restricted in this area and the hazard does not appear to be recorded. In the absence of adequate evidence that the hazards have been addressed, it may be necessary to place a restriction on usage and/or speed at this Depot entrance.
5. The Risk Register does not include the risk of derailment due to over-speed on curves. A speed restriction has been applied to the southbound approach to the Broadstone curve but, as discussed, the precise arrangements are not clear, nor has the risk of a driver failing to comply with the restriction been addressed. The additional warning measures under discussion in the UK following the Croydon derailment such as use of chevron signs should be considered.
6. As discussed yesterday, we need assurance that the hazards noted in the Transdev TSWG Minutes are being appropriately managed. In particular:
  - a. The requirement for 'sleeving' of OCS components at "top Dawson Street" and



- b. Temporary protection of the OCS pole at Lower Grafton Street which is to be moved – the use of barriers should be considered as reflective tape alone may not be sufficient.

We have other concerns about the adequacy of the Safety Plan and the lack of a formal Safety Case which may be addressed prior to Stage 6 APIS. With respect to the Safety Plan, a significant concern is that the Project Organisation / Roles and Responsibilities section must reflect the arrangements for Operation rather than Construction.

When we speak later we can sort out how to record less pressing issues.

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**From:**  
**Sent:** Wednesday 6 December 2017 16:37  
**To:** Ruth Baldwin  
**Cc:** Mary Molloy; Caoimhe Boland  
**Subject:** LCC APS Submission Stage 5 - 6th Dec 2017  
**Attachments:** PSD-BXD-017-01 LCC Signalling Hazards Addressed.pdf; RE: sleeved OCS wire Dawson St; TDLR LUAS RA105 Iss2 LCC Passenger service.pdf; TDLR LUAS RA107 Iss1 LUAS Cross City Passenger Service Safety Case.pdf; Driver Brief - LUAS Cross City Opening.pdf; PR40 LCC RISK REGISTER.xlsx

Hi Ruth,

As per our discussions yesterday, Transdev have closed out all comments in relation to our submission for Stage 5 Interim Operation. Below are the comments and the actions taken, including comments received from Richard Popplestone.

The following updated documents are attached:

- TDLR LUAS RA107 Iss1 LUAS Cross City Passenger Service Safety Case
- TDLR LUAS RA105 Iss2 LCC Passenger service
- PR40 LCC RISK REGISTER
- Driver Brief - LUAS Cross City Opening
- PSD-BXD-017-01 LCC Signalling Hazards Addressed
- Email from TII relating to OCS on Dawson Street

|   | Comment  | Action   |
|---|--|--|
| 1 | Change Safety Plan to Safety Case (Include Document Control)   | Name changed<br>Document control in place<br>Future tense terms removed  |
| 2 | Update Safety Case to refer to Stage 5 and risk evaluation (E.g. Table 5.6 and section 5.7)  | Safety Case updated to reflect change to a Stage 5 submission, including references to Annex 3.  |
| 3 | Update Safety Case to explain linkage between Safety Compliance Matrix, Hazard Record, Hazard Log and Risk Register  | Section 5.9 now explains that Transdev have been handed the relevant documents and how Transdev have assessed and incorporated residual issues into the PR40 Risk Register and RA105 Risk Evaluation.  |
| 4 | Items from the SAWG process <ul style="list-style-type: none"> <li>a) Historic Walls Phibsborough</li> <li>b) Evacuation in case of tram fire at Phibsborough (CRR have requested change to emergency procedure to include this within 2 months of start of operations)</li> </ul> | Items open in Hazard log <ul style="list-style-type: none"> <li>a) Ongoing monitoring and maintenance by IMC. Monitoring of planning applications for developments once operations commence by TII and Transdev.</li> <li>b) Transdev will update emergency procedures to incorporate specific arrangements for Phibsborough.</li> </ul> |



|    |  |  |
|----|--|--|
| 5  | Populate PR40 Risk Register with risk scores for LCC specific items  | Updated for LCC specific items   |
| 6  | Change wording in Driver Safety Notice   | Changed  |
| 7  | The Safety Case, when it arrives, needs to demonstrate that junction/location specific hazards have been identified and adequately mitigated. In many instances this may be by reference to existing protective measures and comparison with the operational sections of the network. The "Signalling Hazards Addressed" (no reference number) document provides a very good basis for this analysis but has some omissions e.g. risk of a driver failing to comply with a stop signal, particularly in areas of restricted line of sight.                     | This TII document is now part of the TII document control PSD-BXD-017-01 (LCC – Signalling Hazards Addressed in the Design) and is referenced in Section 5 of the Risk Evaluation.   |
| 8  | Where the mitigation of any of these hazards leads to a requirement for SIL rated equipment/safety functions this must be stated in accordance with the Safety Plan (Section 5.18), the selected SIL must be justified and evidence provided of the independent verification.  | All road junction controllers are the property of DCC, and are managed and maintained by DCC.<br>The Broombridge depot LSS is based on an AEGIS Axle Counter which is SIL rated equipment, now referenced in Section 5.18 of the Safety Case.  |
| 9  | The identified hazards and their associated mitigations must be reflected by entries in the Transdev RP40 Hazard Record. As it stands, the Hazard Record has extremely limited coverage of signalling hazards in general and tram/tram conflicts in particular.  | Entry for the new LCC crossing areas are now part of the hazard log  |
| 10 | Subject to clarification by Bernard of the derivation of permitted speeds in the vicinity of the South access to Broombridge depot, it is not clear that the risk of head-on conflict between a tram departing from the depot and a northbound service tram has been adequately assessed/mitigated. Line of sight is restricted in this area and the hazard does not appear to be recorded. In the absence of adequate evidence that the hazards have been addressed, it may be necessary to place a restriction on usage and/or speed at this Depot entrance. | All tram movements are protected by signals.<br>Transdev have implemented a stepped down speed limit (35kph) in approach of the Southern gate on a Northbound approach. This is to ensure consistency with other similar areas of the system (Belgard etc.).<br>Broombridge depot movements and access/egress to the main line, from the north and south entrance, are controlled by the CCR and conflicting movements protected by the Tram signalling system |
| 11 | The Risk Register does not include the risk of derailment due to over-speed on curves. A speed restriction has been applied to the southbound approach to the Broadstone curve but, as discussed, the precise arrangements are not clear, nor has the risk of a driver failing to comply with the restriction been addressed. The additional warning measures under discussion in the UK following the Croydon derailment such as use of chevron signs should be considered.   | The curve design speed is 20kph. The 20kph zone has been extended Northwards significantly in advance of the Broadstone stop with a second 20kph tram sign to provide additional warning to drivers entering the curve.  |
| 12 | As discussed yesterday, we need assurance that the hazards noted in the Transdev TSWG Minutes are being appropriately managed. In particular: <ul style="list-style-type: none"> <li>a. The requirement for 'sleeving' of OCS components at "top Dawson Street" and</li> <li>b. Temporary protection of the OCS pole at Lower Grafton Street which is to be moved – the use of barriers should be considered as reflective tape alone may not be sufficient.</li> </ul>  | TII attended the TSWG meeting and provided updates in relation to the two items stating that a final solution is to be formalised (see email on OCS Sleeve attached). These items will followed in the hazard log until close out.   |
| 13 | With respect to the Safety Plan, a significant concern is that the Project Organisation / Roles and Responsibilities section must reflect the arrangements for Operation rather than Construction.   | Updated section 3.1 and 3.2 of the Safety Case to state that certain groups will cease post start of operations and included a number of groups that meet on an ongoing basis  |

|  |
|--|
| e.g. operations, Local Authority traffic<br>Signals Group, Event management<br>and to define Transdev's role in more<br>detail |
|--|

We trust that the above items are to your satisfaction and we look forward to hearing from you tomorrow.

Regards,



TRANSDEV  
LUAS DEPOT, REDCOW, CLONDALKIN, DUBLIN.22  
Tel: +353 1 461 4010 - [www.transdevireland.ie](http://www.transdevireland.ie)



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**From:** Ruth Baldwin  
**Sent:** Friday 8 December 2017 08:46  
**To:** Shane O'Duffy  
**Cc:** Mary Molloy; Caoimhe Boland; Shane O'Duffy; Richard Popplestone; Jennifer Dowson; Peter Lunden-Welden; Morley Reddy; Browne Ciarán; Sinopluoglu Engin  
**Subject:** 171208 LCC Stage 5 APIS Letter of Acceptance  
**Attachments:** 171208.Transdev146NWA-I02 LoA - LCC Interim Operation - ISSUED.pdf

Please see the attached CRR Letter of Acceptance for LCC Stage 5, Interim Operation.

Note the conditions and dates contained in this Letter of Acceptance. This Letter will expire on 31/01/2018.

Kind regards,

**Ruth Baldwin CEng MIEI**  
Inspector

Commission for Railway Regulation,  
Temple House,  
57 Temple Road,  
Blackrock,  
Co. Dublin,  
A94 Y5W5

Tel: +353

Mob: +353

Email: [info@railreg.gov.ie](mailto:info@railreg.gov.ie)

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**Thank You.**

**New Works Assessment  
Letter of Acceptance  
171208.Transdev146NWA-I02**

|                                      |  |                    |                               |
|--------------------------------------|--|--------------------|-------------------------------|
| <b>Acceptance Type</b>               | Stage 5 – Interim Operation  | <b>Expiry Date</b> | 31 <sup>st</sup> January 2018 |
| <b>Name of Railway Organisation</b>  | Transdev Dublin Light Rail Limited, LUAS Depot, Red Cow Roundabout, Clondalkin, Dublin 22  |                    |                               |
| <b>Type of Infrastructure</b>        | Luas Cross City ("LCC") – Luas extension BxD.  |                    |                               |
| <b>Context</b>                       | Transdev Dublin Light Rail Limited ("Transdev"), applicant for Authorisation to Place in Service (APIS), are seeking authority to commence passenger service of the Luas Cross City (BxD) infrastructure.  |                    |                               |
| <b>Basis of Acceptance - General</b> | <p>This Letter of Acceptance is issued in accordance with:</p> <ul style="list-style-type: none"> <li>• Section 42 of the Railway Safety Act 2005,</li> <li>• Guidelines developed and published by the CRR under section 39 of the Railway Safety Act 2005. In particular;             <ol style="list-style-type: none"> <li>1. RSC-G-032-A, "Guideline for the Process of Authorisation for Placing in Service (APS) of Light Railway Subsystems", and</li> <li>2. RSC-G-033-B, "Guideline providing List of Parameters and Requirements for Authorisation for Placing in Service (APS) Light Rail Infrastructure, Energy and Command-Control Subsystems".</li> </ol> </li> </ul> <p>The Acceptance of the CRR is based on the following submissions from Transdev:</p> <ol style="list-style-type: none"> <li>1. Submissions from Transdev to CRR on 27/11/17, 01/12/17 and 06/12/17 containing the following documents:             <ol style="list-style-type: none"> <li>1.1. TDLR Luas RA107 Iss1 Luas Cross City Passenger Service Safety Case</li> <li>1.2. Transdev LCC TTR Luas Safety Plan Rev 1</li> <li>1.3. Hazard Record - Transdev Comments 29/11/2017</li> <li>1.4. Safety Compliance Matrix – Transdev Comments 29/11/2017</li> <li>1.5. LCC Stage 3 Hazard Log SSG to Broombridge V15 28/11/17 Transdev Comments</li> <li>1.6. TII Handover Letter from TII Project Manager to Transdev Managing Director on 23/11/2017</li> <li>1.7. LCC_SAWG_2017-11-20_PC2</li> <li>1.8. TSWG LCC Passenger Service Minutes 30/11/2017</li> <li>1.9. TDLR Luas RA105 Iss2 LCC Passenger Service</li> <li>1.10. PR40 LCC Risk Register</li> <li>1.11. PSD-BXD-017-01 LCC Signalling Hazards Addressed</li> <li>1.12. RE: Sleeved OCS Wire Dawson Street</li> <li>1.13. Driver Brief – Luas Cross City Opening (Issued to CRR on 6/12/17)</li> <li>1.14. TS Briefing 114 Tow Push – Detrainment – Dominic Street Crossover</li> <li>1.15. TS Briefing 115 AEGIS</li> <li>1.16. TS Briefing 116 Shared Run</li> <li>1.17. TS Briefing 117 SSG N</li> <li>1.18. TS Briefing 118 O'Connell Turnback</li> <li>1.19. LCC TTR Test Results Report</li> </ol> </li> <li>2. Evidence provided by TII             <ol style="list-style-type: none"> <li>2.1. EMC Satisfactory Testing Confirmation (Luas network – Iarnród Éireann network) on 29/11/2017</li> </ol> </li> </ol> |                    |                               |

(23)

**New Works Assessment  
Letter of Acceptance  
171208.Transdev146NWA-I02**

|                       |  |             |               |
|-----------------------|--|-------------|---------------|
|                       | 2.2. 17E7007-2 "Interference Measurements at Irish Rail" produced by Compliance Engineering Ireland Ltd<br><br>3. Internal CRR Acceptance<br>3.1. 171206.Transdev146NWA-I01.INT LoA - LCC Interim Operation - INTERNAL   |             |               |
| <b>Special Note</b>   | <p>There have been a number of Assessment Reports prepared for the Midlands and Great Western Railway Retaining Walls.</p> <p>TII have not satisfied the CRR that measures are designed and implemented to mitigate the Inherent risk associated with these walls.</p> <p>CRR will inspect this issue further in early 2018. For Interim Operation see Condition 2 below.</p>  |             |               |
| <b>Conditions</b>     | <ol style="list-style-type: none"> <li>1. The operational speed of trams must not exceed 10 km/h on O'Connell Street through the GPO Plaza, north of O'Connell stop.</li> <li>2. Suitable inspection of the Midlands and Great Western Railway Retaining Walls by an independent competent person each day of LCC operation until such a time as a long term monitoring, inspection and maintenance programme has been agreed and is put in place.</li> <li>3. A specific emergency evacuation plan to be developed for Phibsborough Stop. The emergency plan must include a fire on a tram at Phibsborough Stop, crowd control and any other identified issues. This emergency plan to be submitted to the CRR by 31/01/2018.</li> <li>4. Certification documentation for the elevators at Phibsborough Stop to be provided to the CRR prior to the commencement of LCC Interim Operation 09/12/2017.</li> <li>5. Transdev SMS to be updated to reflect LCC operation. This should be submitted to the CRR within three months of the opening of LCC for Interim Operation.</li> <li>6. All references in Hazard Records and Safety Compliance Matrices to be completed prior to the issuing of Stage 6 APIS LoA.</li> <li>7. SIL4 Certificate(s) for the Aegis detection and interlocking systems installed at Broombridge to be provided to the CRR.</li> </ol> |             |               |
| <b>Prepared by:</b>   | Ruth Baldwin   |             |               |
| <b>Signature</b>      |   | <b>Date</b> | 8th Dec. 2014 |
| <b>Authorised by:</b> | Mary Molloy  |             |               |
| <b>Signature</b>      |   | <b>Date</b> | 8 Dec 2017    |



## New Works Assessment Letter of Acceptance 171208.Transdev146NWA-I02

### Annex – List of Letters of Acceptance

| Letter of Acceptance Ref.         | Issued Date | Expiry Date                         | Purpose   |
|-----------------------------------|-------------|-------------------------------------|---|
| 150106.RPA146NWA.D01              | 06/01/2015  | None                                | Luas network extension LCC (BxD):<br>Fassaugh Road Overbridge Stage 2 & 3 –<br>Detailed Design  |
| 150216.RPA146NWA-C01              | 16/02/2015  | Detailed<br>Design                  | Luas network extension LCC (BxD):<br>Stage 1 - Concept  |
| 160701.TII146NWA-S01              | 01/07/2016  | N/A                                 | Luas network extension LCC (BxD):<br>Luas Red Line operation following the<br>construction of new infrastructure at the<br>crossing point of the existing Luas Red Line<br>and the Luas Cross City Project (extension<br>of the Luas Green Line). |
| 170531.TII146NWA-D02              | 31/05/2017  | Stage 4 –<br>P1 P2 P3 P4            | Luas network extension LCC (BxD):<br>Detailed Design in compliance with<br>Parameters 1, 2, 3 and 4 of the Annex to<br>RSC-G-032-B.   |
| 170531.TII146NWA-D03              | 31/05/2017  | Stage 4 –<br>P5 P6                  | Luas network extension LCC (BxD):<br>Detailed Design in compliance with<br>Parameters 5 and 6 of the Annex to RSC-G-<br>032-B.  |
| 170607.TII146NWA-D04              | 07/06/2017  | Stage 4 – P12<br>P14 P15 P16<br>P20 | Luas network extension LCC (BxD):<br>Detailed Design in compliance with<br>Parameters 12, 14, 15, 16 and 20 of the<br>Annex to RSC-G-032-B  |
| 170615.TII146NWA-S02              | 15/06/2017  | N/A                                 | Luas network extension LCC (BxD):<br>Luas Red Line operation following the<br>works required for Luas Cross City to the<br>OCS at Abbey Street.   |
| 170616.TII146NWA-T01              | 16/06/2017  | 30/06/2017                          | Luas network extension LCC (BxD):<br>Gauge run and dynamic testing excluding<br>signalling system.  |
| 170707.TII146NWA-D05              | 07/07/2017  | Testing                             | Luas network extension LCC (BxD):<br>Detailed Design in compliance with<br>Parameters 11, 13, 17, 18 and 19 of the<br>Annex to RSC-G-032-B.   |
| 170710.TII146NWA-T02              | 10/07/2017  | 20/09/2017                          | Luas network extension LCC (BxD):<br>Testing of systems including AVLS, LSS and<br>DCS.   |
| 170908.Transdev146NWA – T03       | 08/09/2017  | Stage 6 –<br>Operation              | Luas network extension LCC (BxD):<br>Testing and trial running  |
| 171205.TII146NWA-D06              | 05/12/2017  | Stage 6 -<br>Operation              | Luas network extension LCC (BxD):<br>Detailed Design in compliance with<br>Parameter 7 of the Annex to RSC-G-032-B.   |
| 171208.Transdev146NWA-<br>I01.INT | 08/12/2017  | 31/01/2018                          | Luas network extension LCC (BxD):<br>LCC Stage 5 Interim Operation - INTERNAL   |

**From:**  
**Sent:** Friday 8 December 2017 09:22  
**To:** Ruth Baldwin; Bruno Fualdes  
**Cc:** Mary Molloy; Caoimhe Boland; Shane O'Duffy; Richard Popplestone; Jennifer Dowson; Peter Lunden-Welden; Reddy Morley; Browne Ciarán; Sinopluoglu Engin  
**Subject:** RE: 171208 LCC Stage 5 APIS Letter of Acceptance

Hi Ruth,

Thank you for sending through this letter. The conditions and dates are noted.

Regards,



TRANSDEV  
 LUAS DEPOT, REDCOW, CLONDALKIN, DUBLIN.22  
 Tel: +353 1 461 4010 - [www.transdevireland.ie](http://www.transdevireland.ie)



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**From:** Ruth Baldwin  
**Sent:** 08 December 2017 08:46  
**To:**  
**Cc:** Mary Molloy; Caoimhe Boland; Shane O'Duffy; Richard Popplestone; Jennifer Dowson; Peter Lunden-Welden; Reddy Morley; Browne Ciarán; Sinopluoglu Engin  
**Subject:** 171208 LCC Stage 5 APIS Letter of Acceptance

Please see the attached CRR Letter of Acceptance for LCC Stage 5, Interim Operation.

Note the conditions and dates contained in this Letter of Acceptance. This Letter will expire on 31/01/2018.

Kind regards,

**Ruth Baldwin CEng MIEI**  
 Inspector

Commission for Railway Regulation,  
 Temple House,  
 57 Temple Road,  
 Blackrock,



Co. Dublin,  
A94 Y5W5



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**From:** [Redacted]  
**Sent:** Friday 8 December 2017 15:50  
**To:** Ruth Baldwin; Bruno Fualdes  
**Cc:** Mary Molloy; Caoimhe Boland; Shane O'Duffy; Richard Popplestone; Jennifer Dowson; Peter Lunden-Welden; Reddy Morley; Browne Ciarán; Sinopluoglu Engin; Eoghan Sweeney; Catherine Sturgeon  
**Subject:** RE: 171208 LCC Stage 5 APIS Letter of Acceptance  
**Attachments:** AEGIS Interlocking - Copy of SIL4 certification.docx

Hi Ruth,

Please see our comments in relation to the attached conditions below:

1. 10kph limit through GPO Plaza is in place and is included in the Driver Safety Notice for LCC
2. RPS Consultants have been contracted to undertake daily inspections of the retaining walls from 9<sup>th</sup> December 2017. This arrangement will remain in place until such time as long term inspection and maintenance programme has been agreed.
3. A specific Emergency Evacuation Plan will be developed for Phibsborough Platform before the 31/01/2018.
4. The certification documents for the Phibsborough elevators was sent to CRR this morning.
5. The Transdev SMS will be updated within 3 months to reflect LCC operations.
6. All SCMs and HRs will be updated prior to approval for APIS Stage 6.
7. The SIL4 certificate for the AEGIS system at Broombridge is attached.

If you require anything else please let me know.

Regards,



TRANSDEV  
 LUAS DEPOT, REDCOW, CLONDALKIN, DUBLIN.22  
 Tel: +353 1 461 4910 - [www.transdevireland.ie](http://www.transdevireland.ie)



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**From:** Ruth Baldwin  
**Sent:** 08 December 2017 08:46  
**To:** Bruno Fualdes  
**Cc:** Mary Molloy; Caoimhe Boland; Shane O'Duffy; Richard Popplestone; Jennifer Dowson; Peter Lunden-Welden; Reddy Morley; Browne Ciarán; Sinopluoglu Engin  
**Subject:** 171208 LCC Stage 5 APIS Letter of Acceptance

Bruno, Neil,

Please see the attached CRR Letter of Acceptance for LCC Stage 5, Interim Operation.

Note the conditions and dates contained in this Letter of Acceptance. This Letter will expire on 31/01/2018.

Kind regards,

**Ruth Baldwin CEng MIEI**

Inspector

Commission for Railway Regulation,  
Temple House,  
57 Temple Road,  
Blackrock,  
Co. Dublin,  
A94 Y5W5

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**Thank You.**

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\*\*\*\*\*

**From:** [Redacted]  
**Sent:** Wednesday 31 January 2018 10:21  
**To:** Ruth Baldwin  
**Cc:** Mary Molloy; Caoimhe Boland; Shane O'Duffy; Richard Popplestone; Jennifer Dowson; Peter Lunden-Welden; Reddy Morley; Browne Ciarán; Sinopluoglu Engin; Eoghan Sweeney; Catherine Sturgeon;  
**Subject:** RE: 171208 LCC Stage 5 APIS Letter of Acceptance  
**Attachments:** Hazard Record - Transdev Comments 29 11 2017.xlsx; RE: Aegis SIL Certificate; Safety Compliance Matrix - Transdev Comments 29 11 2017\_SOB Adds 24 01 2018.xlsx; TTI LUAS EMP 007 Iss1 Emergency Evacuation Plan Phibsborough.pdf

Hi Ruth,

Please find updates against the conditions as outlined in the LCC Stage 5 APIS Letter of Acceptance below:

1. The 10kph limit through GPO plaza remains in place.
2. RPS Consultants have been contracted to undertake daily inspections of the retaining walls from 9<sup>th</sup> December 2017. This arrangement will remain in place until such time as long term inspection and maintenance programme has been agreed.
3. A specific Emergency Evacuation Plan has been developed for Phibsborough Platform. Dublin Fire Brigade were consulted in the development of this plan. Please find attached.
4. The certification documents for the Phibsborough elevators were provided to CRR on 8<sup>th</sup> Dec 2017.
5. The Transdev SMS will be updated within the prescribed 3 month period to reflect LCC operations.
6. All SCMs and HRs have been reviewed and updated. Please find attached. Further detail will be added once the SMS update is complete.
7. Further information in relation to SIL4 certification for the AEGIS system at Broombridge is attached.

If you require anything else please let me know?

Regards,



TRANSDEV  
 LUAS DEPOT, REDCOW, CLONDALKIN, DUBLIN.22  
 Tel: +353 1 461 4910 - [www.transdevireland.ie](http://www.transdevireland.ie)



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**From:** Ruth Baldwin  
**Sent:** Monday 19 February 2018 12:16  
**To:**  
**Cc:** Mary Molloy  
**Subject:** RE: Extension of Condition LCC APIS

The CRR grant Transdev an extension to the deadline associated with Condition 5 of the Letter of Acceptance with reference "180131 Transdev146NWA-I03".

The extended deadline for compliance with this condition is the 30<sup>th</sup> of April 2018.

Kind regards,

Ruth

---

**From:** Ruth Baldwin  
**Sent:** Monday 19 February 2018 11:42  
**To:** Ruth Baldwin  
**Subject:** Extension of Condition LCC APIS

Hi Ruth,

As discussed last week, Transdev are seeking an extension on Condition 5 of the LCC APIS approval.

This is in order to allow for incorporation of the new 502 tram changes that will also be required and remove the need to reprint the TSI for all drivers on 2 separate occasions over a 2 month period.

If you could please let me know if CRR would be in favour of this extension and if you require this to be requested formally by letter in advance of the current 3 month deadline?

Regards,



TRANSDEV  
LUAS DEPOT, REDCOW, CLONDALKIN, DUBLIN.22  
Tel: +353 1 461 4910 - [www.transdevireland.ie](http://www.transdevireland.ie)

 Before you print this email, please consider the planet and your environmental responsibility. Thank you!

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**From:** Ruth Baldwin  
**Sent:** Tuesday 6 March 2018 14:19  
**To:** Bruno Ruakus  
**Cc:** Mary Molloy; Browne Ciarán  
**Subject:** 180306 Transdev146NWA-I04 LoA - LCC Interim Operation  
**Attachments:** 180306 Transdev146NWA-I04 LoA - LCC Interim Operation - ISSUED.pdf

Neil, Bruno,

Please see the attached Letter of Acceptance for Luas Cross City. Conditions 1 and 6 are now closed.

Kind regards,  
**Ruth Baldwin CEng MIEI**  
Inspector

Commission for Railway Regulation,  
Temple House,  
57 Temple Road,  
Blackrock,  
Co. Dublin,  
A94 Y5W5

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**Thank You.**

**New Works Assessment  
Letter of Acceptance  
180306.Transdev146NWA-I04**

|                                      |   |                    |                             |
|--------------------------------------|---|--------------------|-----------------------------|
| <b>Acceptance Type</b>               | Stage 5 – Interim Operation   | <b>Expiry Date</b> | 30 <sup>th</sup> April 2018 |
| <b>Name of Railway Organisation</b>  | Transdev Dublin Light Rail Limited, LUAS Depot, Red Cow Roundabout, Clondalkin, Dublin 22   |                    |                             |
| <b>Type of Infrastructure</b>        | Luas Cross City ("LCC") – Luas extension BxD.   |                    |                             |
| <b>Context</b>                       | Transdev Dublin Light Rail Limited ("Transdev"), applicant for Authorisation to Place in Service (APIS), are seeking authority to commence passenger service of the Luas Cross City (BxD) infrastructure.   |                    |                             |
| <b>Basis of Acceptance - General</b> | <p>This Letter of Acceptance is issued in accordance with:</p> <ul style="list-style-type: none"> <li>• Section 42 of the Railway Safety Act 2005,</li> <li>• Guidelines developed and published by the CRR under section 39 of the Railway Safety Act 2005. In particular;               <ol style="list-style-type: none"> <li>1. RSC-G-032-A, "Guideline for the Process of Authorisation for Placing in Service (APS) of Light Railway Subsystems", and</li> <li>2. RSC-G-033-B, "Guideline providing List of Parameters and Requirements for Authorisation for Placing in Service (APS) Light Rail Infrastructure, Energy and Command-Control Subsystems".</li> </ol> </li> </ul> <p>The Acceptance of the CRR is based on the following submissions from Transdev:</p> <ol style="list-style-type: none"> <li>1. Submissions from Transdev to CRR on 27/11/17, 01/12/17 and 06/12/17 containing the following documents:               <ol style="list-style-type: none"> <li>1.1. TDLR Luas RA107 Iss1 Luas Cross City Passenger Service Safety Case</li> <li>1.2. Transdev LCC TTR Luas Safety Plan Rev 1</li> <li>1.3. Hazard Record - Transdev Comments 29/11/2017</li> <li>1.4. Safety Compliance Matrix – Transdev Comments 29/11/2017</li> <li>1.5. LCC Stage 3 Hazard Log SSG to Broombridge V15 28/11/17 Transdev Comments</li> <li>1.6. TII Handover Letter from TII Project Manager to Transdev Managing Director on 23/11/2017</li> <li>1.7. LCC_SAWG_2017-11-20_PC2</li> <li>1.8. TSWG LCC Passenger Service Minutes 30/11/2017</li> <li>1.9. TDLR Luas RA105 Iss2 LCC Passenger Service</li> <li>1.10. PR40 LCC Risk Register</li> <li>1.11. PSD-BXD-017-01 LCC Signalling Hazards Addressed</li> <li>1.12. RE: Sleeved OCS Wire Dawson Street</li> <li>1.13. Driver Brief – Luas Cross City Opening (Issued to CRR on 6/12/17)</li> <li>1.14. TS Briefing 114 Tow Push – Detrainment – Dominic Street Crossover</li> <li>1.15. TS Briefing 115 AEGIS</li> <li>1.16. TS Briefing 116 Shared Run</li> <li>1.17. TS Briefing 117 SSG N</li> <li>1.18. TS Briefing 118 O'Connell Turnback</li> <li>1.19. LCC TTR Test Results Report</li> </ol> </li> <li>2. Evidence provided by TII               <ol style="list-style-type: none"> <li>2.1. EMC Satisfactory Testing Confirmation (Luas network – Iarnród Éireann network) on 29/11/2017</li> <li>2.2. 17E7007-2 "Interference Measurements at Irish Rail" produced by Compliance Engineering Ireland Ltd</li> </ol> </li> </ol> |                    |                             |



**New Works Assessment  
Letter of Acceptance  
180306.Transdev146NWA-I04**

|                       |   |
|-----------------------|---|
|                       | <p>3. Internal CRR Acceptance<br/>3.1. 171206.Transdev146NWA-I01.INT LoA - LCC Interim Operation - INTERNAL</p> <p>4. Email correspondence from Transdev to CRR on the 31<sup>st</sup> of January 2018 with the following attachments:<br/>4.1. Hazard Record – Transdev Comments 28 11 2017<br/>4.2. Safety Compliance Matrix – Transdev Comments 29 11 2017_SOB Adds 24 01 2018<br/>4.3. Email RE: Aegis SIL Certificate<br/>4.4. TTI KUAS EMP 007 Iss1 Emergency Evacuation Plan Phibsborough</p> <p>5. Email correspondence from TII to CRR on the 27<sup>th</sup> of February 2018.</p>  |
| <b>Special Note</b>   | <p>There have been a number of Assessment Reports prepared for the Midlands and Great Western Railway Retaining Walls.</p> <p>TII have not satisfied the CRR that measures are designed and implemented to mitigate the inherent risk associated with these walls.</p> <p>CRR will inspect this issue further in early 2018. For Interim Operation see Condition 2 below.</p>   |
| <b>Conditions</b>     | <ol style="list-style-type: none"> <li>1. CLOSED on 06/03/2018 (See basis of acceptance No. 5)</li> <li>2. Suitable inspection of the Midlands and Great Western Railway Retaining Walls by an independent competent person each day of LCC operation until such a time as a long term monitoring, inspection and maintenance programme has been agreed and is put in place.</li> <li>3. CLOSED on 31/01/2018</li> <li>4. CLOSED on 31/01/2018</li> <li>5. Transdev SMS to be updated to reflect LCC operation. This should be submitted to the CRR within three months of the opening of LCC for Interim Operation.</li> <li>6. CLOSED on 06/03/2018</li> <li>7. Suitable and sufficient written assurance to be provided to CRR confirming that the integration of third party safety related equipment including, but not necessarily limited to, Axle Counters and Points Actuators with the Aegis interlockings at Broombridge complies with all relevant safety requirements and does not invalidate the independent SIL certification of the subsystem.</li> </ol> |
| <b>Prepared by:</b>   | Ruth Baldwin  |
| <b>Signature</b>      | <div style="display: flex; justify-content: space-between;"> <div></div> <div><b>Date</b><br/>6th March 2018</div> </div>  |
| <b>Authorised by:</b> | Mary Molloy   |
| <b>Signature</b>      | <div style="display: flex; justify-content: space-between;"> <div></div> <div><b>Date</b><br/>6th March 2018</div> </div>  |

**New Works Assessment  
Letter of Acceptance  
180306.Transdev146NWA-I04**

**Annex – List of Letters of Acceptance**

| Letter of Acceptance Ref.         | Issued Date | Expiry Date                         | Purpose   |
|-----------------------------------|-------------|-------------------------------------|---|
| 150106.RPA146NWA-D01              | 06/01/2015  | None                                | Luas network extension LCC (BxD):<br>Fassaugh Road Overbridge Stage 2 & 3 –<br>Detailed Design  |
| 150216.RPA146NWA-C01              | 16/02/2015  | Detailed<br>Design                  | Luas network extension LCC (BxD):<br>Stage 1 - Concept  |
| 160701.TII146NWA-S01              | 01/07/2016  | N/A                                 | Luas network extension LCC (BxD):<br>Luas Red Line operation following the<br>construction of new infrastructure at the<br>crossing point of the existing Luas Red Line and<br>the Luas Cross City Project (extension of the<br>Luas Green Line). |
| 170531.TII146NWA-D02              | 31/05/2017  | Stage 4 –<br>P1 P2 P3 P4            | Luas network extension LCC (BxD):<br>Detailed Design in compliance with Parameters<br>1, 2, 3 and 4 of the Annex to RSC-G-032-B.  |
| 170531.TII146NWA-D03              | 31/05/2017  | Stage 4 –<br>P5 P6                  | Luas network extension LCC (BxD):<br>Detailed Design in compliance with Parameters<br>5 and 6 of the Annex to RSC-G-032-B.  |
| 170607.TII146NWA-D04              | 07/06/2017  | Stage 4 – P12<br>P14 P15 P16<br>P20 | Luas network extension LCC (BxD):<br>Detailed Design in compliance with Parameters<br>12, 14, 15, 16 and 20 of the Annex to RSC-G-<br>032-B   |
| 170615.TII146NWA-S02              | 15/06/2017  | N/A                                 | Luas network extension LCC (BxD):<br>Luas Red Line operation following the works<br>required for Luas Cross City to the OCS at<br>Abbey Street.   |
| 170616.TII146NWA-T01              | 16/06/2017  | 30/06/2017                          | Luas network extension LCC (BxD):<br>Gauge run and dynamic testing excluding<br>signalling system.  |
| 170707.TII146NWA-D05              | 07/07/2017  | Testing                             | Luas network extension LCC (BxD):<br>Detailed Design in compliance with Parameters<br>11, 13, 17, 18 and 19 of the Annex to RSC-G-<br>032-B.  |
| 170710.TII146NWA-T02              | 10/07/2017  | 20/09/2017                          | Luas network extension LCC (BxD):<br>Testing of systems including AVLS, LSS and DCS.  |
| 170908.Transdev146NWA<br>– T03    | 08/09/2017  | Stage 6 –<br>Operation              | Luas network extension LCC (BxD):<br>Testing and trial running  |
| 171205.TII146NWA-D06              | 05/12/2017  | Stage 6 -<br>Operation              | Luas network extension LCC (BxD):<br>Detailed Design in compliance with Parameter<br>7 of the Annex to RSC-G-032-B.   |
| 171208.Transdev146NWA-<br>I01.INT | 08/12/2017  | 31/01/2018                          | Luas network extension LCC (BxD):<br>LCC Stage 5 Interim Operation - INTERNAL   |
| 171208.Transdev146NWA-<br>I02     | 08/12/2017  | 31/01/2018                          | Luas network extension LCC (BxD):<br>LCC Stage 5 Interim Operation - ISSUED   |
| 180131.Transdev146NWA-<br>I03     | 31/01/2018  | 30/04/2018                          | Luas network extension LCC (BxD):<br>LCC Stage 5 Interim Operation - ISSUED   |