FAXED

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Dear Dave

Attached are the responses to your questions relating to the Wellington Tranz Metro network.

Early in the New Year, we would like to re-engage with the WRC regarding a more suitable operating contract and subsidy agreement. I will be contacting Howard Stone to begin that process. In the meantime, please let me know if you require additional information.

1) The table of Rail Safety Outcomes supplied by the Land Transport Safety Authority relies on reporting from the Police and Tranz Rail Limited. Tranz Rail will forward a summary of statistics for the Wellington Tranz Metro operation under separate covering letter.

2) The term SPAD is an acronym for "Signal Passed at Danger". Tranz Rail adopted the term and sub categories from the United Kingdom in 2000 when additional focus was put on recording and analysing these events.

SPAD's are reported in four categories:

- **Category A** any occasion when a train passes a signal at danger without authority, other than as defined in the other categories.
- **Category B** any occasion when a train passes a signal at danger without authority because a stop aspect or indication to stop was not displayed with sufficient time for the driver to stop safely at the signal. These are technical defects, reversions through power failures etc. These are lower risk SPAD's given it was intended that the train occupy the section beyond the signal.
- **Category** C occurs after a signal has been replaced to red by a signaller in circumstances required by the Rule Book (this should only be done when needed for safety purposes).
- **Category D** occurs when unmanned vehicles pass a signal at danger.

3) The signalling system is designed to be fail-safe:

- **Category A** is the most critical SPAD and mostly occurs through human error influenced by distraction, concentration, fatigue, misjudged train handling. A number of sub issues can influence e.g. personal circumstances, shift preparation. To a lesser degree SPAD's can be influenced by signal equipment failures (e.g. red black outs) and signal view lines.

Tranz Rail has a range of defences in place to mitigate all these factors. When signals are erected, sighting committees involving driver representatives and signalling engineers ensure the position is most appropriate, and drivers are trained and certified by route to achieve competency in understanding each signalled station. Locomotives and Multiple Units are fitted with vigilance devices to promote crew alertness. Signalling systems give advance warning of the aspect that will be displayed by the signal in advance, and individual signal must fit a sighting criteria based on minimum sighting time for the maximum line speed. Tranz Rail has a safety observation programme to assess drivers competence and compliance to procedures and best practices.

- **Category B** events are caused by infrastructure and equipment failures. These typically involve power outages, telemetry failures or relay/hardware failures. As the system is designed to be fail-safe, any failure will place a signal to "danger", but will also hold the intended route exclusive to that train for a pre-set amount of time. This is to allow for the train to run past the danger signal knowing that the signal may have reverted to danger with insufftcient time for the driver to brake. Tranz Rail has a recording and maintenance regime to minimise these events.

- **Category** C events are caused signal operating staff accidentally or deliberately selecting to place a signal to danger. Rule and procedures are documented for this practice, and the system is designed to be fail-safe, with any such action holding the intended route exclusive to that train for a pre-set amount of time. As with Category B events, this is to allow for the train to run past the danger signal knowing that the signal may have reverted to danger with insufficient time for the driver to brake.

- **Category D** events occur rarely on the Tranz Rail network. We essentially use this category for runaway vehicles passing signals at danger.

4) Tranz Rail has in place a 21 point action plan to minimise SPAD's. These actions include auditing the sighting of signals, driver formative training and ongoing education, and some infrastructure modifications. In November, Tranz Rail supported a LTSA initiated signalling review. The company shared research and actions on rostering practices, fatigue management, ergonomic studies and other initiatives.

5) Track buckles due to an increase in temperature above the rails neutral temperature such that the track cannot resist or overcome the forces caused by the increase in rail temperature. Longer continuous lengths of rail have greater potential for expansion, and therefore additional forces in the sleepers, fastenings and ballast. The Tranz Rail network has a large proportion of track formed with continuous welded rail (CWR). There are specific requirements for rail, sleepers, fastenings, ballast and alignment when forming CWR and historically many of these factors have not been adequately managed. When CWR is initially formed

standards require the rail to be fastened down at a defined rail temperature (known as design neutral temperature), which reduces the additional forces imposed on the track through high rail temperatures. The process for achieving this is destressing. Tranz Rail is currently destressing in the Wellington area to minimise the potential for heat buckled to occur.

6) A significant proportion of CWR formation occurred between 1986 and 1993. When this was done, very little distressing occurred and the CWR was installed to varying standards. In 1994 there was a rise in the number of heat buckles and the derailment of the Southerner luggage van near Edendale. In response the company began actively destressing CWR track at approximately 100 km a year. Since 1994 approximately 800km of track has been destressed. We also implemented a CWR risk management system into the operation of trains including imposing heat 40 restrictions at identified CWR risk areas.

Tranz Rail is committed to providing a safe and efficient rail network for our employees, other operators and our customers.

Over the past year, we have completed a number of initiatives to make improvements in the overall track condition:

- We have purchased four track stress free temperature test units and undertaken over 1000 tests over more than 500 kilometres.
- We have completed ***over*** 110 kilometres of destressing to a higher standard than before.
- We have completed a full stability analysis risk assessment review of the CWR network taking into account the 13 key contributing factors associated with heat buckling.
- Together with our contractor Transfield Services, we have refreshed or re-trained the rail maintenance staff in CWR management practices, hot weather patrols and track misalignment rectification.
- To further reduce operational and safety risks we have self imposed more H40 sites than before. For example, on the Tranz Alpine route the kilometreage under restriction has increased from 6 kilometres last year to 36.90 kilometres today.

7) The overhead traction poles in the Wellington area are either Galvanised or painted with anti-corrosive paint. The galvanising allows zinc to corrode sacrificially to protect the steel. Portal Beams (beams spanning two tracks or more) are painted. Rust stains are a consequence of infrastructure in such close proximity to the sea and corrosive conditions.

8) There were 5 rail failures (includes broken rails, welds, and ends) in the Wellington Tranz Metro area since 1 January 2002.

9) There are many causes of rail failures. Rail ends will fail through constant wheel forces. Welds fail either through initial poor quality or if the top of the weld has a dip then this results in high forces through wheels and may result in failure. Mid rail failures occur through internal defects (normally when rail is rolled - newer rail; 20 + years old - is better quality). External damage or severe corrosion are also factors of failure.

10) Prevention relies partly on good initial weld quality. The main preventative regime is ultrasonic rail testing of joints and mid rail. Joints are tested at minimum of g-month intervals and mid rail sections are tested every 12 - 18 months in the Wellington

Tranz Metro area. Tranz Rail also undertakes random sampling of new welds for quality control. Risk protection is provided for broken rails by the signalling system. Rail breaks are detected by the signalling track circuits resulting in signals being held at stop and trains proceeding only under slow and cautious conditions.

11) All staff employed in operating roles must receive both formal classroom and on-the-job training to achieve competency and certification Training Packages are developed as part of the safety system and contain critical safety elements of learning. The length of these training periods is dependant on the role the person will undertake. A trainee driver will typically spend 2 months in a classroom environment (including field visits and lectures) and 3 months on-the-job under tuition.

12) All staff in a rail operating role (Drivers, Guards, Signallers, Train Controllers, Track Maintainers) must have a safety observation (assessing practical competency in critical tasks) every 8 months. Theory tests must be completed every 2 years. These periods are shortened for new entrant staff or persons involved in operating incidents. Typically, a new entrant employee will have safety observations conducted monthly foi 3 months.

13) Tranz Rail has an approved process' to immediately provide learning intervention to staff who have not met the assessment criteria in either field safety observations or -theory tests. Staff are counselled on any incorrect answers or practices to the satisfaction of the assessor or sent for formal re-training in the required discipline. There is a very low proportion of staff requiring formal re-training.

Yours faithfully

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cc: **Ross Hayward**