

# **Draft ATOC Response to “Periodic Review 2013 – Consultation on the allocation of the Variable Usage Charge”; Network Rail, December 2012**

January 28th, 2013

## **Overview**

The Network Rail consultation documents describe much of the background to the calculation of Vehicle Usage Charges for CP5. However, they do not identify the way in which VUCs for individual vehicle types are actually calculated. The documents outline the way that Network Rail’s maintenance and renewal costs are assessed and they describe how vehicles might be weighted according to the level of track damage which they create. But there is no description of how these factors combine to allow the calculation of VUCs for individual vehicle types.

ATOC is aware of the general calculation process for setting VUCs, as used in CP4, and anticipate that it is Network Rail’s intent to follow this general process again in CP5. ATOC would support this.

However, within the overall process for setting VUCs ATOC is concerned about aspects of the way that track damage costs are allocated between vehicle types.

ATOC has two significant concerns:

- All freight vehicles are placed in to ‘suspension bands’ which carry a quality value for their vertical suspension performance. There is no equivalent for passenger vehicles; if there were then all passenger vehicles would have a much higher quality value than freight vehicles
- New work from Serco has identified that axle load has a more important role in track damage than previously thought. This is a concern for freight operators and has lead to calls to defer the adoption of this work, something which ATOC would not support

**ATOC is committed to an assessment of VUCs which is based in engineering science, is cost-reflective and even handed.**

**ATOC therefore again propose the following general process for the allocation of track damage costs to individual vehicle types:**

- 1 Network Rail has calculated, using VTISM, the costs for track maintenance and renewal applicable to CP5 as part of the freight cap exercise; these estimates will continue to be refined. These costs have already been split between freight and passenger vehicles and both freight and passenger and freight operators have been relatively content with the likely CP5 rates that this exercise produced.
- 2 Other infrastructure costs should be split between passenger and freight sectors in the same ratio as track costs
- 3 The separation between freight and passenger overall costs will allow slightly different processes, broadly similar to CP4 processes, to be used for the calculation of individual vehicle charging rates for the freight and passenger sectors. Specifically, there will be no need to introduce the notion of suspension

banding to passenger vehicles in order to retain an even handed approach for the freight and passenger sectors.

ATOC believes that this approach of identifying two separate pots of track damage costs for freight and passenger has important advantages relative to the proposed continued use of a single pot for both sectors together:

Freight operators are likely to be comfortable knowing that the Serco work will only shift costs from high axle load laden vehicles towards low axle load tare vehicles. It will remove any suggestion that passenger vehicles are taking benefit from freight vehicles. There will be no barrier to moving on from the relatively unfounded track damage formula of CP4 and implementing the Serco methodology.

Freight operators will continue to use suspension banding as it currently exists. There will be no requirement to introduce suspension banding for passenger vehicles.

**ATOC regret the ORR decision to implement VUCs on a national average basis** rather than on a local or route basis. ATOC understands that the complexity of local charging would not be acceptable to freight operators, but believe that this complexity could be avoided if VUCs were to be calculated separately for freight and passenger vehicles. This solution (the two pots solution) would allow freight operators to retain the more appropriate national average charges, whilst giving passenger operators the more cost-reflective option of local charging.

ATOC note that industry has committed to a more root and branch review of access charging from later this year, with the aim of informing the charging regime for CP6 and wish to engage with this, but do not support the proposals to defer some of the proposals stemming from the Serco work on Variable Usage Costs until then

## **Consultation Question 1**

What is your view on:

- The surface damage percentages estimated for each activity in Appendix 2 and
- Our proposal that 78% and 22% of track variable usage costs should be attributed to vertical and horizontal rail forces respectively?

**ATOC supports the Network Rail estimates linking maintenance and renewal activities to damage from horizontal forces as broadly reasonable.**

**ATOC believes that Network Rail has failed to provide adequate information for the determination of the split between vertical and horizontal damage costs and that it is therefore impossible to answer the second half of this consultation question.**

The proposed Network Rail values of 78% and 22% are not in themselves unreasonable. In Appendix 2, Network Rail note that the values provided in that Appendix “will inform the split between vertical and horizontal track variable usage costs”. It is important for Network Rail to provide the missing information so that industry can understand and become confident in the proposed split between vertical and horizontal damage costs.

## **Consultation Question 2**

Do you have any comments on the analysis carried out by Serco in order to calibrate the existing equivalent track damage equation?

**ATOC believes that overall this is a sound piece of work** which produces important conclusions in identifying axle load as a more important influence on vertical track damage than previously thought. ATOC support the use of the cross industry endorsed VTISM tool in this area. However, ATOC has significant reservations about some of the detail of the work.

Serco identify the unexpected result that there is less damage for some 100mph cases than equivalent cases at lower speeds; they link this to the higher standard of track construction used by Network Rail on 100+mph routes. This seems to be an entirely reasonable explanation. Serco then choose to exclude the set of VTISM results for 100mph from use in any subsequent analysis. Given the important conclusion from this work that speed is a less important driver for track damage than axle load, Serco's action is not reasonable. **ATOC cannot accept the revised track damage formula produced by Serco until the details of this matter are clarified.**

See the Appendix to this document for further comment relating to this question and for the identification of other, smaller scale issues relating to the Serco work.

### **Consultation Question 3**

Do you consider that for CP5 we should use the revised 'hybrid' track damage formula derived by Serco, incorporating the existing Ct factor in its current format, to apportion vertical track variable usage costs between vehicle classes? Or

Do you consider that the existing track damage formula should be retained for CP5, alongside a commitment from the industry to, as part of the wider charges review in early CP5, to better understand the Serco analysis for potential implementation in CP6?

Ultimately any decisions on charges for CP5 will, however, be a matter for ORR. If it were to be concluded that the existing track damage equation should be retained for CP5, we would also propose using this equation to apportion the relevant non-track variable usage costs rather than the revised 'hybrid' formula recommended by Serco.

**ATOC support the concept of moving to the proposed new hybrid formula from the start of CP5,** subject to the following requirements for clarification:

- Network Rail must publish details on how VUCs will be calculated for individual vehicle types, see comments at the beginning of this document
- Network Rail and Serco must improve the detail quality of the work undertaken to increase industry confidence in the revised track damage formula, see comments in response to question 2 and in the Appendix to this document
- Network Rail must justify use in the track damage equation of the Ct term which, to ATOC, seems to be quite inappropriate; see comments in the Appendix to this document

Should the option of remaining with the CP4 equivalent track damage equation be preferred by ORR, ATOC accept the Network Rail proposal given in the third paragraph of the question above.

### **Consultation Question 4**

Do you have any comments on the analysis in Appendix 3? What is your view on our proposal to update the existing methodology such that it incorporates a new damage

calculation methodology (comprising of separate components for grinding, RCF and wear), a coefficient of friction on the flange of 0.1 (to reflect better lubrication), sample track alignment variations of Tgamma for the trailing wheelset of a bogie?

ATOC's response is based on review of Appendix 3 – Review of Surface Damage Formula

## **Commentary on Appendix 3**

### **Section 1      Damage Cost Calculations**

**ATOC welcomes this Network Rail initiative to improve the CP4 calculation process.** ATOC acknowledges that this process is, of necessity, technically intricate and will benefit from the use of simplifying assumptions. Notwithstanding this, ATOC would like Network Rail to clarify two points:

- **Why is it necessary to introduce grinding cost?** The overall process in Appendix 3 is to determine the propensity for rail damage of different vehicle types; the damage types are limited to rcf and wear. Consideration of these damage types would seem to provide a quite legitimate basis for comparing rail damage from different vehicle types. Rail grinding is not a direct consequence of vehicle forces; it is a Network Rail response to vehicle forces. The estimation of costs would be more transparent if grinding costs were excluded.
- **Crack growth rates are very definitely not linear to a crack depth of 5mm.** This assumption might preclude a tolerably accurate assessment of the mix of rcf and wear damage which occurs on curved rails. Network Rail should justify the validity and benefits of this assumption.

### **Section 2      Friction Coefficients**

**ATOC welcome Network Rail's work in this area** and believe it to be sound. The use of more appropriate values than those used in CP4 is welcomed. However, the good work done on this subject should be supported by reference to published work which supports the Network Rail choice of friction coefficients of 0.1 on the wheel flange and 0.4 on the tread.

### **Section 3      Track Quality**

**ATOC welcome this evolution in calculating rail surface damage.**

### **Section 3      Consideration of damage from the trailing wheelset of a bogie**

**ATOC do not welcome the inclusion of this damage type** as they suspect that it is not significant relative to other types of surface damage. Network Rail should quantify the likely value of these costs in order to justify the increased complexity of the calculation process.

## Consultation Question 5

Would you like to provide any tare and laden vehicle dynamics models in order to facilitate revising an existing, or creating a new, curving class for CP5?

The consultation document seems to imply that this question is applicable to freight vehicles only. **ATOC does not possess any vehicle dynamic models and is unable to assist Network Rail in this respect.**

## Consultation Question 6

What is your view on our proposal to retain the existing equivalent structures damage equation for apportioning metallic under-bridge variable usage costs but using a modified axle load exponent of 4 rather than 4.83?

**ATOC supports this proposal.**

## Consultation Question 7

What is your view on our proposal to use the revised equivalent track damage equation for apportioning embankment, culvert and brick and masonry under-bridge variable usage costs?

**ATOC supports this proposal**, see the Appendix to this document for a more detailed comment.

## Consultation Question 8

What is your view on our proposal to apportion the 50% of signalling variable usage costs estimated to be load related using the equivalent track damage formula and the 50% of signalling variable usage costs estimated not be load related based on vehicle miles?

**ATOC will accept this proposal** but believe it is unnecessarily complicated. See the Appendix to this document for more detail.

ATOC recommend that NR urgently commission research work to understand in more detail the traffic volume and weight related degradation mechanisms for embankments, culverts, brick and masonry underbridges and signalling equipment. Such research should target delivery of supportable models and derived formulae in time for adoption in variable usage charging in CP6.

## Consultation Question 9

What is your view on the draft list of vehicle characteristics contained in the spreadsheet attached to the covering email accompanying this consultation? Do you consider that any of these should be amended (if so, please provide supporting evidence where possible)?

**ATOC has already provided feedback** on certain passenger vehicle characteristics and will urge its members to provide further feedback.

Additionally, in Appendix 4:

**ATOC do not accept the definition of Vehicle operating weight** for passenger vehicles. The definition should use just 50% (rather than 100%) of the passenger load; this is a more accurate assessment of vehicle average weight and is therefore more appropriate for use in the enhanced CP5 process.

**ATOC wish to enhance the definition of passenger vehicle maximum speed** by referring to maximum vehicle speed specified at vehicle build, maximum vehicle speed specified by the current operator, or maximum route speed, whichever is the lower.

### **Consultation Question 10**

What is your view that for existing vehicles, not subject to vehicle modification, VUC rates should be 'locked down' for CP5?

**ATOC supports this proposal**, but believe that changes to maintenance practice (eg fitment of alternative composition brake pads), or operating duty for a vehicle which involves change to either maximum vehicle speed, or average operating speeds should justify a review of VUCs within CP5.

### **Consultation Question 11**

What is your view on our revised freight operating speed estimates and the methodology used to derive them?

Would you like to provide any further information in relation to freight operating speeds?

**ATOC supports the use of consistent process to establish operating speeds for passenger and freight vehicles.** ATOC supports the methodology proposed for freight vehicles.

ATOC does not have information which would assist in establishing freight vehicle operating speeds.

### **Consultation Question 12**

What is your view on our proposal that the default approach should be that passenger operating speeds are estimated using the existing CP4 formula unless evidence, based on the timetable, that an alternative operating speed is more appropriate is provided. Would you like to provide any evidence, based on the timetable, that an alternative operating speed is more appropriate?

**ATOC is broadly supportive of this proposal.**

ATOC supports the formula proposed by Serco for passenger vehicle speed, with one slight modification. The definition of vehicle maximum speed should be set at the lower of the values (maximum vehicle speed defined at new build, maximum vehicle speed specified by the current operator, or maximum route speed); eg MkIV coaches and associated vehicles have a maximum speed of 140mph on a route with a speed limit of 125mph. ATOC do not support the constraint that review of established operating speeds be restricted solely to timetable information and that eg changes in vehicle maintenance practices are also considered

### **Consultation Question 13**

What is your view on our proposal to retain a default rate for freight vehicles and introducing a default rate for passenger vehicles in CP5?

**ATOC support this proposal.**

### **Consultation Question 14**

What is your view on our proposed default rate 'bands' and that the respective rate for each of these bands should be the highest relevant vehicle rate on the CP5 price list?

**ATOC support this proposal.**

### **Consultation Question 15**

What is your view on our proposal to adjust VUC rates during the control period in light of vehicle modifications?

**ATOC support this proposal**, but require that changes in vehicle deployment and vehicle maintenance practices which bring changes to operational speed also be eligible for such adjustment.

Additionally, **ATOC demand that Network Rail provide a process for the calculation of VUCs for modified vehicles** which:

- Is substantially more robust than the CP4 process
- Is managed in an open and transparent way, with clear version control and traceability of changes and is available on the ORR or Network Rail
- Is used by all parties e.g. ORR, Network Rail technical specialists, Network Rail billing team, train operators, RoSCos, manufacturers etc.

## Appendix to ATOC Response

### ATOC Review of “VTISM Analysis to Inform the Allocation of Variable Usage Costs to Individual Vehicles”; Issue 0.3 (DRAFT), Serco, December 2012

January 28<sup>th</sup>, 2013

#### Overview

This work identifies a simple algebraic formula to calculate the vertical track damage done by individual vehicle types; it does not calculate charges for individual vehicles. Generally, this is a sound piece of work which produces important conclusions in identifying axle load as a more important influence on vertical track damage than previously thought.

The strength of this important conclusion is undermined by shortcomings in Serco's analysis of the VTISM data to an extent which makes this work unacceptable to ATOC in its present form.

It would be helpful for Network Rail to distribute a final version of this report rather than draft 0.3.

#### Commentary

##### 3.2 Results

###### Para 2

It is not clear why results are in the range of 1 to 14 when this is the cost ratio from a nominal 20% traffic increase relative to the 100% base case. The remainder of this review assumes that this is not a significant matter.

###### Para 3, bullet 2

Serco identify the surprising result that there is less damage for some 100mph cases than equivalent cases at lower speeds; they link this to the higher standard of track construction used by Network Rail on 100+mph routes. This seems to be an entirely reasonable explanation. Serco then choose to exclude the set of VTISM results for 100mph from use in any subsequent analysis. Given the important conclusion from this work that speed is a less important driver for track damage than axle load, Serco's action is not reasonable. **ATOC cannot accept the revised track damage formula produced by Serco until this matter is clarified.**

Serco could correct their actions quite easily. VTISM does not just generate costs for future Network Rail maintenance and renewal activities. It first generates volumes of work which Network Rail must undertake (miles of track for re-laying, tamping, stone-blowing etc.). The work volumes are then multiplied by the unit cost of the work to achieve costs. An example of a unit cost would be £250,000 per km for renewing one rail.



Network Rail has told Serco that the advanced techniques used for maintenance and renewal of 100+mph track have costs which are significantly higher than techniques used on track for lower speeds. Serco should therefore use simple hand calculations, based on the two sets of unit costs (for 100+mph and for lower speed routes) and on the existing VTISM outputs for work volumes, to produce a revised set of costs for all required operating speeds, including for 100mph. This new data can then be used to define a new, complete and appropriately robust and dependable track damage function.

The additional work to generate improved VTISM data should not exceed one man day.

### **3.3 Development of a revised track damage formula**

In this section, Serco generate a revised track damage formula which does not require the Ct constant used in the CP4 track damage formula. Notwithstanding the clarity of the Serco methodology, Network Rail propose to introduce this constant into the track damage formula (section 2.2 of the main consultation document) without any justification. Inappropriate use of the Ct term will have a material and inaccurate influence on VUCs. **ATOC believe that Network Rail should eliminate the Ct term from the track damage formula unless its use can be justified relative to the Serco work.**

### **4.1 Civils variable usage costs**

#### **Para 4, iii.**

ATOC note that this paragraph is not evidence based and recommend that it should be deleted

#### **Para 5, ii, iii and iv**

ATOCs views are not well presented in these paragraphs. It would be more appropriate to say that **ATOC:**

- **Regrets that Network Rail has not done more to provide sound asset models during CP4.**
- **Believes that in the absence of sound asset models and given the low costs associated with vehicle damage to brick and masonry under-bridges, embankments and culverts, Network Rail might just as well use the track damage formula as any other calculation, and gaining some simplification in the overall calculation of VUCs.**
- **Recommend as a matter of urgency that NR action the development of sound asset degradation models for these asset classes**

These comments can also be applied to the Serco proposed process for allocation of signalling costs; section 4.2.

### **4.3 Approach to estimating vehicle operating speed**

**ATOC supports the use of a consistent method for setting passenger vehicle speeds.** Noting that in section 5.2 and Appendix 4 of the main consultation document, Network Rail propose that speed assessment for individual vehicles can be reviewed on a case by case basis, **ATOC support the formula proposed by Serco for passenger vehicle speed, with one slight modification.**

The definition of vehicle maximum speed should be set at the lower of the values (maximum vehicle speed specified at vehicle build, maximum vehicle speed specified

by the current operator or maximum route speed). MkIV coaches have a maximum speed of 140mph on a route with a speed limit of 125mph.

ATOC notes that the Serco document does not give guidance on any process for setting operating speeds for freight vehicles.