

## INNOVATIVE RUNNING GEAR SOLUTIONS FOR NEW DEPENDABLE, SUSTAINABLE, INTELLIGENT AND COMFORTABLE RAIL VEHICLES

### D5.7 Assessment results and impacts, including direct R&S impacts

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Dissemination Level		
<b>PU</b>	Public	
<b>CO</b>	Confidential, restricted under conditions set out in Model Grant Agreement	X
<b>CI</b>	Classified, information as referred to in Commission Decision 2001/844/EC	

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## PUBLISHABLE SUMMARY

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This report summarises the results of the cross-cutting impact assessment and pre-certification work stream of RUN2Rail. It contains:

- a. a description of the assessment approach followed, as a contribution to the Shift2Rail Integrated Assessment;
- b. detailed assessment (quantitative where possible) of the impacts of the thematic Work Packages;
- c. suggestions for integrations to the R&S framework;
- d. roadmap describing the "favourable impact stairway" or pathway identified during RUN2Rail;
- e. links to the supporting RUN2Rail output documents developed in the thematic Work Packages.

The quantitative analysis of economic impacts, albeit with several simplifying assumptions and approximations, suggests that the technology concepts that should receive top priority are those that bring about light-weighting. For a metro operator, even if not the infrastructure manager, the benefits in terms of passenger revenue, energy savings and wheel maintenance cost reduction could be enough for the choice to be innovation rather than business as usual. From this point of view, the single-axle running-gear concept, made possible by active suspension and steering, is extremely interesting. Novel materials such as composites, as well as novel manufacturing processes such as Additive Manufacturing allowing weight reduction of running gear components, also contribute heavily in this sense. From the condition monitoring side, in-service load/strain monitoring is interesting due to its relatively low cost and potentially high benefit in reducing unsuspended mass. From a system-wide perspective, the above is also quite favourable due to the large potential benefits in terms of track maintenance. This impacts the largest cost item for the sector which is track maintenance, but also wheel maintenance.

If the choice is the conventional bogie-vehicle, then the wheel maintenance benefits of active steering could be sufficiently high to cover the necessary investment, but this is less certain. If the track maintenance costs are included (as for a vertically integrated operator-inframanager), it is more likely that the benefits would exceed the costs.

The other condition monitoring technology concepts bring about lower order of magnitudes of benefits, but also lower implementation costs, and could be worthwhile.

The RUN2Rail virtual method for running-gear noise transmission shows potential for savings in the design phase, particularly for running tests, and will allow improved designs for interior noise with shorter times to market.

The environmental and social impacts look generally positive, desirable, and would not prevent the choice for the innovation route.