

## Chris Baker - Train Aerodynamics papers

C.J. Baker, 1984, "Fact and Friction", Modern Railways, 41, 425, 86-88

C.G. Robinson, C.J. Baker, 1990, "The effect of atmospheric turbulence on trains", Journal of Wind Engineering and Industrial Aerodynamics 34, 251-272, [http://dx.doi.org/10.1016/0167-6105\(90\)90155-6](http://dx.doi.org/10.1016/0167-6105(90)90155-6)

N.J.W. Brockie, C.J. Baker, 1990, "The aerodynamic drag of high speed trains", Journal of Wind Engineering and Industrial Aerodynamics 34, 273-290, [http://dx.doi.org/10.1016/0167-6105\(90\)90156-7](http://dx.doi.org/10.1016/0167-6105(90)90156-7)

C J Baker, S J Dalley, T Johnson, A Quinn, N G Wright, 2001, "The slipstream and wake of a high speed train", Proceedings of the Institution of Mechanical Engineers F Journal of Rail and Rapid Transit, 215, 83-99 (awarded James F Alcock Memorial Prize by Railway Division of the IMechE, 2002), <http://dx.doi.org/10.1243/0954409011531422>

Y. Ding, M Sterling, and C. J. Baker, 2008, "An alternative approach to modelling train stability in high cross winds" Proceedings of the Institute of Mechanical Engineers Part F Journal of Rail and Rapid Transport. 222.1.85-97, <http://dx.doi.org/10.1243/09544097JRRT138>

M. Sterling, C. J. Baker, S. C. Jordan, T. Johnson, 2008, A study of the slipstreams of high speed passenger trains and freight trains, Proceedings of the Institute of Mechanical Engineers Part F: Journal of Rail and Rapid Transport. 222, 177-19 (the most cited paper from JRRT in 2010), <http://dx.doi.org/10.1243/09544097JRRT133>

S. Jordan, M. Sterling, C.J. Baker, 2009, "Modelling the response of a standing person to the slipstream generated by passenger train", Proceedings of the Institute of Mechanical Engineers Part F: Journal of Rail and Rapid Transit 223, 567- 578, <http://dx.doi.org/10.1243/09544097JRRT281>

M. Sterling, C.J. Baker, A. Bouferrouk, H. O'Neil, S. Wood, E. Crosbie, 2009, "An investigation of the aerodynamic admittances and aerodynamic weighting functions of trains" Journal of Wind Engineering and Industrial Aerodynamics 97, 512-522, <http://dx.doi.org/10.1016/j.jweia.2009.07.009>

C.J.Baker, F.Cheli, A.Orellano, N.Paradot, C.Proppe, D.Rocchi, 2009, "Cross wind effects on road and rail vehicles", Vehicle Systems Dynamics 47, 8, 983-1022 (invited paper), <http://dx.doi.org/10.1080/00423110903078794>

C.J.Baker, M.Sterling, 2009, "Aerodynamic forces on multiple unit trains in cross winds" Journal of Fluids Engineering 131 101103-1, <http://dx.doi.org/10.1115/1.3222908>

C.J. Baker, 2010, "The simulation of unsteady aerodynamic cross wind forces on trains", Journal of Wind Engineering & Industrial Aerodynamics 98, 88-99, <http://dx.doi.org/10.1016/j.jweia.2009.09.006>

A.D. Quinn, M. Hayward, C.J. Baker, F. Schmid, J. Priest, W. Powrie, 2010, "A full-scale experimental and modelling study of ballast flight under high speed trains", Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit 224, 61- 74 (in the top three most downloaded papers from JRRT in 2010), <http://dx.doi.org/10.1243/09544097JRRT294>

C.J. Baker, 2010, "The flow around high speed trains" Journal of Wind Engineering and Industrial Aerodynamics 98, 277-298, <http://dx.doi.org/10.1016/j.jweia.2009.11.002>

- C.J. Baker, L. Chapman, A.D. Quinn, K. Dobney, 2010, "Climate Change and the Railway Industry". Proc. IMechE, Part C: J. Mechanical Engineering Science, 224, 519-528., <http://dx.doi.org/10.1243/09544062JMES1558>
- H. Hemida, N.Gil, C.J. Baker, 2010, "LES of the slipstream of a rotating train", ASME Journal of Fluids Engineering 132, 5, 051103-1, <http://dx.doi.org/10.1115/1.4001447>
- N. Gil, C.J. Baker, C. Roberts, 2010, "Passenger Train Slipstream Characterization Using a Rotating Rail Rig," ASME Journal of Fluids Engineering 132, 6, 061401, <http://dx.doi.org/10.1115/1.4001577>
- H. Hemida, C.J. Baker, 2010, "Large-Eddy Simulation of the flow around a freight wagon subjected to a crosswind", Computers and Fluids 39 1944–1956, <http://dx.doi.org/10.1016/j.compfluid.2010.06.026>
- C. Baker, H. Hemida, S. Iwnicki, G Xie, D. Ongaro, 2011, "The integration of cross wind forces into train dynamic modelling", Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit 225, 2, 154-164, <http://dx.doi.org/10.1177/2041301710392476>
- H Hemida, C J Baker, G Gao, 2012, "The calculation of train slipstreams using Large- Eddy Simulation", Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid 228, 1 25-36 <http://dx.doi.org/10.1177/0954409712460982>
- C J Baker, 2013, "A framework for the consideration of the effects of crosswinds on trains", Journal of Wind Engineering and Industrial Aerodynamics 123, 130–142, <http://dx.doi.org/10.1016/j.jweia.2013.09.015>,
- C J Baker, A Quinn, M Sima, L Hoefener, R Licciardello, 2013, Full-scale measurement and analysis of train slipstreams and wakes: Part 1 Ensemble averages. Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit, 228, 5, 451-467, Awarded the William Alexander Agnew Meritorious Award / Clarence Noel Goodall Award of the IMechE Railway Division 2015, <http://dx.doi.org/10.1177/0954409713485944>
- C J Baker, A Quinn, M Sima, L Hoefener, R Licciardello, 2013, Full-scale measurement and analysis of train slipstreams and wakes. Part 2 Gust analysis, Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit 228, 5. 468-480. Awarded the William Alexander Agnew Meritorious Award / Clarence Noel Goodall Award of the IMechE Railway Division 2015, <http://dx.doi.org/10.1177/0954409713488098>
- T Gilbert, C J Baker, A D Quinn, 2013, "Aerodynamic pressures around high-speed trains: the transition from unconfined to enclosed spaces", Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid 227, 6, 608-621, <http://dx.doi.org/10.1177/0954409713494947>
- T Gilbert, C J Baker, A D Quinn, 2013, "Gusts caused by high speed trains in confined spaces and tunnels", Journal of wind Engineering and Industrial Aerodynamics, Journal of Wind Engineering and Industrial Aerodynamics 121, 39–48, <http://dx.doi.org/10.1016/j.jweia.2013.07.015>
- C J Baker, S J Jordan, T Gilbert, M Sterling, A Quinn, T Johnson, J Lane, 2014, "Transient aerodynamic pressures and forces on trackside and overhead structures due to passing trains. Part 1 Model scale experiments", Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid 228 36 – 69, <http://dx.doi.org/10.1177/0954409712464859>
- C J Baker, S J Jordan, T Gilbert, M Sterling, A Quinn, T Johnson, J Lane, 2014, "Transient aerodynamic pressures and forces on trackside and overhead structures due to passing trains. Part 2 Standards applications", Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and

Rapid, 228 36 – 69, <http://dx.doi.org/10.1177/0954409712464859>

C J Baker, 2014, "Train aerodynamics – a review; Part 1 Fundamentals", Aeronautical Journal 118, 1201 <http://aerosociety.com/News/Publications/Aero-Journal/Online/1937/A-review-of-train-aerodynamics-Part-1-Fundamentals>

C J Baker, 2014, "Train aerodynamics - a review; Part 2 Applications" Aeronautical Journal 118, 1202 <http://aerosociety.com/News/Publications/Aero-Journal/Online/2056/A-review-of-train-aerodynamics-Part-2-Applications>

D Soper, C J Baker, M Sterling, 2014, "Experimental investigation of the slipstream development around a container freight train using a moving model facility", Journal of Wind Engineering and Industrial Aerodynamics 135, 105–117, <http://dx.doi.org/10.1177/0954409712464859>

F Dorigatti, M Sterling, C J Baker, A D Quinn, 2015, "Crosswind effects on the stability of a model passenger train - a comparison of static and moving experiments", Journal of Wind Engineering and Industrial Aerodynamics 138, 36-51, <http://dx.doi.org/10.1016/j.jweia.2014.11.009>

J A Morden, H Hemida, C J Baker, 2015, "Comparison of RANS and Detached Eddy Simulation Results to Wind-Tunnel Data for the Surface Pressures Upon a Class 43 High-Speed Train", ASME Journal of Fluids Engineering, 137, 4, 041108, <http://dx.doi.org/10.1115/1.4029261>

M Jesson, M Sterling, C Letchford, C Baker, 2015, "Aerodynamic Forces on the Roofs of Low-, Mid- and High-Rise Buildings Subject to Transient Winds", Journal of Wind Engineering and Industrial Aerodynamics", 143, 42-49 <http://dx.doi.org/10.1016/j.jweia.2015.04.020>

Soper D, Baker C, Sterling M (2015) An experimental investigation to assess the influence of container loading configuration on the effects of a crosswind on a container freight train, Journal of Wind Engineering and Industrial Aerodynamics, 145, 304-317, <http://dx.doi.org/10.1016/j.jweia.2015.03.002>

Zhu, C., Hemida, H., Flynn, D., Baker, C., Liang, X. & Zhou, D. (2016) Numerical simulation of the slipstream and aeroacoustic field around a High-Speed Train, Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit. <http://dx.doi:10.1177/0954409716641150>

D Soper, M Gallagher, C Baker , Quinn A (2017), A model-scale study to assess the influence of ground geometries on aerodynamic flow development around a train, Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit 231, 8, 916-933 <http://dx.doi:10.1177/0954409716648719>

D Flynn, H Hemida, C Baker (2016) On the effect of crosswinds on the slipstream of a freight train and associated effects, Journal of Wind Engineering and Industrial Aerodynamics 156, 14-28 <http://dx.doi.org/10.1016/j.jweia.2016.07.001>

D. Flynn, H. Hemida, D. Soper, C. Baker (2014) Detached-eddy simulation of the slipstream of an operational freight train, Journal of Wind Engineering and Industrial Aerodynamics 132, 1-12 <http://dx.doi.org/10.1016/j.jweia.2014.06.016>

D Soper, C Baker, A Jackson, D Milne, L Le Pen, G Watson, W Powrie (2017) Full scale measurements of train underbody flows and track forces, Journal of Wind Engineering and Industrial Aerodynamics 169, 251-264, <http://dx.doi.org/10.1016/j.jweia.2017.07.023>

D Soper, D Flynn, D, C Baker, A Jackson, H Hemida (2017) A comparison of methods to simulate the aerodynamic flow beneath a high speed train, Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit, 44 p.??

<http://dx.doi.org/10.1177/0954409717734090>

M Gallagher, J Morden, C Baker, D Soper, A Quinn, H Hemida, M Sterling (2018) Trains in crosswinds – comparison of full-scale on-train measurements, physical model tests and CFD calculations, Journal of Wind Engineering and Industrial Aerodynamics 175, 428-444  
<https://doi.org/10.1016/j.jweia.2018.03.002>

C Baker, M Sterling (2018) The calculation of train stability in tornado winds, Journal of Wind Engineering and Industrial Aerodynamics, 176, 158-165,  
<https://doi.org/10.1016/j.jweia.2018.03.022>

P Iliadis, D Soper, C Baker, H Hemida (2018) Experimental investigation of the aerodynamics of a freight train passing through a tunnel using a moving model, Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit  
<https://doi.org/10.1177/0954409718811736>

Y Noguchia, M Suzukia, C Baker, K Nakade (2019) Numerical and experimental study on the aerodynamic force coefficients of railway vehicles on an embankment in crosswind, Journal of Wind Engineering and Industrial Aerodynamics 184, 90-105, <https://doi.org/10.1016/j.jweia.2018.11.019>

C Baker (2019) Discussion of “Field study on high-speed train induced fluctuating pressure on a bridge noise barrier” by Xiong et al (2018), Journal of Wind Engineering and Industrial Aerodynamics 185, 54 <https://doi.org/10.1016/j.jweia.2018.12.014>

D Soper, C Baker (2019) A full scale experimental investigation of passenger and freight train aerodynamics, accepted for publication in Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit <https://doi.org/10.1177/0954409719844431>

P Iliadis, H Hemida, D Soper, C Baker, (2019) Numerical simulation of separated flow around a freight train passing through a tunnel using the sliding mesh technique, Proceedings of the Institution of Mechanical Engineers, Part F: Journal of Rail and Rapid Transit  
<https://doi.org/10.1177/0954409719851421>

D Soper, S Gillmeier, C Baker, T Morgan, L Vojnovic, (2019) “Aerodynamic forces on railway acoustic barriers”, Journal of Wind Engineering and Industrial Aerodynamics 19, 266-278  
<https://doi.org/10.1016/j.jweia.2019.06.009>

P.A. Montenegro, R. Heleno, H. Carvalho, R. Calçada, C.J. Baker (2020) A comparative study on the running safety of trains subjected to crosswinds simulated with different wind models, Journal of Wind Engineering and Industrial Aerodynamics 207, 104398,  
<https://doi.org/10.1016/j.jweia.2020.104398>

Glover A, Sturt R, May R, Baker, C, Hunt M (2023) “An automated digital method for the assessment of crosswind safety for the HS2 route”, PWI Journal, 141. Winner of HS2 Learning Legacy Technical Paper Prize, Institution of Civil Engineers 2021 and PWI Arthur Maber Journal Award 2023

R.Heleno, P.A.Montenegro, H.Carvalho, D.Ribeiro, R.Calcada, C.J.Baker (2021) “Influence of the railway vehicle properties in the running safety against crosswinds”, Journal of Wind Engineering and Industrial Aerodynamics 104732, <https://doi.org/10.1016/j.jweia.2021.104732>

A Pistol, M Sterling, C Baker (2026) “An analytical downburst model and its application to a moving train wind loading”, Advances in Wind Engineering <https://doi.org/10.1016/j.awe.2026.100100>