

The flip side of salting winter roads

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Swedish scientists have studied models to help road and bridge maintenance engineers work out how much damage salting the roads in winter might cause to steel-reinforced concrete structures.

As the winter draws in road safety becomes paramount especially in northern climes where icy roads are a perennial problem for motorists. Gritting and salting the roads can help reduce [road traffic accidents](#) but the use of salt, which contains chloride, comes at a price. Corrosive [chloride ions](#) can penetrate into porous concrete and reach the metal reinforcements within, leading to corrosion after months or years of use.

Luping Tang of the Department of Civil and Environmental Engineering, at Chalmers University of Technology, in Gothenburg, Sweden and his colleague Dr Anders Lindvall of the Central Laboratory, at Thomas Concrete Group AB also in Gothenburg, have looked at the effects of exposure to road salt de-icing over a 10 year and a 25-30 year service period in [computer simulations](#) of chloride ingress into concrete structures. The models simulate heavy traffic moving at speed over such structures.

Writing in the *International Journal of Structural Engineering*, the team explains that, "Chloride induced corrosion of reinforcement in concrete is still one of the main concerns regarding durability and service life of reinforced concrete structures. Prediction of chloride ingress in concrete is one of the important parts in durability design of reinforced concrete structures exposed to the chloride environments."

Of the two models tested, DuraCrete and ClinConc, the latter is valid against the field data from real concrete road bridges tested after 25-30 years of exposure to salting the team says, while the former is adequate for predicting the corrosive effects of chloride after a ten-year period. The study will not only inform those assessing existing reinforced [road](#) and bridge structures but should

allow design engineers to take into account the needs of such structures during the winter months and ensure that they find ways to reduce or even avoid potentially damaging [chloride](#) ingress.

More information: "Validation of models for prediction of chloride ingress in concrete exposed in de-icing salt road environment" in *Int. J. Structural Engineering*, 2013, 4, 86-99

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