

# 1 Tackling the challenges of climate change on roads and road asset management

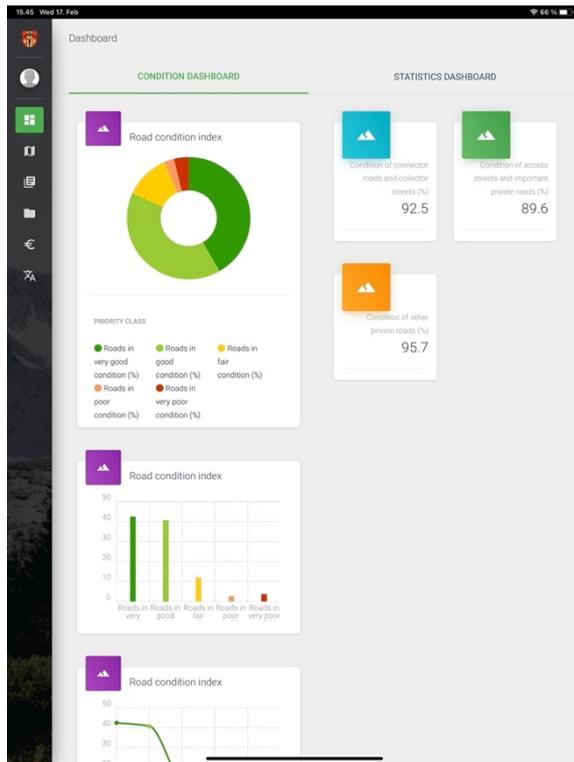
It is estimated that heavy precipitation will increase over 20 percent over the next 80 years. This will create enormous challenges for roads and their assets. Management of road assets will become crucial in order to keep the roads good condition for the users. Risks include road inundation and loss of accessibility, deterioration and increased deterioration speed of the base layer, washout of the wearing course of the unpaved roads, increased pavement distresses, blockage and breaking of culverts and bridges due to debris, erosion of the roadside drainages. These can affect the road massively and if they are not going to be addressed, the cost of rehabilitation and other maintenance works will become unbearable for societies.



SirWay's web-based Road Asset Management System makes use of automatically detected defects on the roads and streets. The system creates automatically rehabilitation, periodic and routine maintenance plans that are user modifiable. Multiple users within the organisation can participate in the planning process. The plans are based on real data in a systematic manner and transparent criteria. The annually collected data is easily available throughout the organisation and beyond facilitating thus data management. Besides the regular maintenance works, the flood risk is taken into consideration. The flood risk on the road and street network is modelled with climate change scenarios taken into consideration and the best suitable mitigation methods proposed on the network. The benefits are more resilient infrastructure with time and cost savings.

Data collection is crucial for this kind of solution to work, and we have identified the required data. Historical precipitation, Digital Elevation Model, land use, soil type, culvert inventory, road inventory, surface types, International Roughness Index, Pavement Distress Inventory, bearing capacity and unit costs for road works.

Climate change and climate risks and especially flooding risk should be taken into consideration in planning for mitigation methods. The mitigation works include culvert repair and construction, erosion control and repair of the side drainages, construction and repair of the retaining walls, paving of the unpaved roads, stabilisation of the base layer, heightening the road centreline, construction of Irish crossings and construction of water basins. Mitigation requires identification of the vulnerable areas and prioritisation of the works to fit in the budgets.



Combination of Sirway’s Road Asset Management System and flood risk modelling would be an exceptional tool for tackling the possible effects of climate change on roads and road assets. This could be applied to other consequences of climate change as well, like erosion and raising of minimum and maximum temperatures. With the right data, the opportunities are endless and similar solutions can be applied to other infrastructure as well.

With the right effort and together, we can help all parts of our society to face the inevitable consequences of climate change. Our solution tackles some of the most hazardous ones our roads, one of the most critical infrastructures we have, are going to face.

