



# A Carbon-First Approach to Road Financing

## Unlocking Climate Finance through Digital Material Intelligence

Target: Multilateral Development Banks, Transport Authorities and Road Agencies

### Executive Summary

Road authorities globally face a dual crisis: A massive maintenance backlog that **accelerates greenhouse gas emissions and project costs**, coupled with limited fiscal space to meet ambitious climate commitments. Traditional road maintenance is viewed as a cost centre; the lack of verifiable data prevents monetising its significant carbon-reduction potential.

ORIS proposes a Sustainable Financing Mechanism (SFM) that transforms road maintenance into a source of revenue. By leveraging a digital platform to systematically quantify carbon reductions from optimised materials and circular maintenance practices, ORIS creates a credible pathway to unlock climate finance and carbon credits under Article 6.2 of the Paris Agreement.

### The Challenges

- 👉 **The Funding Gap:** Insufficient traditional funding leads to deferred maintenance, resulting in rehabilitation projects that are significantly more expensive and strain national budgets.
- 👉 **Unmonetised Environmental Value:** Improved infrastructure has huge potential to reduce carbon emissions, but without standardised, verifiable measurement, this value cannot be converted into financial assets such as carbon credits.
- 👉 **Barriers to Innovation:** High initial costs make it difficult for agencies to justify investing in low-carbon materials without a clear, data-driven financial return.

### The ORIS Solution: A Phased Digital Roadmap

#### 01. Carbon Quantification & Baseline

Rapid pilot on a selected corridor: digitise road designs and calculate a precise lifecycle carbon footprint. This verifiable data foundation builds the business case for the SFM.

#### 02. Systematic Assessment & Optimisation

Standardised CO<sub>2</sub> assessment across the full project pipeline. Engineers model scenarios to optimise material choices, maximising carbon reductions while lowering lifecycle costs.

#### 03. Monetisation via Carbon Markets

Robust, third-party verifiable data enables the issuance of carbon credits under Article 6.2. A cyclical revenue stream where maintenance effectively funds itself through its positive climate impact.





## Key Benefits & Quantifiable Impact

### **Unlock New Revenue Streams**

Access international carbon markets to directly fund maintenance activities and reduce the fiscal burden on governments.

### **Up to 50% Embodied Carbon Reduction**

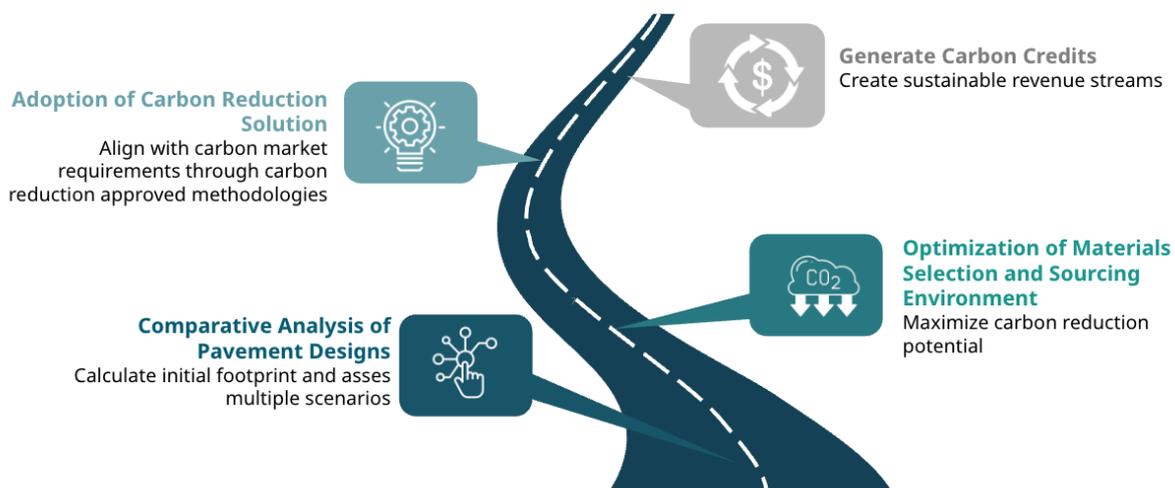
Digital material optimisation significantly reduces the embodied carbon of infrastructure projects relative to the baseline.

### **Improved Project Bankability**

High-fidelity verifiable data meets MDB due diligence requirements and strengthens PPP financing structures.

### **NDC Progress & Climate Resilience**

Reduced vehicle operating costs and emissions directly support National Determined Contributions and long-term climate targets.



*Pathways for Carbon Reduction in Transport Infrastructure*

## Conclusion

As carbon credit mechanisms under Article 6.2 of the Paris Agreement gain global traction, infrastructure must be prepared to leverage these opportunities. The essential first step is robust, transparent measurement; without it, monetisation is impossible.

We propose launching a targeted, low-cost pilot project (typically a 10–30km section) to serve as a real-world testbed. This will provide a validated, data-driven model for a scalable, self-sustaining road maintenance ecosystem applicable to any MDB portfolio.

### **Future Outlook: Building Climate Resilience**

In addition to its carbon optimisation and financing focus, ORIS also offers comprehensive Climate Resilience Assessments. The same system used to analyse a material’s carbon footprint can be leveraged to conduct Climate Risk and Vulnerability Assessments (CRVA), assessing how materials and designs will perform under hazards such as extreme heat and flooding. To learn more about our resilience capabilities, please refer to our dedicated Resilience materials or speak directly with our technical experts.

