Pavement Engineering & Asset Management

Meeting the requirements of our existing & future diverse road networks
Jean Lefebvre (UK) are able to provide analysis and expertise to assist in the design and maintenance of pavement structures to develop a robust long-term asset management approach of network and local level carriageway and footway assets, whilst taking into account contributing technical, commercial, operational and sustainable factors.

Our teams of Pavement Engineering and Asset Management specialists are able to provide solutions that meet the aims and needs of our clients through our knowledge of both business environments and the specifications that affect them. Our support services include:

- Pavement evaluation and investigation
- Pavement and maintenance design
- The provision of innovative solutions and material design
- Whole-life cycle analysis and asset management
- Systems and data management
- Asset register and highways asset management plans

We provide a single point of contact for managing the pavement design while our teams of design engineers ensure that cost-effective and sustainable solutions are designed to meet your needs. Throughout the design process, our engineers combine specialist skills with operational expertise to deliver the benefits of Early Contractor Involvement. This provides the innovative pavement solutions which unite design and cutting-edge construction technologies with an understanding of the need for longer-term investment and maintenance issues.

PAVEMENT INVESTIGATION AND EVALUATION

A key area of our team’s expertise is the investigation and evaluation of the existing pavement structures to establish the current condition of the pavement, the future performance and/or the failure mechanism. We develop a bespoke pavement investigation strategy to suit our client’s requirements along with the nature of the pavement structure. Part of this process includes a thorough investigation to evaluate the historic and existing pavement information. Jean Lefebvre (UK) utilise our in-house teams to conduct and commission a range of field and laboratory testing:

- Visual inspection and video surveys
- Coring - assessment of the pavement thickness and material conditions
- Ground Penetrating Radar surveys - pavement thickness
- Falling Weight Deflectometer testing - structural assessment, back analysis and load transfer efficiency
- Light-Weight Deflectometer (LWD), plate bearing analysis and dynamic cone penetrometer - foundation assessment
- Trial hole logging and material extraction

PAVEMENT DESIGN

Pavement engineering relates to the design and maintenance of pavement structures; Jean Lefebvre (UK) has extensive experience in undertaking standard and analytical pavement designs; both internationally and in the UK on all categories of structures, including carriageways, footways, airfields, ports and other industrial pavements.

By assessing current and projected traffic volumes, site constraints and existing pavement conditions, we can prepare pavement specifications which conform to appropriate guidance standards whilst incorporating best practice along with sustainable and innovative solutions.

Our design service utilises the Alize pavement design software which accurately models the actual pavement characteristics to provide an optimised design with the lowest whole life cost by using parameters specific to the pavement structure in question. The software can be used on both new construction and rehabilitation projects. Value management is key to our design approach; this ensures the solution developed meets our client’s aspirations.

Our engineers combine specialist skills with operational judgement and experience to deliver the benefits of Early Contractor Involvement.
ALIZE

Alize is a comprehensive and powerful pavement analysis and design software developed by the French Institute of Science and Technology for Transport (IFSTTAR). The software can be utilised for all types of pavement structures on both rehabilitation and new construction projects.

The software implements a rational method for mechanical design, which uses a multi-layer linear elastic model to calculate stresses and strains induced by the proposed traffic loading. Fatigue and deformation criterion can then be applied to establish the pavement life.

Alize permits each parameter within the pavement design to be customised, creating a bespoke design which is more accurate and applicable. This optimised design approach will also deliver the lowest whole life cost solution.

The software also has a number of unique functions which permit the user to model:

• Conductivity and frost susceptibility of the pavement foundation
• Back calculate deflection basins generated by FWD

JEAN LEBEBVRE (UK) CAN PROVIDE INDEPENDENT TECHNICAL ADVICE TO ENSURE THAT PAVEMENT AND MATERIAL SPECIFICATIONS PROVIDE A HIGH PERFORMANCE SOLUTION.
Whole Life Modelling

Condition and treatment strategies can be processed through our in-house developed Asset Optioneering Model (AOM). This model can be used to provide an indicative life cycle expenditure profile along with estimated intervention levels at network and road section level. Deterioration models for the asset can also be developed and implemented within the model and whole life cost analysis.

Implementation

Our teams can assist in the implementation and development of carriageway and footway work programmes in-line with specific plans and strategies.

POLICY AND STRATEGY

Jean Lefebvre (UK) can support in the review, development and delivery of network level asset management based strategies. This can comprise of Highway Asset Management Plans (HAMPs) and skid resistance policies which conform to the requirements of ISO 55000.

We are able to aid in the achievement of performance requirements through;

- Identification of key performance targets
- Development of asset management strategies with integrated requirements
- Analysis of network survey data
- Current and projected target reporting

By utilising network condition data, we are able to predict the amount of work/cost to upgrade or maintain the asset.

PLANNING

Planning is essential in delivering a successful asset management strategy. Jean Lefebvre (UK) can provide expertise and advice in several key areas of this process.

Network Surveys

Our experienced team can advise on appropriate survey types along with analysing network level survey data to obtain an accurate understanding of the network condition. This is crucial in developing accurate long-term expenditure profiles to ensure the desired performance levels are maintained across the asset alongside achievable financial savings.

To assist this process, a full understanding of network level surveys and data is required; this includes:

- Surface Condition Assessment for the National Network of Roads (SCANNER)
- Sideways-force Coefficient Investigation Machine (_SCRIM)
- Walked surveys - Detailed Visual Inspections (DVI), Footway Network Surveys (FNS)

Treatment Solution Development

Combined with their knowledge and experience of pavement engineering, our team can develop treatment solutions tailored to the network, taking into account factors such as:

- Budgetary constraints
- Construction types
- Policies and strategies
- Sustainability
- Innovation

Asset Management

Jean Lefebvre (UK) can provide independent technical advice to ensure that pavement and material specifications provide a high performance durable solution.

The Asset Optioneering Model (AOM) is a computer model developed by Jean Lefebvre (JLUK). AOM is a unique options-based tool, which models highway asset management treatments by applying financial, commercial and technical criteria.

The ‘rules’ within the model are consistent with industry recognised sources such as TRL, ADEPT, RSTA, CIPFA and UKPMS. Independent surveys of the network have been used to ensure the right solution is selected.

AOM gives us the ability to tailor asset management and treatment choices in response to changes in budget, political or geographical priorities and results of condition reports. This provides decision makers with a powerful tool in justifying funding requirements and treatment choices. This model supports prioritisation of asset management and treatment decisions, and the effects that treatments and material choices have on future condition and expenditure.

OUR TEAMS CAN ASSIST IN THE IMPLEMENTATION AND DEVELOPMENT OF CARRIAGEWAY AND FOOTWAY WORK PROGRAMMES IN-LINE WITH SPECIFIC PLANS AND STRATEGIES.