

Accelerated Loading Facility

About ARRB:

ARRB Group Ltd (ARRB) provides research, consulting and information services to the road and transport industry. ARRB applies research outcomes to develop equipment that collects road and traffic information and software that assists with decision making across road networks. ARRB is the leading provider of road research and best practice workshops in Australia.

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Accelerated Loading Facility

The Accelerated Loading Facility (ALF) is used to simulate heavy vehicle trafficking on pavement structures under controlled conditions.

The ALF allows pavements to be tested and for their performance to be evaluated in a very short time compared with test sites under normal traffic.

The ALF uses a directly driven load trolley to apply rolling wheel loads in a single direction to pavement strips, at a nominal speed, using a constant mass.

The load is applied to the pavement through a load assembly trolley which consists of a standard heavy-vehicle trailer hub, supporting a load trolley chassis and weight bed. This trolley chassis tracks linearly, guided by rails mounted on the ALF main frame, and is driven directly, by a single 22kW motor rotating the wheel hub. The wheel is lifted off the pavement at the end of each cycle and supported by the main frame on its return.

By loading in a single direction only, the ALF is able to simulate real-world trafficking conditions and conserve the majority of its kinetic energy, via the rising curvature of the rails at each end. The input energy required is only to overcome rolling resistance, grade and crossfall and to lift the load wheels once per cycle.

The ALF control system provides a programmable automatic transfer movement to simulate normal traffic wander across a typical wheel path width.

The original ALF was developed in Australia by the Roads and Traffic Authority of New South Wales. A number of long term pavement performance (LTPP) studies have verified ALF results against pavement performance under real traffic and environmental conditions. The Australian ALF has been used for more than 250 experiments over 25 years, applying over 32 million load passes and simulating well over 300 million Equivalent Standard Axle loads.

Applications

- Rank relative performance of materials or processes
- Investigate parameters used in pavement design
- Provide support for road construction activities such as full scale proof testing
- Assist with development of network deterioration models
- Enhance full scale long term monitoring studies
- Building capacity and expertise



Features

- Designed for energy conservation, high reliability and productivity
- 12 m test pavement length
- Low noise operation (approx 85 dB)
- Process Logic Controller (PLC) with PC interface incorporating wireless control and access via LAN and remote internet based control/monitoring
- Uni-directional, linear pavement loading through swingarm mounted, sprung and damped road wheels
- Over 25 years of operational experience, including verification of ALF results against Long Term Pavement Performance (LTPP) studies
- Pavement heating system for maintaining pavement temperature during testing of temperature sensitive materials
- State-of-the-art transverse surface profile measurement system for assessment of pavement deformation and rutting, as well as surface texture measurement
- Low operation, maintenance and overhead costs
- Ability to vary load in 10 kN increments from 40 kN to 90 kN
- Ability to undertake FWD testing without moving the ALF off the test pavement
- Self propelled jockey wheels allow for easy on-site movement
- User configurable ability to simulate the transverse wander of heavy vehicle traffic loading
- ALF can be moved between distant sites by a prime mover and a steerable rear bogie axle

