

WEBINAR - *The Bikelabs Measurement Bicycle*

How to go from in-lab to in-field bicycle testing and monitoring

Imagine bicycle testing where the bicycle is telling you how it feels. Moreover, imagine bicycle riding where the bicycle is reflecting you how it feels. Testing of bicycles comes in a few nicely worked out practices. All organized presently relying on in-lab application of mechanical forces on professional test equipment, a connection with what happens in-field is backed already for decades on insights in building strong, descent and performing mechanics that always have survived.

Recent research has revealed that the current state of the local or regional roads in Belgium has an impact on bicycle comfort, bicycle strength and behavior (material strength, material deformation, vibration propagation, ...) due to the high exposure to a spectrum of events. But not only the local road condition, also the way bicycles are used may imply dramatic events that impact structural health of the bicycle. In the bicycle industry and market, signals are revealed that steps need to be taken in the direction of mapping the behavior of the bicycle on e.g. the wide variety of road surface profiles, by linking it to the propagation of amplitudes and frequencies of forces to which the bicycle may be subject to. On the one hand, this should lead to the design of more targeted bicycle tests in bicycle test centers, whereby circumstances of bicycle use may be recorded in so-called user profiles. On the other hand, an intelligent, closer-to-use monitoring system is envisaged, in which the history of use of the bicycle is monitored, e.g. as part of damage analysis or warranty provisions for legitimate use or not ... Or how the way a bicycle is used impacts its structural design and health. These aspects can be relevant to play its role in share bicycle platforms and cargo bicycle robustness, but also in specific designs of regular bicycles, e-bikes...

In a first webinar, we will expose a demonstrator case on how data acquisition and extraction from in-field testing can be linked to application of representative forces. Bikelabs has taken steps to perform pioneering work in making the translation of forces and force effects in function of the conditions of use of the bicycle. The *measurement bicycle* concept will be introduced, whereby accelerations and vibrations at critical places of interaction on the bicycle (for example the front fork, handlebar, bottom bracket, saddle, etc.) on the one hand are linked to the forces associated with it, that are measured by means of combinations of accelerometers, vibration sensors and force sensors. Sent through a datalogger, this data can be meaningfully linked to conditions of use depending on the road type (surface condition, impact events), but also driving parameters such as speed, mass, ...

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At Bikelabs International we measure the bicycle.

