Current research studies relationship between Falling Weight Deflectometer (FWD) deflection basin parameters and road pavement structural condition indicators, such as fatigue cracking and permanent deformations induced low bearing capacity of pavement, and pavement equivalent E-modulus. The primary aim of the research was to develop limit values for deflection basin parameters: surface curvature index (SCI), base damage index (BDI) and base curvature index (BCI).

Analyses of data (in all 29790 100 m sections) derived from the Estonian Road Databank disproved the hypothesis of relationship between deflection basin parameters and defects or rutting (Fig. 1). Main reason for that is the difference between data collection principles: FWD measurements are performed only once per every 100 meters and the measurement represents only the condition of the pavement at this exact point, but other condition indicators are collected from all length of the 100 m sections.

Deflection basin parameters and back-calculated pavement equivalent modulus (based on data of 37936 100 m sections) were found to be in good correlation. Strong relationships were found usually between upper layers indicators (SCI and BDI) and pavement equivalent E-modulus ($E_{eq}$) (Fig. 2). Relationship between subgrade indicator BCI and $E_{eq}$, found in the research, was not very strong. Analyses confirm that poor condition of Estonian road pavements is due to weak subbases and subgrades.
Based on the aforementioned relationships, and the required minimum equivalent modulus of particular pavement, the equations to determine the limit values of deflection basin parameters for different types of pavements were developed (Fig. 3). Initially, deflection basin parameters limit values, developed in this research, can be used for pavement condition assessment in network level, but to use them in project level further research will be needed.