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ABSTRACT A feasibility test of the multichannel approach to seismic investigation of a pavement system is described. This test followed the procedure normally taken in the multichannel analysis of surface waves (MASW) method by using geophones and a light (8-oz) hammer source. A wavefield transformation of recorded multichannel data shows a strong fundamental-mode dispersion curve image in the frequency range of 30-600 Hz with normal (30-50 Hz) and reverse (50-600 Hz) trends. However, the transformation shows that this fundamental mode disappears quite abruptly and higher modes start to dominate in the higher frequencies up to 2000 Hz. Simultaneous recording of both vertical and horizontal components of seismic wavefields facilitates identification of seismic events. In order to record the horizontally travelling direct (or possibly guided) P-wave event in the uppermost layer, it seems critical to use horizontal phones with longitudinal orientation. Results of test indicate that for an investigation focused into the uppermost layers of a pavement system it is essential to use a different acquisition system that can handle much higher (> 2000 Hz) frequencies. In addition, complicated and unique elastic properties of pavement systems call for an inter-disciplinary study to develop an effective multichannel seismic method for this area of application.