Modern asset management pursues maximum asset usage through extending the functional lifespan of the assets. The engineering solution to achieve this goal is condition-based maintenance (CBM), which uses a system engineering approach to collect data, enable analysis, and support the decision-making process. Different from corrective maintenance, which is triggered by a failure event, and preventive maintenance, which follows a strict time schedule, condition-based maintenance is performed based on systems’ condition. The foundation of a general CBM system is condition monitoring, which consists of data acquisition, signal processing, and state detection. With further fault diagnosis process and prognosis of remaining useful life (RUL), maintenance recommendations can be made based on all the gathered information. This presentation describes the condition assessment of aircraft structures and civil infrastructure (e.g. water pipes). For aircraft structures, the topics include multi-modal nondestructive inspection (NDI) for corrosion quantification in aircraft lap joints, enhanced visual inspection for surface deformation, and advanced sensor technologies for structural health monitoring (SHM). For the condition assessment of water pipes, both direct and indirect methods are presented. In the subject of direct method, the assessments with impact test, CCTV (closed-circuit television) inspection, thermography, laser scan, and computed tomography are described. In the category of indirect method, data mining approaches are employed to analyze pipe performance and predict deterioration process through soil properties. Finally, how to incorporate the efforts of condition monitoring into the condition-based maintenance is discussed. Multidisciplinary problem-focused research in CBM is foreseen for maintenance of aircraft and management of civil infrastructure.