

SENIORS

SAFETY ENHANCED INNOVATIONS FOR OLDER ROAD USERS

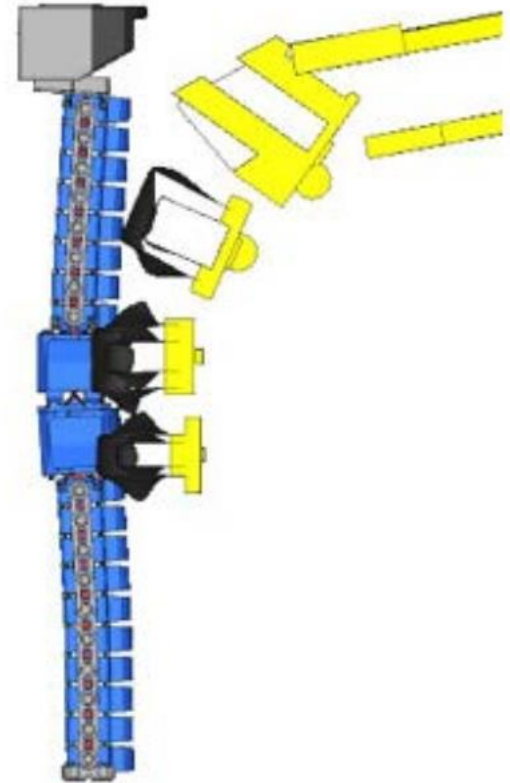
FlexPLI with Upper Body Mass

Transport Research Arena 2018, Vienna

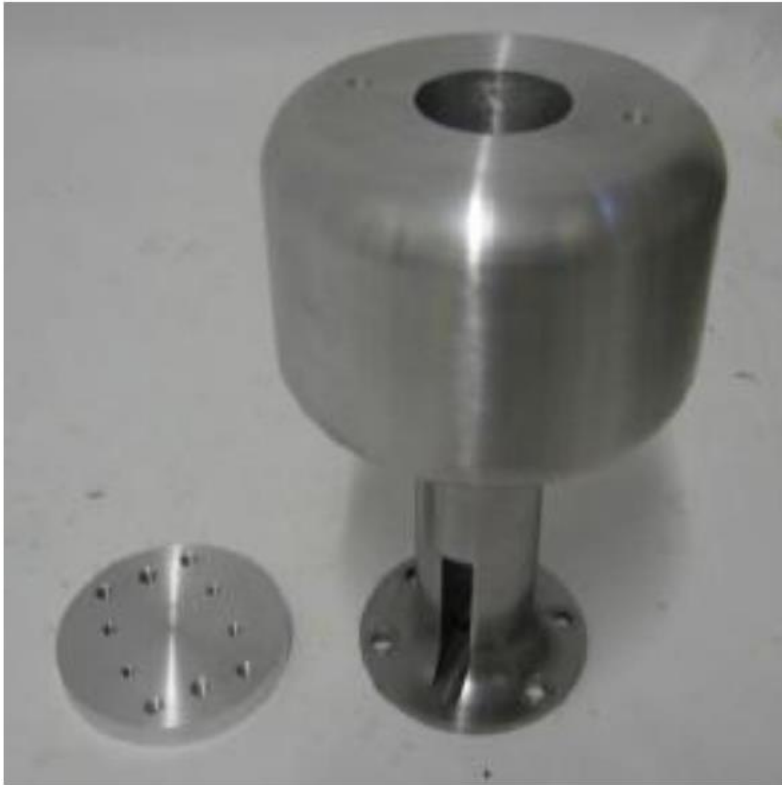
- Motivation for an Upper Body Mass
- Work process for test tool development
- Design and manufacture
- Testing and FE development
- Summary



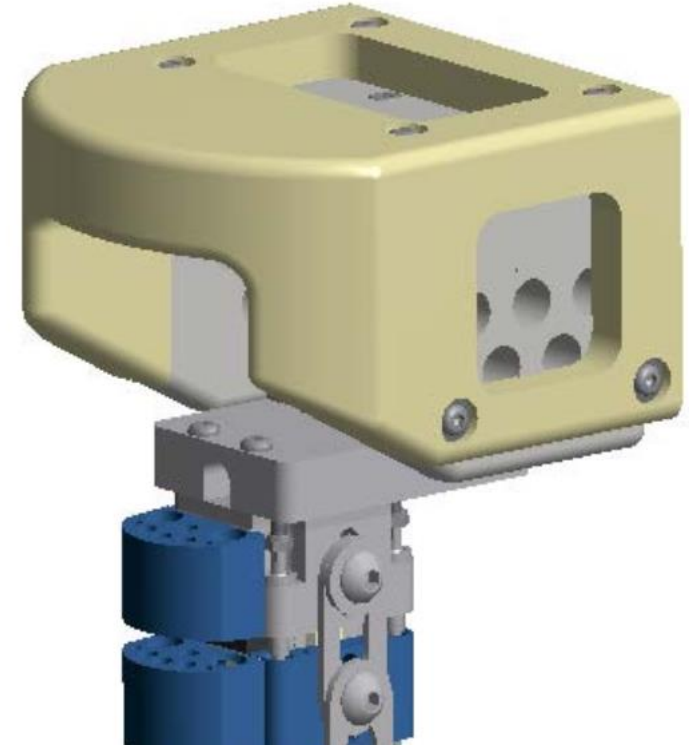
- On high bumper vehicles the lower leg loading cannot be accurately evaluated due to a lack of an Upper Body Mass (UBM)
- An isolated leg tool like FlexPLI has lower outputs especially for the femur with high bumper vehicles
- Kinematics is also more humalike with an UBM
- Tool must assess all vehicles regardless of bumper height



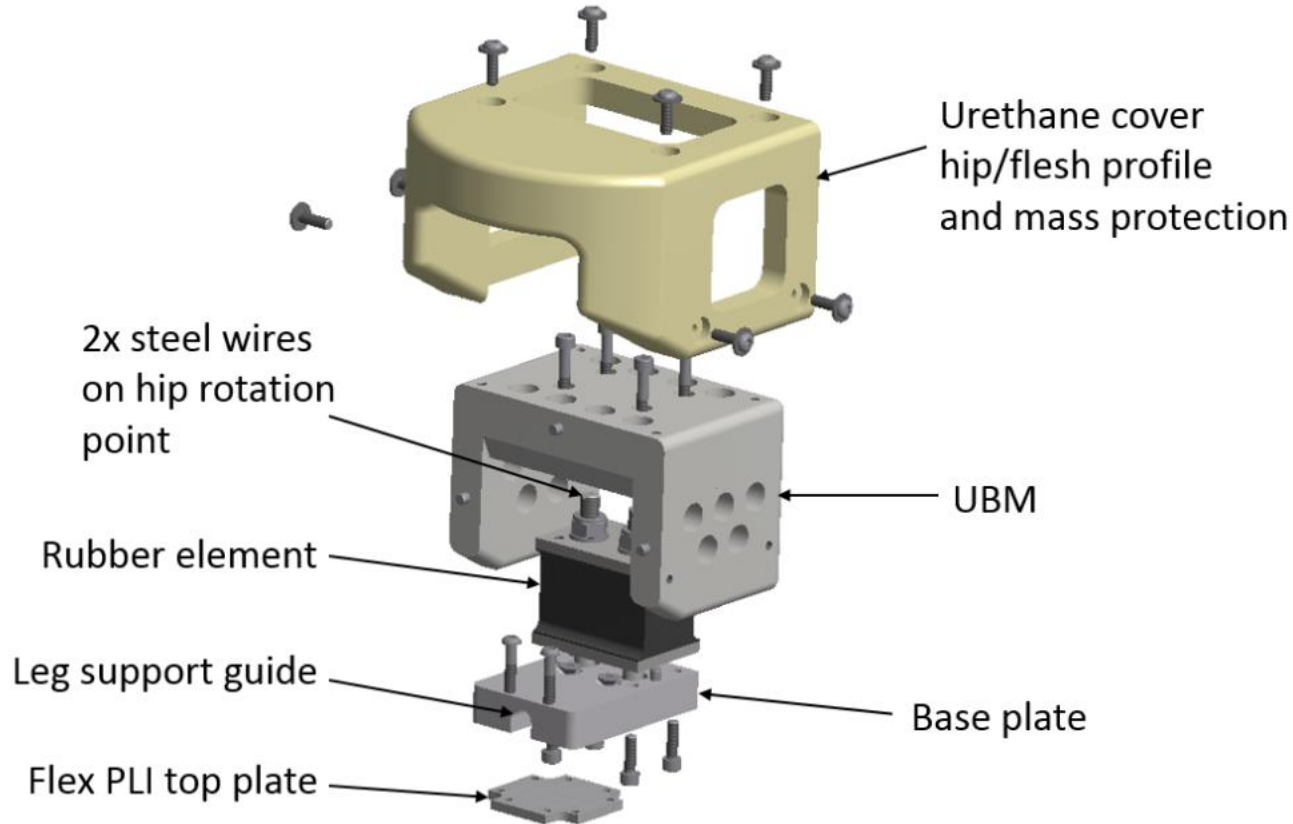
- An UBM was developed in the EU project APROSYS in 2009 . This was a rigidly connected mass of 6 Kg attached to the top of a FlexPLI
- Good results were obtained with this design so in SENIORS the APROSYS design and a new flexible design was developed to try and make the tool more humanlike.
- The intention was to create hip joint rotation and generate a time lag seen in Human body models. The same mass value was used as the APROSYS design as that had provided promising results



APROSYS Rigid mass design



SENIORS Flexible element design
shown attached to FlexPLI



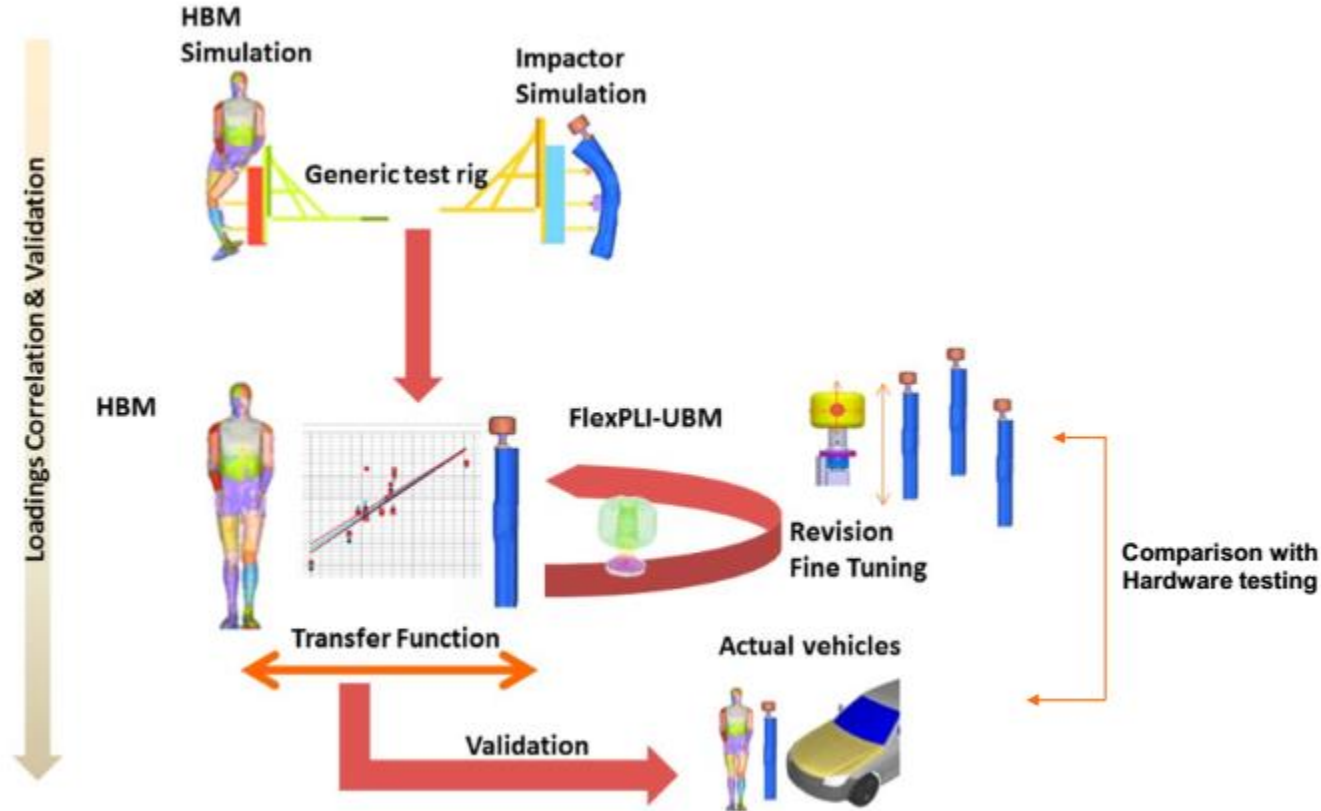
- Along with hardware testing essential FE testing was also carried out in SENIORS. A model was developed to assess various vehicle front ends and compared to Human Body Models (HBM) for validation. Results from this work will be published in SENIORS reports with public access.
- Hardware tests were carried out and results will be published later in the project

Picture of first launch showing
stable flight

www.seniors-project.eu



Work flow process for test tool FE development



- Currently in Regulation R129 only tibia moments and MCL, ACL and PCL knee ligaments are assessed for injury with FlexPLI with the introduction of an UBM femur injuries can also be assessed. New injury criteria will be proposed in the project reports
- The FlexPLI with upper body mass showed improvement to kinematics and biofidelity, also corner bumper rotation was significantly reduced with the addition of the upper body mass
- By adding a UBM to a standard product this creates a new test tool that is easy to implement.

Partners



For further information:



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