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**PISa**

**Powered Two Wheeler Integrated safety**

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<b>Dissemination level</b>	<b>The full deliverable report is RESTRICTED to the PISa Consortium and the Commission Services</b>
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## Executive Summary

Earlier stages of PISa work package 2 have described the derivation and prioritisation of functional requirements for advanced and integrated safety systems in order to mitigate or avoid Powered Two-Wheeler (PTW) accidents. This initial benefit estimate uses the outputs from this prioritisation process to assess the 'target population' benefit attributable to each of the systems; the target population is the number of annual casualties which may be influenced by the system.

The target population benefit assumes that the systems are 100% effective, and as such, this value provides the maximum potential benefit for each system. The potential benefit was calculated for European PTW casualties based on those systems that were predicted to have any level of influence on the accident, and those in which the system was predicted to have a significant influence on the accident. This analysis was also repeated for Great Britain, since it was known that the distribution of PTW bike styles is different to that in Europe.

Using values for the estimated number of annual PTW fatal, serious and slight casualties for Europe and Great Britain a series of calculations were made to derive estimates regarding the distribution of the severity classes by APROSYS accident scenario and the percentage of accident cases in each APROSYS scenario the system was predicted to provide a benefit. Combining these values and applying them to annual casualty numbers resulted in the target population. Monetary values were then assigned to these numbers of casualties to provide an annual casualty benefit for each system. This analysis revealed that for Europe, the priority order of systems in terms of benefit was nearly identical to the priority order proposed in the combined deliverable D13 & D14 Report summarising the selection and prioritisation of integrated safety system solutions.

The analysis of data from Great Britain exhibited expected differences when compared with European accidents. This is due to the different bike type distribution and hence the difference in use and accident circumstances. For Great Britain, the systems selected fit well to the proposed systems, with the top five priorities covered. For those accidents which the system was predicted to make a significant difference, the selection of systems fits less well, although the two main priorities are addressed.

It should be noted that significant assumptions were made in the methodology that have not been validated. The largest of these assumptions is that the in-depth accidents taken as a sample of each APROSYS accident scenario were representative of European or national accidents. However, this and other assumptions were necessary to produce the best possible benefit assessment to validate the selection of systems for development within the PISa project. A more refined benefit estimate is planned for later in the PISa project in which realistic assessments of the effectiveness of the systems will also be incorporated.

The results of this benefit assessment confirm that the systems proposed to be taken forward by the PISa project are, in the light of the available information, appropriate in terms of the target population benefit. In conclusion, the systems taken forward by the PISa project are:

- Slow/stop PTW (autonomous braking)
- PTW to detect other vehicle and provide warning (forward collision warning)
- Brake Assist - EBS (enhanced braking system)
- ABS (anti-lock braking system)
- Brake Assist - CBS (combined braking system/linked brakes)
- ACC (adaptive cruise control)
- Special Fairings on PTW (improve PTW conspicuity with special fairings)