

Motorcycle ASV Charts Outstanding Progress ~ Vehicle -to-Vehicle Communications Destined to Prevent Accidents ~

The Third Advanced Safety Vehicle (ASV) Project, an effort promoted by Japan's 14 automobile and motorcycle manufacturers, experts, the Ministry of Land, Infrastructure and Transport, and other governmental bodies concluded on March 31.

The ASV Project is a five-year plan first launched from fiscal year 1991, with the aim of using electronics and other new technologies to achieve broad reductions in traffic accidents. The third project in this series (FY2001-05) has been positioned to mobilize the technology compiled during the first plan (FY1991-95) and second plan (FY1996-00) to address key themes – notably, the application of vehicle-to-vehicle (V2V) communication technology.

Background for Development of V2V Communications

Statistics on road accident fatalities in Japan indicate that the number of road deaths occurring while operating or riding on motorcycles account for 18 percent of the total (see Figure 1). Examining how fatal accidents involving motorcycles occur, some 63 percent of these mishaps result from collisions between motorcycles and automobiles (Figure 2). Such motorcycle-automobile accidents, meanwhile, occur mainly when making right turns at intersections or in “encounter accidents” (when vehicles run into each other). Exploring the causes of these accidents, over 90 percent result from failure of automobile drivers (first party to the accident) to recognize motorcycles on the road (Figure 3). While not expressed in the statistics, another possible factor is similar mistaken perceptions on the part of motorcycle riders (second party to the accident).

Fig.1: Fatal Accidents by Category

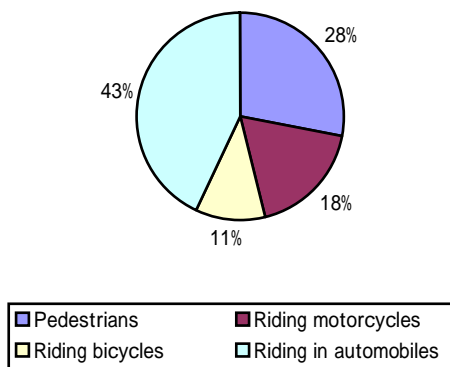


Fig.2: Motorcycle Accident Objects

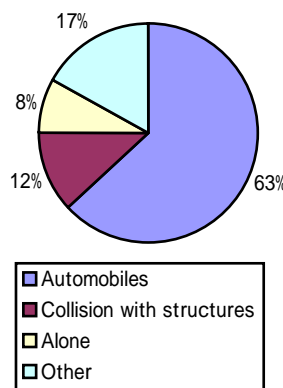
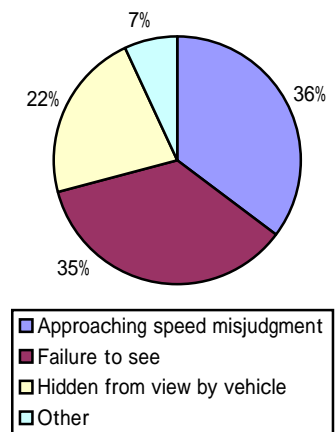


Fig.3: First Party to Accident Cause



Source: Honda R&D Co., Ltd.

Based on this data, the conclusion is that if steps could be taken to convey in advance the presence of other vehicles to both motorcycle and automobile operators, thereby mutually eliminating failures to see the other party, it should be possible to prevent such accidents from occurring.

Cognitive-Assist Systems

In view of these findings, forecasts are that among the various available approaches to “passive safety,” V2V communication systems that support mutual recognition between automobile drivers and motorcycle riders should be especially effective.

According to the ASV Promotion Committee, the number of traffic accidents in which use of V2V communications could prove effective in supporting safer driving outcomes amounts to 2,500 fatality accidents and 25,000 injury accidents per year. This is equivalent to some 30 percent of all accidents.

The belief is that V2V communication based cognitive-assist systems can heighten safety under various different conditions. For example, in cases when a motorcycle merges into traffic on a principal route (Figure 4), from the left lane the motorcycle rider cannot see an automobile approaching from the right (Figure 5). With V2V communications, however, an image of the automobile appears on the display mounted on the motorcycle (Figure 6).

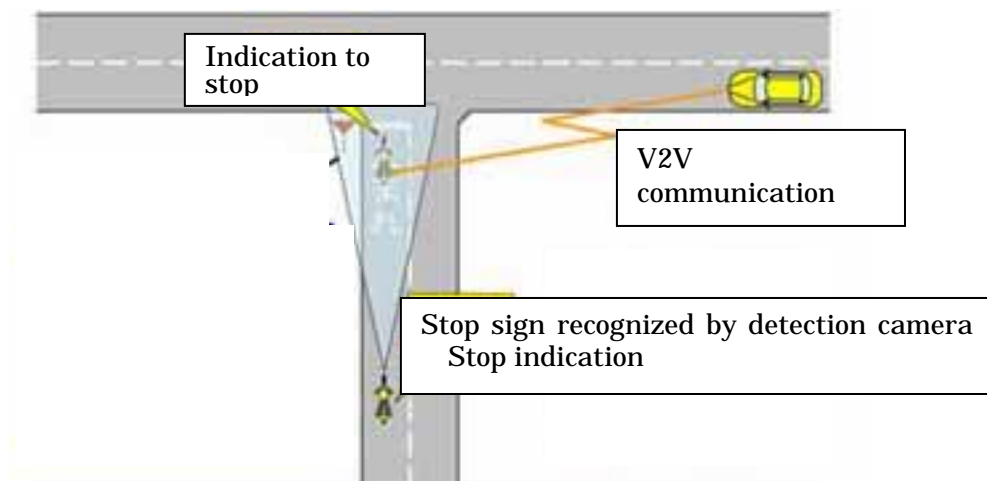


Figure 4: Motorcycle Merging into Principal Route



Figure 5: Merge point viewed by rider (red line ringed stop sign recognized by detection camera)



Figure 6: Motorcycle onboard V2V communication display (Honda model on left, Yamaha on right)

In more specific terms, the motorcycle onboard detection camera initially recognizes the stop sign and line, and then directs the rider to slow down. Once stopped, the rider uses the V2V communication display to confirm that it is safe to merge, and then starts up again. Indications and warnings to the rider are not limited to the onboard display, with voice directions also communicated through the rider's helmet.

With this type of cognitive-assist system installed in both motorcycles and automobiles, communications will occur with vehicles in the vicinity in all types of situations. Incoming information will include the vehicle type, position, driving speed, braking status, acceleration/deceleration, blinker conditions and other data. Approaching vehicles for which the possibility of collisions exist will be identified, followed by the timely supply to drivers of information needed to avoid a mishap. This data will be effective in preventing accidents.

With regard to such V2V communication cognitive-assist systems, projections are that the exclusive frequency ranges, communication protocols and other parameters necessary to make the shift to practical use should be in place by 2008. Moreover, if V2V communications can be effectively fused with road-to-vehicle communication systems, an even more extensive range of accessible information will serve to further improve road safety levels.



Honda ASV-3



Kawasaki ASV-3



Suzuki ASV-3



Yamaha ASV-3