

Appendix A

Looking to the Future - Examples of Communication Technology Benefits

The majority (nearly 60%) of transport fuel is used in urban driving conditions by passenger cars. Congestion impacts detrimentally on fuel consumption and CO₂ emissions. Emerging technologies in vehicle communications systems have enabled the demonstration of autonomously operated cars (for example VW's demonstration in 2006) and the prospect of substantially reducing the separation between vehicles or headway, which at 60 km/h is around five vehicle lengths. The PATH project in California demonstrated a platoon of vehicles controlled through a radar sensing system at 5 m separation distances at 65 mi/hr (105 km/h) on a freeway. Although the IVHS has been slow to be applied in its original form as envisaged in the PROMETHEUS project, for example, because of the lack of harmonious infrastructure, the emergence of vehicle to vehicle communications systems and drive by wire throttles in cars allows a vehicle in traffic to use upstream vehicle condition information to control the speed of the car as well as headway. The speed control can mitigate the effects of stops and the reduced headway can increase road capacity. Likely dedicated lanes would need to be allocated to such vehicle operation.

Figure 1 shows the benefit of a 40 second preview or look ahead system, working through vehicle to vehicle communication that enables the driven vehicle to be appraised of the driving pattern of a car about 20 vehicles ahead and to modify its speed to reduce the magnitude of speed fluctuations.

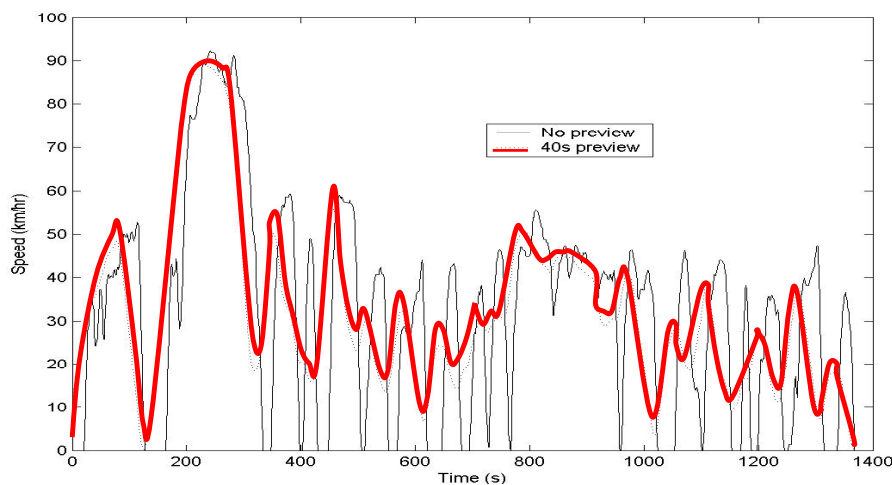


Figure 1 the simulated benefit of 40 seconds look ahead on the US city cycle driving pattern.

Using the widely accepted US DOE's Advisor model with suitable calibration it is possible to obtain fuel consumption over the driving cycle and to develop the

specification for an optimised hybrid car of similar performance to a present large car (Holden Falcon or Holden Commodore.).

Figure 2 shows that the hybrid has city driving fuel consumption advantages of 15 to 25%. When 'look-ahead' is employed. The improvement of the base model car with the no hybrid system is 12 to 32% and the hybrid's advantage is reduced to about 9%.

It seems highly probable that within the next decade or so such systems will enable reductions in fuel consumption equal to that attributable to vehicle development and likely the case for full hybrid's weakened.

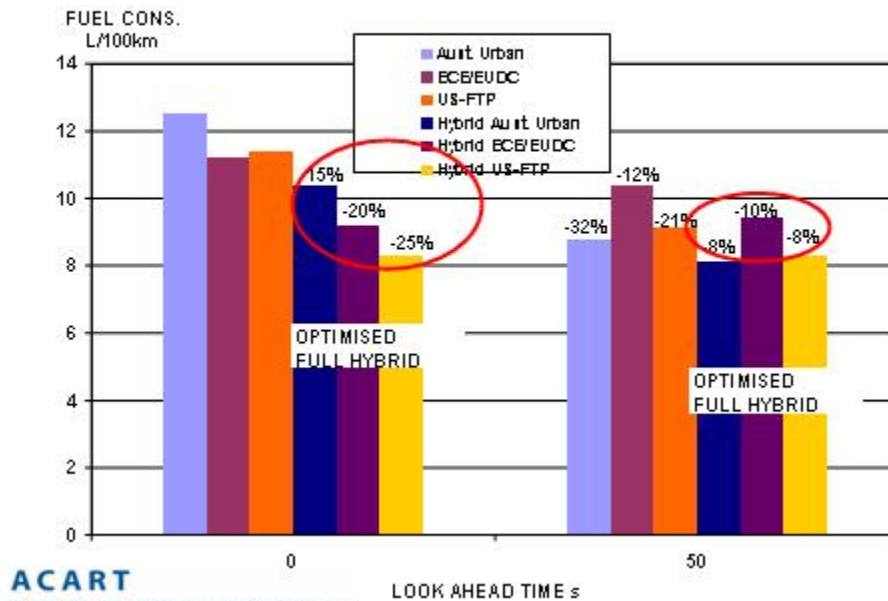


Figure 2 The benefit in reduced fuel consumption through the application of an optimised hybrid drive and a 50 second look ahead system to three driving cycles.

This example emphasizes how decisions which may favor a particular technology and which will impact the marketplace for the many years that vehicles are in-service, will need to be taken with care, looking to the future to avoid outcomes different from those intended.