motor placed in each of its 13-inch wheels. These motors are connected by an optical communications system hooked into a computer. While it optimizes recharging time, the car which I drove could be driven at speeds of 75 miles per hour. It can accelerate 200 meters (one-eighth of a mile) in 12 seconds, and 400 meters in 19 seconds. It was able to travel up a 16.7° slope quite smoothly. It is so carefully designed that brake heat is conserved and used to recharge the batteries.

The acceleration and maximum speed of the Equos, and the reuse of braking heat, is roughly comparable to that of General Motor's Impact, which can go from 0 to 60 miles per hour in eight seconds, has a range of 120 miles at 55 miles per hour, and a top speed of close to 100 miles per hour. The Impact uses two electric motors, one placed in each of the front wheels. Nonetheless, the design of the Impact does not include many of the features of the Equos itself, nor of its successor, the maglev car of the 21st century.

The ability of the wheels of the Equos to accomplish a near-80° rotation, compared to those of a normal car which can only rotate 45°, means that steering on the Equos is unique. The Equos design team is also interested in advanced highway designs which would allow the car to run on trolley tracks during highway driving.

I had the fun of driving in one of their prototype Equos battery-run vehicles. The car has many original driving features which are completely unique, as well as an excellent performance. The independently controlled four wheels of the car can be switched into modes in which the four wheels turn in parallel, so that one can slide into a parking place with no need to maneuver. Furthermore, with the front and back wheels placed in opposition to each other, the car can accomplish a very tight U-turn. The test vehicle which I drove was housed in the body of a typical compact car, and had an acceleration on a par with a typical combustion engine car—even on a steep hill.

Since the people at Aisin and Equos are concerned with transmission and related design, they have not experimented with different advanced batteries. They use a regular zinc battery in their present model, and it can travel 260 kilometers (162.5 miles) without recharging at the slow speed of 40 kilometers (25 miles) per hour. Recharging takes about four hours. International research is ongoing with more advanced batteries like the cadmium battery, which runs 1.5 times as long, but is considered to be bad for the health. At the 1991 Tokyo motor show, Nissan featured a battery-run car which could travel for 100 miles without recharging and then only needed 15 minutes to "gas up."

All battery-run cars currently suffer from corrosion, so that not only is the sale-price of the car perhaps double the cost of a comparable compact car of today, but the several-thousand-dollar cost of battery replacement every three years or so must be factored in.

Will the Equos ever go beyond the design state? That is a question which depends upon many more factors than simply its design specifications. It demands the kind of cooperation between American and Japanese automobile manufacturers which characterized an earlier, happier period of relations between the two nations. Most likely, it also requires involvement by the oil majors, which otherwise look at the Equos and all other electric automobiles as competitors that might ultimately render oil an obsolete resource.

Aisin AW was only established in 1969. If the present global depression is reversed, it will be because of an international commitment to rebuild and transform the world's infrastructure. In such a world, we can assume that Aisin will certainly be a corporate giant of the 21st century.

'Smart highways' offer communications advance

There are a variety of programs now being tested in the United States for "smart highways." These Intelligent Vehicle/Highway Systems are fundamentally not transportation systems, but communications systems which allow the automobile to be hooked into a central information system by radio, or to receive signal relays from the roadside of traffic and safety conditions.

Today, 80% of existing traffic signals at urban intersections operate under isolated intersection control. The new systems will allow local transportation officials to monitor traffic conditions and adjust traffic operations, as well as to respond to accidents. This means a more sensitive adjustment of traffic signals and warning signs. Alternate routes can be suggested to individual drivers, which would help to relieve traffic bottlenecks.

Besides receiving safety information, the driver could be given mapping information to help determine the optimal route to a given location. Typically for today's consumer-oriented society, the systems being tested in most states of the United States include information on restaurants, motels, and so on.

There are also systems under design which would warn the driver in advance of an impending collision, and even some which would act to automatically brake a car that was in danger.

Certainly, smart highways are an interesting service to motorists, and they can undoubtedly assist the smooth flow of traffic and so forth, but they are by no means to be considered a substitute for the integrated national transportation system which is needed.