

Development and Building of an NNC Concept Car

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The authors built a small prototype of electric vehicle according to a new microcar concept called “NNC Concept”. The NNC Concept is named after initial letters of *narrow*, *near* and *current*. “Narrow” means that the small width of a vehicle dominates the way of use of the vehicles and the infrastructure such as road, parking lot etc. for them. “Near” means that the short range of use is adequate for a daily use of the rechargeable electric vehicles. “Current” means that such small vehicles should be able to go with the traffic flow of the ordinary cars which run in the normal cruising speed. The prototype vehicle was made fully with strong members of aluminum alloy in order to secure crash safety. This kind of vehicle can make people’s daily life easier because less load of operate, possession and maintenance etc. would be required especially for elderly people and parents with young children.

Fig. 1 shows that road vehicles in Japan are virtually categorized by their widths which are decided by the number of arrays of passengers. There are some proper usage, regulations and infrastructure for each category. Only one category called “ordinary car” in Fig. 1 is available in current Japan except the large bus and the small bus because “Kei” class car is included in the category due to its oversized width and only few vehicles of “Micro Mobility” are used in Japan. Micro Mobility with mono passenger array can change the use of cars by its narrowness, that is, less parking space leads small shopping mall to be located more than before. People can buy all the commodities and foods in their daily life there, and then the on-foot area will be enlarged. Therefore, they will have less vehicle operations by daily shopping, less fuel consumption and less traffic accidents. In addition, the change of the structure of local cities will be expected.

Fig. 2 is the prototype car by the authors. The car is built based on the first-generation COMS by Toyota Auto Body Inc. The body frame is made with the strong aluminum alloy beams of large cross section. The dimensions are L:2500mm x W:950mm x H:1600mm, 405kg and two persons can ride in tandem style. The cruising range in one battery charge is about 40km and the maximum speed is about 60km/h. The authors are building the second prototype as in Fig. 3 for one adult and two children.

Unfortunately, vehicles of this size with 2 passengers have not been allowed to go on the public road in Japanese vehicle regulation (Table 1). We will promote the social implementation of such type of mobility vehicle.

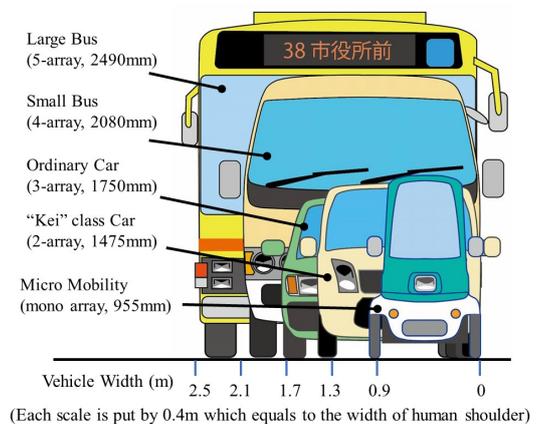


Fig. 1 Width Category of the Vehicle in Japan



Fig. 2 The First Prototype
 Table 1 Category of Road Vehicle in Japan



Fig. 3 The Second Prototype under Building

category regulation	moped typ. 1	moped typ. 2	“kei” class car	ordinary car
two wheeler	50cc motorcycle	125cc motorcycle	“kei” two wheeler	ordinary/ large two wheeler
four wheeler	“minicar”	(blank)	“kei” four wheeler/ “micro mobility**”	small car/ ordinary car
maximum speed by regulation	60km/h 30km/h*	60km/h	100km/h	100km/h
express way	NO	NO	YES (NO**)	YES
max. passenger(s)	1	2	4/2*	5/2*

(*two wheeler)