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Need, State of the Art and Future of Electric Vehicles

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Abstract—*Electricity directly in the power form in the transmission line has been its most common form of application in transportation. Railways as the major beneficiaries provide both passenger and freight services at affordable prices. The strength of railways reflects the might of a country. The best economies of the world, i.e., China, Japan, and Europe are improving their public transport systems for the well-being of their citizens. As a second alternative, the energy is stored in the capacitor banks and battery packs. These batteries can be charged from grid power or from standalone solar or wind energy generators. As a third alternative, hydrogen fuel cells and roof top solar panels generate electricity without batteries to drive the electric vehicles on roads. Due to the high weight of batteries, their wireless charging along with the construction of special highways to achieve the charging are the topics of latest research. One of the most exciting innovations in transportation has been the hyperloop train. Rising on nearly airless tubes at 800 mph, hyperloop is both cheaper and quieter, and is potentially much faster than a maglev train. In future most of the transportation problems will be avoided by using the cars in two distinct modes. They will be driven in the normal manner on the streets, but by robots on high-speed dedicated guideways as robots are smarter than a human driver and can see simultaneously in all the directions. Smart cars are one of the ways to solve transportation problems in major cities. Trips of more than several miles will be on these guideways instead of the highways. The flights of all-electric airplanes like Taurus G4 have revealed their silent, cost-effective and environment friendly operation. For electric flight to really take off, it needs smaller, safer, and lighter batteries than the lithium-ion batteries.*