Electric Wheel-Chair Tricycle

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***Abstract*—At present many exciting developments in electric vehicle technology are taking place. Some of these have advanced sufficiently to be commercially available, whilst others remain for the future. The first demonstration electric vehicles were made in 1830's and commercial vehicles were available by the end of the 19th century. Today's concerns about the environment particularly noise and exhaust emissions, coupled to new developments in batteries, fuel cells, motors and controllers may swing the balance of electric vehicles. There are many types of electric vehicles such as railway trains, ships, aircrafts, cars, bikes, bicycles, wheel chair and many more. But in this project is focused on electrically powered tricycle which is categorized under Low-Speed Vehicles (LVSs) are an environmentally friendly mode of transport for short trips. The objective of the project is to design and develop a concept battery powered tricycle for multipurpose use and to choose the best concept to reduce them ass and expensive batteries required. Besides that, to design a tricycle with high efficiency and greater flexibility to place components in tricycle to optimize weight positioning and minimize aerodynamic drag.**

***Index Terms*—Motor,Power & Charging ,Control & Interface**

I. INTRODUCTION

This study explores e-trikes as pollution-free city transport, assessing their urban commuting performance. Petrol tricycles contribute to air and noise pollution due to the combustion of fossil fuels in their engines, emitting greenhouse gases and pollutants such as carbon dioxide, nitrogen oxides, and particulate matter, which can harm both the environment and human health. Petrol tricycles rely on gasoline as fuel, derived from non-renewable fossil fuels. We designed a tricycle with a 650W motor and 24V battery for eco-friendly short to medium city trips. Switching to electric drive maintains performance and ensures comfortable rides. With around a 16km range per charge, they meet urban mobility needs while championing sustainability. Besides eco-benefits, e-trikes prioritize passenger comfort and safety through smart design and stability. Extensive testing covers energy efficiency, range, and reliability, confirming e-trikes as a viable alternative to gas vehicles. Integrating e-trikes into city transit could dramatically cut pollution and boost air quality, fostering healthier urban environments. This study advocates for e-trikes to lead green mobility efforts and shape future urban transport. Key components include a PMDC motor, Battery, Charge controller

1.1 Brief History of Electrical Tricycle

The design of the electric tricycle is adaptable to current hand-powered tricycles with minimal modification. It encompasses an electric motor, a drive system, a battery, an accelerator, a battery charger, and a power supply. A PMDC motor was chosen due to prohibitive fuel costs, rendering a combustion engine impractical. An intelligent battery charger handles battery charging. The first aspect addressed was the drive system, ensuring efficient power transmission from the motor to the front wheel. Secondly, a method of motor control was determined, incorporating speed and braking controls into a simple electrical accelerator. Thirdly, power is supplied to the motor via a battery pack. All components (motor, transmission, controls, and batteries) are designed for easy installation on existing hand-powered tricycles. The conversion to an Electric Tricycle is straightforward and reversible.

II. FUTURE SCOPE

The future scope of the electric tricycle market is robust, with significant growth projected globally for both commercial and personal applications. Key drivers include the demand for sustainable transport, advancements in battery technology, the boom in e-

commerce, and the need for efficient urban and last-mile connectivity solutions. Despite the promising future, challenges exist, including the high initial purchase price compared to conventional alternatives, a lack of standardized charging infrastructure in some regions, and storage/parking difficulties due to their size. However, manufacturers are working on lightweight, space-efficient designs to address these issues.

III. CONCLUSION

The electric tricycle, successfully designed and developed, offers a solution to pollution. Our oil dependence poses environmental, security, and economic challenges. Oil vulnerability leads to price fluctuations and gas shocks, complicating foreign policy. Oil and petroleum products are major contributors to global warming pollution, surpassing coal. Transportation, heavily reliant on oil, accounts for over two-thirds of U.S. petroleum demand and is a significant source of air pollutants. Motor vehicles emit pollutants like carbon dioxide, exacerbating global climate change. The transportation sector is responsible for approximately 30% of all U.S. greenhouse gas emissions. Electric vehicles offer a solution, reducing pollution and providing an eco-friendly mode of transportation.

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