



MOBILITY OF

E-RICKSHAW

IN DELHI

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(I) Overview of E-Rickshaw Operations in National Capital Region of Delhi

The battery operated rickshaw or electric (E) Rickshaw, as they are commonly known, is a low-floored three-wheeler with handlebar steering, which can seat four passengers apart from the driver.

The battery-operated E-Rickshaws is a new mode of transportation introduced in the capital city of Delhi during the Commonwealth Games in 2010. The number of these type of rickshaws has increased from about 4,000 in 2010 to around 100,000 in 2014 (*Telegraph* 2010). There was neither vehicle registration process nor records of the sales figures. E-Rickshaws are assembled with parts imported from China and put together by local dealers in Delhi. The batteries, chargers and tyre-tubes used in the assembly of these vehicles are locally available, while the body, tyre controllers, motors, and engines are imported from China, dealers said. A new battery rickshaw costs between ₹60,000 and ₹110,000 as, compared to around ₹250,000 to ₹300,000 for an auto rickshaw.

(II) Features of E-Rickshaw

- i. It is typically powered by four rechargeable lead-acid batteries;
- ii. Power output is between 250 W and 850 W capable of providing speeds in the range 15 km/h and 30 km/h;
- iii. A single charge can drive the vehicle between 40 km and 60 km;
- iv. It is a low speed vehicle and provides last mile connectivity between metro/bus stations and residential areas/place of work.

The Ministry of Road Transport & Highways (vide notification G.S.R.709 dated October 8, 2014) has notified E-Rickshaw and E-Cart as separate categories of transport vehicles. As per the notification: *“E-Rickshaw means a special purpose battery operated vehicle having three wheels and constructed or adapted to carry not more than four passengers, excluding the driver, and not more than 40 kilograms luggage in total; the net power of its motor is not more than 2000 watt and the maximum speed of the vehicle not more than twenty five kilometres per hour”*

(III) Popularity and Benefit of E-Rickshaw

1. It provides last-mile connectivity as they ply between residential areas and public transport access points, primarily metro stations, charging an affordable price (low flat fare ₹ 10 to ₹ 20 per person) from the commuter;
2. Cater to huge latent and unmet demand for mobility, especially for shorter distances and access and egress trips;
3. No entry barriers till recently as in the case of other public modes of transport (taxis and autos) and easy procurement and;
4. E-Rickshaws are an environmentally benign mode of Para-transit as they have no tail-pipe emissions and can be charged from electricity.

(IV) E-Rickshaws and the Long Legal Vacuum

E-Rickshaws have had a turbulent ride in Delhi since their launch. The policy flip-flop on E-Rickshaws is a reflection of the state of passenger road transport in India's metros. The Delhi government in its pronouncements and submissions before the High court has maintained their operations illegal, but still the numbers of E-Rickshaws grew by leaps and bounds. At the heart of the e-rickshaw debate is that this mode of transport, unlike cycle rickshaws and cycles, has a motor and was perceived to be in the category of motor vehicle by the Delhi Administration. A study was commissioned to TERI [1] by the Government of Delhi to study whether the E-Rickshaws were motor vehicles or not based on the CMVR Act. As a consequence, E-Rickshaws were found to be under the ambit of Motor Vehicles Act as they did not meet the criteria for exclusion as they surpassed the maximum power requirement of 250 W.

According to the Motor Vehicles Act, 1988 and the Motor Vehicles Rules, 1993, 2(u) (i) (ii) vehicles with a motor power less than 250 W (0.25 kW) and speed less than 25 km/h are not considered as motorized vehicles and were exempted from the rules. However, whether they are motor vehicles or not can be categorically established only if the tests are carried out as provided in CMV Rules of 1989 at the designated testing agencies.

TERI tested 53 E-Rickshaws and in 51 cases, where power measurement was possible, the average output power (closest to the 30 minutes power) of 47 E-Rickshaws, was more than 0.25 kW (230 W). These results made it clear that majority of E-Rickshaws did not meet the criteria for exemption under Rule 2(u) of CMVR and came under the category of motor vehicles. However, whether they are motor vehicles or not can be categorically established only if the tests were carried out as provided in Rule 2(u) of the CMVR by the authorized testing agencies. (Source: TERI, Study on electric rickshaws in Delhi)

The Delhi government in its submissions before the High Court[2] of Delhi had maintained that operation of E-Rickshaws in Delhi is totally unauthorized and illegal and needs to be stopped. So far as the question of making appropriate regulations for permitting plying of E-Rickshaws was concerned, it expressed that Government of NCT of Delhi is not competent to do the same as it will entail amendments in Motor Vehicle Act, 1988 and Central Motor Vehicle Rules, 1989.[7]

(V) Emission Rates of E-Rickshaws

As an alternative to the CNG-powered auto rickshaws, E-Rickshaws offer low cost, low noise, zero local tail-pipe emissions. However, E-Rickshaws indirectly emit pollution as they draw power to recharge their batteries from electricity drawn mostly from thermal power plants, impacting

ambient air quality in regions where power plants are located. India has a high reliance on thermal power. Transmission losses require more electricity to be generated at the plant than is delivered at the outlet. The higher the transmission loss, the more electricity must be generated per kilometre to power electric vehicles. On the other hand, gasoline two-wheelers emit pollution directly into the urban environment, impacting local ambient air quality directly.

Three classes of batteries are used in operating Electric two wheelers/four-wheeled Rickshaws. These are:

1. **The first category** (estimated in Cherry and Weiner et al.) has a lower power (350–500 W) with a maximum speed of 30 km/h. These are technologically mature. The electricity requirements at the plug are 1.8 kWh/100 km.
2. **The second category** is an intermediate with mid-range motor power (750 W) and a maximum speed of 45 km/h. The electricity requirements at the plug are 2.3 kWh/100 km.
3. **The third category** is a more advanced e-scooter, with motor power greater than 1,000 W and maximum speeds of over 55 km/h. The electricity requirements at the plug of this class are estimated to be 3.1 kWh/100 km.

It may be noted that most of the E-Rickshaws plying in Delhi use motor power of 750 W category with a maximum speed of 45 km/h. Thus, emission rate from E-Rickshaw could be similar to electric two-wheelers using motor power of 350–500 W or 750 W (ADB study). The emission from various categories of battery in use for running 2 W/4 W in the ADB study has been arrived at by estimating the total electric energy use requirements per kilometre for various categories of batteries and the estimate of emission intensity of electricity generation, expressed as grams of pollutant per kilowatt-hour. The emissions from three battery classes used in E-Rickshaw/Scooters are given in Table 1. The pollutants estimated from use of conventional power include CO₂, black carbon (BC), CO, NO_x, organic compounds (OC), particulate matter 10 (PM₁₀), particulate matter 2.5 (PM_{2.5}), SO₂, and volatile organic compounds (VOC). E-Rickshaw/Scooters have much lower emission rates on almost all pollutants vis-à-vis gasoline scooter. The only pollutant that has a potentially higher emission rate during the use phase is SO₂. Gasoline two-wheelers are responsible for much, but not all air pollution in urban areas. On the other hand, gasoline two-wheelers are responsible for smaller proportion of transport-related PM emissions (dominated by heavy-duty diesel vehicles).

Table 1: Emission Rate of Battery-operated Vehicles

	Class I LP	Class II MP	Class III HP	4 Stroke@
	E Rick/2 W	E Rick/2 W	E Rick/2 W	2 Wheeler@
CO ₂ (g/km)	21.9	28.0	37.8	55
BC (mg/100 km)	27.3	34.8	47.0	NA
CO (mg/100 km)	0.03	0.04	0.05	1,250,000
NO _x (g/100 km)	4.8	6.2	8.3	15
OC (g/100 km)	92.8	118.6	159.8	NA
PM ₁₀ (g/100 km)	4.5	5.8	7.8	10

PM _{2.5} (g/100 km)	2.8	3.6	4.9	NA
SO ₂ (g/100 km)	8.1	10.3	13.9	NA
VOC (g/100 km)	0.4	0.5	0.6	225

BC = black carbon, CO = carbon monoxide, CO₂ = carbon dioxide, e-scooter = electric scooter, g/100 km = gram per 100 kilometres, g/km = gram per kilometre, mg/100 km = milligram per 100 kilometres, NO_x = nitrogen oxide, OC = organic compound, PM₁₀ = particulate matter 10, PM_{2.5} = particulate matter 2.5, SO₂ = sulphur dioxide, VOC = volatile organic compound, NA = not available

LP-low power, MP-medium power, HP-high power, @gasoline

(Source: Meszler, D. 2007. Air Emissions Issues Related to Two and Three-Wheeled Motor Vehicles. San Francisco: International Council of Clean Transport.

Adapted from ADB, 2006 Study Electric Two-Wheelers in India and Viet Nam: Market Analysis and Environmental Impacts)[9]

(VI) Need for Regulation of E-Rickshaws

While the importance of E-Rickshaws as an important mode of para transit cannot be denied, it is also important to look at some of the issues related to their operations. The complete unregulated growth of E-Rickshaws in large numbers in the city raises concerns related to the safety and security of the passengers. Ideally, any transport service employed for public use at large should not compromise on the safety and security of the passengers. Hence, there is need for regulation to ensure safety and security of passengers.

Tripura Model of Regulating E-Rickshaws

Tripura[3] Battery-Operated Rickshaw Rules (2014) is a modified version of the state's cycle rickshaw regulation, applied to battery-operated rickshaws on the premise that their top speed of 17 km/h is more akin to a cycle rickshaw than a diesel-powered auto rickshaw. The rules require operators to obtain standard non-commercial driving licenses, obtain fitness certificates for their vehicles, register them with the local transport department, and acquire operating permits which tie the operator to a specific area of the city. All this documentation is valid for three years, unless cancelled or suspended for flouting any rules. The license fee of the battery-operated rickshaw is prescribed at ₹300, license renewal fee at ₹100, and registration fee and trade certification fee at ₹1,000 each. In addition, the operator of E-Rickshaw will have to pay an annual road tax of ₹100. Whilst this set of rules does away with the need for a commercial license, it remains fairly exacting and full compliance would be a challenge for any Delhi-based battery rickshaw operator due to the mandatory address proofs. The issuing of permits also provides an opportunity for rent seeking as is the case in the auto rickshaw sector.

A bill to regularize E-Rickshaws and provide for driving licenses for battery-operated vehicles was introduced and passed in Lok Sabha to legalize E-Rickshaws by bringing them under the ambit of the Motor Vehicles Act, 1988,[4] thus paving the way for such vehicles to ply in the national capital and other places. This was done as E-Rickshaws or battery-operated vehicles were banned by the Delhi High Court on safety concerns in September, 2014.

The first amendment Motor Vehicles Act made through the Notification GSR 709 (E) came on October 8, 2014. The amendment limited the maximum number of passengers to four, excluding the driver, raised the maximum net power of its motor from 250 W to 2,000 W and restricted the maximum speed of the vehicle to 25 km/h. Driving licenses were also made mandatory to drive an E-Rickshaw.

A second amendment was issued via Notification GSR 27 (E) on January 13, 2015 which specified the minimum training period and certification required and the need for road worthiness and sale certificate to be issued by manufacturer/dealer/registered association. The notification upheld that the manufacturer or E-Rickshaw association has to get the vehicle tested and approved by a laboratory authorized by BIS. After much deliberation, regarding the topic of E-Rickshaws, the Motor Vehicles (Amendment) Act 2015 came out on March 2015.

This states that the conditions for issuing driver licenses for e-carts or E-Rickshaws shall be prescribed by the central government also provides for the central government to make Rules on: (i) the specifications for e-carts and E-Rickshaws and; (ii) the manner and conditions for issuing driving licenses. The Central Motor Vehicles (Sixteenth Amendment) Rules, 2014, that provide details on the licensing and registration of e-carts and E-Rickshaws, were notified on October 8, 2014.

Delhi Government's Approach to Regulate E-Rickshaws

E-Rickshaw Sewa Scheme

Delhi government launched new E-Rickshaw Sewa Scheme^[5] (No.F. DC/ARU/TPT/2014/245/1724) on December 29, 2014 and brought out its procedural guidelines for licensing/ registration/ fitness/ grant of permit of rickshaw (F.No. DC/OPS/TPT/225/2014/II/8401-24) on February 3, 2015. This decision was taken in the wake of Union Cabinet's approval to promulgate an ordinance on December 24, 2014. This scheme paved the way for the battery-operated vehicles in Delhi subject to the following conditions:

- i. E-Rickshaws will be registered as transport vehicle under registration series DL-1ER and will be granted contract as per carriage permits;
- ii. This battery-operated vehicle will have seating capacity of four persons, excluding the driver, with maximum luggage weight of 40 kg;
- iii. The model of vehicle must be in accordance with provisions of *section 126 of Motor Vehicle Act, 1988*;
- iv. Every E-Rickshaw should have a yellow colour reflective strip on its rear side. Besides, the name, address and telephone number of permit holder should be painted on the left side of the vehicle;
- v. The dimensions of the E-Rickshaw should not exceed length of 2.8 m, 1.8 m height and 1 m width;
- vi. The owner of the E-Rickshaw should possess a valid licence to drive the vehicle besides a public service badge.
- vii. E-Rickshaw should have a valid fitness certificate issued from the Transport Department.

As of now not many new E-Rickshaws are being sold in Delhi as none of the vehicle manufacturers who have got their vehicle models registered has a trade licence. This licence is must for selling E-Rickshaws in Delhi. Delhi Transport Department could have made use of this provision in monitoring the quality and specifications of E-Rickshaws being sold in Delhi.

Box 1: Procedural guideline for Licensing/Registration/Fitness/grant of Permit of E-Rickshaw[6][8]

(Government of NCT of Delhi, Transport Department
(F.No. DC/OPS/TPT/225/2014/II/8401-24)

The government of national capital region has issued detailed procedural guidelines for grant of learner's license, permanent driving license, issue of public service vehicle badge, for registration of new E-Rickshaws sold after October 8, 2014/in use E-Rickshaws sold on or before October 8, 2014, certificate of fitness

Documents required for registration of an E-Rickshaw:

For new E-rickshaw sold after 8/10/2014:The applicant shall apply to the licensing authority in which he / she resides and shall be accompanied by following documents/forms duly filled in:(i) application for registration in Form-20; (ii) sale Certificate in Form-21 (from manufacturer /dealer); (iii) Certificate of Road worthiness in Form-22, (from manufacturer); (iv) manufacturer's Invoice; (v) dealer's Invoice; (vi) proof of residence; (vii) certificate of Insurance / Cover note; (viii) certificate of fitness; (ix) antecedent's verification of vehicle owner from Delhi Police; (x) effective Driving License to drive an E-rickshaw; (xi) Effective Public Service Vehicle (PSV) Badge authorizing to drive an E-rickshaw; (xii) appropriate fee as specified in Rule-81 (xiii) One time Road Tax (if applicable) and (xiv) MCD Parking Fee (if applicable).

For in-use / existing E-rickshaw sold on or before 08/10/2014:The applicant shall apply to the licensing authority in which he / she resides and shall be accompanied by following documents/forms duly filled in: (i) Application for registration in Form-20; (ii) Sale Certificate in Form-21 (to be issued by the manufacturer or dealer or registered E-rickshaw or E-cart association); (iii) Certificate of Road worthiness in Form-22, (to be issued by the manufacturer or dealer or registered E-rickshaw or E-cart association); (iv) proof of residence; (v) certificate of Insurance / Cover note; (vi) Certificate of Fitness. (vii) Antecedent's verification of vehicle owner from Delhi Police; (viii) Effective Driving License to drive an E-rickshaw. (ix) Effective Public Service Vehicle (PSV) Badge authorizing to drive an E-rickshaw; (x) Appropriate fee as specified in Rule-81 (xi) Invoice for calculating road tax (if applicable) (xii) One time Road Tax (if applicable); (xiii) MCD Parking Fee (if applicable)

Certificate of Fitness

The certificate of fitness to E-Rickshaws shall be issued in Form-38 as prescribed in Central Motor Vehicles Rule, 1989. The inspecting authority shall physically verify the vehicle with the details as specified in technical specifications endorsed by the testing agency that it truly represents the vehicle model approved by the designated testing agency and complies with relevant provisions of Central Motor Vehicles Rule, 1989

Documents required for issuance of permit to E-Rickshaw

The applicant shall apply to the licensing authority in which he/she resides and shall be accompanied by following documents/forms duly filled in: (i) Application for grant of Permit in Form- P.C.A. (With photograph); (ii) effective Registration Certificate; (iii)effective Driving License to drive an E-rickshaw; (iv) Effective PSV Badge to drive an E-rickshaw; (v)Details of Bank Account; (vi) PAN / Voter I-Card; (vii) Proof of residence. (viii) Appropriate fee as specified in Delhi Motor Vehicles Rules (ix) An undertaking from the applicant to the effect that he / she is not in possession of any Public Service Vehicle with a permit.

VII Some Unanswered Questions

Following issues need to be addressed through an E-Rickshaw policy:

- a) Regulating E-Rickshaws in the city has been on top of the agenda of the authorities. However, neither the Delhi government's Transport Department nor the Delhi Traffic Police has any idea about number of battery-operated rickshaws plying in Delhi. There is an assumption of around one lakh battery-operated rickshaws currently being operational in the city. However, there is no authentic data number of rickshaws in Delhi. Since VAT is paid on the sale of E-Rickshaws, an alternative source could be VAT Commissioner to help in ascertaining the number of units sold in Delhi. While arriving at the exact number would be difficult till the time all these vehicles are registered with the Transport Department, data from the VAT Department would be helpful in giving a fair idea of these vehicles plying on the streets.
- b) Although plying of E-Rickshaws has been made legal with the amendments in the Motor Vehicles Act but the process and procedures envisaged acquiring a driver's license, registration of an E-Rickshaw, fitness, public service badge, etc., is a formidable task for any E-Rickshaw driver/owner/operator. The process/procedures involved are likely to absorb significant resources (in terms of money, time and otherwise) of a humble E-Rickshaw driver/operator and provide scope for rent seeking to those dispensing licenses/fitness certificates/registration in transport bureaucracy. It involves submission of 40 documents. As a consequence, very few E-Rickshaw operators have applied for a driving license and registration. In contrast, the process of registration and acquiring a driving license for car owners is simple and free from unnecessary duplication.
- c) Legal clarity on the roles and responsibilities of all the stakeholders involved (owner, operator, and civic agency);
- d) What is the insurance safety and cover of passengers, if there is a mishap on road.
- e) What is the liability of buyers and what is liability of sellers in the case of E-Rickshaws.
- f) How can a seller tie up with insurance companies for vehicle insurance on road?
- g) The components and processes used in the manufacturing of rickshaws are not standardized. To this end, government could consider regulating the manufacture of these vehicles to bring about standardization and uniformity in designs;
- h) Government needs to address the issue of safe disposal of E-Rickshaw batteries and use of clean electricity for charging the E-Rickshaws. The average life of an E-Rickshaw battery is 6–8 Months.



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