

# BS VI : CNG / LPG Retrofitment

## Rule Position & Way Forward

February 13, 2020

## Background

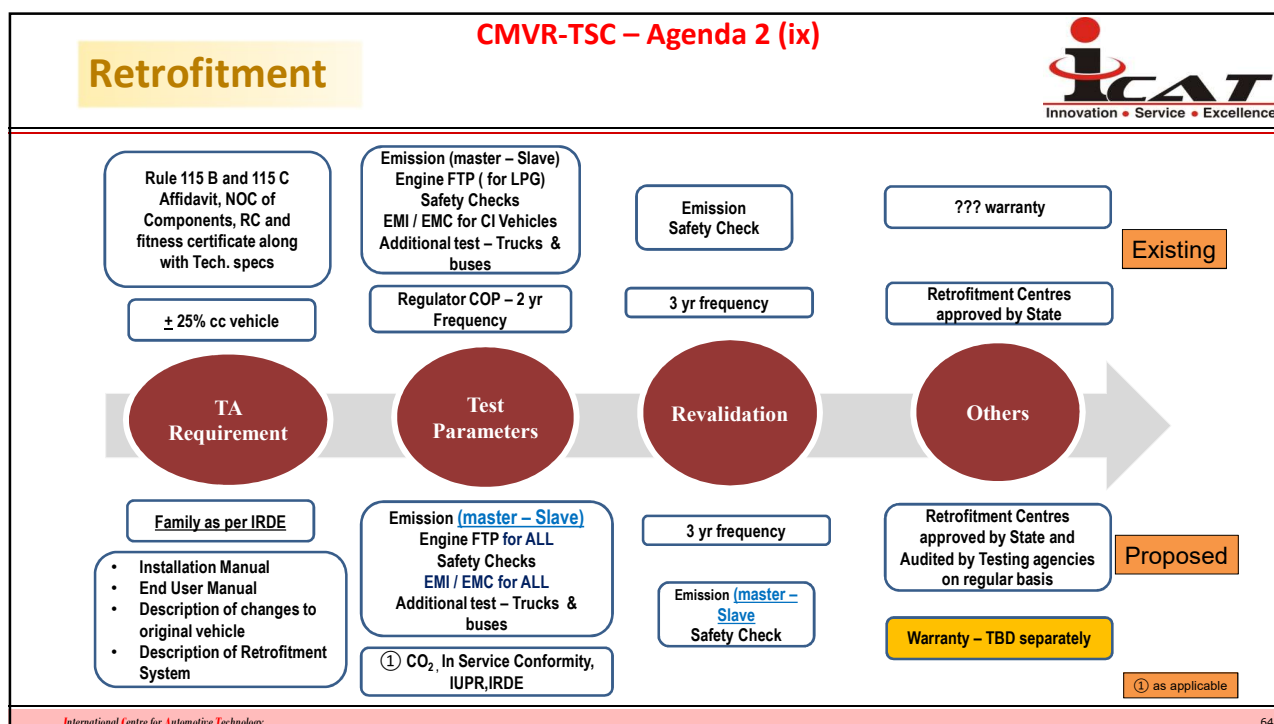
**MoRTH vide letter no. RT-11036/46/2019-MVL dated 15<sup>th</sup> July 2019: constituted committee under Chairmanship of Director, ICAT.**

**Members :**

**Representative from MoRTH, Testing Agencies , SIAM, CNG/ LPG/ alternate fuel association.**


**The Terms of Reference (ToR) of the committee:**

- To carry out a detailed study of existing rules and regulations in comparison to International regulatory framework so as to ensure that the national regulations are in line with international practices .
- To identify the OBD I and OBD II threshold limits; IUPR etc
- Applicability of Real world drive cycle emissions measurement using PEMS and conformity applicability.
- Applicability of In-service conformity and any other regulation.
- Inclusion of additional tests such as EMC and any other safety parameter.
- Review of layout criteria ( +/- 25% in cc range for gasoline vehicles/ same engine cc for diesel vehicles); Revalidation test requirements and condition.
- To identify the responsibilities in the areas of warranty, maintenance and any other parameters involved during retrofitment.



**CMVR-TSC – Agenda 2 (ix)**

**Recommendation**



<u>Parameters</u>	<u>Existing scenario</u>	<u>Recommendations (BS VI norms)</u>
Power test	4W(< 3.5 T):For LPG only 4W(≥3.5 T):For NG	For all category is mandatory Limit: -15% ≤ Power NG ≤ +5%, wrt Power (base vehicle)
CO2 emission and fuel consumption	Not applicable	CO2 to be measured
Family concept	engine cc (displacement) ± 25 per cent , irrespective of make	Engine CC: ± 7% tolerance for vehicles up to 1500 cc & ± 5% above 1500 cc of specific make
In service conformity , IUPR	Not applicable	As applicable, as notified

International Centre for Automotive Technology 65

**RFC improvements**

- Minimum ITI / Diploma Qualification ; Training from Retrofitter for Kit Installation including software and calibration;
- Experience of at least 2 year for Diploma + 5 years for ITI;
- Minimum Staff of 3 trained staff; { other staff helper, support system};
- Regular Audits frequency of 1 year;
- Equipment such as 5 gas analyser and other equipments as per AIS 024 Annexure 5;
- Database of Customers with history of maintenance, service etc;
- Training on Changes/ Alteration carried out on the vehicle as per end user; installation manual ;

# Thank You..!!

### # Review of CMVR and AIS standards in view of the changes in definition of L1 category

- **Background**

- Definition of L1 category vehicle was revised vide G.S.R 1225 (E) dated 20<sup>th</sup> December 2018
- The comparison of definition before and after vide GSR 1225 are below:

Parameter	Upper limit for L1 category	
	Earlier	G.S.R 1225
Engine cc for ICE	50	50
Maximum power kW (for BEV)	Not specified	4
Max. speed (km/h)	45	70

- With the change in speed limit some L2 category vehicles, will now get classified as L1. i.e. where Vmax is more than 45 (in some cases 50) km/h.
- It is felt that technical safety provisions should not be relaxed and the change should only facilitate driving license requirements.
- Principle of change in the applicability:
- Regulations applicable to L2 category to be made applicable to L1 category with Vmax exceeding:
  - ✓ 45 km/h; or
  - ✓ 50km/h, if so specified in the individual standard/ provision (those derived from UNECE regulations)

### # Review of CMVR and AIS standards in view of the changes in definition of L1 category

- **Proposed actions**

- Theoretically a detailed study would be required:
  - To identify provisions to be made applicable for such 2W
  - Provisions which are applicable to only L1 category to be exempted for such 2W (if any), and
  - Modify each AIS/BIS, notification etc.
- However, since:
  - No IC enigned L1 category has been type approved.
  - No specific additional provisions for L1 category exists (para “b” above).
  - BEV, type approved if any, with Vmax above 45 (or 50) km/h prior to date of publication of GSR 1225, would have complied with the requirements of L2.
- Therefore, Including a general rule should suffice.  
**“92(#)** Rules and requirements specified in this chapter for L2 category shall be applicable for those vehicles of L1 category, whose maximum speed exceeds 45km/h or in case so specified, maximum speed of 50 km/h.”
- Also, in the 63<sup>rd</sup> meeting of AISC it was agreed that, threshold limits of maximum speed to decide applicability of certain CMVR provisions to L1 category vehicles need to be harmonized with 50 km/h threshold limit.

- **Committee may deliberate.**

## Provision of different size Tyre as a Spare Tyre (Temporary Spare wheel)

External

### Purpose of Temporary spare Tyre :

- In unforeseen event (*i.e. Tyre Puncture, Tyre cut etc...*), Spare Tyre is used to take the vehicle to the nearest Tyre repair shop
- Spare Tyre is an additional Tyre (5th Tyre) in the vehicle for unforeseen event.



### What is Temporary spare Tyre :

- Temporary spare Tyre is different from Ground tyre in terms of Size & Wheel Type but meeting all basic performance requirement of vehicle with limitation of speed (~ 80 or 120 kmph max)






### Evolution of Temporary Spare Tyre:

- In recent times, the vehicle Tyre size are increasing for making more appealing to customer.
- Providing spare tyre same as regular ground tyre makes customer fatigue while changing tyre & also affects fuel economy (due to its dead weight).
- Hence, the developed countries (like Europe, US etc.) introduced the concept of Temporary Spare tyre to overcome above problem also tyre repair kit as a remedy

**Why Temporary Spare Tyre:**

- Easy to Tyre change :** As compare to ground tyres, Temp (Spare) tyre is designed to save weight and space. Hence customer can handle it with lower efforts
- Better mileage:** As Temp tyre is light in weight, it improves the fuel economy & reduce emission.






### Temporary Spare Tyre & Provision under CMVR

- Temporary Spare Tyre is permitted under CMVR through provisions in Rule 95 and Rule 138.


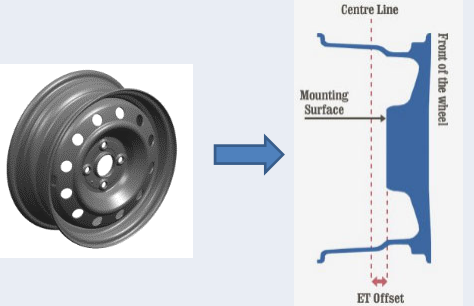
CMVR Rule	Details of provision
95 (7)	<ul style="list-style-type: none"> <li><input type="checkbox"/> As per MoRTH notification GSR 625(E) dtd. 08 Aug 2012, w.e.f. 08<sup>th</sup> Aug 2012, it is permitted to use Temporary spare tyre and Run flat tires in L7, M1 &amp; N1 vehicles.</li> <li><input type="checkbox"/> These tyres should comply to requirements of AIS-110:2009 when fitted in vehicle.</li> </ul> <p>Note : This is in addition to component level testing as per IS-15633/15636.</p>
138(4)(a)	<ul style="list-style-type: none"> <li><input type="checkbox"/> Incase of L7, M1 &amp; N1 category vehicles, it is permitted to use temporary spare tire as spare tire.</li> <li><input type="checkbox"/> If such vehicles are fitted with run flat tyres as standard, it is not mandatory to provide ready to use spare tire.</li> </ul>

**Note :**


- AIS-110 specifies testing requirements of Temporary Spare tyres fitted to vehicles :
  - Brake performance test with the tyre fitted on each axle.
  - Installation checks & speed warning label verification.
  - Description of usage and precautions mentioned in owners
- AIS-110 has been derived from UNECE regulation No. 64 which is for temp tyres & run flat tyres.

**AIS-110: Temporary Spare Wheel /Tyres and Run Flat Tyres** 

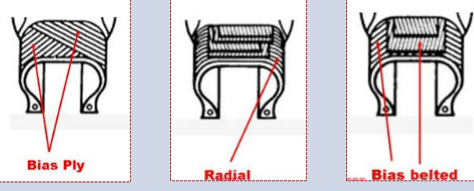
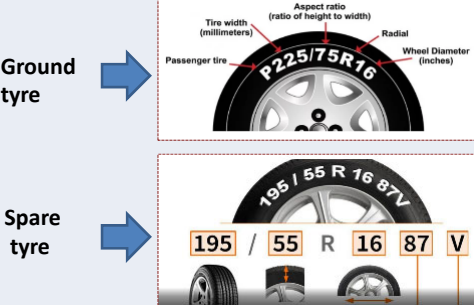
As per AIS-110, Temporary spare tyres can be of following types :

Type	Example	Description
Type 1		An assembly in which the spare tyre is a temporary use spare tyre. This tyre is generally of lesser width than the ground tyre.
Type 2		An assembly in which the spare tyre wheel has a different offset from other ground wheels


*Contd...*

**AIS-110: Temporary Spare Wheel /Tyres and Run Flat Tyres** 


As per AIS-110, Temporary spare tyres can be of following types :

Type	Example	Description
Type 3		An assembly in which the spare tyre is of a different structure from other tyres.
Type 4		An assembly in which the spare tyre is a normal tyre, but size designation of the wheel rim or the tyre or both, differ from those of the other wheel or ground tyre.


*Contd...*

**AIS-110:Temporary Spare Wheel /Tyres and Run Flat Tyres** 


As per AIS-110, Temporary spare tyres can be of following types :

Type	Example	Description
Type 5		<p>An assembly in which a "T-type temporary use spare tyre" or "Run flat tyre" or "Self supporting tyre" is fitted.</p> <p>Such tires are for normal, long term road use, but used in an emergency in a totally deflated condition."</p>

Speed warning Label :




Label for Type 1,2& 3 temporary tyre



Label for Type 4 temporary tyre

*Contd...*

**AIS-110:Temporary Spare Wheel /Tyres and Run Flat Tyres** 

Description of usage and precautions mentioned in owners Manual

**Temporary Spare Tire (if equipped)**  
 Your vehicle comes equipped with the temporary spare tire. It is only intended for temporary emergency use, until the conventional tire can be repaired or replaced. The inflation pressure of the temporary spare tire should be checked at least monthly. At the same time, check that the tire is stored securely. If it is not, tighten it.


Note that two or more temporary spare tires should not be used on one vehicle simultaneously.

**⚠ WARNING**

The temporary spare tire and wheel are intended for temporary emergency use only. Continuous use of this spare can result in tire failure and loss of control. Always observe these precautions when using this spare:


- Your vehicle will handle differently with this temporary spare.
- Do not exceed 120 km/h (75 mph) speed (only vehicle with 215/60R16 95H tire).
- Replace this spare with a standard tire and wheel as soon as possible.
- Use of this spare may reduce ground clearance.
- Set the specified tire pressure indicated on the tire information label located on the driver's door lock pillar.
- Do not use tire chains on the temporary spare. If you must use tire chains, rearrange the wheels so standard tires and wheels are fitted to the front axle.
- The temporary spare tire may have shorter tread life than the conventional tires on your vehicle. Replace the tire as soon as the tread wear indicator appears.
- When replacing the temporary spare tire, use a replacement tire with the exact same size and construction.



**Summary** 

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- ❑ Temporary spare tyres / tyre repair kits are being used in major countries like Europe, Australia, Japan, USA etc. The safety and performance requirements are specified in respective national regulations for temporary tyre.
- ❑ Inline with the international practices, regulatory standard was prepared to cover safety and performance requirements at both component level and vehicle fitment.
- ❑ After detailed deliberations, provision of temporary spare tyres was introduced under CMVR rules 95 and 138 in 2012 through gazette notification GSR 625(E) dtd 8<sup>th</sup> Aug 2012.
- ❑ All vehicles provided with temporary spare tyre are being tested as per applicable standards by the designated test agencies and type approval certificates are issued for same.
- ❑ In addition to temporary spare tyre usage, decision of including tyre repair kit was also agreed in last CMVR TSC meeting for supporting future vehicle developments like packaging SCR tank (BS6 diesel), battery pack (for EV) and CNG/ LPG cylinders.



# Thank You

### CMVR-TSC – Agenda 3 (vi)

#### # Difficulty in implementing the provisions of the sub-rule (1) and (2) of CMVR 125E (Special requirements of motor vehicles transporting livestock)

- Submission is received from All India Buffalo & Sheep Meat Exporters Association (AIMLEA).
- **Comments on:**
  - Sub Rule (1) “On and after, the 1st January, 2016 motor vehicles used for transportation of livestock by road shall be in accordance with the specifications of the Bureau of Indian Standards as provided in IS:14904:2007; or IS:5238:2001; or IS:5236-1982, as the case may be, as amended from time to time and the transporter or consigner of the livestock shall follow the code of practice laid down in the respective specification regarding the transport of the livestock.”
  - **AIMLEA Comments:**  
“Development of livestock markets with essential provisions to implement the guidelines in these codes is a requirement before mandating such provisions for implementation. The markets are grossly deficient of several facilities mentioned in the BIS Codes.”
  - **Secretariat Views:**
    - i. Vehicle related requirements are also mentioned in the said IS standards.
    - ii. The same have been mandated based on the earlier deliberations in Ministry and CMVR-TSC.
    - iii. Development of livestock market may not fall in purview of CMVR-TSC.
    - iv. No change needed.
  - **Committee may deliberate.**

### CMVR-TSC – Agenda 3 (vi)

#### # Difficulty in implementing the provisions of the sub-rule (1) and (2) of CMVR 125E (Special requirements of motor vehicles transporting livestock)

- **Comments on:**
  - Sub Rule (2) “Subject to sub-rule (1), the motor vehicles for carrying animals shall have permanent partitions in the body of the vehicle so that the animals are carried individually in each partition where the size of the partition shall not be less than the following namely:-
    - i. Cows and buffalos = 2 sq.mts
    - ii. Horses and mares = 2.25 sqmts
    - iii. Sheep and goat – 0.3 sq mts
    - iv. Pig = 0.6 sq.mts and
    - v. Poultry = 40 cmsq.”
  - **AIMLEA Comments**
    - Permanent provisions in the body of the vehicle is unimaginable for transport of livestock.
    - Size of animal, age groups, animal condition etc. determine the minimum space for comfort in transportation.
    - Present rules provides a larger space for all the animals of particular species. More than optimum space would cause injuries and discomfort to the animal in the transport as the animals have to be in a compact group but not in free style with larger space than required.
    - This may kindly be looked into and deleted as there are a number of logistic, economic and animal welfare implications.
    - These space requirements when compared with BIS Code, European union, Canada, Australia, FAO, USA, and South Africa are at much variance and certainly not in a desired position on any account.
    - Except Rule125E all other sources provided separate requirements for different size animals.
    - Adverse animal welfare implications when smaller size cattle and buffaloes below 500 kg weight are transported as per the 125E space provision of 2 sq. mts. Large majority of animals transported are much lower than 500 kg live weight. This space provision of 2 sq. mts for cattle and buffaloes should not be implemented as it is against animal welfare by any standard- as animals will be thrown about when larger space is used and may get injured.

## CMVR-TSC – Agenda 3 (vi)

### # Difficulty in implementing the provisions of the sub-rule (1) and (2) of CMVR 125E (Special requirements of motor vehicles transporting livestock)

- **Provisions in different regulations:**
  - 1. Rule 125 E provisions: Irrespective of weight/size: 2 sq. mts per cattle or buffalo
  - 2. BIS Code: 300-400 kg cattle/ buffalo (young/Adult): 1.06 to 1.20 sq. mts per animal
  - 3. Australia: Buffalo 300-500 kg: 0.86 to 1.28 sq. mts per animal; Cattle: 300-500 kg: 0.86 to 1.23 sq. mts per animal
  - 4. European Union: 325-550 kg: 0.95 to 1.60 sq.mts per animal
  - 5. Canada: Beef cattle 300-500 kg: 0.81 to 1.22 sq. mts per animal
  - 6. USA: Cattle: 364 -545 kg: 1.0 to 1.4 sq. mts per animal
  - 7. South Africa (LWCC): Small calf:0.3 sq. mts; Adult cattle: 1.4 Sq. mts
  - 8. FAO Manual: Small calves: 0.30 sq. mts and Mature cattle: 1.0-1.4 sq.mts per animals

- **Requirements given in BIS**

Transport by Road or Rail space allowance				
Class	Weight (kg)	Mean Cattle Dimensions (kg)	Space Required (m <sup>2</sup> )	
			Unhorned	Horned
Calves	Up to 50	0.27 x 1	0.28	0.28
	50 – 100	0.46 x 1.32	0.56	2.56
	100 – 200	0.46 x 1.33	0.62	0.73
Cattle / Buffaloes (Young / Adult)	200 – 300	0.56 x 1.52	0.86	0.96
	300 – 400	0.64 x 1.65	1.06	1.20
	More than 400	---	>1.27 to 1.73	>1.59 to 2

Note: These figures may vary depending on the animal's weight and size but also on their physical condition, the meteorological conditions and the likely journey time. The space allowance should be increased by at least 10 percent during hot, humid conditions.

- **Committee may deliberate.**

## CMVR-TSC – Agenda 3 (vi)

### # Difficulty in implementing the provisions of the sub-rule (1) and (2) of CMVR 125E (Special requirements of motor vehicles transporting livestock)

- **Comments on Sub Rule (3):**
  - "(3) No motor vehicles meant for carrying animals shall be permitted to carry any other goods.
- **Secretariat Comment:**
  - Sub-rule (3) is already modified vide GSR 904 (E) dated 23<sup>rd</sup> September 2016 .
  - "(3) No motor vehicles meant for carrying animals shall be permitted to carry any other goods "while carrying animals".
- **No action required.**

**# Difficulty in implementing the provisions of the sub-rule (1) and (2) of CMVR 125E (Special requirements of motor vehicles transporting livestock)**

- Comments on Sub Rule (4):
  - "(4) The Regional Transport Officer shall issue special licenses for the motor vehicles meant for carrying animals on the basis of vehicles modified in accordance with the provisions of sub-rule (2)."
  
  - **AIMLEA Submission:**
    - This provision need revision in view of the submissions made on sub rule (1) to (3) and there should not be any difficulties in the transport of livestock to the detriment of farmers and the stake holders in achieving the intent of the Rule 125E. The Rule provisions need to be proven ones for adoption.
    - As the basis for the Telangana Govt Circular Memo is the Govt of India 'Notification dated the 8th July 2015, GSR 546 E .. Central Motor Vehicles (Eleventh Amendment) Rules, 2015 ' it is requested the same may be repealed or amended to have implementable provisions.
  
- **Committee may deliberate.**

- # Presentation on 3 W vehicle designed for especially abled persons and senior citizens – creation of a separate vehicle category
  - Committee may deliberate and decide further course of action.

## Why Electric Three Wheeler?

- Adoption of such vehicle will result in improving the state of livelihoods of the specially abled people and senior citizens and restore the ecosystem over the coming decade.
- Electric Vehicles (EVs) are increasingly occupying the collective nation imagination as the one effective way out of the challenge of pollution and fuel resource crunch faced by India.
- Therefore, it's in the best interests of the country to follow suit.

## Present Scenario in India

- In recent past, the Government have been receiving a number of representations from persons with disability, highlighting the problem being faced by them due to non-availability of disability-friendly mobility scooters in the market.
- There is **no provision for category** of such vehicles till date.

## Major Features of the vehicle

### ➤(Single seat):

- Digital display
- Back suspension
- Lead-acid battery (60V 20 Ah)
- Seating capacity --> 1 Adult
- EU Type Approved vehicle
- Category, subcategory and sub-subcategory of vehicle: **L2e-P**
- Regulation (EU) No: 168/2013
- Front disc brake
- Range: 50 km
- Max. vehicle speed: 30 km/h



## Major Features of the vehicle Contd.,

### ➤ **Dual seat:**

- Digital display
- Back suspension
- Lead-acid battery (60 V 20 Ah)
- Seating capacity --> 2 Adult
- EU Type Approved vehicle
- Category, subcategory and sub-subcategory of vehicle: **L2e-P**
- Regulation (EU) No: 168/2013
- Front disc brake
- Range: 36 km
- Max. vehicle speed: 25 km/h



## Significant Advantages

- **Ease to Move Around:** Disabled people cannot walk long distances. This is a big issue.
  - Whether they are older or just don't have the physical strength or recovering from surgery, owning a mobility scooter limits the physical exertion needed to move around.
- **Two wheels at the rear on both the side:** To provide balancing / stability to the vehicle. Chances of fall-related injuries are decreased significantly. To protect drivers and pedestrians from disastrous accidents occurring due to Loss of control of the vehicle.
- **Automatic Reverse Wheel Locking Mechanism:** To prevent the uncontrolled reverse motion of an automobile under slopes and hilly roads. It also ensures safety of the driver and vehicle on inclined terrains.

## Significant Advantages Contd.,

- **Adjustable Seats:** Fully adjustable chair which are far more comfortable for someone who has a disability.
- **Cheaper to Maintain:** It has a lot less moving parts than a conventional petrol/diesel car. There is relatively little servicing and no expensive exhaust systems, starter motors, fuel injection systems, radiators and many other parts.
- **Low Accident Ratio:** The main objective of our project is to prevent accidents due to high speed vehicles, with simple and economical means. Ours is a low speed vehicle, which significantly reduces the probability of accident.

## Significant Advantages Contd.,

- **Cost Effective and More Efficient:** The electricity to charge an EV works out around a third as much per kilometre as buying petrol from the same vehicle. Electric vehicle has low maintenance and operation cost. Electricity is less expensive than gasoline and EVs are more efficient than gasoline vehicles.
- Fuelling with electricity offers some advantages not available in conventional internal combustion engine vehicles. Because electric motors react quickly, EVs are very responsive and have very good torque.
- **Reduced Fuel Consumption:** Battery Operated Vehicles are efficient in reducing the fuel consumption. This is a tremendous opportunity to lower fuel costs, reduce carbon pollution, and cut India's dangerous dependence on oil.



## Significant Advantages Contd.,

- **India's Energy Security**: At present, India is highly dependent on other countries for petroleum imports. EVs are easy to power from local and renewable energy sources, reducing our dependence on foreign oil. There are also better employment benefits for Indians through the use of locally produced electricity.
- **Safety Improvements**: EVs tend to have a lower centre of gravity that makes them less likely to roll over. They can also have a lower risk for major fires or explosions and the body construction and durability of EVs may make them safer in a collision.
- **Comfort and Versatility**: It comes from robust suspension to handle rough terrain.

## Significant Advantages Contd.,

- **Simple to Operate**: Incredibly simple to manoeuvre and operate. One can recharge the batteries from the comfort of their own home.
- **Increased independence**: Allows one to get out and about without the use of an assistant or carer.
- **Ignition**: It is best as it is keyless.
- **Psychological benefits**: From being able to leave the house when it suits you, and peace of mind make owning a high-quality mobility scooter the perfect long-term investment.

## Significant Advantages Contd.,

- **Increase Accessibility:** Allows to explore the places more fully, as well as visiting areas previously viewed as easy for them to access. Provide ability to move, resulting in exciting and fulfilling life. It further leads to wide range of health outcomes, such as reductions in depression and anxiety symptoms, stress, mood disturbance as well as increases in quality of life, sense of community, physical activity levels and cognitive function.
- **Better for the Environment (Less Pollution):** By choosing to drive an EV you are helping to reduce harmful air pollution from exhaust emissions. An EV has zero exhaust emissions.

## Significant Advantages Contd.,

- Have lights, indicators, horn, and rear-view mirrors to comply with legislation.
- They do not require a license or insurance to use.
- Facilitate the person with lower limb disabilities to drive the mobility scooter.
- This action will be ethically permissible.

## Conclusion

- Need to take appropriate action to find a way out to provide a suitable mobility vehicle to the persons with disability without compromising on their safety, as well as safety of other road users.
- The concerned **Government is requested to decide and allot category** and grant permission to use these vehicles for use of physically challenged persons and senior citizens.

Appropriate action from the Government will inspire determination, courage and battle for self-reliance and compassion for physically challenged people. It will be a transformation for them from an object of sympathy to an object of admiration.

# THANK YOU

## # Registration of 3 W electric vehicles

- Committee may deliberate and decide further course of action.

## E – Auto (L5M category)- Registration as a Fleet



### Challenges in scaling up E Auto volumes:

- ❖ Cost structures of E Auto are much higher than the ICE based vehicles.
- ❖ Access to Charging infra for a typical Auto owner / driver.

### Benefits of Fleet ownership / corporate ownership:

- ❖ Such organised players can own vehicles in bulk.
- ❖ Can establish charging points / centres for all vehicles he owns.
- ❖ Deploy these vehicles on rental basis to auto drivers.
- ❖ Can help build scale for faster EV penetration

### Clarity needed at STA level:

- ❖ Some STA are ok for such fleet registration, while some others are seeking clarity.
- ❖ Since such fleet / corporate ownership will help the cause of EV scale up, & for uniformity in understanding, we request MoRTH to issue an advisory to all STA to allow & register E Auto (L5M) in fleet / corporate ownership

**# Creation of 3 W electric vehicle having less than 0.25 kW (thirty minute power), maximum speed 25 km/h and unladen weight not more than 60 kg**

- Battery operated 3 W Ice cream cart, running on small power motor instead of conventional run method of manual paddling.
- It is proposed to use motor and controller with the net power of that product less than 250 watt and speed shall be approx. 12-15 kmph.
- It is stated that the product will enable easy operation and will forego manual labour for small vendors.
- Presently exemption from definition of motor vehicle is given to small engine vehicle irrespective of number of wheels whereas in case of battery operated vehicles, such exemption is available only to 2 W battery operated vehicles.
- It is requested to extend the exemption to 3 W low power battery operated as well.
- [Views from ARAI.](#)

