Two-and-Three-Wheelers: The Challenge with an Increasing Number of Vehicles

We will promote access for all to safe, age- and gender-responsive, affordable, accessible and sustainable urban mobility and land and sea transport systems, enabling meaningful participation in social and economic activities in cities and human settlements, by integrating transport and mobility plans into overall urban and territorial plans and promoting a wide range of transport and mobility options, in particular by supporting: (a) A significant increase in accessible, safe, efficient, affordable and sustainable infrastructure for public transport, as well as non-motorized options such as walking and cycling, prioritizing them over private motorized transportation [...]
What are the Characteristics of Two-and-Three-Wheelers?

Two-and-three-wheelers satisfy the mobility needs. Even in cities with a high density of public transport facilities, they still play a significant role as they cater to the first and last mile connectivity. In middle- and low-income cities, the two-and-three-wheelers offer a significantly:

- high route and schedule flexibility,
- ease of access (door to door) and
- manoeuvrability in congested traffic with
- low operating costs.

Besides the private use, two-and-three-wheelers are also gaining popularity in urban freight distribution for small and medium enterprises due to:

- growing e-commerce,
- traffic congestion,
- restrictions for urban freight distribution, and
- limited on street parking at destinations.

The two-and-three-wheelers play a key role here, as they replace trips otherwise carried out by lorries or vans.

Problems with the growing Number of Two-and-Three-Wheelers

In many cities, the movement of two-and-three-wheelers are becoming increasingly restricted due to high externalities. High densities of motorised two-and-three-wheelers in urban areas pose serious strains on:

- overall traffic congestion,
- energy consumption,
- carbon emissions,
- traffic accidents
- air and noise pollution, and
- road safety.

In the light of the expected growth rates in the two-and-three-wheeler population by 2050, a continuation of existing policies will likely result in a 1.6 to 5-fold increase in externalities compared to 2015 levels. The substantial contribution of two-and-three-wheelers to transport externalities makes a compelling case for prioritizing policy action (Figure 2).

Sustainable Policy Options

Among middle- and low-income cities, there is widespread acknowledgement of the need to improve the sustainability of two- and three-wheelers. Looking to the future, cities need good knowledge of policies and measures on how to proceed. There are various urban examples of reorganizing, regulating and integrating two-and-three-wheelers as a mode of transport within existing transport systems to achieve accessible, affordable, environmentally friendly, and efficient transit.

The following elements are highly relevant for transforming the use of two-and-three-wheelers into a valuable addition to urban sustainable mobility concepts, including:

- driving restrictions,
- regulations for air pollutants and Co2 emissions,
- infrastructure solutions,
- technology-based retrofits
- improving sidewalks,
- cycling facilities, as well as
- public transit accessibility, and quality.

In addition - Components of a Parking Strategy for Two-and-Three-Wheelers:

- strategic planning of location and land use
- features of on- and off-street parking
- prioritizing on-street parking options
- considering private sector involvement
- developing pricing strategies

- to provide greater access/circulation of electric two-wheelers that use pedal assistance instead of throttle power
- to increase the share of renewables in the electricity mix and use lithium-ion batteries instead of lead-acid batteries
- to promote electric scooter sharing schemes and integrate them with existing public transport schemes.


Dedicated lanes are built with the aim of segregating two-and-three-wheelers from mixed traffic, thereby reducing the risk of accidents while improving the capacity and level of service. Two-wheeler lanes should ideally be located between mixed traffic curbs and car lanes to avoid right turn conflicts as well as clashes with stopped vehicles, pedestrians, and cyclists in the curb lane.

5. Vehicle Emission Standards

Two-and-three-wheeler emissions are now regulated in many countries, but there is a very high diversity in the stringency and typology among current regulations between countries. In general, smaller two-wheelers are subject to more stringent standards, while heavier ones, especially three-wheelers, enjoy more relaxed standards. It has been proven most effectively that:

- countries can advance directly to more stringent standards, given that they adequately consider the social costs of air pollution and the speed of technology innovation over the past decade.
- countries with serious PM pollution should consider the development of a specific PM standard for two-and-three-wheeled vehicles.
- countries should strengthen vehicle inspection and maintenance (VVI) programs.
6. Fuel Economy Standards

Due to their small engines and light-weight frames, two-wheelers have a higher fuel efficiency than passenger cars. This is part of the reason why two-wheelers have thus far been neglected in fuel efficiency improvement agendas in many countries. However, it is well established that the fuel efficiency of two-and-three-wheelers decreases as engine capacity and kerb weight grow. Further experience suggests that the design and technology of two-and-three-wheelers plays a significant role in improving fuel efficiency.

It has been proven most effectively that countries set progressive fuel efficiency standards for two-and-three-wheelers. These need to be established simultaneously with vehicle emission standards to ensure high benefits.

Where to learn from?

Singapore has implemented a zero-growth target. This policy is applicable to all private passenger transport modes including two- and three-wheelers. As the quota system is also combined with several other regulations such as electronic road pricing, mass transit improvement, taxation, etc. this restriction is expected to result in a net-positive impact.

In Bangalore, about 120,000 three-wheelers and about 10% of them run on two-stroke engines. As part of the ban of two-stroke vehicles, a 500 USD subsidy was offered to drivers to purchase new, four-stroke, LPG-driven three-wheelers. The economic incentive provided was substantially higher than the resale value of 15 years old three-wheelers which explains the success of this policy.

India recently revised its taxi regulations to accommodate motorcycle use as on-demand ride services. The motorcycle taxis are now acknowledged as a low-cost last mile connectivity solution for the passengers.

In several European cities (e.g. Antwerp, Rotterdam, London), Low Emission Zones have been introduced to fulfill the standards for air quality. Zones are monitored by cameras or via random checks.