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Can Electric Transport Transform Kathmandu's Air?

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Kathmandu's electric-vehicle transition is easy to see. Battery-powered cars move through intersections once dominated by petrol and diesel engines, charging stations are appearing on intercity routes, and consumers increasingly compare range and charging speed alongside price. For a country that imports petroleum and generates most of its domestic electricity from hydropower, the appeal is powerful.

But the question is larger than how many electric cars are sold. Can electric transport materially improve the air breathed by millions of people in Kathmandu Valley? The answer is yes—if electrification is treated as a public-transport and urban-planning

project. If the city only swaps one private car for another, it will reduce tailpipe pollution while leaving congestion, road danger, tyre dust and unequal access largely untouched.

The scale of the air-pollution problem

A 2025 World Bank assessment described air pollution as Nepal's leading risk factor for death and disability. It estimated approximately 26,000 premature deaths each year, an average loss of 3.4 years of life expectancy and an economic cost exceeding six percent of gross domestic product. Kathmandu Valley and the Tarai were identified as major pollution hotspots.

Those figures concern national exposure and many sources, not vehicle exhaust alone. Industry, household fuels, brick kilns, waste burning, road and construction dust, forest fires and pollution moving across the wider Indo-Gangetic Plain all contribute. Electric mobility cannot solve every source. It can, however, directly reduce emissions where people live, walk, study and work—especially when old diesel vehicles are replaced.

What disappears when a vehicle goes electric

A battery-electric vehicle has no tailpipe. It does not emit nitrogen oxides, carbon monoxide or exhaust particles on the street. In dense corridors where buses, vans and motorcycles repeatedly

accelerate, that local benefit matters. Electric motors are also quieter at low speeds, reducing a layer of urban noise.

Nepal has an additional advantage: a power system dominated by renewable hydropower. An electric vehicle charged on this grid can offer substantial greenhouse-gas benefits compared with a fossil-fuel vehicle. The exact result depends on the time and source of charging, battery production, vehicle size and lifetime, but electricity creates a path away from imported petroleum.

What does not disappear

Electric vehicles still require roads and parking. Their tyres and brakes produce particles, though regenerative braking can reduce brake wear. Large batteries add weight. Manufacturing and disposal carry environmental costs. A traffic jam of electric SUVs remains a traffic jam.

This is why counting private EV registrations is a limited measure of success. A better measure asks how many people can reach work, school and services quickly, safely and with low emissions. On that test, one reliable electric bus can matter more than many private cars.

The biggest prize is the public fleet

Kathmandu's buses and minibuses do difficult work: long daily distances, frequent stops and heavy passenger loads. Their fuel

use and exposure to crowded streets make them strong candidates for electrification. Electric buses can reduce operating fuel costs and remove exhaust from the places where commuters wait and vendors work.

The transition needs more than purchasing vehicles. Operators require financing that reflects the higher upfront cost and lower running cost of an electric bus. Depots need dependable charging and enough grid capacity. Routes need to be rationalised so buses are frequent and easy to understand. Ticketing, maintenance training and service standards must improve at the same time.

The Asian Development Bank's proposed Sustainable Urban E-Mobility Project reflects this broader approach, combining electric bus fleets with intelligent transport systems, policy support and public-transport modernisation in Kathmandu and Pokhara Valleys. The design recognises that vehicles and systems must change together.

Two-wheelers and delivery fleets cannot be ignored

Motorcycles and scooters are central to mobility in Kathmandu. Their price, agility and convenience make them difficult to replace quickly with buses alone. Electric two-wheelers can reduce local exhaust and noise, but adoption depends on battery confidence, safe charging, repair networks and resale value.

Delivery riders and commercial fleets are a particularly useful starting point. Their predictable routes and high daily use can make operating savings more visible. Fleet charging can be planned at depots, and maintenance data can help the wider market understand battery performance in Nepal's conditions.

Charging must become ordinary infrastructure

A driver should not need specialist knowledge to find a working charger, understand its price or pay for a session. Nepal Electricity Authority has developed public-charging infrastructure and provides charging-station tools, but the next phase requires reliability, interoperability and transparent maintenance.

Home charging will serve many private owners, while buses, taxis and freight vehicles need faster or depot-based systems. Utilities can encourage off-peak charging to reduce pressure on the grid. Building codes should prepare apartments and commercial parking areas for safe electrical capacity rather than allowing improvised cables to become the norm.

Batteries need a life beyond the showroom

Every growing EV market eventually faces questions about damaged and end-of-life batteries. Nepal needs clear responsibility for collection, transport, testing, second-life use and

recycling. Informal dismantling of high-voltage batteries would create fire, chemical and worker-safety risks.

Importers should disclose battery warranties and replacement costs in comparable terms. Regulators need standards for state-of-health testing so used-EV buyers can assess what they are purchasing. Regional recycling partnerships may be more practical than building every process domestically, but the chain of responsibility must begin in Nepal.

Clean transport also means fewer forced trips by car

Walking is the original zero-tailpipe mode, yet Kathmandu's footpaths are frequently broken, blocked or absent. Safe crossings, shaded sidewalks and protected cycle connections can replace short motorised trips and make public transport usable. A passenger cannot benefit from a clean bus if reaching the stop is dangerous.

Land-use decisions matter too. When housing, jobs and schools spread without coordinated transport, people become dependent on private vehicles. Compact mixed-use neighbourhoods and dependable mass transit reduce energy use regardless of engine type.

A practical clean-mobility agenda

1. Electrify high-use buses, taxis, two-wheelers and delivery fleets first.
2. Pair vehicle finance with route reform, service standards and depot charging.
3. Publish reliable charger locations, prices and operating status.
4. Create battery-health, safety, collection and recycling rules before waste volumes grow.
5. Enforce emissions standards on the fossil vehicles that remain.
6. Control road dust, construction emissions, waste burning and industrial sources alongside transport policy.
7. Invest in sidewalks, crossings, cycling links and bus-priority measures.

Electric transport can transform Kathmandu's air, but technology must serve a transport vision. The cleanest future is not simply a city where every household buys a battery-powered car. It is a city where a child can walk safely, a bus arrives predictably, a delivery rider can charge affordably, and fewer people are forced to inhale exhaust while sitting in traffic. Electrification is the engine of that change; good public policy must provide the direction.

To find and interpret local monitoring observations, read our Kathmandu Valley air-quality guide.

Sources and further reading

- Air Pollution Is the Number One Health Risk Factor in Nepal, World Bank, 2025.
- Nepal: Sustainable Urban E-Mobility Project, Asian Development Bank.
- Nepal Electricity Authority, including public-charging information.

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