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Managing Speed Limits: A Government's Fuel Conservation Measure

Key Message

Managing speed limits on national highways and motorways offers a quick, low-cost way to cut fuel demand. It won't close the gap by itself, but as part of the National Conservation Strategy, it saves fuel and foreign exchange, makes roads safer, and can be put in place almost immediately, without new spending or infrastructure.

Executive Summary

The US-Iran conflict has disrupted global energy markets amid the closure of the Strait of Hormuz, through which roughly one-fifth of global oil supply passes. As a result, oil prices have become more volatile, and import-dependent economies like Pakistan face higher energy security risks. In response, the Government of Pakistan has lowered the maximum speed limit for light and heavy vehicles on motorways and national highways, as one of the government's precautionary fuel conservation measures.

This policy view estimates the total fuel saved by lower speed limits. Using traffic counts for the main motorways and highways, national fuel consumption data and the International Energy Agency's (IEA) estimates on speed and fuel consumption, the central estimate is a saving of about 141 million litres of petrol and diesel a year, worth about Rs 56 billion at the pump prices of 3 October 2026, about US\$ 134 million in import costs. The study estimates total fuel savings range from about 28 million to 332 million litres (Rs 10.9 billion to Rs 131 billion), depending on how far drivers actually slow down. These figures are indicative scenario estimates rather than forecasts, depend on the behavioural assumptions set out in and on the degree of compliance. Further, the low and high values depict alternative scenarios, not the statistical confidence bounds.

The central saving equals about 0.8% of annual road fuel (petrol and diesel) use and about 0.9% of the FY2025-26 petroleum import bill (US\$ 15.6 billion). This measure is therefore helpful but modest on its own. Its value lies in its low cost, road safety benefits and speed of implementation. The result depends mainly on enforcement: at full compliance, the central saving would be close to 218 million litres. Speed limits should be combined with other fuel demand conservation measures, such as eco-driving for freight, remote working and better public transport, to have a larger effect.



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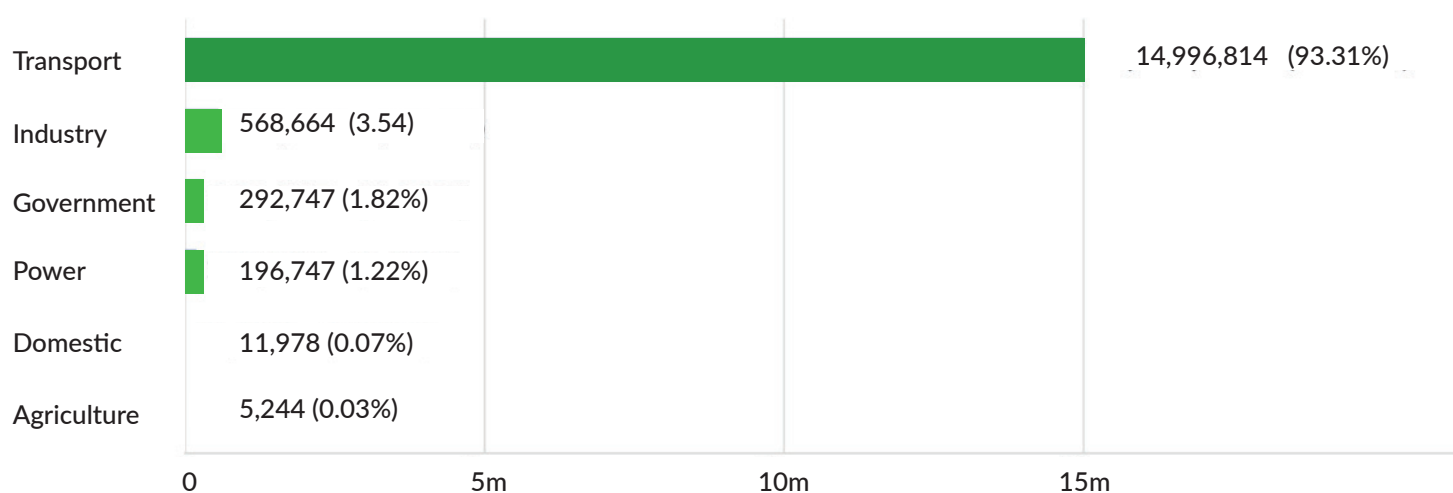
Estimate (per year)	Low	Central	High
Fuel saved (million litres)	28	141	332
Value at pump prices (Rs billion)	10.9	55.8	131.0
Import cost saved (US\$ million)	26	134	313

Source: Authors' calculations

Background and Context

The transport sector is by far the largest consumer of petroleum products in Pakistan, hence making it a natural target for fuel conservation during an oil supply disruption. Road transport accounts for almost 96.9% of total transport sector fuel consumption, using 14.53 million tonnes of petroleum products in Jul-Jun FY2025-26 (Table 1), 1.2% more than in the same period of FY2024-25.

Figure 1: Transport is 93% of domestic Petroleum demand



Source: OCAC / HDIP. Energy products (Metric Tonnes) , Jul–Jun 2025-26.

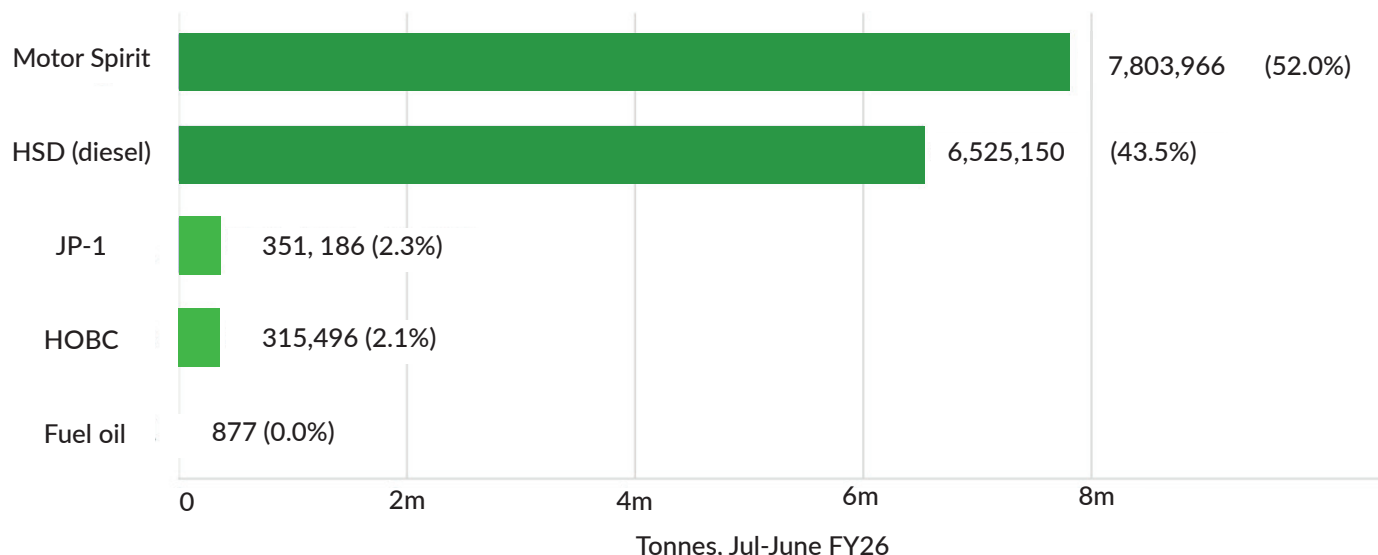
Table 1: Consumption of Energy (Petroleum) Products by Transport (tonnes)

Mode	HOBC	Motor spirit	JP-1	KERO	HSD	Fuel oil	Jul-Jun FY26	Jul-Jun FY25
Road	315,496	7,803,966		139	6,413,558	134	14,533,293	14,364,228
Railways					108,520	188	108,708	115,201
Domestic bunkers					3,072	541	3,613	2,568
Domestic aviation (PIA)			159,682				159,682	169,238
Domestic aviation (others)			191,504			14	191,518	194,084
Total transport	315,496	7,803,966	351,186	139	6,525,150	877	14,996,814	14,845,318

Source: OCAC / HDIP

Motor spirit (petrol) is the main fuel for cars and other light vehicles, while high-speed diesel (HSD) powers most trucks, buses and freight. The fuel mix is heavily concentrated in Motor spirit (7,803,966 metric tonnes) and high-speed diesel (6,525,150 metric tonnes), which together make up 95.5 per cent of total transport fuel consumption. Any movements in the transport sector's total share are, in practice, movements in these two products' share. Jet fuel (JP-1, 351,186 metric tonnes) and HOBC (315,496 metric tonnes) each account for roughly 2 per cent, and fuel oil is only 877 metric tonnes (Figure 2).

Figure 2: Transport Runs on Two Fuels

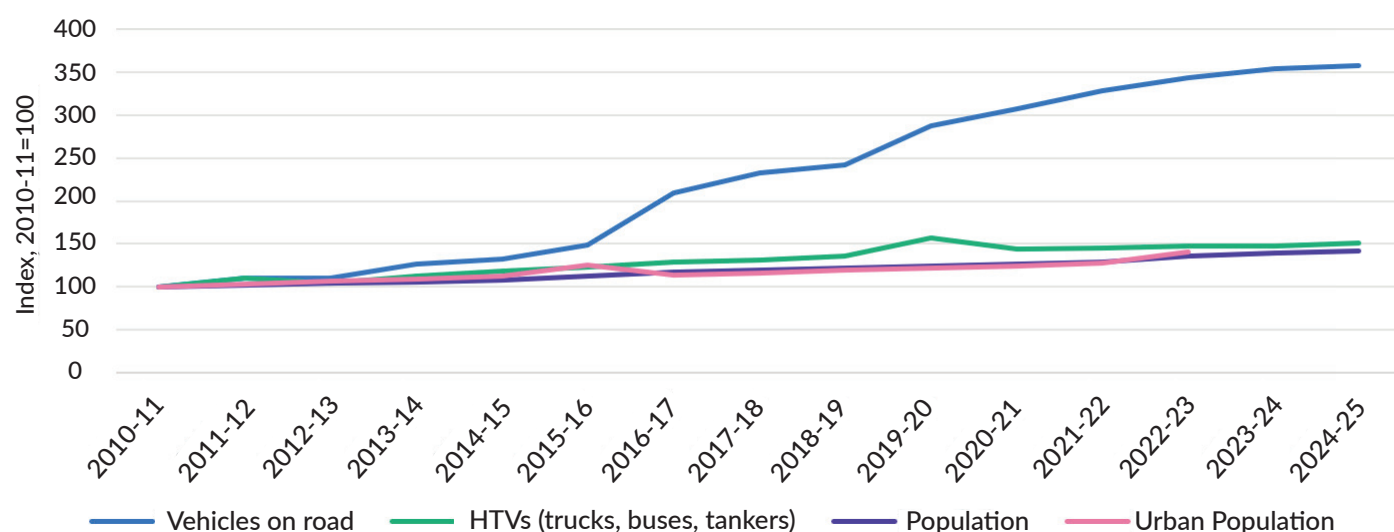


Source: HDIP / OCAC. (Metric tonnes)

Rising Population and Rising Vehicle Demand

Although Pakistan's population and cities are growing rapidly, the number of vehicles, especially privately owned vehicles, is growing at a much faster rate. According to the 2023 Population Census, the population rose from 177.1 million to 241.5 million (36%), and the urban population rose from 66.4 million to 93.9 million (41.4%) during FY2017 to FY2023. However, the number of vehicles on roads rose from 10.4 million to 35.9 million in FY 2023, witnessing an increase of 245.2% during the same period (Figure 3). Several factors, such as population growth, urban sprawl, auto financing, and insufficient public transport, contribute to this trend (Qadir and Batool, 2026).

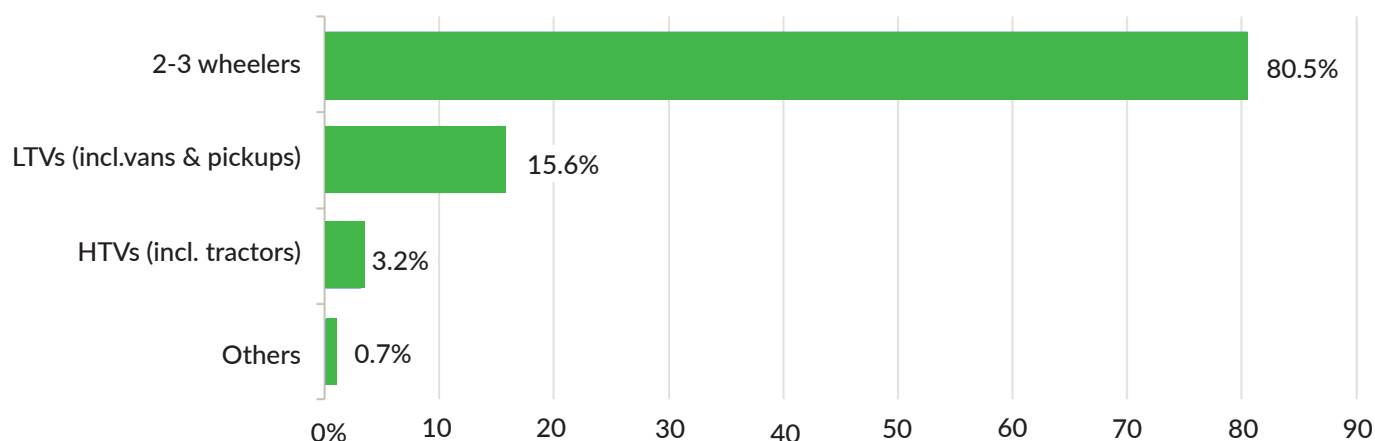
Figure 3: Population and Vehicles on Road (index, 2010-11 = 100)



Source: Pakistan Economic Survey 2025-26.

Figure 4 shows Light transport vehicles (LTVs) are about 6.4 million (15.6% of the total), and heavy transport vehicles (HTVs), are 1.3 million (3.2% of total vehicles on roads). The remaining 0.3 million vehicles (0.7%) are listed under others. Motorcycles (80.5%) are not allowed on motorways and their limits were not changed, so the estimates below cover LTVs and HTVs only.

Figure 4: Vehicle Fleet by Type, July–March 2025-26 (% of total)



Source: Pakistan Economic Survey 2025-26.

The Speed and Fuel Efficiency Relationship

Many factors affect a vehicle's fuel consumption: vehicle type and weight, engine size, driving style, maintenance, tyre pressure, load, air conditioning and road conditions etc. Aggressive driving with rapid acceleration and hard braking uses much more fuel than smooth driving, and under-inflated tyres and poor maintenance make engines work harder. Among the factors a government can influence quickly, speed has one of the largest effects. Air resistance rises with the square of speed and dominates fuel use at highway speeds, so each additional 10 km/h costs more fuel than the last. Research on this link gained prominence after the first oil shock of the 1970s. Lower speed limits are a tried policy response. During the 1973 oil crisis, the French government lowered limits to 90 km/h on ordinary roads and 120 km/h on motorways, and France again encouraged slower driving as part of its response to the 2022 energy crisis (IEA 2026). Table 2 sets out the revised limits by road type and vehicle category.

Table 2: Revised Speed Limits on Motorways and National Highways

Road type	Vehicle category	Previous limit (km/h)	Revised limit (km/h)	Reduction (km/h)
Motorways	Cars / LTVs	120	100	20
Motorways	PSV / HTV	110	90	20
National highways	Cars / LTVs	100	80	20
National highways	PSV / HTV	80	65	15

Source: National Highways & Motorway Police.

The IEA's March 2026 report *Sheltering from Oil Shocks* finds that reducing highway speed by 10 km/h cuts an individual car driver's oil use by 5% to 10%, and that such speed limit reductions may lower national oil use for private cars by 1% to 6%. Heavy freight trucks save less from a 10 km/h cut because they already travel more slowly, but because they drive on highways much more, each heavy truck can still cut oil use by around 5%. The measure reduces diesel demand through heavy traffic vehicles like buses and trucks and petrol demand through cars and light commercial vehicles, where about 90-99% of use is diesel and Motor spirit.

The IEA coefficient is expressed per 10 km/h, while the revised limits are cut by 15 to 20 km/h and the average speed reductions assumed are 10 to 15 km/h. In the estimates below the coefficient is scaled linearly to the assumed average speed reduction, so that a 15 km/h reduction is treated as 1.5 times the saving per 10 km/h. This is an approximation rather than an estimated relationship. Because fuel use rises roughly with the square of speed, linear scaling probably understates savings at the top of the speed range and overstates them at lower speeds; it is used here because no coefficient estimated on Pakistani traffic is available.

Estimating the Fuel Savings

Estimation Framework

Fuel is saved only on the kilometres that vehicles actually drive on motorways and national highways, only by drivers who were going faster than the new limit, and only to the extent that they comply. The estimate therefore works segment by segment (LTVs and HTVs on motorways and on highways):

$$FUEL\ SAVED = \sum_s F_s \times e_s \times \left(\frac{\Delta V_s}{10}\right) \times \beta_s \times c_s$$

where F_s is the fuel used on the network by the segment, e is the share of its vehicle-kilometres driven above the new limit, Δv is the average speed reduction for those kilometres (km/h), β is the fuel saving per 10 km/h (5% to 10% for cars and about 5% for trucks, from the IEA), and c is the compliance rate.

Network fuel F_s is estimated in two ways as follows:

- Method A (National corridors length):**

Corridor road length $\times$ average daily traffic (ADT) $\times$ vehicle mix gives vehicle-kilometres on each motorway and highway, which are converted to litres using fuel economy of 13 km per litre for LTVs and 3.5 km per litre for HTVs (Pak Wheels).

- Method B (National):**

National Road petrol and diesel use (10,475 million litres of petrol and 7,635 million litres of diesel in FY2025-26) $\times$ the share used by each vehicle class $\times$ the share burnt on motorways and national highways. Method B therefore rests on two sets of shares: the share of road petrol used by LTVs and of road diesel used by HTVs and PSVs (80% each), and the share of each burnt on motorways and national highways (petrol 14.6% and 21.1%; diesel 20.9% and 43.4%). The values used imply network volumes of 2,993 million litres of petrol and 3,928 million litres of diesel (Table 5), equal to 28.6 per cent of road petrol and 51.4 per cent of road diesel.

Traffic on the National Road Network

The NHA network is only about 3.0% of national roads, but it carries about 80% of commercial traffic. Table 3 summarises the traffic data used for Method A. Motorcycles (2-3 wheelers) are excluded.

Table 3: Traffic and Fuel Use on Motorways and National Highways (Method A)

Road	Length (km)	ADT excl. bikes	HTV+PSV share	Vehicle-km/yr (billion)	LTV fuel (m litres)	HTV fuel (m litres)
M-1 Islamabad-Peshawar	155	30,000	18%	1.70	107	87
M-2 Islamabad-Lahore	367	23,000	30%	3.08	166	264
M-3 Lahore-Abdul Hakeem	230	17,500	27%	1.47	82	113
M-4 Pindi Bhattian-Multan	309	17,500	27%	1.97	111	152
M-5 Multan-Sukkur	392	2,250	30%	0.32	17	28
M-9 Karachi-Hyderabad	136	35,000	39%	1.74	82	194
Other motorways	1,227	5,000	25%	2.24	129	160
N-5 Jhelum-Kamoki	150	20,000	35%	1.09	55	110
N-5 other sections	1,669	15,000	35%	9.14	457	914
N-55 Indus Highway	1,264	5,000	50%	2.31	89	330
N-25 Karachi-Chaman	813	6,000	40%	1.78	82	203
Other national highways	8,196	2,000	30%	5.98	322	513
Total	14,908			32.8	1,699	3,067

Source: NH&MP / NHA traffic counts; Pakistan Economic Survey 2024-25 (lengths)

Behavioural Assumptions

Table 4 sets out how much drivers are assumed to slow down. The central case assumes that 70% of car kilometres on motorways were above 100 km/h and slow by 15 km/h on average, with 70% compliance, and that heavy vehicles, which already drive more slowly, change less. These assumptions are the main source of uncertainty and should be updated with NH&MP speed-camera and enforcement data.

Table 4: Behavioural Assumptions and Effective Fuel Saving (Central Case)

Segment	Share of vkm above new limit	Average speed cut (km/h)	Saving per 10 km/h	Compliance	Effective saving (central)	Range (low-high)
LTV, motorways (120→100)	70%	15	7.5%	70%	5.51%	1.3% – 13.0%
LTV, highways (100→80)	50%	12	7.5%	60%	2.70%	0.5% – 7.2%
HTV/PSV, motorways (110→90)	40%	12	5.0%	70%	1.68%	0.3% – 3.4%
HTV/PSV, highways (80→65)	45%	10	5.0%	60%	1.35%	0.2% – 2.9%

Source: IEA (2026) for savings per 10 km/h

Estimated Results

Under the central assumptions, Method A gives a saving of 110 million litres a year and Method B 172 million litres (Table 5). Their average, 141 million litres, is used as the central estimate: about 90 million litres of petrol and 51 million litres of diesel @ as per the OGRA-notified prices (Rs 392.76 per litre of petrol and Rs 399.64 per litre of diesel) on October 3, 2026. This is worth of about Rs 56 billion in savings per year. Further, to calculate the foreign exchange saving, petrol saved is valued at its OGRA-notified landed cost at Karachi Port of Rs 255.30 per litre (US\$ 0.92) and diesel at Rs 276.36 per litre (US\$ 1.00), both at the SBP exchange rate of Rs 277.27 per US\$ (OGRA, 3 October 2026). This gives a foreign exchange saving of about US\$ 134 million a year (US\$ 83 million on petrol and US\$ 51 million on diesel).

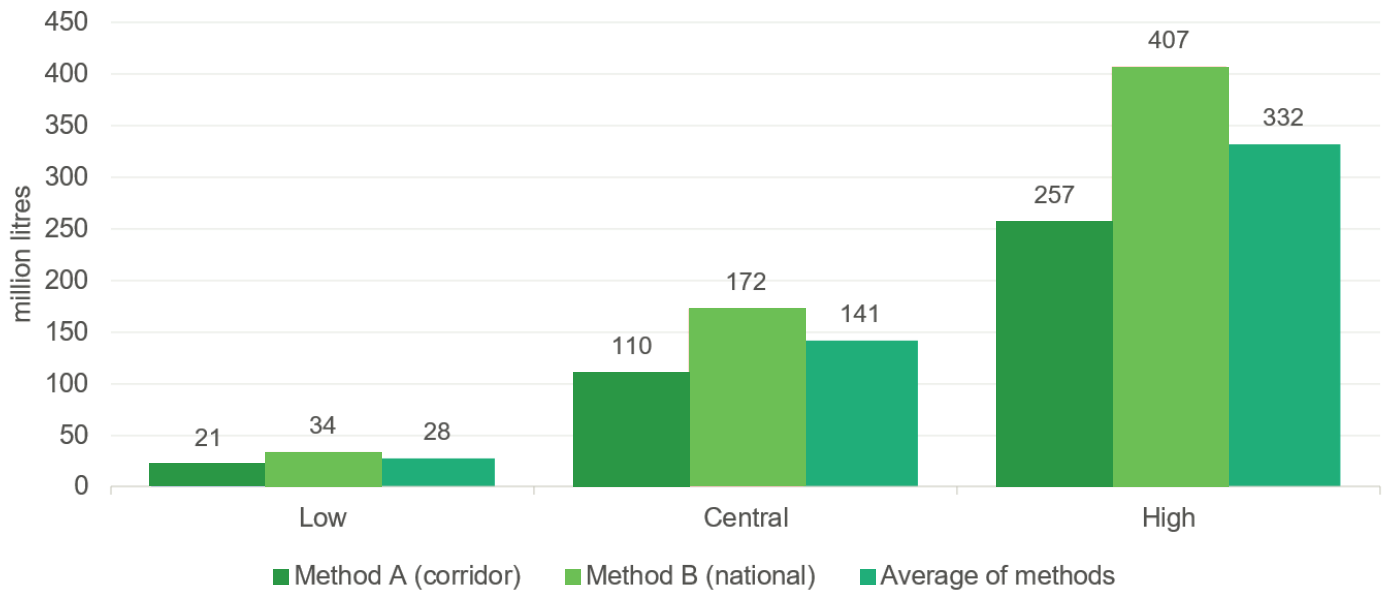
Table 5: Estimated Annual Savings by Segment, Central Case

Segment	Network fuel (m litres) Method A / B	Fuel saved (m litres) Method A / B	Value (Rs billion) Method A / B	Import cost saved (US\$ m) Method A / B
LTV motorways	694 / 1,223	38.3 / 67.4	15.0 / 26.5	35.2 / 62.1
LTV highways	1,005 / 1,769	27.1 / 47.8	10.7 / 18.8	25.0 / 44.0
HTV/PSV motorways	998 / 1,277	16.8 / 21.4	6.7 / 8.6	16.7 / 21.4
HTV/PSV highways	2,069 / 2,651	27.9 / 35.8	11.2 / 14.3	27.8 / 35.7
Total	4,766 / 6,920	110.1 / 172.4	43.6 / 68.1	104.8 / 163.1

Source: Authors' calculations.

The simple average of the two methods is used because these are two independent routes to the same quantity and there is no basis for weighting one above the other. Method A builds up from corridor traffic counts and is sensitive to the assumed ADT and vehicle mix; Method B works down from national fuel sales and is sensitive to the assumed vehicle-class and network shares. Their results are alternative scenarios, not statistical lower and upper bounds, since both rest on the same behavioural assumptions and the same IEA coefficient.

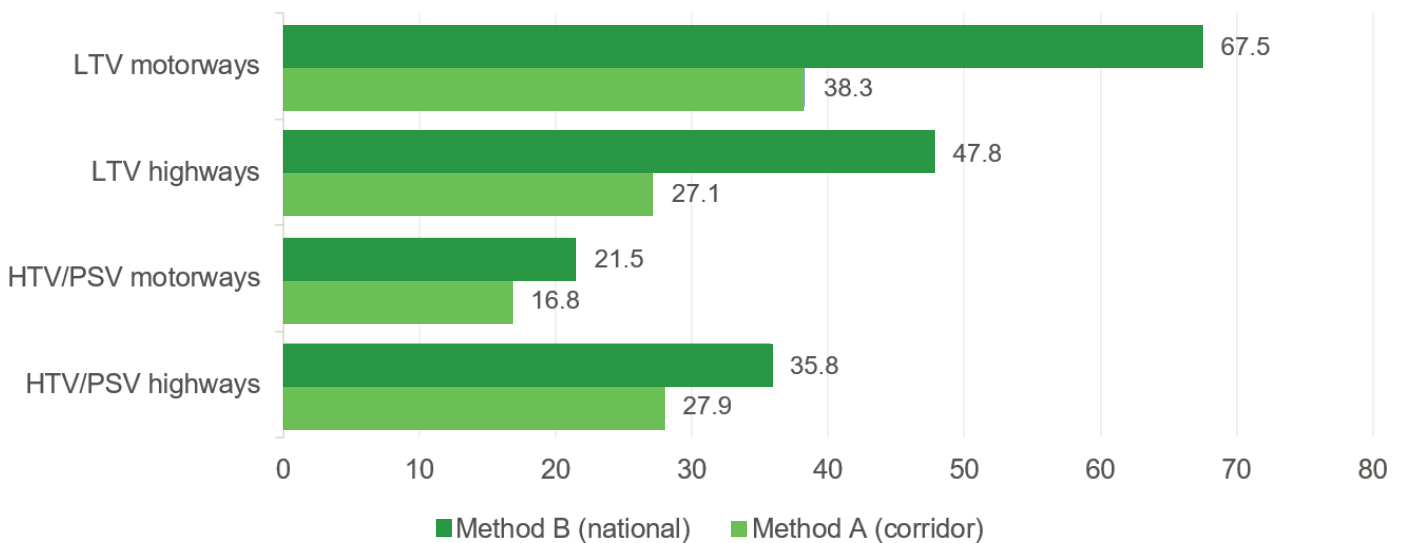
Figure 5: Annual Fuel Saved by Scenario (million litres)



Source: Authors' calculations.

Light vehicles on motorways give the largest saving per kilometre, because cars were driving fastest and the fuel penalty of high speed is steepest there. Heavy vehicles on highways contribute a similar total because they burn so much diesel on the network, even though each vehicle saves less (Figure 6).

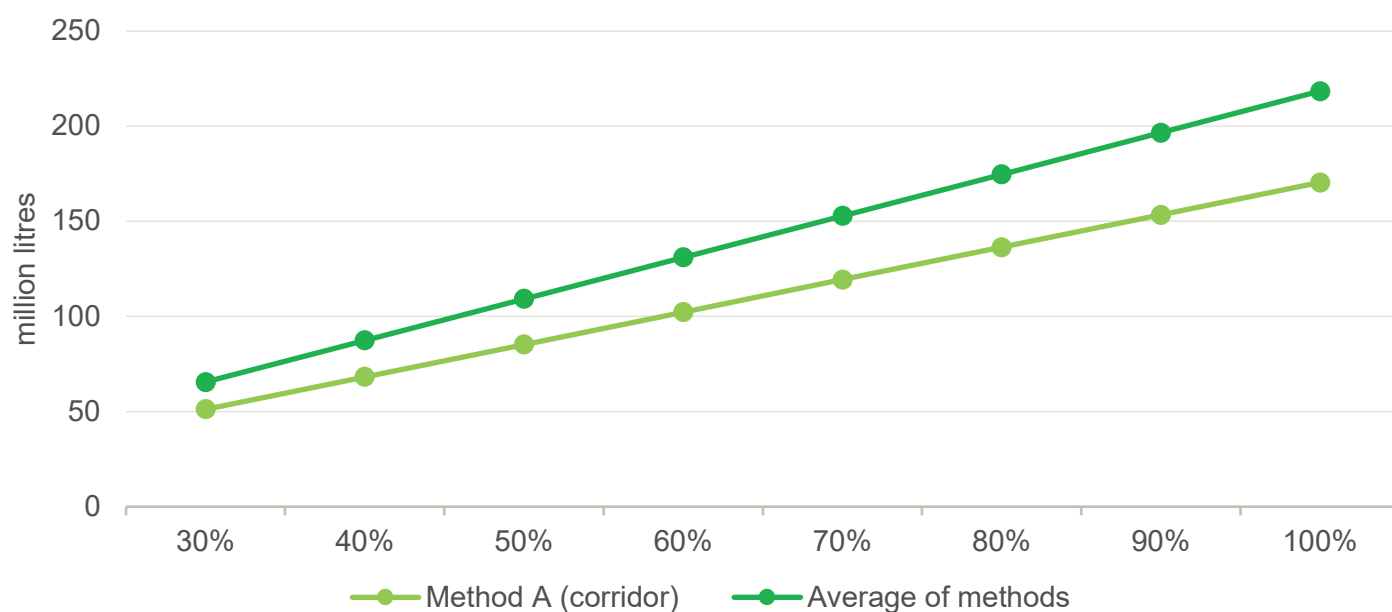
Figure 6: Central Case Fuel Saved by Segment (million litres)



Source: Authors' calculations.

Compliance is decisive. If only 30% of drivers who were speeding slow down, the saving falls to about 65.5 million litres; with full compliance it rises to about 218 million litres (Figure 7).

Figure 7: Fuel Saved at Different Compliance Rates, Central Case (million litres)



Source: Authors' calculations.

Caveats

- The estimates cover only motorways and national highways. Provincial roads and urban traffic, where most petrol is used, are not affected by the new limits.
- Traffic counts are for selected corridors and years, and the heavy-vehicle mix is assumed on several roads. Method A implies that 20% of LTV petrol and 50% of HTV diesel are used on the network, below the network shares assumed in Method B, so the true figure is likely to lie between the two methods.
- The rupee value uses retail prices, which include the petroleum levy and taxes. Lower fuel sales also reduce levy revenue, and part of the saving may be offset by longer travel times for freight. The Rs 56 billion is therefore a reduction in fuel expenditure by households and firms rather than a net economic benefit: it includes the petroleum levy, sales tax and distribution margins, which accrue to the government and the supply chain, and it is measured before the cost of enforcement and the value of the additional travel time that lower speeds impose. The US\$ 134 million foreign-exchange saving likewise assumes that every litre not consumed is a litre not imported.
- Road safety benefits, lower vehicle wear and lower emissions are not valued here.

Macroeconomic Impact

Pakistan's petroleum group imports were US\$ 15.6 billion in FY2025-26, or about US\$ 1.29 billion a month. The estimated savings from lower speeds reduce this bill by less than 1%, so its direct effect on the current account, the exchange rate, and inflation will be small. Table 6 summarises the channels.

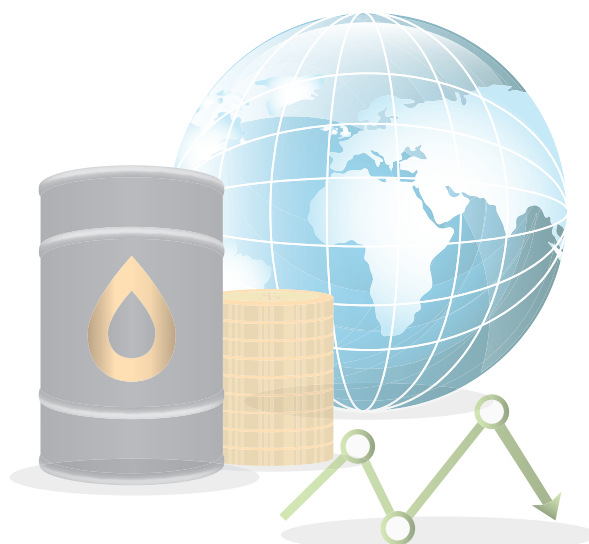


Table 6: Macroeconomic Impact of the Speed Limit Measure

Channel	Mechanism	Estimated size (central)
A. Import bill	Less petrol and diesel imported	About US\$ 134 million a year (0.9% of the FY2025-26 petroleum import bill)
B. Exchange rate	Lower demand for dollars to pay for fuel	Small relief on the rupee; not large enough to change the exchange rate path
C. Inflation	Pump prices are set administratively, so lower volumes do not lower prices directly; lower freight fuel use eases transport costs slightly	Very small direct effect on CPI
D. Households and firms	Lower fuel spending by drivers and transporters	About Rs 56 billion a year @ OGRA notified prices, October 3, 2026.
E. Fiscal	Lower fuel sales reduce petroleum levy and sales tax collections	Revenue loss proportional to litres saved
F. Road safety	Fewer and less severe crashes at lower speeds	Not quantified; likely significant

Source: Authors' calculations and assessment.

Conclusion and Recommendations

Speed management is a low-cost measure that can be introduced immediately. On indicative scenario estimates, the revised limits may save about 141 million litres of fuel a year, i.e., worth about Rs 56 billion, with a plausible range of 28 million to 332 million litres. Fuel saving depends heavily on whether drivers actually slow down. To enforce the limits effectively, speed cameras and average-speed (section) controls should be installed on the busiest corridors, especially M-2, M-9 and N-5, where most of the fuel is burnt. This is a useful contribution during an oil supply shock; however, it will not by itself ease external pressures in a major way.

Disclaimer: Authors used artificial intelligence tools only for language editing, grammar, and sentence restructuring. The research design, data compilation, estimates, and conclusions are the authors' own.

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