

SHORT ROUNDUP ON TRANSPORT INFRASTRUCTURE IN PAKISTAN

YEAR 2000-2016

Source: Based on Pakistan Economic Survey 2016-2017



June 21, 2018

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Section 1: Abstract

Like all other developing and emerging economies, Pakistan's urban transport problem is one of the pressing issues of the time that needs to be assessed and evaluated. With growing road congestion resulting from an increase in number of privately-owned automobiles, urban transport problem is aggravating day by day. For many the solution to the problem is to build larger and better roads- but is it the way to go forward? The purpose of this paper is to analyze the transport infrastructure in Pakistan and the changes they have undergone over the past 16 years. We undertake an analysis of facts and figures available in Economic Survey of Pakistan and try and reach some conclusions about possible public policy implications of these numbers. One of our emerging hypothesis looking at the numbers is that in order to address the urban transport problem in Pakistan, transport infrastructure in Pakistan needs to be re-evaluated and policy making needs to be made in light of empirical evidence. Using statistics on the number of registered motor vehicles, we aim to provide policy makers on urban transport issues required empirical understanding of the transport infrastructure.

The salient findings from the study are as follows:

1. In the past 16 years there has been a 290% increase in the total number of registered motor vehicles in the country.
2. Motor cycles (2 wheels) have increased by a significant 474% over the past 16 years.
3. The number of public transport vehicles increased by 185% over the last 16 years, showing therefore an increasing disparity between Public and Private vehicles.
4. The number of private transport vehicles increased by 327% over the last 16 years.

5. *Railways: 43% decrease in the number of passengers carried over the last 16 years.*
6. *Pakistan International Airlines: 16% decrease in the number of PIA fleet number of planes.*
7. *Registered Cargo Transport increased by 73% over the last 16 years.*
8. *Length of Roads: Total length of roads in the fiscal year 2016-2017(July-March) is 264,401 km's.*

Gallup Pakistan's main aim with this Paper and in general with this series of papers is to bring to public light, available information on various subjects. We believe that the real issue in Pakistan with respect to Empirical Decision making is not the lack of availability of data but lack of awareness about sources of data sets. We accept that our analysis below is quite rudimentary as we are not subject matter experts in relevant fields, case in point being Infrastructure. However, our expertise lies in converting Dense Data Points and Data sets into public usable information. In other words, we process the complex information and convert it into usable information, upon which academics, journalists and also the common citizens can then build their expertise and analysis.

We are always happy to hear feedback on our efforts. If you have any query or feedback please do not hesitate to contact us.

Sincerely

Amnah Imtiaz

Editor of Big Data Series, Gallup Pakistan

Email: amnah.imtiaz@gallup.com.pk

Section 2: Literature Review

Developing countries across the globe face a transport crisis characterized by congestion, mobility problems, environmental pollution, noise, traffic fatalities and injuries.¹ The most common factor contributing to the transport problem in developing countries is rapid population growth resulting in increased urbanization that subsequently translates into travel demand. While on one side demand for travel is escalating, the supply of transport infrastructure and services remains inadequate. Resultantly, existing facilities are over capacitated. Additionally in developing countries, private automobiles grow at an exponential rate compared to public transport which further adds to the transport problem. In India, during the period 1981 to 2002, the number of buses quadrupled, while motorcycles increased 16-fold, cars increased 7-fold and good vehicles 5-fold. Therefore, public transport accounts for a very small share of total vehicles.²

Another factor exasperating the transport problem in developing countries is low incomes and extreme income inequalities; where the richest tenth of the population earns over half of the total national income and government policies serve the interests of the elite minority³, with share of government funds being channeled disproportionately towards private car users and mobilization needs of the poor disregarded, coupled with deteriorating public transport- congestion, safety and environmental degradation are endemic.⁴

Developing countries are declining in terms of mobility and accessibility. Developed countries have immaculately addressed the transport problem by introducing vehicle use restrictions, adopting new technologies, transit management and transit service innovation, privatization and transport pricing among many others.⁵ From the experience of the developed countries, developing countries can follow suit to come out of the transport crisis.

¹ Pucher, John, Korattyswaropam, Nisha, Mittal, Neha, Ittyerah, Neenu. (2005). Urban Transport Crisis in India. Transport Policy, Volume 12, Issue 3, pp 185-198.

² Ministry of Road Transport and Highways, 1999, 2000, 2003. Handbook on Transport Statistics in India Transport Research Office, Ministry of Road Transport and Highways, Delhi, India.

³ Vasconcellos, E., 2001. Urban Transport, Environment and Equity: The Case for Developing Countries. Earthscan Press, London, UK.

⁴ (Gwilliam, 2003)

⁵ Gakenheimer, R. (1999). Urban mobility in the developing world. Transportation Research Part A, 33(7-8), 671-689.

Therefore a good public transport system is needed to overcome the transport crisis. A large amount of literature discusses the benefits of a good transport system in terms of economic, social and environmental payoffs. Peter Newman in his paper 'Why do we need a good transport system?' explains that having a rapid transit system assists cities in their wealth creation by reducing car dependence; an expensive mode of travel.⁶ It is observed that per capita car use is less in the wealthiest cities of the world. Newman and Kenworthy in their study make use of data and suggest that a city spends less on transport that develops its public transport infrastructure.⁷ Furthermore it is estimated that car travel costs around 85c per pass.km while it costs 50-60c per pass.km in transit.⁸ Moreover development in transit transportation is more equitable and results in economic advantages. As highlighted in a study by Center for Transit Oriented Development (TODs) (2005), people living in TODs in the US were similar in comparison to those not living in TODs in terms of age and income, while they had one car less per household. Consequently this led to a 20% increase in households' available wealth, which subsequently results in local economic development. In addition a good public transport reduces oil vulnerability. The most efficient mode of motorized transport is electric rail systems with an average of 0.44 MJ per passenger kilometer and average vehicle occupancy of 30.96. On the contrary, car is the least efficient mode of transport with an average of 2.91 MJ per passenger kilometer and average vehicle occupancy of 1.52.⁷ A good public transport system creates certainty for investment; bus routes are flexible while transits are fixed. Thus a transit provides an opportunity for investment in land and is a viable solution to the transport problem. Peter Newman in his paper points out that new rail systems serve as attractions thus rail projects offer a 15% higher return in the areas around stations.⁶

A good public transport system provides social benefits as well by saving time and space. According to the Marchetti principle, on average people do not prefer to travel more than an hour a day.⁹ Thus a transport system that provides the speed that saves time and is accessible for the commuters would ensure less dependence on cars. Hence rail transits cities serve this purpose; having a transit speed of 35-40 k/h while bus cities have transit

⁶ (Newman)

⁷ Newman, PWG & Kenworthy, JR 1999, *Sustainability and cities: overcoming automobile dependence*, IslandPress, Washington DC.

⁸ House of Representatives 2005, *Sustainable cities*, Australian Government, Canberra.

⁹ Marchetti, C 1994, 'Anthropological invariants in travel behavior', *Technical Forecasting and Social Change*, vol. 47, no. 1, pp. 75-78.

speeds of 20-25 k/h.¹⁰ Furthermore a transport system comprising of heavy rails saves space. Freeway lane has a carrying capacity of 2500 people per hour, bus lane 5,000 to 7,000, light rail line 10,000 to 20,000 while heavy rail line have a carrying capacity of 50,000.¹¹ Therefore it is highly imperative to establish rail systems; rails require 20 times lesser space than cars.

Moreover, literature suggests that an additional 20c per pass.km would be needed to pay for the social, economic and environmental externalities associated with car dependence¹²; hence it is important for developing nations to lay the foundation for mass transit systems.

¹⁰ Kenworthy, JR & Laube, FB 1999, An international sourcebook of automobile dependence in cities, 1960–1990, University Press of Colorado, Niwot, Boulder.

¹¹ Vuchic, V 2005, *Urban transit: planning, operations and economics*, Wiley, Indianapolis.

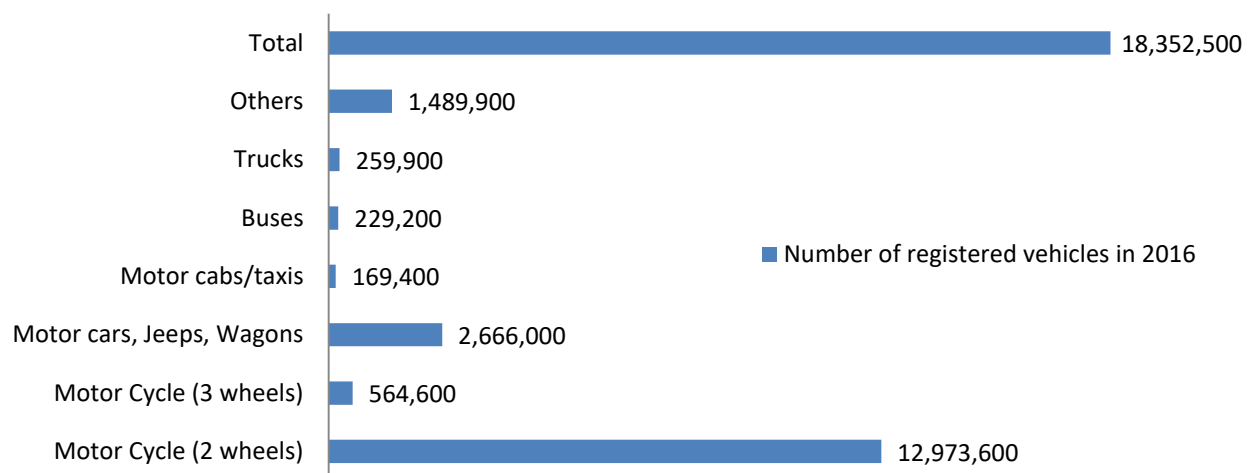
¹² McGlynn, G & Andrews, J 1991, *The economic cost–benefits of urban scenarios that support ESD*, Australian Commission for the Future, Melbourne.

Section 3: Current Status of Number of Vehicles Registered in Pakistan

18,352,500 total registered vehicles in Pakistan in 2016

In 2016 the number of registered motor cycle (2 wheels) was 12,973,600, motor cycle (3 wheels) 564,600, motor cars, jeeps and station wagon 2,666,000, motor cabs/ taxis 169,400, buses 229,200, trucks 259,900, others 1,489,900 and total number was 18,352,500.

Number of registered vehicles in 2016



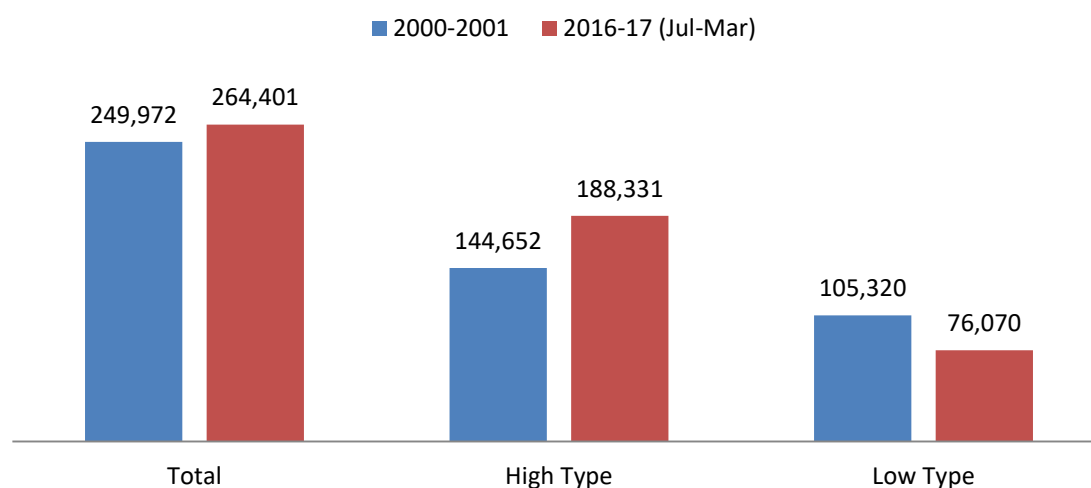
Source: Pakistan Economic Survey 2016-2017

Section 4: Landscape of Transport Communication in Pakistan

Length of Roads: Total length of roads in the fiscal year 2016-17(July-March) is **264,401 km's**.

In Pakistan, over the last 16 years there has been a 6% increase in the length of roads. While high type roads experienced an increase of 30%, low type roads have declined by 28%.

Length of Roads

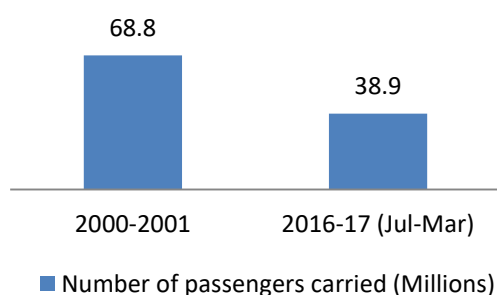


Source: Pakistan Economic Survey 2016-2017

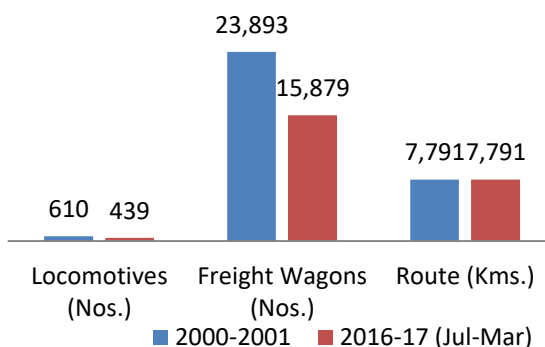
Railways: 43% decrease in the number of passengers carried over the last 16 years

In Pakistan, over the last 16 years there has been a 28% decrease in the railway locomotives, 34% decrease in the freight wagons, railway routes remain constant and a 43% decrease in the number of passengers.

Number of passengers carried (Millions)



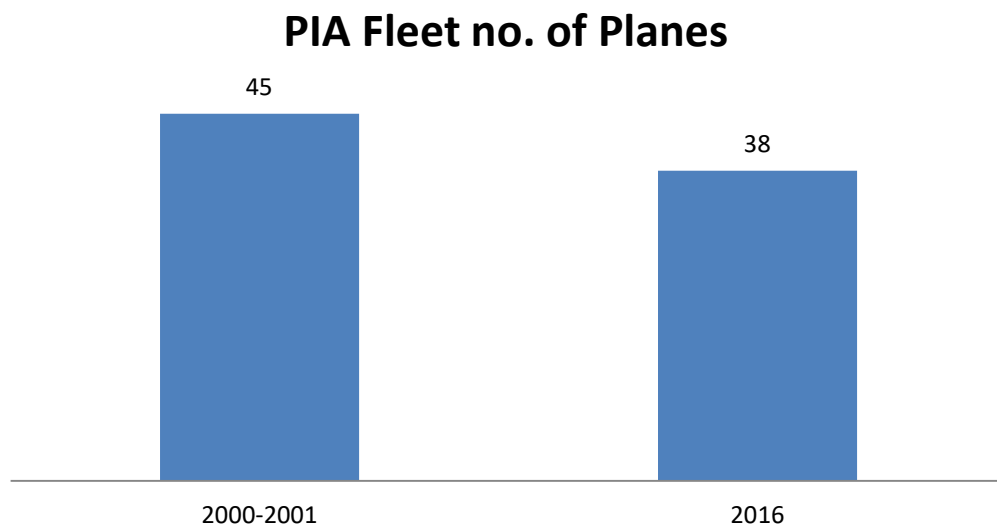
Railways



Source: Pakistan Economic Survey 2016-2017

Pakistan International Airlines: 16% decrease in the number of PIA fleet number of planes.

In Pakistan, over the last 16 years the number of PIA fleet number of planes has decreased by 16% (from 45 to 38).

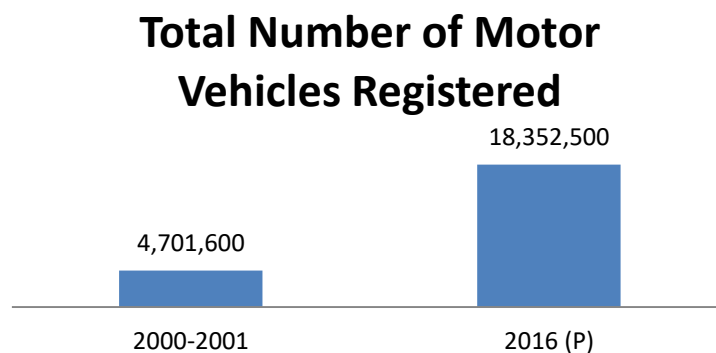


Source: Pakistan Economic Survey 2016-2017

Section 5: Progress and Annual Changes in the Number of Registered Vehicles

Total number of registered motor vehicles has increased by 290% over the last 16 years.

In 2000, the number of total registered motor vehicles was 4,701,600. In 2016, the number of total registered vehicles was 18,352,500; a massive increase.

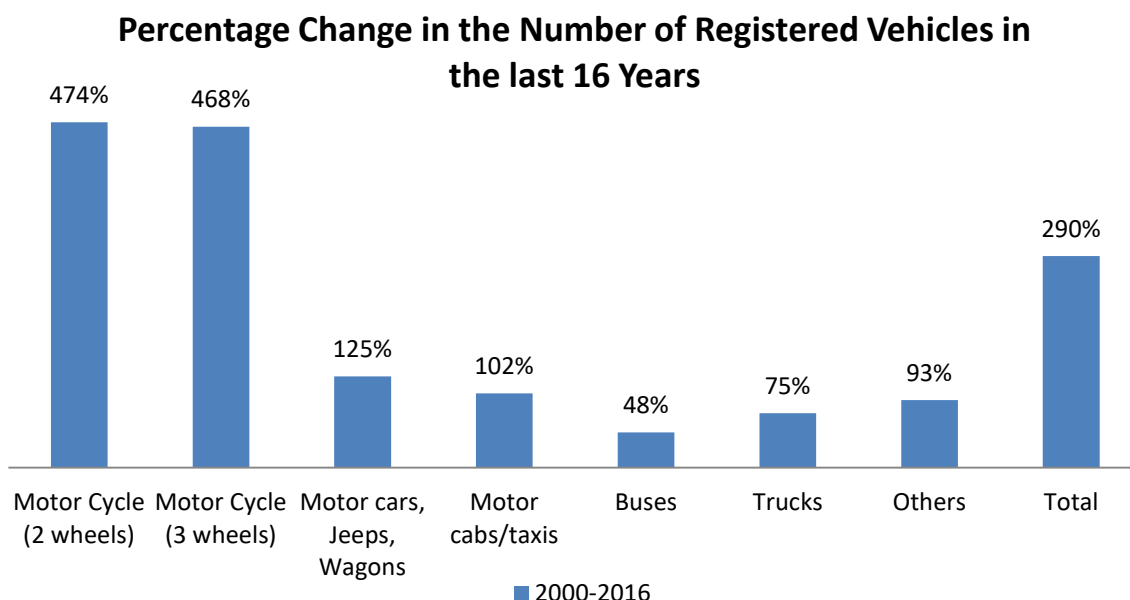


Source: Pakistan Economic Survey 2016-2017

* Total registered vehicles include Motor Cycle (2 Wheels), Motor Cycle (3 Wheels), Motor Cars, Jeeps & Station Wagon, Motor Cabs/ Taxis, Buses, Trucks and Others

Progress: 474% increase in the number of registered motor cycle (2 wheels) in the last 16 years

Keeping 2000 as the base year we measure the progress in the number of registered motor vehicles. From 2000 to 2016, there has been a 474% increase in the number of registered motor cycle (2 wheels), a 468% increase in the number of registered motor cycle (3 wheels), a 125% increase in the number of registered motor cars, jeeps and station wagon, a 102% increase in the motor cabs/ taxis, a 48% increase in the number of registered buses, a 75% increase in the number of registered trucks, a 93% increase in the number of registered other vehicles and a 290% increase in the number of total registered vehicles.



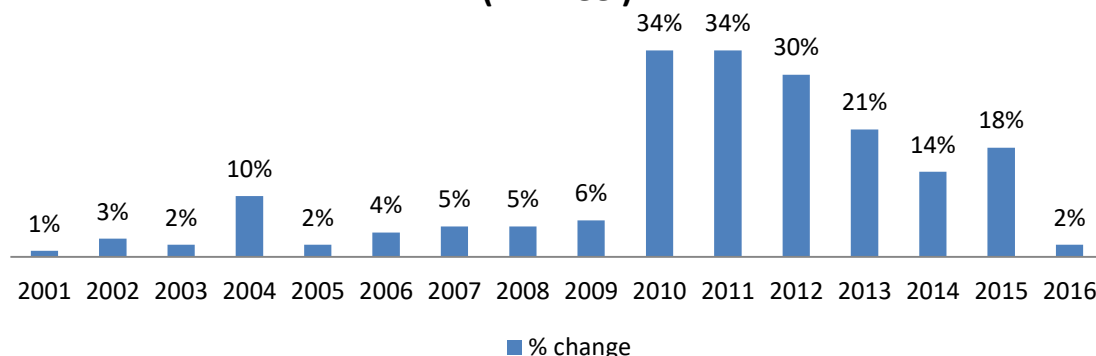
Source: Pakistan Economic Survey 2016-2017

Annual Changes

Motor cycle (2 wheels): Number of registered motor cycle (2 wheels) increased by 34% in both 2010 and 2011 in comparison to the previous year

The numbers of registered motor cycle (2 wheels) in Pakistan have experienced an increasing trend. From 2000 to 2003, there has been an insignificant increase of between 1 to 3% after which the number increased by 10% in 2004. In 2005, the number increased at a decreasing rate of 2% compared to 2004. Between 2006 and 2009, the number increased by 4 to 6%. The most significant increase in the number was of 34% in 2010 and 2011 and 30% in 2012. The annual increase dropped to 21% in 2013, 14% in 2013, increased to 18% in 2015 and decreased to 2% in 2016.

Percentage Annual Change in the number of Motor Cycle (2 Wheel)

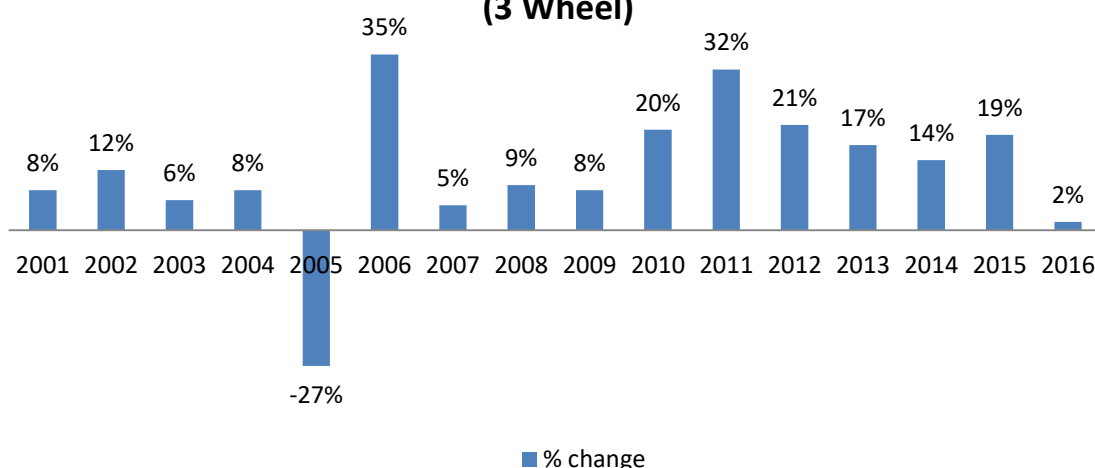


Source: Pakistan Economic Survey 2016-2017

Motor cycle (3 wheels): Number of registered motor cycle (3 wheels) decreased by 27% in 2005 compared to 2004

The numbers of registered motor cycle (3 wheels) in Pakistan have witnessed an increasing trend over the last 16 years. In the years between 2000 and 2004, the annual change varied between 6 to 12% followed by a 27% decrease in 2005. The most significant increase was of 35% in 2006. In the three years that followed, the annual increase declined changing between 5 and 9%. The number increased by 20% in 2010, 32% in 2011, 21% in 2012, 17% in 2013, 14% in 2014, 19% in 2015 and just 2% in 2016.

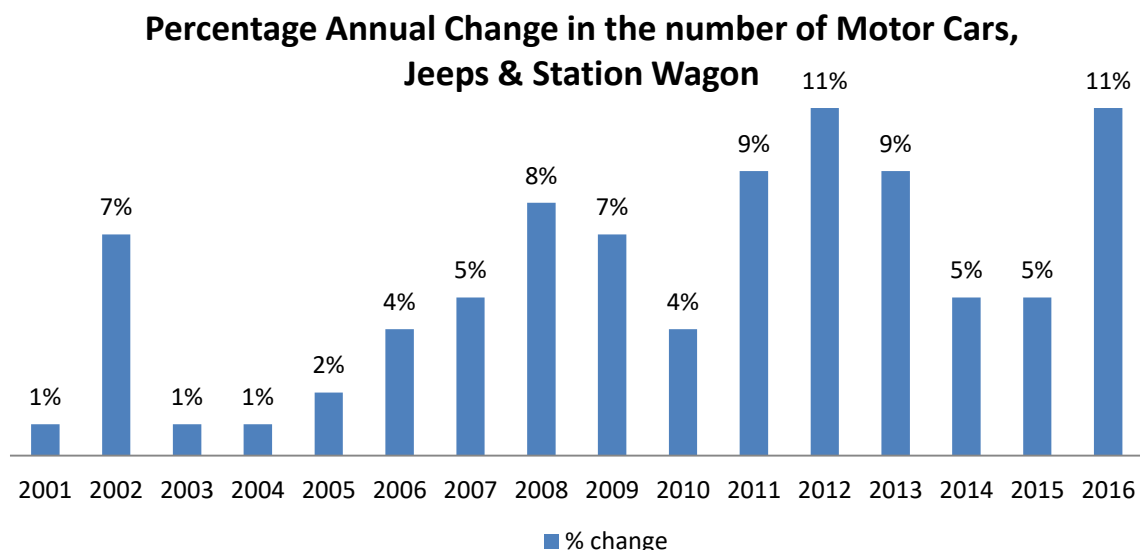
Percentage Annual Change in the number of Motor Cycle (3 Wheel)



Source: Pakistan Economic Survey 2016-2017

Motor cars, jeeps and station wagons: Number of registered motor cars, jeeps and station wagons increased by 11% between 2011-12 and 2015-16

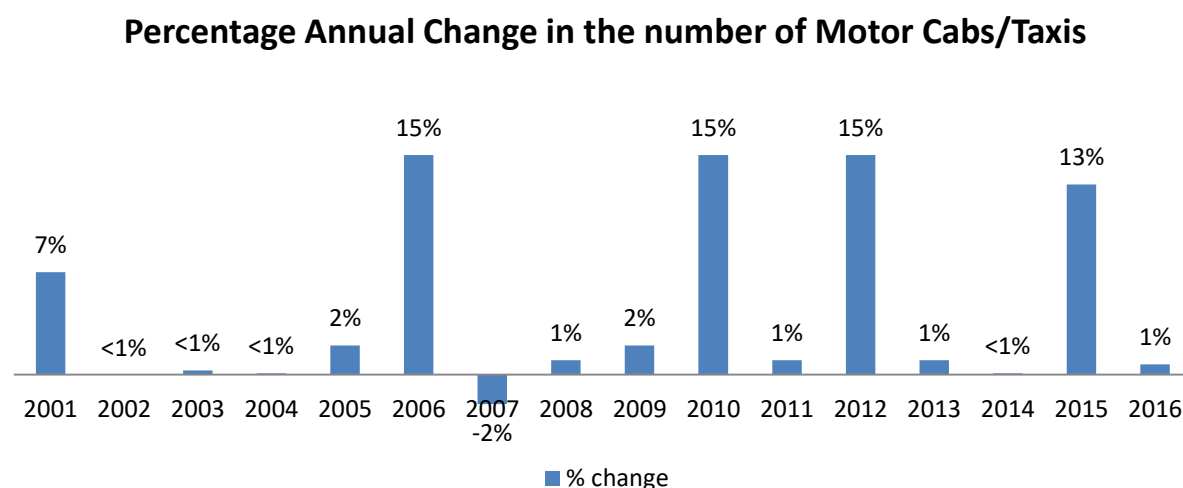
The annual change in the number of registered motor cars, jeeps and station wagon has been small over the past 15 years. The most significant increase was of 11% in 2012 and 2016, followed by 9% in 2011 and 2013.



Source: Pakistan Economic Survey 2016-2017

Motor Cabs/ Taxis: Number of registered motor cabs/ taxis increased by 15% in 2006, 2010 and 2012 compared to the previous year

The number of registered motor cabs/ taxis increased insignificantly in most years over the past 16 years. The most notable increase was of 15% in years 2006, 2010 and 2012. In 2001 the number increased by 7% and in 2013 increased by 13%.

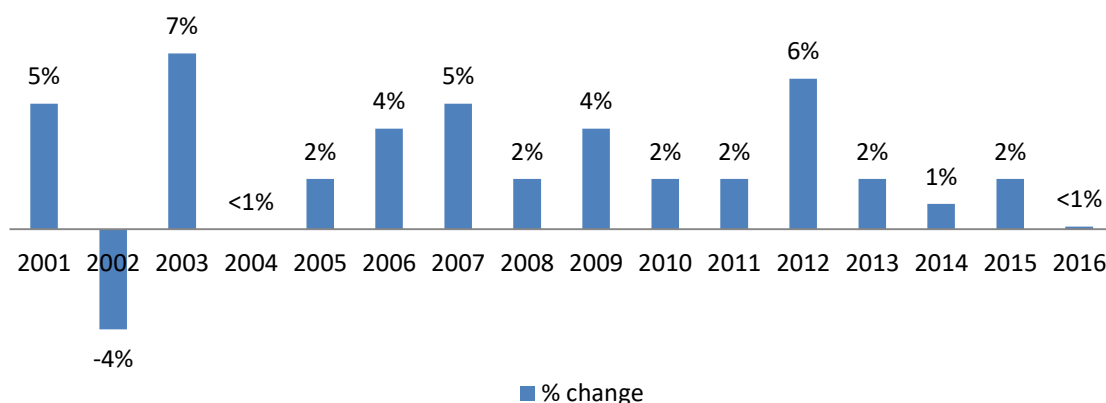


Source: Pakistan Economic Survey 2016-2017

Buses: Number of registered buses increased by 7% during 2002 and 2003

The number of registered buses has observed varied annual changes. The most prominent increase was of 7% in 2003, 6% in 2012 and 5% in 2001 and 2007. In 2002 the number of buses decreased by 4% compared to 2001. In other years the annual change varied between 0 to 4%.

Percentage Annual Change in the number of Buses

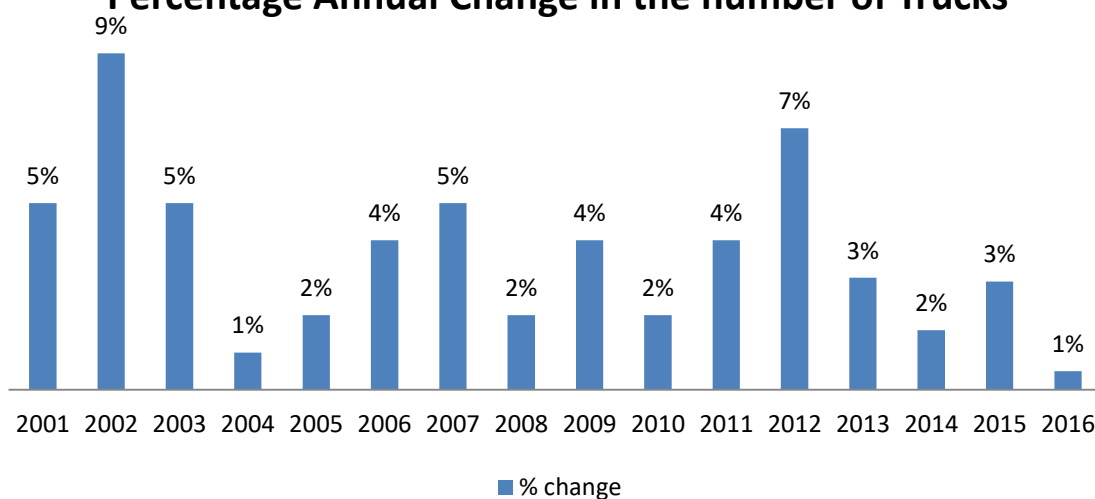


Source: Pakistan Economic Survey 2016-2017

Trucks: Number of registered trucks increased by 9% in 2002 in comparison with 2001

Percentage annual increase in the number of registered trucks has been small over the past 16 years. The most notable increase was of 9% in 2002 and 7% in 2012. In other periods the annual increase changed between 1 to 5%.

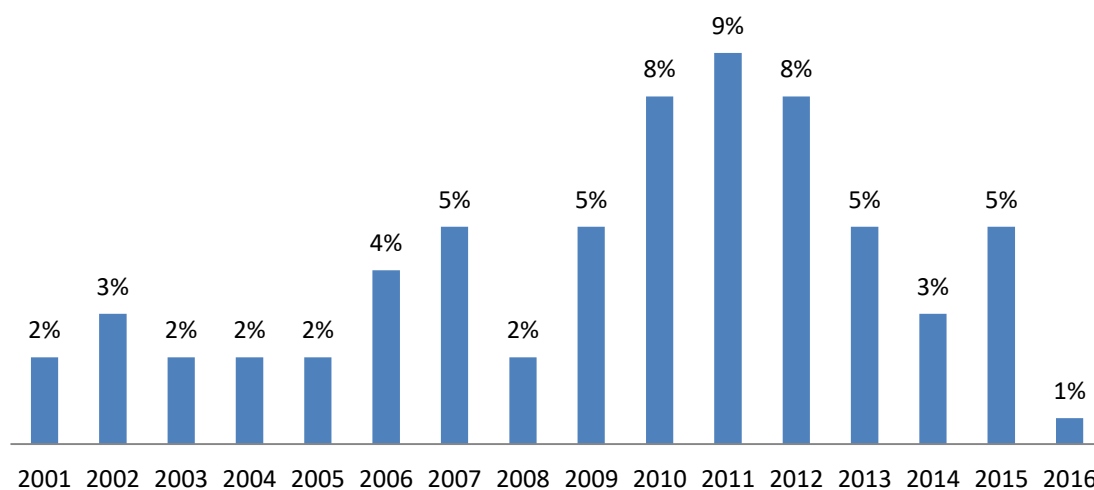
Percentage Annual Change in the number of Trucks



Source: Pakistan Economic Survey 2016-2017

Other Vehicles: Number of registered other vehicles increased by 9% between 2010 and 2011

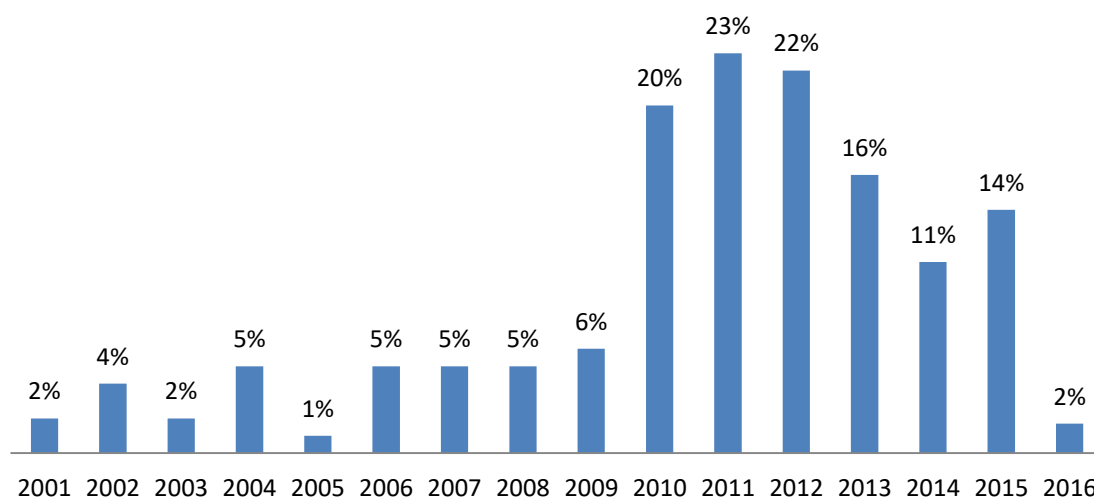
The number of registered other vehicles have experienced an increasing trend over the last 16 years, however the percentage increase has been small, varying between 2 to 9%. The most significant increase in the number of registered other vehicles was of 9% in 2011.

Percentage Annual Change in the number of Other Vehicles

Source: Pakistan Economic Survey 2016-2017

Total Vehicles: Number of registered total vehicles increased by 23% in 2011 compared to 2010

Annual increase in the number of registered total vehicles was between 2 to 6% till year 2009. During 2010 and 2012, the percentage annual increase was greater than 20%, peaking in 2011 to 23%. In 2013, the annual increase was 16%, falling to 11% in 2014 and rising to 14% in 2015, whereas decrease is seen in 2016 to 2%.

Percentage Annual Change in the number of Total Vehicles

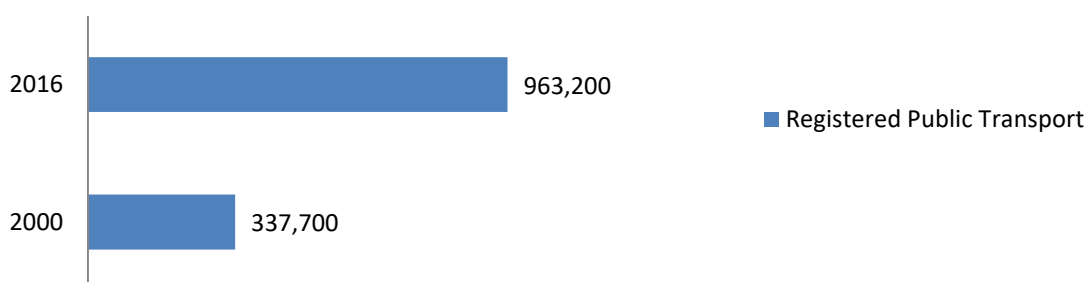
Source: Pakistan Economic Survey 2016-2017

Section 6: Categorization of Motor Vehicles and Growth Trends in Past 16 years

Registered Public Transport increased by 167% over the last 16 years

In 2000 there were 337,700 registered public transport vehicles in Pakistan. In 2016 the number increased to 963,200, indicating an increase of 185% over the last 16 years.

Registered Public Transport

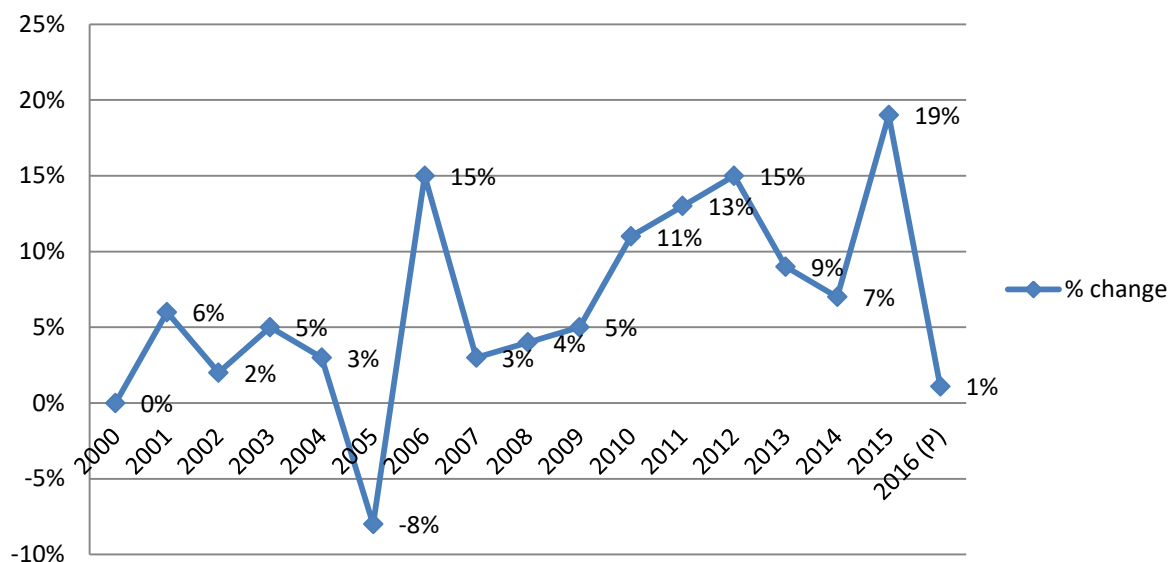


Source: Pakistan Economic Survey 2016-2017

Public Transport increased by 15% in 2006 and 2012 compared to 2005 and 2011 respectively

Public transport comprises of motor cycle (3 wheels i.e. Rickshaws), motor cabs/taxis and buses. We observe a fluctuating trend in number of registered public transport over the years. Registered public transport increased by 6% during 2000 to 2001, after which the percentage increase declined till 2004. Compared to 2004, registered public transport decreased by 8% in 2005. In 2006, registered public transport increased significantly by 15% compared to 2005. In the following years till 2009 the percentage increase fluctuated by 3% to 5% annually. From 2010 to 2012 the percentage increase in the registered public transport was noteworthy compared to the previous year; public transport increased by 11%, 13% and 15% respectively. The next two periods observed a decline in the number compared to the previous period; the number increased by 9% in 2013 and 7% in 2014. In 2015, the number of registered buses increased markedly by 19% compared to 2014. In 2016, the number of registered buses decreased in comparison to the previous year by 1%.

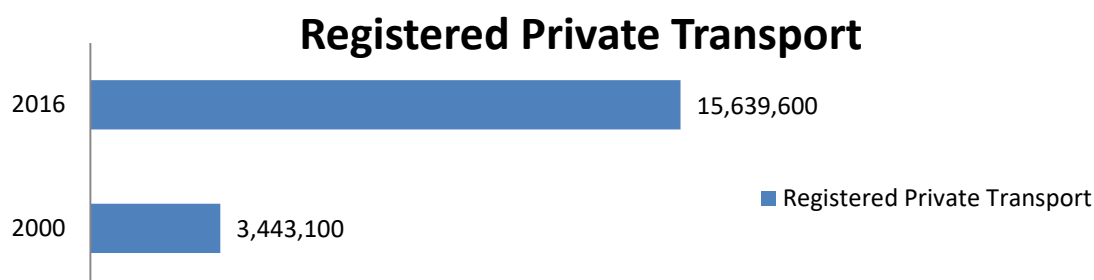
Percentage Annual Change Public Transport



Source: Pakistan Economic Survey 2016-2017

Registered Private Transport increased by 327% over the last 16 years

In 2000 there were 3,443,100 registered private transport vehicles in Pakistan. In 2016 the number increased to 15,639,600, signifying an increase of 354% over the last 16 years.



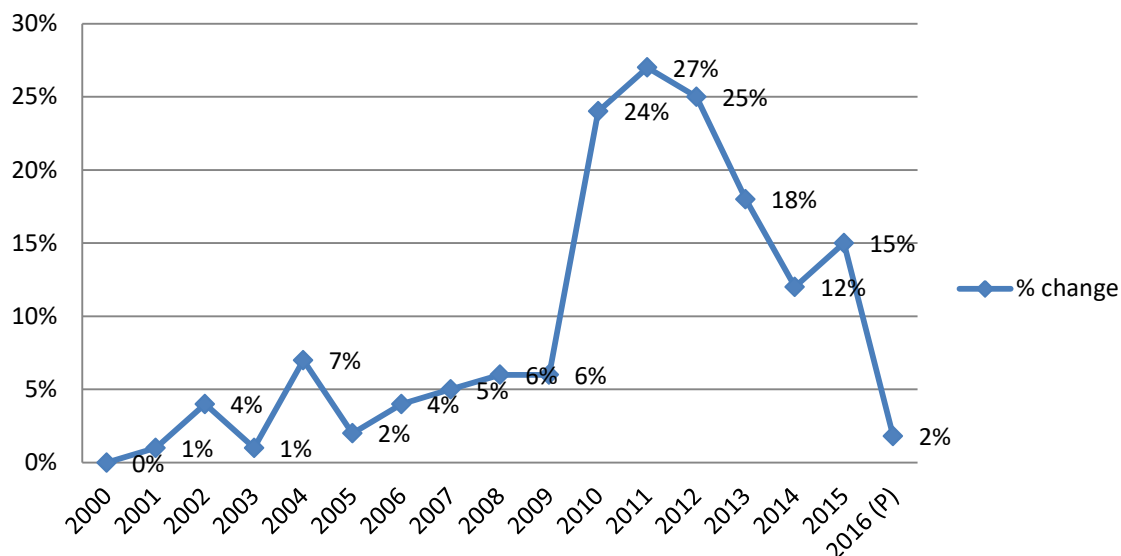
Source: Pakistan Economic Survey 2016-2017

Private Transport increased by 27% in 2011 compared to 2010

Private transport comprises of motor cycle (2 wheels) and motor cars, jeeps & station wagon. We observe an overall increasing trend in number of registered private transport over the years. Registered private transport increased alternatively between 1 to 7% from 2000 to 2009. The number increased by a significant 24% in 2010 compared to 2009. The most striking increase was of 27% in 2011 as compared to the previous year. In 2012, the registered private transport increased by 25% compared to 2011. From 2012

to 2015, the number increased respectively by 18%, 12% and 15% and a decrease is observed in 2016 i.e. annual change was 2%.

Percentage Annual Change Private Transport

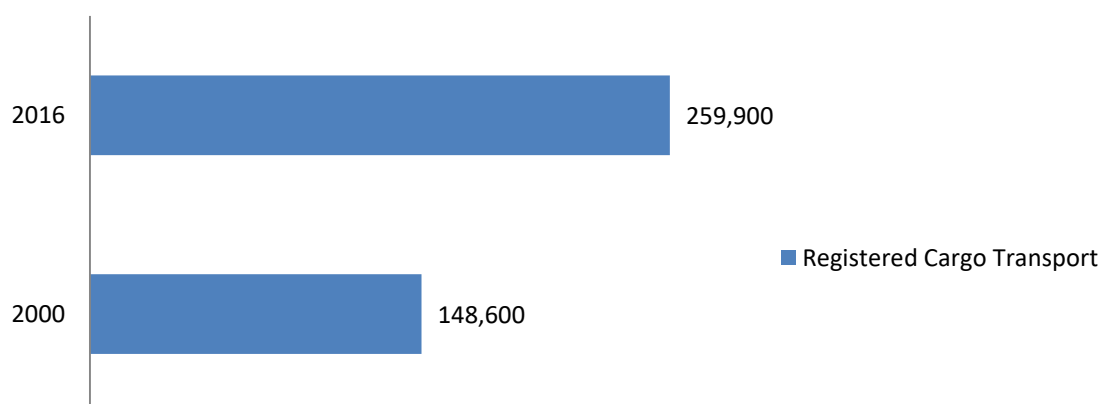


Source: Pakistan Economic Survey 2016-2017

Registered Cargo Transport increased by 73% over the last 16 years

In 2000 there were 148,600 registered cargo transport vehicles in Pakistan. In 2016 the number increased to 259,900, representing an increase of 75% over the last 16 years.

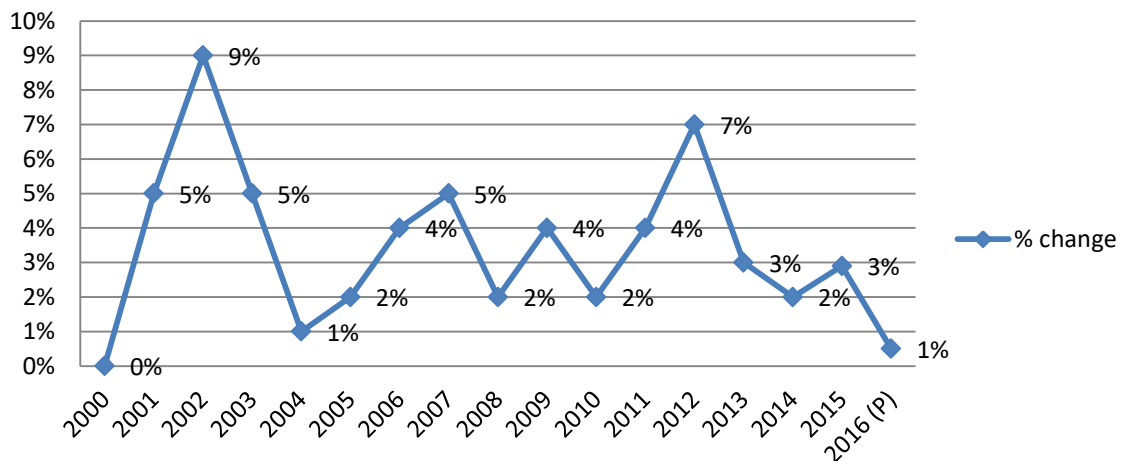
Registered Cargo Transport



Source: Pakistan Economic Survey 2016-2017

Registered cargo transport increased by 9% in 2002 compared to 2001

Registered cargo transport comprises of trucks. This category has undergone small annual increases over the last 16 years. The most significant increase was of 9% in 2002 compared to 2001 and 7% in 2012 compared to 2011.

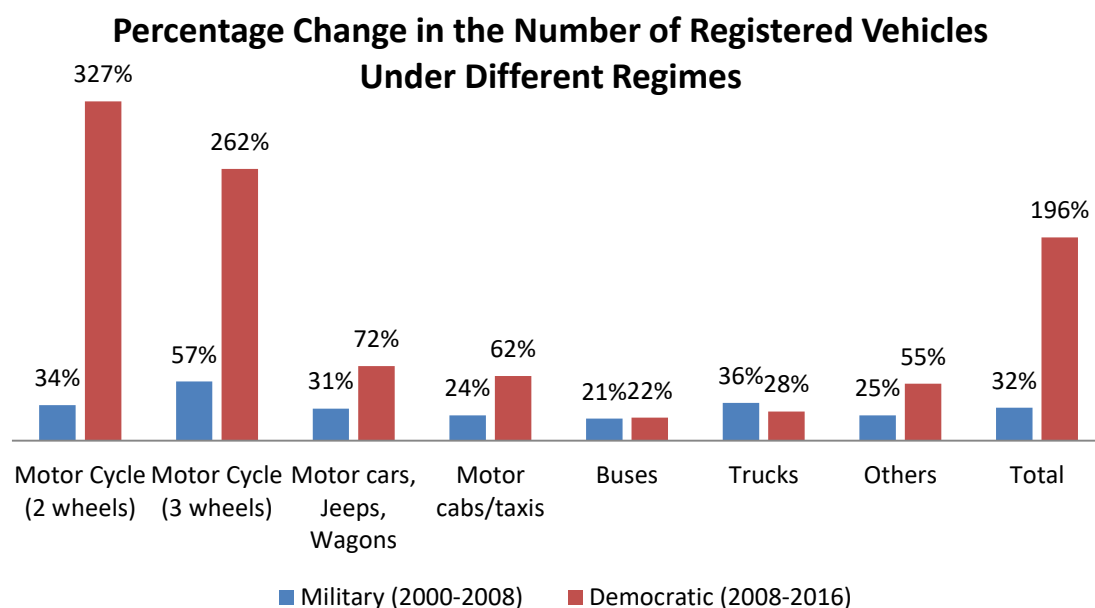
Percentage Annual Change Cargo Transport

Source: Pakistan Economic Survey 2016-2017

Section 7: Growth in the Number of Registered Motor Vehicles under Different Regimes

Number of registered total vehicles increased by 196% under the democratic regime

The number of registered motor cycle (2 wheels) increased by 34% during the military regime and increased by 327% during the democratic regimes. The number of registered motor cycles (3 wheels) increased by 57% during the military regime and increased by 262% under the democratic regime. Registered motor cars, jeeps and station wagon grew by 31% in the military regime and by 72% in the democratic regime. The number of registered motor cabs/taxis increased by 24% during the period of military rule and increased by 62% during the period of democratic rule. The growth in the number of registered buses has been almost similar in the two regimes; growing at 21% during the military regime and at 22% during the democratic regime. The number of registered trucks on the other hand increased by 36% under the military regime and increased by 28% under the democratic regime. Registered other vehicles grew by 25% during the years of military rule and by 55% during the years of democratic rule. The total number of registered vehicles increased by 32% under the military government and increased by 196% under the democratic government.

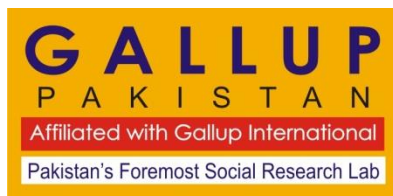


Source: Pakistan Economic Survey 2016-2017

From the analysis above we conclude that the number of registered motor vehicles increased under both the regimes. However, the comparison above points towards the fact that the increase in the number of registered vehicles was significantly higher under the democratic rule as compared to the military rule, trucks being an exception.

Section 8: **Conclusion**

Based on the analysis above we conclude that over the past 16 years motorization has increased tremendously in Pakistan. The figures show that privately-owned transport vehicles have increased more in comparison to the public transport vehicles while road infrastructure has increased by 6%. The question this analysis leaves for the policy makers is- will a 6% increase in road infrastructure be sufficient to accommodate a threefold increase in total vehicles? If government continues its policy of incentivizing private automobile users and shows a lack of interest in laying a strong foundation for a mass transit system, the urban transport problem will remain unsolved.



Contact Details:

Islamabad: +92 51 2655630

Lahore: +92 42 35842419

Karachi: +92 21 4537569

Email: isb@gallup.com.pk

Web : www.gallup.com.pk

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