POLICY BRIEF

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The Energy and Resources Institute

Proliferation of Cars in Indian Cities: Let Us Not Ape the West

CONTENTS

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HIGHLIGHTS

Very fast growth of cars in Indian cities; expected to grow manifolds

Implications

- Increased demand for petroleum products
  - Energy security concern
- Increasing levels of CO_2 emissions
- Increasing air pollution in cities
- Increase in road accidents
- Issue of car-centric city growth leading to inequitable allocation of road space
- Issues related to congestion and parking

Interventions needed

- Promote integrated land use and transport planning
- Adopt a conservative approach to create more road space
- Provide infrastructure for walking, cycling, and non-motorized transport modes
- Make investments in public transport
- Implement measures to restrict car ownership and use

Introduction

Owning a car is not always about necessity; it is often aspirational and also a status symbol. Studies have shown that when per capita income grows by one per cent, the level of car ownership grows by 1.7 per cent (TERI 2006). As incomes rise, those who already own a car tend to buy a second or a third. This is what has happened in the developed world which has taken the car-dependent route for growth. Today, the USA, Japan, and Europe have car-ownership levels above 450 cars per 1,000 persons; India may also go the same way if corrective steps are not taken today.

India currently has about 15 million cars, which is equivalent to 13 cars per 1,000 population.[1] While this by itself is not high, it has to be noted that it is a national average and some cities like Delhi, Chennai,

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[1]   Data for 2011

and Coimbatore have more than 100 cars per 1,000 population (Figure 1). Delhi has an ownership level of 157 cars per 1,000 population, followed by Chennai (127) and Coimbatore (125) while cities like Pune (92 cars per 1,000 population), Thane (98), Bangalore (85), and Hyderabad (72) are fast approaching the 100 cars per 1,000 population mark (GoI 2011; MoRTH 2012).

Different estimates show that the number of cars in India will increase to about 35 cars per 1,000 population by 2025. This would amount to about 45–60 million cars on our roads and in some cities more than 300 cars per 1,000 population. This exponential growth in the number of cars will have serious implications for energy security, air pollution, road safety, equitable allocation of road space and will accentuate problems related to parking and congestion, which many of our cities have already started witnessing. These externalities make it necessary for us to explore whether economic growth

can be decoupled from car ownership and the mobility needs of India's citizens addressed without becoming more car dependent like the West.

Exponential growth in the number of cars

There are different methodologies that can be used to estimate growth in the number of cars in India. It can be done based on the relationship between GDP levels and car ownership in countries of similar per capita income or on the basis of the current trends in car sales and projections into the future on the basis of these trends or based on the likely growth in the number of cars due to increase in the number of middle- and high-income households who have the capacity to buy a car. Whichever be the methodology that is used to project the number of cars in India, by 2025 the number of cars is likely to be in the range of 45–60 million, which works out to 35 cars per 1,000 population by 2025 (Ghate and Sundar, 2013). While this number again may not sound large as compared to the number of cars per 1,000 persons in countries like Hong Kong and Singapore, given the population of India, the absolute numbers will be large. Also, a national average of 35 cars per 1,000 population would imply that some cities could well have 300 or more cars per 1,000 population. For instance, Delhi could have about 380 cars per 1,000 population taking the total cars in the city from 2 million in 2011 to about 10 million by 2025.

The estimated numbers may seem way too high to be added just in a matter of the next 12 years, but this increase is not unrealistic if past trends are to be a guide. We have added more cars in the last decade (2001–11) than we did in the first five decades since Independence (1951–2000); 8.5 million cars were added between 2001 and 2011 as compared to seven million cars from 1951 to 2,000 (MoRTH, various years). The first year of this decade (2010–11) alone has seen an addition of nearly two million new cars.

What are the implications of this unfettered growth?

Implications for energy security: The transport sector in India consumes about 18% of India's commercial energy, second only to industry, which consumes about 42% (TERI 2012). The sector is the largest consumer of petroleum products at 55% [i], with 98% of transport fuel being petroleum products and electricity accounting for the remaining 2% (TERI 2012). Within this sector, road
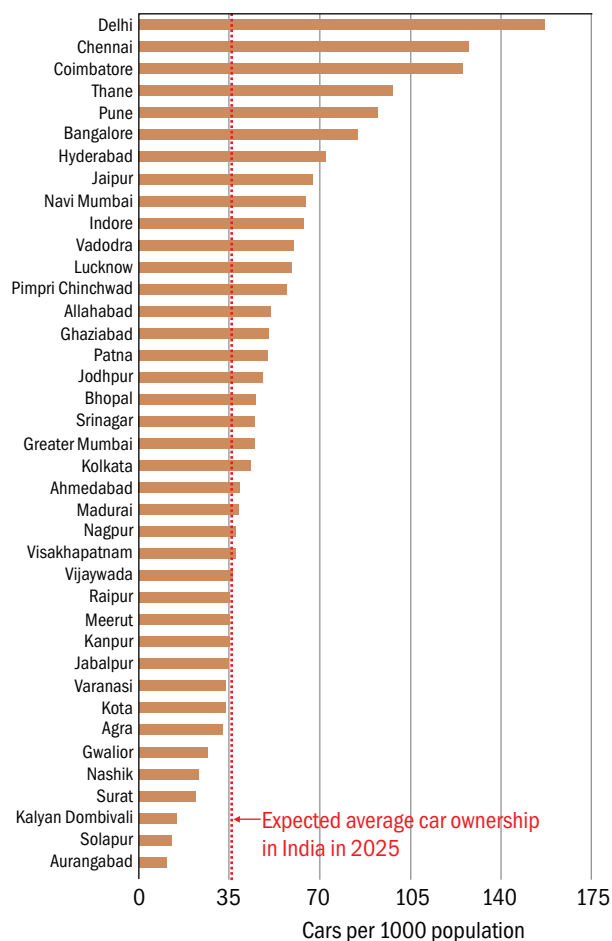

Figure 1: Car ownership levels in 39 out of 53 million plus cities in 2011 for which data is available
Source: Authors
Note: Data from GoI (2011) and MoRTH (2012)

sector consumes more than 90% of the energy with road passenger transport consuming about 65%, and road freight transport about 35%.

Within the passenger road transport sector, cars presently consume nearly 20% of fuel and this number would increase to about 30% by 2030. Considering that India's dependence on oil imports will increase in the future and this increase could pose a serious threat to India's energy security, consumption of fossil fuels should be contained to the extent possible.

Implications for air pollution and CO_2 emissions: Growth in the number of personal vehicles also leads to increasing levels of vehicular pollution in cities. It is interesting to note that all cities with high car-ownership levels have PM_{10} concentrations above the standards set by the World Health Organisation (WHO) (Figure 2). Source apportionment studies carried out in six cities,
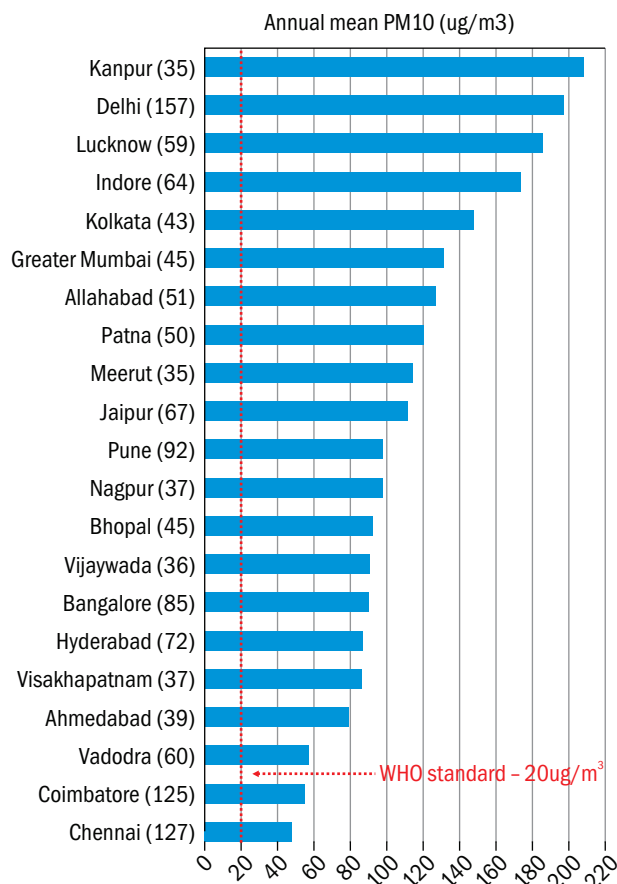
which have high car-ownership levels, indicate that the concentration levels of $PM_{2.5}$, a more dangerous pollutant are beyond the permissible limits prescribed by the WHO (Figure 3). While specific data is not available to show the share of cars in the emission of $PM_{2.5}$, there is evidence to show that cars, especially diesel cars which are increasing in number, emit $PM_{2.5}$ and there is a case for containing this.

Rapid growth in the number of personal vehicles in larger cities of the country also contributes to increasing CO_2 emission levels. The impacts of vehicular emissions of both criteria pollutants and CO_2 on human health and global warming are significant. Indian polity and economy pay a huge price for the use of cars by a minority. Even if these externalities cannot be altogether eliminated, it is time that their costs are measured and recovered from car users.

Implications for road safety: India holds the dubious distinction of having the highest traffic-related morbidity and mortality rates in the world. There were more than 1,42,000 deaths from road accidents in 2011 (MoRTH 2012). Nearly 20% of these deaths were a result of accidents involving cars.

Issues of equity: Most importantly, exponential increase in the number of cars, together with policies that are skewed in favour of increasing motorization, have squeezed out the pedestrians and users of non-motorized transport (NMT) from urban roads. This inequity in the usage of road space, or the denial by a small number of car users of the 'mobility rights' of a
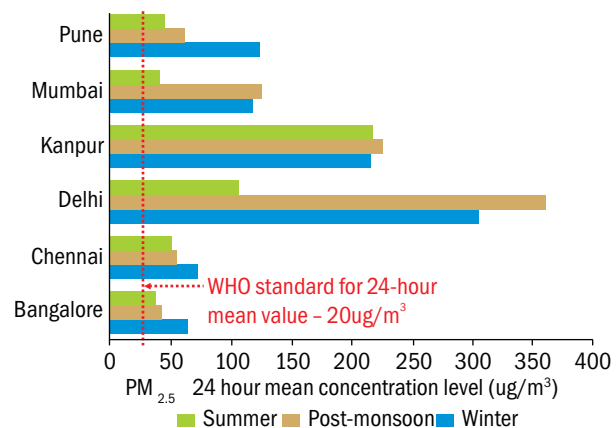
Annual mean PM10 (ug/m3)

Figure 2: PM_{10} concentration levels in cities with high car-ownership levels (Number in parenthesis are the car-ownership levels per 1,000 persons in the respective cities)
Source: Authors
Note: Data from World Health Organization (WHO), 2008. Available at http://www.who.int/phe/health_topics/outdoorair/databases/en/

$PM_{2.5}$ 24 hour mean concentration level (ug/m³)

Summer Post-monsoon Winter

Figure 3: $PM_{2.5}$ concentration levels in select cities with high car-ownership levels
Source: Authors
Note: Data from Central Pollution Control Board (CPCB), 2009

large number of others, is a major challenge that has not even been recognized, let alone addressed. If one were to examine the annual budgets of city governments such as Delhi or large metropolitan/municipal corporations, one would find that a major chunk of investment in transport infrastructure is for creating more road space, flyovers, parking lots, urban expressways, etc., leading to the vicious cycle of more cars, more road space, and even more cars. Nearly 55% of the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) funds allocated to the urban transport sector since 2009 have been allocated for the construction of roads and flyovers (Figure 4).

In fact, in India, we have done very little to provide facilities for walking and cycling, such as shelters, water kiosks, cycle tracks, cycle parking, etc. On the contrary, we have allowed our pavements and cycle tracks to become parking lots for cars. China, on the other hand, provides shelter, water kiosks, and halting places for pedestrians and users of NMT. They have also introduced bike-sharing schemes in their larger cities to encourage NMT. Today, some 30–50% of trips in our mega cities and 40–60% of trips in second-order cities are carried out by walking or cycling. It would be in our interest to retain this percentage and make them modes of 'choice' rather than of 'compulsion'.
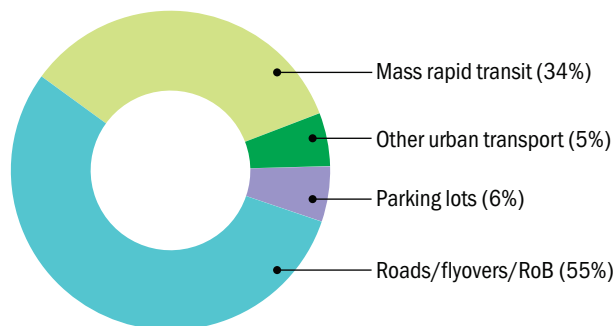

Figure 4: Distribution of funds allocated to urban transport under JNNURM programme
Source: Gadgil, 2013 (based on data provided by the Ministry of Urban Development)

"Downs's Law says, 'if you build them, they will come'."

Issue of increasing congestion: Increasing cars in the cities are leading to congestion on roads with the average traffic speeds falling below 15 kmph. Increasing congestion is in turn leading to increase in travel time and loss of productivity. Idling and slow speeds also result in increased consumption of fuel and emissions of criteria pollutants.

Issue of parking: Parking in public space and roads in Indian cities is resulting in reduced road capacity and encroachment of pedestrian pathways and cycle lanes. Parking in public space in most of the residential areas is not priced and where it is priced, the charges are low and do not reflect the actual cost of parking to the society. Inadequate parking space is also leading to road rage and social tensions.

Should we move people or move cars?
Many cities in the world have shown that the rapid increase in the rate of growth of car ownership can be arrested through appropriate policy interventions without compromising the mobility rights of car users. There is no reason why India should not benefit from the experience of others and attempt to contain the growth in the number of cars. The need for these interventions is urgent because the infrastructure we build now will influence our transport policies and practices for the next 50–100 years. Retrofitting at a later stage will never be easy.

Policy interventions elsewhere
Restricting car ownership
The larger cities in China namely Shanghai, Guangzhou, and Beijing have introduced quotas for the number of cars that can be registered per month. Beijing for instance, allowed only 20,000 cars to be registered per month in 2011, which was 70% less than the number registered in 2010.[ii] Shanghai adopts a car quota system, which allows only 7 to 8,000 cars to be registered per month.[iii] Guangzhou allows only 10,000 car registrations per month.[iv] Even as these cities have restricted the registration of cars, they have made massive investments in public transit systems and NMT in order to provide car users with an acceptable alternative.

In India on the other hand, cities such as Delhi and Bangalore register more than 30,000 cars per month or 1,000–1,200 cars per day. Many other cities are fast

approaching this level of new car registrations. Urban road space will never be able to match the growth in the number of cars and inevitably many of our cities would see a traffic gridlock at the end of this decade.

Using parking and taxation as instruments to control car-ownership

Japan requires a 'Parking Space Certificate' before a car is registered. Parking spaces, if not available at the applicants residence can be rented but usually at exorbitant costs. Some cities in China and a few cities in India are introducing similar policies. It would be interesting to point out here that the Ministry of Urban Development had sought that this be made a condition in the Motor Vehicles Act for registering cars. The Expert Committee set up to amend the Act has accepted this request.[v]

Japan has also made the purchase of a car prohibitive through taxes such as a car acquisition tax, car weight tax, and annual tax together with high on-street parking charges. These measures have impacted on the rate of increase in car ownership and car use in Japan. Annual rate of growth of 'cars in use' in Japan was 1% between 2001 and 2009 as compared to about 5% between 1991 and 2000; new car registrations in Japan have declined at a rate of about 1.1% per annum between 1991 and 2009.[vi]

Using congestion charging to reduce car use

London has attempted to restrain the use of personal cars, if not their ownership through the levy of congestion charges in central London and the simultaneous provision of increased and better public transport. London is encouraging large employers to draw up mobility plans for their staff, which are not car dependent. The city is also using parking regulation, pricing, and development controls for transport demand management

Comprehensive approach to addressing increase in ownership and use of cars

Singapore and Hong Kong are two striking examples of city states, which have been very successful in decoupling economic growth from car ownership as compared to other countries/city-states with similar levels of prosperity (Figure 5).

Interestingly, some of our larger cities, although nowhere near Hong Kong and Singapore in terms of
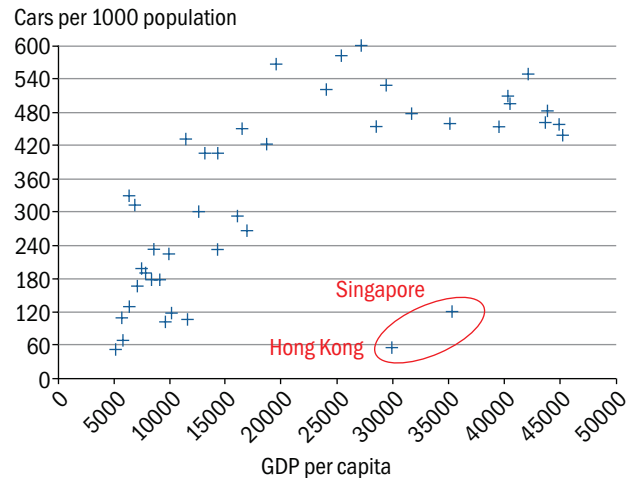

Cars per 1000 population
GDP per capita

Figure 5: Low car ownership in Hong Kong and Singapore as compared to many other countries with similar economic growth levels
Source: Authors
Note: GDP and car ownership data from World Development Indicators, Available at http://data.worldbank.org/indicator/NY.GDP.PCAP.CD and http://data.worldbank.org/indicator/IS.VEH.PCAR.P3/countries

per capita GDP, have overtaken these two cities in terms of car ownership without any thought as to the consequences (Figure 6). Singapore and Hong Kong feature among the top 50 wealthiest cities in the world today.[vii] The residents of these cities can easily own cars, but the car-ownership level in these cities is low because
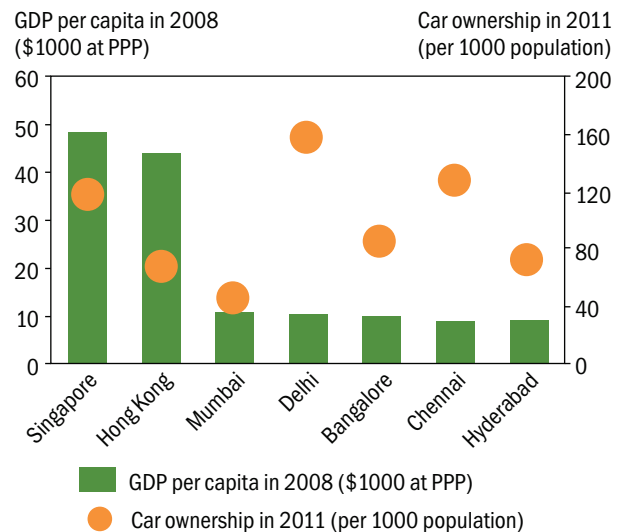

GDP per capita in 2008 ($1000 at PPP)
Car ownership in 2011 (per 1000 population)

Figure 6: Comparison of car ownership level in Indian cities with Hong Kong and Singapore[viii]
Source: Authors
Note: Data from GoI (2011), MoRTH (2012), PricewaterhouseCoopers (2009), Annual Vehicle Statistics, Singapore[ix], Monthly Traffic and Transport Digest, Hong Kong[x]

they wisely chose to plan for 'mobility for all' rather than plan for 'mobility for automobiles'. One of the important goals behind these city states' initiatives to control car ownership was to ensure that the growth in the number of cars did not exceed the growth in road infrastructure and that there was economic and equitable use of available road space.

What should we be doing?

There is no doubt that the automobile industry makes a major contribution to India's growth story. The industry contributed 6% to India's GDP in 2010–11 and has provided direct and indirect employment to 13.1 million workers (MoHIPE, 2012). It is becoming the global hub for small cars and is emerging as a major export earner. More than all this, the automobile industry has generated pride and a sense of modernism in the minds of most Indians. These indeed are positives and should be recognized.

At the same time, these positives need to be weighed against the externalities and the costs of these externalities. It is true that owning a car is fulfilling an aspiration. It is also true that our failure to provide adequate and appropriate public transport has compelled commuters to use personal vehicles. But, these are clearly no reasons as to why we should accept an unabated growth in the number of cars as inevitable and orient all our planning to meet this growth. We need to adopt measures to ensure that we do not ape the West.

Integrated land use and transport planning

In India, unfortunately, land use and transport planning are not integrated; transport planning follows land use planning and transport demand. While the National Urban Transport Policy (NUTP) has recognized this need and urged cities to integrate land use and transport planning, the regulatory framework has not yet made this mandatory. Legislations such as Development Acts or Town and Country Planning Acts that provide the basis for land-use planning in cities should mandate the integration of land-use planning with transport planning.

Conservative approach to creating more road space

In India, we strongly believe that the immediate solution for dealing with growth in car ownership is to provide for more road space. The emphasis of public investment should not be on creating more road space for cars, but

on public transport and NMT infrastructure. Our policies should not continue to be skewed in favour of cars.

We also need to lay emphasis on traffic management so as to optimize the utilization of the existing road systems and avoid the need to create more road space. State-of-the-art Intelligent Transport Systems need to be installed in at least the mega cities that are witnessing fast increase in car use.

Planning for NMT

In India's first- and second-order cities, some 30–60% of total trips are being met by NMT. Although this is an optimum level, this is not by choice. The challenge is to take measures to make NMT safe and comfortable so that it becomes a mode of choice. The development of facilities for NMT should receive priority for funding under the Jawaharlal Nehru National Urban Renewal mission (JNNURM) or any other urban renewal mission that succeeds it.

Introduce and improve public transit

The NUTP and JNNURM recognized for the first time the importance of public transport and provided incentives and funding for augmenting public transport. Even so, the availability of public transport in Indian cities is low. According to data available, only 20 cities had formal city bus services until a few years ago. Although this number has gone up due to JNNURM support, city bus services are still highly inadequate. We need to give a very strong push for introducing and improving public transport in our cities.

Restricting car ownership and use

In fast-growing cities, which are already witnessing very fast pace of car growth, measures should be taken to restrict the use of cars by undertaking transport demand management measures such as congestion pricing, high parking fees, etc. It is also time for us to start thinking about the need to restrict the ownership of cars so that we do not end up becoming a car-dependent country.

Who should be managing transport in our cities?

The consequences of unabated growth in the number of personal vehicles have to be ultimately borne by the cities in India. And yet, Indian cities are not empowered to shape their future. Urban transport is not an activity

that is contained in the Schedule 12 of the 74th Constitutional Amendment, and in any event cities are not empowered to take measures such as restricting the ownership of cars, demanding a parking space before registering a car, making fuel expensive, etc. It is imperative to include urban transport in Schedule 12 and transfer responsibility for managing urban transport to the cities so that they can shape their destinies. Even as cities are empowered, the Government of India must provide technical assistance to the cities to plan and manage urban transport and fund transport projects that are consistent with the NUTP. Unfortunately, both Indian states and cities lack the institutional arrangements and capacity to plan, develop, and manage urban transport with an appropriate inter-modal mix. Responsibility for urban transport is still fragmented between and within the national, state, and city governments, and there is no unified agency to deal with all aspects of urban transport. Also, different aspects of urban transport are governed by different laws and regulations and there is no single or unified law to govern urban transport. It is time that we have a law to govern urban transport, and also establish in the large cities a Unified Metropolitan Transport Authority (UMTA) to deal with all aspects of urban transport. In Singapore, for instance, the Land Transport Authority functions as the unified transport decision-making body. In Hong Kong, it is the Transport Department of the government of the Hong Kong Special Administrative Region. London has been successful in introducing congestion charges to reduce the use of cars in central London and in providing acceptable public transport as an alternative because Mayor Ken Livingstone recognized the need for an integrated approach and established Transport for London.

Measures undertaken by cities in China, Japan, Singapore, Hong Kong, and London indicate that an appropriate mix of supply- and demand-side measures can restrain the ownership and use of cars. These measures do not involve any rocket science and are well within the reach of Indian cities and states. As the country urbanizes rapidly, its cities will witness an exponential growth in the number of private vehicles. Whether it is going to be 30 million more cars in the next 15 years or 40 million is not relevant. The message is clear that the number would be humongous and that unless we wake up now, neither cars nor people would be able to 'move' in our cities.

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iii See http://www.downtoearth.org.in/node/1751

iv   See http://www.chinadaily.com.cn/china/2012-07/01/content _15540462.htm

v   Report of the Expert Committee on Review of Motor Vehicles Act 1988 submitted to the Ministry of Road Transport and Highways (MoRTH), Available at http://morth.nic.in/showfile.asp?lid=377,.

vi   Data taken from http://www.jama-english.jp/publications/MVS2010.pdf

vii   See http://www.citymayors.com/economics/richest_cities.html

viii Consistent data on the per capita GDP for Hong Kong, Singapore, and the five Indian cities for the year 2011 was not available. Also, consistent data on population in these cities in 2008 was not available to enable calculation of the level of car ownership in 2008.

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x   Monthly Traffic and Transport Digest, Hong Kong; Available at http://www.td.gov.hk/en/transport_in_hong_kong/transport_figures/monthly_traffic_and_transport_digest/index.html

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