

80

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Lessons from Global Practices

PRASHANT KUMAR

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ABOUT THE AUTHOR

Prashant Kumar is Associate Fellow at the Observer Research Foundation's Economic Policy program. He is also a member of ORF's India DataLabs team. He is a recipient of the Nikkei Young Asian Scholar Fellowship, for which he spent six months in Tokyo as a Visiting Research Fellow. He is an alumnus of the Asian Forum on Global Governance.

DELHI'S TRAFFIC NIGHTMARE: Lessons from Global Practices

ABSTRACT

Delhi's traffic management is based on a system designed long before motor vehicle ownership in the city had reached its current mammoth size. This system is immensely inadequate to respond to the growing crisis. Small, stop-gap measures are unable to effectively manage the situation, which only promises to worsen if not addressed effectively. This paper describes specific lessons that can be drawn from the experiences of various cities in addressing their own traffic congestion problems. If tweaked to accommodate the peculiarities of India's capital city, these solutions may help ease Delhi's congestion woes which can no longer be ignored.

INTRODUCTION: THE GROWING PROBLEM OF CONGESTION

The Delhi government, in its apparent haste to curb the problem of traffic congestion in the city has ruled, as of 5 December 2015, that Delhi must adopt a stringent, China-based model to ease its traffic-related issues. The solution calls for restricting the movement of motor vehicles within the city, based on their even-or-odd-ending number plates, and according to days of the week. It is meant as an ad hoc plan based on an idea borrowed from a neighbouring country, in hopes that it will create a radical change in the city's congestion situation and improve pollution conditions.

As soon as the government announced the plan, however, it was immediately met with protests for various reasons. The government itself appears to have publicised the new ordinance to be in effect as of 1 January

2016, without a sound plan for its enforcement. Will this rule be a mere 'recommendation'—and thus following it becomes optional—as goes that popular street-joke amongst drivers, referring to the city's toothless road laws? Is this policy decision destined to go to waste?

Yet a larger issue with such a quick-fix solution is that Delhi will do better to emulate the many models, practices and solutions that other countries have used to manage traffic congestion. The odd-even rule, while in fact easier to implement in Beijing due to the city's strict police enforcement, still has not yielded results China had hoped for. Other models exist: Singapore, Manila, and London have had far greater success than China. While there is no doubt that Delhi traffic is caused by the sheer number of vehicles on the roads, the Delhi government might also be ignoring the other causes of this problem.

It appears that the Delhi government has adopted the Beijing strategy without realising its possible implications. Where many other cities use this model, also known as the Road Space Rationing (RSR) model, it is used for specific time periods that are more prone to heavy or peak congestion. Moreover, the Delhi government's sweeping plan of restricting all even or odd numbered cars on alternate days for full days, will be hard on those who have only that one vehicle. Public safety concerns are also being raised, especially for women who rely on the security accorded by their private vehicles in navigating Delhi's roads. The program will require waivers and exemptions for many cases and leeway will have to be given to people with legitimate reasons. The city government's policy decision requires much more thought before it can be implemented.

In fact, when this law was introduced in Beijing in 2008, it was done so to ease the traffic situation for the Olympic Games, which only lasted for two months. Beijing has continued this practice but has also given exemptions and waivers for certain times, situations and people. This also is only one of many strategies that Beijing implemented. Delhi cannot simply extract one portion of a bigger policy and place all its bets on it. When Beijing implemented these strategies they were an amalgamation of solutions, which were termed “one of the toughest traffic reduction measures” in Chinese history. The city imposed higher parking fees, car restrictions based

on number plates, and limiting total car ownership by introducing the ownership application process like in Singapore. The result of these strategies was a decrease in China's level in the congestion index, from 7.54 which is considered medium level congestion to 5.15, considered slight congestion.¹ Further, Beijing's highly planned transportation infrastructure has a very important role to play in the reductions; this is a point lacking in Delhi. And despite such initial reduction and implementation of strict rules and regulations, Beijing congestion has worsened over the years, in fact, with average waiting time in traffic having increased by 25 minutes from 2012 to 2014.²³⁴

Road congestion is only one amongst Delhi's most pressing problems brought about by booming urbanisation in the last few decades. With growing disposable incomes and a rising set of affluent middle class, ownership of private motor vehicles has increased tremendously in the last ten years. It is estimated that nearly 10 percent of all cars in India are in the four largest metros and of these, 90 percent are privately owned. As of 2012-13, Delhi had 8.2 million motor vehicles; 160,000 more are added each year, of which 63 percent are motorised two wheelers.⁵ Some 1,400 cars are added to Delhi's bustling roads every single day.⁶ Congestion due to sheer numbers is exacerbated further by non-functioning traffic lights, violations of traffic rules and norms, flooding and sewage spillage, the closing down of routes for VIP movement, and illegal parking.

There are various policies and laws governing the capital's transport sector. The Delhi Motor Vehicles Taxation Act was passed in 1962, which levied the various forms of motor vehicle taxation practiced today.⁷ The imposition of a registration tax of 10 percent on Delhi-registered vehicles was a method to lower congestion levels in the city by reducing incentives to buy vehicles, but the proximity to cities in Haryana and UP with lower registration taxes allows consumers to circumvent such measures. Other laws and policies are present relating to lane driving, high-beam headlight usage and right of way, though they are not enforced anywhere in the nation.

GLOBAL STRATEGIES AND BEST PRACTICES

Congestion is not a problem faced by India alone; indeed, it is a serious concern for governments of most global cities. Congestion reduction is practiced across the world and successes have been achieved in major cities like London, Singapore and Manila. Cities across the globe are devising their own methods of reducing traffic or else adopting best practices of other countries. India, for its part, appears stuck on laws passed in an era when road traffic was minimal. India also suffers from lack of enforcement as well as the inability to set laws that, by their very nature of being stringent, tend to elicit negative reactions from certain sectors of society, too.

In today's era of information, the Delhi government has no reason not to learn from proven practices from across the world. While some strategies may be harder to implement in Indian cities, other successful best practices can certainly be adopted. Delhi has the choice of using one, or an amalgamation of solutions, to improve the current situation.

Singapore

One of the premier global solutions for traffic management is seen in Singapore. Singapore realised the problem of traffic congestion as early as in the 1970s. It has a two-pronged strategy that has severely reduced the number of motor vehicles on its roads. It uses both Area Taxation and Vehicle Pricing Control to limit the number of vehicles and keep traffic manageable.

The first strategy is to tax motor vehicles in areas of heavy congestion or areas with limited access. A fee is subtracted from a cash card installed in each car when it enters any such zones. Ranging from S\$1 to S\$5, motor vehicles entering the zone are charged based on the time, location and the traffic flow. The electronic road pricing (ERP) system has not only reduced the number of vehicles on the road but increased speed of the traffic as well as promoted carpooling.⁸

Singapore's second strategy is to control vehicle pricing. The Vehicle Quota System (VQS) introduced in the 1990s limits the number of people

eligible to buy a car, to begin with. VQS requires those interested to buy a vehicle to bid for a Certificate of Entitlement (COE). The number of COEs depends on the rate of growth of motor vehicles in the city, and thus COE numbers can vary from year to year. COEs can range from S\$1000 to S\$75,000 and are an additional cost to the plethora of taxes imposed on buying a new car. A COE is only valid for ten years, upon which the car has to either be sold off back to the government or sold to another COE allotted buyer.⁹

London

London introduced the congestion tax in February 2003. Aimed at reducing traffic, increasing revenue for public transportation and reducing carbon emissions in the city, the congestion tax is a heavy tax imposed on motor vehicles entering the congestion zone on a daily basis. While the fees can be paid as per usage, monthly or annually, harsh fines for non-payment ensures adherence to the law. The charge, which averages at GBP 11.50 per day, is exempted for light vehicles, hybrid and electric motor vehicles and other exempted vehicles that must operate in the city. It is charged Monday to Friday, excluding weekends and public holidays.¹⁰

With 253 working days, a vehicle owner paying an annual charge will have to pay approximately GBP 3000. Though the charge is refunded if not used completely, the fine for non-payment of congestion charge can range from GBP 65 to GBP 195, depending on the time taken to pay. Motor vehicles entering the zone are monitored by the Automatic Number Plate Recognition system.

The congestion charge has reduced traffic in the London area by 30 percent. CO2 levels in the area have reduced by 20 percent since 2007 and journey times have reduced by 30 percent. Reports also indicate that residents within the congestion zone (who are exempt) and owners of vehicles exempted from such tax have been relatively unaffected. Further, Traffic of London (TFL) annual report records revenue from the congestion charge at GBP 227 million for 2012.¹¹

Metro Manila

Implemented in 1995 and re-introduced in 2006, the Unified Vehicular Volume Reduction Program (UVVRP) was introduced in Metro Manila, the capital and largest city of the Philippines, to reduce congestion on its roads. The mixed success of the program has resulted in other large cities adopting similar practices across the country.

The UVVRP employs a number coding scheme to limit or ban certain vehicles from main roads and arteries in Manila. The scheme mandates that number plates of motor vehicles ending with 1 or 2 may not be allowed on roads on Monday, 3 and 4 on Tuesday, and so forth. On the weekend, even-numbered are banned on Saturdays and odd, on Sundays. Though open windows during non-peak hours have offered some leeway, most motor vehicles are not allowed to enter city roads if the number plate is banned on that day.¹²

Furthermore, there is registration of motor vehicles annually, represented by a yearly sticker on the number plate. This allows traffic officials to recognise a car that has renewed registration, and take punitive action against those which have not.

While the annual registration tax has helped in both reduction of motor vehicles and increase in revenue, the UVVRP has had mixed results. The main problem with the UVVRP was that it did not account for multiple motor vehicles for the same owner. Thus, the number of motor vehicles that initially reduced with the introduction of this scheme started increasing over time as consumers bought additional vehicles. Recognising this trend, the city's government has now imposed higher registration fees for additional motor vehicles owned by the same person.

Other examples

Numerous other strategies have been implemented across the world. For example, one-way traffic is used in many US cities. Given the fact that most cities in the US are developed within a prescribed grid, this practice is a lot easier but one-way traffic has been adopted in countries without grid-like

structure as well, like South Africa. The system allows major arterial routes to have only sided flow of traffic, making the parallel road for traffic in the opposite direction. The problems of traffic lights, turning, reversing and u-turning vehicles are greatly reduced. Example of one-way flowing traffic include New York, San Francisco and Boston.

Other strategies include centralising the traffic grid itself. Traffic lights in many modern cities are controlled by a central hub, computer or system that can monitor the flow of traffic throughout the city. The hub can control the duration of lights, ease traffic congestion in certain areas and monitor for all emergencies. In Toronto, 83 percent of traffic lights are controlled by the Main Traffic Signal System. The Sydney Co-Operated Adaptive Traffic System (SCATS) not only controls 3,400 signals in Australia but also in 24 cities including Tehran and Singapore.¹³

This is not to say that strategies have not been employed in India to reduce traffic congestion and improve overall traffic flow. For example, the Bus Rapid Transport System (BRTS) employed in Ahmedabad, which organises sections of bus movement in specific corridors, has resulted in higher ridership, improvement in travel speed of up to 8 km/h, higher revenue due to increased loads, lower environmental impacts and overall increased road safety. Similar successes have been achieved in the Indian cities of Jaipur, Jabalpur and Pune. Parking solutions like that of Lindsay Street in Kolkata have had a significant impact on both traffic congestion and flow of traffic.¹⁴ With the construction of the automated parking system and enforcement of fines on illegal street parking, not only has traffic congestion around the area reduced greatly, but other indirect benefits such as higher pedestrian usage and improved safety of people and motor vehicles have been realised. The Kolkata Municipal Corporation (KMC) earns an annual INR 920,000 per annum from this one facility alone.¹⁵

SOLUTIONS AND RECOMMENDATIONS FOR DELHI

As for Delhi, its traffic congestion woes are a result not only of the number of motor vehicles on the roads—although this plays a significant part of the problem on its own. Delhi traffic is further congested by tampered and non-

functioning lights, parking issues, VIP movements and infrastructure inadequacies. Infrastructure inadequacies such as bad or narrow roads, or sewage and flooding, are being constantly addressed by the multiple municipal corporations of the city and laws on VIP routes have been made by both the Supreme Court and the administration. However, problems like number of motor vehicles, flow of traffic, and traffic signals are not being addressed.

Yet, before solutions to reduce Delhi's overbearing congestion can be applied or implemented, the first step for the city must be to improve its over-burdened public transportation system. As of 2013, the Delhi Transport Corporation has approximately 6,000 buses in operation. With 247 private operators and 120 DMRC feeder buses, on any given day, Delhi has approximately 5,500 buses operating in the city.¹⁶ This number may seem large but when compared to the city's population (16,750,000), the ratio comes to a measly 0.03 buses per 1,000 people.^{17 18} Other public transportation systems in the capital carry a similarly heavy burden, with a ratio of 3.2 auto-rickshaws per 1,000 people¹⁹ and 4.1 taxis per 1,000 people.²⁰

Even though strides have been made in improving the public transportation sector, especially with the Delhi Metro running through major areas of the city, the ratio of public transportation to population still remains low. The Delhi Metro, which currently has 208 trains, with a maximum of eight carriages and 100 passengers per carriage, is able to provide public transport service to 2.5 million passengers at any given time²¹ and can be considered one of the more successful Delhi urban transportation strategies, though in recent years, its ridership has far exceeded its expansion.²²

As of now, Delhi public transportation is one of the more fragmented systems in the country and the world. Many Indian and global cities have intertwined public transportation, which allows for a more fluid movement of population using such modes of transportation. Integration methods include common ticketing offices for the various modes of public transportation (such as in Tokyo and New York), neighbourhood and community routes, bus stops and taxi stands around metro stations, and

many other such strategies must be applied to the sparse and segregated public transportation sector of Delhi.

Most important of all, if public transportation is to succeed in the city, it will have to be brought at par with global standards and made a more sensible and appealing choice for many, rather than private ownership of motor vehicles. A mindset shift is called for: The perception of social divisions perpetuated between those who drive motor vehicles and those who ride buses must be changed. Using public transportation must be made as attractive as owning private motor vehicles, which implies improving quality of public transportation, efficiency and schedule adherence, linking communities and neighbourhoods off main arterial routes and enhancing both security and Wi-Fi connectivity aboard the various modes of public travel.

Road laws in Delhi and the country must be cognizant of modern traffic patterns, demand and supply of motor vehicles and market prices. Registration costs cannot differ vastly between neighbouring cities and states and a uniform registration system across the country must be formulated.²³ Negating the choice of registering a motor vehicle from areas with cheaper registration costs will reduce the attraction and ease in motor vehicle ownership. Most importantly, enforcement of laws in the city must be made more stringent. Without enforcement, even measures such as increased taxation, improved traffic lighting and other such solutions, will be pointless.

Fines and fees for traffic violations must reflect changing disposable income. Low fees and fines allow vehicle owners to ignore traffic rules and regulations.²⁴ Delhi must introduce a congestion tax. As monitoring systems such as the ERP or the Automatic Number Plate Recognition system may be a step too far ahead, an annual tax levied on all motor vehicles in India can more easily be applied; such tax will depend on factors such as the size and weight of the car, capacity, and carbon emission. The tax must be heavy enough and be an addition to all other road taxes for it to deter people from buying vehicles and make the use public transportation a more sensible choice. Payment of this annual tax can be represented by the yearly sticker on number plates, as used in Manila, for instance. Motor vehicles registered

outside the NCR and entering into Delhi for short durations must be made to pay before entering city or congestion zone limits. Additional taxation can also include a green tax based on fuel type and carbon emissions, especially for new motor vehicles.²⁵

While this strategy may be opposed on the lines of social inequality or hindrance to some economic and commercial activity, the revenue generated from such taxes will greatly help the city's struggling public transportation system as well as reduce carbon footprint and reduce journey time within the city. Delhi can also look to introduce an automated traffic light management system, as employed in cities like Toronto, New York and Sydney. The central computer system will allow traffic lights to remain functioning, not be tampered with and control the flow of traffic where necessary. A central traffic light system will also allow for Advance Warning System (AWS) which can provide timely warning on road closures, heavy congestions and diverted routes. Though the cost of implementing such technology in the city would be high, it will reduce congestion tremendously.²⁶

Delhi must also improve its parking management system. Currently, the parking fees mandate by local communities, trader associations and area owners are not reflective of market prices. The government must look to wrest control of parking pricing from such agents and create a uniform parking fee across the city. Parking fees should also be increased and decreased according to demand and supply. Central control of parking pricing will not only result in enforcing parking rules and regulations but can be a good source of revenue for the city's administration. While the Delhi Master Plan 2021 requires residential plots (depending on size) to provide parking within each unit, commercial development has no such mandate.²⁷

Further, public parking facilities must be developed in the city. Areas of heavy congestion, especially market areas of Delhi must be given dedicated land for formal parking facilities. Even though some initiatives in this regard have been undertaken, the progress of such formal parking areas has been weak. For example, the automated, central parking of Sarojini Nagar is underutilised as parking on roads is still allowed.^{28 29} Higher fines for not parking in these formal areas must be enforced such that it deters vehicle owners from using illegal, informal areas as parking lots. Other examples

include Hauz Khas market, where the central parking structure is yet to be opened to the public, even after a year since completion.³⁰ The Centre and the Delhi government must look to set aside land and invest in creating multi-level parking across the city to reduce vehicle standing on roads and arteries.

The private sector can also play an integral part in helping traffic reduction, especially in infrastructure development. The BJP government in its 2015 budget announced its intention to increase public private partnership in roadways. While the development of roads, which include additional roads, widening of roads and pathways can be the responsibility of the government, other aspects can be handed over to the private sector, such as road maintenance and parking facilities. If the private sector can be made responsible for the traffic congestion around their proximity, large segments of the city can be maintained with little involvement of the government, which is often hobbled by delays and inefficiencies. It will require the government to provide incentives to boost private sector investment, but at the same time can severely reduce the burden on the city's accounts.

Cities like Bhopal, Kolkata, Ahmedabad and Jaipur have all used some level of PPP in their traffic reduction system or public transportation sector. Mumbai and Pune both have PPP projects in the pipeline. Thus it is surprising that Delhi has not been able to effectively create a PPP model for urban mobility and must correct this, if it is to not only effectively navigate the complex urban mobility issue but also to limit the expenditure of city accounts that are diverted to managing the ever-increasing traffic congestion.³¹

The role of civil society in traffic reduction is more a behavioural change than one pertaining to laws and rules. Delhi traffic is further exacerbated by the ignorance of rules and regulations especially in regard to lane-driving, signalling, right-of-way and giving way to emergency services. These small, individual behavioural changes, when multiplied manifold, can result in smoother flow of traffic, fewer inadvertent turns and blockages and improving road safety. Campaigns are also required to promote the use of public transportation and carpooling.

CONCLUSION

Delhi's rapid urbanisation continues to throw new challenges, one of which is traffic congestion. There are heavy consequences related to increase in traffic congestion, including loss in economic activity, strain on the city's already over-extended resources, increase in fuel costs and impact on the overall environment, highlighted most starkly in Delhi's worsening pollution levels. In order to mitigate these ill effects, tough decisions need to be made by both the state and central governments. These policy decisions will likely be opposed by the booming middle class that highly regards car ownership for not only its convenience, but also as a status symbol. As one scholar has said, "It will have to be explained to them that it is in their own interest to embrace these measures".³²

The Delhi government can ill-afford to create laws and regulations in haste. The measures needed to curb both congestion and environmental degradation will have to encompass various situations and needs of citizens, that a law like the recent odd-even rule does not take into account. There are numerous considerations that need to be worked out and at best a solution for the worsening congestion of the city will have to come from an amalgamation of global best practices, and adoptable and sustainable strategies. For example, congestion tax on specific areas or higher annual registration taxation could be measures that can be coupled with this new odd-even ordinance. Another suggestion would be to allow citizens with two cars with the same number (either only even or only odd) to pay a charge to change the number of one car to be able to use on either days. This will maintain the objectives of this new rule while not putting many under undue duress. Altogether, it will require better use of technology and the upgrade of existing infrastructure. Without the use of these, though measures created and implemented in a hurry will bring short-term gains, in the long run they may not have the desired impact and, like in the case of Beijing, may turn negative altogether.

These measures, which may require large resources in the short run, will pay off economically, environmentally and socially in the long term. While critics against increased investment often cite the example of Sweden to

show the unprofitability of urban transportation measures and solutions—wherein 95 percent of related costs are borne by the federal authority—they do not take into account successful models like those of Ahmedabad and London, which through such measures have generated large amounts of revenue while reducing traffic congestion.³³

Measures such as increasing the ratio of public transportation to population must be the first step in attempting to correct the traffic situation in the city. The provision of public transport not only causes a systemic shift away from private ownership, but if coupled with other measures, it can become a high revenue generating instrument for the city's economy. Public transport has to be made efficient, safe and made socially worthy, if it is to be seen as a viable alternative to private vehicle usage.

Concomitantly, measures such as congestion tax are equally necessary in a city like Delhi. Monetary strains in the form of taxation and the consequent price rise have often been used as deterrents for consumption or usage of certain commodities. By increasing the price of all motor vehicles, the government will significantly reduce the propensity of the population to buy cars and with regular updates dependent on changing incomes, this measure can be made sustainable.

The capabilities of implementing agencies must be improved drastically. Training of traffic police officers to be able to manage traffic smoothly and efficiently and respond to emergencies should be of high priority to the city administration. Digitalisation and record-keeping of offenses of drivers, automated offense recording through CCTVs and transparent system of collection of fines and fees must be instituted at the earliest. Further, capacity of other road management agencies, such as those concerned with infrastructure improvements, traffic management and planning, must be built to be able to manage the city's growing motor vehicle numbers.

Finally, laws in Delhi and in India overall, must reflect modern transport patterns. The laws and regulations should not only be enforced, but designed in a way that does not allow circumvention. They should be cognizant of evolving patterns in vehicle ownership and usage. It is also important that laws and regulations be made uniform across state lines and city limits such that incoming and outgoing vehicles are subject to the same

duties as other population groups. This will ensure equitability in transport measures, which can be a serious roadblock towards implementing such measures.

The imperative to discontinue stop-gap measures for the booming urban transportation sector and initiating schemes and programs aimed at reducing traffic congestion has now become more urgent. The unchecked growth of motor vehicles and the burden on city's infrastructure is not sustainable for Delhi in the long run and must be addressed immediately. 

ENDNOTES:

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DELHI'S TRAFFIC NIGHTMARE: LESSONS FROM GLOBAL PRACTICES

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