CITIZEN REPORT
ON
DELHI MONSOON 2010

2010 is an important year in the history of modern Delhi. It is the year when construction and destruction in the name of Commonwealth Games 2010 comes to an end, and the Games will come and go.

Delhi Greens reached out to the citizens to help prepare a Citizen Report on the state and status of civic infrastructure in Delhi especially during the monsoon months.

This Citizen Report on Delhi Monsoon 2010 captures the impact and experience of monsoon on Delhi in the year 2010.

Delhi Greens

Website: http://delhigreens.org
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Delhi Monsoon 2010: A Citizen Report

For when they see the people swarm into the streets, and daily wet to the skin with rain, and yet cannot persuade them to go out of the rain, they do keep themselves within their houses, seeing they cannot remedy the folly of the people.

- Thomas More

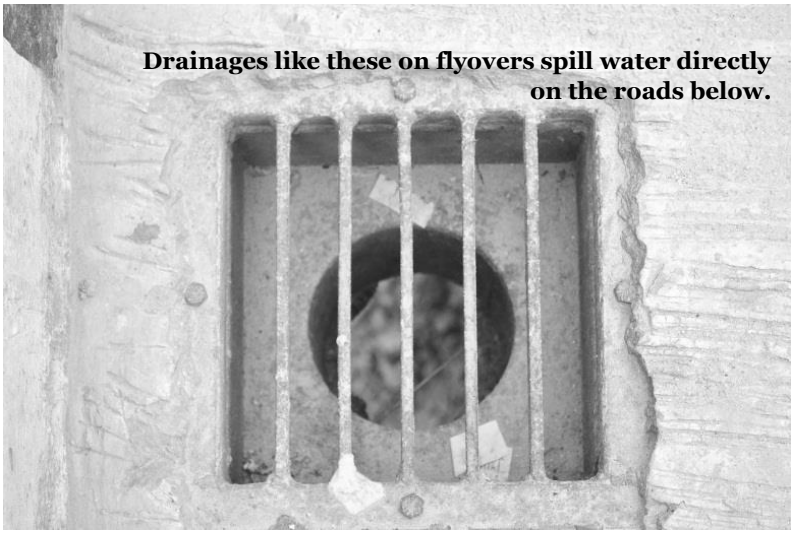
Rains always bring relief to Delhi's soul parched dry by the unrelenting summer son. But as the city mushrooms out into all corners, rains also bring about misery, discomfort and disease. With this year's record breaking monsoon soaking the city through and through, we try to analyze what this spells out for our streets, the lifeline of a metropolitan.

The Road*scape*

During the monsoons, the roads and the TV news channels - the Kafka-*esque* funny tragedy sprawled across every citizen's subconscious this season, as one leaves home, not knowing what embargo they are going into, to trundling back mud-laden in the evening, praying to the laundry gods for mercy.

To analyze the current situation, let us have a brief overview of traffic scenario in Delhi. While the road length has increased from 22,487 km in 1991 to 31,183 km in 2008; an increase of 17%, the number of vehicles has increased from 19 lakhs to over 60 lakhs during the same period. This is a whopping rise of over 200%[1], and that too when almost 80% of the population in the city uses buses as its primary means of transport[2]. Since roads occupy around 21% of the total space available, further lengthening of the road network is not feasible (this accounts for the low rise in road length over the past two decades), which then leads us to widening of the existing infrastructure through flyovers, underpasses, etc.

The first and foremost problem faced this monsoon has been excessive waterlogging. Under the purview of roads, incorrect planning and lack of proper drainage can be accounted for as the most crucial reason. While water logging disrupts traffic by narrowing the effective usage area of the road, long stagnation leads to the road eventually caving in. Most of the flyovers in the city, including the Metro pillars and the Commonwealth Games construction, seemed to have ignored storm water drainage as something too simple to have an effect.



Drainages like these on flyovers spill water directly on the roads below.

While labourers could be seen boring in water inlets in the recently constructed Mayur Vihar flyover on NH-24, the Metro pillars on the MG road dump huge loads of water directly on the road below, which is not only an obstruction for the vehicles passing by, but can also lead to injuries (water falling from a height does hurt!), and the water passed in to the road accumulates in the villages around the Andheria Mor region (Ghitorni, Aya Nagar, Rajokri).

[1] http://www.dimts.in/pdf/Delhi_BRT_System_Lessons_Learnt.pdf

[2] http://www.ccsindia.org/ccsindia/downloads/intern-papers-09/bus-transport-in-delhi-210.pdf

Another issue that is being encountered more frequently this monsoon, is that of roads caving in. Fragmented infrastructural upgrades seem to be the major culprit. The builder lays a road; the electricity department digs it up for wires, the water department for pipes, the telecom department for cables and so on. The 2021 Master Plan, even while acknowledging the problem, seems to moving towards the same *faux pas*.

Around two dozen roads have caved-in in the past three months, and almost 90% of them have had had some repair or upgrades done to them during the past year. Rakesh Mishra, PWD engineer-in-chief, blames the trench-less technology used to lay down electricity and communication cables for the mishaps. According to P. K. Sarkar, Head of Transport Planning, School of Planning and Architecture, "For laying electricity cables and communication lines digging up the entire stretch is no longer required. Over a period of time water starts seeping and the soil becomes soil and gives way when it rains heavily".[3]

The agencies till now seem to be firefighting - widening the roads, more and more flyovers, but this simply serves in shifting the problem from one sector to the other. Take the instance of Ring Road, while it is almost signal-free as the agencies had promised, there is no lax in the amount of congestion. Flyovers, built to handle *x* number of vehicles, have to handle *5x* vehicles by the time they are finished, thereby nullifying the purpose for which they were constructed, i.e. minimizing congestion.

Rather than trying to cater to the ever increasing vehicle base, the need of the hour is to restore the faith of the public in the public transport system. The Delhi Metro has been a commendable example in this regard. With rising fuel prices and high cost of maintaining private vehicles (and the traffic as a monster that it is), a major section of the populace (the so termed 'middle class') would be more than willing to hitch a ride provided it is clean, comfortable, punctual and safe.

Although the BRT system failed to take off despite the good intentions, a bit of tweaking can set it right. The BRT aims to collate the various transport modes, viz. the Metro, BRT, Monorail etc. into one seamless conveyance structure from point A to B rather than overlapping these modes over one another, as the case is presently. This is what makes it an important mode of transport that Delhi should not give up on.

[3] http://www.hindustantimes.com/Road-cave-in-reports-on-record-high-in-city/Article1-590471.aspx

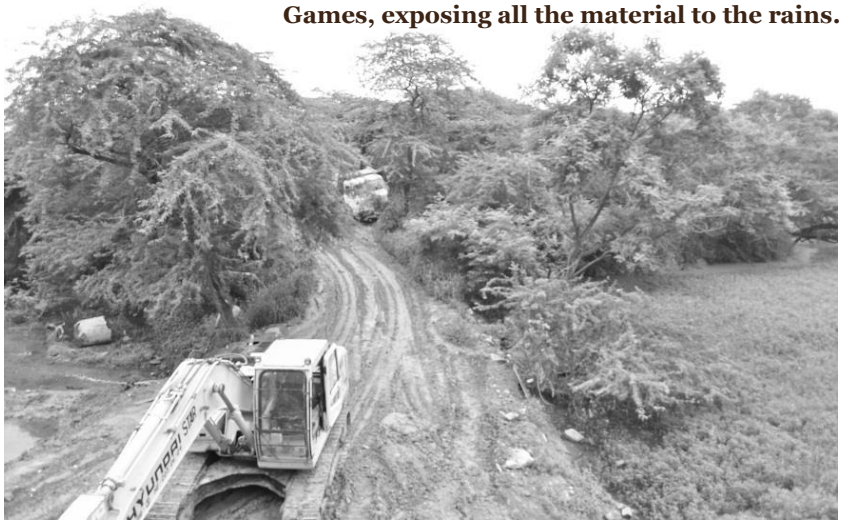
The Drainage System

The monsoon in Delhi in 2010 has put the waterlogging problem in Delhi at par with cities like Mumbai. However, considering the diversity in the scape and geography, the problem goes deeper than an erratic spell of weather. Delhi has always shown clear signs of lucid and elaborate planning as far as urban infrastructure is concerned. This is true for all the cities that Delhi has seen from its genesis especially the seven ancient cities which flank Lutyen's grandeur even to the present day. From the Tughlaqs to the Mughals to the British, all of whom are credited with endowing a stable infrastructure for their principalities, urban planning was very important. That is, until the modern Indian metropolitan came a calling. And goodbye to the simple and green, and we now welcome the concrete.

While the rapidly developed concrete jungle did a fair job in catering for the rapid influx of populace from all corners of the country, proper drainage system has proved to be the Achilles' heel time and again. Apart from the central region of the city (and even that ceases to be an exception now owing to the Commonwealth Games), a majority of the areas, from the slums of Jahangirpuri to the posh Vasant Kunj, street ponds seem to have become a new leveler in Delhi during monsoon 2010. Defining the problem is easy, in a blind flurry of the Games, the 2021 Master Plan and the corporate growth spurring on rapid infrastructural upgrades, builders have simply forgotten to provide sufficient inlet drains, leading to poor storm water drainage which was the best solution to a major part of the city's waterlogging problems.

There are two main reasons for this. One, apathy in all the recent construction plans, the prime example of which is the BRT corridor, or the section near the Commonwealth Games village in Mayur Vihar; lack of sufficient (in some cases, none) rainwater inlets leads to rapid waterlogging, which in turn makes the traffic jam worse.[4]

Construction work lies unfinished for the Commonwealth Games, exposing all the material to the rains.



Second, tonnes of construction material to be used for the Commonwealth Games and the Delhi Metro (and the consequent debris) lie open to the generous monsoons, blocking the existing drainage system. The new decorated sidewalks for the Games were put together in such a rush that no one remembered to bore some inlets in, and they are now leading to massive traffic snarls even in well-regulated areas like Chanakyapuri.

On a citizen level, improper disposal of waste is something we all are culprits of, not realizing that even an empty wrapper, not supposed to enter a sieved sink pipe, can cause waterlogging in the kitchen. Blocking the existing drainage system has exponentially increased the problem in many residential colonies like RK Puram. Water logging has also exposed faulty construction work in many new and old developments across the city, and since it is more viral to the slum sections of the city scape, the losses multiply manifold, from a collapse in infrastructure to dampening of public spirit. The major problem posed by water logging is not the traffic jams, but the diseases that can very easily take the form of epidemics in such conditions.

[4] http://indiatoday.intoday.in/site/Story/109852/114/rains-create-chaos-in-delhi.html

Apart from the latest Dengue scare, diseases like malaria, typhoid and jaundice are just lurking around the corner, waiting for a chance to strike. In almost all the low lying colonies of the city (a majority of which are post-independence), the responsibility of storm water disposal lies with the Municipal Corporation of Delhi (MCD), but the pumping facilities require an area of almost a square kilometre, a problem in the already congested Delhi metropolitan.

Another problem, more generic in nature, is the fragmented nature of infrastructural planning. Presently, Delhi has a three tier drainage system - **internal drains** take care of discharge from residential areas which then empty into **peripheral drains** in their vicinity which then enter into the **trunk drains.** The water is then treated heavily to rid it of its toxicity before being discharged into the Yamuna.

Drainage Channels and Catchments for Delhi

S. No.	Catchments	Location	Length of main drains (km)	Drainage channels	Discharge (cumecs)
1	Alipur	North	140	Supplementary Bhiwana Escape - No. 6 drain - New Drain	141 33
2	Kanjhawala	West	120	Mungeshpur	52
3	Najafgarh	Central-North, West and South-West	105	Najafgarh Palam Bhupania-Chudania (from Haryana)	283 86 40
4	Khushak-Barapulla	Central-South and South-East		Khushak and Barapulla drains ('nallah')	120
5	Trans-Yamuna	East	45	Shahdara outfall - Ghazipur Trunk drain No. 1	158 86
6	Mehrauli	South	5		

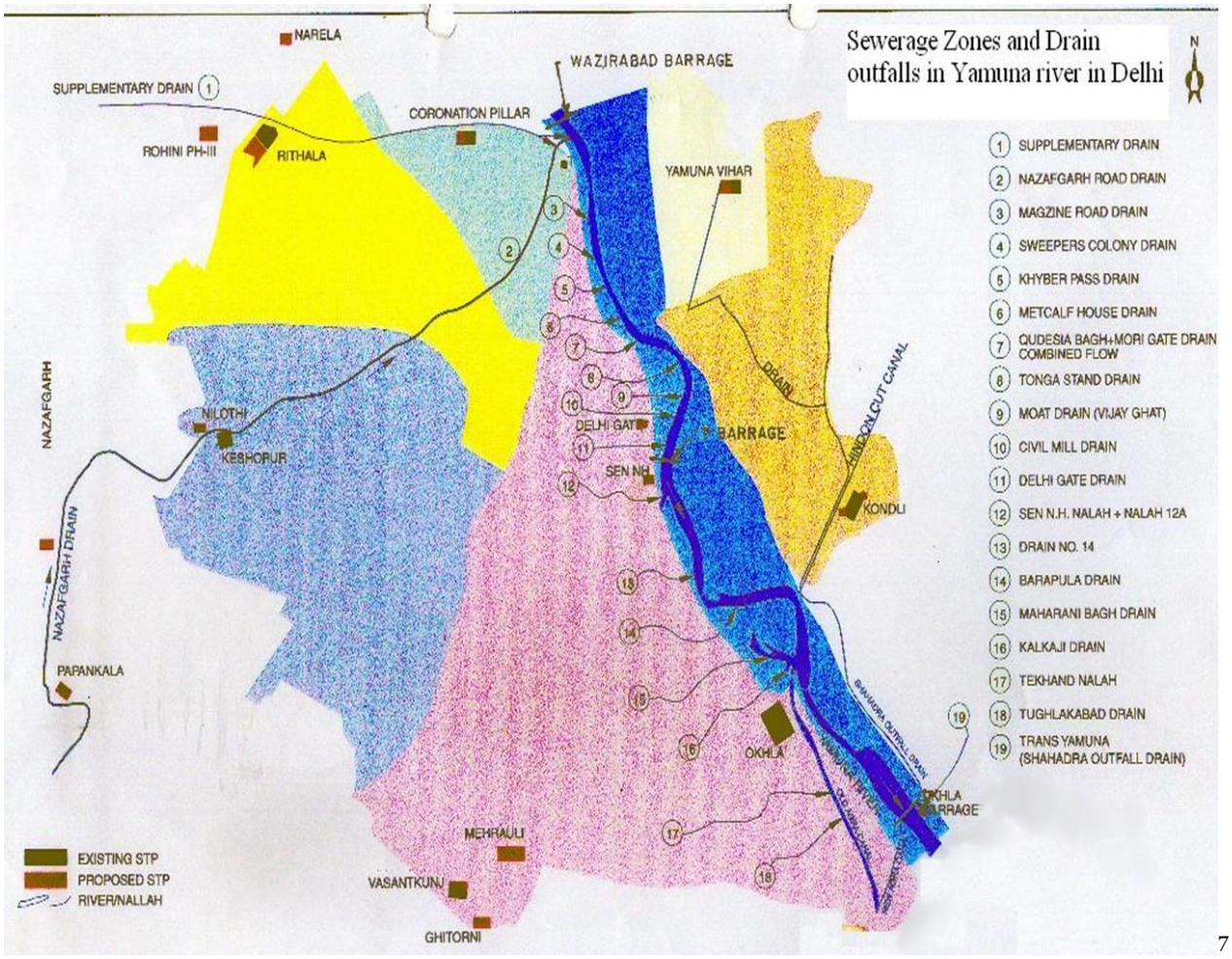
[5]

The last Master Plan to comprehensively study the drainage system was in 1976[6], and considering the city has undergone a lot of expansion, geographically as well in terms of the population, there is an urgent need to restudy the recommendations, even the ones that have come up in the Master Plan 2021. From an ordinary citizen's point of view, the following steps could have a positive impact in battling this annual monsoon menace that plays a spoiler to the joy and smell of the rains.

- Since there already have been many surveys and case studies in this regard, one needs a single platform to collate all this information which would greatly help in preparing a roadmap tackling all the dimensions of the problem.

- Rather than starting top down in developing the water drainage and treatment plants, one could take the bottom up approach, which would help in reducing the pressure on the existing systems. For instance, residential colonies could have their own small water treatment systems, while the peripheral and trunk drains (see table) could be kept aside for treating industrial waste. This becomes more crucial owing to the fact that standard storm water drains are only meant to carry the surface sweep water and not sewage or industrial waste.

[5] http://www.ccsindia.org/ccsindia/pdf/Ch10_Storm%20Water%20Drainage.pdf
[6] http://www.ccsindia.org/ccsindia/pdf/Ch10_Storm%20Water%20Drainage.pdf



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- Drainage systems for the trans-Yamuna region need to have a separate, stronger drainage and treatment infrastructure, since lying in a floodplain region and now with the addition of the Commonwealth Games village, the ecological consequences become larger.

- Many monuments of the Tughlaq and the Mughal period have water harvesting systems that are now defunct (like the *baolis*) or simply lying unused. Even if these systems cannot be restarted, they can be used for ancillary functions like ground water recharge, since they are already protected by various agencies, so maintenance does not bode a problem.

Ancient ground water recharge systems could be studied for installing better rainwater harvesting systems.

[7] http://www.cpcb.nic.in/...Delhi/STP%20Report%20-Chapter2%20(Methodology).doc

Traffic - The Black Widow

Say *rush hour* to any office employee at 5'o clock in the day and you can see dismay clouding over their otherwise carefree face. Traffic, especially during the rains means long jams, erratic traffic lights, endless drone of horns and rising tempers, not accounting hours of delay; and for mortals on lesser wheels, an extra change of clothing. Most of the traffic problems in the city can be blamed upon road congestion and improper drainage, both of which have been discussed in detail above.

The traffic system in Delhi is more ridden of a management problem than the burden of an overload. The entire transport system needs to be placed in a single system to observe the entire spectrum of movement in Delhi roads, ranging from buses to bullock carts. The lukewarm response to the BRT system suggests that further systems need to be tested out to find the best match for the city. An interesting comparison study on the positioning of bus lanes was found in an IIT Delhi research paper.[8]

Sl. No.	Central Bus Lane	Curb-Side Bus Lane
1.	**Excessive side-entries for vehicles into service lanes or individual plots.**	**Limited access to service lanes or widely spaced entry points into adjoining area.**
Rationale	The high volume of turning traffic interferes with the through movement of bus traffic if the bus uses the same curb-side lane as the turning vehicles.	
2.	**Closely placed traffic lights for vehicles.**	**Traffic lights at larger intervals.**
Rationale	Buses using the curb-side lane are forced to stop at every red signal with other vehicles reducing throughput and encouraging passengers to board and alight in unsafe areas.	
3.	**Low frequency of bus-stops**	**Higher Frequency of bus-stops**
Rationale	If the frequency of bus-stops is higher a central bus-lane will create too many pedestrian crossings defe ating the its purpose while a curb-side bus lane will provide safer and more efficient bus -stops.	
4.	**Higher volume of two-wheeler and three-wheeler vehicles**	**Lower volume of two-wheeler and three-wheeler vehicles**
Rationale	High volumes of two-wheeler and three-wheeler vehicles interfere with the movement of buses in the curb-side lane especially at the bus -stops where buses often cannot approach the designated bus-bays due to the three-wheelers parked there and the two-wheelers trying to overtake from the left-side. Also, the difference in sizes of these vehicles sharing the curb-side lane makes the situation unsafe for the smaller vehicles.	
E. g.	**Arterials through heavy commercial land-use areas like Vikas Marg**	**Highways through large institutional areas like stretch of Ring Road in ITO area.**

The traffic light system in the city also needs an upgrade. Though the transport authorities have begun installing intelligent Pelican crossing[9] systems, the concept of user interactive lights still needs to be communicated to a wider audience.

Considering the increasing number of hobby turned commuter cyclists in the city, systems like the toucan crossing[10] can be introduced on a pilot basis in regions like Lutyen's Delhi.

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[8] Tiwari, Geetam, Bus Priority Lanes for Delhi; http://www.iitd.ac.in/tripp/publications/paper/planning/bwkshop_gt.PDF

[9] http://en.wikipedia.org/wiki/Pelican_crossing

[10] http://en.wikipedia.org/wiki/Toucan_crossing

But the most crucial factor here is the driving attitude. Promoting an easy-going approach through public information dissemination and interactive platforms will help nurture more responsible drivers. The Delhi Traffic Police's Facebook page[11] is a good effort in this direction. Not only has it brought the driving community closer to the administration, it has made tracking offenders easier (the number of offences have also seen a drop), and serves as an effective tool in communicating real time traffic updates.

The Minnows: Cyclists and Pedestrians

I (Parth Joshi) am a cyclist by hobby. Having cycled across almost all major roads in Delhi, I can safely conclude that the city does not take kindly to the wannabe racers in shiny helmets – for one can easily see stranded cyclist in the middle of the road trying to get to their rightful place on the road, or even if it is the other way round. Not to say that everyone is rude though. There are still instances where drivers are courteous enough to offer the right of way.

Clubbing pedestrians and cyclists: will not help.

The authorities, after years of apathy, have finally woken up to realize the multitude of benefits cycling could have upon the city – from cleaning up the roads to cleaning up the air. The roads are being tinkered with again to etch out cycle lanes. However, certain amount of public awareness is still needed to make the city more cyclist-friendly.

[11] http://www.facebook.com/?ref=logo#!/pages/New-Delhi-India/Delhi-Traffic-Police/117817371573308?ref=ts

The BRT corridor[12] tried to remove the Bus-Cycle conflict by placing their lanes at different ends of the road, but the system got ridden with two problems. One, placing the buses on the central lane disrupted the traffic system drastically. Two, the cycle lanes were more often than not infested by motorcycles and even small cars in some cases. However, the authorities are doing a credible job by manning each entry to the lane.

While the positioning of bus lanes still remains an issue to be debated in the BRT system, the cycle lanes are a positive step and should be adopted on other road networks, albeit with a proper study and consequent adaptive strategies. Moreover, encouraging people to cycle is something that will only benefit the city in the long run. The rent-a-cycle system started at the Vishwavidyalaya Metro Station is a good case in this regard, where it provides a cheap mode of temporary transport for college students to and from the station.

The BRT corridor also plans to have this system introduced (it already has, in five locations between Ambedkar Nagar and Moolchand). But unless the infrastructure for cycling in the city is made safe and hassle free, it will still be a tall order dissuading people out of their four wheelers on to the saddle.

"As the drains get clogged with construction material thrown about by educated people, the roads get flooded and it is an enjoyable experience especially on a cycle."

– *Photo and Text by Abhay Chawla from Gurgaon, Delhi NCR.*

Closing Remarks by Delhi Greens:

It is a known history that two out of the last seven cities established in Delhi namely Shahjahanabad and Tughlaqabad, came down due to water problems. Thus monsoon, that feeds most of the water resources of Delhi, becomes a vital environmental component that can shed light and bring solutions to many existing, alarming problems in the city. The much awaited thing in Delhi after (and more than) the Commonwealth Games these days is the next monsoon. The killer heat and merciless dry wind leave the citizens with no option but worship and await the monsoon religiously. Hence highlighting its importance and giving it the due regard, Delhi Greens will continue to explore and document the season long celebration of monsoon in the city.

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[12] http://web.iitd.ac.in/~tripp/delhibrts/brts/hcbs/hcbs/BRTdesignsum.pdf

Appendix: Driver Interviews

No view on the city can be holistic without getting to know what its residents feel like. We interviewed a couple of drivers across the city to see what they viewed of Delhi's traffic situation, especially during the monsoons.

- **Name: Bramh Pal**
  Age: 26
  Occupation: Private Driver
  (Snow Leopard Adventures P Ltd.)

- **For how many years have you been driving in Delhi?**

  4 years.

- **Can you comment upon the city's road conditions over the years?**

  The road conditions have improved on major circles like the Ring Road, but road conditions in residential colonies like Aya Nagar remain as bad.

- **Can you comment upon the city's traffic conditions over the years?**

  Flyovers and underpasses have eased out many red lights, but faulty roads make jams a common occurrence during the rainy season, so the traffic conditions remain as bad as they were 3-4 years back.

- **What other problems do you face on the city roads during monsoons?**

  Nothing in particular.

- **What do you think needs to be done to improve the traffic on Delhi roads?**

  Traffic police needs to be installed at major bottlenecks throughout the year and not just during the jams.

- **Name: Vijay Kumar**
  Age: 38
  Occupation: Autorickshaw Driver

- **For how many years have you been driving in Delhi?**

  8 years.

- **Can you comment upon the city's road conditions over the years?**

  The roads have improved over the years, but there are still places like east Delhi where improvement is needed.

- **Can you comment upon the city's traffic conditions over the years?**

  The number of cars, especially bigger cars has increased over the years. We do not see too many small cars these days.

- **What other problems do you face on the city roads during monsoons?**

  Harassment by the traffic police, especially when they are trying to frame a culprit for traffic jams. They simply catch hold of the first autorickshaw they can find and put the entire blame of the jam upon him, and even illicit a fine in some cases.

- **What do you think needs to be done to improve the traffic on Delhi roads?**

  Lane traffic should be followed by all and red lights should be properly maintained.