



# **Seeking solutions to air pollution, health and congestion, in our cities**

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**Jaipur City dialogue**

**Jaipur Development Authority and  
Centre for Science and Environment**

**Jaipur, October 09, 2012**





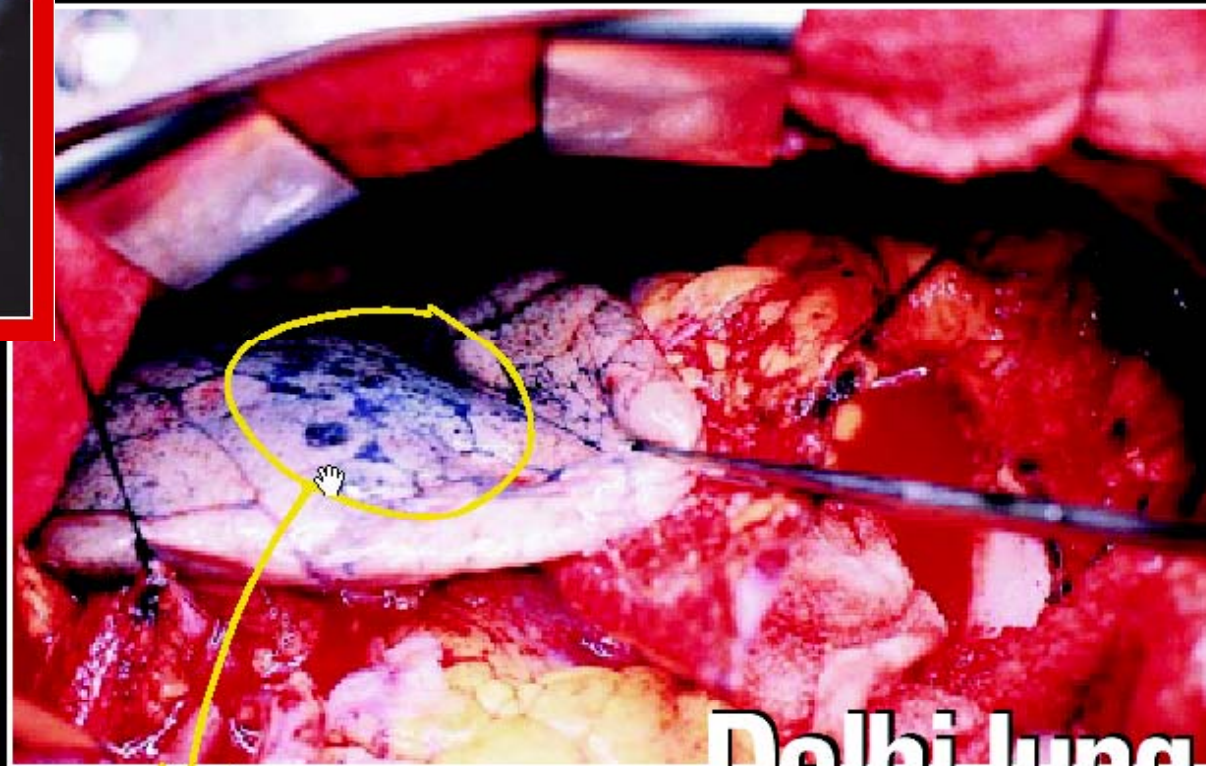
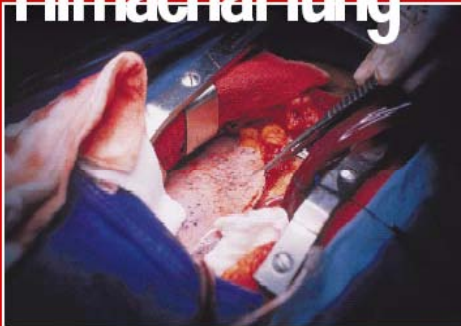
# Imprint of growth Our lungs at risk



Bad air! We all know about it, but the fact that it gets into our bodies and inflicts fatal injuries is unknown to most of us. Surgeons who have the privilege of seeing inside us have a funny story to tell. They can tell, just by looking at the colour of the lungs, whether the person is from a dirty big city or not. Actually a shocking tale!

Look at the spotless lung below. The fortunate owner comes from a relatively cleaner place.

## Himachal lung



Look at these black spots on the lung. The unfortunate owner lives in Delhi and has been breathing polluted air. Air full of carbon particles which accumulate in the lungs (black spots). What you can't see is a cocktail of gases and tiny particles, even smaller than carbon that get into our bodies. Actually, you are getting polluted.

## Delhi lung

Capital punishment

Scary? But those can't all be scary!

CSE Poster

We dared to test the lung of our Chief Minister in the midst of an Auto Show in Delhi



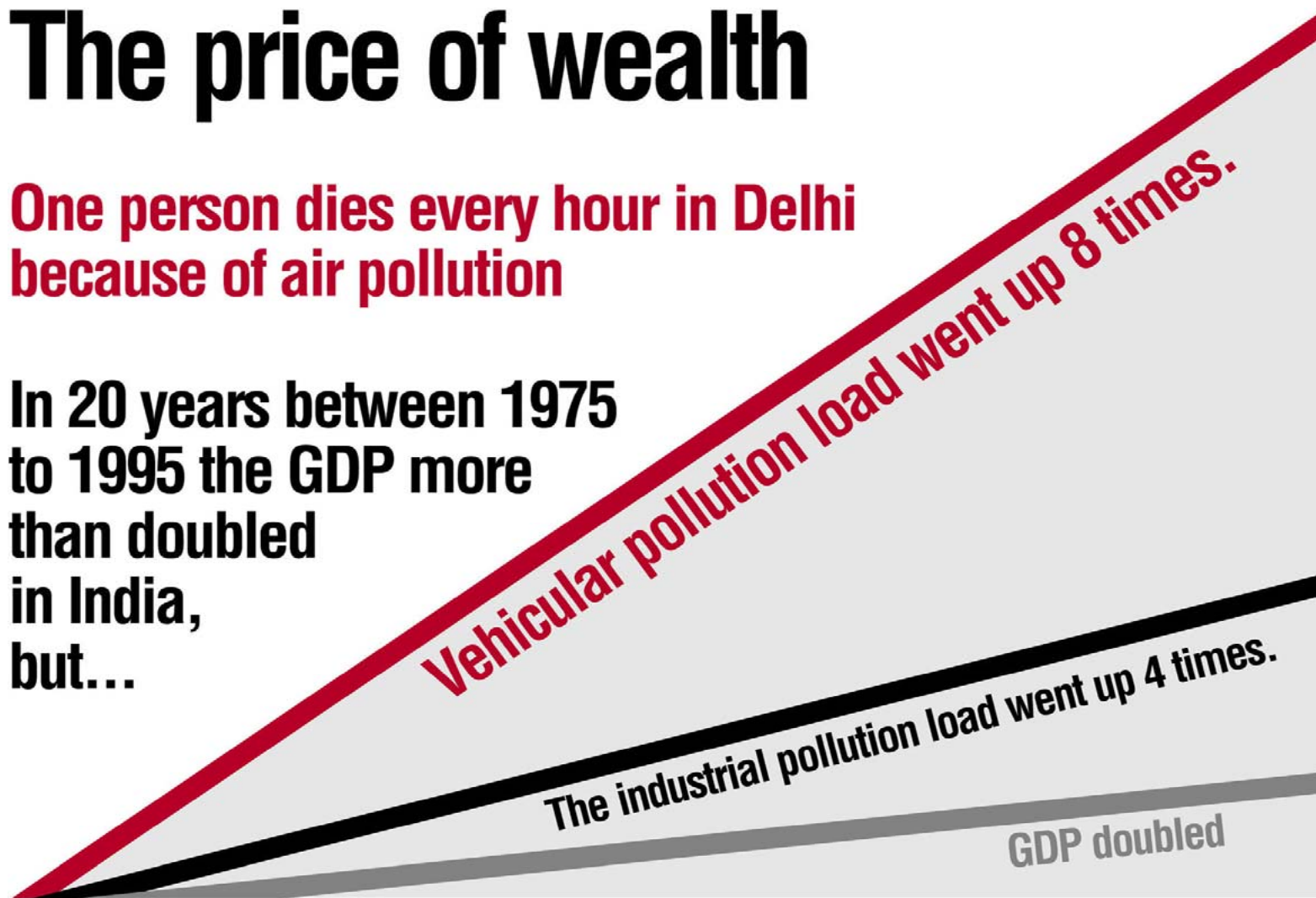




# The price of wealth

**One person dies every hour in Delhi  
because of air pollution**

**In 20 years between 1975  
to 1995 the GDP more  
than doubled  
in India,  
but...**





# First generation reforms.....

## Soft options are now all exhausted



### Delhi has fought hard to get breathing space

#### On vehicles

- Introduced low sulphur fuels and petrol with 1 per cent benzene
- Mandated pre-mix petrol to two- and three-wheelers
- Moved from Euro I to Euro IV over the last decade
- Implemented largest ever CNG based public transport programme
- Capped the number of three-wheelers
- Phased out 15 year old commercial vehicles
- Strengthened vehicle inspection programme (PUC)
- Efforts made to divert transit traffic
- Set up independent fuel testing laboratories to check fuel adulteration

#### On industry

- Relocated polluting units
- Tighter controls on power plants. No new power plants.

#### Air quality monitoring

- Adopted new ambient air quality standards
- Expanded air quality monitoring and reporting

#### Other sources

- Emissions standards for generator sets
- Ban on open burning of biomass

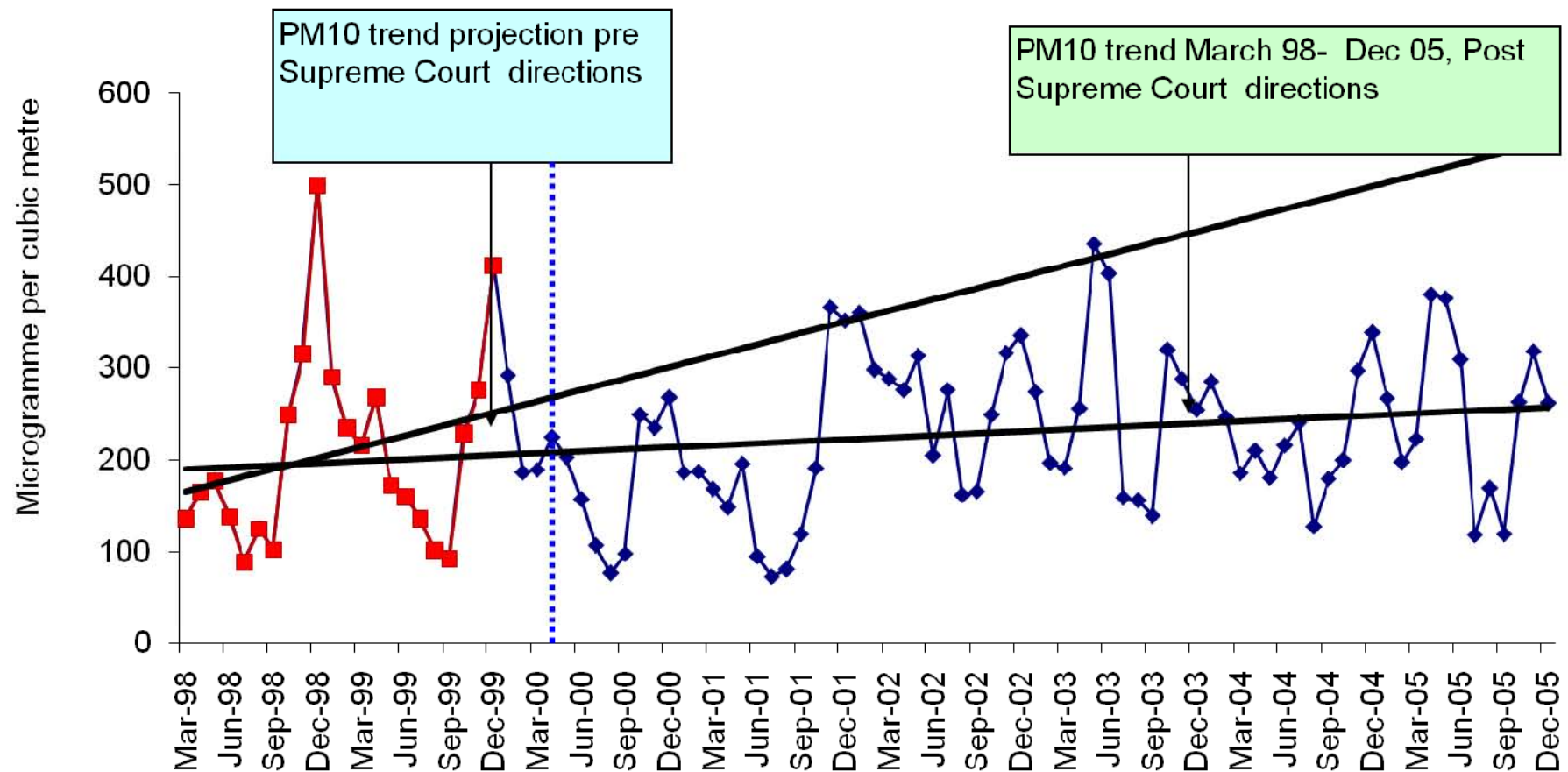
**This now needs scale and stringent enforcement**



# Delhi got cleaner air: it avoided pollution



PM10 at ITO Traffic Intersection



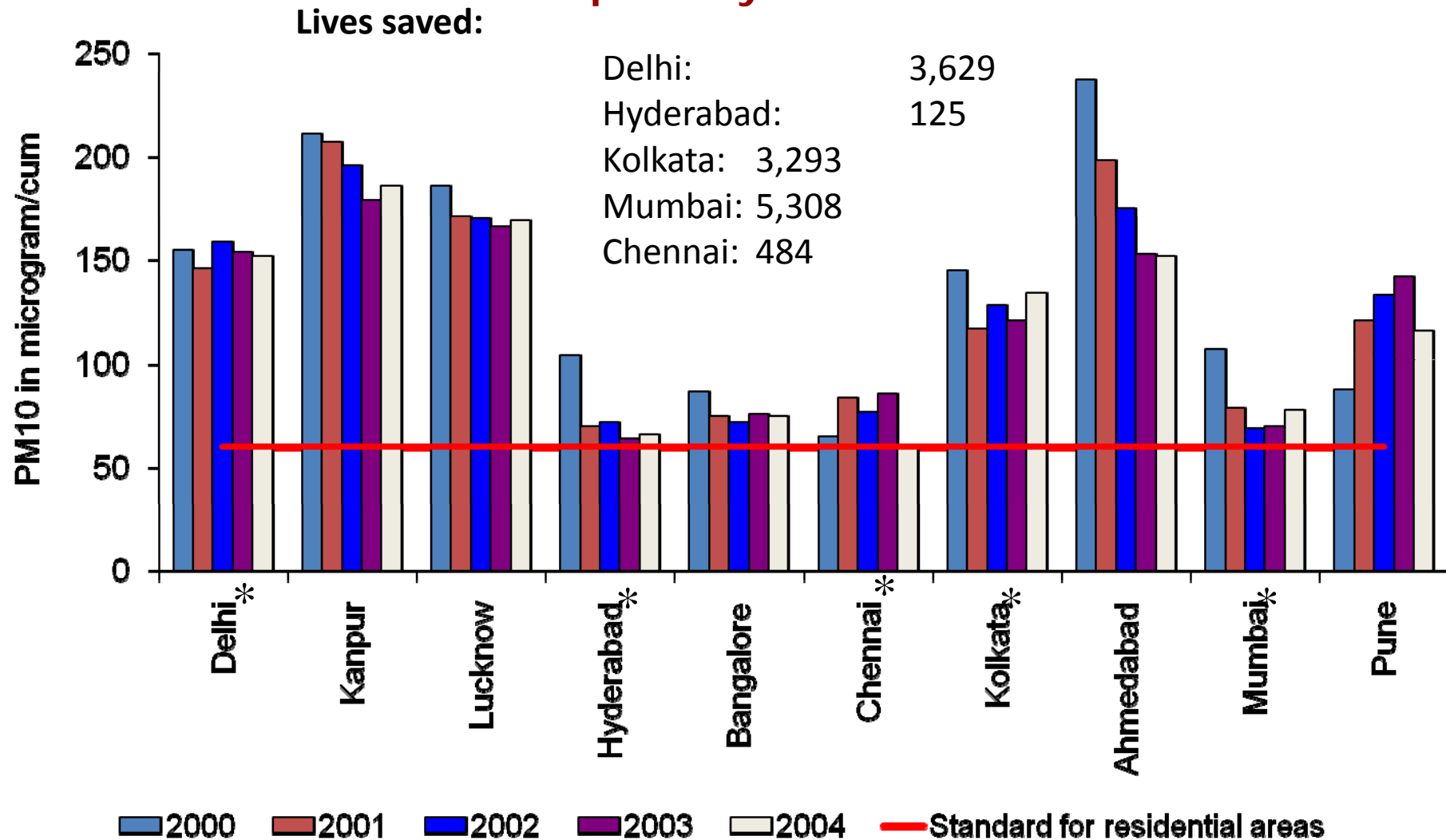
CPCB reported 24% drop in PM10 levels in 2002 compared to 1996 levels.



## Evidence of action: Health Benefits



**Downward PM10 trend in some cities\* have led to  
13,000 less premature deaths and reduction in  
respiratory illness<sup>1</sup>**



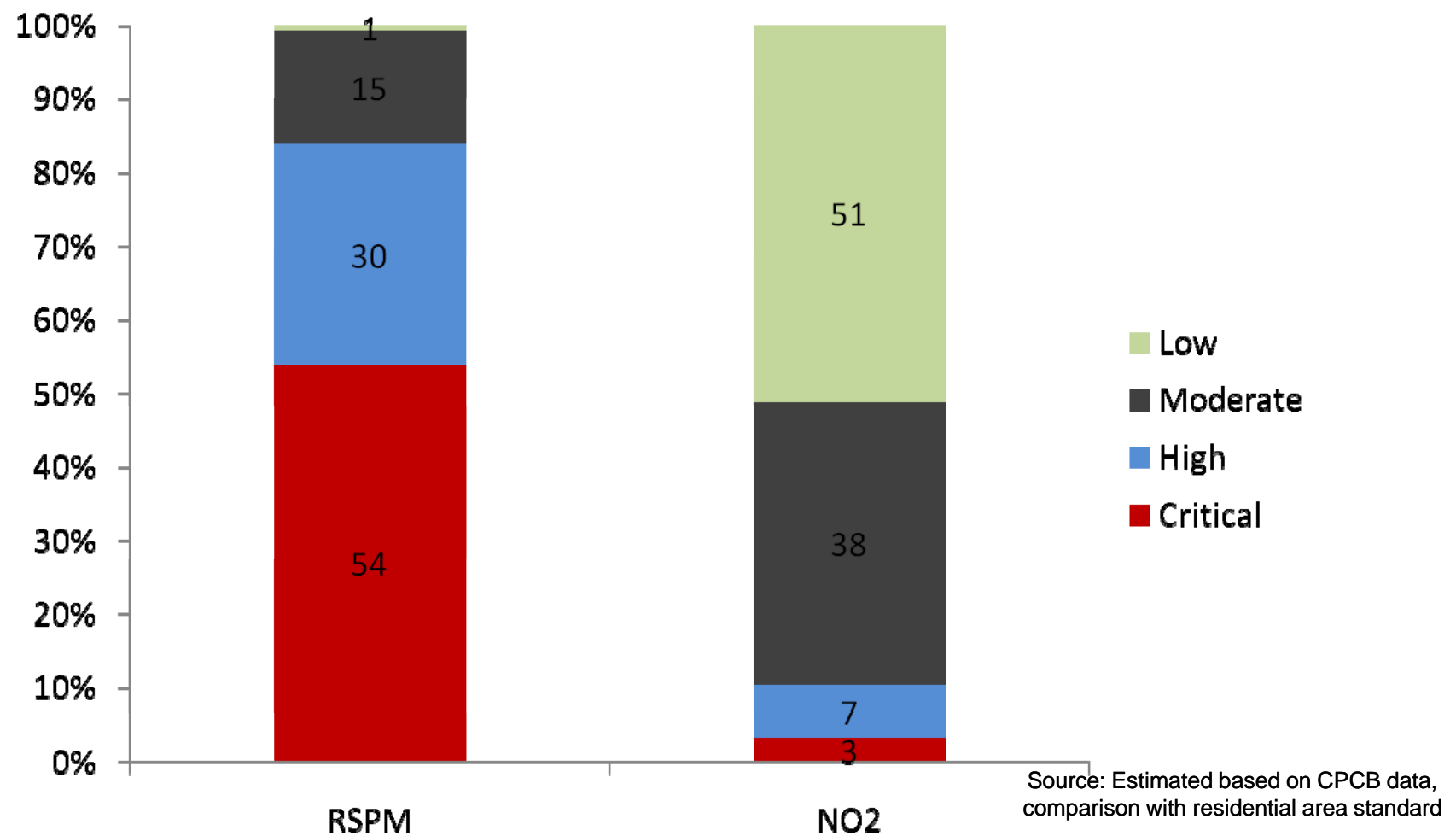
Source: CSE: based on NAMP data, CPCB, and World Bank 2004



## India: Proliferating pollution hotspots



Half of the cities are critically polluted due to high PM10, even NO2 is rising in many of them – a twin trouble



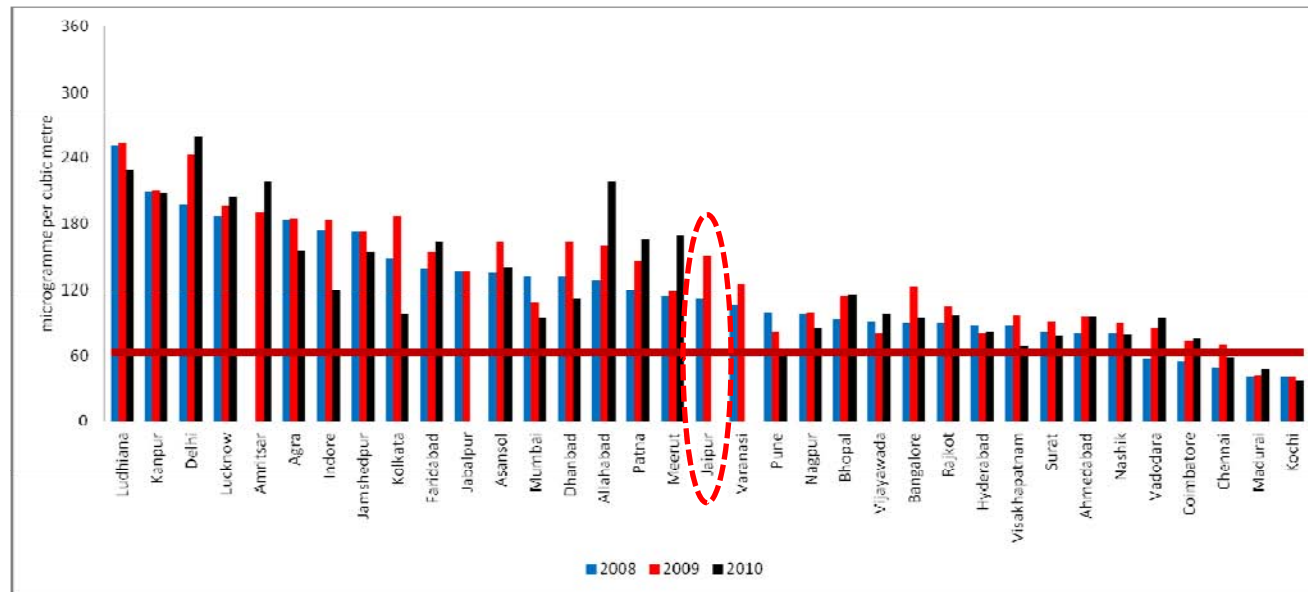




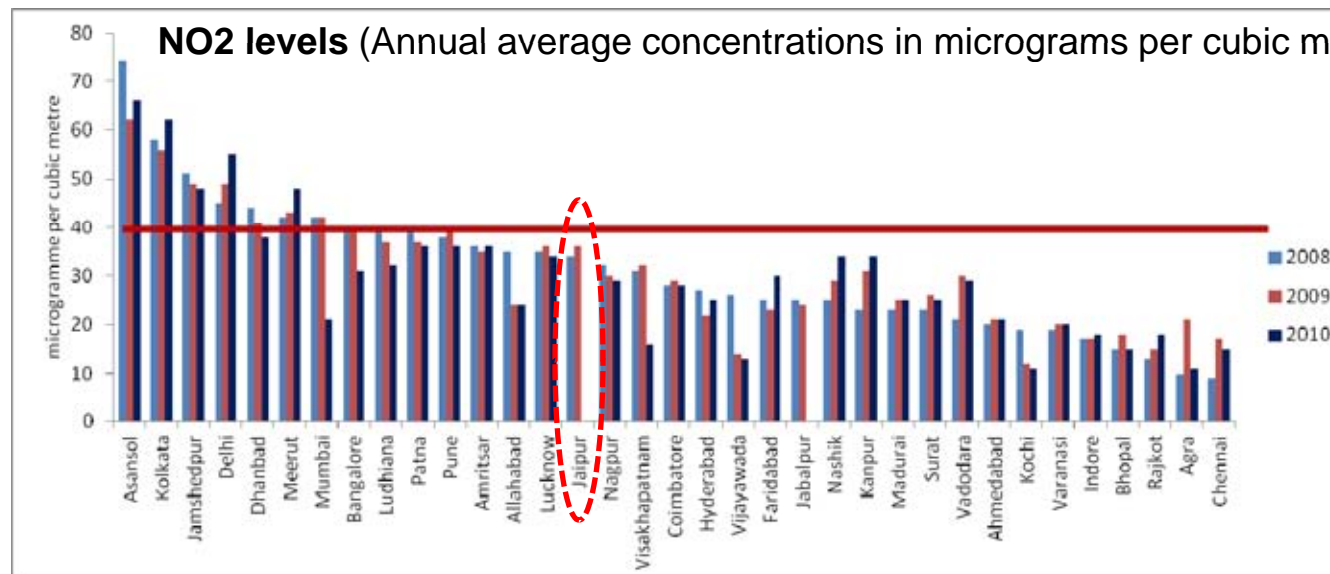
## Jaipur amongst pollution hotspots



**PM10 levels** (Annual average concentrations in micrograms per cubic meter)



**NO2 levels** (Annual average concentrations in micrograms per cubic meter)



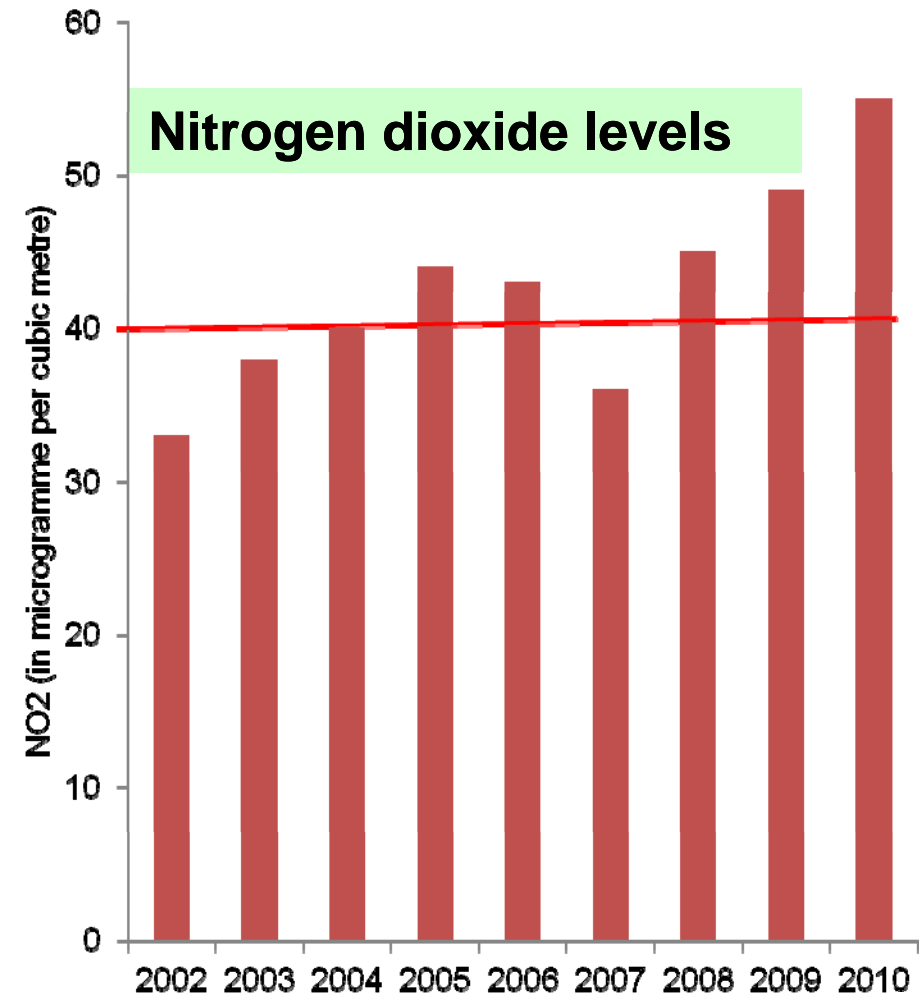
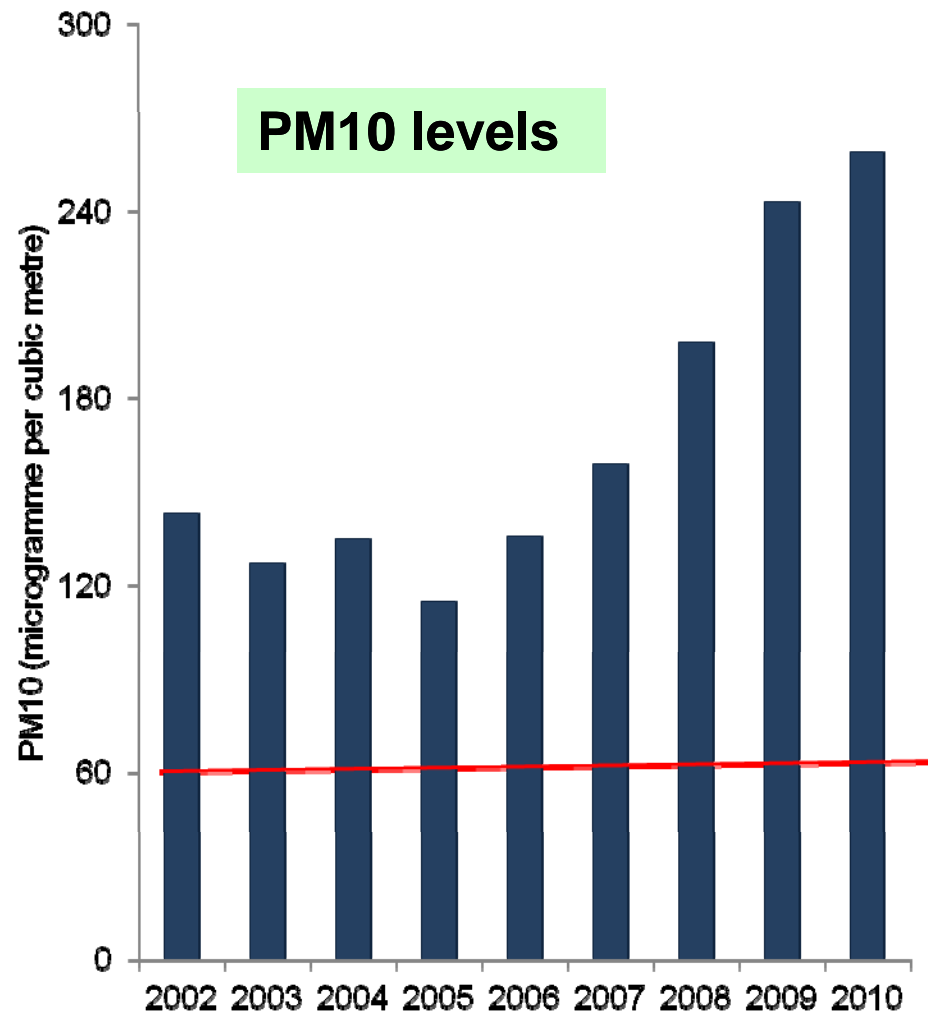


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Learn from Delhi.....



## Delhi has lost its gains. After a short respite pollution curve turns upward



Source: Based on CPCB data



## **Jaipur has also begun action....**

First generation Programme..



### **Action on vehicles:-**

- Introduced Bharat Stage III norms for vehicles in 2010
- Strengthened pollution under control system.
- LPG programme for autos and tempos introduced
- Green tax introduced on vehicles
- Transport vehicles at the time of renewal of fitness certificate after 5 years pay an extra tax
- New buses introduced and routes rationalized;
- BRTS introduced on some routes
- City has taken a decision to organise “No vehicle days” in walled city area
- Vehicle purchase linked with availability of parking space (The Rajasthan High Court directive)
- Rajasthan Infrastructure Development Fund constituted under JNNURM
- Entry time of transit commercial vehicles restricted within the city limits
- Battery driven motor vehicles are exempted from VAT

### **Action on industry**

- The Jaipur Development Plan 2025 has taken a decision that no air polluting industry would be permitted within a radial distance of 10 kms from any heritage/structure of National/State or local significance.

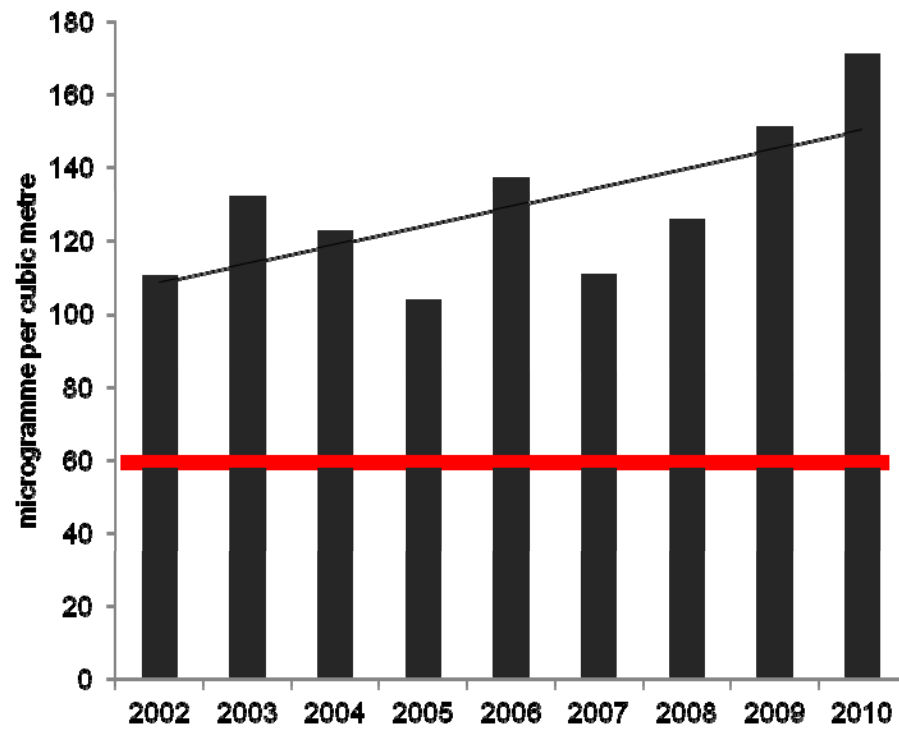
**But not enough...**



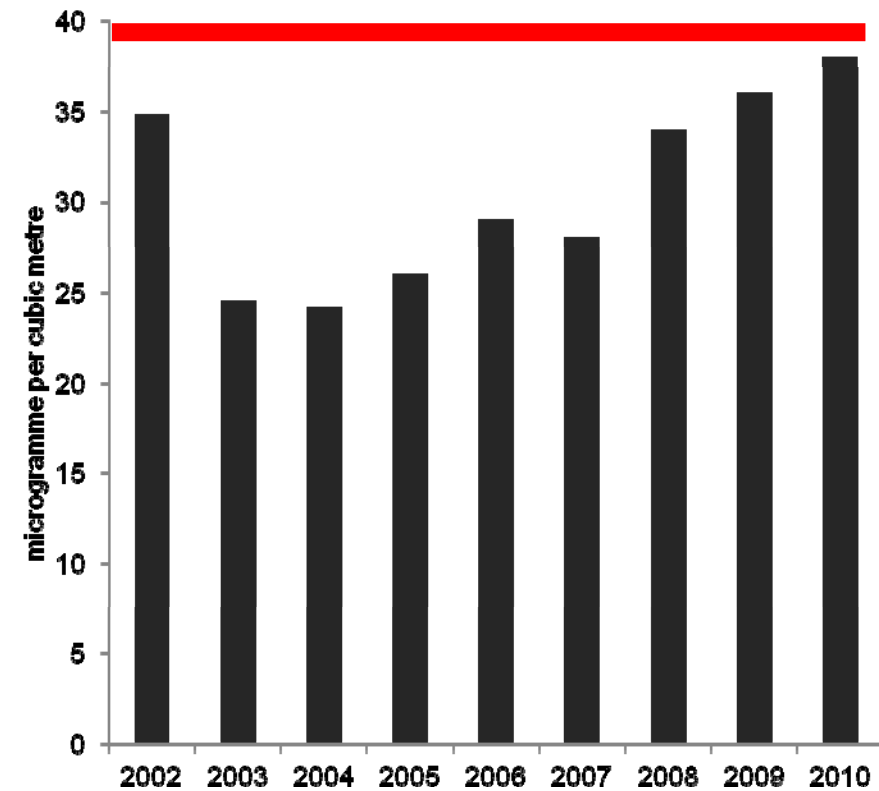
## Jaipur: Air pollution rising again



### PM10



### NO2



Source: Based on data provided by CPCB

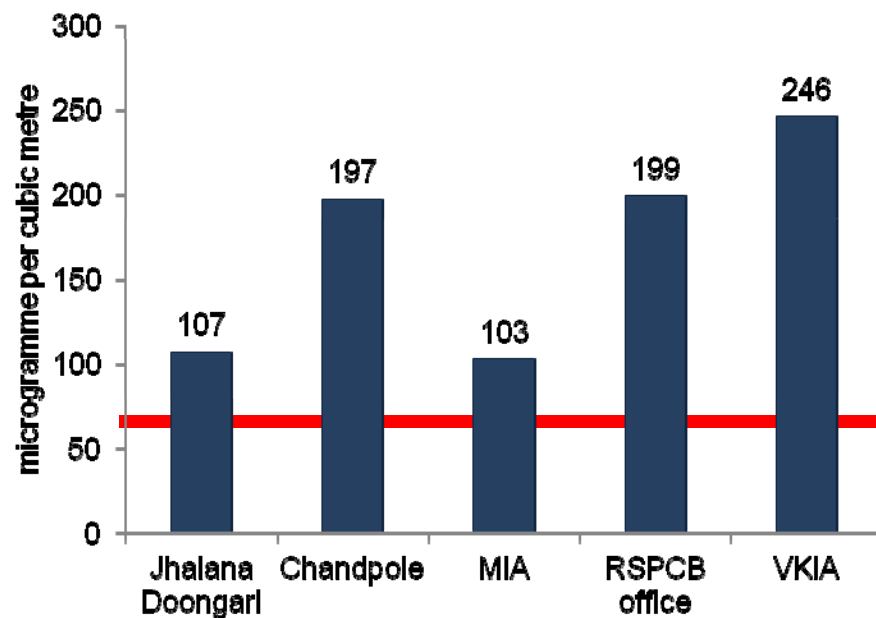




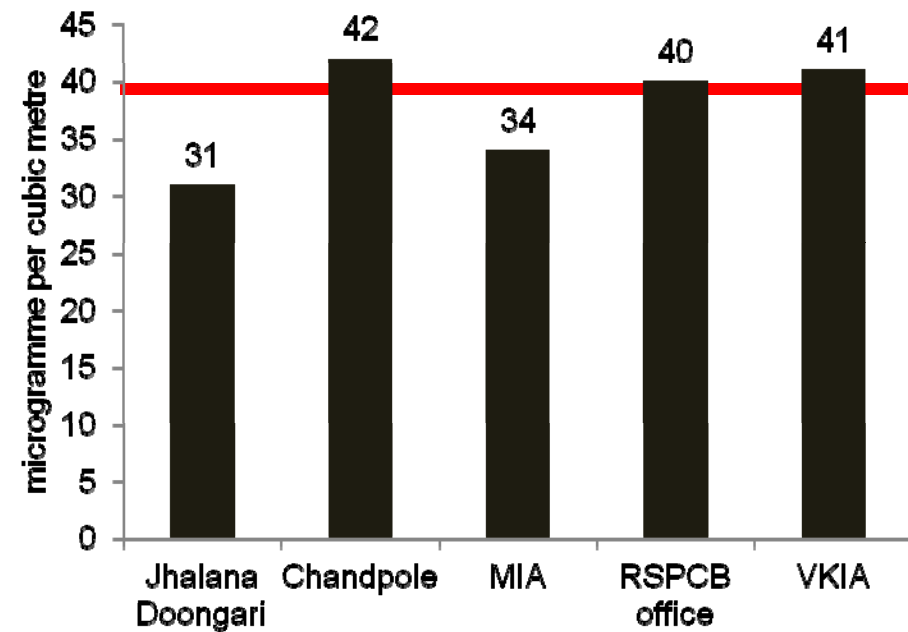
# Pollution across the city



Many locations have critical levels of PM10



Most locations have moderate to high NO2 levels





Publication: The Times Of I

## Pollution curbs for Jaipur, 3 other cities

Anindo Dey | TNN

Jaipur: The Union ministry of environment and forest has decided to put a brake on all development projects that need a clearance from it in the cities of Bhiwadi, Jodhpur and Pali in Rajasthan. Jaipur, too, will face some curbs.

Publication: The Times Of India Jaipur; Date: Jul 4, 2012; Section: Times  
**Rising pollution  
takes a toll on  
kids' health**

Syed Intishab Ali | TNN

Being born in a big city is always con-  
a privilege. ing, exposing  
all of which g  
and ready to  
However  
levels of p  
binging  
pleasant

## Pollution level alarmingly high in Walled City area

Rachna Singh | TNN

Jaipur: It's probably time to regulate vehicular traffic in the Walled City. According to the Rajasthan Pollution Control Board (RPCB), while pollution levels in rest of the city are well under control, they are alarming in the Walled City.

If according to the standard norms, the suspended particulate matter (SPM) should be maximum 200 microgram, but in the Walled City they almost vary between 350 and 400, according to a survey conducted recently at the Aimeri Gate

Publication: The Times Of India Jaipur; Date: Jul 4, 2012; Section: Times

## 'Pollution level 4 times high in Walled City'

TIMES NEWS NETWORK

Jaipur: The state government on Monday filed a detailed report on the shops and sculpture manufacturers working in Khajanewala Ka Rasta in the old Walled City and stated that no manufacturing work will be allowed as it has resulted in air and noise pollution.

The government also



The report said 971 such small and big sculpture manufacturers are cutting and slitting marbles and other stones pushing the noise and air pollution level four times higher than the prescribed parameters

## CNG dream: Jaipurites still to step on gas

TIMES NEWS NETWORK

Jaipur: As newer sets of wheels hit the roads at an increasing rate, and the Pink City expands rapidly, the debate on should the vehicles be fuelled with compressed natural gas (CNG) like the national capital is gaining momentum.

While mentioning the reasons like eco-friendliness, fuel efficiency and the gas burning smaller holes in their shrinking pocket, its logistics that plague the suppliers and government

Though the previous govt was keen on introducing CNG in the state, it meant an investment of Rs 400-500 crore, which neither the government nor the private players were willing to do citing reasons of non-feasibility

dream, the previous gov-

### CITIZENS PITCH

CNG is obviously a better fuel than petrol or diesel; it has low emission with less carbon content. All one needs is to install a kit and reap its benefits

Shyam Agarwal | CHERRY



The rate at which we are using liquid fossil fuels, the reserves would dry up in the coming years. I would be happy even if our government makes it mandatory for public transport to use CNG

Ankit Ghorawat | STUDENT



renewal plans have been made for the Walled City. These heritage initiatives for its renewal have been taken up by the government, NGOs and private sector but they are in piecemeal and uncoordinated. The ground conditions have only worsened in the Walled City with encroachments, congestion, poor solid waste management etc."

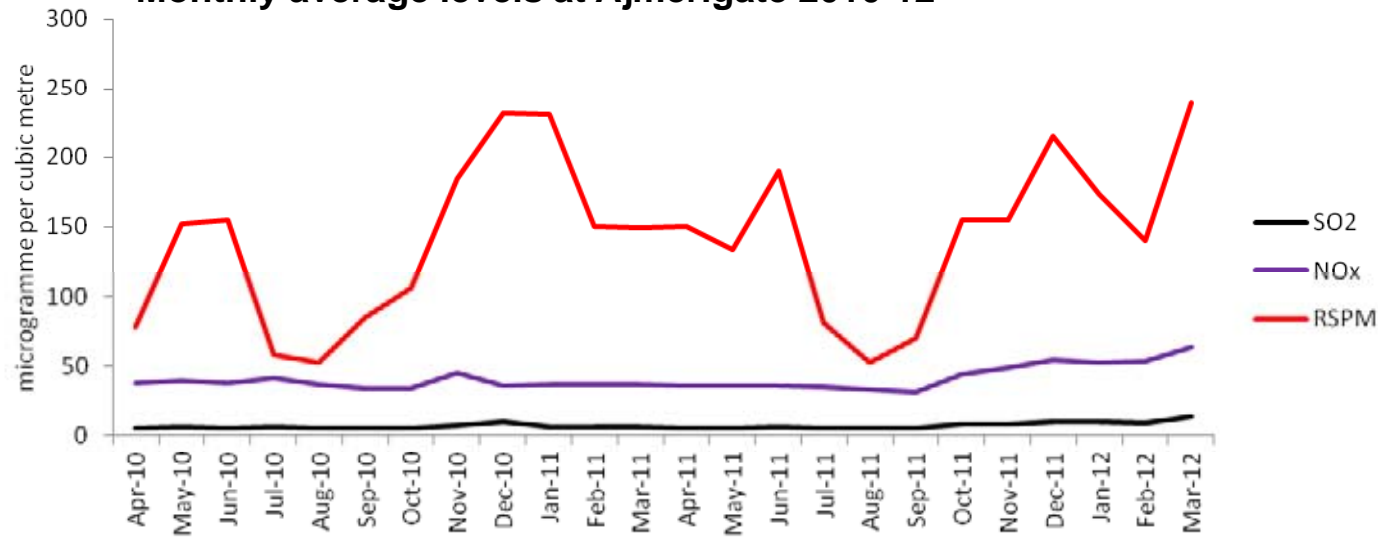
The economy of Jaipur today relies heavily on heritage tourism and cultural industries with at least 30 percent of Jaipur population living and working in heritage struc-



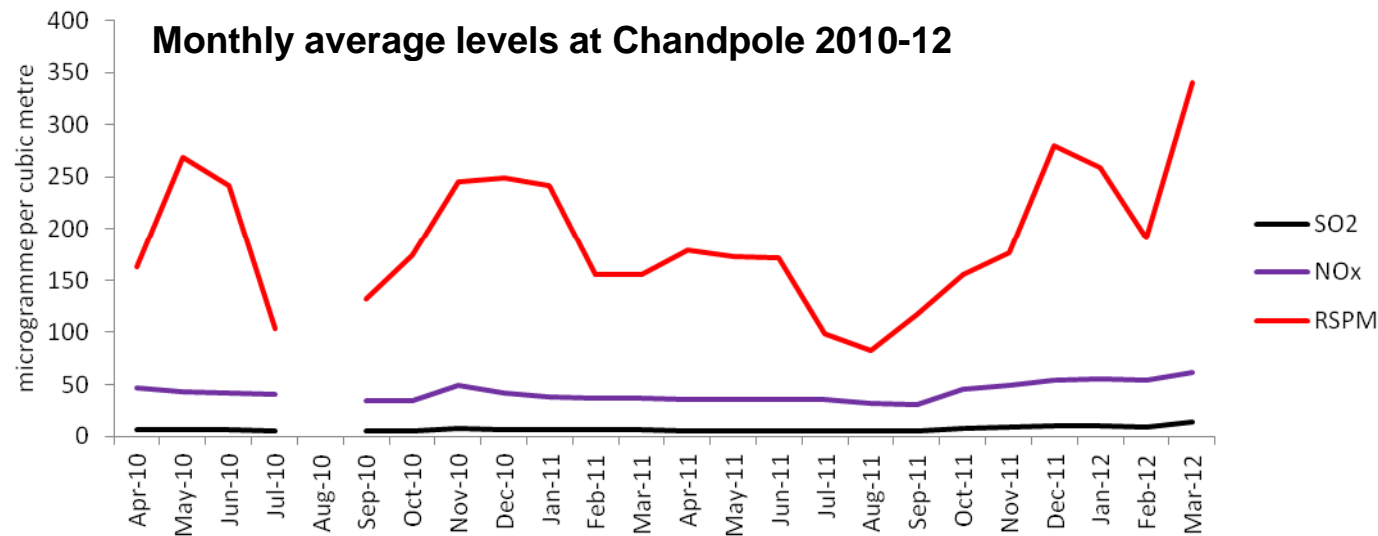
# Winter woes ...Deadly winter pollution



Monthly average levels at Ajmerigate 2010-12



Monthly average levels at Chandpole 2010-12







## Daily dose of poison in Delhi...

Most locations in Delhi have Unhealthy levels of PM10, PM2.5 and NO2.

CO level is also unhealthy for sensitive groups

Ozone levels are moderately high in 5 locations

AQI Range	
0 to 50	Healthy
50 to 100	Moderate
100 to 150	Unhealthy (Sensitive Groups)
150 to 200	Unhealthy
200 to 300	Very Unhealthy
> 300	Hazardous

		November 18, 2010					
Location		CO	O <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>
1	National Stadium	96	36	161	176	57	173
2	Nehru Stadium	91	40	163	179	59	173
3	Velodrome Stadium	92	29	168	181	63	174
4	Indira Gandhi Stadium	95	22	170	185	69	177
5	Games Village	82	39	161	174	53	171
6	Karni Shooting Range	67	54	152	163	58	166
7	Jamia Millia Islamia Univ	90	44	164	183	61	175
8	Talkatora Stadium	90	36	158	169	53	170
9	Yamuna Sports Complex	88	38	157	167	57	167
10	Thyagaraj Sports Complex	87	42	163	177	58	171
11	Siri Fort Sports Complex	88	48	164	180	56	171
12	Airport	71	50	142	155	49	161
13	AIIMS Hospital	100	40	172	186	61	175
14	India Gate	102	32	165	179	56	176
15	Connaught Place	106	31	166	179	61	177
16	Nizamuddin	104	23	198	215	62	192
17	ITO	97	28	162	177	64	175
18	Delhi College of Engg	77	27	135	152	51	166
19	Janakpuri	101	30	182	195	53	181
20	CPCB	92	41	159	171	54	168
21	NSIT Dwarka	73	50	152	160	46	163
22	DMS Shadipur	106	17	169	184	63	179
23	IHBAS Shadara	89	34	156	165	57	167
24	Punjabi Bagh	100	31	167	181	52	174
25	Anand Vihar	103	22	173	188	58	179
26	Dwarka Kuan Junction	101	25	177	187	52	178
27	Karol Bagh	97	31	159	170	55	171
28	GK2	100	44	182	199	58	181
29	Chanakyaपुरi	86	42	155	165	50	167
30	RK Puram	98	36	167	178	50	172
31	Pragati Maidan	96	36	161	176	57	173
32	Vasant Kunj	73	53	153	162	58	163
33	Mayur Vihar	88	51	162	174	53	169
34	Okhla IDE	90	24	165	184	72	182
35	Gurgaon	79	58	154	162	48	165
36	Faridabad	68	43	154	169	58	174
37	Badarpur	68	61	156	171	59	166



## Tightening of the national ambient air quality standards has changed the air quality status of locations in Jaipur



Monitoring Locations	NOx		PM10	
	Previous air quality status	New air quality status	Previous air quality status	New air quality status
Jhalana Doongari	Moderate	Moderate	Critical	Critical
Chandpole	Moderate	High	Critical	Critical
MIA	Moderate	Moderate	Critical	Critical
RSPCB office	Moderate	Moderate	Critical	Critical
VKIA	Moderate	High	Critical	Critical

Source: CSE analysis based on CPCB data





## Need legally enforceable air quality targets



- **No punitive action on state governments for not meeting the ambient air quality norms.**
- **Abatement plans are not designed to meet local air quality targets**
- **Emissions regulations are kept weaker for most of India.**
  - **In the US** the air quality standards are federally enforceable. EPA impose sanctions if states fail to meet the air quality targets -- such as cut highway funds.
  - Civil society can sue the state governments.
  - “Citizen Court Suits” allowed against EPA for failure to promulgate NAAQS, emissions standards or implement state implementation plans.
- **In India** the eleventh five year plan mandates the central government to set monitorable target of air quality -- achieve the standards of air quality in all major cities by 2011–12

Ensure enforcement of air quality standards, accountability and compliance.



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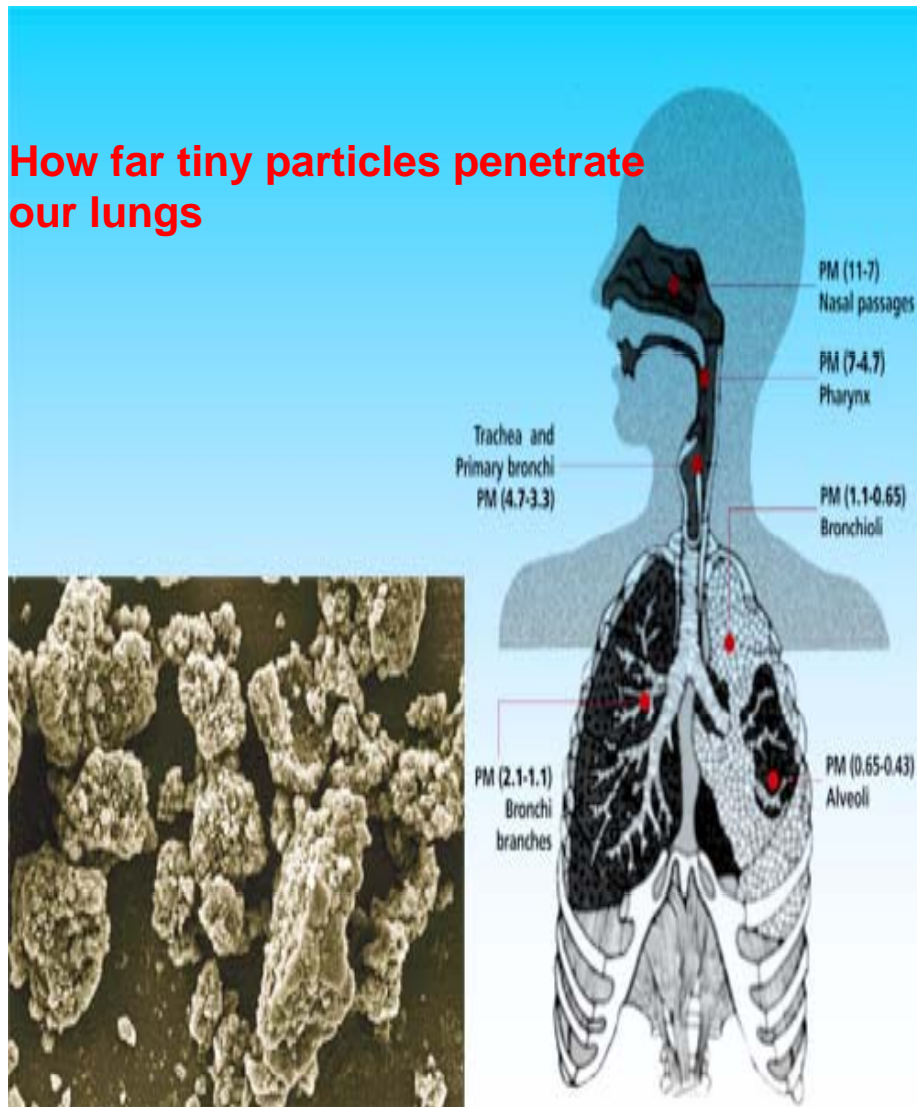
**Our health must matter.....**



# The myth of safe air



**How far tiny particles penetrate our lungs**



**Ultrafine particles 0.65 microns**  
**Magnified 200,000 times**

**Our health is at serious risk.....**

**Particulate matter: Special worries:**

Acute and chronic effects; Cause premature deaths. Studies show association of PM with mortality at much lower level (less than 50 microgramme per cum (HEI)

**WHO says -- no safe level**

Global evidences abound: Clinching evidences from American Cancer Society study that tracked effects in 600,000 people over 18 years.

Observed large effects....-- A mere increase of 10 microgramme per cum of PM<sub>2.5</sub> can increase the risk of lung cancer by 8%, cardiopulmonary deaths by 6%, all deaths by 4%.

**Other cocktail of pollutants -- A Killer mix:**

Ozone, Nitrogen oxides, hydrocarbons, Carbon monoxide...Air toxics: -- Aldehydes, formaldehydes, acetdehydes, benzene, 1,3 butadiene, metals, PAH etc.....Dangerous at trace levels



# Mounting health evidences in Jaipur



## Health studies in Jaipur

- **Respiratory morbidity linked to auto-exhaust pollution in traffic policemen of Jaipur:** SMS Medical College and Hospital in Jaipur found that respiratory morbidity is more in groups working in heavy traffic than the control group. (*Virendra Singh et al 2009*)
- **Prevalence and Risk Factors for Bronchial asthma in Adults in Jaipur district of Rajasthan:** (*P R Gupta and D K Mangal 2006*)
- **Air pollution affects pulmonary functions adversely in Jaipur:** Long-term periodic exposure to air pollution can affect lung function even in healthy subjects (*Singh V, Khandelwal R, Gupta AB. 2003*)
- **High air pollution linked to respiratory problems:** Health status in Jaipur of 691 surveyed residents in five localities found that in the 563 out of 604 residents of high air pollution localities have respiratory and cough related ailments. (*Cited by RSPCB*)



## India's unique public health challenge



- The Asiawide review of existing studies show that the estimated health effects are similar to those found in the extensive studies in western countries.
- But the risk in India could be more serious. Science has yet to assess the unique risk factors in Asia
- Extremely high levels of particulates and pollution cocktail -- the problem of exposure to multiple pollutants
- 
- Impact of poverty: Socio economic variables are not included in health studies to influence public policy. Sporadic studies elsewhere show poor are more susceptible
- **Understand risk transition**





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Pollution comes from a variety of sources.....  
Why are we specially worried about vehicles?



# High exposure to vehicular fume



- Vehicular emissions contribute to significant human exposure. **Pollution concentration in our breathe is 3-4 times higher** than the ambient air concentration.
- In densely-populated cities more than **50 – 60% of the population lives or works near roadside** where levels are much higher. This is **very serious in low income neighborhoods** located close to roads.
- **Poor have a higher prevalence of some underlying diseases** related to air pollution and proximity to roadways increases the potential health effects.
- In three cities World Bank review found **vehicles contributing an average 50% of the direct PM emissions and 70% of PM exposure.**
- **The WHO report of 2005:** Epidemiological evidences for the adverse health effects of exposure to transport related air pollution is increasing.
- **Public transport users, walkers and cyclists are the most exposed groups** – most of them are also poor.



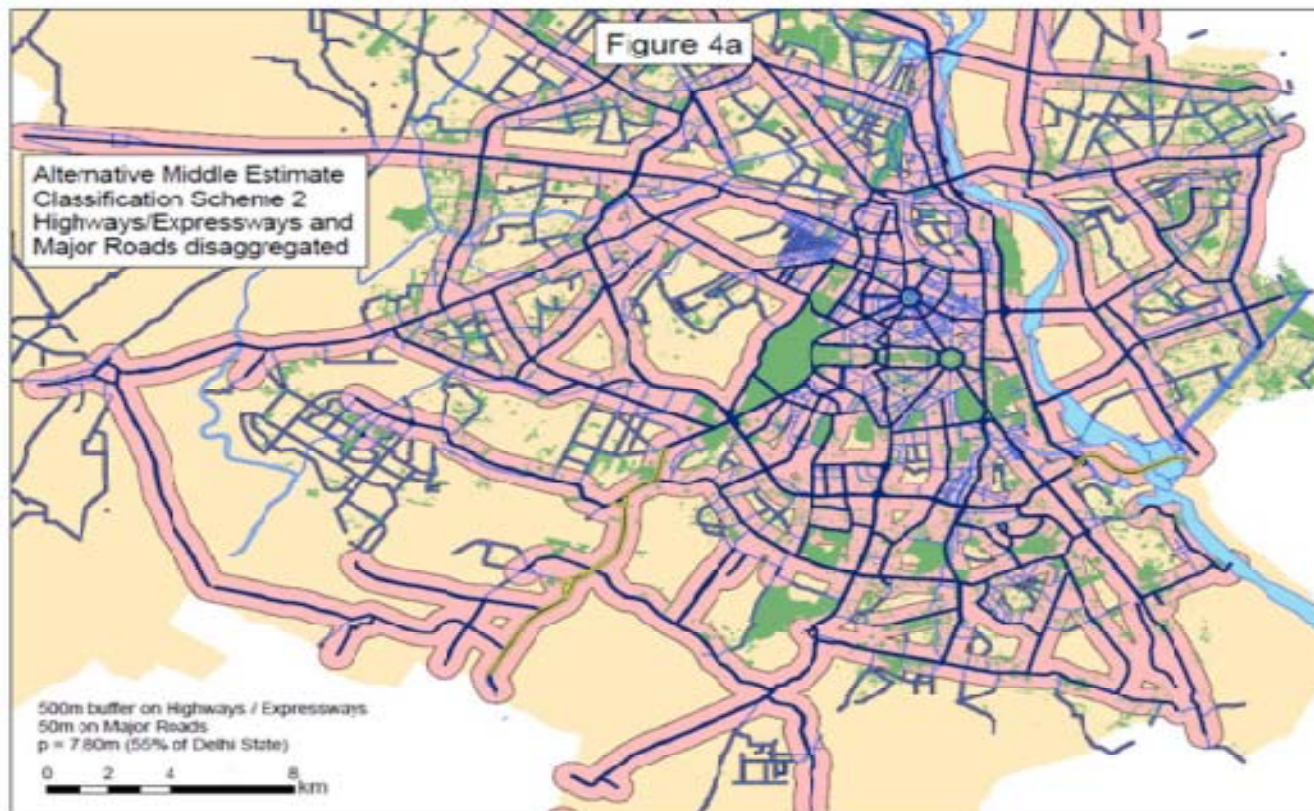


## People living close to roads are most exposed to vehicular fume

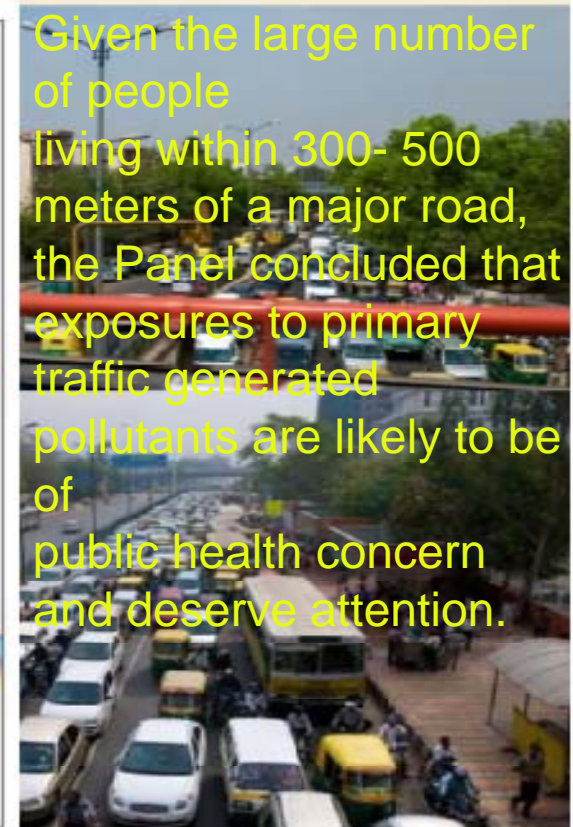
Evidence from Delhi....



### *The Traffic Impact Area in Delhi: New HEI Analysis: 55% of the Population within 500 meters of a Freeway; 50 meters of a Major Road*



Given the large number of people living within 300- 500 meters of a major road, the Panel concluded that exposures to primary traffic generated pollutants are likely to be of public health concern and deserve attention.

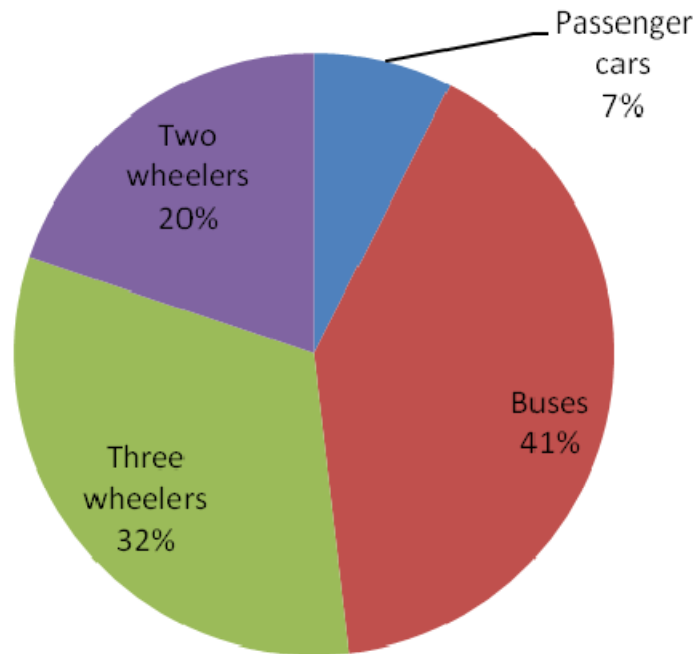




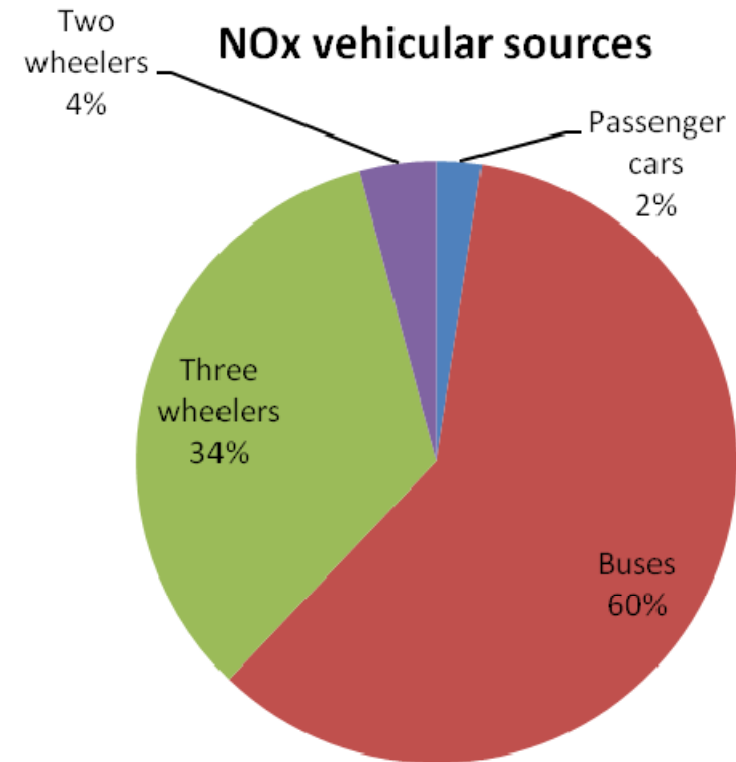
# Vehicles contribute hugely to pollution



**PM2.5 vehicular sources**



**NOx vehicular sources**

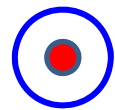


Source: Prepared based on data provided in "Sarath Guttikunda 2009, Motorized Passenger Travel in Urban India, Emissions & Co-Benefits Analysis, SIM-air Working Paper Series: 24-2009"





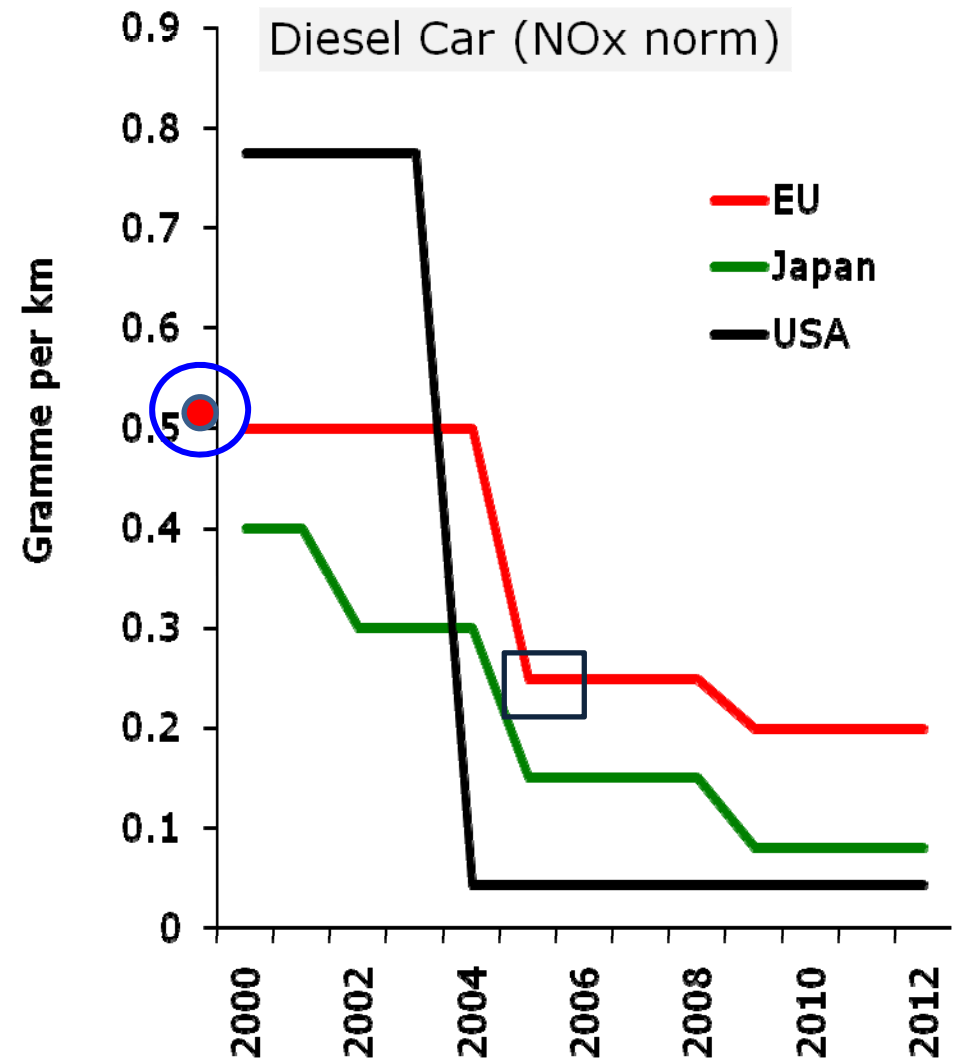
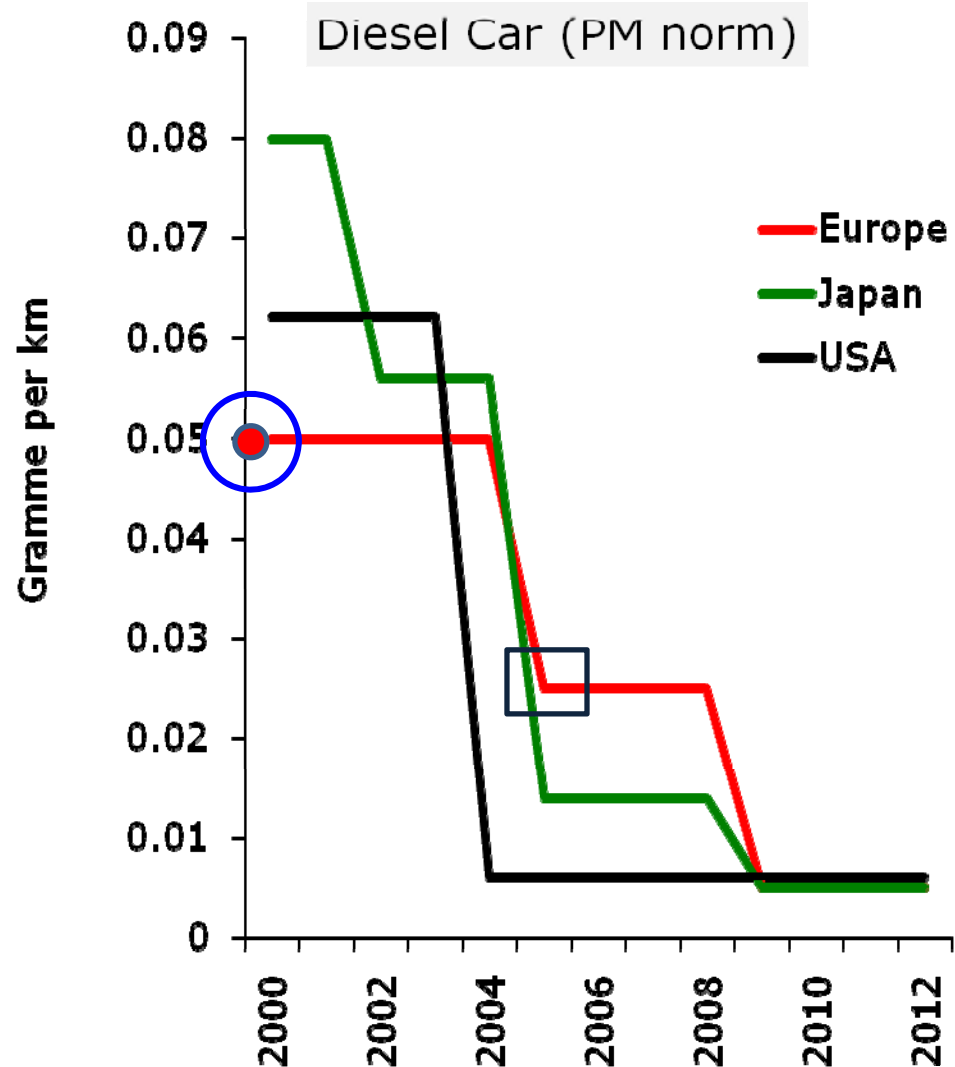
## Technology-lag: Public policy fails to drive emission regulations to reduce toxic exposure



Rest of country at Euro III  
including Jaipur



Metro cities





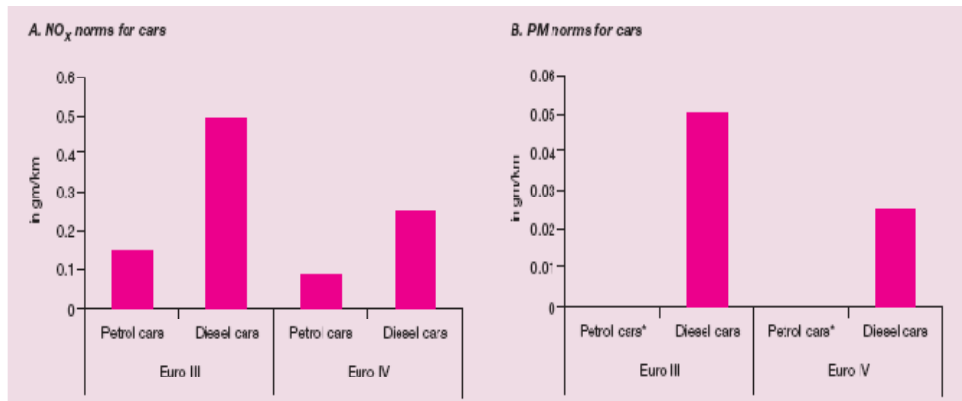


# License to Pollute

Diesel cars are legally allowed to emit three times more NO<sub>x</sub> than petrol cars under the Euro norms

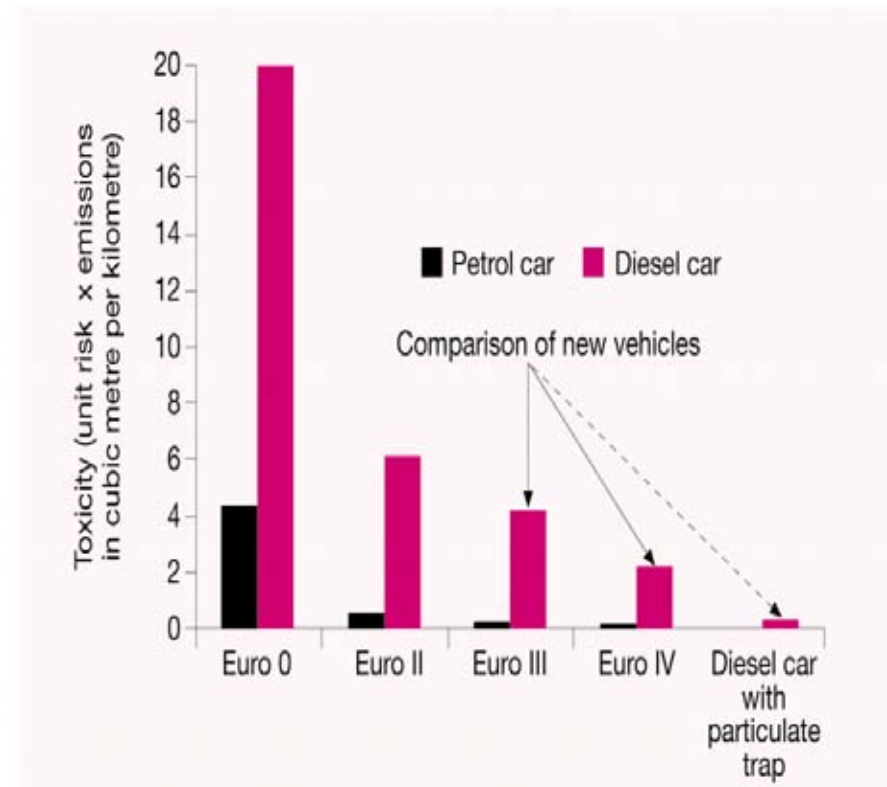
## NO<sub>x</sub> norms for cars

## PM norms for cars



**One diesel car emits as much NO<sub>x</sub> as 3 to 5 petrol cars. PM is several times higher**

## Toxicity of diesel emissions



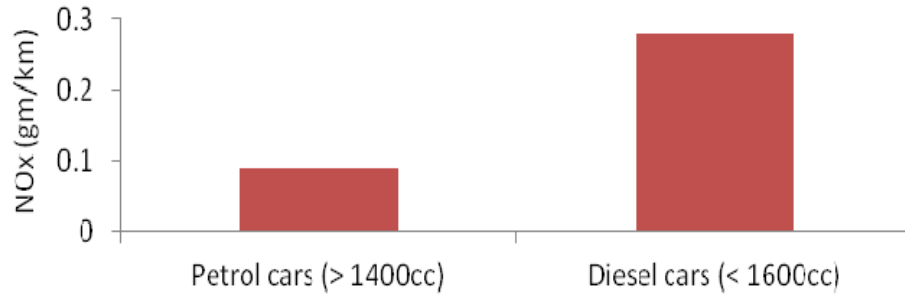
Source: MP Walsh



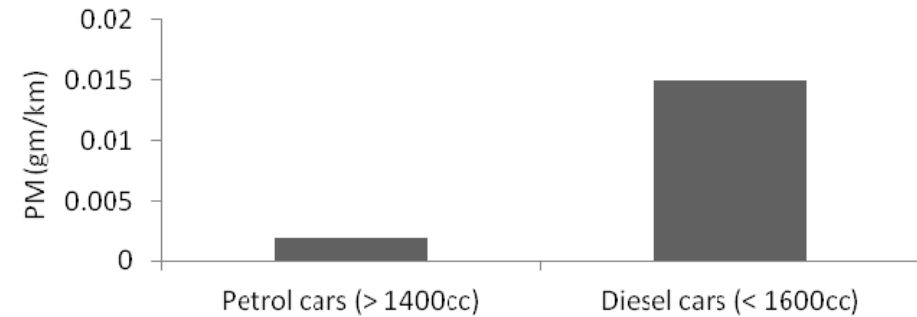
## Toxic risk of diesel emissions



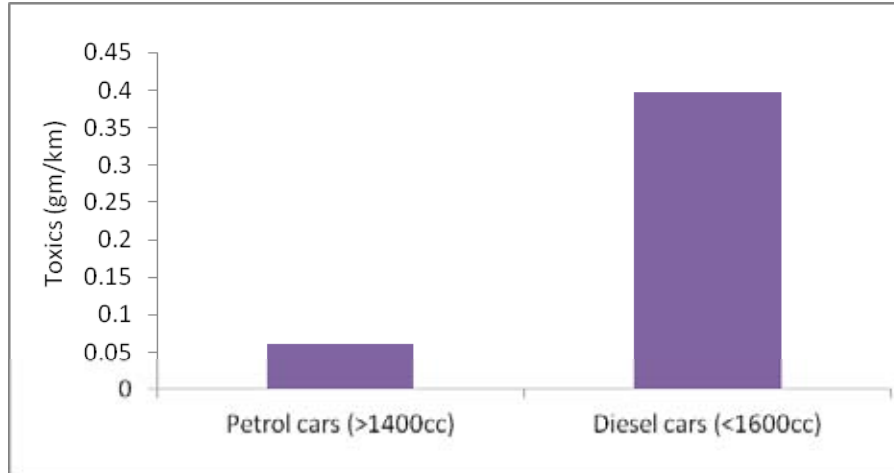
### NOx



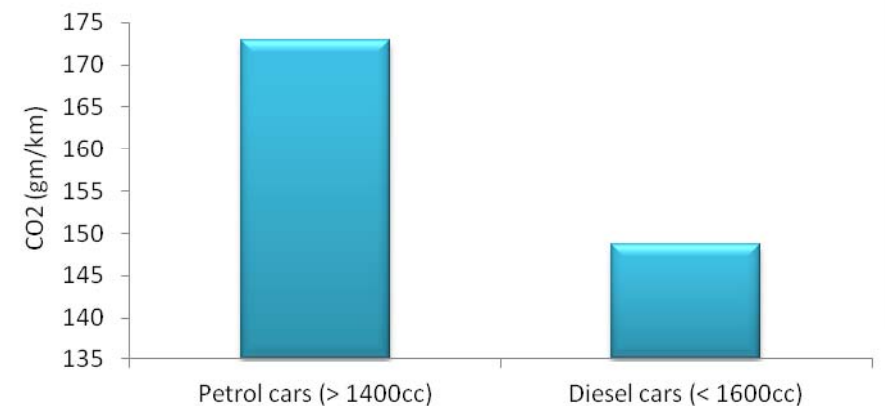
### PM



### Toxics



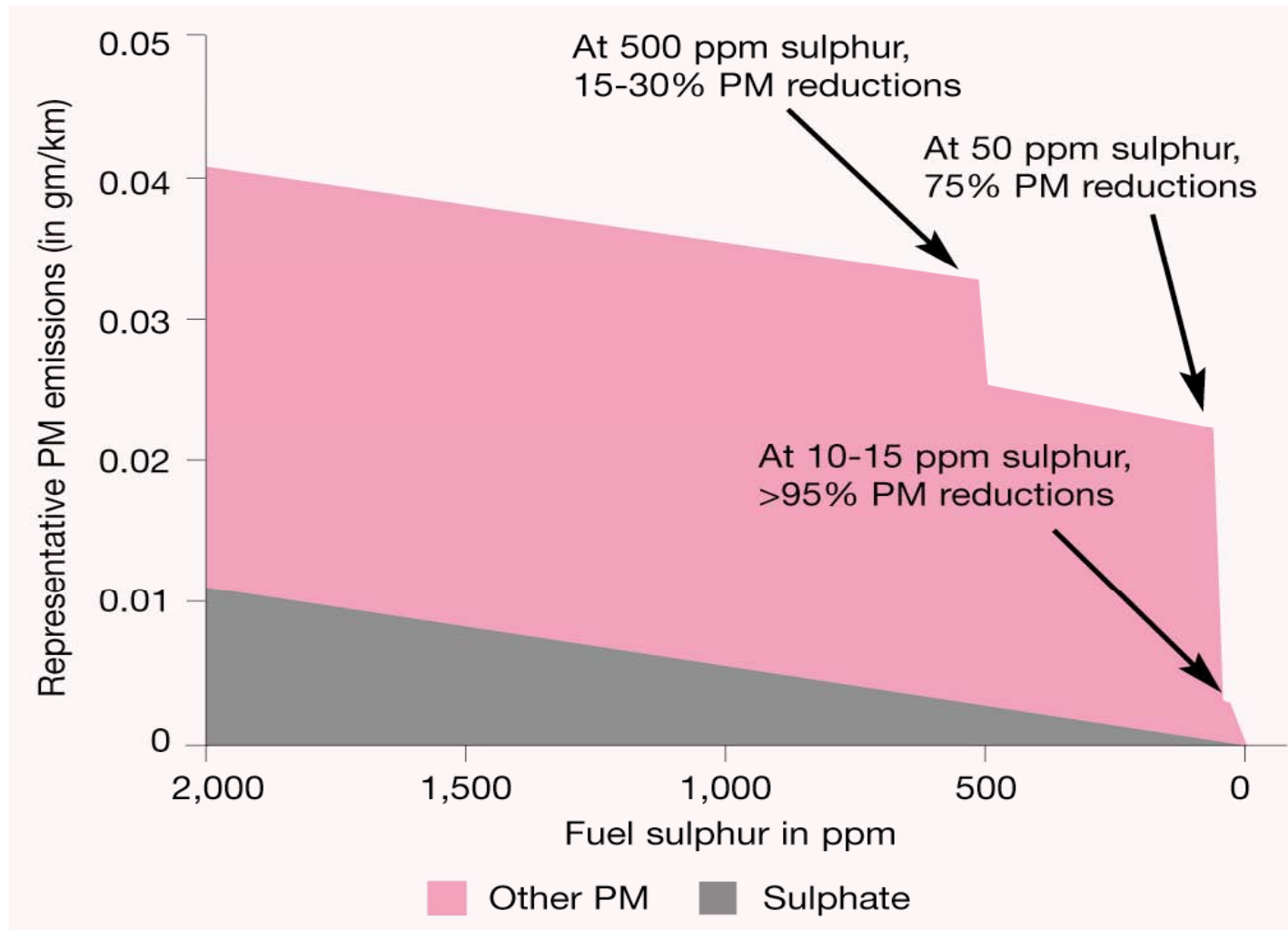
### CO2



Emissions vs efficiency remains unresolved in India.....



**Countries are moving towards Clean diesel technology to  
reduce harmful diesel emissions drastically.  
But India is dieselising without clean diesel**



Source: ICCT

**What experts  
say?**

Do not replace a new petrol car with a diesel, unless they meet:

- US Tier 2 or Euro 5 Standards
- And ULSD is Available



Vehicles make us more energy insecure....  
Climate insecure.....

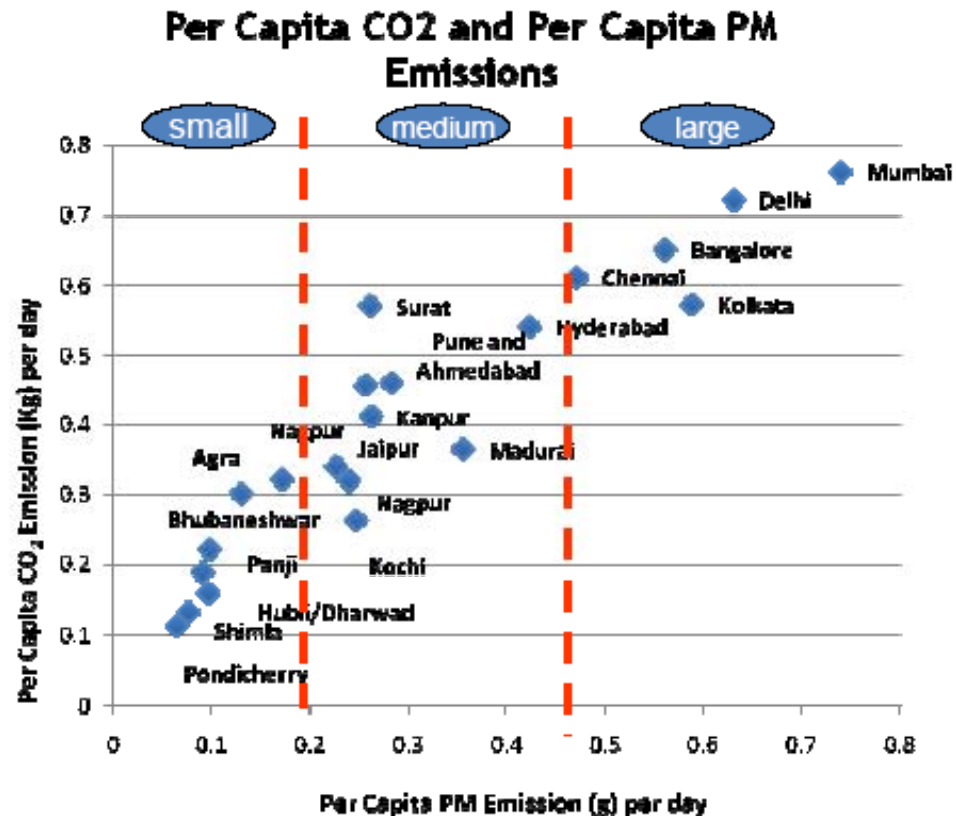




## New generation challenge



### Pollution, energy guzzling and warming...



- Indian cities show strong correlation between emissions of air pollutants and GHGs
- As cities grow in size, transport emissions increase
- Importance of catching cities early before they start to grow.

Source : Analysis of MOUD- Study on Traffic and Transportation Policies and Strategies in Urban Area By CAI-Asia



# Vehicles threaten energy security

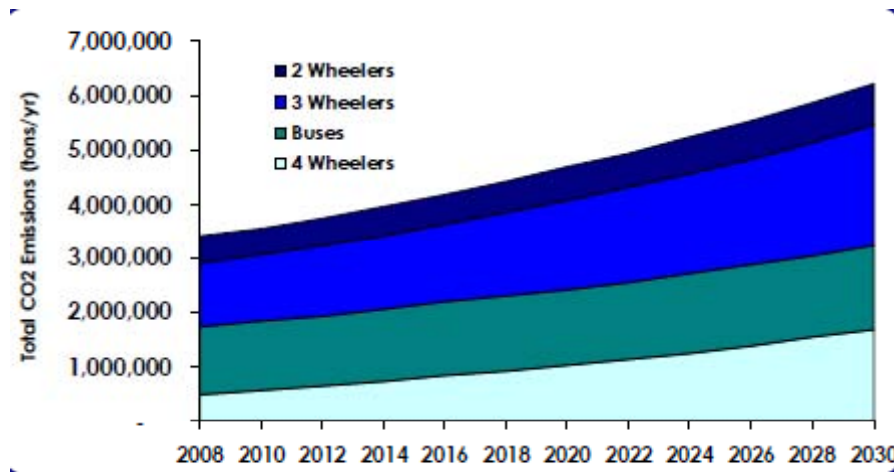


-- In Jaipur cars and two wheelers use up close to 30% of the total transport energy consumption.

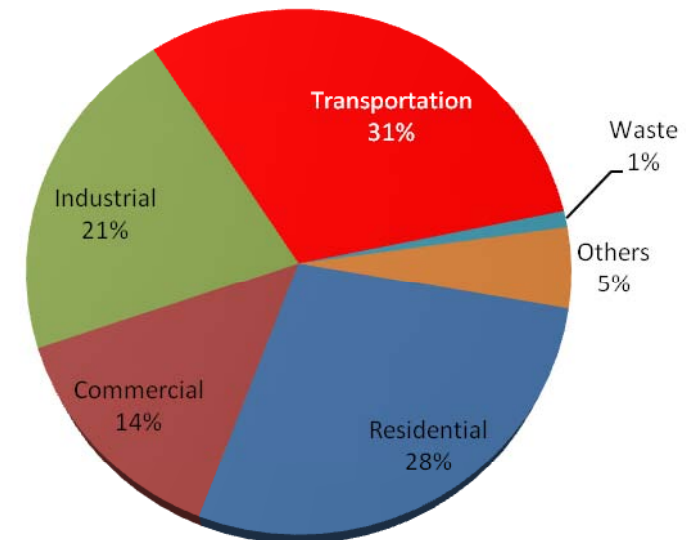
In India transport oil consumption will increase thrice by 2030 with largest increase expected from four wheelers.

## CO2 emissions from different sectors in Jaipur 2007-08: Transport's share close to 30%

### Total vehicular CO2 emissions by categories in Jaipur



Source: SIM Air



Source: ICLEI



**Public opinion counts .....**





# People of Jaipur want change... CSE Survey



CSE's rapid stakeholders' perception survey to understand people's perception of air pollution and mobility problems in the city. The preliminary results capture the mood....

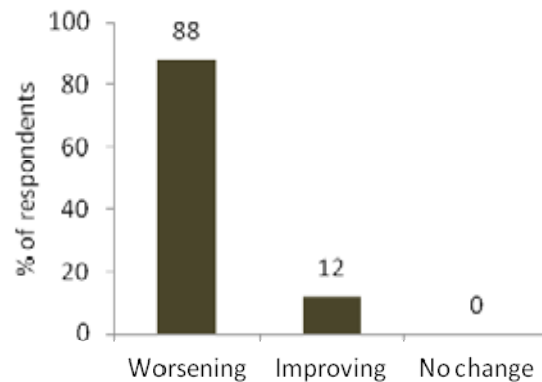
- The majority – a whopping **88 per cent** have said **air pollution is worsening**. **About 94 per cent have said incidences of respiratory diseases are rising**.
- **More than 70 per cent** have **identified road congestion a big problem** during morning and evening peak hours
- **Majority (52%)** have said that **cycles and cycle rickshaws are important** and should be given priority in terms of space
- **Nearly 38% have rated public transport as good**, **30%** have rated city **public transport services average**. There is nearly unanimous support for improved public transport. **Nearly 86% have supported dedicated lanes for buses**. Majority are not satisfied with services of mini-buses.
- **About 42%** rated the **auto/tempo services as average but they are important**.
- **Nearly 70% of the respondents have supported no vehicle zone in the old city area**. Want non-motorised vehicles.
- **Nearly 94%** think **parking of vehicles causing encroachment** of footpaths and congestion
- **Nearly 86%** respondents think that government should make efforts to reduce the dependence on personal vehicles.
- **The majority find the walking infrastructure well maintained**, clean and usable **only in some areas of the city** and as a result of this they do not enjoy walking. This needs immediate attention as pedestrian traffic is the strength of the city



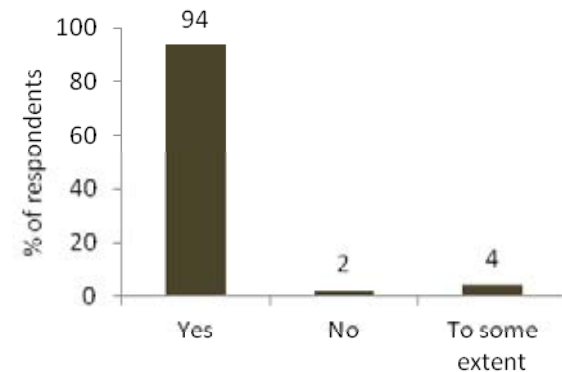
## Public opinion: -- air quality worsening; respiratory diseases rising; congestion worsens; Controls on private motorization becoming necessary



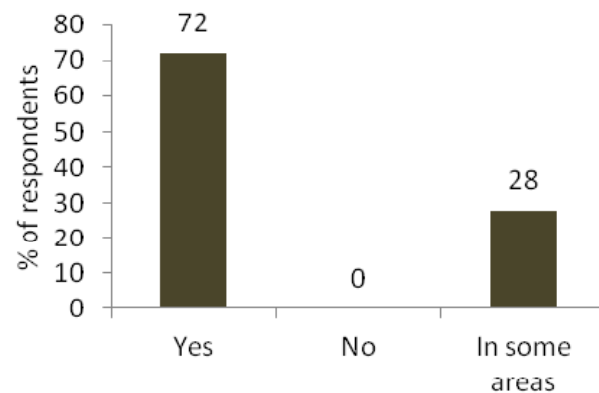
What is your perception of air quality in the city?



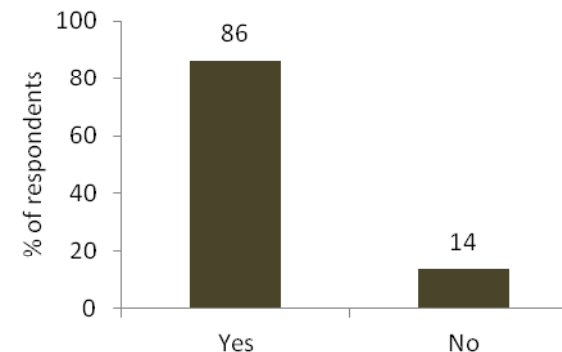
Do you think incidences of respiratory diseases are increasing in the city?



Road congestion is a big problem during morning and evening peak hours?



Do you think that the city has reached to a situation that government should make efforts to reduce the dependence on cars and two wheelers and encourage people to use public transport?



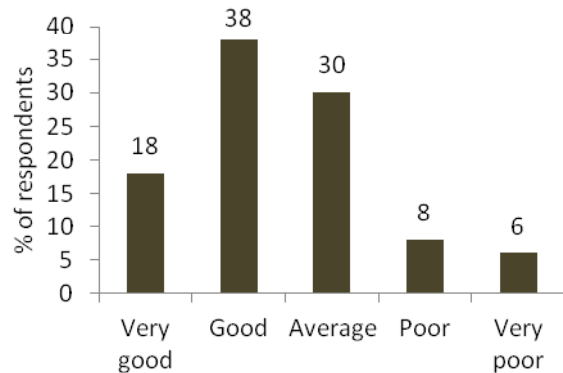


**Public opinion : about 60% are satisfied with bus services; consider it good/very good, but only about 30% satisfied with auto/tempos, majority support BRT, and many are not satisfied with services of**

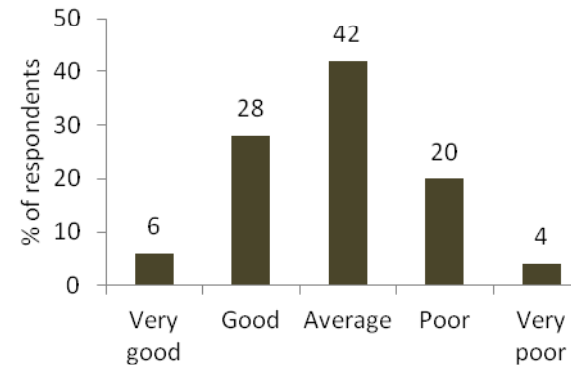


### mini-buses

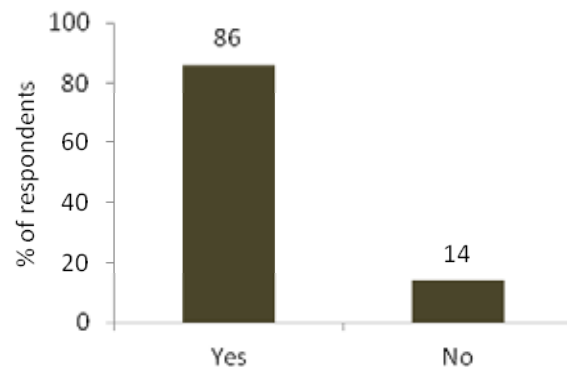
Rate the city bus service in your city



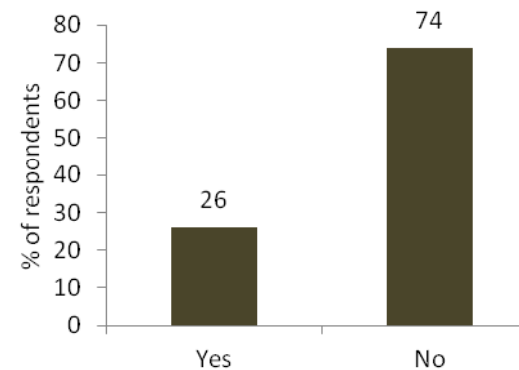
Rate the intermediate public transport service (autos/tempos) in your city



Do you think BRT that allows buses to move in great speed is a good initiative and needs to be expanded to more areas in the city?



Are you satisfied with mini-bus service in the city?

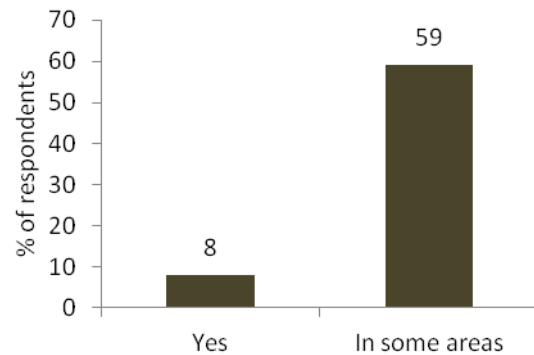




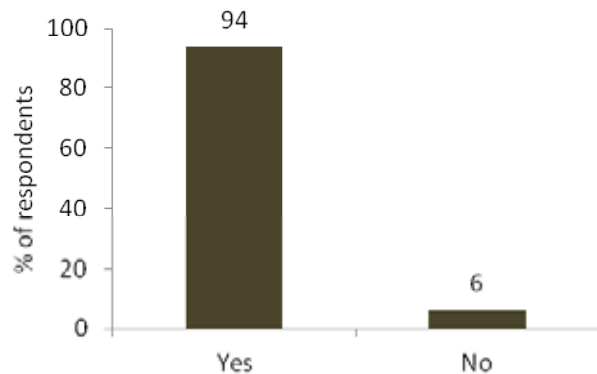
**Public opinion : close to 60% find good and usable footpaths only in few areas, majority agree cycles/cycle rickshaws should be promoted. Overwhelming 94% find that vehicle parking is encroaching on their walking and open spaces and close to 70% support the idea of 'no motorized vehicle zone' for walled city area**



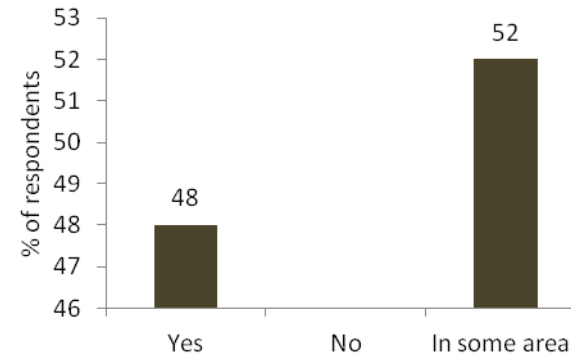
Do you find the footpaths and walking spaces on roads in your city are well maintained, clean and usable?



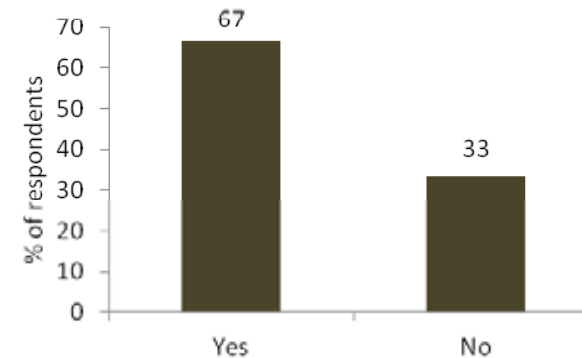
Do you think growing demand for parking of vehicles is making the footpath inaccessible and leading to congestion on the roads?



Do you think that cycles and cycle rickshaws are important and should be given segregated space for safety and better traffic movement?



Do you support that the old city should be a 'no vehicle zone'





# MOBILITY CRISIS



Cities are losing battle of car-bulge: **The rapid increase in vehicles is destroying all gains of air pollution and health**





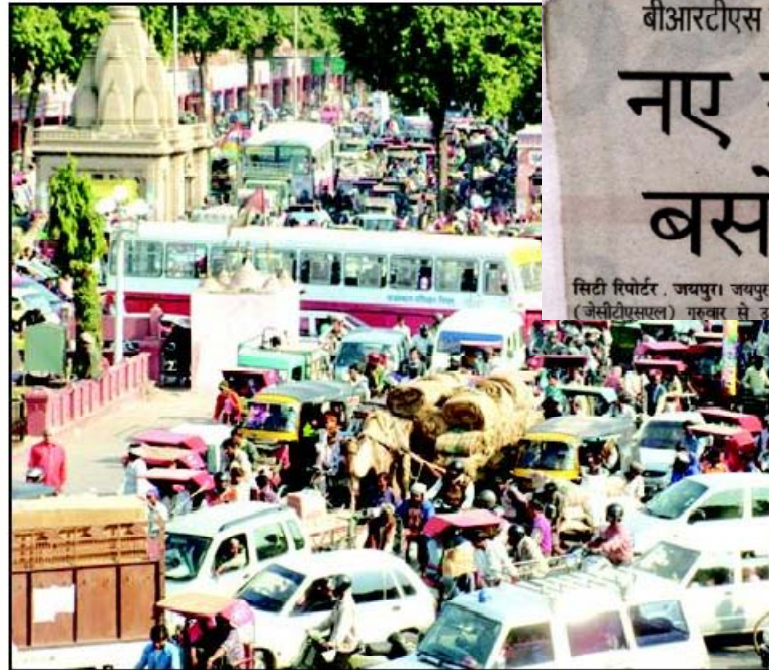


# TRAFFIC TRAVAILS

## QUESTION FOR THE WEEK

*The traffic is growing at a much faster pace than imagined. Should our city have different drive lanes for vehicles which will control traffic in the most efficient way and prevent accidents and also save a lot of time? Voice your opinion.*

Write in your answer in not more than 150 words and send it to us on [timesproperty.jaipur@gmail.com](mailto:timesproperty.jaipur@gmail.com). Your answer will be published in the Times Property section along with your photograph. You can also write to us at: The Times of India, Times Property, 8, 9 Anupam Chambers, Tonk Road, Jaipur. Ph: 0141-2743186.



बीआरटीएस कॉरीडोर पर आज से दौड़ेंगी ल... बसें  
**नए रूट्स पर नई  
बसों की सौगात**

सिटी रिपोर्टर, जयपुर। जयपुर सिटी ट्रांसपोर्ट सर्विसेज लि.  
(जेसीटीएसएल) गुरुवार से दून् रूट्स पर भी बसों का

चारदीवारी के व्यापारी बसों

...सभी वाहन बंद रहेंगे। राज्य  
...दिन के लिए तो वहीकल डे घोषित  
...स्ता सहित चारदीवारी के सात प्रमुख  
...रही है। मुख्य सचिव सी.के. मैथ्यू की  
...देयस" पर हुई बैठक में रामनिवास बाग की  
...कल डे का फैसला किया गया।

## हफ्ते में एक दिन बाजार में वाहन बंद

Thursday, 13 Jun 2012 2:33:45 PM IST

## परकोटे के बाजारों में सप्ताह में एक दिन वाहन नहीं चलेंगे

जयपुर। परकोटे के बा

अधिकारियों के साथ हुई बैठक में यह फैसला किया गया।

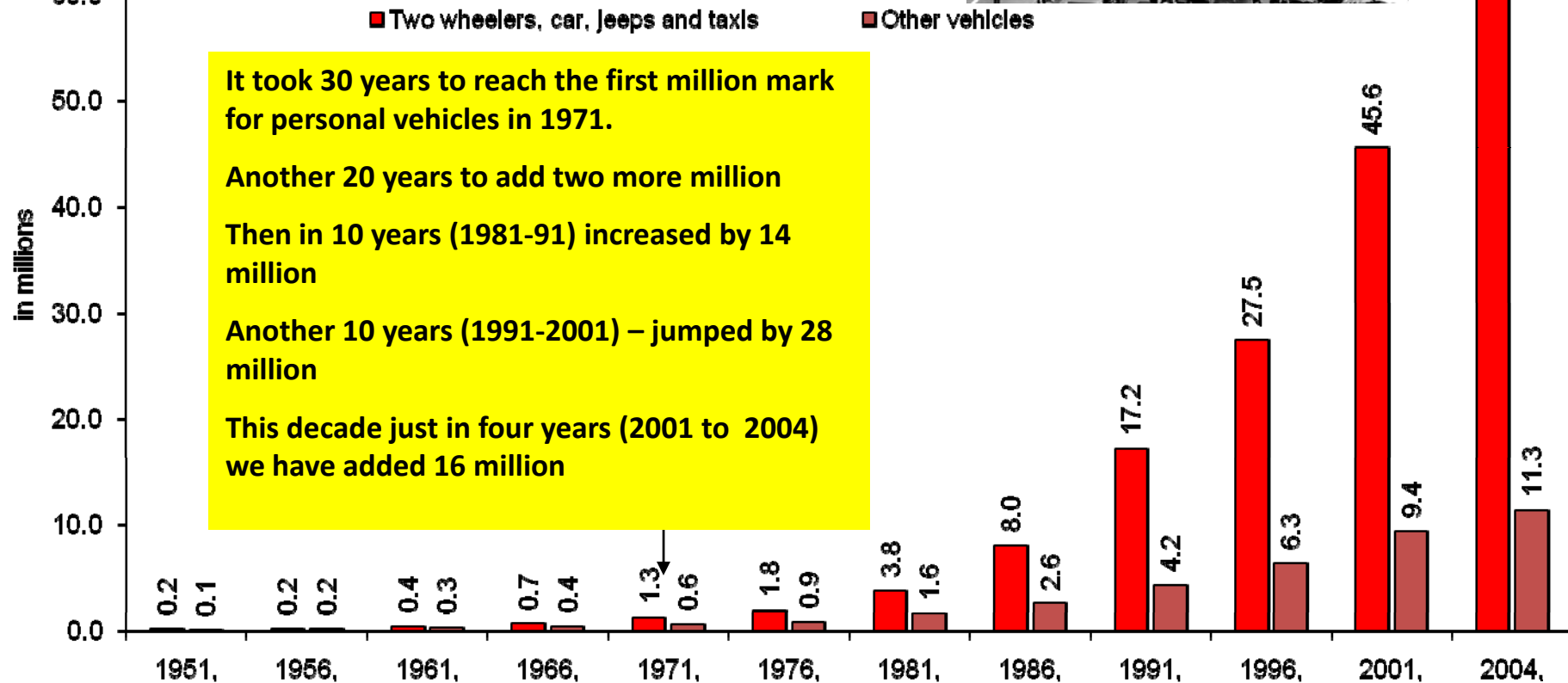




# Explosive numbers



Vehicle registration in India: India's urban population has grown 4.6 times, vehicle numbers have increased 158 times

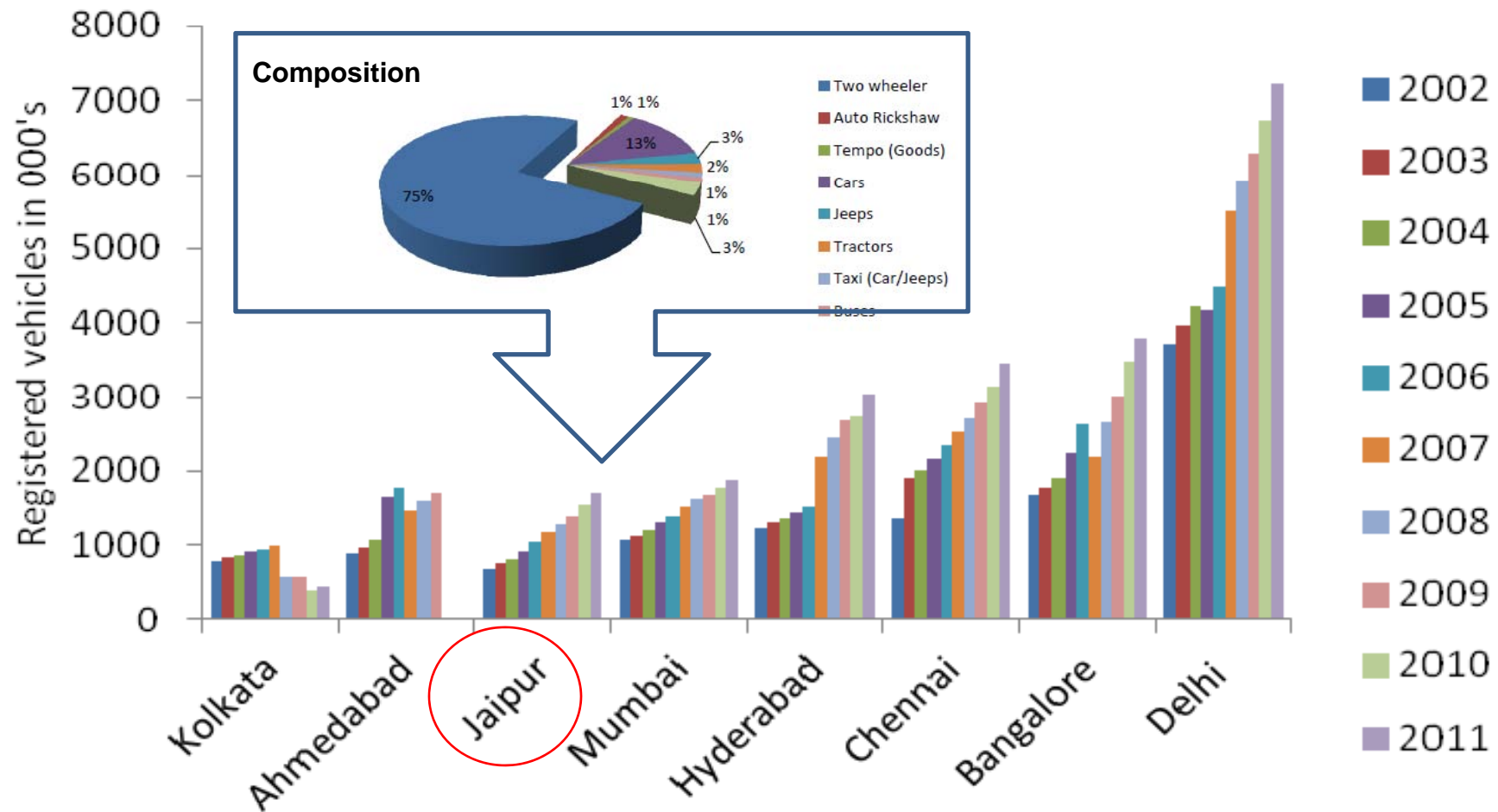




# Galloping vehicle numbers



## Vehicle registration trend in selected cities



Source: Based on MORTH data

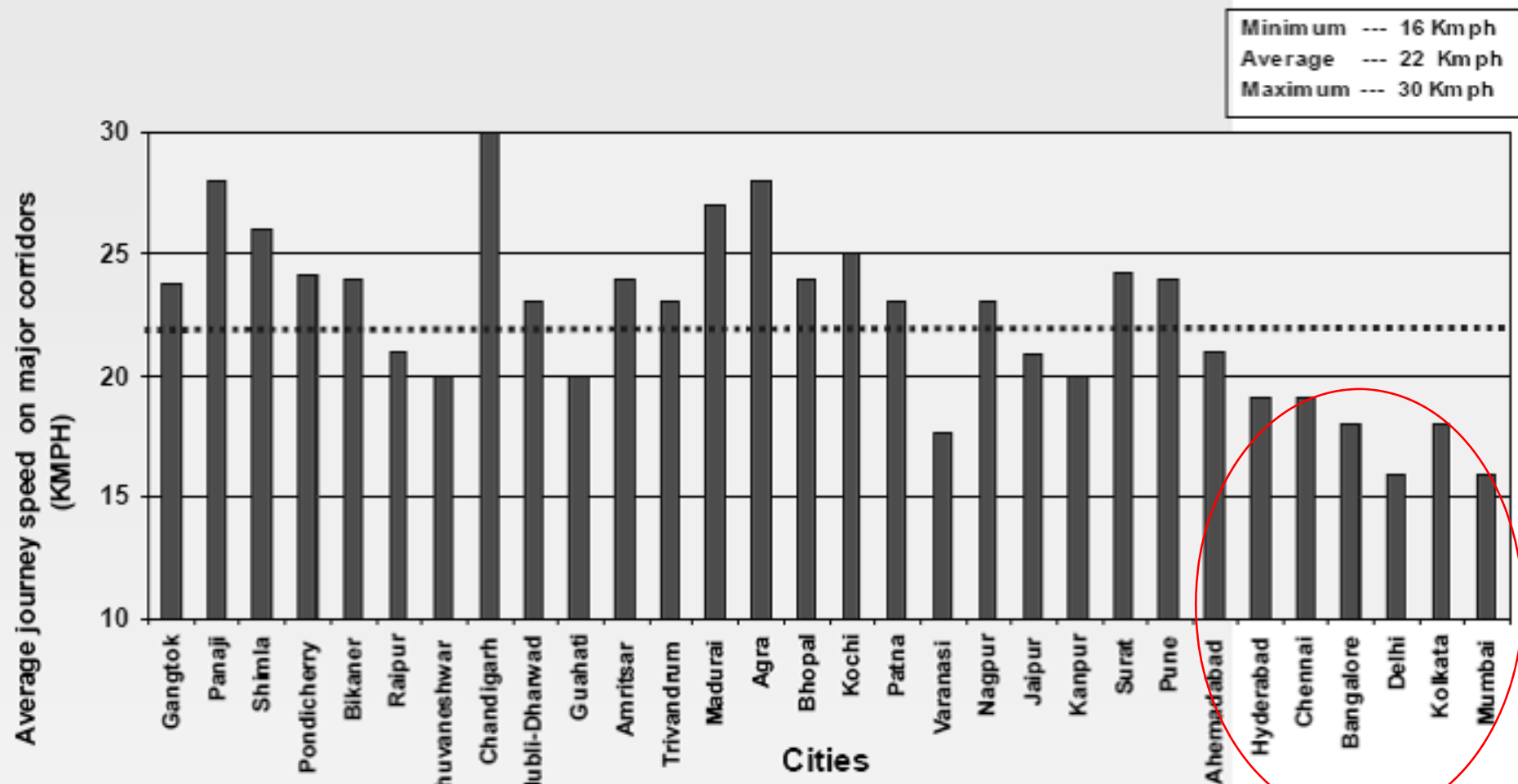


# Cities are Paralyzed

## The Crawling Traffic



The average journey speed in Delhi (16 km/hr), Mumbai (16 km/hr) and Kolkata (18 km/hr): Abysmally poor compared to smaller cities



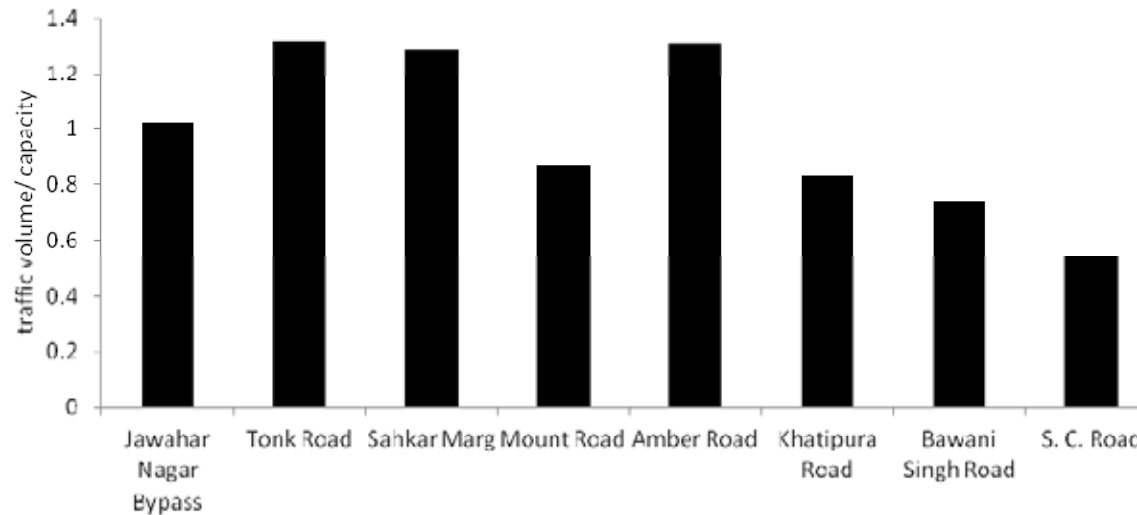
Source: Anon 2008, Study on traffic and transportation policies and Strategies in Urban Areas in India, MOUD, p63



# Congestion leads to more pollution



**Congested roads in Jaipur: traffic volume exceeding the carriage capacity**



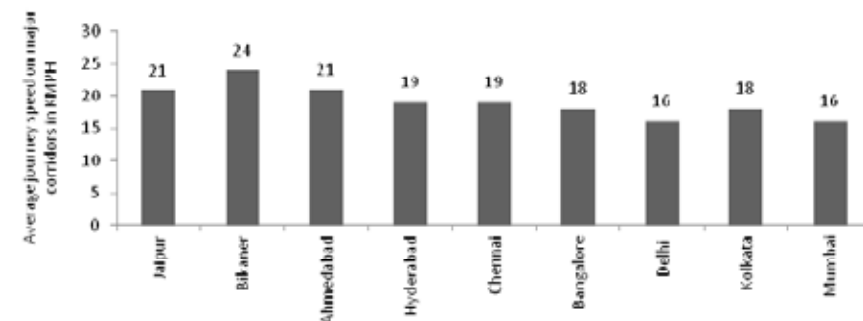
Source: CDP

## Vehicle Emissions vis-à-vis Speed

Speed (kilometer per hour)	Autos Change in emissions with speed (gm/km)			Buses Change in emissions with speed (gm/km)		
	CO	HC	NOx	CO	HC	NOx
10 km/hr	33.02	4.47	2.53	22.60	5.70	22.30
25 km/hr	21.20	2.60	2.17	14.40	2.30	16.40
50 km/hr	9.80	1.30	2.24	8.20	0.00	11.90
75 km/hr	6.40	0.93	2.97	-	-	-

Source: E A Vasconcellos, 2002, Urban Transport, Environment and Equity — the Case for Developing Countries, Earthscan Publications Ltd, London

## Average travel speed in Jaipur vis-à-vis other cities



Source: MOUD/WSA



## Can building more roads help?

### Learn from Delhi

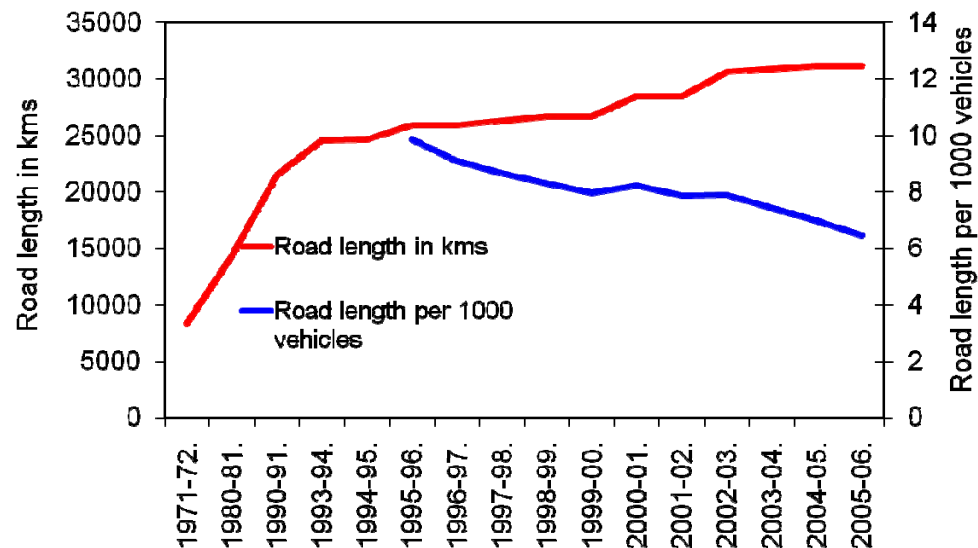
..... *We can never build enough roads*



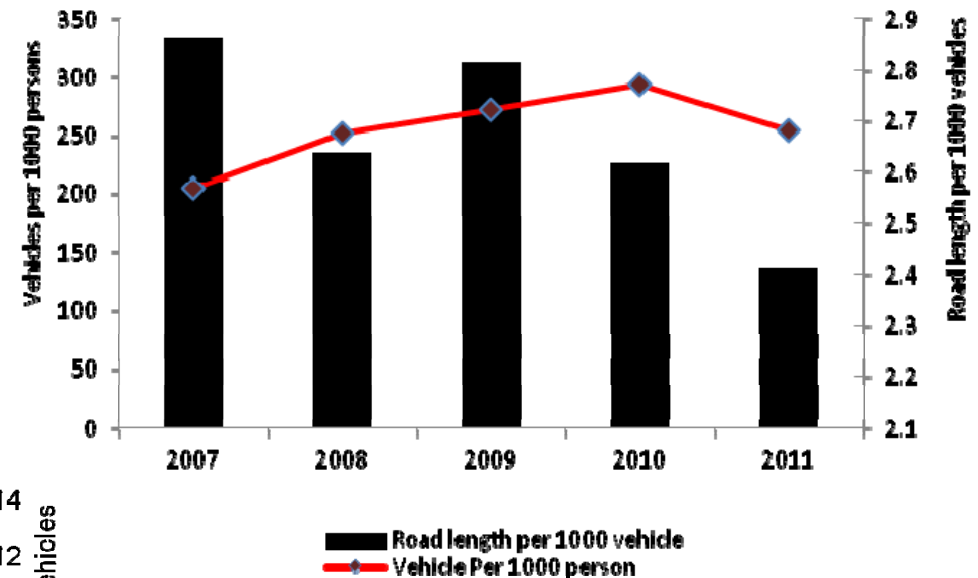
- In Jaipur road length per thousand vehicles have fallen from 2.9 to 2.4 and vehicles per 1000 people have increased from 204 to 254

- The road capacity has been expanded by over 33% between 2007 and 2011, but the vehicle growth is very high – during the same period vehicles have increased by as much as 58%.

Delhi road length increase and availability for 1000 vehicle



Jaipur road length per 1000 vehicles and vehicles per thousand people





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## **The second generation challenge .....**



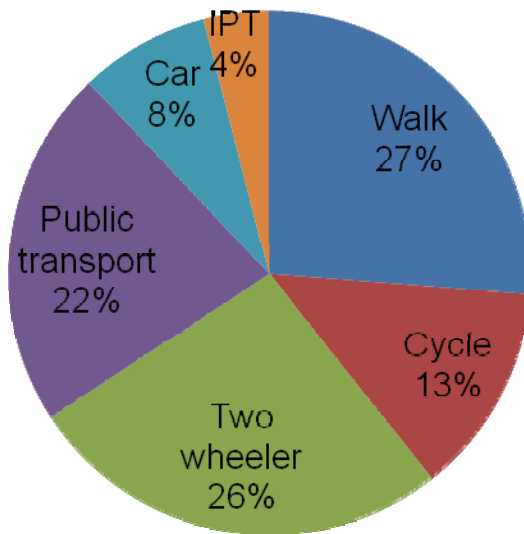


## The challenge.....and the strength of Jaipur

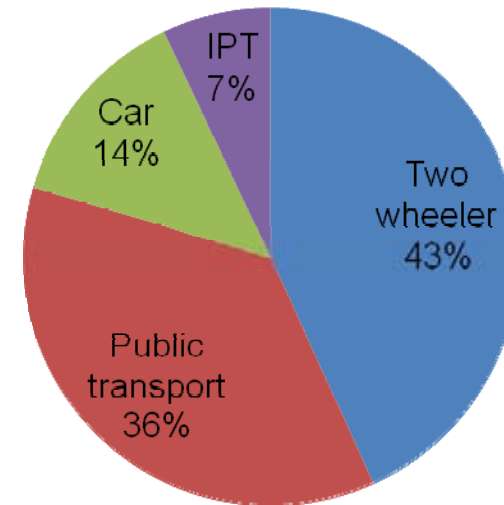


Traditionally the share of formal public transport has been low. Cars and two-wheelers are nearly 90 per cent of all vehicles. But the total share of public transport, autos, rickshaws, cycle and walk are still 65 per cent of the travel trips. This is an opportunity.....

**Modal share (all modes)**



**Modal share (motorised modes)**



Source: Based on MOUD/WSA

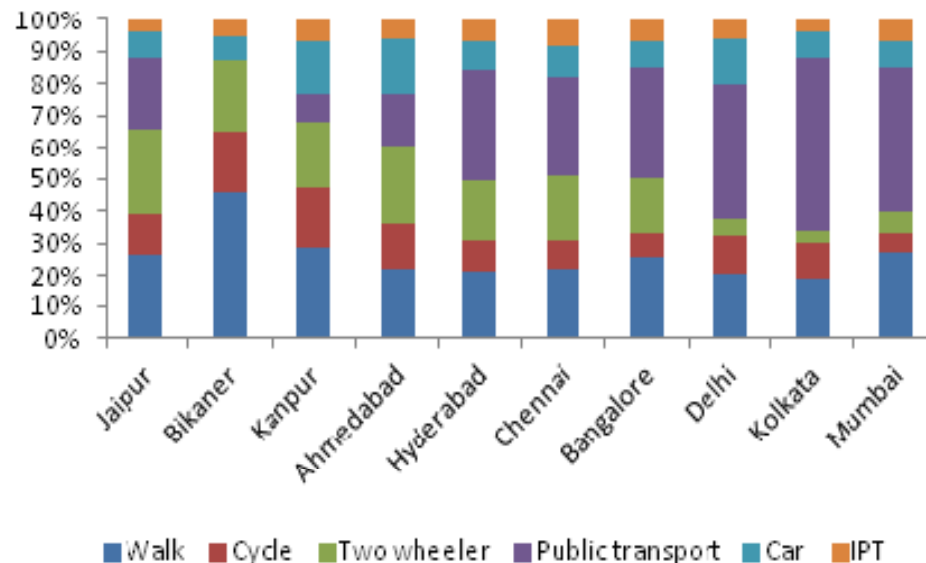


## The share of formal public transport is still low.....

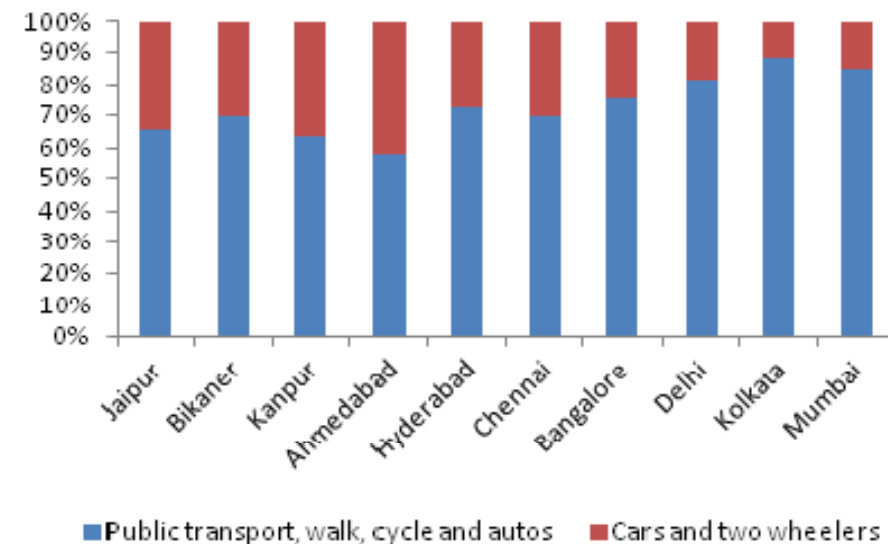


The share of public transport in Jaipur is well below the desired range of 50-60 %

Modal share of in key cities including Jaipur



Combined modal share of in key cities including Jaipur



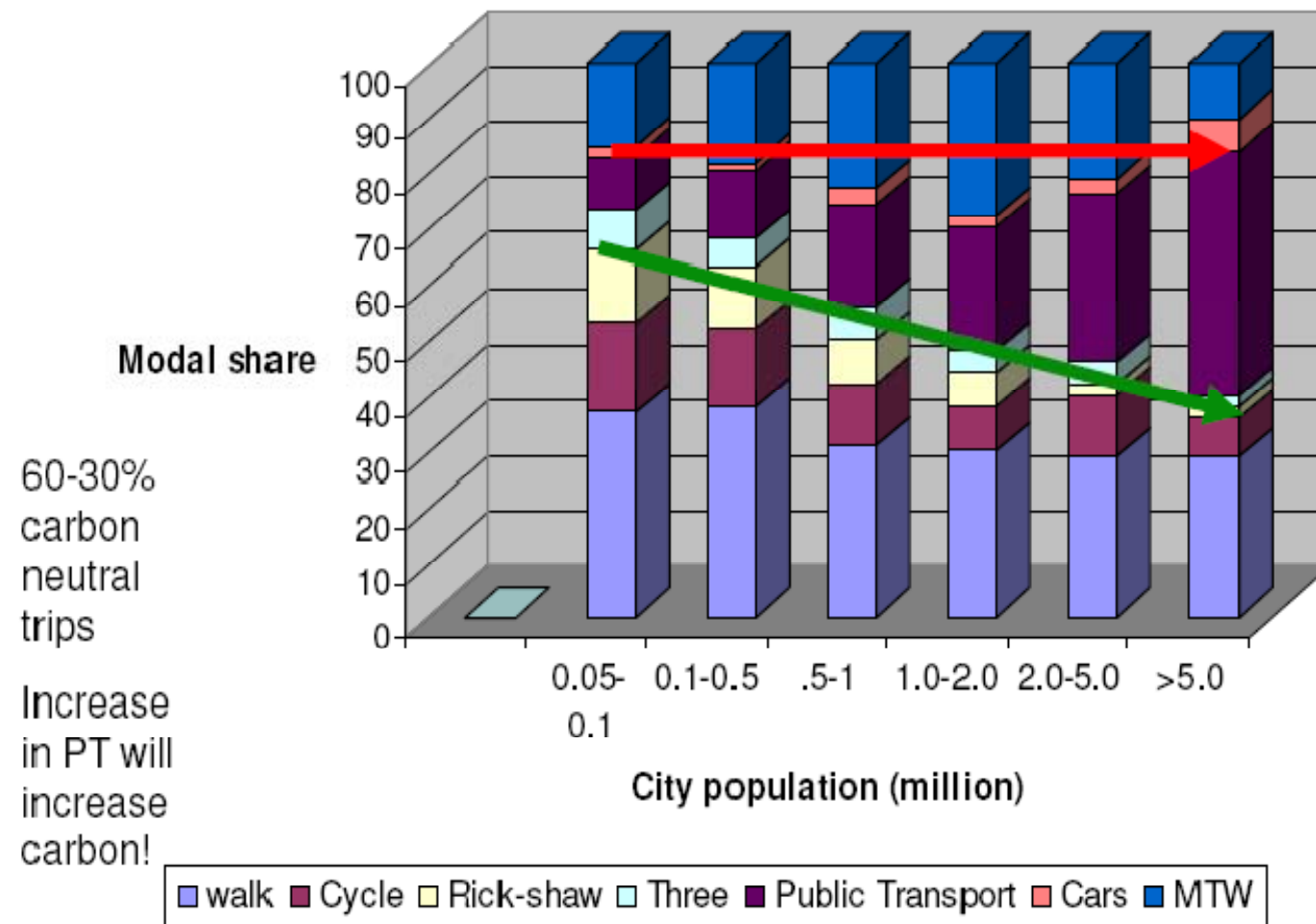


## Strength of our cities....



### Urban Mobility

PT and NMV based, MTW majority personal vehicles





## **How do we move ahead?**

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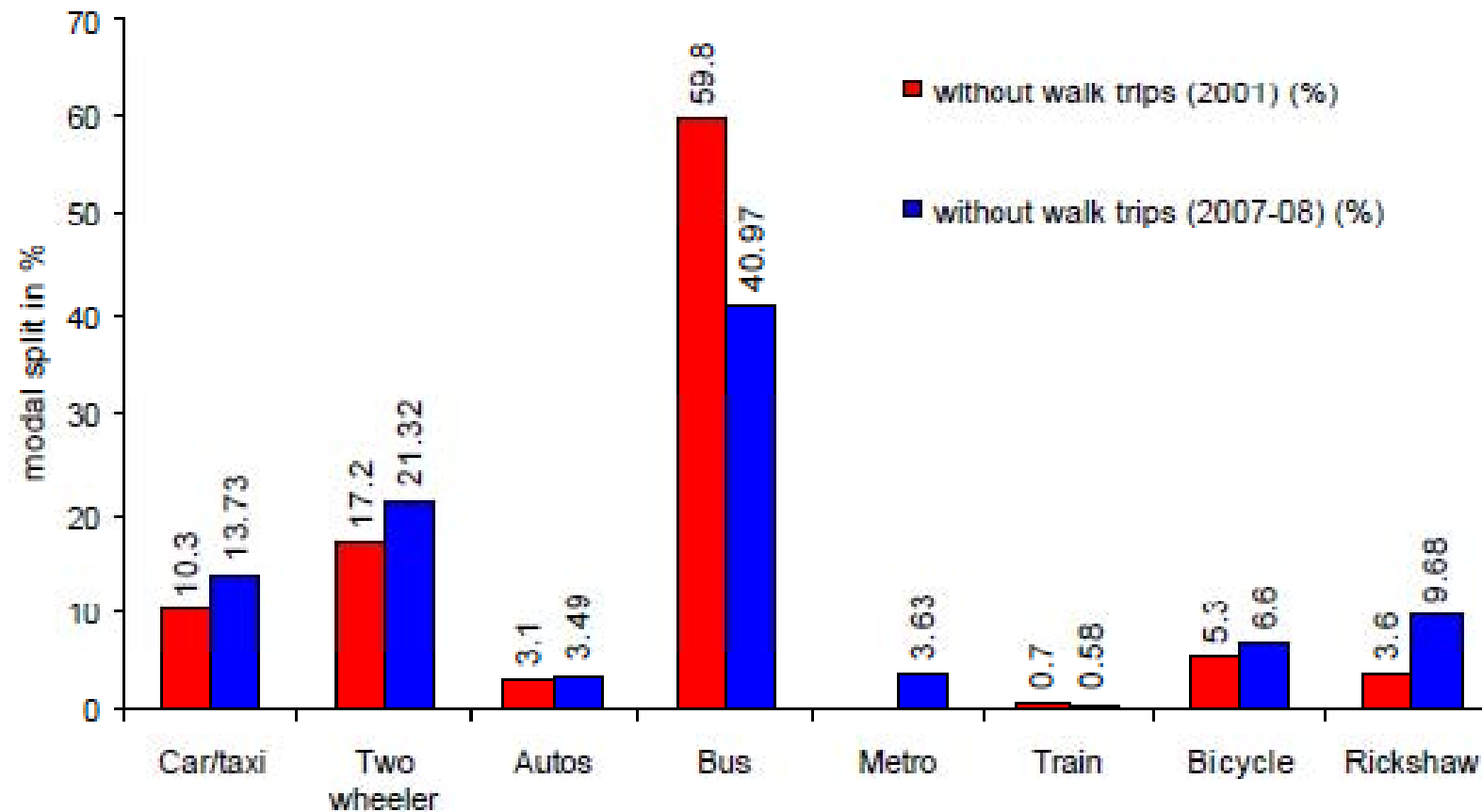


- Jaipur City Mobility Plan has set the goal of 50% public transport modal share, 35% of NMT share and 100% coverage of footpaths on all roads during the horizon year 2030**
- Delhi Master Plan has set the target of 80% public transport ridership by 2020.....**



# Reality check in Delhi

## Public transport losing ground





## But the future can be different...

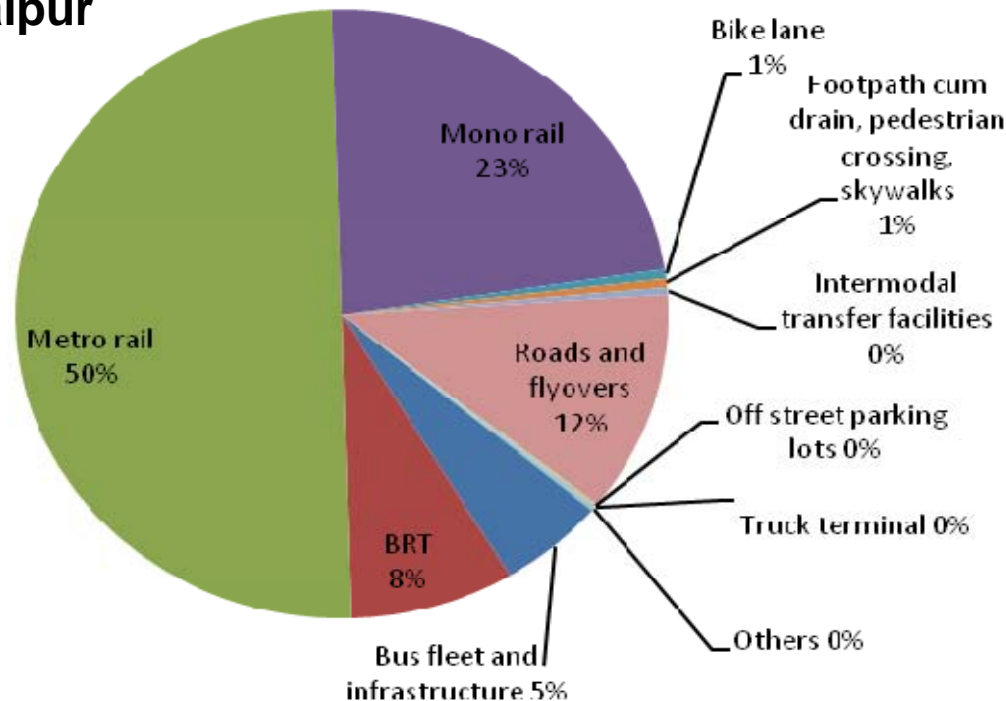


**CMP expects massive investments in high-end public transport modes to increase the public transport ridership**

Comprehensive mobility plan's Rs 24,112 Crore investment plan for transport improvement during 2010 to 2031 in Jaipur

Metro Rail and Mono rail together have more than 70% of total investment plans proposed by CMPs – the city needs a comprehensive plan for integration and accessibility through walkways and other NMT modes

**Graph: CMP's investment plans in Jaipur**



Source: Based on CMP





## Reform process has begun in other cities.....

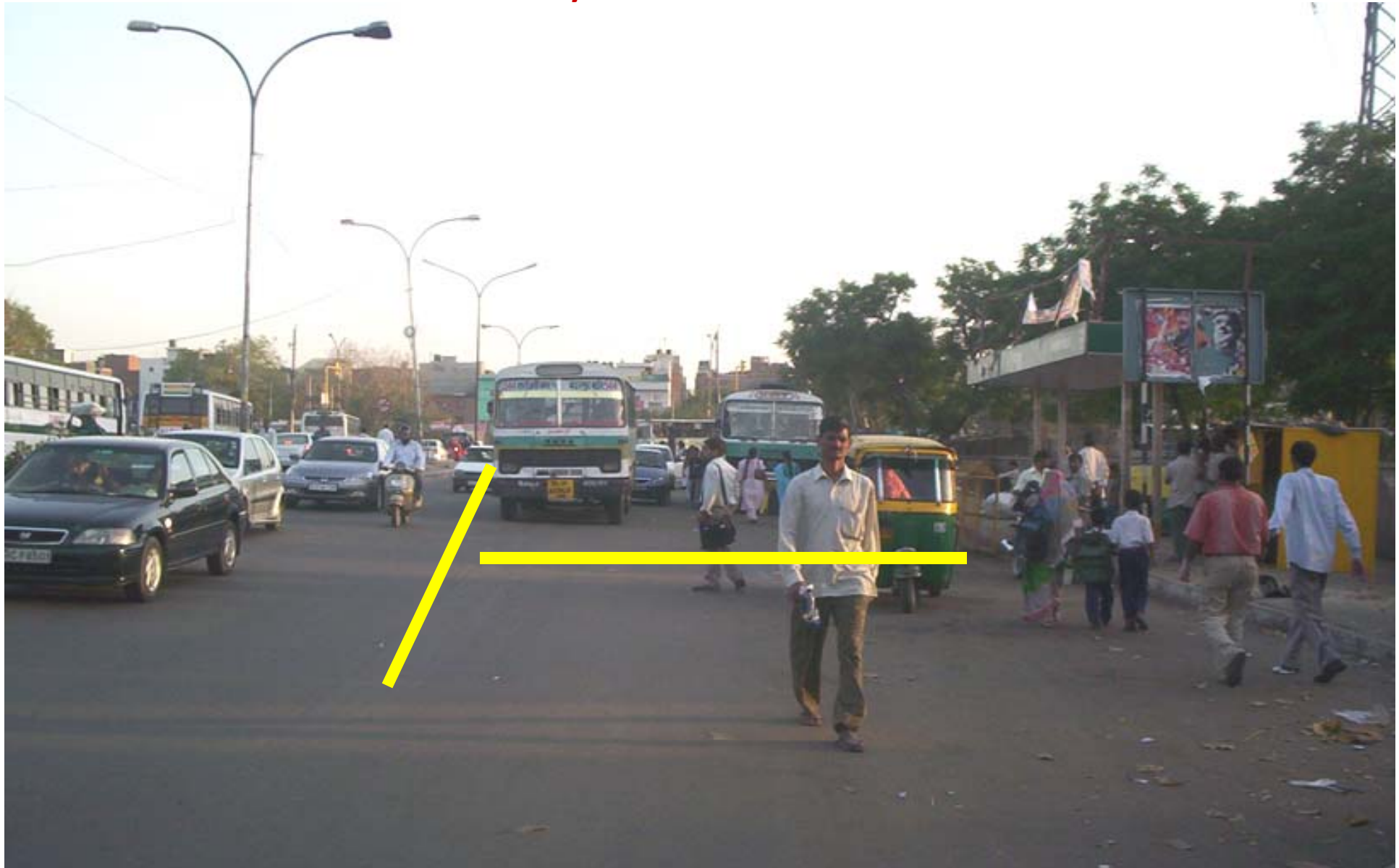
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- Bangalore Metropolitan Transport Corporation is modernising bus deployment and operations
- Delhi transport department is restructuring bus sector –
  - All city bus routes have been bunched into 17 clusters. Private bus agencies will bid and operate these clusters within defined performance parameters.
- Indore bus service reforms etc



**But bus needs its space..... Bus caught in congestion is even more unattractive. You may ask – where is the space? But the current road space is used inefficiently. Look at Delhi. How much road space is wasted. Only one lane available to motorists.**





## Need equity in the usage of road space Reorganise the road space according to road users



### Bus Rapid Transport in Delhi:

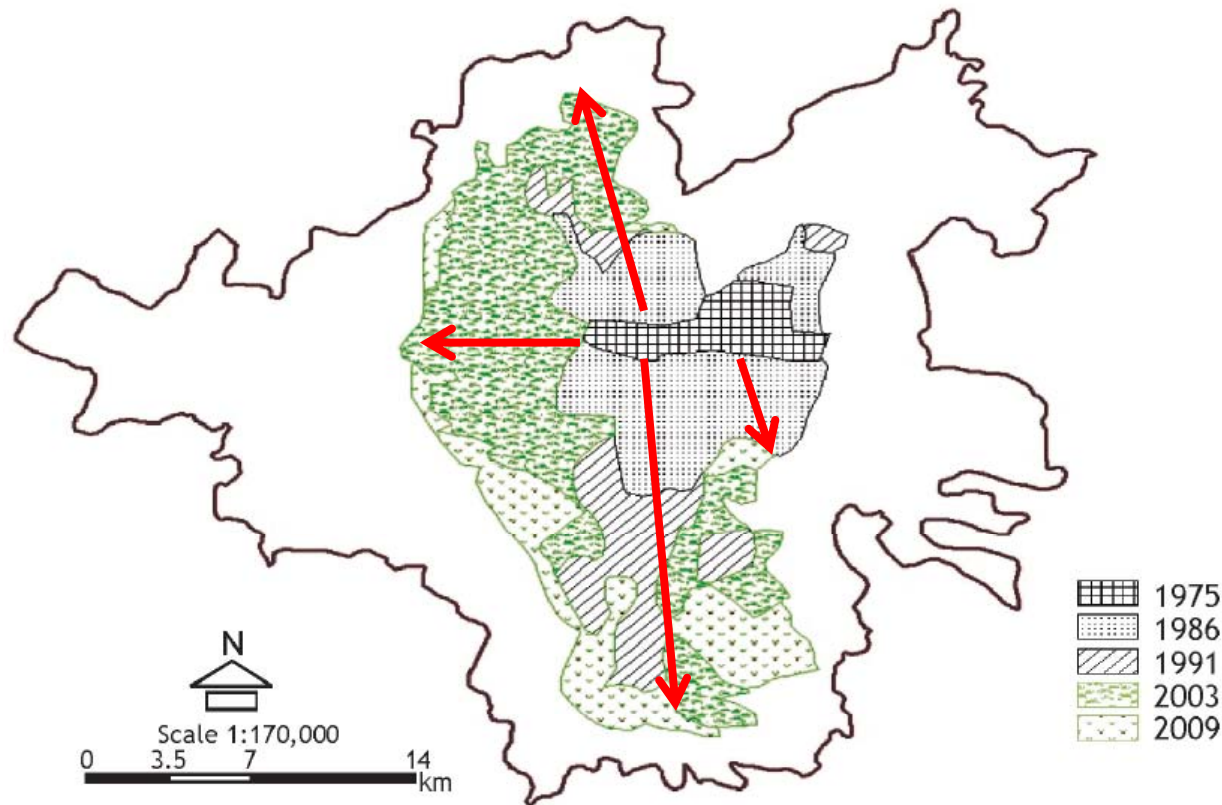
Right of the way segregated according to users --- bus users, walkers, cyclists and motorised vehicles. Bus speed increased from 11km/h to 19km/h. Benefits nearly 60% of road users. Delhi working on the next phase of the network.







## Jaipur: Urban growth 1975 to 2009: The compact city design under pressure



Built up land increased from 46.39 sq km in 1975 to 197.96 sq km in 2009, whereas the maximum expansion is observed in low density built up land.

Residential area has higher rate of expansion after 1975, the major expansion is observed in the western, southern and south-eastern parts and along the national highways 8, 11 and 12.

*City's built-up area has increased with the rate of 4.46 sq km per year or 1.02 percent per year. The crop area has shrunk by 1.60 sq km per year, fallow land 2.94 sq km per year, and wasteland 0.59 sq km per year in last 34 years*

Source: Rupesh Ku. Gupta 2011, Change Detection Techniques for Monitoring Spatial Urban Growth of Jaipur City, Institute of Town Planners, India Journal 8 - 3, July - September 2011, 88 - 104

- **Jaipur Metropolitan District Master Plan has proposed 12 satellite cities with investment of Rs 10,000 in next 15 years. We need to plan well so that our new cities can act as models for sustainable mobility**
- **Rajasthan is the first state to constitute the state commission on urbanization.**

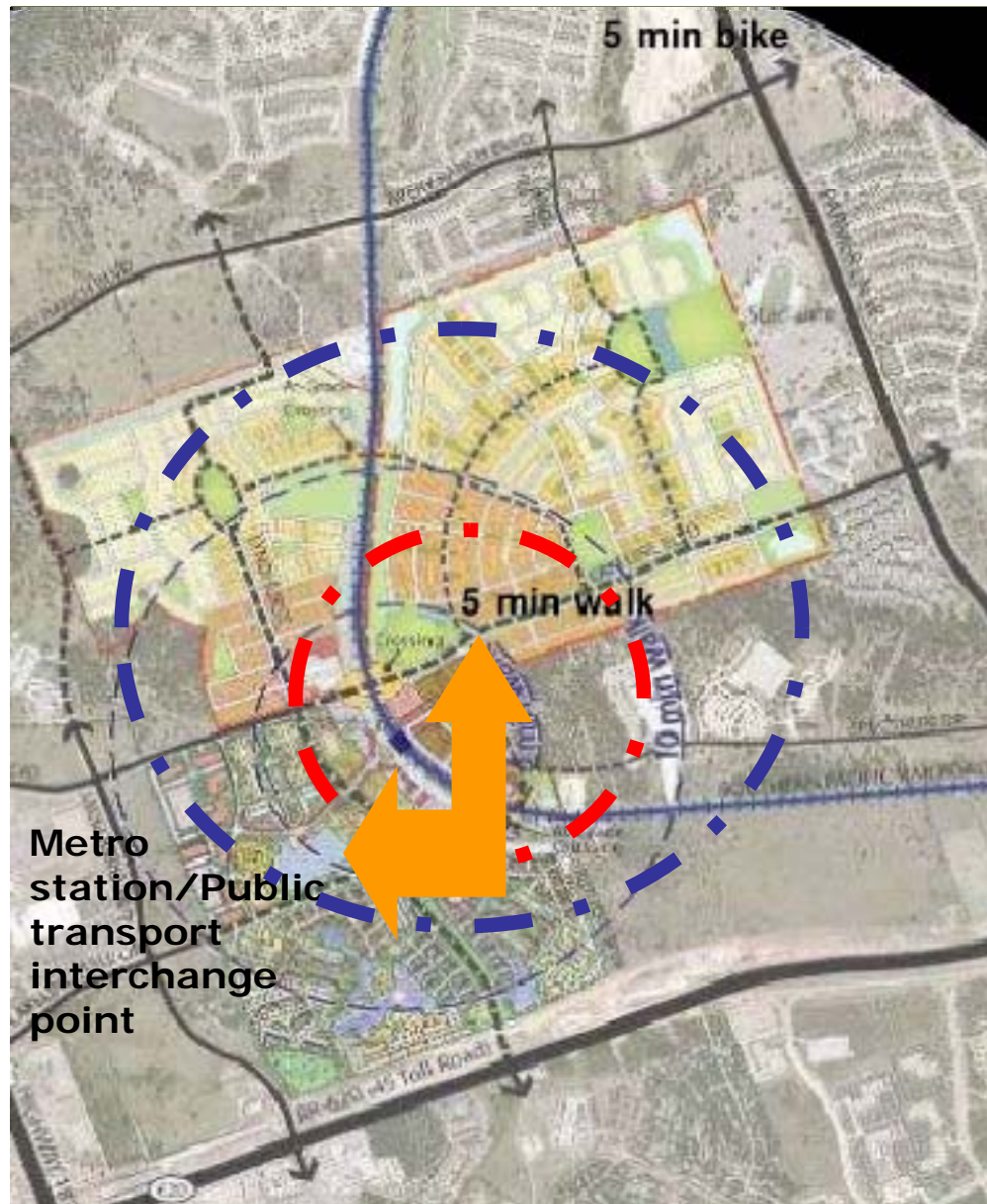


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**Integrate, integrate integrate.....**

## Delhi is developing guidelines for modal interchange location

Delhi-- UTTIPEC/DDA guidelines



**Bus stop, cycle rental:** within 50 meter level walk from station exit

**Cycle and two wheeler parking :** within 100 meter level walk from station exit

**Auto rickshaw stand:** within 150 meter level walk from station exit

**Private car/taxi/auto rickshaw “drop off”:** with barrier-free of exiting pedestrians and NMT

**Pedestrian exits, bus-stops and Cycle-rickshaw stands must be closest to main pedestrian exits from station.**

**Car parking if provided, must be BEYOND 250 M distance of Station/ or PT interchange point**

**Pairing of Origin-Destination (O-D) Nodes:**

Provide cycle/ auto stands at nearby important destinations.

Signages at both end locations.

Private car parking only at Terminal Stations.

Discourage car parking at Stations within inner-city urbanized areas.





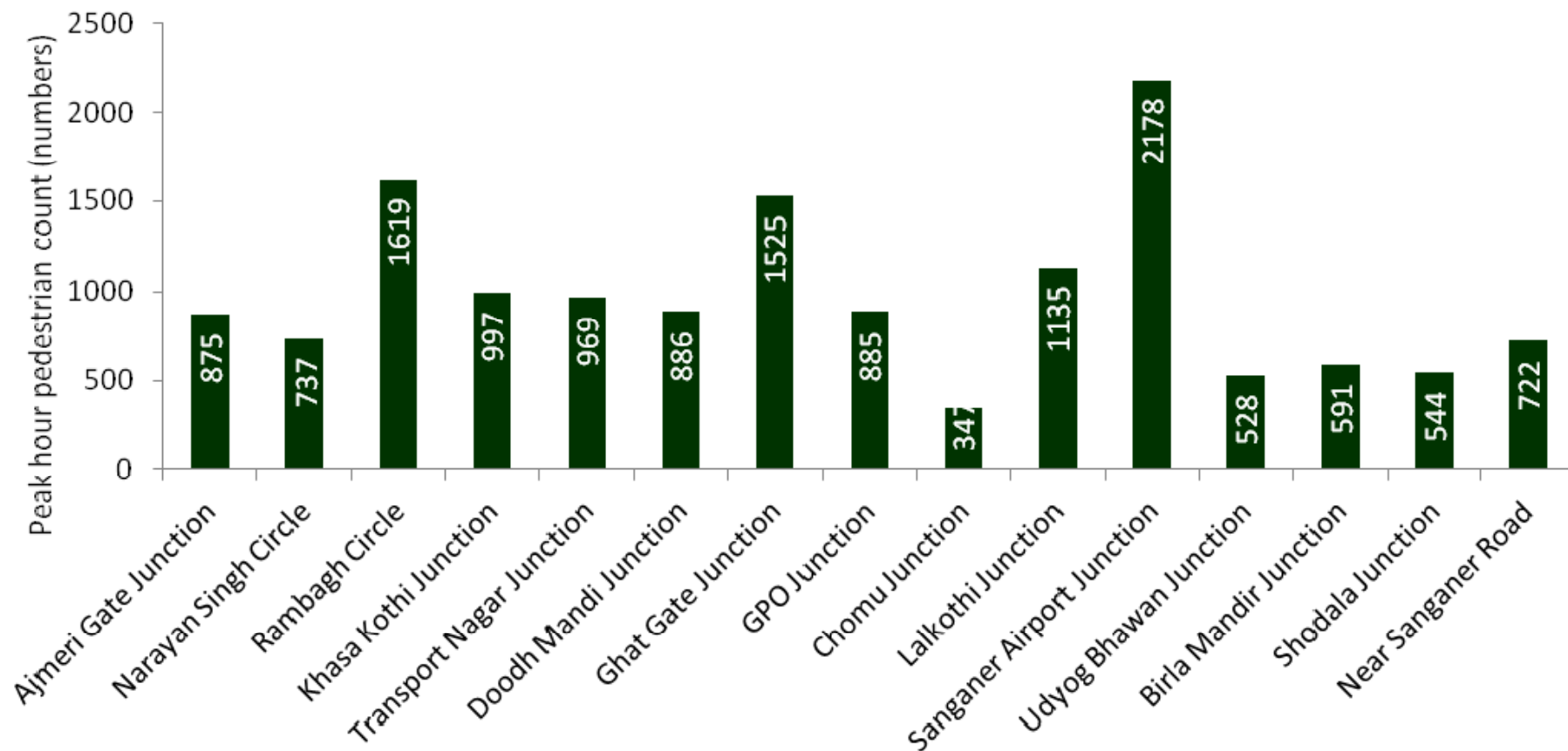
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**Public transport cannot work in isolation.....**

**Need walkways, intermediate public transport, and non-motorised transport..... Why?**



## Very high pedestrian count on most roads in Jaipur...





## We built walkable cities.....



Kolkata: 1900s



Jaipur walled city



**Substantial number of people in our cities walk to work.....** 16-58% in our cities. In Delhi nearly half of education and even business trips are walk trips

**Walking and urban poor.....**A great part of urban people live in low income localities and slums. Many of them are too poor to even take a bus....

**Disability and walking.....**Survey in Delhi shows 58% of the disabled people find steps, ramps, difficult to negotiate; 45% of elderly find steps and ramps daunting; 20% find uneven, narrow sidewalks difficult. Engineering guidelines for disables are not implemented

**Public transport can be successful only if our cities walkable:**

**Urbanity and life style.....**Co-relation between active transportation (walking and cycling) and obesity.

China – 1.8kg weigh gain after and twice as likely to get obese for a Chinese who acquired a car.  
King County – people weigh 7 pounds less on an average in walkable neighbourhoods

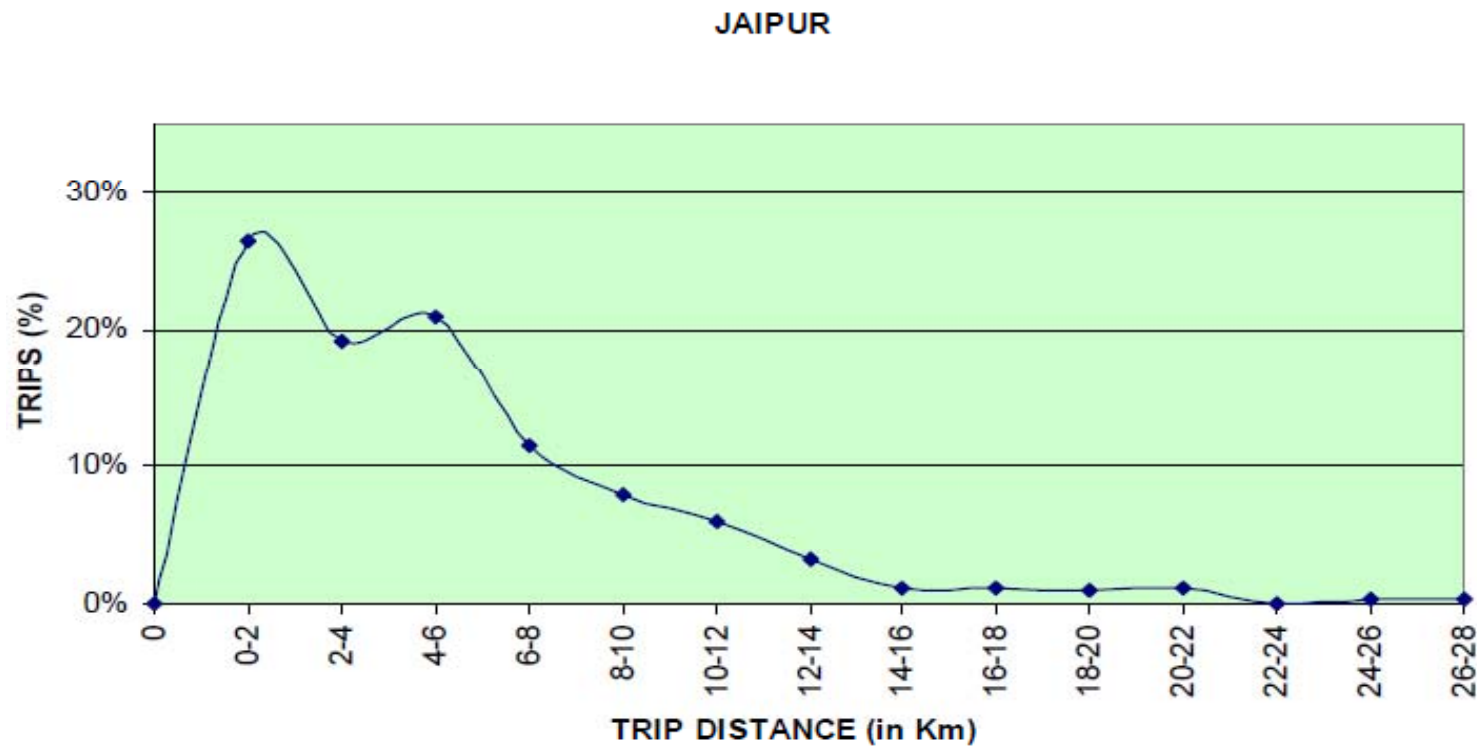


## What makes Jaipur walk friendly?



**Majority of trips generated in the Jaipur have less than 6 km distance, of this majority fall within 0-4 km – walkable. Overall average trip length is 6kms only**

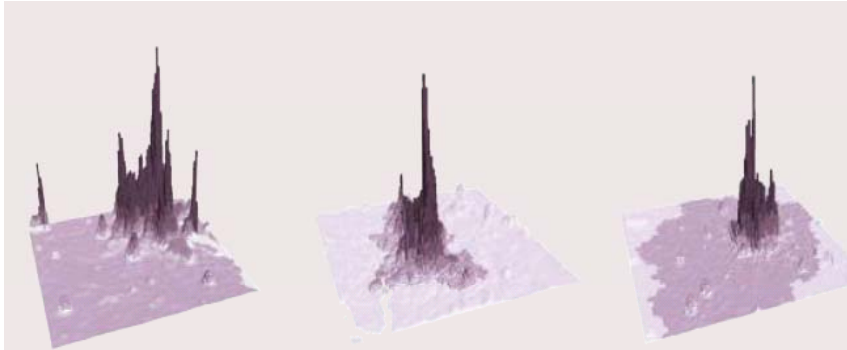
Trip distance





## Our cities are built differently

High density, mixed land use, and narrow streets -- an opportunity to plan mobility differently



Delhi

Kolkata

Bangalore



Mumbai



London

Source: Urban age

- In a typical city the core can just be 5 km across and easily walkable within a reasonable time.
- Studies show more than 40 to 50% of the daily trips in many cities have distances less than 5 kilometers. In Kolkata its 3 km.
- These have enormous potential to convert to walking and non-motorised trips.







# Jaipur's plan for public transport



Jaipur Bus network



Metro route network



Metro-BRT convergence







# CSE's NMT Audit



- Centre for Science and Environment has conducted a random survey in selected locations in Jaipur to assess the status of NMT infrastructure
- This highlights the key policy changes needed to improve Non motorised infrastructure in Jaipur.
- The assessment involves auditing of the footpaths and cycle track infrastructure against existing IRC guidelines.
- The NMT infrastructure has been benchmarked on the basis of design guidelines for tracks and crossings, overall environment condition of the surroundings and supplemented by the user perception survey on these stretches of roads
- Locations were selected to represent residential and commercial land-use classes and also low income neighbourhoods.

## **Five selected locations in different parts of Jaipur with different landuses**

- Johari Bazaar and Bapu Bazar, Walled city area
- Stretch outside JDA
- BRTS stretch, Sikar road
- Sodala, Jaipur
- Mansarovar, Jaipur



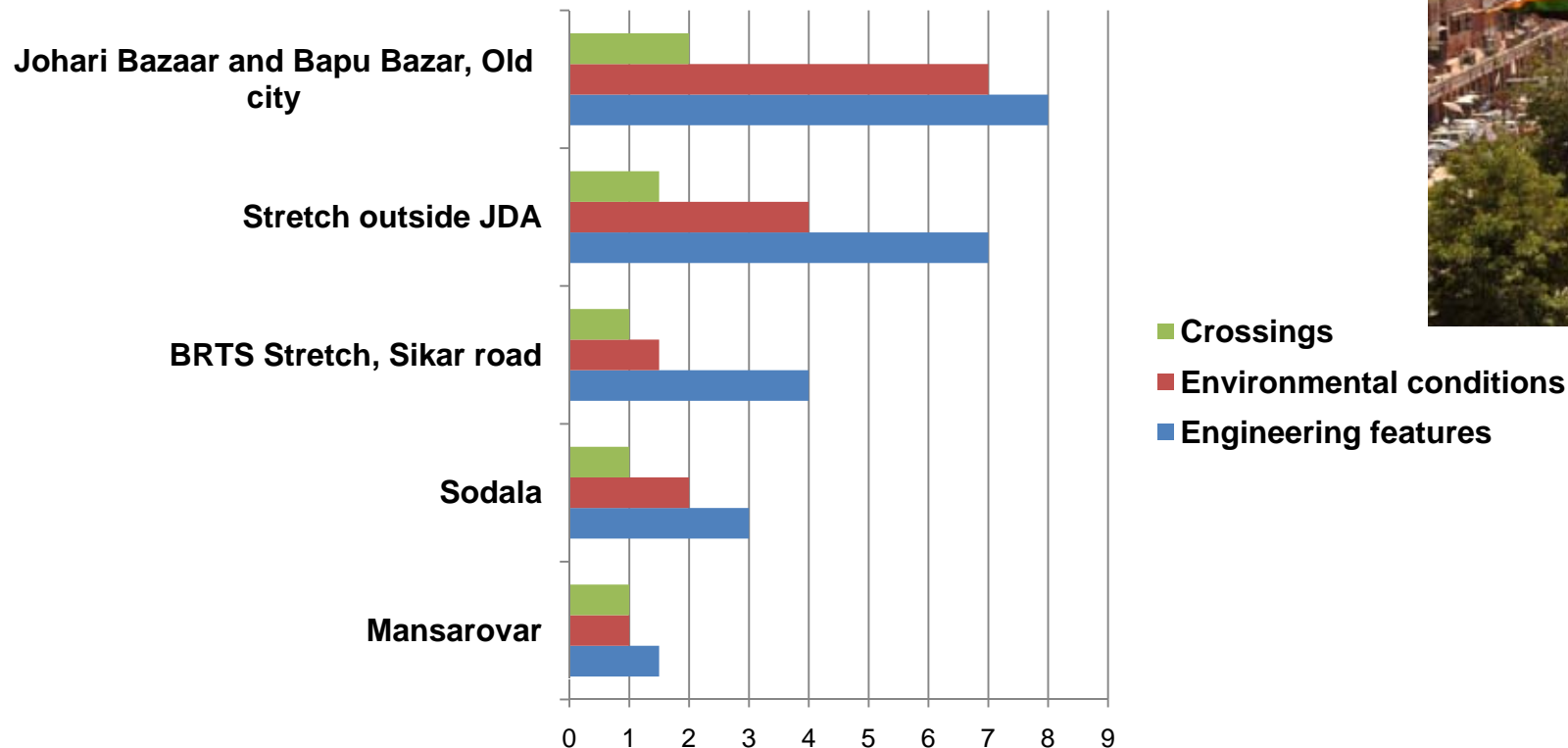
# Our audit parameters



- **Engineering features** includes continuity of sidewalks, their width, clear view, headroom provided, buffer between NMV and MV lanes, street signanges and parking spaces for cycles.
- **Crossings facilities** traffic calming measures at the junctions, pedestrian signals, raised crossing at slip roads and designated traffic signal for NMV.
- **Environmental conditions** includes safety, maintenance, enforcement, encroachment, concentrated lighting and amenities including gender sensitive public toilets, telephone facilities, drinking water facilities, food kiosks, dustbins, arcades, and trees.



# Good, bad and ugly....



**All the locations surveyed have been ranked on scale of ten. These have been assessed from the perspective of engineering features, their overall environment and crossing facilities.**



## Number 1: Johari Bazaar and Chaura Rasta in Walled city



- Traditional footpaths serve as walkable verandah
- Shaded verandahs is unique to the old city area
- The verandah is covered all along, -- a continuous and shaded space for walking.
- Very safe in the night as they are well lit and the shops make walkers feel secured.
- Shopkeepers do use the walking area for display but still clear width of 1-1.5 metre is available in most of the stretch





## But crossing in Johari Bazaar and Chaura Rasta have hurdles



- The pedestrian infrastructure in Johari Bazaar ranks best in engineering features and environment conditions but rank poor on crossing facilities.
- Absence of zebra crossing. IRC guidelines not adhered to
- No raised crossings on slip roads
- Lacks pelican signals
- Lack of traffic calming measures
- This stretch even lack covered bus stops and stands for cycle rickshaws







## Number 2: Footpath outside JDA building

- The newly constructed pedestrian footpaths outside JDA is well surfaced
- This stretch has 2-2.5m wide footpaths along with 1m multi use zone
- Bus shelters have been provided at regular intervals
- But the environment conditions require improvement
- There is no concentrated lighting provided especially for the NMT infrastructure
- There is no specific space allocated for cyclists







## **Stretch outside JDA building score low on crossing facilities**

- This stretch lacks in crossing facilities
- Around 5' high railing runs on the whole stretch with only one crossing
- No raised crossings at slip roads
- There are no pelican signals at pedestrian crossing
- Lack traffic calming measures





### Number 3. BRT Stretch, Sikar road



- This stretch lacks in NMT infrastructure. Walking access to BRT is poor
- The footpaths are just 1m wide and mostly encroached
- Dingy at most places, and not maintained properly
- This stretch does have demarcated cycle track, but its not been separated by any kerb so it becomes the part of the main carriageway
- The footpath is uneven
- Pedestrians prefer walking on the main carriageway





## **BRT Stretch, Sikar road** ....Highly encroached







## Number 4: Sodala road



- Sodala, dominated by commercial landuse, has footpaths separated with railings from the main carriage way
- The footpaths are uneven at most of the places
- Poor maintenance of crossing facilities
- Footpaths are just 1m wide and mostly encroached
- There is no concentrated lighting provided
- This stretch scores very low on environment conditions, and crossing facilities and engineering features too
- Most of the area, has no bus stop shelters, people have to wait on the road
- Even though there is metro construction happening, no attention has been given to improving pedestrian infrastructure





## Number 4: Sodala road

### Poor condition of footpaths





## Number 5: Mansarovar



- Masarovar has no footpaths in most areas
- The little that exist are badly maintained or uneven
- There is no crossing facility, or zebra crossings
- This stretch scores minimum on environment conditions, crossing facilities and engineering features
- Most of the area, has no bus stop shelters, people have to wait on the road







# Mansarovar needs drastic makeover...





## Some initiatives...

- Some initiatives include areas near C scheme, JLN marg, Vidhansabha road
- There are few FOBs constructed in few areas with escalators
- The area near statue circle is properly pedestrianised with wide footpaths and sitting areas

FOB at narain singh circle with properly demarcated zebra crossings



Footpath along statue circle



Footpath along vidhansabha road







- FOBs are not popular
- People must remain at grade

No pedestrians, Near Jaipur golf course



No walker, FOB at collector circle



No walker, FOB at narain singh circle

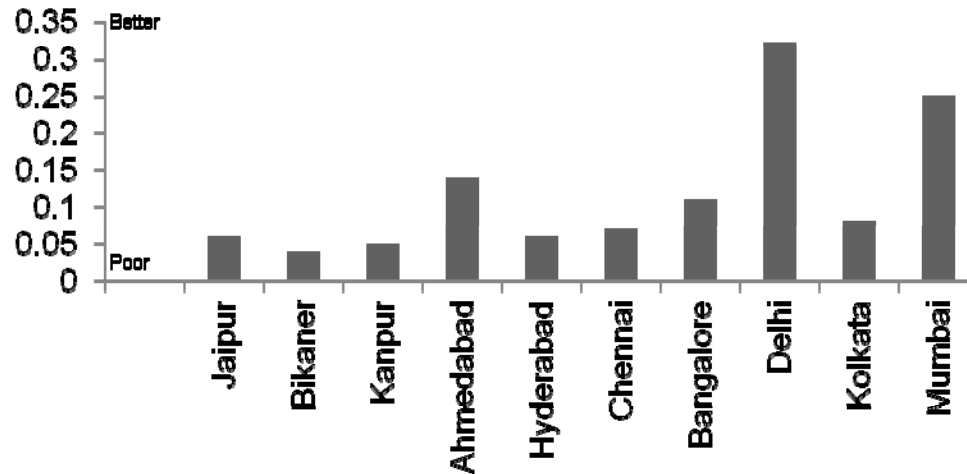




## How Jaipur compares with other cities?



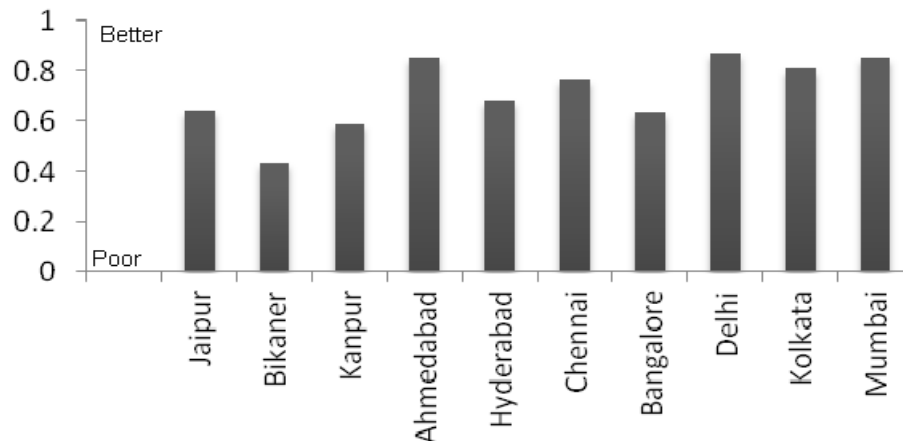
**Road safety index: Jaipur scores poor in road safety**



- The road accidents statistics for 2010 indicates that 414 fatal accidents took place in the city and total accidents were 2,000.

- CMP indicates that number of fatal accidents have increased in the city from 17 per cent in 2004 to 22 per cent in 2008.

**Walkability index: Jaipur, Kanpur, Bangalore are comparable**



- The Wilbur Smith Report indicates that the share of bicycle accidents of the total accidents are 2 per cent and pedestrian accidents are 7% as per 2005 data.



## Lessons from Delhi

### Poor walking infrastructure in Delhi



Captive walker in poor neighbourhood (Govindpuri and Zaffrabad): Traffic and people on collision course.....

- Discontinuous, poorly paved footpaths, and not easily accessible
- Height and width of pavements violate norms
- Poor signages, no pedestrian refuge islands -- crosswalks are ordeal
- No kerbed ramps or blended crossings to access the crosswalk facilities
- Exposure to traffic very high.





## Mismatch in demand and supply in Delhi



### Aurangzeb Road and Govindpuri

We have counted 3 persons per 10 minutes in Aurangzeb Road and 100 person per five minutes in Govindpuri

Urban planning does not keep people in focus





## Car infrastructure severing neighbourhoods and pedestrian routes in Delhi

(All India Institute of Medical Sciences intersection)



**Before**



**After**

Cloverleaf flyover disrupt at-grade continuity and direct shortest route, increase walking distance for the ailing visitors using public transport  
At least in one direction use of subway is unavoidable



**Delhi: Jay walking....asserting their right to cross where convenient**



**But car centric design does not allow safe, quick and shortest crossing**



Sai Chowk, Patparganj



Scindia House, CP

Seamless and signal free traffic is interrupting shortest direct route for pedestrians. This is inciting jay walking





## Unusable infrastructure: Wasteful



Unusable infrastructure:  
Wasteful

Guidelines of Indian Road  
Congress are inadequate

Eg. In the absence of proper  
guidelines on height of  
pavements unacceptably  
high pavements without  
proper gradients are being  
made.....





## Retrofitting changes.....



Connaught Place

- Sidewalks are now being rebuilt in Delhi



Source: CSE





## It is possible to change

Redesigned streets in a small town of Nanded in Maharashtra



**Before**

**After**



Source: Pradeep Sachdeva



## Need to change the practice



While car owners resent expansion of walk space ..... **...public voice gets stronger for liveable walking city**



Public protest against PWD road-widening for the Commonwealth Games at Siri Fort to save the **footpaths**

PROTESTS PERSIST: Locals says the government body doesn't have necessary approval to undertake the work

Source: Times of India





## **Walking needs policy strategy**



**Reform and enforce mandatory pedestrian guidelines** for new roads as well as rebuild, beautification of existing roads – transform the entire city network

Delhi has adopted pedestrian guidelines. These are the basis of approval of road projects infrastructure funding.

**Public transport plan needs linkage with pedestrian plan**

**Urban local bodies must conduct periodic walkability and safety audits**

**Legislate right to walk:** Should we have comprehensive road users act?

**Need zero tolerance policy for accidents**

**Involve communities on decisions on use of road space**

**Need pedestrian network plan**

**Adopt traffic volume reduction plan**



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**Remove hidden subsidies to cars.....**



# No solution yet to parking MESS



All busy market roads have become parking slots. No space is left for shoppers

TIMES NEWS NETWORK

The city authorities are said to have been campaigning to make Pink City a world-class one for some time now, but citizens keep wondering how this could be possible when basic facilities like proper parking space outside markets are absent. In residential areas most of the houses have not adhered to building laws. This has shrunk road space as vehicles are parked on roads.

TOI takes a look at bizarre parking habits of residents:

## Raja Park:

This is considered a posh area. However, people here seem to have violated all civic norms. Residents complain uncontrolled commercialisation of the area has choked the roads. At least 100 houses here have no parking space.



APRIL SHARMA

parked in front of gates blocking the entrance of residential blocks.

Proposed project: ADPR is ready and the government is likely to approve after the tender of the project. After the tendering process is completed the work order will be issued. The proposed site would cater to commercial establishments in the C-Scheme and it would handle around 800 vehicles.

## Johari Bazaar:

The traditional market areas in the Walled City like Johari Bazaar, Chandpol Bazaar, Bapu Bazaar, Bani Park and others have the same problem.

—no parking space

one-way traffic for most of the day due to congestion and almost no slot for parking except one (paid parking) near Jayanti Market. Traders have often appealed to the JMC without results. Ratan Jaiswal, a trader says, "We have the same problems faced by businessmen in the Walled City. Only the roadside is available for parking. We can only hope that the recent government announcement to develop five parking slots at various locations in the Walled City will be about soon."

# Govt mulls parking policy for city

## Huge Hikes In Parking Fees Likely To Discourage Use Of Private Vehicles

Publication: The Times Of India Jaipur; Date: Aug 17, 2012; Section: Times City; Page: 3;

# 3 multi-level parking projects inaugurated

TIMES NEWS NETWORK

Jaipur: Three major parking projects worth over Rs 160 crore were inaugurated in the city on Sunday. They will provide parking facilities to around 3,000 vehicles. The three projects are a 2,000 vehicle capacity underground parking at the Ramleela Ground, a 500 vehicle parking at Ashok Marg culvert and another 500 vehicle parking near Panch Batti.

The projects are being promoted by the JMC and will be developed on public private



Shanti Dhariwal inaugurates a parking project on Sunday

6%, the number of registered vehicles increases by 12% annually.

"Vehicles parked on roads not only obstruct the traffic, lack of parking space also creates a difficulty for the visitors at the major markets. It has been a good move from the government to initiate special measures for solution of the issue," said MLA Civil Lines, Pratap Singh Khachariyawas.

Work on four multi-level parking proposed at Atish Market, Chandpole Anaj Mandi, and Government Hostel and

The underground parking at Ramleela Ground is expected to eradicate encroachments on roads by unauthorized parking in Walled City. The parking initially was proposed to be nearly 300 vehicle capacity but it was later expanded to accommodate 2,000 vehicles considering the increase in parking demand. The urban development department has however assured that the parking project will not affect the appearance and functionality of the Ramleela Ground.

Meanwhile, as a mark of

Publication: The Times Of India Jaipur; Date: Jul 13, 2008; Section: Times City; Page: 1;

# Parking menace irks Sindhi Camp traders

TIMES NEWS NETWORK

Jaipur: The parking woes at the biggest bus stand in the state - Sindhi Camp - came to fore on Saturday when traders blocked Station Road and shouted slogans against civic and police authorities alleging acute negligence towards the problem.

Saturday's stir was sparked by a clash between two traders and some taxi





## Free and discounted parking creates more incentive for car use for all kinds of travel....



**Parking: wasteful use of cars:** Out of 8760 hours/year the total steering time of an average car is 400 hours. For about 90 to 95% of the time a car is parked.

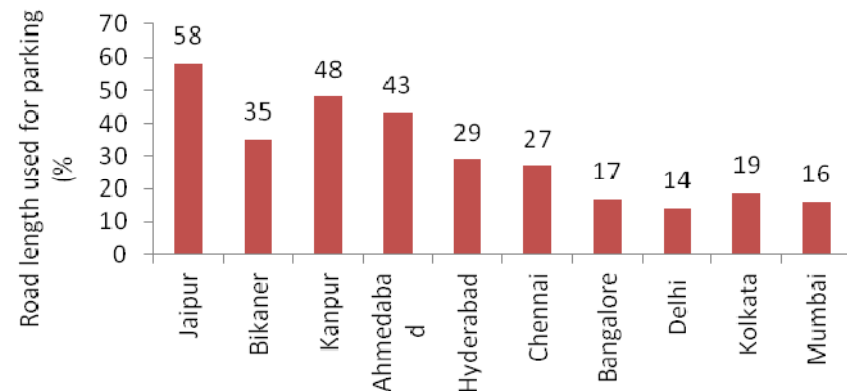
**Insatiable demand for land:** If demand for land for an average car is computed based on average car size and multiple parking spaces per car -- the total cars already use up 10% city's urbanised area. The forest cover in Delhi is 11.5 %.

**Annual registration of cars in Delhi** is generating demand for land equivalent to 310 football fields! Land is expensive and has other opportunity costs. Jaipur about 50 football fields every year.

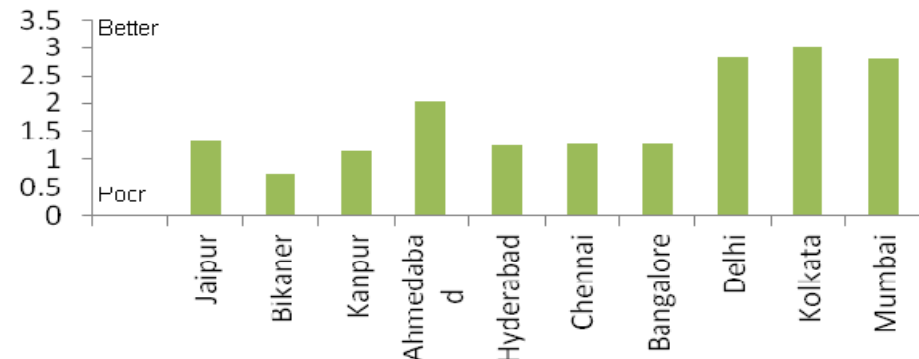
**Inequitous use of land:** A car is allotted 23 sq m for parking. Under low cost housing scheme only 18 sq m is allotted to poor families. Car owning minority using up more urban space.

**Cars are biggest encroachers in Jaipur: 58% of roads in Jaipur are taken up by parking**

**On –street parking on major road corridors: Jaipur 58% roads**



**On street parking interference index: Parking causes similar levels of interference in Jaipur, Hyderabad, Chennai and Bangalore**



Source: Based on MOUD data



## Use parking policy to reduce demand for parking and cars. Influence commuter choice



### Should we keep supplying more parking?

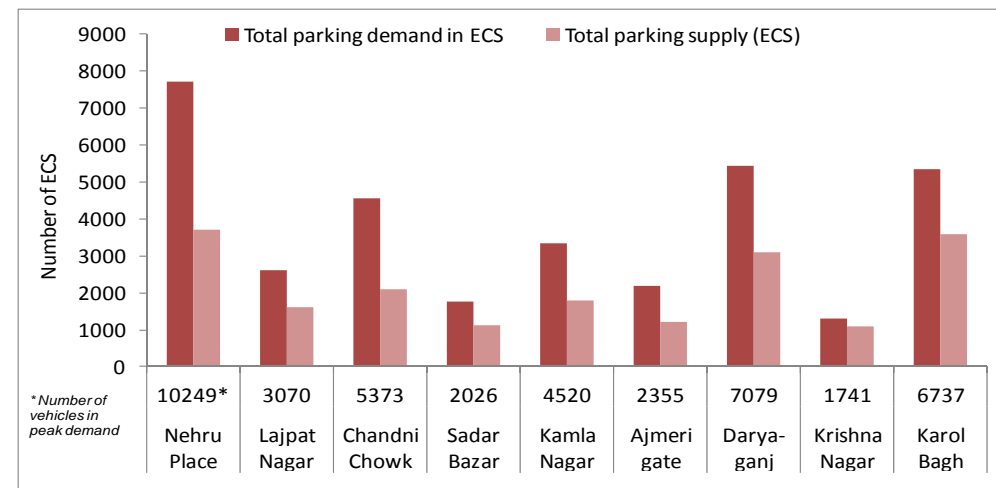
Delhi provides 3 parking slots per 100 sqm in commercial areas

Jaipur provides one slot/ 50 sq m built up area

Tokyo has highest car ownership in Asia – 350 cars per 1000 people. But its parking standards in commercial areas is 0.5 parking slots per 100 sqm.

But Delhi with 84 cars per 1000 people provides 3 parking slots per 100 sqm.

### Example from Delhi: Yawning gap between peak parking demand and supply and short fall



Source: CSE estimates based on CRRl report: (2006), New Delhi,





## Hidden subsidy to car owners



### Jaipur CMP focuses on parking supply and management. Revision of parking pricing not considered

- Organize the on street parking on Chandpol bazaar, Ramganj bazaar road, Kishanpol bazaar, MI road by providing designated parking bays
- Additional off-street at grade parking space on the vacant land near Rajiv Gandhi Shopping complex
- new parking spaces to integrate with public transport terminals
- Parking plan to facilitate pedestriansation schemes
- New mutli storied off-street parking structures to substitute on street parking

### Jaipur parking fees are dismally low:

**Buses are charged several times higher than cars**

Duration	Cycle	2-wheeler	Car	Bus
First 3 hours	2	3	10	30
3-12 hours	3	5	15	50
12-24 hours	5	10	20	100
Monthly	75	150	400	1500

Source: Jaipur Municipal Corporation





## Understanding cost of multi level parking

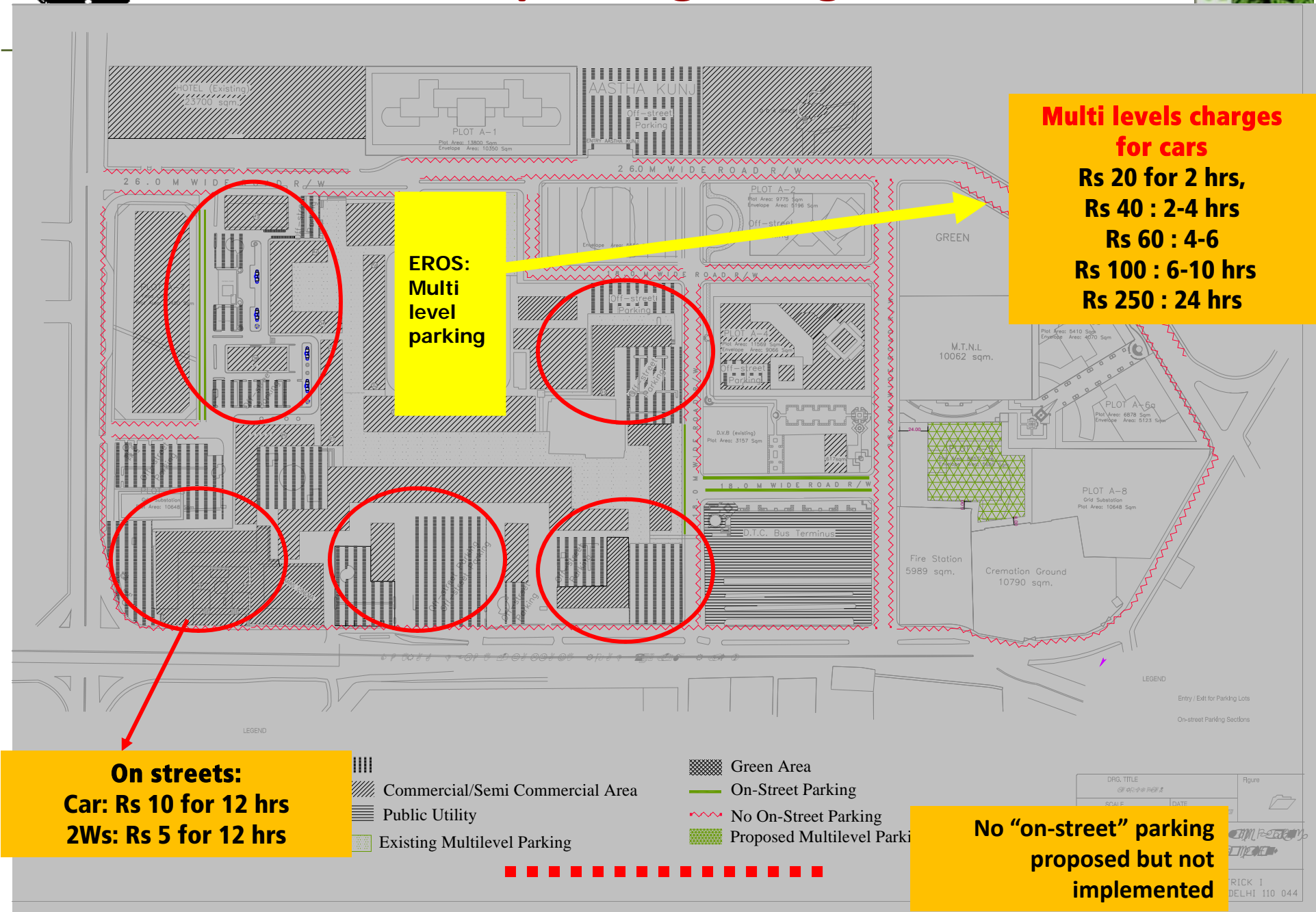


### Example from Delhi

	BKM multi level parking		HT multi level parking	
	Parking and commercial	Parking only	Parking and commercial	Parking only
ECS	941	780	1,209	1,025
Cap. Cost Rs in lakh per ECS	4	4	4	4
Total Cost in lakhs (including cap, working, taxes etc) (Net Present Value)	5,290 (Rs 1672 per sq feet)	3,849	7,523	5,310
Revenue in lakhs (NPV)	6,724	4,168	9,352	5,574
IRR in %	12.68	12.67	12.68	12.69
Parking charges	Rs 10/h	Rs 30.25/h	Rs 10/h	Rs 39/h



# Irrational parking charges in Delhi





## Need parity of rates between structured and surface parking



**Lesson from Mumbai: Discrepancy in rates can lead to underutilisation of MLP**

**INOX the multiplex in Nariman Point**

**Before construction of MLP:** No. of surface parking spaces: **140**, Utilisation: **100%** during office hours

**After:** No. of parking spaces: **540**, Utilisation of MLP during office hours: **10%** Parking rates are Rs 5 per 30 minutes or Rs 10 per hour.

**Surface parking rates :** Rs 5 per hour and Rs 3 for every additional hour.

Source: Mumbai Environmental Social Network



**Poor  
utilization of  
multi level  
lot**

Situation in INOX Parking area on 5<sup>th</sup> May 06 – a weekday at peak time of 11:am

**Delhi** the cost of providing multi level parking is nearly Rs 4 lakh to 6 lakh per car space. Accordingly parking fee should be **Rs 30-39 per hour**. But people are used to paying paltry sum. This is a hidden subsidy to rich car owners.



## Parking policy: Guiding principles....



- Adopt flexible parking standards and review parking standards. Do not create oversupply. Account for improved public transport access and reduction in personal vehicle travel.
- Integrate parking design with multi-modal integration. Priority to NMT and public transport
- More stringent parking controls and enforcement in areas well served by public transport. Phase out on-street parking in targeted areas.
- Parking pricing -- Minimise free parking, restrict on-street parking, use variable parking rates, avoid fixed annual payment, price parity between surface and multi-level parking
- No parking on green spaces, pavement, NMT lanes, and service lanes. Non-negotiable.
- Need parking strategy for residential areas and mixed land use areas.
- Use parking revenue for other congestion reduction strategies and local amenities
- Stringent penalty on parking violations.
- Develop parking strategy for special localities like hospitals, railway station, cinemas, shopping malls, schools, high impact events etc
- Provide parking for public transport vehicles
- Need innovative parking strategies for residential areas for demand management

**Policy opportunity:** National Urban transport policy provides for parking as a restraint measure; JNNURM reform agenda; Supreme Court directives on parking and congestion.





## Other countries are limiting and pricing parking supply



**Portland, Oregon** set an overall cap of 40,000 parking spaces downtown. This increased public transport usage from 20-25 per cent in the 1970s to 48 per cent in mid 1990s.

**Seattle** allows a maximum of one parking space per 100 square metres at downtown office

**San Francisco** limits parking to seven per cent of a downtown building's floor area

**New York:** Very high parking fees and limited parking supply lowers car ownership far below the average rates in other US cities.

**Boston** has frozen parking requirements at 10 per cent higher than the 1973 levels. This has helped Boston to meet the federal clean air standards.

**Bogota** has removed limit on the fees that private parking companies can charge. The revenue is dedicated to road maintenance and public transit improvement.

**Shenzhen:** Hike in parking fees during peak hours leads to 30% drop in the parking demand.

**Tokyo:** Enforcement against parking violations cuts congestion drastically . Private firms allowed to issue tickets for parking violations. This makes on-street parking expensive.

**Bremen:** No free parking in city centre. Parking charges higher than public transport cost.

**Globally,** customers agree to pay high parking charges if they get good shopping and pedestrian environment. This also improves business.



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**The affordability challenges.....**



## National JNNURM: What's wrong (and right) here?



**In India National Urban Renewal Mission has a reform based funding scheme for transport.**

**But.....**

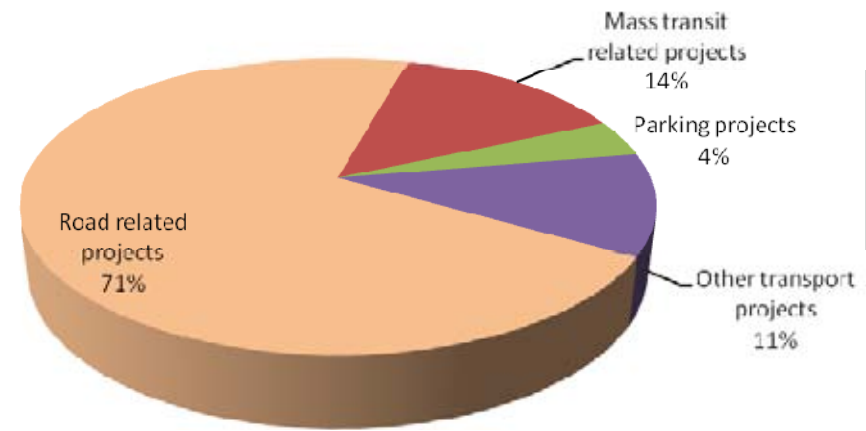
The investment so far is heavily biased towards road infrastructure.

**More than 71% of the transport related projects are road related projects.**

Little on public transport and barely any in cycling and walking infrastructure.

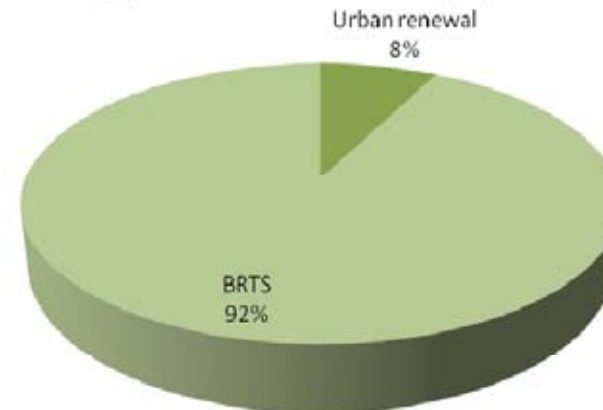
### Funding ignores sustainable modes in 63 cities

Urban transport projects - segment wise distribution



### Jaipur is an exception: more than 90% funds are for BRT

JNNURM approved cost of sanctioned projects for Jaipur





# Indian style socialism



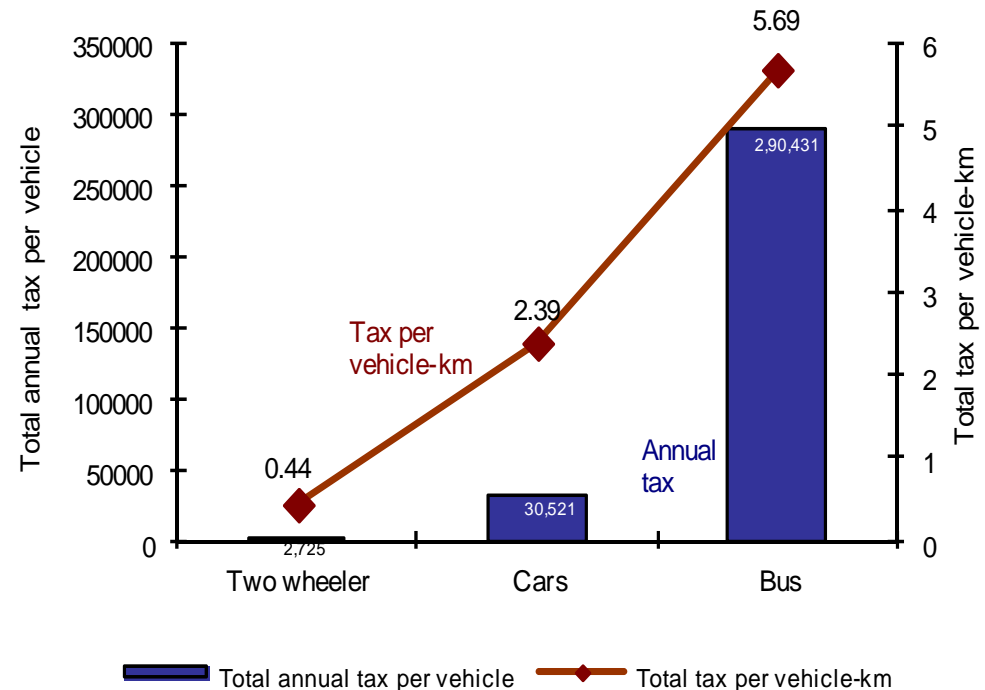
## We tax our public transport more than cars...

### Correct distortions...

Buses bear high tax burden than cars and two-wheelers. If lifetime tax is amortised then car pays roughly Rs 300 per year. But buses pay about Rs 13,000 per year – 43 times more than cars. **Thus, penalised for carrying more passengers**

If bus fares are raised, a substantial public transport ridership can be lost to two wheelers with running cost of just Re 1/km

For example -- Delhi with nearly the highest per capita income and car pays the lowest taxes.





## In Jaipur too bus pays more tax than cars



- **Road tax on buses:** 1.2% of cost of vehicle (up to 2 lakhs) to 1.5% of cost of vehicles (cost of vehicle > 4 lakhs).
- **Road tax on cars** – 2.5% on cars costing from Rs 2.5 lakh to 10% on more than Rs 10 lakh
- This translates into -- a bus priced at Rs 27 lakh pays Rs 40,500 as tax
- A car costing Rs 4 lakh pays Rs 20,000 tax – less than bus.
- The tax on buses is double that of cars. Total incidence of taxes on buses is substantial.
- There is no annual tax.
- The city has exempted city buses from VAT







## A small whiff of change.....

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JNNURM mandates dedicated urban transport fund

Identifies the following as the possible sources of funds that can act as a fiscal brake on car centric growth.....

- Waive off/reimburse all its taxes on urban buses and city bus service

- Need advertisement policy to tap newer source of revenues

- Need parking policy as a car restraint measure

- Additional cess on automotive fuels

- Additional registration fees on cars especially diesel cars and two-wheelers

- Annual renewal fee on driving license, vehicle registration

- Congestion tax



## Nascent beginning...



### Indian cities have begun to apply fiscal instruments

#### Delhi

##### **Air Ambience Fund from environment cess on diesel fuel:**

**Air Ambience fee of 25 paise per litre on sale of diesel fuel has been implemented.**

Revenue from this cess is used to create Air Ambience fund to meet the cost of Delhi's clean air action plan. The power that has been conferred on the state boards – Delhi Pollution Control Committee – under section 31 (A) section 17 (1) of the Air (Prevention and Control of Pollution), Act 1981.

Air Ambience Fund used to subsidise battery operated vehicles from the 15 per cent subsidy and 12.5 per cent VAT reimbursement. The registration charge and one-time road tax levied at the time of registration to be reimbursed. Also subsidise conversion of old commercial LCVs.

CNG fuel has been fully exempted from sales tax

Subsidized loan for conversion of auto rickshaws and taxis



## More instances.....

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**Jaipur:** **Differentiated green tax** on old and new vehicles.  
Created urban transport fund

**Surat** **Dedicated urban transport fund:** Its revenue components to include vehicle tax amounting to Rs 8 crore, pay and park charges of Rs. 2 crore and license fee for advertisement rights of all kinds amounting to Rs. 5 crore

### **Bangalore**

**Green tax:** Bangalore has taken the lead to introduce Green tax that is imposed on the older vehicles.

**Fiscal incentive** for LPG conversion

Comprehensive **parking Policy** proposed

### **Hyderabad**

Exemption of motor vehicles tax on vehicles running on CNG, battery and solar power



## Learn from global approaches to tax reforms



### Annual registration or road fees on personal vehicles.

**US** – Cars pay more taxes and also differentiates the tax according to engine size – fuel inefficient bigger cars pay more.

**Singapore** – Road tax differentiated by engine size, fuel type

**Germany** – Cars complying with older emissions standards pay more than the current standards.

**China** has a range of taxes on vehicles –

**On purchase-** Excise, VAT, Tariff, Vehicle acquisition tax

**On ownership** – New car check out fee, License plate fee, Vehicle usage fee,

**Vehicle use** – Insurance fee, Road maintenance fee, Consumption tax

London, Singapore -- Direct fees for using roads and congestion. London reduced congestion by 26%. Increased in public transport ridership.

**There is no one silver bullet. Need a package of fiscal strategy to make the difference**



## Other governments calculate hidden Subsidies for Urban Car transportation and public funds for private transport



	Budget year	Inhabitants	Income from car transportation	Expenditure for car transportation	Difference	Subsidy per inhabitant	Cost-Recovery
Heidelberg	2004	142.500	13.137.822	30.634.581	17.496.759	122,8	42,9%
Rotenburg	2003	22.500	693.380	3.094.252	2.400.872	106,7	22,4%
Ludwigsburg	2000	86.936	9.090.874	19.293.557	10.202.683	117,4	47,1%
Düsseldorf	2002	569.046	24.699.867	167.106.878	142.407.011	250,3	14,8%
Lüneburg	2000	70.000	3.411.848	9.194.623	5.782.775	82,6	37,1%
Augsburg	2000	254.867	21.046.353	47.766.056	26.719.703	104,8	44,1%
Aschaffenburg	2002	67.788	3.041.045	11.366.940	8.325.895	122,8	26,8%
Freiburg	2000	201.000	17.163.087	37.993.383	20.830.296	103,6	45,2%
Ingelheim	2003	26.000	1.264.617	6.985.282	5.720.665	220,0	18,1%
Bremen	2000	547.000	12.551.020	72.959.184	60.408.163	110,4	17,2%
Dresden	2000	459.000	9.132.653	65.306.122	56.173.469	122,4	14,0%
Stuttgart	2000	581.000	20.663.265	104.591.837	83.928.571	144,5	19,8%
Average Germany (based on inhabitant numbers)						145,5	29,1%
Graz	2003	238.000	20.832.664	60.959.484	40.126.820	169,0	34,0%
Geneve	2002	182.560	13.944.143	40.038.362	26.094.219	142,0	34,8%
Ferrara	2002	130.000	3.553.267	9.310.289	5.757.022	440	38,2%

Source ICLEI, Hidden Subsidies for Urban Car Transportation





## Other global cities are dismantling car centric infrastructure.....



**Before**



**After**

Seoul's Cheonggyecheon restoration project

**Cities that have destroyed roadways**



San Francisco

Milwaukee

New York

Portland

Toronto

Seoul





**Our cities need upscaled transition  
Avoid future emissions  
Shift to sustainable modes of mobility**



**Opportunity to provide scaled up alternatives**

Public transport and integration  
Infrastructure for walking and cycling

**Reduce demand for travel and vehicle usage**

Land-use planning  
Road pricing  
Tax rationalisation  
Parking policy and charges

**Leapfrog technology**

Emissions standards  
Fuel economy standards

**Fund the transition:** Need tax measures to allocate resources efficiently and raise revenue. Taxes on public transport is 2.6 times higher.

**This needs support. Must not be allowed to fail..**

**Otherwise what???**



Thank You...

