Sustainable cities are inclusive cities: urban growth in the South has to be affordable and so sustainable

Sunita Narain,

Centre for Science and Environment, New Delhi

Sustainable cities

- Oxymoron?
- Cities use huge amounts of resources, emit and excrete and discharge huge amounts of waste
- Are resource and capital intensive
- So can provide so some and not for all
- This is the '**nature**' of urbanization

Ugly, unhealthy, inequitable cities

- Inevitable?
- Toxic air pollution
- Scarcity of water
- Polluted rivers
- Garbage
- Lack of affordable housing
- Lack of mobility
- Shrinking common (public and green) spaces

Change is possible

- How?
- Need to change our method of ‘sustainability’ so that we can have affordable growth
- Cannot first pollute and then clean up
- Cannot first invest in expensive capital and then provide for all
- Cannot first invest in cleaning for some and expect to clean for any

Toxic air: clean how?

- Air is un-breathable in our cities
- Dangerous for our health
- Not just Delhi – almost every Indian city and every other South city
- Many do not know as they do not monitor
- Question is what do we do?
- Can we do what the rest of the world has done?

Incremental clean up…

- Clean air comes at high cost; needs constant investment; local air is cleaned but global atmosphere is polluted. Problem is not fixed.
- It is externalized. Or pushed to fix another day
- **We cannot follow**
- Do not have funds for incremental change
- Do not have air space to meet needs of all

Trajectory of pollution

- Clean up does not happen
- Mid-1980s; **SPM** – cleaned fuel; invested
- Mid-1990s; **RSPM**; **PM10**; **PM2.5** – Improved engines; mass of particles went down; but so did size: again invested
- Mid-2000; **NOx** – higher temperatures for particulate control; again investing
- Now **black carbon**; **ozone**, **climate change** contribution

Delhi's pollution story

- Mid-1990s: air black with smoke
- 15 years behind the world in terms of emission and vehicle technology standards
- We said lets **leapfrog**
- Move to CNG; don't just improve fuel but change fuel itself to reduce emissions

Roll down the window of your bullet-proof car, Mr Prime Minister
The security threat is not the gun. It's the air of Delhi

Hon'ble Prime Minister,

Here is something that just may convince you: while India's Gross Domestic Product has increased two-and-half times in two decades (1975-1995), the pollution load from industries has gone up four times and from vehicles a shocking eight times.

A study by the Centre for Science and Environment shows that the number of people dying due to air pollution went up by almost 30 per cent in four years between 1991 and 1995. An estimated 52,000 people are dying due to air pollution every year – about 10,000 of them in Delhi itself.

One person dies every hour due to air pollution in the city.

In Delhi vehicles are responsible for 70 per cent of the pollution load. Because of the high toxicity of fumes from transport fuel, one out of every 10-15 people living in Delhi is likely to get cancer.

Your government has failed to arrest this deterioration of air quality in Indian cities. Worse still, it contributes to the pollution in a big way by producing low quality fuel in state-owned refineries. Improving fuel quality is a short-term measure which will go a long way. Vehicles using clean fuel will pollute less.

Seeing your government's inability to tackle air pollution, we present you with a peoples' charter for clean air. This will help to immediately improve the quality of the air we breathe.

Mr Prime Minister, 50 years into Independence, please give us our right to clean air. We hope you will take our concern seriously.

Yours sincerely

Centre for Science and Environment
November 2, 1998

PEOPLES' CHARTER ON CLEAN AIR

FOR AN IMMEDIATE IMPACT

✔ **PRODUCE CLEAN DIESEL OR IMPORT**
Diesel emissions contain deadly particulate matter with traces of the strongest carcinogen known till date. Indian diesel is 250 times dirtier than the world's best.

✔ **REMOVE BENZENE FROM PETROL**
India is moving towards unleaded petrol. But this fuel contains too much benzene. Though we use one hundred times less petrol than USA, the total amount of benzene emissions from Indian vehicles is the same as in the US.

Benzene causes blood cancer and air should have no benzene at all, says WHO. Yet the level of benzene in and around Connaught Place in Delhi is 10 times higher than the European safety limit. If you live in Delhi, your chances of getting blood cancer are twice as high as people living in Bangalore, Chennai and Mumbai.

✔ **STOP PRIVATE DIESEL CARS**
Registration of all private diesel models should be banned in cities like Delhi. Cheap government diesel means more diesel cars, including luxury models.

✔ **TAX TO IMPROVE VEHICLE TECHNOLOGY**
Penalise vehicle manufacturers for producing polluting technology. Tax vehicles according to their emission level. Manufacturers will then invest in cleaner technology.

✔ **INTRODUCE EMISSION WARRANTY**
Make the industry accountable for the life-long emission efficiency of all vehicles they produce.

✔ **MAKE EMISSION LEVELS PUBLIC**
Manufacturers must inform buyers of the exact emission levels of their vehicles.

✔ **MONITOR ALL HARMFUL GASES**
Improve air quality assessment. A wide range of poisons are not monitored till date. Alert people about pollution levels in the city. It is done all over the world..

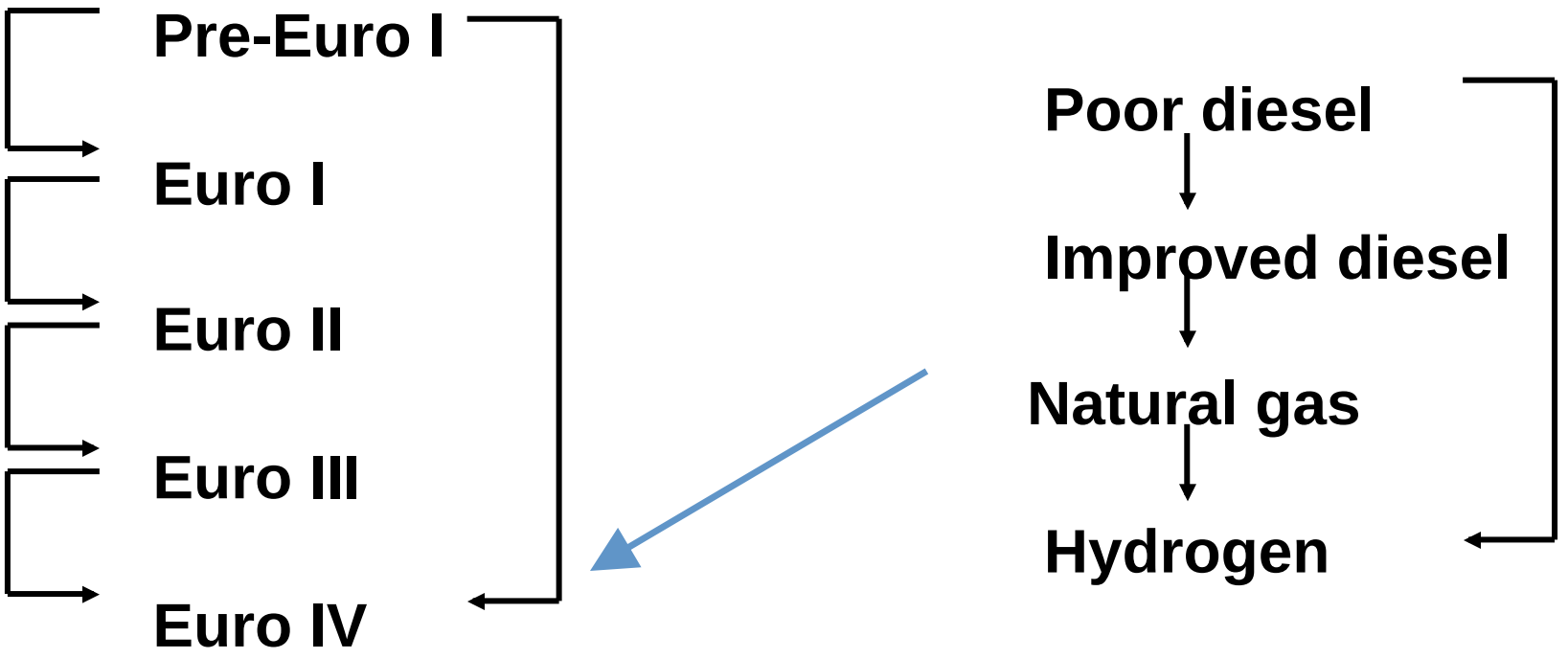
Register your protest to the Prime Minister today
PMO, South Block, New Delhi 110 001
Tel: 301 8939 Fax: 301 6857, 301 9817

Join CSE's Right To Clean Air campaign

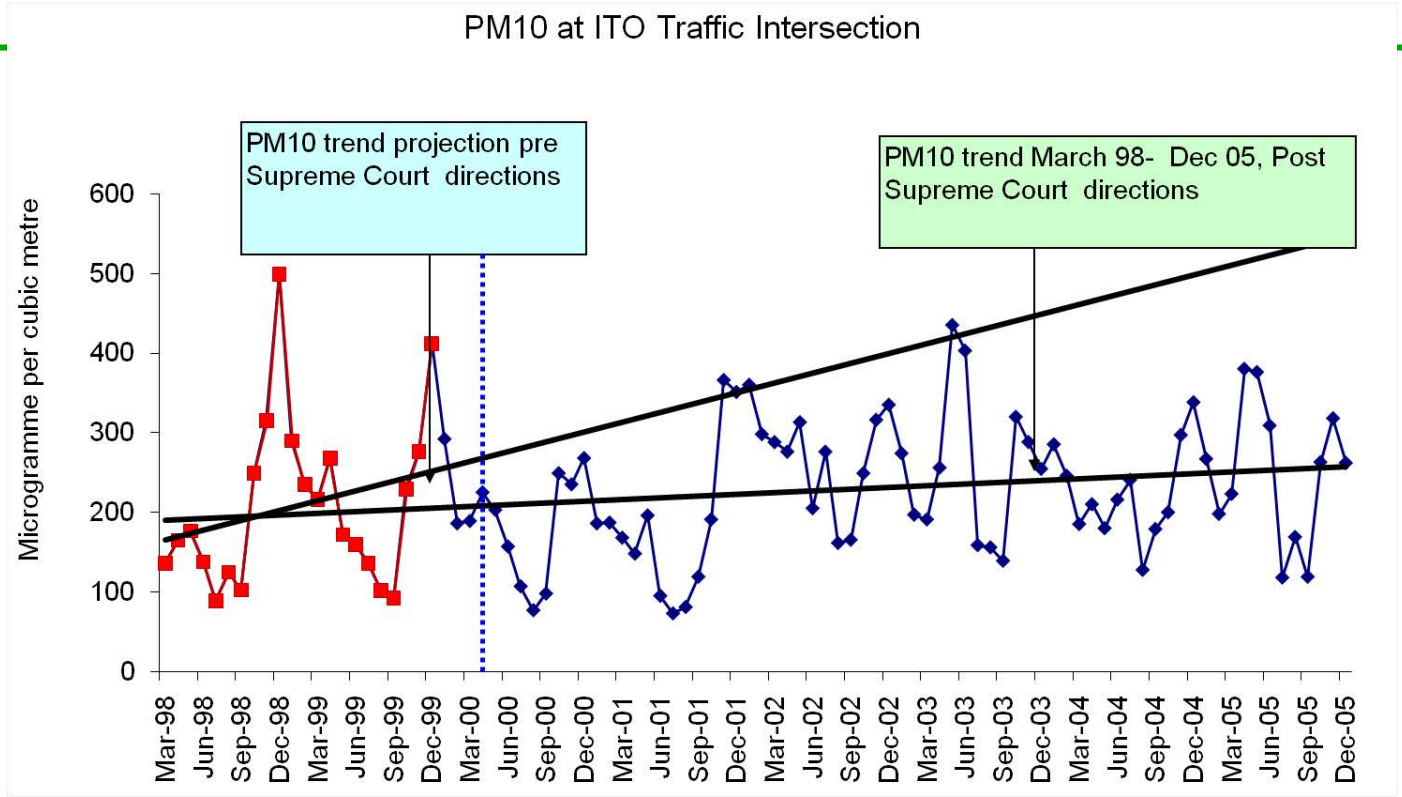
CSE
Centre for Science and Environment
41, Tughlakabad Institutional Area, New Delhi 110 062
Tel: 698 3394, 698 1124, 698 6399 **Fax:** 698 5879
Email: cse@cseindia.org **Website:** www.cseindia.org

Ist generation: jumping fuel

Leapfrog

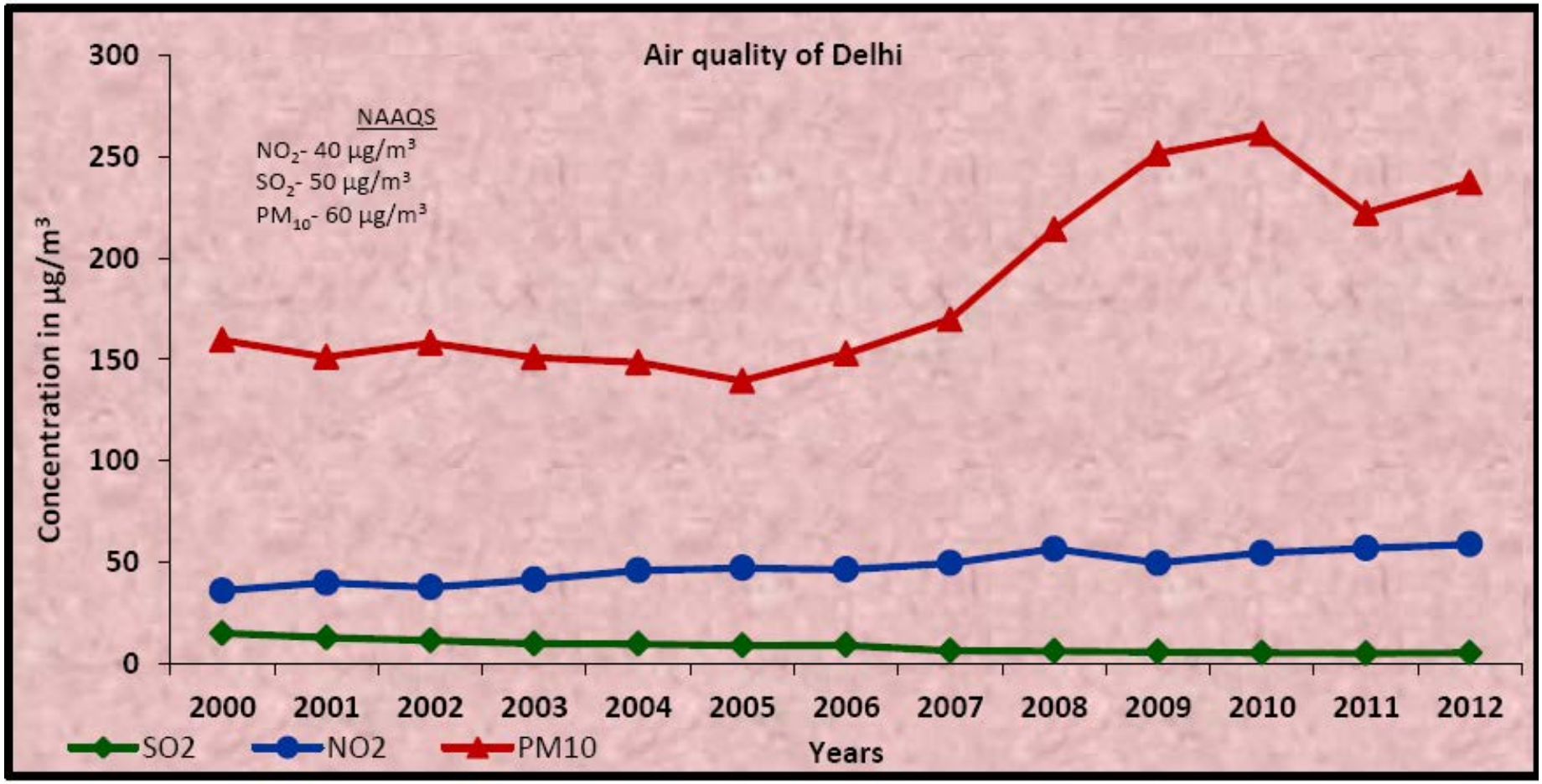


Delhi got cleaner air: it avoided pollution. We saw the stars



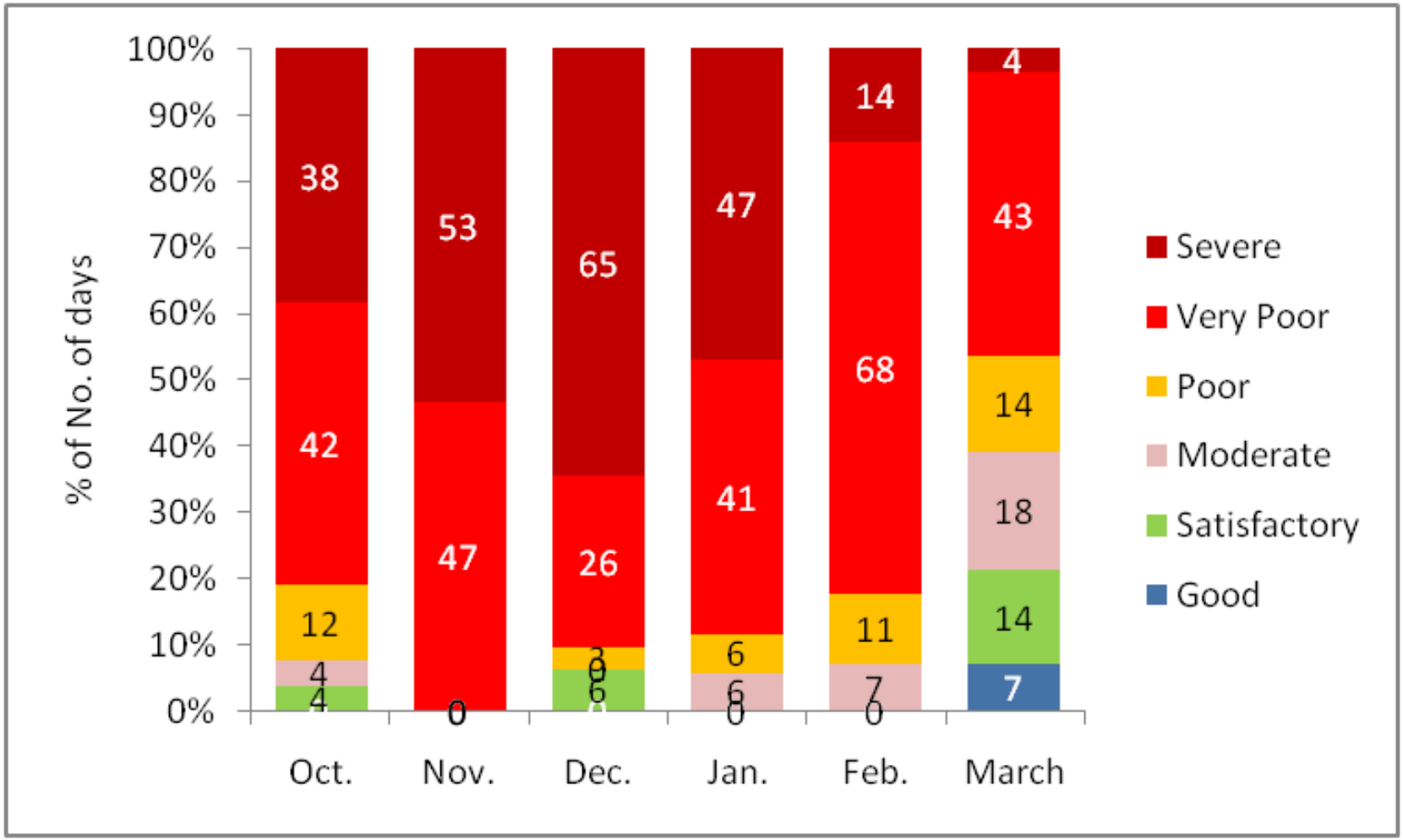
CPCB: 24% drop in PM10 levels in 2002 compared to 1996 levels
Resources for Future, US: CNG bus programme reduced RSPM, CO, SO2
Jawaharlal Nehru University study: Drop in polycyclic aromatic hydrocarbons levels in Delhi's air immediately after the introduction of the CNG programme
World Bank: Delhi has avoided more than 3500 premature deaths a year

But now pollution is back



Source: CPCB 2014, National Ambient Air Quality Status & Trends – 2012, page 133

Winter 2015:
Severe and very poor air quality

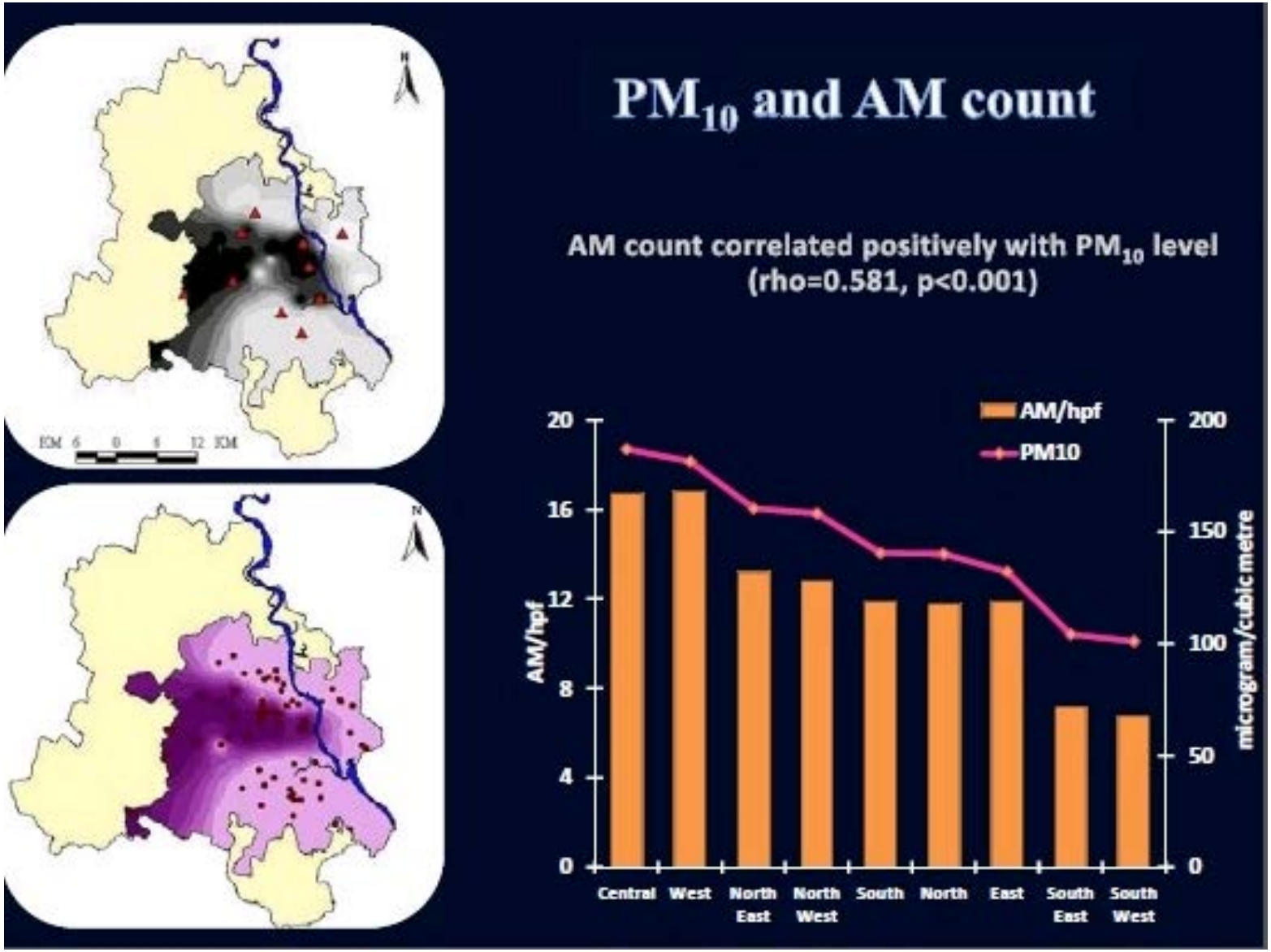


Deadly for our health
Not dust. But toxin in air

- **2012 epidemiological study on children in Delhi. Covered 11,628 school-going children from 36 schools**

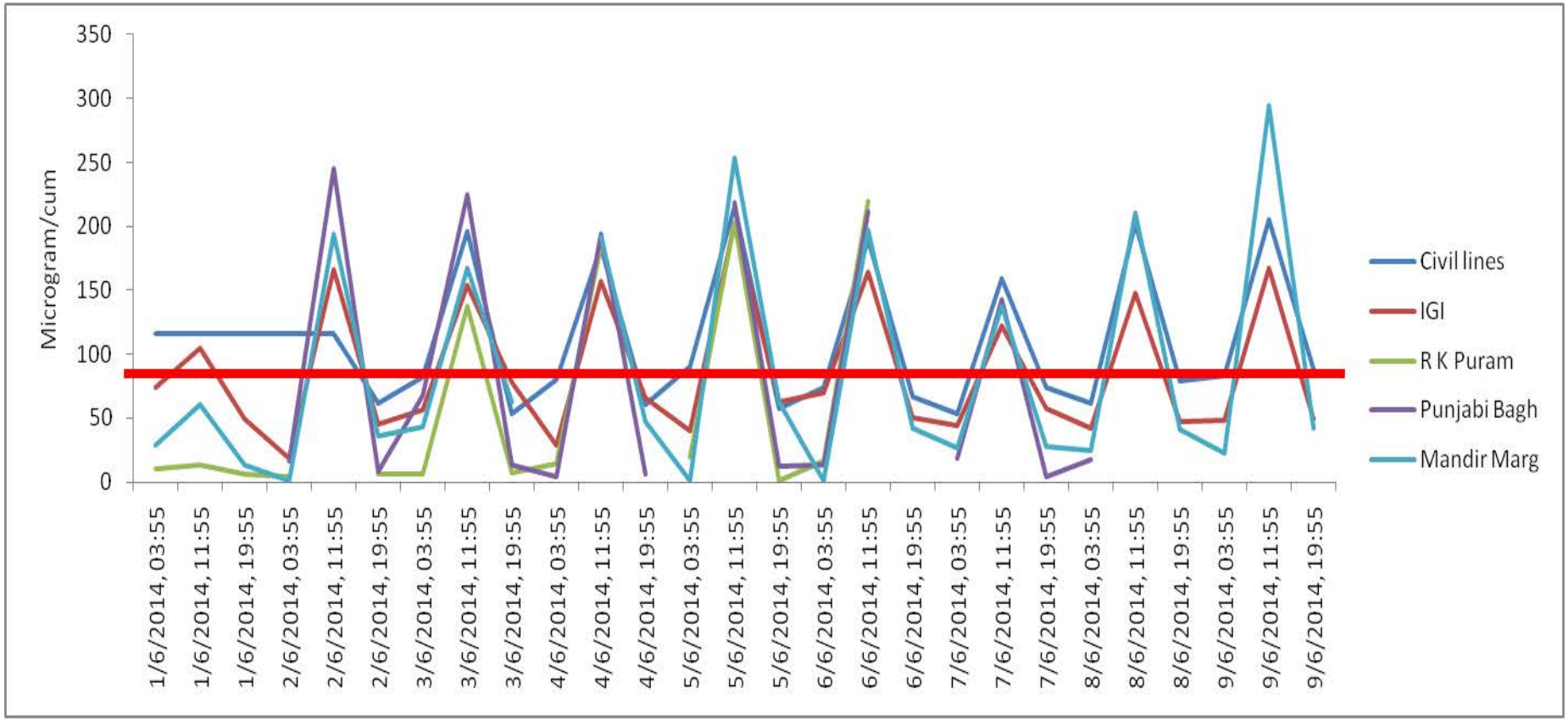
- **Every third child has reduced lung function. Sputum of Delhi's children contains four times more iron-laden macrophages than those from cleaner environments, indicating pulmonary hemorrhage**

Study co-related lung damage with high pollution levels in Delhi: global evidence even clearer



Not just poor; air pollution is great equalizer
Ozone: very bad for lungs is found where it is green

Ozone levels: Delhi summer of 2014

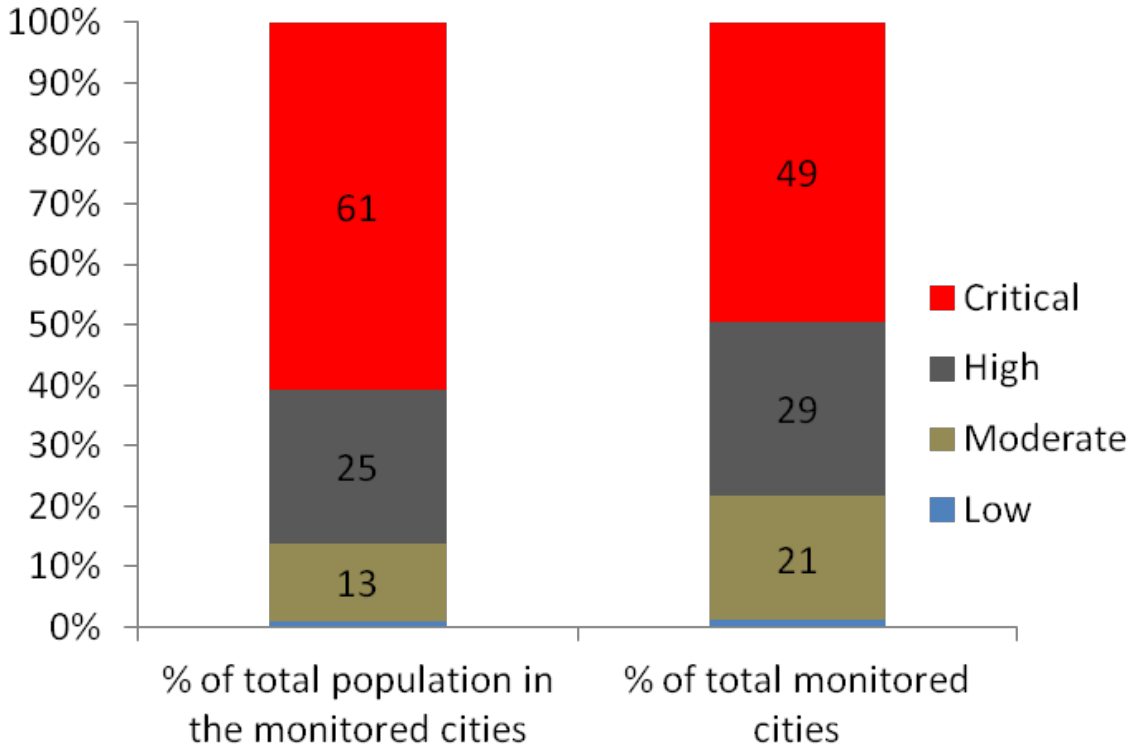


Source: Delhi Pollution Control Committee

Not just Delhi: all Indian cities air is toxic

50% of cities monitored are critically polluted for PM10: and increasing

But monitoring is poor; quality of data is abysmal



Source: CSE based on CPCB air quality data and Census population data

Why air pollution?

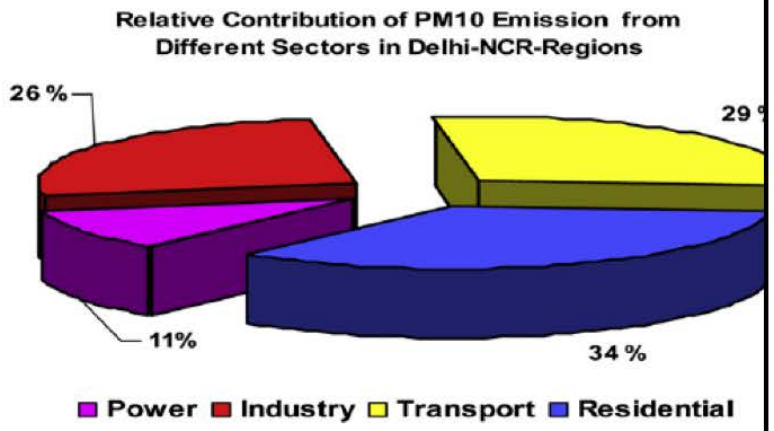
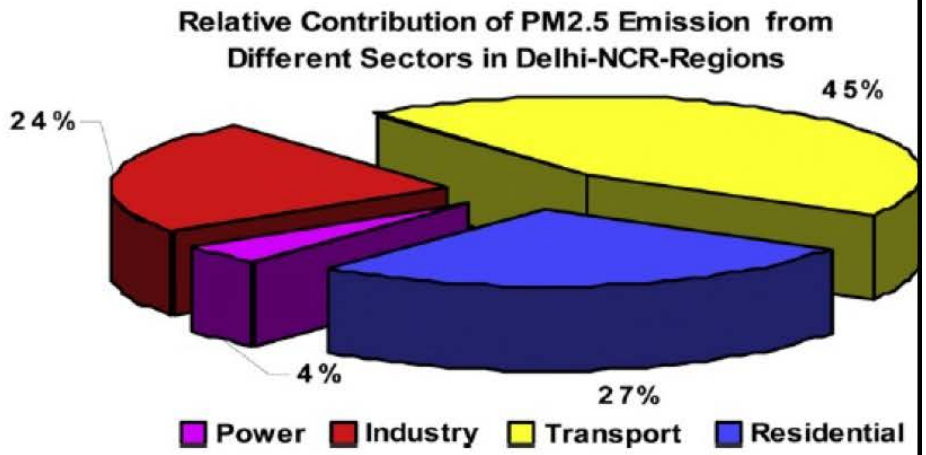
- Vehicles biggest source of pollution
- Cleaner vehicles introduced; but many more added = Pollution
- Cleaner vehicles but diesel vehicles growing = Pollution
- Don’t have money to check every vehicle

We stay behind the problem

Pollution grows; congestion grows

Why pollution?

Size of particulate matters: smaller and more deadly comes from transport; larger from construction/residential

Sources of PM10 in Delhi	Sources of 2.5 in Delhi
	

Source: Ministry of Earth Sciences, 2009

Mobility transition

- Technology-fuel quality improvement not enough
- We cannot afford model to first pollute and then clean up
- Only 15% of people in cities drive today. Already huge pollution, congestion
- Need **transformation**, not transition

No space for all

Today only **10-15%** of India commutes by cars

Private cars take up **90% of road space**

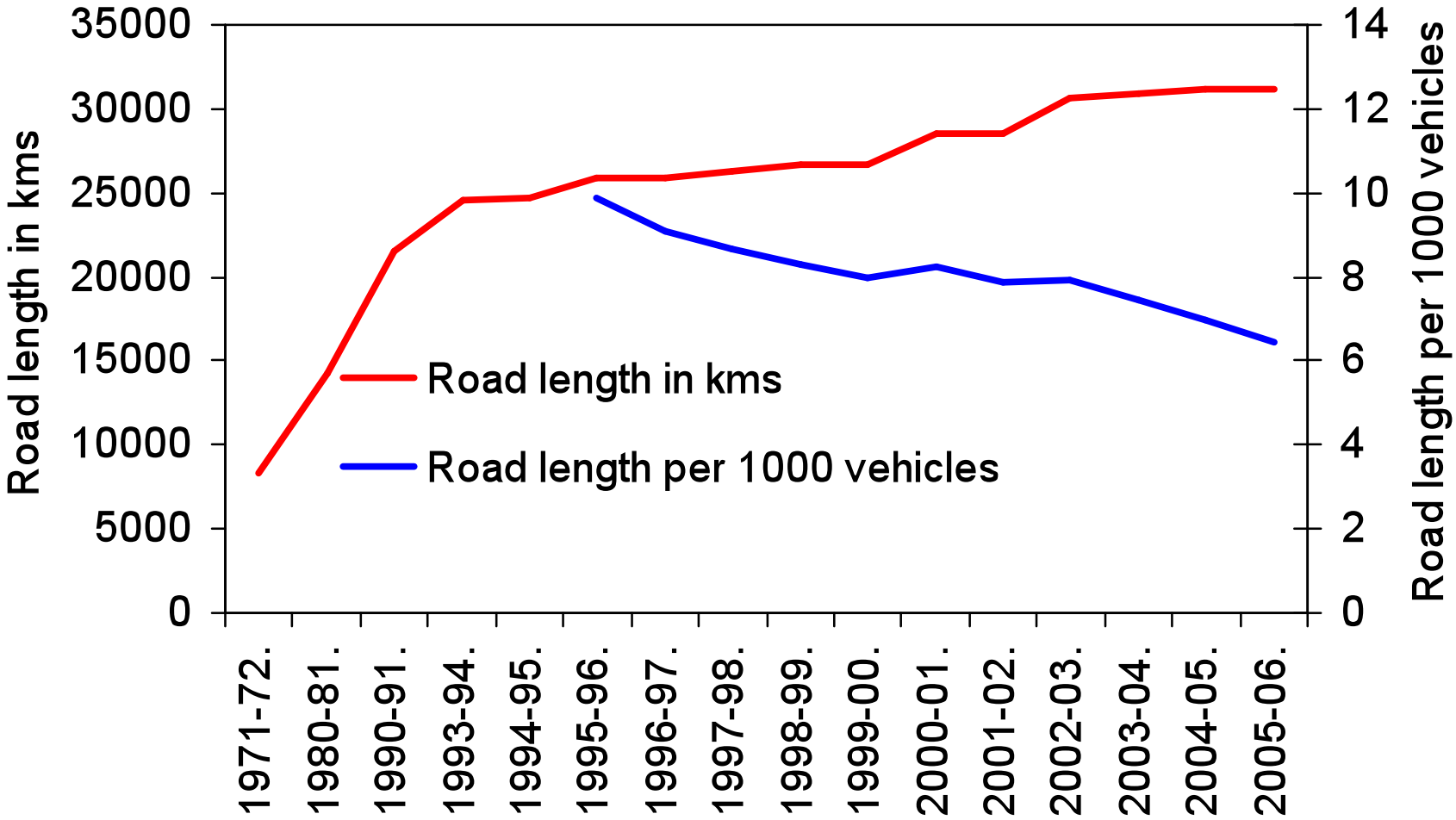
Flyovers built and filled

Delhi has 26% under road; 66 flyovers; pollution is up; road speeds are down

Where is the space for the rest 80-90% to drive

No choice but to plan differently today: Equity in road space use

More roads; less space and this when only 15% drive



Source: On the basis of Economic Survey, Delhi Govt

Must recognise the threat and opportunity

Cars occupy 90 per cent of road space in cities

Cars have not replaced the bus, the bicycle or walking

Cars have only marginalised the bus

40-60% use bus

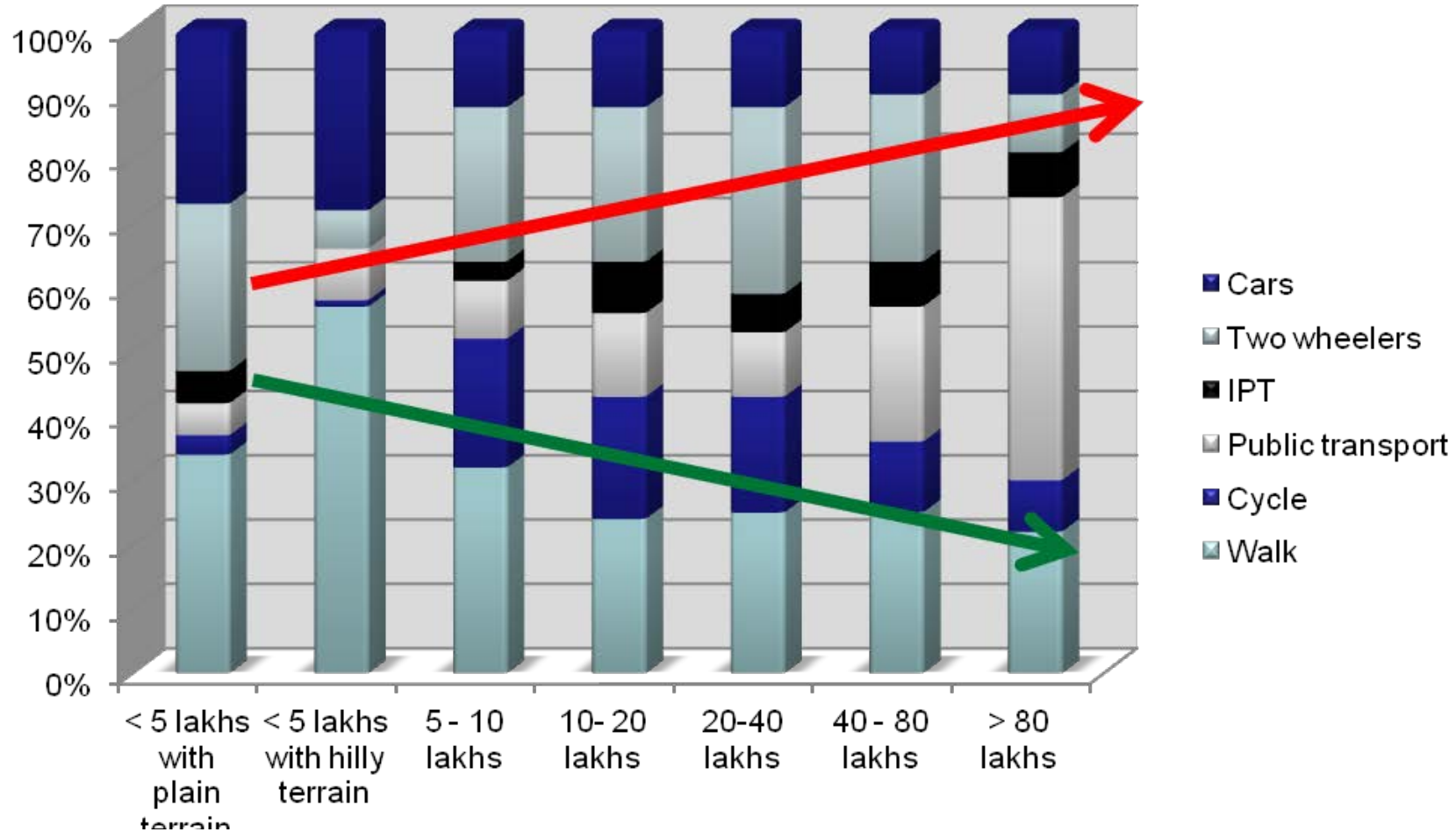
10-20% cycle

10-20% walk

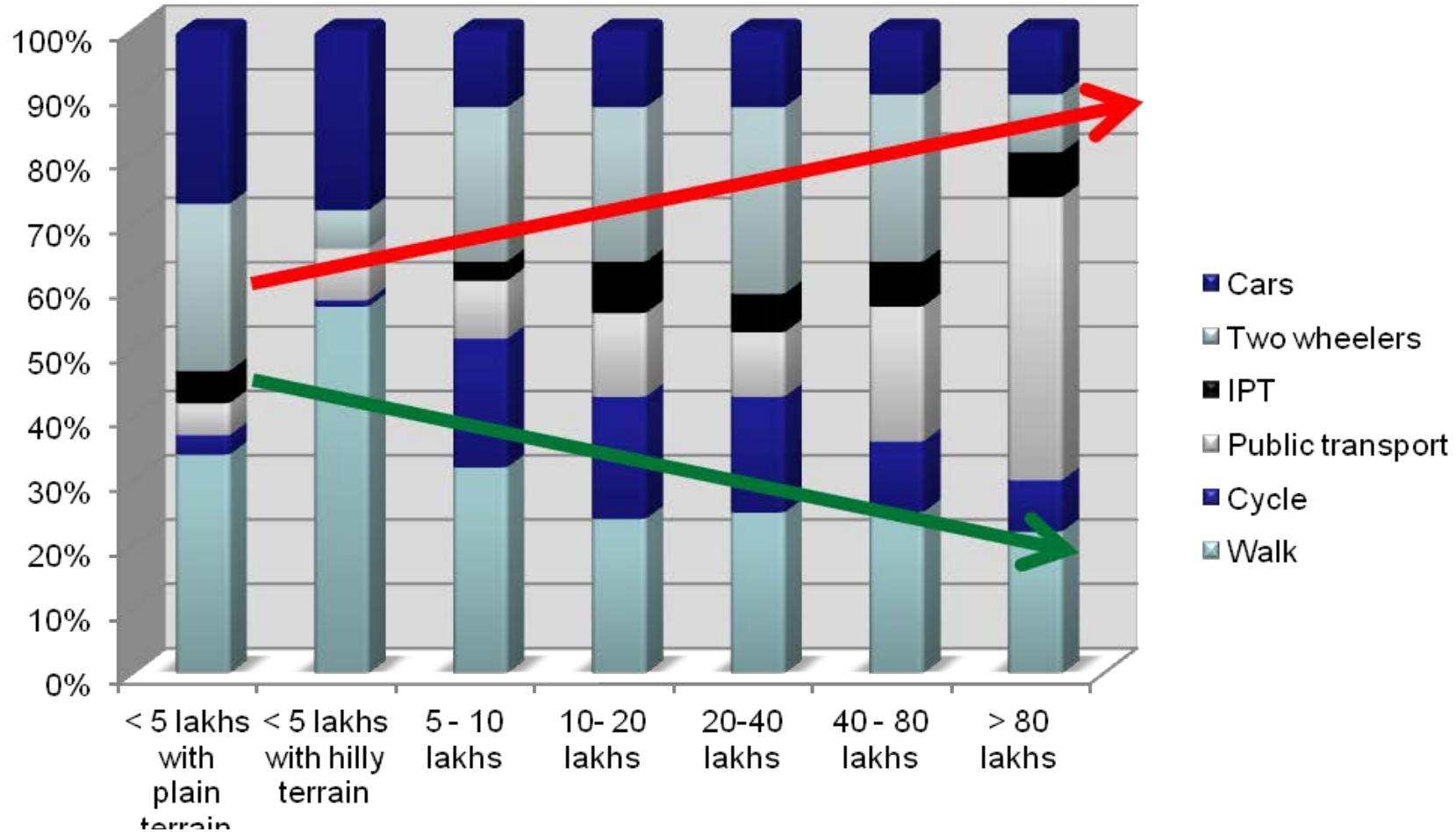
Only **10-30% use car+2-wheeler**

The opportunity

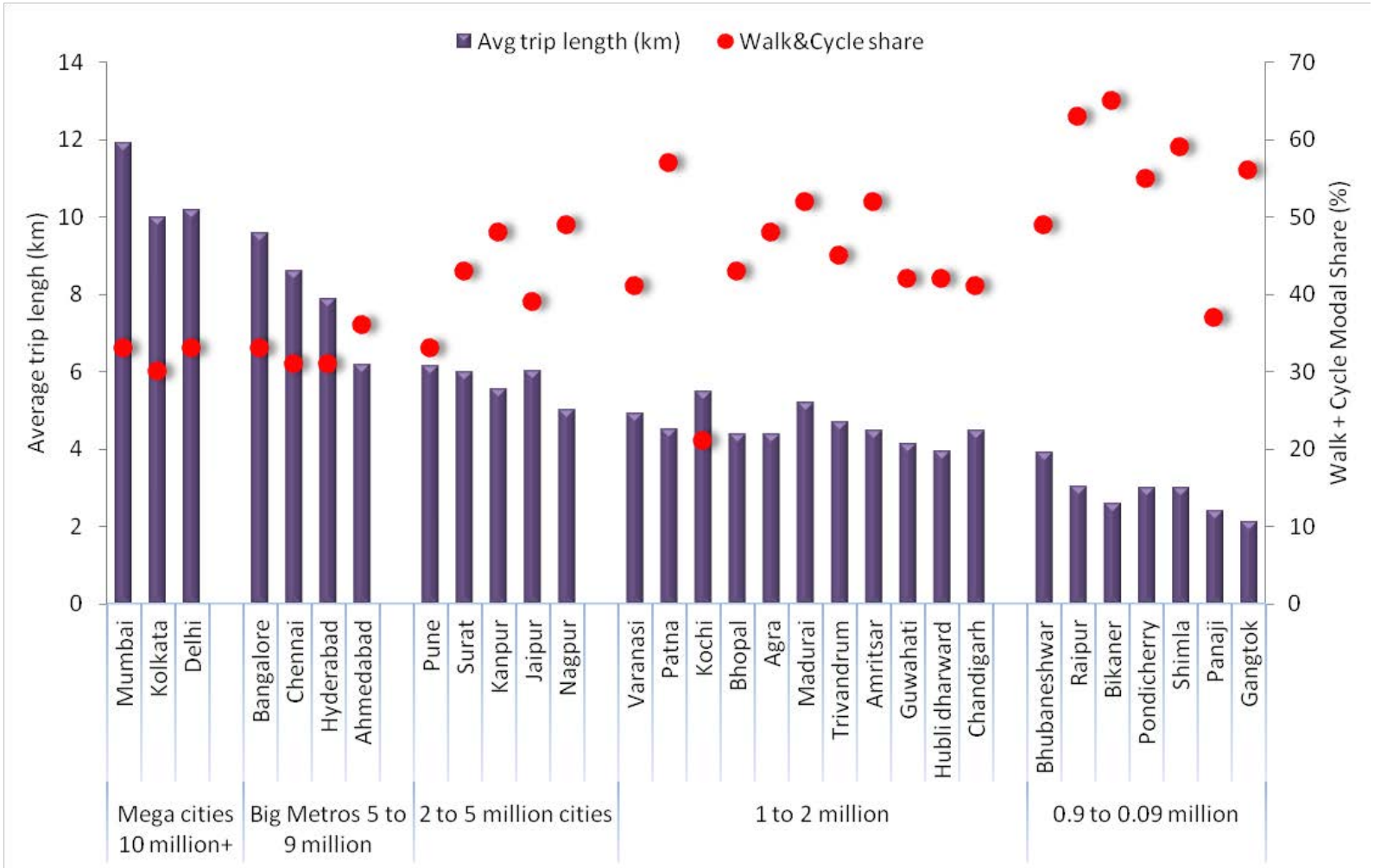
We walk and cycle because we are poor



How can we walk, cycle, bus when and because and when we are rich?



Walk and cycle will go down because cities will become bigger. Cities with shorter trip length have higher share of walking and cycling



Source: Based on MOUD/ WSA 2008

Air pollution control =

= reinventing mobility and city planning

- Cleaner cars; electric cars; fuel efficient cars are small part of solution
- Big answer is planning cities without cars
- Planning for augmented; modern public transport with last mile connectivity so that everybody can move together – inclusive city
- Clean air not possible without this

Water-waste

- Same story. Same paradigm

Water sourced from further and further away

Leads to increasing cost of supply

Leads to high distribution losses

Less water to supply at end of pipeline

Less water means more costly water

Cities not able to recover costs of supply, have no money to invest in sewage

Our study

71 city data analyzed
City water-waste profiles

Where does water come?

Where does waste go?

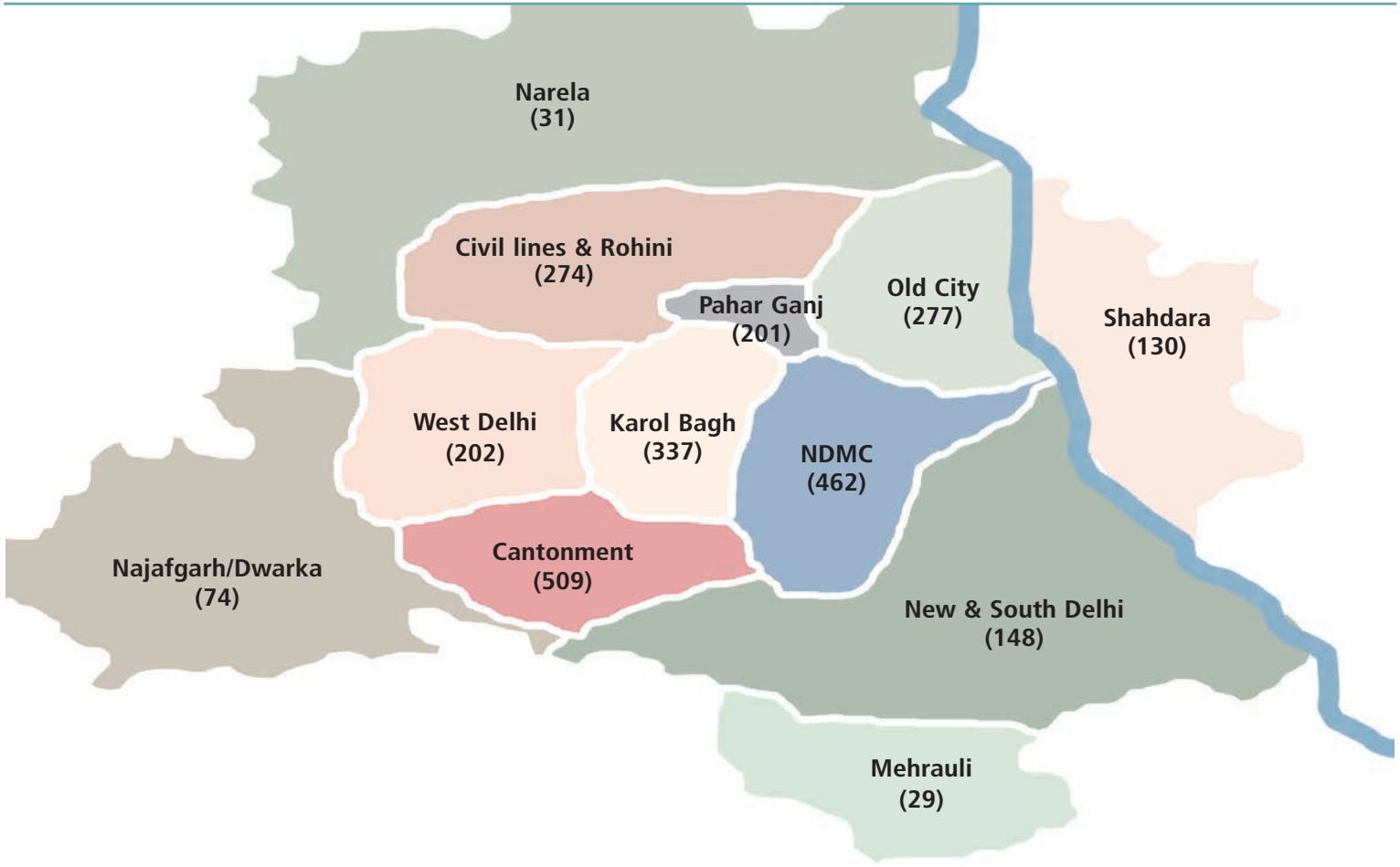
Capital intensity Leads to inequity

- Indian cities have ‘enough’ water for supply
- But water does not reach all
- Intra-city inequity is huge and growing

- Challenge is about justice, **but it is about technology** – current system expensive, too expensive to supply to all

= ‘Official inequity’

DELHI: CAPITAL INEQUITY (IN LPCD)



LPCD: Litres per capita daily; NDMC: New Delhi Municipal Corporation
Source: Sunita Narain *et al* 2007, *Sewage Canal: How to Clean the Yamuna*, Centre for Science and Environment, New Delhi

Water=waste

Cities plan for water, **forget waste**

80% water leaves homes as sewage

More water=more waste

But sewage treatment costs

It costs to build sewage pipelines; pump, convey; take to treatment plant; then treat

Costs of treatment is higher if there is no assimilation capacity in river/lake

First count
Toilets connected to waste

Census 2001	Census 2011	
No latrine	**Flush/pour toilet latrine connected to**	**72.6**
Service latrine	a. Piped sewer system	32.7
Pit latrine	b. Septic system	38.2
Water closet	c. Other system	1.7
	Pit latrine	
	With slab/ventilated improved pit	6.4
	Without slab/open pit	0.7
	Night soil disposed into open drain	1.2
	Service latrine	
	Night soil removed by human	0.3
	Night soil serviced by animals	0.2
	No latrine within premises	
	Public latrine	6.0
	Open	12.6

Source: Census of India 2011, Houses, Household Amenities and Assets: Latrine Facility,

Partial treatment = pollution

Cities cannot control pollution

Cost of building system is high

- City can build sewage system for **few**
- Spend to pump, repair and treat waste of **few**

But

- Treated waste of **few** gets mixed with **untreated waste of majority**
- The result **is pollution**

Full costs are not affordable

Privatization or not is not the question

Water-sewage-pollution costs are high and unaffordable by all

Cannot pay full costs

Sustainability..

..Demands that the system has to be affordable

1.Plan deliberately to **cut costs** of water supply – invest in local supply; cut demand

2.Spend on sewage and **cut costs** of treatment – local treatment; improved septic systems; recycle and reuse

3.Water to all; sanitation to all; costs of system has to be afforded by all

Sustainability requires
Planning for all

- Critical for sustainability that quality of public service has to improved
- Public service must be designed to meet needs of rich and poor – at affordable but differentiated costs
- Otherwise rich will move out (cars; air and water filters; bottled water)
- Cost of discharge/reject will be borne by poor and then by all

Garbage..

- Same story
- Increasing – though nobody knows how much we generate
- Changing in composition – more non-biodegradables
- Current solutions built on generating more; but then collecting and then getting ‘rid’ somehow. Failing

NIMBY: changing this story

- Not-in-my-backyard
- **Poor saying cannot dump your waste**
- **Rich saying cannot build incinerator**
- Option then is to do waste management differently
- Reduce
- Treat locally
- Recycle

‘Waste’ differently

- Value recycling industry
- Currently large proportion of waste (again nobody knows how much) is collected; separately; sorted; re-used and valued
- All this is done without recognition
- All this is seen as business of poor; because they are poor. **Not for us**
- This in fact is the future way

Bottom-line

- Invent ‘nature’ of urbanization
- Less resource intensive – so it is sustainable
- Less capital intensive – so it is affordable

- Real bottom-line
- **If not equitable then it will not be sustainable**

Urban environment issues: neglected in research

- Data is poor (does not exist); most calculations are based on assumptions – how much water do we use; how much garbage do we generate; how much sewage do we generate; who uses and how much; how is this changing
- Cannot design smart cities on this. **Very un-smart think to do**
- **But policy cannot wait for research to catch up. So urgent, rigorous and policy focus research needed**

CAPITAN AMERICA

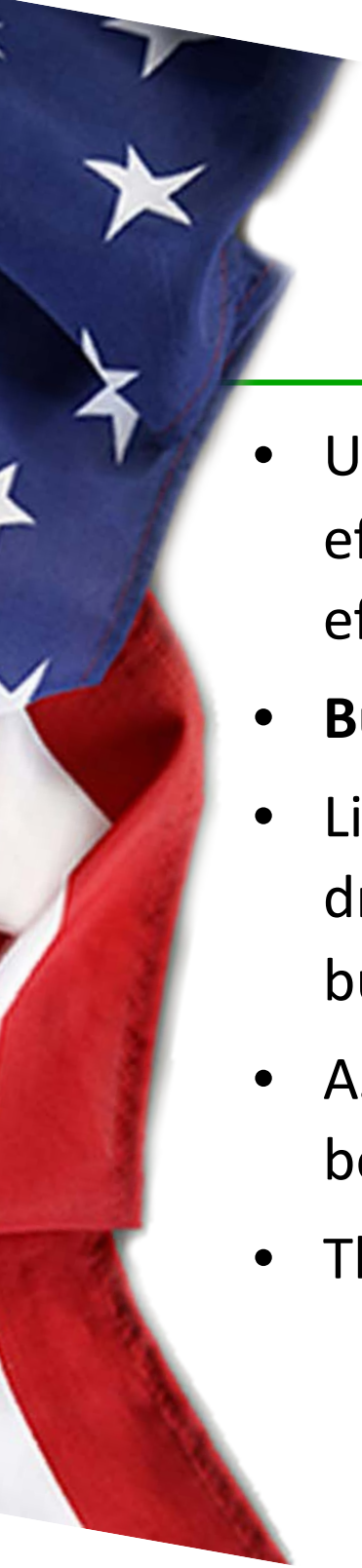
Centre for Science and Environment

Report assessing US climate action plan

Download report from:

cseindia.org

and downtoearth.org.in



Consumption is the C-word

- US INDC is based on regulatory measures to improve efficiency in fuel used in vehicles; appliances and energy efficiency in buildings through voluntary codes
- **But consumption is increasing**
- Lifestyle is not changing: people are buying more cars; driving more because vehicles are now more efficient; building bigger houses; buying more appliances
- As a result gains made in improvement in efficiency are being negated, and lost completely in many sectors
- This ‘silver bullet’ is not working. Bad for climate

Mall-thusians

- Cannot be sustainable
- Paris agreement is not about reducing emissions, but appropriating carbon budget
- No space for millions in this plan

- Cannot be the way of the future
- **Have to dissent; push to make C-word the C-word**