Decade of action on air pollution: The second coming
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
Pollution levels up: Delhi will lose its gains

Both PM10 and NO2 levels show an increasing trend and exceed the safe levels. PM10 exceed the standard by nearly 4 times and NO2 by 1.3 times.

Note:

-- Annual averages of residential areas, Charts are based on CPCB, MOEF data
-- Red lines denote National ambient air quality standards; PM10 at 60 microgramme per cubic metre; NO2 at 40 microgramme per cubic metre
Ozone: emerging threat

Harmful for those suffering from respiratory and asthmatic problems, and those involved in outdoor activities.

Even short duration exposure bad.

Source: CSE analysis based on CPCB/DPCG air quality data.
Air pollution: national crisis
Close to half of total urban population breathe the air which exceeds the standard of PM10

Source: Based on CPCB air quality data
Pollution hot spots
Smaller towns are getting more polluted than the metros

NO2 Hotspots

PM10 Hotspots
Global Burden of Disease 2013
Globally air pollution among the top 10 killers
South Asia most vulnerable
In India 620,000 premature deaths a year
More than 18 million healthy life years lost a year
Air pollution triggers stroke, cardiovascular and respiratory diseases, cancer
1st generation reforms: seem easy now

1. Switched to CNG for buses and autos
2. Tightened and advanced emission standards – moved from Euro-0 to Euro-2 and Bharat Stage-4
3. Check on heavy vehicles not destined for Delhi
4. Upgraded PUC and set up Burari inspection for commercial vehicles
5. Cess on diesel and ambient air fund for promotion of battery vehicles
6. Mandated only-CNG vehicles for light duty commercial
Need 2\textsuperscript{nd} generation reform

CNG leapfrog jumped us beyond Europe. Big solution; not incremental. What can we do now?

Pre-Euro I

- Euro I
- Euro II
- Euro III
- Euro IV

Poor diesel

Improved diesel

Natural gas

Hydrogen
Why air pollution?

• Inventory of sources find **vehicles**, particularly **diesel vehicles** (mobile sources) biggest source

• Controls on stationary sources – power plants and factories possible through standards and better fuels

• But vehicles grow in number; we lose benefit of cleaner fuel and cleaner technology

• Keep cleaning vehicles; but adding more; we stay behind the problem

• **End result = Pollution**
Big particles other sources; small particles – deadly for bodies – **vehicles** dominate

Vehicles growing fast in small cities; all faster than rate of urbanization
Vehicle numbers: Explosive already and more coming

Need stringent and preventive action and decision here to influence the future stock -- several times higher than the legacy stock

Source: CSE
Over 2 million vehicles enter or leave Delhi every day: Have to plan for air-shed of NCR; plan mobility for region

Daily vehicles entering or leaving Delhi: massive growth

Source: Based on RITES survey in Delhi, mimeo
Need second leapfrog

• Need big answer:
  • Need to make transition to public transport

• We must; We CAN
  • In our cities car has not replaced the bus
  • In our cities car has marginalised the bus
THE IMPERATIVE: Re-invent mobility
No space for all

Today **10-15%** of India commutes by cars
Private cars take up **90% of road space**
All the flyovers are not enough: build and fill
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
The opportunity
We walk and cycle because we are poor

Source: Based on: MOUD 2008, Study on traffic and transportation policies and strategies in urban areas in India, Wilbur Smith Associates, Ministry of Urban Development, May
How can we walk, cycle, bus when and because we are rich?
Mr Moily try taking this bus
Buses vs cars

- Over 1 million cars are sold each year
- Over 30,000 buses are sold each year

- Crisis of management of bus service
- Crisis because of neglect
- Crisis because we don’t plan for buses, only cars
Travel demand is growing; but bus passenger down; fleet utilization down; bus service more unreliable
Without right to walk we cannot take a bus

We cannot cross the road
Think of **mobility not cars**

- Trajectory of growth has to be re-invented and reversed
- Western world had money to invest and keep investing in cleaning up air
- Moved from **SPM** to **RSPM** and now to **Nox** and to **Ozone** and **black carbon**
- We cannot do the same. Do not have money; have huge needs to meet
Our study: our future
Stand behind change

- Recognise the actions – small as they may seem – which change this trajectory

- Cities that recognise that they must grow differently

- No big answer yet: but this is the second coming
Change maker cities: bus

- **Delhi**: bus ridership is up;
- **Bengaluru**: celebrates a bus day
- **Chennai**: combines efficiency with affordability
- **Tumkur**: has modern bus service; reports 20% modal shift

- Need more such leaders
Change-makers: walk/cycle

- Delhi: *issues street guidelines making walk mandatory*
- Bhubaneswar: *builds roads for pedestrians*
- Chennai: *71 roads planned for walk improvement*
- Nanded; Chandigarh, Nainital, Puducherry
- Shimla: *passes a law to make walking city*
- Matheran: *is India’s only no car city*
- Colombo *is way ahead of all*

How do we make sure that we can grow and get modern but differently
Think and do differently

• Correct what we are doing so wrong:
  • Tax car more than bus
  • Charge for parking
  • Charge/tax diesel use in private cars

• Use all this to create facilities for all; convenient modern and accessible to take the bus or cycle or walk
Free or for pittance: Indian cities have lowest parking charges in the world

Comparison of daily rates in commercial business Districts in different cities

<table>
<thead>
<tr>
<th>City</th>
<th>Parking charges ($)</th>
</tr>
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<tbody>
<tr>
<td>London (City)</td>
<td>65.97</td>
</tr>
<tr>
<td>Tokyo</td>
<td>62</td>
</tr>
<tr>
<td>New York (mid town)</td>
<td>41</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>28.25</td>
</tr>
<tr>
<td>Singapore</td>
<td>24.59</td>
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<tr>
<td>Bangkok</td>
<td>13.2</td>
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<td>Beijing</td>
<td>7.05</td>
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<td>Mexico City</td>
<td>15</td>
</tr>
<tr>
<td>Dubai</td>
<td>4.08</td>
</tr>
<tr>
<td>Bangalore</td>
<td>1.54</td>
</tr>
<tr>
<td>Delhi</td>
<td>1.32</td>
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<tr>
<td>Mumbai</td>
<td>1.1</td>
</tr>
<tr>
<td>Chennai</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Source: Colliers International (2011) - CBD daily parking charges (in US $)

If hidden subsidies are removed parking rates in multi level car parks will increase six times
Countries are learning to control parking demand and cap supply

**Portland, Oregon** 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** has very high parking fees and limited parking supply which lowers car ownership far below the US average

**Bogota** Removed limit on the fees charged by private parking companies. The revenue goes to road maintenance and public transit improvement.

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

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

**Barcelona**: Parking revenue directed to a special fund for mobility purposes.

**London**: parking income channeled to transportation projects.

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

**Antwerp**: parking fines are invested into mobility projects

**Paris**: Street space freed for bike sharing and trams

**Copenhagen**: Streets freed up for bike lanes
In India all states tax buses more than cars. Only Tripura, Goa and West Bengal have the lowest differential.

Comparison of motor vehicle tax cars and buses

Source: CSE computation based on Road Transport Year Book, 2009-10 and 2010-11, Transport Research Wing, Ministry of Road Transport and Highways, Government of India, New Delhi
Tax on cars is highest in Karnataka followed by Andhra Pradesh and West Bengal.

Source: CSE computation based on Road Transport Year Book, 2009-10 and 2010-11, Transport Research Wing, Ministry of Road Transport and Highways, Government of India, New Delhi
In India all states tax diesel with love.

Only Odhisa and Chattisgarh do not maintain any differential between petrol and diesel tax.

Need tax policy to discourage dirty fuel.

Different choices

• Pollution injurious to our health
• No need to first do wrong and then fix it
• Can and must get it right

• Get people to move and not cars
• That has to be our mantra