Inventory and Co-benefits Analysis of Hyderabad Action Plan for Transport Sector

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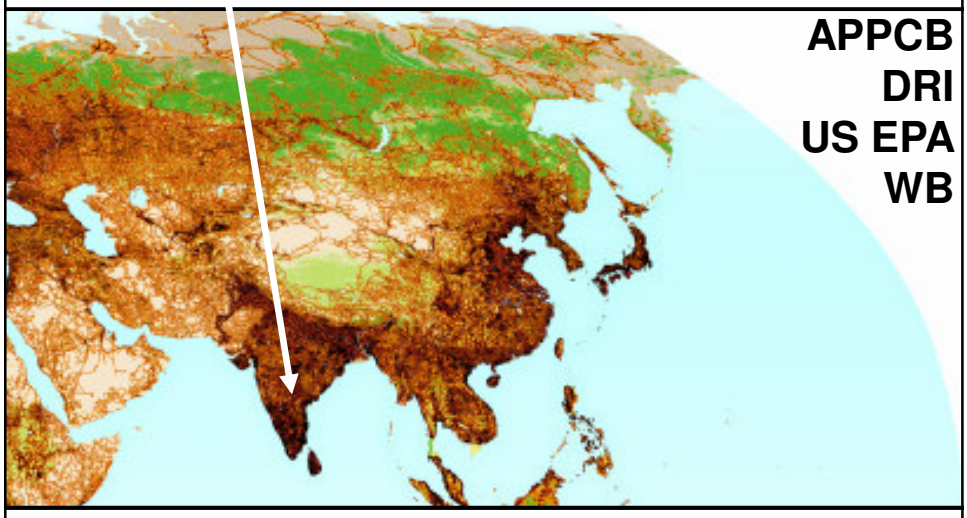
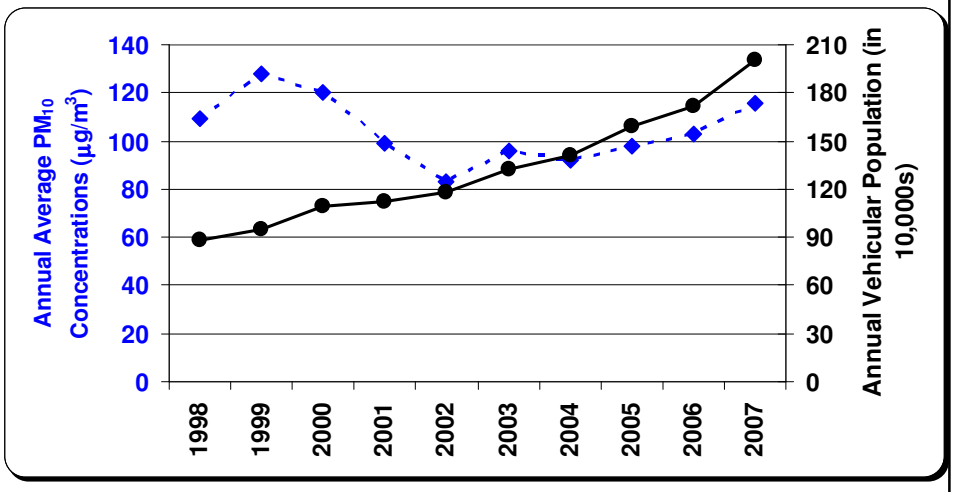


APPCB
DRI
US EPA
WB

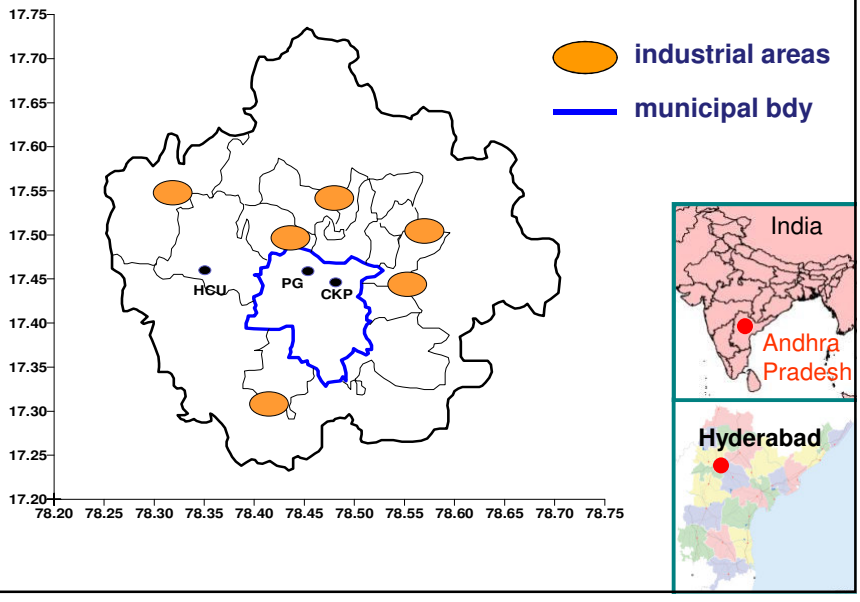
2006-08

Transport vs. Air Quality



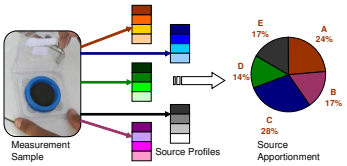
Total Vehicles; 2002 = 14.5 L; 2006 = 18.0 L; 2007 = 20.0 L

Hyderabad Urban Development Area



Source Apportionment Study

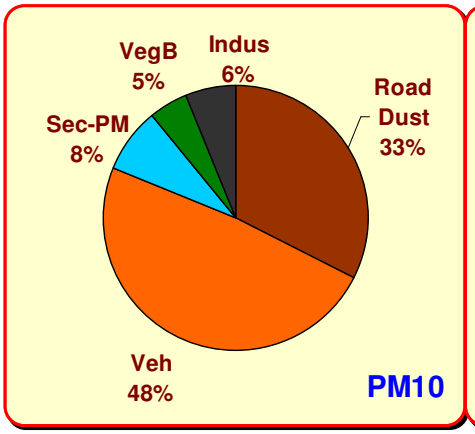
- Three seasons in 2005-06
- Three sites
- Airmetrics MiniVol samplers
- 24-hour sampling periods
- Filters
  - PM_{10} and $PM_{2.5}$
  - Teflon/quartz fiber filters
- Averages
  - PM_{10} ranged 59 to 160 mg/m^3
  - $PM_{2.5}$ ranged 26 to 86 mg/m^3

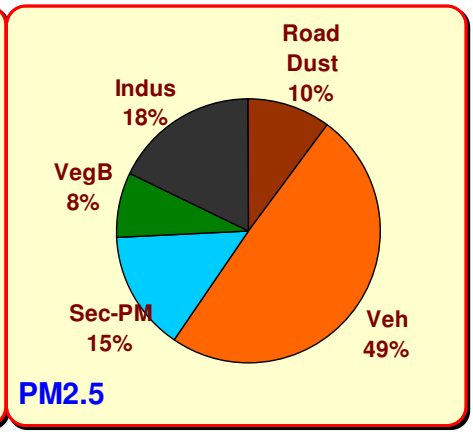


Receptor Model: CMB 8.2

Detailed report @ www.epa.gov/ies

CMB Results:
Average Sectoral Contributions





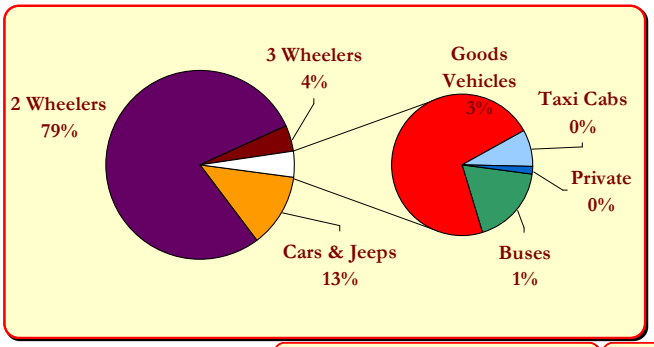
Emission Inventory (yr 2006)

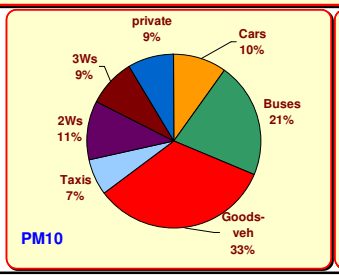
Category	PM_{10}	SO_2	NO_x	CO_2
Vehicular activity	8,410	6,304	38,772	6,260,099
Paved road dust	3,422			
Unpaved road dust	5,110			
Industry	11,054	7,110	7,836	916,486
Domestic	1,845	667	545	83,485
Open Waste Burning	810			
Total	**30,473**	**14,081**	**47,152**	**7,260,070**

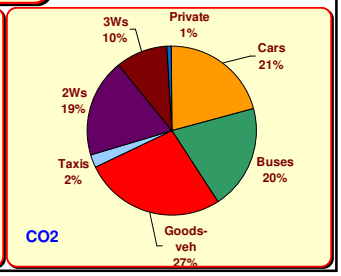
in tons/yr

Detailed report @ www.epa.gov/ies

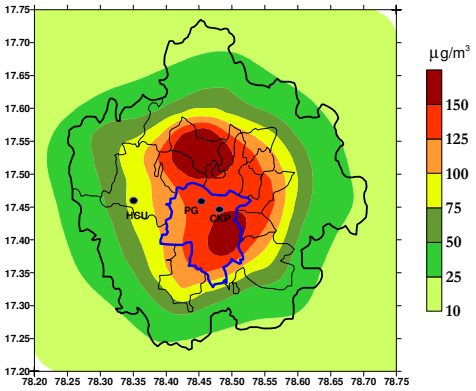
In-Use Vehicular Mix (yr 2006)



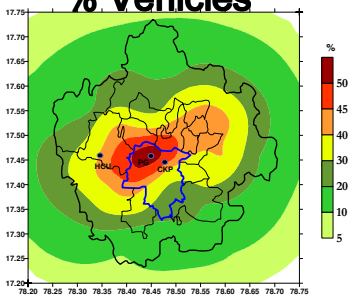




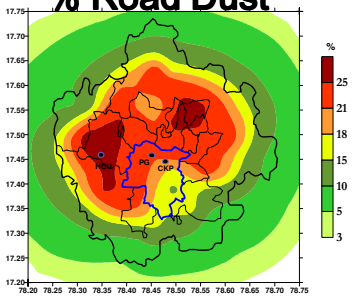
Modeled Annual Average PM_{10}



% Vehicles



% Road Dust



Top-Down vs. Bottom-Up

Location	Vehicles		Veh+RD		Industry		Dom+OWB	
	SA	M	SA	M	SA	M	SA	M
Punjagutta	54 ± 10	40-45	81 ± 10	66-70	13 ± 10	15-20	5 ± 10	4-6
Chikkadpally	45 ± 10	40-45	80 ± 10	60-66	15 ± 10	20-30	4 ± 10	4-6
HCU	43 ± 10	30-35	80 ± 10	50-60	16 ± 10	10-15	5 ± 10	8-10

SA = top-down = source apportionment M = bottom-up = modeled

Detailed report @ www.epa.gov/ies

Hyderabad: Proposed Action Plan

- Road maintenance
- LPG for 3 W's
- Public transport – bus & rail
- New emissions standards
- Phase-out for old 2 W's, 3 W's, & Cars

- Industrial energy efficiency
- Garbage management

Co-Benefits for 2010

Estimated Overall Percent Reductions

Intervention	PM_{10} (%)	CO_2 (%)
20% buses old diesel to new	0.6	1.2
3Ws Petrol to LPG	2.3	1.1
Public transport	2.4	8.5
Wet & vacuum sweeping	5.8	
50% buses old diesel to new diesel	0.2	0.6
I & M	0.4	1.0
Emission regulations for GVs	4.0	9.4
Dust collection efficiency at industries	8.9	

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Co-Benefits for 2020

Estimated Overall Percent Reductions

Intervention	PM_{10} (%)	CO_2 (%)
100% buses to CNG	11.6	16.2
Public transport	6.1	9.8
Wet & vacuum sweeping	6.9	
I & M	1.2	3.8
Abolish diesel gen sets & biomass	14.2	2.0
Control illegal garbage burning	1.6	
Coal use in domestic sector	3.1	0.6

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In Retrospect.. Results

Vehicular activity (direct and indirect) dominates the local pollution

Largest reductions in PM & GHG emissions are expected from transport sector

Combined benefits of proposed action plan are estimated at ~$196 million for 2010 and ~$472 million for 2020

In Retrospect.. Challenges

Scattered and conflicting data

Customization tools and methodologies

Adequately reflecting local needs

Recycling information

Thank you

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@ www.urbanemissions.info

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