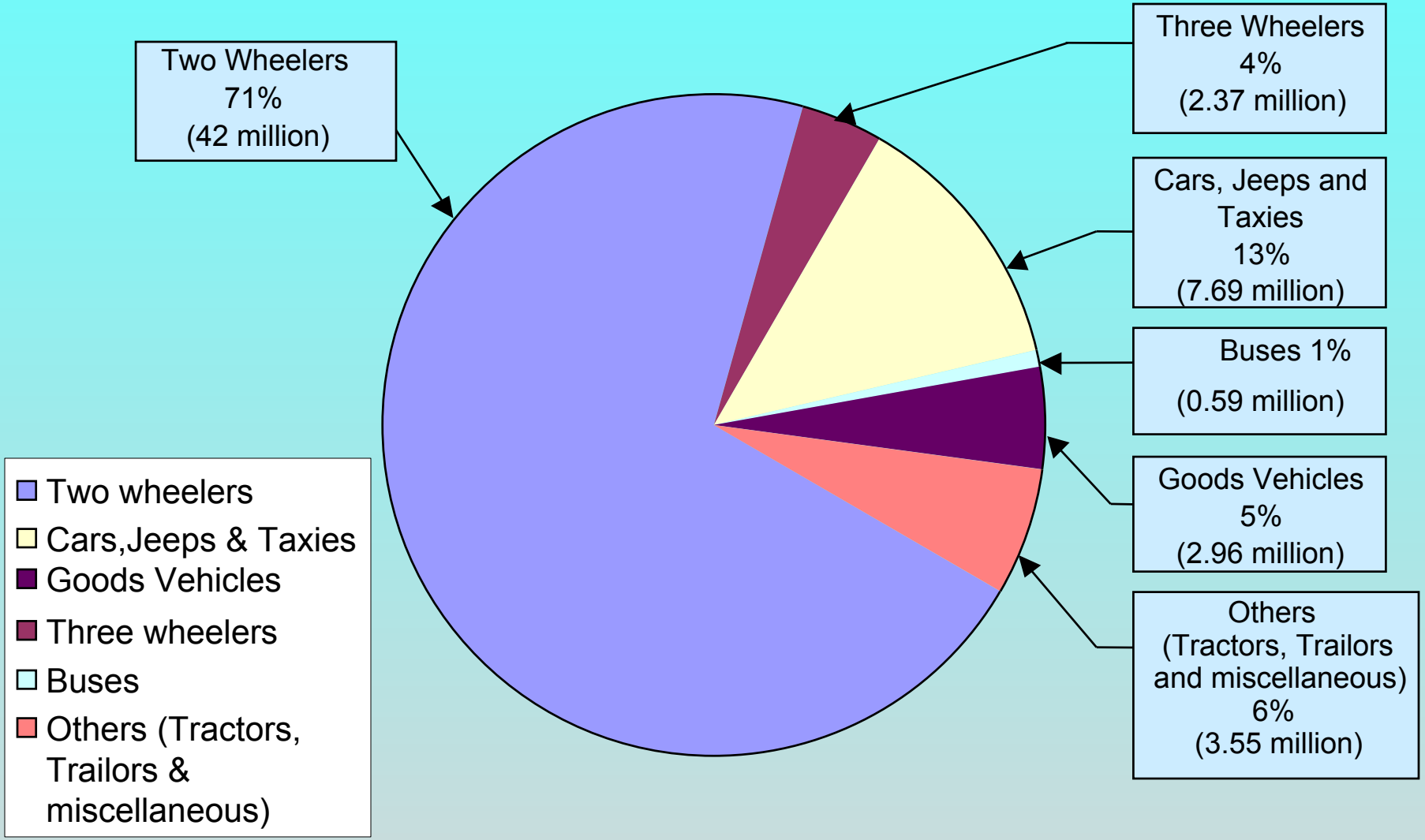
Informal Document No. **WP.29-133-10**
(133rd WP..29, 22-25 June 2004,
agenda items 5.2. and B.2.3.11.)

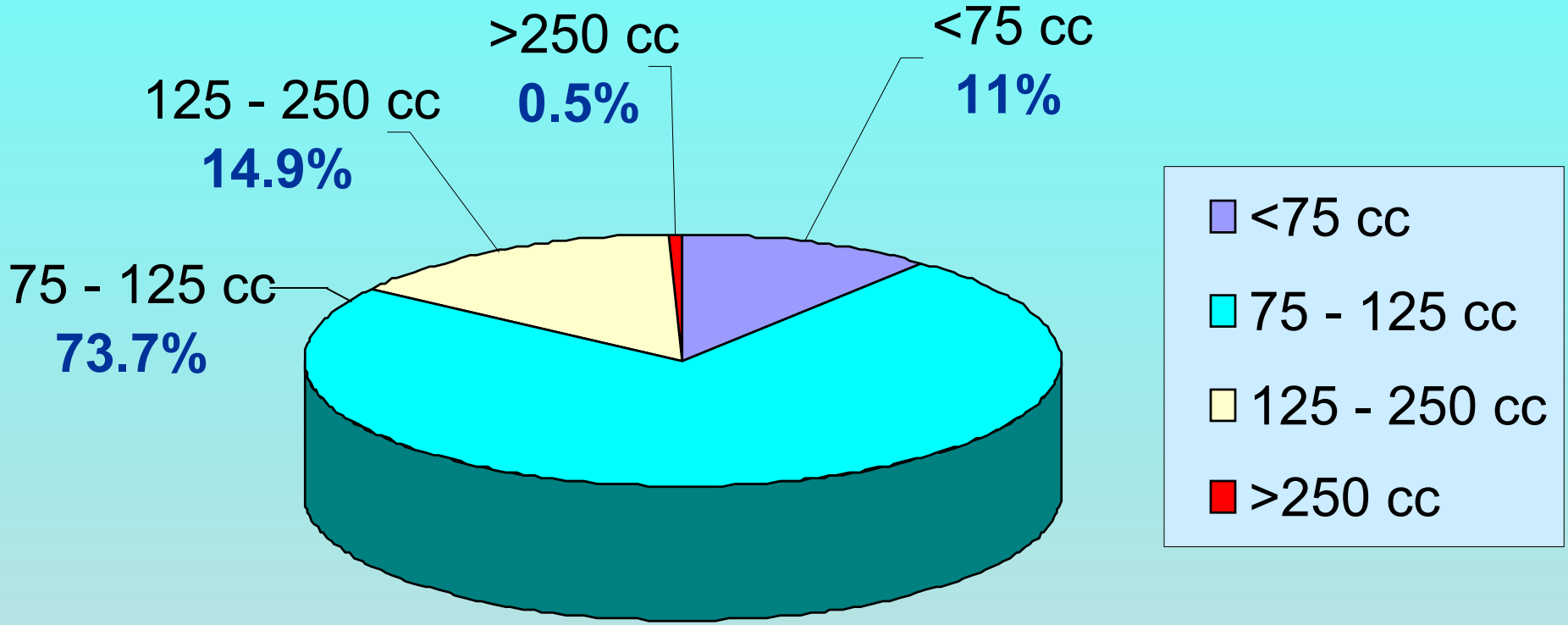
INDIA'S CONCERNS REGARDING PROPOSED WMTC CYCLE DEVELOPMENT BY GRPE

Fleet composition of all vehicles



INDIA

Two wheeler fleet composition in India



In India,85% of vehicles are having engine capacity less than 125 cc, whereas in Europe (35%), Japan (31%) and US (7%).

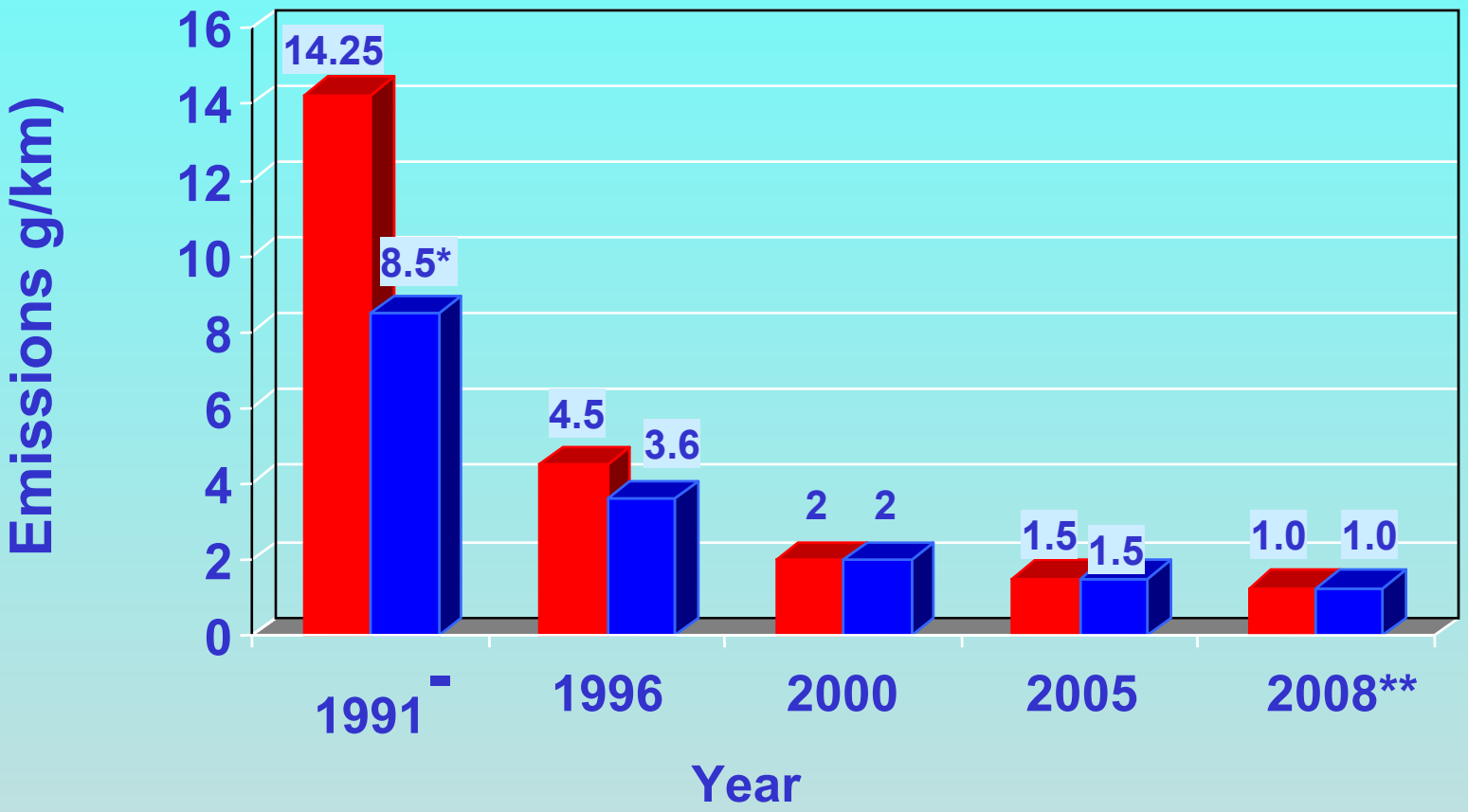
INDIA

Usage Pattern in India

Quite different from many other countries

- Initial cost and fuel economy are highest priority
- more a utility and family oriented vehicle
- Small entrepreneurs and formers conduct their business carrying loads
- Very limited usage for sport

Indian Emission Norms for 2 Wheelers

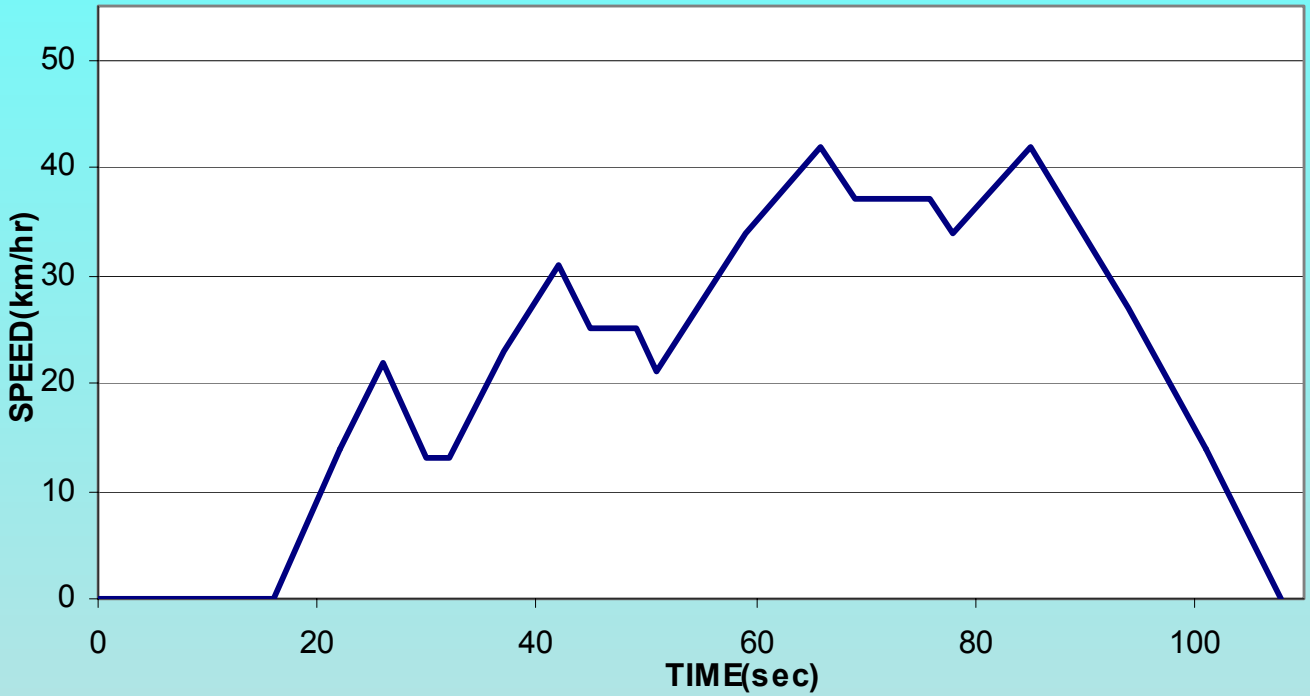


For Ref. Mass 170 kg ; * Only for HC ** Under Discussion

CO HC+Nox

INDIA

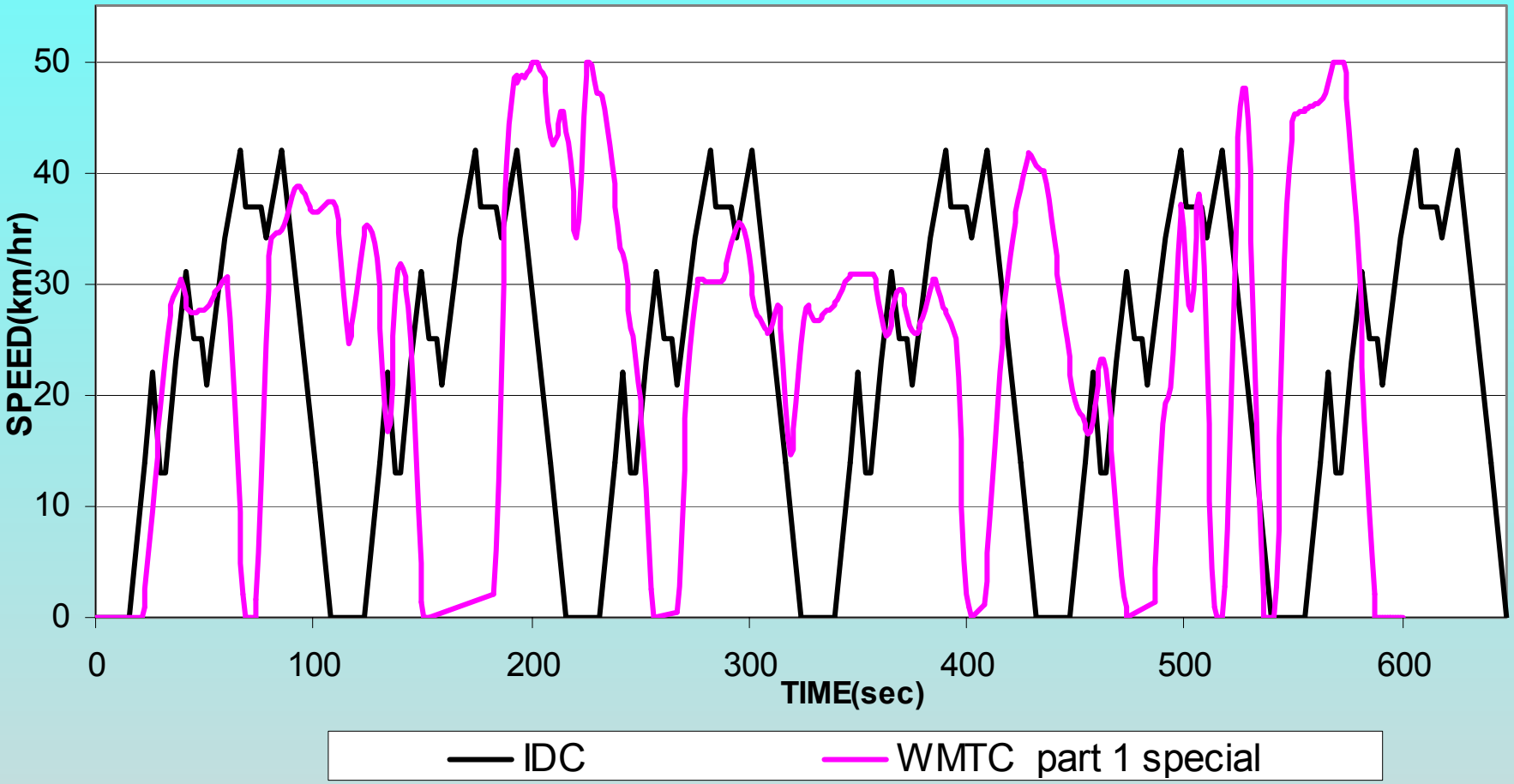
Indian Driving Cycle



	Time sec	Distance km	Avg. Speed km/h	Max. Speed km/h	Max. accel. m/s2	Max Decel m/s3	Idle time ratio %	Accel. Time ratio %	Decel time ratio %	Cruise time ratio %
IDC (6 Cycles)	648	3.948	21.93	42	0.65	0.63	14.81	38.89	34.26	12.04

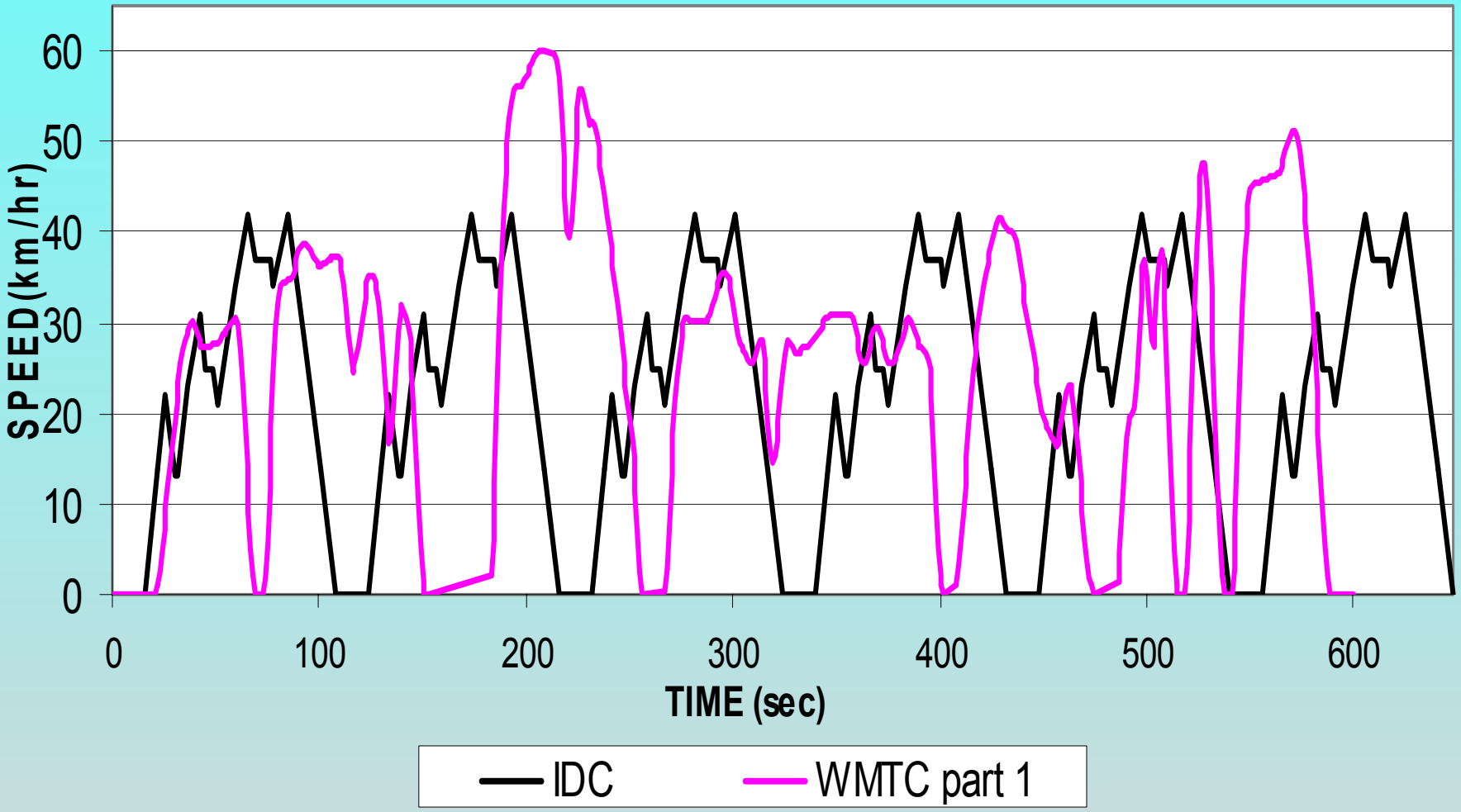
INDIA

Comparison of IDC and WMTC part 1 special cycle



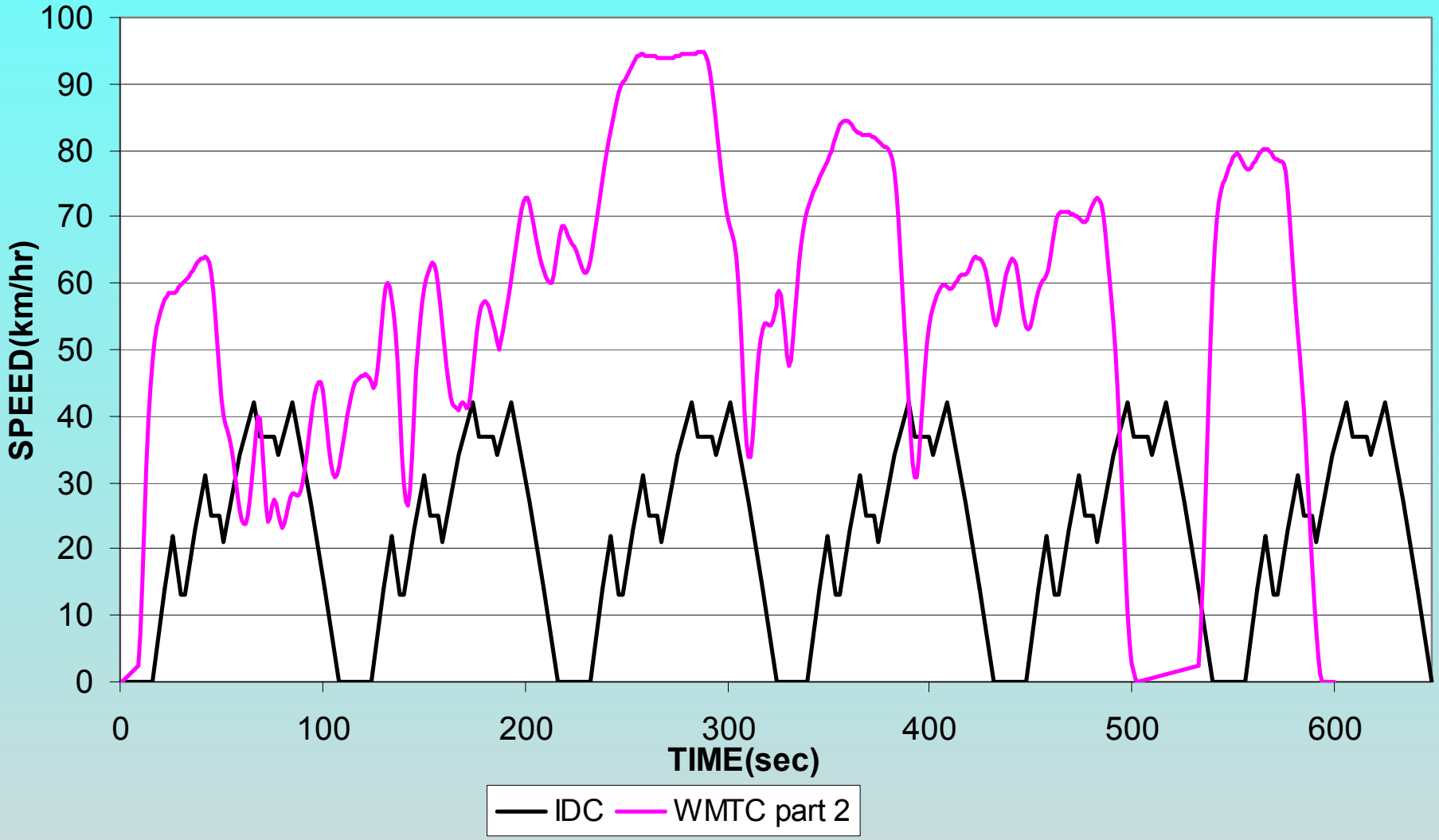
INDIA

Comparison of IDC and WMTC part 1 cycle



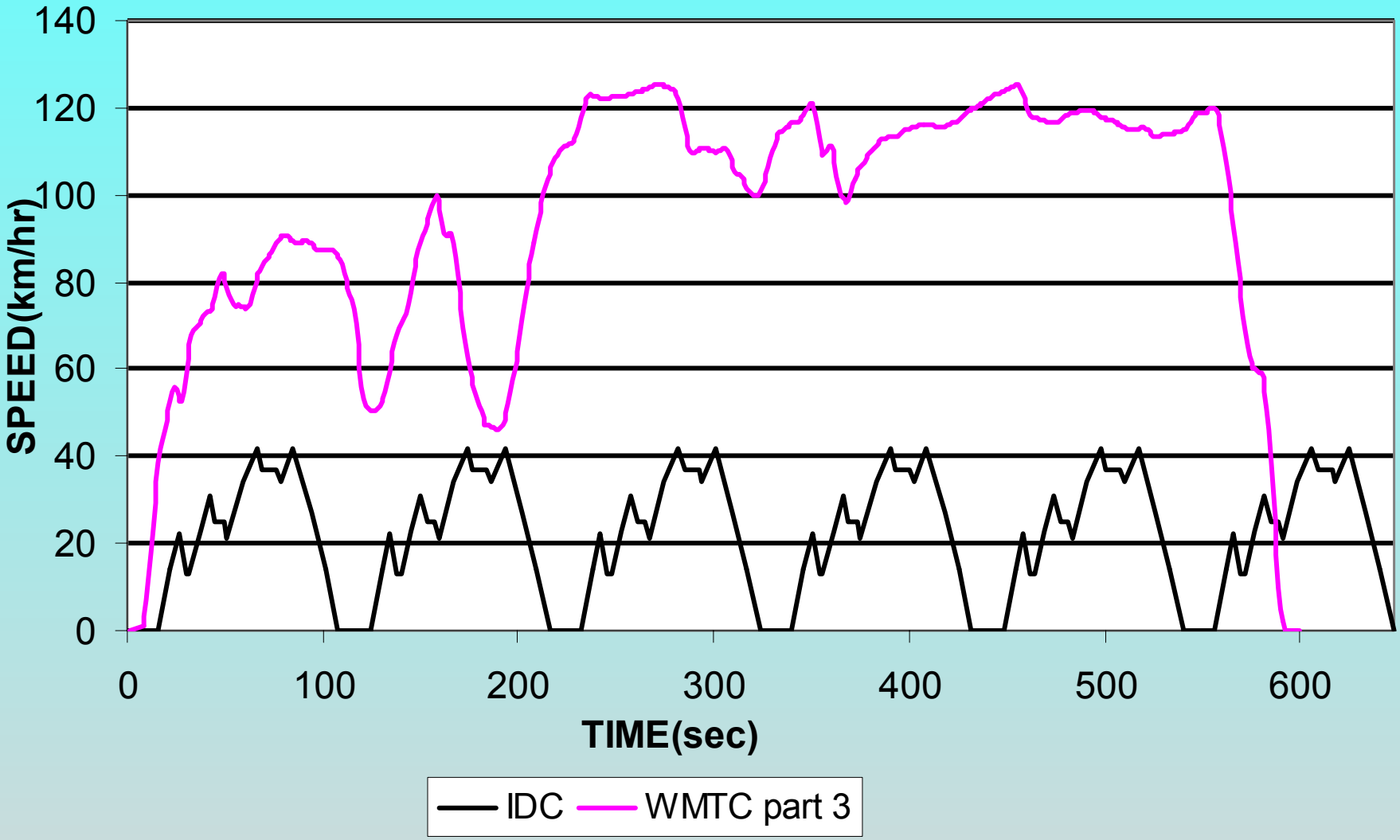
INDIA

Comparison of IDC and WMTC part 2 cycle



INDIA

Comparison of IDC and WMTC part 3 cycle



INDIA

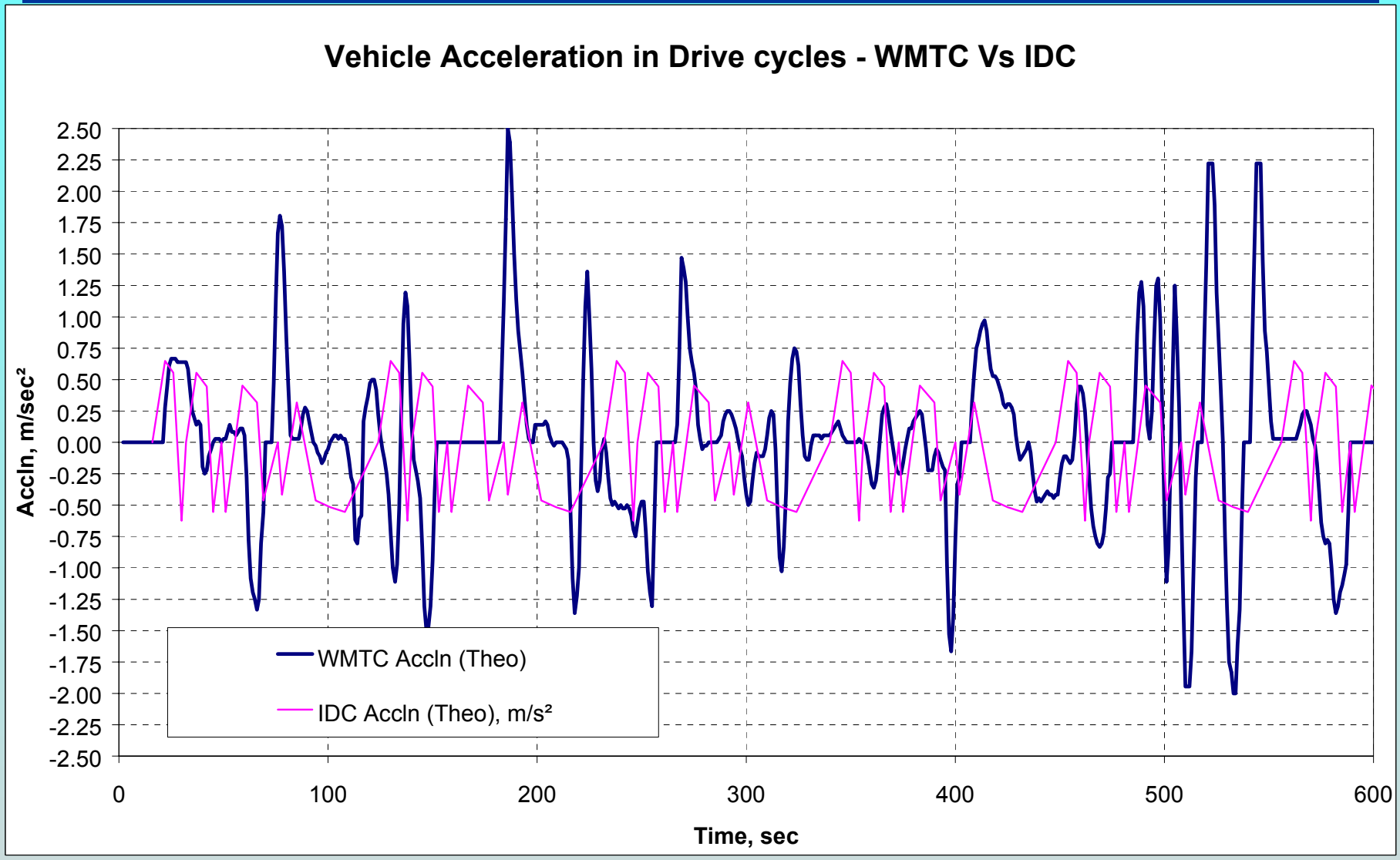
IDC and WMTC cycle details

WMTC cycle (ver.8)	Time	Distance	Avg speed	Max.Speed	Max.accel	Max.decel
	sec	km	km/h	km/h	m/s^2	m/s^2
IDC	648	3.948	21.93	**42.0**	**0.65**	**0.63**
Part 1 special	600	3.940	23.6	**50.0**	**2.00**	**2.00**
Part 1	600	4.070	24.4	**60.0**	**2.51**	**2.00**
Part 2	600	9.110	54.7	94.9	2.68	2.02
Part 3	600	15.740	94.4	125.3	1.56	2.00

Vehicle < 50 cc & Vmax < 50 Km/hr does not find classification in WMTC.

WMTC cycle (ver.8)	Idle time ratio	Acceleration time ratio	Deceleration time ratio	Cruise time ratio
	%	%	%	%
IDC	14.81	38.89	34.26	12.04
Part 1 special	17	27.3	28.7	27.0
Part 1	17	28.3	28.2	26.5
Part 2	7.3	35.5	28.3	28.8
Part 3	2.5	25.7	18.5	53.3

Drive cycle Comparison – WMTC Part 1 Vs IDC (on acceleration basis)



INDIA

IDC and WMTC cycle details contd.

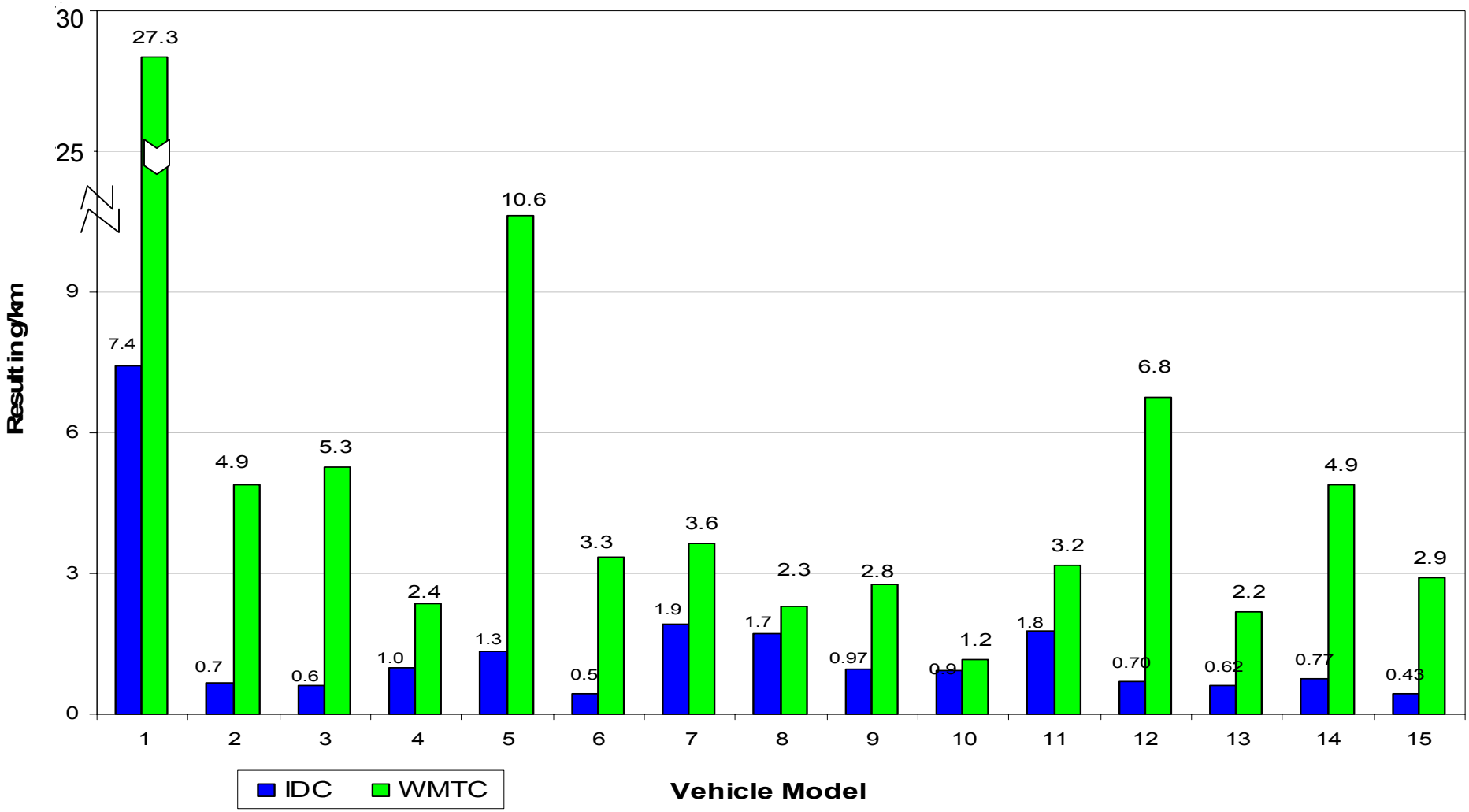
- Most of Indian Two Wheelers will fall under class 1 of WMTC (sub-classes 1-1, 1-2, 1-3) and a few in Class 2 (sub-class 2-1).

- Mopeds < 50 cc with max. speed of 50 km/h does not find place in any classification specified by WMTC.

- Most of Indian two Wheelers find difficulty to negotiate steep acceleration ramps designed in WMTC cycle - around 170/200 secs. and 510/570 secs. portions of the cycle.

- Models of 350 cc / 500 cc Motorcycle with low power and high Engine capacity will fall under Class 2 (sub class 2-3 / 2-4) would not represent the actual operating conditions.

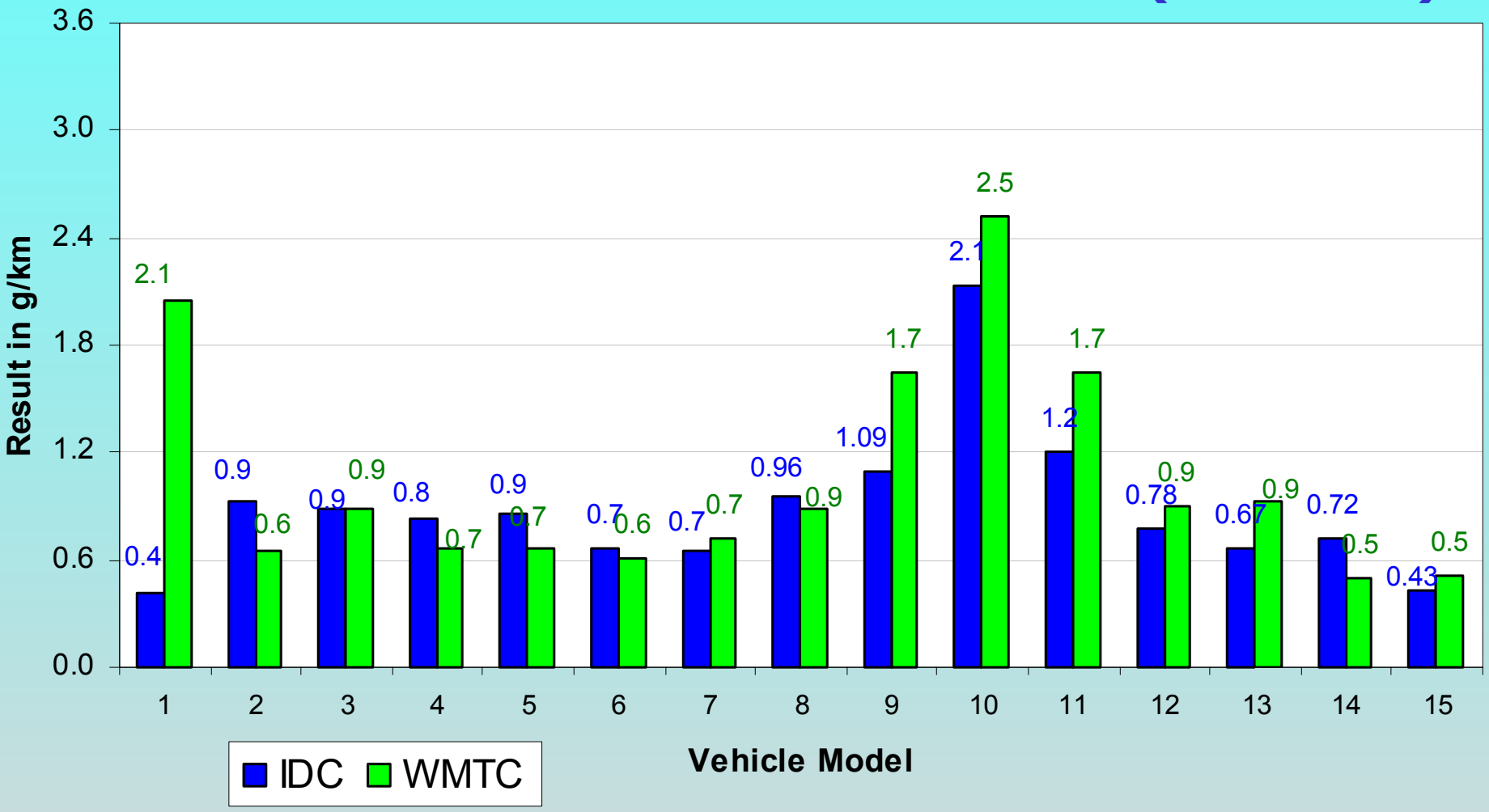
IDC Vs WMTC CO (g/km) Results comparison



INDIA

IDC Vs WMTC HC (g/km) Results comparison

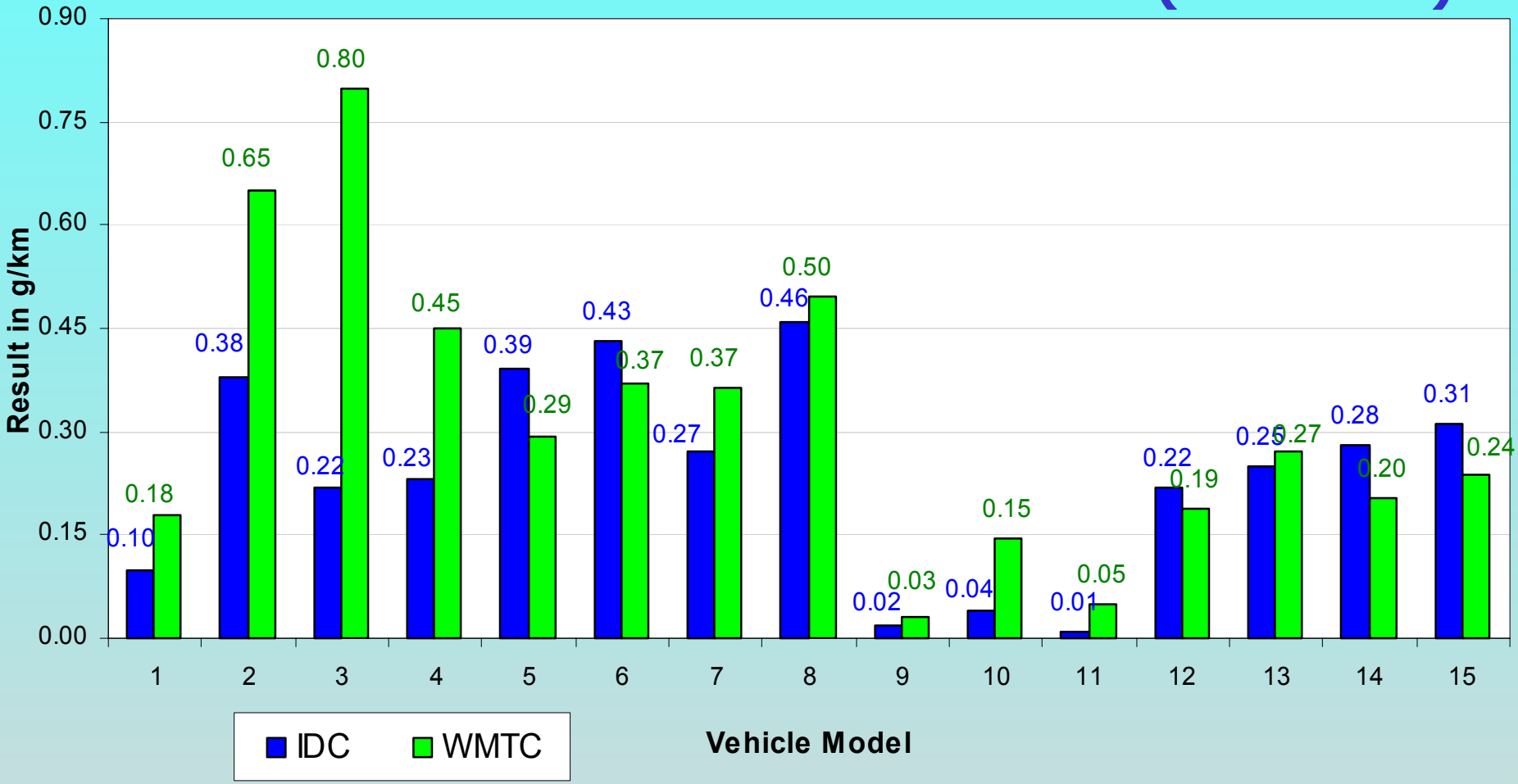
(Nov 2003)



INDIA

IDC Vs WMTC NOx(g/km) Results comparison

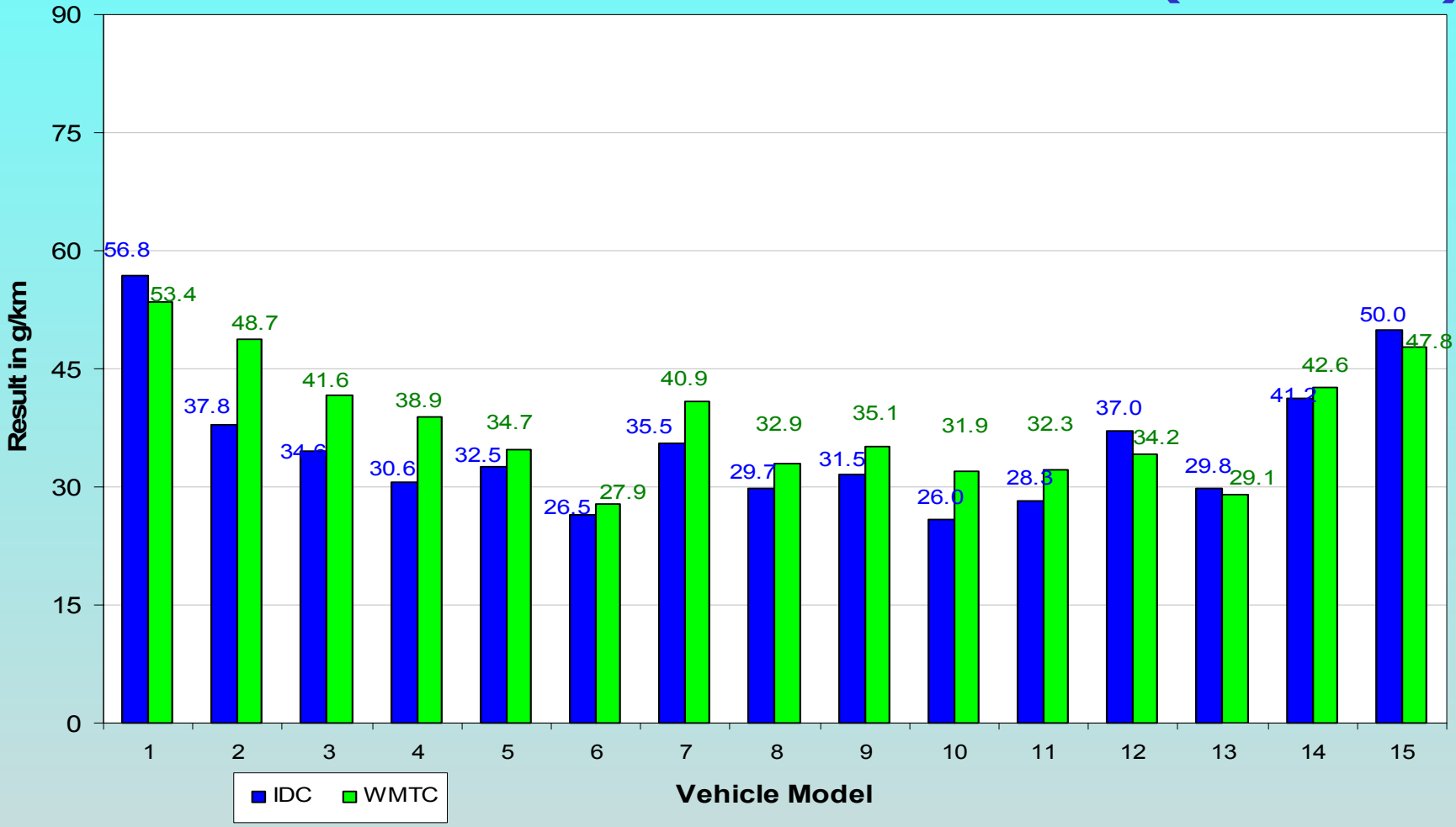
(Nov 2003)



INDIA

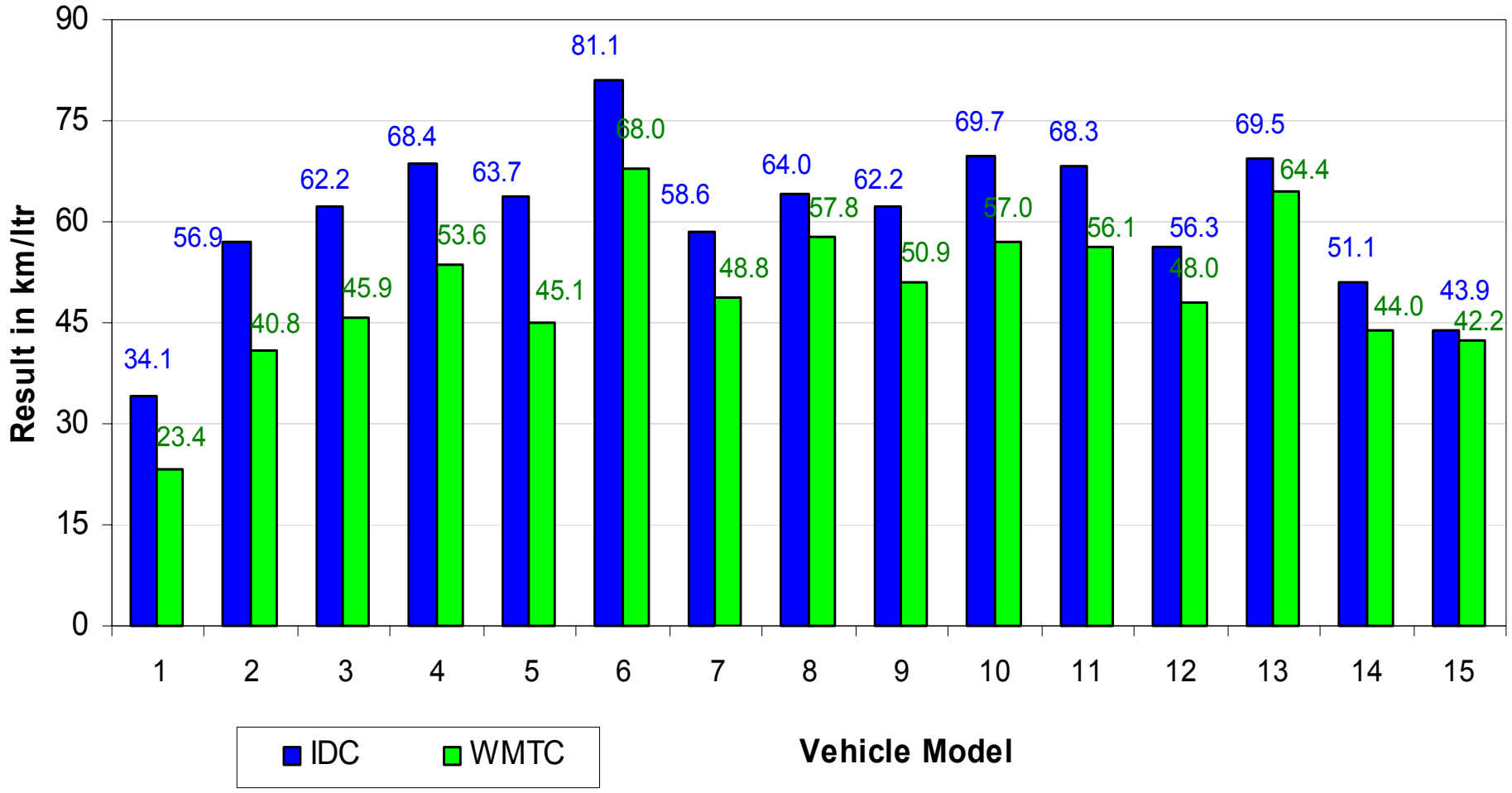
IDC Vs WMTC CO2 (g/km) Results comparison

(Nov 2003)



INDIA

IDC Vs WMTC Fuel consumption(km/ltr) Results comparison (Nov 2003)



INDIA

IDC Vs WMTC Fuel consumption(kmpl) comparison continued

- Comparison of fuel consumption (kmpl) under actual operating condition on road and fuel consumption recorded on Driving Cycle can be a good reference to determine the effectiveness of the cycle to represent the actual operating conditions.

- In past few years, we find that there is good correlation between fuel consumption values recorded on IDC and field data from customers.

- Fuel consumption values on WMTC cycle would not represent the actual driving conditions in India.

- This is corroborated by high value of CO readings recorded on WMTC compared to IDC.

Observations

- India's traffic pattern is heterogeneous which comprises of cyclist, mopeds, 2&3 wheelers, transport vehicles, buses and slow moving vehicles.

- WMTC does not take into account ground reality of India having 40 million 2-wheelers, perhaps the largest in the world

- High acceleration & speeds specified in WMTC are not relevant to Indian vehicles. Indian vehicles have low speed, low acceleration and are lean tuned to suit city driving & fuel economy.

- Indian driving cycle is formulated after collecting real world data from major cities representing actual driving pattern.

Observations

- WMTC cycle as its stands now, would not be suitable for implementation in India and would affect 5 million two wheelers coming on to Indian roads annually..

- From International Harmonization point of view the currently proposed WMTC would not cater for requirement of developing countries like India.

- Need for having two driving cycles, one for developing countries and other for developed countries. It may be necessary to consider the driving cycle based on Indian driving cycle, for all developing countries like India.

THANK YOU

INDIA