

Comparison of EMFAC2000 and MOBILE6

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Background

- EMFAC2000 final version became available last Fall
- MOBILE6 will soon be available
- The models predict emissions for the same vehicles
 - future evap standards a little different
 - warranty a little different

Model Comparison (Light Duty)

- EMFAC2000
 - updated basic emission rates
 - impacts of OBD
 - aggressive driving impacts
 - updated speed correction factors
 - a/c effects
- MOBILE6
 - updated basic emission rates
 - impacts of OBD
 - aggressive driving impacts
 - updated speed and facility correction factors
 - a/c effects

Focus

- Passenger cars
 - Exhaust: Tier 1, LEV I LEV, LEV II LEV
 - Evap: Enhanced and “Near-Zero”

Development of Emission Rates

Item	MOBILE	EMFAC
Emitter Regimes	2	5
Effect of Standards on Regimes	Reduces emission of normals only	Reduces emissions of all
Effect of Onboard Diagnostics	85% effective; 90% response rate first 36K miles, 10% after 36K miles	No high emitters first 70 K miles
Effect of I/M	90% response rate after 36 K miles	With OBD, finds high emitters after 70 K miles

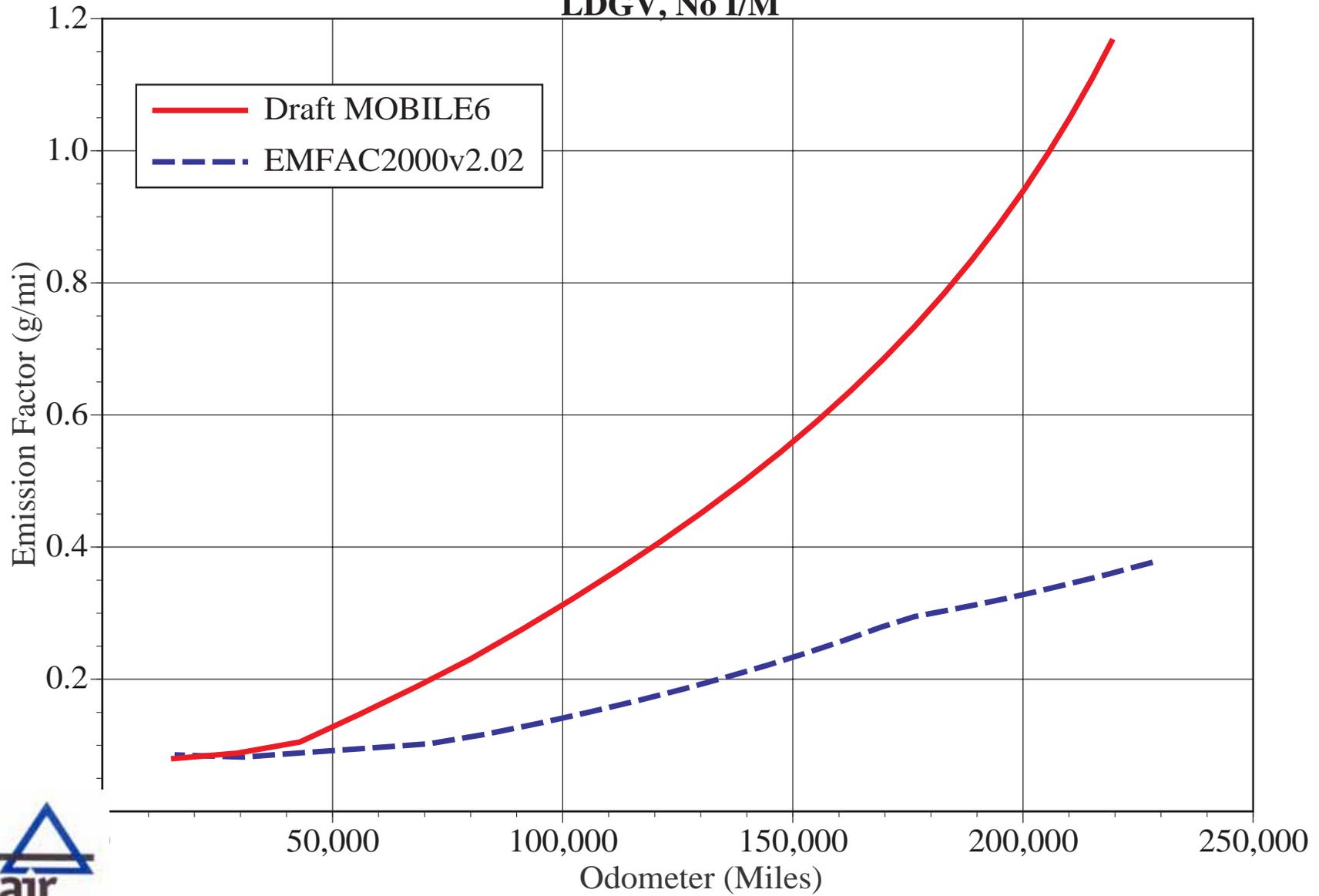
Method

- Harmonized technologies
 - 1994-2000: Tier 1
 - 2001-2003: LEV I LEV (NLEV)
 - 2004+: LEV II LEV (Tier II)
- Harmonized temperatures and I/M
 - Lake County: close to no I/M (change of ownership)
 - SCAB: enhanced
- Harmonized speeds, registration distributions, and VMT vs age distributions
- Not harmonized
 - start distribution

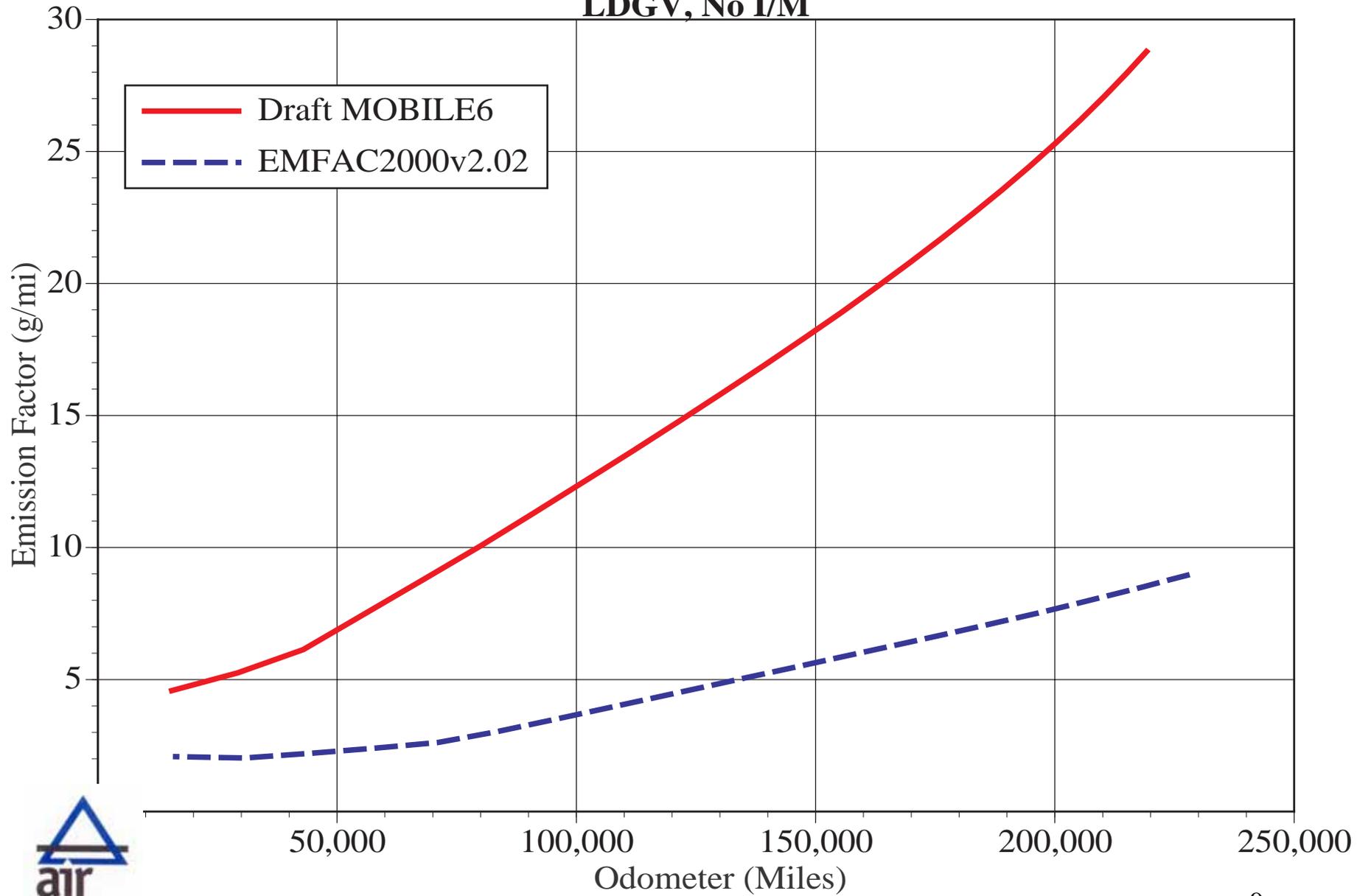
Comparisons

- Emissions vs mileage (deterioration)
- 1990-2020 g/mi, no I/M

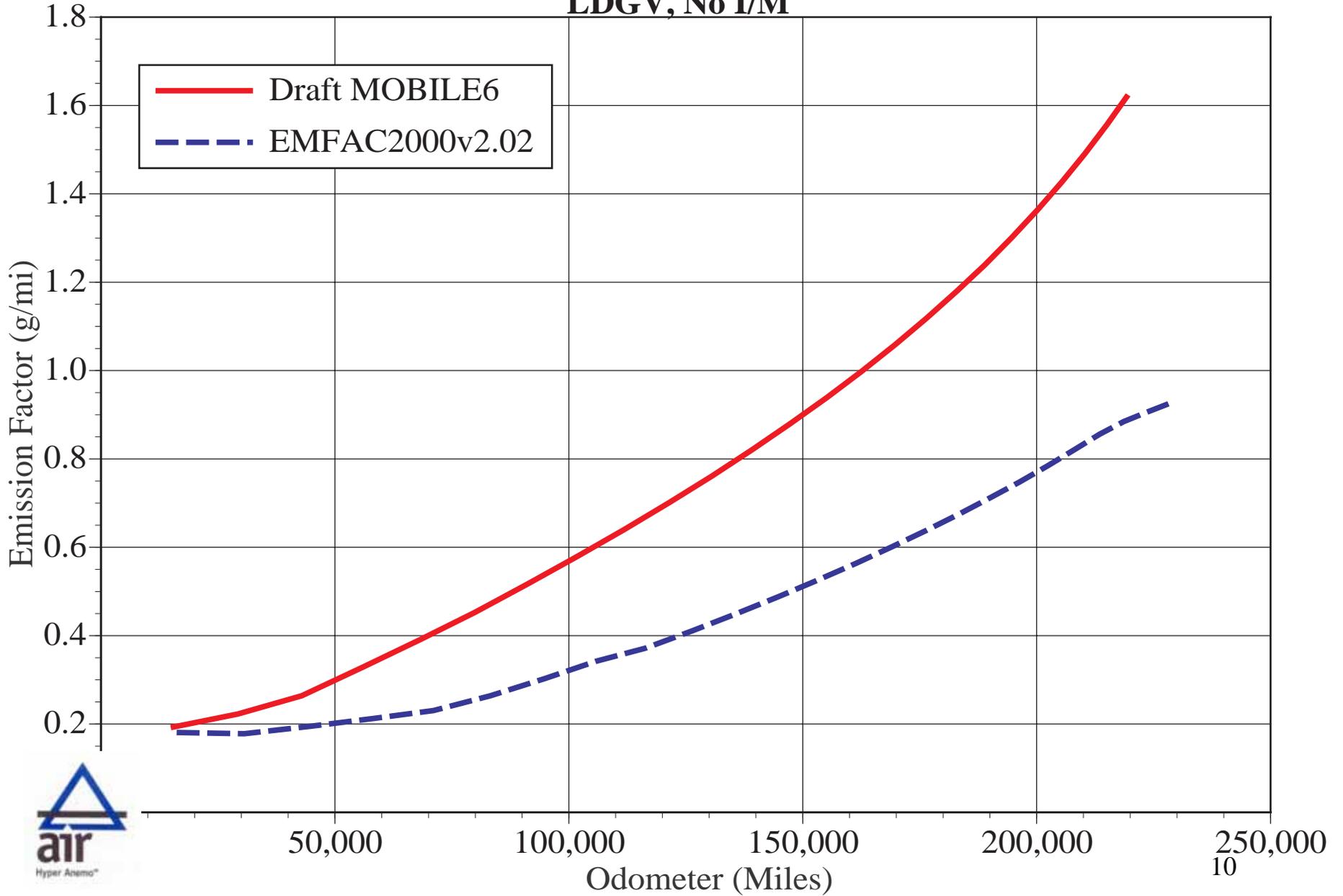
LEV 1 THC Exhaust Emission Factors versus Mileage LDGV, No I/M



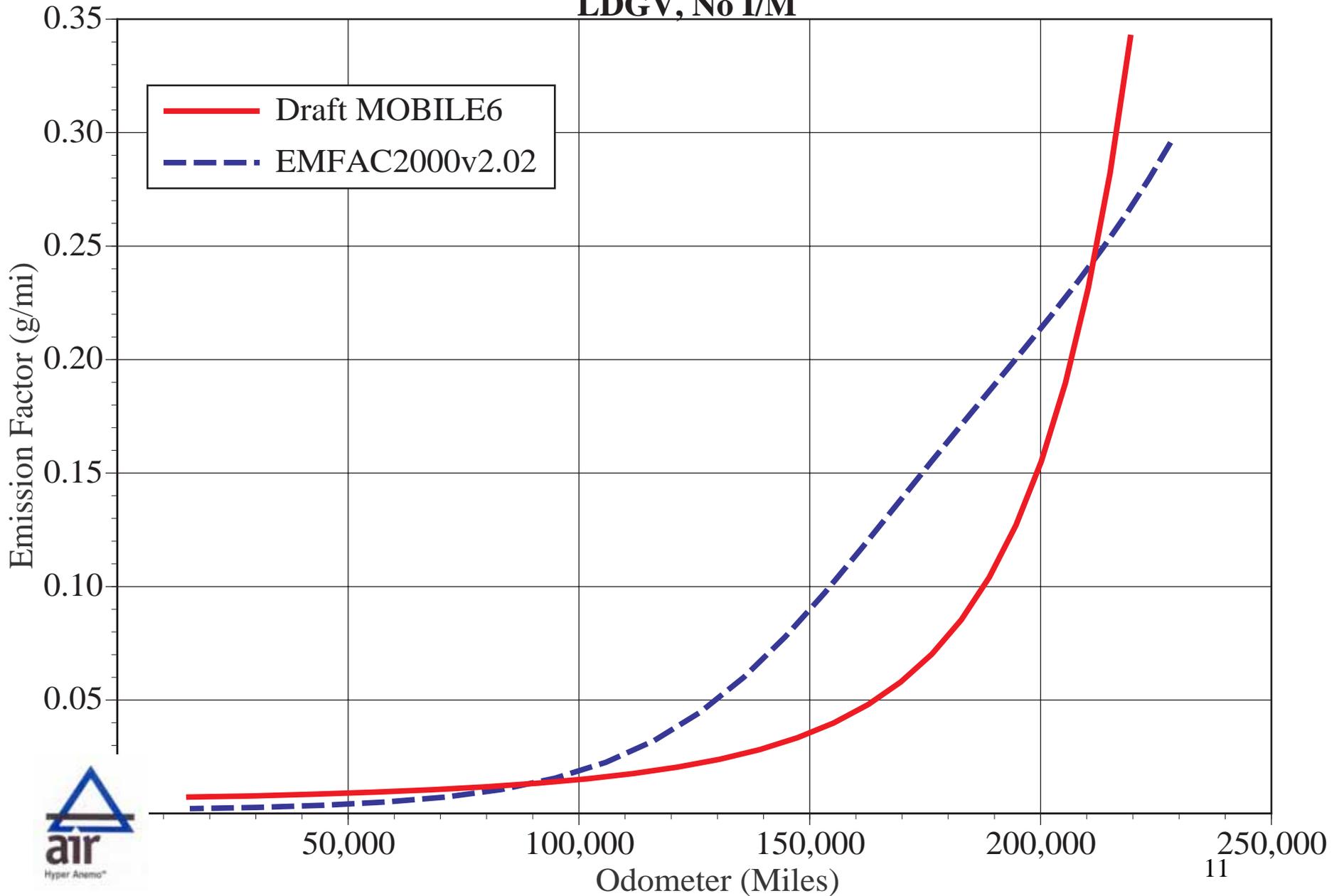
LEV 1 CO Emission Factors versus Mileage LDGV, No I/M



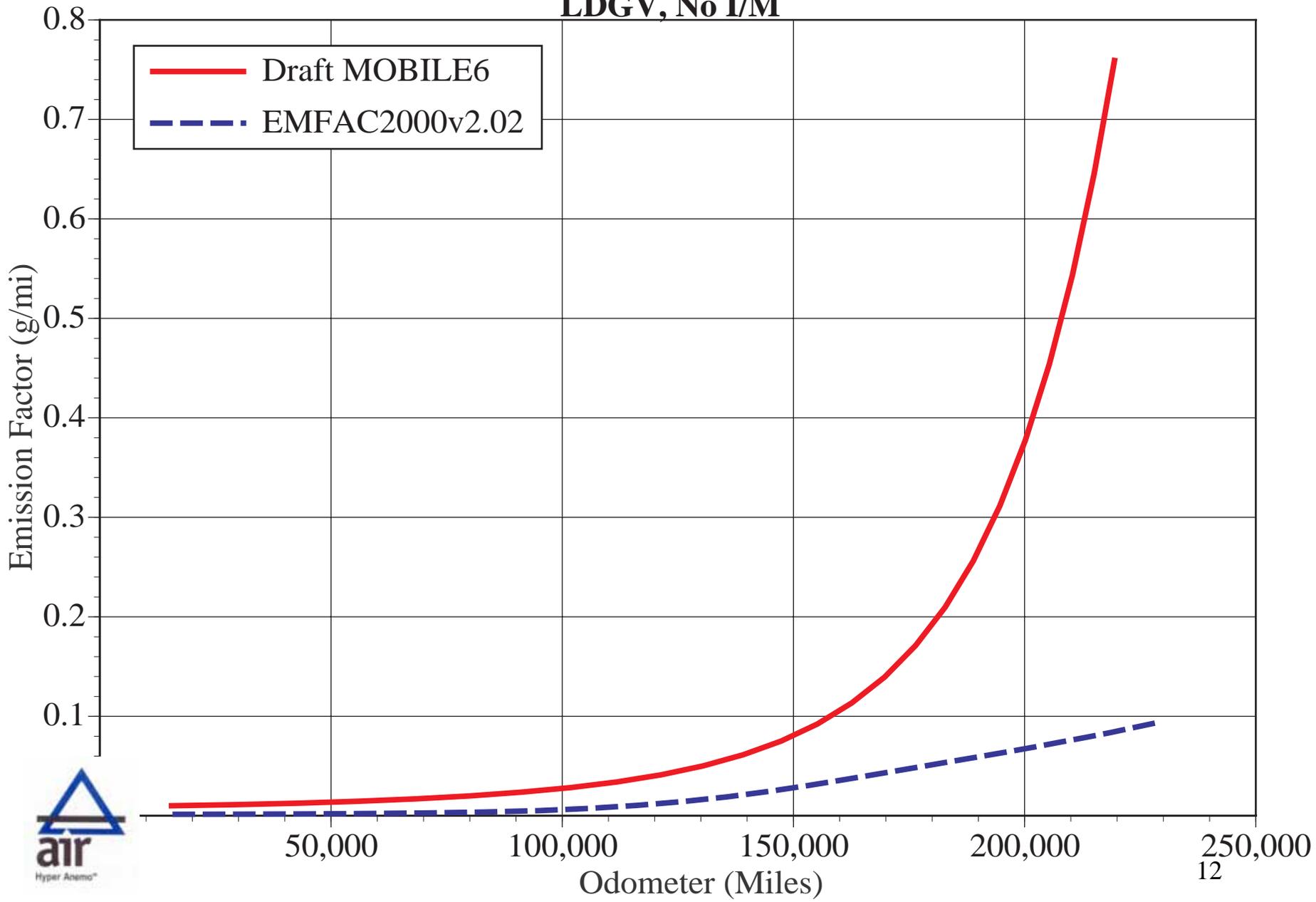
LEV 1 NOx Emission Factors versus Mileage LDGV, No I/M



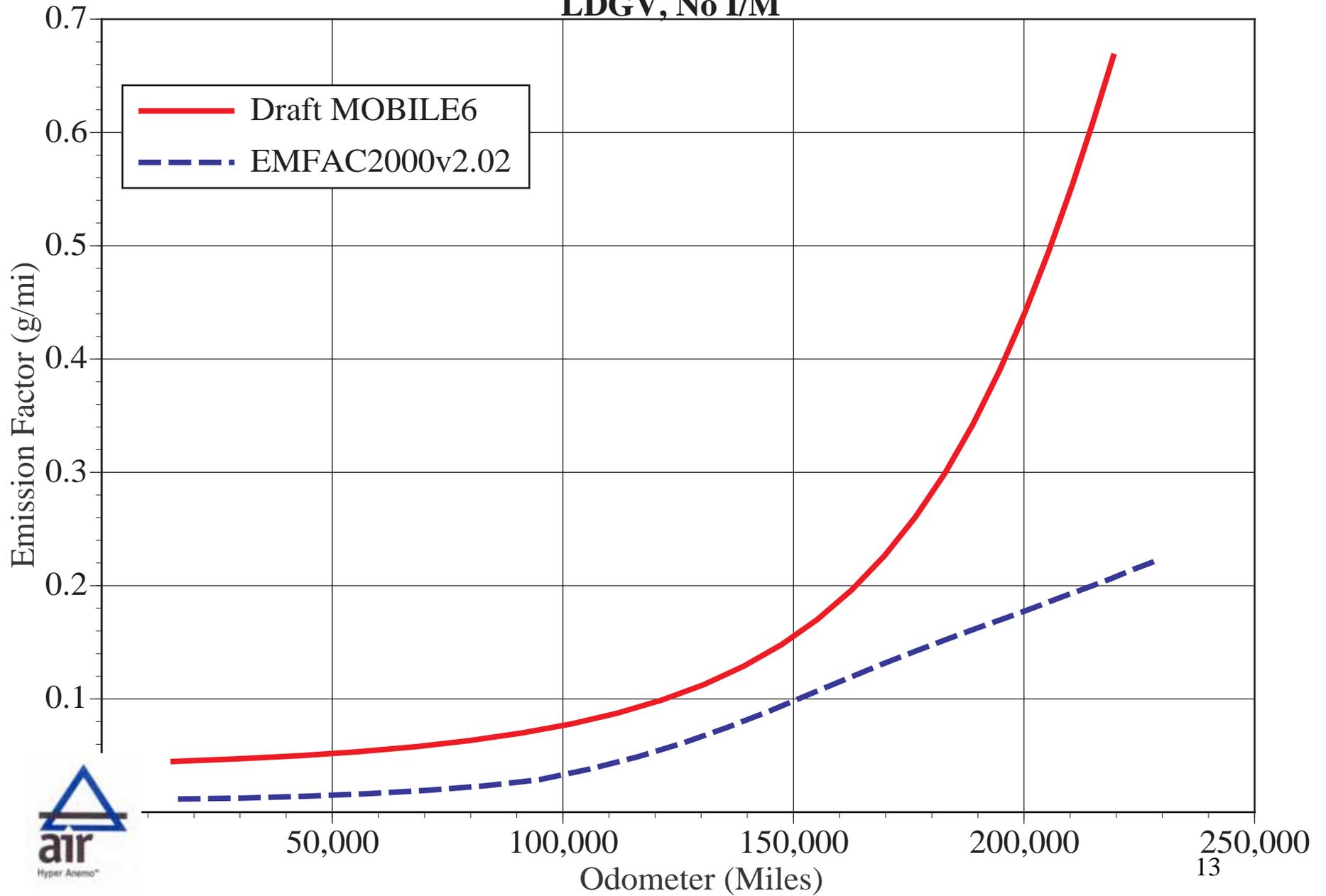
Enhanced Diurnal+Resting Emission Factors versus Mileage LDGV, No I/M



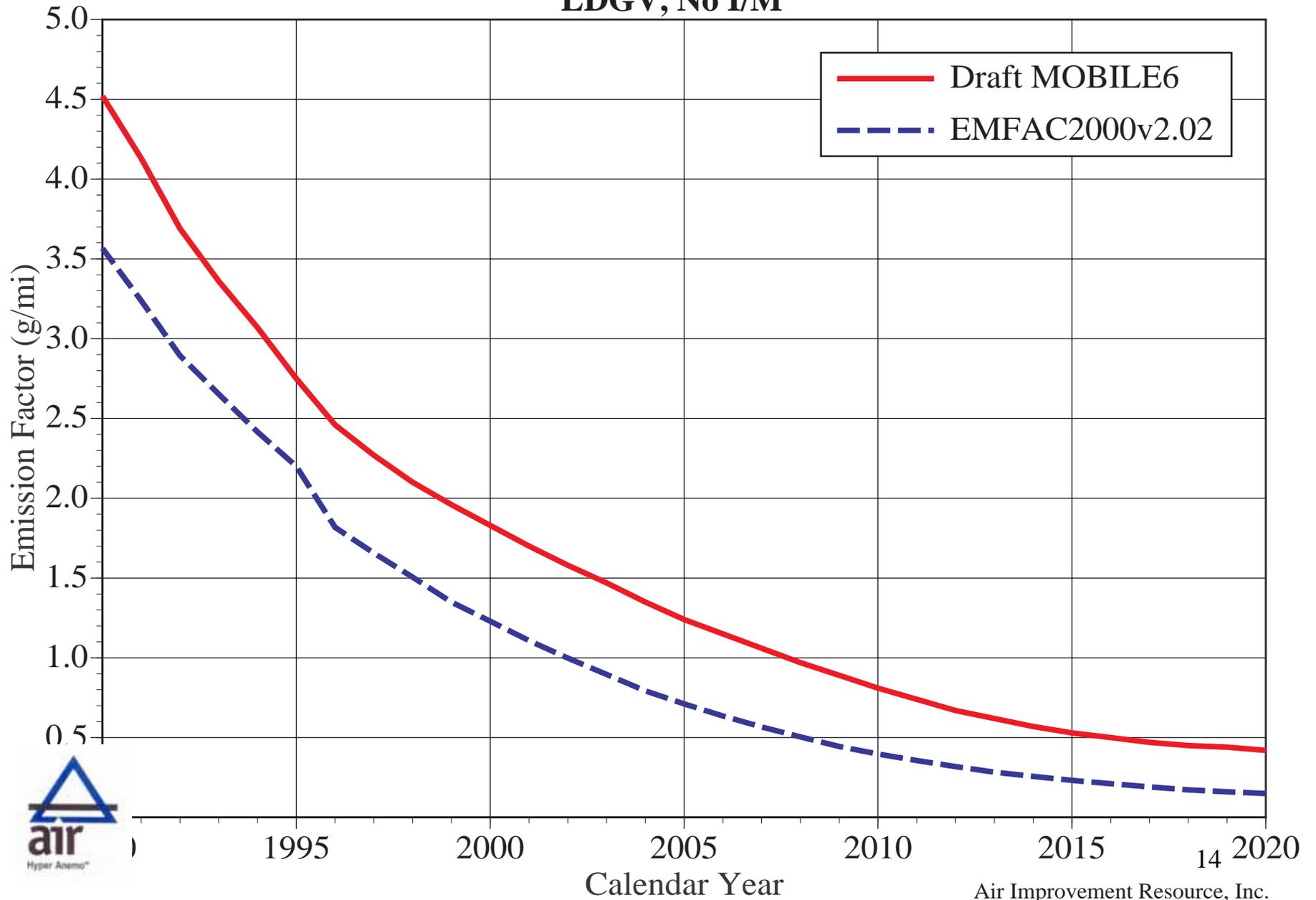
Enhanced Hot Soak Emission Factors versus Mileage LDGV, No I/M



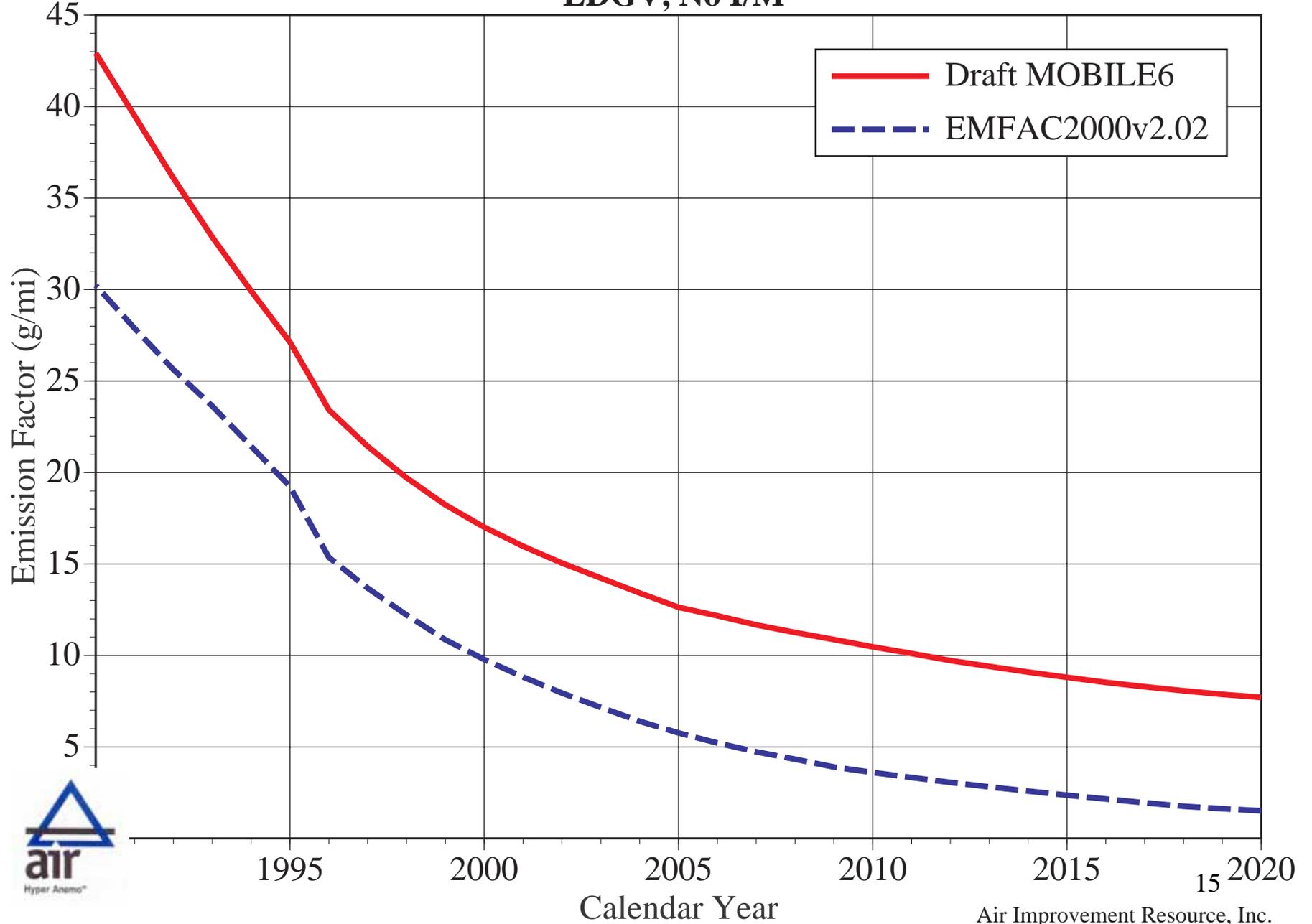
Enhanced Running Loss Emission Factors versus Mileage LDGV, No I/M



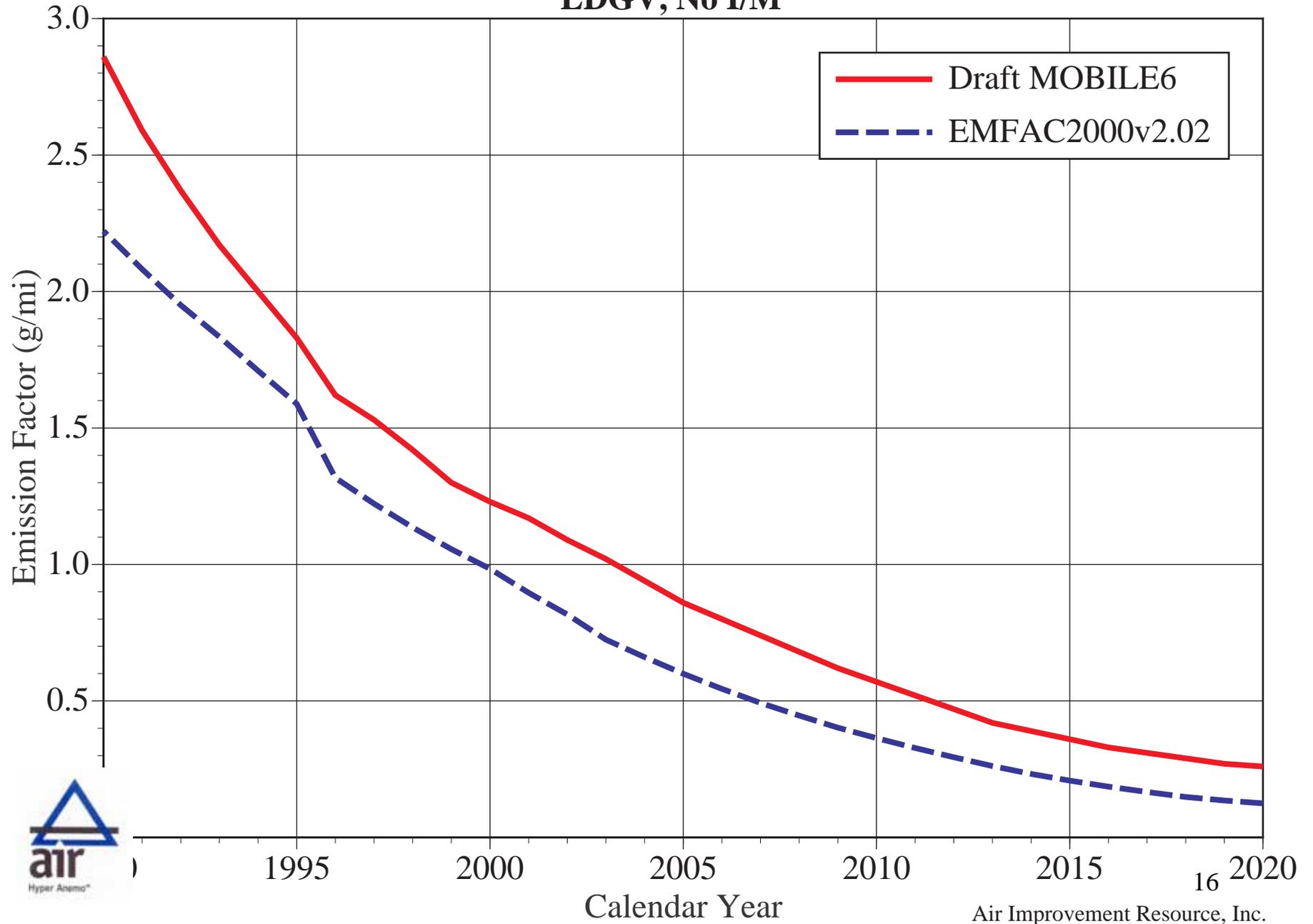
Composite THC Emission Factors LDGV, No I/M



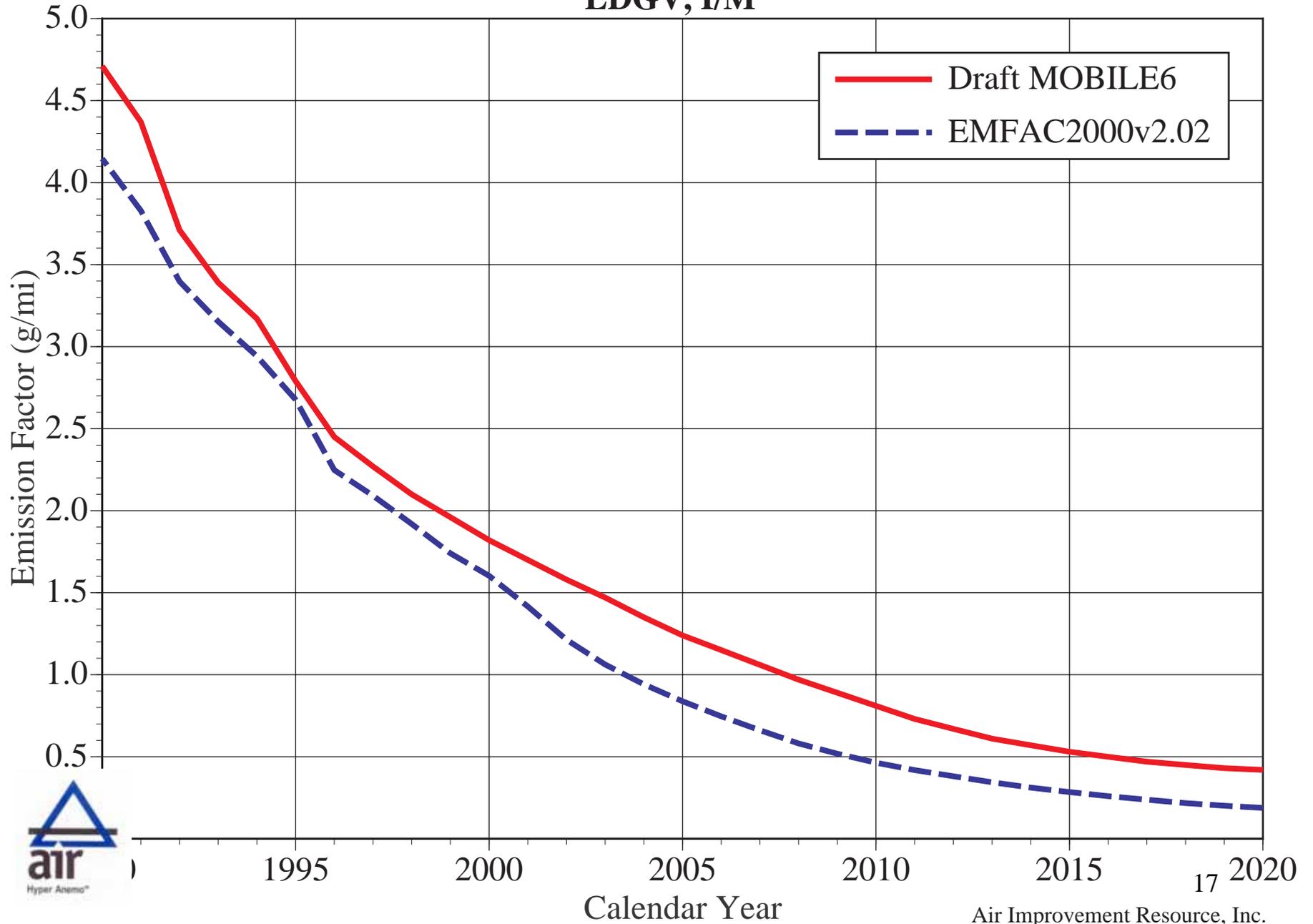
Composite CO Emission Factors LDGV, No I/M



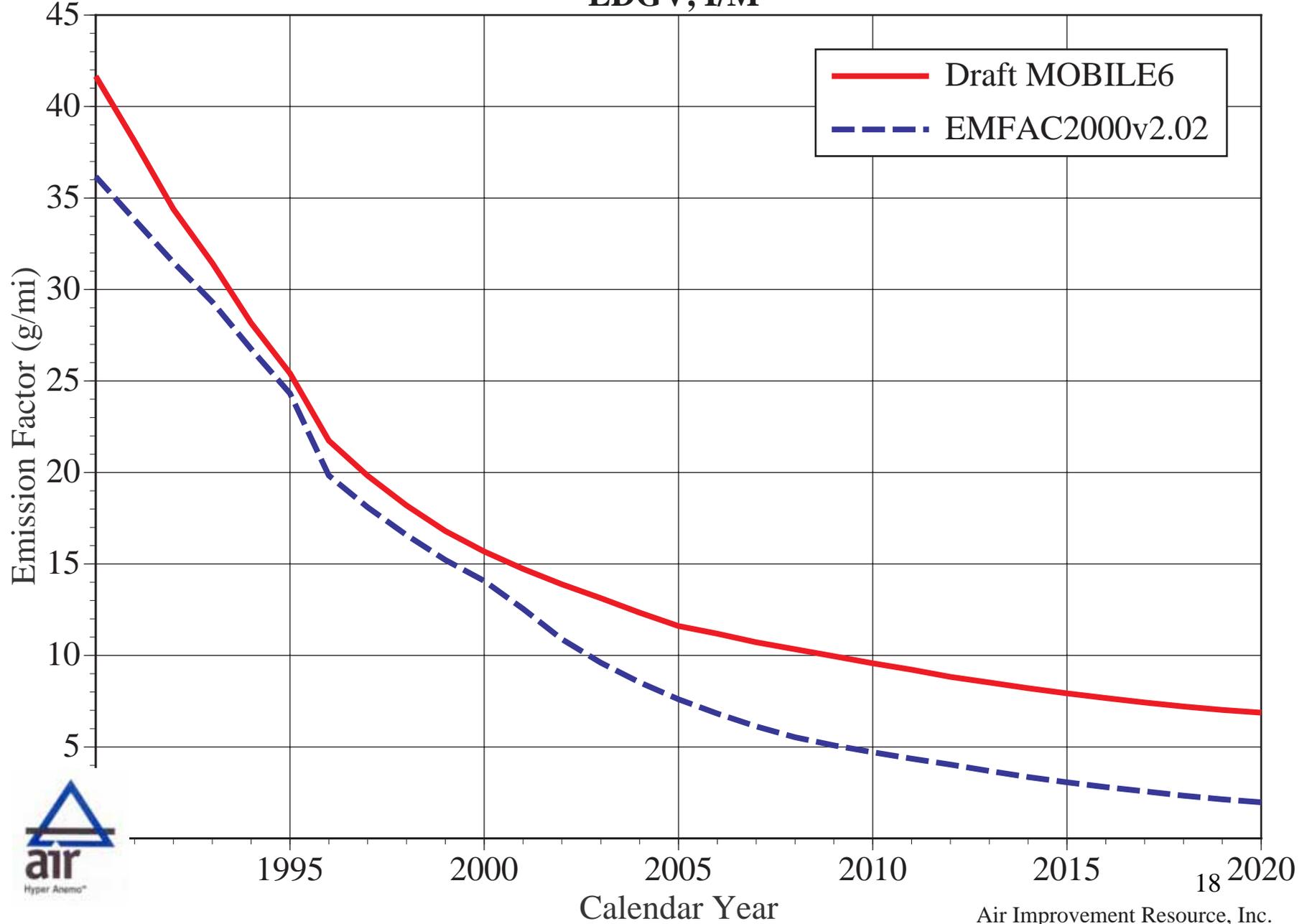
Composite NOx Emission Factors LDGV, No I/M



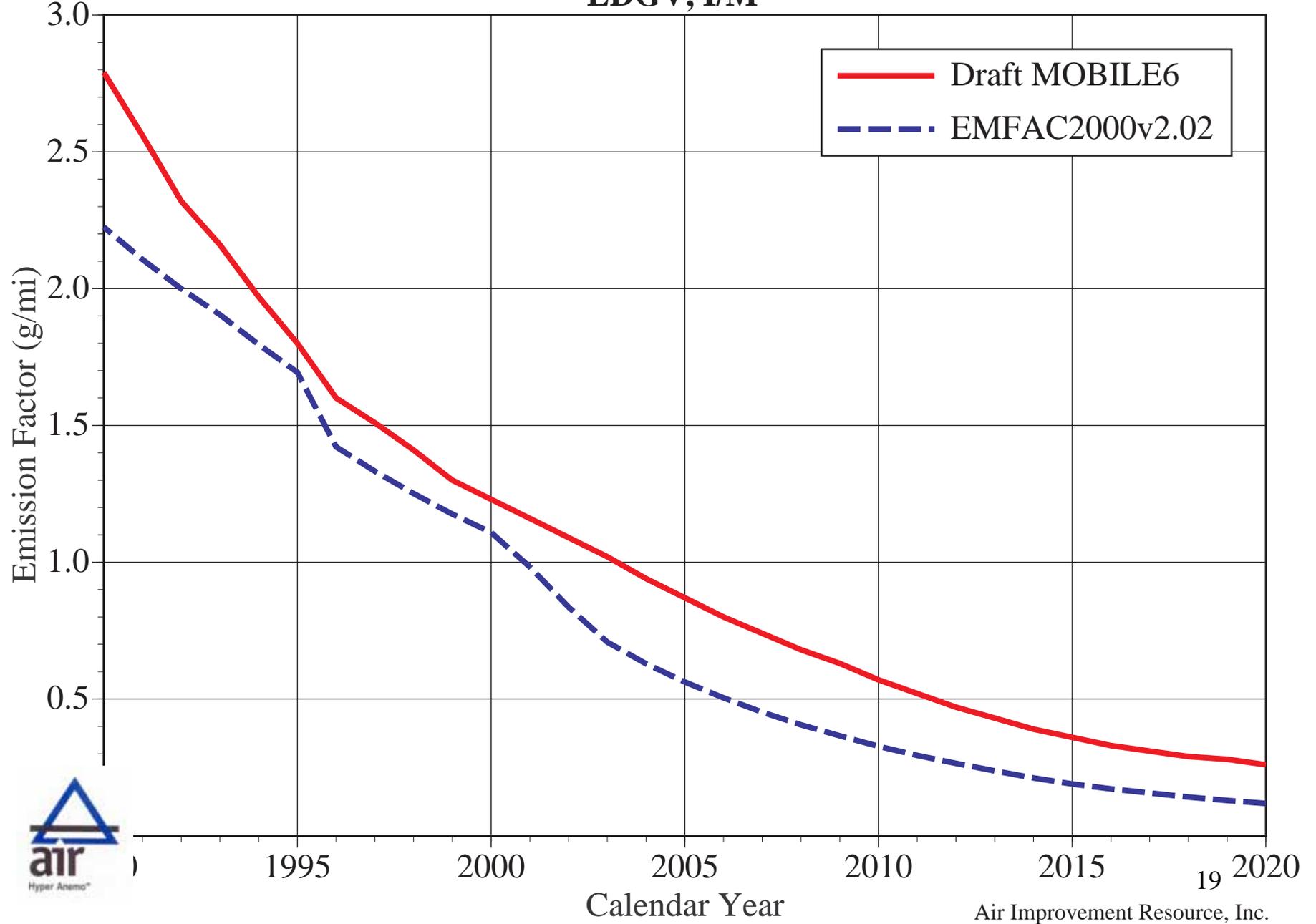
Composite THC Emission Factors LDGV, I/M



Composite CO Emission Factors LDGV, I/M



Composite NO_x Emission Factors LDGV, I/M



Conclusions

- Critical differences in assumptions
 - Response of high emitters to emission standards
 - OBD effectiveness
- Concerns:
 - won't have enough data in near future to resolve differences
 - SIP credits for California standards will be different in different states
 - emissions are either underpredicted in California, or overpredicted elsewhere