



Air Toxics Benefits Associated with Vehicle I/M Programs

How were the cities selected?

Choosing the cities used in this analysis was done using a 2-step process.

- The total number of U.S. cities was limited to only those cities with an existing enhanced I/M program. All cities in California were then excluded because California uses does not use EPA's models to develop emission factor estimates. This avoids introducing uncertainty into the analysis by making compensating adjustments to inputs and results in the attempt to reconcile the models.
- The list was further narrowed using a traffic congestion index derived from "*The 1999 Annual Mobility Report – Information for Urban America*" produced by The Texas Transportation Institute. The cities included in the analysis all have index values greater than 1.0, making them relatively congested during peak travel periods.

Why do the "cities" sometimes include areas much larger than the city itself?

Because the focus is on the impacts of I/M programs, the affected areas were defined to match the extent of the respective I/M programs. In many cases, I/M program areas are not consistent with the geography of the city itself.

Why isn't the impact of diesel emissions included in this study?

Although recent information has highlighted the air toxic concerns for diesel emissions, the purpose of this analysis is to demonstrate the often-overlooked air toxic benefits of enhanced I/M programs. Diesel vehicles are sometimes subjected to smoke or opacity tests. However, the dynamometer-based, tailpipe-testing systems used in enhanced I/M programs are not applied to diesel-fueled vehicles.

Does the MOBTOX5b model account for variability in RFG among the cities when calculating emissions?

One of the benefits of reformulated gasoline is that it provides air toxic emission reductions. The MOBTOX5b model includes the ability to model the impacts of RFG. These fuel-specific impacts are captured in the analysis.



Aren't you overstating the benefits in year one by not allowing for the time it will take for cars' emission levels to get worse?

The model we used (MOBTOX5b) was not sensitive enough to capture gradual worsening of emissions, so we were forced to treat the first year as if the maximum additional emissions would occur all year. However, we were conservative enough with other factors, so that we feel this slight overstatement of the first year does not misrepresent the total emissions benefit.

Don't the results indicate that the impact of I/M programs declines over time?

Over time, the addition of new vehicles and the removal of older ones results in a cleaner fleet since newer vehicles are required to meet more stringent emission limitations both at the time of manufacture and as they age. This leads to an overall reduction in emissions from mobile sources. As this shift occurs, however, the relative size of reductions achieved through I/M programs increases as a percentage of total emissions, creating a greater percentage benefit.

How do you respond to the National Academy of Science's Report's point that EPA's MOBILE model overestimates emission reductions for hydrocarbons?

EPA, in the latest version of the MOBILE model (MOBILE6), has substantially updated the procedures used to estimate benefits from I/M programs to more accurately reflect actual I/M benefits. The result is a less optimistic outlook regarding I/M benefits than previously thought. The MOBTOX5b model incorporates many of these changes already and represents the best data available to date for toxic emissions.

How do you respond to the NAS Report's point that typically less than 10% of the fleet contributes more than 50% of the emissions for any given pollutant, and that I/M programs should focus primarily on identification the highest-emitting vehicles?

EPA addressed this topic in their response to the NAS report. Their key point to take from this is that while it is important to identify those 10% of the vehicles, it is also important to identify the vehicles that make up the remaining 50% of emissions.

How will newer technologies such as on-board diagnostics (OBD) and remote sensing affect air toxic emissions?

These technologies are improving and are useful tools as part of an I/M program. Inclusion of these elements into existing I/M programs would contribute to the ability of the relevant regulatory agency to continue to monitor and maintain emissions from the affected vehicle fleet at levels that are required by EPA. These levels are set in terms of controlling carbon monoxide and ozone precursor pollutant — NOx and VOCs. EPA has yet to characterize the impact of these technologies on air toxic emissions.



Don't the report's results overstate the benefits of I/M? The methodology seems to be designed to select the worst cities.

The methodology is designed to select some of the largest and most congested cities in the United States, where millions of Americans live in areas with unhealthy air. This analysis accurately projects the I/M program benefits for the target cities. It would be an incorrect overstatement to project the benefit levels accrued by these 14 cities to other cities. However, as the report indicates, I/M programs in other cities do indeed deliver air toxic (and other pollutant) reduction benefits. Therefore, the I/M program impact nationally will be much higher than the impact projected for these 14 cities.

Why did the analysis use MOBTOX5b instead of MOBILE6.2?

EPA's MOBILE5b model does not have the ability to determine air toxic emission factors. Therefore, this analysis uses EPA's MOBTOX5b model because it was the best method available for determining air toxic emission factors when the analysis was undertaken. In May 2002, EPA released a draft version of MOBILE6.2, which includes a module for developing air toxic emission factors. EPA is in the process of soliciting comments for this version of the model, and it is expected that there will be some change between the current version and the final, approved version issued by EPA.

MOBILE6.2 incorporates much of the information in MOBTOX5b, however, there is a difference in emission factors. In the short term, MOBILE6.2 estimates higher emission factors, and converges with the MOBTOX5b factors into the future. For this reason, this analysis is considered conservative.