

Directed Vehicle Selection Methodology

Each month, BAR uses the High Emitter Profile (HEP) to assign each vehicle due for a biennial inspection a failure probability. The failure probability determines which vehicles are most likely to fail their next Smog Check inspection, and is ultimately used to identify vehicles required to obtain an inspection at a Test-Only or Gold Shield station. The HEP derives failure probabilities from the initial failure rates of similar vehicle groups.

At the first and most sophisticated level, a vehicle's failure probability is based on these factors:

- 1) Model year, make, model, body style, engine displacement, and transmission type;
- 2) Previous initial Smog Check inspection result for each vehicle;
- 3) Elapsed time since each vehicle's last Smog Check certificate; and
- 4) The last Smog Check odometer reading for each vehicle (only applicable to vehicles with a six digit odometer).

However; if too few vehicle tests exist containing all the information in factor 1 above, a statistically significant failure probability for a given vehicle group cannot be generated. In this case, vehicles are grouped at a secondary level with fewer factor 1 items in order to maintain statistical significance. An example of this would be a particular vehicle group with previous initial inspection results from only fifteen 1992 Chevrolet Astro vans with a 4.3 liter engine and an automatic transmission. Since fifteen vehicles would not be statistically significant, these results would need to be combined with other 1992 Chevrolet 4.3 liter engine vehicles similar to the 1992 Chevrolet S-10.

In this second level group, factor 1 no longer includes body style and transmission type; factors 2, 3, and 4 still apply.

- 1) Model year, make, model, engine displacement;
- 2) Previous initial Smog Check inspection result for each vehicle;
- 3) Elapsed time since each vehicle's last Smog Check certificate; and
- 4) The last Smog Check odometer reading for each vehicle (only applicable to vehicles with a six digit odometer).

If too few vehicle tests exist at the secondary level to achieve a statistically significant group, further simplification of factor 1 items would result in combining vehicles with the same model year and make. For example, the 1992 Chevrolet Astro in the example above would be combined with all other 1992 Chevrolets, without looking at the model, body style, engine displacement, and transmission type. In this third level group, factor 1 only includes the model year and make; factors 2, 3, and 4 still apply.

Finally, if there still are not enough vehicles to achieve a statistically significant group, the initial test failure rate is averaged by model year for all vehicles in order to establish a failure probability for vehicles with limited inspection history. For example, it is unlikely that there are enough 1976 Ferraris to form a statistically significant calculation of their failure probability. In this case, the 1976 Ferraris would be assigned the average failure rate for all 1976 vehicles with similar odometer readings. In this fourth level group, factor 1 only includes the model year; and factor 4 still applies.