REVECORP

ENGINEERING AND DATA SOLUTIONS

Independent Review of the 2017 Smog Check Performance Report

PREPARED FOR:

THE CALIFORNIA DEPARTMENT OF CONSUMER AFFAIRS BUREAU OF AUTOMOTIVE REPAIR

Agreement 001546

June 20, 2018

Independent Review
of the
2017 Smog Check Performance Report

Prepared for:

Bureau of Automotive Repair
10949 N. Mather Blvd.
Sacramento, CA 95670
(916) 403-8600
www.bar.ca.gov

Agreement 001546

June 20, 2018

Prepared By:

Revecorp Inc.
Dr. Michael J. St. Denis
Robert Budd
5732 Lonetree Blvd.
Rocklin, CA 95765
(916) 786-1006

www.Revecorp.com

With

Eastern Research Group
Sandeep Kishan
Jim Lindner
3508 Far West Blvd., Suite 210
Austin, TX 78731
(512) 407-1830
www.ERG.com

Disclaimer:

The statements and conclusions in this report are those of the Contractor and not necessarily those of the Bureau of Automotive Repair (BAR) or the State of California. The mention of commercial products, their source, or their use in conjunction with material reported herein is not to be construed as actual or implied endorsement of such products.

Table of Contents

Independent Review
of the
2017 Smog Check Performance Report

1 EXECUTIVE SUMMARY

Revecorp was tasked with providing an independent review of the 2017 Smog Check Performance Report (the Report or SCPR) developed by the Bureau of Automotive Repair (BAR). The Report is mandated by Assembly Bill (AB) 2289 (Eng, Chapter 258, Statutes of 2010) codified in Health and Safety Code §44024.5, which requires BAR, in cooperation with the California Air Resources Board (CARB), to perform an evaluation of the Smog Check Program (Program) using available data.

This is an independent review of the 2017 SCPR versus the specific requirements of AB 2289. In addition to addressing statutory requirements, this review offers suggestions to improve the clarity and to increase the usefulness of the SCPR in future years.

The major findings from our review of BAR's 2017 SCPR are:

- New analysis in this report continues to strongly support that the STAR Program is increasing the effectiveness of the Program. BAR should continue to focus in future Reports on the differences in performance between station types and Follow-up Pass Rate (FPR) scores of stations and inspectors to incentivize improved STAR station performance.

- The Report evaluation is mostly still limited to older (1976-1995) vehicles, which comprise a small fraction of the fleet and approximately half of the fleet excess emissions. BAR should continue their plans to expand the model years of vehicles sampled, including analysis of the OBDII data collected.

- As acknowledged by BAR and noted in Revecorp's review of the 2016 Report, a larger population of vehicles need to be tested at roadside inspections to better trace performance of the Program over time.

- The roadside failure rates immediately after a passing Smog Check inspection could be attributed to the durability of related emissions repairs. More research into the durability of repairs should be undertaken by BAR and described in their analysis as this relates to excess emissions between inspections. This could prompt program changes that may lead to longer lasting repairs, and therefore larger emissions reductions due to the Program.

- BAR should expand the evaluation of Program emission reduction benefits beyond tailpipe emissions. Other program components such as cold start, evaporative emissions reductions and motorist voluntary response to the check engine light should be included in the analysis. These all provide reductions in excess emissions but are missing from the current analysis based on roadside testing data.

2 2017 SMOG CHECK PERFORMANCE REPORT REVIEW REQUIREMENTS

BAR is mandated by Assembly Bill (AB) 2289 (Eng, Chapter 258, Statutes of 2010) codified in Health and Safety Code § 44024.5, to perform an evaluation of the Smog Check Program each year. HSC §44024.5 describes the specific goals to be met and methods to be used.

HSC §44024.5 (a) requires BAR to collect "emissions profiles" and "data from motor vehicles that are subject to the motor vehicle inspection program" using any source of data including Program data, roadside (in-use) testing data and remote sensing. The analysis of these data is "…to evaluate the program and to assess the performance of Smog Check stations".

HSC §44024.5 (b) describes seven specific tasks to be completed using the data collected in subsection (a) to provide the evaluation of the Program and Smog Check stations:

> **"(1)** An independent validation of the evaluation methods, findings, and conclusions presented in the Report.
>
> **(2)** The percentage of vehicles that initially passed a Smog Check inspection and then failed a subsequent inspection as indicated by the data collected pursuant to subdivision (a).
>
> **(3)** The percentage of vehicles that initially failed a Smog Check inspection and then failed a subsequent inspection as indicated by the data collected pursuant to subdivision (a).
>
> **(4)** An estimate of excessive emissions resulting from vehicles identified in paragraphs (2) and (3).
>
> **(5)** A best-efforts explanation regarding the reasons vehicles identified in paragraphs (2) and (3) inappropriately failed or passed an inspection.
>
> **(6)** Recommended changes to the Smog Check program to reduce to a minimum the excess emissions identified in paragraph (4). In developing the recommended changes, the department and the state board shall undertake a thorough evaluation of the best practices of other state Smog Check inspection programs, and shall include in the recommendations how these other state best practices can be incorporated into California's program. Program recommendations pertaining to contracting with one or more entities to manage Smog Check stations shall not be implemented unless the Legislature, by statute, authorizes that contracting.
>
> **(7)** A comparison to the findings of the report, "Evaluation of the California Smog Check Program Using Random Roadside Data," dated March 12, 2009."

Validation of the methods used for the evaluation (1) was performed in 2014 by UC Riverside. The methods used for the evaluation have not changed and therefore Revecorp was not asked to review this item. Items (2) through (7) were all addressed in the 2017 Smog Check Performance Report developed by BAR. Revecorp has reviewed these responses and from them developed questions related to the Report and ideas to increase the clarity and usefulness of the Report.

3 SPECIFIC COMMENTS FOR IMPROVING THE REPORT

Listed below are comments and questions that should be used to clarify some of the discussion in the 2017 SCPR and/or should be considered for the 2018 SCPR. Specific page numbers refer to the 2017 SCPR.

3.1 General Comments on the 2017 SCPR

- The body of the Report has a large number of footnotes, which sometimes disrupts the flow for the reader. It may make the report easier to read if a reference list was added at the end where citations are listed and only use footnotes for clarifying the text. Additionally, some of the footnotes are important and should be moved to the text of the report, e.g., footnote 18 (discussed below).
- The word "significant" is used often in the text. While there are large differences between the 2003-2006 roadside data and the 2015-2016 roadside data, it would make the report clearer to use the word "significant" only in a statistical context, e.g., "statistically significant differences at a 90% confidence level."

3.2 Specific Comments on the 2017 SCPR

- Comment - Page 1, Paragraph 2 – The term "roadside follow-up pass rate data" will not be understood by a reader not familiar with the data. Suggest that it be simplified or explained at this point further.
- Comment - Page 1, Paragraph 3 – One possible explanation for the lower roadside failure rate could be a result of the older vehicles that are currently on the road being in better cared-for condition, as poor performing vehicles would have been scrapped by now. The fact that the roadside failure rate has decreased while the Smog Check failure rate has increased supports this idea and should be pointed out in this paragraph.
- Comment - Page 1, Footnote 2 – There should be an explanation of the "greatest likelihood to fail vehicles". For example, it could say, "using an algorithm based on past make, model, model year and Smog Check failure history" or some other simple description.
- Comment - Page 2, Figures 1A & 1B
  - Were the same standards applied to each of the figures? This should be noted.
  - It would be useful to see the previous year's plots so it is clear the progress that is being made.
  - Are the red failing lines the same on both graphs, i.e., in Figure 1A it says initial fail and in Figure 1B it says the red line is initial fail/passing retest? Did Figure 1A fails also pass a retest? The following text answers this, but the figure legends should be modified to make it easier to understand it just by looking at the figures.
  - The points for the red line in the Figure 1A may be parabolic which would lower the intercept value.
  - There should be some discussion to explain why at time zero the roadside failure rates are not zero (that some of this difference is expected and some of this represents vehicles which may not have actually passed their Smog Check inspection).
- Comment - Page 3, List – The term "significantly" is used in several cases. See comment above.
- Comment - Page 3, Item 2 – If there was a difference in the standards applied in 2003 to 2006 and in the current testing which could influence the comparison, then it should be noted.
- Comment - Page 3, Item 4 – Is it possible to supply a simple metric to support the statement that low-performing stations have continued to deteriorate in performance?

- Comment - Page 3, Item 6 – "...the ability to estimate excess…" needs to be reworded.
- Comment - Page 3, Item 6 – The Report pointed out that although the population of model year 1999 and older vehicles is small, they comprise 50% or more of the excess emissions. It would be useful to present that in a figure here in order to emphasize the importance/impact of the older vehicles.
- Comment - Page 3, Item 7 – It is agreed that more work is needed to understand durability of Smog Check repairs. A program similar to CARB's "Recapture" study conducted in 1991-1993 should be considered for gathering the data necessary to understand this important aspect. See "Discussion" section below.
- Comment – Page 4, End of First Paragraph – Performing Acceleration Simulation Mode (ASM) tests on newer OBD vehicles in the future should be considered to assist in developing better future emissions estimates.
- Comment – Page 4, Last Paragraph - "Sierra" was already defined on Page 1, footnote 6.
- Comment – Page 4, Footnote 9 – This statement should be modified to clarify that an Enhanced Smog Check Program is required in areas with severe National Ambient Air Quality Standards non-compliance, whereas a Basic Smog Check Program could be implemented in areas with less severe air quality issues.
- Comment – Page 4, Footnote 9 – The second sentence should end with "in California". The ASM test is not required on model year 1996 and newer vehicles by US EPA or in other vehicle inspection programs outside of California.
- Comment – Page 5, Second Paragraph - "Assembly Bill" already defined on Page 1, 1st sentence.
- Comment – Page 7, First Sentence - "Statute requires…", it seems like there should be a "The" before this or make statute plural.
- Comment – Page 7, Table 1 – This table should have the heading for columns 2 to 5 changed to, "Failure Rates from BAR Roadside Surveys" to make it easier to understand.
- Comment – Page 7, Table 1 – Confidence intervals would be useful, particularly given the small sample size of the Non-STAR stations. The failure rates from the 2014-2015 and 2015-2016 roadside data are probably not statistically different.
- Comment – Page 7, Second Paragraph - The two referenced datasets for the model year 1976-1999 vehicles, tested in 2015-16 (January 2015-December 2016) and 2014-15, (dates not specified, but referenced as described in the 2016 SCPR). Presumably as the dates in the data sets overlap, the same data may be used in both datasets. Is that the case? If so, the report should explicitly define that.
- Comment – Page 8, First incomplete Paragraph, Sentence ending "than they were in the earlier survey" - This is not that unexpected, because one school of thought is that with these vehicles, while they are older by 10 years, only the ones that are better maintained survive. The survival of the fittest reasoning.
- Comment – Page 8, Footnote 20 - Is "directed vehicles" defined anywhere? Even though it may be common knowledge, this term should be defined somewhere.
- Comment - Page 8, Footnote 18 – As noted above, this is an important point that needs to be highlighted in the body of the Report. Is the increased failure rate for the newer Smog Check data (2016) a result of more stringent standards, better testing/station performance, or both?

- Comment – Page 9, Second Paragraph - Is an alternative theory that the more rapid deterioration is due to the vehicles being even older now, so keeping them clean just gets harder?
- Comment – Page 9, Third Paragraph - To avoid the potential adverse impact of new STAR stations, BAR could do the STAR station analysis with and without the new stations and see how it changes.
- Comment – Page 9, First full paragraph - It is critical for clarity to define the terms "re-fail rates" and "fail rates" in the context of the figures. For example, "re-fail rates" are the fail rates at Roadside inspections for the vehicles that failed their Smog Check, were presumably repaired, and then were certified at the end of the Smog Check process. Similarly, "fail rates" in the figures refers to the group of vehicles that failed Roadside inspections but were initial passes at their scheduled Smog Check.
- Comment – Page 9, First Full Paragraph - "Time-zero" re-fail rates should be explained for clarity. An endnote could be added such as 'time-zero' fail rates refers to the projected roadside fail rate at the time of the Smog Check and accounts for the potential emissions control system deterioration from the date of the Smog Check to the date of the roadside inspection or test to test variability.
- Comment – Page 9, Bottom – The term "FPR" (Follow-up Pass Rate) should be defined here, not on Page 10.
- Comment – Page 10, Second Paragraph - The phrase ", and as compared to similar vehicles." needs explanation in a footnote. Does it refer to the fact that any age differences are accounted for before comparing fail rates among stations?
- Comment - Page 10, Second Paragraph – A simple definition of FPR should be supplied, such as:
  - A high FPR implies that a passing vehicle in the current inspection cycle was a "true-pass" in its last inspection regardless of whether it was an initial test pass or whether it failed and received repairs; and
  - A low FPR implies that the last inspection was compromised and/or repairs are not holding up.
- Comment – Page 11, Last Paragraph - "The 2009…" The phrase "emissions reductions lost" should be explained in a footnote.
- Comment – Page 11, Last Paragraph - "The 2009…" Sentence ending 70 TPD to 50 TPD. Does BAR have reasoning to present for this change? Could this again be due to the "survival of the fittest" issue with older vehicle mentioned earlier? (Even though the vehicles in question are older, there are fewer of them in the fleet, and the ones that are there are probably better maintained than the ones that have "died" out.) One method to evaluate this would be to compare the distribution of makes and models from when new (what did this comprise in 1980) and what does this distribution of makes and models look like today. It is possible that some vehicles are simply more durable, have emissions control systems with greater longevity and are less expensive to maintain or are easier to maintain, therefore they have remained on road longer. BAR should consider adding a simple analysis of this type in the future.
- Comment – Comment Page 12, Conclusions:
  - As noted in the General Comments, the word "significantly" should be reserved to be used as a statistical term.
  - Bullet 2 – It should be verified that same standards were applied in both cases. If they were not, then there should be an explanation of the impact that would have. If the current standards are more stringent, then it would be important to point out that despite more stringent ASM standards, the roadside failure rates have been reduced.

- Bullet 4 – In addition to using the Roadside result to compare STAR stations to non-STAR stations, the cycle-over-cycle results could be compared to see if failing vehicles fail again in 2 years and if they fail for the same components. This should also be done for the OBD fleet, where it is easier to identify the component through a diagnostic trouble code (DTC).
- Bullet 5 - Can the 34 tons-per-day lost benefit be put in context? What fraction of the light-duty vehicle fleet does that represent? How does this compare to emission benefits of other recent measures that CARB has pursued?
- Bullet 7 – We agree that there is a need to better understand the durability of Smog Check repairs and their effect upon roadside fail rates and excess emissions. This understanding could be achieved by repeating a study similar to the "Recapture" study discussed below.
- The report references Attachment B as providing insights as to the causes of excess emission test failures at the roadside. Attachment B is more related to better understanding station performance and the FPR metric.

- Comment - Page 13, Last Paragraph – There is a discussion of changes to NOx standards. Were these changes important or not when comparing results of the different data sets?

4 DISCUSSION ON WAYS TO IMPROVE THE REPORT

Following are areas where Revecorp believes the roadside studies could be expanded to increase the usefulness of the Smog Check Performance Report. Some of these ideas were mentioned in Revecorp's review of the 2016 SCPR, however if they have not been addressed yet, they are included here again for clarity.

4.1 Expand the Roadside Sample Size and Model Years

HSC §44024.5 (b) requires a comparison of current roadside data to the 2009 Sierra Research report. The data for the Sierra Research report were from 2003 to 2006 roadside inspections of vehicles model year 1976-1995. Although the fleet in that study has since decreased in size, the comparison of that report to the current analysis is useful to show the trends in Program performance over time. At the same time, due to fleet turnover, the excess emissions produced by newer vehicles with lower emission rates and higher vehicle miles traveled (VMT) may be equal to emissions from older vehicles with a small population, lower VMT and higher per vehicle emission rates. This balance, at least in the short term, will make the refail rates of older vehicles potentially important for some time, but the report needs to also capture the excess emission contributions of newer vehicles into the future.

The 2016 and 2017 Reports broadened the range of model years to 1976-1999, from the range of 1976-1995 model years that was analyzed in earlier SCPRs and in the Sierra report. In order to increase the usefulness of the Report "… to evaluate the program, and to assess the performance of Smog Check stations" (HSC §44024.5 (a)), the model years sampled on-road need to be further expanded. As noted on Page 6, BAR has collected roadside OBDII data and intends to include an analysis of that data in a future report. This is necessary to keep up the validity and usefulness of the Report; however, sampling more newer vehicles, if the sample size remains the same, will lower the number of older vehicles sampled and lead to higher uncertainty in the analysis of all groups. Therefore, Revecorp continues to recommend expansion of the roadside sampling to include more vehicles across more model years. The sampling should be stratified to represent the relative re-fail rates and contributions to excess emissions estimated for each model year group (as discussed in detail in Revecorp's review of the 2016 Report).

4.2 Evaluation of Repair Durability

BAR notes on Page 3 of the Report in Item 7 and on Page 9 in the explanation of slope of the lines in Figure 1A, that more work is needed to understand the durability of repairs as they relate to both the observed roadside fail rates and excess emissions growth over time after a passing Smog Check. A better understanding could lead to additional emissions reductions from more durable and longer lasting repairs. Unfortunately, little recent research has been conducted on repair effectiveness, with the exception of some specifically targeted studies performed by the Colorado Department of Health and Environment.

The most recent study of repair effectiveness in California was conducted by CARB from 1991-1993 (the "Recapture" study). A good summary of the structure of that study can be found in a 1996 JAWMA journal article[1], while a brief summary is given below:

- 1,115 randomly selected "should fail" vehicles from the South Coast Air Basin were recruited to participate in the study.

[1] Sudhir Chella Hajari (1996) Diagnosis and Repair of Excessively Emitting Vehicles, Journal of the Air & Waste Management Association, 46:10, 940-952. See http://www.tandfonline.com/doi/abs/10.1080/10473289.1996.10467529

- Baseline testing (FTP + Smog Check) was conducted by CARB.
- Vehicles were sent to commercial stations for Smog Check and repairs.
- After-repair FTP testing was conducted by CARB.
- Follow-up FTP tests were conducted after one year (770 vehicles) and two years (483 vehicles).

Analysis of the study data showed that the majority of the total after-repair deterioration occurred within two years.

A similar analysis of after-repair deterioration is warranted due to the significant changes in technology since that study and analysis were conducted. Due to changes in technology, for model year 1996 and newer vehicles, it may be possible to use OBDII data loggers or remote OBDII transmitting devices to gather data on repair durability for these vehicles in a highly cost-effective manner. Vehicles repaired as part of BAR's Consumer Assistance Program (CAP) could be used as a pool of candidates. The vehicles could receive a baseline ASM test and have the data loggers installed at the time of repair. Pre-1996 model year vehicles could also participate, but only by performing the after-repair ASM test as a baseline and then paying the motorist to bring the vehicle back every six months and do an additional emissions test. BAR performed a similar study in the mid-1990s (Vehicle Emissions Reduction Studies) which yielded highly useful data on repairs.

4.3 **Additional Areas of Emissions Reductions BAR Should Investigate**

The mandate of AB 2289 was for BAR to provide an evaluation of the Program each year, and compare the results to the 2009 Sierra Research study. The Sierra study relied on the results of roadside testing, however, changes in the program and technology have made it so some emissions reductions attributable to the Program are no longer captured in the roadside measurements. Revecorp has identified below several areas which should be considered for inclusion in future analyses of the Program performance.

4.3.1 **Vehicle Early Retirement and Repair Assistance Benefits**

In fiscal year 2015/2016, BAR notes that 47,868 vehicles were retired early through the Enhanced Fleet Modernization Program (EFMP)[2]. BAR also estimates that the EFMP and repair assistance provided through the CAP delivered a reduction of 6,822 tons of air pollution. The reduction in emissions due to the CAP are measured in the roadside testing, however the effects of the EFMP are not (the vehicles are not still on road). For this reason, the analysis of the roadside data is missing emissions reductions achieved by removing older vehicles from the road because they are not sampled. In future analyses, BAR should estimate the reductions for the EMFP as part of the Report. A survey should also be conducted with EFMP participants to determine if Smog Check was a determining factor in the decision to participate in the program, and what type of transportation (another vehicle, public transit, bicycle, etc.) replaced the EFMP vehicle. This could be helpful in determining the difference in emissions between the EFMP vehicle and the new transportation method to estimate benefits of the EFMP.

[2] https://www.bar.ca.gov/pdf/CAP_Annual_Report_15_16.pdf

4.3.2 **Motorist Reaction to the Check Engine Light (MIL[3])**

Studies such as CRC-E72 "Consumer Response to MIL Illumination[4]" performed by Eastern Research Group in 2005, indicate that most motorists have a positive response to the Check Engine light illuminating (obtain repairs in a timely manner). The results of a survey which was conducted in the study are shown below:

Table 1-3. An Illustration of the Major Factors Affecting Response to a MIL Illumination and MIL-Still-On Rates

	Type of Response to Illuminated MIL	Rate of Response (Percent)	Percent of MILs-Still-On After Vehicle Driven 5,000 Miles After MIL Illumination
Warranty	Positive	94%	15%
	Negative	6%	70%
No Warranty	Positive	89%	20%
	Negative	11%	70%

As the California fleet has turned over, most vehicles on the road are now OBDII equipped. If motorist response to the Check Engine light is high, roadside studies of newer vehicles may not capture the emissions reductions from repairs by these motorists, although this would help contribute to intercepts of the lines in Figure 1A versus 1B. The Program should quantify and take credit for the emissions reductions caused by these repairs. Additional emissions reductions may be achieved by motorists learning that if they come in for a Smog Check with their Check Engine light on, they will fail, and therefore this induces pre-Smog Check repairs.

One way to measure this would be to both look at MIL illumination rates at roadside for model year 1996 and newer vehicles by six month intervals in the collected roadside data and to ask drivers if their Check Engine light had illuminated since their last Smog Check. The emissions reductions from repairs done to turn off the MIL could be estimated and added to the emissions reduction benefits of the Program. It would also be useful to compare the MIL illumination rates at roadside for vehicles due for Smog Check within three months, to the observed MIL illumination rates on initial tests at Smog Check. A lower MIL illumination rate during initial Smog Check inspections should be directly attributable to the Program, as an un-documented pre-inspection repair.

4.3.3 **Out-Of-Area Vehicle Registrations**

Motorists may register their vehicles outside of the "basic" and "enhanced" Smog Check areas requiring a biennial inspection in "change of ownership" areas which only require inspection when a vehicle is sold, to avoid the requirements of the Program. If the rates of this Program Avoidance can be determined, they could be used to estimate loss in program benefits due to this activity. Program Avoidance rates could be determined by capturing license plate numbers of all vehicles passing the roadside inspection locations and determining the location where each vehicle is registered. This could be used to come up with a rate of vehicles operating in the basic or enhanced areas but registered outside these areas. Changes in the rate of vehicles registered out of the basic and enhanced Smog Check areas over time could be used to determine if there is an increase or decrease in emissions benefit from reducing this behavior.

4.3.4 **Evaporative Hydrocarbon Emissions**

According to EMFAC, evaporative emissions account for more than half of all excess vehicle hydrocarbon emissions. Excess evaporative emissions may be identified by fuel cap and

[3] "MIL" is the Malfunction Indication Light synonymous with "Check Engine Light"

[4] https://www.crcao.org/reports/recentstudies2005/E-72%20CRC-050330_main.pdf

pressure testing in the Program, but due to motorist convenience issues at roadside[5], these tests are not performed as part of the roadside data collection. It may be possible to perform a more focused study of these failures and the benefits of these repairs through the CAP, to be included as part of the emissions benefit of the Program and identify losses by performing these tests at roadside on a smaller sample of vehicles which previously had failed a portion of the evaporative emissions inspection.

4.3.5 **Cold Start Emissions**

The current roadside tailpipe testing does not measure emissions during cold starts, and for motorist convenience reasons, visual inspections of cold start related components are not performed. However, there are reductions of cold start emissions caused by the Program which could be identified. This benefit is currently not well understood and determining this benefit would require testing of vehicles which have failed a Smog Check for a defective part which impacts cold start emissions (such as the secondary air injection system), before and after repairs. There is potential to perform this testing on vehicles that are part of the CAP by performing a tailpipe test on these vehicles at cold start both before and after repairs are performed and also identify losses by performing the visual inspection at roadside on a smaller sample of vehicles which previously failed the visual inspection.

4.3.6 **STAR Program Enhancements**

The Report on the bottom of Page 9 and top of Page 10 states that BAR is pursuing regulatory changes to decrease the time it takes to remove low-performing stations from the STAR Program. Such a change is clearly needed to offset the significant financial incentive that low-performing stations now enjoy by continuing to conduct improper emissions tests of directed vehicles while their STAR status is being invalidated for poor performance[6]. A partial solution to this problem would be to implement triggers using historical inspection records combined with real time inspection data to block improper inspections as they occur. The authority to block these inspections is given in HSC §44036 (b)(3)(K), and BAR has implemented this feature using OBDII "fingerprint" data to identify vehicles which should historically irregular or mismatched data and stop the inspection ("Certificate Blocking"[7]). These vehicles are sent to the Referee stations for inspection – stopping both the station and inspector from performing an improper inspection and significantly, forcing the vehicle to come into compliance providing previously lost air quality benefits.

A Program evaluation metric that BAR should consider for the SCPR is the trend in the number low performing stations and stations with STAR certifications invalidated each year. In addition, data collected at roadside on vehicles which were last inspected at stations which were invalidated could be compared to the rest of the roadside sample, to determine if the roadside tests are identifying the low performing stations.

---

[5] The fuel cap test, low pressure fuel evaporative tests and visual inspection, all require significant time to perform and the delay would be unacceptable to the public at roadside, therefore these portions of the inspection are currently not performed at roadside.

[6] This is described in detail in Revecorp's 2016 comments.

[7] https://www.smogcheck.ca.gov/pdf/ARSC_Newsletter_Spring_2018.pdf, Page 5.