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TECHNICAL
R E P O R T



The Impact of Extended Vehicle Emission Warranties on California's Independent Repair Shops

Lloyd Dixon

Prepared for the California Air Resources Board



RAND INFRASTRUCTURE, SAFETY, AND ENVIRONMENT

The research described in this report was sponsored by the California Air Resources Board through Agreements 00-604 and 03-612 and was conducted within RAND Infrastructure, Safety, and Environment (ISE), a unit of the RAND Corporation

Library of Congress Cataloging-in-Publication Data

Dixon, Lloyd S.

The impact of extended vehicle emission warranties on California's independent repair shops / Lloyd Dixon.

p. cm.

"TR-235."

Includes bibliographical references.

ISBN 0-8330-3750-1 (pbk. : alk. paper)

1. Service stations—California. 2. Environmental law—Compliance costs—California. 3. Warranty. 4. Air—Pollution—California—Prevention—Costs. I. Title.

TL153.D548 2005

629.28'6—dc22

2005003657

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Published 2005 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
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Summary

The California Air Resources Board (CARB) allows automobile manufacturers to satisfy part of the state's Zero Emission Vehicle (ZEV) Program requirements by manufacturing and selling partial-zero emission vehicles (PZEVs). When new, PZEVs must meet very stringent emission standards, and in an effort to keep emissions low as the vehicles age, CARB requires that they be covered by a comprehensive 15-year/150,000-mile emissions-system warranty. The PZEV warranty extends the three-year/50,000-mile emissions warranty currently required in California. To be covered under warranty, repairs must usually be done at dealer repair shops and, thus, CARB has expressed concern that extended warranties may adversely affect independent repair shops.

This report examines and quantifies, where possible, the effects of extended vehicle warranties on the independent repair industry. The findings are based on a survey of the vehicle-repair behavior of drivers in 366 households across California, a survey of repairs at 48 independent repair shops and 28 dealer repair shops in California, existing data on the vehicle repair and maintenance industry, and models of the vehicle fleet that were developed by CARB.

Effects of Extended Warranties on Independent Repair Shop Revenue

A model of consumer expenditures at independent and dealer repair shops was used to estimate the impact of extended emission warranties on revenues at independent repair shops. Estimates were based on scenarios for the number of PZEVs produced between 2003 and 2020.¹ In the scenario in which manufacturers produce the maximum number of PZEVs that can be used to satisfy ZEV program requirements (the "maximum-PZEV" scenario), the

¹The ZEV program took effect in the 2005 model year, although manufacturers produced PZEVs in 2003 and 2004 to generate credits that can be used to satisfy ZEV program requirements.

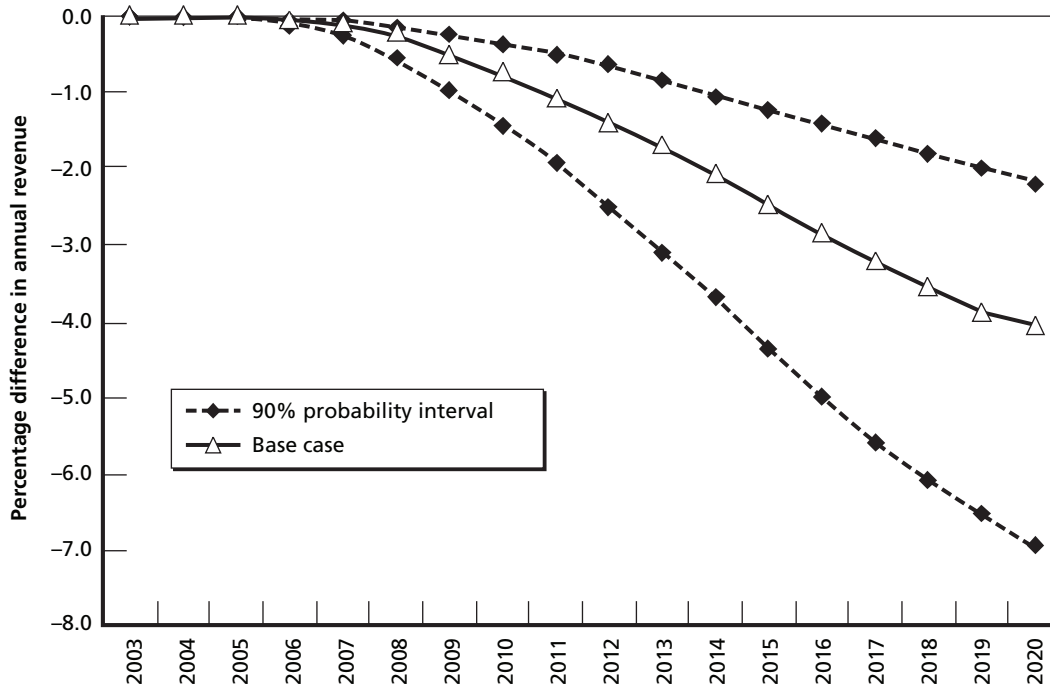
number of PZEVs on the road increases gradually starting in 2003 and reaches 38 percent of the light-duty vehicles (LDVs) in California by 2020.

Independent Repair Shop Revenue in California Will Continue to Grow with Extended Warranties but at a Slower Rate

Figures S.1 through S.4 present the predictions for the maximum-PZEV scenario in constant year-2004 dollars. Extended warranties have no effect on independent repair shop revenue in California between 2003 and 2005 because warranties for the first three years or 50,000 miles of a PZEV's life remain the same as those on vehicles with standard emission warranties. Using a base-case set of parameter values, revenue at independent repair shops is predicted to be 0.8 percent lower (\$120 million of \$15.4 billion) in the maximum-PZEV scenario than it otherwise would be in 2010 and 4.1 percent lower (\$730 million of \$17.9 billion) in 2020.²

There is considerable uncertainty in many of the parameters that underlie the predictions. This analysis, thus, examines how the results change when the parameters are allowed to vary over their likely ranges. The result is that the predicted decline in independent repair shop revenue in 2020 ranges from 2.2 to 6.9 percent (\$375 million to \$1.3 billion) in the maximum-PZEV scenario (as shown by the 90-percent probability intervals in Figures S.1 and S.2).³

Figure S.1
Percentage Difference in Annual Revenue at Independent Repair Shops Due to Extended Warranties, 2003–2002, Maximum-PZEV Scenario

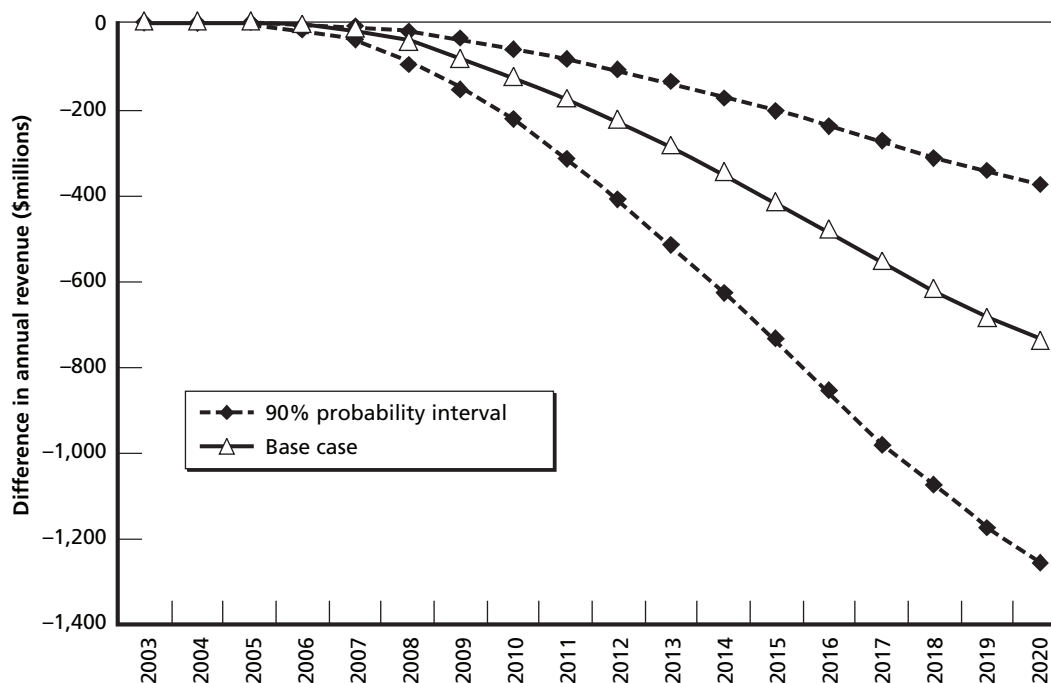


RAND TR235-S.1

² Estimates of independent repair shop revenue do not include revenue from collision repairs and vehicle customization. Including these types of service would increase the baseline for independent repair shop revenue and thus reduce the percentage decline in revenue somewhat from that predicted here.

³ The 90-percent probability interval is determined by the uncertainty in the parameters that underlie the prediction. There is a 90-percent chance that the effect of extended emissions warranties will fall in the interval, given the assumptions on the distributions of the underlying parameters.

Figure S.2
Dollar Difference in Revenue at Independent Repair Shops Due to Extended Warranties, 2003–2020, Maximum-PZEV Scenario



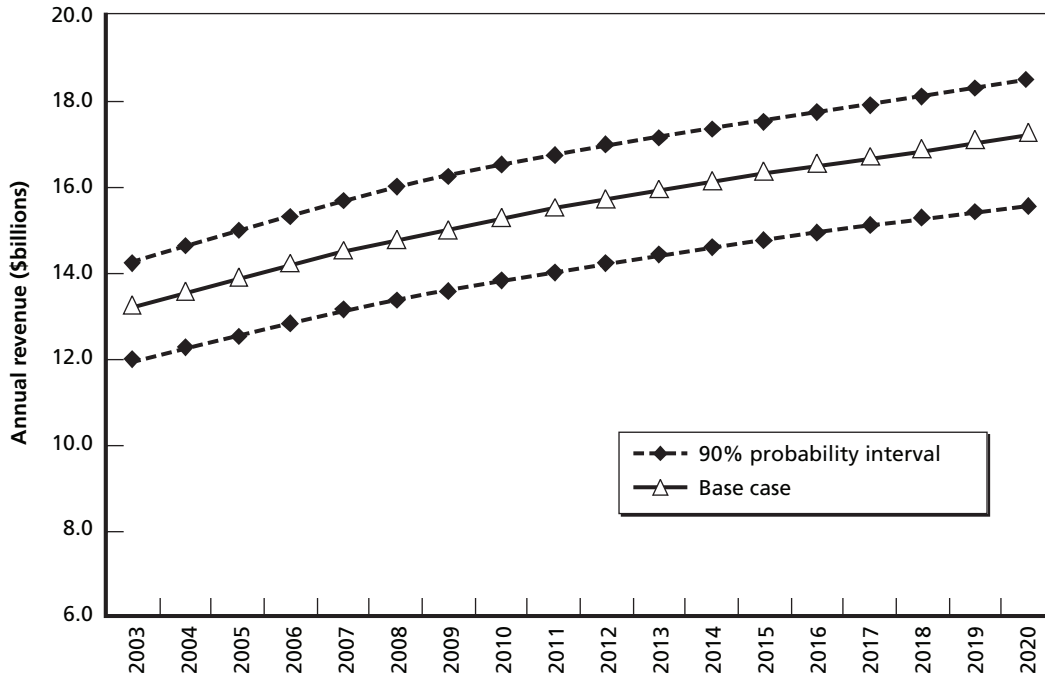
RAND TR235-S.2

Even though revenue at independent repair shops will be lower with extended warranties than it would be if warranties were not extended, revenue at independent repair shops in California will grow between 2003 and 2020 even with extended warranties (see Figure S.3). Projected revenue climbs 30 percent between 2003 and 2020 in the maximum-PZEV scenario with extended warranties and 36 percent without them. This increase is driven by a projected 32-percent rise in the number of vehicles on the road between 2003 and 2020 and a gradual increase in average vehicle age over this period. Figure S.4 shows the change over time in independent repair shop revenue with extended warranties from the level of revenues in 2003.

While it seems plausible that manufacturers will produce enough PZEVs to just satisfy as much of the ZEV program as program rules allow, the number they will actually produce is uncertain. Manufacturers could conceivably produce fewer PZEVs than in the maximum-PZEV scenario, or competitive pressures could induce them to produce more than in the maximum-PZEV scenario. The effects of extended warranties were thus simulated under various scenarios for the number of PZEVs produced. The effects were found to be roughly proportional to the number of PZEVs produced. Even when it was assumed that all vehicles sold after 2008 carried extended warranties, revenue at independent repair shops grew 25 percent between 2003 and 2020. The growth in independent repair shop revenue would not be as large if the vehicle fleet grows more slowly than expected.

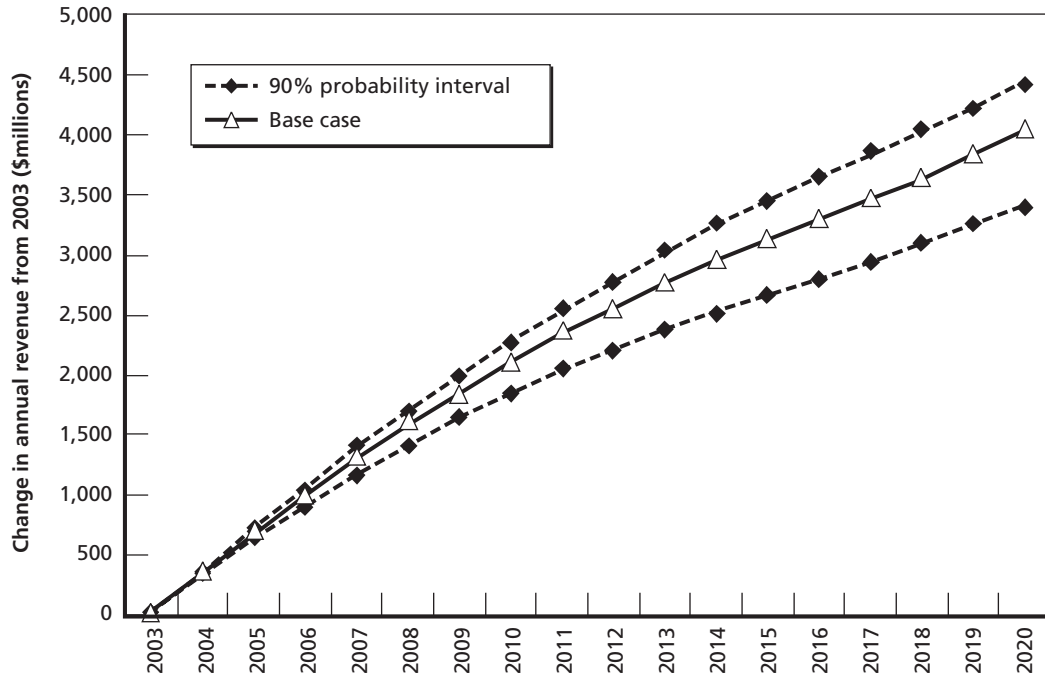
While there is some evidence that the durability of emission-control systems has improved in recent years, sufficient data were not available to project future improvements. Thus, the effects of extended emission warranties are predicted assuming no change in durability. Durability may improve, however, and the simulations in this report show that

Figure S.3
Annual Revenue at Independent Repair Shops with Extended Emission Warranties, 2003–2020, Maximum-PZEV Scenario



RAND TR235-S.3

Figure S.4
Change in Annual Revenue at Independent Repair Shops from 2003 with Extended Warranties, 2003–2020, Maximum-PZEV Scenario



RAND TR235-S.4

estimates assuming no change in durability will likely overstate changes in independent repair shop revenue when durability improvements are factored in.

More specifically, there are two types of durability improvements of interest. First, durability may improve even if warranties are not extended due to the phase-in of more stringent vehicle certification requirements and more extensive emissions testing of vehicles in use. Such an improvement would reduce the impact of extended warranties on independent repair shops because there would be fewer repairs that could migrate from independents to dealers. This type of durability improvement would thus cause the estimates in this report to overstate the actual effect of extended emission warranties on independent repair shops. Second, extended emission warranties might also improve durability. Such an improvement could, on the one hand, magnify the adverse effects of extended warranties on independent repair shops because, in addition to reducing the share of work that goes to independents, extended warranties would reduce the overall amount of work to be split. On the other hand, durability improvements caused by extended emission-system warranties could cause fewer non-emission-system repairs to migrate from independents to dealers (so called pull-along work) when warranties are extended.

Based on estimates of the amount of non-emission work that is done along with emission work, the simulations show that improvements in durability due to extended emission warranties will likely reduce the negative impact of extended emission warranties on independent repair shops. Thus, the predictions here (which assume no change in durability) will again tend to overstate the effects of extended emission warranties.

Effects on Shop Workers, Owners, and Consumers

By reducing revenue at independent repair shops from what it would be otherwise, extended warranties may adversely affect workers at independent repair shops, independent repair shop owners, and consumers.

Extended Warranties Should Not Cause Layoffs in the Repair Industry as a Whole, Although There May Be Layoffs at Some Independent Repair Shops

Aggregate revenue at independent repair shops is predicted to grow even with extended warranties. Thus, there should be no need to lay off current workers at independent repair shops as a whole. However, the findings of this study suggest that some independent repair shops will likely be more affected by extended emission warranties than others. Extended warranties may, thus, cause layoffs at some independent repair shops even though employment at all independent shops combined grows. These layoffs may cause hardship for some workers. Whether or how many independent repair shops might have to lay off employees could not be quantified; however, because the impacts of extended warranties are felt only gradually over time, workforce reductions could possibly be handled through normal attrition. In addition, workers may be able to quickly find employment at other independent repair shops or at dealer repair shops.

Extended Warranties Will Likely Reduce Profits of Independent Repair Shop Owners Somewhat

In the standard competitive economic model, increases in demand raise prices, which in turn increase profits of the firms currently in business above the normal return on capital. In the

case of the repair industry, these extra-normal profits would encourage new independent repair shops to enter the market, reducing prices and profits per firm. Extended emission warranties will cause demand for services at independent repair shops to increase more slowly than it would without extended warranties. This implies that existing independent repair shops will enjoy fewer periods of extra-normal profits than they would otherwise. The loss to current owners is the discounted present value of these foregone profits.

Several factors will moderate the significance of these losses. First, compared with many other industries, it seems easy for new firms to enter the vehicle-repair industry. Easy entry will limit the amount of extra-normal profits. Second, many of the losses will be felt ten or more years in the future. The relatively high discount rate appropriate for small-business profits and the long lead times for the effects of extended warranties will substantially reduce the present value of the losses. Finally, as reported above, independent repair shop revenue is expected to grow 30 percent over 18 years with extended warranties and 36 percent without them. It seems unlikely that the present value of the lost profits will be large relative to the size of discounted profits over this period.

There Will Likely Continue to Be a Large Number of Independent Repair Shops in Most Parts of the State

Slower revenue growth at independent shops may mean fewer independent repair shops than there would be otherwise. Fewer repair shops may mean that repair shops are less conveniently located for some consumers. It may also mean less competition and possibly higher prices at both dealer and independent repair shops.

Investigation of how slower growth in revenue may translate into slower growth in the number of repair shops (or may translate into more rapid decline in the number of independent repair shops if other factors are causing consolidation in the industry) was beyond the scope of this analysis. Revenue growth between 2003 and 2020 is predicted to be 6.0 percentage points slower with extended warranties, so the effect on the number of repair shops is not likely to be great, and a large number of independent repair shops will still likely be in the state.

The reduction in the number of repair shops per vehicle could have more significant consequences for consumers in some parts of the state than in others. For example, the effects could be greater in sparsely populated rural areas where there are few dealer or independent repair shops to start with. This analysis did not allow a determination of whether or how effects on the number of repair shops will vary by region or how the effects on consumers of any declines in the number of shops that did occur will differ between urban and rural areas.

It should be noted, though, that added business at dealer repair shops may induce dealers to open up more locations, which would offset some of the decline in the number of independent repair shops. A full analysis of the effect of extended emissions warranties on drivers and Californians more generally would also need to consider benefits in dimensions not examined here including cleaner air and more durable vehicle emission control systems.

Policy Implications

The study results suggest that the effect of extended emission warranties on independent repair shops will not be large and will be felt only gradually over time. The California Air Resources Board may still want to consider programs to reduce the impacts that do exist. Options are examined in Chapter Eight for preventing or reducing the effects that occur in the first place, reducing the negative ramifications of effects that do occur, and compensating repair shop owners for their losses.

Policies that facilitate the transition of workers at independent repair shops to new jobs could be an attractive way to reduce negative ramifications that do occur. Requiring automakers to cover emission repairs using service contracts that allow repairs to be done at an approved network of independent repair shops is a potentially promising option for reducing the declines in business at independent repairs shops. Consumer education on emission warranties also is a potentially promising option for reducing the effects on independent repair shops. Better information on warranties may reduce the frequency with which drivers go to a dealer for repairs that are not covered under warranty because such information will clarify what the warranty does and does not cover, and better information may also dispel any notions that maintenance work must be done at the dealer to maintain the warranty. While the effects of emission-system warranties predicted by this analysis suggest that the benefits of such interventions will not be great, it is up to policymakers to determine whether further exploration of these options is warranted.