August 28, 2001
ILR 2001-G

Speaker Martin R. Stephens
Utah House of Representatives
318 State Capitol Building
Salt Lake City, UT 84114

Subject: Utah's Safety and Emission Testing of Newer Vehicles

Speaker Stephens:

In accordance with your request, we reviewed test data from several of Utah's vehicle safety and emissions programs and estimate that, on average, 11 percent of Utah's passenger vehicles 0 - 5 years old fail the safety inspection and less than 2 percent of those vehicles fail the emissions inspection. While the emissions failure rate may seem insignificant, the safety failure rate indicates that a number of passenger vehicles may be operating unsafely. We found that safety and emission inspection programs vary from state to state and are not always required. In fact, Utah is the only western state that requires a safety inspection for passenger vehicles of any age.

There are currently about 1.5 million passenger vehicles registered each year in Utah. The older vehicles are required to undergo safety inspections every year and the newer vehicles require an inspection every other year. Vehicles in four of Utah's counties (Davis, Salt Lake, Utah, and Weber) are also required to have emission inspections performed every year as part of each county's air quality program. Statewide safety testing costs $10.50 per vehicle and regional emission testing costs $20 to $25 per vehicle. If a vehicle fails either test, the owner must make the vehicle comply within a two-week period and bear the cost of repairs.

Because the majority of newer vehicles pass the safety and emissions testing, many states do not have safety inspection programs and have cut back their emission testing of newer vehicles. In Utah, we estimate that vehicles 5 years old or newer account for approximately one-third of all registered vehicles, but because of current exemptions, only 19 percent of safety inspection revenues. Part of the fees collected from the vehicle safety inspections provide funding for the Highway Patrol's (UHP) vehicle safety inspection program which includes school bus inspections, training of inspection technicians, and auditing of inspection shops. In addition, part of the inspection fees contribute to the transportation fund to keep the roads maintained. Eliminating the safety inspections for these newer vehicles would mean a significant reduction in funding to the UHP's inspection program and to the transportation fund. As mentioned above, we estimate that about 19 percent of the total vehicles inspected per year fall within this category and this calculates to about $290,000 in revenues to the transportation fund and $145,000 in enhancement fees to the UHP's safety inspection program.

Inspection Programs Vary by State

Currently there are 22 states that have some type of mandatory safety inspection program for passenger vehicles of any age. Utah, however, is the only state in the west with any type of safety inspection program. Many states have eliminated safety inspection programs because federal funding is no longer available. Unlike the safety inspection program, the majority of states require emission testing. Of all 50 states, 33 have mandatory emission inspection programs. Of the 11 western states, only Montana and Wyoming do not require emissions testing. Figure 1 summarizes western state inspection requirements.

Figure 1. Western State Inspection Requirements. Utah is the only western state that requires safety inspection of vehicles.

State	Mandatory Safety Inspections	Mandatory Emissions Testing
Arizona	No	Yes
California	No	Yes
Colorado	No	Yes
Idaho	No	Yes
Montana	No	No
Nevada	No	Yes
New Mexico	No	Yes
Oregon	No	Yes
Utah	**Yes**	**Yes**
Washington	No	Yes
Wyoming	No	No

Utah Is Only Western State Requiring Safety Inspections

Among western states, Utah is the only one with a mandatory safety inspection for passenger vehicles. Other states had safety inspection programs at one time but they were dropped when the federal government eliminated the avenue for funding. According to the UHP, Utah retained its program because it believed that safer vehicles resulted in fewer accidents, fewer highway deaths, lower vehicle maintenance costs, and lower insurance rates. There may be some validity to these claims according to statistics provided by the National Highway Traffic Safety Administration (NHTSA), as a 1994 study showed a lower fatality rate for Utah than in other neighboring states. Figure 2 shows Utah's fatality rate, per 100 million miles traveled, is 1.9 while the average of the surrounding states is 2.1. We could not find any studies demonstrating why Utah's rate is lower—but some groups claim this is because Utah has a required vehicle safety inspection program. However, Colorado's lower rate without a safety inspection program implies there are other variables involved in accident rates.

Figure 2. Fatality Rates for Western States - 1994. Colorado was the only western state with a fatality rate lower than Utah's.

State	Fatality Rate per 100 Million Miles Traveled
Colorado	1.7
Utah	**1.9**
Idaho	2.1
Wyoming	2.2
New Mexico	2.2
Arizona	2.3
Nevada	2.3
Average	**2.1**

Another study showed that combined average auto insurance premiums in 10 other western states are about $91 more, or 14.5 percent greater per year than the average premiums in Utah. Insurance premiums are based on actuarial statistics collected by the insurance companies. Premiums are lower where there are fewer accidents. While there are many factors that contribute to automobile accidents, the three main causes are, vehicle, road, and driver conditions. Since Utah requires vehicle safety inspections, one of the main causes of accidents, vehicle condition, may be improved by the program.

Emission Testing Required in Most States

Emission testing, while required in most states, varies from state to state. In the 33 states where it is required, it varies from county to county. Generally, the emission standards are imposed in the areas where geography and population density result in air quality that does not meet Environmental Protection Agency (EPA) standards. In the heavily populated areas of the east coast, many states have emission standards that apply to the whole state. In the mid-west and mountain states, however, emission standards are typically localized to a few of the metropolitan areas of the state.

In the west, Utah is a more urbanized state with higher concentrations of traffic that create pollution problems. Utah requires emission testing every year in four counties. Washington requires statewide testing every other year. Arizona also requires emissions testing every other year, but only in a few counties. Nevada requires annual testing in two counties and Idaho and New Mexico require annual testing in only one county. Wyoming and Montana, the least populated states of the west, don't require any emissions testing.

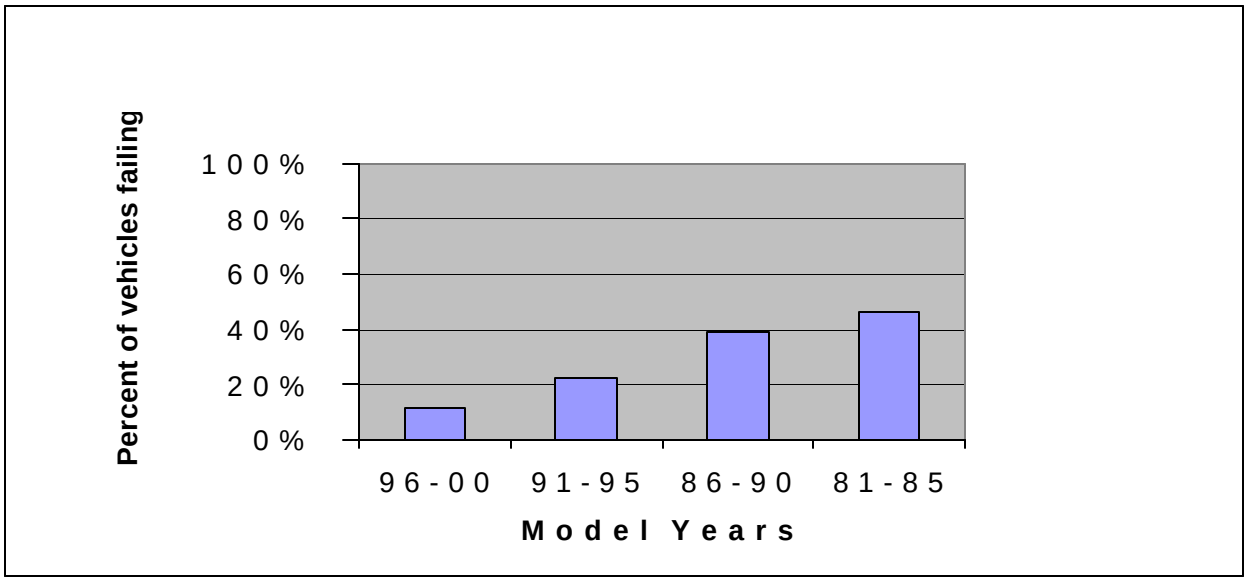
Safety Inspections Provide Valuable Information About Utah Vehicles

We collected safety inspection data on vehicles inspected during the 2000 calendar year. We visited six shops located in different parts of the Salt Lake County and reviewed 3,000 safety inspection certificates. We also analyzed data on 11,000 vehicles inspected in Davis County. Our analysis clearly demonstrates that failure increases as vehicles age and that lights, brakes and tires are the most common problems for newer vehicles. Our analysis also shows that failure rates vary from one location to another. This variability between test centers is partly because of socio-economic factors and partly because different shops may pre-screen the vehicles or they may emphasize tests on certain parts of the vehicle and exercise more critical judgement on these tests.

Failures Increase as Vehicles Age

The average failure rate for all vehicles up to 5 years old is 11.1 percent in Salt Lake county and 13.1 percent in Davis county. As the vehicles get older, the percentage of failures increases and becomes more and more significant as indicated in Figure 3. In Salt Lake County, the average failure rate for all vehicles tested is about 25 percent. This means that one in every four vehicles on the road has failed in at least one of the 15 test areas of the safety inspection program.

Figure 3. Safety Inspection Failure Rates by Vehicle Age. The percentage of safety failures increase with the age of the vehicle.



Failures for newer vehicles are significantly less but still occur. For newer vehicles, safety inspections are required every other year as a method of recognizing their better state of condition. The data summarized in Figure 4 shows that in both Salt Lake and Davis Counties, as the vehicle ages the failure rate increases significantly. Private shop owners believe this increase is due to the natural wear of replaceable components. They state that brakes and tires usually need replacement every 2 to 3 years.

Figure 4. Safety Failure Rates by County. Newer vehicles show significant failures after two years.

Vehicle Year	Salt Lake County	Davis County
2000	3.6%	3.8%
1998	8.5	9.9
1996	16.3	17.5

Weighted Average	**11.1%**	**13.1%**

Most Common Equipment Failures on Newer Vehicles Are Lights, Brakes, and Tires

The safety inspection covers numerous areas of concern on passenger vehicles. The most common failure for newer vehicles is the lights. This includes head lights, tail lights, brake lights, signal lights and other lights on the exterior of the vehicle. If any of the lights are not working properly, the vehicle could be rejected. The second leading cause for rejection is the brakes, including emergency and foot brakes. There are two ways to test the brakes. The most common test procedure is the skid test which measures the stopping distance and overall brake functioning when the brakes are applied at a given speed. The other way is to pull the wheel and measure the thickness of the brake pads.

About 25 percent of all vehicles tested fail at least one of the safety tests. In Salt Lake County last year, 639,000 vehicles were registered—which means about 159,750 vehicles failed the safety inspection. To illustrate the level of potential brake failures, approximately 16 percent of all safety failures are because of brake problems which translates to over 25,000 potential failures for brakes. The safety inspection program identified those vehicles and required that brakes be repaired as a condition of registering the vehicle. Figure 5 shows that other tests with significant failures were tires, wheels, windshield tint, and other. These five areas account for nearly 80 percent of the failures for vehicles that don't pass the inspection.

Figure 5. Most Common Equipment Failures for Newer Vehicles. Replaceable components are the most common failures for newer vehicles.

Equipment Failures for Vehicle Years 1996-2000	
Equipment	**Percent of Total Failures**
Lights	21%
Brakes	16
Tires/Wheels	16
Other	14
Tint	12
Wipers/Washers	7
Windshield	5
Exhaust	3
Mirrors	2
Horn	2
Steering	1
Suspension	1
Windows	1

Failures Rates Vary by Location

One of the results of our analysis was that failure rates varied by location. A number of factors may contribute to the differences. First, several shop managers informed us that in some areas of the county, the residents have less income and, consequently, they drive older vehicles that need more repairs and need them more frequently. These owners tend to put off getting repairs done on their vehicles until absolutely necessary. When the vehicle is inspected for safety, the shops often find 4 or 5 things wrong with the vehicle.

Another factor, according to one shop manager, is that each inspector might have an area that he focuses on specifically. For example, in one shop we observed that windshield wiper failures occurred twice as often as in other shops. The manager told us he is very strict on wiper blades. If they leave streaks or if there is no washer fluid, he fails the vehicle.

Other locations might just advise the vehicle owner for the same vehicle. On another

occasion, we visited a shop that does safety and emission inspections in addition to repairing mufflers and brakes. At this shop, we reviewed a sample of 150 of their safety inspection certificates from several months of service. There were 23 vehicles rejected (15.3 percent) in this sample; 22 vehicles (95 percent) were failed because of brakes and the other vehicle failed for tires. This shop had a focus area where their mechanics paid particular attention to brakes and did not show leniency toward vehicles that were borderline cases.

As these two examples show, there can be inconsistency in the way safety inspections are administered. Currently, the Highway Patrol is not well-equipped to spot these inconsistent test stations because they don't have the safety inspections in a computerized data system. All of the safety inspection records and reports are handwritten by the station and then filed away by the Highway Patrol. A computerized system would enable the Highway Patrol to analyze monthly reports and highlight stations that produce results that are inconsistent with the norm. Without a computerized system these types of reports would be extremely time consuming and laborious because there are simply too many stations to keep track of. Salt Lake County alone has close to 500 licensed inspection stations.

Finally, some inspection shops may do visual pre-screening of vehicles to let the owners know if there are safety defects that will cause the vehicle to fail. If the windshield is cracked or tinted too dark, or if the reflectors or lens coverings on the lights are broken, or if tires are bald, these are obvious defects that will not pass the safety inspection. Some shop owners tell the vehicle owner to get the repairs done before they have the inspection. Otherwise they will fail the vehicle and the repairs will have to be done anyway.

Emission Failure Rates for Newer Vehicles Are Low

Overall, the emissions failure rate for newer vehicles is low. The failure rate varies from one county to another because each county sets their own standards and testing procedures. The state, however, is generally in attainment with the EPA air quality standards. In fact, emissions testing of the newer vehicles might be paired back without significant harm to the air quality.

Emissions testing of all passenger vehicles is required annually in four counties along the Wasatch front. These urbanized, heavily populated counties are required by the EPA to have an air quality implementation plan which governs and regulates emissions from automobiles and industry. Each county may define their own testing procedures for vehicle emissions as long as the air quality stays within attainment levels agreed upon by the state and the EPA. Because each county has different testing procedures and because they may

monitor different pollutants in the air, each county may have different rates of failure for the emission testing. In Salt Lake County, for example, the overall failure rate for vehicles tested during the last year was 6.76 percent. However, in Utah County where the standards and testing procedures are different, the overall failure rate was 11.9 percent. We didn't have complete data for Davis and Weber counties but they each have their own standards and testing procedures and their emissions failure rates will differ accordingly.

Emissions Testing Varies by County

In Salt Lake County, during the past year, 639,000 vehicles were tested for emissions. The overall failure rate for these vehicles was over 6.76 percent. Narrowing the analysis to vehicles that are less than five years old, the percentage of failures drops considerably. There were 217,700 vehicles tested during the year that were less than 5 years old. The failure rate for these vehicles was only 1.4 percent. In Utah County, the failure rate for vehicles less than 5 years old was 2.3 percent. The emissions test failure rate for these newer vehicles in Davis county was 0.14 percent. The emissions failure rates for the three counties that provided us with data are shown in Figure 6.

Figure 6. Emission Failure Rates for Newer Vehicles. Failure rates vary by county because of differences in testing procedures and in air quality standards.

Emission Failure Rates Per 100 Vehicles Tested by County* for the year 2000			
Model Year	**Salt Lake County**	**Utah County**	**Davis County**
2000	0.53	1.16	0.00
1999	0.91	1.00	0.00
1998	1.17	1.61	0.05
1997	1.51	2.57	0.17
1996	2.25	4.01	0.33
Average	**1.39**	**2.28**	**0.14**

** Differences in failure rates is due to different testing procedures and standards.*

Some of the difference in county failure rates is in part, due to variances in county air standards and testing procedures. For example, in Salt Lake County the test stations use a dynamometer which measures emissions from the vehicles while standing still and while

moving at a given speed. This test is a more accurate indicator of what the vehicle is actually emitting under driving conditions. In Utah, Weber, and Davis counties the shops use a static test while the vehicle is stationary with the engine running. The procedure is to attach a probe to the exhaust pipe to directly measure exhaust pollutants emitted in the vehicle's exhaust. This test does not replicate actual driving conditions and it does not pick up different levels of emissions while the engine and transmission are under different operating loads.

Emission Testing for Newer Vehicles Could Be Reduced

Annual emission testing is required because that is what was agreed upon by the four counties and the state for their air quality State Implementation Plan (SIP). Some sources have said that the air quality probably would not suffer if emissions testing were conducted every other year on newer vehicles. The newer vehicles, in particular, are cleaner burning because, since 1996 automobile manufacturers have installed on-board diagnostics (OBD) that tell the driver when something is wrong with the systems and when to replace things that contribute to increased emissions such as spark plugs and filters. This improved diagnostic system, combined with better engine designs, is why newer vehicles have low failure rates. It appears probable that air quality would stay within the attainment levels set forth in the SIP if newer vehicle testing were conducted biennially. Any changes to the testing procedures or standards would require amendments to the SIP.

However, the emissions testing programs of Utah, Weber and Davis counties would be significantly affected by reduced testing, because their revenues are collected from testing fees. These counties collect about $2.25 per test that is used to run their tech centers and contribute to the emissions programs. Salt Lake County collects their fees for the program from a $3 anti-pollution control (APC) fee assessed to every vehicle registered in the county, so their program would not be affected by a reduction in testing. There is some concern, however, that private safety and emissions tests center owners may not survive if either safety or emissions testing were eliminated or reduced.

Not withstanding the minimal effects on air quality, there are other concerns with changing to biennial emission testing. Salt Lake County, for example, has contractual obligations that were based on specific test volumes. A reduction in testing of newer vehicles would result in test station owners losing nearly 17 percent of their emission testing revenues. Because of these contractual obligations, Salt Lake County recommends that if a change does occur, it should not occur until after April 1, 2003.

Consumers might also be affected by moving to biennial emission testing. Current law provides that if a vehicle fails an emissions inspection during the first two years of operation

or 24,000 miles, the manufacturer is responsible for repairing the vehicle. Under a biennial emission testing plan, any problems with the vehicle's emission equipment may not be found during the two-year warranty period.

In summary, elimination of safety inspections has been done in a number of other states but at a possible cost of greater accidents. Elimination of only newer vehicle testing demonstrates a less risky alternative but does not address 2 to 3 year old vehicle needs for standard wear items such as brakes and tires. Total elimination of emission testing is not possible but a reduction in testing for vehicles that are less than 5 years old does appear feasible and should have no significant effects on the state's air quality.

We hope this report identifies the information you desired. If you have further questions concerning this information, please feel free to call me or call Paul Hicken at 538-1033, extension 119.

Sincerely,

Wayne L. Welsh, CPA
Auditor General

WLW:PAH/lm