

Critique of the LAO Report

“HOV Lanes in California -- Are They Achieving Their Goals”

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The California Legislative Analyst's Office has prepared this survey report in support of the consideration of several HOV Lane bills before the legislature this year.

As a factual survey, the report is an excellent and useful document. With regard to the pro and con arguments, however, it treads a difficult line between reporting and editorializing. While agreeing generally with the major factual findings and recommendations of the report, we find it misleading in its generally uncritical acceptance and thereby implicit endorsement of a number of classical HOV lane fallacies as follows.

Page 3,4 Goal of HOV lanes

The legitimate fundamental goals of HOV lanes are,

to reduce congestion and improve air quality,
exactly as stated by LAO. The Caltrans defined goals on pages 3 and 4 however, are not goals. They are sometimes, but not always means to the end of the above goals. By incorporating the *rationale* of HOV lanes in those goals, they confuse goals and means and commit the logical error of “begging the question”.

Page 6. HOV Lanes Used by Urban Areas L

Due to state and federal air quality regulations, the state is severely limited in its ability to add capacity to the highway system . This is because adding capacity to the state highway system is likely to result in additional VMT thereby adding to vehicular emissions L

Adding capacity to the system will indeed increase VMT. At the same time, however, it reduces congestion and improves speed of travel, thereby reducing emissions per mile (as acknowledged later on p.17 of the report). In my experience, the reduction of emissions per mile is commonly about twice that due to increase of VMT, resulting in a net *reduction* of emissions. Almost any traffic planning model study will confirm this result.

Page 7 .. Empty Lane Syndrome

Any comprehensive analysis of HOV lane performance must take “emptiness” into account. The historical use of the term “syndrome” in this context has been as a pejorative term meant to imply a certain mental aberration on the part of those concerned about it. The adoption of the pejorative is not in keeping with the otherwise reasonably balanced tone of the report.

In extreme cases (less than about 700 vph peak), emptiness and its associated adverse effects become blatantly obvious to all observers and something may be done about it, as in New Jersey. But even when not obvious, underutilization is always an adverse factor that must be taken into account in any comprehensive analysis of overall effectiveness. To ignore it as is commonly done is a much more serious error than to ignore the effect of benefit carpooling induced by the lane.

“The potential consequences (of converting the HOV lanes to mixed flow) has generated concerns that this would)

- *Cause many carpoolers to revert to SOVs*

a few certainly, but very, very few, see later comments

- *Attract new vehicles to the corridor as a result of the additional capacity*

Of course. This is the point of any capacity addition, to attract travelers using more congested facilities to less congested ones. If we built new capacity and no-one came to use it *that* would be a real cause for concern.

It is particularly ironic that this would be viewed as a “concern” in view of the fact that supporters invariably quote growth of vehicle traffic in the HOV lane as an indicator of its success (p.14)

- *Cause all freeway lane to be congested*

Conversion to all GP would increase congestion for the HOVs and decrease it for the much larger number of SOVs. If and only if that result is a net reduction of overall congestion, the lane should be operated mixed flow.

None of these are in any meaningful sense problems or legitimate “concerns”.

Page 7. Criticism of HOV lanes

In its summary of criticisms, the Report mentions only one, “The Empty Lane Syndrome”. By itself, this is probably the weakest argument against HOV lanes and arguably invalid, on the same basis as is the “more persons in the lane” proponent argument, namely half-truth, looking at only one, selected side of the whole picture; incomplete analysis.

The most compelling, and in fact –only—whole truth argument for or against HOV is in the results of comprehensive traffic modeling studies. See, “Best Evidence on HOV Lane Effectiveness” at <http://home/earthlink.net>. Those comprehensive analysis results appear almost unanimously to say that the mixed-flow operation is significantly more effective than HOV in every congestion and air quality measure.

Page 10. Measuring Performance of HOV lanes

With respect to reducing congestion, HOV lane performance can be evaluated based on 1) usage of the lanes, and 2) impact on carpooling.

This loses sight of the fundamental goals set forth at the outset. Even complete information on lane usage and carpooling, if it were available (it is not), that information cannot be translated into congestion and air quality, as the report itself admits on page 16. HOV simulations have shown repeatedly cases where there is some expected increase in carpooling and increase in person usage-of the lanes, and yet overall congestion and air

quality is made worse by the adverse effects of the HOV lane on SOV lanes performance. Those measures are simply irrelevant to the fundamental goals.

We estimate that the state's HOV lanes carry an average of about 2,518 person per hour during peak hours. This is substantially more than the number carried by a congested mixed-flow lane between 1,368 and 1938 person per hour.

This widely used statement is intended to imply that therefore the freeway as whole is carrying more than it would as a mixed-flow freeway. That's wrong and terribly misleading. As a result of the HOV/SOV traffic diversions due to the HOV lane, two things happen: 1) The HOV lane is carrying *more* persons in *fewer* cars, and 2) the SOV lanes are carrying *fewer* persons in *more* cars. All this happens and can be fully explained solely on the basis of preexisting, "ambient" carpools, without any new carpools being formed and has nothing to do with new, "benefit" carpool formation.

The *net* effect on congestion and air quality depends on the *difference* of the beneficial effects on the HOV lanes and the adverse effects on the SOV lanes and there is no way to infer that from the above information.

Page . 12. On average, only Two Thirds of HOV lanes (Vehicle) Capacity is Used.

Actually, this is in peak hour. On a day round basis the number is considerably smaller 40-50%. And this bears directly on the previous comment on person throughput for the following reason. Person throughput is related *exactly* to vehicle throughput by:

$$(\text{overall person throughput}) = (\text{overall AVO}) \times (\text{overall vehicle throughput})$$

So far, nothing has been said or implied about any increase of carpooling or AVO. All of the observed, quoted person and vehicle throughput numbers are compatible with, and can be fully explained under the hypothesis that there has been no change in carpooling or overall AVO. And if overall AVO is unchanged, then by the above equation, person throughput is affected in exactly the same ratio as vehicle throughput. Thus if overall average vehicle throughput has been reduced by one-third of a lane, then

so also has overall person throughput been reduced by one-third of a lane.

Page 15 Statewide Impact of HOV lanes on Ridesharing is Difficult to Determine

One way to determine the impact of carpooling is to conduct surveys of drivers L In 1999 the (RIDES) survey found that L 64 percent (of carpoolers) said they would discontinue carpooling if the lanes were eliminated.

A credible survey must anticipate and correct for possible bias in answers. This was not done.

Suppose you had been carpooling for 10 years. The city establishes an HOV lane that offered you time and congestion savings. Then they send out a survey asking "Would you discontinue carpooling if the lane were eliminated?". It would be pretty naïve to expect honest answers to such a survey.

In Sept. 1988 an OCTA survey of this type found that:

- 43% of carpoolers had been carpooling before the HOVL was established, and

- 95% of the carpoolers cited the HOV lane as “the primary reason” for their carpooling.

in other words, at least 37% contradicted themselves.

Any such survey must support a heavy burden of proof that the results were not significantly biased by self interest on the part of the respondents. The quoted surveys have failed to do so.

Page 23. Congestion Relief from Conversion is Short Lived

L evidence suggests that this relief would be only temporary.1

No such evidence is presented. The theoretical argument that follows is only half correct — the HOV favorable half. The full argument is as follows:

When an HOV is converted to Mixed-Flow there are two components of congestion relief

- 1) That due to the almost immediately more favorable traffic redistribution, and
- 2) that due to HOV “benefit” carpooling which ultimately in say 30 months time will disappear.

So the ultimate relief depends on the relative size of the traffic redistribution effect and the benefit carpooling effect.

By the best estimates of comprehensive traffic models on this issue, in typical cases. benefit carpooling is only 5 to 10% of the traffic redistribution effect.

To our knowledge, there has never been any actual measurement of the “benefit carpooling” effect, much less that it ever exceeded or even approached the magnitude of the traffic redistribution distribution effect.

Page 24 CONCLUSION

We concur with these general conclusions.