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Bottom Line: HOT Lanes Aren't All They're Cooked Up To Be

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April 2009—High Occupancy Toll Lanes (HOT) lanes, Express Toll Lanes (ETL), and other forms of managed lanes seem to be all the rage on the urban transportation front these days. Since the successful deployment of the landmark SR 91 Express Lanes in late 1995, about a dozen similar projects have been placed in operation or are now under development.

Contrary to common opinion, only one of them, SR 91, is self-financing. The rest were either operational conversions of previously constructed HOV lanes or required considerable public funding to cover capital costs. The largest HOT lane project in the U.S., on I-495 in Virginia, required a large, one-time infusion of state capital to fund construction, but is designed to fully support its private debt repayment and its operating/replacement cost over the concession period.

SR 91 was initially developed as a purely private enterprise, the first project completed under California's early 90's legislation AB680. (It was sold to the Orange County Transportation Agency to deal with issues related to competitive transportation improvements.) It proved to be an incredibly important demonstration of the potential for pricing only "new capacity", and the ability to manage demand through variable tolling.

It also proved to be highly financially successful, reaching peak annual revenue of close to \$40 million before experiencing a revenue decline last year with the downturn in travel caused by high gas prices and the growing recession. Not bad for a 10-mile project that cost less than \$125 million to build.

So, does the financial success of SR 91 and the popularity of the concept suggest these projects are all “cash cows”? Not exactly. They can be. But it all depends on a number of factors, the most notable of which involve public policy decisions on how the facility is operated.

In practice, of the eight managed lane projects now in operation, seven generate less than \$5 million per year in revenue. Most of the other projects were conversions of existing HOV lanes to HOT operation, such as I-15 in San Diego, I-394 in Minneapolis and I-25 in Denver. These projects generate much lower revenue, largely because much (or even most) of the vehicles using the lanes are toll-free carpools.

In general, all these projects are considered successful, and represent sound public policy. They all represent new choices for drivers, optimize the effective utilization of all capacity and are generally perceived as “win-win” for both users and non-users.

In essence all types of managed lanes preserve a portion of capacity that is free flowing, available for all drivers to use when they really need it. This is an important concept in an urban transportation future in which some believe it will be increasingly difficult to build out of congestion.

To better understand why some HOT/ETL lane projects generate big revenue numbers and some do not, it is useful to consider two important axioms of managed lanes:

- The financial “success” of managed lanes depends on the operational “failure” of the competing general purpose lanes; and
- There is a sensitive equilibrium balance between the managed and general purpose lanes, namely, as more traffic uses the toll lanes, less traffic uses the toll-free lanes, resulting in less congestion in the free lanes and less time savings in the toll lanes.

The latter axiom is extremely important but often overlooked in considering how best to operate managed lanes. The more vehicles there are that are allowed to use the lanes for free—unmanaged by pricing—the less the revenue potential will be. This is a function of both the limited managed lanes capacity available and the improved operating conditions in the competing lanes. Hence, policy decisions on who gets free access are the biggest determinant of revenue.

There are generally four “degrees of freedom” in HOT lanes:

- HOV-2+ (two or more occupants—typically 15-20% of total traffic); examples include I-15, SR 167, I-25 and I-394;
- HOV-3+ (three or more occupants—typically 3-5% of total traffic); SR 91 is operated this way, although HOV-3+ pays a reduced toll during some hours;
- Registered 3+ carpools and vanpools (perhaps 1-2% of total traffic); the I-95 Express UPA project in Miami is the first example of this.
- Express Toll Lanes, in which all users are required to pay.

The difference in revenue potential can be enormous, especially when HOV-2+ free vehicles consume the majority of capacity in the HOT lanes. While every project is unique, it would not be surprising that Express Toll Lanes would produce 3-5 times as much revenue as the same project in the same corridor operated as a HOT lane allowing vehicles with two or more occupants free usage. The mandated free inclusion of low-emission and hybrid vehicles adds further revenue risk. This will no doubt become a bigger issue as the future battle over greenhouse gas emissions heats up.

The policy goals of pricing strategies can also have a major impact on revenue potential. All managed lanes facilities use variable pricing which will “manage demand” to keep the lanes free flowing. But beyond this, pricing may be set to optimize the traffic distribution or maximize revenue potential. Policymakers may choose to set pricing to fill the managed lanes to levels just below capacity while still keeping free flow; this may reduce congestion in the adjacent free lanes somewhat. Revenue is typically maximized at rates which may not “fill the lanes”.

None of this suggests that HOT lanes cannot make money, if the right conditions and operation policy considerations exist. But even for the best projects, potential project sponsors should fully understand certain unique characteristics of managed lanes:

- Revenue in early years will likely be low, but revenue growth in managed lanes will likely far exceed traffic growth in the overall corridor;
- Revenue is very sensitive to small changes in corridor demand, including day-to-day fluctuations, incidents and weather;
- High revenue can be expected only during certain hours of the day; and
- Revenue growth potential is stronger than traditional toll roads, as toll rate increases beyond inflation are required to manage demand. ■