

PRICED MANAGED LANES: Q & A

Question: How are toll prices determined?

Answer: (Ken Buckeye) Our tolling facility is a fully dynamic price facility. We use computer software that reads the data coming from the sensors in the road telling us traffic volume and speed, and that information is fed into our software and an algorithm determines the price at the time. It's the density and the speed of the lane: as the density increases and the speed of the lane decreases the price goes up so consequently some of the potential users are priced out of the facility. Our price -- as I mentioned in the webinar -- can range from \$0.25 to \$8 anytime it is open.

(Debora Riviera): We do it very similarly to the way Ken just described. We are also dynamically pricing, the intent is to manage congestion through pricing. So obviously as the price goes up we hope to discourage more entry into the facility. We also are not revenue maximizing so our focus is primarily on density, lane occupancy, speeds, and also using the data collected through the detection system. We also use software so there are no people artificially manipulating the algorithms, so it's done purely to manage traffic flow in the lanes.

(Larry Cloyed) We are very similar to what Debora and Ken discussed. The performance metric: the standard of course is to guarantee minimum ride speeds and those guaranteed minimums are driven by the SAFETEA-LU and now the MAP-21 standards for speed and lanes. But other than very similar system, it uses a dynamic model, and our prices can run anywhere from \$0.50 to anywhere as high as \$18 depending on congestion.

Question: Why did your agencies view adding managed lanes preferable to adding capacity?

Answer: (Ken Buckeye) Obviously there are a number of reasons. MnPASS lanes provide better travel time reliability for our users, and also does a better job getting people through during peak periods than the general purpose lanes do. Also MnPASS lanes encourage transit use and use of higher occupancy vehicle use, because on our facility those users are free, they are not tolled. And then pricing, in terms of the long term sustainability of performance, pricing enables us to provide these congestion free conditions into the future just by the market pricing of the lanes. We know there's not enough money to continue to add lanes to our freeways to reduce congestion, and therefore we feel it's an imperative to provide the best return on investment for our highway investments and we believe that congestion priced lanes typically provide a better return on investment than general purpose lanes.

(Debora Riviera) Similar to Ken, and we have some similar underlying reasons. In addition to the fact that money is not unlimited, neither is right of way. 95 Express was born out of a need to provide additional capacity where there was no room for traditional widening. When you have no other alternative and you

need to stay within footprint, the strategies need to be very different. We learned a lot with 95 Express, which is why it was quickly applied to other facilities, we realized that we could support transit more effectively, we could incentivize transit usage, we could manage and further increase carpooling, and essentially provide for a more sustainable mobility option. But it's not always just that money is unlimited, sometimes you really are physically constrained, and in some locations widening is not an option, so it's not really a question of managed lanes or widening, it's managed lanes or nothing. At least for 95 Express, there was no room to widen, it was either convert or do some double decking, which was very costly.

(Larry Cloyd) Same for Virginia that Debora and Ken laid out, with a few additional items. We've been heavy in the P3s in terms of utilization of private funds as well as private loans. That preserves the state's bonding capacity obviously, and that's an important factor, but most practically it's simply the best means of managing peak capacity at the lowest possible cost, and additionally the use of the private sector funds is a means of providing needed monies to the state. We aren't collecting the gas tax any longer, and the message at least in Virginia and I'm sure in other states, seems to be a practical preference on the part of the customer to be more inclined to pay as you specifically need services as opposed to sharing the wealth across all communities and so the price managed lanes fit into several of those categories well.

Question: Are there any analyses or studies that are available that were used or could be used as a template to make the determination to move forward with cost managed lanes, for example a benefit-cost analysis?

Answer: (Debora Rivera) Yes, we did those analyses. Obviously you're doing your revenue study, that's one of the things that you move forward with. The cost difference, at least for us based on our experience with 95 Express, it was a relatively low cost project when you compare it to (if widening were even an option) interstate widening. There was that kind of analysis that was done to support the urban partnership agreement application, so I'm sure we have those things tucked away in project files.

(Ken Buckeye) We too had done analyses on our lanes, and we'd be glad to share performance reports that we have comparing general purpose lane performance with MnPASS lane performance. Performance evaluation is a very important part of the work we do, in that that's what we are able to share with the public, and we needed to win support that MnPASS congestion pricing was a good policy.

(Angela Jacobs) I just want to point that for the 6 UPA & COD projects there's a report that includes a lot of great data, which also includes a benefit and cost analysis. But that's a national evaluation of all of the 6 projects, which includes the Florida project I-95, the one Ken talked about in Minnesota, in addition to the LA metro project and several others as well.

Question: What proportion of vehicles travel free, and how do traffic models forecast that traffic?

Answer: (Ken Buckeye) Generally speaking, there's a range on the corridor of 10-25% of vehicles that are priced. So the majority of the vehicles travel free, which means they are high-occupancy carpool vehicles or transit vehicles. So a very high percentage of our users are travelling on the MnPASS lanes for free.

(Debora Rivera) Our numbers are very different, they're about the opposite. We are running somewhere in the neighborhood of 10-20% that are using the facility and not paying a toll, where the rest of the users are paying a toll. For us at least, because of the really high levels of congestion and the terrible operating conditions we had prior to the project, it's hard to influence how the lane operates unless you have a pretty significant number of users that are influenced by pricing. So we wanted to make sure that we didn't exceed a certain threshold for users of the facility that are unpriced. Our numbers are probably closer to between 10-20% of the users are using the facility without paying a toll.

(Larry Cloyd) The model numbers, these are your maximums that you worked towards, on the beltway were about 24% of the capacity to travel free, in the case of 95 that number was close to 35%. We're running close to those numbers on 95 currently, we are up in that range. On the beltway those numbers have been a little below the anticipated numbers, currently they are running about 9% but we are still in the ramp-up period for that roadway. Those are roughly the numbers we are dealing with today.

Question: What are the keys to getting commuters and the general public to buy in to HOT lanes?

Answer: (Debora Rivera) I don't want to say I was easy, because certainly it was not, but at least with 95 Express the fact that you had such oppressive levels of congestion and the fact that there were physical constraints to traditional widening, the local metropolitan planning organization didn't have a solution and had been asking us to look at the corridor for a long time. Primarily the big success story for us, I believe the urban partnership agreement made all the difference in the world: the facts that the grant required, we proposed in our application a very rapid turnaround, we had documents ready to go and the fact we were able to, in less than a year, get proof of concept on the ground so quickly, really helped sell the story. There was a lot of early effort done upfront with local elected officials, we got a lot of support, an urban partnership agreement. We spent a lot of time, money, and energy doing grassroots outreach before the project opened to traffic. Going to churches, going to PTAs, going to homeowners associations, there was a lot of work done there. It was really a grassroots effort.

(David Ungemah) What Debora mentioned in terms of the extent of grassroots outreach can't be undersold. The difference between price managed lanes and other types of capacity improvement projects is inherent in the nature of how the passengers will interact with the transportation system. You're paying a fee, or you're forming a carpool, or you're riding a bus. All these are activities that are very different from just getting into a vehicle and driving without consideration of those factors. So when we're asking individual drivers and travelers to make these kinds of choices, they are a very significant change from the way they interact today with other highway facilities. And that creates a lot of fear and a lot of anxiety. Addressing these fears and anxieties early in the planning process and continuing a very extensive amount of contact with the public and political stakeholders throughout the entire project development process will help mitigate these issues and enable a facility to launch with success as well as support from within those communities. I think these three panelists that are here today reflect that within their individual states, that their projects took years upon years of not only technical development, but also political and public development in a way that each of these projects can move forward with a confidence that a change in the next election wasn't going to necessarily undo their projects.

(Larry Cloyd) The only thing I would add is this: the kind of project you're envisioning will to some extent dictate the potential success of that program in regard to outreach to the communities. If you're converting an existing facility that hasn't been tolled in the past and placing a toll on it on a 24/7 basis, that's a tough sell in many cases. You've got to get out there in advance and convince people that the advantages of guaranteed rides and the advantages of the multimodal choice options and the

advantage that it could potentially provide to improvements in the general purpose lanes in terms of converting some of that traffic over. All of those are important benefits that are derived from that use of period managed lanes. For instance in the case of 95 we were using a reversal of an HOV system that had been in existence for some time. You've got to assess what it is you want to do, and determine what impact it will have on the public as they might perceive it, and what benefits you're actually giving them. You lay those things out with the business community, elected officials, and users, and Debora is right it's a major task but it's an important one, and you've got to go through that and get it done right in order to have those projects succeed.

(Ken Buckeye) I would add three things: preservation of the facility for transit is hugely important to the public, commitment on enforcement, and in terms of winning support the notion of price managed lanes as a choice seems to resonate with the public.

Question: Can you talk about the procurement process? In particular, were unsolicited proposals DBFOM by the original proposer?

Answer: (Larry Cloyd) Unsolicited proposals were most prevalent in initial project proposals. The trend on VDOT's part in recent years has been to shift to solicited proposals in the DBFOM format. In the case of the I-66 project, VDOT is prepared, should DBFOM proposals not be considered competitive, to construct the facilities directly.

Question: What was the impact of managed lanes projects on traffic congestion in general purpose lanes?

Answer: (Debora Rivera) For 95 Express, the impact of price-managed lanes combined with newly implemented ramp-metering on the general purpose lanes was significant and almost immediate. Operating speeds during peak periods in the general purpose lanes more than doubled with most of that improvement directly attributable to the express lanes.

(Larry Cloyd) The impact was positive. In the case of the Beltway, the Department additionally negotiated auxiliary lanes in some key points of congestion, also providing relief to general purpose lanes chokepoints. So credit must be given to both congestion pricing and additional capacity improvements in these locations.

(Ken Buckeye) In Minnesota we have studied the impact of managed lanes on adjacent general purpose lanes. There are a lot of factors that come into play, but generally speaking, they have improved congestion in the general purpose lanes. We price the lane to attempt to get optimal performance and throughput on the facility during the peak-hours. By doing that more traffic is drawn off the general purpose lanes, which frees up some additional capacity and thus may help reduce some congestion on those lanes.

Question: There are many success stories. Do you know of any that were not as successful, and what the lessons learned from these experiences were?

Answer: (Debora Rivera) While a project may be an overall success story, most if not all had setbacks in getting to the success. 95 Express' biggest lessons learned were related to delineator spacing, and construction activities outpacing communication. Other lessons might include avoiding a "hard" toll cap, and avoiding or controlling toll-exempt users.

(Ken Buckeye) In Minnesota we consider all of our MnPASS lanes to be successful and we are able, at this point in time, to continue to guarantee free flow on the managed lanes by giving free access to HOVs and by varying the toll price for SOVs. However, there are several managed lanes facilities that are congested due to the predominance of HOVs or allowing other exemption to low emission vehicles on those lanes. If the operational philosophy is to give priority to HOVs, and the facility is full of HOVs, it is hard to say that is a failure.

(Larry Cloyed) The Pocahontas Parkway in suburban Richmond was written off by the private operator and handed back to the banks, after suffering substantial losses. It was one of several projects across the nation that were planned and built in the late 90's, early 2000's, anticipating suburban growth that essentially collapsed in the subsequent recession.

Note: Pocahontas Parkway was a toll road and not a managed lanes facility.

Question: Ken Buckeye mentioned their decision to not provide free access to their priced managed lanes facilities to low emission and electric vehicles because of their potential to create difficulties in accurately pricing a facility. What is the practice of the other facilities regarding low emission vehicles and are there examples of where these vehicles have cause an issue?

Answer: (Debora Rivera) Because 95 Express was a conversion we were required by FHWA to allow previously "exempt" vehicles to remain exempt and this included motorcycles and low emission vehicles. The problem arises when these vehicles – unaffected by price – reach a critical mass where demand can no longer be adequately managed.

Question: Debora Rivera mentioned that FDOT has installed price managed lanes on some highway segments (e.g. The Sawgrass and the Turnpike extension) that were fairly low-congestion. Are you planning for future congestion there, or do you think there's some benefit to managed lanes in low-congestion contexts?

Answer: (Debora Rivera) I don't believe that I said we have installed price-managed lanes on the Sawgrass, and as for the lanes on the Turnpike, the conditions are most definitely not low-congestion (I drive it every day and have first-hand knowledge). The 595 facility did suffer from congestion prior to the re-construction, but much of the congestion along this corridor was resolved with the improvements to the general purpose facility. The use of price-managed lanes on 595 helps ensure the sustainability of the capacity. And while the demand for the express lanes on 595 is modest now, growth in the region is expected to increase the demand and result in steady increases in congestion as well. I do not personally believe that there are significant benefits to price-managed lanes in low-congestion contexts although "low-congestions" means different things in different markets. Ultimately the benefits and costs need to be analyzed through revenue studies and cost estimates, and each community needs to make decisions based on what makes sense to them and what they value.

(Ken Buckeye) Low-congestion facilities are not at the top of our list for MnPASS applications in Minnesota. With that said, however, our latest MnPASS facility, I-35E, when fully opened is not likely to experience the same level of demand as our I-35W and I-394 MnPASS facilities for years because some general purpose capacity was added when it was reconstructed. However, I-35E facility will be available for years to come and will be able to absorb more demand from traffic growth in the corridor while ensuring the free flow conditions for HOVs, transit and toll paying SOVs.

Question: Now that I-595 has opened, are there any regrets that it was done as an availability payment P3 rather than a full-blown DBFOM with traffic and revenue risk?

Answer: (Debora Rivera) The Department remains satisfied with the procurement method used. The availability payment model eliminated the private sector's revenue risk which we believe resulted in a better project price. The choice of this model was also useful in addressing concerns related to private-sector pricing motives. Risk should be assigned to the entity best able to manage it, and revenue risk was something the FDOT felt was most appropriate for the agency to assume.

Question: How are you planning on addressing connected and autonomous vehicles in HOT and express lanes?

Answer: (Ken Buckeye) This is an interesting question that no one has their arms around fully. We recognize that this must be addressed, but at the same time how much accommodation will be required if these vehicles are truly autonomous? These are questions that will be addressed in upcoming MnPASS planning analysis.

(Larry Cloyed) In Virginia, State and privately operated toll facilities are currently coordinating our efforts to address both technological and legal issues as they arise in development, testing, and implementation of connected (and ultimately autonomous) vehicles. The effort is a part of a larger effort statewide to "be ready" as these vehicles transition into service.

Question: Debora Rivera, why did you elect to go with an availability payment scheme?

Answer: (Debora Rivera) An availability payment model is one where the risk of revenue/toll projections is retained by the public sector, and where the payment stream to the concessionaire/private sector is based on the "availability" of the facility for its intended purpose – mobility and congestion reduction. This model can be effective if the entity retaining the risk feels comfortable with their ability to predict that risk, value it, and control it. Risks which are difficult to estimate or manage by the private sector, if assigned to the private sector nearly always result in higher costs. The availability payment model can also help with public concerns related to private sector motives in pricing.

Question: While State DOTs may not be looking to maximize revenue, private partners are looking for attractive investment return while minimizing risk. How were pricing strategies affected in efforts to balance the two interests?

Answer: (Debora Rivera) The availability payment model eliminates toll revenue risk for the private sector. This allows the private sector to focus on reducing costs through design, construction and maintenance innovation (within the limits of the performance standards and contract requirements) as the principal way of increasing return.

(Ken Buckeye) Minnesota's MnPASS managed lanes are not priced to maximize revenue, but rather to optimize performance by ensuring free flow conditions. Because transit and HOVs are free MnPASS is not well suited for a pure tolling scenario. As a result these facilities were constructed with partners that did not request an equity position in the project nor did they request any portion of the revenue stream.

(Larry Cloyed) Long and often difficult negotiations to determine the best balance of cost and risk each party will carry through the term of the agreements. May involve shared financing, supplemental payments, surplus revenue sharing, sharing operational and maintenance responsibilities, etc.

Question: How would you manage a situation where performance is dropping due to overuse and raising the toll rate is no longer an option due to a toll rate cap?

Answer: (Debora Rivera) First thing we did for 95 Express was to go back through rule-making to allow "administrative" stepped increases to the cap based on the facility's performance. Other tools might include reducing the number of non-paying customers – this could include the elimination of HOV, motorcycle, hybrid or other incentives being used on a particular facility. Another strategy might include additional access restrictions thus throttling the use of the facility.

(Ken Buckeye) That is a big challenge. In Minnesota's situation, we do not have a legislatively mandated toll rate cap, but there are practical limits on what the toll rate can be. One option that is still available for managing our MnPASS managed lanes is to increase the vehicle occupancy requirement from HOV2+ to HOV3+. That comes with a lot of political and public acceptance issues. Other options include adding capacity in the MnPASS lanes or general purpose lanes, using camera tolling/enforcement, or requiring HOVs to register.

(Larry Cloyed) Our priced managed lanes in NOVA have no toll rate cap. They utilize dynamic pricing methodologies to balance supply and demand. Therefore performance can be maintained in the HOT facilities, though depending on growth and demand, overall performance of the adjacent non-tolled facilities could decline.

Question: What percentage of vehicles are violators (e.g. no valid toll tag or misrepresenting themselves as HOVs)? How do you enforce HOV misrepresentations?

Answer: (Ken Buckeye) On our MnPASS lanes we have frequently done a surveys to gather information on violation rates. Our latest survey indicates a violation rates are in the 5-8 percent range of SOVs.

(Larry Cloyd) It's a difficult number to gauge accurately in NOVA, due to enforcement difficulties created by congestion, narrow shoulders, limited number of officers to enforce violations, etc. A violation must be observed by a trooper, a stop made, and a ticket written to validate an enforcement action. The state of technology for using automated readers that would read accurately while protecting individual privacy rights is advancing, but has not yet reached perfection. Our best guess numbers run somewhere between 20% and 50% on any given rush hour workday where restrictions are in force.