

KEY TOPICS

Estimation of Revenues from Use Charges, Taxes, and Other Sources of Income

PRESENTATION

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Note: The full text of the resource paper prepared and circulated by Mr. Gillen in advance of the conference appears in the "Resource Papers" section of these proceedings.

Randall Eberts talked about what we should be doing. Randall Pozdena said how we should be evaluating our options among infrastructure alternatives. And now I am going to talk about how we pay for our choices.

The earlier discussions concerning capital stocks are also important to this discussion, because that is really what this revenue forecasting is about. Indeed, in the past decade, we have witnessed a dramatic shift from a supply-side world to a demand-side world, or at least a world in which one must recognize what the value of the demand side looks like. This is essential for revenue forecasting, as revenues are driven by demand for the product, which is, in this case, transportation infrastructure services.

If you look at highway finance you find that the majority of revenue (54 percent) comes from fuel taxes. About 24 percent of total highway revenue comes from registration fees. How difficult can it be to predict revenues and thus set expenditure targets? Can you not just

predict how much fuel and how many vehicle registrations are projected and arrive at some pretty good numbers? Why is this a problem?

My analysis of registration fee revenues nationwide revealed very little variability over time. But the story is very different when one considers individual states, and this is true for both registration fee and fuel tax revenues. Consider Louisiana. Between 1994 and 1995, both registration and fuel tax revenues went up about 1.7 percent. Between 1995 and 1996, they went up 27.6 percent. Between 1996 and 1997, they went down 18.5 percent. If you gear spending to anticipated revenues, you will take on some significant political and economic risk if your cutoff point keeps going up and down, year in and year out. I should note that Louisiana is not unique in these huge fluctuations; Montana, North Carolina, and Pennsylvania all display this same type of variability.

What is going on here? The vehicle miles traveled (VMT) cannot be changing all that much. The fuel efficiency of the fleet is not changing all that much. Can our measurements really be that bad? I think that there are really three questions that one should be asking:

- First, if the models are good, are the data bad?
- Second, if the data are all right, are the models bad?
- And third, what are we to do about other types of transportation-related revenues? States' reluctance to increase gasoline taxes is redirecting interest toward tolls and dedicated taxes. How we are going to integrate those new revenue streams into our forecasting models?

How does one go about looking at questions like these? Well, you might start out by looking at the formula for fuel tax revenues: revenues are simply the product of fuel price times quantity sold. The quantity sold is in turn a function of how far one drives and how fuel-efficient the vehicles are. So then the question becomes, how accurate are VMT measurements and how accurate are the fuel efficiency measurements of the vehicle stock?

When you look at input data, and particularly VMT measurements, they really are not all that good. Some states have permanent traffic detectors, but those detectors are generally in older areas of town and thus ignore newer, growing areas where there may, in fact, be more traffic. Also, these trip detectors don't tell you anything about the attributes of the trips, and, as we know from the preceding presentations, attributes matter.

As for models, those currently used to estimate travel patterns and fuel efficiency are relatively simple. They merely produce accounting identities and reflect nothing about behavioral patterns. So, you cannot understand how an increase in world fuel prices affects VMT, for example.

I conclude that we certainly need better measures of the relevant variables and more insightful modeling of the structural forms. We really must figure how things fit together and derive the reduced forms.

We also need some better econometric techniques. We appear to be in the midst of a shift away from needs studies and toward an emphasis on making optimal investments. This implies an analytic process that more closely resembles a private-sector mentality, and that in turn suggests a new approach to estimation.

In closing, I will list the research statements that appear in my paper:

- First, we need better estimates of VMT and particularly of the attributes of VMT. How long are the trips? Where are they taking place?

- Second, we need some sort of generic model that the states could adapt to their own particular circumstances.

- Third, we need some development of commercial VMT. To date, almost all work has focused on passenger trips, and almost none on commercial movements.

- Fourth and finally, we need a study that looks at new financing mechanisms and how they are integrated both institutionally and practically into the construction of revenue capital requirements.

[Note: Mr. Gillen's remarks led members of the audience into a general discussion concerning the differing time periods over which revenue forecasting can take place. Robert Martinez noted that revenue forecasting can be viewed in two ways: first, as a tool for projecting one's ability to meet cash-flow demands 1 or 2 years into the future; and second, as a tool for planning long-range capital investments. Mr. Martinez added that when serving as Virginia's secretary of transportation, he found that the state was quite capable of projecting short-term revenues for cash-flow purposes, but that the real problem came when one attempted to look significantly further into the future. Dennis Lebo of the Pennsylvania Department of Transportation and Samuel Bonasso of the West Virginia Department of Transportation agreed that short-term revenue projections within their states were quite reliable, but that accuracy in long-term projections was problematic. All three further agreed that although short-term forecasts of state-level revenues were quite reliable, federal funding levels from one year to the next were notoriously uncertain and represented one of the greatest challenges to state-level decision making.

[Mr. Gillen responded that in his view, revenue forecasts cannot look more than 3 to 5 years into the future with any level of accuracy. He added that even these 3- to 5-year forecasts tend to be questionable and demand improvements to causal models and a better understanding of behavioral relationships.]

WORKING GROUP FINDINGS

Christopher Mann of the Southeast Michigan Council of Governments led the discussions of the working group assigned to the issue of revenue forecasting. In contrast to the other groups, the group dealing with revenue forecasting elected to examine Questions 1 and 2 (key questions policy makers should be asking and the sufficiency of existing data and analytic tools) together. The group chose to do so be-

cause members felt that policy makers who rely on revenue forecasts for policy-making purposes ought to have an understanding of the foundation for those forecasts. In particular, the members of the group felt that policy makers need to know how robust the forecasting model and input data are. Policy makers also need to understand the risk of a forecast being off by 10 or 20 percent and the implications of that margin of error.

The specific findings of this working group follow.

Key Questions and Sufficiency of Data and Analytic Tools

- Current status: Who is doing what? What data are used and what are their limitations? What are the purpose and use of these data?
- Given that states and larger metropolitan planning organizations have different levels of expertise in revenue forecasting, how do we network with other states? How might we encourage information sharing and mentoring?
 - How accurate are the data currently being collected?
 - How is nonuser fee revenue—for example, receipts from local option taxes, tax increment financing districts, and other alternatives—forecast?
 - What do forecasters need to improve accuracy?
 - How will transportation and information collection technology affect our ability to forecast revenue?

Research Needs

- Development of an information base of current revenue forecasting efforts,
- Improvement of estimates of state-level VMT for passenger vehicles and commercial trucks,
- Development of a generic starting point model for forecasting state fuel tax revenue,
- Examination of the implications of alternative revenue instruments for highway financing,
- Examination of Bureau of Transportation Statistics products' role in improved revenue forecasting,
- Assessment of the impact of evolutionary vehicle and information technology on revenue forecasting, and
- Examination of the revenue gains and cost savings attributable to shifts in the point of fuel taxation.