of pay-as-you-go. Investment could be financed by borrowing, with future trust fund receipts hypothecated against payment of bond interest and principal. Many state highway budgets once operated on this basis. So the following remarks will not be directed toward trust funds in general, because trust funds in general have no particular relationship to the problem of discounting future costs and benefits. Instead, attention will be focussed on the special features of Federal funding of its contribution to the Interstate Highway System, via a combination of a trust fund and pay-as-you-go.

If the provision of highways had to respond to a growth in demand as rapid as that now facing airports, a pay-as-you-go type of trust fund would involve unusually *high* discount rates if it were the only source of investment. Conversely, a pay-as-you-go trust fund for a relatively mature industry would involve successive investments which could be justified only at lower and lower discount rates for future benefits. The essential problem with any trust fund, therefore, is that it simply extrapolates the past into the future.

This analysis cannot be applied directly to the Federal Highway Trust Fund, because the proceeds from this fund are used as a supplement to the larger funds already available to states and localities for the specific purpose of financing construction of the Interstate Highway System. Upon completion of this system, however, the incompatibility of a pay-as-you-go trust fund with the whole idea of appropriate rates of discount for future benefits will have to be faced.

5. Money prices and shadow prices; user charges and tolls

A benefit is a benefit, whether it is charged for or not. But the "benefit" numerator in benefit-cost calculations may assume very different values depending on the presence or absence of a specific charge for the service enjoyed. A "user charge" may also take the form of a specific charge for a specific service, in which case it might properly also be called a "toll"; or it may represent a general charge for the use of the service in general.

Neither the distinction between money prices and shadow prices nor the distinction between user charges and tolls is peculiar to charging for transportation. Moreover, neither distinction seems to have any direct relevance to the problem of a proper rate of discount for use in converting future into present values. But there are substantial indirect connections between these concepts and both transportation and discounting. The world of transportation not only involves a mixure of public and private enterprise. It also involves a jumble of real prices and shadow prices, of general user charges and specific tolls. To revert to the railroad illustration: if all railroads were publicly-owned, the case for charging rates only sufficient to cover operating costs would be better than for other forms of transport; for, as long as the rail system contains excess capacity, extra use does not entail the costs of additional investment. Elimination of all spreads between rates and operating costs would enlarge total benefits derived from the use of railroads as well as the problems of covering railroad financial charges. Conversely, the land and air space used by the most convenient large airport in a metropolitan area may be vastly preferable to those available anywhere else in the area; and expansion of the airport may be possible only with sharply-rising costs. In crowded metropolitan areas, even a public body might expect to earn large economic rent on its most favorably-situated facilities. In terms of the relationship of pricing, benefits, and investment policy, the combination of private ownership of excess capacity and public ownership of very scarce resources may produce results which are far from perfect.

Even if the type of ownership is matched against the presence or absence of excess capacity at zero prices, there remains the fact that what matters is not the appropriate or proper discount rate, as such, but the appropriate or proper net relationship of discounted benefits and costs expressed as present values. The benefits to be derived from use of a facility at a zero price will normally exceed those to be anticipated from future use at a positive price unless special problems on congestion are created as total use increases. Once congestion appears, the whole level and distribution of benefits will be affected by the use of specific tolls, to control use of facilities, on the one hand, or by the use of general user charges, on the other hand.

Chairman PROXMIRE. Thank you, Mr. Mackey.

Mr. Levine?