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INTRODUCTION

Users fees for highway systems in this country date back to the late seventeen hundreds when private companies constructed roads and charged tolls for the use of the roads.¹ The companies were franchised by the states they operated in. The first state to impose a user in the form of a motor fuel tax was Oregon which implemented the fee in 1919. By 1929 every state in the Union had a gasoline tax.² The federal government imposed a highway user tax with the enactment of the Federal Highway Act of 1956.³ This concept of user fees has evolved from a simple gallonage tax in the early nineteen hundreds to a sophisticated and rather complex system embracing the concept of cost responsibility. Thus, over the past hundred years the conceptual underpinnings of user fees have developed in this country and include:

- * Those who use the roads should pay for them.
- * Users should pay for the roads in proportion to the cost they occasion.
- * User fees should be used for the construction and maintenance of the roads.

¹D. Philip Locklin, **Economics of Transportation**, Seventh Edition, Homewood, Il. Richard D. Irwin, Inc. 1972. p. 103.

²Ibid, p. 623.

³Although there was a federal tax on motor fuel prior to 1956 it was in the nature of an excise tax rather than a user tax with the proceeds going into the general fund.

Although the concept of a user fee implies a single beneficiary, i.e., the user, this is not necessarily true in the case of highways. It is well established that non-users also benefit from the development of an integrated road and highway system. The term user fee can also lull one into the perception that such a concept is an objective one, which it is not. The basis of a user fee is rooted in the concept of equity which is highly subjective and furthermore the technical methods for determining user fees are at best controversial. One of the reasons for the most recent controversy regarding highway user fees is the decline in road revenue purchasing power due to inflation, gains in fuel efficiency, and other factors.

Rational for User Fees

There are several economic and practical reasons for developing highway user fees and most of them are interrelated. The most fundamental of these economic reasons for a user fee system revolves around the free market and price system and the allocation of scarce resources. If highways were financed from general fund sources they would become a free good. As is the case with most free goods the demand for them would exceed the willingness of users to pay for them thus resulting in transportation not worth its cost and a misallocation of resources. However, if user fees in the form of motor fuel taxes, sales tax on vehicles, tolls, etc. are applied a quasi-price system has been imposed. In theory with such a system the user will demand a highway system which equates the benefits he receives with the cost he incurs leading to a more appropriate allocation of resources. A second economic justification for user fees is that it provides a rational basis for modal choice by shippers and it provides equity between the rail and truck modes. If a highway system was provided to commercial trucking without any user fee their costs

would be artificially low. Trucking firms in such a situation would be subsidized relative to railroads which pay for the acquisition and maintenance of their right of way. Shippers would not have a price choice between modes which reflected the true cost of developing and maintaining the right of way for the respective modes thus leading to misallocation of resources.

A practical justification for user fees is that they lead to a higher quality road, bridge and highway infrastructure than if the same were financed from some non-user based tax system. It is likely that the users will demand a better highway system and will be willing to fund that system if they are paying for said system. However, if the system is funded by some form of general taxation the users would not have as much influence on the development of the system and the type and quality of the system.

User and Non-user Contribution

The concept of a user financed highway system is almost intuitively appropriate to members of a free market society and if not intuitive it is easily acceptable for many. Although federal highway expenditures are user financed that is not true of all levels of government. State and local governments do finance some construction and maintenance from tax revenue sources other than user fees. In 1977 non-users contributed to 24 percent of the total highway expenditures (Table 1).

The rationale for non-user financing of the highway system is based on the multipurpose nature of said system which provides a variety of functions which benefit non-users and users alike. The obvious reason for developing a road and highway system is vehicular transportation. Other purposes include:

- * military preparedness
- * means of access to land
- * social integration and community service
- * economic development

Although some of these purposes are interrelated with one another it is safe to say that some non-users benefit from the development of a highway system. One clear example is the unearned income attributed to increases in land prices as a result of the development of a highway system.

TABLE 1. 1977 NON-USER REVENUES FOR HIGHWAY PURPOSES COMPARED TO COST RESPONSIBILITIES AGGREGATED FOR ALL LEVELS OF GOVERNMENT				
	USER SHARE		NON-USER SHARE	
	(MILLIONS OF DOLLARS)			
	\$	(%)	\$	(%)
Revenues contributed, as adjusted for gross subsidies.	26,704	(76.0)	8,429	(24.0)
Cost responsibility, assuming property access costs are assigned to nonusers.	18,974	(61.3)	11,850	(38.7)
Cost responsibility, assuming property access costs are not assigned to nonusers.	28,399	(92.7)	2,245	(7.3)

SOURCE: Section 506 Study, Department of Transportation, Washington, D.C.

Allocation Methods

Methods of allocating user fees among classes of vehicles is a complex issue and it is not the objective procedure that some would claim. The controversy surrounding this issue and the volume of varying literature written on the subject is indicative of the subjective nature of allocating user fees.

Ideally from a free market perspective, user fees should be implemented on the basis of marginal cost pricing. Theoretically this would lead to the optimum allocation of resources. However, this is not possible for several reasons, of which one is that marginal cost pricing would lead to excess or insufficient revenues. In one case you would have general taxation taking place under the guise of user fees, the other case would lead to subsidization of users from other tax sources. Thus most methods of allocation have been justified on the basis of being equitable to all classes of vehicles. Two common approaches to equitable allocation of user fees has been to allocate them on the basis of "benefits received", or the "incremental cost" approach which allocates fees on the basis of costs incurred by vehicle class in providing the infrastructure. The incremental cost approach is the one accepted by the federal government and many states.

The initial problem that arises in allocating user fees on an incremental cost approach is that some of the costs are common to all classes of vehicles. In fact in the base period of a recent DOT study only 44 percent of the total costs were of an attributable nature with the remaining portion of the costs being residual (Table 2). Common costs include such items as right of way, basic road structure, lighting and signing, and ramps. Residual costs for bridges are also very high relative to other components of the system such as pavement. The selection of a method of distributing common costs among different classes of vehicles is very arbitrary. Some suggested methods include:

- * vehicle miles traveled
- * axle miles
- * ton miles

The age old economic problem of finding a logical and objective method of distributing common costs plagues the highway system as well as many others.

Distribution of attributable costs by defination should not be difficult, however this is not the case. There is much debate about the appropriateness of the various methods used to identify cost responsibility due to specific vehicle classes.

The method of incremental cost currently utilized by the federal government assigns costs to class of vehicle on the basis of required design criteria for new construction (Figures 1 and 2). This method correlates the vehicle size and weight with new construction costs.

One of the criticisms of this method, there are several, is that it is no longer appropriate because highway expenditures are shifting from new construction to maintenance and restoration of the existing system. The critics of the current system maintain that restoration and rehabilitation costs, which is largely repavement, are occasioned more by heavier axle loadings than the current incremental allocation system reflects.

The method of allocating user fees based on the concept of cost responsibility is to some degree also arbitrary and will only be as good as the state of the art of the methodologies for determing costs attributable to distinct vehicle classes. One can safely say that attributable costs are a function of:

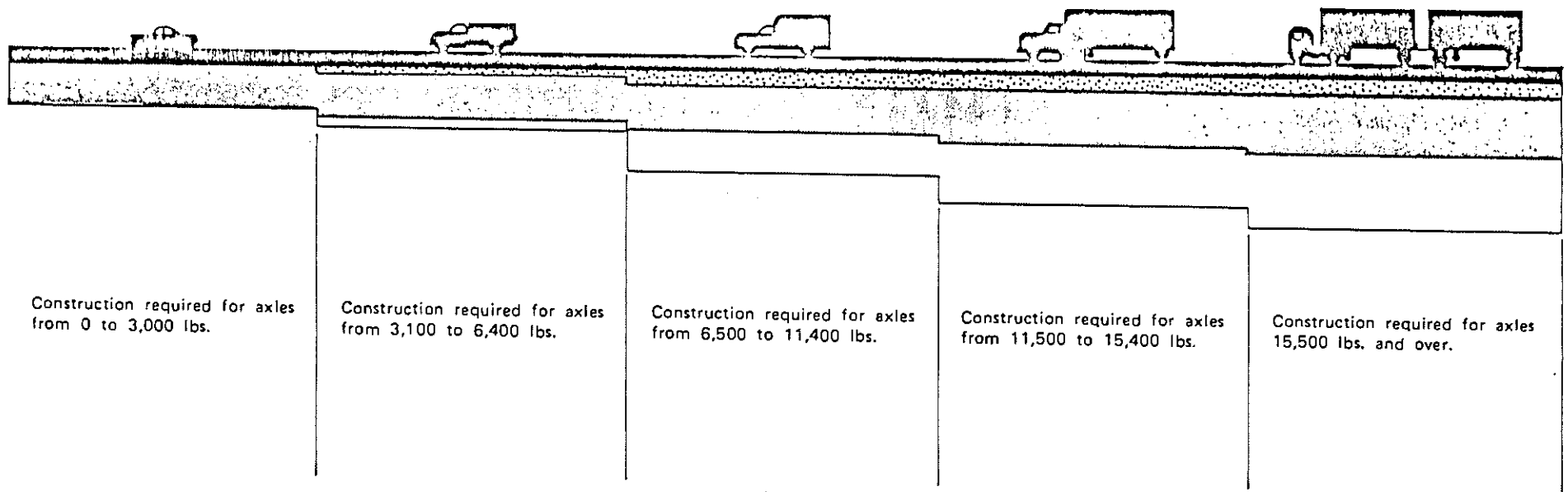
- * vehicle size
- * vehicle weight
- * traffic volume

TABLE 2. SHARES OF ATTRIBUTABLE AND RESIDUAL COSTS BY VEHICLE CLASS.

	BASE PERIOD		FORECAST PERIOD	
	PERCENT SHARE	PERCENT SHARE OF TOTAL COSTS	PERCENT SHARE	PERCENT SHARE OF TOTAL COSTS
SHARES OF ATTRIBUTABLE COSTS BY VEHICLE CLASS				
Autos/Motorcycles	21.5	9.5	16.8	8.9
Buses	2.4	1.1	2.1	1.1
Pickups/Vans	9.1	4.0	12.5	6.7
Other single unit trucks	11.9	5.3	11.7	6.2
Combination trucks	55.1	24.4	56.9	30.4
TOTAL	100.0%	44.3%	100.0%	53.3%
SHARES OF RESIDUAL COSTS BY VEHICLE CLASS				
	BASE PERIOD		FORECAST PERIOD	
	PERCENT SHARE	PERCENT SHARE OF TOTAL COSTS	PERCENT SHARE	PERCENT SHARE OF TOTAL COSTS
Autos/Motorcycles	74.1	41.3	67.1	31.3
Buses	0.4	0.2	0.3	0.2
Pickups/Vans	16.4	9.1	22.9	10.7
Other single unit trucks	3.8	2.1	3.6	1.7
Combination trucks	5.3	3.0	6.1	2.8
TOTAL	100.0%	55.7%	100.0%	46.7%
SHARES OF TOTAL FEDERAL CAPITAL COSTS BY VEHICLE CLASS				
	BASE PERIOD		FORECAST PERIOD	
Autos/Motorcycles	50.8		40.3	
Buses	1.3		1.3	
Pickups/Vans	13.1		17.3	
Other single unit trucks	7.4		7.9	
Combination trucks	27.4		33.2	
TOTAL	100.0%		100.0%	

SOURCE: Section 506 Study, Department of Transportation, Washington, D.C.

FIGURE 1
 INCREMENTAL METHOD OF DETERMINING SURFACING RESPONSIBILITY



CO

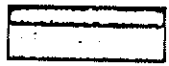
Construction required for axles from 0 to 3,000 lbs.

Construction required for axles from 3,100 to 6,400 lbs.

Construction required for axles from 6,500 to 11,400 lbs.

Construction required for axles from 11,500 to 15,400 lbs.

Construction required for axles 15,500 lbs. and over.



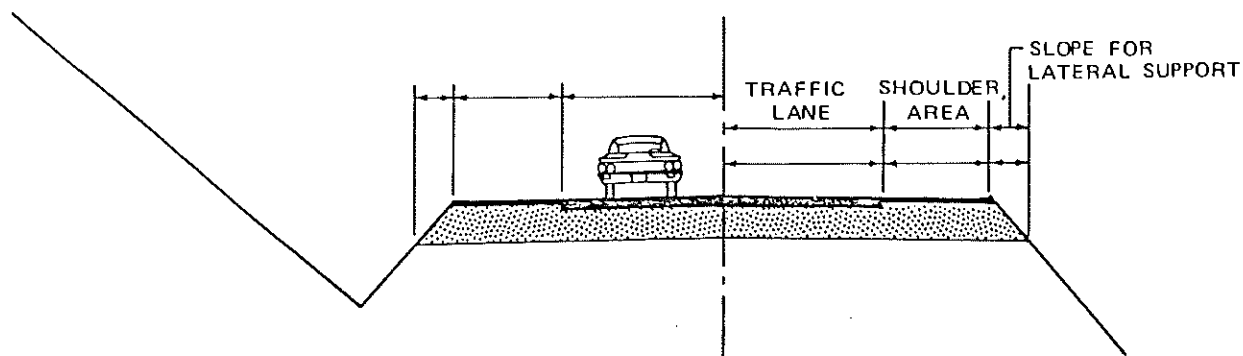
Indicates the construction required for the lightest axles considered. Cost to be shared by all vehicles in accordance with axle miles of travel.



Indicates the construction required for heavier axles. Cost of each increment to be shared by the vehicles with axle weights equal to or greater than the axle weights requiring it; in accordance with axle miles of travel.

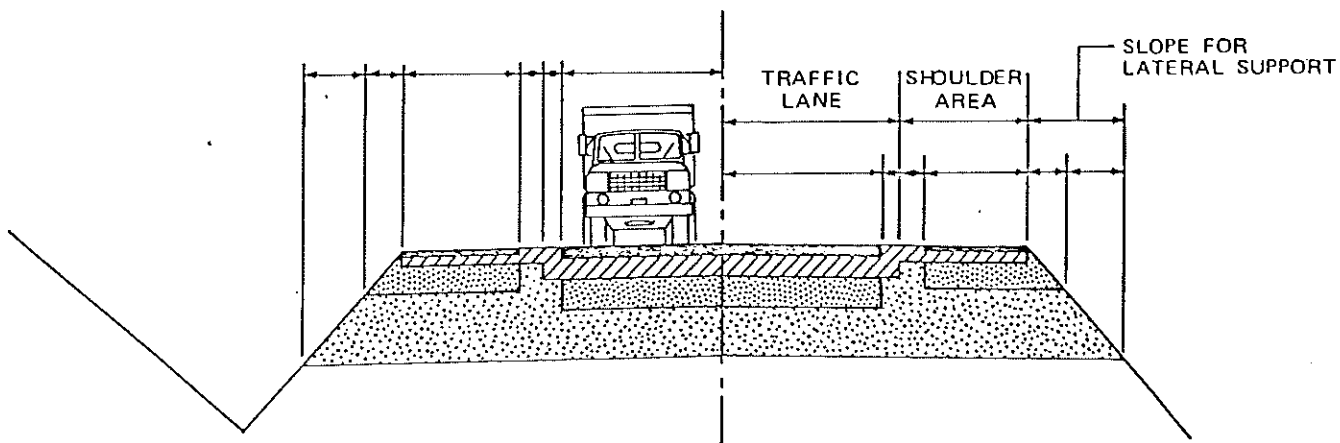
Source: Oregon Motor Vehicle Cost Responsibility Study 1980, Oregon Department of Transportation.

SURFACING RESPONSIBILITY



DESIGN REQUIRED FOR LIGHT VEHICLES ONLY

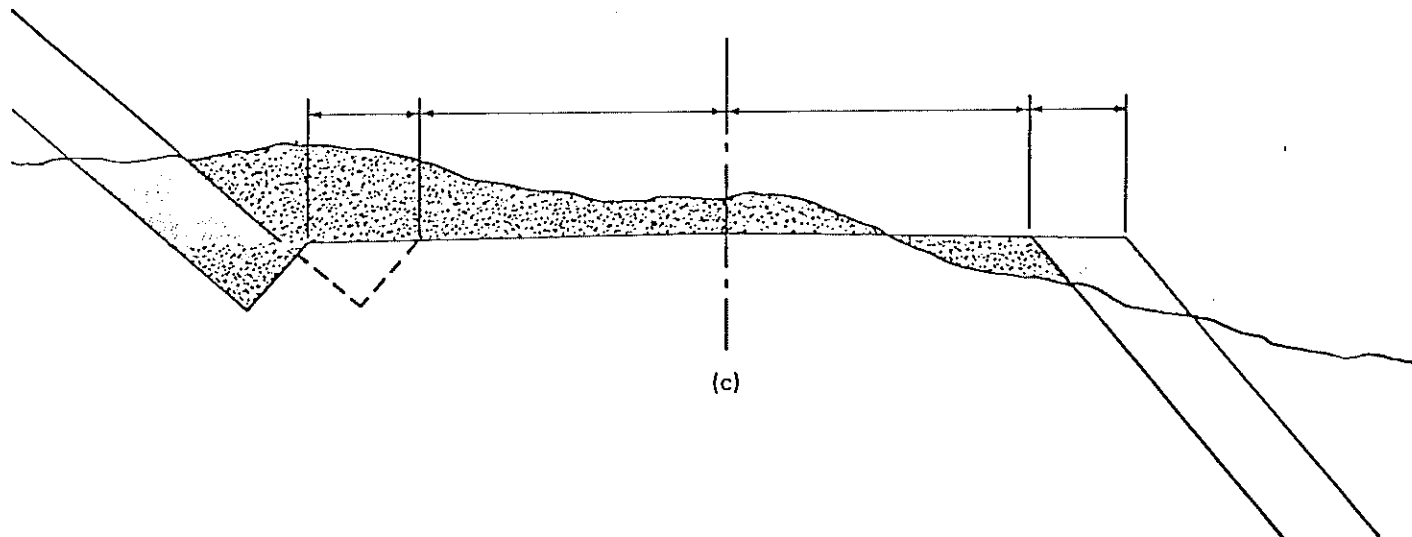
(a)



DESIGN REQUIRED FOR TRAFFIC INCLUDING HEAVY VEHICLES

(b)

GRADING RESPONSIBILITY



(c)

- | | | | | |
|---|--|--|--|---|
| — | | | | Responsibility of basic vehicle to be shared by all vehicles in accordance with distance travelled. |
| — | | | | Sole responsibility of heavy vehicles. |

DOT Section 506 Study

The U. S. Department of Transportation recently completed a study on the allocation of federal highway program costs among the vehicle class occasioning such costs and on more equitable alternatives in allocating fees. The conclusion of the report was that passenger vehicles pay their fair share of user fees but that lighter trucks subsidize heavier trucks (Table 3). The DOT has recommended substantial increases in heavy truck user fees.

TABLE 3. RATIOS OF USER CHARGES TO ALLOCATED COSTS BY VEHICLE CLASS UNDER CURRENT USER CHARGE STRUCTURE.		
	1977	1985
Autos	(1.1)	(1.0)
Large	1.2	1.2
Small	0.7	0.7
Motorcycles	0.5	0.6
Buses	(0.5)	(0)
Intercity	1.2	.2
Other	0.3	0
Pickups/vans	1.2	1.1
Total passenger vehicles	(1.1)	(1.0)
Other single unit trucks	(1.5)	(2.0)
Less than 26,000 GVW	1.3	1.7
Greater than 26,000 GVW	1.7	2.2
Combination trucks	(0.6)	(0.8)
Less than 50,000 GVW	0.8	1.2
50,000-70,000 GVW	0.9	1.3
70,000-75,000 GVW	0.6	0.8
Greater than 75,000 GVW	0.5	0.6
Total trucks	(0.8)	(1.0)
All vehicles	1.0	1.0

SOURCE: Section 506 Study, Department of Transportation, Washington, D.C.

Administration Proposal

The current administration has proposed some significant changes in highway user fees based on the Section 506 study which is as follows:

	EXISTING	PROPOSED
Fuel	4¢/gal.	9¢/gal.
Tires over 100 lbs.	\$.10/lb.	\$.25/lb.
Tread Rubber	\$.05/lb.	\$.25/lb.
Truck parts-vehicles over 33,000 lbs. (repeal tax for vehicles under 33,000 lbs.)	8%	
Truck excise for vehicles over 33,000 lbs. (repeal tax for vehicles under 33,000 lbs.)	10%	12%
Trucks, 70,000-80,000 lbs.	\$3/1000 lbs.	\$2,000 + \$19/100 lbs. above 10,000