TRANSPORTATION AND PUBLIC SECTOR POLICY IN YUGOSLAVIA

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I. INTRODUCTION

The debate on the efficiency of the Yugoslav system has neglected the »public sector«, defined loosely, in the western sense, as that group of activities which governments engage in — education, government, provision of roads and urban infrastructure, railroads (sometimes), and so on. An analysis of the Yugoslav public sector, as reflected in transportation activities, shows that it is precisely the application of the same organizational principles which have been thought to be conducive to inefficiency in the other sectors of the economy, that have promoted efficiency in this part of the public sector. Most important of these are the expansion to the greatest imaginable degree of the principle of enterprise self-reliance and commercial viability, and political decentralization.**)

We begin with a brief overall survey of the transport sector and the principal land modes, road and rail (these are quantitatively the most important and can provide a context to analyze the most difficult issues in transport economics). Here we consider some physical evidence of the efficiency of these modes. Next we review the evidence on the efficiency of model split, and pricing policies. Finally we consider the present methods of supplementary non-user contributions to the financing of the system.

II. OPERATION AND ORGANIZATION OF THE TRANSPORT SECTOR

II.1 OVERALL GROWTH

The structure of transport activity since 1939 is shown in Table 1. This reflects the officially designated common carrier (ODCC) sector only. Neglect of other activities is most important for road transport

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** Perhaps the best survey and analysis of the operation of the Yugoslav economy, is Branko Horvat, »Yugoslav Economic Policy in the Post-War Period: Problems, Ideas, Institutional Developments«, *American Economic Review, Supplement,* June, 1971.

where there is a very large own-account activity by production enterprises, (which is actually greater than the ODCC activity) as well as a large private (individual owner-operator) truck fleet, called »prives«, (which is really a common carrier activity, although it is not so classified). However, these activities showed more or less the same growth pattern, in the 1960's at any rate, so that the data of Table 1 may be taken as trully representative.

Table 1

Volume of Officially Designated Common Carrier Transport, Ton-Kilometers, Selected Years, and National Income

(1952 = 100)

	National Income (in 1966 prices	Total Transport	Rail-road	River	Air	Road
1939		78	60	167	16	43
1946		47	53	37	14	47
1952	100	100	100	100	100	100
1959	194	205	173	225	331	662
1964	284	309	228	421	1,425	1,796
1969	368	480	214	463	3,494	4.264
1970	391*	535	229	594	5,038	5,045

Source: Transport indexes — *Jugoslavija 1945—1964*, pp. 173—174 and *Statistički Godišnjak*, 1971, p. 187; National Income — *Stat. God.* 1971, p. 100.

* Preliminary.

The indexes in Table 1 reflect the growth of synthetic ton-kilometer units, not further defined in the source. As is evident, overall transport has been growing faster than national income since 1952, although railroad activity, which weights the index very heavily, has been growing a little slower. The fast growth of water transport modes since 1952 is probably explained in terms of their low levels in that year. This leaves road and air transport as the most rapidly growing activities, much more rapid than other modes, which suggests that much or most of the growth in transport was due to the different features of these newer technologies.

Total investment in transport as a share of total fixed investment in the economy in Yugoslavia averaged 17 percent. According to a recent study by Dražen Bejaković,*) it has been approximately equal to the average for 45 countries in widely different development stages (18 percent) and a little lower than the average of the two highest per capita income groups in the study. The poorest countries in the study devote higher shares to transport, and so do most of the richer countries. Ten socialist countries in the study, which with an average of 12 percent have the lowest relative transport investment (in all income ranges), pull down the study-wide average.

Although they cannot pretend to constitute grounds for a definitive assessment of overall transport investment, these comparisons, suggest that there is nothing radically out of line with this aspect of investment allocation.

II.2. RAILROAD OPERATIONS

The national railroads are divided into five rail transport enterprises, each responsible for operations in one republic, except for the Serbian enterprise which also oversees activities in Motenegro. Complaints are hard about various aspects of the operations, such as low demurrages, long interline turnaround time, poor equipment, etc. but answers to such problems are not always obvious. For example, higher demurrages might speed up turnaround time, if not immeditely, then after warehouse capacity are added. The higher demurrages themselves might be used to finance part of the warehouse investment. On the other hand, demurrages high enough to cover a large part of the warehousing cost might discourage enough traffic to make the warehousing unprofitable. No one knows all this at present, at least not with sufficient certainty to justify a large warehouse investment program out of central investment resources. It is safe to say that if the enterprises saw a competetive advantage in warehouse construction, with their present market orientation they would undertake it, (assuming an absence of price controls). In some other societies, the length of the turnaround time itself might be taken as an irrefutable need. In Yugoslavia, a sharper test must be passed.

Most physical productivity measures appear satisfactory, especially considering the antiquated state of much of the nation's rolling stock. This can be seen through comparisons of data contained in a 13-volume study of the Yugoslav transport sector published by the Institut Kirilo Savić in 1971. Some of the essential data on the performance of the major national railroad lines in Europe, taken from this study, are shown in Table 2.

Of all the nine lines, Yugoslavia has the lightest population density, i.e. sparser traffic market. This can be seen by comparing the ratios of line length to area, which for Yugoslavia is the lowest. With

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* Dražen Bejaković, »The Share of Transport and Communications in *Total Investment*«, *Journal of Transport Economics and Policy*, Sept. 1970, p. 338—9.

Table 2

Some performance indicators of nine major European railroad lines, 1967

	Yugoslavia	East Germany	Austria	Italy	France	Great Britain	Switzer-land	Poland	Romania
1. Inhabitants/Km²	78	233	87	174	91	226	147	102	81
2. Line/100 km² (kilo)	44.2	121.2	70.6	53.0	68.6	88.8	70.6	85.0	46.5
3. Population/kilometer (000)	1.8	1.9	1.2	3.5	1.3	2.5	2.1	1.2	1.8
4. Tractive Power/Kil. (hp)	175	572	380	442	347	—	879	—	—
5. Net Freight T-K/man (million)	1.1	1.3	1.0	.9	2.0	.5	.2	5.1	—
6. Pass.-Kil/man (million)	.8	.8	.7	1.6	.9	.7	.2	2.1	—
7. Loss per Kil (France = 100)	6	154	262	256	100	112	(1)	—	—

Source: Institut Kirilo Savić, *Optimalna struktura* ...., Vol. 7.

1,800 it occupies the fifth place in terms of population per kilometer of line. The network has relatively fewer inhabitants as potential traffic and each kilometer of line has a larger area to serve so that the scale economies arising in dense traffic are less available. Finally, its tractive force per kilometer of line is also lowest: it equals to from 46 percent of the Austria coefficient and to only 20 percent of that of Switzerland.

Since most of these countries — and all of those for which tractive power data are presented — are very mountainous, we can make performance comparisons, which might be unjustified in more heterogeneous conditions. Freight and passenger services output per man are shown in lines 5 and 6. The data derivation is not described in the Kirilo Savić report, so that biases may be introduced if, for example, the railroads engage in other activities as well. For example, the Yugoslav railroads are known to do so to a small extent (some tourism and trucking); other national railroads may engage more or less heavily and the figures may not reflect this. Leaving aside such potential distortions, Yugoslav output per man with its median value for passenger — kilometers, and its fourth place (out of eight, in freight appears quite respectable. It we consider only the six countries for which tractive power data are available, Yugoslavia ranks third in freight and is tied for third in passenger traffic. Since the country has the lowest tractive power per kilometer, not to mention its generally antiquated rolling stock, this seems a remarkable performance.

Table 3

Indexes of Average Earnings, 1964—1970, selected years

	1964	1966	1968	1970
Total economy	100	100	100	100
Economic sector	96	97	97	97
Industry	100	99	96	95
Construction	91	91	95	96
Transport and Communications	111	110	108	109
Rails	105	103	98	100
Motor Transport	112	110	108	110

Source: *Stat. God.*, 1971, page 268.

Moreover, the annual financial performance of the Yugoslav railroads in 1967 compares extremely well with that of the other six lines for which data are available (all except Poland and Romania). Thus,

except for Switzerland, which showed a small profit, its loss per kilometer of line (shown in line 7) was the smallest. It amounted to only 6 percent of the French loss, while the losses of some countries (Austria and Italy), ranged up to over 2.5 times the French loss, (which is to say, they were 40 times as high as the Yugoslav loss per kilometer). Even allowing for complexities and noncommensurabilities in the national accounting practices, this is a healthy showing.

Finally, we must explore the question whether this good financial performance may mask an exploitative income distribution wherein railroad labor is forced to subsidize other sectors of the economy, a contention that is encouraged by a comparison of wages in railroad to those in other parts of the transport sector. Table 3 shows various wage data for selected years since 1964. The comparisons are distorted somewhat since some railroad workers are included in other sectors, e.g. track maintenance workers who are reported in the civil construction sector. Apart from these workers — whose share in the total number is not insignificant —*) the raiload workers cannot claim to be badly paid. As Table 3 shows, their earnings have kept pace with the economy-wide average over the last eight years. They are lower than the transport and communications sector as a whole, but this sector includes the very highy paid air transport sector, the internationally conditioned maritime sector, and the motor transport sector, the disutility of whose work, involving extended stays on the road, is greater. On the other hand, since the lowest skilled workers tend to be in civil construction, the workers covered by the railroad data of Table 3 represent higher skills than those of the railroad sector as a whole. It is still possible, of course, that the present level, approximately equal to the economy-wide average, is appropriate, but even if a higher wage and continued rate controls were adopted, the ton-kilometer loss would still remain far lower than that of the other countries reported in Table 2.

Removal of price controls might permit higher earnings, if rail transport demand is sufficiently inelastic. Since much of the higher-value traffic has already been diverted to highway transport, cross elasticity of much of what is left is probably low. But it is a mistake to conclude that its own-elasticity is low — while e.g. coal might not switch, it might cease to move. Expenditures would also fall, but it would take a careful analysis to puzzle out all the ramifications.

II.3 MOTOR TRANSPORT

Motor transport is organizationally similar to the rest of the economy — enterprises, associations of enterprises, »prives« (one-truck operators), and own-account trucking activities by non-transport enterprises. Firms appear to be extremely quick to seize cost-reducing and

* The IKS study shows a railroad labor force of 137.4 thousand in 1967 (Vol. 11—7, p. 168), while the employment figure for the series underlying Table 2 appears to be 99.3 thousand, i.e. 28 percent less (*Stat. God.*, 1971, p. 86).

income increasing opportunities — they combine into associations to rationalize traffic flows and spread overhead, undertake own-account activities when advantageous (and thence go into common carrier activities), expand into other sectors such as hosterly and tourism, urban transport, and even manufacture of metal products. Some observers have complained that this diversification is inefficient, but it is an untenable criticism since activities like these — freight forwarding, trucking itself, hotelkeeping and tourism, small parts manufacture, etc. — are not marked by economies of scale. In addition, the existence of these organizational forms, the adaptability of truckers to changing situations, and the ability to seek new markets, all testify to an efficient motor transport sector.

Besides the organizational-behavioral evidence of efficiency, there are two other indication that motor transport is an efficient activity — anecdotal and statistical, with logical interpretations predicated thereon. The first includes observations on various aspects of the activities of the enterprises, such as: 1) the widespread use of the two-driver system in long-distance trucking; 2) a pass-along by the enterprise to the driver of fines for overloads beyond legal road limits; 3) the introduction (on the part of the motor vehicle producer) of (a) a system of incentives for maintenance-free long-term operation to encourage drivers to get better use out of their vehicles and, incidentally, (b) a testament to the quality of the vehicle; 4) consideration of the use of radios for urban bus control by one »conglomerate« trucking firm, and so on. All these manifestations indicate rationality, or at least provide a framework within which rational decisions trading off extra revenue against the risk of overload detection and fine, prolonged vehicle life and award vs. extra maintenance required to preclude major vehicle problems, and so on — can be made.

II.4 INTERMODAL SPLIT

Officially designated common carrier passenger and freight motor transport, and railroad activities, have grown as shown in Table 4. The ODCC freight by itself comprises only around 40 percent of the total, with own-account and prive activity accounting for the balance.

In general, truck transport has tended to attract the higher value traffic, although trucks also carry many low-value goods in areas which lack good rail connections, on shorter hauls, and in cases where the need for door-to-door delivery would, if freight were to move by rail, impose a relatively high additional cost. Although statistics are compiled only for ODCC transport, evidence available for the rest of the truck transport sector tends to confirm the analysis based on the ODCC data.

Table 5 presents some aggregative indicators of road and rail freight traffic patterns. These demonstrate that the two principal land modes tend to be used to their best advantage. The first five measures show clearly that rail tends to be used for long haul movements; twelve

Table 4

Rail and ODCC Motor Transport Activity 1958—1970 (Selected Years)

	Passenger Kilometers (billions)				Freight: Ton-Kilometers (billions)			
	Rail	Road (ODCC)	Total	Rail/Total (%)	Rail	Road (ODCC)	Total	Rail/Total (%)
1958	8.9	1.8	10.7	83	13.0	.6	13.6	96
1960	10.4	2.8	13.2	79	15.2	1.0	16.2	94
1965	12.8	6.0	18.8	68	18.0	3.0	21.0	86
1970	10.9	14.1	25.0	44	19.2	6.7	25.9	74

Source: *Saobraćaj i veze*, 1970, pp. 26, 108, 109.

of its commodity classes show an average haul greater than the overall road average haul, (compare it to the only one road average haul which exceeds the average haul of all rail traffic) (row I—4). Moreover, the commodities comprising the five homogeneous flows which are heaviest in terms of truck ton-kilometers account for only 28 percent of the total rail and road ton-kilometers of those commodities (row I-5); at the same time the leading five rail traffics, in terms of ton-kilometers, account for 83 percent of the total rail and road movement of these commodities, and show the tendency of rail to be used in long hauls and on dense flows.

The last three measures indicate density and value patterns. These again indicate rational modal split. Of the five lowest-value commodities,*) only one (»other mineral building materials«) accounts for more than five percent of road ton-kilometers, while three rail classes exceed this share; the corresponding numbers for simple tonnage are two and three respectively.

The fact, that truck transport has such a heavy flow on certain commodities (59 percent of the total rail and road tonnage on the five densest truck flows moves by truck) at first glance, seems to impugn the rationality which has been claimed for modal split. However, this heavy share is in large measure due to »other mineral building materials«, which account for 44 percent of total truck tonnage, but have an average haul of only 29 kilometers. The discrepancy can probably be explained by data about the distance from quarry to construction site or processing plant. Leaving this flow out of all calculations reduces the percentage in Item II.3 to 21. Moreover, these five commodity

* (1) Coal, (2) ores and concentrates, (3) non-metallic minerals and products, (4) firewood and cellulose and (5) other mineral building materials.

flows have average hauls ranging from 82% (coal) to 40% (cement) less than the corresponding rail hauls.

Trucking activity outside the ODCC sector tends to specialize in short-hauls. Thus, the average haul in this activity can be calculated from the annual transport yearbook as 18 kilometers in 1969. A large part of this is urban traffic, although no official estimates on geographical shares are known to exist.

Table 5

Some Measures of Rail and Road Freight Patterns in 1969*)

	Road	Rail
I. Measures of Trip Length		
1. A. L. H. (all commodities), kils.	98	252
2. Max ALH kils.	283	329
3. Min. ALH kils.	29	88
4. Number of commodity average hauls exceeding ALH of other mode	1	12
5. Relative *t-k* volume of five leading homogeneous commodity classes in mode as percentage of all rail and road shipment of these commodities	28%	83%
II. Measures of Density and Value		
Number of low value goods accounting for more than five percent of:		
1. Tonnage	2	3
2. Ton-kilometers	1	3
3. Relative tonnage volume of five leading homogoneous commodity classes in mode as percentage of all rail and road shipment of these commodities	59%	55%

Source: *Saobraćaj* i *Veze*, 1970, pp. 30, 113.

III. PRINCING OF LAND TRANSPORTATION

III.1 RAILROADS

On the whole, the Yugoslav railroad rate structure appears to follow sound commercial principles; it is oriented to considerations of both direct variable cost and reasonable value-of-service discrimination among freight and passenger classes.

The present freight structure has undergone large changes during the last decade. From 28 comomdity rate classes up to 1960, the number

has progressively been reduced to five in 1971. Individual commodity rate groups were given a better direct variable cost orientation, with a loading charge, a fixed line-haul component, and a constant incremental rate, as shown in Table 6. These changes accompanied the reforms of the sixties which placed increased emphasis on enterprise self-reliance.*)

Table 6

Characteristics of Commodity Class 5, Line-Haul Rate on Yugoslav Railways, 1971 Rate per ton for 20-ton load

Distance (Kilometers)	Rate (Dinars)	Average Rate Per Kilometer		Incremental Rate Per Kilometer*)	
		Dinars	Percent of Avg. Rate at 20 Kil.	Dinars*	Percent of Incremental Rate at 20 kil.
20	11	.55	100	.1	100
100	21	.21	.38	.1	100
200	33	.165	.30	.1	100
300	45	.15	.27	.1	100
500	69	.138	.25	.1	100
1,000	127	.127	.23	.1	100

* Incremental rate per ton-kilometer caloulated on the basis of 50-kilometer increments aimed at smoothing out discontinuities.

Source: *Tarifa za prevoz robe* Deo 6, (Spt 36), Belgrade, 1971.

Incremental rate policy may be one of the best insights into the reasonableness of the cost orientation of a railroad management, since distance-incremental costs are one of the few relationships about which something can be said with comparative certitude. This because: 1) they do not involve joint costs which are difficult to apportion; 2) direct incremental costs are linear; and 3) apart from certain commodity classes on certain distances which can be determined independently, and which would not be reflected in the incremental structure of the general class rates incremental distance is inappropriate as a basis for discrimination. The present Yugoslav incremental rate is constant, and must be considered as sound although it has not always been so. Prior to the last wave of reforms there was a sizable taper on many commodities.

In the last fifteen years, the spread between the highest and lowest freight classifications has fallen appreciably. Many high-valued goods are now shipped by truck, and the usefulness of special commo-

* See Horvat, op. cit., pp. 82—87.

dity distinctions as a tool for discrimination is eliminated. Thus the spread between highest and lowest commodity rates has fallen from 14 times, prior to 1960, to 8 times in 1965, and to 1.9 in the late 1960's. In the 1970 rates, this ratio fell to 1.69.

The passenger rate structure also appears to be efficiently conceived. Its main features can be summarized as follows:

i. Starting at five kilometers there is a constant incremental charge of .16 dinar per kilometer in the second class »passenger train« rate.

ii. First class is uniformly fifty percent higher.

iii. Round trips are priced at a 20 percent discount from two one-way trips.

iv. There is a series of discounts up to 75 percent for various social groups, through e.g. monthly worker or student discount cards.

v. Lump sum passenger surcharges are added for special trains, as follows:

fast (brzi)	10 dinars
business (poslovni)	20 dinars
express (ekspresni)	30 dinars

Some questions can — and probably should — be asked about some minor aspects of the railroad rate structures, such as the basis for the inter-enterprise rate cofficients for freight and the imposition of lump sum premium charges on passenger traffic. But on the whole, it seems reasonable.

III.2. MOTOR TRANSPORT

Although the data on motor transport rates are not sufficiently detailed, all indications are that these rates are well managed. Trucking enterprises remain in business, new enterprises enter the field, depreciation appears to be taken into account on a realistic basis (subject to quadrennial revaluations and some slippage), and, finally (as shown in Table 3), personal income in motor transport appears to be high.

But the important pricing feature to investigate in this sector is the pricing of what is provided publicly, i.e. the road investment and maintenance services. In the previous paper*) in this series, I have analyzed in detail the correnspondence between the Yugoslav pricing patterns and a set of normative pricing principles which called for segregation and pricing of joint components according to demand elasticity

*) Alan Abouchar, »Efficient Highway Finance and the Yugoslav User Charge Structure«, EAWM, 3—4, 1974.

and for pricing of directly variable components according to the indicator of use. This treatment recognizes, of course, that component classification varies from one country or region to another depending on local geological and climatic differences, presence of transport alternatives, and so on. For example, while generally speaking, the base is varied according to vehicle size expectations, in Slovenia, say, the base depth required to support the minimum good road will be greater than on the sea level plain. Similarly, the demand for incremental engineering designs for large truck specifications on the pavements will depend in part on how much of the preceding cost can be imputed to the users of these preceding stages.

Our study of Yugoslav road user charges concluded that the warranted user charge of the largest (20-ton capacity) truck in Yugoslavia fell short of the actual contribution by only 20 percent, somewhat more when taking account of the urban truck use. This warranted user charge included short-run variable components (like maintenance), a demand-elasticity charge for joint components of the new links on the existing network, and a size variable charge based on AASHO road deterioration coefficients for the annual pavement reconstruction and modernization. We were not able to make an urban use adjustment, and deduct from the acutal contribution a part to be credited to the urban economy, but this is probably less important here than on smaller vehicles. Most — but not all — smaller vehicle contributions were more than ample to allow for this item.

Again, too little has been done in highway economics to permit cross-country comparisons. The best statistical tabulations, with regard, at least, to administrative-functional revenue categories, have been assembled by the International Road Federation, but the statistics are not consistent with the variable cost-demand elasticity approach proposed above. This so because: 1) total revenue is compared to total expenditure; 2) total revenue includes sales taxes; 3) no attempt is made to consider the different user class elasticities for incremental engineering specifications, and so on. However, one component, the annual license fee structure, is comparable and in this Yugoslavia shows up as one of the best countries. Although somewhat incomplete, the IRF data show that out of seven countries (other than those treated more fully below) six have decreasing or constant fees, while only one shows a significant increase.*) This analysis can be taken much further on the strength of EEC data for seven conutries as reported by the Institut Kirilo Savić, and summarized in Table 7. Only GDR and Sweden have more sharply rising schedules, while the other four fall by as much as 30 percent, then rise a little.

*) Greece rises up to four tons, with a constant incremental rate thereafter; Great Britain rises by 2/3 between four and ten tons; Finland is constant with respect to capacity and West Germany is constant with respect to engine volume; Iceland has decreasing average fees, and so, apparently, does Norway, while Hungary exempts trucks entirely. (International Road Federation, *World Road Statistics*, 1965—69, Geneva, 1970, pp. 110—124.)

Table 7

Size-Registration Fee Relationship, Selected Countries

	(Fee as percent of 3-ton truck)						(fee per ton)
Truck Size (ton capacity)	Belgium	Holland	Italy	GDR	Switzer-land	Sweden	Yugos-lavia
3	100	100	100	100	100	100	100
5	78	64	104	103	71	100	112
8	54	45	82	84	62	73	120
10	70	66	90	135	55	125	126
20	70	74	118	172	—	200	150

From EEC data in IKS, *Opt. Strukt. Saob. Sist. Jug.* Vol. 13, 1971, p. 63.

IV. SUPPLEMENTARY FINANCING OF HIGHWAY DEVELOPMENT

Since we evaluated the user charges in terms of their directly imposed variable cost and in terms of the demand elasticities of different user classes, which, ultimately, reflect the vehicle and time savings from better roads, shortfalls we should expect between annual road sector revenue and annual expenditure. In this section we will first estimate the user contribution and then analyze the sources of revenues to cover the shortfalls.*)

IV.1. DETERMINATION OF USER CONTRIBUTIONS

We must first of all deal with some potential organizational perversities. Some observers have complained that the present procedures for maintenance and modernization tend to encourage overmaintenance rather than parallel construction of new roads. The districts are assigned to road maintenance enterprises for surveillance during a year at agreed upon, unit contract prices. The maintenance enterprises also do the modernization — resurfacing, including surface upgrading — and are free to bid upon larger jobs. Since, in the past, the republic shares of the road fuel tax *(naknada za puteve)* have been earmarked for maintenance, this system has been alleged to encourage overmaintenance.

*) Since the railroads have small deficits, and occasionally get small profit on operating account, the sources of their investment funds must also be analyzed. There appears to be some ambivalence, with many pressures growing for supporting new line projects out of public revenues, although even here the countervailing pressures tend to force local sources (up to republic level) to provide large parts, if not all, from the funds. New rolling stock and equipment are, in principle, to be built into the railroads' cost base, although the supporting loans generally are at low rates of 3—4 percent. This is a distortion, but, then, similar low interest loans have been made to other sectors which at the time were favoured by government policy.

It is very difficult to prove or disprove this assertion. (My attempts to do this during a recent trip underaken in the company of a West European engineer failed). But the alertness of republic supervisory engineering personnel, and the competitive spirit pervading the sector inspired confidence that if a maintenance enterprise did get out of line, sanctions would be imposed, are striking. This same competition seemed to be apparent in bidding for new projects by civil construction firms. Thus, on the strength of anecdotal evidence, one would be tempted to reject the allegation of perverse behavior arising in the present organizational structure.

To estimate the share of annual expenditure which originates in the road user charges and then examine the sources of the annual expenditure which is not covered by user contributions, we must first define user contributions.

There has been growing dispute in recent years about what constitutes a user charge, user associations, road administrations, and other interested groups maintaining that all taxes paid in excess of comparable taxes elsewhere should be construed as user charges. To start, this approach would include, the annual registration fees and the road fuel tax, paid on fuels, and then would add in the difference between sales or turnover taxes *(porez na promet)* that was or would be paid if the »ordinary« (18%) rates which are applied elsewhere were also levied on motor transport materials inputs, and differential import duties.

The most important of the taxed inputs is fuel. The relative structure of fuel prices is shown in Table 8.

Table 8

Relative Structure of Retail Fuel Prices 1971 (percent)

	Gasoline		Diesel Fuel
	86 octane	98 octane	
Producer's Price	28.3	30.2	43.4
Retail Margin	9.4	9.7	7.6
Turnover Tax	31.8	32.6	26.0
Fuel Road Surcharge	30.5	27.5	23.0
Retail Price	100.0	100.0	100.0

Source: *Jugoslovensko društvo za puteve* (Yugoslav Highway Association), *Predlog mreže magistralnih puteva Jugoslavije*, Belgrade, 1971, p. 40.

The turnover tax is evidently the largest single component. To assess the propriety of considering the differential portion of this tax as a fuel tax we must examine it more closely. This tax is applied almost exclusively on certain final consumption goods (the turnover tax on diesel fuel is the only exception, apart from incidental use of some »final produots« as intermediate inputs in production). The goods which are exempted from tax include »necessities of life« (food products, wood, coal, electric energy, and agricultural products), certain cultural goods (books), and certain goods whose exemption implies an income transfer to lower-income groups (artisinal work, agricultural products, and transport services). Intermediate products, except for diesel oil, are simply left out, or else a mechanism exists for granting rebates under petition (federal officials feel that there is no significant cheating).

Until 1972, the basic federal tax rate was 12.5 percent of retail price, less tax. Additional rates of 4.0 percent and 1.5 percent, respectively, were imposed by the communes and republics, making a total of 18 percent. (Under the new law (1972), all of the former federal tax will go to the republics, with further division yet to be decided.) Some goods are taxed more heavily; luxury goods have a progressive federal turnover tax rate, reaching 50—70 percent of retail price less tax (i.e. 32—40 percent of counter price). Cigarettes and alcohol are also taxed more heavily.

These considerations imply that the intent of the turnover tax is not to discourage consumption in favor of investment and preferential development of the capital goods sector, as in the Soviet Union where it has traditionally been levied at high rates even on »basic necessities.« As noted above, the tax is not levied on transport services directly, but it is imposed indirectly on diesel fuel and gasoline. Accordingly, it would appear that all automotive diesel turnover taxes, along with taxes on that gasoline consumption which can be thought of as an intermediate input, principally bus and truck gasoline consumption, should be considered as a user charge and allotted to the road economy.

High customs duties (50 percent) are imposed on passenger cars, and lower rates on buses (20—26 percent) and trucks (20—36 percent); it seems best to regard these as luxury taxes or foreign exchange shadow premia to support the developing motor vehicle industry.

For automobiles and private sector trucks, progressive turnover taxes are added to these duties, the rates being 18 percent, 26 percent, and 36 percent, respectively, on border prices (including duty) of less than 30,000 dinars, 30,000—50,000 dinars, and over 50,000 dinars. Imported spares are taxed similarly. Meanwhile, the lowest turnover tax rate (18 percent total) is applied on all passenger cars of domestic manufacture.* All this is consistent with present turnover tax policy.

* All customs duty and turnover tax information in this section from IKS *op. cit.*, vol. 8, pp. 185—6.

The other kind of specific fee is an international toll, collected at the border. Since Yugoslavia has many reciprocity arrangements with other European nations, these do not amount to very much. In 1969 they totalled 30.8 million dinars, 2.5 percent of road revenues. In addition, there are two toll roads i nYugoslavia; tolls imposed for superior facilites are acceptable.

Finally, there do not appear to be any implicit subsidies to higway users in petroleum and motor vehicle industry policies. Some price distortions may arise in the pyramiding of import duties on some vehicle components. This is probably not terribly important as a modal transport price distortion, although it may be an important factor in the competitive position of individual vehicle producers if practices are inconsistent.

IV. 2. CONTRIBUTION BY NON-USERS

IV. 2.1. Classification of Non-User Revenue Sources

For this discussion, »non-user« will mean an organization whose payment to the road sector is not roughy propartional to its annual tonmileage. Five non-user sources can be distinguished: the federation, the army, republics, communes and production enterprises. The share of total road contributions to I, II, and III class roads accounted for by each of these in 1969 is shown in Table 9. This information relates to revenues for the I, II, III class road organizations and exceeds recorded expenditures for these networks by about 20 percent (see below), possibly because of lags in contract awards or payments. It will be used as the basis for the following analysis of non-user contributions..

Table 9 presents the official administrative breakdown of revevenue sources and must be adjusted in consonance with the view of the turnover tax functions presented above and the urban-interurban use patterns.

i. Federation and Army

The army share, which amounts to less than two percent of total revenue, is beyond the bounds of the present inquiry. The federal contribution went to Bosnia-Herzegovina, Montenegro, Serbia Proper, and Kosovo. Thus it went to four of the poorest five national sub-units in the country, only Macedonia receiving nothing. In these sub-units the federal contribution comprises a share varying from four to 60 percent of the total I—III class road revenue. Thus, the federal grant appears to be an income redistribution mechanism. But it may be redundant or inconsistent with the principles underlying the Fund for Underdeveloped Regions (see below) which is itself designed for just such purposes, and which can compare all specific forms of income distribution objective within poor regions.

Table 9

Total National Road Organization Revenues by Source, 1969

(I, II, III roads)

Source of Revenue	Dinars (millions)		Percent of Total
1.Federation	210.1		8.7
2. Yugoslav National Army	42.7		1.8
3. Fund for U. D. Regions	28.0		1.2
4. Rep., Prov., and Regional Roads Funds	2,135.9		88.4
a. Petroleum Road Charges[a])		874.8	36.2
b. Motor Vehicle Fees (portion accruing to I, II, III)		145.3	6.0
c. Socio-Political Org.		460.4	19.0
c.1 Republics	of which	(191.3	7.9
c.2 Communes		(269.1	11.1
d. Foreign Mo. Veh. Taxes		30.8	1.3
e. Special Retail Taxes		52.9	2.2
f. Working Organizations		99.8	4.1
g. Loans		394.8	11.3
h. Other		76.1	3.1
5. Road Enterprises	negligible		
TOTAL	2,417.3		100

[a]) Naknada za puteve only.

NB: All percentages are expressed in relation to 2,417.3, therefore, should be placed in single column.

ii. Commune Subscriptions and Loans

The communes (cities and towns) participate in two ways in the road system. They construct and maintain fourth class roads, and they make supplementary subscriptions to republic road construction activities. The first activity is supported by the commune allocations as shown in Table 9. The supplementary road contributions are given by the communes to the republic, provincial, or regional road funds, and are supported by loans to the communes by commune members. The loans offer modest interest rates — about the same as bank deposits, which, have not kept pace with the rate of inflation. But citizens are

said to subscribe nonetheless because of what they see as their own self-interest. The commune contributions amounted to 11 percent of total national I, II, and III class road revenues in 1969. with contributions in individual sub-units ranging from zero in Vojvodina to twenty percent in Croatia.

Besides the commune subscriptions, there is also direct participation by production enterprises.

For a number of reasons, a policy of local financing is likely to be much more efficient than the republican or federal transfers. Though the rule necessary to maximize social benefits (provide any service up to the point where the last unit of consumption has a value equal to the social cost of providing that unit) is straightforward, when trying to implement such a policy, numerous problems arise. First of all, project makers cannot be relied upon to evaluate in terms of the same criteria all project alternatives in the economy. For example, triangular (consumer surplus) vs. rectangular (national income) measures may frequently be compared, not only between sectors, but even within sectors, e.g. in the case of road improvements vs. penetration roads. There is no guarantee that re-employment characteristics of labor are adequately reflected.

Moreover, even if they could be consistently evaluated, high administrative costs would be the result.

For, republic road agencies would have to be set up or expanded during construction and cut back within a year or two when, it turns out, that best projects are say in water resources. This implies high cost in terms of administration costs, excess equipment capacity and so on. The only way to avoid such costs would be to allot the highways some fixed share out of the general (federal or republic) budget for period of several years at a time or for a period of indefinite length to stabilize operations. But there could usually be no sound economic basis for such a decision — indeed, any sector-wide allocation like this would be inconsistent with the original intent of interregional transfers, which is to ensure that individual projects in whatever sector are not neglected because of inability to devise efficient price discrimination. These considerations would also militate against a nationwide earmarking, from fuel revenues or other sources, for road building.

iii. Republic Supplementary Contributions out of General Budget

The republic contributions accounted for over half of the national non-user contributions in 1969, and for shares varying from 18 to 58 percent in individual republics. The contributions were largest in the poorest republics and provinces (Bosnia-Herzegovina, Macedonia, and Kosovo).

In principle, the republic contributions must be presumed to be potentially less efficient than commune or enterprise contributions, since their effect may be to redistribute income sectorally or geograp-

hically in a way which is inconsistent with republic income distribution objectives and which may distort prices confronting users. For example, a large contribution out of general republic budget to coastal highway would require transfer of income from the interior of Croatia to the enterprises engaged in coast-related activities (e.g. hotel enterprises), and would distort prices and decision-making by enterprises elsewhere in Croatia and in other republics. An enterprise might now find transport costs in this region lower than elsewhere and build a plant here rather than in another locale, contributing eventually to congestion in the region, and creating pressure for still another highway. This is less likely to happen when the supplementary contribution is keyed to local resources since the levies imposed by the local governing authority to support the contribution will serve as a price signal to potential road users contemplating such moves.

It is not being suggested here that the kind of danger just described has actually transpired — in 1969, at any rate, the republic supplementary contributions did not yet reach very large proportions in the republics involved in substantial road operations, except in Bosnia-Herzegovina, which ranked fifth in expenditures and fourth in road revenues).

The main adjustments to Table 9 are the incorporation of the intermediate-use portion of the fuel turnover tax and the allocation to urban districts and communities of tax revenues arising therein. (We accept as proper the present 50—50 division of the licence fee revenues, although this should be looked into). In conformity with position advanced earlier in this chapter, all diesel turnover taxes should be assigned to user charge revenues; and if we assume that 1/3 of all gasoline is consumed by trucks, 1/3 of the gasoline turnover tax also should be viewed as a user charge. But we lack discriminative data on the tax amounts which arise out of gasoline and diesel consumption respectively, and are not able to reconstruct them from physical production series since some diesel fuel is used for other purposes.

If, as a tentative trial estimate we assume that the net result of these assumptions raises the user charge contribution to the I, II, III class road network by fifty percent in 1969 (item 4a, in Table 9), notionally replacing a corresponding amount of the non-beneficiary contribution and leaving an unchanged total, the share of fuel road user contributions rises from 36 percent to 54 percent. Accordingly, the non-beneficiary share, which in 1969 amounted to 36 percent (Federation 8.7 percent, Army 1.8 percent, and Republics, 25.4 percent — Table 9), now falls to 18 percent.

The foregoing illustrative calculation is tentative, but it is not too sensitive to errors in the assumpions. For example, a reduction of 40 percent in the estimate of the amount of fuel turnover taxes properly conceived as a user charge (from 50 to 30 percent of the presently designated road user charge — naknada za puteve) would reduce the net non-user contribution from 36 to 25 percent. But considering the relative truck-car fleet sizes (approximately 1:5), assuming an approximate 3:1 ratio in mileage driven per vehicle, and having in mind the

much greater loads transported and lower mileage/fuel ratio of trucks, an error of such magnitude is very unlikely. Hence, a rough estimate of arround 20—22 percent is probably not too far off as an estimate of net non-beneficiary contributions, with 78—80 percent coming from beneficiaries.

On the other hand, a possibility exists that this total I, II, III road user charge should be debited with some unknown amount which is connected with urban road transport costs. Guiding principles for such an allocation could be devised, but large-scale data collection would be necessary for a study on it. For the time being it could probably be said that the communities are being overcredited in at least one category, the licence revenues paid by large trucks. Or, if it could be shown that high mileages — 20—25 percent or more — of the large truck acitivity are run within cities and that half the licence fee should be credited to communities, the calculated present contribution to the I—II—III network falls, and the 20 percent shortfall between actual and warranted contribution of large trucks which we calculated in [1], would rise to around 35 percent.

The foregoing analysis has been couched in terms of contributions (Din. 2.4 billion) to revenue rather than expenditure (2.0 billion) which in 1969. was about 1/6 lower. The difference may be due in part to lags in disbursements for jobs actually executed, or to lags or inconsistencies in reporting which would presumably even out over the years. If we assume the »trend« expenditure value to be midway between the two observed values, and relate sources of revenue to Din 2.2 billion, we would find a beneficiary contribution of 87 percent. This is a remarkably good showing. Moreover, about half of the remainder consists of supplementary republic contributions, much, if not most is consistent with the local-orientation principles advocated here.

V. CONCLUSION

On the strength of a variety of evidence, it appears that the Yugoslav transport sector is efficiently organized and run, and that public policy towards transportation, which is predicated on the essential principles that are operative throughout the economy, has been such as to discourage intersectoral misallocation and price distortions. Considering some of the pressures that must have been perceived by policymakers at highest level, the resistance to the demands of special interests has been all the more remarkable.

One can easily imagine the pressures which argue in favor of a much more generous policy towards railroad investment — line amelioration, equipment, and electrification — to keep the six republics together. To be sure, the phenomenon of precarious federation also exerts countervailing pressures against large-scale interregional transfers — any republic might walk out if larger regional transfers were implemented. However, these need not be inconsistent — it would be quite thinkable for example to have regionally neutral intersectoral

transfers, with large amounts out of general public funds being spent to develop railroads and highways, even while many pressing needs remain elsewhere in the economy. That this has not happened is a testament to the efficacy of the system.

While policy has been efficient in the past, countertendencies appear to be developing today. These are probably most apparent in some of the associations which embrace numerous beneficiary groups — users, builders, and suppliers — and may eventually accumulate the most influential expertise within their ranks. For example, one could imagine that road user groups may become so strong that large public funds are channeled into highway construction through intersectoral transfers. One could conceive that the railroad groups can demand similar policies for their own interests And all of this might go unchallenged for lack of organized opposition. In this light it is regrettable that the opportunity of the recent review of the retail tax structure on fuels was not used to harmonize the administrative designation of the tax structure with its functional-analytic structure. As we showed in the earlier highway user charge study, once the turnover tax is distributed according to the final consumption view the rates at the new levels are fairly consistent with the warranted user charge levels that we calculated. However, by raising the turnover tax, and then resorting to the administrative device of allocating percentages of this tax revenue to the road sector, as is now being done, the pattern is set for continued and not necessarily rational manipulation of the turnover tax in the future. This may, let us say, help to establish firmly the notion that everyhing in excess of 18 percent be used for highway construction, instead of a more discriminating segregation of revenues according to their truck (large, small, medium), bus, and automobile origin.

(Rad primljen avgusta 1974).

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POLITIKA TRANSPORTA I JAVNIH SLUŽBI U JUGOSLAVIJI

Alan ABOUCHAR

Rezime

Osnovni princip politike i funkcionisanja transporta u Jugoslaviji je u saglasnosti sa principima privrede u celini — maksimalni oslonac na tržište i maksimalni profit individualnih privrednih organizacija, a minimalne dotacije i transferi u vezi sa alokacijom. Javne službe u Jugoslaviji su, čini se, efikasnije nego u većini drugih zemalja. Na primer, železnice ove zemlje ne gutaju nacionalne resurse u onoj meri u kojoj to čine železnice mnogih drugih zemalja a od principa racionalnog korišćenja puteva se mnogo manje odstupa.