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A Review on Road Transport Engineering: Haryana State Road Transport

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Abstract: *Road passenger transport was originally started in the private sector. However later on through nationalization of passenger transport in varying degree by the states, public sector was introduced in this sector. Presently passenger transport services are provided both by the State Transport Undertakings (STUs) and by private operators. Following liberalization, the share of STUs has declined with the entry of private operators to meet the incremental passenger traffic demand. The share of the private sector in the total number of buses has increased from 57 percent in 1980-81 to 85 percent in 2003-04. Over the years, the modal split in passenger movement between rail and road (by bus mode) has skewed in favor of the latter. The share of bus transport in passenger movement, which was around 15 percent in 1950-51, has increased to around 87 percent while that of railways has fallen from around 85 percent to barely 13 percent over the same period. Taking into account the traffic carried by other commercial vehicles, the share of the private sector in total passenger traffic is estimated to be at about 85 percent.*

Keywords: Sthar, Stu, Dea, Vrs

Introduction: Mechanized road transport has a comparatively short history in India. The first motor vehicle came to India in the year 1898. For several years, it remained a novelty and a luxury. As the strength of these vehicles slowly increased, there were several provincial enactments to control and regulate their movement and for the purpose of their registration. The first Indian Motor Vehicles Act (all India enactment dealing with the operational control of motor vehicles) came into force in the year 1914. After the First World War, the surplus military vehicles were diverted to civilian market. The unexpected and unprecedented growth of motorized transport triggered off by the surplus vehicles of the First World War, created problems of not only intense competition among motor vehicles but also threatened the Railways. The Indian Motor Vehicles Act, 1914 could not cope with the pressures and had to be supplemented by enactments made in the various provinces in order to introduce some degree of regulation and control. Seeing all these conditions, a

study of Rail-road coordination was initiated in the year1932.

Commenting upon the state of affairs in the Road Transport Industry at that time, the committee observed:

"The evil from which the public service motor transport is suffering are largely due to the excessive competition, unemployment amongst buses and their concentration on the more popular routes. We think that the evils attending unlimited competition are now such that the alternatives namely monopoly, would be preferable. In any event, a controlled monopoly will be necessary to encourage enterprise on less popular-route."

Review of Literature: In their study on rapid transit productivity, they found evidence of increasing returns to scale in the long run and of economies of density in the short run. It assumed that the technology of producing rapid-transit output (vehicle miles) could be described by a generalized Cobb-Douglas technology, taking, as inputs, man-hours of labor, kilowatt-hours of electricity, and the total miles of track. Predominant among them was the choice of the functional form. It assumed that the technology of producing rapid-transit output (vehicle miles) could be described by a generalized Cobb-Douglas production function, taking as inputs the man-hours of labor, kilowatt-hours of electricity, and the total miles of track. It argued against the assumption of a Cobb-Douglas production function because the elasticity of substitution between different factors of production are important elements when analyzing transit productivity, and in the Cobb-Douglas production function, these elasticity are taken as fixed. Grabowski uses a production frontier method to measure the revenue efficiency of railroad industry in the U.S. Colburn and Talley analyzed the economies of scale and scope of a single urban multi-service company using quarterly data from 1979 to 1988. Four modes are distinguished: motor-bus, dial-a-ride, elderly service, and van pool service. They used a Trans log total cost function with the following explanatory variables: four outputs, measured in vehicles-miles, and three factor prices (labor, fuel and capital). The empirical results reported in that study indicate unexploited scale economies. However, the evidence of cost complementarities is limited to certain combinations involving motor-bus and the

three Para-transit services (elderly service, and van pool service). It studied the cost structure of a sample of 289 urban transit companies operating in the U.S. between 1984 and 1986. Six modes are distinguished: motor-bus, rapid-rail, streetcar, trolley-bus, demand responsive mode and a last mode including all other modes. He uses a quadratic total cost function with the following explanatory variables: six outputs, measured in vehicles-miles, price of labor and the average speed in each one of the six modes. Empirical results highlight the presence of economies of scale and scope. Berechman (1993) discusses a number of possibilities for the behavior of transit managers. One of them is that the transit firm, which is usually controlled or owned by a public agency, strive to maximize the budget surplus (i.e., budget less expenditures). Since the annual budget is normally fixed or difficult to rise, this approach would lead to a cost-minimization result. The empirical evidence, presented by him is that while the total budget allocated to transit firms (bus or rapid-rail transit) has increased substantially over time, neither total output nor even labor input have increased, while the unit cost of output has gone up dramatically.

Objectives of the Study: The present study is an attempt to investigate the various dimension of productivity and efficiency of physical and financial performances of Haryana state road transport undertaking. The performance of STHAR has also been studied at depot level. Similarly, comparison of STHAR with other STUs has also been done to get a more informed status. This study intends to diagnose the productive gaps and factors responsible for poor performance and explore the reasons of losses. The major objectives of the study are as mentioned below:

- To examine the performance of Haryana State Road Transport in comparison to other STUs in India.
- To study the trends in the performance of STHAR over the study period
- To measure the efficiency of depots
- To estimate the performance of STHAR at depot level.
- Decomposition of performance to know the reasons responsible for inefficiency in depots.
- To suggest appropriate recommendation for improvement in performance of STHAR.

Managerial Management of STHAR: As per the objectives laid down

in the Road Transport Corporation Act (1950), the State Transport Undertakings (STUs) have been constituted to provide adequate, economic, efficient and properly coordinated passenger transportation in the geographical areas entrusted to them. Haryana State Road Transport is one of the best transport undertakings in the country. It is a departmentally operated state transport undertaking. It had a fleet strength of only 475 when it was bifurcated from the Punjab in 1966. Haryana Government nationalized the passenger transport in the state in the year 1970. As an STU, the Haryana state road transport (STHAR) is entrusted with the responsibility of achieving the above objectives for the state of Haryana. Though the STU is principally service-oriented, it should also earn a little profit on passenger transportation for its perpetual succession and expansion. The transportation of passengers should be planned in such a way to realize adequate revenue at reduced costs. The various policy decisions taken by the Roadways are aimed at achieving the objectives laid down in the Act and the targets and standards are fixed for both revenue and cost. The Roadways make efforts to achieve the above objectives through the better managerial set up and their management practice.

Organization setup of STHAR: STHAR is a departmentally operated state undertaking. Organization set up of Haryana Roadways is two tiers

1) Head Office level 2) Depot level

Organization set up of STHAR is given in Figure.

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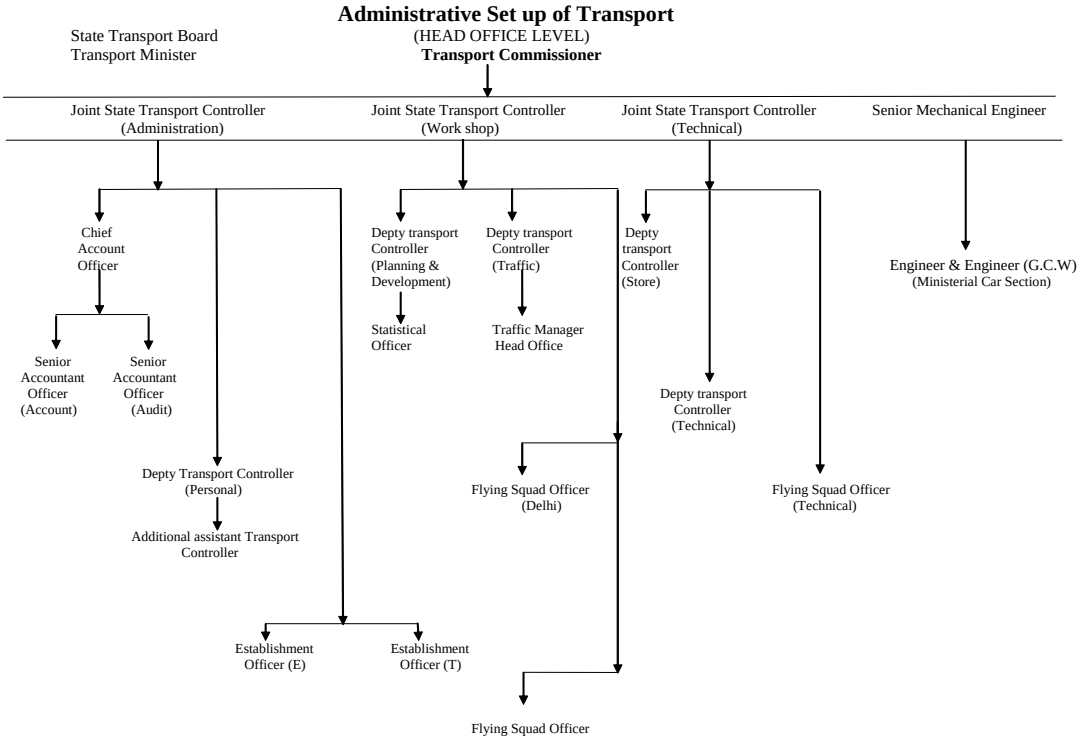

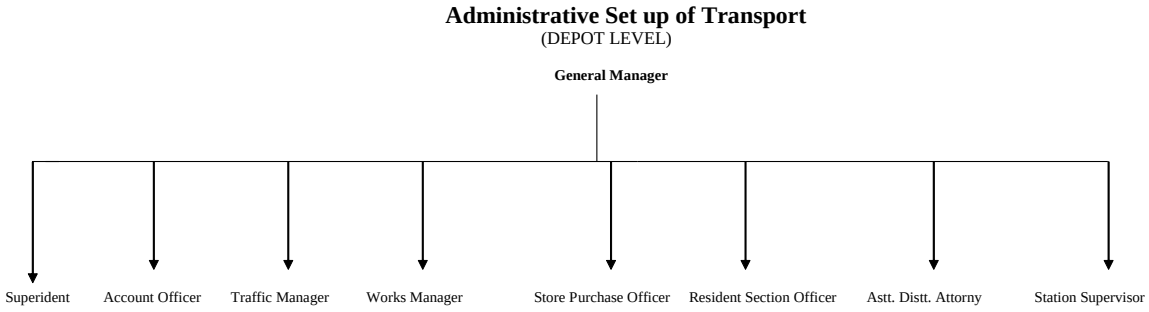

Comparison of STHAR with Other STUs of India

Productivity growth in transport has been the subject matter of intense research over the last five decades. Development economists have examined the source of productivity growth over time and productivity differences in countries/regions over the period. The concept of productivity is widely accepted as a key performance benchmark for entities. Rising productivity is related to increased profitability, lower costs and sustained competitiveness. Productivity is defined as the ratio of outputs to inputs. Productivity can be analyzed at various levels as economy, industry, firm/agency and operational unit. The focus of this study is at a more disaggregated level; how well the service delivery units of government passenger transport convert

inputs of labor, materials and capital into outputs of services. It is determined by dividing the output by the inputs. When productivity of two firms are compared, the more productive firms produce more output with the same inputs or it produces the same output with the lesser inputs. Productivity improvement is the basic function of the management. We compare performance (productivity) of STUs of different states of India with STHAR. Presently there are nearly 53 STUs in India having fleet strength of 1, 13,000 which is at about 23 percent of overall total passenger transport. Any enterprise, which carries their operation on the business principle, would endeavor to increase the output, reduce cost, and obtain some profit (reasonable returns on investment). There is a need to measure the utilization of input resources. In this paper, we study that how much efficiently STHAR utilizes its financial and physical input resources to produce output in comparisons to other STUs. For this purpose, we have selected a sample of 20 STUs (of different states) from all over India. All the selected STUs are prizewinner for their best performance in different fields.

Data Envelopment Analysis (DEA) is used for efficiency measurement. It is the non-parametric mathematical programming approach to frontier estimation. CRS input oriented model is used for estimating Technical Efficiency (TE) of STUs. VRS input oriented model is used for estimating Pure Technical Efficiency (PTE) of STUs. Scale efficiency (SE) is estimated by dividing the CRS-Efficiency by the VRS-Efficiency for STU. If a STU scores value of both CRS-Efficiency and VRS- Efficiency unity, it is operating in the Most Productive Scale Size (MPSS). Returns to scale reflect the extent to which proportional increases in all inputs increase outputs.

Conclusion: In this paper, we decompose the results by using Malmquist TFP index numbers method. This method is considered as better as method for analysis of the cross-sectional and inter-temporal behavior of the industry. This method calculates total factor productivity change and its decomposition into efficiency change, technical change, pure efficiency change and scale efficiency change. It is susceptible to the effects of data noise, and can suffer from the problem of "unusual" shadow prices, when degrees of freedom are limited. This issue of shadow prices is important, and is one that is not well understood among authors who apply these Malmquist DEA methods. A major advantage cited in support of the use of DEA in measuring productivity growth, is

that these methods do not require any price data. This is a distinct advantage, because in general, price data is not available sufficiently in most of the cases. However, an important point needs to be added here. Even though the DEA- based productivity measures may not explicitly use market price they do implicitly use shadow price information, derived from the shape of estimated production surface. This issue is described in some detail that showed that one could use these shadow prices to calculate shadow information, to help shed light on the factors, influencing these productivity growth measures.

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