Comparative Economics of Planning Public Transport Provision to Address Transport Connectivity Issues in a Rural Setting: The Case of Kalyanipura – Weli Oya

T Lalithasiri Gunaruwan [1] and M. H. Saumya Dilrukshi[2]

Introduction

Transportation functions as an essential cornerstone of rural development. Improved rural transport infrastructure provides greater mobility and access to services such as education and health at affordable costs (BMZ, 2013). It also facilitates access to jobs and enhances the movement of agricultural products (Rubel, 1990; cited by Brown & Flake, 1999). For instance, the lack of low cost and efficient goods transport services from villages to market centers has become a critical issue faced by rural farmers (Silva. R, 2014). Transport connectivity gaps therefore often impose limits on the welfare of deep rural settlements, and constitute one of the root causes of rural poverty.

The village of Kalyanipura in Weli-Oya, an enclave formally known as *Dollar-Farm*, which was destroyed by the LTTE terrorists in 1984 and rehabilitated in 2009 after the defeat of terrorism, is no exception: here, too, the lack of reasonable transport connectivity has, *inter alia*, rendered the village unattractive to settlers, with less than 40 out of the approximately 100 families resettled in 2009 continuing to live there at present.

A survey was conducted in the village in early 2016 to identify the problems and possible solutions to infrastructure gaps faced by the village. This survey resulted in an assessment of the transport connectivity problem and the economic impediments of providing private transport solutions owing to insufficient affordability (Gunaruwan & Dilrukshi, 2016).

This paper summarises the outcomes of the extended research conducted to examine the viability of addressing the transport connectivity problem of Kalyanipura by planning a public bus service, and the comparative economics of associated service provision alternatives.

Materials and Methods

The objective of this analysis was to evaluate the options of providing an affordable transport solution to Kalyanipura village. The problem was positioned between two

[1] *Department of Economics, University of Colombo*

[2] *Department of Economics, University of Colombo*

delicate parameters where (a) poor income levels of villagers made any private transport modal ownership and operating cost unaffordable, while (b) the distance from town and the sparsely populated nature of the village rendered any public transport operation costly, and less financially attractive to operators (Hine, 2014). The most pragmatic scenario for analysis therefore was a bus operation planned and operated by the Sri Lanka Transport Board (SLTB) through its Kebithigollewa Depot, where any shortfall of revenue could be expected to be bridged through national or provincial grants.

Data pertaining to travel demand and distances were obtained from the survey conducted and from the transport modal affordability analysis by Gunaruwan and Dilrukshi (2016). Bus operating cost data required for the assessment were sourced from the SLTB.

Analysis and Findings

According to Gunaruwan and Dilrukshi (2016), for motor bicycle travel cost to be economically justified, a villager should on average place a value of at least Rs. 48 per hour saved. However, little over half of this amount justifies the operating cost that has to be incurred to secure such time savings by way of bus travel. Therefore, it is clear that most economical mode of motorised mobility which could be provided for Kalyanipura villagers is a public bus transport facility.

This exercise examined supply economics, by comparing alternative modes of bus transport service provision. The operation of a bus by the private sector was not considered in this analysis because SLTB operation would imply significantly less capital costs and greater deployment flexibility for the purpose from among the fleet of SLTB buses in the Kebithigollewa Depot. The thrice daily operation of a new service from Sampath Nuwara to Kalyanipura was planned, comprising two school trips in the morning and afternoon, as well as one trip in the evening. The total operation would involve 126 bus kilometres daily.

Based on the operating cost statistics of Kebithigollewa SLTB Depot in 2014, it could be worked out that this bus operation would cost Rs. 5,890 per day (or nearly Rs. 2.12 Million per year), and would require 1.41 Million passenger kilometers of travel demand annually, if this cost is to be met through bus operating income from passenger tickets. Assuming an average spread of passengers in all the buses operated, this would require a near 78% of minimum load factor to be realised, which is not a practically achievable scenario for a rural route (Hine, 2014). Besides, the break-even passenger demand would be nearly 4.4 times the total

estimated passenger travel demand of 26,700 passenger kilometers per month, as worked out for Kalyanipura.[3]

The study also worked out the uneconomic route operating compensative grant that would be required to meet the revenue gap based on the actual cost of operation and the practically feasible travel demand estimates, and found it to be Rs. 1.64 Million per year payable to the Kebithigollewa Depot by the National Transport Commission or relevant Provincial Council.

Alternatives to such service provision were therefore examined. It was brought to the notice of the study team that a bus is currently operating to Gajabapura, which does not pass through Kalyanipura village. This bus, currently plying through a forest patch of nearly 4 km without serving any passengers, could well run through Kalyanipura by travelling approximately 6 additional kilometers on each trip. The study examined the comparative economics of this option, and found it to be much more attractive for both the supplier and the national or provincial authorities. The comparative results are presented in Table 1.

Table 1: Costs and Operating Indicators of Bus Service Provision Options

Cost / Operating Parameters	Dedicated Bus Service to Kalyanipura	Existing service re-routed to run via Kalyanipura
Supplementary Bus Operation	42km x 3 trips/day = 126 Km /Day	6km x 2 way x3 trips = 36 Km/Day
Variable Cost of supplementary Bus Operation per Year	Rs 2.12 Mn	Rs 0.61 Mn
Additional (or new) passenger km of travel demand needed to cover Variable Cost	1.4 Mn (4.41 times the actual travel demand)	0.40 Mn (1.26 times the actual travel demand)
Compensation payable to the Depot by the authorities to sustain the bus operation	Rs 1,639,980 per Year	Rs.125,280 per Year

Source: Author Estimates

It was thus revealed that the option of re-routing the current bus operation to Gajabapura to run via Kalyanipura would be very much more economical to the

[3] Gunaruwan & Dilrukshi, (2016) assumed that school trip demand arises 5 days a week, and each adult would travel to town at least once a month for various reasons.

operator as well as to the national or provincial transport authorities than planning a dedicated bus service to Kalyanipura.[4]

The study also found that a narrow culvert en route to Kalyanipura has to be broadened if the 42 seater bus currently operated to Gajabapura is to serve Kalyanipura as well, because a smaller bus which could operate on the route as it exists at present may cause a welfare loss to the existing clientele of the bus to Gajabapura.

Conclusions and Recommendations

The research examined the economics of the alternatives to providing a bus service to an isolated rural village setting, namely Kalyanipura in Weli-Oya. Introducing a public bus service was found to be a potentially affordable mobility solution for villagers due to their income constraints. The importance of serving the purpose through the most economical means also was revealed through the study: A new dedicated bus service would require a 13 times greater compensative grant payable by the authorities to the Kebithigollewa Depot than a re-routing of the existing bus service to Gajabapura to run through Kalyanipura. If serving the village once in every journey (instead of going through the village both on up and down journeys) is adequate to meet the purpose, it would be even less costly, to the extent that no compensative grant at all would be required by the Depot. In such a case, the Depot would be able to fully cover the cost of additional trip distance through the incremental earnings from passengers to and from Kalyanipura.

It is therefore recommended that the authorities examine the road infrastructure gaps, if any, which may prevent the 42 seater bus taking the route via Kalyanipura and solve such problems enabling the implementation of the most economically efficient bus transport service option to provide affordable mobility to the villagers of Kalyanipura, Weli-Oya. Such examination also should capture (i) the likelihood that the passengers using the bus to Gajabapura at present having to incur increased travel time costs owing to the proposed re-routing, and (ii) the possibility of this new bus service inducing more settlers who have left the village to return: resulting in increased patronage of the bus and reduction of compensative grants required to meet the operating economics of the bus service. Such furtherance is likely to call for more intensive primary data gathering on the present clientele of the bus as well as on the settlers who have already left the village.

[4] However, this re-routing causes existing passengers using Gajabapura bus to spend additional travel time. Not capturing this externality is a shortcoming of this research.

Key-words: Transport Planning, Transport Costing, Rural Mobility, Public Transportation

JEL Codes: L91, L98, O18, R41, R42

References

Brown, M.D and Flake, O.L, 1999, Rural Transportation, Economic Research Service, U.S Department of Agriculture, United States of America.

[ntl.bts.gov/lib/000/300/349/biblio.doc]

Federal Ministry for Economic Cooperation and Development (BMZ), 2013, Improving the Accessibility of Rural Areas: The Contribution of Transport of Rural Development. [Available from: file:///C:/Users/econ/Desktop/giz2013-en-the-contribution-of-transport-to-rural-development.pdf]

Gunaruwan, T.L and Dilrukshi, M.H.S, (2016), Transport Connectivity Issues of a Rural Setting: A Case Study of Appraising Modal Options, International Research Conference of the Faculty of Arts, University of Colombo, Sri Lanka.

Hine,J. 2014. Good Policies and Practices on Rural Transport in Africa: Planning Infrastructures and Services. African Transport policy Programme, South Africa.

[https://www.ssatp.org/sites/ssatp/files/publications/SSATPWP100-Rural-Transport-Planning.pdf]

De Silva, R. 2014, A case study on establishing and running a community bus service. *Transport and Communications Bulletin for Asia and Pacific*, 84, 41