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REVIEW OF THE "SISU SERIYA" SCHOOL BUS SERVICE

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ABSTRACT

School Transport is considered an essential service that provides equitable access to school children who have difficulties in accessing their respective schools. Different school transport systems in countries differ from each other based on their resources and topography.

This paper presents a case study conducted on the Sri Lankan School Bus service "Sisu Seriya" initiated in 2005 to provide a sustainable, reliable and safe mechanism for providing State assistance for school transport. It provides bus service at a concessionary rate through a state subsidy to schoolchildren across the country, contracting bus operators in both public and private sectors, engaged for regularly scheduled services through a specific contractual arrangement in which a set of regulatory and safety conditions are stipulated. Sisu Seriya engages over 1,565 buses serving more than 100,000 school children daily. The paper has benchmarked the Sisu Seriya service through a systematic review of global best practices. Initiation of the system, design features, implementation mechanism and monitoring procedures of the Sisu Seriya service and areas for potential improvement are discussed based on its 15 years of operation, while elucidating the distinctive characteristics of the system. It further highlights how the service design has addressed the challenge of resource limitations, inherent to developing countries, through effective utilization of the existing fleet.

Keywords: *Sisu Seriya, Transport, School Children, Dedicated, Concession, Sri Lanka*

1. INTRODUCTION

Transport plays a crucial role in the economic, social and cultural development although it is considered as a product fetching derived demand. Efficient and effective transport systems are directly attributable to the development of a country. A sustainable transport system addresses social and cultural needs while respecting economic and environmental imperatives. School transport is an area that society should focus on as it relates to an age group that bears responsibility for the future of a particular society [1],[2],[3].

Sri Lanka is a middle-income developing country with 21 million people, out of whom 4.2 million are students attending 10,000 schools. Of these schools, 96.5% are classified as provincial schools and the others as national schools [4]. Only 10% of the total student population in the most populous and economically-advanced Western Province use buses in commuting to school. In other provinces, most students attend schools located within walking distance from their residences, due at least in part to the absence of bus services. It has been found that more than 50% of students in the Western Province use either cars or vans, resulting in increased traffic congestion in the vicinity of schools in urban areas[5].

One of the responsibilities of the Government, especially in a developing country with significant income disparities, is the social and cultural development of its people by ensuring equitable access to education. Affordable and accessible transport services for school children are often provided with government support or subsidies; perceived as investments owing to their benefits being accrued in the long run. [1],[6].

This case study illustrates the design and implementation of a concessionary school bus service called *Sisu Seriya* that has continued successfully since its inception in 2005. *Sisu* Seriya, meaning "students' travel" in Sinhala, was inaugurated by the National Transport Commission on 12th September 2005 with 180 buses at Temple Trees, Colombo; the service has since expanded island-wide, providing 1,418 daily services to nearly 100,000 students [7],[8].

2. LITERATURE REVIEW

This literature review summarises global school transport service arrangements while noting their special features. These provide insights into global best practices in the selected countries throughout the world. The provision of school transport varies globally, from students having to share scheduled public transport to having a dedicated school bus service operated free of charge by the Government or the respective education authorities [9]. Safety and reliability have been identified as essential combinations of school transportation given the nature and need of

commuters [1],[2]. Compared to other modes available for school transport operations, relatively larger seating capacity, safety, reliability, and flexibility make the bus mode the top choice [10].

The United States of America (USA), Australia, Canada, New Zealand, the United Kingdom (UK) and Japan are all high-income countries with well-developed school transport systems. The USA, Australia, the UK and Russia provide free school transport to all students or at a minimum to those eligible for free transport. Eligibility criteria include being enrolled at the nearest appropriate school, receiving a minimum compulsory education, residing no further than 3-5 km from school, or residing outside of an area where public transport services are unavailable [9],[11]. In Australia and most of the European continent, dedicated transport services are provided to students with special needs, free of charge or at a concessionary rate [12],[13],[14]. In addition, it is common to observe dedicated school buses with a specified colour and customised hazard lighting: a practice that originated in the USA. Countries with large geographic areas delegate school transport provision to the respective Provincial Transport Authorities (PTA): this creates practices that often differ within the same country [6]. In the U.S. and Australia, such services are usually provided by school districts, who provide dedicated services through buses or contract out service delivery to bus operating companies [15].

However, only a few Asian countries have dedicated school bus services, and some are yet to be extended into full-scale programmes. China, Hong Kong, the Philippines, Singapore and South Korea are some countries that have implemented dedicated school bus services [9],[16],[17],[18]. However, except for Singapore, all other countries are still far behind in improving safety standards and fulfilling the demand [9],[17].The lack of suitable public transport for students often results in parents making arrangements with private operators of passenger vans or buses at a premium rate. The absence of proper regulatory guidelines and the lack of ownership and operational controls of such services result in many delivery problems and issues [18],[19]. In addition, countries like Japan, the Netherlands, Hong Kong, the United Kingdom, South Korea and Italy have encouraged non-motorised transport to school, such as walking and cycling. Such policies are supported by urban development policies and school admission policies which urge students to be enrolled at nearby schools so that non-motorised access is feasible [8],[20],[21],[22]. Table 1 compares school transport systems in different countries according to their design features.

The most common problem faced by countries lacking public school transport services is that parents have to provide transport for their children, leading to a loss of workforce productivity. Studies have shown that parents are more concerned about

safety and convenience than cost, sustainability, and reliability of transport arrangements, resulting in them personally driving their children to school [1],[4].

Table 1: Comparison of the features of global school transport services

Characteristic		China	Japan	HongKong	Singapore	South Korea	Russia	Australia	New Zealand	United Kingdom	Germany	Italy	Netherlands	Poland	USA	Canada	Mexico	Argentina	Sisu Seriya
Providers	Government				✓		✓	✓	✓					✓	✓	✓	✓		✓
	Private	✓	✓	✓	✓	✓				✓	✓	✓						✓	
	School	✓		✓				✓						✓			✓		
Service	Exist. public transport							✓		✓									✓
	Additional provision										✓								
	Dedicated service				✓		✓	✓	✓	✓		✓		✓	✓	✓	✓		✓
	Special needs						✓	✓	✓	✓			✓	✓	✓	✓			
Main mode	Bus	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓
	Van	✓		✓		✓		✓										✓	
	Walk / Bikes		✓	✓		✓				✓			✓						
Consession	Free of charge						✓	✓		✓			✓	✓	✓	✓			
	Discounted								✓	✓	✓						✓	✓	✓
	Season tickets					✓													✓
	Allowance					✓		✓	✓		✓								
	Eligibility criteria						✓	✓		✓				✓	✓		✓		
	Symbol / Wording	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓					✓
Vehicle features	Colour	✓	✓			✓	✓	✓	✓	✓		✓		✓	✓	✓	✓		✓
	Lights	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		
	GPS	✓	✓			✓	✓	✓	✓	✓		✓		✓	✓	✓	✓		
	Video surveillance	✓			✓		✓	✓											
Rules and regulations	Speed limits	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓
	Traffic priority	✓				✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		
	crews	✓				✓	✓	✓	✓	✓		✓		✓	✓	✓	✓		✓
Routes	Existing routes										✓							✓	
	Dedicated routes				✓		✓	✓	✓	✓				✓	✓	✓	✓		✓

Safety is a vital element of school transport, given the involvement of a sensitive group of riders. Europe, the USA and Australia can be identified as pioneers in implementing dedicated safety standards for school transport [3],[21],[23],[24]. Many Asian countries have followed suit, engaging in different arrangements between regulators and users. These are often triggered by accidents and social pressures after accidents [18],[22]. Many countries have implemented traffic priority measures that provide dedicated school bus services: for example, restrictions on overtaking school buses, on children boarding or alighting, prohibiting or permitting certain action only at a reduced speed [11]. A study to measure and analyse the school bus service quality level in Malang City, Indonesia used Importance Performance Analysis (IPA) to rate the service's features. It included adequate space, seating capacity, availability of trash can, availability of information boards at the bus stops, availability of public telephones at bus stops, and CCTV [25]. In the City of Lisbon, Portugal, a transport mechanism integrating different routing problems arrived at a Mixed Integer Linear programming (MILP) solution for a multi-route school bus service. The system was capable of developing solutions for a single medium-sized school. However, in the case of multiple schools and multiple cities, there were some complexities in arriving at an efficient and effective solution [26].

In the case of developing countries, financial, technological and infrastructural capacity need to be evaluated to design a sustainable and productive school transport mechanism. Systems designed with inadequate consideration of these factors have collapsed or incurred high costs to the Government [27],[28].

3. DESIGN OF SISU SERIYA SCHOOL BUS SERVICE

3.1. School Bus Transport before Sisu Seriya

Sri Lanka had been implementing different concessionary schemes to encourage children to attend school by facilitating travel between home and school since as early as the 1950s. It started well before the nationalisation of the bus industry to establish the State monopoly operator, the Ceylon Transport Board (CTB) [29],[30],[31]. Such schemes can be identified and elaborated as follows:

Season Tickets – A season ticket is a printed card issued at the beginning of each month. The CTB, formed in 1958 after the private operators were nationalised, initially issued season tickets at a 67.5% discount for students under 12 years and a 35% discount for those above that. These season tickets allow students two trips between home and school every school day in a school uniform. These concessions were further increased to 85% discount in 1993; the CTB’s financial losses increased when those discounts allowed were not reimbursed to the CTB by the State [30],[31].

School Bus Service provided by CTB – This was a mechanism where the CTB provided a fare-paying dedicated school bus service for schoolchildren attending a specific or any cluster of schools. Students who possessed a monthly season ticket could travel in these dedicated buses without paying extra, which was considered an excellent service at its initiation in the 1960s [32]. However, there was no incentive for the CTB to keep operating such dedicated bus services, which were not accessible to daily fare-paying ordinary passengers. However, there was no incentive for the CTB to keep operating concessionary services. Therefore, it often neglected these services, favouring more remunerative services, making the school bus service unreliable. This practice led to the CTB losing student passengers who consequently moved out to reliable modes of transport, reducing the school bus service to around 70 operations a day by 2005 when there were 200 scheduled operations island-wide. This situation was a direct consequence of expecting the CTB to cross-subsidise the loss-making service, which the Government should have assisted given the social and economic benefits delivered through such a service.

Even though the economic benefit to users through this initiative was considered significant at the beginning [29],[31], school buses' quality, reliability, and safety gradually became unsatisfactory [29],[32],[33],[34]. Besides, the share of public bus transport services provided by the Sri Lanka Transport Board (SLTB), the successor to the CTB, dropped to around 30-40% after private bus operators re-entered the market in 1978. As a result, schoolchildren had to wait longer for the arrival of an SLTB bus and, when it arrived, had to struggle to get on board as the bus would invariably be overloaded [29],[33]. This type of high concessionary mechanism could rarely be observed in the international context without subsiding the operator for such provision. Most countries provide school transport services either entirely freely, either through a dedicated service provider who is being paid for the service provided or by paying an allowance for eligible students, which removes the financial burden from the operator.

This practice led to both types of services, namely school season tickets and dedicated school buses, becoming less reliable and less attractive by 2005 even though the State was spending over Rs 225 million every year on season ticket concessions. Schoolchildren often had to depend on other modes of transport, usually paying much higher fees and sometimes in addition to what was paid for their season tickets. The result was an emergence of large numbers of privately-operated school vans that provided school transport services for a premium rate, generally around 20 times the season ticket rate.

On top of this, the high concession rates granted for schoolchildren created a considerable loss to the SLTB. Thus, the SLTB prioritised general commuter service

in the morning peak, which was more lucrative than the school service, resulting in a shortage of buses made available for school children. Gradually, the system became commercially unviable for SLTB due to the absence of a sustainable financing mechanism, which led to the system's collapse by 2005 [35].

Some schoolchildren in remote areas are seen as having abandoned studies due to these difficulties. Table 2 summarises the issues and repercussions of the systems that existed prior to *Sisu Seriya* being introduced.

Table 2: Issues and repercussions in the school bus system prior to Sisu Seriya

No.	Issue	Repercussion
1	Buses not operating on schedule, leading to poor service reliability	Higher absenteeism, children were returning home without attending school, children unable to return home, leading to parents' anxiety. Some students dropped out of school as more reliable transport was expensive.
2	Inadequate service provision underpinned by the limited number of buses assigned to dedicated school services	Congested school buses and students not being able to travel in comfort. Other disciplinary issues arose within buses, resulting in violent student behaviour, with buses being taken to the police station.
3	Due to the captive market and losses in providing the service, the operator assigned some of the oldest buses for school transport.	High exposure of students to breakdowns, accidents etc.
4	There was no regulator as it was an arrangement between the Government and state bus operators.	The inability of the self-regulatory mechanism to maintain quality of service led to gradual deterioration of services.
5	Due to the high concession of even up to 85% provided to the students, most of which was not reimbursed by the Government, the operator has to bear heavy losses, making such services financially unviable.	The quality and reliability of the service deteriorated due to the operator’s lack of eagerness to provide a loss-making service. Students bought seasons tickets as they were highly discounted, but often travelled in private buses as they were more frequent and regular.
6	The emergence of private transport providers providing school service at a rate 20 times the regular transport fare	The system was unaffordable for the majority of the school children. In addition, school vans entering and parked near the schools were creating congestion interrupting the urban vehicle flow.

3.2. Concept of *Sisu Seriya*

The inefficiency of the prevailing system by 2005 raised the need to design a better system [29],[32],[33],[36]. The concept of *Sisu Seriya* was initiated with the idea of addressing the above-discussed deficiencies through a standardised and regulated service. The paramount need was to create an environment where the children could go to school well in time and return home safely without being inconvenienced mentally or physically.

The school transport concept was restructured considering that the private sector provided around 70% of the buses deployed for regular route operations, most individual bus operators. The SLTB supplied the balance through around 100 bus depots scattered across the country.

The National Transport Commission (NTC), the regulator of the public bus industry, and mainly the inter-provincial private bus services, took the lead in innovating a new system of school bus service provision. Upon detailed assessment of the conjuncture, lessons learnt from the hitherto existing systems, and the objectives, the *Sisu Seriya* service was developed with the following objectives and features:

(a) Objectives of Sisu Seriya Service

The objectives of the Sisu Seriya school bus service, as set out in the aim of the service at the inception, can be listed as follows [37]:

(i) Provision of a reliable and quality transport service for students from school to home and back, reliable and on time to provide them with a pleasant mind in readiness to engage in educational activities that would contribute towards a fruitful new generation.

(ii) Charge only 50% of the ticket price from students who use this service to reduce the economic burden of schooling to families.

(iii) To create a pleasant social environment for students to interact during the commute to school.

(iv) Substitute a large bus instead of a large number of small vehicles to reduce fuel consumption and environmental pollution and to reduce traffic congestion;

(v) Incorporate both SLTB and private bus operators to provide more supply.

(b) Features of the Design of Sisu Seriya

The following key features were incorporated to ensure success and sustainability:

(i) **Reliability** by imposing penalties for non-operation of buses and delays compelling regular operations;

(ii) **Security** by stipulating that two teachers be carried free of charge and safety guidelines issued for the operators;

(iii) **Affordability** by charging only 50% of the regular fare while allowing the use of the Season Tickets remain unchanged on SLTB buses;

(iv) **Ownership** by setting up School Transport Committees (STCs) made up of teachers and students;

(v) **Continuity** by reimbursing estimated operator losses through a dedicated budget allocation for Sisu Seriya and incorporation of both State and private operators;

(vi) **Quality** by setting standards required for safe and convenient carriage of children including the minimum age for bus crews, uniforms, EPF/ETF etc. in the contract and termination clauses as required;

(vii) **Monitoring** by requiring the accreditation by STCs and the regulatory agencies (NTC and PTAs) about the service before payments are made and allocating free tickets for two teachers and one senior student to certify the services provided every month.

The *Sisu Seriya* proposal, developed incorporating the above attributes, was submitted to the Cabinet of Ministers in 2005 through the Ministry of Transport. Upon approval and receipt of the necessary funding from the Treasury, the *Sisu Seriya* school bus service was inaugurated on 12th September 2005, commencing the operation with 180 buses in 7 districts serving 152 schools across the country.

The systematic planning and incorporation of the necessary attributes listed above have enabled the *Sisu Seriya* to be endowed with a service model that stood well above the prevailing systems despite being developed and operated in a developing country.

3.3. Selection of Sisu Seriya Buses

The selection of a Sisu Seriya bus service begins with a school (the "trip attractor") making a written request to the NTC for a school bus service. After evaluating the requirement, the NTC directs the request either to the SLTB or to the relevant Provincial Transport Authority (PTA) to nominate an existing private bus operator on the same or nearby route to serve the school most easily. Once the supplier details are verified and matched with the school requirements, a service agreement is generated between the NTC and the operator with the necessary terms and conditions for three years. After the NTC approves the service, the respective school must form an STC to be held responsible for the smooth operation of the service. This appears to be a unique user quality assurance feature that has worked very well.

Figure 1 depicts the processes of service assignment in the *Sisu Seriya* programme.

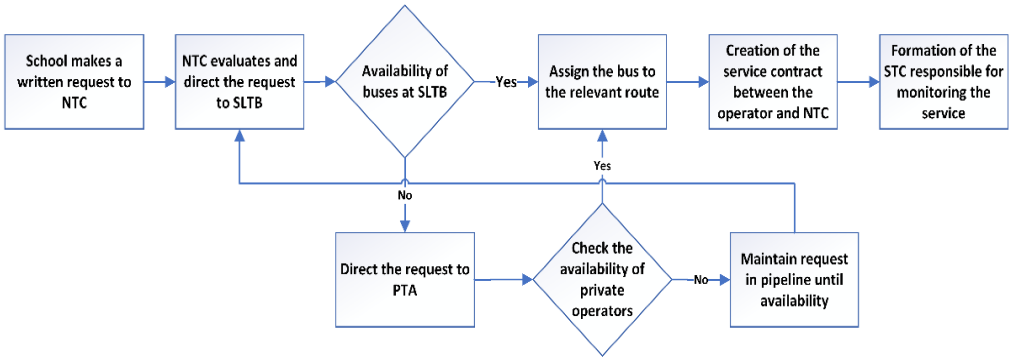

Figure 1: Process of bus assignment in Sisu Seriya service

3.4. Scheduling of Services

The bus chosen is taken from its existing schedule and assigned for the two trips required by the *Sisu Seriya* service. Other buses are rescheduled as necessary. The bus remains in public scheduled service at all other times of a school day. On weekends and school holidays, it provides regular public services.

3.5. Financing Model

Under this model, the operator collects 50% of the fare. The Government provides a subsidy for the balance provided that the service is delivered under the guidelines regarding availability, reliability, crew conduct, quality of bus, etc. The subsidy also pays the operator for the empty haul in both directions at the bus operating cost rate calculated annually by the NTC. Thus, a bus operating from x to y, a distance of 24 km, for instance, will be paid for 2 x 24 km. If the bus operating cost for a 40-seater bus is calculated at Rs 100 per km, then the subsidy provided will be at 50% of the operating cost, Rs 50 per km x 48 km, making a total of Rs 2,400 per day for approximately 200 days a year that schools function. However, the maximum number of km the subsidy is provided is 90kms in the Western Province and 110 km in other provinces. The NTC uses the index applicable to the annual fare revision to revise the bus operating cost annually. The SLTB, as it offers the season ticket subsidy to students on top of the 50% fare concession, will also get that portion of subsidised from the Treasury.

3.6. Payment Process

The bus operators qualify for the payment only if they provide at least 90% of the monthly scheduled trips. In 2010, this was raised to 95% but subsequently lowered back to 90% due to the inability of the providers to comply. An unserved trip is

penalised with a monetary penalty twice the subsidy provided for that trip. A penalty equal to the subsidy assigned for the relevant ride is charged if a bus gets delayed. The NTC issues a log-sheet for a bus every month, where the actual delivery and times of the two school trips should be certified by the assigned staff member/student each day. This sheet is to be kept inside the bus for inspection by NTC officers when providing the *Sisu Seriya* service. The NTC makes payment after the log sheet is submitted to the NTC through the SLTB Depot Manager or the PTA in the case of a private operator. The price per trip in the contract is renewed by applying the percentage of the annual fare revision, which takes place in July every year. The price has increased and decreased with changes in input prices, mainly affected by changes in fuel price.

Source: National Transport Commission, Sri Lanka - Annual Report, 2018

Figure 2: Images of Sisu Seriya Service

3.7. Stakeholder Duties and Responsibilities

The *Sisu Seriya* service requires the participation of several stakeholders for successful implementation.

School Transport Committee (STC)

All schools to which many children arrive by means other than walking are encouraged by the NTC to form an STC after assigning a Sisu Seriya bus service. The Principal of the school appoints this committee. It consists of two senior teachers, two responsible parents, the Officer in Charge of the Police of the area and the General Manager of the PTA if the bus is provided by a private operator and the representative who is in charge of the operations in the respective SLTB depot. Other members are co-opted where necessary. This committee should meet at least once every month. If

one bus is shared among students of several schools, a lead school may take the initiative to ensure adequate representation of other relevant schools in the committee.

The responsibilities of the committee are:

- To plan new services and amend existing services to provide maximum benefits to the students;
- Inform the parents regarding the services and securing the support for the service provision;
- To discuss with the bus company to provide and maintain a regular school bus service and to monitor such service;
- To appoint a Warden for each school bus to maintain discipline and to liaise with the bus company daily;
- To plan and manage the parking, traffic control and road safety in the vicinity of the school, especially at times of starting and closing of the school;
- To monitor school van services according to guidelines that may be prepared and issued by the Ministry of Education or NTC;
- To certify the provision of bus services for endorsing payment to SLTB and private companies for services provided;
- To maintain the “log sheet" with proper updates mentioning the dates when the service was not provided and specifying any quality concerns in the same sheet.

Service Conditions

The buses employed for the programme have to be labelled with the logo developed for the programme. The name Sisu Seriya is marked in both Sinhala and Tamil, as depicted in Figure 3.

Figure 3: Logos used in Sisu Seriya

A dedicated bus is allocated for the service by the operating company, which is responsible for providing a replacement if the designated bus is not available. Since the Sisu Seriya buses are used in regular service at other times, another advantage of Sisu Seriya is that buses in the regular public transport service are used instead of

dedicated buses that are colour coded, as in some other countries. This feature enables the bus service to be provided at the regular ticket price, and the State only subsidises the relevant concession discounted from the regular fare. This case study depicts how a developing country successfully provided a service mainly seen in developed countries.

Following requirements need to be fulfilled by the private operators to be eligible for the service provision.

- In the case of a private bus, it should possess a valid route permit for the general route on which the bus would operate.
- Priority is given to the operators who reside close to the point of origin.
- An operator possessing more than one bus is considered preferable.
- The minimum capacity of the bus should be 40 seats, and the carrying capacity should be 80.
- The bus employed for this service should be less than ten years old.
- The operator should register to pay social security payments for the crew.
- The driver and the conductor should be registered either under NTC or PTA.
- Operators are required to maintain communication facilities inside the bus.

In addition, there are specified requirements for the crew.

- Should wear the uniform while on duty
- Should be more than 30 years of age
- Should possess sound knowledge on the route
- Should be free of charges of having been found unkind or impolite to passengers
- The driver should not have been involved in fatal accidents during his career.

3.8. Implementation Issues

Though well-received by the public, the Government and other stakeholders, there were considerable protests from the school van owners whose business and incomes were impacted due to *Sisu Seriya*. Given the benefits of *Sisu Seriya* through reduced congestion and the resulting economic benefits to society, these objections were not strong enough to disrupt the service. However, the option was given for school van operators to get the *Sisu Seriya* service after converting to bus permits. As a result, some former school van owners now operate only a *Sisu Seriya* Service as it is perceived that operators who provide a good school bus service receive social recognition as a provider of meritorious and altruistic service.

3.9. Monitoring

Monitoring is an essential element for the success of any new programme. Countries with dedicated school bus systems make the respective regulatory authorities responsible for monitoring. However, the *Sisu Seriya* service is monitored primarily by its users. The two teachers and a student leader aboard the bus, who represent the STC, certify the log sheets daily and implement the penalty system for absence, delays and failure to adhere to the contract conditions.

This auditable and corruption-free mechanism is needed to complete payments for bus operators made from public funds. Hence the operators are motivated to get the log sheets signed every day. The log sheets also require the Principal's signature before being sent to the transport authorities for payment. In addition, the NTC conducts unannounced spot checks from time to time to evaluate the compliance of the service providers, especially when a complaint of a breach of conditions is received.

3.10. Current status of Sisu Seriya

Table 3: Progress of Sisu Seriya School Bus Service by Province (2009-18)

Year	Western	North Central	Central	Sabaragamuwa	Uva	Southern	North Western	Eastern	Northern	Inter-provincial	Total
2009	216	70	32	105	57	105	76	31	0	0	692
2010	216	70	32	105	57	105	76	31	0	0	692
2011	220	76	33	118	60	118	77	52	29	0	783
2012	317	72	47	111	83	224	99	77	29	0	1059
2013	296	111	35	122	68	240	130	100	23	10	1135
2014	310	96	62	86	69	225	133	119	25	10	1135
2015	410	111	42	122	67	231	131	108	23	10	1255
2016	337	99	51	98	89	226	136	140	26	10	1212
2017	424	121	48	126	82	272	147	109	32	09	1370
2018	431	118	51	127	92	286	155	115	36	07	1418
2019	422	163	51	122	100	104	298	117	36	07	1420
2020	426	168	53	122	111	107	321	117	36	07	1468
2021	432	187	55	123	141	107	351	122	36	12	1565

The province-wise expansion of the *Sisu Seriya* service is given in Table 3 [38],[39],[40]. The highest number of services is provided in the Western Province. However, the highest growth is recorded by the North Western Province. The only provinces where the services are proportionately less are the Eastern and Central Provinces.

The annual subsidy provided over the last 14 years, together with the growth of the fleet, is depicted in Figure 4. It could be observed that the growth rate of the subsidy, even at a nominal value, is less than the growth in the number of services. In 2018, the subsidy amounted to Rs 552 million, entirely distributed among the respective operators. The NTC absorbs the administration cost of this programme as an assigned regulatory role.

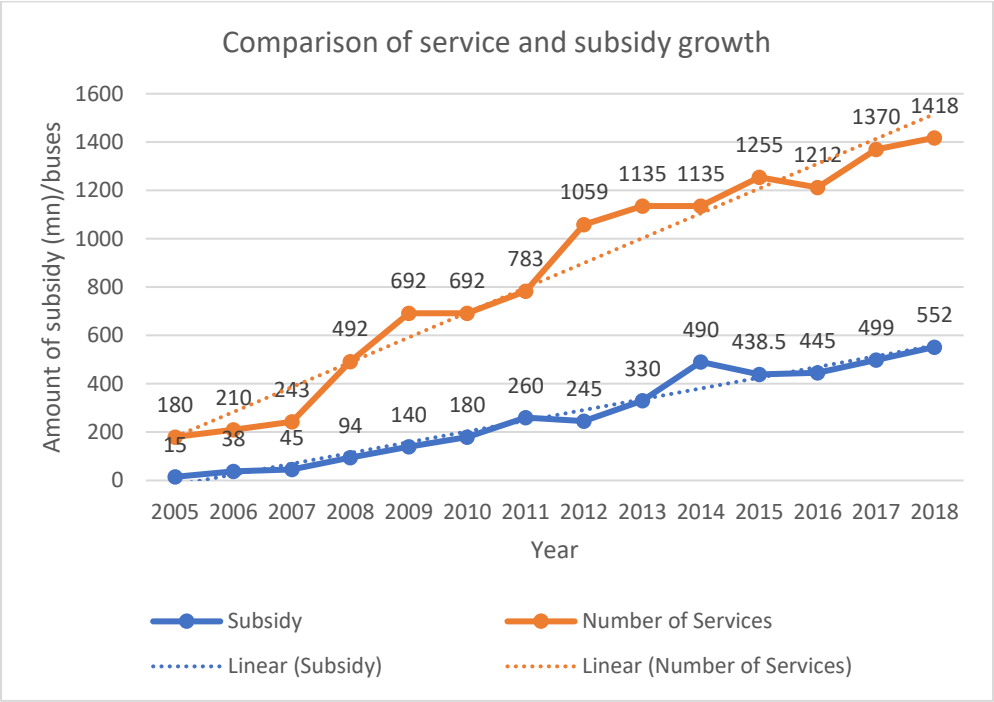

Figure 4: Comparison of Service and Subsidy Growth

4. CONCLUSIONS AND INSIGHTS FOR FUTURE DEVELOPMENTS

Sisu Seriya has many notable features which allow it to be compared with other leading and noteworthy global school transport systems, especially given that Sri Lanka is still a developing middle-income country. Its design that integrates both the State-owned and private providers in delivery without conflicts is noteworthy and crucial. The demand-driven process and the setting up of STCs have empowered the schools to ensure several key success parameters, namely (a) ownership by the users,

(b) certification of services and (c) continuity. The cost-based service provision and the annual fare revision formula helps to retain and continue with successful operators. The penalty systems and on-board monitoring reduce the occurrence of irresponsible behaviour of operators and their incomes being pruned, at the limit even making them exit from operations. Such operators have a fall-back position as they could return to their regular route service and, as such, could leave voluntarily.

The experience so far reveals that the number of buses deployed for *Sisu Seriya* has grown by 16% p.a. without Government investment or assistance to operators—the rapid growth being due to the use of regular route operators for school trips. School trips make up just two trips a day out of their total of eight to ten trips. Counting also the days on which schools do not operate, this works out to around 12% of the total kilometres operated by such a bus being used for *Sisu Seriya*.

The programme has reduced the operation of school vans, especially in large urban areas. The school buses have reduced congestion on urban roads as these vans were parking on roadsides near the schools [33]. Hence the schools have encouraged buses to minimise traffic congestion and parking around schools. It is also reported that school children prefer to use a bus against a school van and even those driven by their parents in some cases, as the social climate in a school bus is considered enjoyable- an area for future research.

Even though major accidents have not been reported to date, there is room for improving safety with the use of hazard lights during alighting and boarding school children and implementing GPS-based monitoring of speed.

There have been protests by the school van operators arising from loss of patronage [41], which provides an opportunity for concessions to be provided to existing privately provided school buses and vans to upgrade their services to become “school buses”. The subsidy can be tied to introducing higher-quality buses with air conditioning to get students out of parent-driven vehicles. Moreover, traffic priority measures have not been legislated in favour of the *Sisu Seriya* school bus service. It is suggested that the upcoming developments in Sri Lanka in Bus Priority Lanes and bus modernising systems could further enhance both the quality and quantity of *Sisu Seriya* school bus services.

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