

Estimation of Person-Kilometers of Travel in Sri Lanka

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ABSTRACT

Person Kilometers of Travel (PKT) provides all trip information of an individual including trips by motorized, non-motorized, public or informal public transport modes. Estimating PKT in developing countries seems much important as PKT is one of key parameters in transport planning and policy making. Since PKT focuses on an individual, it is influenced by socio demography of the person. However, timely PKT is not estimated by relevant agencies of Sri Lanka. The study focused on estimating PKT in Sri Lanka with travel mode distributions. A paper-based travel survey was conducted over all administrative districts in Sri Lanka for collecting trip information and socio demographic factors of people. 9,012 people participated in surveys resulting a 77.62% response rate. Respondents were asked to provide information of their trips in a typical week, in special holidays and seasons, information on travel modes and their socio demographic information. Data obtained from surveys were aggregated to annual level and weighted in order to obtain PKT/person/year under each socio demographic category. Weightages were estimated using census data in each administrative district. The study came up with important findings; weighted PKT estimations and travel mode distributions in each administrative district. Further, statistical comparisons of PKT estimates among different socio demographic groups and districts were conducted using One-Way Analysis of Variance (ANOVA) test. These findings were key contributions to the existing literature in the country.

KEYWORDS: *Personal Kilometers of Travel, travel mode distributions, transport planning, policy making, paper-based survey, socio demographic factors, statistical comparisons.*

1 INTRODUCTION

PKT is a measure of person travel. More generally, if one person travels one kilometer, it results one PKT. When several people participate for one trip, each passenger is making one - person trip and, it is accounted for estimating PKT. This differs from Vehicle-Kilometers of Travel (VKT) as it always refers to a vehicle. In PKT, focus is always on the person. PKT measures the amount of travel that a person makes by different transport modes as a driver or a passenger. PKT accounts for public transport, taxis and non-motorized transport modes other than private transport modes. In developing countries, most people do not own personal vehicles and, the main means for mobility are walking, intermediate means of transport and public transport services (Starkey & Hine, 2014). Therefore, PKT is more convenient than estimating VKT in developing countries like Sri Lanka. By 2009 in Sri Lanka, there was a demand for around 80 billion passenger km annually by all modes of motorized transport (Kumarage et al., 2009). For the majority in the country, public transport serves as the only means of transport. It accounted around 68% of the total motorized passenger transport by 2009. Bus transport is the most predominant mode of public transport where Sri Lanka railway accounts for only 5% of the passenger transport (Sri Lanka Country Report, 2012). Discussions on poor quality of public transport have been raised in policy making during past few decades; however, it is not in a satisfactory level for most users. Frequently addressed issues in the transport sector in the country are higher levels of

congestion in urban areas, poor quality of public transport, increasing trend of vehicle fleet, accidents etc. In addressing such issues in Sri Lanka, the lack of professionalism is the most critical shortcoming (Kumarage et al., 2009). It results a critical gap of data and lack of research in the area. PKT and VKT are key parameters in transport planning and policy making; however, no responsible agencies are engaging with estimating timely VKT or PKT. Therefore, findings of this research study are a key contribution to the existing literature.

The objectives of the study were; to conduct a travel survey aiming to collect travel information of people during a year together with socio demographic information, to estimate weighted PKT under each socio demographic group, to obtain travel mode distribution of people in different administrative districts and, to compare PKT of different administrative districts statistically. This study was structured on data obtained from a paper-based survey. The survey was conducted over all 25 administrative districts in Sri Lanka. Information on trip distances, vehicle modes and socio demography of people were collected during surveys. The data on trip distances were aggregated to annual level and weighted under different socio demographic groups in order to obtain PKT/person/year. Vehicle mode-wise estimations were carried out under different socio demographic groups. Statistical analyses were conducted using One-Way ANOVA for comparing statistically significant differences of PKT among administrative districts under several socio-economic groups. The remainder of this paper is organized as follows. Second and third sections present literature review and methodology. Research findings and discussions are presented in the fourth section and, fifth section is allocated for conclusions.

2 LITERATURE REVIEW

Land passenger transport in Sri Lanka includes private vehicles, public transport, railway and non-motorized transport modes. Public transport has become the only means of transport for many people in Sri Lanka where public busses contribute for 55% of passenger kilometers of travel (Kumarage, 2012). Non-route busses, hired vans, three-wheelers and taxis contribute for another 11% of passenger kilometers of travel. The most common and visible mode of informal public transport in Sri Lanka is three-wheeler. However, knowledge on VKT, PKT and vehicle mode distribution is lacking in Sri Lanka as none of responsible agencies are engaging with timely estimations of such data. Only few researchers have attempted for estimating these data in some areas of the country (Weerasekara & Amarasingha, 2017; Amarasingha & Balasayanthan, 2018). Therefore, the lack of research and data is prominent in this area of study in Sri Lanka.

According to the United States' (US) department of transportation, Person-Miles of Travel (PMT) is the summation of all trip distances of a person in miles on the travel day or for a specific time period (U.S. Department of Transportation, 2016). Many demographic factors influence on daily passenger travel patterns. Elements of travel behavior such as PMT, VKT, mode split, route choice and trip frequencies can be influenced by factors of built environment, urban form and traveler's socioeconomic characteristics (Sardari et al., 2018). Another key factor is the influence from traffic congestion; however, it was rarely discussed. The influence of traffic congestion on individuals' PMT, VKT and trip frequencies in the US was examined with reference to VKT per driver. The study utilized National Household Travel Survey (NHTS) disaggregated data and traffic congestion data around households' and work locations. Research findings revealed that, due to the proximity of origins and destinations in denser areas with higher job-population balances, residents in compact development regions have lower daily VKT. As the NHTS was designed at national level, for most states or subdomains within states do not have sufficient samples to produce reliable estimates (Vaish et al., 2010). Therefore, a study was conducted aiming at small area estimates in all 50 states and district of Columbia. These state-level estimates were useful in identifying areas with higher daily PMT in the US. Out of 60,282 interviewed people in the NHTS data set, only 53,142 people reported any travel day trips. PMT of other 7,140 people was set to zero. State-level percentages with higher daily PMT were studied. Then PMT data were merged with personal and household data. The survey-weighted-hierarchical Bayes small area estimation method was employed in producing output. The study showed the efficiency of conducting small area estimates from large national surveys like the NHTS.

There are several methodologies for estimating VKT such as using traffic counts and roadway centerline length, fuel sale method, vehicle odometer surveys, travel diary surveys, paper-based household surveys etc. However, travel surveys seem flexible in collecting PKT and travel mode related

data of people. All trips that are made by both motorized and non-motorized transport modes and socio demographic information of people can be collected using this travel survey method. This methodology was employed in Melbourne for assessing changes of VKT after implementing the travel behavior change program called *Travel Smart* (Seethaler & Rose, 2009). In the study, a before and after travel diary survey and, a household-odometer survey was conducted. Then, week-long odometer readings were aggregated to household level for calculating average daily household VKT. It reduced the variability of travel distance recordings among household members and weekday recordings in travel diaries. The relationship between vehicle fuel economy as a measure of energy efficiency and, VKT as a measure of consumption was examined in Columbia (Munyon et al., 2018). VKT data were extracted from the NHTS in 2009. The survey was conducted over 13 months in all 50 states and, the District of Columbia in the US. Several attributes related to households, drivers within the households, vehicles and travel data for each member of the household and, each vehicle were taken into account during the survey. Energy consumption related data such as mileage per gallon per any given vehicle type, gas price data etc. were collected through the Energy Information Administration and Oak Ridge National Labs. Miles driven by each vehicle per annum was estimated based on annualized odometer readings which were recorded using daily trips carried out by each vehicle in the household.

Another travel survey was conducted in Iskandar, Malaysia for investigating the impact of housing development designs on VKT (Majid et al., 2014). During the survey, travel diaries and questionnaire forms were distributed to households within a sample of housing developments. First, students from selected primary and secondary schools were asked to take travel diaries and questionnaires home. And they were also asked to return the completed documents in the following week. For additional respondents, travel diaries and questionnaires were distributed to a group of randomly selected households within the sample. Total of 325 forms were collected from households representing 24 housing developments for the study. VKT data were collected through a paper -based survey including information on impact factors such as purpose of travel, travel distance, transport type respectively for urban and inter-city travels, vehicle characteristics, odometer readings, respondent characteristics etc. in Beijing, China (Hou et al., 2013). The purpose was to examine daily VKT and its impact factors for designing of powertrain battery powered and plug-in hybrid electric vehicles. A total of 500 questionnaires were distributed among private passenger cars in Beijing. The daily VKT distribution was assessed with the help of software Minitab and, the statistical analysis was conducted using several tests such as ANOVA.

The knowledge on PKT and travel mode distribution is lacking in Sri Lanka. First, this study provides an understanding on PKT estimations of each district in Sri Lanka which is a major contribution to the existing literature. Second, this study aims at providing an understanding on travel mode distribution among different socio demographic groups of people. As very few studies can be found at this point of view in the current literature of the country, this would be a good contribution. Further, the study provides statistical comparisons of PKT under each socio demographic group in each area.

3 METHODOLOGY

3.1 Travel Survey

The data used in this study are derived from a paper-based survey conducted for the year 2019-2020 representing each administrative district in Sri Lanka. Sri Lanka is an island with a 65,610 km² land area and about 20 million of population. There are 25 administrative districts under 9 provinces in Sri Lanka. It is a lower-middle-income country with a GDP per capita of USD 3,852 (World Bank, 2019). The basic access to economic activities of people is provided by the road transport network (Asian Development Bank, 2017). It is consisted of 117,012 km of roads spread over the country. The aim of the travel survey was to collect information on trip distances, travel modes and socio demographic factors of people in Sri Lanka. Trip information for a typical week, holidays, new year season, school vacation and special yearly trips were taken into account separately. The selected socio demographic factors for the study were gender, employment status, residential area and age of the respondent. Initially, a questionnaire was developed. Then, prior to actual surveys, a pilot travel survey was performed in one administrative district, Colombo district. For the pilot survey, 100 respondents were participated. It was useful in developing a productive questionnaire form. Sample sizes for each

administrative district were statistically derived with a 90% level of accuracy using following equation (Krebs, 2013).

$$\text{Sample size} = \frac{\text{coefficient of variation}^2 \times \text{standard normal variant}^2}{\text{level of accuracy}^2} \quad (1)$$

As the survey aimed at different population groups in gender, age, employment status, and residential area, stratified sampling method was used. It was useful to verify the participation of all selected groups of people for the surveys. The main purpose of this sampling method was to obtain a representative sample of selected socio demographic groups of the community in the country. For that, minimum number of samples that required to represent each socio demographic group were pre-defined in each district. Each percentage of population under different socio demographic groups in census data were represented in the actual survey sample. The number of required samples were satisfied during surveys in each district. The actual sample size for the country including all administrative districts was 6,995 samples. Totally, 9,012 number of questionnaires were distributed over the country for achieving the actual sample size, resulting an overall response rate 77.62%. The travel survey was conducted and completed over the country within four months of time period. Questionnaires were distributed at schools, government and private offices, shops, super-markets and, also, by visiting households in each district. As questionnaires distributed and collected at the same day, the survey was completed at the first call.

3.2 Weighted PKT Estimations and Travel Mode Distributions

Respondents within samples in each district were classified under selected socio demographic groups. There were two gender-groups, two employment status-groups, two residential area-groups and six age-groups. It resulted 48 possible categories of people that a person can be fallen based on socio-demography. Information on trip distances provided by respondents for a typical week, holidays and special seasons were aggregated to annual level. Then, PKT of each respondent were weighted under selected socio demographic factors. For estimating weightages, census data were used in each administrative district. Equations 2 -4 show the steps of calculating weighted PKT.

$$\text{Weighting ratio} = \frac{\text{Average PKT in each category in sample}}{\text{Unweighted overall PKT}} \quad (2)$$

$$\text{Weighted overall PKT} = \frac{\sum(\text{Average PKT in each category} \times \text{Population in each category})}{\text{Total population of all categories}} \quad (3)$$

$$\text{Weighted PKT in each category} = \text{Weighting ratio} \times \text{Weighted overall PKT} \quad (4)$$

Category-wise weighted PKT estimations were used in calculating PKT of a random person under any socio demographic group. This weighting method provided more generalized values. Then, weighted PKT estimates under each vehicle mode was obtained and, predominant mode distributions among people in each administrative district were determined. Repeated attempts were made to estimate annual weighted PKT over 25 administrative districts.

3.3 Statistical Comparisons of PKT

ANOVA test was used for comparing PKT among districts under different socio demographic groups. Initially, one-way ANOVA was used and assumptions of the test were assessed. Assumptions of one-way ANOVA are; dependent variable should be measured at the ratio/interval level (continuous), independent variable should have two or more categorical, independent groups, independence of observations, dependent variable should be approximately normally distributed and homogeneity of variances. In the data set, dependent variable was not normally distributed for many groups, therefore, log-transformation of PKT was used in the ANOVA. Also, many categories violated the homogeneity of variance assumption. Levene's statistic was used in finding the homogeneity of variance. When this

assumption is violated, the normal practice is to use the Welch's ANOVA test. Therefore, this study accommodated Welch's ANOVA test to identify statistically significant differences of groups under each socio-demographic category. Welch's statistic can be denoted as below (Mendes & Akkartal, 2010),

$$F_{welch} = \frac{\sum_{i=1}^k W_i (\bar{X}_i - X'_{..}) / (k-1)}{[1 + \frac{2}{3}(k-2)\Lambda]} \quad (5)$$

Where, weight W_i to reduce the effect of heterogeneity of variance can be denoted as,

$$W_i = \frac{n_i}{S_i^2} \quad (6)$$

$$X'_{..} = \frac{\sum_{i=1}^k W_i \bar{X}_i}{\sum_{i=1}^k W_i} \quad (7)$$

Lambda, which is based on weights can be expressed as,

$$\Lambda = \frac{3 \sum (1 - W_i / \sum_{i=1}^k W_i)^2 / (n_i - 1)}{(i^2 - 1)} \quad (8)$$

Where, n_i = Sample size in the i^{th} group, S_i = Observed Sample variance for the i^{th} group, \bar{X}_i = Sample mean for the i^{th} group. Effect size of identified statistically significant differences from the Welch's ANOVA were measured using Eta-Squared estimates. They gave the size of effect as small, medium or large. This effect-size estimation improved the practical significance of results. Eta-squared value can be given as below where, SS_{effect} is the sum of squares of the effect and SS_{total} is total sum of squares (Lakens, 2013).

$$\eta^2 = \frac{SS_{\text{effect}}}{SS_{\text{total}}} \quad (9)$$

4 RESULTS AND DISCUSSIONS

4.1 Weighted PKT Estimates

Weighted PKT in kilometers/person/year under selected socio demographic groups are presented in Table 1. Colombo administrative district showed higher PKT values for several socio demographic and economic groups. For a male person, female person, unemployed person, urban person and, for a person within 15-24 years age group, 55-64 years age group and, more than 65 years group showed highest PKT in Colombo district compared to other districts. Colombo is the commercial capital in Sri Lanka. According to the Department of Census and Statistics (DCS) in Sri Lanka, Colombo district has the largest population; 11.4% from the total population of the country (Department of Census & Statistics, 2012). Areas coming under all municipal councils and urban councils are currently considered as the urban sector in Sri Lanka. In Colombo district, 77.6% people are living in urban areas. Also, Colombo municipal council accounts for 15% of the total population in urban areas. As the economic hub of Sri Lanka, Colombo is home to many of Sri Lankan corporate offices, trade centers, entertainment venues, hotels and restaurants, tourist destinations and for many famous landmarks. Therefore, the higher PKT values reported under different socio demographic groups may be indicators of above-mentioned features in the community of Colombo district.

For an employed person, the highest PKT was reported in Trincomalee district. A person within 45-54 age group also had the highest PKT in Trincomalee. A rural person in Vavuniya district travelled more compared to rural people in other districts. Also, a person within 35-44 years age group showed a higher PKT in Vavuniya district. These two districts were exposed to a civil war over three decades and, totally rescued in 2009 by the government armed forces. After, the infrastructure development is being undertaken by both state and private sectors in those areas. Higher PKT may reflect long trip distances

for fulfilling daily needs and, thereby the need of further economic and infrastructure development in those areas. A person within 25-34 years age group showed higher PKT in Puttalam district. Also, in most of districts, PKT for a person within 25-34 years old seemed higher compared to people in other age groups. This may be because people within this age group are mostly engaged with the workforce of the country, involving for more economic activities. In 2015, about 82% of population in Sri Lanka lived in rural areas (World Bank, 2016). Also, about 80% of the rural road network remains unpaved or in fair to very poor condition. It does not provide people a proper connectivity to markets, employment, education, health and many opportunities. This may be resulted long trip distances/long distances between destinations, thereby higher PKT. As a result, in most of districts in Sri Lanka, PKT was higher for rural people more than urban people. In Colombo, Gampaha, Kandy, Puttalam, Kegalle, Galle, Ampara, and Jaffna districts, urban people have travelled more compared to rural people. There are four districts in Sri Lanka which are comprised only with rural areas. No urban areas are found in those districts according to the current definition introduced by the DCS, Sri Lanka. In most of districts, an employed person has travelled more compared to an unemployed person. It is obvious that, daily trips for their employments create higher PKT. Also, there is no noticeable difference in gender-wise PKT estimates over 25 districts in Sri Lanka.

Table 1. Weighted PKT Estimates in each Administrative District

Administrative District	PKT in kilometers/person/year											
	Gender		Employment status		Residential status		Age in years					
	Male	Female	Employed	Unemployed	Urban	Rural	15-24	25-34	35-44	45-54	55-64	>65
Colombo	8611	10950	8191	11370	10940	8622	9846	11634	7990	10760	10882	7572
Gampaha	5603	5569	5896	5276	5734	5437	6225	5593	4610	6813	5839	4433
Kalutara	5492	4001	5484	4009	4572	4921	6805	3974	4211	5676	3918	3894
Kandy	5803	4970	6288	4486	5748	5025	7575	3289	5240	5913	4762	5541
Matale	4212	5074	5090	4196	4051	5235	6762	2111	4120	3795	4024	7047
NuwaraEliya	4837	3921	5456	3301	3511	5246	6962	4191	3926	3508	3958	3727
Kurunegala	3936	5053	4081	4908	4066	4923	4739	4794	4504	3804	4359	4768
Puttalam	7093	5772	7496	5368	7104	5761	4628	13466	5597	5026	4283	5594
Kegalle	4480	7484	5863	6102	6501	5463	5821	4034	3000	12281	3667	7091
Ratnapura	5651	5237	4741	6148	4213	6675	4146	8070	7448	5993	4341	2665
Galle	5007	4554	4897	4665	5155	4406	6558	8201	4228	3854	3287	2556
Matara	3664	2403	4468	1599	2734	3332	4113	2940	2865	1953	4307	2022
Hambantota	3769	5721	4511	4979	4529	4961	5753	4165	6549	4631	3053	4320
Batticaloa	4093	4619	5559	3755	3918	4669	3754	4364	3498	4851	5160	5665
Ampara	3447	3734	3121	4059	3748	3431	3381	3281	3013	3686	5076	3393
Trincomalee	7633	8225	11895	6404	5854	8189	6506	2499	4242	12298	9933	5825
Monaragala	4837	6975	5923	5892	-	5906	7120	4884	5781	6036	5081	7162
Badulla	4654	5940	5484	5149	4511	6241	4545	4988	6008	4228	8213	3545
Jaffna	2903	3498	3611	2770	3309	2636	3581	4404	3567	3043	2066	270
Mannar	1542	3192	2660	1435	2039	6182	1975	1732	3636	3341	2856	367
Kilinochchi	2119	2241	2113	2372	-	2217	1730	2616	2038	2190	3978	652
Mullaitivu	4961	3876	4584	2859	-	4271	2434	6361	4457	4203	2873	1065
Vavuniya	6050	9318	8372	9616	6611	19301	7320	7910	12555	8977	6809	960
Anuradhapura	4342	3814	5503	2654	3125	5031	5457	3575	5281	4482	4330	1345
Polonnaruwa	2413	2771	2928	2256	-	5184	2552	2414	2607	1807	1979	4193

4.2 Vehicle Mode Distributions

Table 2 – Table 7 present vehicle mode distribution of people in each district. PKT values in PKT/person/year were converted to percentages under each socio demographic category. MB and TW

are denoted motor bicycles and three-wheelers respectively. Busses and motor bicycles were used as most predominant travel modes by males and females in many districts. A male person in Puttalam district has been travelled mostly by three-wheelers. In Ampara district, a male has travelled by cars more frequently. Van was the mostly used transport mode for a male person in Polonnaruwa district. For a female in Colombo and Galle districts, the most predominant transport mode was vans while it was three-wheelers for a female in Kegalle and Badulla districts. For employed people in most districts, motor bicycles and busses were the most used travel modes. Three-wheeler was the predominant travel mode for an employed person in Puttalam and Ampara districts. In Colombo and Galle districts, van was the mostly used travel mode by employed people. Regard to an unemployed person in Colombo, Kegalle, Badulla and Mullaitivu districts mostly used three-wheelers. Car was used as the most predominant travel mode by an unemployed person in Ampara and Trincomalee districts. In other districts, bus and motor bicycle were frequently used. An urban person in Colombo, Puttalam, Kegalle and Badulla districts frequently used three-wheelers for their travelling. In Ampara district, car was the predominant travel mode for an urban person. Busses and motor bicycles were frequently used by urban people in other districts. For a rural person in Matale and Badulla districts, the mostly used transport mode was three-wheeler. Van was the mainly used transport mode for a rural person in Colombo and Kegalle districts. Rural people in other districts commonly used busses and motor bicycles.

Table 2. Vehicle Mode Distribution as Percentages in each District by Gender

District	Male							Female						
	Car	Van	Jeep	MB	TW	Bus	Taxi	Car	Van	Jeep	MB	TW	Bus	Taxi
Colombo	4.02	16.33	0.48	14.48	12.26	51.41	1.01	1.68	42.27	0.90	6.68	36.26	11.48	0.73
Gampaha	4.28	6.02	3.58	21.22	14.59	48.04	2.26	0.96	8.16	0.34	19.58	9.94	59.22	1.80
Kalutara	3.49	11.32	0.02	32.23	13.90	38.16	0.87	2.64	10.38	0.81	30.27	6.88	46.99	2.03
Kandy	1.48	6.52	0.90	36.34	1.68	52.53	0.55	1.41	31.00	0.12	39.59	2.55	23.92	1.41
Matale	2.07	0.48	0.00	9.71	33.62	51.51	2.60	2.98	0.40	11.79	9.17	24.62	50.96	0.07
NuwaraEliya	10.40	5.91	0.22	9.66	3.11	70.40	0.30	1.99	1.30	0.00	19.58	8.78	65.48	2.88
Kurunegala	18.73	8.90	0.33	22.35	10.08	38.40	1.21	8.27	4.41	0.29	24.92	8.35	53.26	0.51
Puttalam	0.49	1.00	1.64	17.33	48.53	30.15	0.86	0.26	2.09	9.79	28.49	9.65	48.96	0.75
Kegalle	2.43	13.92	2.05	32.87	11.29	36.61	0.85	1.32	21.26	1.40	19.62	37.66	17.98	0.77
Ratnapura	0.88	9.05	0.00	37.11	3.69	48.84	0.44	0.62	6.97	0.64	25.00	11.73	51.67	3.38
Galle	4.51	6.27	0.69	26.67	20.26	41.12	0.49	1.23	37.40	0.26	14.10	10.68	35.47	0.86
Matara	13.61	2.54	0.57	42.28	5.74	34.79	0.46	8.61	6.57	2.69	28.04	6.98	40.49	6.61
Hambantota	1.21	15.22	1.26	31.87	15.33	34.00	1.10	1.22	4.10	2.17	36.37	10.04	45.46	0.64
Batticaloa	9.24	3.10	10.78	64.86	3.56	8.41	0.04	7.13	17.14	11.09	51.98	5.32	7.30	0.04
Ampara	44.84	8.16	8.68	15.94	12.14	9.99	0.26	16.27	11.77	0.86	31.41	25.67	13.81	0.20
Trincomalee	35.02	1.99	0.27	43.32	5.80	12.48	1.11	24.44	2.25	0.03	34.88	7.43	29.64	1.34
Monaragala	12.64	0.75	2.71	36.84	12.76	34.31	0.00	16.85	0.16	3.60	31.44	23.06	24.90	0.00
Badulla	22.14	1.34	0.02	35.77	31.41	9.33	0.00	3.57	1.72	0.00	33.41	48.17	13.14	0.00
Jaffna	7.57	0.34	0.20	37.66	0.44	53.80	0.00	13.76	1.39	0.00	45.35	0.00	39.49	0.00
Mannar	0.00	0.00	0.00	58.80	0.00	41.20	0.00	3.83	0.15	0.00	54.15	0.00	41.86	0.00
Kilinochchi	4.19	6.97	0.00	48.75	0.00	40.08	0.00	4.74	0.81	0.00	50.81	0.00	43.64	0.00
Mullaitivu	0.00	0.00	0.00	2.52	0.00	97.48	0.00	0.00	0.00	0.00	41.08	20.44	38.48	0.00
Vavuniya	0.00	0.00	0.00	73.70	0.27	26.02	0.00	2.71	0.00	0.00	83.54	0.04	13.71	0.00
Anuradhapura	6.61	3.37	0.74	66.22	5.97	16.87	0.22	19.71	8.36	0.14	27.38	14.47	29.69	0.25
Polonnaruwa	9.40	28.03	0.00	18.81	23.67	19.80	0.30	3.26	12.04	0.07	54.89	7.64	21.57	0.52

Table 3. Vehicle Mode Distribution as Percentages in each District by Employment

District	Employed							Unemployed						
	Car	Van	Jeep	MB	TW	Bus	Taxi	Car	Van	Jeep	MB	TW	Bus	Taxi
Colombo	3.30	42.56	1.89	14.65	11.42	24.81	1.36	1.96	27.79	0.05	6.02	38.53	25.17	0.48
Gampaha	2.53	9.94	3.62	24.16	16.44	40.77	2.54	2.64	4.23	0.19	16.51	7.88	67.06	1.49

Kalutara	3.33	5.43	0.05	43.54	3.42	43.33	0.90	2.86	18.64	0.77	14.31	21.55	39.86	2.01
Kandy	0.91	16.30	0.84	39.93	2.60	38.34	1.09	2.18	21.10	0.10	35.14	1.42	39.25	0.81
Matale	1.39	0.43	0.00	10.74	29.66	56.51	1.27	3.88	0.46	13.67	7.97	27.44	45.47	1.12
NuwaraEliya	9.65	5.66	0.00	13.98	4.45	64.86	1.39	1.66	0.85	0.33	14.10	7.53	73.98	1.54
Kurunegala	19.62	5.02	0.52	31.07	5.02	38.04	0.72	7.35	7.62	0.12	17.66	12.56	53.78	0.91
Puttalam	0.55	0.22	1.48	14.02	48.47	34.01	1.25	0.20	3.12	10.37	33.26	7.91	44.90	0.25
Kegalle	1.69	28.13	0.75	28.14	5.37	34.75	1.18	1.78	8.62	2.56	20.98	50.65	14.99	0.41
Ratnapura	1.58	7.20	0.72	22.06	5.86	58.69	3.88	0.16	8.69	0.00	38.15	8.70	43.97	0.34
Galle	4.14	31.45	0.86	17.16	19.40	26.08	0.92	1.31	10.18	0.00	24.25	10.60	53.29	0.38
Matara	13.26	4.74	0.40	45.45	5.12	29.64	1.39	7.09	2.51	4.22	12.35	9.23	57.46	7.15
Hambantota	1.58	11.65	0.31	29.05	13.03	43.34	1.04	0.87	5.79	3.17	39.58	11.37	38.61	0.63
Batticaloa	10.54	18.06	0.95	67.24	3.21	0.00	0.00	6.80	5.78	16.68	53.14	5.18	12.36	0.06
Ampara	14.29	9.29	10.84	24.61	25.53	15.23	0.19	44.98	10.18	0.84	21.76	12.88	9.10	0.25
Trincomalee	22.61	0.17	0.00	57.63	8.55	11.03	0.00	32.51	3.21	0.20	28.12	5.73	28.30	1.92
Monaragala	14.04	0.91	5.98	37.50	18.10	23.47	0.00	15.95	0.00	1.07	30.66	19.38	32.93	0.00
Badulla	15.61	3.22	0.02	38.44	27.86	14.85	0.00	7.72	0.05	0.00	30.78	52.92	8.53	0.00
Jaffna	12.05	0.92	0.14	41.68	0.17	45.04	0.00	9.80	1.00	0.00	42.77	0.22	46.21	0.00
Mannar	3.02	0.11	0.00	54.56	0.00	42.32	0.00	0.00	0.00	0.00	64.64	0.00	35.36	0.00
Kilinochchi	2.79	3.50	0.00	55.86	0.00	37.85	0.00	6.89	0.00	0.00	43.75	0.00	49.36	0.00
Mullaitivu	0.00	0.00	0.00	16.57	0.00	83.43	0.00	0.00	0.00	0.00	17.28	53.91	28.81	0.00
Vavuniya	2.78	0.00	0.00	80.74	0.11	16.37	0.00	0.00	0.00	0.00	86.98	0.00	13.02	0.00
Anuradhapura	6.73	5.84	0.53	62.77	7.07	16.95	0.11	25.85	4.70	0.37	16.89	15.91	35.79	0.49
Polonnaruwa	1.66	25.40	0.00	40.30	20.29	12.06	0.29	12.82	11.04	0.09	34.15	7.75	33.51	0.63

Table 4. Vehicle Mode Distribution as Percentages in each District by Residential Area

District	Urban							Rural						
	Car	Van	Jeep	MB	TW	Bus	Taxi	Car	Van	Jeep	MB	TW	Bus	Taxi
Colombo	2.63	27.74	0.34	8.81	41.31	18.34	0.83	2.25	42.07	1.39	10.12	8.26	35.10	0.80
Gampaha	2.78	7.72	1.30	14.84	13.72	58.42	1.22	2.38	6.47	2.57	26.33	10.59	48.78	2.88
Kalutara	1.49	10.72	0.53	37.11	11.94	37.15	1.07	4.70	11.11	0.18	26.05	10.01	46.31	1.64
Kandy	1.31	22.00	0.00	36.32	0.75	39.41	0.20	1.61	13.84	1.17	39.85	3.77	37.86	1.91
Matale	5.65	0.92	0.00	8.48	13.49	70.48	0.97	0.57	0.12	10.93	10.01	38.57	38.47	1.33
NuwaraEliya	13.93	7.40	0.00	9.90	5.73	61.65	1.40	1.69	1.44	0.21	16.88	5.50	72.79	1.48
Kurunegala	19.96	3.99	0.00	27.28	1.58	46.94	0.25	7.03	8.47	0.56	20.83	15.50	46.30	1.31
Puttalam	0.09	0.00	0.13	12.79	51.83	34.09	1.07	0.73	3.17	11.26	33.27	7.00	44.05	0.52
Kegalle	0.28	2.99	0.00	24.85	46.85	24.75	0.28	3.25	34.65	3.36	24.35	7.82	25.25	1.32
Ratnapura	0.66	11.73	0.76	23.23	3.36	57.07	3.19	0.81	5.80	0.03	36.34	10.04	45.97	1.02
Galle	2.04	28.76	0.00	21.57	5.00	42.13	0.49	3.81	14.15	1.01	18.95	27.28	33.94	0.86
Matara	18.47	3.69	3.00	39.12	4.81	29.46	1.45	5.92	4.55	0.12	34.48	7.42	43.36	4.16
Hambantota	0.00	0.65	0.00	48.06	13.73	36.81	0.74	2.27	15.58	3.41	22.62	10.78	44.44	0.90
Batticaloa	7.34	1.60	14.01	68.73	2.31	6.02	0.00	8.73	16.25	8.82	51.09	5.93	9.13	0.06
Ampara	45.25	7.82	0.61	21.75	15.12	9.15	0.30	14.01	12.44	11.12	24.63	22.52	15.15	0.14
Trincomalee	14.60	3.19	0.00	60.55	4.40	14.89	2.38	30.14	2.06	0.14	36.82	6.91	22.77	1.15
Monaragala	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.11	0.40	3.23	33.67	18.81	28.77	0.00
Badulla	4.15	0.80	0.02	36.50	44.47	14.06	0.00	17.46	2.17	0.00	32.70	38.22	9.44	0.00
Jaffna	12.49	1.06	0.09	38.33	0.21	47.81	0.00	0.00	0.00	0.00	73.72	0.00	26.28	0.00
Mannar	4.53	0.15	0.00	49.63	0.00	45.69	0.00	0.00	0.00	0.00	64.54	0.00	35.46	0.00
Kilinochchi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.61	1.92	0.00	50.46	0.00	43.01	0.00
Mullaitivu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	7.50	75.83	0.00
Vavuniya	3.64	0.00	0.00	76.47	0.14	19.75	0.00	0.00	0.00	0.00	90.80	0.00	9.20	0.00
Anuradhapura	18.77	2.19	0.93	49.10	6.38	22.51	0.12	7.98	7.64	0.19	49.96	11.68	22.24	0.31
Polonnaruwa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.17	19.60	0.04	37.82	15.21	20.74	0.42

Table 5. Vehicle Mode Distribution as Percentages in each District by Age

District	15-24 years							25-34 years						
	Car	Van	Jeep	MB	TW	Bus	Taxi	Car	Van	Jeep	MB	TW	Bus	Taxi
Colombo	1.78	64.3	0.16	4.43	14.54	14.45	0.29	2.45	12.57	1.56	8.29	53.43	20.90	0.80
Gampaha	2.51	6.94	1.35	11.37	19.55	54.22	4.06	0.61	4.34	0.54	29.28	9.55	53.45	2.23
Kalutara	2.36	18.7	0.27	19.70	26.20	31.28	1.46	4.09	16.98	0.00	27.57	12.00	39.14	0.22
Kandy	1.25	8.39	0.00	50.43	0.91	38.45	0.57	1.75	4.79	0.35	40.64	1.66	49.28	1.52
Matale	2.84	0.03	0.00	2.06	25.77	68.90	0.40	3.20	0.02	0.00	3.59	11.59	81.02	0.58
NuwaraEliya	0.55	0.43	0.48	15.41	10.31	70.90	1.91	0.73	1.64	0.00	10.09	4.48	82.70	0.36
Kurunegala	1.64	2.57	0.41	32.83	9.20	52.72	0.63	16.18	3.45	0.06	14.39	2.12	62.87	0.92
Puttalam	0.61	2.19	0.59	45.91	10.32	39.11	1.27	0.08	0.36	2.43	3.93	71.88	21.07	0.26
Kegalle	3.68	12.8	4.95	33.15	6.22	36.60	2.64	5.45	2.30	0.00	51.82	14.59	25.50	0.34
Ratnapura	0.46	1.78	0.02	17.21	16.26	63.45	0.83	0.12	14.11	0.00	42.93	10.71	27.22	4.90
Galle	0.20	1.18	0.00	30.21	37.22	30.99	0.19	2.08	46.62	0.05	15.38	3.52	31.82	0.53
Matara	10.78	1.23	0.24	38.15	7.18	39.19	3.24	14.55	11.56	0.07	14.17	6.88	52.05	0.71
Hambantota	3.08	8.32	0.69	59.03	2.17	24.88	1.82	3.05	3.30	0.00	35.86	3.52	53.78	0.49
Batticaloa	6.08	2.10	6.33	74.30	0.62	10.48	0.10	6.44	6.99	21.74	58.22	3.55	3.00	0.07
Ampara	45.36	9.20	0.00	16.83	28.58	0.00	0.04	21.24	1.57	20.27	17.77	17.52	21.31	0.31
Trincomalee	51.45	0.99	0.00	24.23	0.24	18.36	4.73	0.00	0.14	0.00	9.42	0.00	90.44	0.00
Monaragala	0.40	0.00	8.66	43.79	28.72	18.43	0.00	23.41	2.74	2.66	16.53	20.05	34.62	0.00
Badulla	16.50	1.69	0.00	33.57	29.82	18.41	0.00	7.23	3.02	0.04	44.90	30.88	13.93	0.00
Jaffna	13.90	0.82	0.00	34.81	0.14	50.34	0.00	5.93	0.00	0.00	34.39	0.00	59.67	0.00
Mannar	0.00	0.00	0.00	84.42	0.00	15.58	0.00	0.00	0.00	0.00	53.53	0.00	46.47	0.00
Kilinochchi	0.00	0.00	0.00	41.16	0.00	58.84	0.00	3.39	2.86	0.00	56.42	0.00	37.33	0.00
Mullaitivu	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.00	0.00	15.22	0.00	84.78	0.00
Vavuniya	100.0	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	78.77	0.21	20.55	0.00
Anuradhapura	15.85	10.4	0.48	36.21	15.43	21.31	0.28	6.76	8.33	0.09	25.45	4.26	54.38	0.74
Polonnaruwa	3.41	5.41	0.00	47.10	12.12	31.55	0.42	2.35	31.49	0.00	42.10	3.62	20.29	0.15

Car was the main mean of transport for a person aged 15-24 years in Ampara, Trincomalee and Vavuniya districts. For a person aged 15-24 years in Galle district, mostly used transport mode was three-wheeler while a person in similar age group in Colombo district frequently used vans for travelling. In other districts, a 15-24 age person frequently travelled by motor bicycles and busses. Also, a person in 25-34 age range commonly travelled in motor bicycles and busses in many districts. In Colombo and Puttalam districts, three-wheeler was the most frequent transport mode of a such person. Van was the most predominant transport mode for a such person in Galle district. A person within 35-44 years age range in Nuwara-Eliya, Matara and Ampara districts frequently used cars for their travelling. A person in similar age group in other districts mostly used busses and motor bicycles. 45-54 years aged individual in Kegalle district used three-wheelers frequently. In Colombo and Kandy districts, the most predominant travel mode for a such person was vans. 45-54 years aged individual in Ampara and Monaragala districts mostly used cars for their travelling while the majority of people in similar age group in other districts used busses and motor bicycles. In Colombo and Badulla districts, a person within 55-64 years age range travelled by three-wheelers more frequently. A person in the similar age group in other districts commonly used motor bicycles and busses for their travelling. For a person aged greater than 65 years in Colombo, Kegalle, Galle, Batticaloa and Ampara districts mostly used vans. Three-wheeler was the most popular mode of transport for a person aged greater than 65 years in Matale, Monaragala and Polonnaruwa districts. An individual in the similar age group in other districts frequently used motor bicycles and busses for their travelling.

Table 6. Vehicle Mode Distribution as Percentages in each District by Age

District	35-44 years							45-54 years						
	Car	Van	Jeep	MB	TW	Bus	Taxi	Car	Van	Jeep	MB	TW	Bus	Taxi
Colombo	0.80	6.13	3.17	14.95	9.85	62.67	2.43	1.68	42.27	0.90	6.68	36.26	11.48	0.73

Gampaha	5.97	5.18	0.92	19.10	14.09	53.62	1.11	0.96	8.16	0.34	19.58	9.94	59.22	1.80
Kalutara	2.07	8.15	0.00	50.80	1.93	36.66	0.40	2.64	10.38	0.81	30.27	6.88	46.99	2.03
Kandy	0.54	17.34	1.93	57.06	3.51	18.10	1.51	1.41	31.00	0.12	39.59	2.55	23.92	1.41
Matale	0.48	1.96	0.00	10.92	5.38	77.93	3.34	2.98	0.40	11.79	9.17	24.62	50.96	0.07
NuwaraEliya	33.98	0.01	0.00	25.42	5.14	32.12	3.34	1.99	1.30	0.00	19.58	8.78	65.48	2.88
Kurunegala	36.70	3.77	0.95	10.82	3.92	42.42	1.41	8.27	4.41	0.29	24.92	8.35	53.26	0.51
Puttalam	1.59	0.07	0.00	17.50	11.20	69.55	0.07	0.26	2.09	9.79	28.49	9.65	48.96	0.75
Kegalle	3.66	9.45	6.16	51.18	3.88	25.21	0.46	1.32	21.26	1.40	19.62	37.66	17.98	0.77
Ratnapura	0.26	5.21	0.08	24.10	2.63	66.77	0.95	0.62	6.97	0.64	25.00	11.73	51.67	3.38
Galle	9.91	5.16	2.93	19.37	7.08	55.26	0.29	1.23	37.40	0.26	14.10	10.68	35.47	0.86
Matara	31.84	5.54	0.00	25.01	12.50	18.51	6.60	8.61	6.57	2.69	28.04	6.98	40.49	6.61
Hambantota	0.26	4.81	2.23	38.09	3.38	51.02	0.22	1.22	4.10	2.17	36.37	10.04	45.46	0.64
Batticaloa	5.35	11.52	0.00	42.80	15.92	24.41	0.00	7.13	17.14	11.09	51.98	5.32	7.30	0.04
Ampara	35.47	5.24	0.44	34.73	11.01	12.87	0.24	16.27	11.77	0.86	31.41	25.67	13.81	0.20
Trincomalee	8.49	0.40	0.00	49.73	24.14	15.97	1.28	24.44	2.25	0.03	34.88	7.43	29.64	1.34
Monaragala	15.29	0.00	0.21	49.56	11.23	23.71	0.00	16.85	0.16	3.60	31.44	23.06	24.90	0.00
Badulla	16.21	2.37	0.00	40.43	24.32	16.66	0.00	3.57	1.72	0.00	33.41	48.17	13.14	0.00
Jaffna	20.35	0.00	0.00	42.11	0.50	37.03	0.00	13.76	1.39	0.00	45.35	0.00	39.49	0.00
Mannar	0.99	0.27	0.00	82.06	0.00	16.68	0.00	3.83	0.15	0.00	54.15	0.00	41.86	0.00
Kilinochchi	21.42	7.14	0.00	45.44	0.00	26.00	0.00	4.74	0.81	0.00	50.81	0.00	43.64	0.00
Mullaitivu	0.00	0.00	0.00	39.95	0.00	60.05	0.00	0.00	0.00	0.00	41.08	20.44	38.48	0.00
Vavuniya	0.70	0.00	0.00	83.98	0.00	15.32	0.00	2.71	0.00	0.00	83.54	0.04	13.71	0.00
Anuradhapura	4.49	4.88	0.00	79.60	2.62	8.28	0.14	19.71	8.36	0.14	27.38	14.47	29.69	0.25
Polonnaruwa	5.48	31.08	0.00	36.09	5.87	20.97	0.51	3.26	12.04	0.07	54.89	7.64	21.57	0.52

Table 7. Vehicle Mode Distribution as Percentages in each District by Age

District	55-64 years							>65 years						
	Car	Van	Jeep	MB	TW	Bus	Taxi	Car	Van	Jeep	MB	TW	Bus	Taxi
Colombo	1.87	4.38	0.37	7.53	57.69	27.65	0.52	1.43	46.92	0.11	22.40	1.19	26.65	1.30
Gampaha	3.58	18.84	0.53	8.59	5.06	62.72	0.68	0.36	1.80	10.39	30.84	4.36	48.75	3.49
Kalutara	0.96	5.82	1.94	35.87	13.62	39.88	1.91	5.81	5.45	0.00	18.70	5.72	61.62	2.70
Kandy	0.31	19.52	0.02	39.75	1.34	38.01	1.05	0.21	7.24	0.97	23.97	0.92	66.51	0.18
Matale	0.00	1.43	0.00	32.47	22.03	40.88	3.20	0.08	0.00	20.58	7.13	53.71	18.49	0.00
NuwaraEliya	3.41	23.81	0.00	13.22	2.70	56.39	0.47	0.53	0.00	0.00	3.92	4.37	89.49	1.69
Kurunegala	2.58	2.72	0.34	20.81	1.52	71.11	0.92	10.17	13.11	0.00	45.95	16.02	14.11	0.65
Puttalam	0.39	7.03	0.00	12.16	22.74	56.47	1.21	0.05	0.08	26.67	27.62	0.86	44.63	0.09
Kegalle	0.56	8.12	0.70	34.99	4.79	50.10	0.73	0.28	66.05	0.00	4.34	9.65	19.18	0.49
Ratnapura	1.57	9.72	0.00	15.05	2.49	70.02	1.15	2.20	1.38	3.79	13.36	16.46	61.14	1.67
Galle	1.80	17.0	0.68	29.93	7.55	40.81	2.21	1.30	41.58	0.00	14.21	22.35	20.40	0.16
Matara	2.81	2.72	4.65	62.86	1.32	25.38	0.26	3.03	3.22	0.00	41.87	9.82	33.90	8.16
Hambantota	0.68	14.1	0.00	34.65	25.69	24.85	0.03	0.00	24.04	7.32	0.34	23.90	43.47	0.92
Batticaloa	17.44	5.47	32.46	44.63	0.00	0.00	0.00	9.73	43.60	1.87	42.82	1.97	0.00	0.00
Ampara	6.21	14.50	0.00	42.85	12.03	23.71	0.70	10.03	29.15	2.11	26.66	17.70	14.34	0.00
Trincomalee	25.99	2.47	0.00	61.75	1.95	6.63	1.21	33.29	7.16	0.75	38.04	0.00	19.69	1.07
Monaragala	8.37	0.00	0.00	36.84	3.64	51.15	0.00	0.00	0.00	4.76	29.70	53.02	12.52	0.00
Badulla	3.45	0.27	0.00	10.32	75.81	10.15	0.00	0.00	0.00	0.00	80.30	19.7	0.00	0.00
Jaffna	12.13	3.75	0.00	38.87	0.00	45.25	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Mannar	0.00	0.00	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
Kilinochchi	0.00	0.00	0.00	34.90	0.00	65.10	0.00	0.00	0.00	0.00	86.21	0.00	13.79	0.00
Mullaitivu	0.00	0.00	0.00	51.82	0.00	48.18	0.00	0.00	0.00	0.00	0.00	0.00	100.0	0.00
Vavuniya	0.00	0.00	0.00	69.16	0.00	30.84	0.00	0.00	0.00	0.00	94.71	0.00	5.29	0.00
Anuradhapura	33.08	4.55	0.00	42.42	7.60	12.35	0.00	0.00	0.00	0.00	44.95	7.00	47.89	0.15
Polonnaruwa	25.39	14.39	0.00	44.33	6.15	9.31	0.43	4.28	16.56	0.00	16.92	39.0	22.63	0.60

4.3 Statistical Comparisons of PKT

Results from the statistical analysis are presented in the Table 8. All socio-demographic groups showed statistically significant differences among districts at 0.05 ($\alpha=0.05$) level of significance ($p<\alpha$). Therefore, the null hypothesis H_0 ; all means are equal, was rejected for all the below cases. For age groups; 15-24,55-64 and >65, Welch ANOVA could not be performed due to low sample size of several groups. For 25-34 and 45-54 age groups, the effect size was in a medium range while all the other factors had a small effect size. These research findings; weighted PKT of people under each socio demographic group in each district, mode choice of people under each socio demographic group in each district and statistical comparisons of them can efficiently be used in transport planning and policy making in the country, in monitoring and enhancing public transportation, identifying travel pattern of individuals and many other purposes. PKT estimates would provide a representative measure of travel patterns/behavior of individuals in developing countries like Sri Lanka, where the only means of transportation for the majority is public or non-motorized transport modes.

Table 8. Statistically Significant Differences across Districts in Sri Lanka

Factor	Sub factor	Welch statistic	p	Significant difference among districts (Yes/No)	Eta-squared	Effect size
Gender	Male	4.484	0.000	Yes	0.020	Small
	Female	6.352	0.000	Yes	0.032	Small
Age (in years)	25-34	4.238	0.000	Yes	0.050	Medium
	35-44	2.405	0.000	Yes	0.036	Small
	45-54	2.536	0.000	Yes	0.058	Medium
Employment Status	Employed	6.979	0.000	Yes	0.027	Small
	Unemployed	4.412	0.000	Yes	0.032	Small
Residential Area	Urban	3.102	0.000	Yes	0.036	Small
	Rural	8.861	0.000	Yes	0.017	Small

5. CONCLUSIONS

Weighted PKT estimates were higher for many socio-demographic groups in Colombo district compared to other districts in Sri Lanka. Results revealed that, a rural person has travelled more compared to an urban person in many districts. Also, an employed person has travelled more compared to an unemployed person in many districts in Sri Lanka. In all administrative districts, motor bicycles and busses were the most frequently used travel modes by people in any socio demographic group. Then, three-wheelers, cars and vans were used and, taxis and jeeps have been rarely used. Mostly used travel modes in Colombo district were busses, three-wheelers and vans. Statistical comparisons revealed, PKT of districts were significantly different under any selected socio demographic group. This study showed the experience of a travel survey which was conducted all over the country for collecting travel information of people. Weighted PKT and travel mode distributions revealed travel patterns of the community in Sri Lanka. These district-wise data are useful in transport planning and infrastructure development in the country. It is beneficial to estimate such data in a timely manner.

Many studies that are related to travel surveys in other countries (Vaish et al., 2010) were conducted by state agencies. In Sri Lanka, there are ongoing-national-level surveys in every 10 years to collect census and population data of people. Therefore, this travel survey can be implemented parallel to the existing surveys. Also, many travel surveys conducted in other countries have considered small area estimates. In this study, administrative district-wise estimates have been obtained. However, this travel survey can be split into GN-Divisions, if this is implemented with the national census and population survey in the country. In some travel surveys conducted in other countries, people were given the travel-questionnaire and asked to fill the survey (Seethaler & Rose, 2009). However, it will be more beneficial to interview people rather than distributing questionnaires and collecting them back. Also, for obtaining more precise and clear understanding on travel patterns in each district or to compare them, it is recommended to include more influencing factors other than socio demography. More research work is needed and encouraged in this area of study to fulfill existing critical gap of data. However, this research effort would be a motivation for future research work, as the literature found to be very little in this area of study in Sri Lanka.

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