



Report

Policing of road traffic in Sri Lanka has become a major task for police. Due to increase in volume of road traffic in the Island the Sri Lanka police facing many challenges to get control of it. But this is a difficult task to manually control it. So the author and the team are planning to create an application to solve this problem. By logging on to this system the user will be able to see the traffic congestions in cities especially during the peak hours and will be able to see the alternative paths to particular places.

How does the system gather data to E-Statistical Analyzer module?

Data collection will be carried out through two major sources; primary data and secondary data, which involves many methods of data gathering, where some of these methods will be applied in data collection process. The system gather information's from road development authority, police department.

How to analyze past data?

Using the past data we can predict the future. There were some equations used.

To predict the future population:

$$\text{Future Population} = \text{Current Population} + \text{This Year Birth} - \text{This Death}$$

$$\text{To Predict the Future } N = Y e^{rt}$$

N = Future Birth or Death

r = rate of increase

t = time taken

Time Series algorithm

Life table analysis

How the system Analyze the past data?

ESA is providing an Administrator panel to insert the past data to the database, using the system Admin can insert millions of data in split second.

Why Graphs need?

*The best and efficient way to analysis the data is using the graphs.
Using the graphs the user will get a clear idea about the outcome.*

In which way ESA module helps the End User?

Provide a mechanism to get an idea about the future from the past statistical data. This is better for ease the workload, provides accurate and efficient reports, minimize the unwanted delay time, Generate statistical graphs and reports and get an idea about the future.

With my module we can get Better relationship with motorist, more accurate history and information, improved road management information, faster processing of services details, these solutions are providing by graphs to users.

Traffic In Sri Lanka

Road Traffic is a major problem in Sri Lanka, due to lack of high ways and increase in vehicles. Monitoring of road traffic has become a major task for police. Due to increase in volume of road traffic in the Island the Sri Lanka police facing many challenges to get control of it. But this is a difficult task to manually control the traffic. There is an increase in accidents due to the number of road vehicles and passengers rapidly growing. The researchers have indicated that the traffic jams accidents and the environmental costs are increasing due to lack of monitoring and control.

Why Traffic Causes?

- ☐ *Most Important reason is that the increase of population, too much of vehicles cause traffic and it interrupt the people.*
- ☐ *Accidents occur.*
- ☐ *Growth of the country economy*
- ☐ *Poor road development.*
- ☐ *Increasing vehicle population.*
- ☐ *Increases of number of road users.*

The following facts were taken to analyze the future data of traffic.

- ☐ *Population*
- ☐ *No of Vehicles*
- ☐ *Economy*
- ☐ *Accident rates*
- ☐ *Equations used to calculate the population*



ACCIDENT STATISTICS IN SRI LANKA

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1. INTRODUCTION

The total population had risen from 14.8 million to 18.7 million between 1981 and 2001, and the population growth is reducing and comparatively small about 1.10%, as shown in Table 1. The census, which was scheduled for 1991, could not be conducted due to unsettled condition in Sri Lanka. The census in 2001 which is the 13th in the series was conducted after a time-lag of 20 years, where population statistics were officially taken with certain limitations. More than population increases; the increasing fleets have had a damaging effect on the number of road accident in Sri Lanka. The vehicle population has risen from 0.213 million in 1977 to 1.78 million in 2001. Over 1.06 million motor vehicle of all varieties were registered during the period between 1990 and 2001. The total number of vehicles registered in 2003 was 2,073,869, and in year 2004 this increased to 2,297,711, with by an increase of 223,842. A sharp increase was observed in the motorcycles segment, where there were 86,877 registrations in 2003 and increased to 124,474 in year 2004. Moreover, there is an extraordinarily increases in number of three-wheelers, a mode of Paratransit providing door-to-door service, between 1994 and 2001, and currently about 240,000 three-wheelers in operation in the Island

infrastructure, the traffic accident in Sri Lanka shows an ever increasing trend and the alarming numbers of fatality as shown in Table 2.

The number of reported accidents to the Police has increased from 26,196 in 1989 to 52,444 in 2005. In 1989 a total of 1,454 fatal accidents were reported and 2,141 were reported in 2005. However, it should be noted that these figures were based on the total accidents, which were reported to the Police. But, normally most of the minor accidents are not reported to the police, and many of the damage only accidents are settled amicably by both parties.

3. ROAD USERS INVOLVED IN ACCIDENTS

The total number of fatalities and fatalities among different road users are given in Table 3. Similarly, the total number of casualties and the casualties of among different road users are given in Table 4. In these tables the drivers means the drivers of a vehicle having three or more wheels and passengers means the commuters travelled in a vehicle having three or more wheels. The others includes road side business person run over by a vehicle and so on. Developed regression model for five-year average data revealed most vulnerable group was

For more details can refer: <http://www.iatss.or.jp/pdf/research/30/30-1-12.pdf>

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Population, Intercensal growth 1981-2001 and population density by district

District	Population		Intercensal growth		Average Annual Growth rate (per cent)	Population density (persons per sq.km.)
	Census 1981	Census 2001	Number	Per cent		
Sri Lanka ^(a)	14,846,750	18,797,257	3,950,507	26.6	1.2	300
Colombo	1,699,241	2,251,274	552,033	32.5	1.4	3,330
Gampaha	1,390,862	2,063,684	672,822	48.4	1.9	1,539
Kalutara	829,704	1,066,239	236,535	28.5	1.2	677
Kandy	1,048,317	1,279,028	230,711	22.0	1.0	667
Matale	357,354	441,328	83,974	23.5	1.0	226
Nuwara Eliya	603,577	703,610	100,033	16.6	0.8	412
Galle	814,531	990,487	175,956	21.6	1.0	613
Matara	643,786	761,370	117,584	18.3	0.8	600
Hambantota	424,344	520,414	102,070	24.1	1.1	211
Jaffna ^(a)	738,788	490,621	-248,167	-33.6	-2.0	528
Mannar ^(a)	106,235	151,577	45,342	42.7	1.7	81
Vavuniya ^(a)	95,428	149,835	54,407	57.0	2.2	81
Mullaitivu ^(a)	77,189	121,667	44,478	57.6	2.2	50
Kilinochchi ⁽ⁿ⁾	91,764	127,263	35,499	38.7	1.6	106
Batticaloa ^(a)	330,333	486,447	156,114	47.3	1.9	186
Ampara	388,970	592,997	204,027	52.5	2.1	140
Trincomalee ^(a)	255,940	340,158	84,210	32.9	1.4	135

The highest population is reported from Colombo district and it is 2,251,274.

The populations increase is affect in the vehicles populations.

	2002	2003	2003/02 % Change	2004	2004/03 % Change	2005	2005/04 % Change	2006	2006/05 % Change	2007	2007/06 % Change	2008	2008/07 % Change	2009	2009/08 % Change	2010 ⁽ⁱ⁾	2010/09 % Change
A. Global aggregates at current market prices (Rs. Million)																	
1. Gross Domestic Product (GDP)	1,636,037	1,822,468	11.4	2,090,841	14.7	2,452,782	17.3	2,938,680	19.9	3,578,688	21.8	4,410,682	23.2	4,835,293	9.6	5,602,321	15.9
2. Gross National Product (GNP)	1,611,994	1,805,933	12.0	2,070,109	14.6	2,422,733	17.0	2,898,256	19.6	3,535,594	22.1	4,305,651	21.6	4,779,497	11.0	5,530,464	17.7
3. Three Major Sectors of GDP																	
Agriculture	233,615	241,122	3.2	262,271	8.8	289,906	10.5	333,137	14.9	418,104	25.5	590,114	41.1	613,694	4.0	716,892	16.8
Industry	458,264	518,029	13.0	598,359	15.5	740,448	23.7	900,479	21.6	1,070,737	18.9	1,295,470	21.0	1,434,701	10.7	1,649,141	14.9
Services	944,158	1,063,317	12.6	1,230,211	15.7	1,422,428	15.6	1,705,064	19.9	2,089,847	22.6	2,525,099	20.8	2,786,897	10.4	3,236,288	16.1
B. Global aggregates at constant (2002) prices (Rs. Million)																	
1. Gross Domestic Product	1,636,037	1,733,222	5.9	1,827,597	5.4	1,941,671	6.2	2,090,564	7.7	2,232,656	6.8	2,365,501	6.0	2,449,214	3.5	2,645,432	8.0
2. Gross National Product	1,611,994	1,717,497	6.5	1,809,475	5.4	1,917,884	6.0	2,061,806	7.5	2,208,291	7.1	2,309,171	4.6	2,420,952	4.8	2,611,500	7.9
3. Three Major Sectors of GDP																	

The Gross Domestic Product growth in Sri Lanka

For more details : Department of Census and Statistics, Sri Lanka
(<http://www.statistics.gov.lk/page.asp?page=National%20Accounts>)

Total GDP (Growth Domestic Product) is increasing year by year. The economy growth of Sri Lanka can affect the vehicles populations.

4.2.5 Fabricated metal Products, Machinery & equipment	23,697	28,339	30,217	34,480	38,872	47,947	55,185	62,013	72,990
4.2.6 Other Industries	3,705	5,030	5,549	6,613	8,414	9,965	11,391	12,778	14,675
4.3 Cottage industry	18,539	21,225	24,094	27,442	30,900	34,886	38,658	42,176	46,888
5. Electricity, gas and water	35,608	43,562	49,116	57,908	72,457	88,005	104,666	113,687	127,625
5.1 Electricity	29,775	36,393	41,022	46,958	58,869	70,976	87,116	96,321	106,029
5.2 Gas	3,765	4,750	5,976	7,513	9,473	12,754	13,158	12,224	15,616
5.3 Water	2,068	2,419	2,118	3,437	4,115	4,275	4,391	5,142	5,980
6. Construction	100,404	110,111	127,692	167,999	216,833	264,104	327,138	366,248	423,414
Services	944,158	1,063,317	1,230,211	1,422,428	1,705,064	2,089,847	2,525,099	2,786,897	3,236,288
7. Wholesale and retail trade	389,332	441,950	513,498	569,255	659,597	790,628	949,372	948,425	1,096,323
7.1 Import trade	149,845	159,964	191,997	206,713	231,483	282,510	343,254	282,929	341,449
7.2 Export trade	77,334	88,960	101,341	106,492	118,686	141,973	148,799	138,950	157,301
7.3 Domestic trade	162,153	193,026	220,159	256,051	309,428	366,145	457,319	526,546	597,573
8. Hotels and restaurants	3,460	9,277	11,763	14,218	16,646	18,367	20,611	24,988	33,213
9. Transport and communication	173,746	200,702	240,307	287,491	344,909	423,820	530,980	599,934	709,400
9.1 Transport	153,441	175,398	209,796	244,104	289,237	353,402	446,677	558,206	656,469
9.1.1 Transport- Railway	2,323	2,371	2,123	2,965	4,387	5,554	6,804	7,772	8,890
9.1.2 Transport- Passenger and Goods	151,118	173,027	207,674	241,139	284,851	347,848	439,874	550,434	647,579
9.2 Cargo handling-Ports and Civil aviation	10,293	10,853	11,864	14,537	16,512	18,501	21,585	21,488	25,667
9.3 Post and telecommunication	10,011	14,451	18,647	28,850	39,160	51,918	62,718	20,240	27,263
10. Banking, insurance and real estate etc.	130,465	153,869	178,119	205,322	266,972	328,158	413,322	499,304	597,540
11. Ownership of dwellings	68,371	73,033	77,676	88,759	103,201	126,212	141,794	161,485	171,871
12. Government services	139,094	142,793	163,474	206,497	257,837	333,758	380,765	445,543	500,547
13. Private services	39,691	41,693	45,375	50,886	55,902	68,905	88,255	107,219	127,393
Gross Domestic Product	1,636,037	1,822,468	2,090,841	2,452,782	2,938,680	3,578,688	4,410,682	4,835,293	5,602,321

@ provisional

Year by Year money allocation for transport is increasing. But since the population and number of vehicles are increasing along with the years. To stand to this increment the money allocation for transport section is not satisfied. These are some kind of reasons which directs to increasing traffic.

Author's task in this application is to create auto generated graphs. By viewing these graphs the users of this application will be able to manage their time and prevent unwanted delays. System will also send alert messages to the users about the accidents, road blocks, fire, explosions and other disasters. So the users can plan their programs ahead and avoid the unexpected circumstances related to traffic.

By the initial analysis the numbers of accidents are increasing because of increased number of vehicles, poor development of road and poor traffic management. So this system will help to reduce the accidents by having good safety management measures.

A graph will be generated within the application to see the statistics of the accidents. In addition this application will also support to extend the knowledge of the users on road traffics.

To reduce road accidents

- *Overall road safety target for Sri Lanka is to promote a society free of road accidents.*
- *National Road Safety awareness campaigns and training programs.*
 - *Driver Training Programme*
 - *Developed driver training hand book*
 - *Traffic safety education for school children*
 - *Developed school curricular to be implemented in schools for the primary as well as secondary schools.*
- *Public Awareness Programmes*
 - *published appropriate Road Safety messages in the news papers*
 - *published Road Safety slogans in News papers*
 - *Publish banners and posters with road safety slogans at public places.*
 - *Distribute leaflets on road safety*
 - *Distribute a booklet on “How to be a good driver”*
 - *Conducted TV programmes on road safety.*
 - *Printed hand bills on road safety.*
- *Conduct enforcement Programmes on road rules and regulations by the police.*
- *Conduct health and environmental programmes for drivers (young and old) emphasizing the health standards and effects of vehicle emissions.*
- *Conduct media briefing on road safety.*

Recommendations

- *Since the population and number of vehicles are increasing along with the years, government needs to do some investments in roads, highways and subways.*
- *People should be educated on road rules and regulations. A strict rules and policies should be maintained in order to protect the road laws.*
- *Government may promote people to use public bus services and train services rather than using private transportation. For this Government should ensure a good public transportation service to people.*

Thank-You