

Development of Stop Times File for General Transit Feed Specification (GTFS) Format in The Context of Western Province Bus Transits

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Abstract

Public transport which is a vital aspect of transportation consists of a modal share 40.4% in Western Province of which 37.7% is of buses. However, regarding the convenience and ease of access to information, not so many measures are implemented in Sri Lanka. Recently in order to communicate better service information on public transportation to users, Google Transit service was enabled in Google Maps.

To provide the information via Google Maps, Google accepts the data feed in the format of General Transit Feed Specification (GTFS) which is an international data format. Currently a static feed is provided which includes the components of schedule, fare and geographic transit information. The schedule component contains the file stop_times.txt which provide the schedule of a bus journey. For a certain bus journey, it gives the stops that the riders board and alight, arrival and departure time at each stop and the stop sequence of a certain journey.

However, in Sri Lankan context, the transport agencies use the fare tables (figure 1) which depicts the stops that the bus makes and the fare at each stop and the bus frequency (figure 2) which gives the times that a bus of a certain route would leave the initiating bus station.

පානදුර				
එළවිල හංදිය	12.00	එළවිල හංදිය		
කුරුස හංදිය	15.00	12.00	කුරුස හංදිය	
මහබෙල්ලන	19.00	15.00	12.00	මහබෙල්ලන
බොල්ගොඩ පන්ස	24.00	19.00	15.00	12.00 බොල්ගොඩ පන්සල
බිණ්ඩාරගම	28.00	24.00	19.00	15.00 12.00 බිණ්ඩාරගම

430 මතුගම - කොළඹ (සාමාන්‍ය සේවා)									
පැය	විනාඩි								
HOURS	MINUTES								
3:00	07	30	45						
4:00	00	10	20	30	40	50			
5:00	00	07	14	20	28	35	42	49	56
6:00	03	10	17	24	30	37	44	50	57
7:00	04	11	18	25	33	42	52		

Figure 1: Fare Table Example

Figure 2: Frequency Table Example

In coding the arrival and departure times at each bus stop is required. However, in Sri Lanka no such time table exist for each and every bus stop. Therefore, an average speed was identified for each route and considering the distance travelled, arrival and departure times were recorded for each stop in a bus journey. In obtaining the average speeds, for the inter provincial buses, the average speed in the annual report of National Transport Commission was referred. In order to get the Western Province intra provincial bus average speeds the speed graphs of the CoMTrans Study were referred. An average speed for the whole day was taken approximately for all inter-Provincial buses.

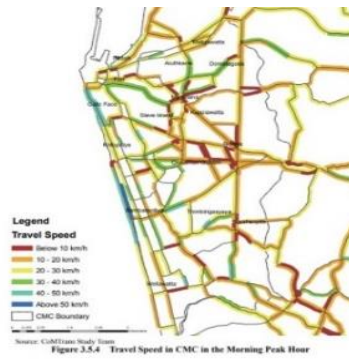


Figure 1: Average Speeds of Morning Peak (CoMTrans Study)

In practical scenario, inside Western Province most inter provincial buses do not allow the riders riding for a short distance to board the bus. Instead they are required to take the intra provincial bus. However, as the inter provincial buses travel faster than the intra provincial buses within the Western Province too, the google will indicate the inter provincial bus as the preferred best route. User is misguided.

Another error identified in inter-provincial bus routes is, bus routes in the same corridor having different average speeds. For an example the two buses Colombo-Kandy and Colombo-Katugasthota travels in the same corridor. But the Colombo-Katugasthota bus route's allocated average speed is higher than the Colombo-Kandy bus route's average speed which are defined by NTC. Therefore, higher speeded bus route is given priority which is misleading. For above errors mitigation methods were carried out by adjusting the speed of bus routes depending on the practical scenarios, traffic conditions, Western Province boundaries and the impacts of expressway network. Also, a major drawback of coding exact times for bus routes is that is not representing situations where the buses being delayed or cancelled. Also the waiting time at each bus stop varies and cannot be reasonably included in the coding. In order to represent the most accurate service information, the real time data feed is required.

Keywords: GTFS, Stop times, Western Province

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