# Identification Of Traffic Jam Using Call Detail Records

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## Problem Definition

To identify traffic jam affected area in a specific interval of time using call detail records.

## Objective

- To find out the dynamic users in a particular day from the calling history.
- To determine the frequency of the calls in a particular interval of time under different mobile phone towers.
- To identify the traffic jam affected areas from the calling frequency received by a tower under different locations.

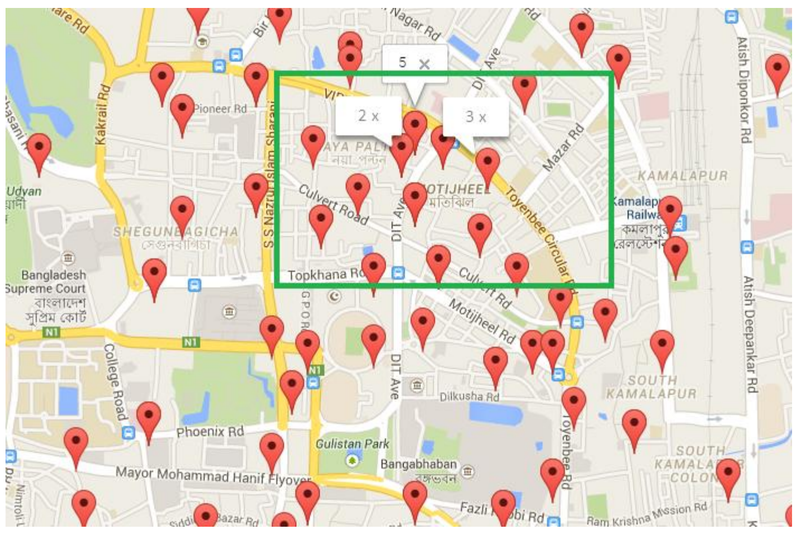


**Figure:- The calling frequency of different towers under Motijheel**

## Methodology

- The sample data that has been collected from Telecommunication Company is:

| ID | Call Date | Call Time | Duration | Latitude | Longitude |
|---|---|---|---|---|---|
| AAH03JAC+AAAcVKAC | 210120707 | 08:56:34 | 242 | 23.7908 | 90.3753 |
| AAH03JAC+AAAcVKAC | 210120707 | 16:14:20 | 15 | 23.7902 | 90.3756 |
| AAH03JAC+AAAcVKAC | 210120707 | 16:42:14 | 21 | 23.7902 | 90.3756 |
| AAH03JAC+AAAcVKAC | 210120707 | 18:46:54 | 18 | 23.7902 | 90.3756 |
| AAH03JAC+AAAcVKAC | 210120707 | 20:26:37 | 48 | 23.7908 | 90.3753 |
| AAH03JABiAAJKnPAa5 | 210120701 | 11:15:55 | 28 | 23.7908 | 90.3753 |
| AAH03JABiAAJKnPAa5 | 210120707 | 18:24:30 | 11 | 23.7905 | 90.3751 |

- Dynamic users are such persons those are found under different co-ordinate in a same day through their call history.
- Firstly, the dynamic users have been identified from the call history.
- Then at a particular location, at a specific interval of time, the frequency of the phone calls of the moving users has been measured.
- From the frequency of those calls, the density of the people has been predicted.
- From the density of those moving people, the traffic jam has been predicted.

## Outcome

- From a total of 779700 call records, 1343 moving users have been found on 7 July 2012 between 5pm-8pm.
- Their frequency has been calculated in different areas and it provides images as follows:

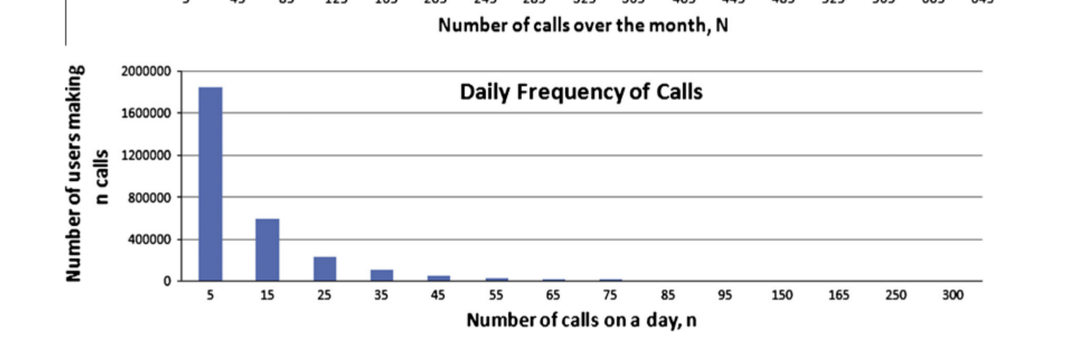


**Figure:- The traffic jam of Mirpur road, Bashundhara city and tejgaon has been identified**

**Figure:- Daily and Monthly frequency of calls.[1]**

- We can see the Daily and Monthly frequency of calls of the users which gives enough data to determine the dynamic users who are responsible for traffic jam in a particular location at a specific time.

## References

1. Md. Shahadat Iqbal, Charisma F. Choudhury, Pu Wang, Marta C. González ,Development of origin–destination matrices using mobile phone call data. Published in 2014.
2. Asakura, Yasuo, Hato, Eiji, 2004. Tracking survey for individual travel behavior using mobile communication instruments. Transp. Res. Part C 12 (3–4), 273–291.
3. Bar-Gera, Hillel., 2007. Evaluation of a cellular phone-based system for measurements of traffic speeds and travel times: a case study from Israel. Transp.Res. Part C 15 (6), 380–391.
4. Cheng, P., Qiu, Z., Ran, B., 2006. Particle filter based traffic state estimation using cell phone network data. In: Proceedings of the IEEE ITSC 2006.