## Record of activities related to the Project

30/12/2013:

* First day of Reporting.
* Spoke to the external guide who briefed us about the project.
* Asked us to study about RS232, fixed point arithmetic, LM35 temperature sensor.

02/01/2014:

* Max sampling frequency, resolution of ADC, Difference between Fourier and Laplace transforms, Why both? ZigBee protocol, working of frequency domain plotting in Matlab, Hartley oscillator and OSI Model.

07/01/2014:

* SPI, Traffic detector handbook, variation of inductance with permeability, inductance with frequency, design of comparator, LT Spice.

09/01/2014:

* Spoke to Surendra who briefed us about installation of iSense development environment.
* Spoke to Jileesh who helped us out with simulation of oscillator in LT Spice.

11/01/2014:

* Design of Toroid and simulation of comparator.

13/01/2014:

* Got the required components and built the oscillator.
* Wrote a Matlab program for comparing two signals.

16/01/2014:

* Wrote a Matlab program for thresholding.

17/01/2013:

20/01/2014:

22/01/2014: Nothing worth mentioning in this report.

23/01/2014:

24/01/2014:

28/01/2014:

* Got the modules out of BEL.

29/01/2014:

* Visited Nihon communication technologies and figured out that the USB cable was damaged.
* Built Colpitt’s oscillator in college.

30/01/2014:

* Went to SP road and got the connector.
* Fixed the USB cable.

31/01/2014:

* Wrote a Dot Net program to read data serially.

02/02/2014:

* Wrote a program to transmit data wirelessly from the master module to the slave module.
* Wrote a Matlab program to display a frame of data acquired by the magnetic sensor module.

03/02/2014:

* Modified the Matlab program to display the data acquired by the magnetic sensor module in real time.

04/02/2014:

* Returned the modules to BEL.
* Feasibility of real time processing of data ruled out.

05/02/2014:

* Set up the development environment on BEL laptop.

06/02/2014:

* Acquired magnetic sensor output curves using a real car.
* Magnetic sensor saturation found to be a problem.
* Car generates a single peak in the output curve. Classification based on axle spacing seems improbable for cars.
* Got the modules out of BEL.

12/02/2014:

* Acquired magnetic sensor output for 2 wheeler and cars by placing the sensor on the side of the road.

13/02/2014:

* Acquired additional sensor output curves for 2 different cars.

18/02/2014:

* Developed an algorithm for detection of vehicle based on thresholding and slope detection.
* Wrote a program for the slave module to detect the vehicle, record the time stamp and transmit it to the master module.
* Wrote a program for the master module to receive the detection time stamps from two slave modules.
* Briefed our internal guide about our progress.
* Built the oscillator circuit using <op amp x> and added a comparator at the output to generate square waves on a spring board.
* Soldered the components onto a PCB.

19/02/2014:

* Tested the oscillator circuit and found that it worked satisfactorily.
* Built an induction loop to replace the inductor and checked the frequency drift in presence of large metallic objects.
* Extended the project period till 28th of Feb 2014.

20/2/2014:

* Checked the frequency drift due to various vehicles and noted that there were very small variations.
* Oscillator was taking a long time to return to its original frequency even after the vehicle had moved away from the loop.
* Got the induction loop out of BEL.