



De La Salle University – Dasmariñas

**AN OPTIMIZATION MODEL FOR LBC DELIVERY HUB – DASMARIÑAS  
VEHICLE ROUTING**

**An Undergraduate Research Presented to  
the Mathematics Department  
College of Science  
De La Salle University – Dasmariñas**

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Degree of Bachelor of Science in  
Applied Mathematics**

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### Abstract

Martirez, Angelina F. *An Optimization Model for LBC Delivery Hub – Dasmariñas Vehicle Routing*. De La Salle University – Dasmariñas. November 2011.

Luzon Brokerage Corporation (LBC) was established in 1950. It offers money remittances and package delivery. The management of LBC has a process on how to deliver the packages whether it is by door – to – door or by pick – up. From the different branches, all the packages must go first to the Hangar which is in Pasay City. Its purpose is to check what is inside the package though the package is already inspected in the branch where it comes from. From the Hangar, it segregates the packages according to their destination. After the segregation, it is now ready to transfer all the packages to the different delivery hubs. In Cavite, there are two delivery hubs which are located in Bacoor and in Dasmariñas. The delivery hub is in – charge to deliver the packages in their respective branches or in the houses.

The study focused on delivery hub which is located in Dasmariñas and the packages that are by pick – up. The purpose was to determine the optimal shipping cost of delivery in terms of distance and gas cost. It tried to answer the following:

1. Is the current operation of LBC optimal?
2. If not, what is the optimal way of delivery, both for van and motorcycle using the shortest path and traveling salesman problem algorithms?
3. Is there a significant difference between the existing and proposed routes?





The data that were gathered were the manifesto of LBC from November 2010 to June 2011. The researcher identified the routes taken by the motorcycles and the vans. Google map was used to determine the distance from hub to branch and from branch to another branch. Shortest path method was used if the destination is only one branch and traveling salesman algorithm if it is more than one branch. T – test, a statistical tool, was used to determine the significant difference of the existing and proposed routes.

With the aid of TORA, software for linear programming, the researcher found out the optimal distance. Gas cost of the existing and computed routes was also computed. Cost (Pesos) that has a negative (-) sign means that cost of delivery in terms of gasoline consumption can still be decreased. If the value has positive (+) sign, this means that the current operation of LBC is already optimal while a value of zero (0) means the current route and the route given by TORA are the same.

The results indicated that the current operation of LBC was not yet optimal. There were certain cases where the current operation could be replaced by the proposed distance. At 5% level of significance, there was no significant difference for the routes taken by both motorcycle and van.