**Base Model:**

***Parameters:***

*M: Annual maintenance cost*

$C$*: Building cost*

*Q: Annual order quantity*

*S: Shipping cost per mile*

*A: Area of Chaoyang*

***Calculated Parameters:***

$B$: *Annual Building cost = C/10*

$(A/n)^{1/2}$*: Average distance between warehouse and customer*

***Decisions:***

$n$: Number of warehouses to build in Chaoyang distinct;

The decision variables are in cells C10 of *Model Tab* in the attached excel file.

***Objective:*** The objective is to minimum the total cost

$$Total Cost= Mantiance Cost + Building Cost + Shipping Cost $$

$Mantiance Cost = M\*n$

$Building Cost=B\*n$

$$Shipping Cost =Q\*S\* (A/n)^{1/2} $$

$Total Cost=(M+B)\*n+Q\*S\* (A/n)^{1/2} $

The objective is in the cell C12 of *Model Tab* in the attached Excel file.

***Constraints:***

$n \in Integer $ (Number of warehouses should be integer)

***Recommendation:***

When we finished running solver for the model we developed, we got an optimal decision of Alibaba group can achieve their business expansions goal in Chaoyang while get the minimum cost, the minimum cost is $1,752,270 when build 5 warehouses in Chaoyang distinct. Thus, we recommend that the Alibaba Group should follow the decision we got from the solver.