**Model.**

Parameters:

$D\_{j }$: *Demand of Order of community j,* $ where j\in \left(Blvd 1900, Vertex, Pala Mesa\right)$

$F\_{i}$: *Fixed cost to hire person* $i $*,* $ where i\in \left(A,B, C, D\right)$

$C\_{ij }$:*Cost to deliver one order by person* $i$ *to Community j,* $ where i\in \left(A,B,C,D\right), j\in (Blvd 1900, Vertex, Pala Mesa) $

*S: Weekly capacity of delivery Men*

Decisions:

$x\_{i}$: *Whether person* $i$ *should be hired,* $ where i\in \left(A,B,C,D\right)$

$n\_{ij }$: *Order to deliver by person* $i$ *to community* $j$*,* $ where i\in \left(A,B,C,D\right), j\in (Blvd 1900, Vertex, Pala Mesa) $

Objective: *Maximize Revenue*

$min\sum\_{i,j}^{} $ $x\_{i}$\*$ F\_{i}$ + $n\_{ij }\*$ $C\_{ij }$

Constraints:

$\sum\_{i}^{}n\_{ij }\geq D\_{j } \left(1\right)$ Satisfy demand of a community

$\sum\_{j}^{}n\_{ij }\leq S\*x\_{i} ($2) No delivery allowed from no-hired people

$ x\_{LA}\geq x\_{NY } $ (3) If A is hired, B must be hired

$\sum\_{i}^{}x\_{i }\leq 2$ (4) At most 2 people can be hired

$\sum\_{i}^{}x\_{i }\geq 1$, $where i\in \left(B,D\right)$ (5) Either B or D must always be hired

$n\_{ij} \_{ }\geq 0$ (6) Non- negative number of orders

$x\_{i}\in $ {0,1} (7) Binary decision

Notes:

Constraint 2 ensures that the number of delivery cannot exceed logical capacity constraint. When an investment is not chosen, $x\_{i}$=0 then $n\_{ij }$is forced to be 0. If an investment is chosen, $x\_{i}$=1 then $n\_{i }$can be any value less than S, that is the weekly capacity of person i.

1. A minimum cost of 162$ can be attained by selecting the routes below with number of orders as shown below.

