Problem with Matrix constraint:

My suggestion on how to solve this is based on the non-linear to linear programming technique we had however I might get a problem as q will depend on x and C will depend on q again (which makes C actually depend on x) not sure if this is possible or if AMPL will then start to complain. My suggestion would be as follows:

Cijvmxijvm

Where

0-300, 300-450, 450- 600

0 <= qv <= Q1 xijv1

Xijv2Q1 <= qv <= Q2o2v

…

…

ohvQh-1 <= qv <= Qhohv

where o is binary and the sum of *o’s* has to be 1. qv is the sum of the whole distance driven by v, see below. And Q is kilometer intervals. And:

qv = sum(xijvDij)

uppercase: for another Set. Indexes down.. use H for docks

where U is the distance between node i and node j.

Q: Not sure if it makes sense to make another binary variable o next to x or if I should try and integrate x and o together? Need to integrate o with x or else not linear

Q: Also don’t know if it like I said makes sense to make q dependent on x but on the other hand I don’t see any way of determining in which segment I am without x.

Time Window constraint:

vja = binary variable for each time window

sum (vja) = 1 for all j

so time window constraint will look something like:

xijv (tiv + Tijv) <= vja Tja – for all j

xijv (tjv - Tijv) <= via Tia (upper) – for all i

Does this look like a usable representation?

Dock constraint:

Just have to connect the d variable to the x like with the load constraints. Have done this at home and I will send it all to you in the next pdf.

Read big M in the slides

Speed optimization, maritime transportation problem, speed a, speed b etc. kjetil fagerholt, inge norstad