

Yard Storage in Port Terminal Operations

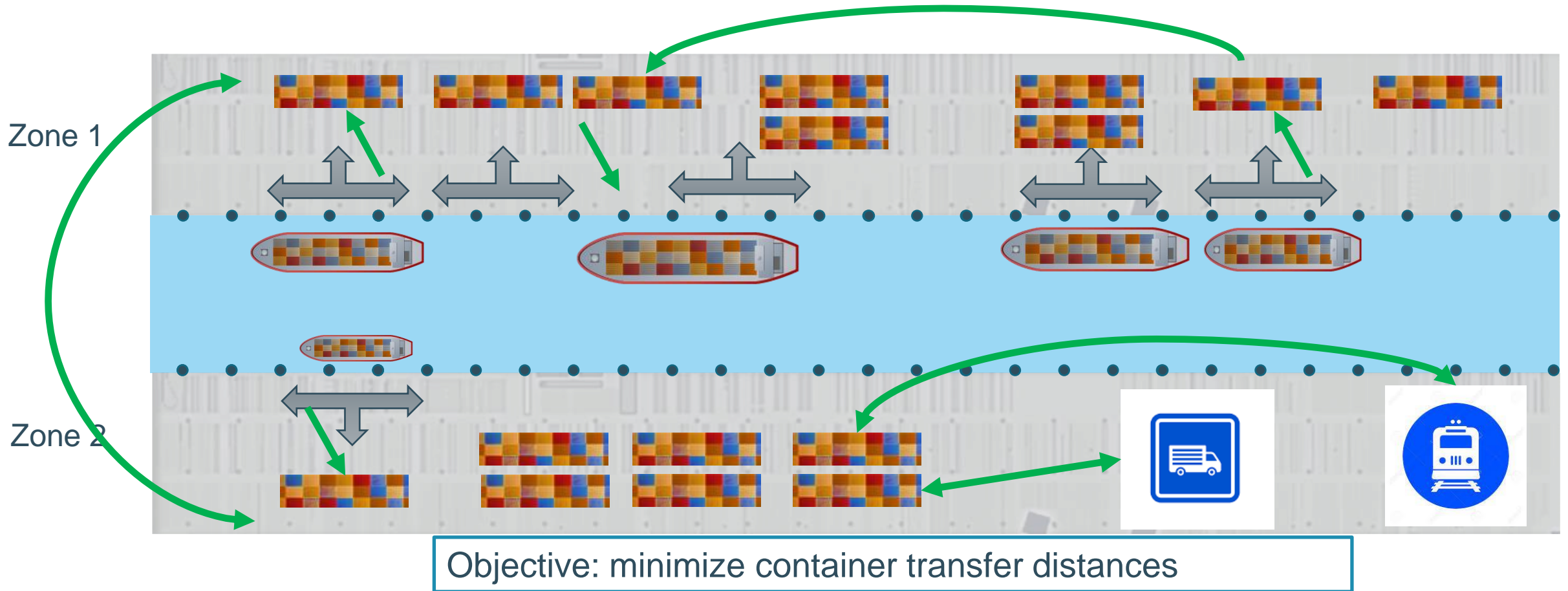
Software-Simulatie



Deurganckdock



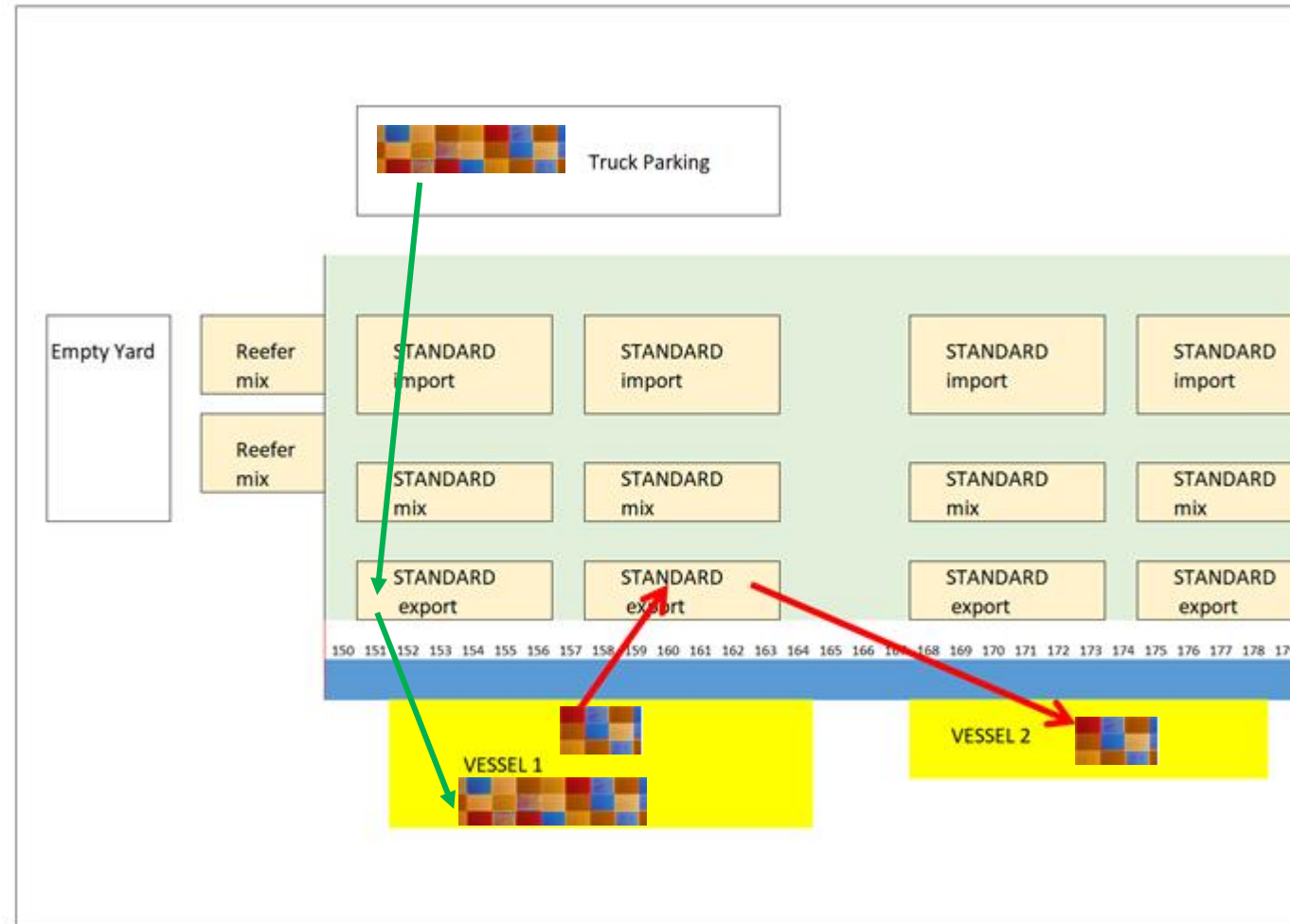
General Setting



Yard scheduling – Container Groups

Each Container Group (CG) g

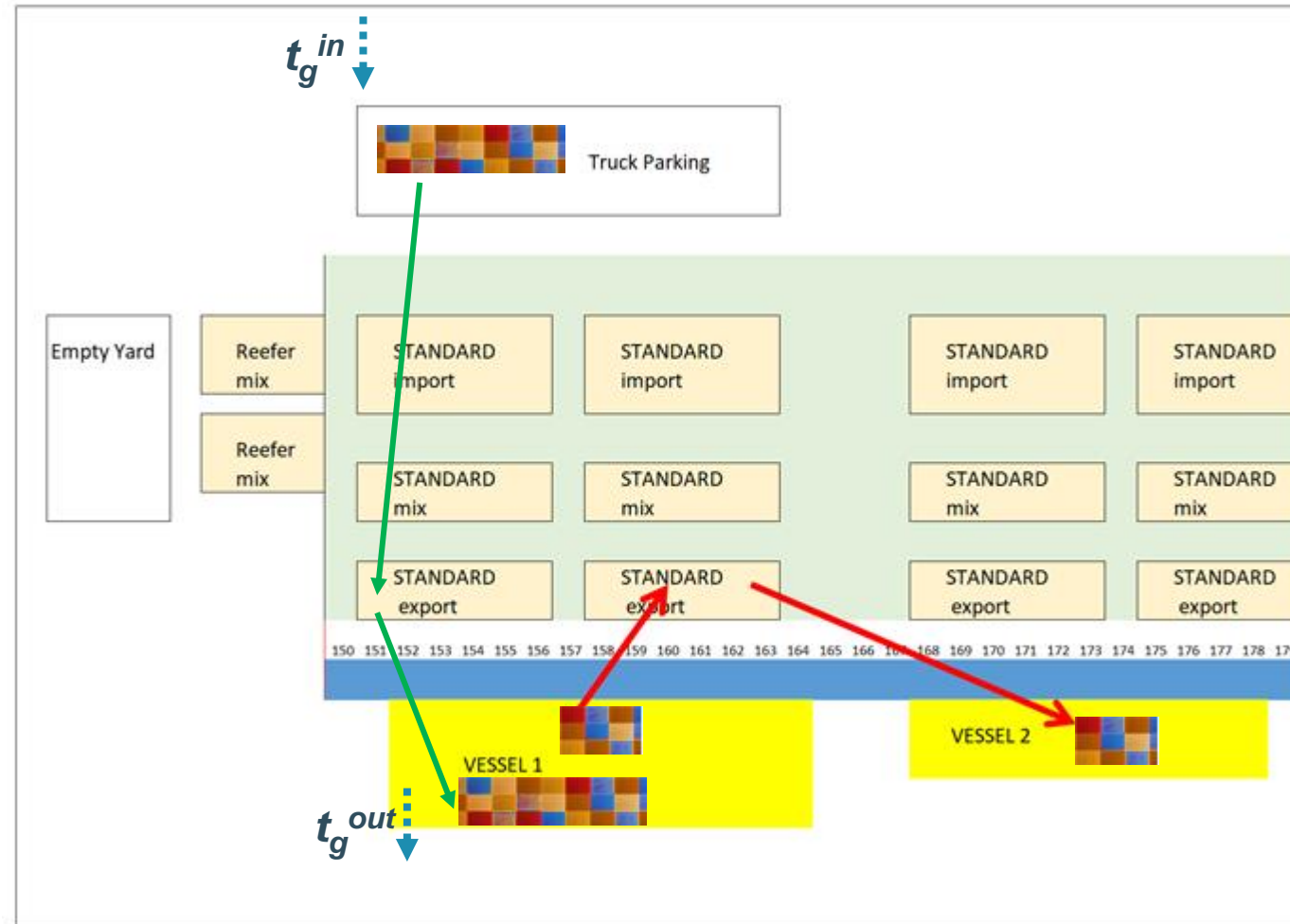
- Number n_g of containers
- Arrives and/or Departs with a vessel



Yard scheduling – Container Groups

Each Container Group (CG) g

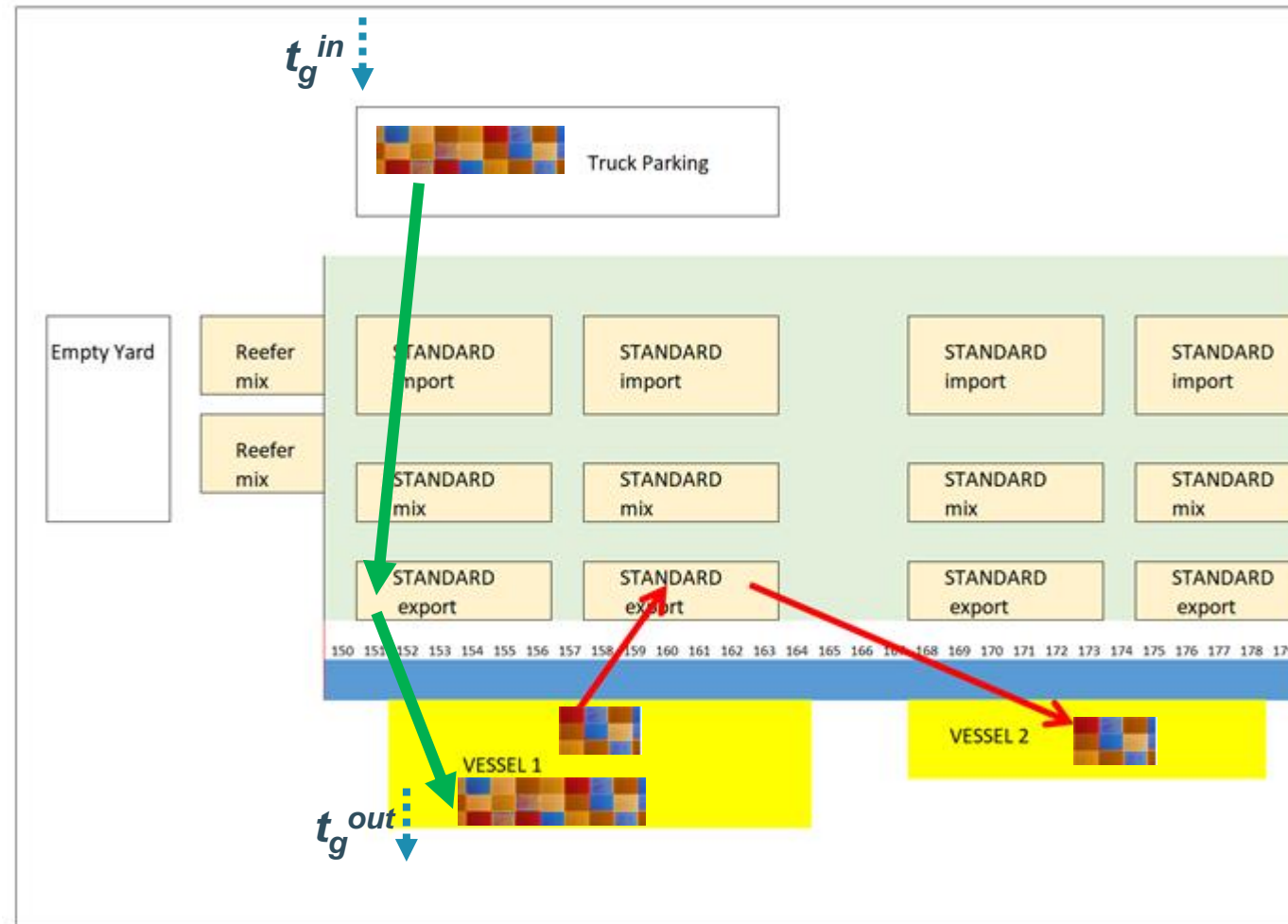
- Number n_g of containers
- Arrives and/or Departs with a vessel
- Specified time window to be processed within $(t_g^{in} - t_g^{out})$



Yard scheduling – Container Groups

Each Container Group (CG) g

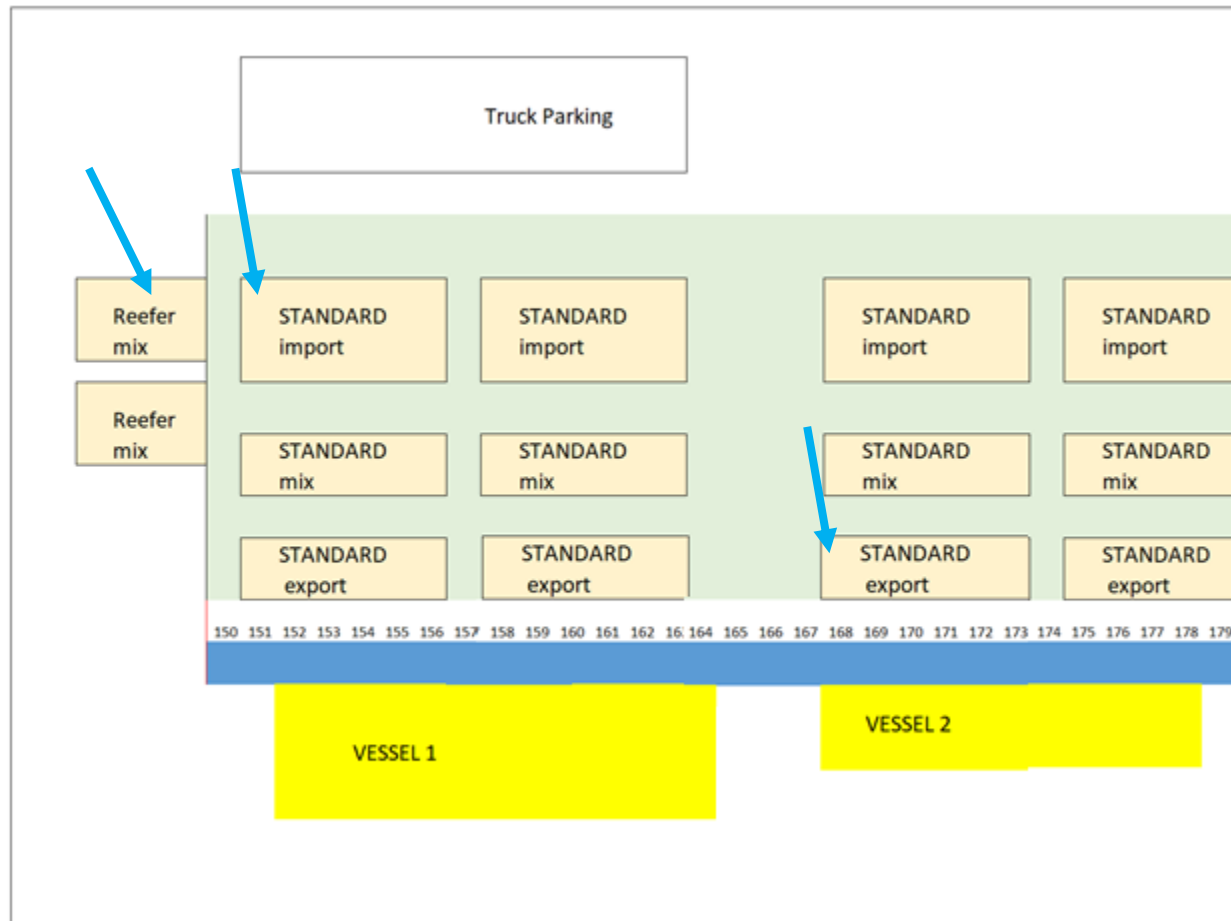
- Number n_g of containers
- Arrives and/or Departs with a vessel
- Specified time window to be processed within $(t_g^{in} - t_g^{out})$
- Must always be stored in an intermediate storage location (yard block)



Yard scheduling – Yard Blocks

Each Yard Block(CG) z

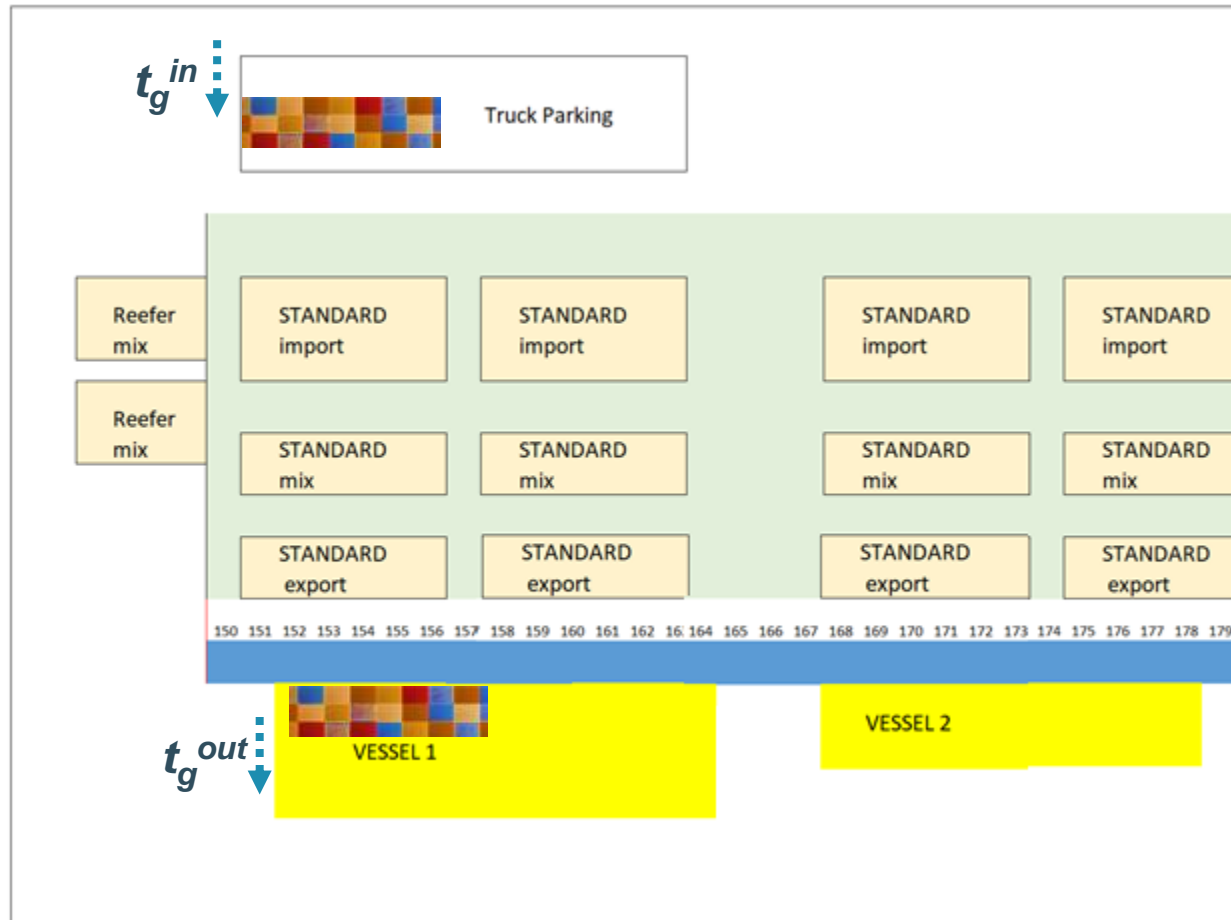
- Capacity ϕ_z^{max}
- Compatible with certain CGs
(depending on container content and flow)



Yard assignments

For each CG g define a Yard Assignment (YA)

$y = \langle g, z_y \rangle$ such that:

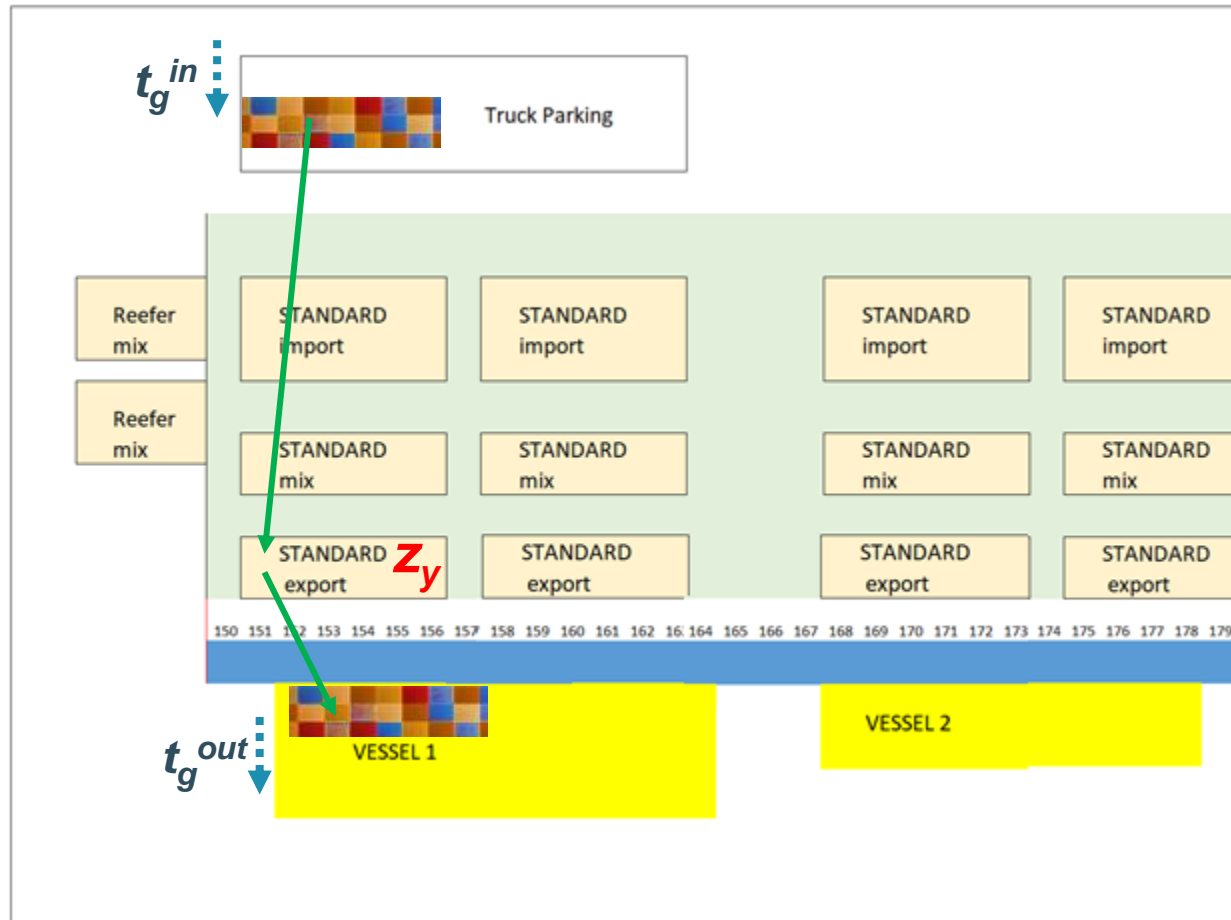


Yard assignments

For each CG g define a Yard Assignment (YA)

$y = \langle g, z_y \rangle$ such that:

- z_y a yard block compatible with g



Objective function

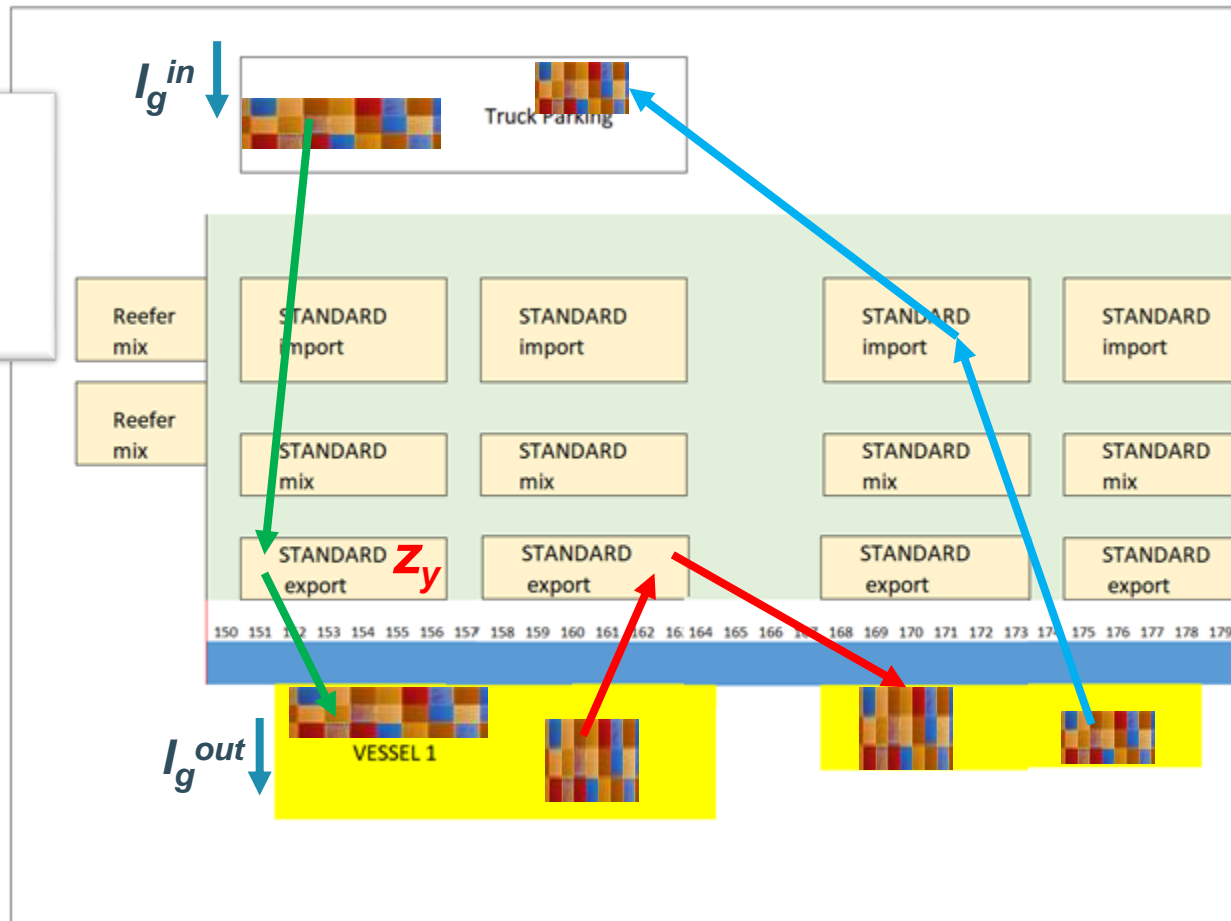
Cost of each Yard Assignment y :

$$YC(y) = n_{g_y} \cdot \left(dist(\ell_{g_y}^{in}, z_y) + dist(z_y, \ell_{g_y}^{out}) \right)$$

Cost function:

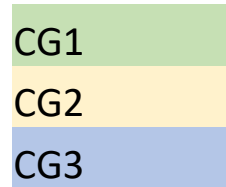
Total Container Transfer Distance:

$$TCTD = \sum_{y \in Y^G} YC(y)$$



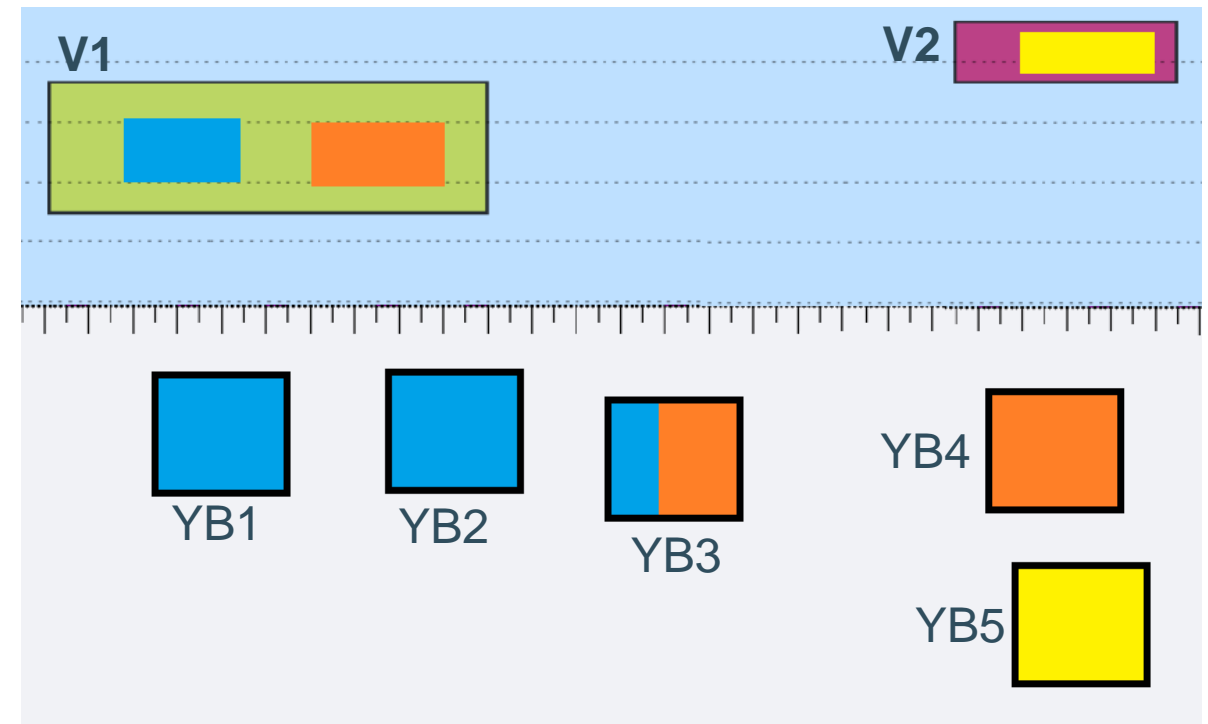
Yard assignment simulation

Processing
order



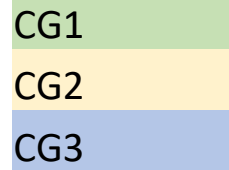
YARD ASSIGNMENTS

Processing order



Yard assignment simulation

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YARD ASSIGNMENTS

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