trip 53 bus 55 bus 77 taxi (see file 'optimization improvement example 1')

To yield the suggested optimal, we could follow two operations:

```
1 area swap between bus 53 and bus 55
2 bookings swap between bus 53 and taxi 77 (not sure if it could
be achieved using syphoon booking)
    syphoon booking between taxi 77 and bus 53
    another syphoon booking between bus 53 and taxi 77
```

area swap

One of the reason could be how we handling the candidates resulted from local search swap_area()

Recall in our optimizer, we handles trips as followed:

step 1: generate candidates
see codes

```
for any trips pair t1, t2:
    candiates <- swap any two compatible areas in between t1 and
t2
    candidates <- try to combine t2 and a third trip into t1
    candidates <- try to disspate t1 to other trips (exhaust)
```

step 2: sort the candidate and yield a best trip
step 3: For best trip's old trip, we only retain the best trip and kill all the other potentials from this old trip. (even a third swap might result in an optimal).
see codes

```
    for any old trip resulted in current best trip:
        remove old trip itself
        remove any candidates originated from this old_trip
```

From the beginning, we know we can get to the optimal through two
area swaps. For example, if we first swap_area(trip 53, trip 55) AND
RETAIN THE RESULT which swap Maria Studios (from 55) with Altantica
Eleon Grand (from 53). Then in the next optimization run, we have
another area swap swap_area(trip 53, trip 77) and might yield a
solution which swap Plessas Palace (from 77) with TUI BLUE Zante
Maris (from 53). But if as our optimize does, if the first swap
between 53 and 55 yield a best trip which is not the same as the
above first swap, then the solution with the above first swap would
be killed in step 3.
(In other cases, if the best trip from the first swap doesn't
originate from swap between trip 53 and trip 55, that's safe.)

Generally speaking, if an optimal solution is not monotonically cost-
reducing from pair-wise swapping, there is a risk that we kill the
paths to the optimal.
PS: we can't say the risk is high, in some cases that there are many
alternative pairwise swaps that lead to the optimal or closed-
optimal, killing some of them might not be an issue.

cost

could be killed by our optimizer

optimal

# of steps of

swap area

our optimizer is good with such a path

if it exists