

## Benchmark Report

# Result summary

3 benchmarks have failed!

Best score

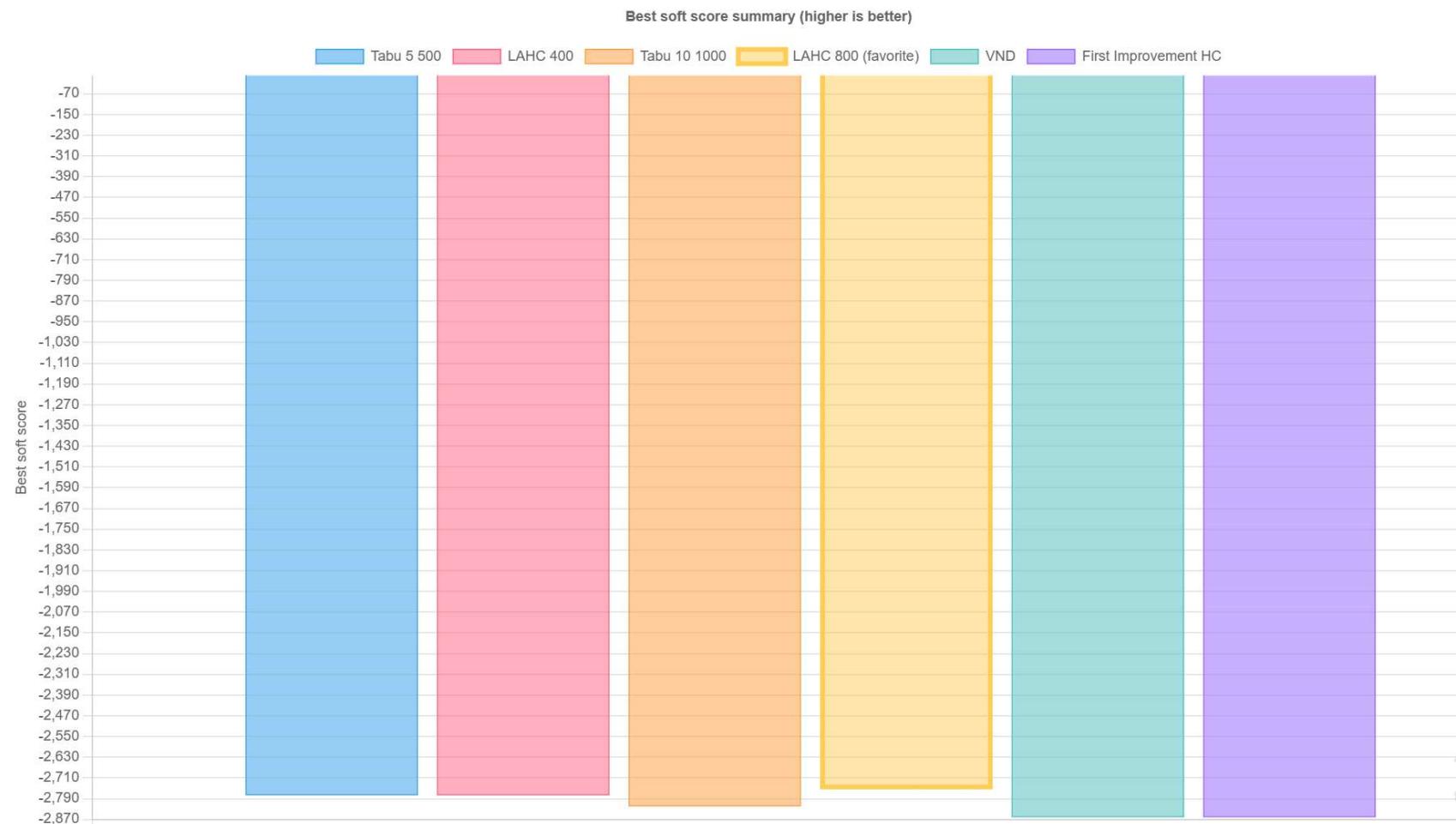
Best score scalability

Best score distribution

Winning score difference

Worst score difference percentage (ROI)

Useful for visualizing the best solver configuration.



Solver	Total	Average	Standard Deviation	Problem
				airport_auto_example_3
Tabu 5 500 1 !	-72hard/-2777soft	-72hard/-2777soft	0.0E0/0.0E0	-72hard/-2777soft 1 !
LAHC 400 1 !	-72hard/-2777soft	-72hard/-2777soft	0.0E0/0.0E0	-72hard/-2777soft 1 !
Simulated Annealing F				Failed
Great Deluge F				Failed
Tabu 10 1000 3 !	-72hard/-2820soft	-72hard/-2820soft	0.0E0/0.0E0	-72hard/-2820soft 3 !
LAHC 800 0 !	-72hard/-2754soft	-72hard/-2754soft	0.0E0/0.0E0	-72hard/-2754soft 0 !
VND 4 !	-72hard/-2862soft	-72hard/-2862soft	0.0E0/0.0E0	-72hard/-2862soft 4 !
First Improvement HC 4 !	-72hard/-2862soft	-72hard/-2862soft	0.0E0/0.0E0	-72hard/-2862soft 4 !
LAHC 400 Entity-focused F				Failed

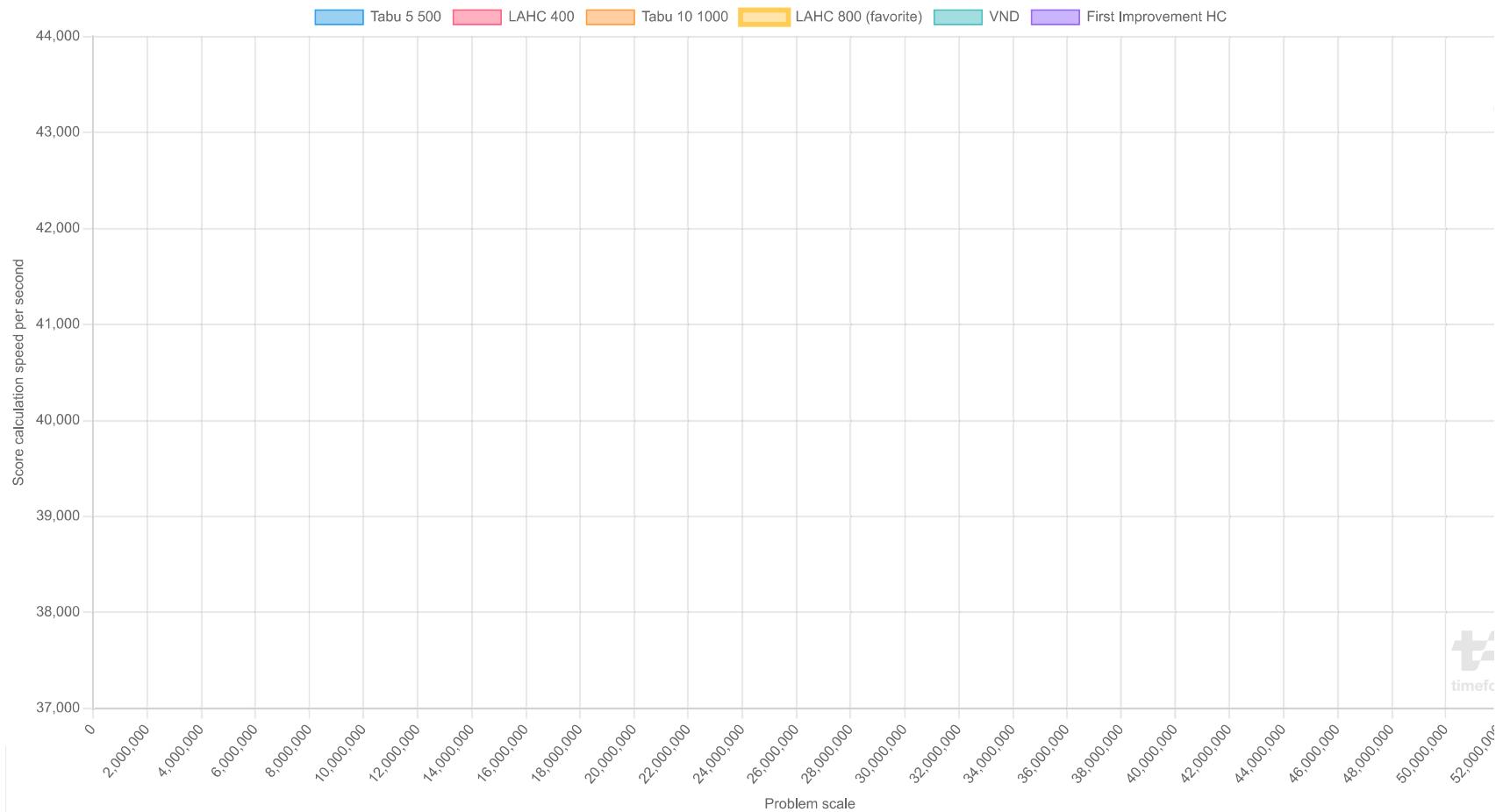
## Performance summary

Score calculation speed    Move evaluation speed    Worst score calculation speed difference percentage    Time spent

Time spent scalability    Best score per time spent

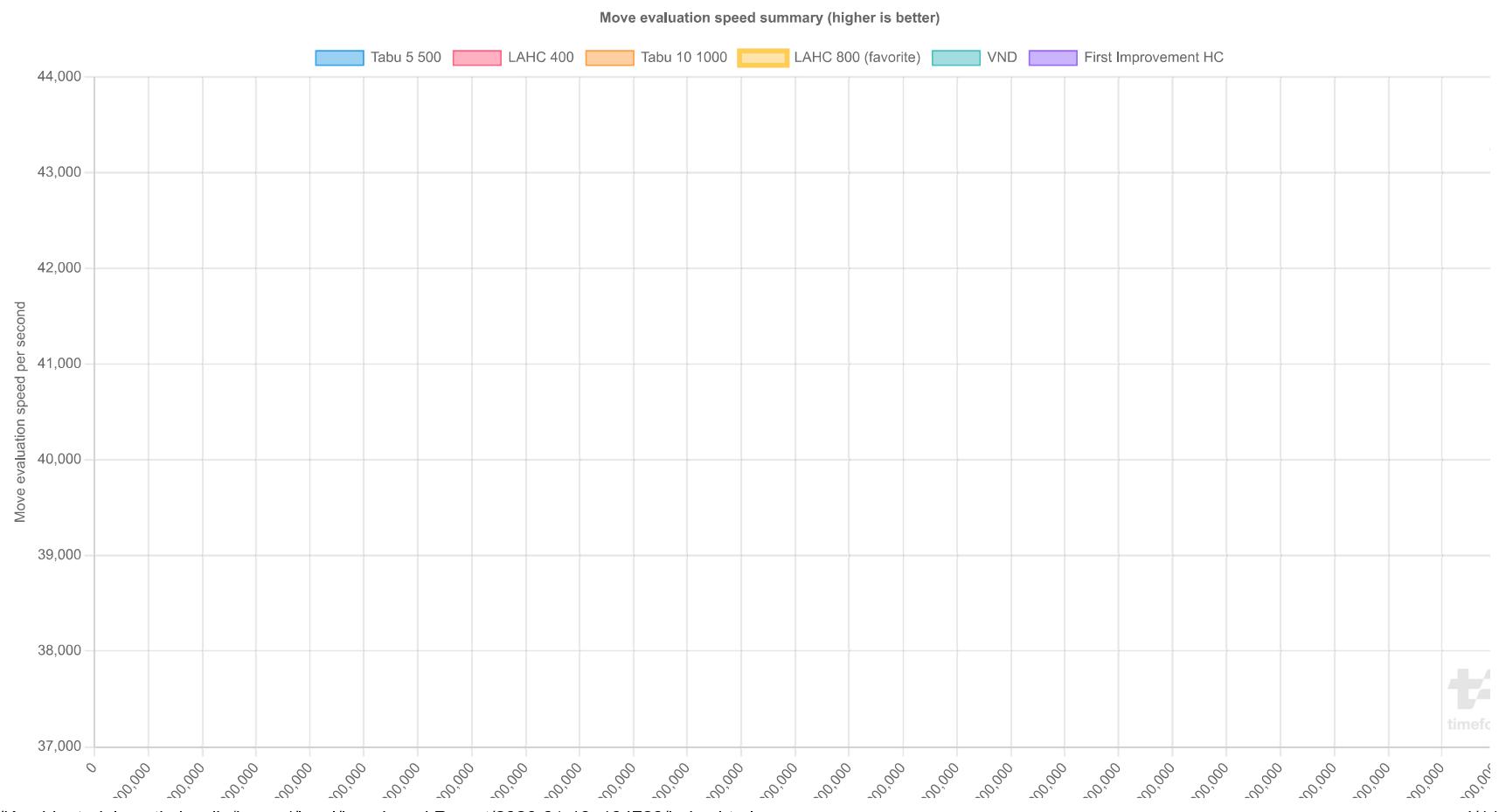
Useful for comparing different score calculators and/or constraint implementations (presuming that the solver configurations do not differ otherwise). Also useful to measure the scalability cost of an extra constraint.

## Score calculation speed summary (higher is better)



<b>Solver</b>	<b>Average</b>	<b>Problem</b>
		airport_auto_example_3
<b>Problem scale</b>	52,002,995	52,002,995
<b>LAHC 800</b> 0 !	43,247/s	43,247/s 0 !
<b>VND</b> 4 !	43,686/s	43,686/s 4 !
<b>First Improvement HC</b> 4 !	43,872/s	43,872/s 4 !
<b>LAHC 400 Entity-focused</b> F	/s	Failed

Useful for comparing different score calculators and/or constraint implementations (presuming that the solver configurations do not differ otherwise). Also useful to measure the scalability cost of an extra constraint.



2,0<sub>c</sub> 4,0<sub>c</sub> 6,0<sub>c</sub> 8,0<sub>c</sub> 10,0<sub>c</sub> 12,0<sub>c</sub> 14,0<sub>c</sub> 16,0<sub>c</sub> 18,0<sub>c</sub> 20,0<sub>c</sub> 22,0<sub>c</sub> 24,0<sub>c</sub> 26,0<sub>c</sub> 28,0<sub>c</sub> 30,0<sub>c</sub> 32,0<sub>c</sub> 34,0<sub>c</sub> 36,0<sub>c</sub> 38,0<sub>c</sub> 40,0<sub>c</sub> 42,0<sub>c</sub> 44,0<sub>c</sub> 46,0<sub>c</sub> 48,0<sub>c</sub> 50,0<sub>c</sub> 52,0<sub>c</sub>

Problem scale

Solver	Average	airport_auto_example_3
<b>Problem scale</b>	52,002,995	52,002,995
<b>Tabu 5 500</b> 1 !	37,921/s	37,921/s 1 !
<b>LAHC 400</b> 1 !	40,998/s	40,998/s 1 !
<b>Simulated Annealing</b> F	/s	Failed
<b>Great Deluge</b> F	/s	Failed
<b>Tabu 10 1000</b> 3 !	43,730/s	43,730/s 3 !
<b>LAHC 800</b> 0 !	43,247/s	43,247/s 0 !
<b>VND</b> 4 !	43,686/s	43,686/s 4 !
<b>First Improvement HC</b> 4 !	43,872/s	43,872/s 4 !
<b>LAHC 400 Entity-focused</b> F	/s	Failed

## Problem benchmarks

### airport\_auto\_example\_3

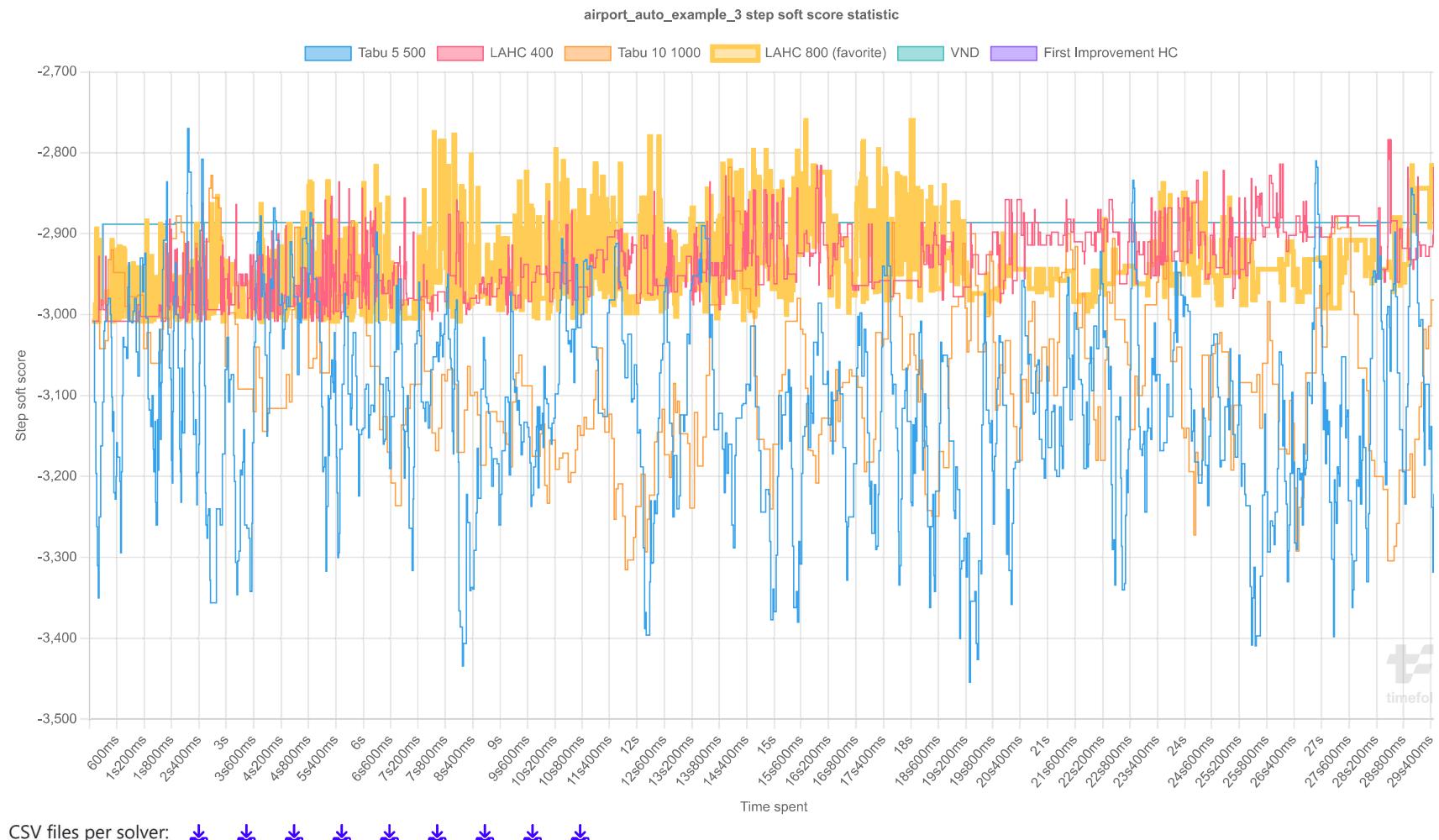
3 benchmarks have failed!

<b>Entity count</b>	4
<b>Variable count</b>	4
<b>Maximum value count</b>	40
<b>Problem scale</b>	52,002,995
<b>Time to load input solution</b>	0.001 s. (1 ms.)
<b>Memory usage after loading input solution</b>	11,806,905 bytes on average

Only the median sub single run of each solver is shown in the statistics below.

Step Score   Best Score   Picked Move Type Best Score Diff   Constraint Match Total Best Score

Constraint Match Total Step Score



## airport\_auto\_example\_3\_Tabu 5 500

Only the median sub single run of each solver is shown in the statistics below.

**Explanation of score (-72hard/-2770soft):****Constraint matches:**

```

-72hard: constraint (Gate type mismatch) has 40 matches:
-3hard: justified with ([null])
-3hard: justified with ([null])
...
-2000soft: constraint (Company terminal mismatch) has 20 matches:
-100soft: justified with ([null])
-100soft: justified with ([null])
...
-770soft: constraint (Total delay) has 20 matches:
-96soft: justified with ([null])
-92soft: justified with ([null])
...
0: constraint (Arrival must finish before departure starts) has 0 matches:
0: constraint (Must assign gate after scheduled time) has 0 matches:

```

**Indictments (top 5 of 40):**

```

-3hard/-142soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-118soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-112soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-108soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-106soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...

```

...

**airport\_auto\_example\_3\_LAHC 400**

Only the median sub single run of each solver is shown in the statistics below.

**Explanation of score (-72hard/-2784soft):****Constraint matches:**

```

-72hard: constraint (Gate type mismatch) has 40 matches:
-3hard: justified with ([null])

```

```
-3hard: justified with ([null])
...
-1800soft: constraint (Company terminal mismatch) has 18 matches:
-100soft: justified with ([null])
-100soft: justified with ([null])
...
-984soft: constraint (Total delay) has 20 matches:
-180soft: justified with ([null])
-102soft: justified with ([null])
...
0: constraint (Arrival must finish before departure starts) has 0 matches:
0: constraint (Must assign gate after scheduled time) has 0 matches:
Indictments (top 5 of 40):
-3hard/-142soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-118soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-108soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-106soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-102soft: indicted with (null) has 2 matches:
-3hard: constraint (Gate type mismatch)
-102soft: constraint (Total delay)
...
```

## airport\_auto\_example\_3\_Simulated Annealing

3 benchmarks have failed!

## airport\_auto\_example\_3\_Great Deluge

3 benchmarks have failed!

## airport\_auto\_example\_3\_Tabu 10 1000

Only the median sub single run of each solver is shown in the statistics below.

```
Explanation of score (-72hard/-2818soft):
  Constraint matches:
    -72hard: constraint (Gate type mismatch) has 40 matches:
      -3hard: justified with ([null])
      -3hard: justified with ([null])
      ...
      -1600soft: constraint (Company terminal mismatch) has 16 matches:
        -100soft: justified with ([null])
        -100soft: justified with ([null])
        ...
        -1218soft: constraint (Total delay) has 20 matches:
          -224soft: justified with ([null])
          -180soft: justified with ([null])
          ...
          0: constraint (Arrival must finish before departure starts) has 0 matches:
          0: constraint (Must assign gate after scheduled time) has 0 matches:
  Indictments (top 5 of 40):
    -3hard/-142soft: indicted with (null) has 3 matches:
      -3hard: constraint (Gate type mismatch)
      -100soft: constraint (Company terminal mismatch)
      ...
      -3hard/-118soft: indicted with (null) has 3 matches:
        -3hard: constraint (Gate type mismatch)
        -100soft: constraint (Company terminal mismatch)
        ...
        -3hard/-108soft: indicted with (null) has 3 matches:
          -3hard: constraint (Gate type mismatch)
          -100soft: constraint (Company terminal mismatch)
          ...
          -3hard/-106soft: indicted with (null) has 3 matches:
            -3hard: constraint (Gate type mismatch)
            -100soft: constraint (Company terminal mismatch)
            ...
            -3hard/-102soft: indicted with (null) has 2 matches:
              -3hard: constraint (Gate type mismatch)
              -102soft: constraint (Total delay)
              ...

```

## airport\_auto\_example\_3\_LAHC 800

Only the median sub single run of each solver is shown in the statistics below.

**Explanation of score (-72hard/-2760soft):****Constraint** matches:

```
-72hard: constraint (Gate type mismatch) has 40 matches:
-3hard: justified with ([null])
-3hard: justified with ([null])
...
-1700soft: constraint (Company terminal mismatch) has 17 matches:
-100soft: justified with ([null])
-100soft: justified with ([null])
...
-1060soft: constraint (Total delay) has 19 matches:
-224soft: justified with ([null])
-96soft: justified with ([null])
...
0: constraint (Arrival must finish before departure starts) has 0 matches:
0: constraint (Must assign gate after scheduled time) has 0 matches:
```

**Indictments** (top 5 of 40):

```
-3hard/-142soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-118soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-106soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-100soft: indicted with (null) has 2 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
-3hard/-100soft: indicted with (null) has 2 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...

```

**airport\_auto\_example\_3\_VND**

Only the median sub single run of each solver is shown in the statistics below.

**Explanation of score (-72hard/-2886soft):****Constraint** matches:

```
-72hard: constraint (Gate type mismatch) has 40 matches:
-3hard: justified with ([null])
-3hard: justified with ([null])
...

```

```

-1900soft: constraint (Company terminal mismatch) has 19 matches:
  -100soft: justified with ([null])
  -100soft: justified with ([null])
  ...
  -986soft: constraint (Total delay) has 21 matches:
    -180soft: justified with ([null])
    -96soft: justified with ([null])
    ...
  0: constraint (Arrival must finish before departure starts) has 0 matches:
  0: constraint (Must assign gate after scheduled time) has 0 matches:
Indictments (top 5 of 40):
  -3hard/-178soft: indicted with (null) has 3 matches:
    -3hard: constraint (Gate type mismatch)
    -100soft: constraint (Company terminal mismatch)
    ...
  -3hard/-118soft: indicted with (null) has 3 matches:
    -3hard: constraint (Gate type mismatch)
    -100soft: constraint (Company terminal mismatch)
    ...
  -3hard/-112soft: indicted with (null) has 3 matches:
    -3hard: constraint (Gate type mismatch)
    -100soft: constraint (Company terminal mismatch)
    ...
  -3hard/-108soft: indicted with (null) has 3 matches:
    -3hard: constraint (Gate type mismatch)
    -100soft: constraint (Company terminal mismatch)
    ...
  -3hard/-106soft: indicted with (null) has 3 matches:
    -3hard: constraint (Gate type mismatch)
    -100soft: constraint (Company terminal mismatch)
    ...
  ...

```

## airport\_auto\_example\_3\_First Improvement HC

Only the median sub single run of each solver is shown in the statistics below.

**Explanation of score (-72hard/-2886soft):**

**Constraint** matches:

```

-72hard: constraint (Gate type mismatch) has 40 matches:
  -3hard: justified with ([null])
  -3hard: justified with ([null])
  ...
  -1900soft: constraint (Company terminal mismatch) has 19 matches:
    -100soft: justified with ([null])
    -100soft: justified with ([null])
    ...
  -986soft: constraint (Total delay) has 21 matches:

```

```

-180soft: justified with ([null])
-96soft: justified with ([null])

...
0: constraint (Arrival must finish before departure starts) has 0 matches:
0: constraint (Must assign gate after scheduled time) has 0 matches:
Indictments (top 5 of 40):
-3hard/-178soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-118soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-112soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-108soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
-3hard/-106soft: indicted with (null) has 3 matches:
-3hard: constraint (Gate type mismatch)
-100soft: constraint (Company terminal mismatch)
...
...

```

## airport\_auto\_example\_3\_LAHC 400 Entity-focused

3 benchmarks have failed!

## Solver benchmarks

Tabu 5 500	1 !	LAHC 400	1 !	Simulated Annealing	F	Great Deluge	F	Tabu 10 1000	3 !
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LAHC 800	0 !	VND	4 !	First Improvement HC	4 !	LAHC 400 Entity-focused	F
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```

<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<solver xmlns="https://timefold.ai/xsd/solver">
  <environmentMode>PHASE_ASSERT</environmentMode>
  <monitoring>
    <metric>STEP_SCORE</metric>
    <metric>BEST_SCORE</metric>
    <metric>PICKED_MOVE_TYPE_BEST_SCORE_DIFF</metric>
    <metric>CONSTRAINT_MATCH_TOTAL_BEST_SCORE</metric>
    <metric>CONSTRAINT_MATCH_TOTAL_STEP_SCORE</metric>
  </monitoring>
</solver>

```

```

</monitoring>
<solutionClass>lv.lu.eztf.dn.combopt.evrp.domain.EVRPsolution</solutionClass>
<entityClass>lv.lu.eztf.dn.combopt.evrp.domain.Gate</entityClass>
<entityClass>lv.lu.eztf.dn.combopt.evrp.domain.Visit</entityClass>
<scoreDirectorFactory>
  <constraintProviderClass>lv.lu.eztf.dn.combopt.evrp.solver.ConstraintStreamCostFunction</constraintProviderClass>
</scoreDirectorFactory>
<termination>
  <secondsSpentLimit>30</secondsSpentLimit>
</termination>
<constructionHeuristic/>
<localSearch>
  <unionMoveSelector>
    <subListChangeMoveSelector/>
    <listChangeMoveSelector/>
    <listSwapMoveSelector/>
    <kOptListMoveSelector/>
  </unionMoveSelector>
  <acceptor>
    <valueTabuSize>5</valueTabuSize>
  </acceptor>
  <forager>
    <acceptedCountLimit>500</acceptedCountLimit>
  </forager>
</localSearch>
</solver>

```

## Environment Information

<b>Name</b>	2026-01-18_134729
<b>Aggregation</b>	false
<b>Failure count</b>	3
<b>Starting timestamp</b>	2026. gada 18. janv. 13:47:29
<b>Warm-up time spent</b>	0.030 s. (30 ms.)
<b>Parallel benchmark count / available processors</b>	1 / 8
<b>Benchmark time spent</b>	09:03.586 s. (543,586 ms.)
<b>Environment mode</b>	PHASE_ASSERT
<b>Logging level for ai.timefold.solver.core</b>	DEBUG
<b>Solver ranking class</b>	TotalScoreSolverRankingComparator

<b>VM max memory (as in -Xmx but lower)</b>	4,217,372,672 bytes
<b>Timefold Solver version</b>	Community Edition v1.27.0
<b>Java version</b>	Java 17.0.16 (Eclipse Adoptium)
<b>Java VM</b>	Java OpenJDK 64-Bit Server VM 17.0.16+8 (Eclipse Adoptium)
<b>Operating system</b>	Windows 11 amd64 10.0
<b>Report locale</b>	Unknown
<b>Report timezone</b>	Europe/Riga

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