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Crew scheduling of light rail transit in Hong Kong: From modeling to implementation.

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Summary: This work concerns the problem of crew scheduling for the Hong Kong Light Rail Transit (LRT), which together with Heavy Rail Transit, makes up the two divisions of Kowloon–Canton Railway Corporation. As of early 1996, LRT operates eight routes, two train depots and 57 stations on its operational network. It is rapidly expanding on routes, capacities and territorial coverage, hence pressing needs for timely constructions of crew schedules whenever passenger demand variations necessitate modifications in train timetables, typically every 3–4 months. Computer-assisted manual solutions from old software can take up to 1 month of painstaking work. Our project aims at automating this complex schedule construction, adopting a novel optimization modeling approach amenable for decomposition into separate solution stages by network and heuristics algorithms. The entire crew schedule can be constructed iteratively in less than half an hour on a PC. The implementation runs as a decision support tool, with contributions of an overwhelming reduction in human effort in crew schedule construction and a feasible and better (higher productivity rate) schedule, with possible further manual improvements that can be made.

MSC:

[90B35](#) Deterministic scheduling theory in operations research

[90B90](#) Case-oriented studies in operations research

Cited in **5** Documents

Keywords:

[crew scheduling](#); [optimization modeling](#); [heuristics](#)

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References:

- [1] Ball, M.; Bodin, L.; Dial, R., A matching based heuristics for scheduling mass transit crews and vehicles, *Transportation science*, 17, 4-31, (1983)
- [2] Ball, M., Bodin, L. and Greenberg, J., Enhancement to the RUCUS 2 crew scheduling system. In *Computer Scheduling of Public Transport*, Vol. 2, ed. J. M. Rousseau. North-Holland, Amsterdam, 1985, pp. 279-293
- [3] *BUSMAN: Bus Management Software System*, University of Salford, England, 1991
- [4] Carraresi, P.; Gallo, G., Network models for vehicle and crew scheduling, *European journal of operational research*, 16, 139-151, (1984) · [Zbl 0537.90053](#)
- [5] Chan, E. C. H., *Computerized Crew Scheduling System. Report to LRT-KCRC*. 1996, 34 pp
- [6] Desrochers, M. and Rousseau, J. M., *Computer-Aided Transit Scheduling*. Lecture notes in Economics and Mathematical Systems 386. Springer-Verlag, Berlin, 1992 · [Zbl 0790.90030](#)
- [7] Desrochers, M.; Soumis, F., A column generation approach to the urban transit crew scheduling problem, *Transportation science*, 23, 1-13, (1989) · [Zbl 0668.90043](#)
- [8] Desrosiers, J., Dumas, Y., Solomon, M. M. and Soumis, F., Time-constrained routing and scheduling. In *Network Routing, Handbooks in Operations Research and Management Science*, Vol. 8, eds. M. Ball et al. North-Holland, Amsterdam, 1995, pp. 35-139 · [Zbl 0861.90052](#)
- [9] Lessard, R., Rousseau, J. M. and Dupuis, D., HASTUS I: A mathematical programming approach to the bus driver scheduling problem. In *Computer Scheduling of Public Transport: Urban Passenger Vehicle and Crew Scheduling*, ed. A. Wren. North-Holland, Amsterdam, 1981, pp. 255-268
- [10] Rousseau, J. M., Lessard, R. and Blais, J. Y., Enhancements to the HASTUS crew scheduling algorithm. In *Computer Scheduling of Public Transport*, Vol. 2, ed. J. M. Rousseau. North-Holland, Amsterdam, 1985, pp. 295-310

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