

CHMC Advanced: Optimal airports

January 11, 2020

The following was one of the 2001 COMAP High school modeling competition questions:

Problem A: Design of an Airline Terminal

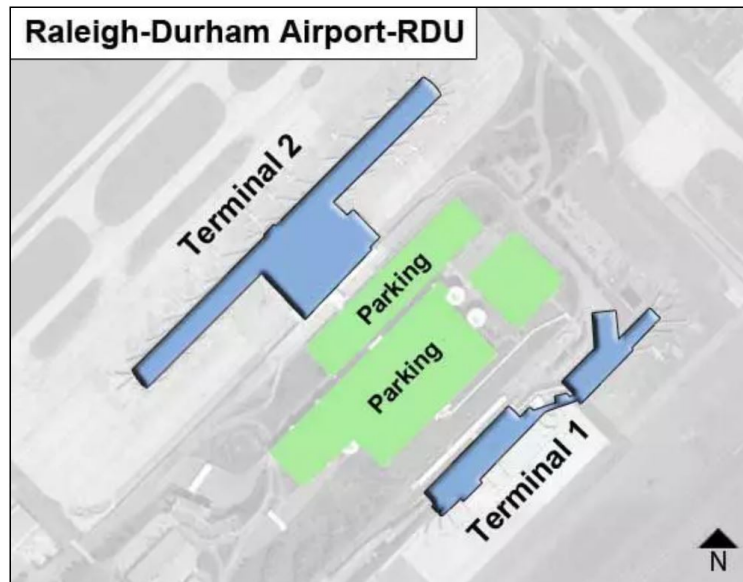
The design of airline terminals varies widely. The sketches below show airline terminals from several cities.

The designs are quite dissimilar. Some involve circular arcs; others are rectangular; some are quite irregular. Which is optimal for operations? Develop a mathematical model for airport design and operation. Use your model to argue for the optimality of your specified design. Explain how it would operate.

Below is the current RDU airport design, and on the back of this worksheet you can find some other airport designs from 2001.

Here are some leading questions:

1. How would you define “optimal for operations”? See how many aspects you can come up with.
2. What are other aspects of an airport, different than the design, that could affect optimality?
3. What are examples of very non-optimal airports?



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¹Taken from <https://www.ifly.com/raleigh-durham-international-airport/terminal-map>.



Boston-Logan International



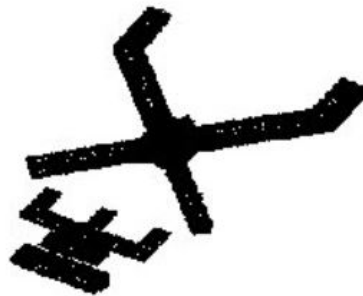
Munich International



Charlotte/Douglas International



Ronald Reagan Washington National



Pittsburgh International