

### Transport of the Future?

The concept of personal rapid transit (PRT) has existed for many years. Initially such ideas appeared in the context of futuristic visions offered by science fiction authors. More recently, however, PRT is beginning to be seen as an innovative answer to some of today's pressing transport problems.

### Independence and Knowledge

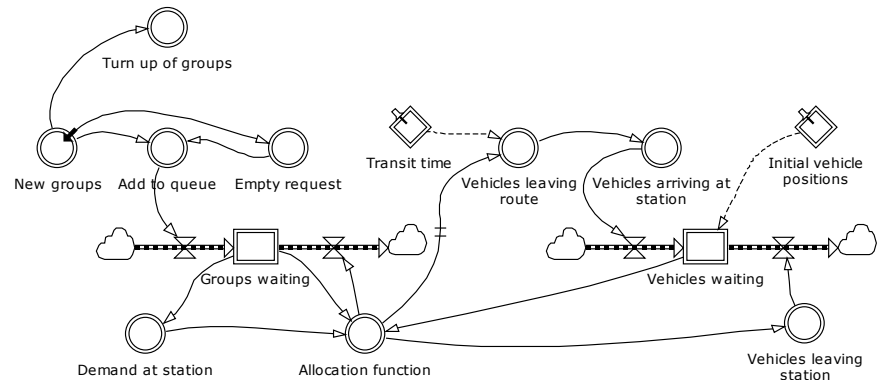
One of our clients became interested in how PRT might solve a very specific transport issue and asked Analytical Decisions to provide expert assistance. Our independence coupled with relevant knowledge allowed us to form an impartial view of the merits and disadvantages of a proposal.

The client asked us to provide further help in a competitive tendering process to assess a number of PRT system designers. Our particular area of interest was in connection with controls systems, software development and overall system performance.

### Lateral Thinking

Of course, since there is only limited experience in the operation of real PRT systems, we had to develop an approach to model the performance of an entire PRT network.

The key to such a system is



Part of the System Dynamics-based PRT model

the management of empty vehicles—ensuring that they are available wherever the passenger demand is. This is exactly the same issue that faces DCV (destination coded vehicle) systems, about which Analytical Decisions has considerable modelling and system analysis experience. This allowed us to create, very quickly, a system-wide model of the PRT network as applied to our client's situation.

### Modelling Approach

The maturity of the proposed systems was such that detailed simulations were not appropriate: in some cases the equipment had yet to be designed and, in all cases, details of layouts, etc had still to be finalised. Consequently a flow-based model (as distinct from a discrete event model) was developed, using the System Dynamics technique. This was sufficient to provide some

discrimination between proposals and to compare generic PRT systems with the current road-based services.

Using the model, combined with survey data from existing usage patterns, we were able to estimate passenger waiting times, end-to-end journey times, station and mainline capacities. We were also able to demonstrate the importance of empty vehicle management and the impact of fleet size on overall network performance.

### Insights

While mainline headways are important for assessing ultimate capacity, especially on certain sections of the fully deployed PRT system, they alone were not a good discriminator between the suppliers. Instead, fleet size and station capacities proved to be a more stringent test of the proposals.

### Transport of the Future

As a result of this work, we have a unique insight into the application of PRT systems.

Analytical Decisions has now been retained by our client to work with the preferred PRT supplier to develop and deploy an operational trial system to carry public passengers. This will be the first stage in a plan to replace existing car, mini bus and bus services.

