



# Reducing forestry transport costs with FastTRUCK

Luke Mirowski<sup>1,2</sup> and Mauricio Acuna<sup>1,2</sup>

<sup>1</sup>CRC for Forestry

<sup>2</sup>University of Tasmania

## Introduction

Transporting wood from coupes to mills costs the Australian forest industry \$1.2 million a day. In order to reduce these costs, the CRC for Forestry (CRCF) developed a software system that provides a way for the industry to improve transport planning, thereby reducing transport costs by 10%. FastTRUCK is an operational, tactical and strategic tool, available for use within forestry companies. Using the software, the company can identify and reduce costs across the entire planning spectrum. This includes daily dispatching of trucks, from harvest locations to mills; haulage contract design; fleet configuration on a monthly basis; fleet configuration on an annual basis; and even the performance of outsourced dispatching operations (see Figure 1).

## How FastTRUCK works

Reducing transport costs starts when the company models its current transportation system using FastTRUCK (see Figure 2). The software runs on a desktop computer. Users interact with it through its dashboard: a series of windows that enables them to model, simulate and report on current and optimal transport plans. Most companies already have the information required by FastTRUCK—information on the depots, trucks, coupes, customers and roads, along with product supply and demand information—to produce an optimised transport plan.

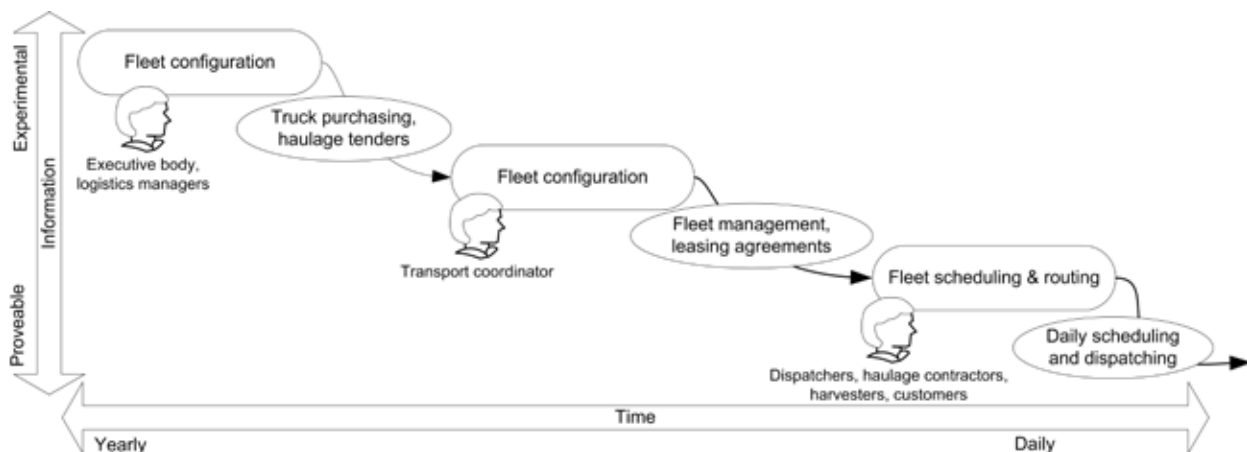
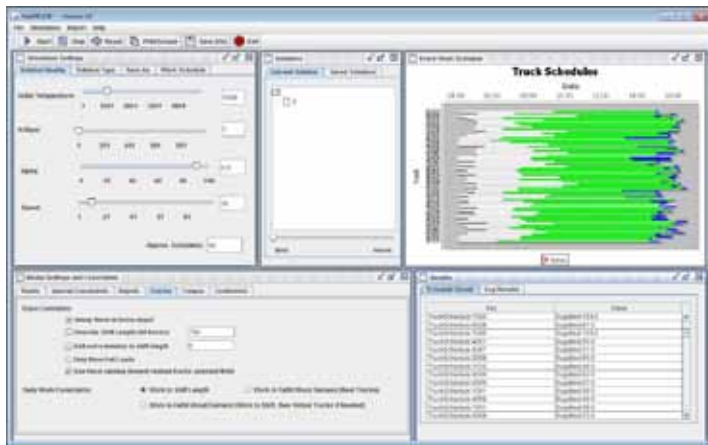


Figure 1. FastTRUCK can improve all stages of the planning process



**Figure 2. FastTRUCK operates on a desktop computer**

The optimised plan is the least-cost way of routing trucks to satisfy the demand for products. It is produced when FastTRUCK analyses the loads, pick-up points and delivery destinations, and matches these to the known truck fleet, constraints and known routes.

When the ‘optimal’ plan is compared with the ‘business as usual’ plan, there is a very large reduction in costs (about 10%), which comes from planning the routing of trucks more effectively, avoiding delays in coupes or mills and running trucks to capacity.

FastTRUCK can be used by a variety of users, ranging from transport managers who decide on how many trucks to hire, through to truck drivers actually carrying out the deliveries. FastTRUCK provides three levels of reporting in Microsoft Excel format:

- The ‘Dispatch schedule’ shows the strategic information, e.g. how many trucks the company needs and what they cost.
- The ‘Truck schedule’ shows the tactical information, e.g. the performance of each truck and how many hours trucks need to work on the day.
- The ‘Stages’ level shows the operational information, e.g. activity at the coupes and mills, and arrival times for the trucks. It also serves as the dispatch information for dispatching of trucks on the day.

Each report contains critical statistics, showing information on the fleet’s performance, i.e. utilisation, the percentage of kilometres used transporting loaded vehicles, loading and unloading times, and delays. All of this is useful for understanding how transportation costs can be reduced.

## Case study: optimising haulage contracts

The CRCF used FastTRUCK to model the transport operations of five Australian companies, effectively showing them what ‘business as usual’ costs and showing how simple changes to transportation can translate into a substantial reduction in costs. We’ve selected one of these companies to use as a case study.

The company operates a decentralised transport system—a typical transportation setup in Australia—meaning there is minimal coordination across the truck fleet, which is operated by haulage contractors.

Truck utilisation was the first issue dealt with on behalf of the company. There are many factors to consider when scheduling trucks, so the potential for human error is high. Sometimes, this means trucks are sent to harvest locations or mills when loading and unloading equipment is already in use, causing delays throughout the entire day.

FastTRUCK was used to make recommendations for haulage contract design. By scheduling trucks to travel to harvest locations and mills only when loading and unloading equipment was available, delays were avoided, making the trucks about 9% more productive over the course of their shifts (see Table 1).

**Table 1. FastTRUCK was used to make recommendations for haulage contract design, increasing productivity for each truck**

	Current fleet	Optimised fleet	Utilisation increased
Truck utilisation	77%	79%	2%
Utilisation over shift	54%	63%	9%

One of the benefits of using FastTRUCK is that it can explore ‘what if’ changes to the company’s transport plans, to show the ‘before and after’ effects. For the same company, we were able to use this feature to explore changes to their strong contractual links between haulage and harvest contractors.

When we removed the ‘contractual constraints’ using FastTRUCK, we showed how truck fleet size could be reduced by 15% across all locations (see Table 2).

**Table 2. FastTRUCK was used to show the difference between optimisation and 'business as usual', enabling the company to model current operations, and then remove constraints that have existed**

	<b>Current fleet</b>	<b>Optimised fleet</b>	<b>Number reduced</b>	<b>Percentage reduced</b>
Location A	30	25	5	17%
Location B	44	44	0	0%
Location C	49	34	15	31%
Location D	21	19	2	10%
<b>Overall</b>	<b>144</b>	<b>122</b>	<b>22</b>	<b>15%</b>

For this company, when FastTRUCK was used to explore a range of scenarios, cost reductions flowed from the increased truck utilisation and reduced fleet size; because of commercial-in-confidence surrounding the cost-model, the exact figures cannot be shown here.

FastTRUCK was used to show how this company's haulage contracts could be redesigned to reduce costs from an operations point of view. However, realising the cost savings on a daily basis would mean considering a move towards a centrally planned system, whereby haulage contractors use FastTRUCK to coordinate truck movements.

FastTRUCK has been developed directly with the Australian industry and has already overcome major obstacles to its acceptance and use within the industry. Moving forward, FastTRUCK has already garnered industry support for 'live trials', with analysis and reporting on the results of these trials anticipated within the next 12 to 18 months.

## Take-home messages

- With transportation costing the industry \$1.2 million per day, log transport planning is highly important to the Australian forest industry. FastTRUCK can reduce this cost by 10% by:
  - demonstrating the benefits of investing in transport planning systems and encouraging forestry companies to move to planned transport systems
  - enabling cost reductions across the entire transport planning spectrum.
- Using FastTRUCK to reduce costs will enable a more competitive Australian forest industry.

## Organisations supporting this research

Hancock Victoria Plantations (HVP), Forests New South Wales (FNSW), Forestry Tasmania, Australian Blue Gum Plantations (ABP), Gunns, and Asset.

## More information

### CRC for Forestry website:

<http://www.crcforestry.com.au/research/programme-three/index.html>

### Project scientists:

Luke Mirowski: [luke.mirowski@utas.edu.au](mailto:luke.mirowski@utas.edu.au),

Mauricio Acuna: [mauricio.acuna@utas.edu.au](mailto:mauricio.acuna@utas.edu.au)

[www.youtube.com/watch?v=gQPIbOvmZRc&feature=youtu.be](http://www.youtube.com/watch?v=gQPIbOvmZRc&feature=youtu.be)