

Carrier bid optimisation



If you are a shipper contracting out a large number of consignments, possibly full or part vehicle loads or airfreight, you will face issues such as:

- Which contractors should I use, for what consignments, at which despatch locations?
- What is the saving in cost from the current operation?
- If a contractor offers volume discounts to certain areas, how does that affect the best combination of carriers?
- If I set a minimum and maximum of number of carriers by despatch location, how does that affect the solution?

Major shippers, such as international manufacturers or 4PLs, face complex calculations when trying to determine the best combination of carriers. Carriers may offer quotations for only part of an RFQ and may give volume discounts for bundles of loads and have different levels of performance. We use the Infor Transportation Procurement tool (formerly known as CAPS Bidpro) to guide clients through the bidding process and to quantify the many possible scenarios a shipper may face.



Data gathering

The first step is to establish the volume base against which carriers will bid. This is likely to be based on historic volumes, possibly overlaid with a forecast. Performance measures, such as % on-time or EDI capability, also need to be set at this stage. Potential carriers can be issued with a Microsoft Access or Excel template along with an RFQ, which will determine the structure of the bid responses. This de-skills data collection and allows responses to be loaded directly into the system.

The screenshot shows a Microsoft Excel spreadsheet titled "BidDemo(BIDIT).xls". The active sheet is "Shipper Load Requirements". The table contains the following data:

ID	Type	FromID	ToID	ShipperID	Shipments
SHIP1014	Inbound	Genk	CWW-GE2	SHIP01	18
SHIP1015	Inbound	Genk	DAFE S1	SHIP01	6
SHIP1016	Inbound	Genk	DAGENH1	SHIP01	23
SHIP1017	Inbound	Genk	DALPHI1	SHIP01	26
SHIP1018	Inbound	Genk	DALPHI2	SHIP01	6
SHIP1019	Inbound	Genk	DEUTSC1	SHIP01	24
SHIP1020	Inbound	Genk	DR FRA1	SHIP01	34
SHIP1021	Inbound	Genk	DR FRA2	SHIP01	24
SHIP1022	Inbound	Genk	DRAFTE1	SHIP01	4
SHIP1023	Inbound	Genk	DRAFTE2	SHIP01	47
SHIP1024	Inbound	Genk	DUEREN1	SHIP01	35

Carrier bids can be handled in a wide variety of ways, such as a cost per shipment, a cost per mile or using a custom table or formula. Additional charges, such as for driver delays or out of hours deliveries, can also be specified. Volume discounts can be used, and may be applied to all volumes or just incremental volumes. Deficit rating can also be used, where the system checks the next higher weight break to determine whether sending a shipment at that rate will reduce the overall charge.

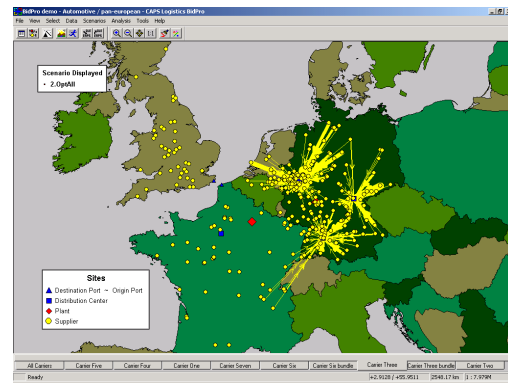
Analysing carrier bids

A model can then be set up containing the despatch points, destination locations, volumes shipped and carrier responses. Typically, the analysis process would start with establishing the total cost of the shipments in the RFQ, which provides a baseline against which other scenarios can be compared.

A scenario manager allows different carriers to be added in to compete against each other and for different constraints to be added or removed. For example, penalties may have been attached to carriers that could not meet all the performance measures, so scenarios may be run including or excluding these. Also, a scenario may have given a large amount of work to one carrier, which may leave the shipper vulnerable. An additional scenario could then be run with a minimum number of carriers per site, to establish the additional cost. Alternatively, a scenario may have given a large number of carriers to a site, which would be difficult to manage. An additional scenario could then be run with a maximum number of carriers per site.

Optimisation

When a scenario has been set up, the problem is sent to CPLEX, a proprietary MILP solver, which is embedded within the system. When the solver has reached the optimum solution, the allocation of shipments to carriers are displayed graphically for ease of understanding. The cost of the solution can also be viewed in summary and in detail, with extensive reports by carrier and consignment.



It is likely that the negotiation would go through a number of stages, as carriers' bids are analysed and discussions continue. Additional scenarios in the system allow new optimisations to be run, allowing an informed decision on the best combination of deals.

Carrier	Cost
Carrier Five	£0.00
Carrier Four	£6,771.42
Carrier One	£5,108.46
Carrier Seven	£24,037.53
Carrier Six	£6.85
Carrier Six bundle	£0.00
Carrier Three	£8,539.26
Carrier Three bundle	£0.00
Carrier Two	£2,618.73
Total Cost	£47,082.30
Total Revenue	£0.00
Total Penalty	£0.00
Total Acc.Charge	£0.00
Overall Total Cost	£47,082.30

From	Carrier	To	Total Shipments
From: Kuettedingen	Kurt	To: Frankfurt	1
From: Kuettedingen	Kurt	To: Frankfurt	14
From: Kuettedingen	Kurt	To: Frankfurt	1