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WheelTug plc
Management summary
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Project background

Main goals of the project were:

Completion and validation of the revenue model

- Exact description of benefits (input parameters, calculations and results)
- Differentiation of low cost and full service carrier perspective
- Validation of logic and consistency of the model

Application on KLM case

- Application of KLM publicly available data in the model and computation of expected resulting benefits

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Project deliveries

Revenue model in Excel

- Model for low cost carrier (input parameters, calculations and savings results)
- Model for full service carrier (input parameters, calculations and savings results)
- Model for KLM case (filled publicly available values for KLM)

Management summary in Powerpoint

- Complete project management summary

Management summary in PDF

- Management summary as a leaflet for presentation purposes

Model - overall

- The model shows and calculates **financial benefits** that can be obtained by using WheelTug on **aircraft family Boeing 737 Next Generation per one flight cycle of one aircraft.**
- The model enables **calculation of savings per one cycle based on custom input parameters from airline.** Adjustment of variables to one cycle of one aircraft was chosen in order to obtain more precise values of savings and cover differences among fly routes and airports.
- Additionally, model also shows **results of three scenarios** (pessimistic one - low savings, realistic one - medium savings, most optimistic one - high savings) based on publicly available data. The scenarios differ in input parameters considered in calculations.
- **Four main categories of benefits** were identified – **Fuel savings, Parking stand operations benefits, Maintenance savings and Long-term benefits.** First three categories represent benefits that provide immediate savings after WheelTug system is installed on an aircraft. The last category includes benefits that mature significantly after longer time when the solution is in operation.
- Model is created in **two perspectives – low cost carrier and full service carrier.** As a benchmark for low cost carrier - Ryanair was used. As benchmark for full service carrier - KLM was used.

Model - benefits

Immediate benefits



Fuel savings include benefits that result from reducing jet engines running time during taxi operations. It leads to lesser fuel consumption, which has an impact on direct savings on fuel bill, lower production of carbon dioxide and reduced loading of fuel.



Parking stand operations benefits result predominantly from simplifying pushback process. Pushback tug or tractor is not needed thus expenses for renting it and for paying ramp agent are saved and number of staff needed on an apron is reduced. In addition, probability of injuries is smaller. Simplifying pushback process also leads to time savings that improve aircraft utilization.



Maintenance savings result from reduction of usage of jet engines and reduction of break wear. Benefits are based on the fact, that engines are not predominantly used for taxi operations. Model also considers higher costs of maintenance of auxiliary power unit.

For all these three categories, all input variables requested from an airline and all parameters used in the model are described and also all calculation steps are explained in detail on separated work sheet to ensure better understanding of the model and to provide transparency of results. Each benefit is matched with current costs of the item and expected costs with WheelTug. Difference between those two values is considered as the saving.

Long-term benefits



Long-term benefits represent a category of benefits that have impact after a certain period of time. Calculations of them are based on qualified estimations. They are itemized in a separated worksheet in order to enhance clarity of the model.

Results – airline type perspective

Low cost carrier and full service carrier perspective

Results are shown in USD:

	Full service carrier			Low cost carrier		
Savings scenarios	Low	Medium	High	Low	Medium	High
Immediate savings	282	642	1 578	262	605	1338
Long-term savings	159	515	1 778	109	288	755
Overall savings	441	1 157	3 356	371	893	2 093

Both airline types gain similar immediate savings in comparison of respective scenarios. However, long-term savings steeply rise in perspective of full service carrier, especially in the most optimistic scenario where it is possible to reach more than 10 times higher savings than in the pessimistic scenario. It is expected that WheelTug usage will bring higher savings to full service carriers than to low cost carriers.

Results – KLM case

In KLM case publicly available data were used as input parameters to model expected savings for the carrier.

		Savings scenarios		
		low	medium	high
Category	Description			
Fuel savings	Taxi out fuel costs	\$58,55	\$81,07	\$144,12
	Taxi in fuel costs	\$31,53	\$40,53	\$74,31
	Carbon taxes for CO2 emissions	\$6,36	\$8,58	\$15,42
	Carry cost for taxi delays	\$4,53	\$7,77	\$19,30
	Sum	\$100,96	\$137,95	\$253,15
Parking stand operations benefits	Unused aircraft utilization	\$50,00	\$250,00	\$950,00
	Pushback costs	\$0,00	\$100,00	\$100,00
	Injuries costs	\$29,58	\$29,58	\$29,58
	Sum	\$79,58	\$379,58	\$1 079,58
Maintenance savings	Brake wear	\$31,55	\$31,55	\$31,55
	Maintenance towing	\$3,14	\$3,14	\$3,14
	Engine maintenance due to taxi	\$66,67	\$90,00	\$216,67
	APU maintenance due to taxi	\$0,00	\$0,00	-\$6,20
	Sum	\$101,35	\$124,69	\$245,16
Long-term savings	Long-term savings	\$136	\$491	\$1755
	Sum	\$159	\$515	\$1778
Immediate savings		\$282	\$642	\$1 578
Long-term savings		\$159	\$515	\$1 778
OVERALL SAVINGS		\$441	\$1 157	\$3 356

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