

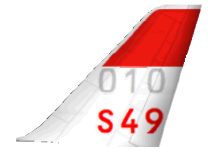
Fuel MI service

The successful implementation of a Fuel Management Information system

Marcel AMHERD, Owner, Eng. UAS, Pilot
Matthias HÄFLIGER, Owner, Eng. UAS, Pilot

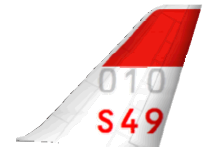
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Agenda

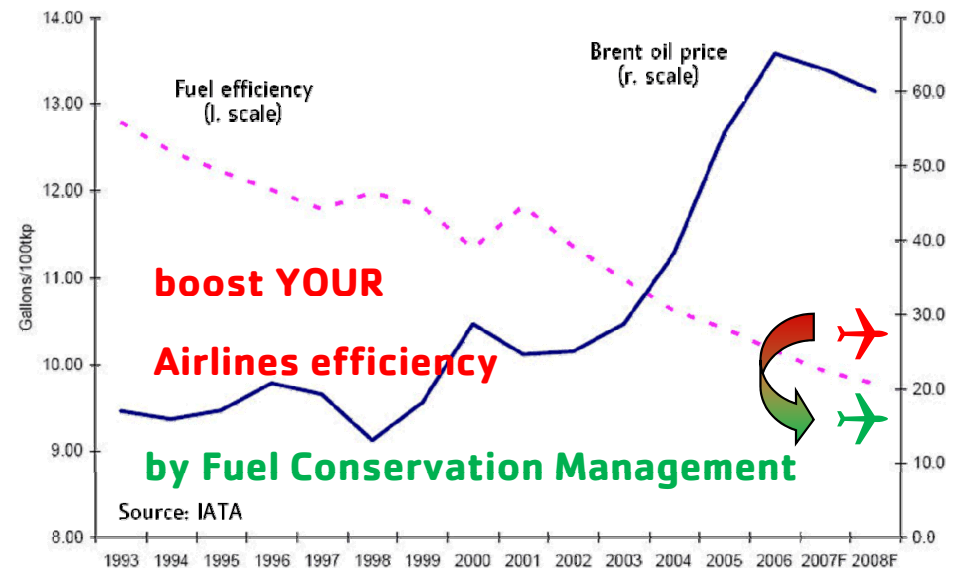


- **Why focus on Fuel conservation**
- Airlines influence on Fuel efficiency
- How to save money on fuel consumption
- Flight Data Mining examples

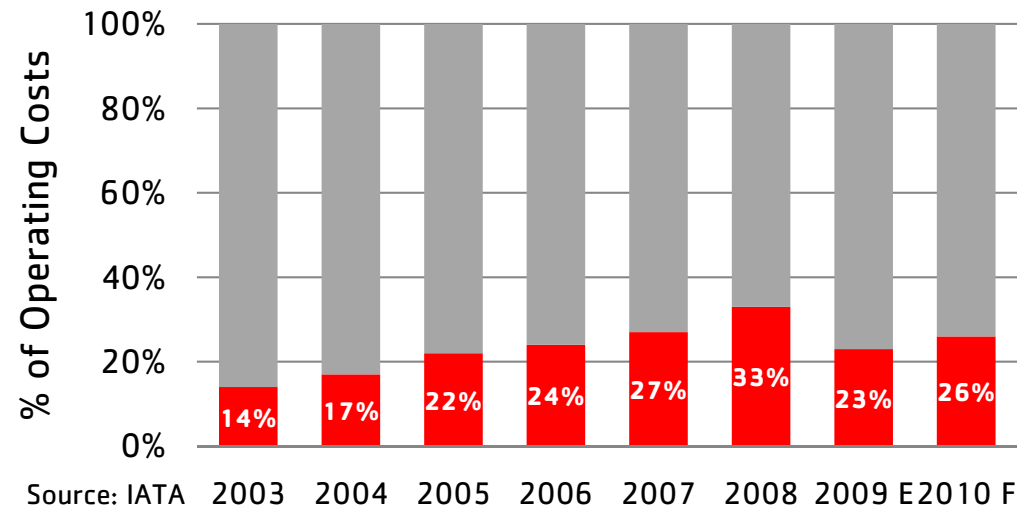
IATA Jet Fuel price history



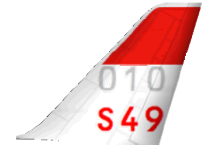
The price of jet fuel has doubled over the past years



In 2010 Fuel costs rise to 26% of total operating costs.



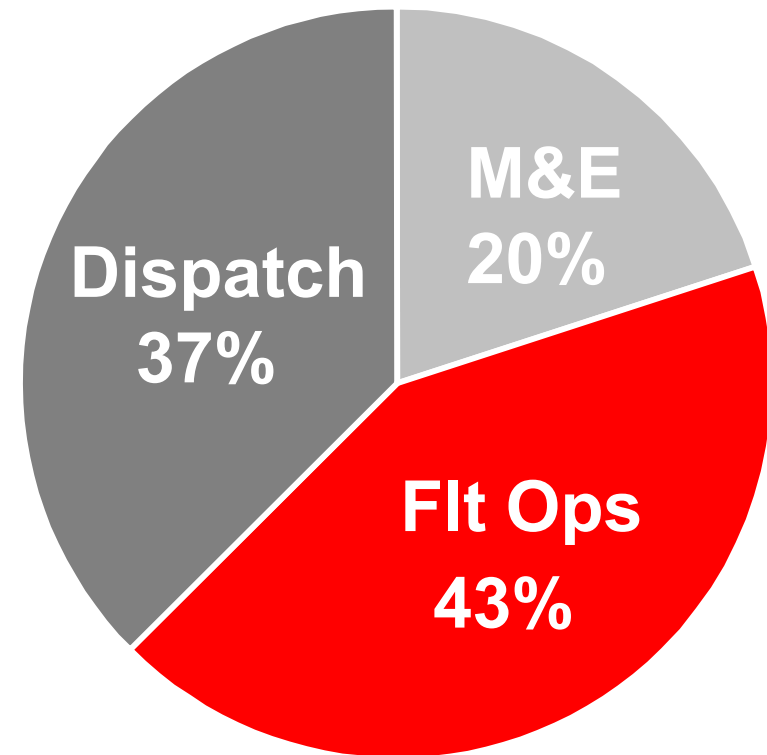
Why focus on Fuel efficiency



- IATA estimates uncovered fuel savings of 5,9%.
- Flight operation is with 43% the single largest field to increase efficiency in fuel, followed by Dispatch and Maintenance & Engineering.

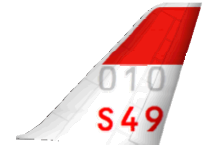


The airline needs a process to **measure and quantify** all three saving areas.



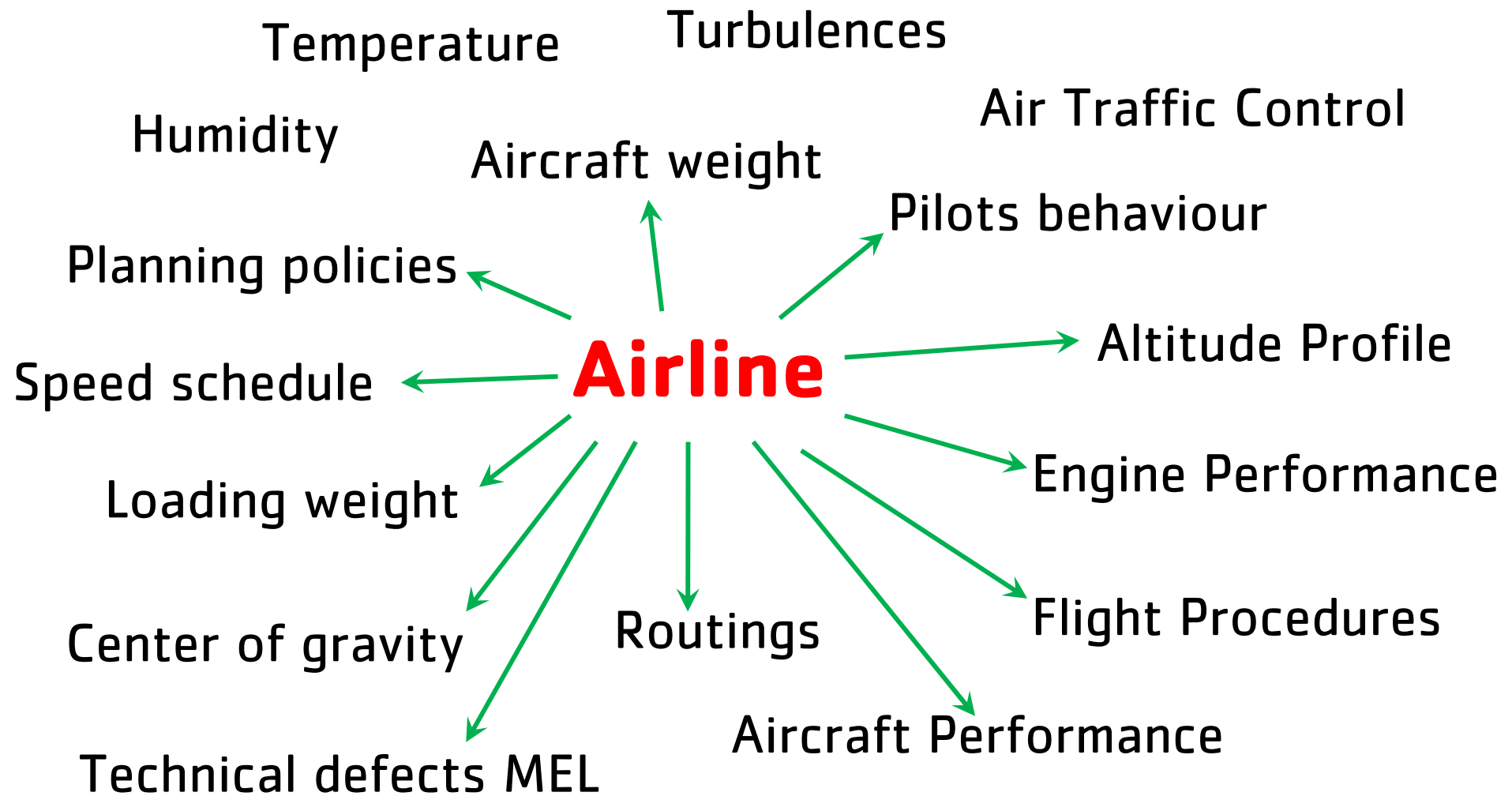
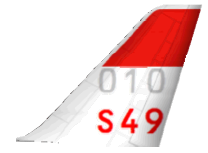
Source: IATA

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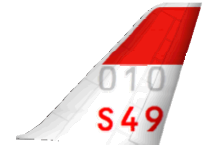


- Why focus on Fuel conservation
- **Airlines influence on Fuel efficiency**
- How to save money on fuel consumption
- Flight Data Mining examples

Influences on Fuel efficiency

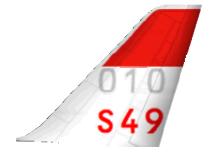


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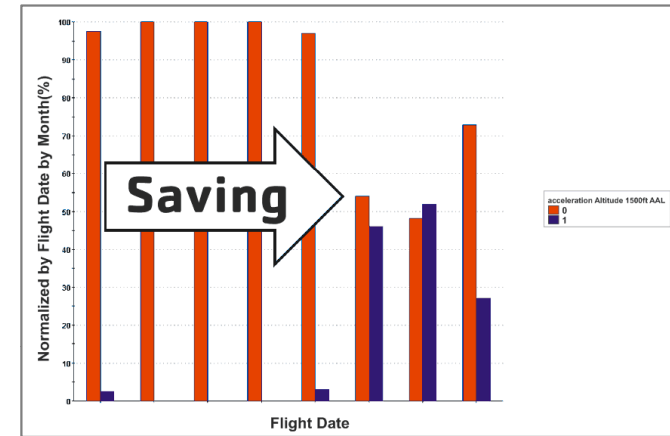
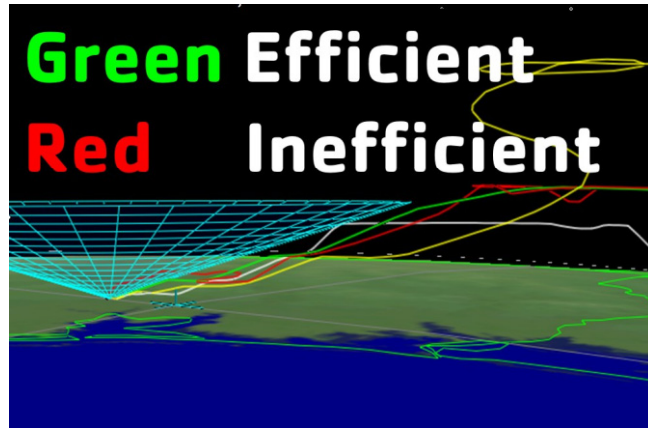


- Why focus on Fuel conservation
- Airlines influence on Fuel efficiency
- **How to save money on fuel consumption**
- Flight Data Mining examples

significant savings proved



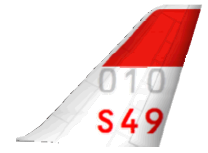
a recent Fuel Conservation Project summary



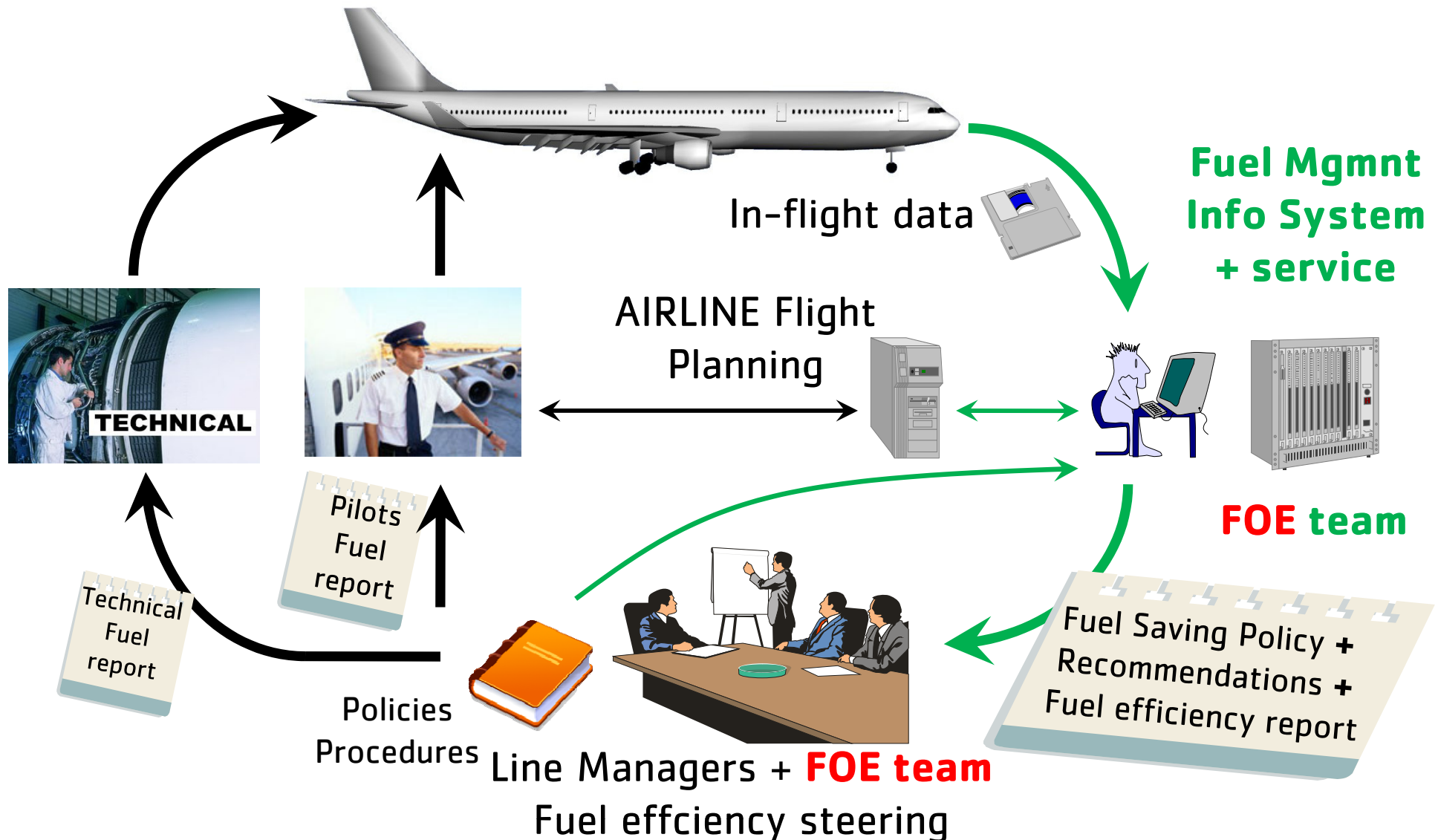
Fuel Conservation process
implemented 15 Operational Changes
at European National Flag Carrier with 70 aircraft

→ **Savings after 12 months = ~10 Mio. US\$ recurring**
(equals 1.5% of Total Fuel Budget 667 Mio US\$)

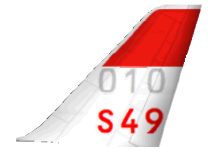
Increase **F**light **O**ps **E**fficiency



Best Practise: Fuel conservation + controlling



measure every flight



Statistical measurement methods

FOE team FUEL CONSERVATION MEASURES

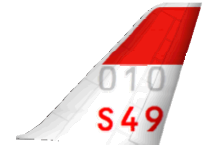
- **Before/after** comparison: typical **history in-flight data** vs. **average of actual in-flight data** (minimum 100 flights and/or equivalent data)
- **Weight reduction savings: IATA and manufacturer** published fuel saving figures

(e.g. 180 US\$/kg/year for A330-300, 210 US\$/kg/year for B777-200)

MANAGEMENT INFORMATION SYSTEM

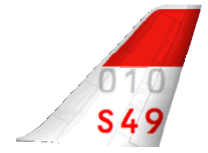
- **fuel factor** = specific fuel burn per distance and revenue payload [ton]
-> how efficient is AIRLINE payload transported

Agenda

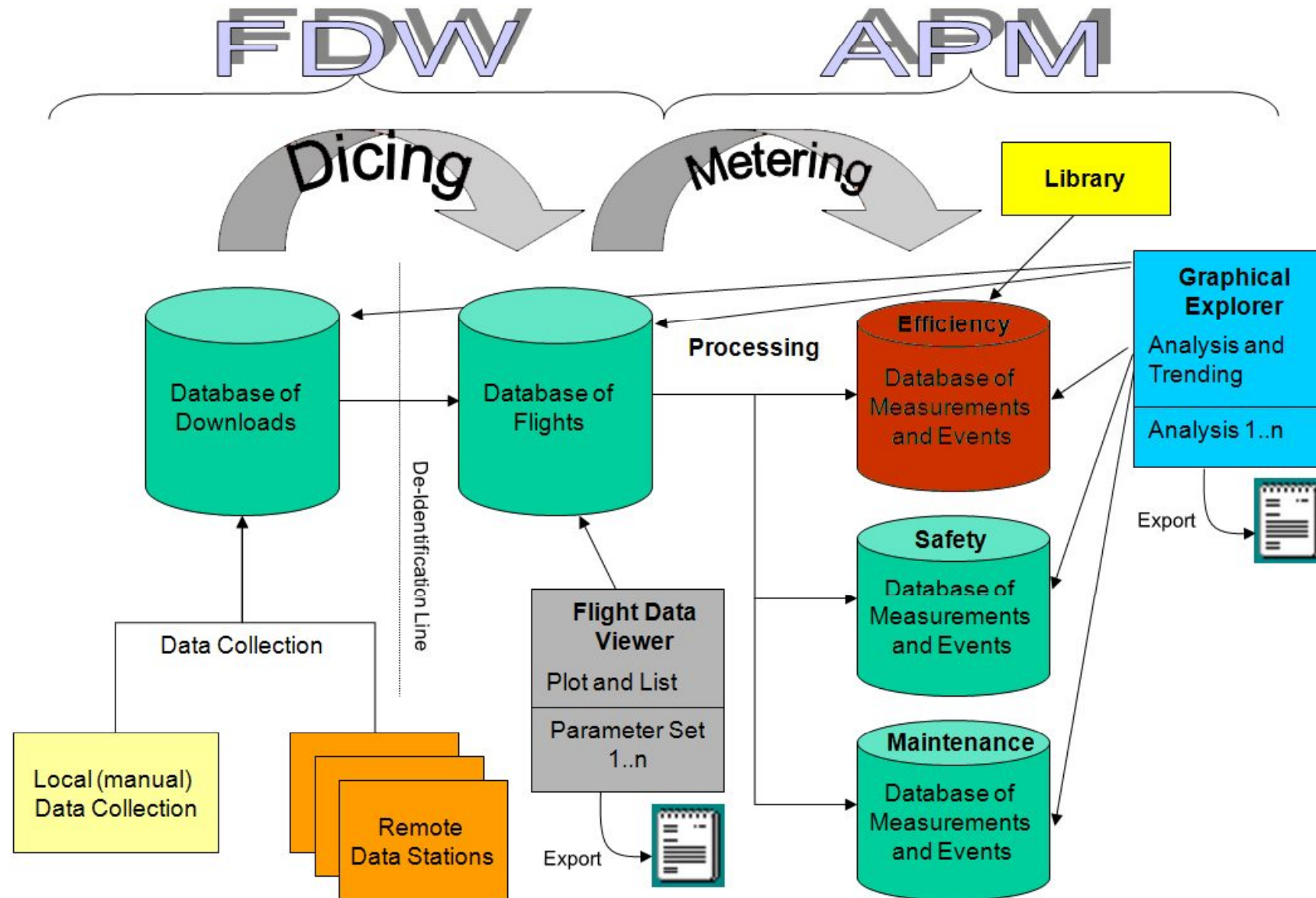


- Why focus on Fuel conservation
- Airlines influence on Fuel efficiency
- How to save money on fuel consumption
- **Flight Data Mining examples**

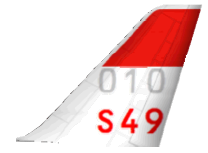
Flight Data Mining



Database with over 3'000 Efficiency Measurements

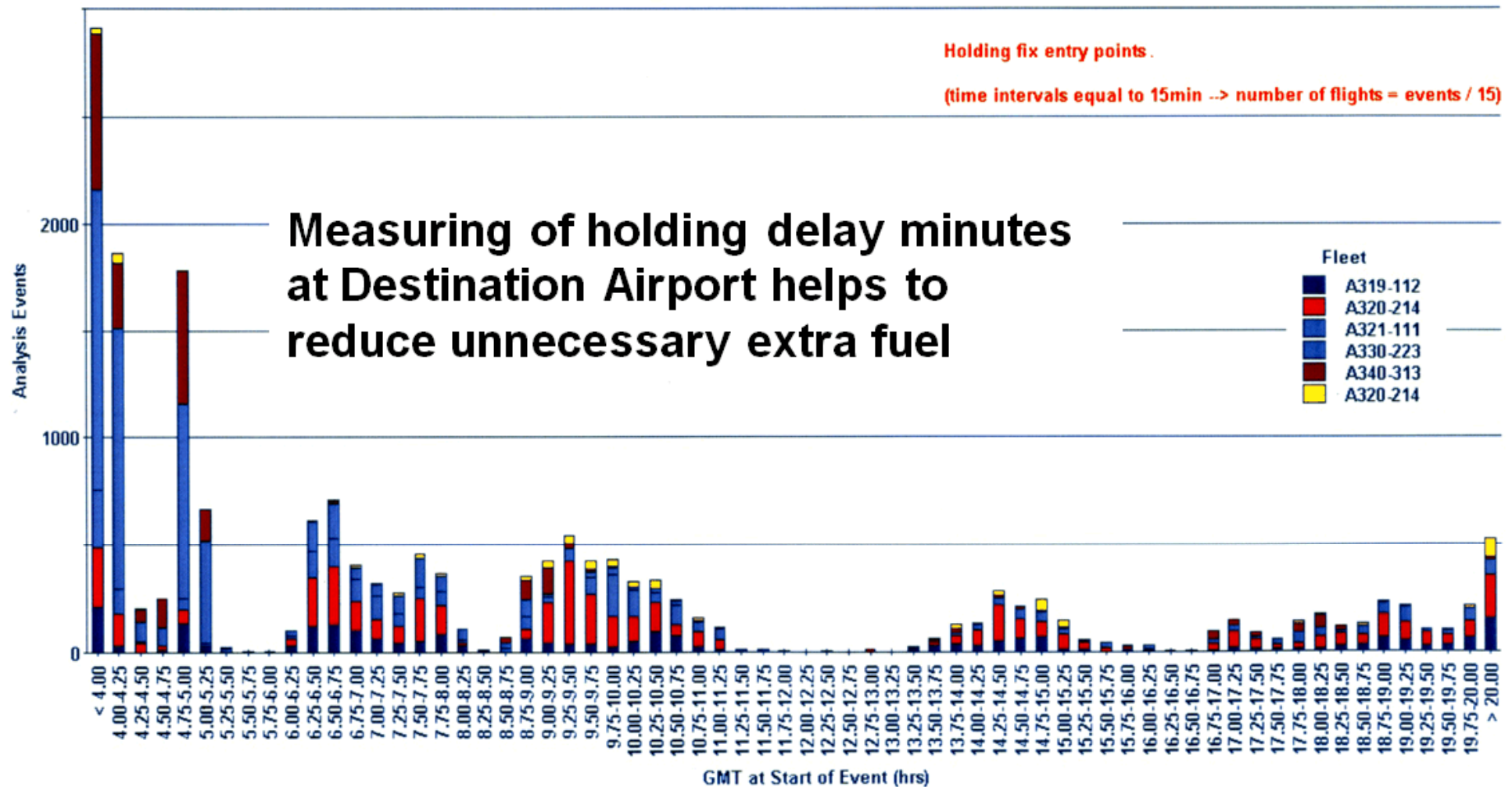


Arrival Holding vs. GMT

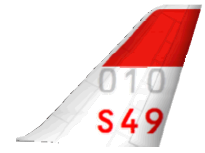


ATFM procedures efficiency analysis

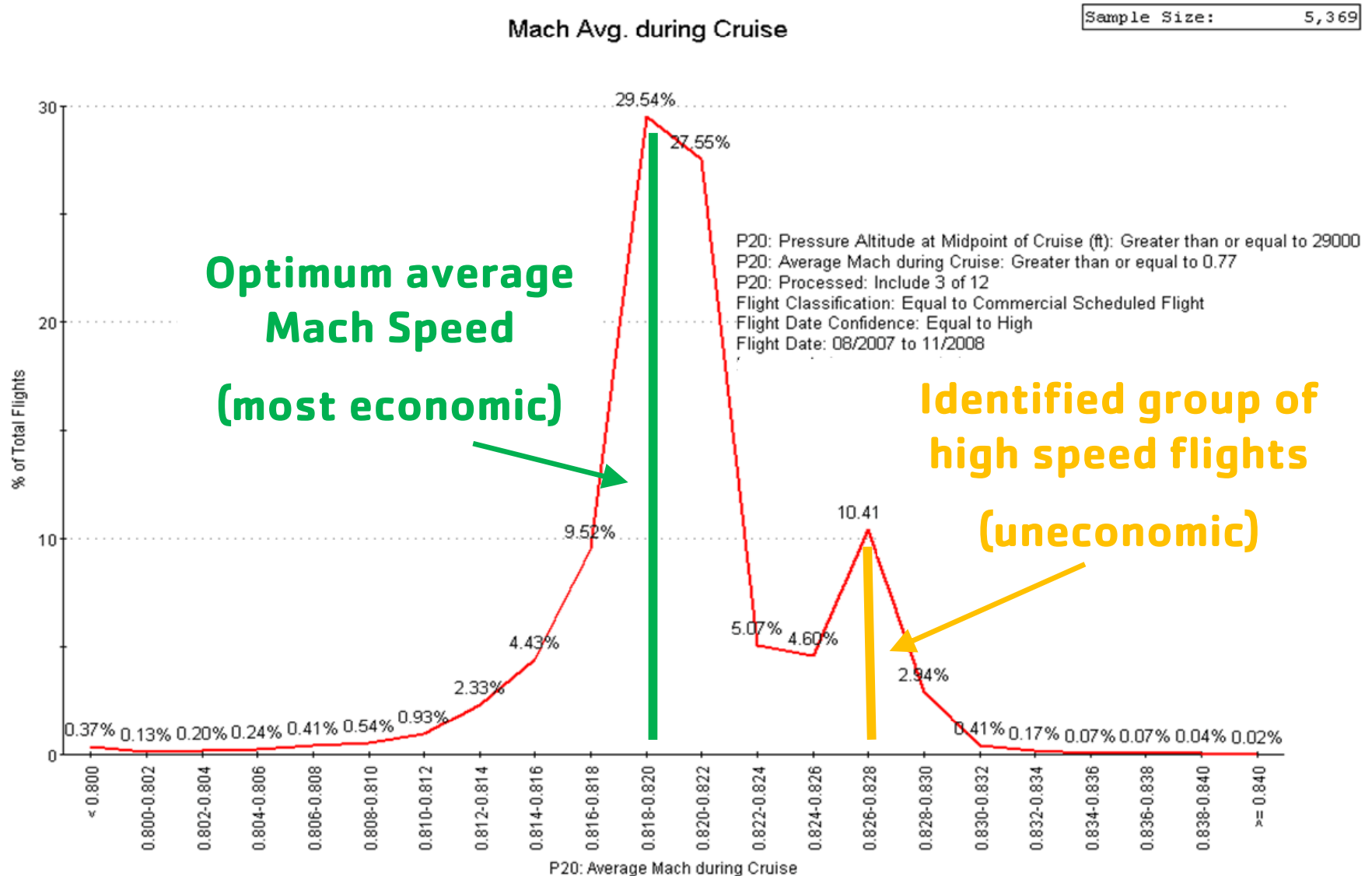
Sample Size: 17200



Cruise Speed Analysis

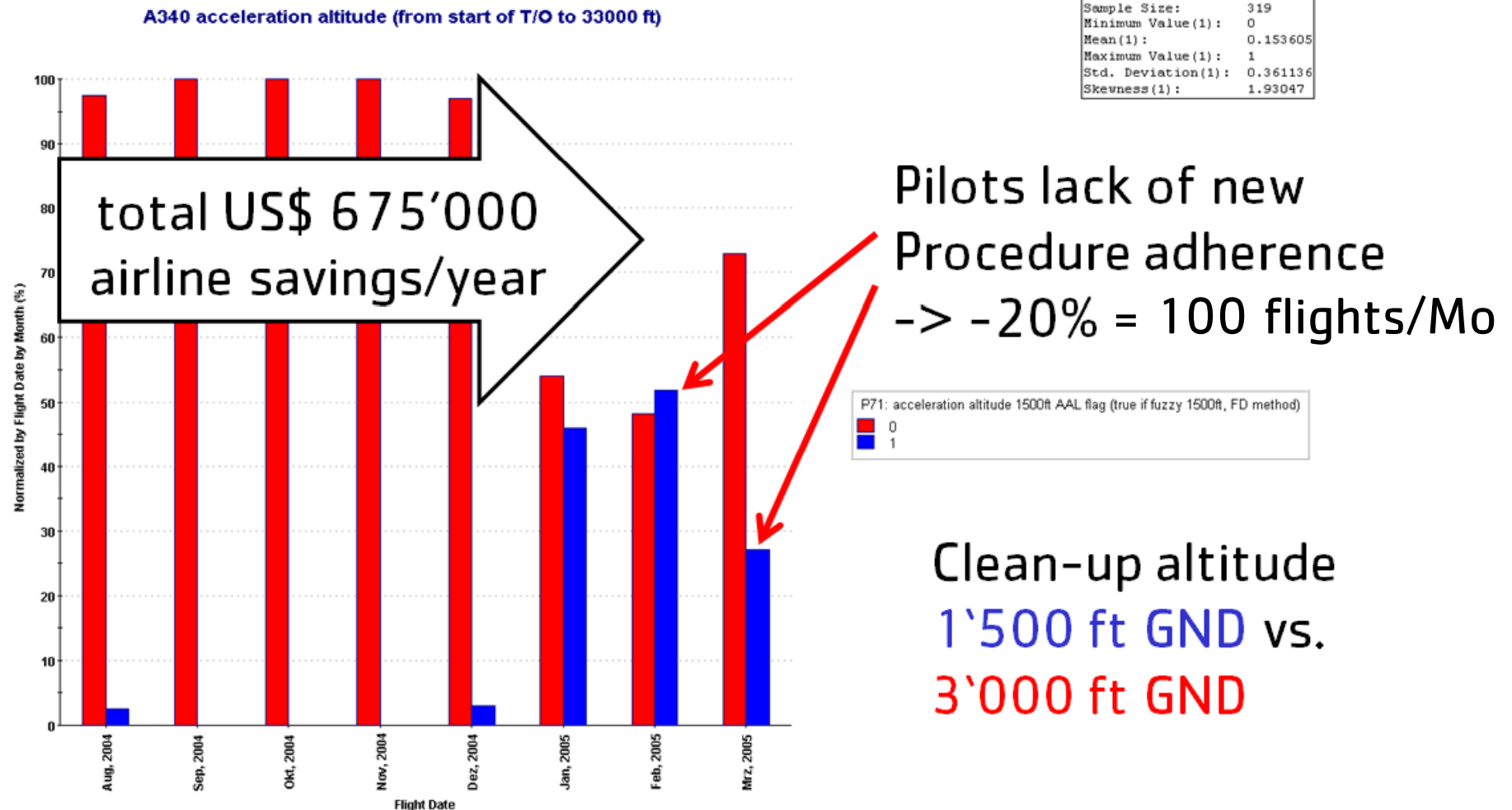


Fuel cost increase due High Speed flying



Flight Procedure change

Measure: Earlier retraction of Flaps to save fuel (flight procedure optimisation)



This saving measure is one out of 15 and the savings accounted for 0.1% of the overall project savings

Flight Plan accuracy check

Measure: Comparison of *Planned Burnoff* versus *Actual Burnoff*

Pilots Info - last 30 Days Statistics

Flight Period: 15/ /200 - 15/ /200
Airport From: XYYY To: YYZZ

Flight No	Route No	SCORE	OFF COF	ACT Mach Nr.	OFF Mach Nr.	ACT Flying Time	OFF Flying Time
123	114	1472	1400	0.81	LRC	08:11	08:17
	106	1446	1300	0.81	LRC	07:54	07:58
	115	1350	1400	0.81	LRC	08:10	08:18
	108	1287	1400	0.81	LRC	08:12	08:13
	115	1255	1400	0.80	LRC	07:55	07:53
	108	1243	1300	0.81	LRC	07:46	07:50
	107	1166	1200	0.79	LRC	07:48	07:45
	107	1164	1400	0.81	LRC	07:59	08:01
	88	932	1400	0.81	LRC	08:15	08:15
	103	880	1300	0.80	LRC	07:51	07:51
	110	854	1400	0.80	LRC	08:06	08:07
	105	780	1300	0.81	LRC	08:03	08:03
	107	765	1900	0.81	M82	08:07	08:14
	117	605	1300	0.81	LRC	07:54	07:54
	114	588	1300	0.81	LRC	07:54	07:59
	110	562	1300	0.80	LRC	08:03	07:57
	112	476	1400	0.80	LRC	08:04	08:06
	117	469	1300	0.81	LRC	07:56	08:03
	107	429	1500	0.81	LRC	08:09	08:10
	109	368	1500	0.80	LRC	08:14	08:10
	114	361	1300	0.80	LRC	08:05	07:59
	215	324	1500	0.81	LRC	08:22	08:16
	115	309	1300	0.81	LRC	08:18	08:10
	104	229	1300	0.80	LRC	07:50	07:57
	116	+61	1400	0.81	LRC	08:18	08:19
	121	-163	1300	0.81	LRC	08:03	08:01
	208	-590	1400	0.81	LRC	08:20	08:04

Score > 0 means
Actual Burnoff
was **less than**
Planned Burnoff

Pilots take **less Extra Fuel** due
more confidence
in Ops Flight Plan

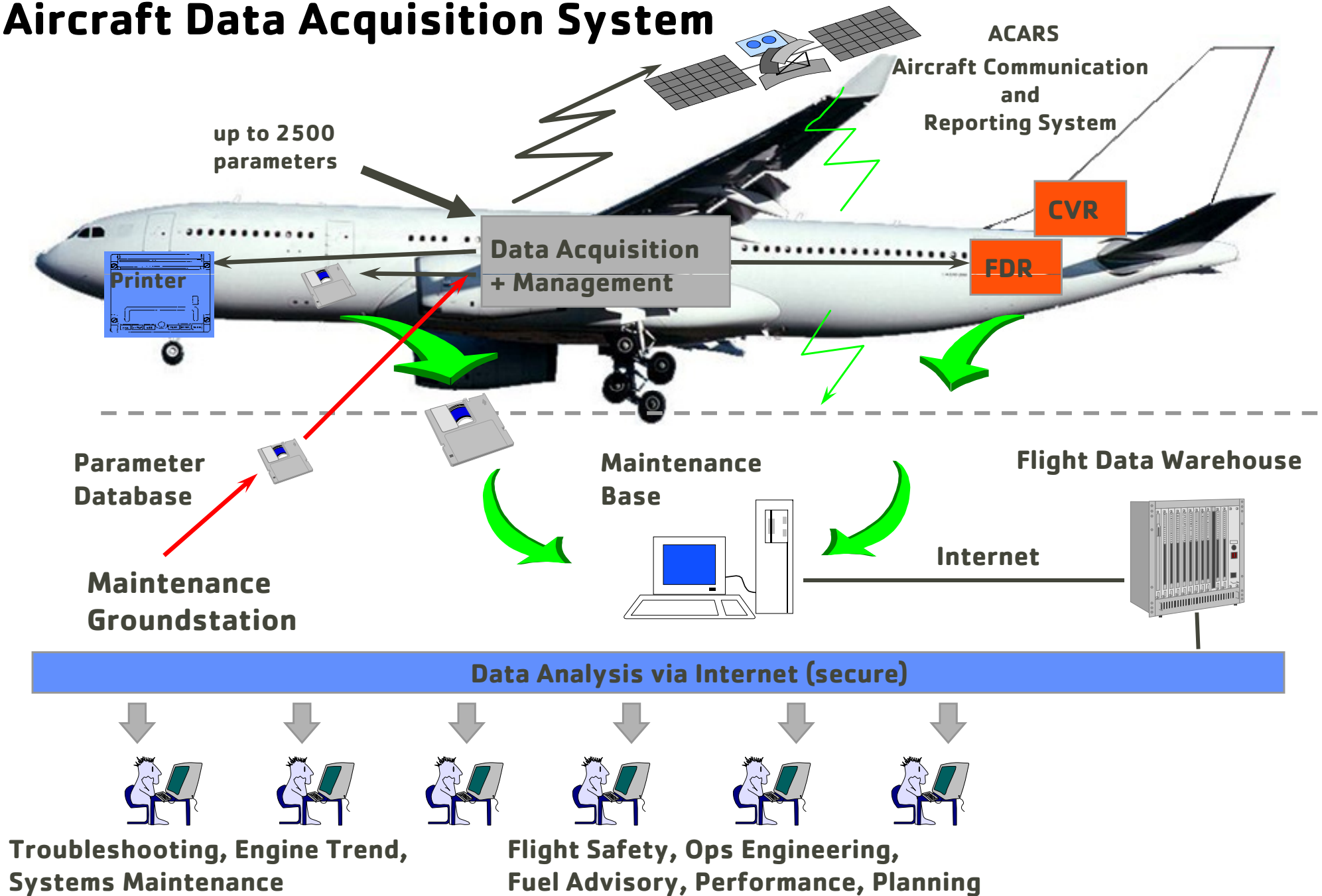
Tripfuel Summary %

ct = plnd to +500kg % act = plnd +501kg to +1t % act = plnd +1001kg to +2t %
7.41 3.70 0.00

Approach types: **Green** = low energy, **Amber** = medium energy, **red** = high energy

QUESTIONS & ANSWERS

Aircraft Data Acquisition System



IATA Jet Fuel price history

