Aerospace Performance Factor - APF

Safety Tools Workshop
Cyprus, May 2015

EUROCONTROL

Agenda

- Introductions
- Interactive Group Discussion – Measuring performance
- The Journey – Managing what you can measure. Safety v Risk
- Finally – an integrated system!
- Presentation by IAA
- Look for the “je ne sais quoi”!
- Q & A

Group Discussion: Measuring the Effectiveness of an SMS & System Performance

- Limited data? Or more than we know what to do with – or both?
- Political and outside pressure and perceptions. Real?
- Safety v. Risk. Explain this to the “non-safety” person!
- Measuring intangibles. “Seeing through the eyes of the beholder?”
- Lagging and leading indicators. The past and the future!

The Journey – Where All That Lead -

- APF started in 2006 with a “simple” question – “So we are going to accept the system as it currently is? OK, but how do we measure that?”
- *APF was the quantifiable answer to a political question.*
- The methodology uses multiple metrics, normalising denominators, human judgment, and statistical analysis to present a organisations performance over time utilising its own data.
- Integrated with RAT & TOKAI
- Can utilise BowTie risk methodology / concepts

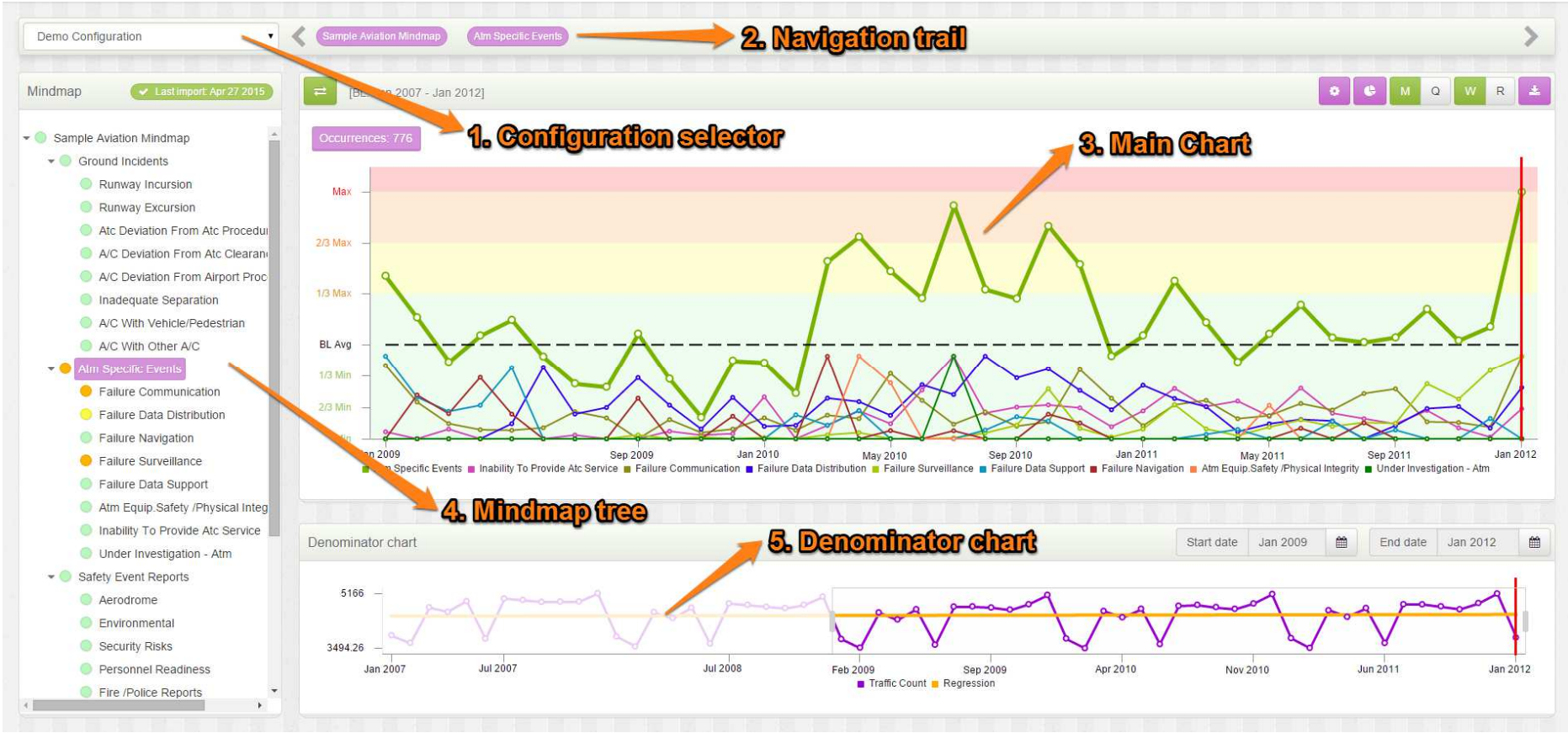
Performance – The APF Provides:

- Data trending showing overall performance;
  - Lagging indicators over time are good (but crude) “forecasts” of where you might be headed
  - Leading indicators can give you “early warnings” of change

- Normalisation against output, e.g., flight hours, number of operations, etc.;
  - This presents a balanced approach

- Utilisation of historical high & low performance points to create benchmark performance targets/goals
  - Baselines are set by the organisation and performance is measured against the baseline

Performance Trending and Targets



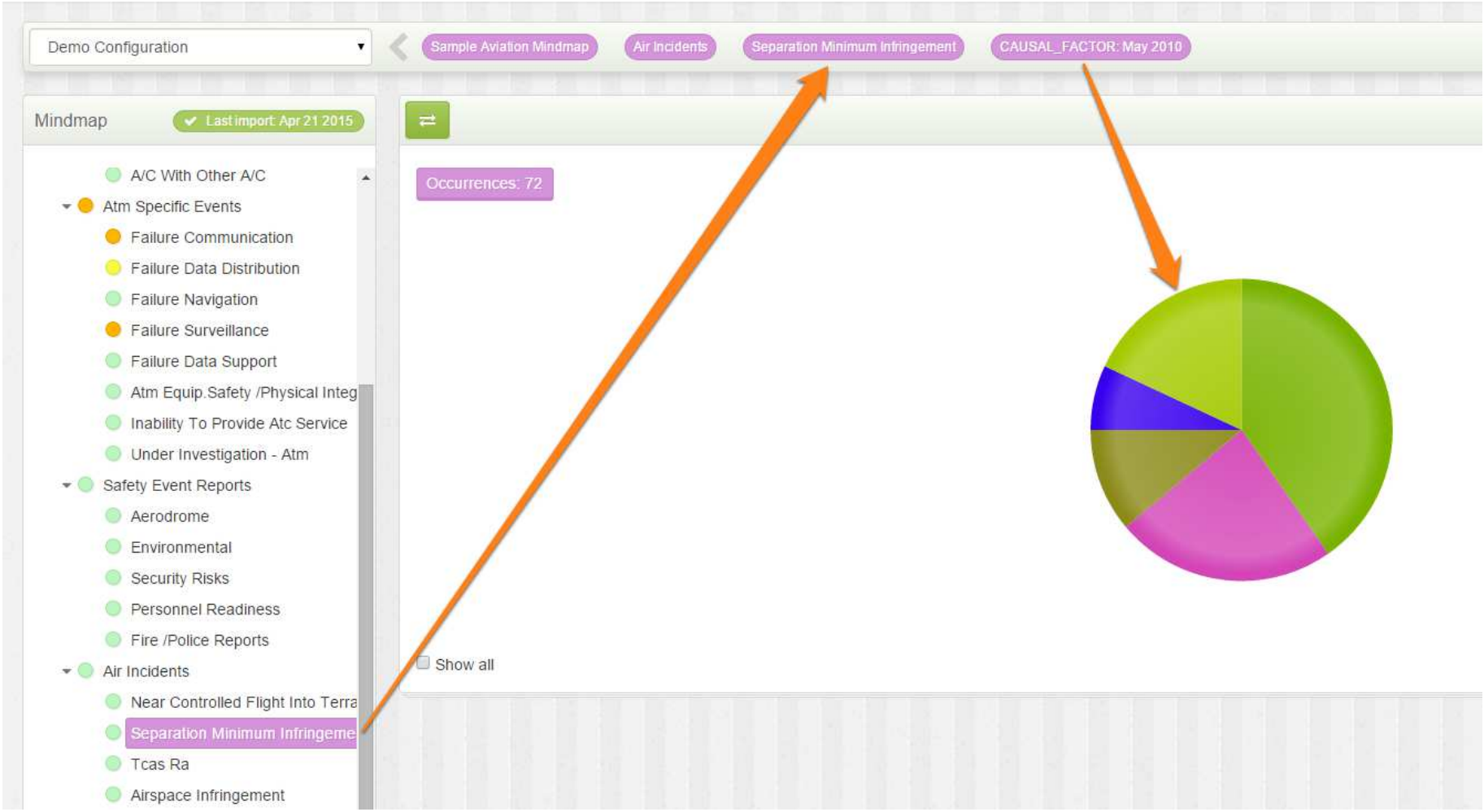
Safety Indicators – The APF Provides:

- Capability to drill down by location and look for influencing factors;
  - Supports the search for “why” events are occurring

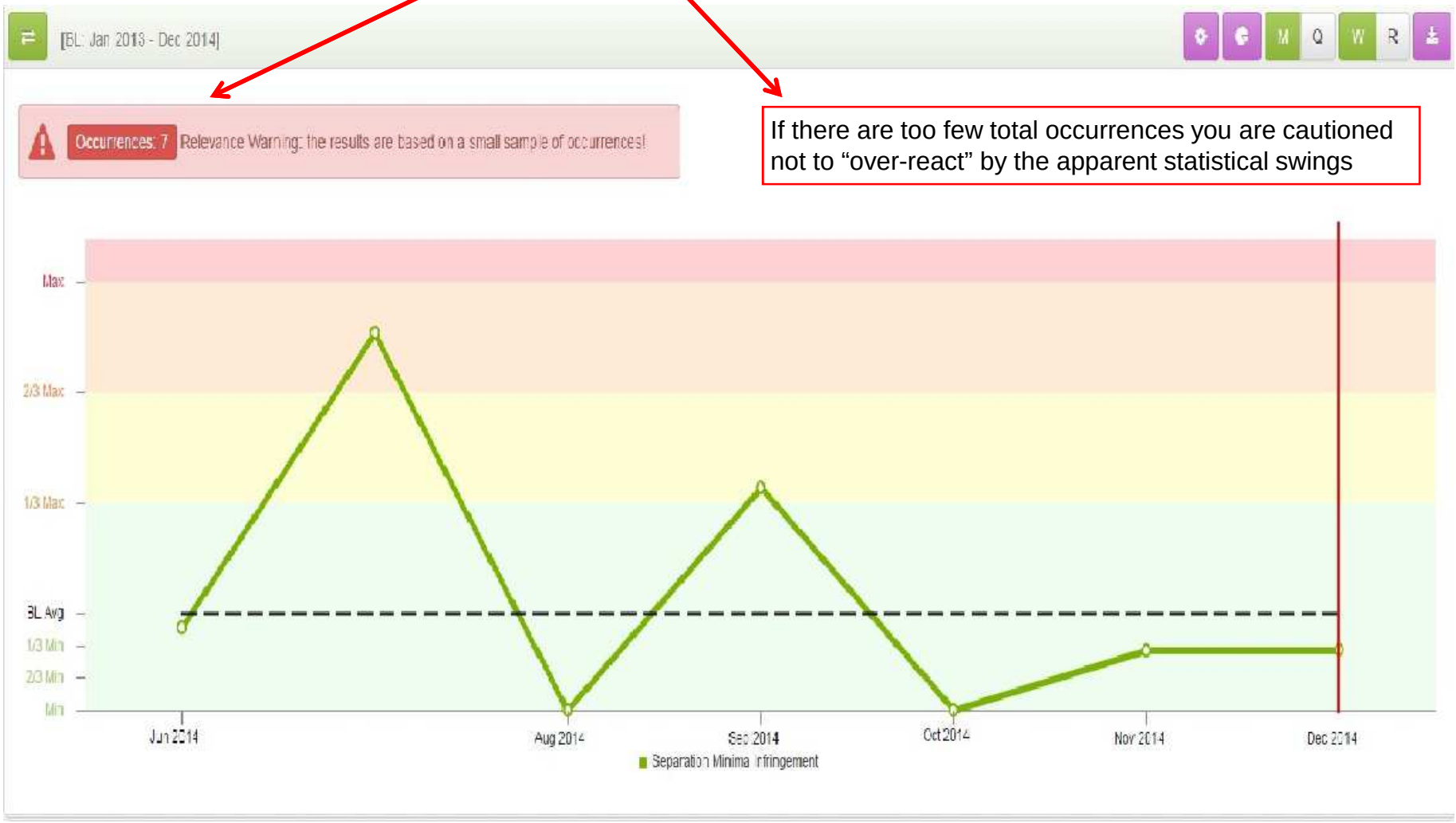
- Capability to search for key lagging and leading indicators
  - ***All totally dependent on the quantity & quality of your data***

- A “What If” function to allow you to model data elements and time to see what the impact would be on overall performance
  - Allows for modeling and resource allocation based on data

Drill Down and Diagnostics



Cautions About Statistical Significance!



If there are too few total occurrences you are cautioned not to “over-react” by the apparent statistical swings

Experience From An ANSP With APF v1

Bill Becton

IAA Safety Management Unit

IAA use of APF

- Commenced the implementation and use of APF in 2014
- Currently being validated prior to full roll out
- ESARR 2 Mind Map with some minor additions being used at present.
  - To be reviewed and re-validated by end of 2015
- Will simplify the process of trend reporting by operational units.
- Currently consulting with NSA with regard to using APF for performance and trend reporting.
- To be used as decision making tool by Organisational Safety Committee

Example of APF Use By IAA

- Using APF a potential issue identified with Separation Minima infringements at one operational unit.

Example of APF Use

- **Action:** Specialist group put in place involving ATC, Standards and Procedures department and Safety Management unit
- Using APF looked back at trend in Sep Min events to start of 2013 (including review of investigation reports).
- **Outcome:** Group reported back to Director Operations and Head of Safety Management within one week identifying recommendations or areas that require further action.

Safety Management Unit
EUROCONTROL

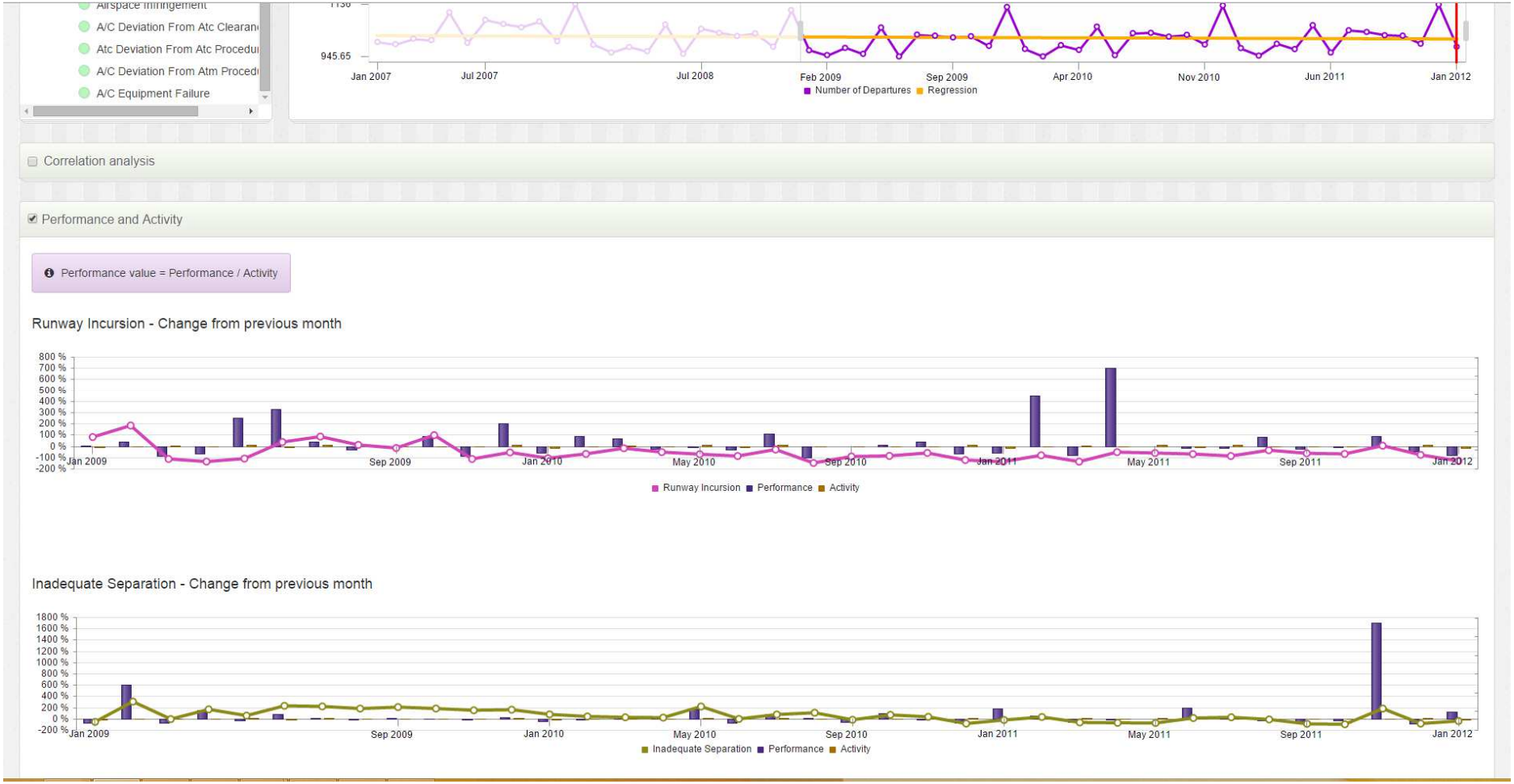
Thank You

And Now….v2.0!

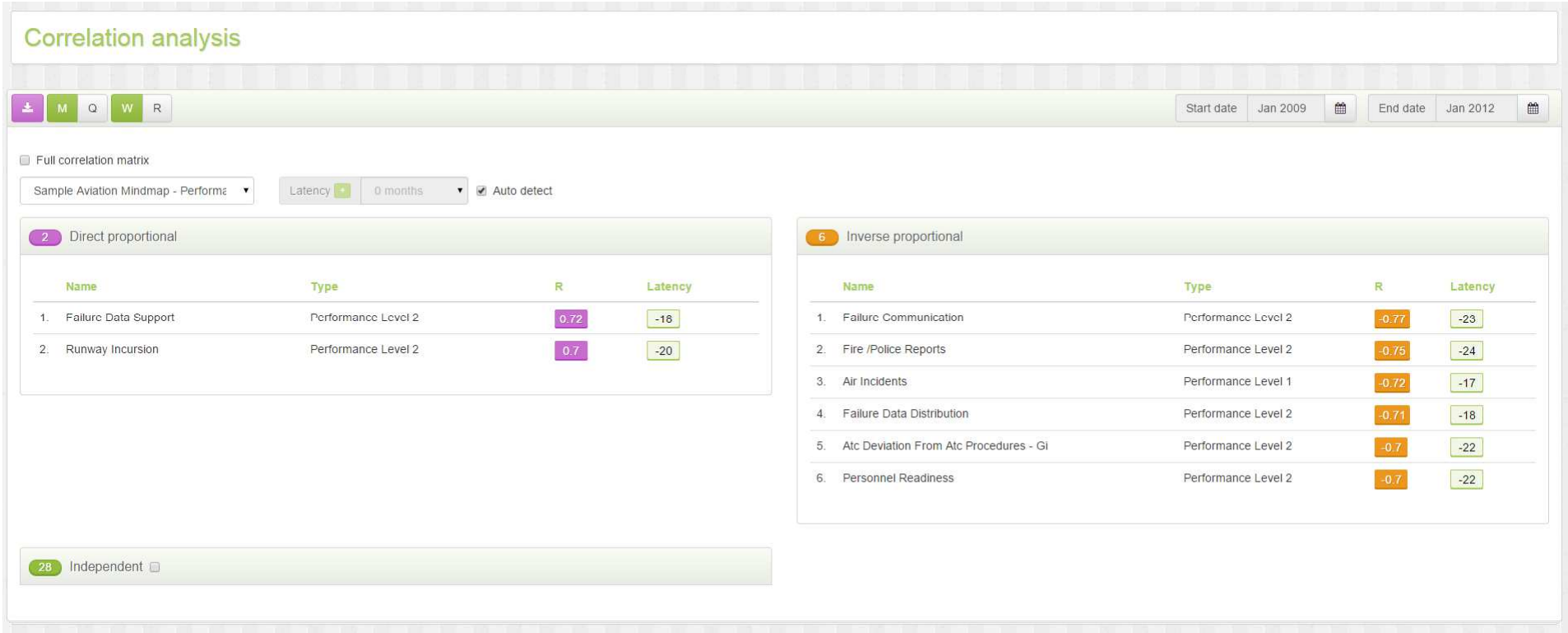
Analysis – APF v2 Provides:

- Advanced – and automated – analysis including:
  - Correlation Analysis to indicate relationships between data elements;
  - A “What If” function to allow you to model data elements and time to see what the impact would be on overall performance
  - Pareto charts – and the ability to export them
  - Indication of provisional data pending full investigations

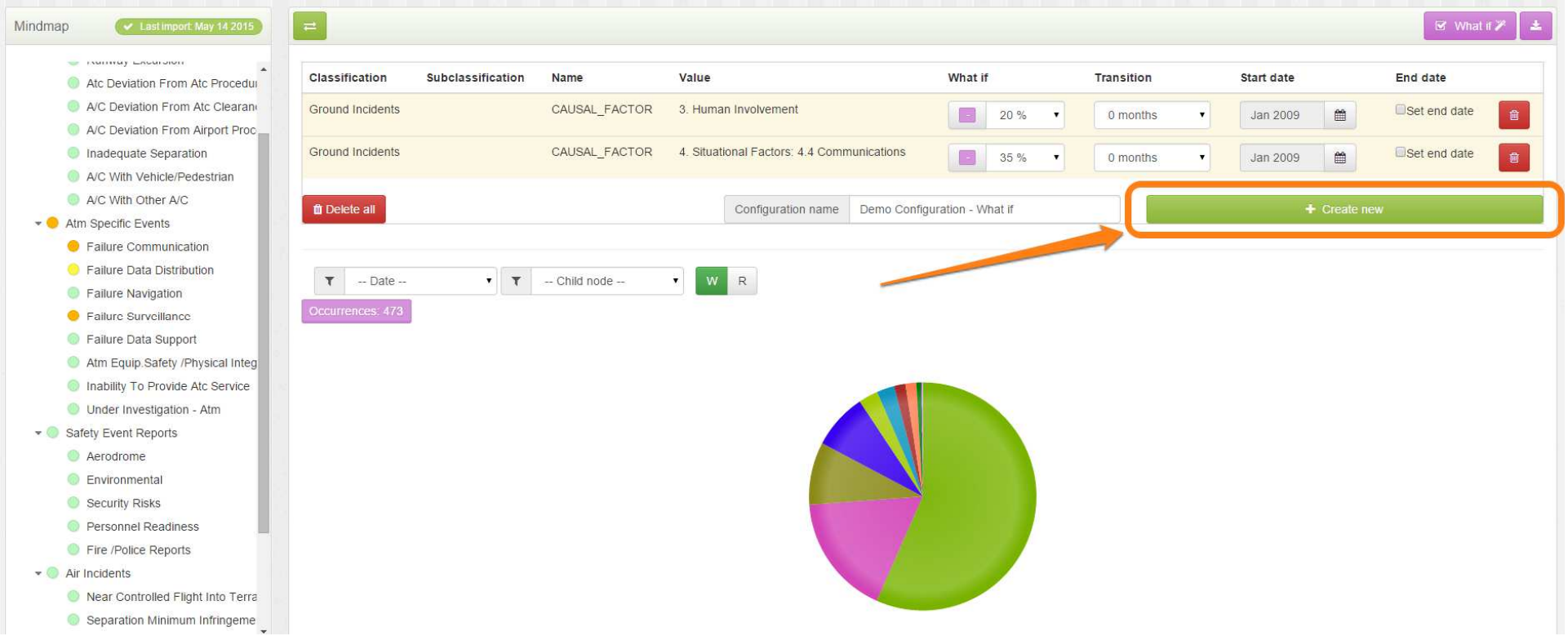
Performance v Activity & Influence



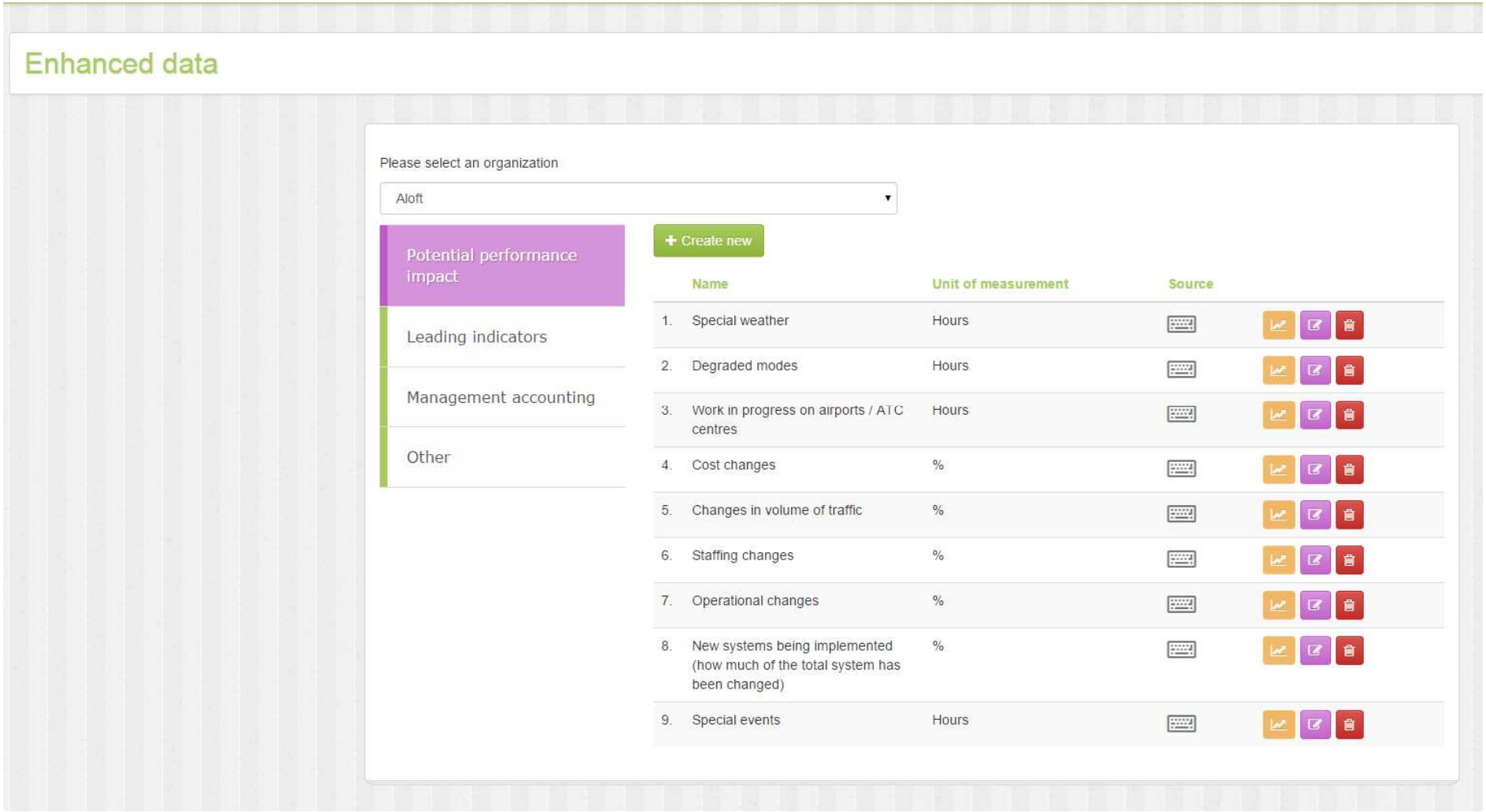
Correlation Analysis & Relationships



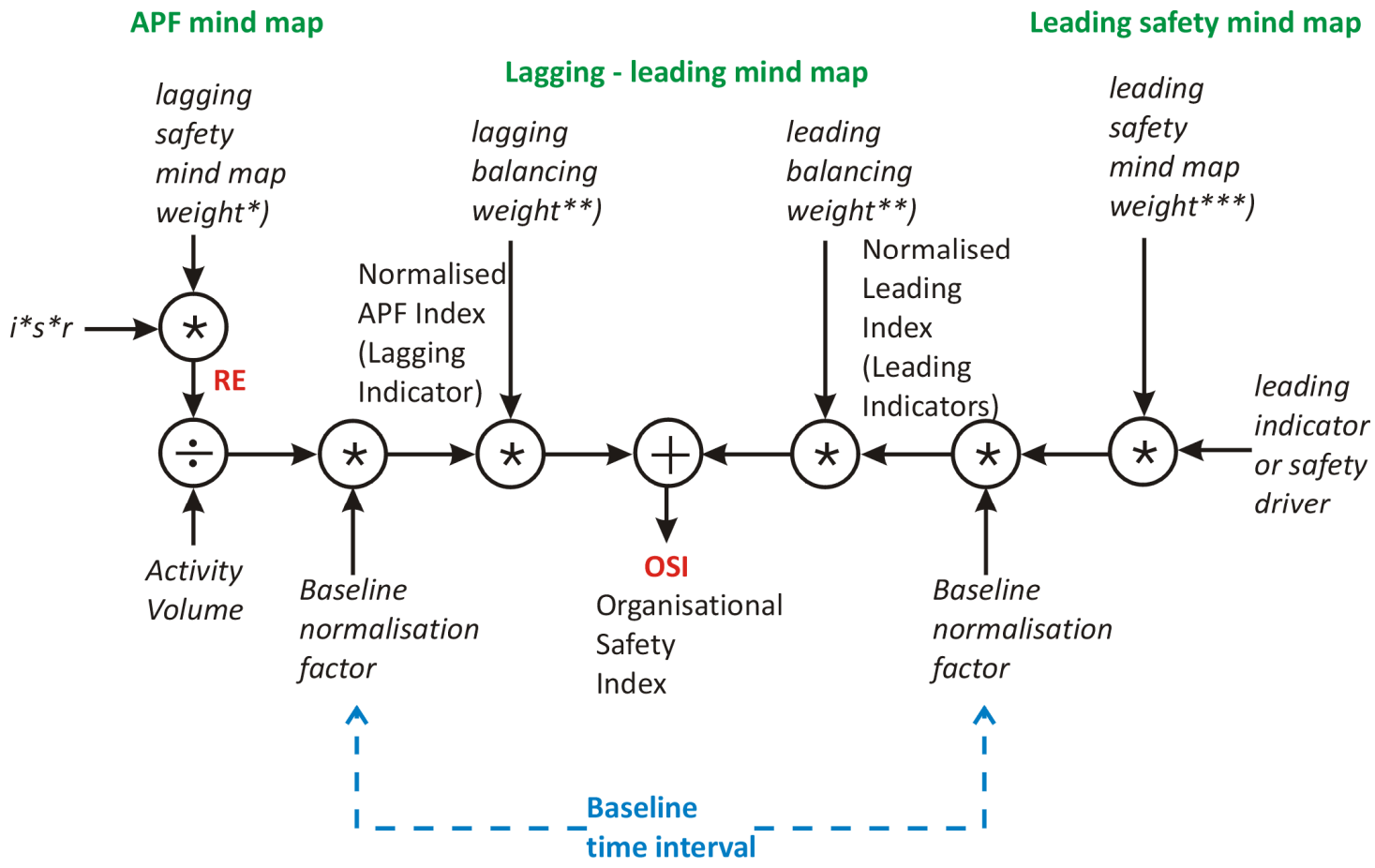
What If – Data Modeling



Enhanced Data Capabilities



The Engineering Design (For Leisure Review)



Other Capabilities – Depending On Your Data

Supports Positive Safety	Supports Leading Indicators, KPAs / KPIs
Management accounting of costs	Correlation Analysis
Pareto Analysis	Multiple Counting
Modeling and (basic) forecasting via the What If Tool	Data noise reduction
Changeable time units	Adjusts for data semantics paradox (higher numbers can be good, etc.)
Warning when limited data makes results statistically questionable	