Predicting Runway Incursions

Draft for Dialog

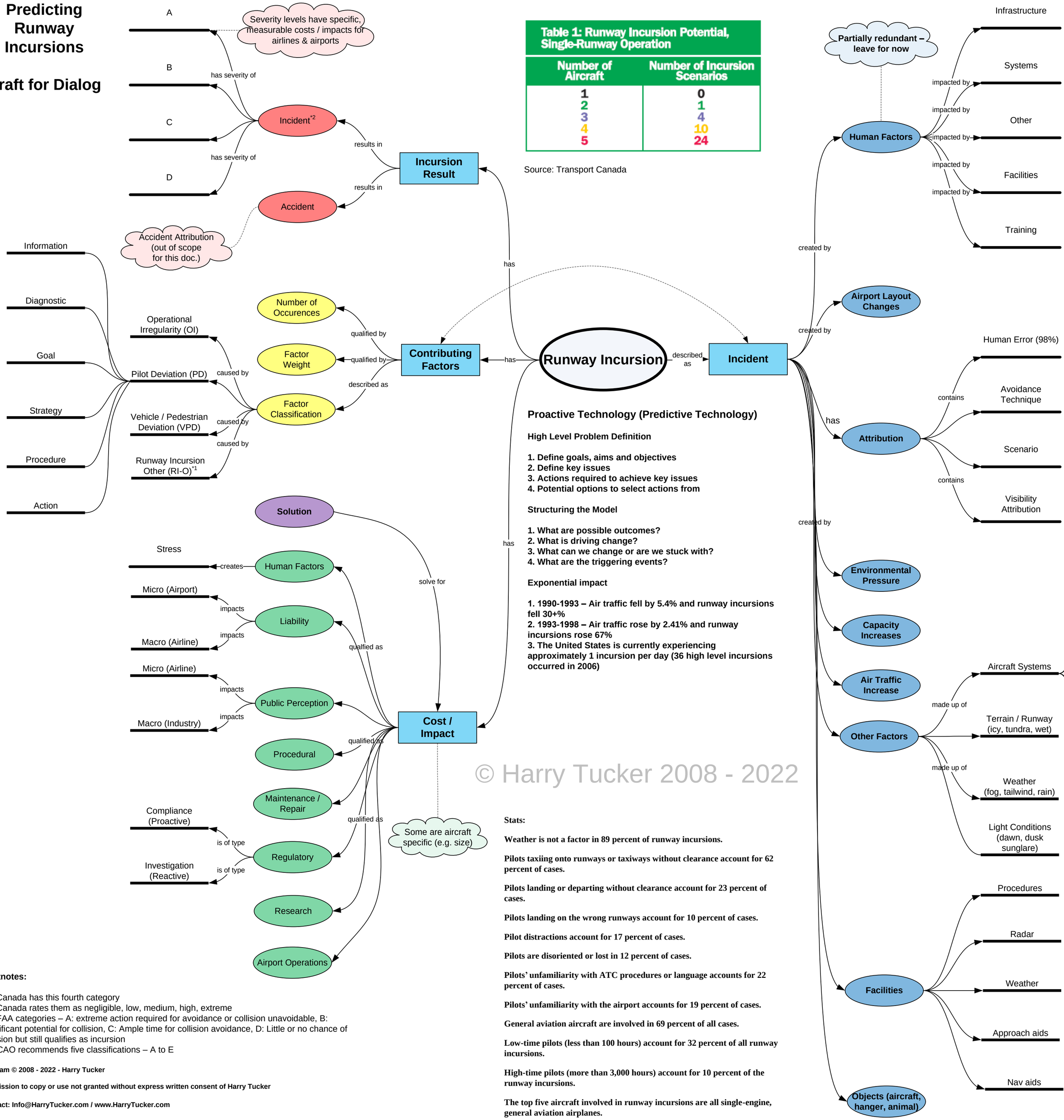
MATHEMATICAL REPRESENTATION

COST / IMPACT

Table 1: Runway Incursion Potential, Single-Runway Operation

Number of Aircraft	Number of Incursion Scenarios
1	0
2	1
3	4
4	10
5	24

Source: Transport Canada



Proactive Technology (Predictive Technology)

High Level Problem Definition

1. Define goals, aims and objectives
2. Define key issues
3. Actions required to achieve key issues
4. Potential options to select actions from

Structuring the Model

1. What are possible outcomes?
2. What is driving change?
3. What can we change or are we stuck with?
4. What are the triggering events?

Exponential impact

1. 1990-1993 – Air traffic fell by 5.4% and runway incursions fell 30+%
2. 1993-1998 – Air traffic rose by 2.41% and runway incursions rose 67%
3. The United States is currently experiencing approximately 1 incursion per day (36 high level incursions occurred in 2006)

Stats:

Weather is not a factor in 89 percent of runway incursions.

Pilots taxiing onto runways or taxiways without clearance account for 62 percent of cases.

Pilots landing or departing without clearance account for 23 percent of cases.

Pilots landing on the wrong runways account for 10 percent of cases.

Pilot distractions account for 17 percent of cases.

Pilots are disoriented or lost in 12 percent of cases.

Pilots' unfamiliarity with ATC procedures or language accounts for 22 percent of cases.

Pilots' unfamiliarity with the airport accounts for 19 percent of cases.

General aviation aircraft are involved in 69 percent of all cases.

Low-time pilots (less than 100 hours) account for 32 percent of all runway incursions.

High-time pilots (more than 3,000 hours) account for 10 percent of the runway incursions.

The top five aircraft involved in runway incursions are all single-engine, general aviation airplanes.

Footnotes:

1 – Canada has this fourth category
2 – Canada rates them as negligible, low, medium, high, extreme
– FAA categories – A: extreme action required for avoidance or collision unavoidable, B: Significant potential for collision, C: Ample time for collision avoidance, D: Little or no chance of collision but still qualifies as incursion
- ICAO recommends five classifications – A to E

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