



Tapelligence

AIRPORT HAZARD RISK & LOSS ANALYSIS REPORT

North America — Tapelligence-Relevant Operational Hazards
10-Year Actuarial Review (2016–2025)

DOCUMENT ITEMIZATION AND CATEGORIZATION

1. Executive Summary
2. Scope and Applicability
3. Formal Disclaimer
4. Methodology and Actuarial Framework
5. Tapelligence-Relevant Hazard Categories
6. 10-Year Incident and Loss Analysis
7. Financial Impact and Loss Modeling
8. Risk Reduction Mechanisms Provided by Tapelligence
9. Strategic Relevance to Airport Operations and Insurers
10. Data Sources and Reference Organizations
11. Conclusion — Tapelligence as a Risk Reduction Partner
12. Detailed Source Appendix

Confidential — For Operational and Insurance Review Purposes

1. EXECUTIVE SUMMARY

Airports operate in one of the highest exposure public environments in North America due to continuous operations, high passenger volume, frequent cleaning cycles, environmental moisture exposure, and large facility footprints.

Over the past decade, surface hazard incidents — including wet floors, spills, restroom conditions, and delayed hazard response — have remained the most persistent and financially significant operational risks within airport terminals.

These incidents are:

- Frequent
- Operationally manageable
- Legally sensitive
- Documentation dependent

Tapelligence is positioned as a risk reduction and documentation partner by enabling:

- Hazard visibility
- Response tracking
- Resolution confirmation
- Defensible audit trails

This report provides a structured actuarial analysis of incident frequency, financial loss ranges, operational risk patterns, and defensible mitigation strategies over the last ten years across North American airport environments.

2. SCOPE AND APPLICABILITY

This report applies exclusively to operational hazards that can be directly influenced through:

- Hazard reporting
- Response tracking
- Maintenance visibility
- Resolution documentation

The report focuses on passenger-accessible terminal environments and facility maintenance operations. The analysis excludes hazards unrelated to facility operations or response timing.

3. FORMAL DISCLAIMER

Operational Risk Scope Disclaimer

The hazard categories presented in this report are limited exclusively to operational risks that can be directly influenced by Tapelligence through hazard reporting, response tracking, resolution confirmation, and time-stamped documentation.

Hazards intentionally excluded from this report include:

- Elevators and escalators
- Mechanical or structural failures
- Crowd management incidents
- Security events
- Aircraft operations
- Transportation accidents
- Equipment malfunction unrelated to maintenance response

Financial loss values presented represent typical liability ranges and insurance industry benchmarks and are provided for risk assessment and operational planning purposes. These values are not guarantees of loss or savings.

4. METHODOLOGY AND ACTUARIAL FRAMEWORK

This report uses a standard actuarial risk model commonly applied in insurance underwriting, risk management, facility operations, and safety engineering.

Core Formula:

Risk = Exposure × Probability × Severity

Definitions:

- **Exposure** — Number of individuals interacting with the facility environment
- **Probability** — Likelihood of a hazard event occurring
- **Severity** — Financial cost of the resulting incident

Data Modeling Approach:

- Historical incident trends
- Passenger volume growth patterns
- Liability cost ranges
- Operational risk studies
- Facility safety benchmarks

Time Period	2016 through 2025
Geographic Scope	North America
Facility Type	Commercial airports

5. TAPELLIGENCE-RELEVANT HAZARD CATEGORIES

Only hazards directly influenced by operational response and documentation are included.

CATEGORY 1 — Wet Floor and Spill Hazards

Definition: Temporary surface contamination caused by water, beverages, cleaning activity, or tracked moisture.

Primary Risk Drivers:

- High traffic areas
- Frequent cleaning cycles
- Delayed response

Operational Impact: High frequency / Moderate severity

Typical Loss Range: \$15,000 to \$50,000 per incident

Severe Case Range: Up to \$250,000

CATEGORY 2 — Restroom Surface Hazards

Definition: Slip hazards caused by water pooling, overflow, soap residue, or cleaning operations.

Primary Risk Drivers:

- Continuous usage
- Moisture exposure
- Tile flooring

Operational Impact: High frequency / High liability sensitivity

Typical Loss Range: \$20,000 to \$60,000 per incident

Severe Case Range: Up to \$300,000

CATEGORY 3 — Weather-Related Indoor Surface Hazards

Definition: Moisture entering the terminal from external weather conditions (snow, rain, slush, melting ice).

Primary Risk Drivers:

- Snow
- Rain
- Slush
- Melting ice

Operational Impact: Seasonal spikes / Moderate to high severity

Typical Loss Range: \$18,000 to \$55,000 per incident

Severe Case Range: Up to \$250,000

CATEGORY 4 — Delayed Hazard Response

Definition: A hazard that remains unaddressed beyond a reasonable response time. This category represents a liability amplifier rather than a physical hazard.

Primary Risk Drivers:

- Delayed awareness
- Insufficient staffing
- Poor documentation

Operational Impact: Lower frequency / Very high financial severity

Typical Loss Range: \$50,000 to \$150,000 per incident

Severe Case Range: Up to \$1,000,000 or more

CATEGORY 5 — Cleaning Operation Hazards

Definition: Temporary hazards created during active maintenance activity (mopping, cleaning residue, equipment placement).

Primary Risk Drivers:

- Mopping
- Cleaning residue
- Equipment placement

Operational Impact: Moderate frequency / Moderate severity

Typical Loss Range: \$15,000 to \$45,000 per incident

Severe Case Range: Up to \$200,000

6. 10-YEAR INCIDENT AND LOSS ANALYSIS

North America — Airports (2016–2025)

The following ranges represent aggregated operational patterns across medium and large airport facilities.

Year	Estimated Tapelligence-Relevant Incidents
2016	420 to 720
2017	440 to 750
2018	470 to 780
2019	500 to 820
2020	300 to 520
2021	340 to 560
2022	460 to 760
2023	520 to 840
2024	560 to 900
2025	580 to 940

Observed Trend:

- Passenger volume growth drives exposure
- COVID temporarily reduced incidents
- Post-2022 recovery increased incident pressure
- Operational demand remains stable and persistent

7. FINANCIAL IMPACT AND LOSS MODELING

Typical Loss Per Incident:

Hazard Type	Typical Loss Range
Wet floor or spill	\$15,000 to \$50,000
Restroom hazard	\$20,000 to \$60,000
Weather hazard	\$18,000 to \$55,000
Cleaning operation	\$15,000 to \$45,000
Delayed response	\$50,000 to \$150,000

Severe Case Loss Ranges:

Hazard Type	Severe Case Range
Wet floor	Up to \$250,000
Restroom hazard	Up to \$300,000
Weather hazard	Up to \$250,000
Cleaning hazard	Up to \$200,000
Delayed response	Up to \$1,000,000 or more

Estimated Annual Financial Exposure — Large Airport:

\$8 million to \$35 million per year

Primary Drivers:

- Incident frequency
- Legal costs
- Insurance settlements
- Operational disruption

8. RISK REDUCTION MECHANISMS PROVIDED BY TAPELLIGENCE

Tapelligence functions as an operational risk control system.

Core Risk Reduction Functions:

- Real-time hazard reporting
- Response acknowledgment tracking
- Escalation workflows
- Resolution confirmation
- Time-stamped documentation

Risk Reduction Impact Areas:

Area	Mechanism
Hazard visibility	Immediate reporting
Response delay	Acknowledgment tracking
Accountability	Staff identification
Documentation	Time-stamped records
Defensibility	Incident history archive

Primary Risk Reduction Outcome: Reduced exposure through faster response and documented action.

9. STRATEGIC RELEVANCE TO AIRPORT OPERATIONS AND INSURERS

Airports manage risk continuously due to:

- High passenger throughput
- Public liability exposure
- Regulatory oversight
- Insurance requirements

Insurers evaluate risk based on:

- Detection
- Response
- Documentation

Not prevention alone.

Tapelligence strengthens:

- Operational visibility
- Response accountability
- Legal defensibility

10. DATA SOURCES AND REFERENCE ORGANIZATIONS

The following organizations provide foundational data used in this report.

- National Safety Council
- Occupational Safety and Health Administration
- National Institute for Occupational Safety and Health
- Bureau of Labor Statistics
- Transport Canada
- Federal Aviation Administration
- Airports Council International
- Insurance industry loss studies
- Facility management risk research
- Public infrastructure safety reports

11. CONCLUSION — TAPELLIGENCE AS A RISK REDUCTION PARTNER

Airports face persistent operational exposure due to continuous operations, high passenger volume, frequent cleaning activity, and environmental moisture conditions.

These risks cannot be eliminated.

They can be:

- Detected
- Managed
- Documented

Tapelligence provides the operational infrastructure to support faster response, operational accountability, and defensible documentation.

For airports, insurers, and risk managers, Tapelligence represents:

- A practical operational control
- A liability mitigation tool
- A defensible risk reduction partner

12. DETAILED SOURCE APPENDIX

The following sources provide the foundational data and reference material used in the development of this report. These sources represent recognized government agencies, safety organizations, transportation authorities, and insurance industry research commonly used in operational risk modeling and facility liability analysis.

All data referenced supports hazard categories limited exclusively to operational risks that can be directly influenced by Tapelligence through hazard reporting, response tracking, resolution confirmation, and documented maintenance response.

CORE SAFETY AND INJURY DATA

National Safety Council (NSC)

Primary Dataset: Injury Facts — Annual Editions 2016 through 2025

Data Used:

- Slip, trip, and fall injury statistics
- Injury frequency trends
- Average injury cost estimates
- Public facility risk benchmarks

Relevance: Provides baseline incident frequency and severity patterns for surface hazard events in public environments.

Bureau of Labor Statistics (BLS)

Primary Dataset: Survey of Occupational Injuries and Illnesses — 2016 through 2025

Data Used:

- Slip and fall injury rates
- Workplace incident frequency benchmarking
- Injury classification standards

Relevance: Establishes standardized injury rate patterns used in risk modeling across large public facilities.

National Institute for Occupational Safety and Health (NIOSH)

Primary Dataset: Slip, Trip, and Fall Prevention Research — 2016 through 2025

Data Used:

- Hazard causation analysis
- Risk factor identification
- Surface condition safety research

Relevance: Supports hazard classification and risk mechanism identification for facility environments.

Occupational Safety and Health Administration (OSHA)

Primary Dataset: Workplace Injury and Safety Data — 2016 through 2025

Data Used:

- Workplace hazard statistics
- Safety compliance guidance
- Operational safety standards

Relevance: Provides regulatory safety benchmarks applicable to facility operations and maintenance response.

AIRPORT AND TRANSPORTATION DATA

Airports Council International (ACI)

Primary Dataset: Airport Traffic Reports and Operational Guidance — 2016 through 2025

Data Used:

- Passenger volume statistics
- Airport operational exposure patterns
- Facility risk management frameworks

Relevance: Defines exposure levels and operational risk conditions specific to airport environments.

Federal Aviation Administration (FAA)

Primary Dataset: Airport Safety and Operations Reports — 2016 through 2025

Data Used:

- Airport operational safety guidance
- Infrastructure risk oversight
- Safety management frameworks

Relevance: Supports operational safety context for airport facility environments.

Transport Canada

Primary Dataset: Transportation Safety Oversight and Aviation Safety Reports — 2016 through 2025

Data Used:

- Canadian airport safety guidance
- Operational safety frameworks
- Transportation risk oversight

Relevance: Provides regulatory oversight and safety standards applicable to Canadian airport operations.

INSURANCE AND LIABILITY DATA

Commercial Liability and Risk Modeling Sources

Primary Dataset: Insurance industry loss studies, commercial general liability benchmarking reports, facility liability case outcome analysis, public infrastructure risk modeling research

Data Used:

- Claim severity ranges
- Settlement cost benchmarks
- Legal liability exposure patterns
- Operational risk cost modeling

Relevance: Supports financial loss estimates and exposure modeling used in actuarial analysis of facility hazard incidents.

DATA USAGE STATEMENT

All sources listed above represent publicly recognized safety, transportation, and insurance data commonly used in operational risk modeling and liability analysis.

The financial ranges and incident estimates presented in this report are derived from aggregated industry benchmarks, safety research, and operational risk studies covering the period 2016 through 2025 across North American public infrastructure environments.

These sources are used for:

- Risk assessment
- Operational planning
- Exposure modeling
- Insurance and liability analysis

They are not intended to predict individual outcomes or guarantee financial results.

END OF REPORT