

Infrastructure Risk Intelligence Enhancement Package

Initiative: Infrastructure Risk Modernization

Environment: Palantir Foundry

Version: v2

Stakeholders: Mission Analysis, Regional Operations, Risk Data Engineering

Overview

This release introduces an integrated risk intelligence capability within Foundry that allows mission analysts and resilience planners to:

- Calculate dynamic risk scores for infrastructure assets based on both tier criticality and associated hazards and threats.
- Simulate hazard or threat events and mitigation scenarios to quantify impacts on assets and regions.
- Automatically extract and process Authoritative Hazard Threat Assessment (AHTA) data from PDF sources to keep risk scores continuously aligned with the latest intelligence.

Data Sources

Source	Details
Authoritative Hazard Threat Assessment (AHTA)	PDF-based source listing hazards, threats, likelihood, impact, mitigation
Asset Registry	Foundry ontology of infrastructure assets including location, tier, system
Operational Metrics (optional)	Service performance, downtime records, and maintenance schedules

Foundry Objects and Integration Points

Object Type	Name	Function
Dataset	AHTA_Parsed	Structured hazards and threats extracted from PDFs.
Ontology Object	Asset	Represents each infrastructure component.
Ontology Relationship	Asset_Has_Hazard	Links assets to hazards or threats.
Transformation	Risk_Scoring_Pipeline	Calculates tier-weighted risk scores.
Application	Risk_Simulation_App	Runs hazard realization and mitigation simulations.

Workflow	AHTA_Ingestion_Automation	Parses new PDFs and proposes updates.
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Inputs and Outputs

Process	Inputs	Outputs
Dynamic Risk Scoring	Asset tier, hazard likelihood, impact, mitigation maturity	Asset-level risk scores with haz
Scenario Simulation	Hazard parameters, mitigation levels	Per-asset and aggregate impac
PDF Extraction and Update	AHTA PDF	Parsed dataset, proposed risk s

User Story 1 — Enhanced Risk Scoring with Hazard and Threat Association

As a Risk Analyst

I want the asset risk score to incorporate all associated hazards and threats from the AHTA, weighted by their tier relevance and exposure levels

So that I can produce a comprehensive and dynamic view of each asset’s true risk posture.

Description

Risk scores currently depend on tier level and manually loaded risk data. The enhanced calculation references AHTA hazards and threats, using likelihood, impact, exposure, and mitigation maturity to derive composite scores.

Acceptance Criteria

- Risk scores dynamically calculate from tier weight multiplied by the sum of linked hazards and threats.
- Formula uses (Likelihood x Impact x Exposure) x (1 – Mitigation_Maturity).
- Changes to AHTA records automatically refresh dependent asset scores.
- Risk breakdown is viewable by contributing hazards per asset.
- Data lineage is traceable between asset, hazard, and AHTA record within Foundry.

Outcome

- Risk assessments reflect current hazard intelligence.
- Mitigation work can be prioritized by actual exposure.
- Provides a foundation for scenario simulation and resilience planning.

User Story 2 — Hazard or Threat Impact Simulation and Mitigation Modeling

As a Resilience Planner

I **want** to simulate both the realization of a hazard or threat and the effect of proposed mitigations

So that I can visualize how assets and regions are affected, evaluate mitigation effectiveness, and quantify changes to individual and aggregate risk scores.

Description

The scenario engine supports hazard realization to assess direct and cascading effects, plus mitigation modeling to evaluate how control changes alter risk scores and resilience indices.

Acceptance Criteria

- Users can define or import hazard scenarios (type, intensity, region, probability).
- Affected assets and dependencies are automatically identified.
- Service degradation and operational impact are calculated per asset.
- Users can modify mitigation variables to see quantitative effects.
- Output includes per-asset and aggregate risk score deltas.
- Visualization layer displays comparative before/after charts and maps.
- All simulation runs are saved with parameter metadata and results.

Example

- Flood in Region 3, severity 0.8: 12 assets impacted, average degradation 27%.
- Resilience index shifts from 0.74 to 0.59 before mitigation.
- Levee reinforcement plus sensors reduce aggregate risk by 0.11 (15%) and raise resilience to 0.68.

Outcome

- Quantifies hazard impacts and mitigation ROI.
- Supports comparisons of resilience improvement across assets and regions.
- Delivers actionable insight for investment prioritization and continuity planning.

User Story 3 — Automated AHTA Extraction and Risk Impact Updates (PDF Source)

As a Risk Data Engineer

I **want** to automatically extract and process AHTA data from PDF reports
So **that** asset risk scores are continuously aligned with the latest hazard and threat intelligence.

Description

Automated parsing of AHTA PDFs generates structured datasets, maps hazards to the asset ontology, and drafts risk updates for analyst approval.

Acceptance Criteria

- Foundry pipeline ingests PDF files from a defined source location.
- Hazard and threat data are parsed into structured AHTA tables.
- Assets are matched to hazards based on region, function, or metadata.
- Draft risk updates are computed and previewed before commit.
- Visualization compares current versus proposed risk scores.
- Audit log records all updates, user actions, and timestamps.

Example

- Analyst uploads AHTA_Q3.pdf into Foundry.
- Parser extracts a Severe Drought hazard affecting specific regions.
- System maps the hazard to eight assets using geospatial metadata and forecasts an average risk increase of 0.12.
- Analyst reviews, approves, and commits updates.

Outcome

- Reduces manual handling and accelerates hazard intelligence adoption.
- Maintains up-to-date asset risk profiles.
- Creates a continuous feedback loop between hazard intelligence and risk analytics.

Technical Implementation Notes

Component	Description	Technologies
PDF Parsing	Extract structured data such as tables and key-value pairs from AHTA PDFs.	Foundry
Entity Mapping	Link parsed hazards to asset ontology entries via metadata and geospatial joins.	Foundry
Risk Scoring Logic	Apply tier-weighted hazard aggregation formula.	Transmute
Simulation Engine	Apply hazard parameters and mitigation variables to risk models.	Simulation

Visualization	Produce comparative dashboards for before/after analysis.	Found
Automation and Scheduling	Detect and process new AHTA PDFs.	Found

Jira Hierarchy Overview

Level	Key / Title	Highlights
Epic	INF-RISK-V2 – Integrated Risk Intelligence	Coordinates dynamic risk scoring, simulation, and PL
Story	INF-RISK-V2-001 – Enhanced Risk Scoring	Subtasks: transformation pipeline, hazard links, tier a
Story	INF-RISK-V2-002 – Hazard or Threat Impact Simulation	Subtasks: simulation engine, mitigation modeling, ris
Story	INF-RISK-V2-003 – Automated AHTA PDF Extraction	Subtasks: PDF ingestion, hazard mapping, draft upd

Deliverables

Deliverable	Description
Risk Scoring Model	Updated dataset and ontology relationships incorporating hazard-weighted scoring.
Risk Simulation Application	Scenario and mitigation modeling interface for planners and analysts.
AHTA Extraction Pipeline	Automated PDF ingestion with analyst review and audit logging.
Documentation & Dashboards	Reference material and visualization assets demonstrating outputs.