



# FROM OUTDOOR TO INDOOR: cartes d'intérieur en 3D

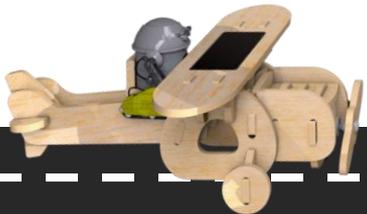
Ken Bragg  
Safe Software  
@kenatsafe

#fmewt

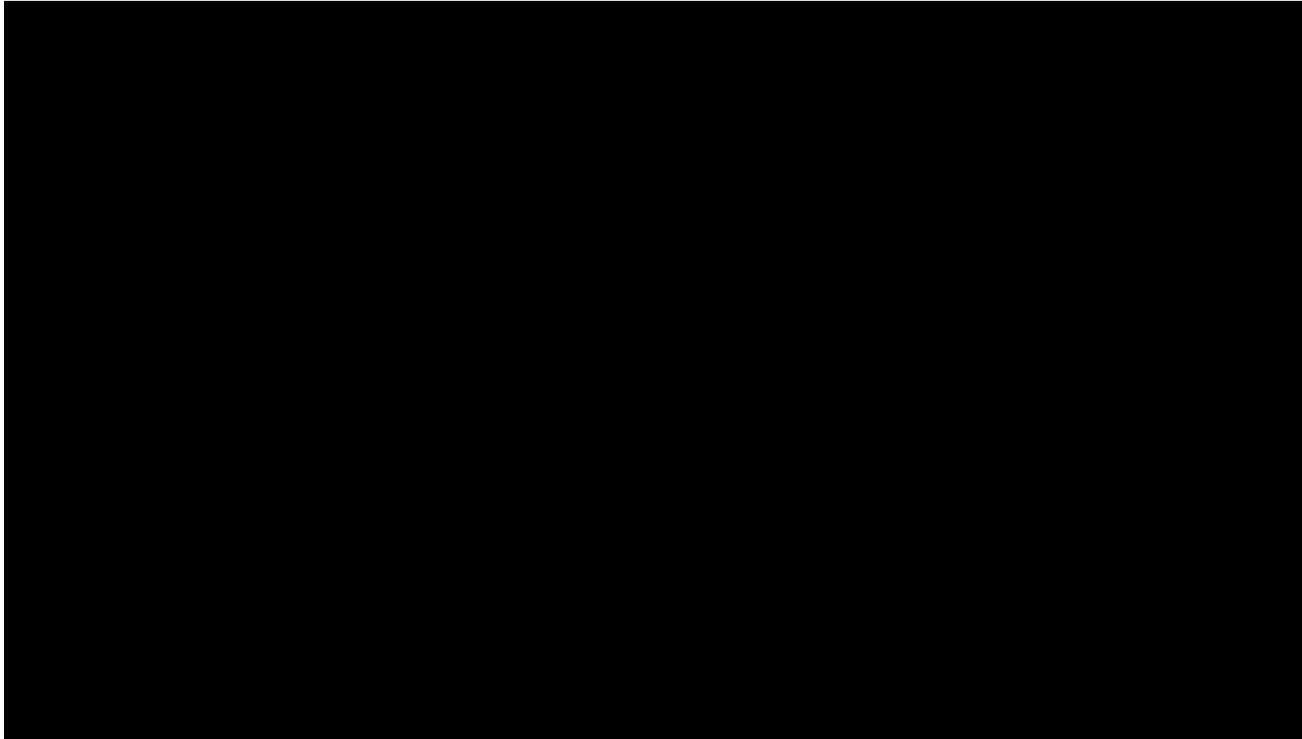


# Pourquoi?

- gestion des propriétés et des installations (BIM?)
- la navigation d'intérieur



# HEATHROW NAVIGATION



# défis de la cartographie intérieure

- extraction de données à partir de différents formats
- exigences strictes
- données tabulaires et données géographiques requises
- les propriétés sont toujours en évolution



# FME nous permet de

- Production de données pour les apps mobile
- Echange données entre les différent Platform
- Visualisation des données de bâtiment en 3D
- Contrôle, les mises à jour et automatisation de données



# Génération de données AVF



**extraction de données**

les format BIM,  
CAO, SIG etc



**transformation**

transformation  
de la géométrie  
et des attributs



**contrôle de données**

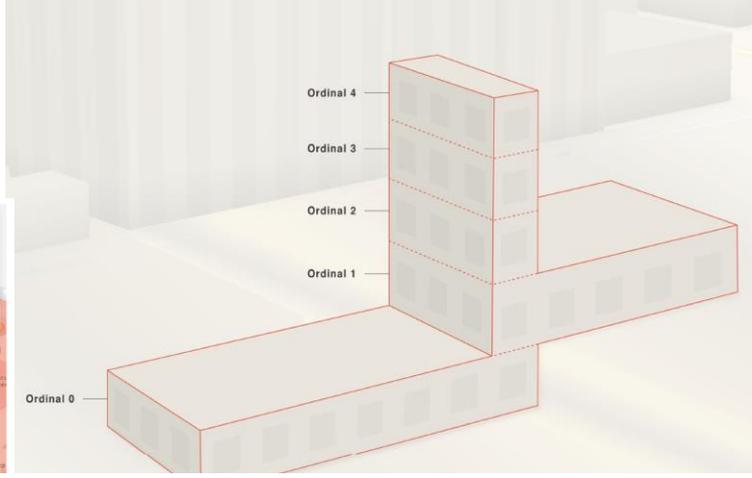
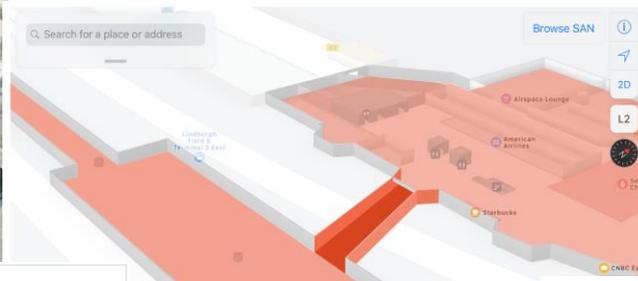
AVFValidator



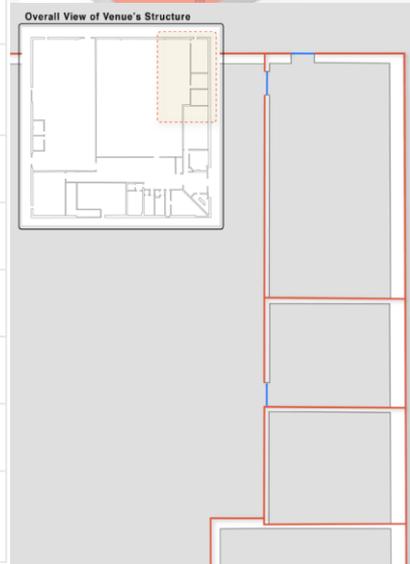
**écriture de données**

Fichier AVF etc  
et les envoyez

# AVF - Beaucoup de règles!



Property	Type	Description
<code>category</code>	<code>LEVEL-CATEGORY</code>	The category that best describes the function of the physical Level.
<code>restriction</code>	<code>null</code> OR <code>LEVEL-RESTRICTION</code>	The category that best describes a restriction that applies to the entire physical Level.
<code>ordinal</code>	<code>INTEGER</code>	The Level feature's "stacking" position, relative to others (if present).
<code>name</code>	<code>LABELS</code>	The name of the Level as declared by the Venue Organization.
<code>short_name</code>	<code>LABELS</code>	The short name of the Level as declared by the Venue Organization.
<code>display_point</code>	<code>null</code> OR <code>DISPLAY-POINT</code>	The curated location to use as the point-based representation of the Level.
<code>address_id</code>	<code>null</code> OR <code>ADDRESS-ID</code>	ID reference to Address record.
<code>building_id</code>	<code>null</code> OR JSON array of <code>BUILDING-ID</code>	Identity of the Building(s) the Level possesses an association with.



Feature-type	Category	Rule	Feature-type	Category
<code>"anchor"</code>	<code>N/A</code>	<b>MUST</b> be <b>within</b>	<code>"unit"</code>	<code>"room"</code>
<code>"amenity"</code>	<code>"traversal.elevator"</code>	<b>MUST</b> be <b>within</b>	<code>"unit"</code>	<code>"room"</code>
<code>"amenity"</code>	<code>"traversal.escalator"</code>	<b>MUST</b> be <b>within</b>	<code>"unit"</code>	<code>"room"</code>
<code>"amenity"</code>	<code>"traversal.movingwalkway"</code>	<b>MUST</b> be <b>within</b>	<code>"unit"</code>	<code>"room"</code>
<code>"amenity"</code>	<code>"traversal.ramp"</code>	<b>MUST</b> be <b>within</b>	<code>"unit"</code>	<code>"room"</code>

## Free Apple Venue Format (AVF) Validator

Upload an Apple Venue Format (AVF) file and receive a validation report - all powered by FME. You can also use FME to convert floor plans into AVF files.

### Notify Me When It's Available

Sign up to be notified as soon as the free AVF validator is available - currently scheduled to be released in late 2017.

Sign Up to Be Notified

You can unsubscribe at any time.

# contrôle de données AVF

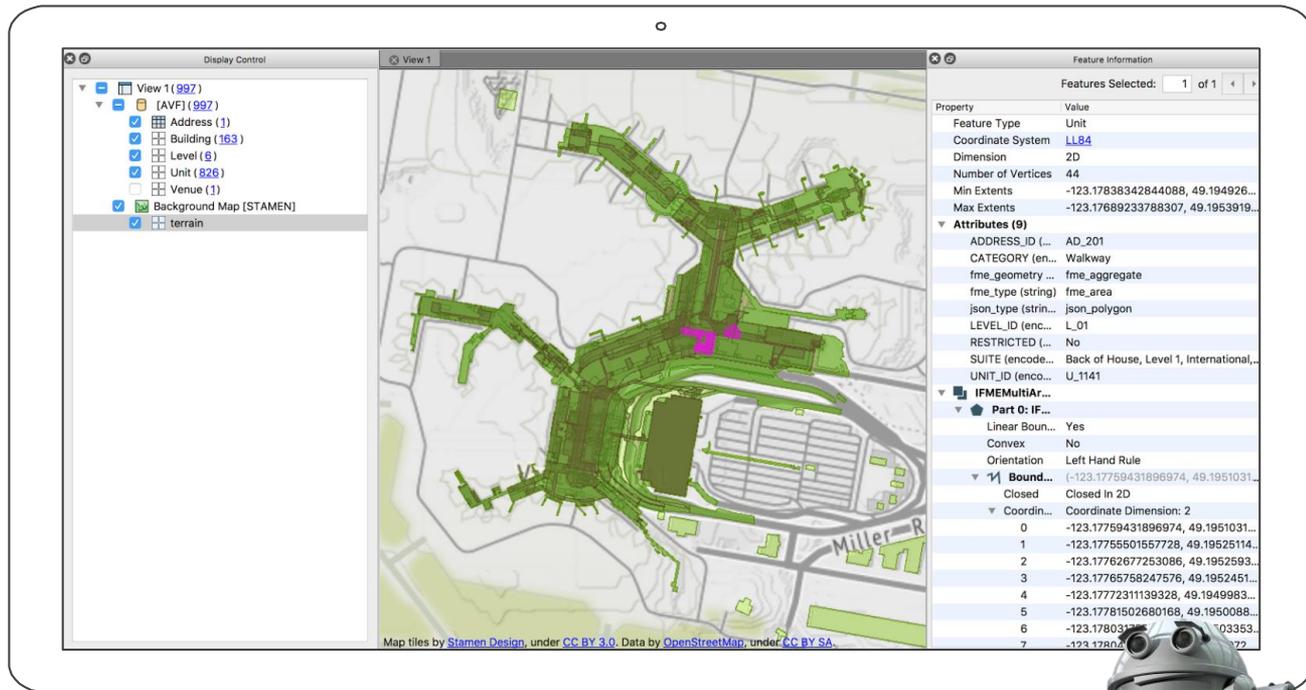
- **AVFValidator** transformateur disponible sur FME Hub.
- **Service Web** — chargez les fichiers AVF et recevrez un rapport [safe.com/avf](http://safe.com/avf)

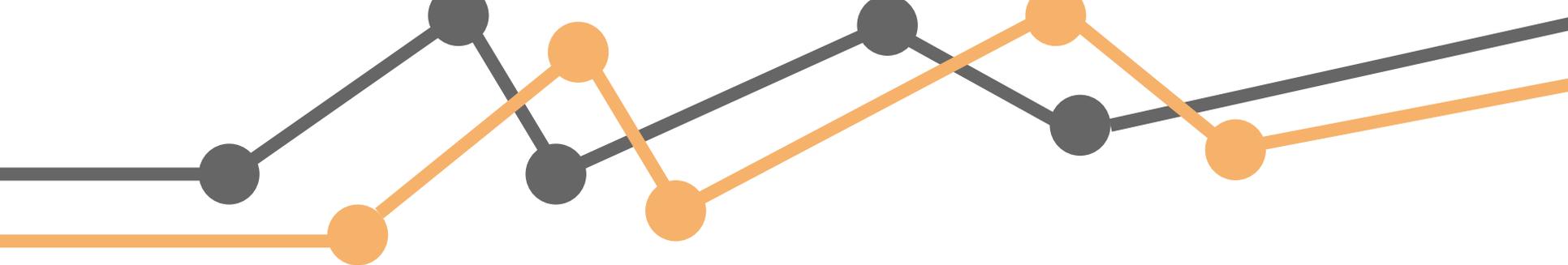


**EXAMPLE:**  
**1. Vancouver Airport YVR**

# JSON à AVF

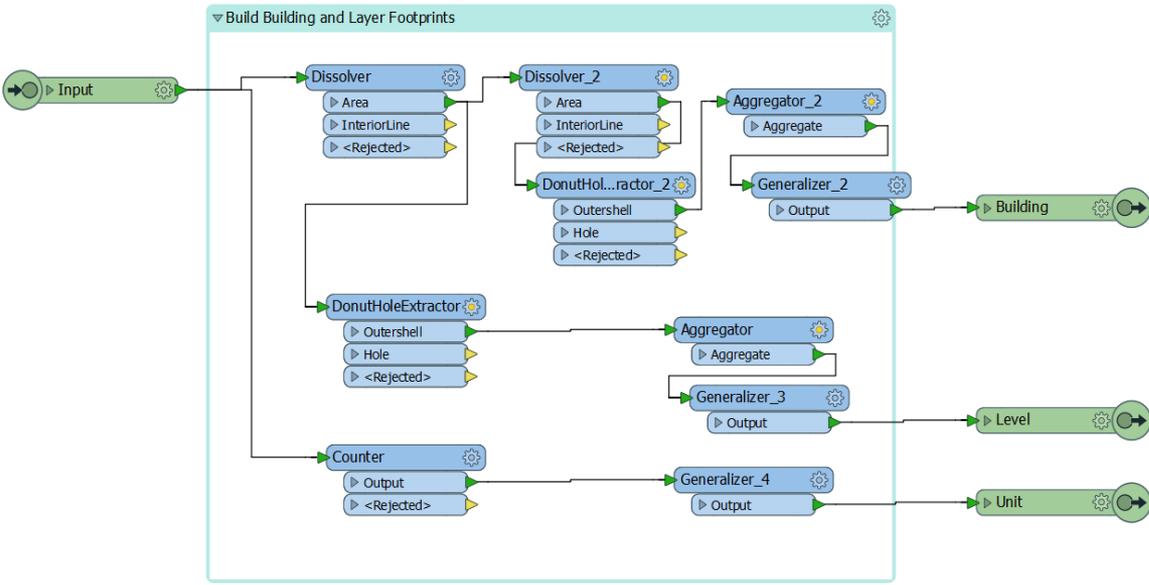
## Vancouver Airport (YVR)





# YVR Traitement

- Lire les données JSON d'un service interne
- Transformation en LL-WGS84
- transformation de la géométrie
- restructuration du schéma
- contrôle avec les règles AVF
- écriture AVF



**Generalizer Parameters**

Transformer Name: Generalizer

Parameters

Algorithm: Douglas (Generalize)

Preserve Shared Boundaries: Douglas (Generalize)

Generalization Tolerance (>=0): Thin (Generalize)

Smoothness Factor (1-30): Deveau (Generalize)

Sharpness Angle (0-180): Wang (Generalize)

Number of Neighbors (>=0): McMaster (Smooth)

Displacement Percentage (1-100): McMaster Weighted Distance (Smooth)

Weighting Power (>=0): WURBitt (Smooth)

Degree of Basis Polynomial (>=2): Inflection Points (Measure)

Segment Length (>=0): Orthogonal Distance Regression (Fit)

Buttons: Help, Defaults, OK, Cancel

**GeometryValidator Parameters**

Transformer Name: GeometryValidator

Parameters

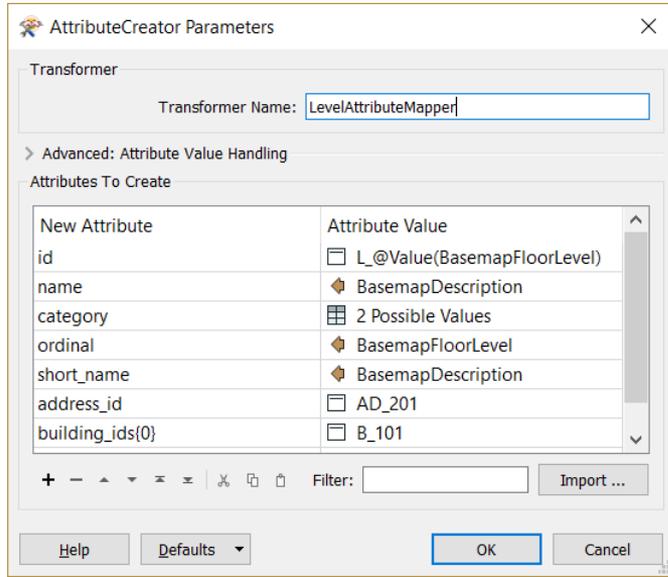
Set of Issues to Detect: Custom

Issue	Parameters	Repairable
<input type="checkbox"/> Contains NaN (Not a Number) or Infinity	...	Yes
<input type="checkbox"/> Contains Null Geometry Parts	...	Yes
<input type="checkbox"/> Duplicate Consecutive Points	...	Yes
<input type="checkbox"/> Degenerate or Corrupt Geometries	...	Yes
<input checked="" type="checkbox"/> Self-Intersections in 2D	...	Yes
<input type="checkbox"/> Non-Planar Surfaces	...	Yes
<input type="checkbox"/> Invalid Solid Boundaries	...	Yes
<input type="checkbox"/> Invalid Solid Voids	...	Yes

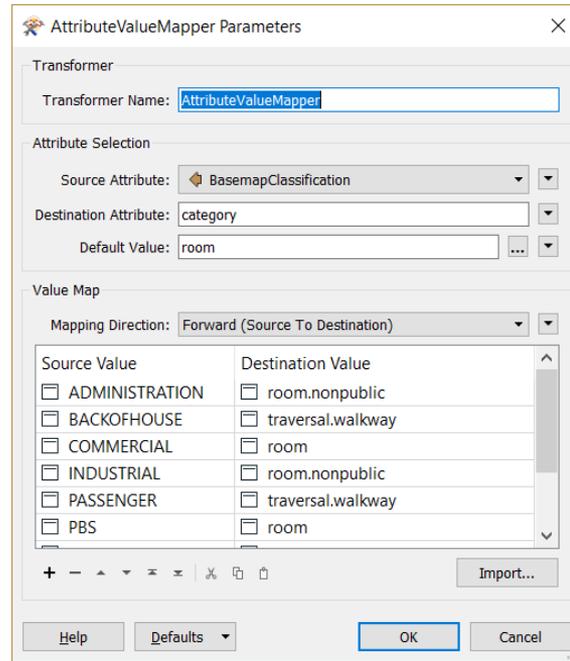
Buttons: Help, Defaults, OK, Cancel



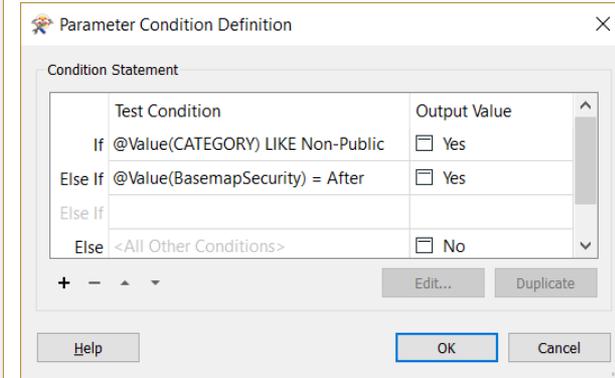
# YVR AVF: transformation de la géométrie



Attribute Mapping



Value Mapping

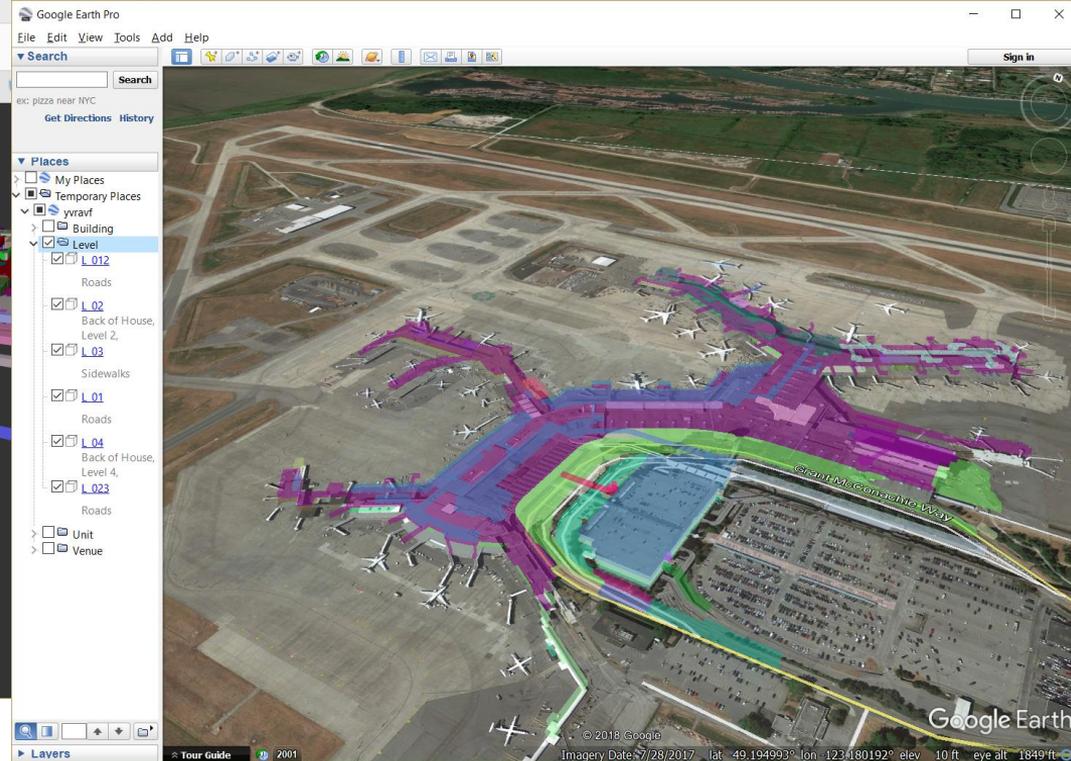
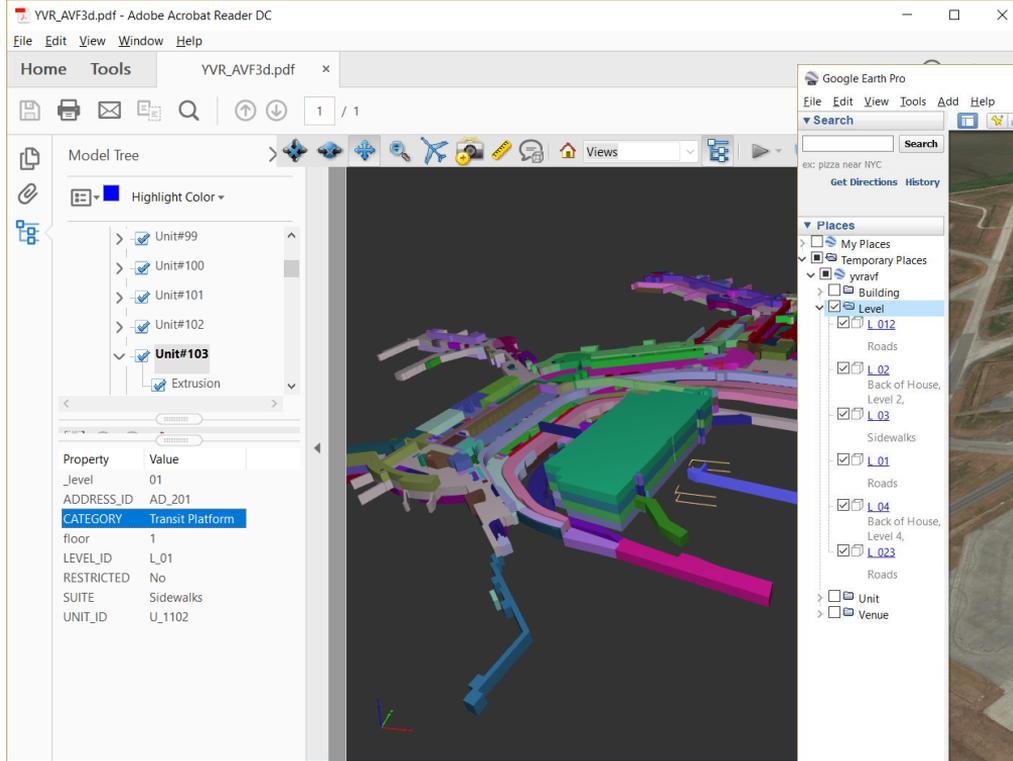


Conditional Mapping



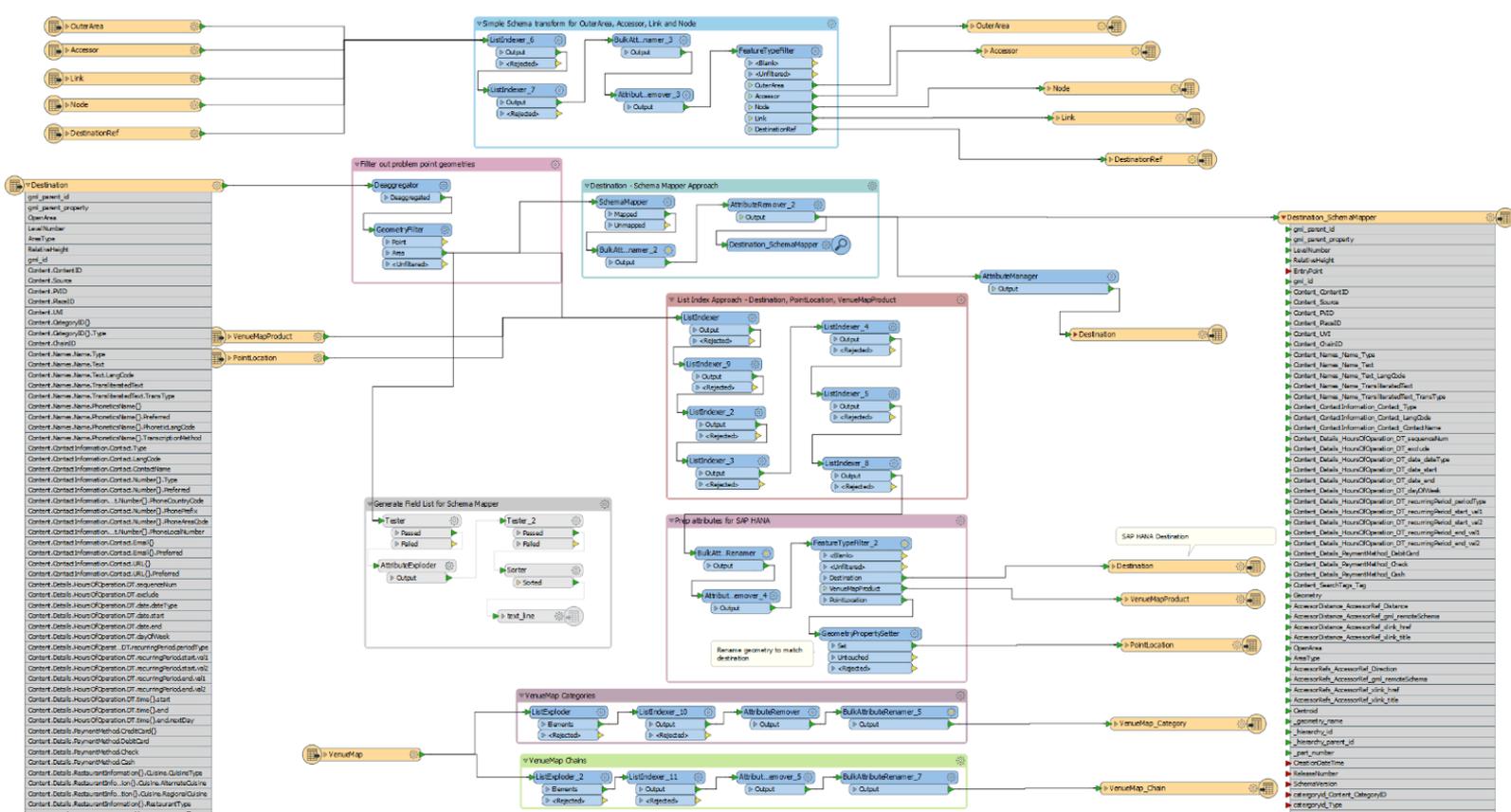
# YVR to AVF: restructuration du schéma

# Visualisation AVF en 3D





# **EXAMPLE: 2. HERE Maps**



# Exemple: Conversion HERE Venue Format vers SAP HANA



The video displays a SAP Live Airport dashboard on a large screen. The dashboard is titled 'CLEVERVIEW PLUS' and features several data visualization components:

- Security Workforce:** A line chart showing workforce levels over time, and a pie chart showing the distribution of workforce across different security areas.
- Passenger Clearance:** A bar chart showing the number of passengers cleared at Terminal 1 over time, categorized by arrival and departure clearance.
- Terminal Map:** A 3D map of the terminal building with colored dots representing passenger flow and clearance points.

The video player interface at the bottom shows a progress bar at 2:05 / 6:17 and various control icons.

# SAP Live Airport



# **3. EXEMPLE: AMSTERDAM AIRPORT SCHIPHOL**

# SCHIPHOL

## Traitement de Données



**données source**

bâtiments en DWG,  
données propriétés  
et des installations



**Préparation**

enrichissement et  
contrôle de qualité



**données orientation**

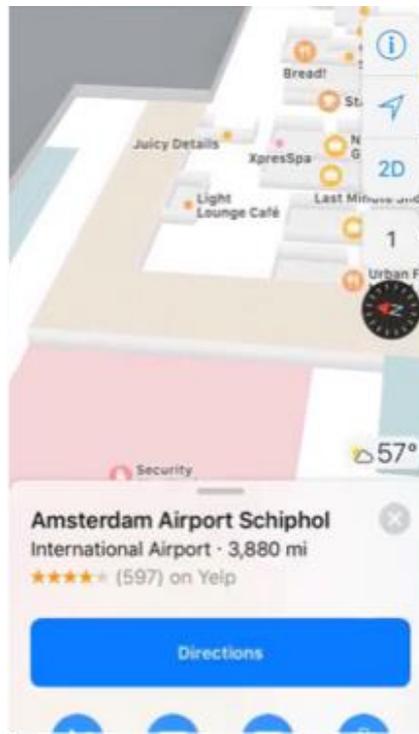
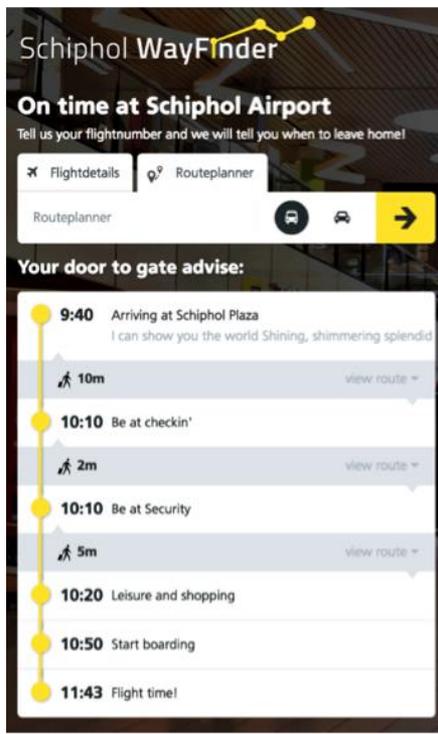
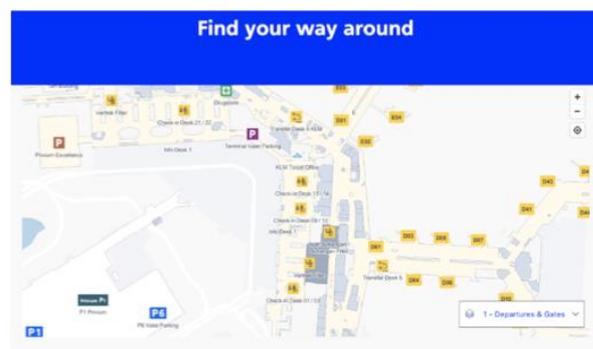
compilation de données  
navigation, plans de  
bâtiment, points d'intérêt,  
informations commercial



**distribution**

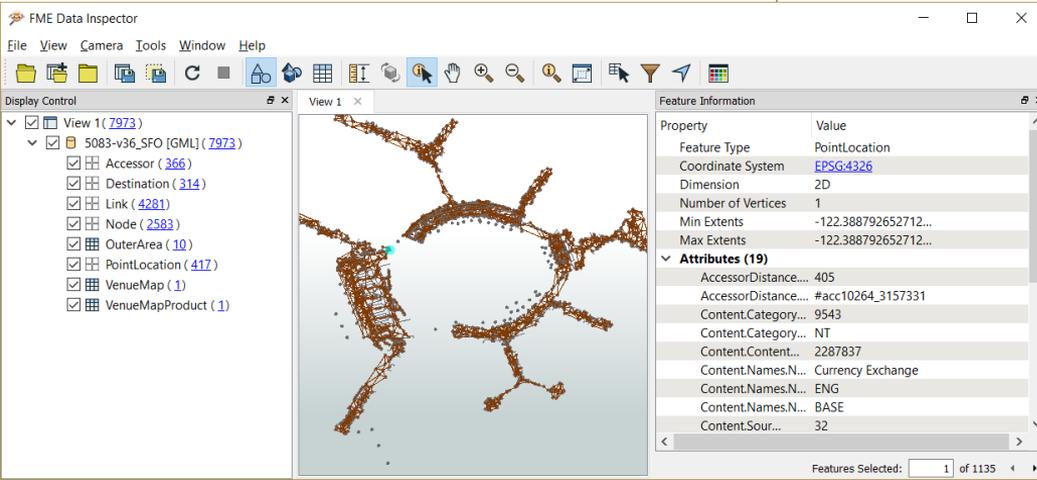
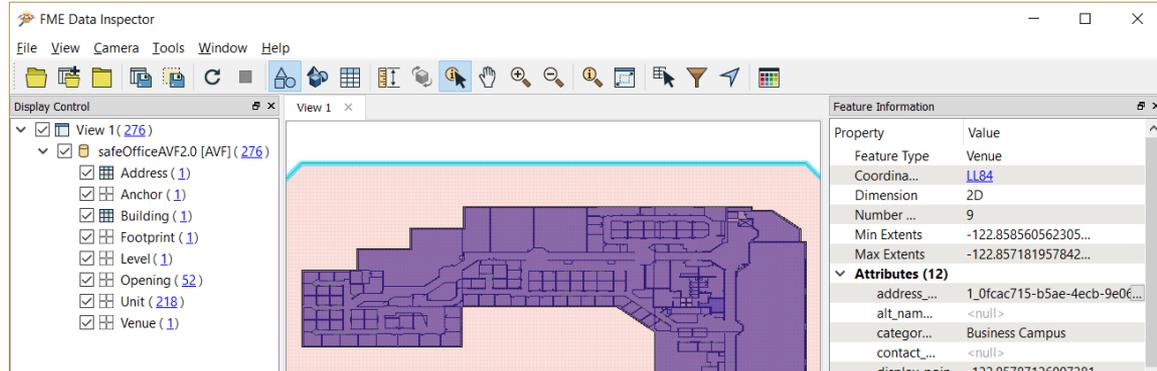
livraisons à Schiphol  
API, Apple Maps,  
Google Maps, etc.

# SCHIPHOL AIRPORT: RESULTAS



# Autres projets

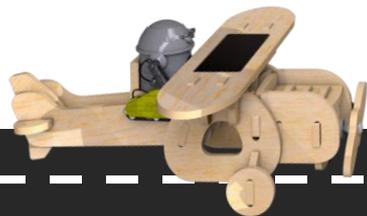
- NL Railways
- SFO
- Siege de Safe



# Résumé

- Compilation des données des bâtiments, propriétés et installations, BIM, SIG
- Transformer les attributs et géométries
- Génération du différent formats en vogue *indoor mapping*
- Contrôle qualité de données (ex. AVFValidator)

Exemples du monde entier





The logo for FME World Tour 2018 features the letters 'FME' in a stylized, white, blocky font with a dotted circular border above it. Below this, the words 'WORLD TOUR' are written in a large, white, serif font, and the year '2018' is written in a smaller, white, sans-serif font below that.

FME  
WORLD TOUR  
2018

# Q&A

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