Building a High-Performance PlanRight Data Model with FME and ArcGIS Enterprise

Maddie Giles | FME Roadshow

September 2026



NZ TRANSPORT AGENCY
WAKA KOTAHI

New Zealand Government
Te Kāwanatanga o Aotearoa

Agenda

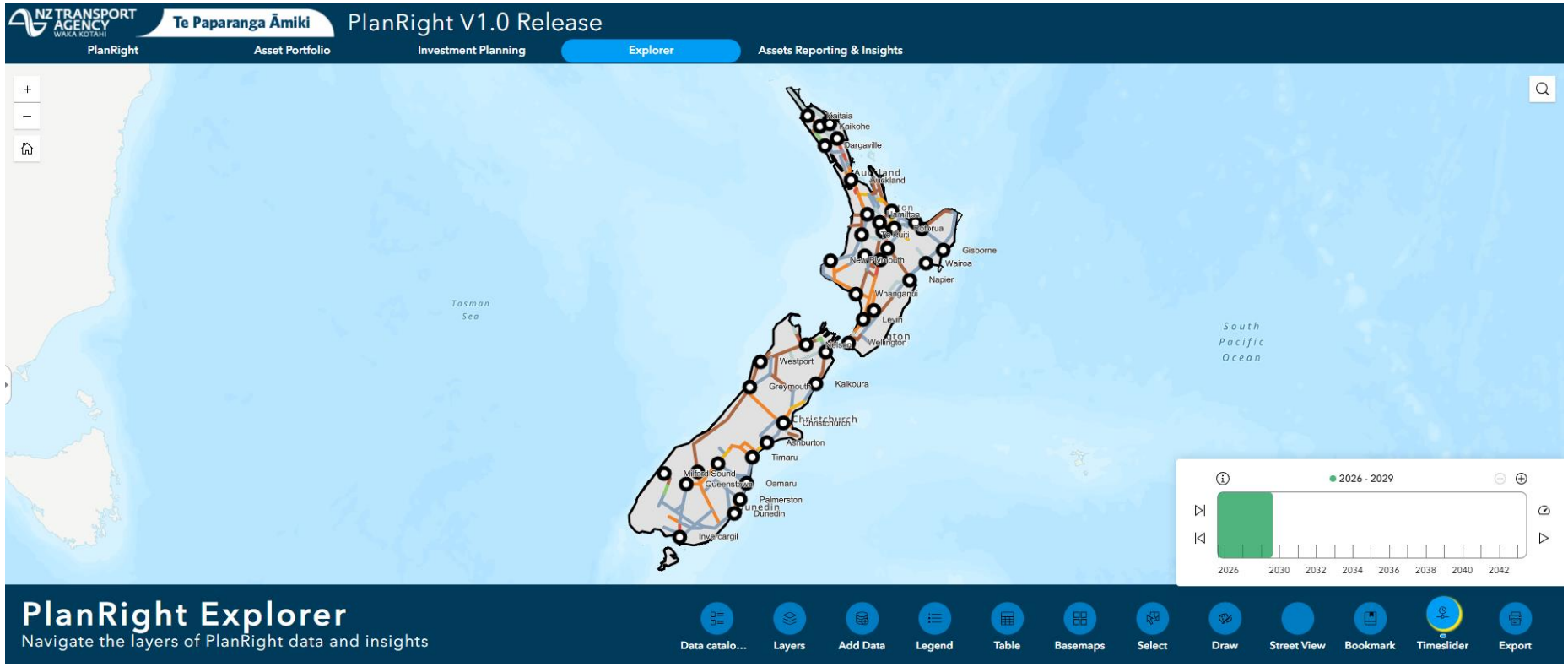
- What is PlanRight?
- Why did we build it?
- Minimum viable product release
- Challenges & decision pathways
- FME methodology overview
- Current state & what's next
- Questions



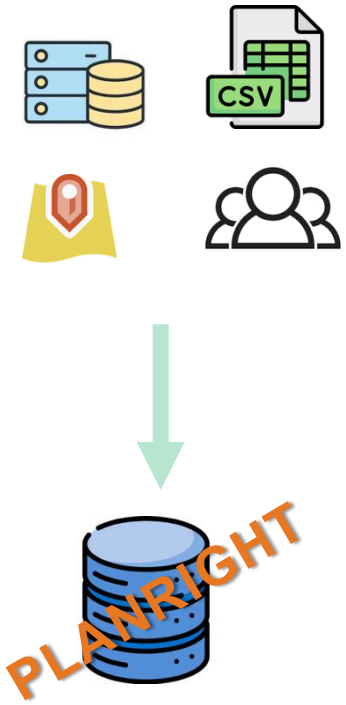
What is PlanRight?

ESRI Web Experience hosted in our Internal GIS platform

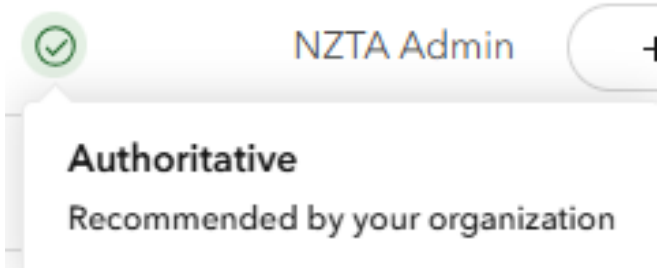
ArcGIS Experience Builder



Why did we build it?



Centralise Information



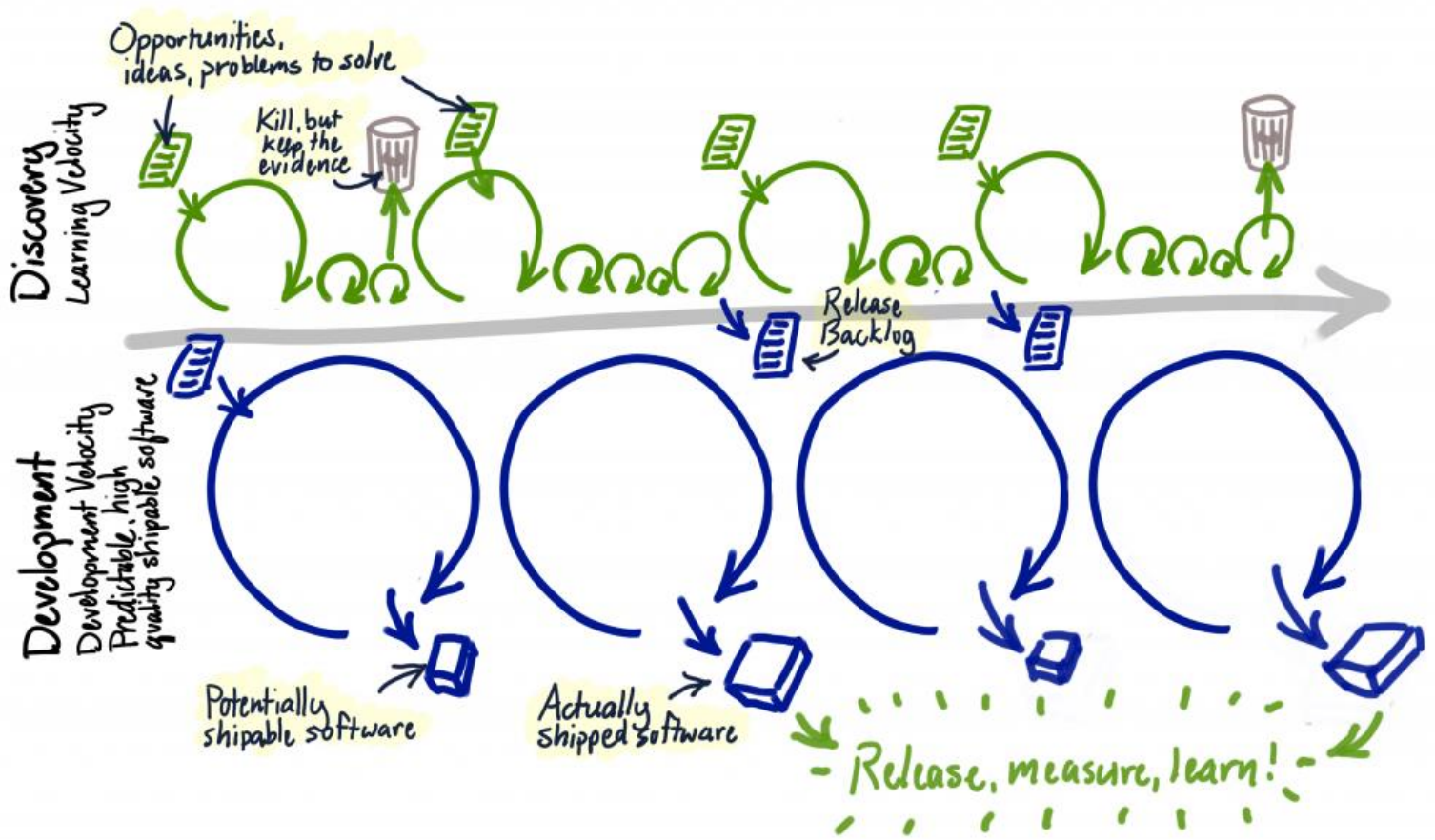
Single Source of Truth



Aligned with NZTA Strategy

MVP Release

- Originally had the data structed as feature datasets
- Published as hosted feature layers
- Complex geometry



Challenges & decision pathways

Hosted Feature Layer

- Performed poorly during first layer render with an average render time of **10 seconds**.
- Large, complex asset geometries and combined geometry-attribute layers increase rendering and query overhead.
- Simple geodatabase structure

Registered Geodatabase

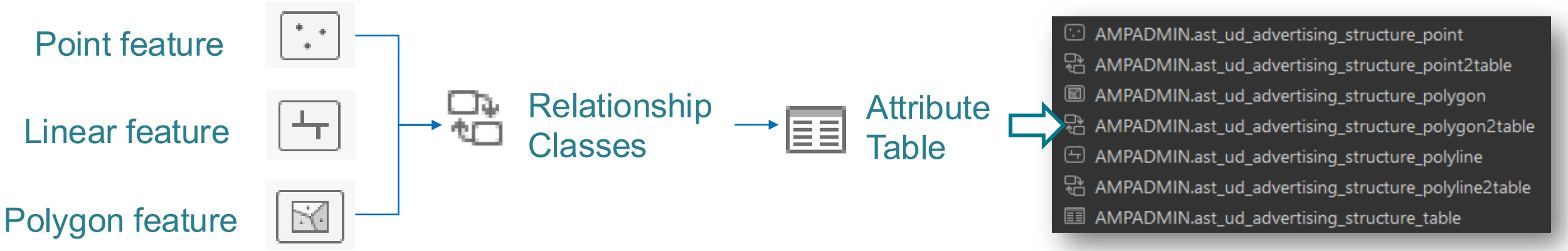
- Performed ok during first layer render with an average render time of **3 seconds**.
- Less control over indexing
- Harder to do schema changes if required
- Requires system team support

Map Service(s)

- Performed ok during first layer render with an average render time of **3 seconds**.
- Can set indexing when publishing
- Can stop & start map services to do schema changes
- Doesn’t require system team support

Proposed map service design

Separating geometry & attributes



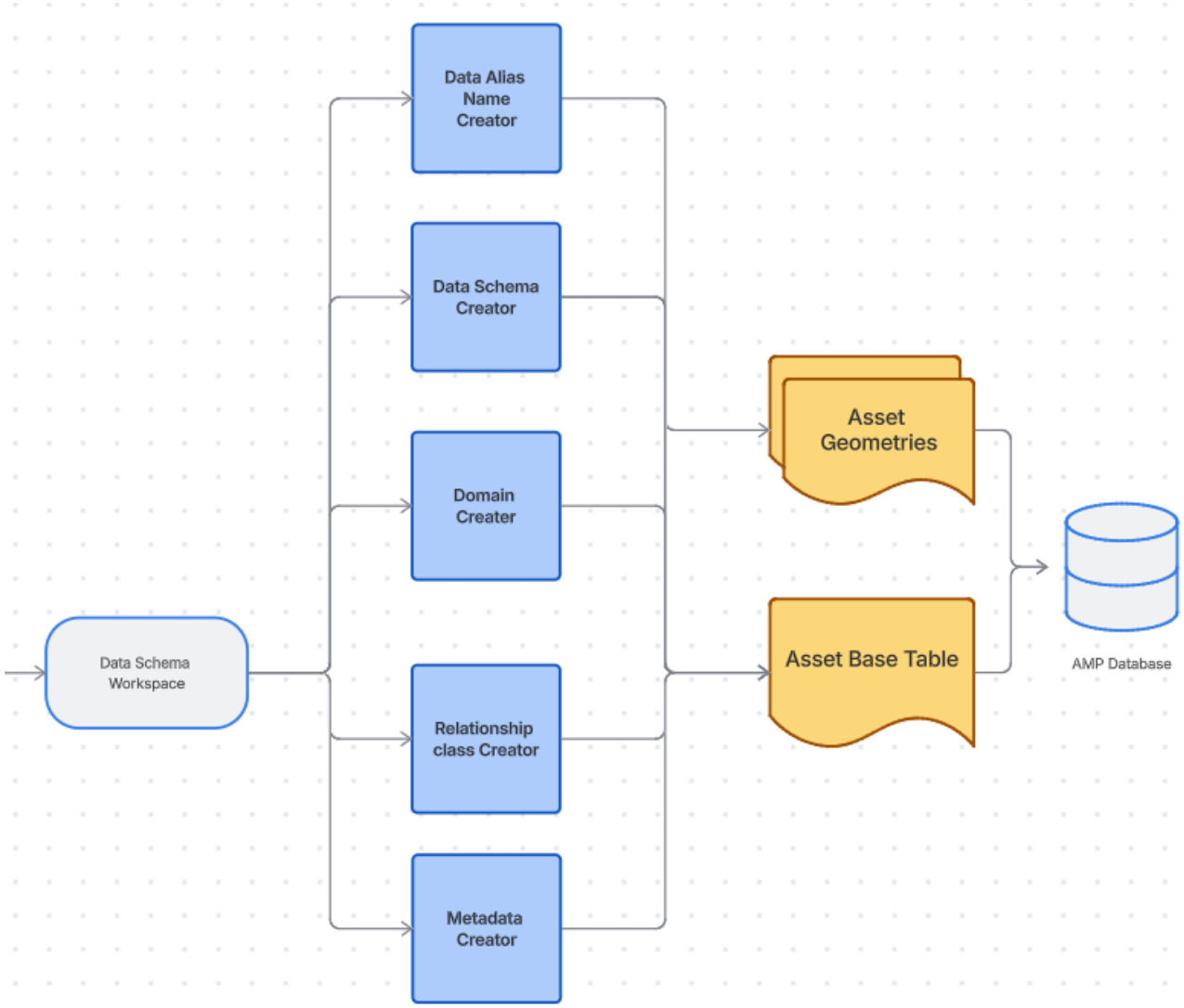
Map service design

Advantages

- Improved data query responding speed & drawing performance in apps
- Referential integrity maintained via UUID-based relationship classes

Disadvantages

- Increased data-structure complexity
- Bulk upload processing time **doubles**

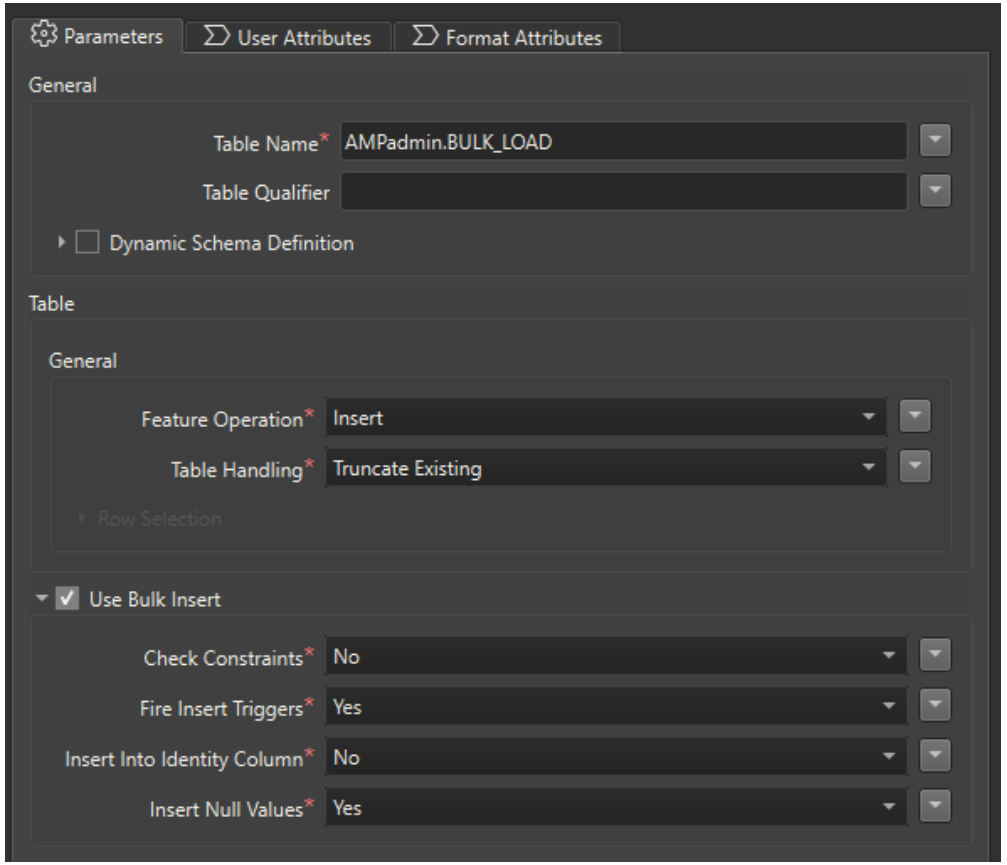


How we used FME to do this

- **Schema Creation** – Automates table, field and domain creation across the base attribute table and geometry layers
- **Relationship Class Generation** – Builds and maintains the UUID-based relationship classes linking geometry to attributes
- **SDE Privilege Management** – Sets and audits user and role permissions on SDE datasets as part of the build
- **Bulk Loading** – Loads millions of records into SDE
- **Publishing Support** – Prepares dataset for publishing in ArcGIS Enterprise



Introducing SQL into the workflow



- **Bulk Operations** – Execute high-volume inserts, updates, and deletes directly in the SDE database, significantly faster than row-by-row processing.
- **Full Data Control** – Perform complex joins, filters, aggregations, and multi-table operations using native SQL.
- **Data Validation** – Quickly verify data integrity using COUNT(*), aggregates, comparisons, and other SQL validation queries.
- **Automation & Repeatability** – Reuse SQL scripts to build consistent, maintainable workflows for scheduled data updates.

Using SQL to bulk load data

Time saving!



Old Data Bulk Data Writer

ast_ud_marking	158894	stewie	DONE	3 HR 15 MINS
ast_ud_mast	276	stewie	DONE	4 MINS
ast_ud_me_chamber	972	stewie	DONE	5 MINS

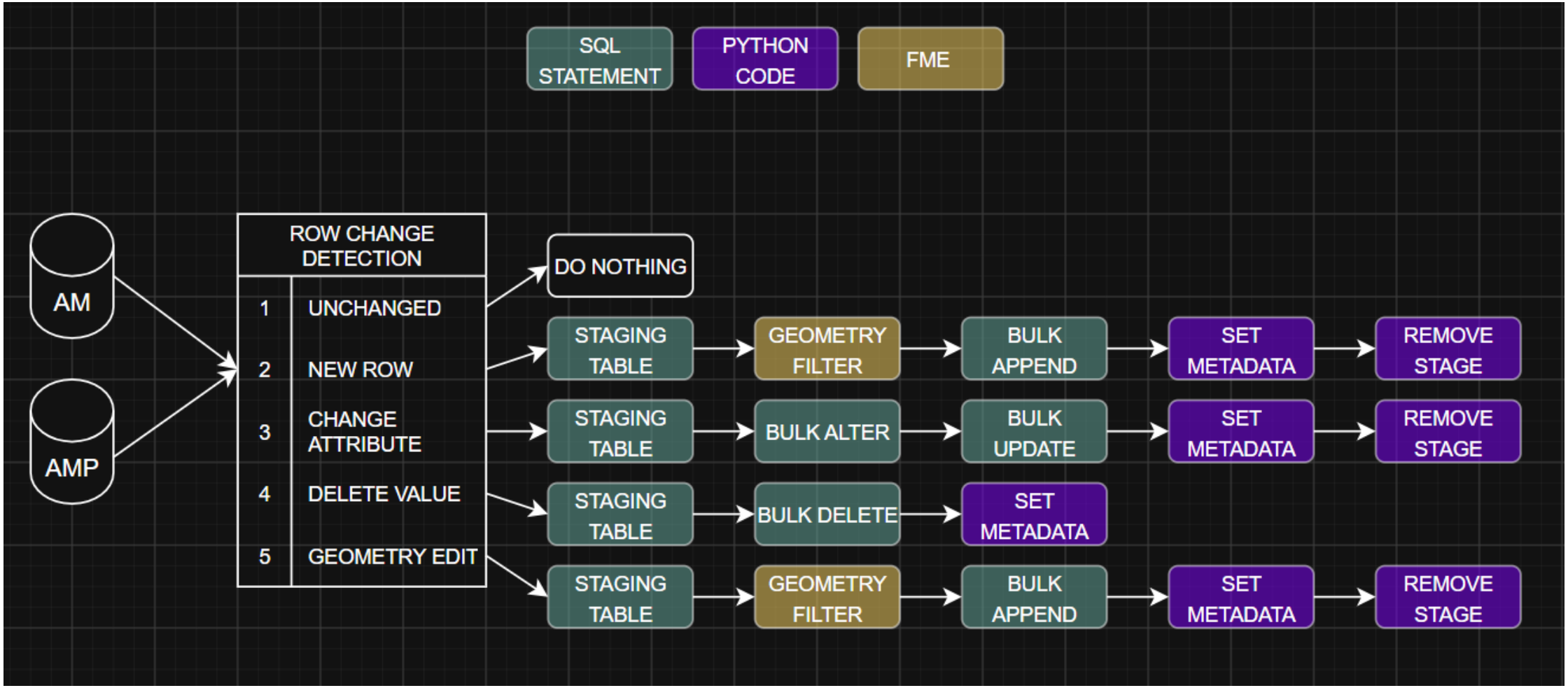


New Data Bulk Data Writer with SQL

```
=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-
Translation was SUCCESSFUL with 10 warning(s) (0 feature(s) output)
FME Session Duration: 38 minutes 56.5 seconds. (CPU: 1325.0s user, 101.2s system)
END - ProcessID: 39244, peak process memory usage: 6961512 kB, current process memory usage: 1395784 kB
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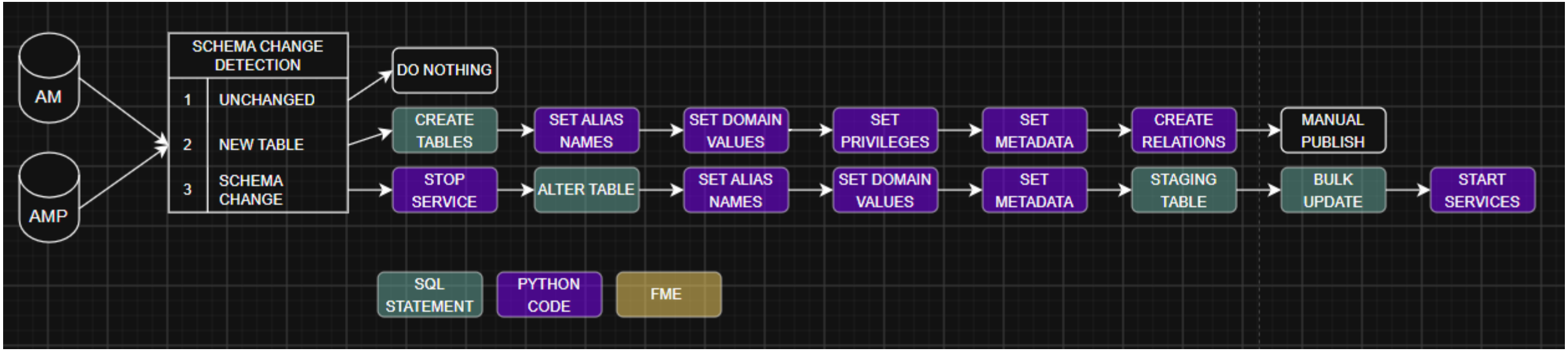
FME methodology overview

Maintaining data



FME methodology overview

Maintaining data



Current state & what's next?

Current State



Automated data updates via FME Flow



Successfully deployed through UAT

What's Next



Data source might be changing



Workflow efficiencies



Ready for schema changes coming mid 2027

Team effort!



This work would not be possible without the contributions of Stewie He

He designed & built many of the foundations showcased in this presentation.

Stewie has since moved on to Watercare, but his contribution continues to have a lasting impact on the project

Thanks!

Thanks for listening

Ngā mihi