Power BI and DAS Financial Datamart: Join Guide

Background:
This document was created to provide detailed table join information when using the 'Microsoft's Power BI Desktop' query tool program against the Department of Administrative Services (DAS) Financial Datamart. In 2025, the DAS Datamart team added 'key' fields to the DAS Datamart to help with the join process. As a result of this addition, the new standard practice, whenever possible, is to join tables using their key fields.

The DAS Financial Datamart is built using two types of tables: **Financial** and **Profile**. The key difference between them lies in their purpose, content, and how they're used in reporting and analysis.

Financial Tables
Financial tables store transactional or summary financial data. This includes information such as expenditures, revenues, budgets, actuals, encumbrances, fund types, cost centers, and fiscal periods. These tables support core financial reporting, budget tracking, and various forms of financial analysis.

Profile Tables
Profile tables contain metadata or descriptive attributes that add context to transactional data. They serve as reference or lookup tables, providing readable titles or descriptions for codes (e.g., fund names, department titles). Profile tables enhance reports by enabling more intuitive filtering, grouping, and labeling.

To make financial data more meaningful and user-friendly in tools like Power BI, you are able to join financial tables with Profile tables using shared "key" fields.

Important Join Guidelines
To ensure proper performance and accurate results, follow these best practices when joining tables:

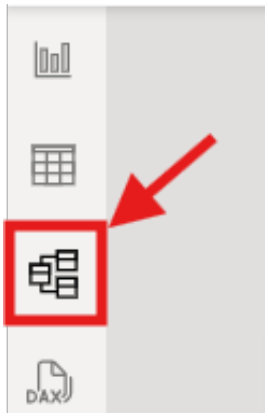
1. Do not join two financial tables together – this can cause performance issues and result in incorrect or incomplete data.
2. Avoid joining two profile tables together – similar to the above, this can lead to performance and query problems.
3. Always follow the recommended join structures – as outlined in this document – to avoid data extraction problems or model performance issues.
4. Focus on creating joins between **Financial and Profile tables**, using appropriate key fields to establish **one-to-many** or **many-to-one** relationships. This approach ensures efficient queries and accurate reporting.

If you are having issues with joins, please contact: Datamart.support@das.oregon.gov.

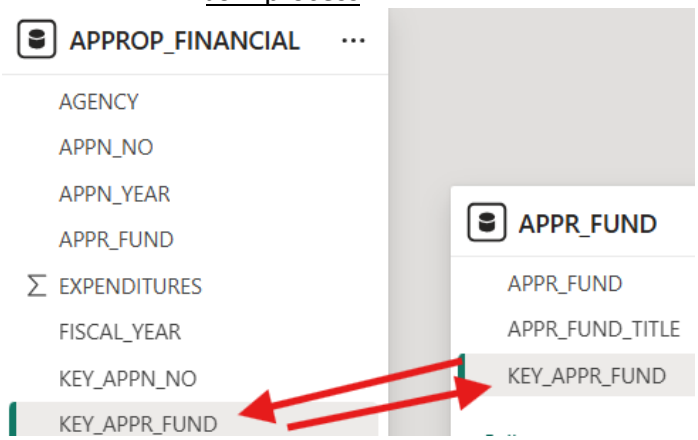
Join process:

1. **Create a Query in Power BI**
   Start by creating a query that includes the appropriate related tables, as described in this document.
2. **Transform the Data**
   Apply any necessary filters and limits to prepare the data for analysis.
3. **Apply and Close**
   Once the data transformation is complete, select **'Close & Apply'** to apply the changes and return to the main Power BI interface.
4. **Create Table Relationships**
   - Go to the **'Model View'** tab (see example below).
   - Drag and drop a field from one table to the corresponding field in another to create a relationship.
   - Ensure you are joining **key field to key field**.
     - *Example:* Connect Key_Appr_Fund from the **'Appr Fund'** table to Key_Appr_Fund in the **'Approp Financial'** table.

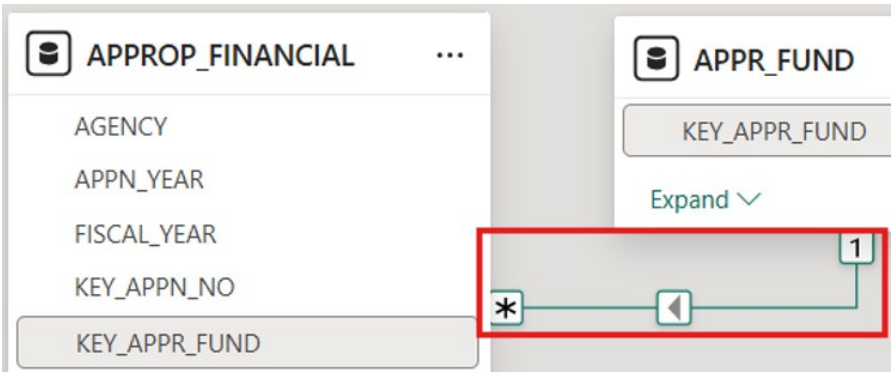
Model View:



Join process:



Verify and Edit:
After completing a table join in Power BI, it's important to **verify and/or edit** the relationship to ensure it was created correctly. Although Power BI attempts to automatically detect and create relationships between tables, you **should not rely solely on this automated process**.



To verify a relationship:

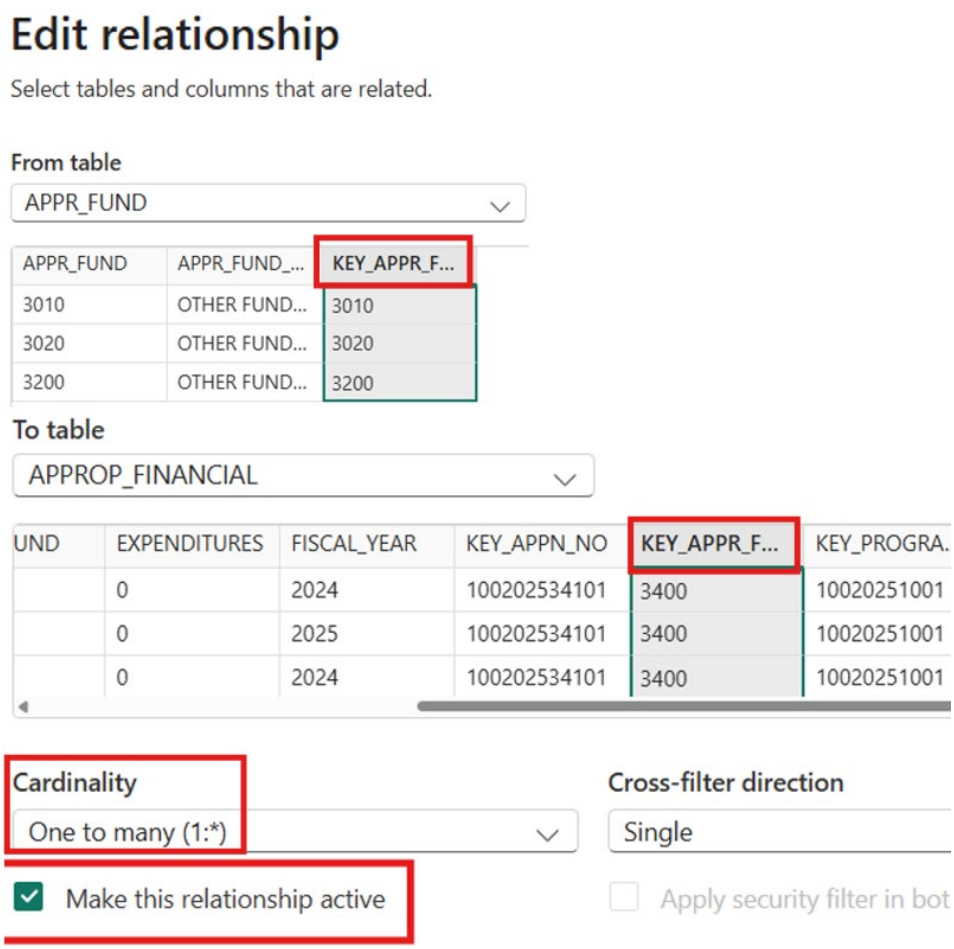
1. **Double-click** the line connecting two tables in the model view. This opens the **Edit relationship** window, where you can inspect and adjust the relationship settings.

In the Edit Relationship Window:

- **Verify the correct fields are used** in the join. Ideally, fields with the same name and matching key values should be joined. If matching fields are not available, refer to the alternative join instructions provided in this documentation.
- **Check the relationship cardinality** (e.g., *one-to-many*, *many-to-one*) to ensure it reflects the correct data structure. Typically, the *profile* table should be on the **'one'** side of the relationship, and the *financial* table on the **'many'** side. This structure is necessary for accurate data extraction from the Datamart.
- **Confirm the relationship is active** by ensuring the **"Make this relationship active"** option is checked.

Standard Relationship Example:

- **"One-to-many"** or **"Many-to-one"** relationship between a profile table and a financial table, with the profile table as the *one* side.



There are a few exceptions to the rules listed above.

Exceptions can vary, for example, some tables do not have a 'key' field, and others have very complex joins that are currently not possible within Power BI. The exceptions are listed throughout the document.

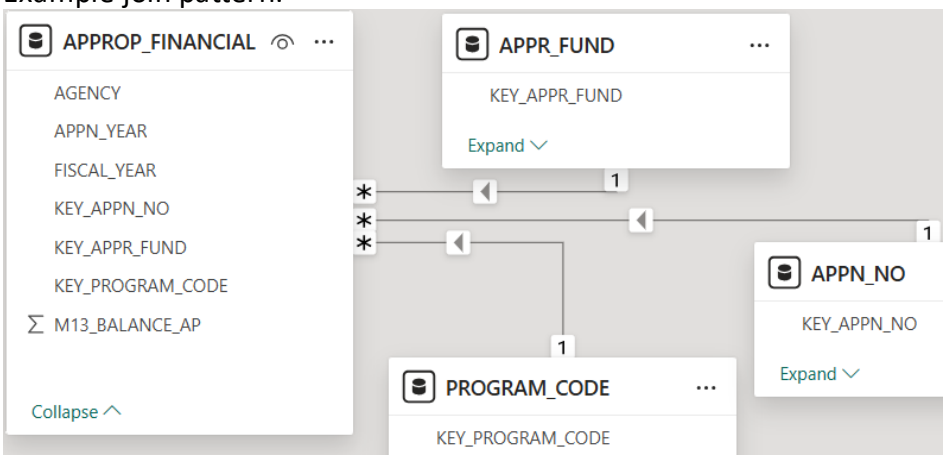
Warning: When creating joins, it's important to **limit the number of tables** included in your query's data model. Joining too many tables can significantly degrade performance. For optimal results, it is recommended to **join no more than four tables** whenever possible.

Join Diagnostics:

Join 1: The following tables are part of the 'Appropriation Financial' table join info:

APPROP_FINANCIAL (main financial table)
APPN_NO (profile table)
APPR_FUND (profile table)
PROGRAM_CODE (profile table)

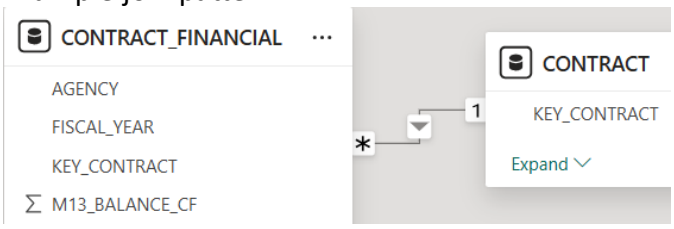
Example join pattern:



Join 2: The following tables are part of the 'Contract Financial' table join info:

SFMSPUSR.CONTRACT_FINANCIAL (main financial table)
SFMSARCH.ARCH_CONTRACT_FINANCIAL (main financial table: Joins mirror the standard Contract Financial)
SFMSPUSR.CONTRACT (profile table)

Example join pattern:



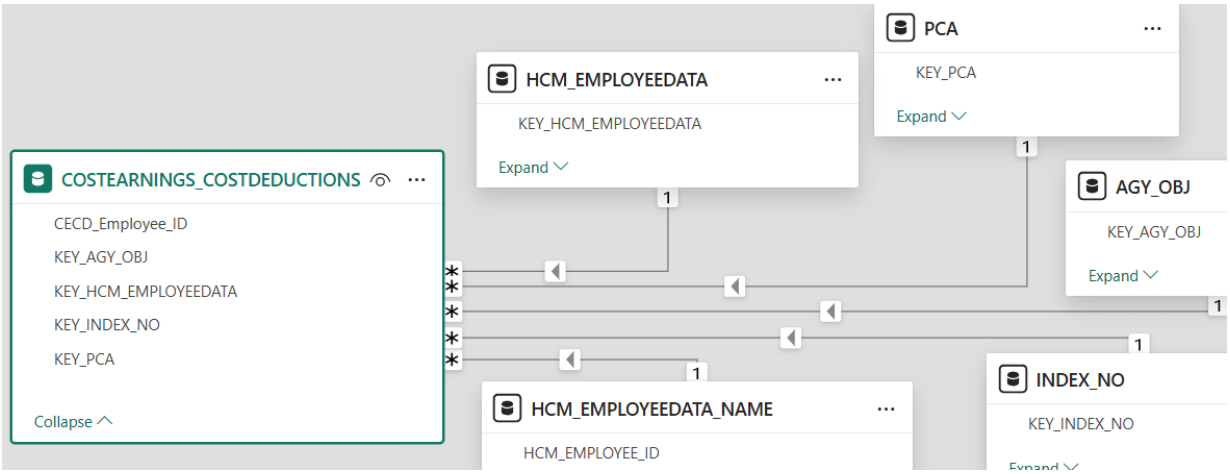
Join 3: The following tables are part of the Workday CECD, CE and CD table join info:

Exceptions:

- **'U' tables:** These tables were designed for use with Excel and should be joined in the same way as their standard counterparts.
- **'Position Costing' table:** This table is not included in the join diagram because it requires a **greater than/less than join** on the **'Effective Date'** field, which is not supported in the relationship model.
- **'Workday HCM Employee Name' table:** This table does **not contain a key field**. Instead, it joins using the **'HCM Employee ID'** field, which should be matched to the **'Employee ID'** field on the main financial **CECD Workday** table.

WORKDAY.COSTEARNINGS_COSTDEDUCTIONS (main financial table)
WORKDAY.COSTEARNINGS_COSTDEDUCTIONS_U (main financial table: Joins mirror the standard CECD table)
WORKDAY.COSTDEDUCTIONS (main financial table)
WORKDAY.COSTDEDUCTIONS_U (main financial table: Joins mirror the standard CD table)
WORKDAY.COSTEARNINGS (main financial table)
WORKDAY.COSTEARNINGS_U (main financial table: Joins mirror the standard CE table)
SFMSPUSR.AGY_OBJ (profile table)
SFMSPUSR.INDEX_NO (profile table)
SFMSPUSR.PCA (profile table)
WORKDAY.HCM.EMPLOYEEDATA (profile table)
WORKDAY.HCM.EMPLOYEE_NAME (profile table)

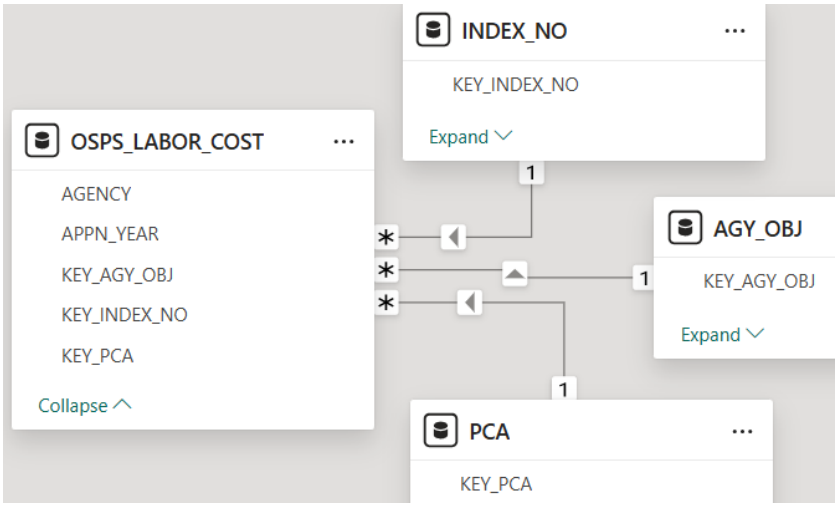
Example join pattern:



Join 4: The following tables are part of the 'OSPS Labor Cost' table join info:

OSPSPUSR.OSPS_LABOR_COST (main financial table)
KEY_AGY_OBJ (profile table)
KEY_INDEX_NO (profile table)
KEY_PCA (profile table)

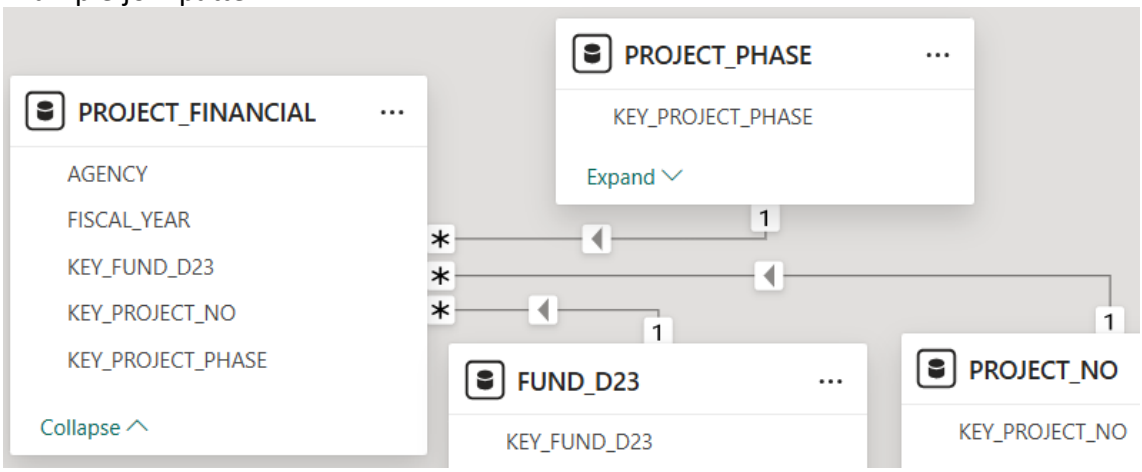
Example join pattern:



Join 5: The following tables are part of the 'Project Financial' table join info:

SFMSPUSR.PROJECT_FINANCIAL (main financial table)
SFMSPUSR.PROJECT_NO (profile table)
SFMSPUSR.PROJECT_JOIN (profile table)
SFMSPUSR.FUND_D23 (profile table)

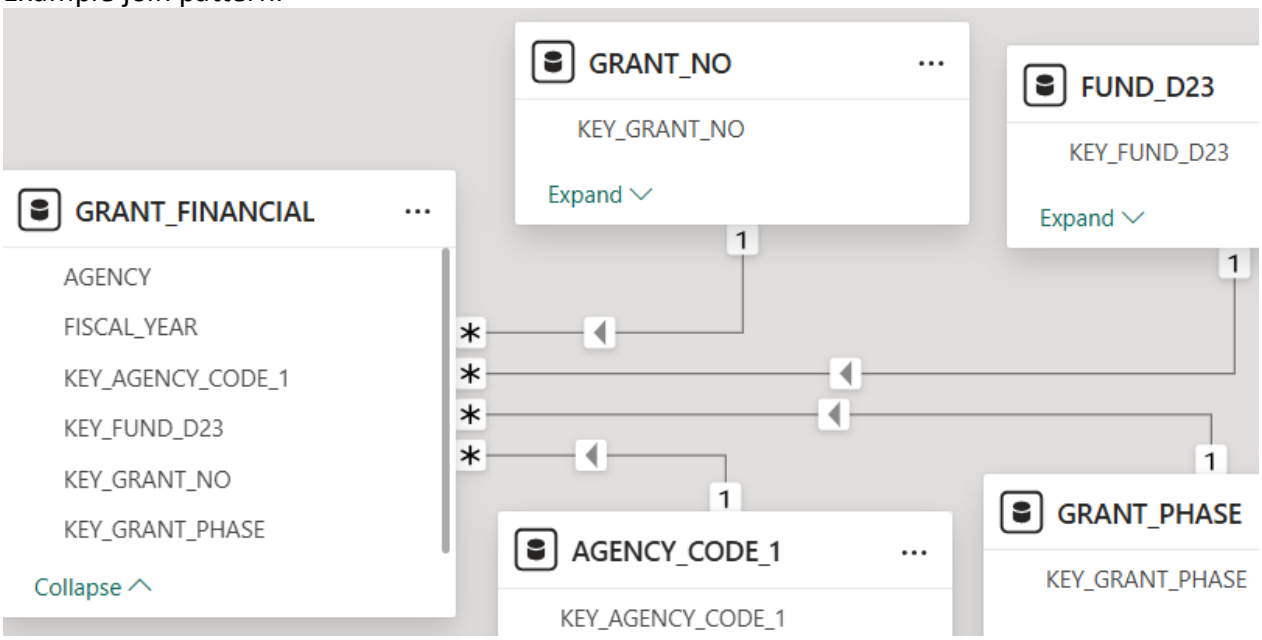
Example join pattern:



Join 6: The following tables are part of the 'Grant Financial' join info:

SFMSPUSR.GRANT_FINANCIAL (main financial table)
SFMSPUSR.AGENCY_CODE_1 (profile table)
SFMSPUSR.FUND_D23 (profile table)
SFMSPUSR.GRANT_NO (profile table)
SFMSPUSR.GRANT_PHASE (profile table)

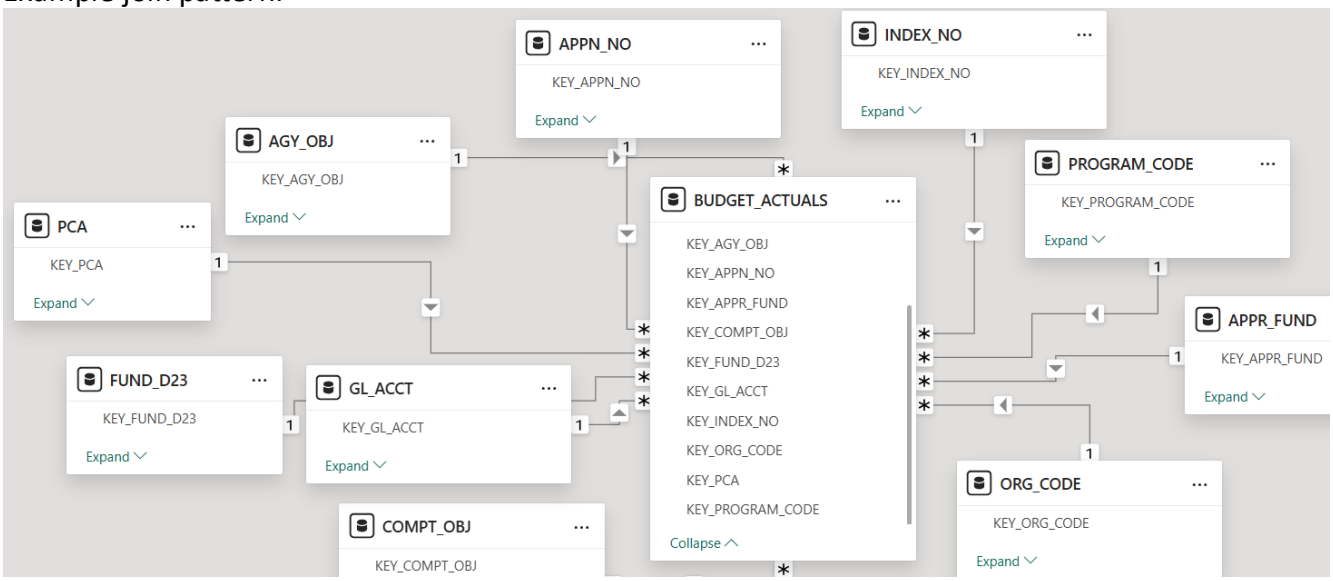
Example join pattern:



Join 7: The following tables are part of the 'Budget Actual' join info:

SFMSPUSR.BUDGET_ACTUAL (main financial table)
SFMSPUSR.AGY_OBJ (profile table)
SFMSPUSR.APPN_NO (profile table)
SFMSPUSR.APPR_FUND (profile table)
SFMSPUSR.COMPT_OBJ (profile table)
SFMSPUSR.FUND_D23 (profile table)
SFMSPUSR.GL_ACCT (profile table)
SFMSPUSR.INDEX_NO (profile table)
SFMSPUSR.ORG_CODE (profile table)
SFMSPUSR.PCA (profile table)
SFMSPUSR.PROGRAM_CODE (profile table)

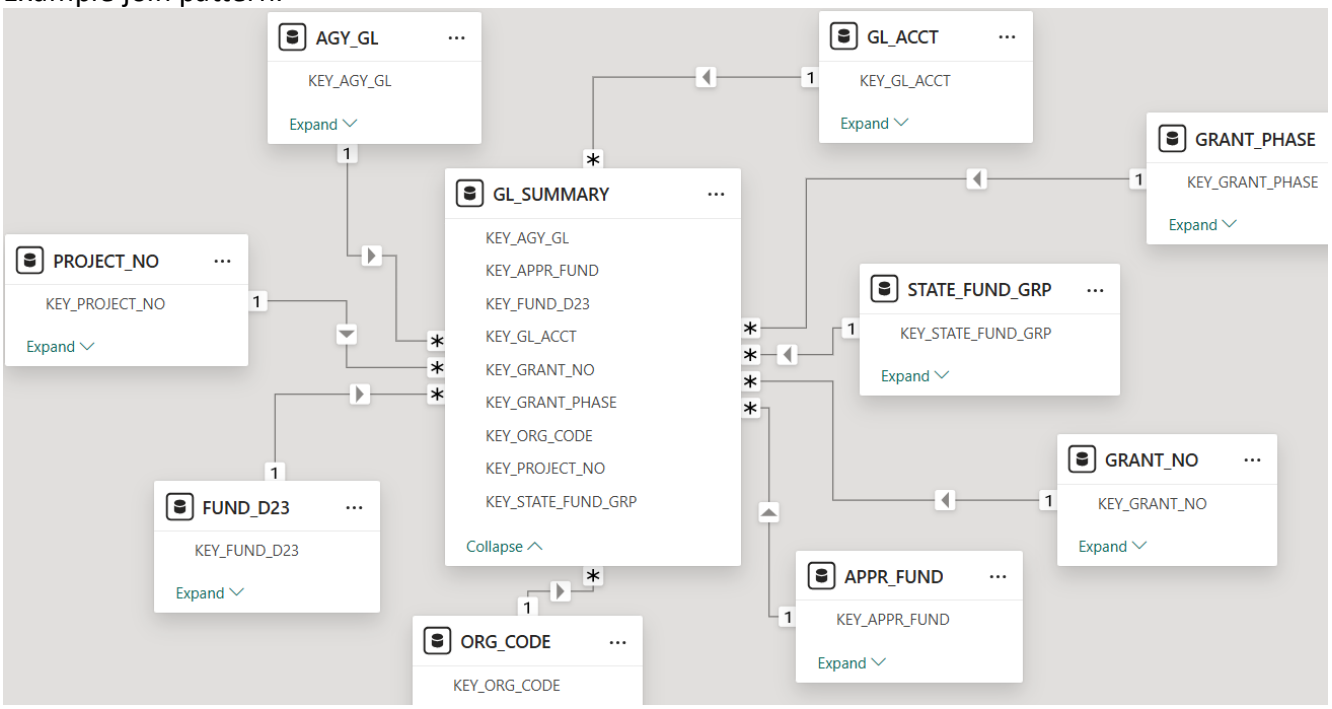
Example join pattern:



Join 8: The following tables are part of the 'GL Summary' table join info:

SFMSPUSR.GL_SUMMARY (main financial table)
SFMSARCH.ARCH_GL_SUMMARY (main financial table: joins mirror the standard GL Summary table)
SFMSPUSR.AGY_GL (profile table)
SFMSPUSR.APPR_FUND (profile table)
SFMSPUSR.FUND_D23 (profile table)
SFMSPUSR.GL_ACCT (profile table)
SFMSPUSR.GRANT_NO (profile table)
SFMSPUSR.GRANT_PHASE (profile table)
SFMSPUSR.ORG_CODE (profile table)
SFMSPUSR.PROJECT_NO (profile table)
SFMSPUSR.STATE_FUND_GRP (profile table)

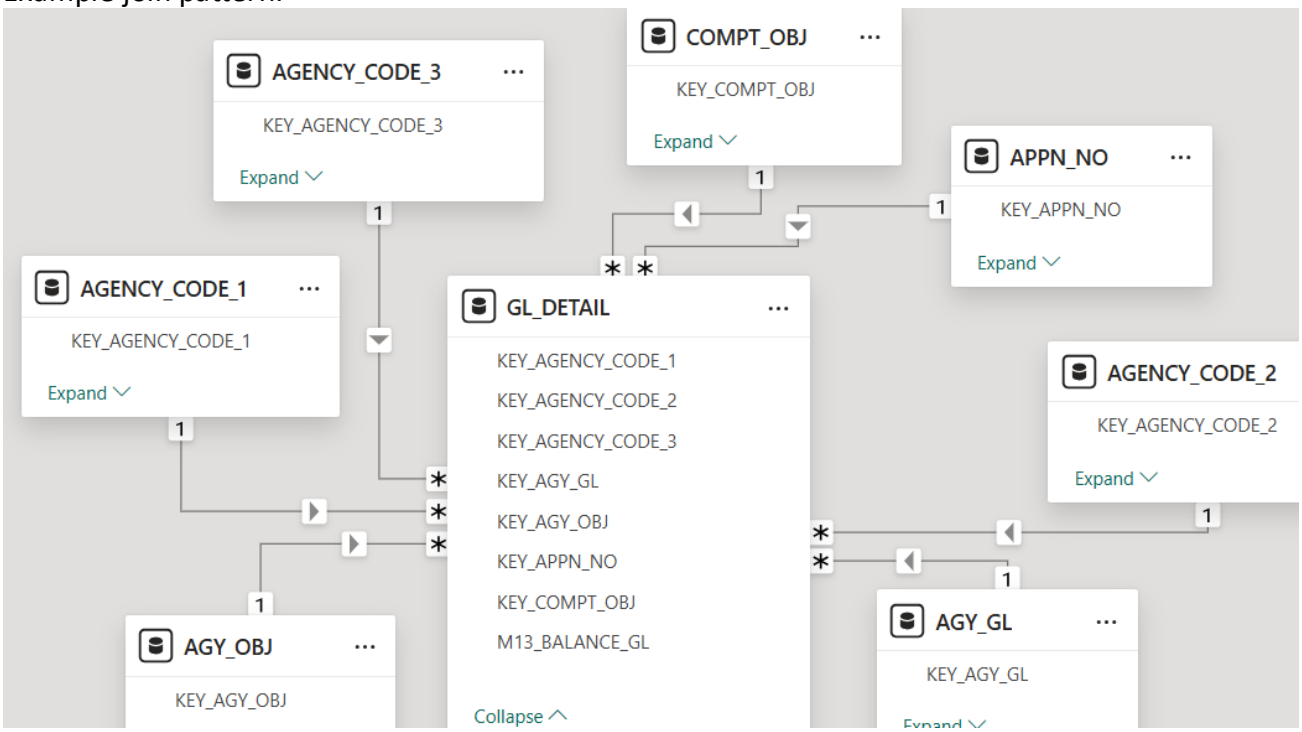
Example join pattern:

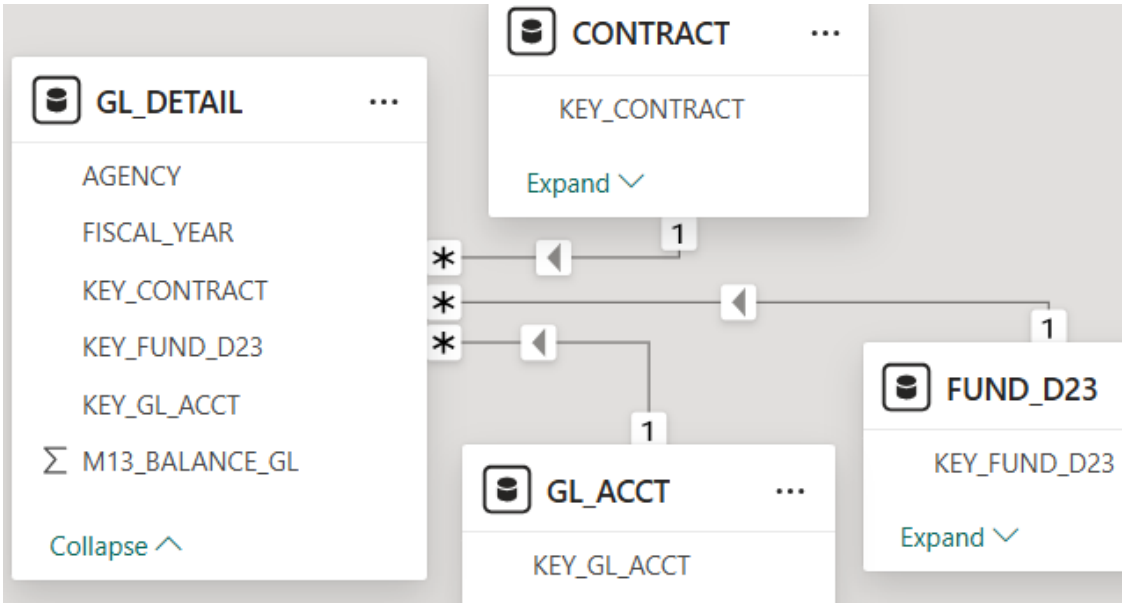


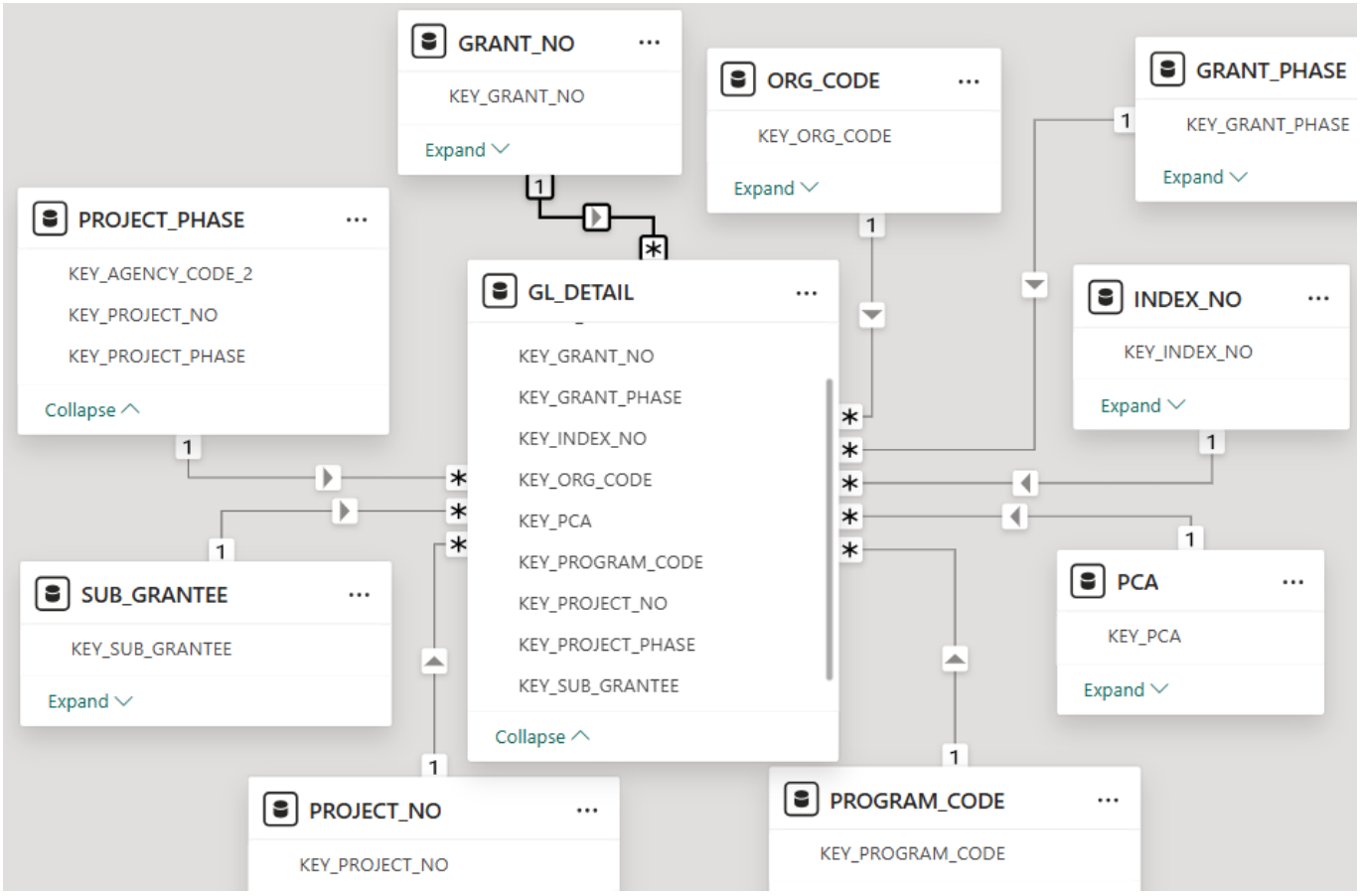
Join 09: The following tables are part of the 'GL Detail' join info:

SFMSPUSR.GL_DETAIL (main financial table)
SFMSARCH.ARCH_GL_DETAIL (main financial table: Joins mirror the standard GL Detail table)
SFMSPUSR.AGENCY_CODE_1 (profile table)
SFMSPUSR.AGENCY_CODE_2 (profile table)
SFMSPUSR.AGENCY_CODE_3 (profile table)
SFMSPUSR.AGY_GL (profile table)
SFMSPUSR.AGY_OBJ (profile table)
SFMSPUSR.APPR_NO (profile table)
SFMSPUSR.COMPT_OBJ (profile table)
SFMSPUSR.CONTRACT (profile table)
SFMSPUSR.FUND_D23 (profile table)
SFMSPUSR.GL_ACCT (profile table)
SFMSPUSR.GRANT_NO (profile table)
SFMSPUSR.GRANT_PHASE (profile table)
SFMSPUSR.INDEX_NO (profile table)
SFMSPUSR.ORG_CODE (profile table)
SFMSPUSR.PCA (profile table)
SFMSPUSR.PROGRAM_CODE (profile table)
SFMSPUSR.PROJECT_NO (profile table)
SFMSPUSR.PROJECT_PHASE (profile table)
SFMSPUSR.SUB_GRANTEE (profile table)

Example join pattern:







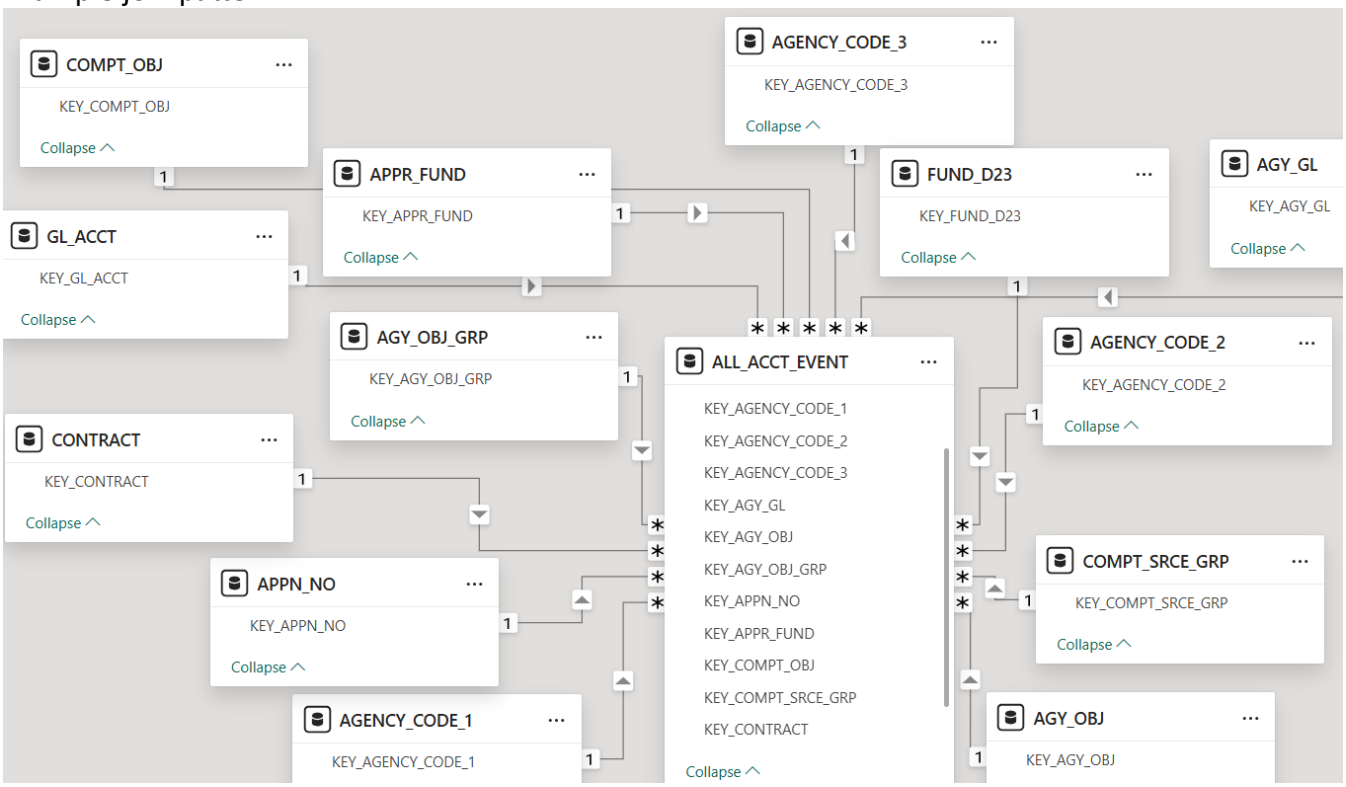
Join 10: The following tables are part of the 'Accounting Event' table joins:

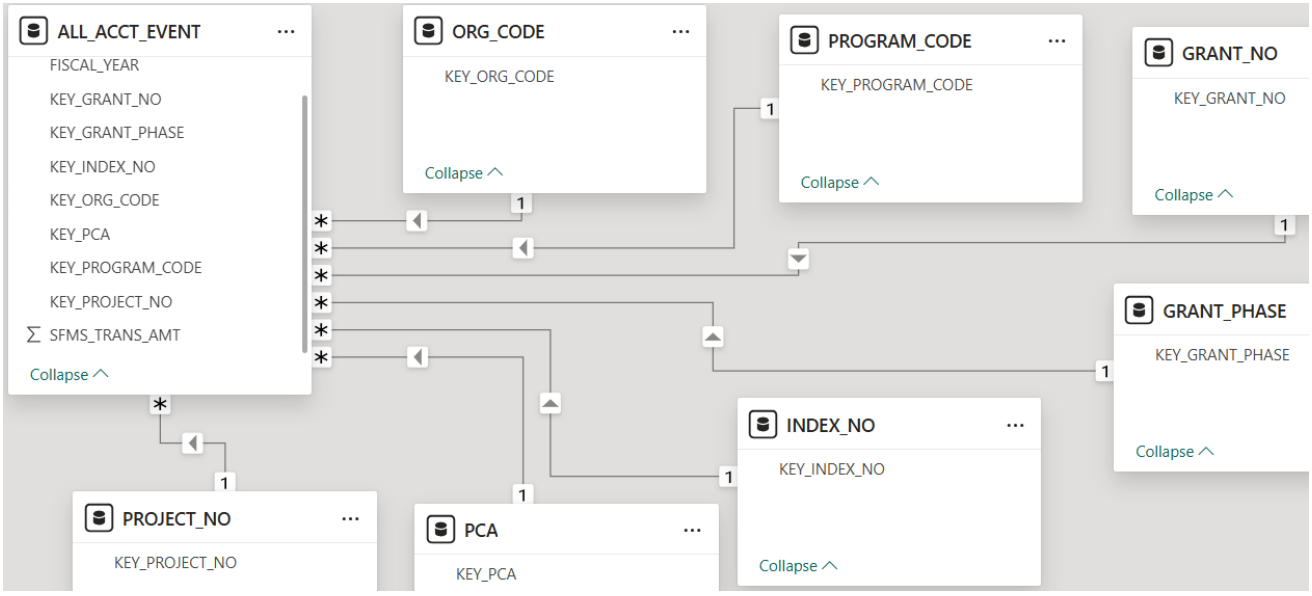
SFMSPUSR.ALL_ACCT_EVENT (main financial table)
SFMSPUSR.ACTIVE_ACCT_EVENT (main financial table: Joins mirror the standard All Acct Event table)
SFMSARCH.ALL_ACCT_EVENT (main financial table: Joins mirror the standard All Acct Event table)
SFMSPUSR.AGENCY_CODE_1 (profile table)
SFMSPUSR.AGENCY_CODE_2 (profile table)
SFMSPUSR.AGENCY_CODE_3 (profile table)
SFMSPUSR.AGY_GL (profile table)
SFMSPUSR.AGY_OBJ (profile table)
SFMSPUSR.AGY_OBJ_GRP (profile table)
SFMSPUSR.APPR_NO (profile table)
SFMSPUSR.APPR_FUND (profile table)
SFMSPUSR.BUDGET_OBJ (profile table)
SFMSPUSR.CASH_FUND (profile table)
SFMSPUSR.COMPT_OBJ (profile table)
SFMSPUSR.COMPT_SRCE_GRP (profile table)
SFMSPUSR.CONTRACT (profile table)
SFMSPUSR.FUND_D23 (profile table)

SFMSPUSR.GL_ACCT (profile table)
SFMSPUSR.GRANT_NO (profile table)
SFMSPUSR.GRANT_PHASE (profile table)
SFMSPUSR.INDEX_NO (profile table)
SFMSPUSR.OPERATOR ID (profile table)
SFMSPUSR.ORG_CODE (profile table)
SFMSPUSR.PAYMENT_CONTROL (profile table)
SFMSPUSR.PCA (profile table)
SFMSPUSR.PCA_INDEX_REL (profile table)
SFMSPUSR.PROGRAM_CODE (profile table)
SFMSPUSR.PROJECT_NO (profile table)
SFMSPUSR.PROJECT_PHASE (profile table)
SFMSPUSR.STATE_FUND_GRP (profile table)
SFMSPUSR.SUB_GRANTEE (profile table)

Exception: The **SFMSPUSR.GRANT_OBJ** profile table could not be joined to the **Accounting Event** tables due to the complexity of the required **'from/to' range-based join**, which is not supported in Power BI's standard relationship model.

Example join pattern:




ALL_ACCT_EVENT
FISCAL_YEAR
KEY_GRANT_NO
KEY_GRANT_PHASE
KEY_INDEX_NO
KEY_ORG_CODE
KEY_PCA
KEY_PROGRAM_CODE
KEY_PROJECT_NO
SFMS_TRANS_AMT
Collapse
ORG_CODE
KEY_ORG_CODE
Collapse
PROGRAM_CODE
KEY_PROGRAM_CODE
Collapse
GRANT_NO
KEY_GRANT_NO
Collapse
GRANT_PHASE
KEY_GRANT_PHASE
Collapse
INDEX_NO
KEY_INDEX_NO
Collapse
PROJECT_NO
KEY_PROJECT_NO
PCA
KEY_PCA
1
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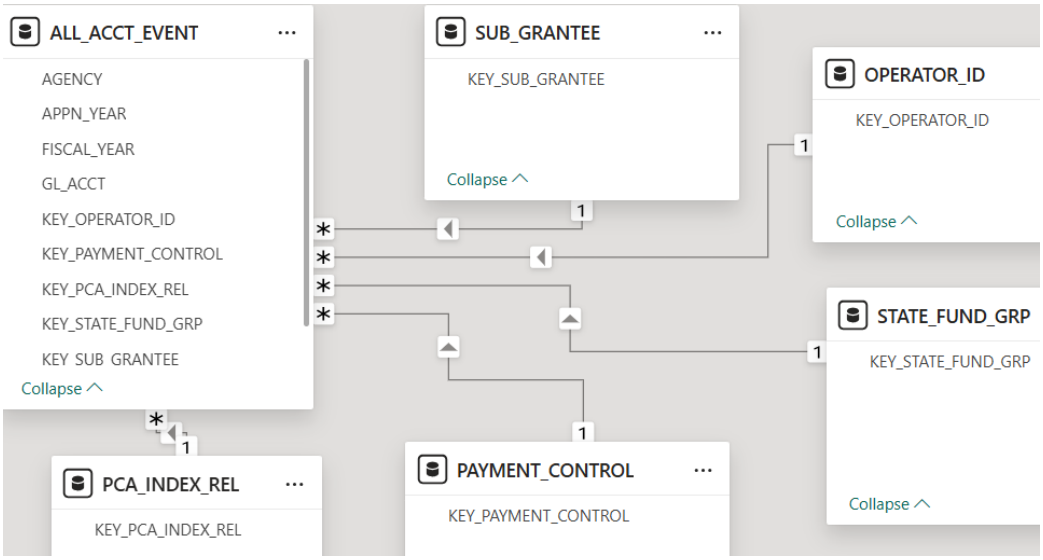
ALL_ACCT_EVENT
AGENCY
APPN_YEAR
FISCAL_YEAR
GL_ACCT
KEY_OPERATOR_ID
KEY_PAYMENT_CONTROL
KEY_PCA_INDEX_REL
KEY_STATE_FUND_GRP
KEY_SUB_GRANTEE
Collapse
SUB_GRANTEE
KEY_SUB_GRANTEE
Collapse
OPERATOR_ID
KEY_OPERATOR_ID
Collapse
STATE_FUND_GRP
KEY_STATE_FUND_GRP
Collapse
PCA_INDEX_REL
KEY_PCA_INDEX_REL
PAYMENT_CONTROL
KEY_PAYMENT_CONTROL
1
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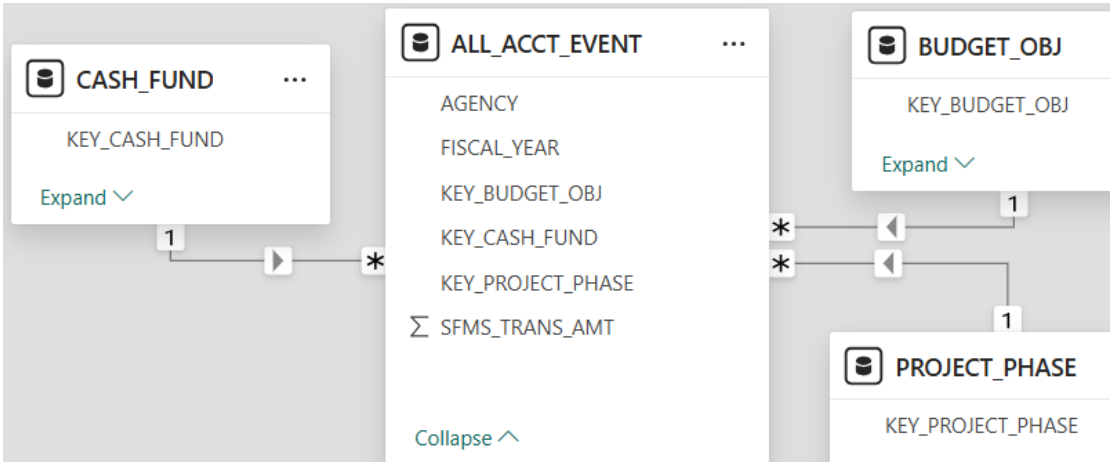
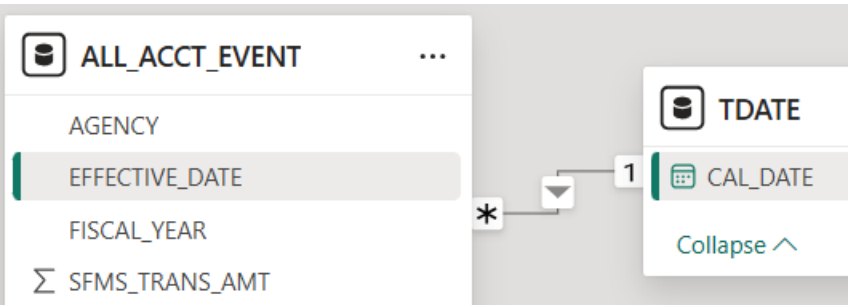

CASH_FUND
KEY_CASH_FUND
Expand
ALL_ACCT_EVENT
AGENCY
FISCAL_YEAR
KEY_BUDGET_OBJ
KEY_CASH_FUND
KEY_PROJECT_PHASE
SFMS_TRANS_AMT
Collapse
BUDGET_OBJ
KEY_BUDGET_OBJ
Expand
PROJECT_PHASE
KEY_PROJECT_PHASE
1
*

Join 11: The following tables are part of the **'Year-end' (YE) joins**. These tables contain data exclusively for Month 13 and follow the same join patterns as their corresponding non-YE tables described above.

SFMSPUSR.YE_GL_DETAIL (main financial table: Joins mirror the standard GL Detail table)
SFMSPUSR.YE_GL_SUMMARY (main financial table: Joins mirror the standard GL Summary table)
SFMSPUSR.YE_ACTIVE_ACCOUNT_EVENT (main financial table: Joins mirror the standard Acct Event table)

Join 12: The **'Tdate'** table can be joined to other tables that contain date fields. For example, you can join the **'Cal Date'** field from the **Tdate** table to the **'Effective Date'** field in the **Accounting Event** tables. This join enables the use of multiple date-related fields in various formats, supporting more flexible date analysis and reporting.



Join 13: The **'Agency'** table does not have a key field; however, it can be joined to financial tables using the **Agency** field.

Example: Join the **Agency** field from the **All Acct Event** table to the **Agency** field in the **Agency** table.