Analysis Services and Power BI Premium Model Feature Matrix

The following matrix identifies analytical data modeling features available to the current and upcoming versions of Analysis Services Tabular models and Power BI Premium datasets. Specifically, the following four model [compatibility levels](https://docs.microsoft.com/en-us/analysis-services/tabular-models/compatibility-level-for-tabular-models-in-analysis-services) (ie releases) are included:

1. **Analysis Services 2017 (1400 Compatiliblity Level)**
2. **Analysis Services 2019 (1500 Compatibility Level)**
3. **Power BI Premium Dataset (1465 Compability Level)**
   1. Current compatibility level as of 11/10/2019
4. **Power BI Premium Dataset (15XX Compatibility Level)**
   1. A future compatibility level which exposes additional or all existing Analysis Services functionality in addition to features exclusive to Power BI Premium datasets.

Roadmap guidance is that Power BI will become a [superset of Analysis Services](https://powerbi.microsoft.com/en-us/blog/whats-new-for-sql-server-2019-analysis-services-ctp-3-0/).

|  | | **Analysis Services** | | **Power BI Premium** | |
| --- | --- | --- | --- | --- | --- |
| **Feature** | **Feature Details** | **2017 (1400 CL)** | **2019 (1500 CL)** | **1465 CL** | **15XX CL** |
| Aggregations | Define aggregated tables to dynamically support queries which only require the aggregated granularity. [MS Docs: Aggregations](https://docs.microsoft.com/en-us/power-bi/desktop-aggregations) | Not Supported | Not Supported | Supported | Supported |
| Bi-directional Relationships | Ability to define relationships in which filter context is propagated from each table of the relationship to the other table in the relationship. [MS Docs: Bi-directional relationships](https://docs.microsoft.com/en-us/analysis-services/tabular-models/bi-directional-cross-filters-tabular-models-analysis-services) | Supported | Supported | Supported | Supported |
| Calculation Groups | Groups of reusable calculation items (e.g. YTD, MTD, YOY) [MS Docs: Calculation Groups](https://docs.microsoft.com/en-us/analysis-services/tabular-models/calculation-groups) | Not supported.  Required to create many distinct measures with common logic | Supported | Not Supported. Required to create many distinct measures per base measure. | Supported via XMLA endpoints |
| Composite Models | Define the storage mode per table (DirectQuery, Import, Dual) thus supporting multiple data access modes in the same model.  [MS Docs: Composite Models](https://docs.microsoft.com/en-us/power-bi/desktop-composite-models) | Not Supported | Not Supported | Supported | Supported |
| Detail Row Expressions | Define the columns to be exposed in a ‘show details’ or drillthrough action in a client tool per measure or as a default for a table [SQL BI: Detail Rows Expression](https://www.sqlbi.com/articles/controlling-drillthrough-using-detail-rows-expressions-in-dax/) | Supported. Available only to MDX client tools. | Supported. Available only to MDX client tools. | Not Supported | To Be Determined |
| Display Folders | Group measures or columns into folders and optionally nested subfolders to improve usability. | Supported | Supported | Supported | Supported |
| Hierarchies | Relationships defined between two or more columns in a table to enable easier user navigation (e.g. Year, Quarter, Month, Week, Day) [MS Docs: Hierarchies](https://docs.microsoft.com/en-us/analysis-services/tabular-models/hierarchies-ssas-tabular) | Supported | Supported | Supported | Supported |
| Incremental Refresh Policies | Define policies governing data history to be stored and processed/refreshed. (Avoid custom refresh scripts)  [MS Docs: Incremental Refresh](https://docs.microsoft.com/en-us/power-bi/service-premium-incremental-refresh) | Not Supported | Not Supported | In Preview | Supported |
| Key Performance Indicators (KPIs) | Embedded logic to compare a measure versus a target measure or absolute value and associate this variance with a conditionally formatted icon (e.g. red, yellow, green stoplights, flags, etc).  [MS Docs: KPIs](https://docs.microsoft.com/en-us/analysis-services/tutorial-tabular-1400/as-lesson-7-create-key-performance-indicators) | Supported | Supported | Not Supported. Can only create KPI icon sets in Power BI reports (not datasets). | To Be Determined |
| Many-to-Many Relationships | Create relationships between tables in which both columns are non-unique.  [New Features in Analysis Services 2019 (1500 CL)](https://docs.microsoft.com/en-us/analysis-services/what-s-new-in-sql-server-analysis-services)  [Many-to-Many Relationships in Power BI Desktop](https://docs.microsoft.com/en-us/power-bi/desktop-many-to-many-relationships) | Not supported. Required to add intermediate (‘bridge’) tables and relationships. | Supported | Supported | Supported |
| Model Development Tools | Tool(s) and features to develop data models and simplify and to streamline the development processs. [MS Docs: Desktop Modeling View](https://docs.microsoft.com/en-us/power-bi/desktop-modeling-view)  [Visual Studio Marketplace: Analysis Services Project Extension](https://marketplace.visualstudio.com/items?itemName=ProBITools.MicrosoftAnalysisServicesModelingProjects) | Microsoft Analysis Services Projects extension or SQL Server Data Tools in Visual Studio. (Tabular Model Explorer, DAX Editor, Source Control Integration, etc) | Microsoft Analysis Services Projects extension or SQL Server Data Tools in Visual Studio. (Tabular Model Explorer, DAX Editor, Source Control Integration, etc) | Modeling view in Power BI Desktop (custom diagram views, set common properties of multiple objects at once, properties pane) | Modeling view plus full support for Application Lifecycle Management (ALM) tools in Power BI Desktop such as ALM Toolkit and other tools via XMLA endpoints |
| Object-level Security | Ability to restrict access to both data and metadata of sensitive tables and columns  [MS Docs: OLS](https://docs.microsoft.com/en-us/analysis-services/tabular-models/object-level-security) | Supported | Supported | Not Supported | To Be Determined |
| Perspectives | Custom viewable subsets of a model to improve usability. [MS Docs: Perspectives](https://docs.microsoft.com/en-us/analysis-services/tabular-models/perspectives-ssas-tabular) | Supported | Supported | Not Supported | To Be Determined |
| Power Query (M) Connect & Transform | ‘Get Data’ graphical interface and Power Query (M) expressions for optionally transforming source data. [MS Docs: What is Power Query?](https://docs.microsoft.com/en-us/power-query/power-query-what-is-power-query) [MS Docs: AAS Data Sources](https://docs.microsoft.com/en-us/azure/analysis-services/analysis-services-datasource) [MS Docs: PBI Data Sources](https://docs.microsoft.com/en-us/power-bi/desktop-data-sources) | Supported, but with significantly fewer data sources than PBI. | Supported, but with significantly fewer data sources than PBI. | Supported | Supported |
| Ragged Hierarchies | Hide members property of hierarchies with option to hide blank or missing values at varying levels of a hierarchy (e.g. cities without a state/province). [MS Docs: Ragged Hierarchies](https://docs.microsoft.com/en-us/analysis-services/tutorial-tabular-1400/as-supplemental-lesson-ragged-hierarchies) | Supported | Supported | Not Supported | To Be Determined |
| Row-level security (RLS) | Define roles with specific row filter definitions and map users or groups to those roles.  [MS Docs: RLS](https://docs.microsoft.com/en-us/power-bi/service-admin-rls) | Supported | Supported | Supported | Supported |
| Table Partitions | Ability to define partitions of tables to improve manageability and support incremental data refresh processes.  [MS Docs: Partitions](https://docs.microsoft.com/en-us/analysis-services/tabular-models/partitions-ssas-tabular) | Supported | Supported | Not Supported | Supported via XMLA endpoints |
| Translations | Ability to define additional and alternative translations of a single object (e.g. table, column) within the same model.  [MS Docs: Translations](https://docs.microsoft.com/en-us/analysis-services/tabular-models/translations-in-tabular-models-analysis-services) | Supported | Supported | Not Supported | Supported via XMLA endpoints |
| Writeback | Ability to write or edit values in the model from a client tool. | Not Supported | Not Supported | Not Supported | Not Supported |
| XMLA Endpoint Connectivity | Support for MS and third-party client tools (e.g. SQL Server Management Studio, SQL Profiler, third-party BI tools, etc) to enable read and write functionality and application lifecycle management (ALM) [Release Plan: XMLA Read/Write](https://docs.microsoft.com/en-us/power-platform-release-plan/2019wave2/business-intelligence/xmla-readwrite) | Supported | Supported | Read Only (in Preview). Supports common read scenarios such as monitoring and DMVs. | Supported |