DASH Project
Data Base and Data Framework

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Database Design and Relationships

▶ We focused on designing database for effective use in analytics tools. Key achievements include:

▶ **Modeling**

  o analyzing the data requirements of the DASH system. This involved identifying key entities, attributes, and their relationships.

▶ **Normalization**

  o breaking down data into smaller, related tables and establishing appropriate connection between tables.

▶ **Data Validation and Constraints**

  o defining data types, unique constraints, and foreign key relationships.

▶ **scalability**

  o We designed the database not just for today but also with an eye on the future, making choices to handle more data and changing analytics needs.

Database Design and Relationships

▶ **Create SQL Server on Azure. Establish SQL database with essential configurations.**

Database Design and Relationships

▶ First version of Database diagram provided for DASH project
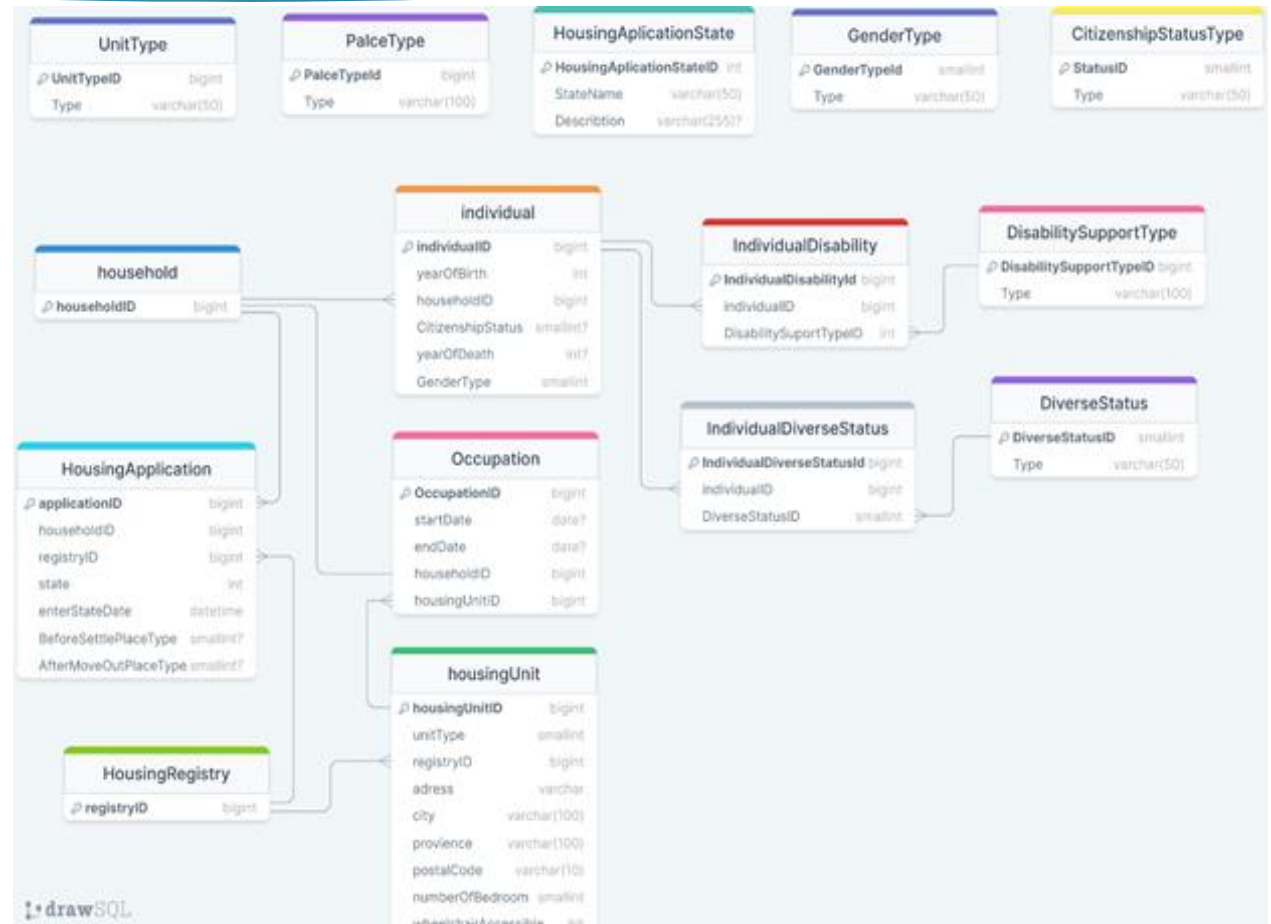
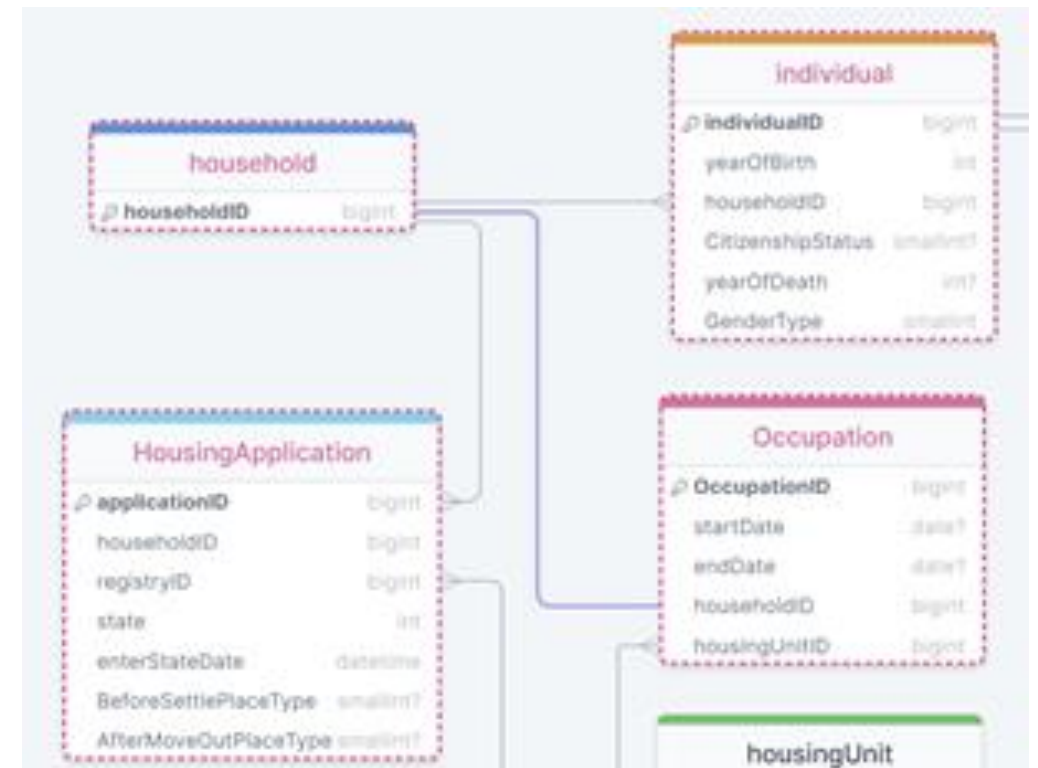# Data Framework
Household Table

▶ **Household Table**

- o Manages information about households.

▶ **Reason for Existence**

- o To store information about households associated with individuals, occupations, and housing applications.

▶ **Relations**

- o refers to each family.

- o Each individual in the individual table should have one household ID

- o the housing application table and the occupation table store the household ID to track the status of each family.

Data Framework
HousingApplication Table

▶ **HousingApplication Table**

  ○ Manages housing applications.

▶ **Reason for Existence**

  ○ To store information about housing applications, their states, and related details.

  ○ When a household applies, this table is used to track it through the 'state' field.

  ○ Each time the state changes, the date of entry into that new state is recorded in the "enterStateDate" field.

  ○ The household can also populate the fields "BeforeSettlePlaceType" and "AfterMoveOutPlaceType"

applicationID	householdID	state	enterStateDate	BeforeSettlePlaceType	AfterMoveOutPlaceType
1	608	Move_Out	2010-05-29	Own_House	Family_House
2	1000	Awaiting	2003-09-23	Prison	Family_House
3	876	Awaiting	1990-11-11	Friend_House	Friend_House
4	220	Awaiting	2014-10-30	Friend_House	Own_House

Data Framework
HousingApplication Table

▶ **HousingApplication Table**

   ▶ **Status Type**

      ○ Awaiting

         ○ when a household's application is approved

      ○ Allocated_Living

         ○ when the household settles in social housing, its state changes to "living".

      ○ Move_Out

         ○ When the household moves out

      ○ AfterCare

         ○ If the household has some track after moving.

Housing Application Status Type	
1	Awaiting
2	Allocated_Living
3	Move_Out
4	Aftercare

Data Framework
HousingApplication Table

▶ **HousingApplication Table**

   ▶ **Place Type**

      o "BeforeSettlePlaceType"

      o "AfterMoveOutPlaceType"

   o The household can populate the fields "BeforeSettlePlaceType" and "AfterMoveOutPlaceType"

      ▪ Refer to the place of residence before settling in social housing and the destination after moving out of social housing.

	Place Type
1	Family_House
2	Friend_House
3	Own_House
4	Prison
5	None

Data Framework HousingRegistry Table

▶ **HousingRegistry Table**

o Manages housing registries.

▶ **Reason for Existence**

o To track housing registries associated with housing units and applications. Non-profit housing providers registered with Social housing registry.

o Housing providers can register more than one housing unit.
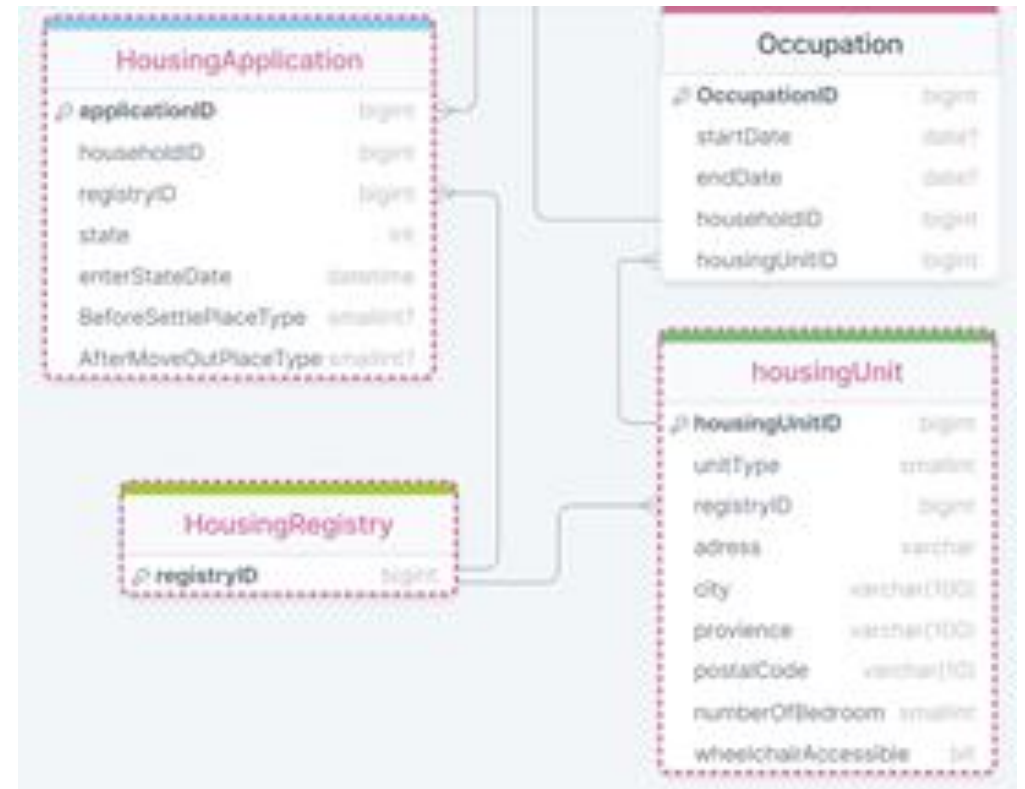
Data Framework
HousingUnit Table

- **HousingUnit Table**
  - Manages housing units and their attributes.

- **Reason for Existence**
  - To store detailed information about housing units available for social housing.

- **Unit attributes**
  - **UnitType, address, city, province, postal code, number Of Bedrooms , wheelchair Accessible**

Data Framework
HousingUnit Table

▶ **HousingUnit Table**

    ▶ **Unit Type**

Unit Type	
1	Market_Rental
2	Social_Housing
3	Affordable_Housing
4	Hotel
5	Shelter

Data Framework Occupation Table

- **Occupation Table**

  o Records occupation details.

- **Reason for Existence**

  o This table stores information about the allocation of Households to HousingUnits during the period from the start to the end date of occupation.

  o **startDate:** The date when the occupation of the housing unit started.

  o **endDate:** The date when the occupation of the housing unit ended.

Data Framework Individual Table
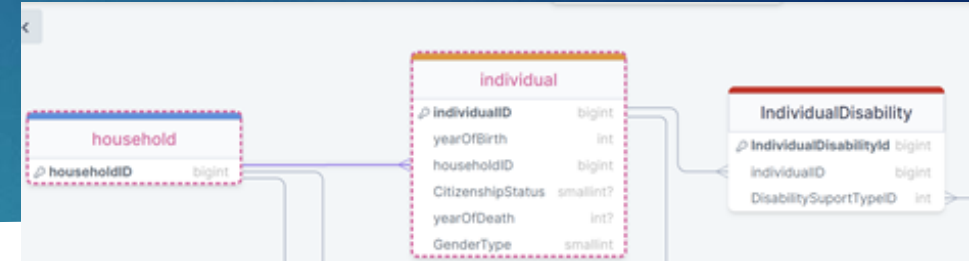

▶ **Individual Table**

  ○ Manages information about individuals.

▶ **Reason for Existence**

  ○ To store detailed information about individuals, including their demographic data.

  ○ As each individual can have multiple disabilities and require various types of disability support, the 'individual' table should establish a connection to the 'disabilitySupport' table using a junction table called 'individualDisability'.

▶ **Data Dictionary**

  ○ **yearOfBirth:** The year of birth of the individual.

  ○ **CitizenshipStatus:** Indicates the citizenship status of the individual.

  ○ **yearOfDeath:** The year of death of the individual. Must be greater than the year of birth.

  ○ **GenderType:** Describes the gender of the individual.

  ○ **diverseStatus:** Provides information about the diverse status of the individual.

  ○ **householdID:** Links to the Household table, identifying the household to which the individual belongs.

  ○ **individualID:** Serves as the unique identifier for each individual.

Data Framework Individual Table

▶ **Individual Table**

   ▶ **Citizenship Status Type**

Citizenship Status Type	
1	Citizen_BornInCanada
2	Permanent_Resident
3	Refugee_Claimant
4	Refugee
5	Worker_Visa
6	Student_Visa

Data Framework Individual Table

▶ **Individual Table**

    ▶ **Diverse Status Type**

Diverse Status Type	
1	Visible_Minority
2	Indigenous_Metis
3	Indigenous_Inuit
4	Indigenous_FirstNations
5	Veteran
6	Black
7	None

Data Framework Individual Table

▶ **Individual Table**

    ▶ **Gender Type**

Gender Type	
1	Female
2	Male
3	Non-Binary
4	Transgender
5	other

Data Framework Individual Table

▶ **Individual Table**

    ▶ **Disability Support Type**

        ▶ to provide insights into the diverse support requirements based on different disability types.

Disability Support Type	
1	Hearing
2	Visual
3	Walker
4	Wheelchair
5	Mental Health
6	Cognitive
7	Service Dog

Data Types

▶ The types provided for this database are based on initial investigations and requirements in this phase of the DASH project.

▶ They will be expanded and modified as new requirements emerge.

Unit Type	
1	Market_Rental
2	Social_Housing
3	Affordable_Housing
4	Hotel
5	Shelter

Place Type	
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4	Prison
5	None

Gender Type	
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Disability Support Type	
1	Hearing
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Citizenship Status Type	
1	Citizen_BornInCanada
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Enhancing BI and ML with Integrated Database

▶ Tables Filled with Provided Data Types and Synthesized with a Tool Generating Random but Accurate Amounts.

▶ **Integration with Power BI for Dynamic Reporting**

  ▶ The Filled Database Feeds into Power BI, Enabling the Creation of Interactive Dashboards for Data Visualization

▶ **Enabling Machine Learning Predictions**

  ▶ The Filled Database Fuels Machine Learning Algorithms, Leading to Predictions and Advanced Analytics.