



**Florida Department of Transportation
Office of Information Technology (OIT)**

Data and Database Design Standards for SQL Server

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Document Revision History

Date	Name	Description
6/29/2017	Jessica Rogers	Created document
8/2/2017	Stephanie Taylor	Updated the document format

About the Standard

This document contains the database design standards applied to naming master data elements contained within all enterprise-wide data warehouse, mart, and cube development efforts commissioned by the Florida Department of Transportation (FDOT).

These standards are in effect for all new enterprise-wide data warehouse, mart, and cube development efforts beginning August 1st, 2017, and compliance is mandatory to maintain current, accurate, and complete data lineage and usage from a datum's origin through extract/transport/load (ETL) into enterprise-wide reporting and business intelligence (BI) platforms via a Master Data Management (MDM) repository.

These standards are not applicable to COTS application systems purchased by the Department.

All requested exceptions to these standards shall be submitted to the Technical Standards Review Team (TSRT) in writing. The TSRT will review each exception request and send a recommendation to the Application Services Manager, who will make the final decision.

1.0 Data Architecture

1.1 FDOT Systems of Record

1.1.1 The FDOT Data Architecture requires the use of the following components:

1.1.1.1 The FDOT [Meta Data Repository Glossary](#)* for approved acronyms, abbreviations of business or logical names, and key words for naming objects

1.1.1.2 Department sources of record:

- Staff Repository System of all internal and external staff
- Transportation Vendor Information system of all FDOT Vendors
- Organization Codes for the FDOT organizational units
- Work Program and Financial Projects for the FDOT construction projects
- Contract Information for the FDOT Contracts

*A standardized process exists to request additions to Glossary words. Please see the [Meta Data Repository Glossary Update Process](#).

2.0 Design Standards

All database objects addressed in this document must comply with the following standards.

2.1 Table

- 2.1.1 Key unification must not occur in a physical schema, and must be resolved no later than the physical design step of the database design.
- 2.1.2 All tables must be assigned estimated volumetric information applicable to the first year of use
- 2.1.3 All tables must contain primary key columns.
 - 2.1.3.1 Applications should not rely on implemented column order, as the responsible DBA may change the order for optimal database logging efficiency.

2.2 Table Constraint

- 2.2.1 Constraints must use SQL syntax as defined by the ANSI SQL92, or newer, standards.
- 2.2.2 FDOT does not implement column-level encryption or decryption.

2.3 Column

- 2.3.1 All supported column data types may be used, however if using a type in the list below, consult with the responsible DBA
 - 2.3.1.1 VARCHAR(max)
 - 2.3.1.2 VARCHAR(max)
 - 2.3.1.3 VARCHAR(max)
 - 2.3.1.4 VARCHAR(max)
- 2.3.2 Each foreign key (child) column data type must be the same as the contributing (parent) column data type.
- 2.3.3 Table columns can be defined as IDENTITY columns under the awareness that partial refreshes and recoveries may take longer for the responsible DBA to complete.
- 2.3.4 Names shall only be assigned to those column constraints defined for columns where application rules dictate specific behavior or values.
- 2.3.5 Each column shall have the same data type definition for all occurrences of the column in the database.

2.4 Key and Index

- 2.4.1 Each table must contain a clustered primary key index.
- 2.4.2 Each foreign key must contain a foreign key constraint enforced by the database and not programmatically.
- 2.4.3 Overlapping indexes shall not be generated.

2.4.4 The primary key index column order must match the order of the columns in the table which comprise the primary key.

2.4.5 Foreign key column order must match the column order of the table contributing the foreign key.

2.5 Relationship

2.5.1 Each identifying relationship shall not allow nulls in the child foreign key column(s).

2.5.2 Each relationship must have valid parent and child tables.

2.5.3 Many-to-many relationships must be resolved by a resolution table.

2.5.4 Each relationship shall be enforced by the database

2.6 Physical Storage

2.6.1 Physical storage file names and allocations shall be assigned by the responsible DBA.