



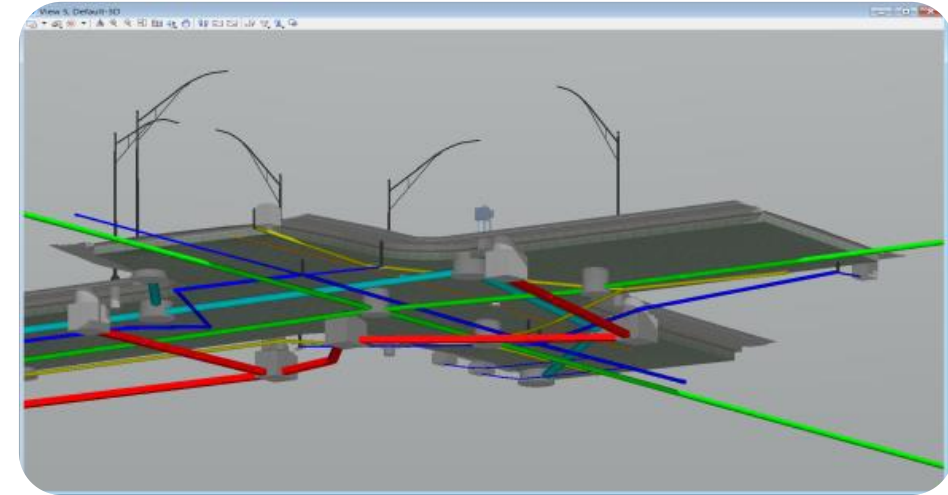
Using OpenRoads Designer to Identify and Manage Utility Clashes in Transportation Projects

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Advancing Infrastructure

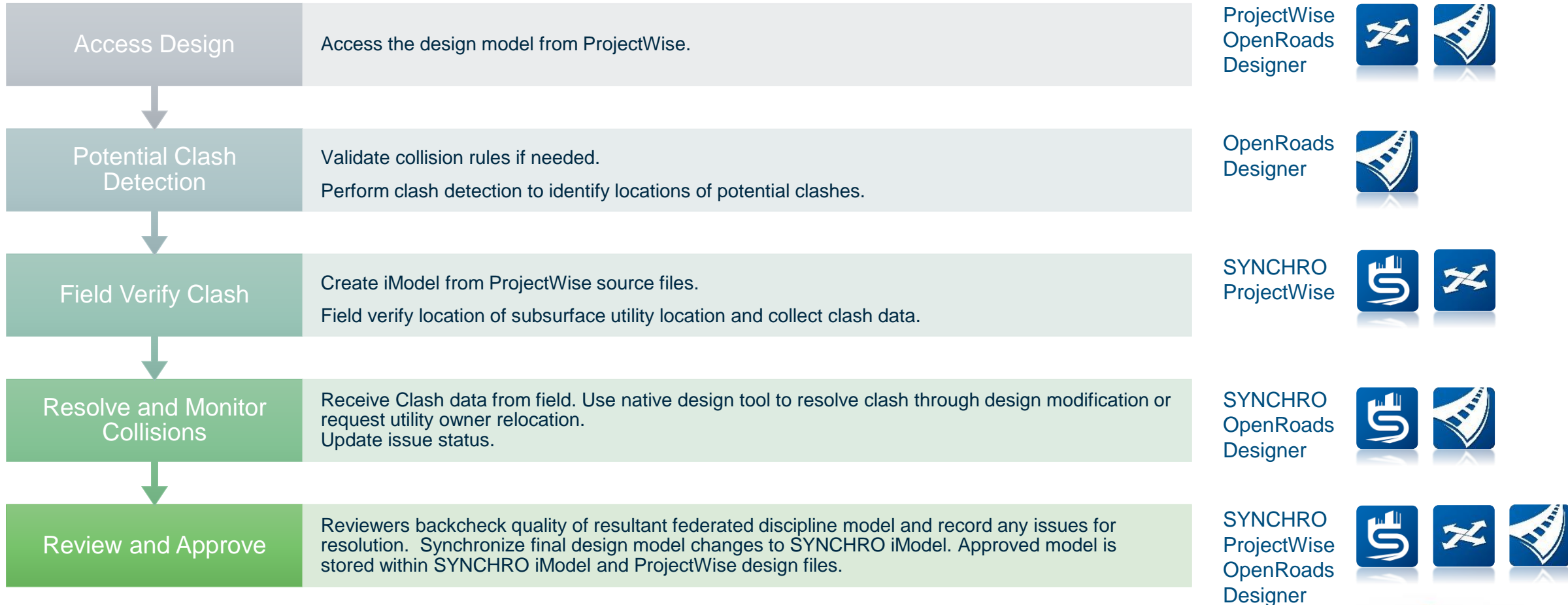
Introduction

- **Transportation agencies typically do not own the utilities that are in the right-of-way, therefore they do not typically design utility networks.**
- **Construction in ROW requires conflict detection and management**
- **OpenRoads Designer Subsurface Utilities – 3D modeling and drainage analysis – also has built-in conflict detection and management tools**



Utility Coordination

- Analyze a federated model of design models using rule sets to identify potential collisions between design elements and subsurface utilities.
- Utility coordination includes performing a field verification of the potential clash to verify utility position.
- Resolution through relocation or design modifications are tracked through completion.



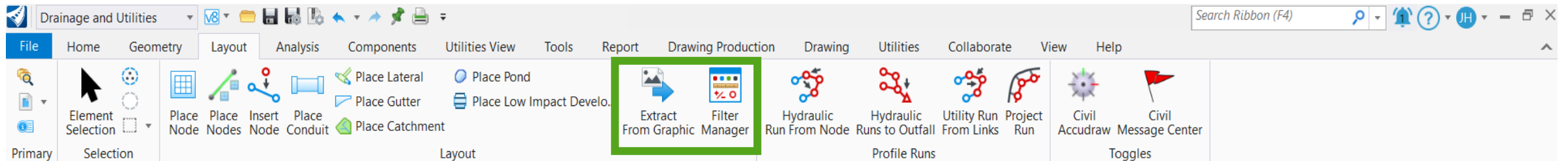
Agenda

- **Creating the 3D model by importing data (ORD)**
 - Survey
 - DGN/DWG
 - PDF or paper information
- **Creating the 3D model using Model Builder (ORD)**
 - Database and Shape Files
- **Conflict Detection reporting and management (ORD and SYNCHRO)**
- **Conflict management in construction (SYNCHRO)**
- **Storage of utility information for future projects (ProjectWise)**

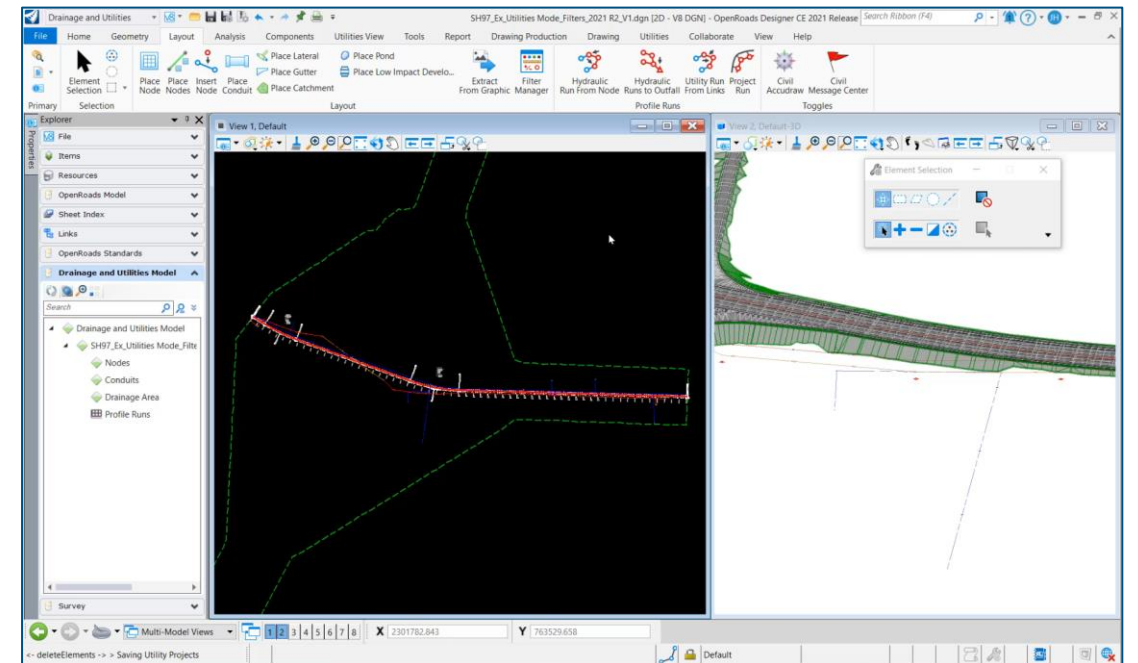
Scenario

- **Survey in ORD is 3D**
 - Surveyors pick up depths
 - Identify utility correctly
- **Utilities Department/Designer**
 - Check utilities, Import to ORD DU, Run Conflict Detection
 - Add attributes
 - Owner, pay item, installation date, bedding type, attributes for asset management, etc.
 - Manage
 - Store Project Information

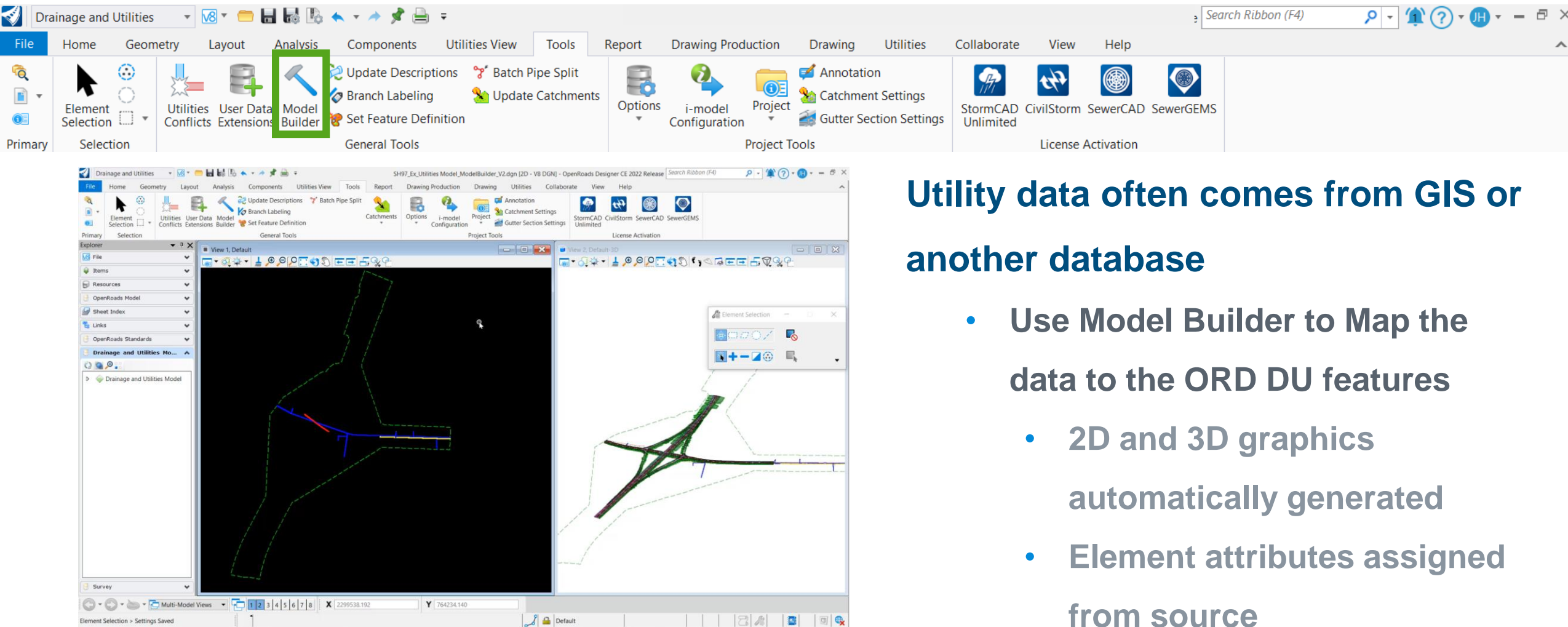
Creating the 3D Model – Extract from Graphics



- **2D DGN/DWG – drape data below surface and identify as not verified**
 - This can be from 2D drawings or PDF/paper
- **3D DGN/DWG – import to ORD DU and identify as designed or constructed or not verified**



Creating the 3D Model – Model Builder



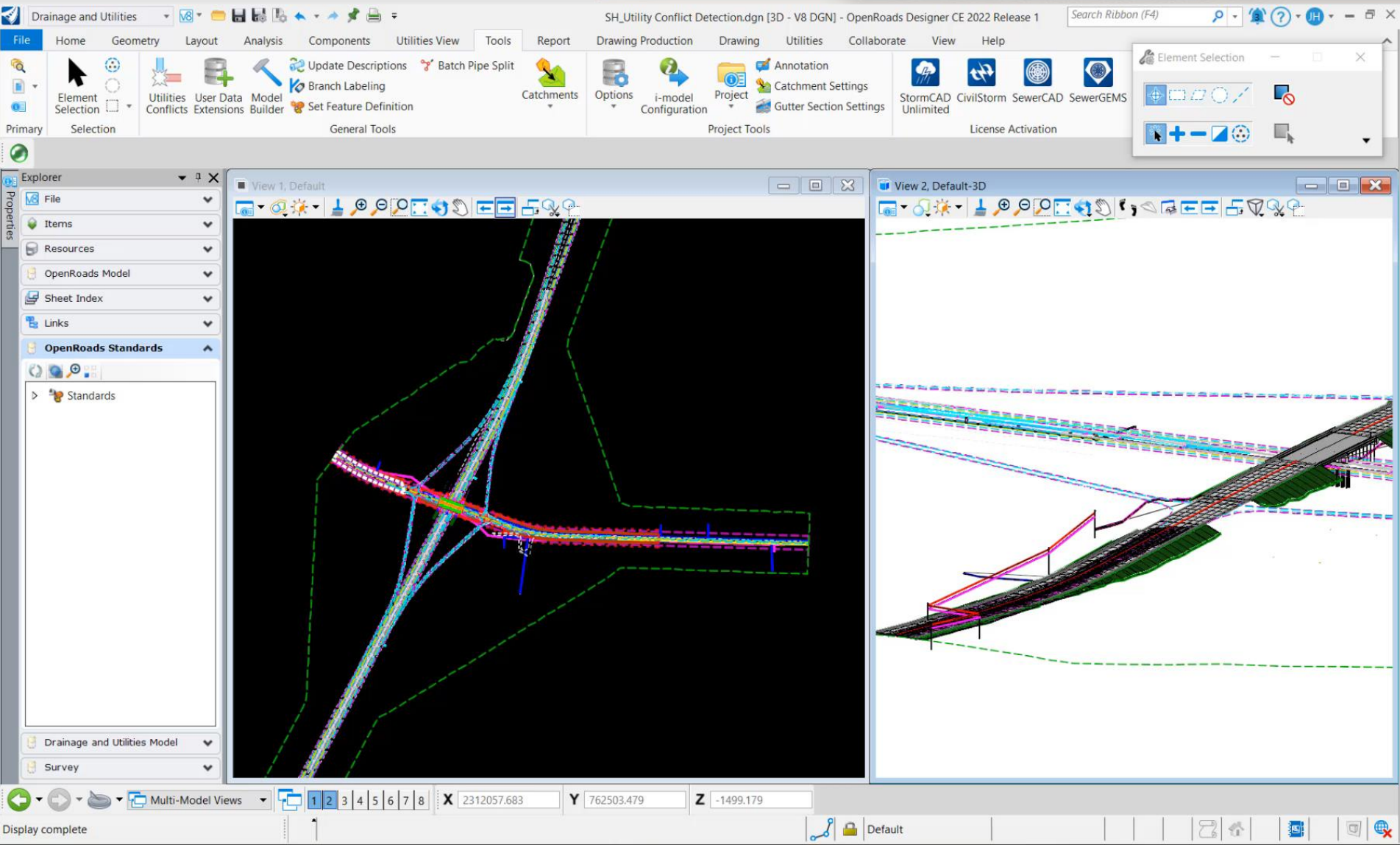
Utility data often comes from GIS or another database

- Use Model Builder to Map the data to the ORD DU features
 - 2D and 3D graphics automatically generated
 - Element attributes assigned from source

Conflict Detection

- **Check conflicts between Feature Definitions and/or elements on named Levels**
- **Set soft tolerances per element to be checked**
- **Set conflict type**
 - Potential
 - Confirmed
 - Bore Hole Needed
- **Elements are checked against themselves and other elements**
- **All Conflict Nodes are written into the database with attributes**

Conflict Detection

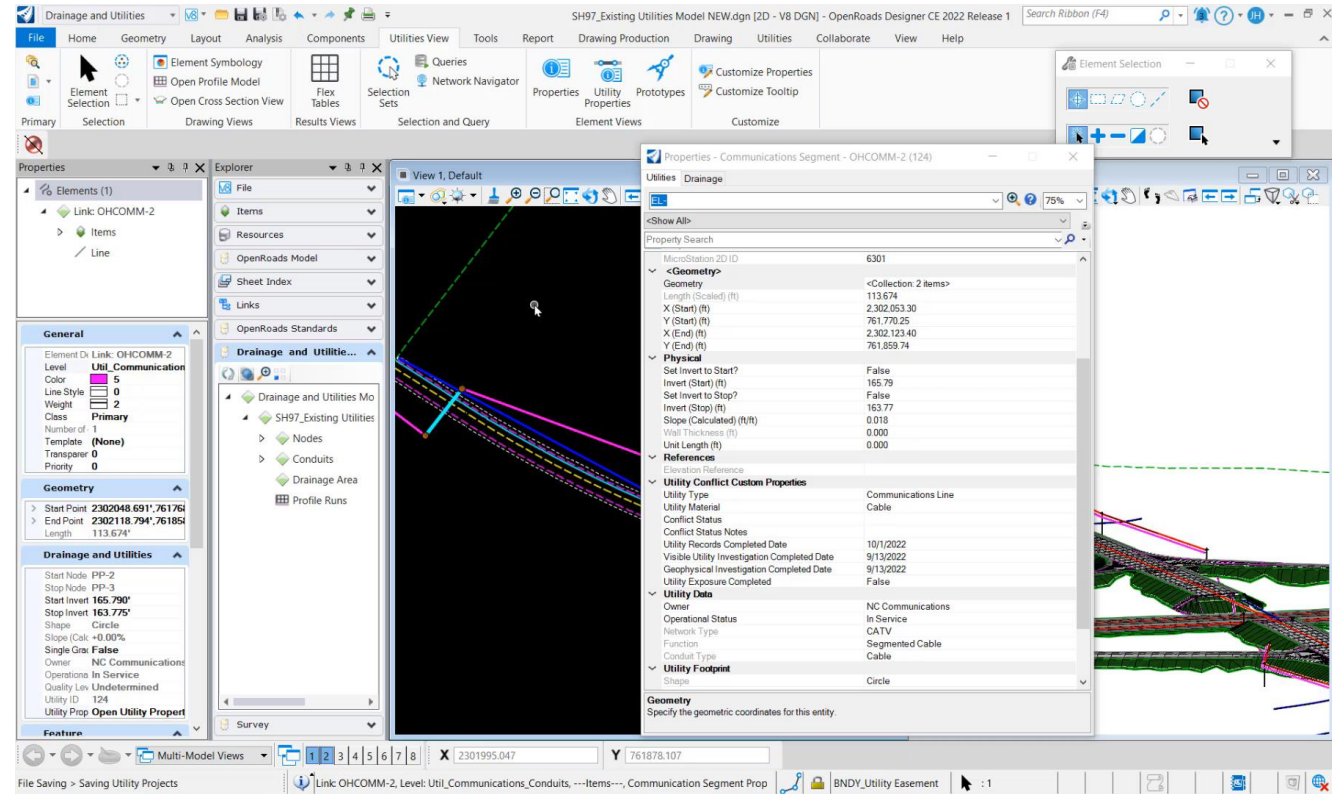


Reviewing and Updating the Data

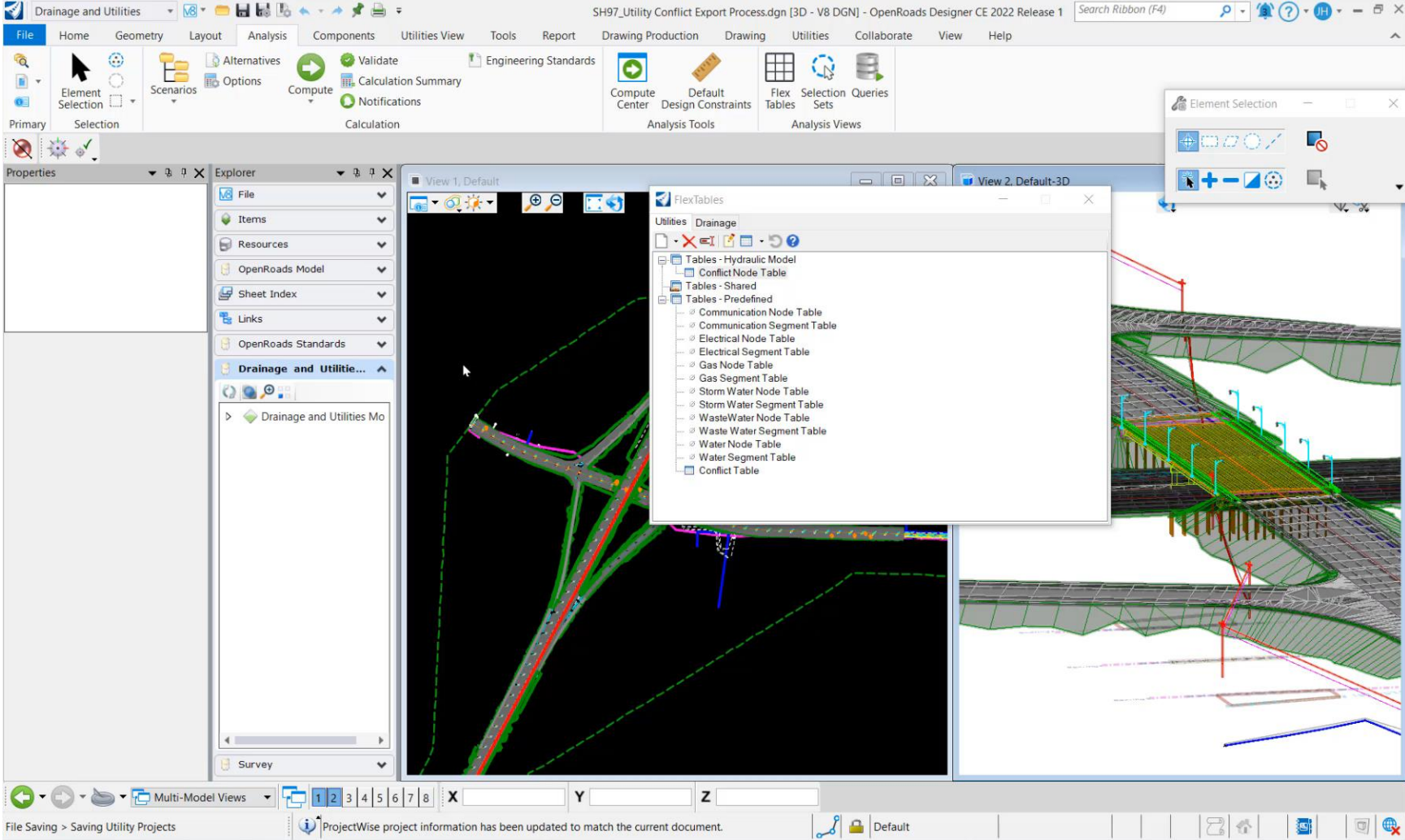
- **ORD DU – Data is stored in a SQLite Database in the file**
- **Attributes are customizable**
- **Different types of data – dates, text, formulae**
- **Using Item Types to transmit attribute data to other applications – iModel**
- **Reporting:**
 - **Flex Tables**
 - **Item Types**
 - **Queries**

Reviewing and Updating the Data

- The information on the conflict nodes to be used for locating, managing, and documenting the conflicts
- Once information has been received and logged for the conflict then this information can then be transposed over to the utilities themselves
 - Edit utility properties via Queries, Selection Sets, and Flex Tables
 - Edit utility properties via Model Builder with updated spreadsheet(s)



Exporting the Data



Conflict Management

- Automated iModel from ORD to SYNCHRO via ProjectWise
- Attribute data visible
- Facilitate Field to Design office communication and back
- Update model with field data and store for future use



Thank You!

