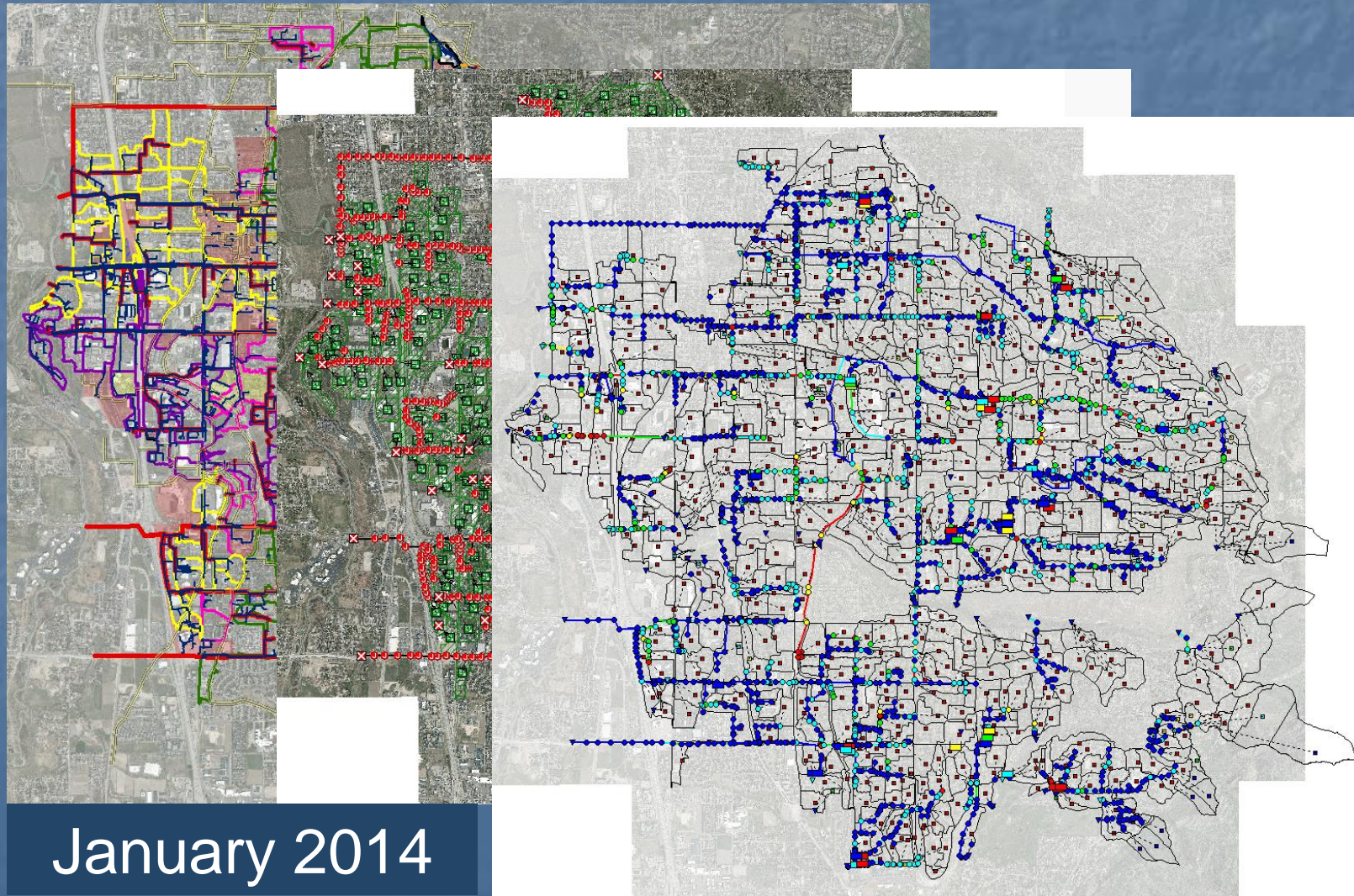


Sandy City Storm Drain Model Update

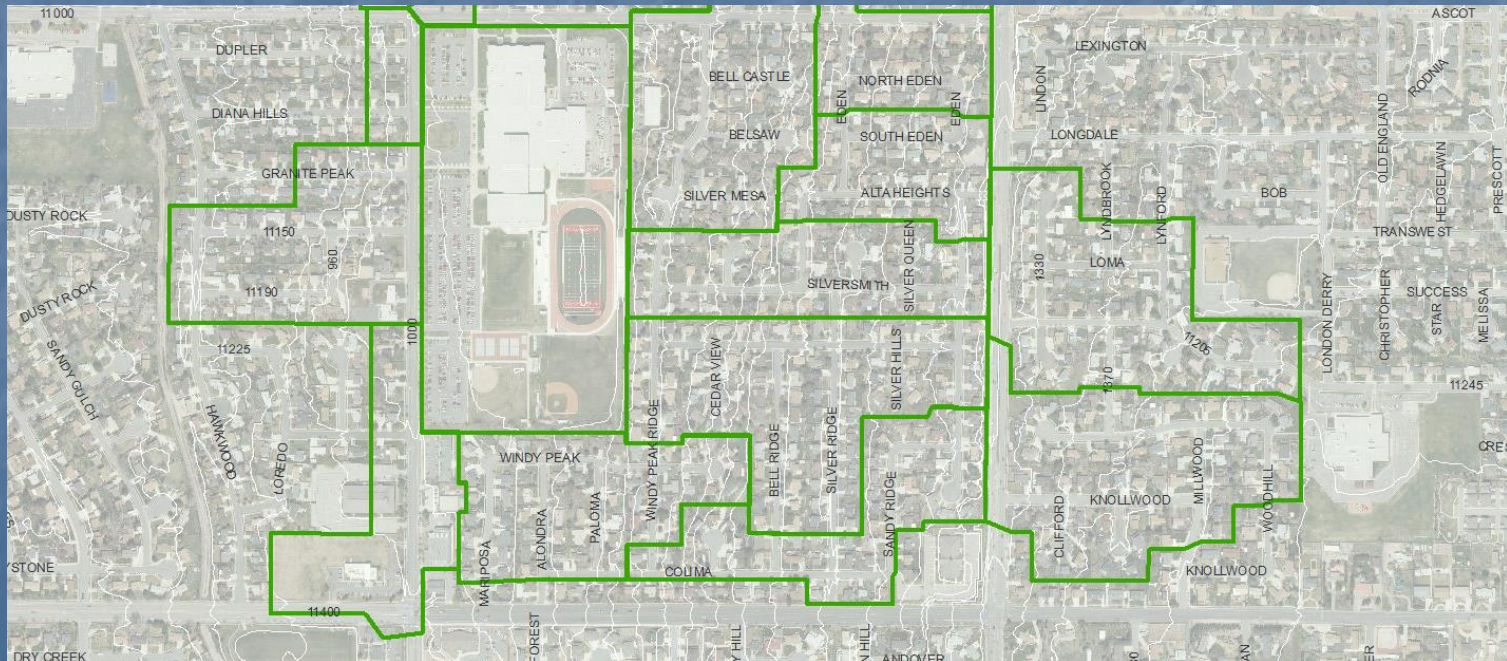


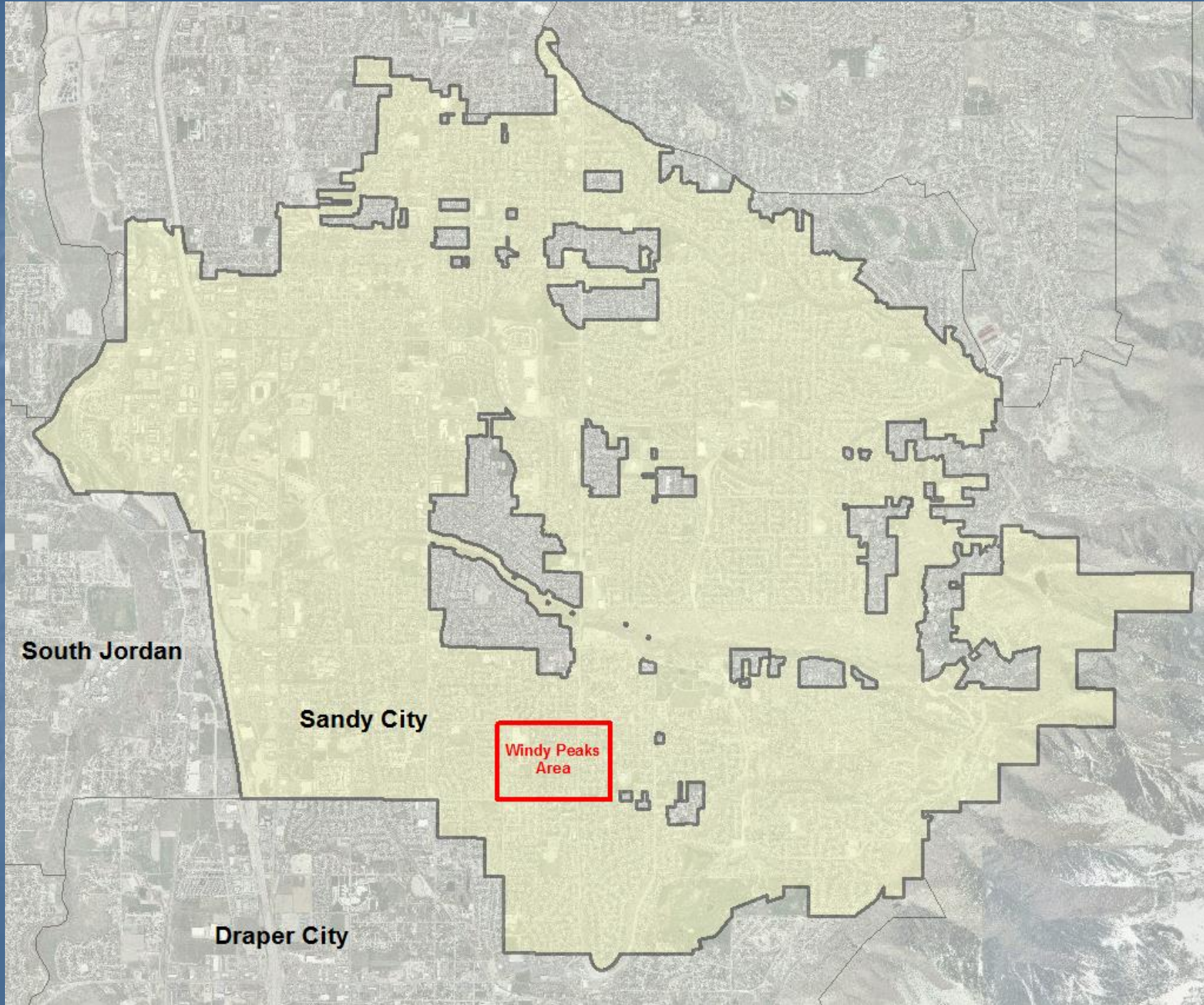
Introduction

- Purpose of Model Update
- Available Data
- Model Selection and Capabilities
- Model Creation
- Model Presentation

Project Purpose

- Update the Storm Drain Model for Sandy City
- Prompted by Windy Peaks Storm Drain Project
- Previous model over-predicted flows
- Subbasins didn't represent drainages well





South Jordan

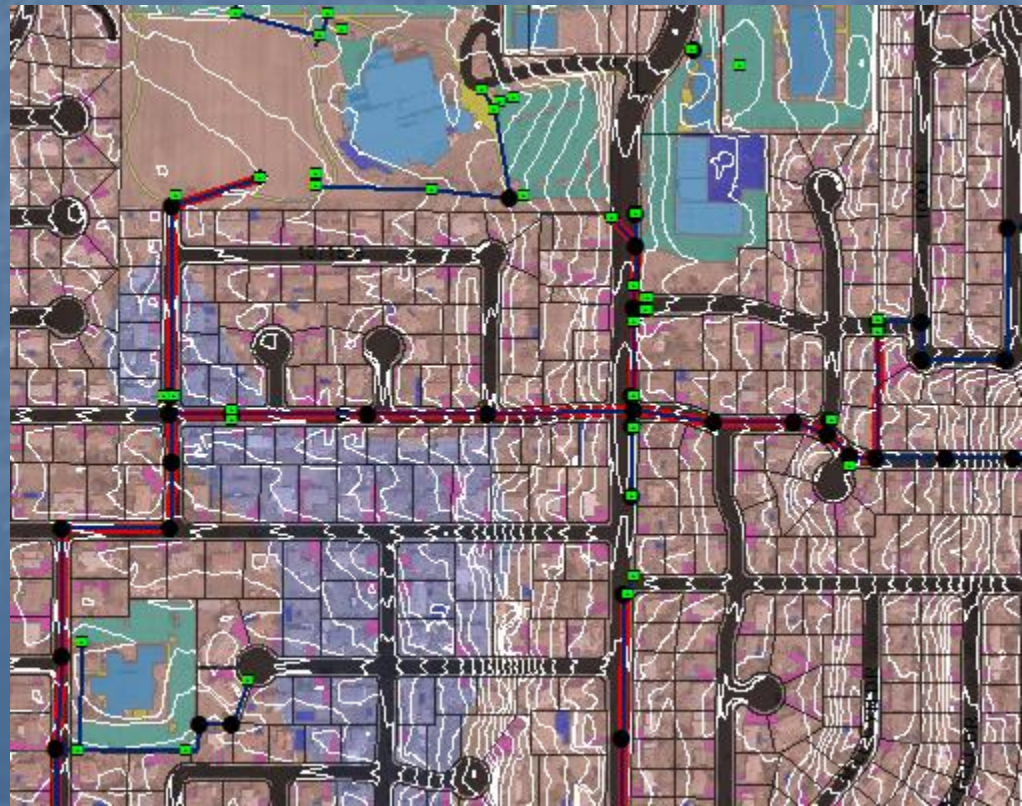
Sandy City

Draper City

**Windy Peaks
Area**

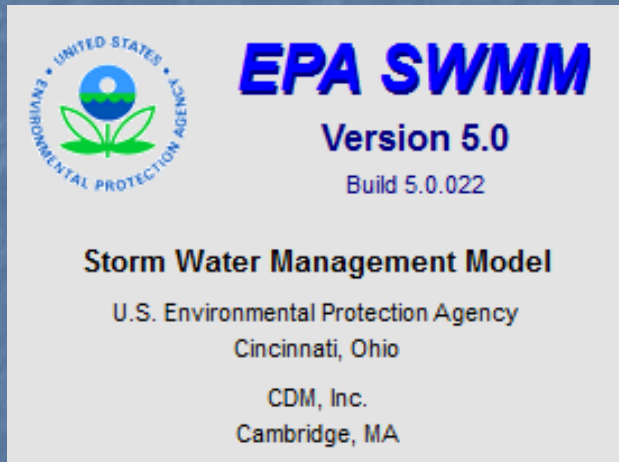
Available Data

- Previous Storm Drain Model (EPA SWMM)
- SSURGO (Soil Survey Geographic Database)
- Sandy Storm Drain System (GIS)
- Parcels (GIS)
- 2 Foot Contours (GIS)
- Impervious Surfaces (GIS)



Model Selection

- Sandy City preferred free modeling software



Hydrologic Modeling System (HEC-HMS)

Version: 3.5 Build: 1417 Date: 10Aug2010 Java: 1.6.0_19

This software is developed primarily to meet the needs of the U.S. Army Corps of Engineers, though we provide a copy free on our website. Funding comes from the Corps' Civil Works Research and Development program and from special projects. To provide feature suggestions, report errors, or request additional information, write to the development team at:

U.S. Army Corps of Engineers
Institute For Water Resources
Hydrologic Engineering Center
609 Second Street
Davis, CA 95616-4620

You can also contact the development team through our website at:

www.hec.usace.army.mil

SWMM Capabilities

- Infiltration Modeling
 - Horton Method
 - Green Ampt Method
 - Used in Previous Model
 - Curve Number Method
 - Modify to account for impervious unconnected areas



EPA SWMM

Version 5.0

Build 5.0.022

Storm Water Management Model

U.S. Environmental Protection Agency
Cincinnati, Ohio

CDM, Inc.
Cambridge, MA

SWMM Capabilities

- Routing Methods
 - Steady Flow
 - Inflow Hydrograph = Outflow Hydrograph
 - Kinematic Wave
 - Does not account for pressurized flow
 - Dynamic Wave
 - Complete Saint Venant Equations
 - Most accurate routing method



EPA SWMM

Version 5.0

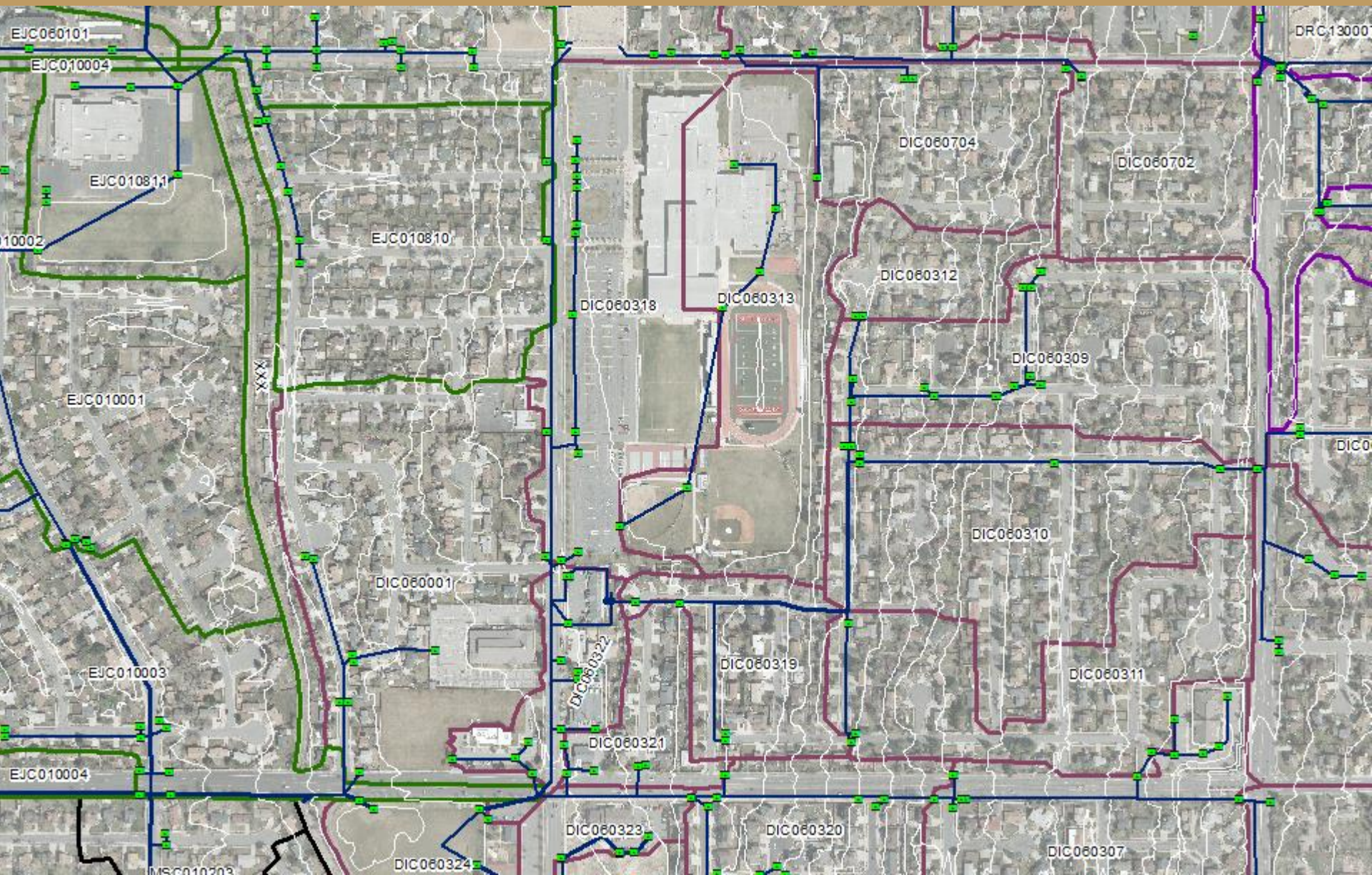
Build 5.0.022

Storm Water Management Model

U.S. Environmental Protection Agency
Cincinnati, Ohio

CDM, Inc.
Cambridge, MA

Model Creation



Model Creation

■ Subbasin Names Determined by:

- Tributary Stream JOR
- Outfall on Stream 06
- Detention Basin 19
- Subbasin Number 01

JOR061901

Model Creation

- Composite Subbasin Attributes
 - Width (feet)
 - $\text{Width (ft)} = \text{Area (ft)} / \text{Longest Overland Flow Path (ft)}$
 - Percent Impervious (Directly Connected)
 - Curve Number

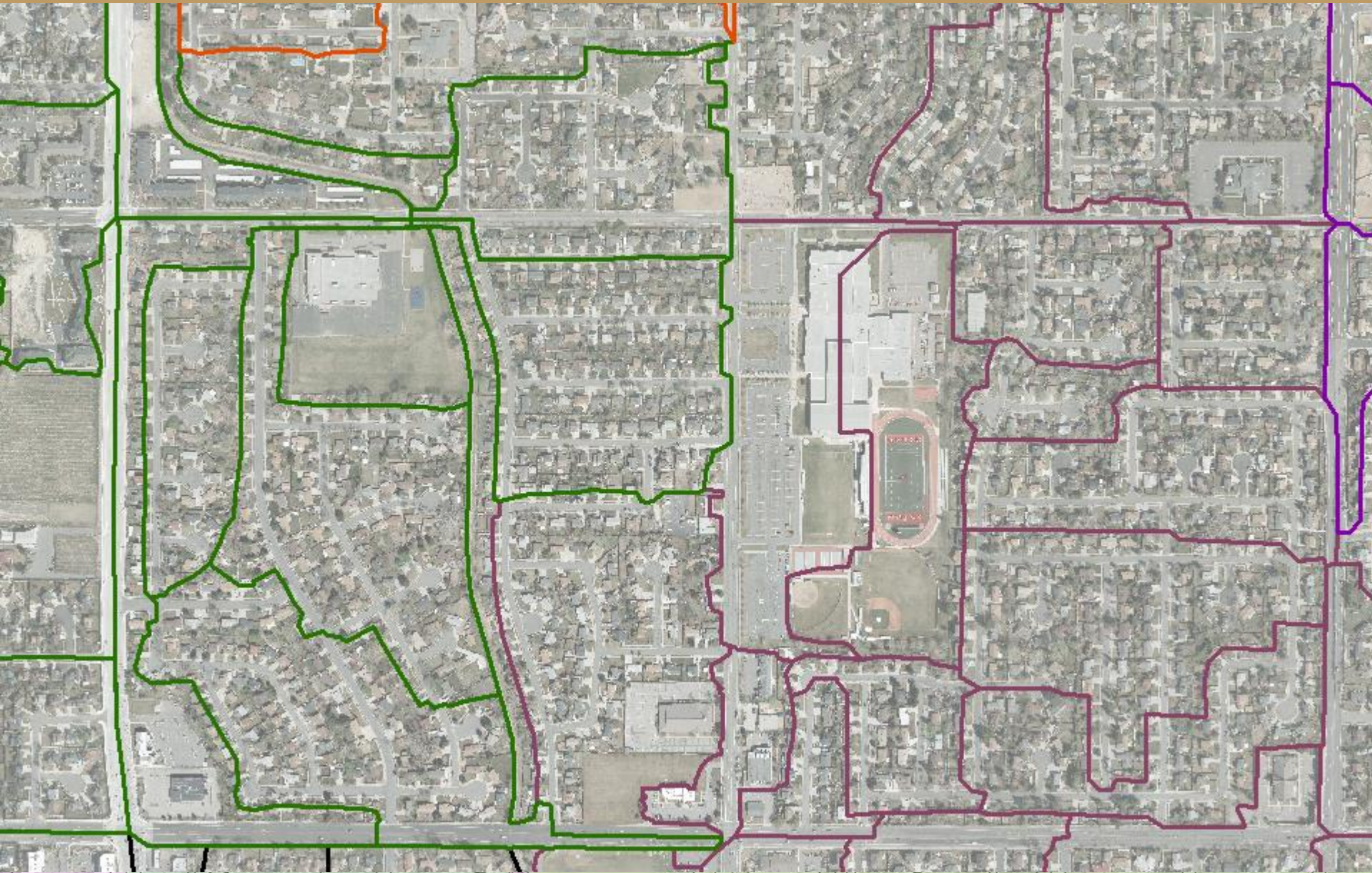
Composite Attributes Calculations



Composite Attributes Calculations



Composite Attributes Calculations

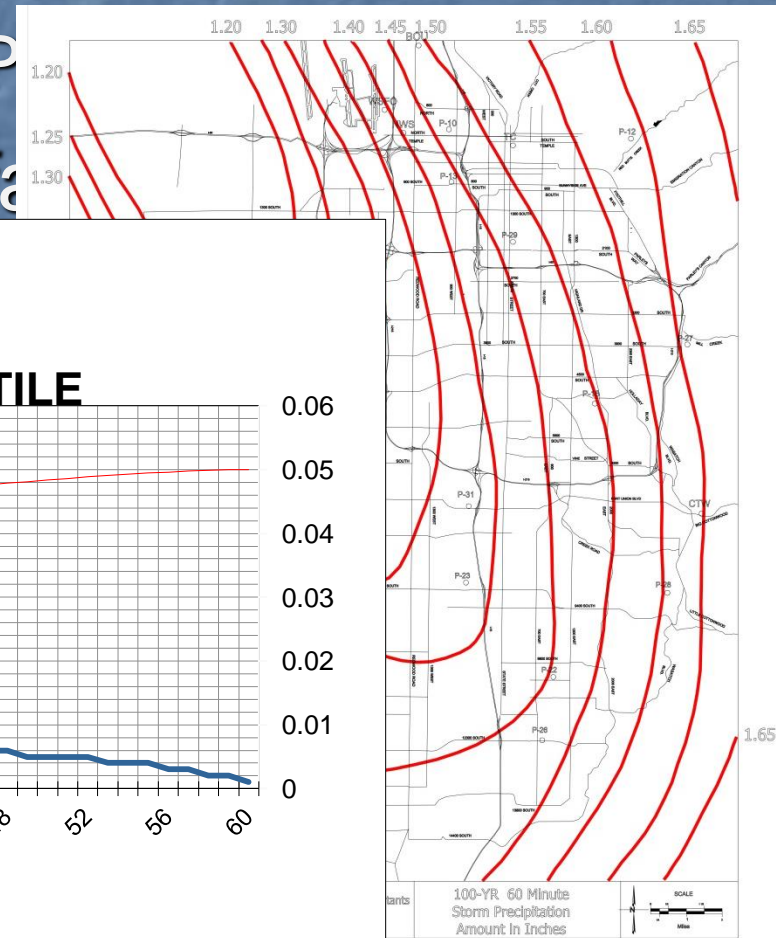


Composite Attributes Calculations

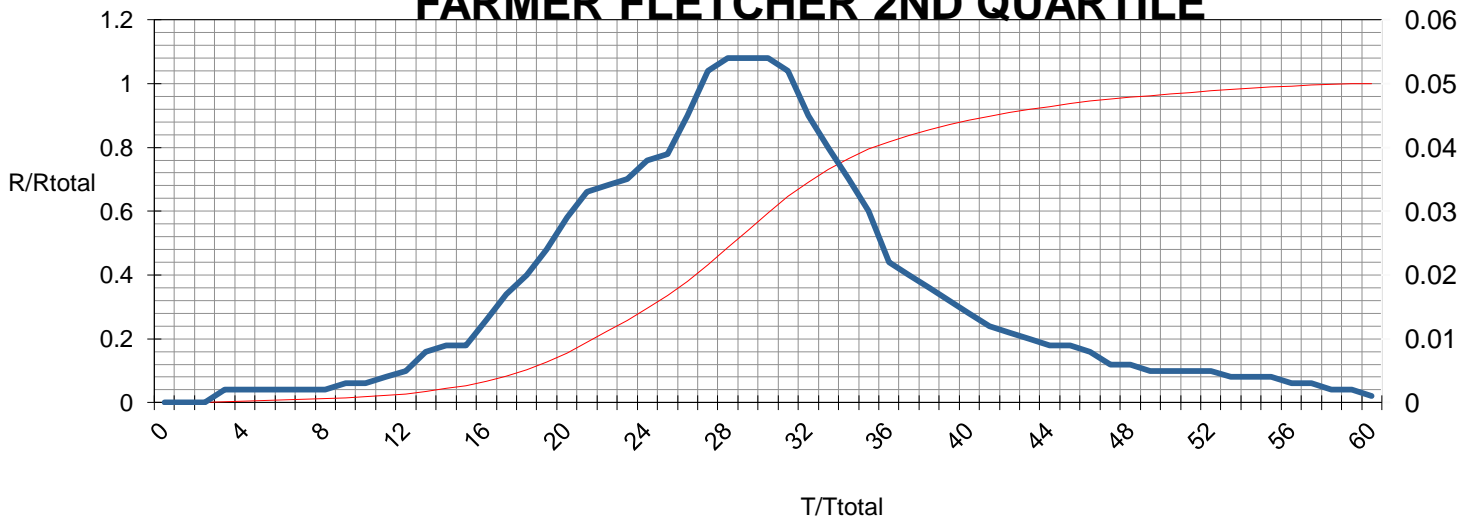
- Curve Number and Percent Impervious similarly calculated
- Factors in Curve Number Calculation
 - Parcel Type
 - Impervious/Pervious Area
 - Soil Type
 - Subbasin
- Factors in Percent Impervious
 - Parcel Type
 - Impervious/Pervious Area
 - Subbasin

Storm Event

- 10 year and 100 year 1-hr Storm Events
 - TRC North American Weather Consultants
 - Used by Salt Lake County Planning Department
- Farmer and Fletcher Rainfall



FARMER FLETCHER 2ND QUANTILE



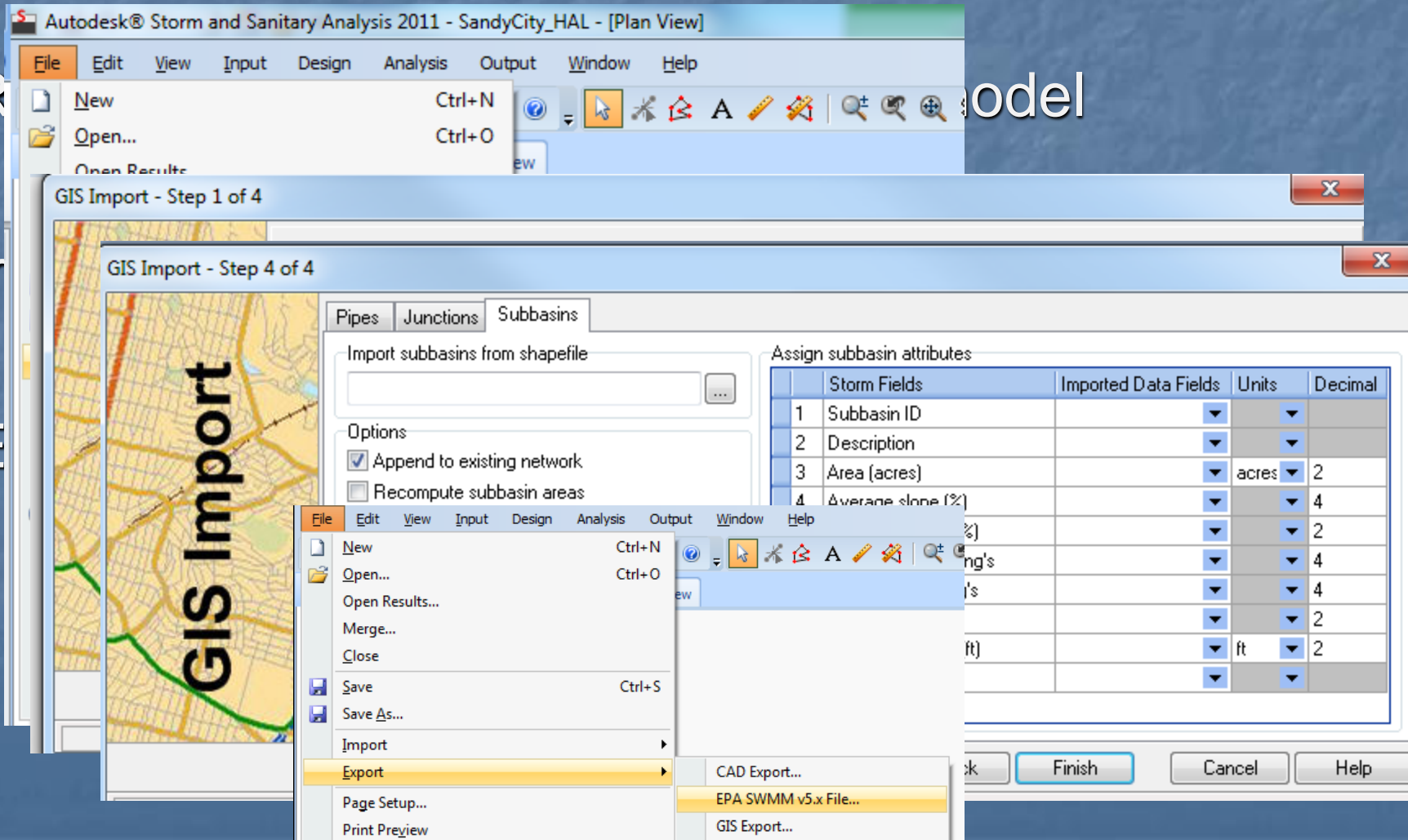
Model Import

- AutoCAD SSA Model as Import/Export Tool

- R

- In

- E



Model Presentation