BIM FOR URBAN PLANNING

Ahmad Khairat

Technical Specialist AEC | **Autodesk**

AUTODESK. UNIVERSITY

ABOUT THE SPEAKER

Technical Specialist AEC, Autodesk

- Based in Riyadh, Saudi Arabia
- 13+ years of experience in BIM, GIS & FM industries
- Various roles (Engineering, pre-sales, Cloud architecture, Software design & development)
- B.Sc. in Urban and Regional Planning from Cairo University
- Passionate about the Forge Cloud platform and the convergence between BIM & GIS

MORE
IS INEVITABLE

LESS
IS A REALITY

OPPORTUNITY OF
BETTER

WHAT IS URBAN PLANNING

URBAN PLANNING

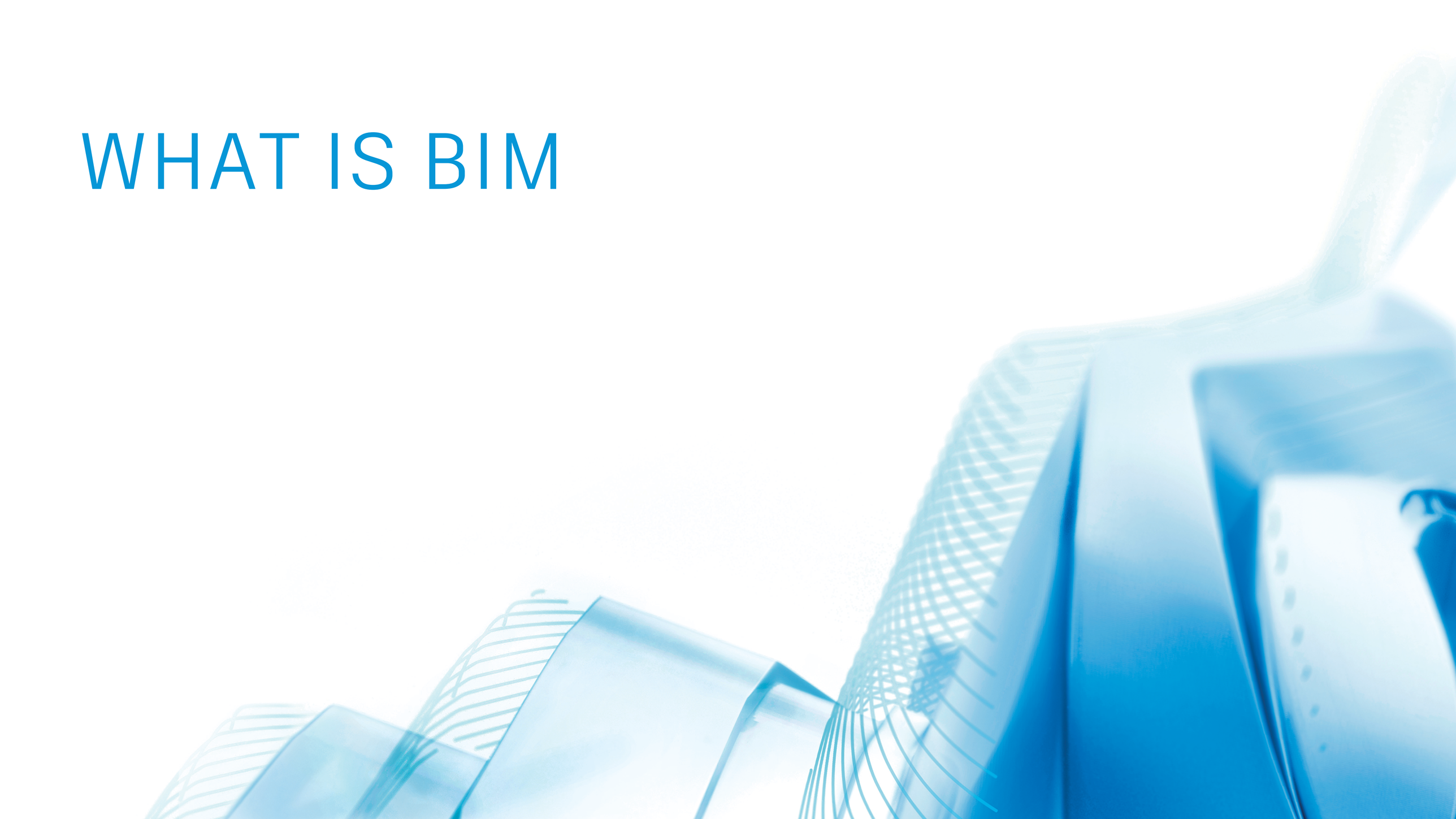
- A technical and political process
- Concerned with:
  - the welfare of people
  - control of the use of land
  - Design of the urban [built] environment including transportation and communication networks
  - Protection and enhancement of the natural environment

- McGill School of Urban Planning

Author: MarianZubak at English Wikipedia. - Transferred from en.wikipedia to Commons., CC BY 2.5, https://commons.wikimedia.org/w/index.php?curid=3402935

SOURCE: https://www.youtube.com/watch?v=_5ot_1tbQX8

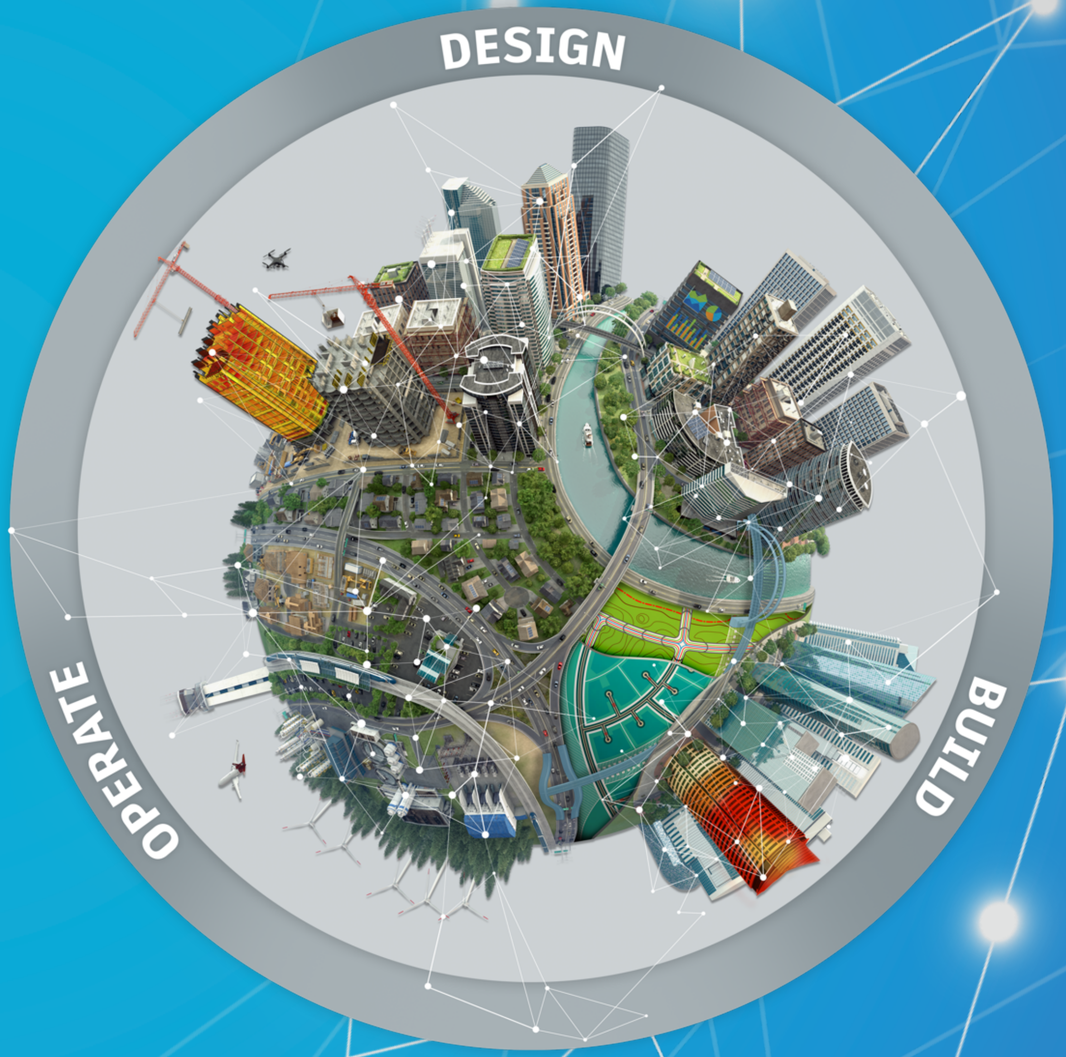
WHAT IS BIM



Building Information Modeling

More efficiently plan, design, construct, and manage buildings and infrastructure.

“A minimal increase in upfront costs of about 2% to support optimized design will lead on average to life-cycle savings of 20% on total costs.”

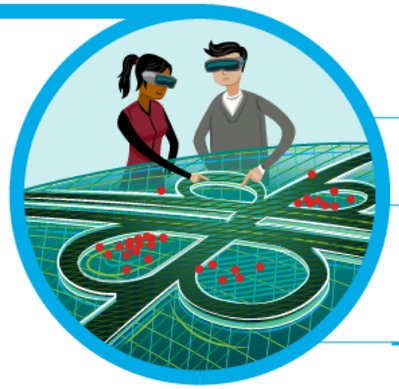


Source: World Economic Forum report “Shaping the Future of Construction” 2017.

CONNECTED BIM for INFRASTRUCTURE

DESIGN

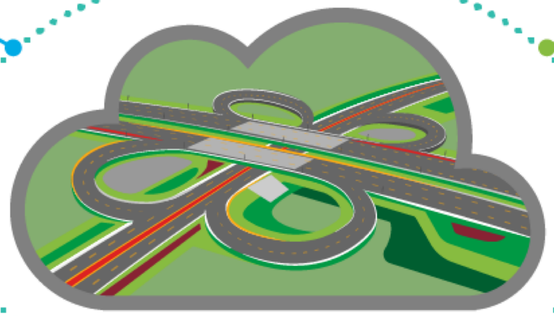
BUILD



DETAILED

CONCEPT

PLAN

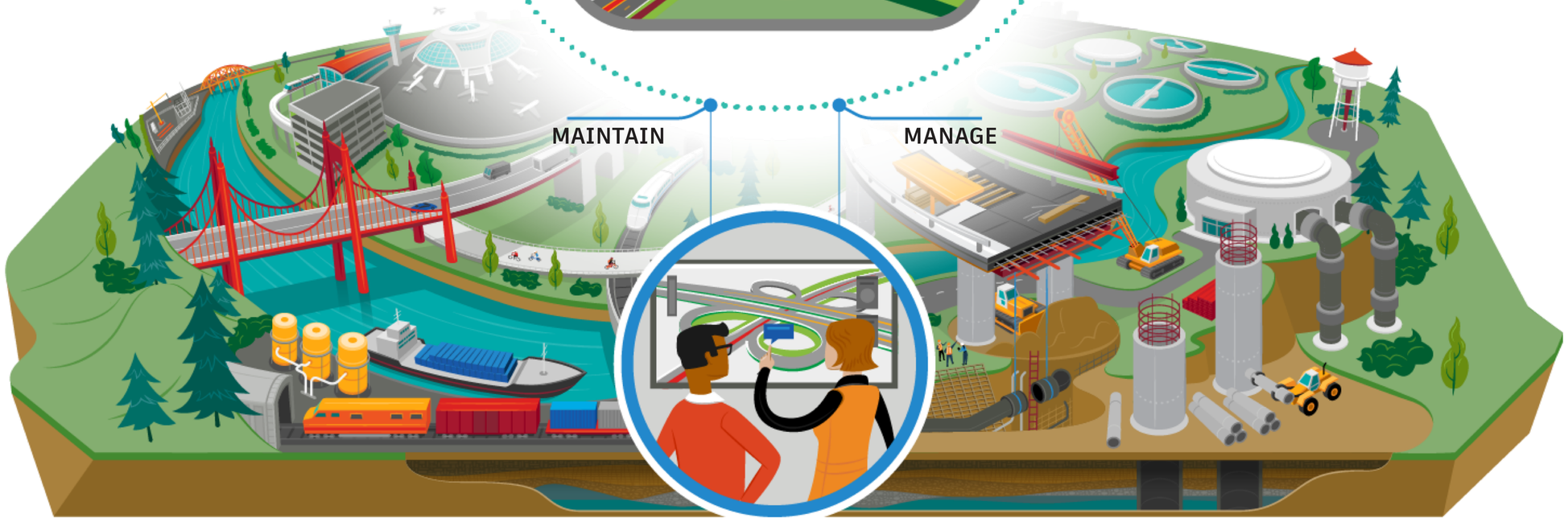


SIMULATE

CONSTRUCT

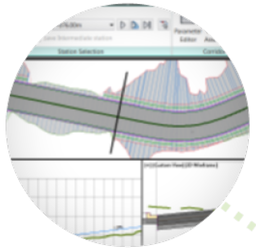
MAINTAIN

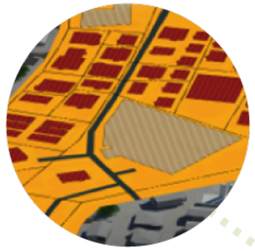
MANAGE



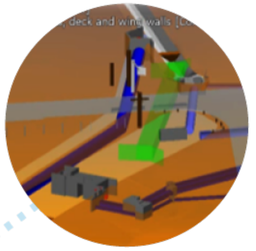
OPERATE

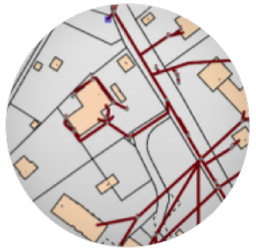
Infrastructure Model

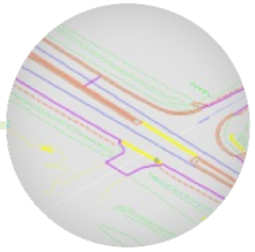

Civil

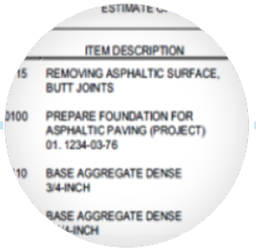

Geospatial data

Automated machine guidance

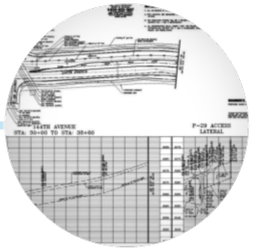

5D project scheduling

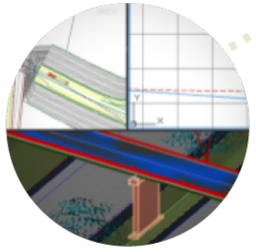

Utility


Survey



Estimation

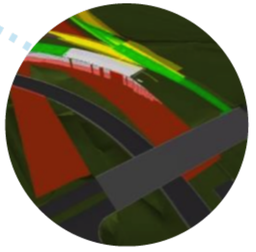

Documentation


Structural

Reality capture

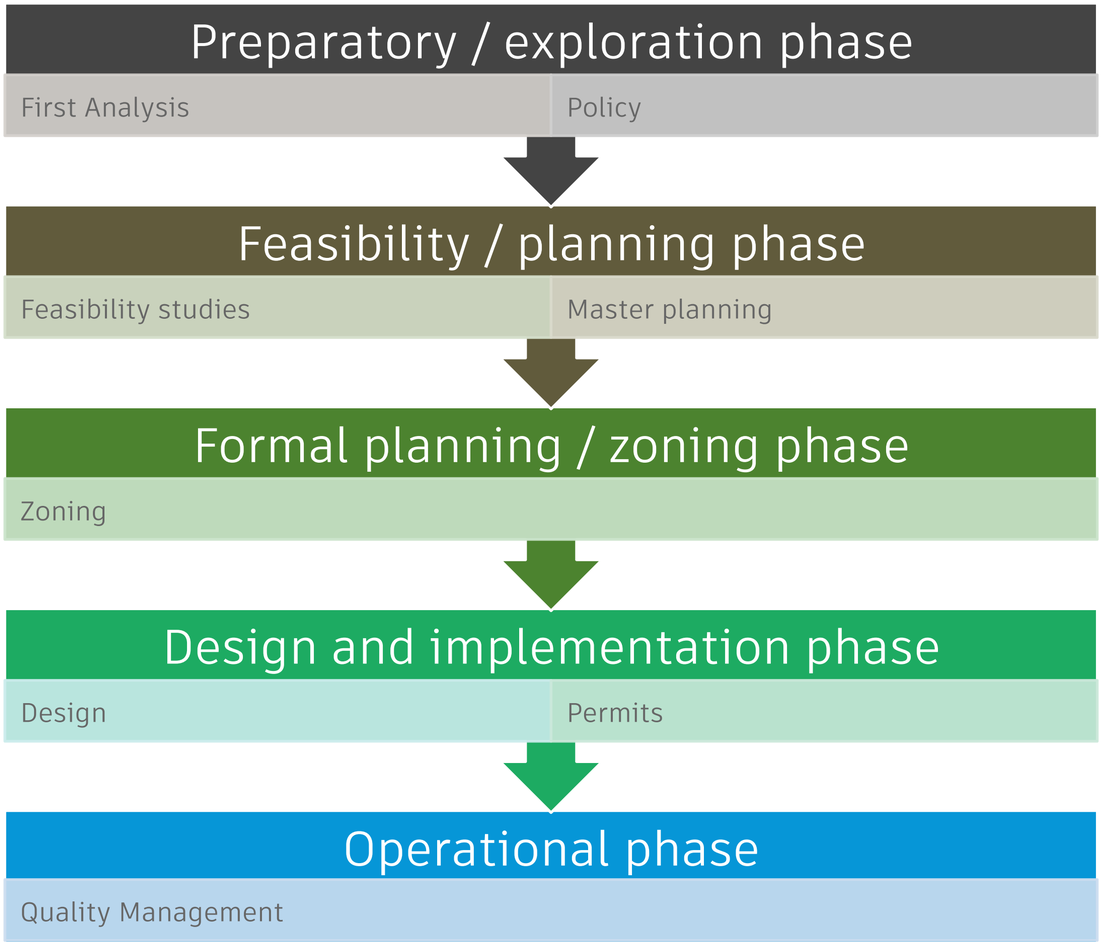
BIM

Visualization

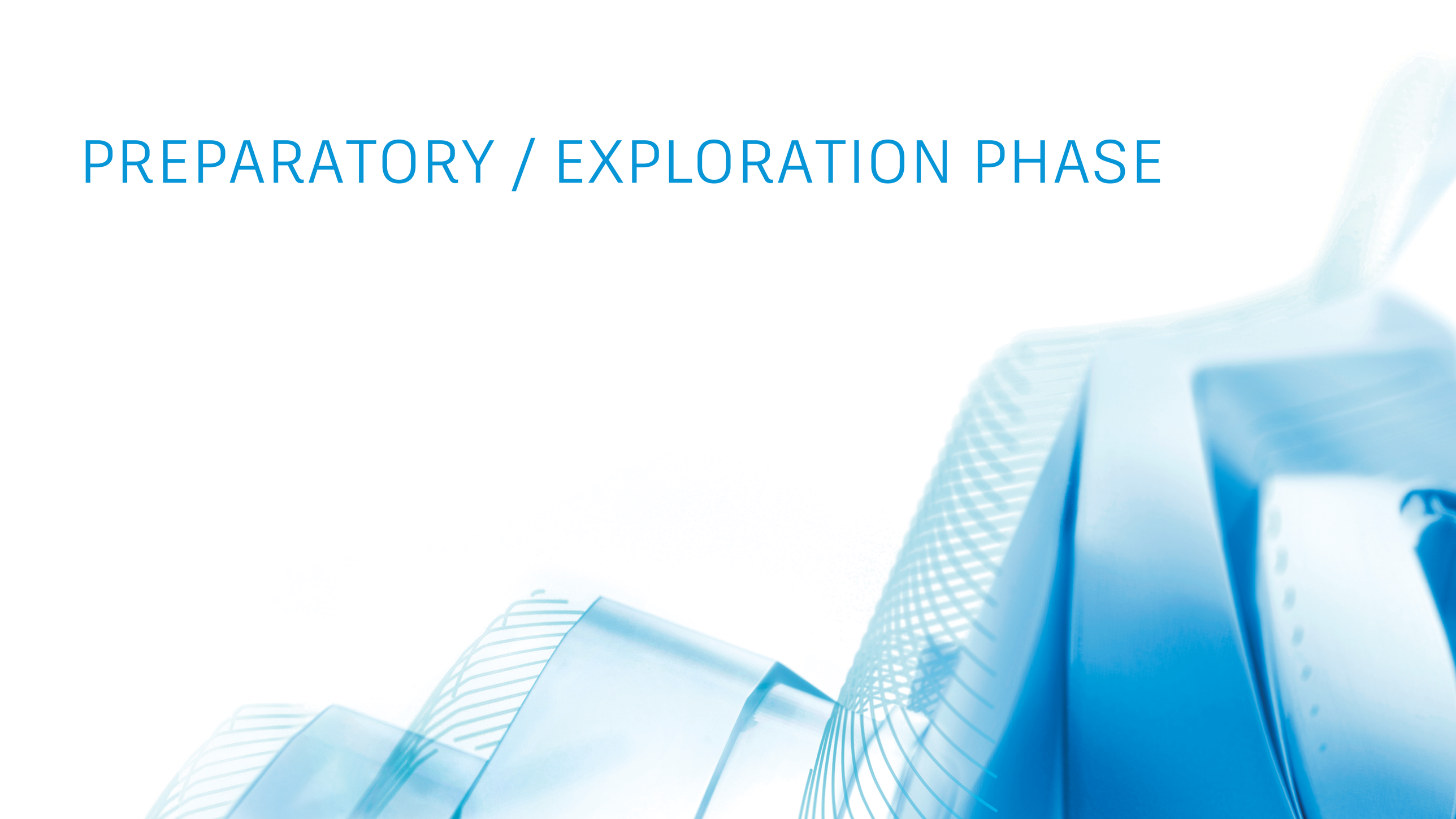

Construction simulation

BIM IN THE CONTEXT OF URBAN PLANNING

URBAN PLANNING PROCESS

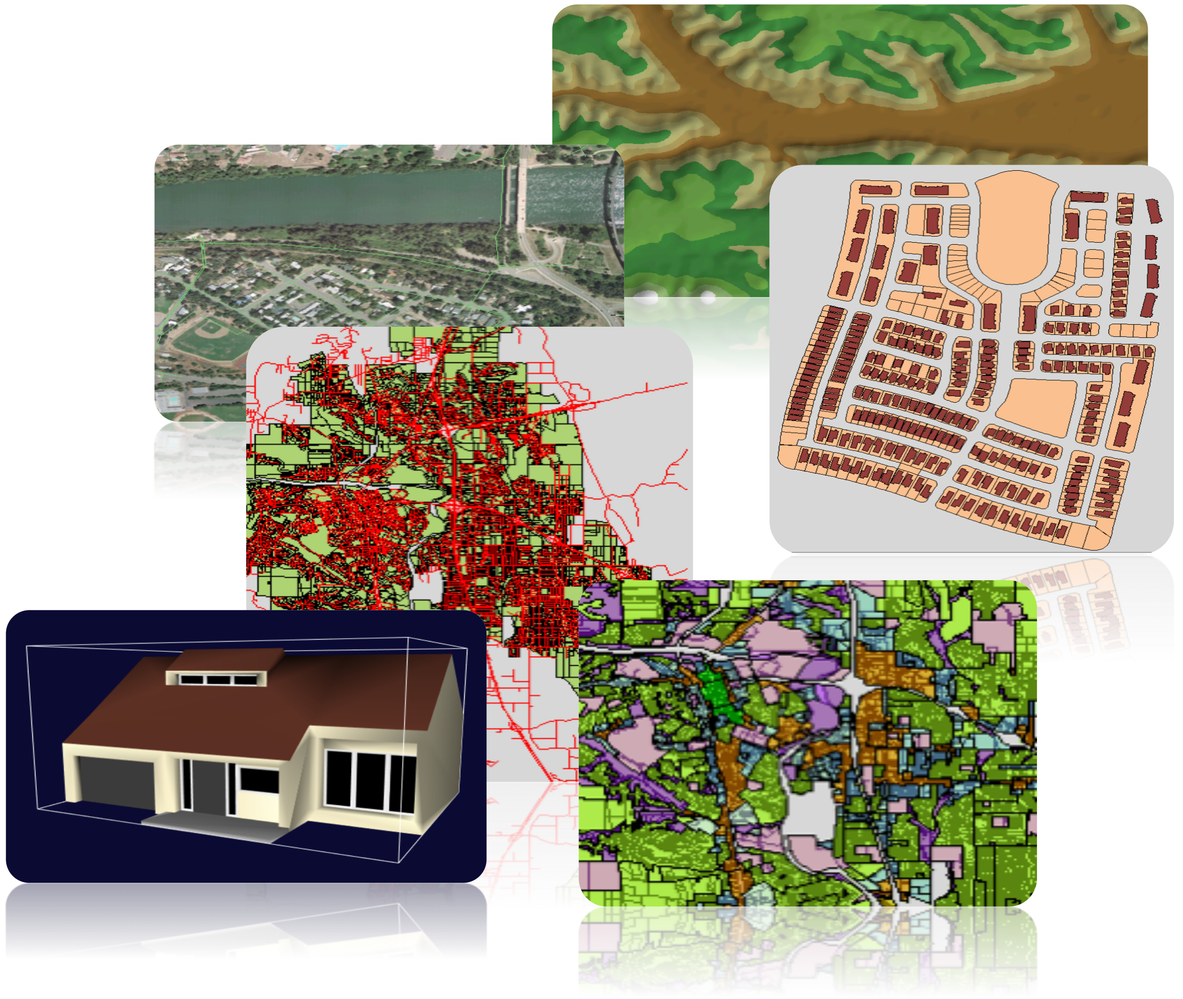


PREPARATORY / EXPLORATION PHASE



Build your Digital City model in hours, not weeks

- **Connect and explore**
  - Terrain (surfaces)
  - Aerial photography
  - Transportation networks
  - Building footprints
  - Parcel maps
  - Hydrography
  - Zoning maps
  - Land use Maps
  - 3D/BIM/Revit models



AUTODESK ARCHITECTURE, ENGINEERING & CONSTRUCTION COLLECTION

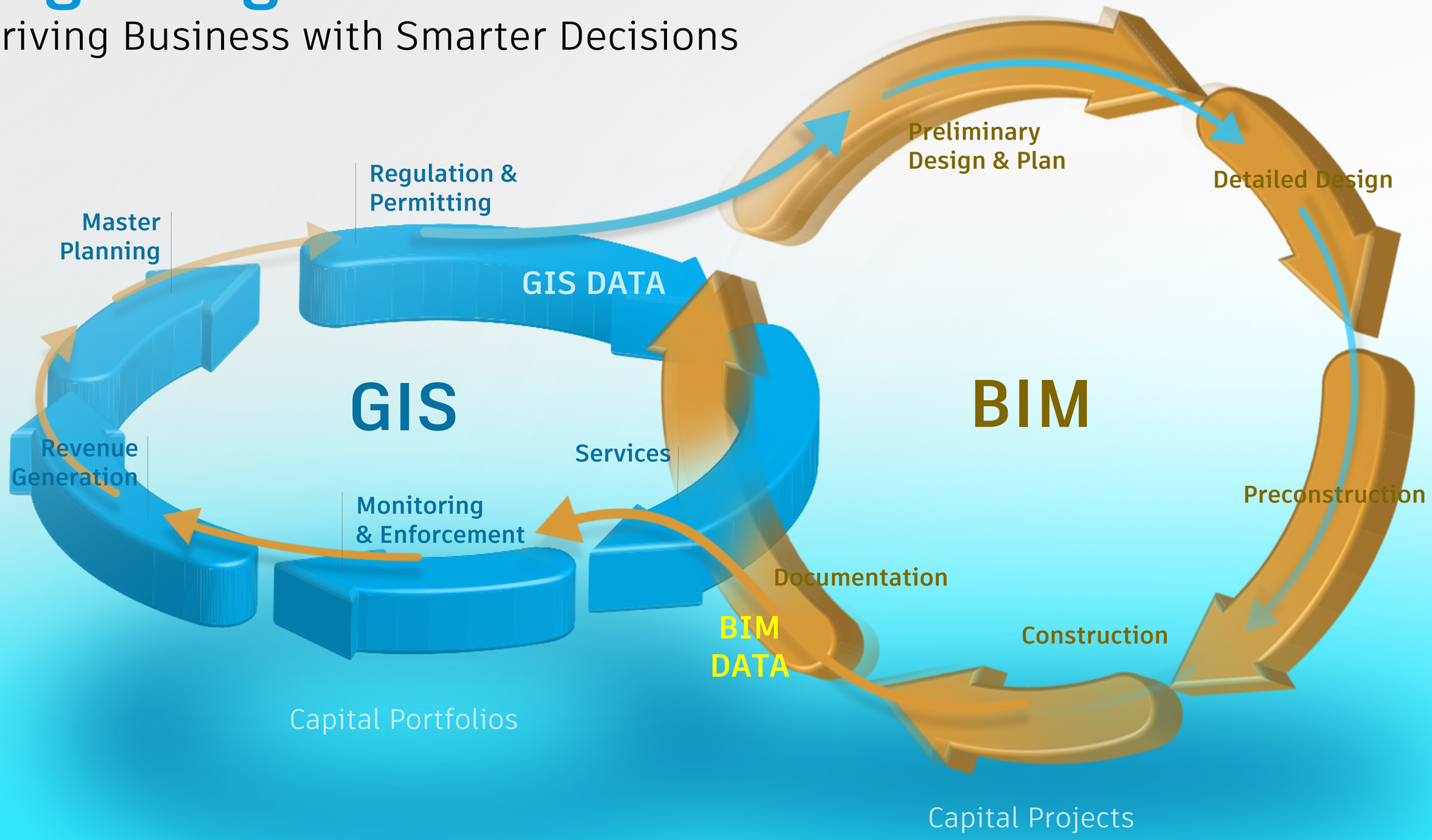
What's New in InfraWorks 2020.1

User Interface Cohesion

AUTODESK.

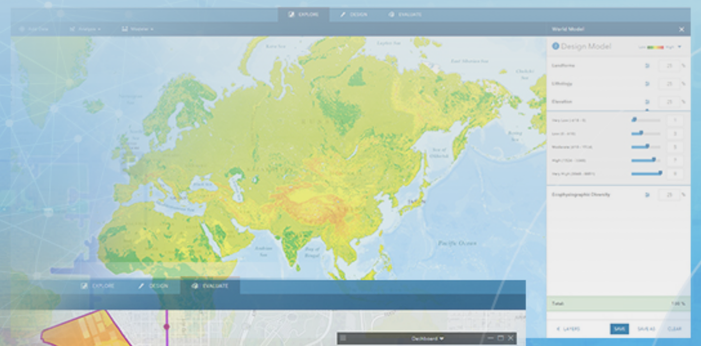
Integrating BIM and GIS Workflows

Driving Business with Smarter Decisions



GIS and BIM Are Revolutionizing How We Plan and Design

Integrating and Making Available Everything We Know



Life Cycle Management

Architects & Designers

BIM

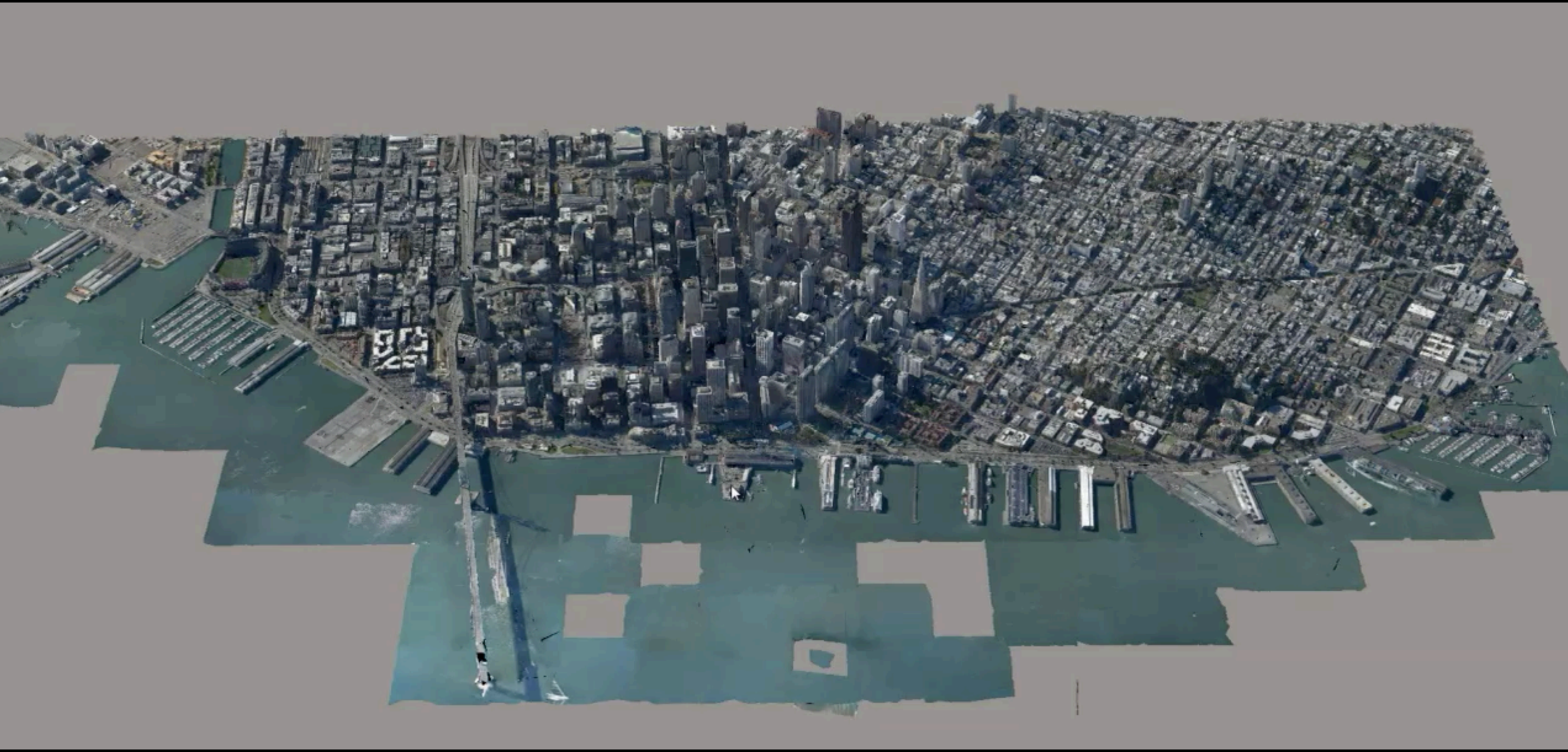
Planners

GIS

. . . Bringing Together Two Communities and Enhancing What We Do

Project Information Model

ArcGIS®
Map 3D
GIS
LIDAR
Infrared
Digital Programming
Reality Capture
Civil 3D®
Revit®
BIM
Climate
Traffic
Utilities
Parking
Lighting
IoT



FEASIBILITY / PLANNING PHASE

SIDEWALK CONNECTIONS BETWEEN PLAZA, PRIMARY INTERSECTION AND AREAS BEYOND
EXISTING RTD PARK-N-RIDE
4-STORY VERTICALLY MIXED USE BUILDING WITH THREE 20,000 S.F. OFFICE FLOORS OVER 15,000 S.F. OF RETAIL, RESTAURANT, & BUSINESS USES
S. SANTA FE DR.
EXISTING RIGHT-IN / RIGHT-OUT ACCESS
RETAIL / RESTAURANT
RETAIL PARKING
MIXED-USE 4 STORIES
MONUMENT SIGN
EXISTING RIGHT-IN / RIGHT-OUT ACCESS
SIDEWALK CONNECTION ALONG MINERAL
RESTAURANT PAD WITH DRIVE THROUGH
SIGNALIZED FULL MOVEMENT INTERSECTION
PAD
SHOPS
SHOPS & RESTAURANTS
RETAIL JR. ANCHOR
RETAIL
GAS CANOPY
SOUTH PLATTE RIVER PARKWAY
W. MINERAL AVE.
RESTAURANT PAD WITH DRIVE THROUGH
APARTMENT
PAD PARKING
CONVENIENCE STORY
GARAGE
APARTMENT PARKING
CLUB HOUSE & SALES OFFICE
POOL
ASSISTED LIVING SAFE ENTRANCE
INDEPENDENT LIVING ENTRANCE
4-STORY CONGREGATE CARE FACILITY
MEMORY CARE ENTRANCE
PROPOSED RIGHT-IN / RIGHT-OUT ACCESS
APARTMENT AMENITY
SOUTH PLATTE RIVER OPEN SPACE
CONGREGATE CARE FACILITY INCLUDES INDEPENDENT LIVING, ASSISTED LIVING, AND MEMORY CARE LIVING

Rambøll Sweco ANS - InterCity Sørli-Brumenddal

Images courtesy of Ramboll Sweco ANS

Existing railway
Jernbaneverket

Concepts Performance Analysis & Evaluation

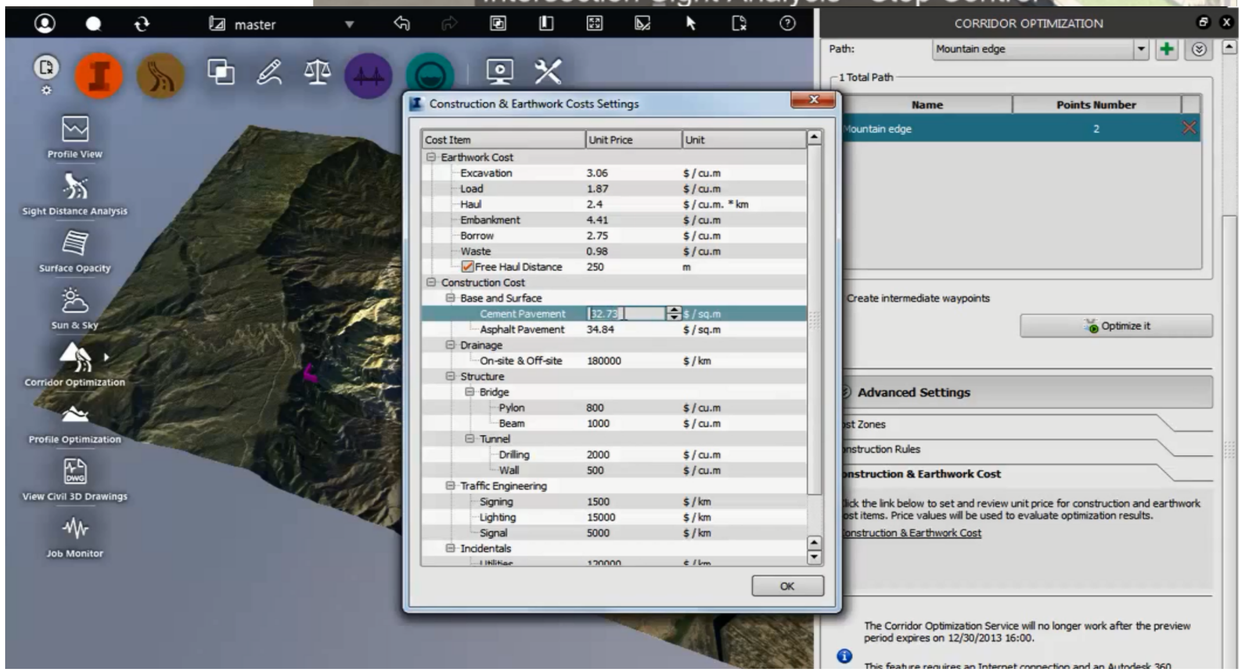
- Thematic Maps, Sight analysis…
- Material Take-offs
- Unit Costs
- Corridor/profile optimization & reporting

Station: 184.00

5. VOLUME REPORT

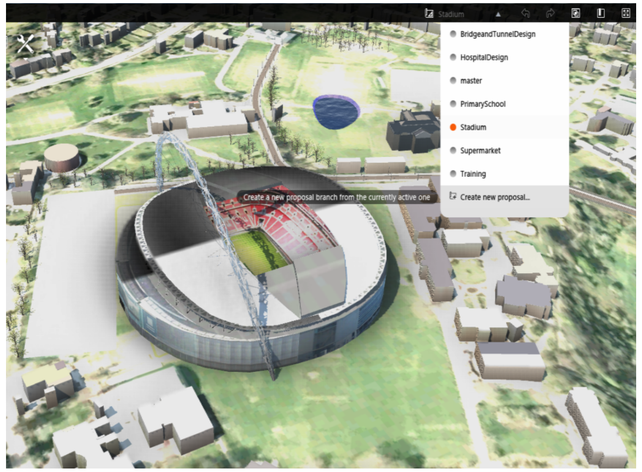
Station:	Cut area: (m^2)	Cut vol: (m^3)	Fill area: (m^2)	Fill vol. (m^3)	Cum. cut: (m^3)	Cum. fill: (m^3)	Cum. net: (m^3)
0.00	0.51	0.00	0.57	0.00	0.00	0.00	0.00
92.00	4.72	343.64	0.00	3.38	343.64	3.38	340.27
184.00	0.00	390.60	6.12	47.33	734.24	50.70	683.54
276.00	20.81	812.31	0.00	247.64	1,546.55	298.34	1,248.21
368.00	4.44	424.63	0.00	71.65	1,971.18	369.99	1,601.19
460.00	9.73	345.61	0.00	0.45	2,316.79	370.43	1,946.36
552.00	0.00	112.55	3.77	372.99	2,429.34	743.42	1,685.92

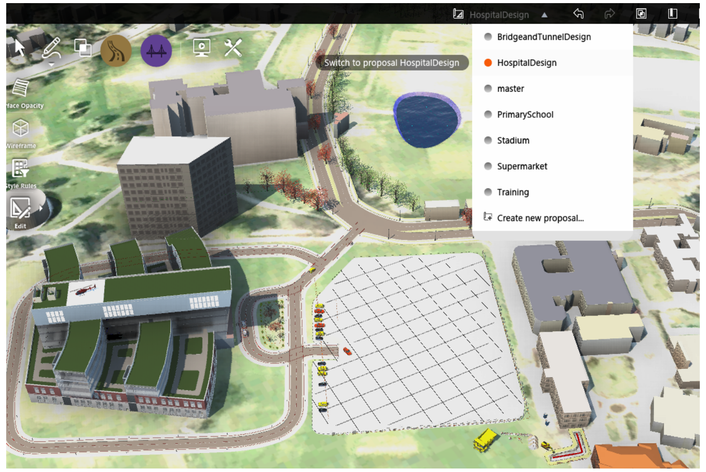
Fill area:	0.00
Road elevation:	7.98
Surface high:	9.76
Surface low:	8.56



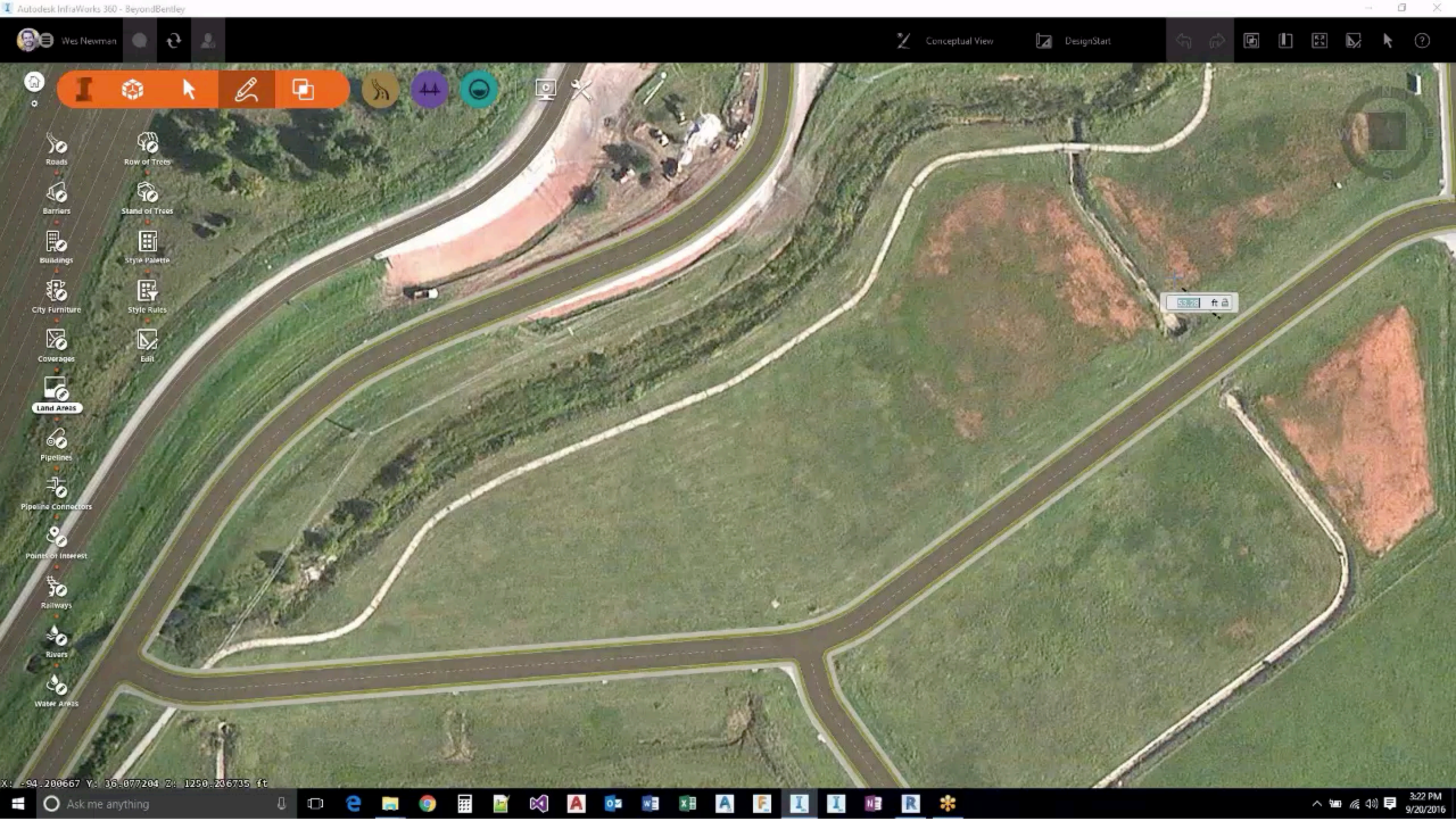
master

Develop & Explore Various Alternatives





FORMAL PLANNING / ZONING PHASE

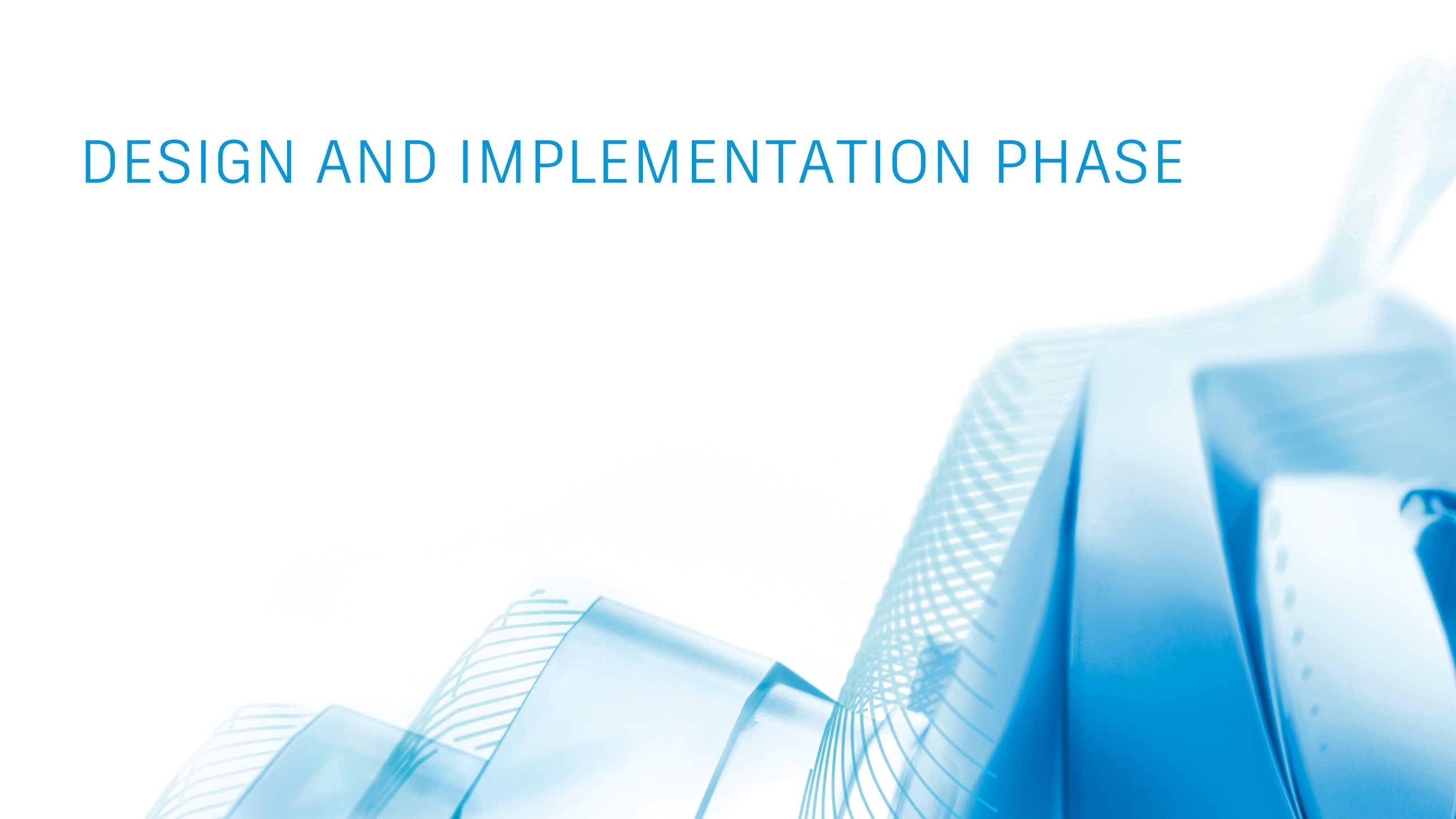

Autodesk InfraWorks 360 - BeyondBentley
Wes Newman
Conceptual View
DesignStart
Roads
Row of Trees
Barriers
Stand of Trees
Buildings
Style Palette
City Furniture
Style Rules
Coverages
Edit
Land Areas
Pipelines
Pipeline Connectors
Points of Interest
Railways
Rivers
Water Areas
X: -94.200667 Y: 36.077204 Z: 1250.236735 ft
Ask me anything
3:22 PM
9/20/2016

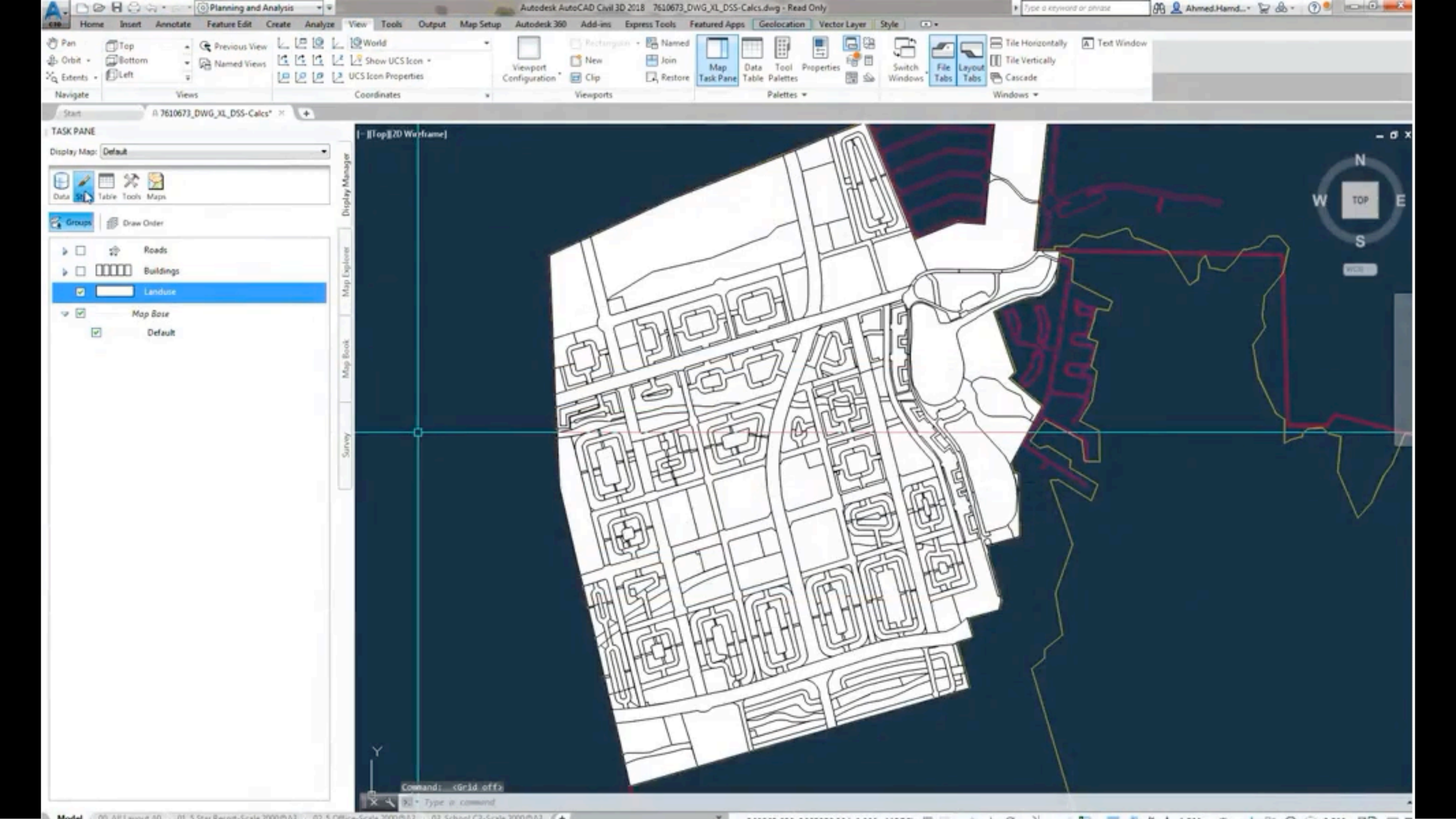
Reimagining the Eiffel Tower landscape

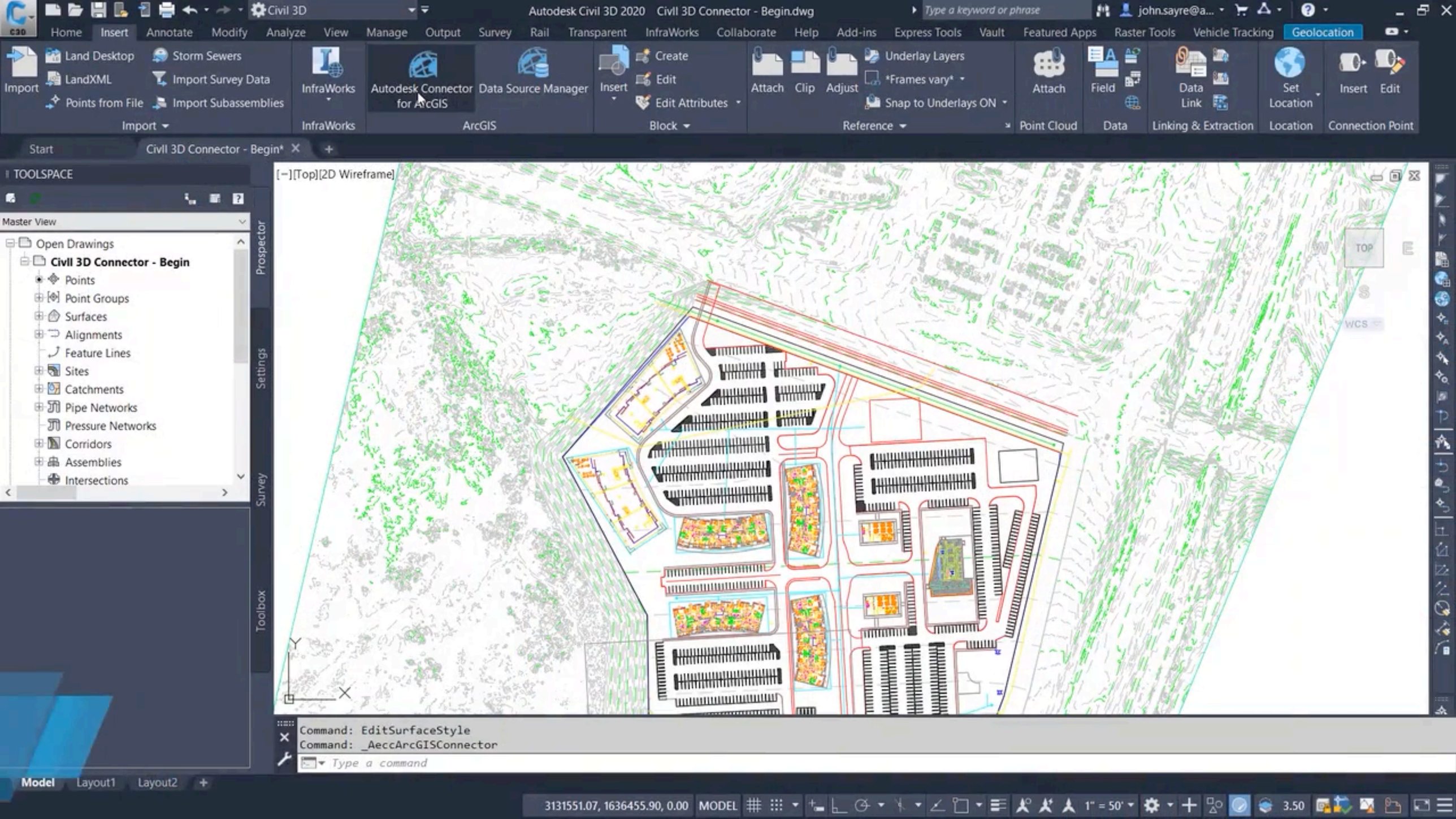
Reimagining the Eiffel Tower landscape

http://www.infrastructure-reimagined.com/eiffel-tower-context-modeling-VR

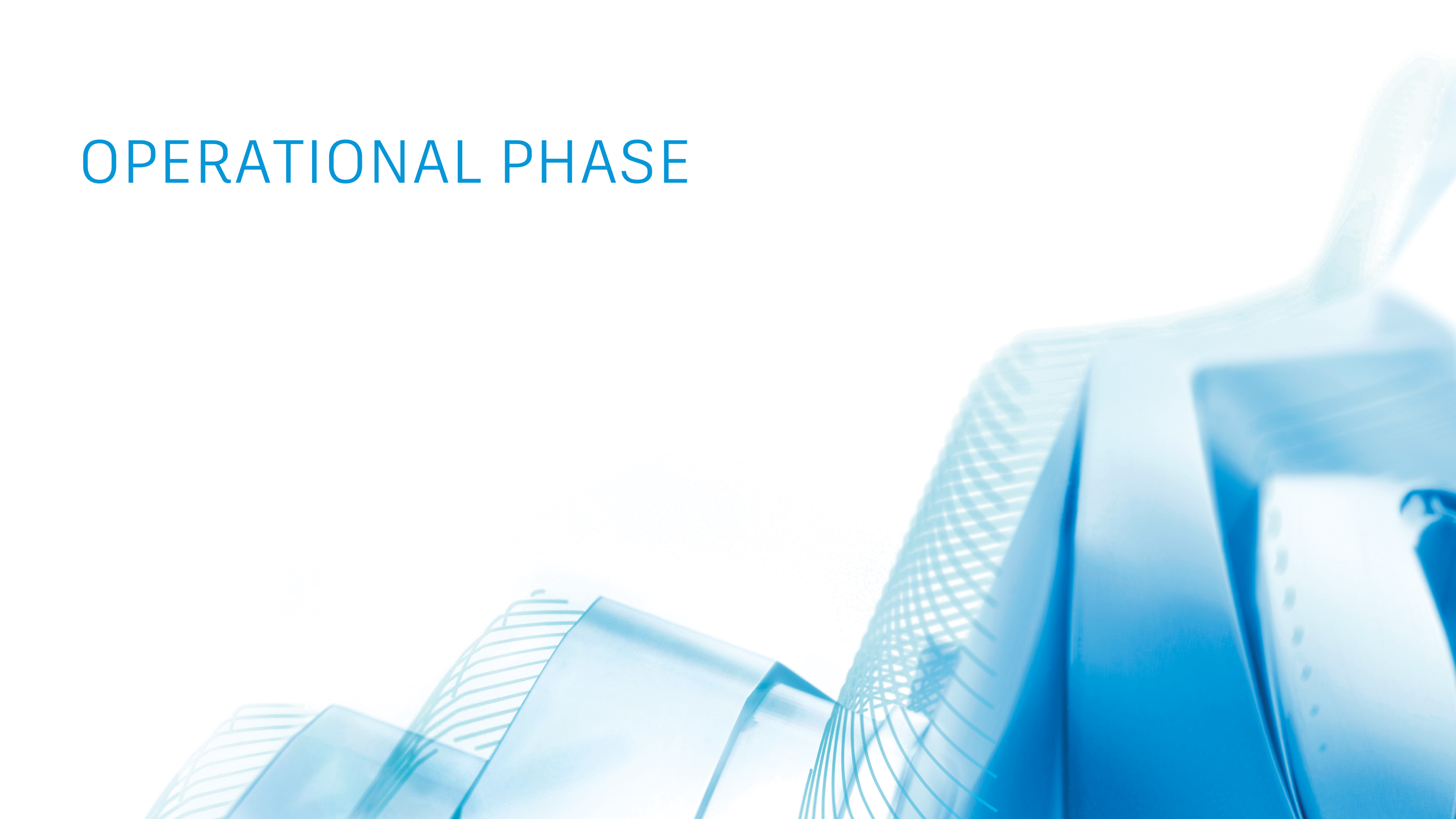
DESIGN AND IMPLEMENTATION PHASE

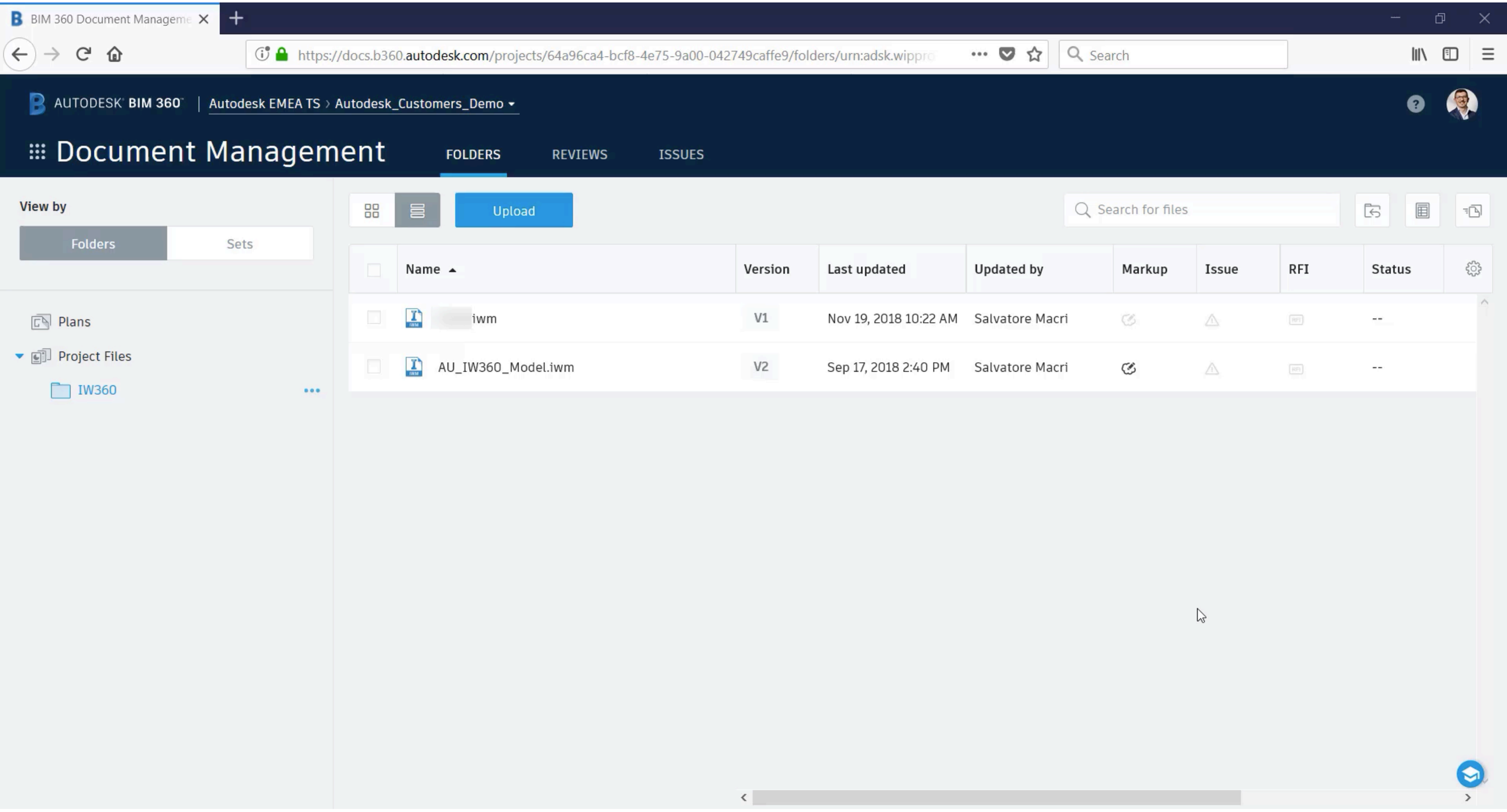



Planning and Analysis
Autodesk AutoCAD Civil 3D 2018 7610673_DWG_XL_DSS-Calcs.dwg - Read Only
Home Insert Annotate Feature Edit Create Analyze View Tools Output Map Setup Autodesk 360 Add-ins Express Tools Featured Apps Geolocation Vector Layer Style
Pan Orbit Extents
Top Bottom Left
Previous View Named Views
World Show UCS Icon UCS Icon Properties
Viewport Configuration
Rectangular New Clip
Named Join Restore
Map Task Pane Data Table Tool Palettes Properties
Switch Windows File Tabs Layout Tabs
Tile Horizontally Tile Vertically Cascade
Text Window
Navigate Views Coordinates Viewports Palettes Windows
Start
7610673_DWG_XL_DSS-Calcs*
TASK PANE
Display Map: Default
Data Style Table Tools Maps
Groups Draw Order
Roads
Buildings
Landuse
Map Base
Default
Display Manager Map Explorer Map Book Survey
[-][Top][2D Wireframe]
N W TOP E S
Command: <Grid off>
Type a command
Model


Civil 3D
Autodesk Civil 3D 2020 Civil 3D Connector - Begin.dwg
Type a keyword or phrase
john.sayre@a...
Home Insert Annotate Modify Analyze View Manage Output Survey Rail Transparent InfraWorks Collaborate Help Add-ins Express Tools Vault Featured Apps Raster Tools Vehicle Tracking Geolocation
Import
Land Desktop
LandXML
Points from File
Storm Sewers
Import Survey Data
Import Subassemblies
Import
InfraWorks
InfraWorks
Autodesk Connector for ArcGIS
Data Source Manager
ArcGIS
Insert
Create
Edit
Edit Attributes
Block
Attach
Clip
Adjust
Underlay Layers
Frames vary
Snap to Underlays ON
Reference
Attach
Point Cloud
Field
Data
Data Link
Linking & Extraction
Set Location
Location
Insert
Edit
Connection Point
Start
Civil 3D Connector - Begin*
TOOLSPACE
Master View
Open Drawings
Civil 3D Connector - Begin
Points
Point Groups
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Prospector
Settings
Survey
Toolbox
[−][Top][2D Wireframe]
TOP
WCS
Command: EditSurfaceStyle
Command: _AeccArcGISConnector
Type a command
Model
Layout1
Layout2
3131551.07, 1636455.90, 0.00
MODEL
1" = 50'
3.50

OPERATIONAL PHASE

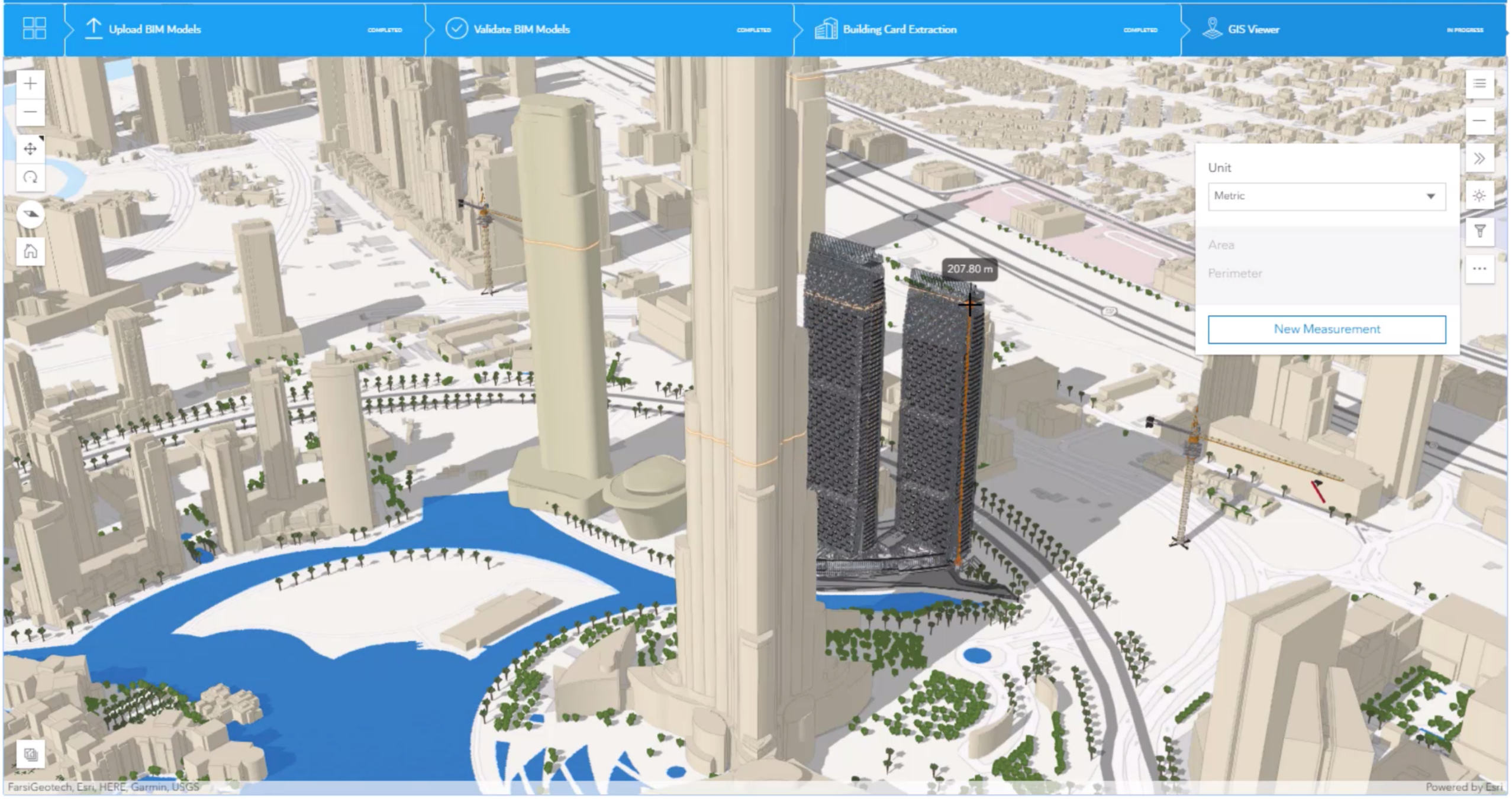


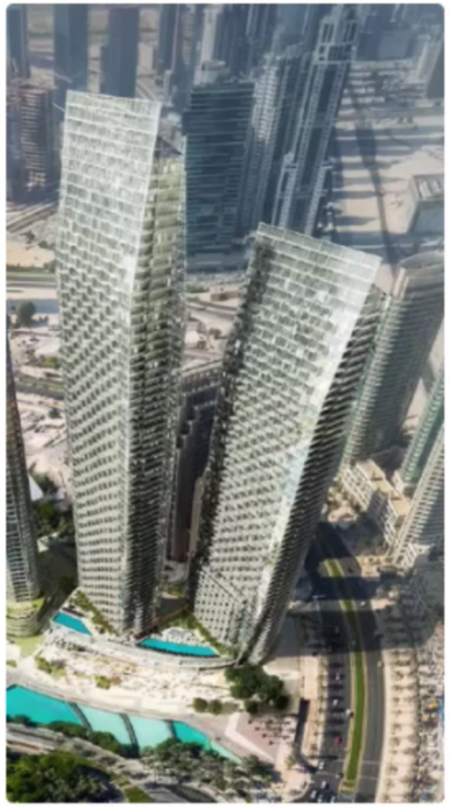

BIM 360 Document Manageme
https://docs.b360.autodesk.com/projects/64a96ca4-bcf8-4e75-9a00-042749caffe9/folders/urn:adsk.wippro
Search
AUTODESK BIM 360
Autodesk EMEA TS › Autodesk_Customers_Demo
Document Management
FOLDERS
REVIEWS
ISSUES
View by
Folders
Sets
Plans
Project Files
IW360
Upload
Search for files
Name
Version
Last updated
Updated by
Markup
Issue
RFI
Status
iwm
V1
Nov 19, 2018 10:22 AM
Salvatore Macri
--
AU_IW360_Model.iwm
V2
Sep 17, 2018 2:40 PM
Salvatore Macri
--

Dubai Smart Building Permit System

Dubai Smart Building Permit System

- e-Submission
- Validation
- Building card extraction
- GIS conversion


Upload BIM Models
COMPLETED
Validate BIM Models
COMPLETED
Building Card Extraction
COMPLETED
GIS Viewer
IN PROGRESS
Unit
Metric
Area
Perimeter
New Measurement
207.80 m
FarsiGeotech, Esri, HERE, Garmin, USGS
Powered by Esri



The Address Residences Downtown Opera

LOCATION
Burj Khalifa

PARCEL ID
3456900

PLOTS
A2, A3, A1a

OWNER
Emaar Properties PJSC

CONSULTANTS
Mace International Limited

Khatib & Alami

MAIN CONTRACTOR
TAV Construction

DESCRIPTION
Hotel apartments with 2 towers, one featuring 64 storeys, the other 56 and a podium (6 Basements + Ground floor +2 floor)

BUILDING STRUCTURE

- 56 F
- 64 F
- Podium G + 2 F
- | 6 B

Upload BIM Models

Drag & Drop files here

or

Browse Files

Validate BIM Models

Validate BIM Models

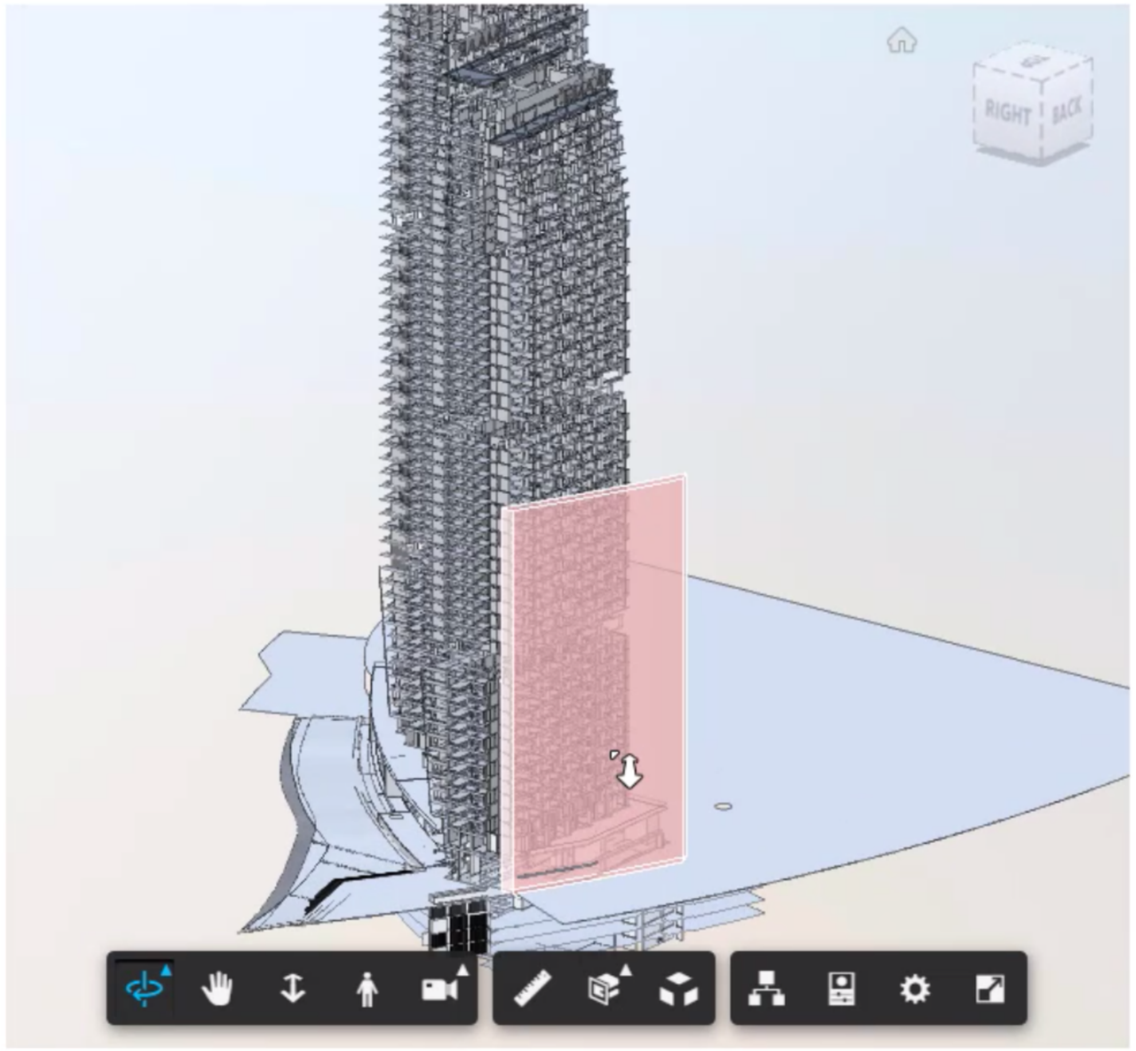
Project: The Address Residences Dubai Opera

- Zoning and setbacks
- Door/Room
- Parking Space Check
- Room Classification
- Corridor Check

100% Validated

94% Compliant

6% Non-Compliant



Checking zoning regulations

Building does not meet Zoning regulations

Violation 1

Height needs to be a maximum of 190 meters

Violation 2

Setback West needs to be 3 meters

Violation 3

Setback North needs to be 12 meters

QUESTIONS

AUTODESK®

Make anything™

Autodesk and the Autodesk logo are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product and services offerings, and specifications and pricing at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document.

© 2019 Autodesk. All rights reserved.