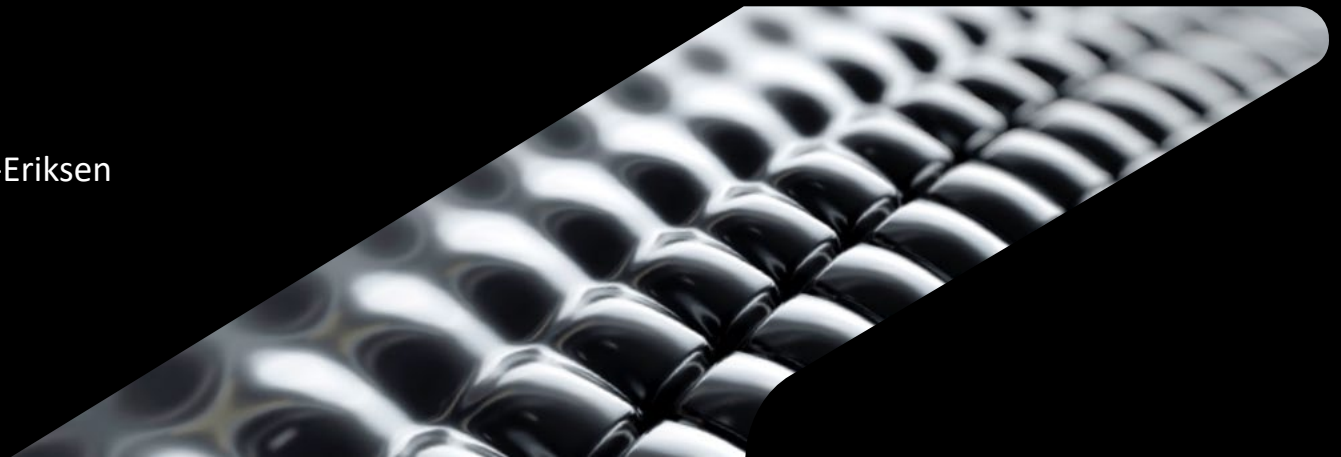
AUTODESK UNIVERSITY

Iterative concept design with Spacemaker & Revit

AS501289



Caoimhe Loftus & Arne Bassøe-Eriksen
CALLISONRTKL & SPACEMAKER

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Technical instruction - Structure

Introduction to Spacemaker

5 min

Current workflow

Early-stage planning. Re-imagined

What Spacemaker can help you with

Who we are

Recommended workflow

5 min

Traditional workflow

Transitional workflow

Suggested workflow

Why change workflow

Demo

45 min

Project setup

Analysis

Spacemaker > Revit

Revit > Spacemaker

Learning objectives

Project setup in Spacemaker

Iterate design and real-time analyses in Spacemaker

Pushing Spacemaker proposals to Revit with the Revit plugin

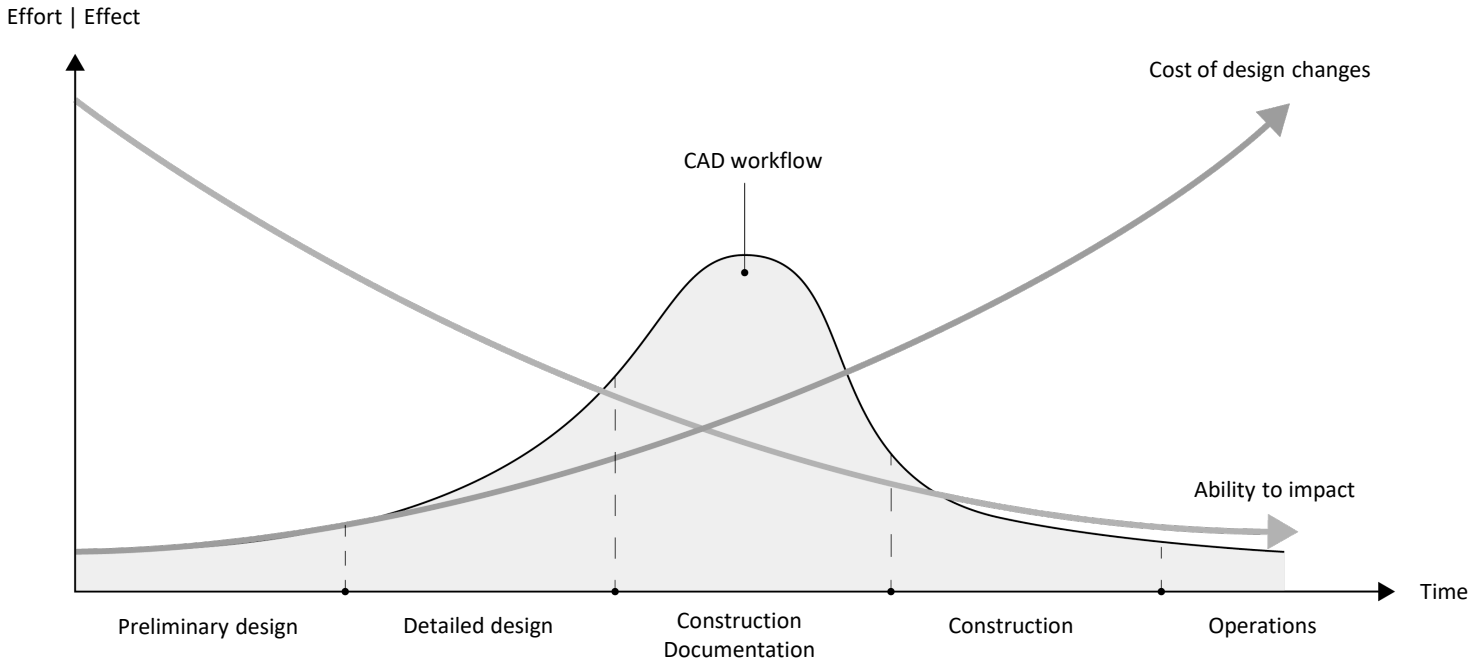
Pushing Revit proposals back to Spacemaker for updated analyses

REMINDER

Spacemaker changes fast

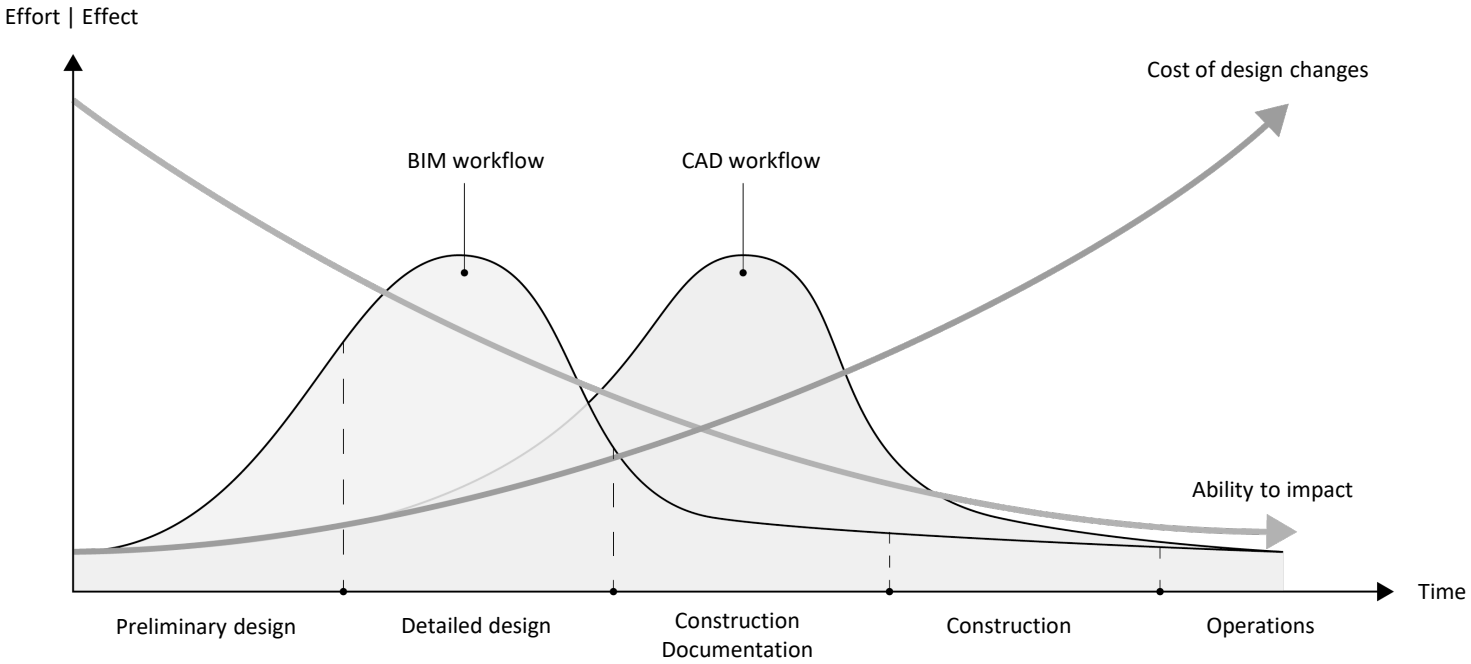
This workflow may have evolved by the time you watch this video

Cost for Making Changes



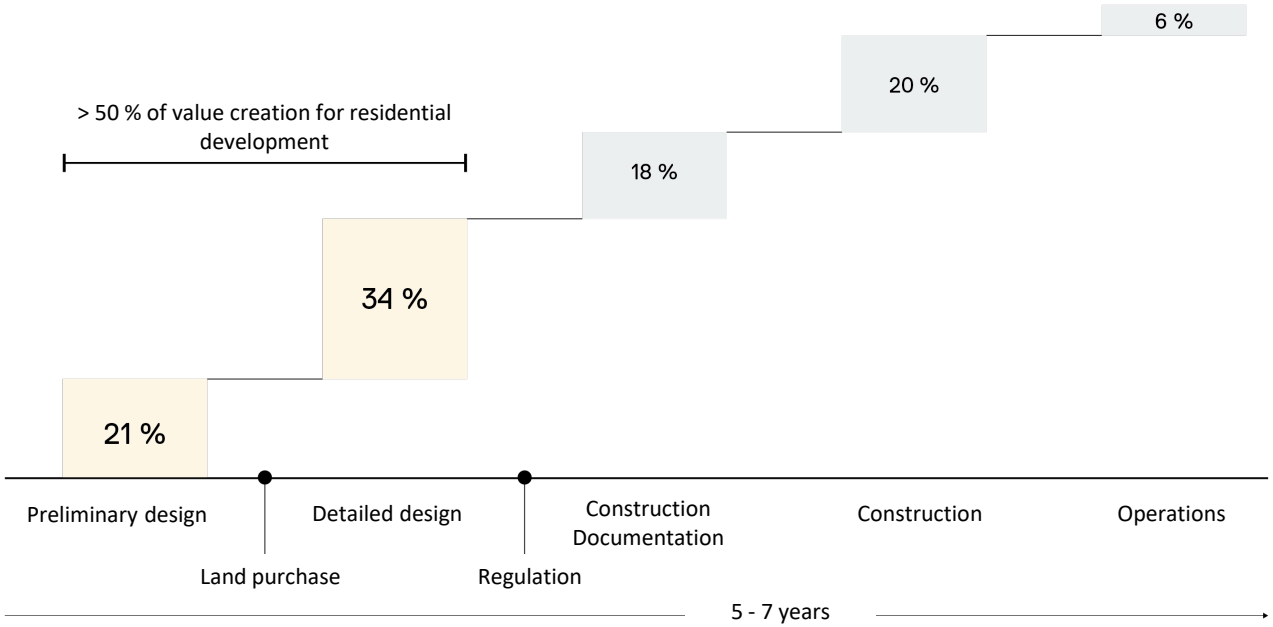
Source: McLeamy curve

BIM tools increased the designers impact



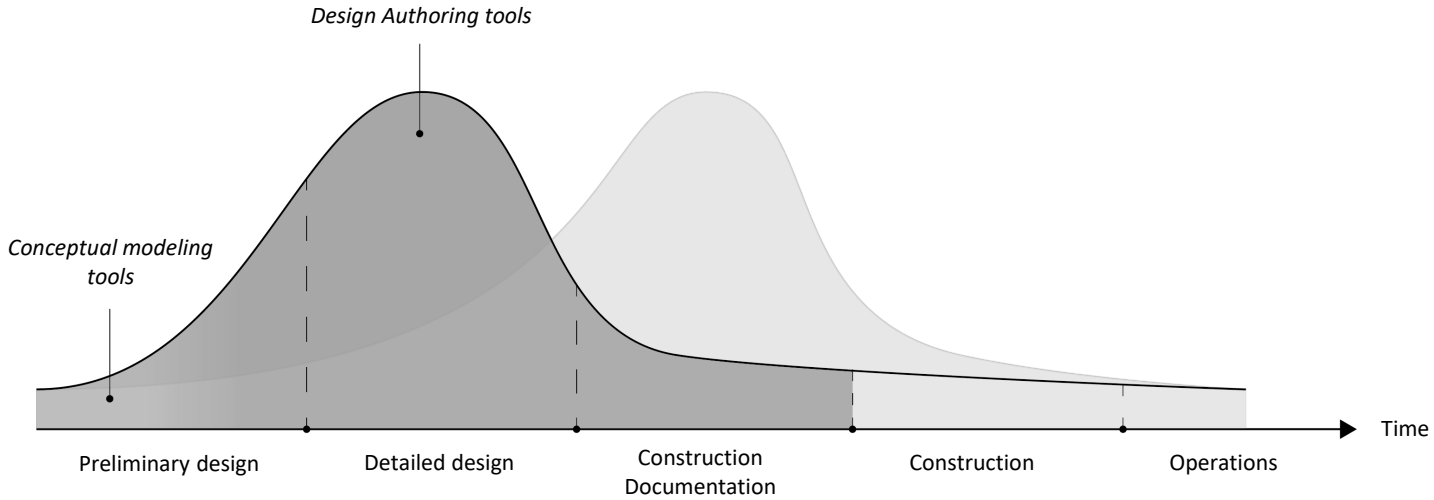
Source: McLeamy curve

Value creation happens in the beginning

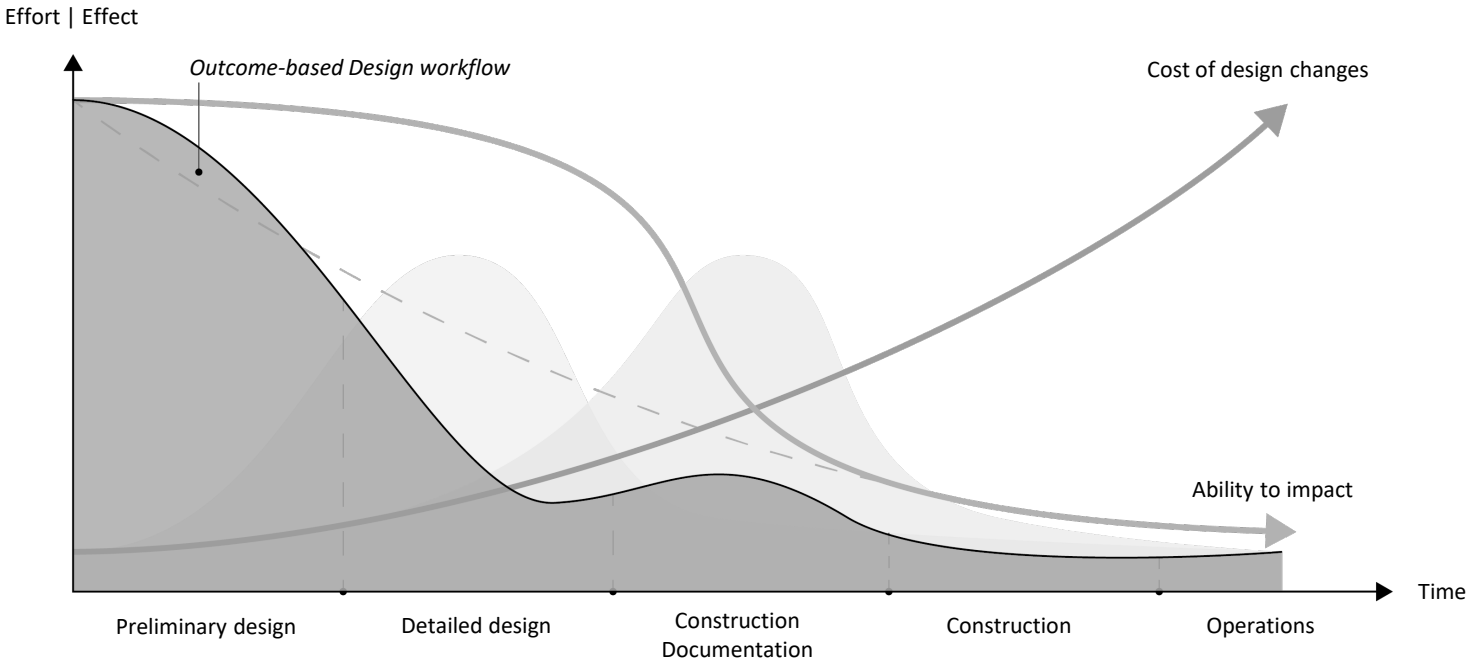


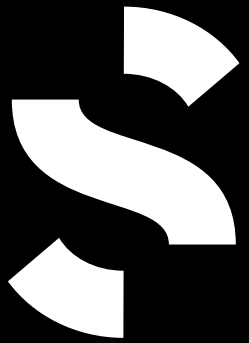
Source: Skanska annual report 2018

Despite technological advancements, current common methods are still insufficient



Optimal situation?





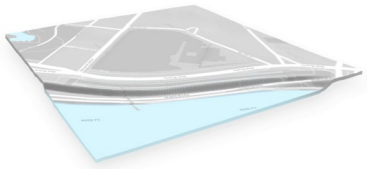
SPACEMAKER

An AUTODESK product

Early-stage planning. Re-imagined.

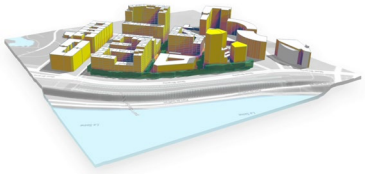
Instant digital model

Select an address and build your 3D model in minutes. Bring your own or use automatically sourced data sets*



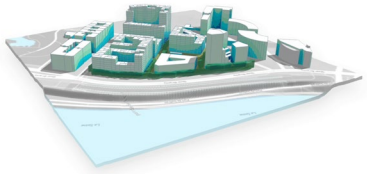
AI-powered design

Design, explore and optimize solutions with unparalleled speed and ease of use



Real-time analysis

Perform advanced real time analysis to evaluate the performance of your design



Seamless collaboration

Work with the entire planning team in ONE platform, on the same digital models.

*Automatic data availability varies country by country

Access to 100+ analyses on each design proposal

AREA

Site

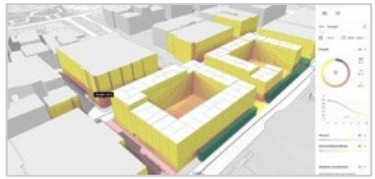
Buildings

Apartments

SURROUNDINGS

Terrain

Outdoor area

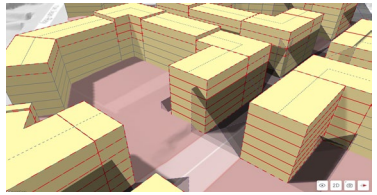


Effects on neighbours

REGULATIONS

Parking

Noise

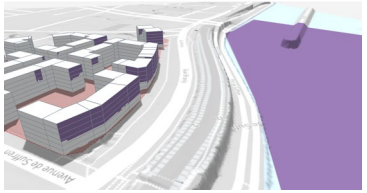


Geometrical constraints

SUSTAINABILITY

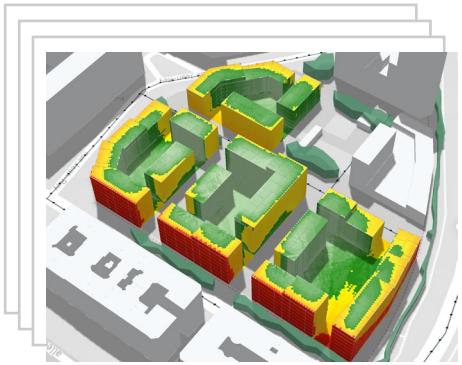
Wind

Daylight & Sunlight



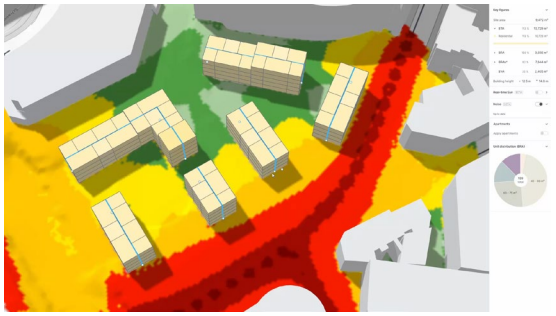
Views

Instant analyses with Machine Learning



Noise Analysis

Training with dataset
(20,000+)



Instant Noise Analysis

Go from this ...

Some exploration

Testing a limited amount of alternatives

before ending at the final design

without having tested the full solution space

… to this!

Wide exploration

Testing & iterating with several alternatives

improving one alternative

Spacemaker is integrated with Autodesk software to reinvent early stage evaluation and design

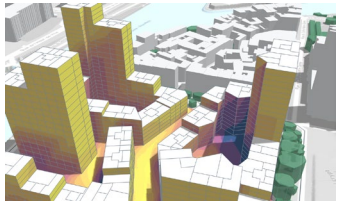
SPACEMAKER
An AUTODESK product

A CAD
C C3D
R RVT
N SIM

AUTODESK Construction Cloud

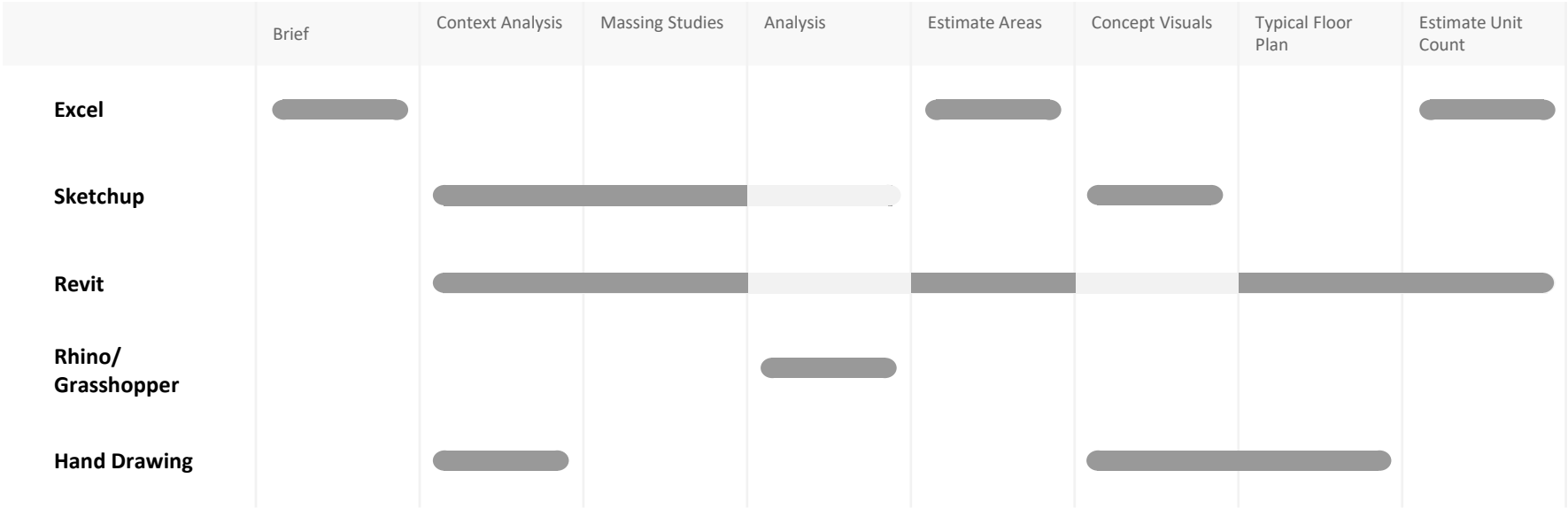
EVALUATE / PLANNING | DESIGN | PLAN | BUILD

Site Acquisition | Site Development

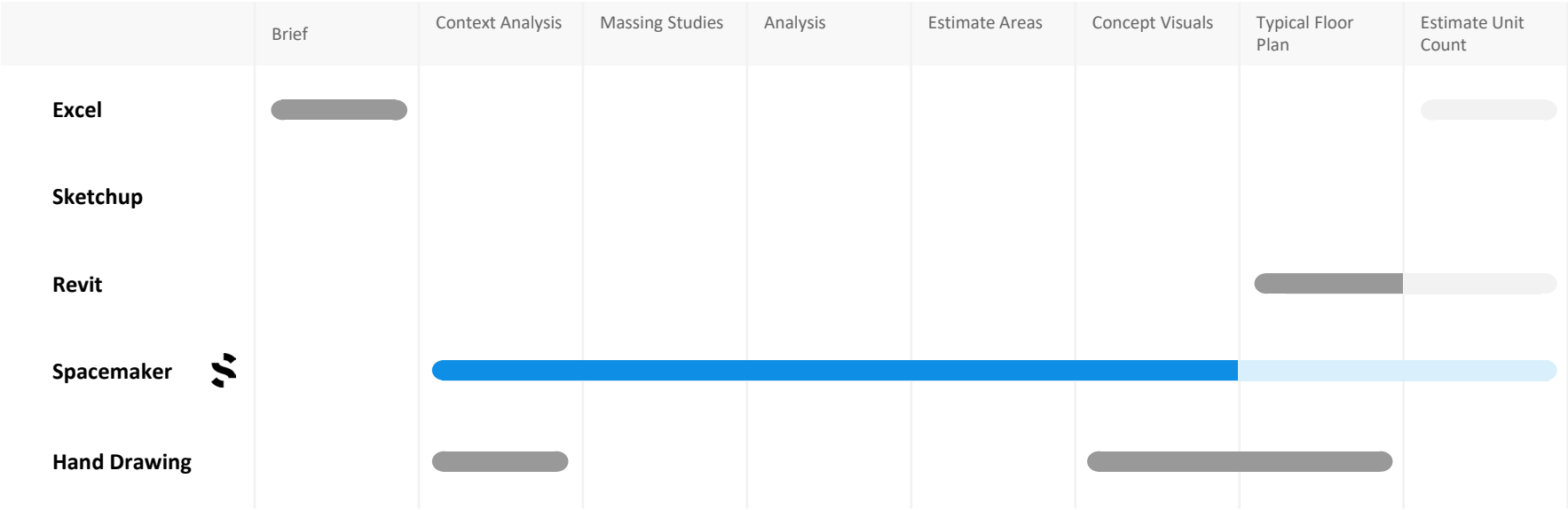


Export/sync models

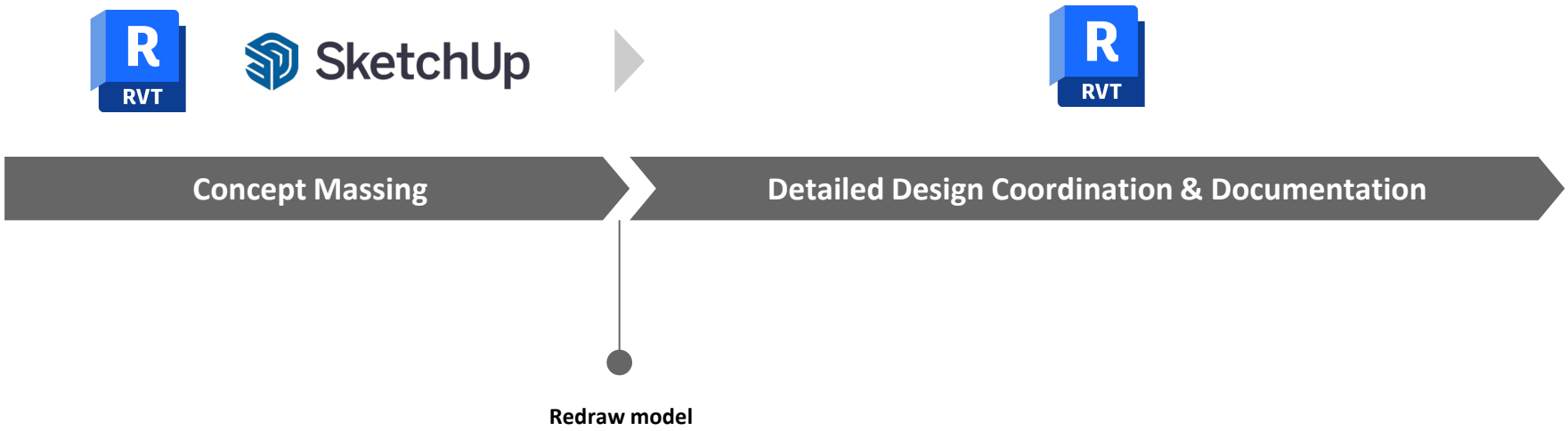
Traditional workflow



Spacemaker workflow

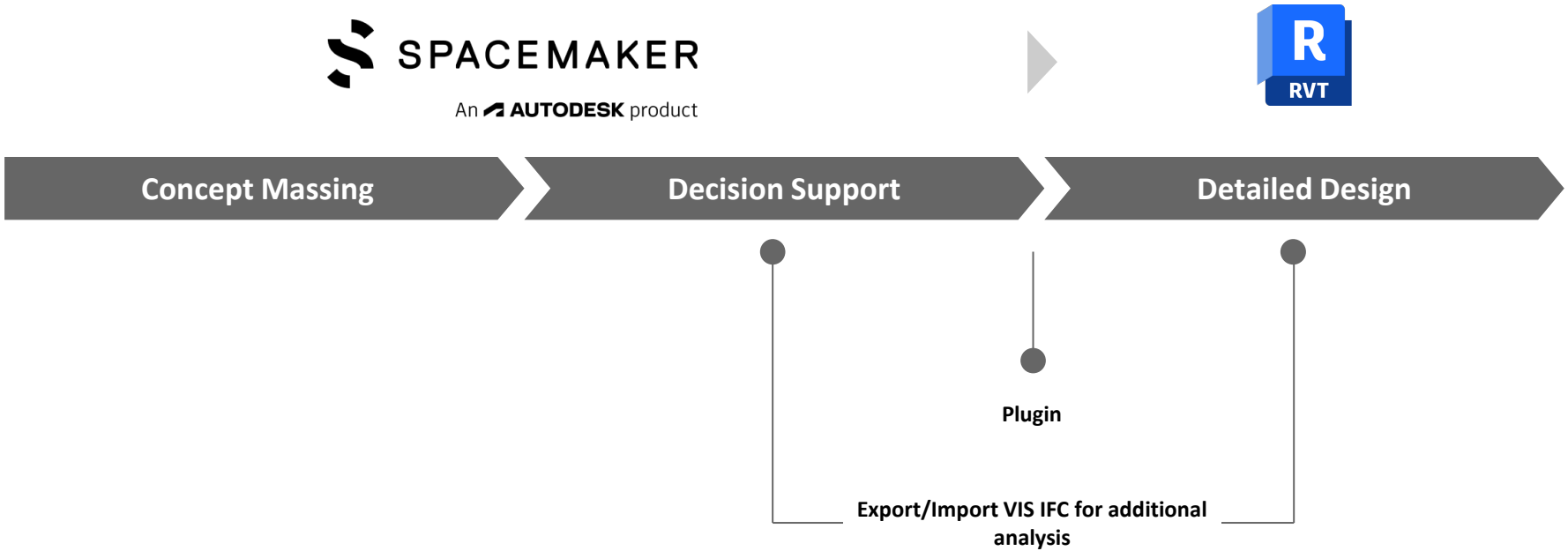


Workflow before Spacemaker



Transitional workflow

Recommended workflow



Typical design process

Collect context info

Site analysis

Design & Analyze Options

Client viability study

Modify Generic massing

Update analyses

Detailed design model

Feedback from local authorities

Design development

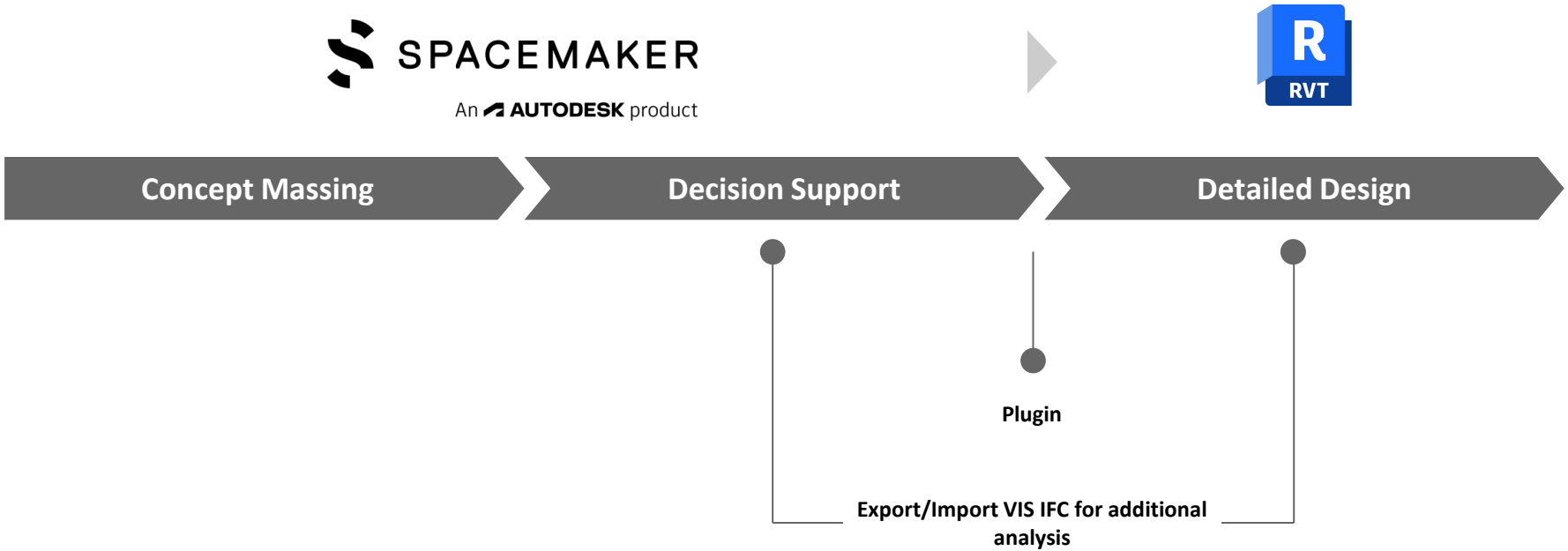
Detailed feedback

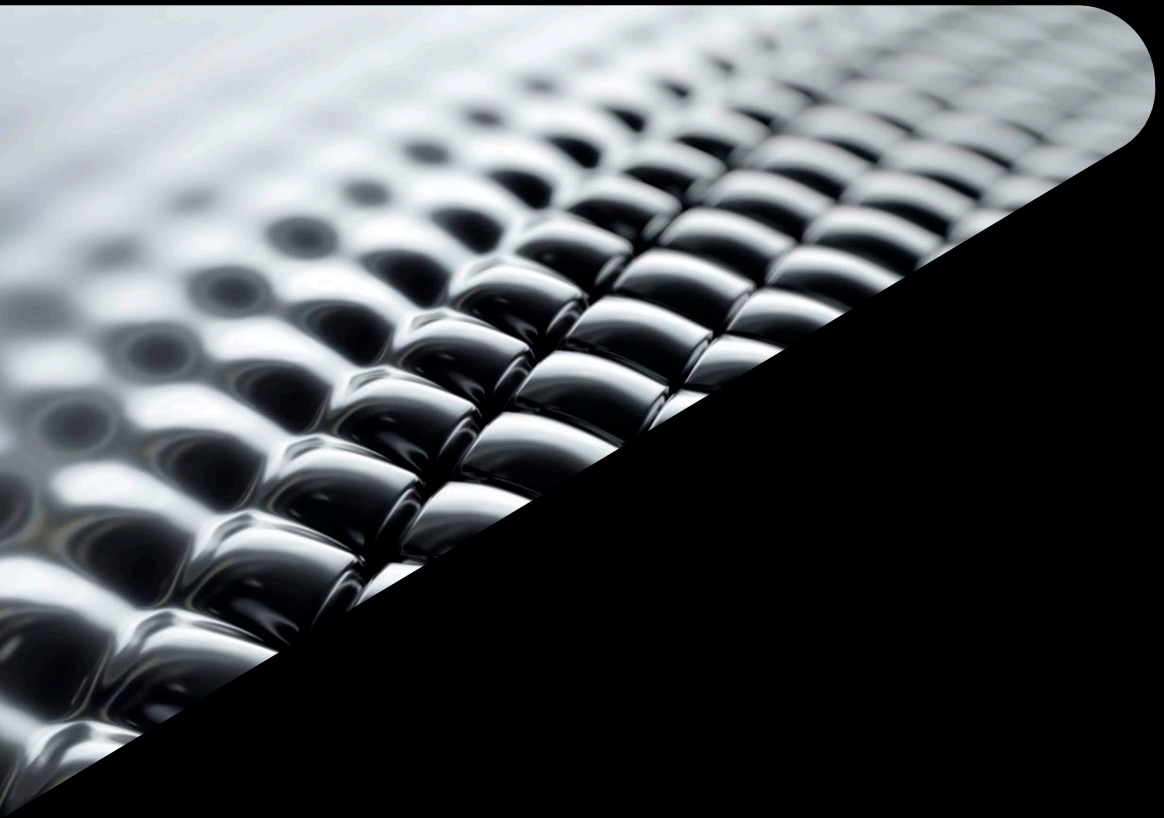
Late design changes

Why push from Spacemaker to Revit

1. Don’t repeat work you’ve already done
2. Develop more detailed option studies
3. Automatically get a more enriched model (walls, slabs, etc.,)

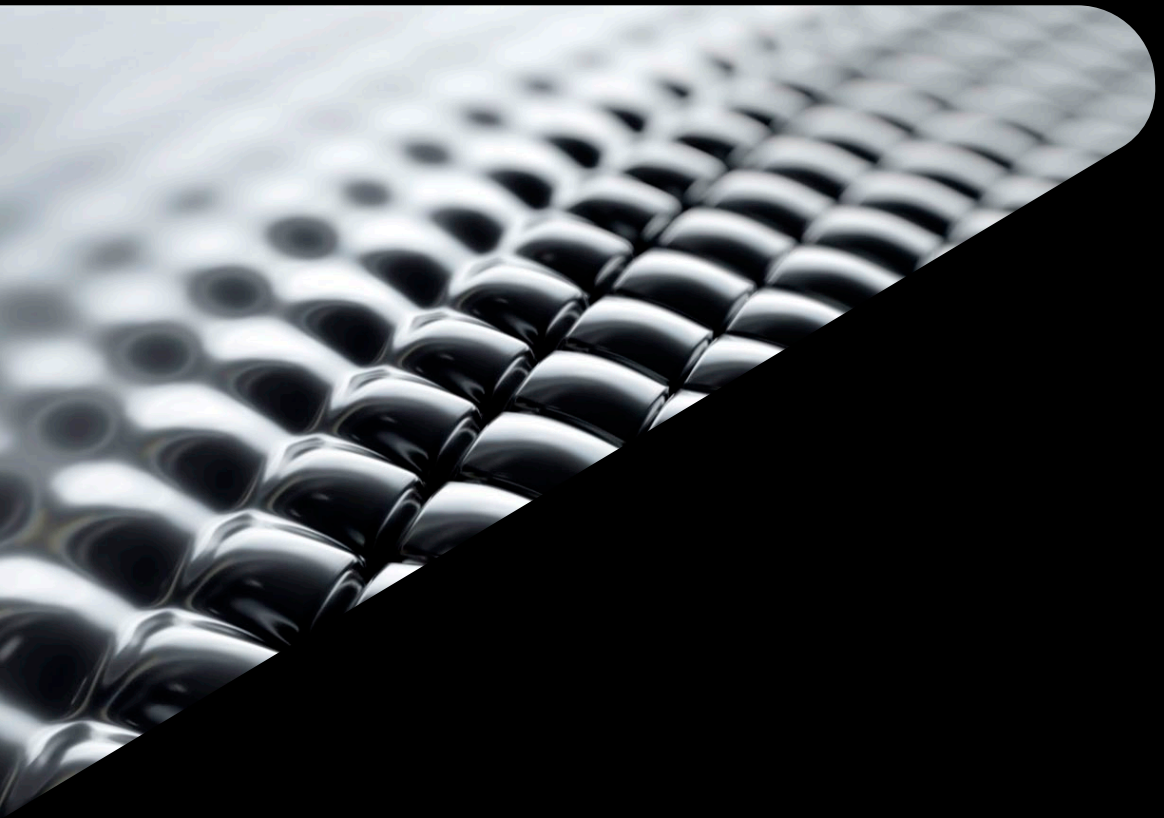
Recommended workflow





Demo

Introduction to Spacemaker



Demo

Spacemaker Revit Workflows

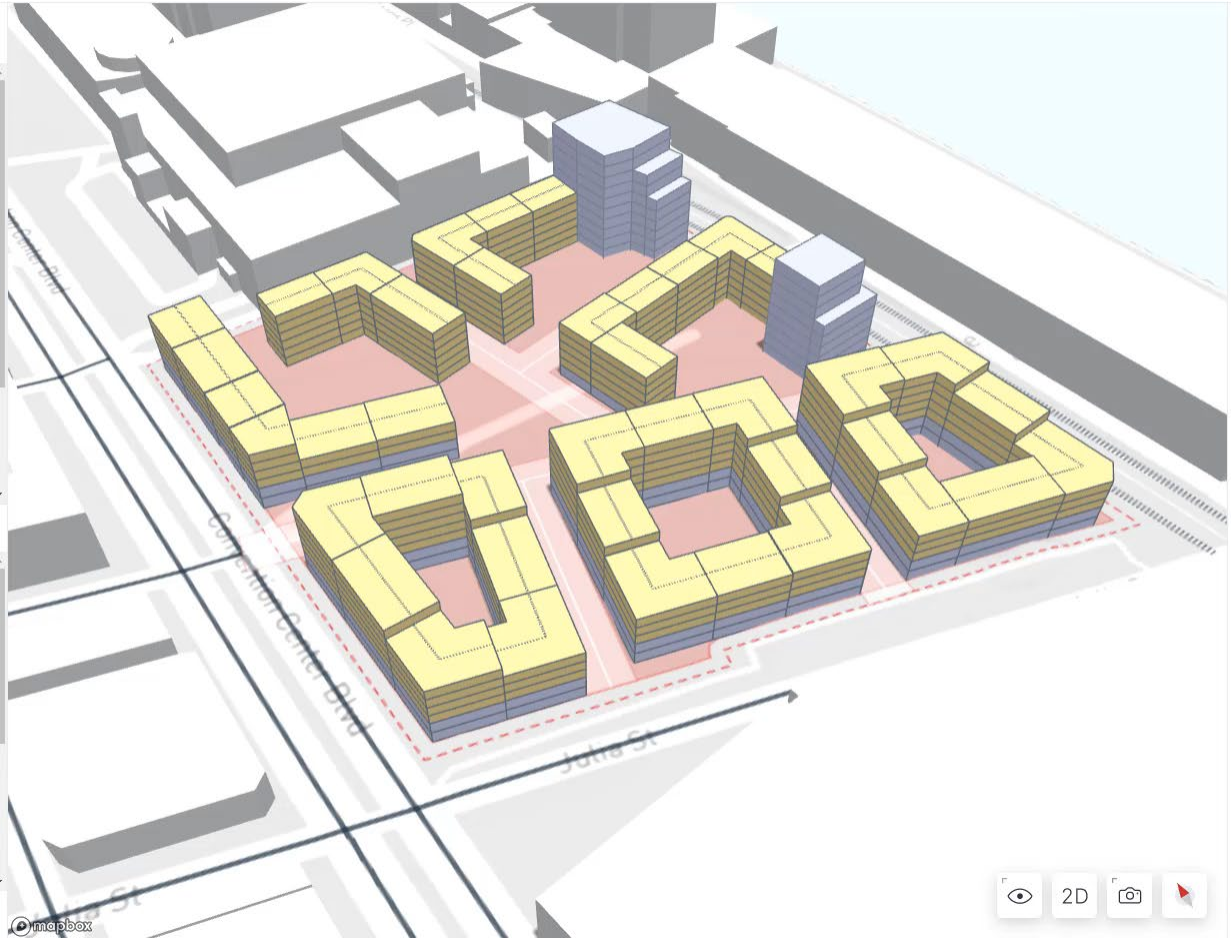
All proposals

- Proposal 2 — 24 hours ago
- Proposal 1 — yesterday
- Proposal 2.2 — 23 hours ago
- Proposal 1.2 — 24 hours ago

Layers

- Buildings
- Division lines
- Demo — Edit
  - Site limit
  - Buildable area
  - Existing buildings
  - Surrounding buildings
  - Outdoor area

Assets



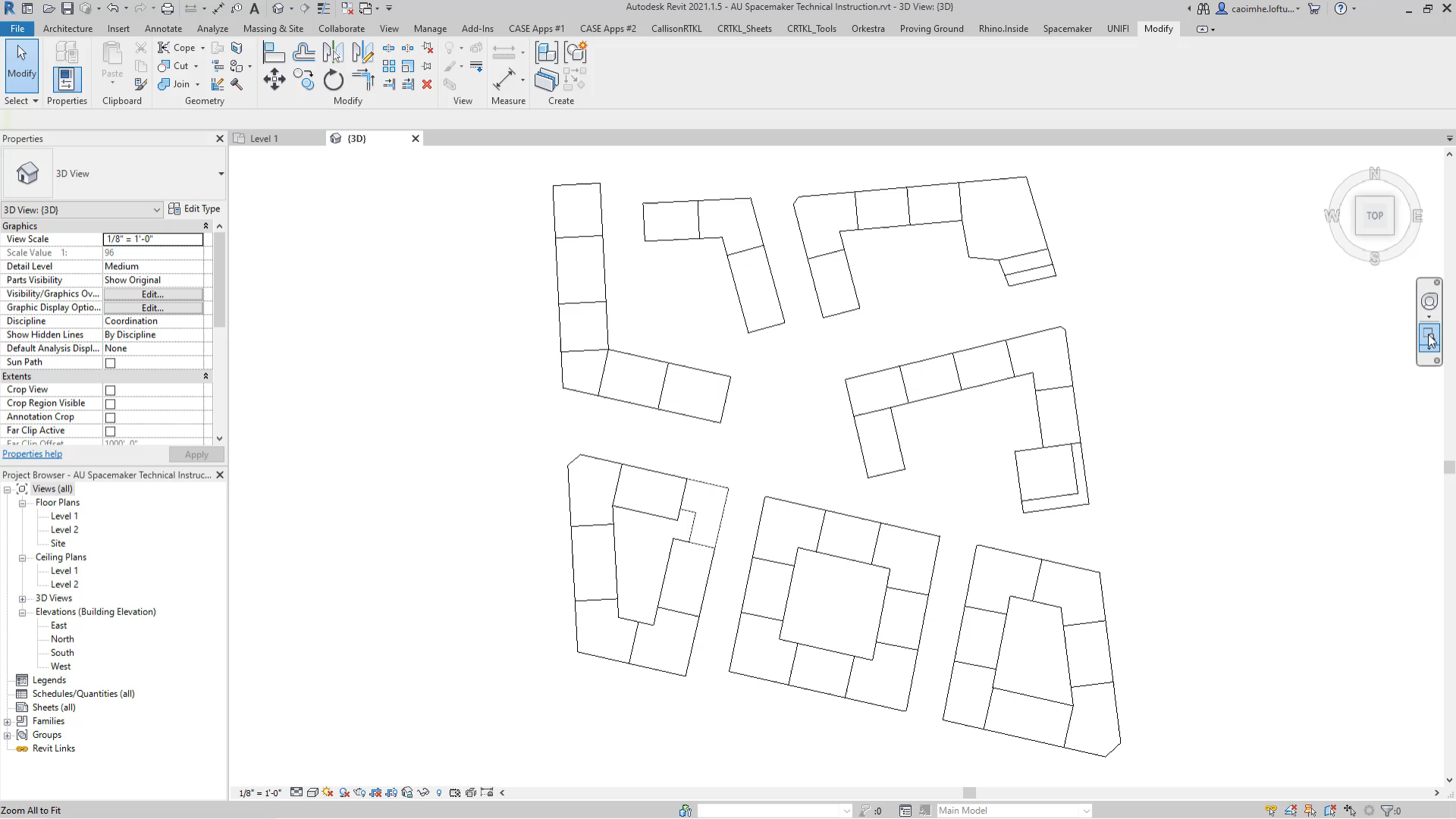
Rapid analyses

Area metrics

Site area		334,215 ft²
GFA	254 %	850,128 ft²
RA	229 %	765,115 ft²
BC	41 %	137,632 ft²
FAR		2.54
Efficiency Factor		0.90
Building height	⁺ 65 ft	⁻ 119 ft

2D

Help


Autodesk Revit 2021.1.5 - AU Spacemaker Technical Instruction.rvt - 3D View: {3D}
File
Architecture
Insert
Annotate
Analyze
Massing & Site
Collaborate
View
Manage
Add-Ins
CASE Apps #1
CASE Apps #2
CallisonRTKL
CRTKL_Sheets
CRTKL_Tools
Orkestra
Proving Ground
Rhino.Inside
Spacemaker
UNIFI
Modify
Modify
Select
Properties
Clipboard
Cope
Cut
Join
Geometry
Modify
View
Measure
Create
Properties
3D View
3D View: {3D}
Edit Type
Graphics
View Scale
1/8" = 1'-0"
Scale Value 1:
96
Detail Level
Medium
Parts Visibility
Show Original
Visibility/Graphics Ov...
Edit...
Graphic Display Optio...
Edit...
Discipline
Coordination
Show Hidden Lines
By Discipline
Default Analysis Displ...
None
Sun Path
Extents
Crop View
Crop Region Visible
Annotation Crop
Far Clip Active
Properties help
Apply
Project Browser - AU Spacemaker Technical Instruc...
Views (all)
Floor Plans
Level 1
Level 2
Site
Ceiling Plans
Level 1
Level 2
3D Views
Elevations (Building Elevation)
East
North
South
West
Legends
Schedules/Quantities (all)
Sheets (all)
Families
Groups
Revit Links
Level 1
{3D}
N
W
TOP
E
S
1/8" = 1'-0"
Zoom All to Fit
Main Model

Design - AU Parking lot
https://app.spacemaker.ai/design/pro_xxeerdvc4e/prop_3axowvj1jo3?branch=scb_au2022p_30990
Not syncing
AU Parking lot
Demo
Design
Analyze
Explore
All proposals
Proposal 2
yesterday
Proposal 1
yesterday
prop_24
3 minutes ago
Proposal 2.2
24 hours ago
Layers
Buildings
Division lines
Demo
Edit
Site limit
Buildable area
Existing buildings
Surrounding buildings
Outdoor area
Assets
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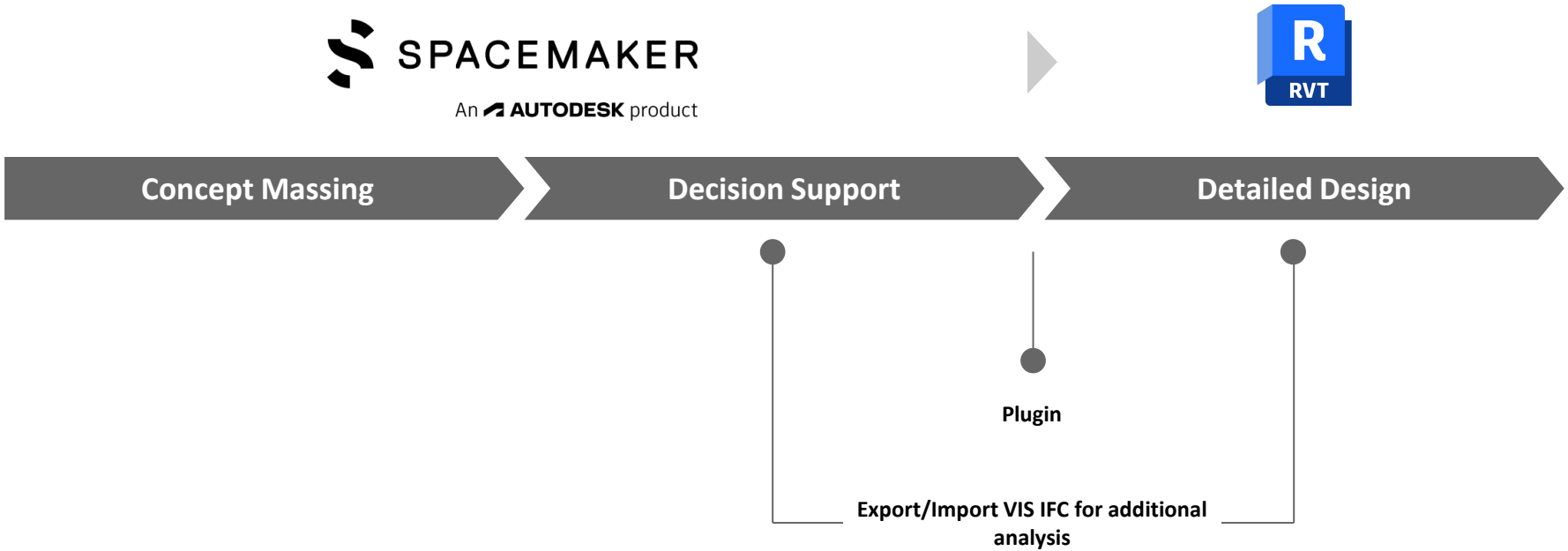
Site area 334,215 ft²
GFA 254 % 850,128 ft²
RA 229 % 765,115 ft²
BC 41 % 137,632 ft²
FAR 2.54
Efficiency Factor 0.90
Building height + 65 ft ⁻ 119 ft
2D
Help
mapbox

Recommended workflow



Helpful Resources

1. Detailed Instructions in Handout
2. help.spacemaker.ai
3. www.autodesk.com/products/spacemaker/free-trial

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