

## Assessing and monitoring Urban Development projects

2018.06.15

URBAN TOOLBOX – an integrated 3D design tool

# CONTENT

01 \_THE GOAL

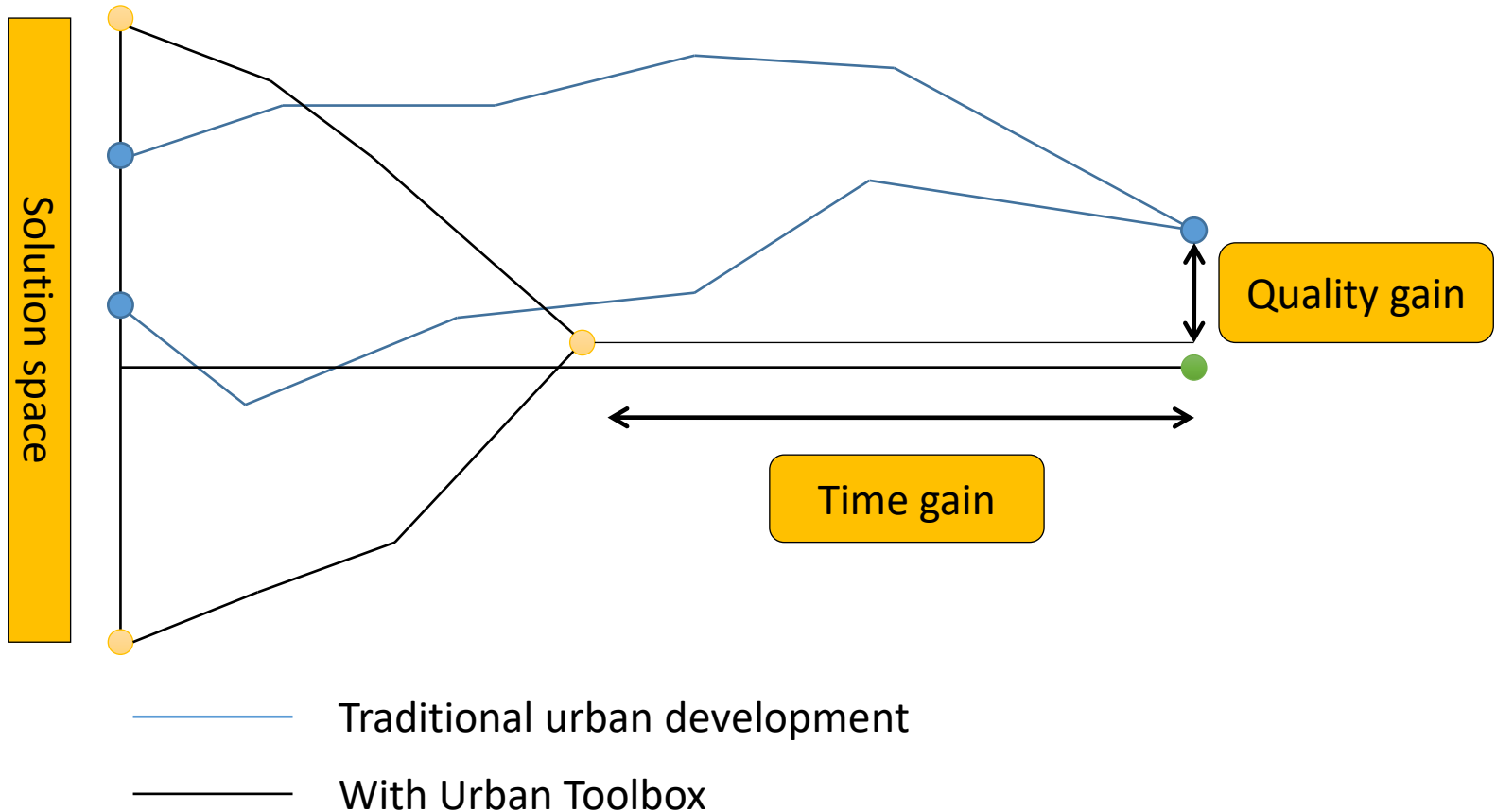
02 \_THE CHALLENGE

03 \_URBAN TOOLBOX



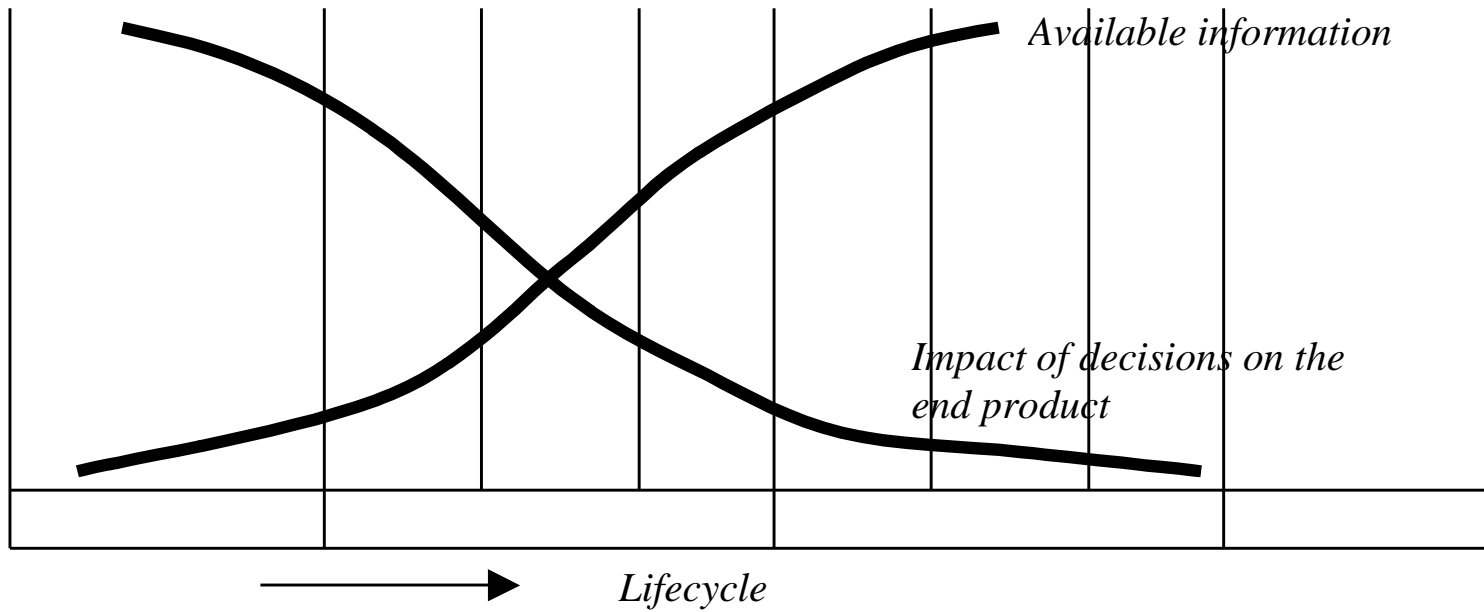
# 01\_THE GOAL

Exploring the entire solution space, faster decision-making



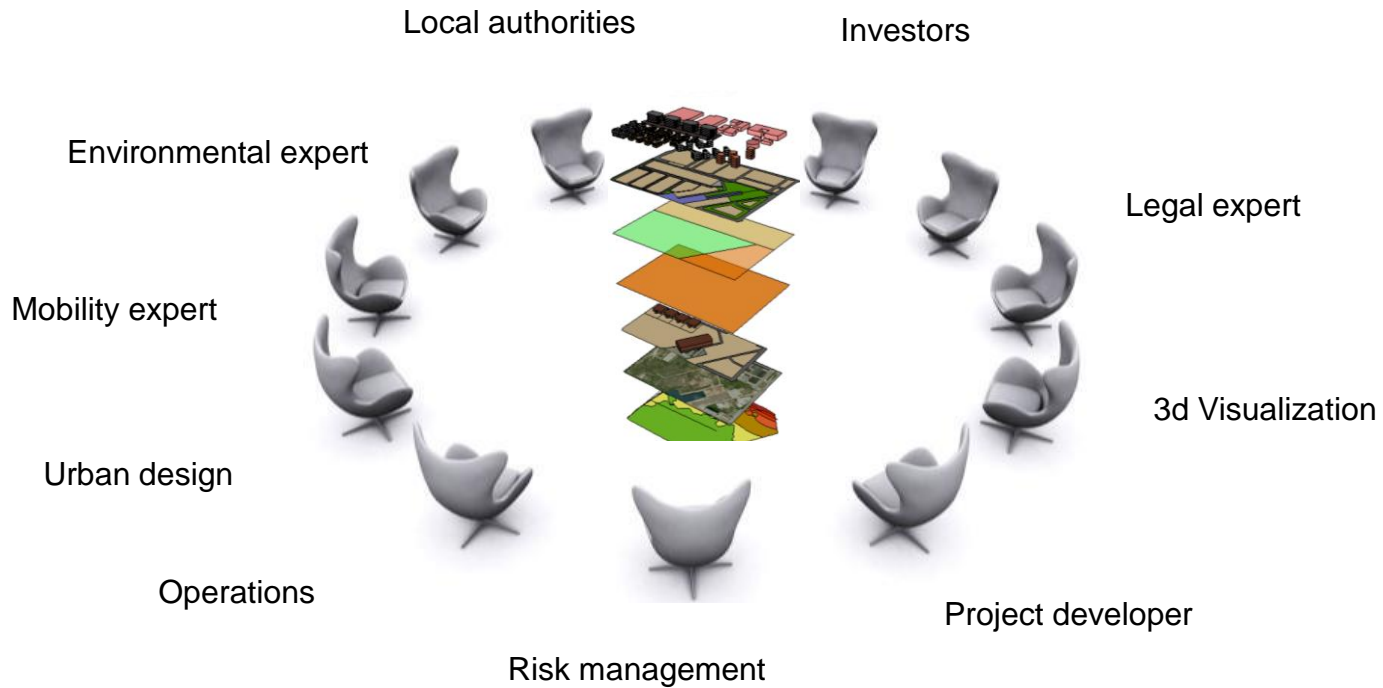
## 02\_THE CHALLENGE

information availability vs. impact of decisions



## Our solution

- a collaborative design- and calculation tool, for facilitating multi-stakeholder cooperation and negotiation





# 03\_URBAN TOOLBOX

## Our solution

- 3D model directly linked to advanced calculation-models for land use, land development, real estate development, mobility, water management, energy...

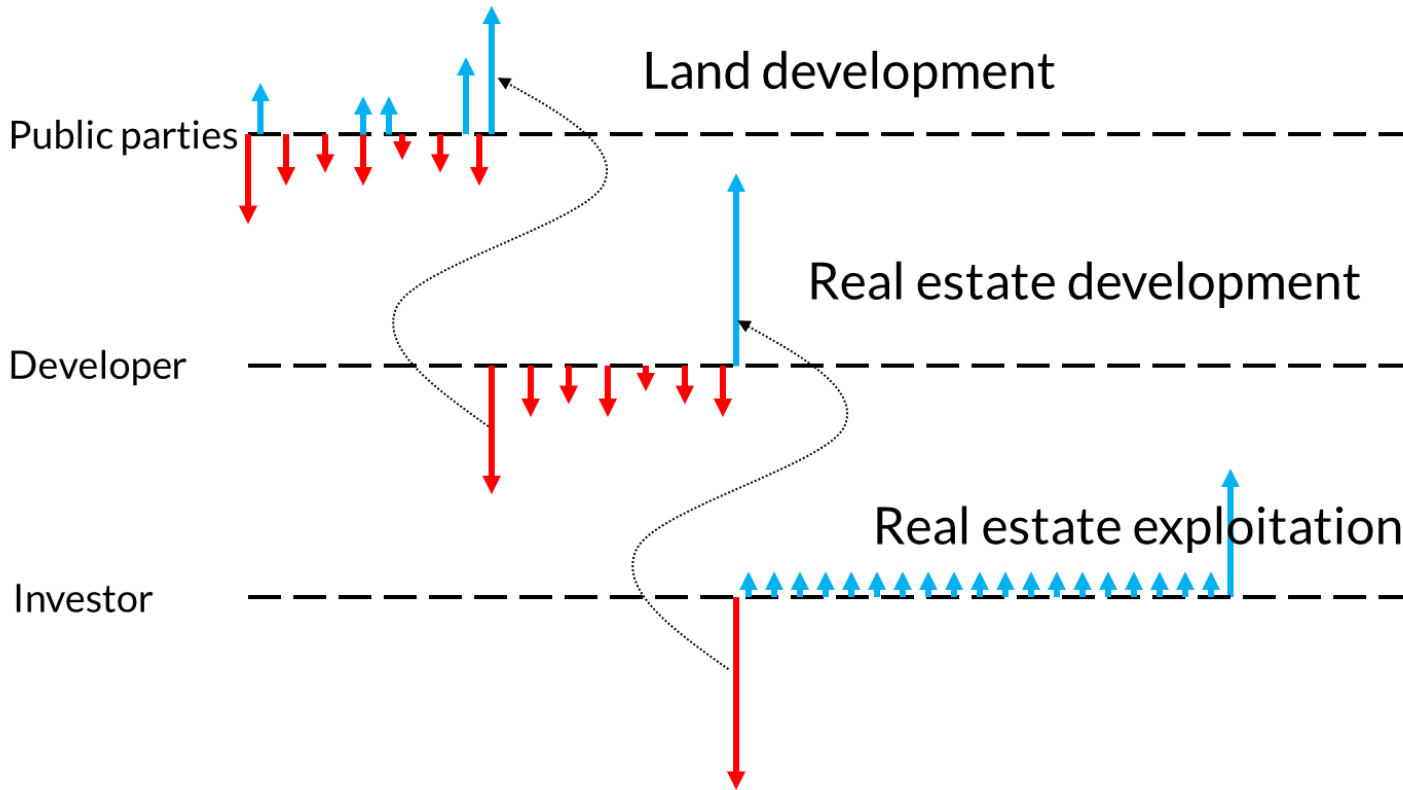
The screenshot displays a software interface with several overlapping windows and data tables. The main window shows a 'Rapport' (Report) with a list of items and their values in Euros (€) and years (2018-2023). Below this is a 'Planning (prijzen inclusief jaarlijkse stijging tov huidig jaar)' table with columns for 'Investeringen GREX', 'Boekwaarden', 'Prijzepeil 2018', 'NCW 1-1-2018', and 'EW 2028'. A smaller table shows 'Verandering van de budgetten in de tijd (toestemming en reuze in tabelten aan rechterkant)'. On the right, a 'Konden' (Costs) window lists various categories like 'Opbrengsten' and 'Apparaten' with their respective values. At the bottom, there are sections for 'Parkeerplaats oplossingen' (Parking solutions) and 'Inzichten kaart' (Map insights).

Investeringen GREX	Boekwaarden	Prijzepeil 2018	NCW 1-1-2018	EW 2028
Bestanden kavels	€ -	€ -	€ -	€ -
Oplagen	€ -	€ -	€ -	€ -
Bouwenkosten en aanvang	€ -	€ -	€ -	€ -
Verrijken ondergrondse infrastructuur	€ -	€ -	€ -	€ -
Overig bmv	€ -	€ -	€ -	€ -
Verkoning	€ -	-1.951.394 €	-1.951.394 €	-1.729.378 €
Opzet en water	€ -	-176.876 €	-184.140 €	-201.962 €
Ruiling	€ -	-521.962 €	-486.817 €	-511.522 €
Verkoning	€ -	-139.716 €	-121.609 €	-107.993 €
Brandkasten	€ -	-13.949 €	-14.836 €	-19.374 €
Mogelwiel	€ -	-36.147 €	-34.122 €	-41.189 €
Kunstoeveren	€ -	€ -	€ -	€ -
Overige posten functierijmaten	€ -	€ -	€ -	€ -
Overige kosten	€ -	-1.222.955 €	-1.246.753 €	-1.345.929 €
Bevoorzieningen o/m begrotingen	€ -	-1.972.336 €	-1.972.336 €	-2.689.653 €
Functierijmaten o/m begrotingen	€ -	€ -	€ -	€ -

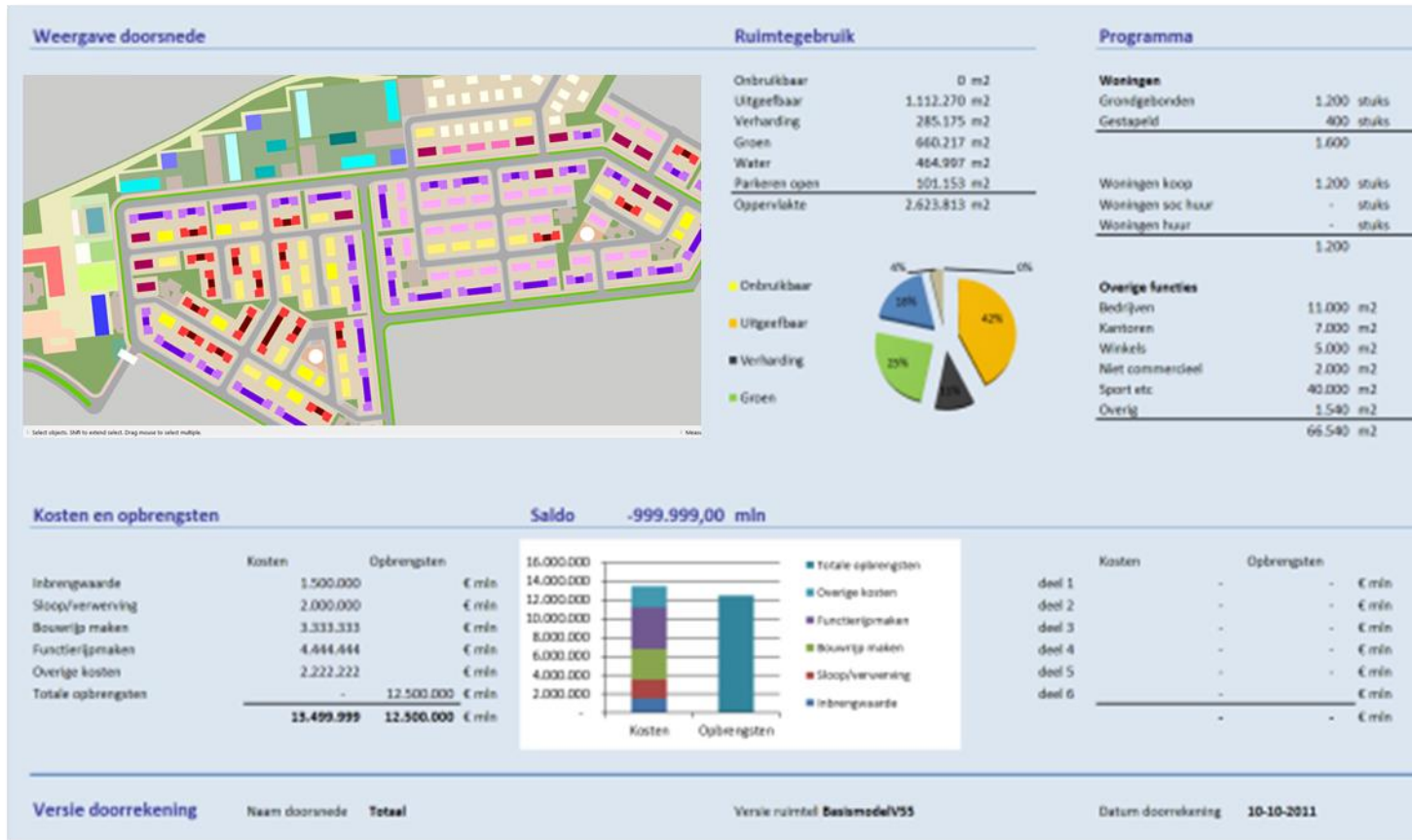


## Our solution

- Separate and linked financial modules for public & private parties and investors



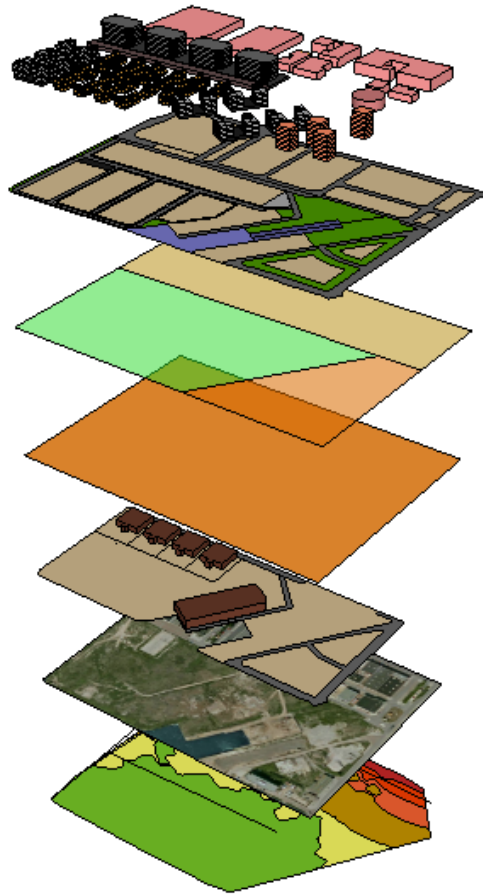
- Dashboards with common operational picture & tailor-made key performance indicators





# 03\_URBAN TOOLBOX

## information layers



Real estate

Land use

Sub area's

Project area

Existing parcels

Photo

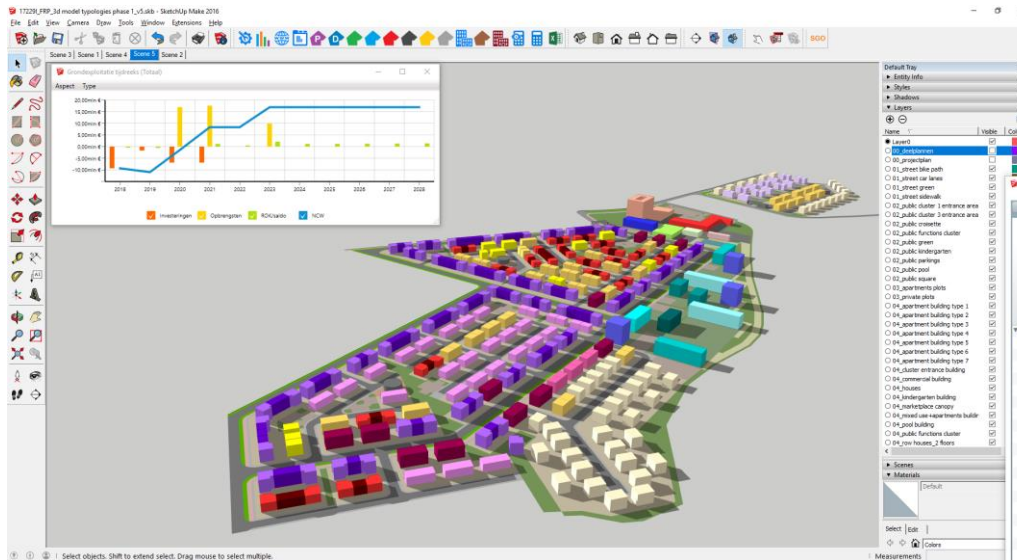
Other spatial data

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## required input

- Spatial design
- Building typologies: m<sup>2</sup> gross/net floor area, parking norm
- Costs for land development/m<sup>2</sup> (landscaping, roads, sewage, etc.)
- Costs for real estate construction/m<sup>2</sup> (for each type of real estate)
- Revenues/m<sup>2</sup> (for each type of real estate)
- Phasing

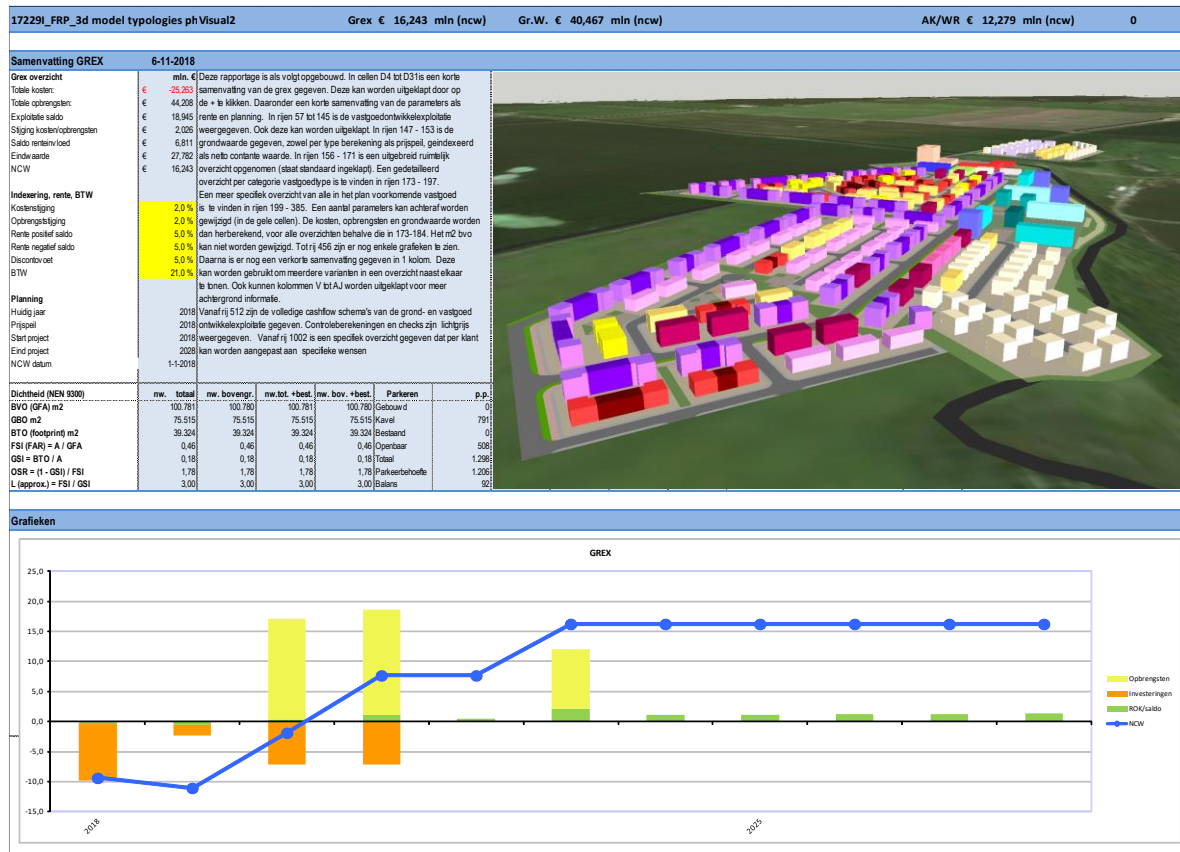
For all input default values are present, but client specific databases can be added. A detailed questionnaire will be drawn up



# 03\_URBAN TOOLBOX

## output

- Direct output: standard graphs & tables for land use, real estate, mobility, water management, planning, sustainability themes...
- Secondary output: tailor-made management reports in excel with overview of costs, benefits, land use, building typologies, cash flows, phasing, density indicators, cost breakdowns and more



## 03\_URBAN TOOLBOX

### Calculation models

*criterium: Financial*

<b>Criteria</b>	<b>Output per scenario (DCF based)</b>	<b>Input</b>
Land development	Land value, cash-flow, risk analysis (NPV, FV)	Land acquisition, site preparation & construction of public space, planning
Real estate development	Development value, cashflow, risk analysis (NPV, FV)	Construction costs, development costs, revenues
Ground lease	Cashflow (NPV, FV)	Contract data
Rental exploitation	Cashflow, (NPV, FV)	Contract data
Maintenance of public area	Cash-flow (NPV, FV)	Unit prices per m2 for different type of public land use (roads parks, etc)

## 03\_URBAN TOOLBOX

### Calculation models

*criterium: mobility*

Criteria	Output per scenario	Input
Parking	Parking balance	New & existing buildings and parking solutions (on parcel, public street or build parking garage), parking norms per type of real estate
Double use of parking space	Parkin balance corrected for double use	Standards for double use per type of real estate
Traffic generation	Amount of rides	Standards for rides per type of real estate



# 03\_URBAN TOOLBOX

## Calculation models

*criterium: Urban Density*

<b>Criteria</b>	<b>Output per scenario</b>	<b>Input</b>
Urban density & form	Development area (A), footprint, layers (L), FSI, GSI, OSR	Program & mass study
Land use	m2 land use per type	Map with existing and newly added land use

# 03\_URBAN TOOLBOX

## Calculation models

*criterium: Program*

<b>Criteria</b>	<b>Output per scenario</b>	<b>Input</b>
Program	m2 GFA per type of real estate (dwellings, commercial, amenities, etc.)	Program (m2 per type of real estate) assigned to the masses in a mass study
Price class	Selling Price or rent per m2 per type of real estate	Assignment of selling price or rent to each type of real estate
Size class	Unit size per type of real estate	Assignment of unit-size to each type of real estate
Planning	Start and completion of construction activities	Planning per (sub)project
Urban Amenities	Required m2 per type of amenity	Mass-study, standards for amenities

## 03\_URBAN TOOLBOX

### Calculation models

*criterium: Sustainability*

Criteria	Output per scenario	Input
Real estate material intensity	Ratio façade/GFA, building compactness	Program & mass study
Energy (buildings)	Standard energy use per p2 real estate, % sustainable energy, m2 roof suitable for PV-cells	Program & mass study Energy standards, % of energy generated by building, % of sustainable energy
Energy (area)	% locally generated sustainable energy	Data regarding local energy production (solar, wind, biomass,.. )
Water	Amount of required water buffer Drink water usage	Map of land use, data regarding infiltration capacity, % of green roofs,
Economy	Nr. of jobs m2 GFA of sustainable businesses m2 GFA total businesses	Standards for jobs per m2 GFA of a specific type of real estate