



Patrick Mc Gloin – Product manager

20. June 2019



3D Intersection in Novapoint 20.XXFP4a



AGENDA

- Agenda
 - Summary 3D Intersection
 - DEMO

The image displays a 3D rendering of a road intersection and the software interface used to create it. The 3D view shows a roundabout with a central island, surrounded by buildings and greenery. The software interface includes a 'Create parametric intersection' dialog box and a 'Table Civil Intersection Tool' window.

Create parametric intersection

Type

- T Turning hammer
- D Circular cul-de-sac
- X Secondary road
- Y

Show

- Surface
- Centour lines 0.050
- Triangle model
- Handles
- Snapping interval 5

Attribute	Attribute value	Description
The width of the outer area	0.000	The width of the outer area
Curb height	0.120	Height of island curb. Note that zero and negative values are also possible.
Tilting	Automatic	Method to compute angle of tilt for the roundabout
X	98406.703	X
Y	1211922.872	Y
Z	27.103	Z
Island's area structure		Double click to select structure type
Leg 1		
Main road leg	No	Main road leg
Trimming method	Tangent curve	The method used to modify the vertical geometry of this leg when the leg joins to a ma
Trimming length	30.000	The station distance from the main road or roundabout by which the trimming method
Minimize road leg	No	The method used to define if a road leg is minimized automatically
Length from center	139.265	The length from the center point of intersection to the end of the leg

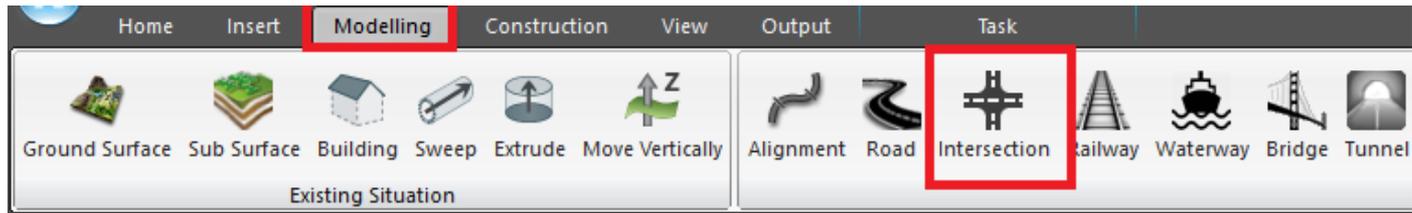
Rotate Import... Export... Reinitialize calculation basis Structure properties... Select structure... OK Update Close Help

Table Civil Intersection Tool: Intersection 100 (19.2-00 X64 WORK (02.05.2019 12:36:16))

X=1211886.347 Y=98338.910 Z=28.956 Ground surface

3D Intersection

Seperate TASK for 3D Intersection



New – Now produces 3D Solids

New – Possible to pull legs along their alignment

New – Alignments contain task name

3D Intersection

Select **Open** on the task:

The image displays the Tekla Civil Intersection Tool interface for a project named 'Kryss 75000'. The main window shows a 3D perspective view of a road intersection with four legs, overlaid with a technical diagram. The diagram features four legs labeled 1, 2, 3, and 4. Leg 1 is a straight road, while legs 2, 3, and 4 are curved. The intersection is shown with lane markings, shoulders, and a central island. The background is a 3D model of a site with buildings and trees.

On the left, a 'Create parametric intersection' dialog box is open, with the 'Open' button highlighted in red. The dialog shows the following options:

- Type: T Turning hammer, O Circular cul-de-sac, X Secondary road, Y
- Show: Surface, Contour lines (0.050), Triangle model

The main window also shows a toolbar with icons for Tunnel, VA/Kabel, Arealplan, Terrengforming, Volum, and Skråning, along with a 'Ny situasjon' button.

At the bottom of the main window, the coordinates are displayed: X=1212881.027, Y=98353.399, Z=28.941. The 'Ground surface' is also indicated.

Attribute	Attribute value	Description
Intersection		
Interpolation method	Parallel	Method is used to compute helping lines to the surface model. These in
Main road method	S curve	Method to compute main road edge. 'S curve' fits a S curve between leg
X	98405.634	X
Y	1212918.597	Y
Z	27.223	Z
Leg 1		
Main road leg	Yes	Main road leg
Minimize road leg	Yes	The method used to define if a road leg is minimized automatically
Lane width right	4.000	Lane width right
Lane slope right	-0.030	Lane slope right (e.g. -0.03)
Lane width left	4.000	Lane width left
Lane slope left	-0.030	Lane slope left (e.g. -0.03)
Shoulder width right	0.750	Shoulder width right
Shoulder slope right	-0.050	Shoulder slope right (e.g. -0.03)
Shoulder width left	0.750	Shoulder width left
Shoulder slope left	-0.050	Shoulder slope left (e.g. -0.03)
Type	None	The island type used for this leg
Leg 2		
Main road leg	No	Main road leg
Trimming method	Tangent curve	The method used to modify the vertical geometry of this leg when the l
Trimming length	30.000	The station distance from the main road or roundabout by which the tri
Minimize road leg	Yes	The method used to define if a road leg is minimized automatically
Lane width right	4.000	Lane width right
Lane slope right	-0.030	Lane slope right (e.g. -0.03)
Lane width left	4.000	Lane width left
Lane slope left	-0.030	Lane slope left (e.g. -0.03)
Shoulder width right	0.750	Shoulder width right
Shoulder slope right	-0.050	Shoulder slope right (e.g. -0.03)
Shoulder width left	0.750	Shoulder width left
Shoulder slope left	-0.050	Shoulder slope left (e.g. -0.03)
Type	None	The island type used for this leg
Leg 3		
Main road leg	Yes	Main road leg
Minimize road leg	Yes	The method used to define if a road leg is minimized automatically

3D Intersection

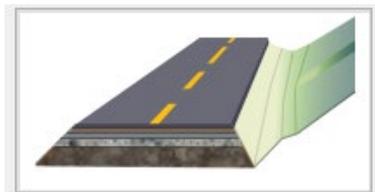
Select the parameters you wish to edit – Add a traffic Island– select road structure:

The screenshot displays the Tekla Civil Intersection Tool interface. The 'Create parametric intersection' dialog box is open, showing various parameters for the intersection. The 'Structure template selection' dialog box is also open, showing two options: 'Intersection Traffic Area with Side Area' and 'Intersection Traffic Area without Side Area'. The main 3D model shows a roundabout intersection with a central island and four legs. The island is highlighted in green, and the legs are highlighted in orange. The 'Structure properties...' dialog box is also open, showing the 'Type' parameter set to 'Roundabout isla...'. The 'Structure properties...' dialog box is also open, showing the 'Structure properties...' dialog box.

Attribute	Attribute value	Description
Intersection		
Style	Circular	The shape of the roundabout
Radius	8.000	The radius of the roundabout
The width of the lane	7.000	The width of the lane
The slope of the lane (e.g. 0.03)	-0.030	The slope of the lane
The width of the inner area	0.500	The width of the inner area
The width of the outer area	0.000	The width of the outer area
Curb height	0.000	Height of island curb. Note that zero and
Tilting	Automatic	Method to compute angle of tilt for the
X	98405.634	X
Y	1212918.597	Y
Z	27.223	Z
Island's area structure		
Double click to select structure type		
Leg 1		
Main road leg	No	Main road leg
Trimming method	Tangent curve	The method used to modify the vertical geometry of this leg when the l
Trimming length	30.000	The station distance from the main road or roundabout by which the tri
Minimize road leg	Yes	The method used to define if a road leg is minimized automatically
Lane width right	4.000	Lane width right
Lane slope right	-0.030	Lane slope right (e.g. -0.03)
Lane width left	4.000	Lane width left
Lane slope left	-0.030	Lane slope left (e.g. -0.03)
Shoulder width right	0.750	Shoulder width right
Shoulder slope right	-0.050	Shoulder slope right (e.g. -0.03)
Shoulder width left	0.750	Shoulder width left
Shoulder slope left	-0.050	Shoulder slope left (e.g. -0.03)
Widen right lane	No	Enable widening of incoming direction
Widen left lane	No	Enable widening of outgoing direction
Type	Roundabout isla...	The island type used for this leg
Continuous channeling	no	The channeling object (island) continues all the way out to the end of l
Slope reference	Crown to left	This property has an effect on the elevation of the island. Choose 'Crown
Shoulder left	0.250	The width of the shoulder
Shoulder right	0.250	The width of the shoulder
Walking path distance	6.500	Distance from front of island to the beginning point of pedestrian walk
Walking path width	0.000	Width of walking path of the island.

3D Intersection

Select Road Structure:



Parameter	Type	Value
1-1) Wearing course	Delta z	0.05000
2-1) Binder 1	Delta z	0.05000
2-2) Binder 2	Delta z	0.05000
3-1) Base 1	Delta z	0.10000
3-2) Base 2	Delta z	0.10000
3-3) Base 3	Delta z	0.10000
4-1) Sub-base 1	Delta z	0.20000
4-2) Sub-base 2	Delta z	0.20000
4-3) Sub-base 3	Delta z	0.20000
5-1) Filter	Delta z	0.00100
Cut slope	Gradient	1.00000
Ditch bottom width	Distance	0.50000
Ditch depth	Delta z	0.50000
Ditch slope	Gradient	-0.50000
Fill slope	Gradient	-0.50000
Inner slope	Gradient	-0.66700
Side course slope	Gradient	-0.03000

3D Intersection

Select structure – Traffic area only



Parameter	Type	Value
1-1) Wearing course	Delta z	0.05000
2-1) Binder 1	Delta z	0.05000
2-2) Binder 2	Delta z	0.05000
3-1) Base 1	Delta z	0.10000
3-2) Base 2	Delta z	0.10000
3-3) Base 3	Delta z	0.10000
4-1) Sub-base 1	Delta z	0.20000
4-2) Sub-base 2	Delta z	0.20000
4-3) Sub-base 3	Delta z	0.20000
5-1) Filter	Delta z	0.00100

3D Intersection – Early design

3D Intersection stored to Novapoint Base – change and **Update**

The image shows a software interface for creating a parametric intersection. The main window displays a 3D perspective view of a roundabout with a central island and four legs. A 2D plan view of the same intersection is shown on the right, with the central island highlighted in green and the legs in orange. The 'Create parametric intersection' dialog box is open on the left, showing various settings for the intersection type and leg properties. The 'Update' button is highlighted with a red box.

Create parametric intersection

Type

- T Turning hammer
- O Circular cul-de-sac
- X Secondary road
- Y

Show

- Surface
- Contour lines 0.050
- Triangle model

Attribute	Attribute value	Description
Intersection		
Style	Circular	The shape of the roundabout
Radius	8.000	The radius of the roundabout
The width of the lane	7.000	The width of the lane
The slope of the lane (e.g. 0.03)	-0.030	The slope of the lane
The width of the inner area	0.500	The width of the inner area
The width of the outer area	0.000	The width of the outer area
Curb height	0.000	Height of island curb. Note that zero and negativ
Tilting	Automatic	Method to compute angle of tilt for the roundab
X	98405.634	X
Y	1212918.597	Y
Z	27.223	Z
Island's area structure		Double click to select structure type
Leg 1		
Main road leg	No	Main road leg
Trimming method	Tangent curve	The method used to modify the vertical geomet
Trimming length	30.000	The station distance from the main road or roun
Minimize road leg	Yes	The method used to define if a road leg is minim
Lane width right	4.000	Lane width right
Lane slope right	-0.030	Lane slope right (e.g. -0.03)
Lane width left	4.000	Lane width left
Lane slope left	-0.030	Lane slope left (e.g. -0.03)
Shoulder width right	0.750	Shoulder width right
Shoulder slope right	-0.050	Shoulder slope right (e.g. -0.03)
Shoulder width left	0.750	Shoulder width left
Shoulder slope left	-0.050	Shoulder slope left (e.g. -0.03)
Widen right lane	No	Enable widening of incoming direction
Widen left lane	No	Enable widening of outgoing direction
Type	Roundabout isla...	The island type used for this leg
Continuous channelling	No	The channelling object (island) continues all the
Slope reference	Crown to left	This property has an effect on the elevation of th
Shoulder left	0.250	The width of the shoulder
Shoulder right	0.250	The width of the shoulder
Walking path distance	6.500	Distance from front of island to the beginning p
Walking path width	0.000	Width of walking path of the island.

Rotate Import... Export...

Create alignments Structure properties... Select structure...

OK **Update** Cancel Help

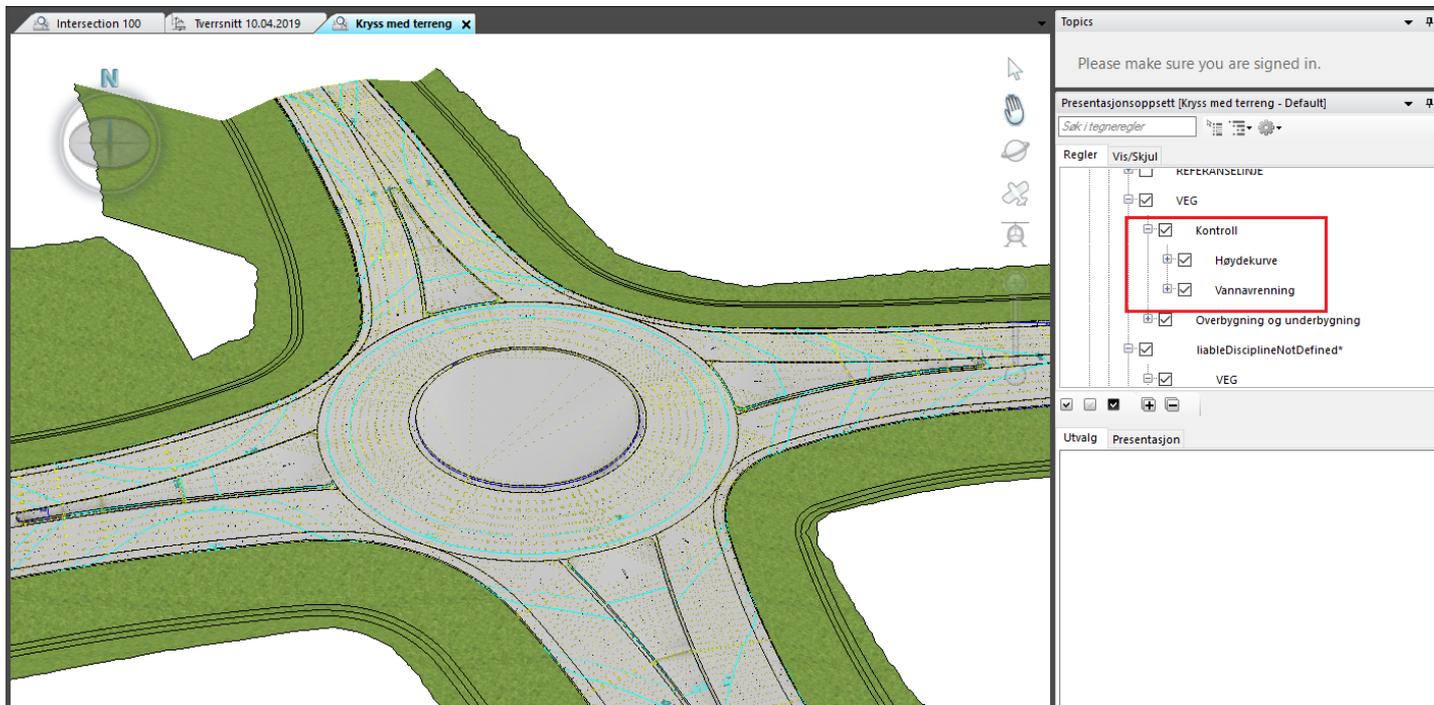
3D Intersection

Calculated against the ground surface:



3D Intersection

...analysis:

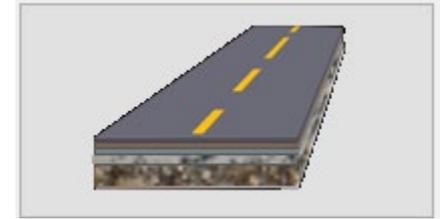
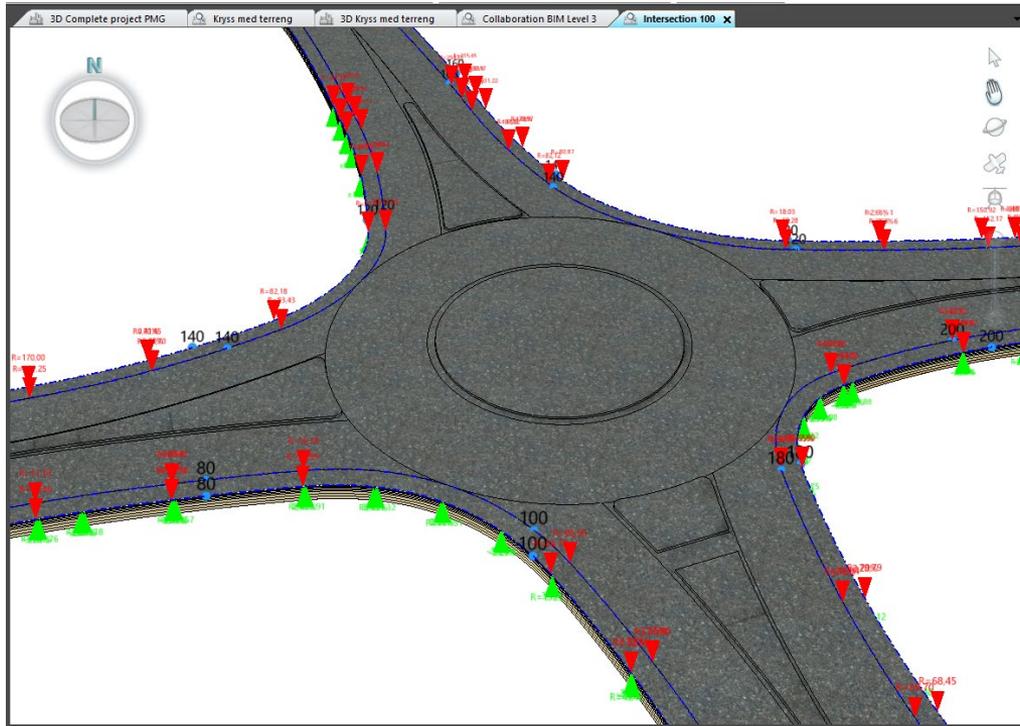


3D Intersection – Constructible model

Define ground surface connection with individual road models from alignments produced by the intersection:

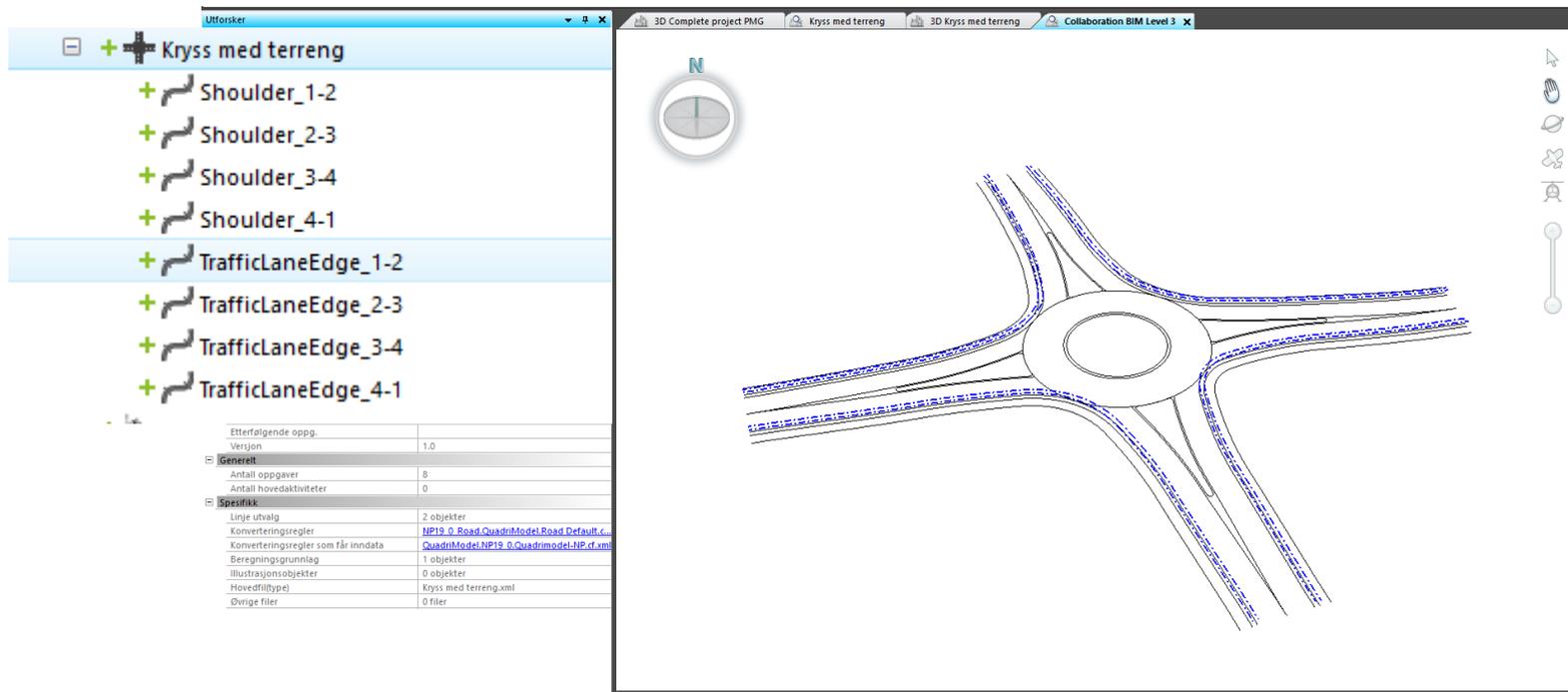


3D Intersection – Step 1 – calculate traffic area



3D Intersection –

3D string lines are created automatically and edge alignments are created as separate tasks:



The screenshot displays a software interface for a 3D intersection project. On the left, a task list is visible under the heading "Kryss med terreng". The tasks include "Shoulder_1-2", "Shoulder_2-3", "Shoulder_3-4", "Shoulder_4-1", "TrafficLaneEdge_1-2", "TrafficLaneEdge_2-3", "TrafficLaneEdge_3-4", and "TrafficLaneEdge_4-1". Below the task list is a table with project details.

Etterfølgende oppg.	
Versjon	1.0
Generelt	
Antall oppgaver	8
Antall hovedaktiviteter	0
Spesifik	
Linje utvalg	2 objekter
Konverteringsregler	NP19_0_Road_QuadriModel.Road.Default.c...
Konverteringsregler som får inndata	QuadriModel.NP19_0_Quadrimodel.NP.d.xml
Beregningsgrunnlag	1 objekter
Illustrasjonsobjekter	0 objekter
Hovedfil(t)type	Kryss med terreng.xml
Øvrige filer	0 filer

The main view shows a 3D model of a four-way intersection with a central roundabout. The road edges are highlighted in blue. A north arrow is visible in the top left corner of the 3D view, and a toolbar with various icons is on the right side.

3D kryssfunksjon – Steg 2 bygg vegmodeller

The screenshot displays a 3D road design software interface. The main view shows a 3D model of a road intersection with various annotations, including speed limits (e.g., 100, 80, 200) and radii (e.g., R=18.03, R=2886.1, R=10052). The interface includes a project tree on the left, a properties panel, and a 3D view of the road with various annotations.

Utforsker

- 3D ROAD(S) (9/7)
- 501 ROAD MODELS (86)
- 5011 ROAD UNDER DESIGN (41)
- 10000
- 20000
- Intersection 100
- Intersection 100 Road 1-2
- Intersection 100 Road 2-3**
- Intersection 100 Road 3-4
- Intersection 100 Road 4-1
- Intersection old conversion
- Kryss med terreng
- Shoulder_1-2

Egenskaper

Veg

Interne egenskaper

Oppgavetype-ID	684
GUID	482d2882-7313-412c-8b36-f9929a009c59

Generelt

Navn	Intersection 100 Road 2-3
Beskrivelse	
Type	Veg
Opprettet dato	27.11.2018 13.13
Sist endret	27.11.2018 13.26
Deloppgave til	5011 ROAD UNDER DESIGN
Modell	Collaboration BIM Level 3
Sekvensnr.	0
Foregående oppg.	Ground Surface complete
Etterfølgende oppg.	CalculationBasis_ManholeTopCover, Ca...
Versjon	2.0

Spesifikk

Vegstandard	Norway (2013)
Dimensjoneringsklasse	H1
Tverrfall	Nei
Breddeutvidelse	Nei
Tool Tutorial	

3D Intersection – Step 2 build road models

The screenshot displays a 3D road design software interface. The main view shows a roundabout intersection with various road models and elevation markers. The interface includes a left-hand panel with a tree view and a properties panel.

Tree View:

- 3D KROADS (3/1)
 - 501 ROAD MODELS (86)
 - 5011 ROAD UNDER DESIGN (41)
 - 10000
 - 20000
 - Intersection 100
 - Intersection 100 Road 1-2
 - Intersection 100 Road 2-3
 - Intersection 100 Road 3-4
 - Intersection 100 Road 4-1
 - Intersection old conversion
 - Kryss med terreng
 - Shoulder_1-2

Properties Panel (Egenskaper):

Veg

Interne egenskaper

- Oppgavetype-ID: 683
- GUID: 569ce289-bde9-4f98-b9d1-f5e100b915fc

Generelt

- Navn: Intersection 100 Road 3-4
- Beskrivelse: Veg
- Type: Veg
- Opprettet dato: 27.11.2018 13.06
- Sist endret: 30.11.2018 13.30
- Deloppgave til: 5011 ROAD UNDER DESIGN
- Modell: Collaboration BIM Level 3
- Sekvensnr.: 0
- Foregående oppg.: Ground Surface complete
- Etterfølgende oppg.: Versjon
- Versjon: 2.0

Spesifikk

- Vegstandard: Norway (2013)
- Dimensjoneringsklasse: H1
- Tverrfall: Nei
- Breddeutvidelse: Nei
- Tool Tutorial

3D Intersection – Step 2 build road models

Utforsker

- 3D KURVS (9/1)
- 501 ROAD MODELS (86)
 - 5011 ROAD UNDER DESIGN (41)
 - 10000
 - 20000
 - Intersection 100
 - Intersection 100 Road 1-2
 - Intersection 100 Road 2-3
 - Intersection 100 Road 3-4
 - Intersection 100 Road 4-1**
 - Intersection old conversion
 - Kryss med terreng
 - Shoulder_1-2

Egenskaper

Veg

Interne egenskaper

Oppgavetype-ID	682
GUID	109a22c9-b925-4244-b93d-8b187e7a4efc

Generelt

Navn	Intersection 100 Road 4-1
Beskrivelse	
Type	Veg
Opprettet dato	26.11.2018 21:21
Sist endret	27.11.2018 13:25
Deloppgave til	5011 ROAD UNDER DESIGN
Modell	Collaboration BIM Level 3
Sekvensnr.	0
Foregående oppg.	Ground Surface complete
Etterfølgende oppg.	
Versjon	2.0

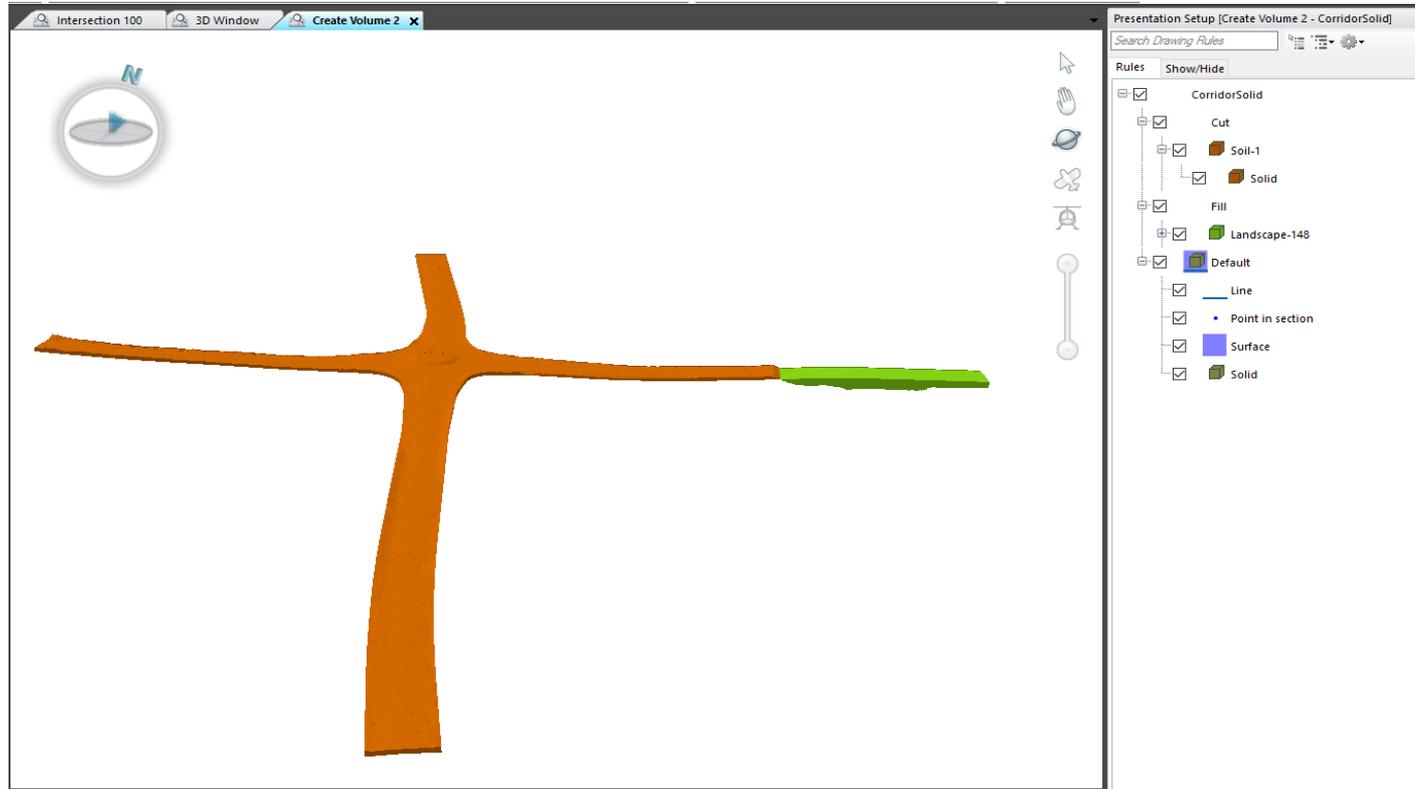
Spesifikk

Vegstandard	Norway (2013)
Dimensjoneringsklasse	H1
Tverrfall	Nei
Breddeutvidelse	Nei
Tool Tutorial	

3D Complete project PMG | **Kryss med terreng** | **3D Kryss med terreng** | **Collaboration BIM Level 3** | **Intersection 100 x**

The 3D view shows a road intersection with various annotations including radii (e.g., R=18.03, R=2.00% 1, R=150% 2, R=100% 1, R=100% 2, R=100% 3, R=100% 4, R=100% 5, R=100% 6, R=100% 7, R=100% 8, R=100% 9, R=100% 10, R=100% 11, R=100% 12, R=100% 13, R=100% 14, R=100% 15, R=100% 16, R=100% 17, R=100% 18, R=100% 19, R=100% 20, R=100% 21, R=100% 22, R=100% 23, R=100% 24, R=100% 25, R=100% 26, R=100% 27, R=100% 28, R=100% 29, R=100% 30, R=100% 31, R=100% 32, R=100% 33, R=100% 34, R=100% 35, R=100% 36, R=100% 37, R=100% 38, R=100% 39, R=100% 40, R=100% 41, R=100% 42, R=100% 43, R=100% 44, R=100% 45, R=100% 46, R=100% 47, R=100% 48, R=100% 49, R=100% 50, R=100% 51, R=100% 52, R=100% 53, R=100% 54, R=100% 55, R=100% 56, R=100% 57, R=100% 58, R=100% 59, R=100% 60, R=100% 61, R=100% 62, R=100% 63, R=100% 64, R=100% 65, R=100% 66, R=100% 67, R=100% 68, R=100% 69, R=100% 70, R=100% 71, R=100% 72, R=100% 73, R=100% 74, R=100% 75, R=100% 76, R=100% 77, R=100% 78, R=100% 79, R=100% 80, R=100% 81, R=100% 82, R=100% 83, R=100% 84, R=100% 85, R=100% 86, R=100% 87, R=100% 88, R=100% 89, R=100% 90, R=100% 91, R=100% 92, R=100% 93, R=100% 94, R=100% 95, R=100% 96, R=100% 97, R=100% 98, R=100% 99, R=100% 100) and speed limits (e.g., 100, 80, 200).

3D Intersection – Step 3 Quantities



3D Intersection – Step 3 Quantities

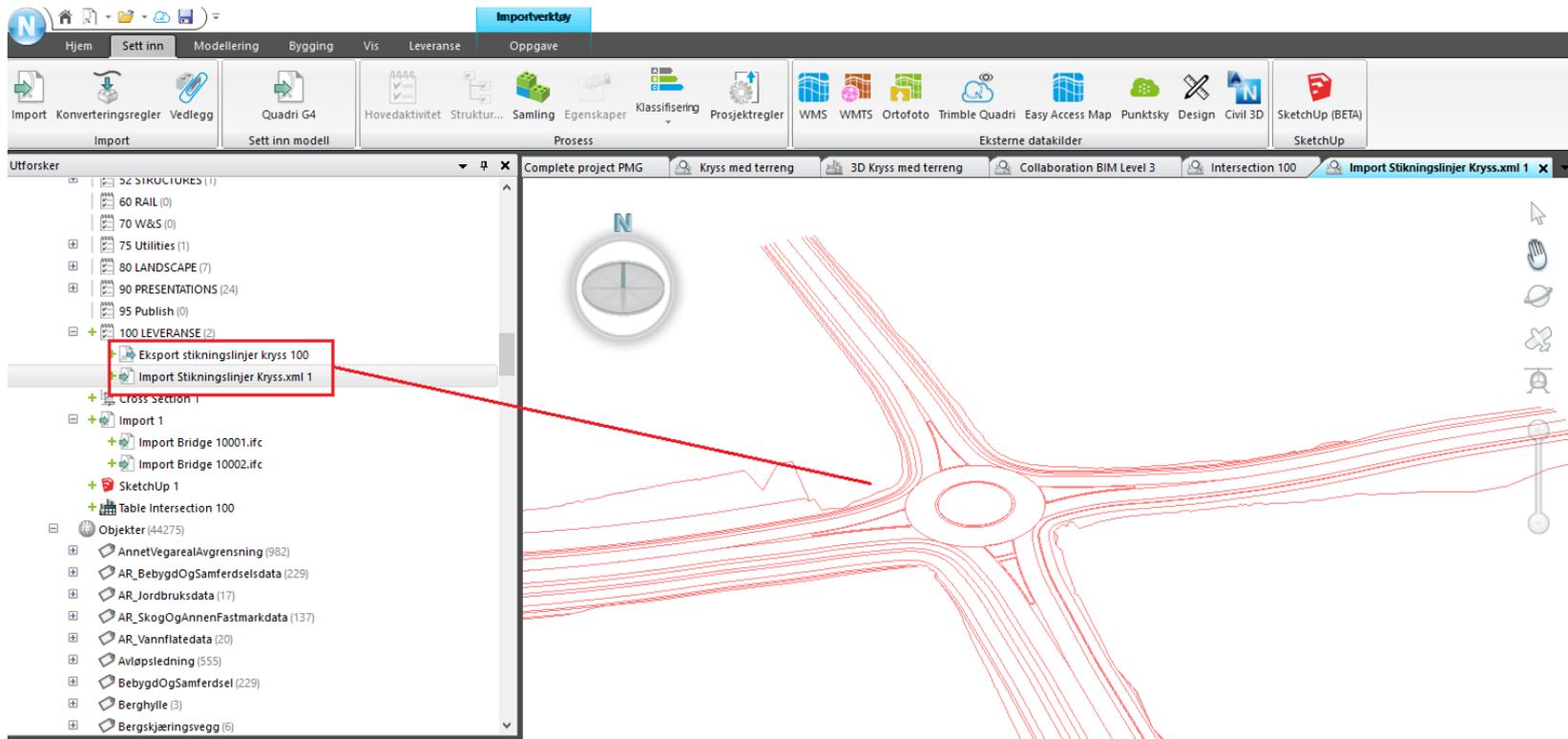
The screenshot displays a software interface with a table of quantities and a spreadsheet export window. The table lists various tasks and features with their respective counts and values. A red box highlights the 'SpreadSheet' button in the top toolbar, and a red arrow points from it to the spreadsheet window. Another red arrow points from the 'Table Intersection 100' entry in the Explorer panel to the spreadsheet window.

Task	Feature Type Name	Count	Subgroup			Count	Attribute	Value	Unit
lagBeskrivelse.designation: lagBeskrivelse.designation:Base course	lagBeskrivelse.keyIdentifier:1.01	lagBeskrivelse.name:1.01	Materiale.materialNature:	1	Area 3D	6,610.633	m ²		
				1	Area 2D	6,573.570	m ²		
	lagBeskrivelse.keyIdentifier:1	lagBeskrivelse.name:PAVEMENT_BASE_COURSE_1	Materiale.materialNature:Asphalt	1	Volume	384.774	m ³		
				1	Area 3D	6,579.775	m ²		
	lagBeskrivelse.keyIdentifier:2	lagBeskrivelse.name:PAVEMENT_BASE_COURSE_2	Materiale.materialNature:Asphalt	1	Area 2D	6,573.571	m ²		
				1	Volume	657.353	m ³		
lagBeskrivelse.keyIdentifier:3	lagBeskrivelse.name:PAVEMENT_BASE_COURSE_3	Materiale.materialNature:Asphalt	1	Area 3D	6,579.776	m ²			
			1	Area 2D	6,573.570	m ²			
				1	Volume	657.360	m ³		
				1	Area 3D	6,579.776	m ²		

The spreadsheet window shows the following data in columns A through K:

Column	Value
A	lagBeskrivelse.designation:Base course
B	lagBeskrivelse.keyIdentifier:2
C	lagBeskrivelse.name:PAVEMENT_BASE_COURSE_2
D	1
E	Materiale.materialNature:Asphalt
F	Area 3D
G	6,579.775
H	Volume
I	657.353
J	m ³
K	

3D Intersection – Step 4 Setting out data as string lines or as surfaces



3D Intersection

Limitations:

The road and shoulder widths for the intersection legs/arms must be entered manually

Approach roads must be adjusted manually

Does not support sub surface layers

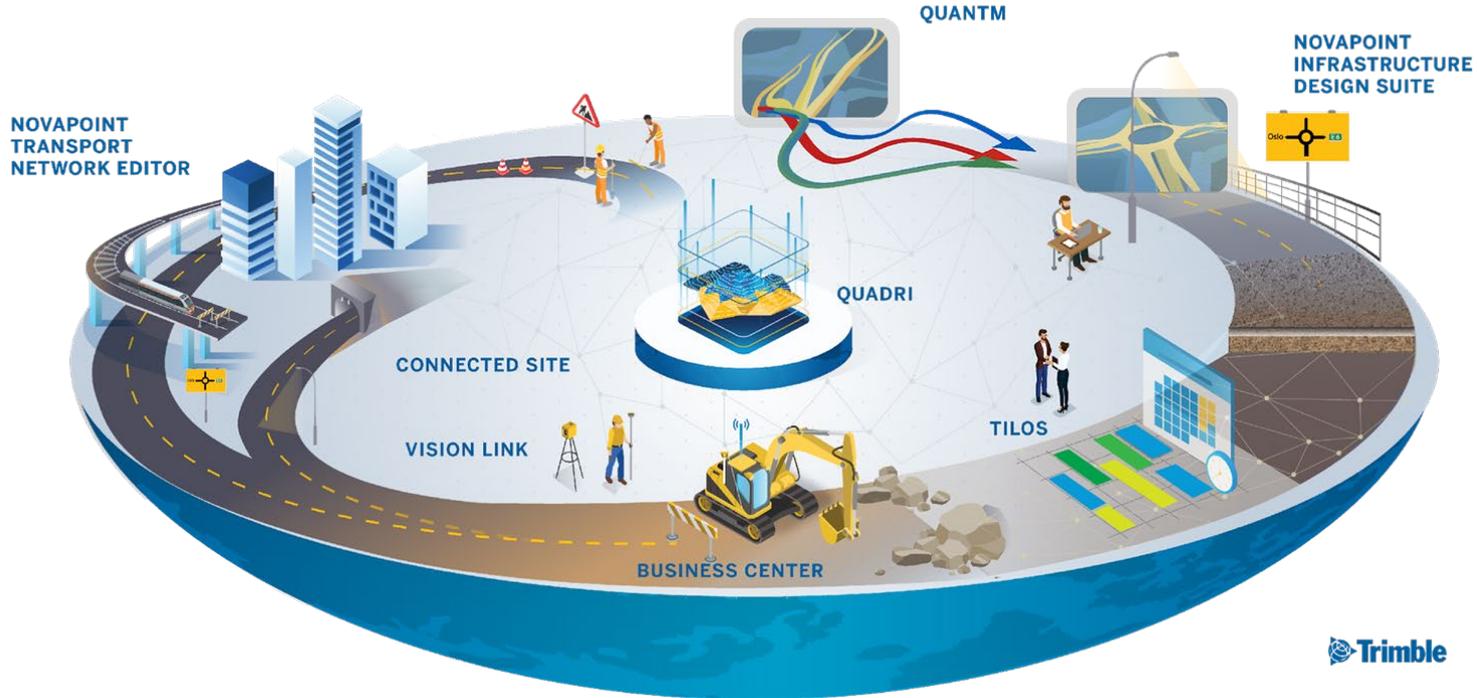
Cut and fill volumes must be calculated separately

Ny kryssfunksjon - DEMO



Connected Construction

Civil Engineering and Construction Software



≡ Keep yourself informed....



Novapoint & Quadri web: www.novapoint.com (no/se/dk)



Novapoint & Quadri resource center: <http://help.novapoint.com>

To stay updated on the latest tips & tricks, news, events and more, follow us on...



Trimble Civil Engineering Solutions



Novapoint & Quadri

Contact information:

patrick_mcgloin@trimble.com