



12d[®] International Conference

2016

12d International Innovation Awards

Aidan Bickhoff LGIP - SIDRA-2-12D Bridge

WINNER: DESIGN AND VISUALISATION



Name:	<input type="text" value="Aidan Bickhoff"/>	Category:	<input checked="" type="checkbox"/> Design & Visualisation
Position:	<input type="text" value="Civil Designer"/>		<input type="checkbox"/> Survey & Construction
Company:	<input type="text" value="Sunshine Coast Regional Council"/>		<input type="checkbox"/> Drainage, Sewer, Utilities & Rivers
Name Project:	<input type="text" value="LGIP - SIDRA-2-12D Bridge"/>		<input checked="" type="checkbox"/> Customisation
Client:	<input type="text" value="Sunshine Coast Regional Council"/>		<input type="checkbox"/> 12d Synergy





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Description of Project:

The project was spurred from a need to quickly develop multiple intersection concept design options and analysis the practicality and efficiency of these conceptual design.

My role at Sunshine Coast Regional Council is to prepare designs for inclusion in the Local Government Infrastructure Program (LGIP).

The scope of the LGIP which my team is responsible for is approximately 270M between 2016-2031, and this involves preparing multiple design options...2,3,5,10,15 sometimes more options and multiple iterations of each options are required for each potential project with the LGIP Program to be submitted to the state government for approval.

As the only Civil Designer in my team, it is a very time consuming process to design all these options and equally time consuming for other member of my team whom analyses and modelled the intersections.

It was clear that we were going to be unable to deliver the LGIP for submission to the state government without applying more resources (which wasn't an option) or missing our deadline (again not an options)

We needed a more efficient design and analysis process...from the fire and flames that is a raging Civil Designers desk the SIDRA-2-12D Bridge was born one Saturday afternoon...

Very much in the early development phase, however Rome wasn't built in a day, and we have been able to get some proof-of-concept projects with a few basic intersection components / forms exported from 12D and into SIDRA and back again!

Description of problem faced / task undertaken:

The current workflow and method of designing a static concept intersection within AutoCAD was very slow and it couldn't be dynamically updated post-optimisations from SIDRA.

Furthermore, it was a cumbersome process and required manual translation of design data and variables from paper plans (AutoCAD output) into SIDRA...and visa-versa.

- Old Workflow:
 - Prepare concept design / intersection layout in AutoCAD,
 - Plot design as scaled drawing,
 - Create a new SIDRA Project,
 - Manually determine the intersection form (T-Intersection, Signals, Roundabout etc.)
 - Scale & measure intersection details (Number of lanes, lane lengths, lane width etc.)
 - Run SIDRA Analysis
 - Optimise the design and re-analysis within SIDRA,
 - Print or PDF Intersection diagram from SIDRA
 - Modify design in AutoCAD

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How the problem was solved:

I created a 12D Macro, the 'SIDRA-2-12D Bridge' and a few customised intersection components to enable the design properties of a Roundabout and Signalised Intersection to be seamlessly transferred to SIDRA for analysis and then import the SIDRA output and re-run a design chain to update the intersection component.

New Workflow:

- Prepare concept design in 12D using a Customised Component,
- Use the SIDRA-2-12D Bridge to create and pre-populate a SIDRA intersection project
- Run SIDRA Analysis,
- Optimise the design and re-analysis within SIDRA,
- Import the optimised design into 12D using the SIDRA-2-12D Bridge,
- Run chain command to update component
- Done.... go reward yourself with some coffee and a donut, you can finish at 5pm today!

Along with the two (2) 12D Macros, one (1) to Import and the other to Export the intersection component data, there was also a few other support files to liaise with the SIDRA .dll libraries and talk to the SIDRA database.

From my proof-of-concept tests I was able to do over a weeks worth of work and refinement of designs in a few hours !!!

We anticipate that once the macros and translation files have been perfected and matured that this will lead to significantly more time savings, both from a designer perspective and a traffic engineering / analysis perspective.

Whereas previously the design, analysis and optimisation process took days (often more than a week at a time), by combing the power and flexibility of 12D Components with SIDRA, this can now be done in 4 – 5hours!

Relevant 12d screenshots and/or data attached:

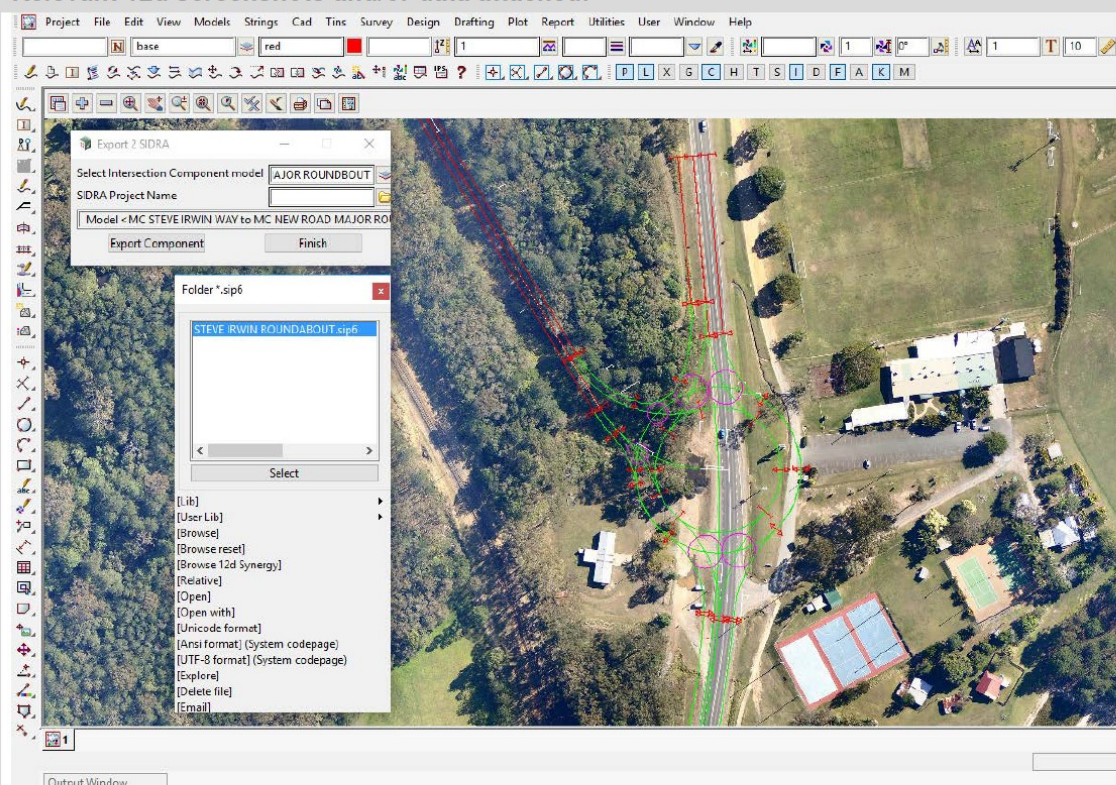


Figure 1: Export the component properties from 12D to SIDRA

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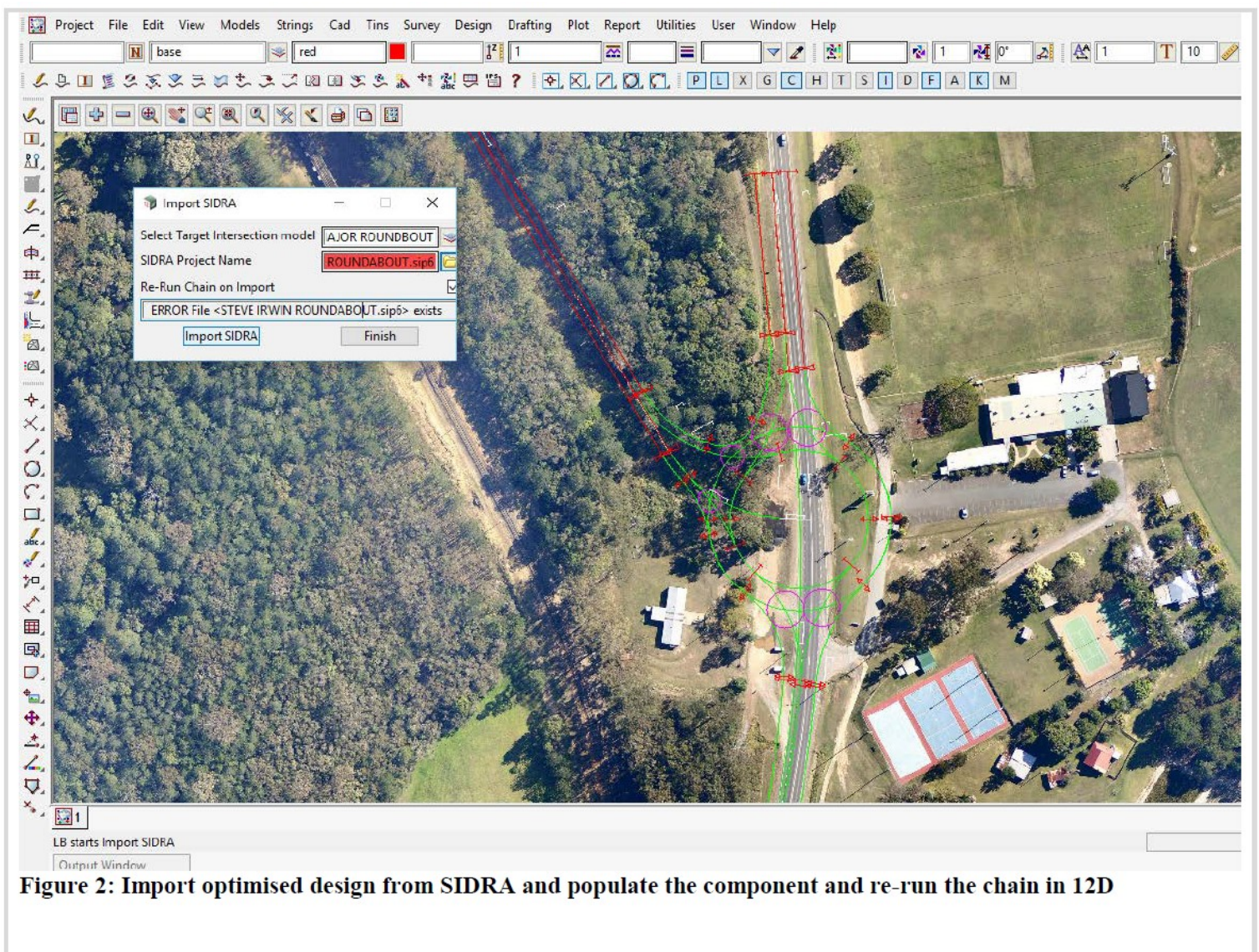


Figure 2: Import optimised design from SIDRA and populate the component and re-run the chain in 12D