An introduction to using API for SIDRA INTERSECTION 8 and VOLUMES Utility

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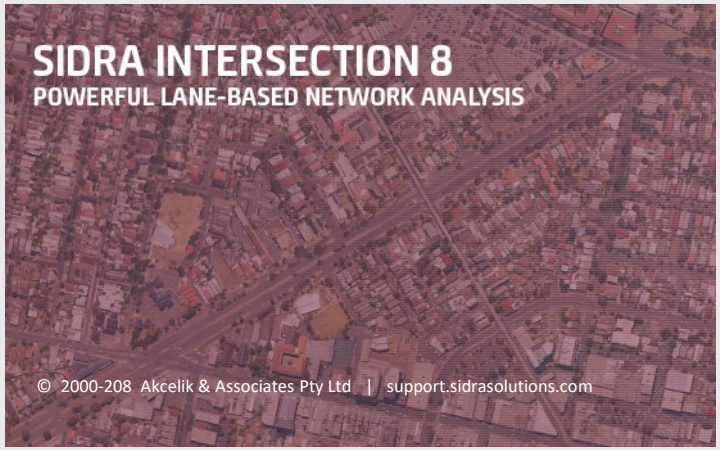
PRESENTATION OBJECTIVES / CONTENTS



SIDRA Application Programming Interface

- What is the SIDRA API?
- Methods of using the API.
- Resources available for users.
- Support in future versions.
- Examples and sample code.

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What is the SIDRA API?

The Application Programming Interface for SIDRA INTERSECTION (SIDRA API) provides a programming interface that enables external applications to communicate with the software.

This happens outside the SIDRA User Interface.

We will also discuss direct access to the database in the SIDRA INTERSECTION Project File.

What Can You Do Using the API?

- Get full programmatic access to the Site and Network input and output data contained in the SIDRA INTERSECTION Project file.
- Create a Project file and add a Site / Network / Common Control Group (CCG) / Route.
- Specify geometry data (e.g. add and remove intersection legs and lanes, specify lane configuration and lane disciplines).
- Specify phasing and timing data, and other data as required.
- Process a Site or Network.

Ways of Using the API

Three Options

- Programming interface via Component Object Model (COM)
- Programming interface via Microsoft .NET
- Direct access to project file database

COM API Access

- **Component Object Model (COM)** is a binary-interface standard for software components introduced by Microsoft in 1993.
- COM provides a stable **application binary interface (ABI)** that does not change between compiler releases.
- COM would be used when programming in languages such as **C**, **C++**, **Python**, **Visual Basic**.
- A licensed copy of SIDRA INTERSECTION must be installed on the computer in order to use the COM interface.

.NET API Access

- Microsoft introduced the **.NET Framework** in 2002 with the idea of language interoperability and to simplify programming tasks such as memory management and version control of software modules.
- Many .NET languages but **C#** is by far the most popular.
- To overcome issues with version control when SIDRA updates are released, a **Late Binding DLL** must be used. This is available from our website.
- A licensed copy of SIDRA INTERSECTION must be installed on the computer in order to use the .NET interface.

Direct Access to SIPx File Database (1)

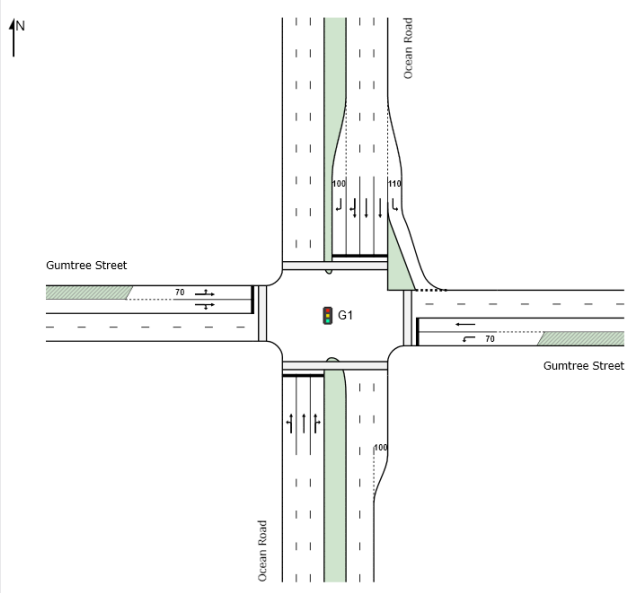
- The SIDRA Project File is a Compact SQL database and can be edited directly using SQL commands.
- Changing to SQLite in Version 9.
- It is not required to have SIDRA INTERSECTION installed on the computer to edit the Project File in this way.

Direct Access to SIPx File Database (2)

- There are no limitations or error checking when accessing the Project File in this way.
- Reading of any data from the database is OK.
- Writing or changing data should only be done in limited ways for items that will not have any interaction with other data, e.g. Volumes, Lane Width.
- Operations like removing a lane or leg are likely to have side-effects that will not be taken care of correctly and can lead to a Project File that can no longer be processed or used via the User Interface.

Limitations and Precautions

- Site and Network **Layout Pictures** can be created from the API but other graphical outputs are not available.
- You must not access the same Project File through multiple programs simultaneously (risk of data corruption).
- Creating unique names and IDs for Sites and Networks is the API programmer's responsibility.
- SIDRA INTERSECTION can be run and a specified project opened via a command line but there is no facility for Site selection.



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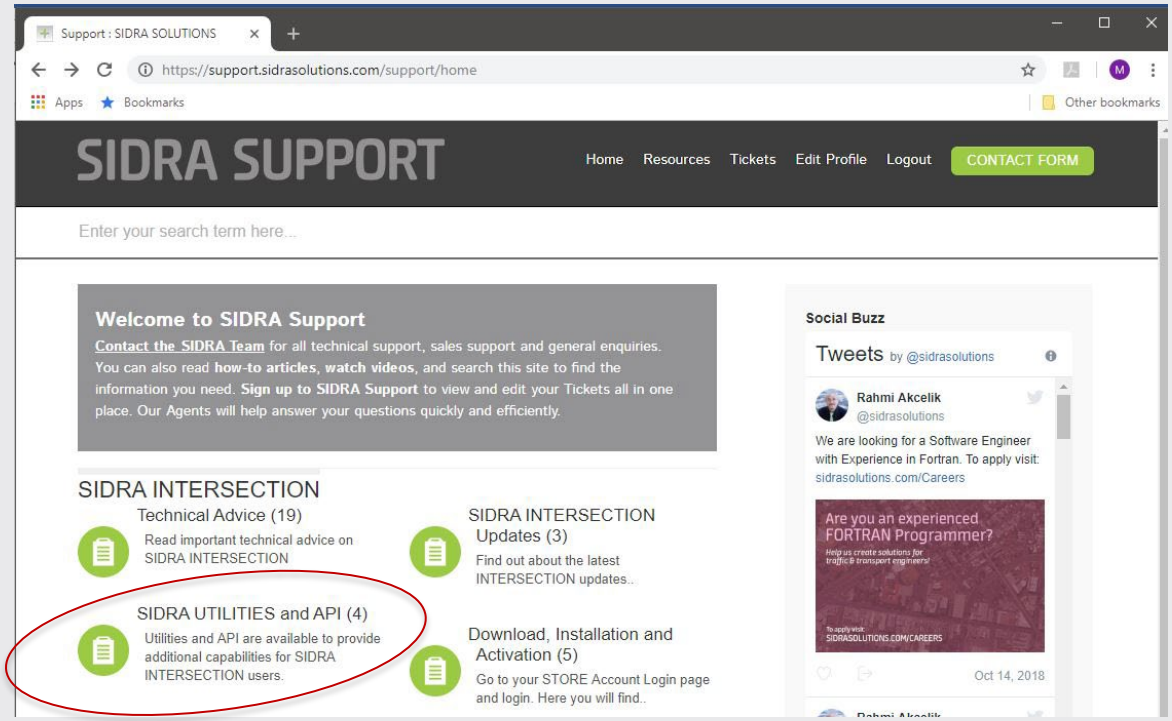
Resources for Users

SIDRA SUPPORT Website



https://support.sidrasolutions.com/support/solutions

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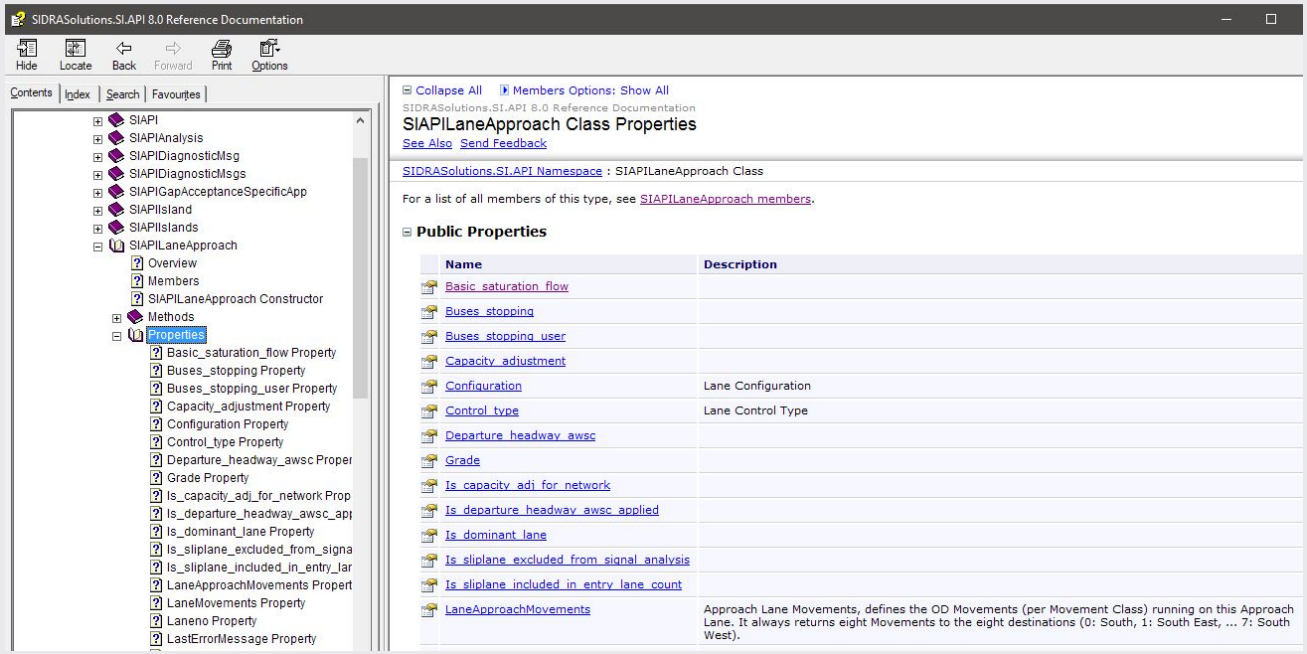
Resources for Users

- **Help File** with complete listing of **Classes**, **Properties** and **Methods**.
- Also gives insight into the project file **database structure**. Most of the names and data structure in API are the same as the SQL database.



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Future Support

- We will try to maintain a similar structure in the API for future SIDRA Versions to minimise changes that would be necessary to existing API programs.
- Current SQL Compact will change to SQLite in SIDRA Version 9. This would only affect programs that access the SIP file data directly.

Example Programs

On the SIDRA SOLUTIONS Support Website:

- CSharpSample using C# (.NET)
- CppSample using C++ (COM)
- SIAPIPythonSample using Python (COM)
- VOLUMES Excel using VBA (COM)

We will demonstrate some of these today.

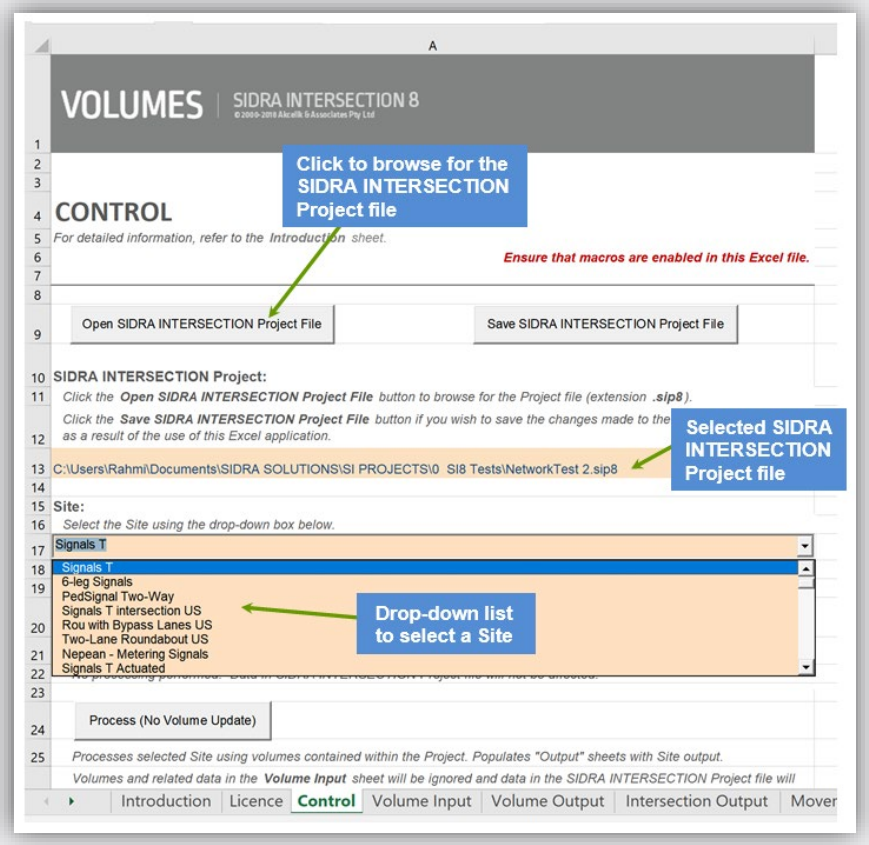
I will start by showing the VOLUMES Excel.

VOLUMES Excel Utility

The **VOLUMES utility** for SIDRA INTERSECTION is a macro-enabled Excel application:

- allows specification of **volumes and related data** within the Excel file,
- processes a selected Site in a SIDRA INTERSECTION Project using data given in the Project file or in the Excel file,
- provides Volume Output, Intersection Output, Movement Output, Lane Output and Pedestrian Output data in Excel sheets.

For detailed information about **VOLUMES Excel Utility**, refer to **SIDRA INTERSECTION 8 User Guide, Section 12**.



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END OF PRESENTATION

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