



SIDRA SOLUTIONS

Akcelik & Associates Pty Ltd  
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# GUIDE TO SIDRA INTERSECTION 4 APPLICATION PROGRAMMING INTERFACE

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## ACKNOWLEDGEMENTS

Akcelik & Associates Pty Ltd acknowledges the contributions by numerous users from many countries around the world through their valuable comments towards the development of the SIDRA INTERSECTION software.

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## CONTACT US

### Email

For general enquiries, sales information and training workshops: [info@sidrasolutions.com](mailto:info@sidrasolutions.com)

For technical support enquiries for users with current COVER: [support@sidrasolutions.com](mailto:support@sidrasolutions.com)

### Postal Address

Akcelik and Associates Pty Ltd, PO Box 1075G, Greythorn, Vic 3104, AUSTRALIA

## TECHNICAL SUPPORT

### CONDITIONS

Technical support is provided for the latest version of SIDRA INTERSECTION only, and you need to have valid **COVER**. A reasonable amount of technical support is provided to registered users under the COVER agreement. This includes assistance to make the software operate on your computer system, and investigation of example files that fail to run or produce unexpected results. It does not include assistance in the normal use of the software such as coding of input from an intersection plan. SIDRA SOLUTIONS training courses that cover these topics are offered from time to time.

### BEFORE CONTACTING AKCELIK AND ASSOCIATES

Before contacting Akcelik and Associates, refer to the relevant sections of this User Guide. Also refer to the **Technical Advice** page of the **Support** section of [www.sidrasolutions.com](http://www.sidrasolutions.com), which is frequently updated with answers to user questions. If you are unable to find an answer to your problem using these resources, please use the process described below to contact Akcelik & Associates.

### PROCESS FOR CONTACTING AKCELIK AND ASSOCIATES

To expedite support services, we prefer electronic communications via EMAIL. Use the following EMAIL address to ensure that your message is replied to as promptly as possible:

[support@sidrasolutions.com](mailto:support@sidrasolutions.com)

#### When you send an EMAIL message:

- ensure that you have a valid **COVER**,
- provide your **Customer ID** and **Licence Type** which can be found in the **About** dialog under the SIDRA INTERSECTION button (top left corner of the user interface),
- include your **phone number** and **organisational details** in your EMAIL message,
- describe your problem succinctly, and include any error messages reported by the program (**Message Console**), and
- if it is a problem with input and output, attach the **Project (sip)** file in a zipped folder, or if it is a computer system problem, give details of your computer.

## GUIDE TO SIDRA INTERSECTION 4 APPLICATION PROGRAMMING INTERFACE

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## 1. INTRODUCTION

An **Application Programming Interface (API)** has been introduced in SIDRA INTERSECTION Version 4 in order to enable users to interface other programs to SIDRA INTERSECTION. In addition to the API, full access has been provided to input and output data that resides in the Project File database. New input and output data structures were developed for this purpose. This document provides technical information about the SIDRA INTERSECTION API.

The **SIDRA INTERSECTION API** provides a simple programming interface that enables external applications to communicate with SIDRA INTERSECTION. This API provides the following capabilities:

- access to input data (currently limited to Volumes and some related data),
- access to most output data that appear in the Intersection Summary, Movement Summary and Lane Summary output reports,
- programmatic access to the Site structure contained in a Project, and
- a method for processing (running the program).

The API assembly can be accessed natively from any .NET (3.5 SP1 Minimum) programming language or it can be accessed via classes exposed by COM. The API defines a number of classes / objects which define a simple hierarchy for a SIDRA INTERSECTION Project.

**A licensed version of SIDRA INTERSECTION must be installed on a computer before the API can be used. The API will not work with a Trial Version of the software.**

General information on SIDRA INTERSECTION API, including information about the material available for download from the SIDRASOLUTIONS website is presented in *Section 2*, and information about two sample API applications (**Volumes** Excel application and **Site Comparison** program) is presented in *Sections 3 and 4*.

## 2. GENERAL INFORMATION

### *Documents and Applications*

The following documents providing technical information and sample API applications are available for download from the SIDRA INTERSECTION API page on the SIDRASOLUTIONS website. They are provided for SIDRA INTERSECTION 4 users and programmers who want to develop API applications.

- **SIDRAINTERSECTION4\_API.pdf:** General information about SIDRA INTERSECTION API and sample programs.
- **Volumes\_SI40API.xlsm:** This sample Excel application allows specification of Volumes and related data within the Excel file, and processes a selected Site in a SIDRA INTERSECTION Project using data given in the Project file or in the Excel file, providing Intersection Summary, Movement Summary, Lane Summary and Pedestrian Movement outputs.

The **Volumes** application requires **MS Office 2007** use with macro-enabled Excel file extension **xlsm**.

- **SiteComparison\_SI40API.exe:** Sample API program written in C#. This API program processes one or two selected Sites in a SIDRA INTERSECTION Project, providing Intersection Summary output (for vehicle movements only) and comparing the output statistics when two Sites are selected.

The file **LB\_SI40API.dll** must be present in the same folder as the **Site Comparison** program. This DLL provides connection to the SIDRA INTERSECTION 4 API and will function correctly with future updates to Version 4. It will not work with Version 5 or later versions where new versions of the API applications will be required.

For the use of **Volumes** Excel application and **Site Comparison** program, a SIDRA INTERSECTION Project file (extension **sip**) needs to be prepared first. Once the Project file is ready, the SIDRA INTERSECTION software should be closed. Simultaneous running of SIDRA INTERSECTION and any API application must be avoided. Otherwise, various problems and data updating issues will result due to trying to access the same database from two different programs.

### *Documents for Programmers*

The following documents are available for the purpose of programmers who want to develop API applications for SIDRA INTERSECTION 4:

- **Help\_SI40API.chm:** This is the API help file for programmers. This provides detailed information about all parameters and the structure accessible in the SIDRA INTERSECTION API.
- **SIPStructure\_SI40API.pdf:** This document provides detailed information about the SIDRA INTERSECTION Project database.

Programmers should note that the file **LB\_SI40API.dll** uses late binding to access the SIDRA INTERSECTION assemblies in the GAC. This resolves issues related to assembly version changes when SIDRA INTERSECTION updates are applied. .NET applications developed to use the SIDRA INTERSECTION API should use this DLL to access the API.

Updated versions of LB\_SI40API.dll may be released in the future either to add functionality or to fix any bugs that are discovered. It would be advantageous if API applications continued to work with any later version and therefore tying the DLL reference to a specific version is not recommended.

Programmers requiring information about the DLL interface should first refer to the **Help\_SI40API.chm** help file. More detailed information about the DLL interface, the COM interface, and **C# source code** for the sample API program **Site Comparison** are available on request.

For all queries and requests related to API, please send an email to:

**info@sidrasolutions.com**

### ***Feedback***

For feedback on the use of SIDRA INTERSECTION API applications and experience with programming using SIDRA INTERSECTION API, please send email to:

**support@sidrasolutions.com**

### 3 VOLUMES EXCEL API APPLICATION

The **Volumes** Excel API application for SIDRA INTERSECTION allows specification of Volumes and related data within the Excel file, and processes a selected Site in a SIDRA INTERSECTION Project using data given in the Project file or in the Excel file, providing Intersection Summary, Movement Summary, Lane Summary and Pedestrian Movement outputs (the Excel file name is **Volumes\_SI40API.xlsm**).

This application requires **MS Office 2007** use with macro-enabled Excel file extension **xlsm**.

The **Volumes** Excel application has two purposes:

- to enable volume data to be written from Excel into the Project file, thus:
  - facilitating the running of several Sites with the same set of volumes, and
  - allowing programmatically-generated volumes to be passed into Site data without retyping, and
- to enable the user to have the output in the Excel file, and also copy and paste the output into a Word document if desired.

The Movement Summary is given for Vehicles only. Results for Pedestrians are given in a separate sheet.

#### *How to Use the Volumes Excel API Application*

To use the Volumes Excel API application, open the Excel file **Volumes\_SI40API.xlsm**. **Enable macros if they have been disabled**.

Select the **Control** sheet (see *Figure 3.1*). Click the **Open SIDRA INTERSECTION Project File** button and browse for SIDRA INTERSECTION Project file (extension **.sip**). The full path of the Project file will be shown.

Select the **Site** to be used from a drop-down box.

Three functions are provided and these are accessed by clicking the buttons in the **Control** sheet.

- **Get Volumes**  
This function will copy the Volume and related data for the specified Site from the SIDRA INTERSECTION Project database and insert them into the **Volume Input** sheet in Excel. The SIDRA INTERSECTION Project will not be affected by this operation. Any existing data in the Volume Input sheet will be overwritten. No processing will be performed.
- **Process (No Volume Update)**  
This function will process the specified Site using the volume data contained within the Project. Volumes in the Excel Volume Input sheet will be ignored and data in SIDRA INTERSECTION Project file will be unaffected using this option. Resulting Intersection, Movement, Lane and Pedestrian output data will be written directly into the various output sheets in Excel.
- **Update Volumes & Process**  
This function will insert volumes and related data from the Volume Input sheet into the SIDRA INTERSECTION Project database, overwriting any existing data for the Site. The Site will then be processed and the resulting Intersection, Movement, Lane and Pedestrian output data will be written directly into the various output sheets in Excel.

The **Update Volumes & Process** function can also be used to update some volume data but leave the remaining data intact in the Project file before processing. This could be useful, for example, in a case where main road volumes are fixed but varying volume scenarios are being examined on a side road in relation to a proposed development. Any volume data cells that are *blank* (not zero) will not update the corresponding volume data items in the SIDRA INTERSECTION Project database.

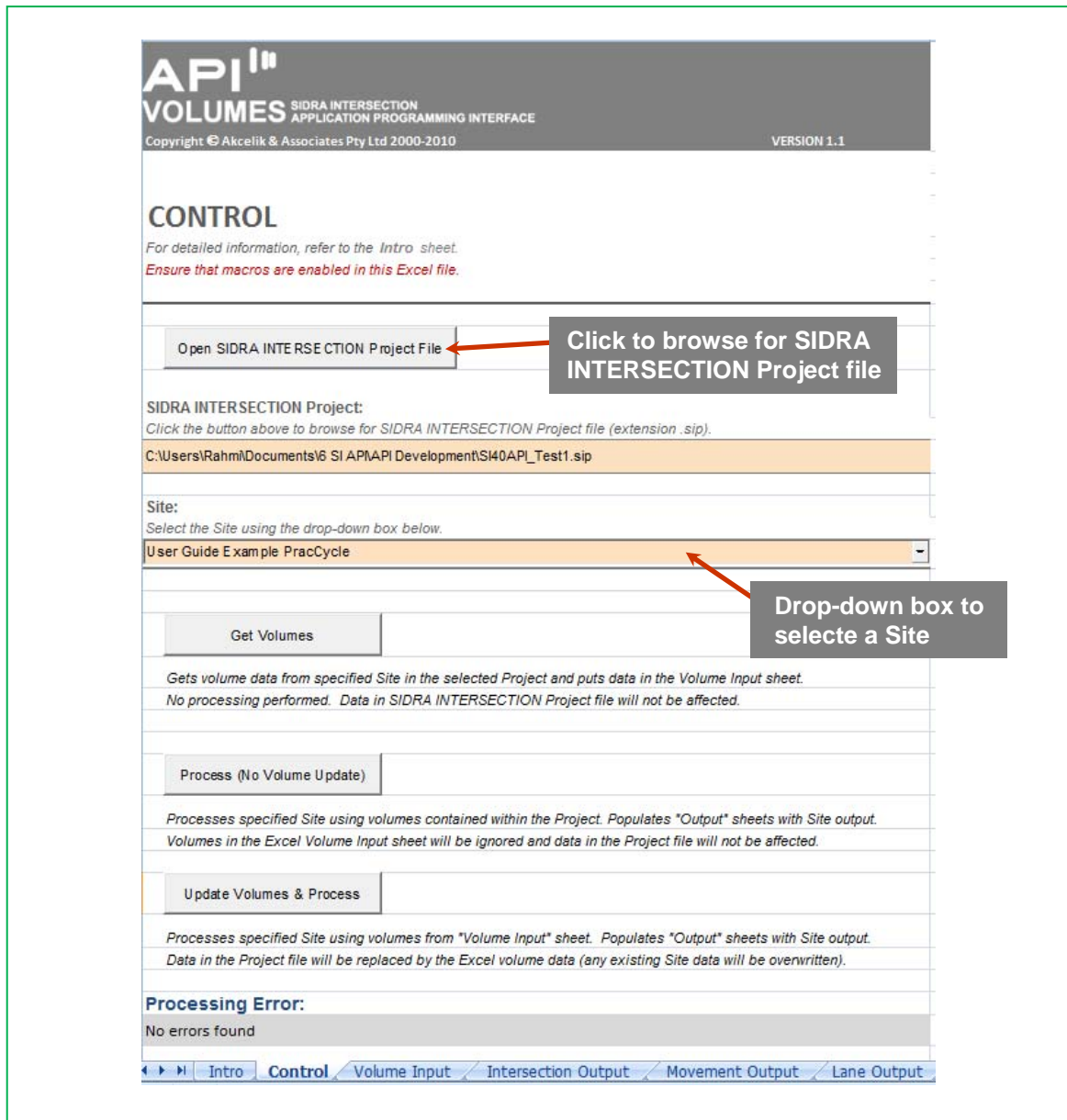


Figure 3.1 - The Volumes Excel API Application - Control sheet

### ***Processing Errors***

Processing via the **Volumes** Excel application is subject to the same error checking that is done when processing using the SIDRA INTERSECTION program. If no errors are found, the words "No errors found" will appear under the **Processing Error** title at the bottom of the **Control** sheet. If errors are detected, an error message will be shown in red.

The error messages are the same as those that appear in the Message Console in the SIDRA INTERSECTION program. If the errors are not directly related to the volume data in Excel, it will be necessary to use the SIDRA INTERSECTION program to fix them.

### ***Customisation of the Volumes Excel API Application***

Users with knowledge of Excel and Excel VBA programming may wish to customise the Volumes Excel API Application.

Within the Control and Volume Input sheets, cell positions must not be changed (e.g. by adding or removing rows) as this will stop the application from working correctly. The Output sheets are locked and cannot be modified.

New sheets can be added without any limitation, but you must not change the names of any existing sheets. Selection and copying of Output sheets is allowed, and new sheets that refer to data in the Output sheets may be added.

Using VBA programming, significant changes could be made to the application, such as customisation of output. This requires some knowledge of VBA programming. We will provide basic assistance to users with current COVER in relation to macro programming. However, the amount of assistance will be limited to the provision of programming references directly related to the SIDRA INTERSECTION API. We cannot provide general assistance in VBA programming.

## 4 SITE COMPARISON API PROGRAM

The **Site Comparison** API program for SIDRA INTERSECTION is a C# program that processes one or two selected Sites in a SIDRA INTERSECTION Project, providing Intersection Summary output (for vehicle movements only) and comparing the output statistics when two Sites are selected. The executable file name is **SiteComparison\_SI40API.exe**.

The program has a simple interface for ease of use (*Figure 4.1*). The output can be printed directly, or easily copied and pasted into Word or Excel files.

The file **LB\_SI40API.dll** must be present in the same folder as the **Site Comparison** program. This DLL provides connection to the SIDRA INTERSECTION 4 API and will function correctly with future updates to Version 4. It will not work with Version 5 or later versions where new versions of the API applications will be required.

### How to Use the Site Comparison API program

To start the program, double click the executable file **SiteComparison\_SI40API.exe**. The **program name** will be displayed at the top left corner of the user interface (*Figure 4.1*). The **version number** can be viewed by opening the **Help - About** dialog.

Initially, the user interface will display two empty **Site Lists** (**Site 1** and **Site 2**) on the left-hand side and an **Output** window with only headers shown on the right-hand side.

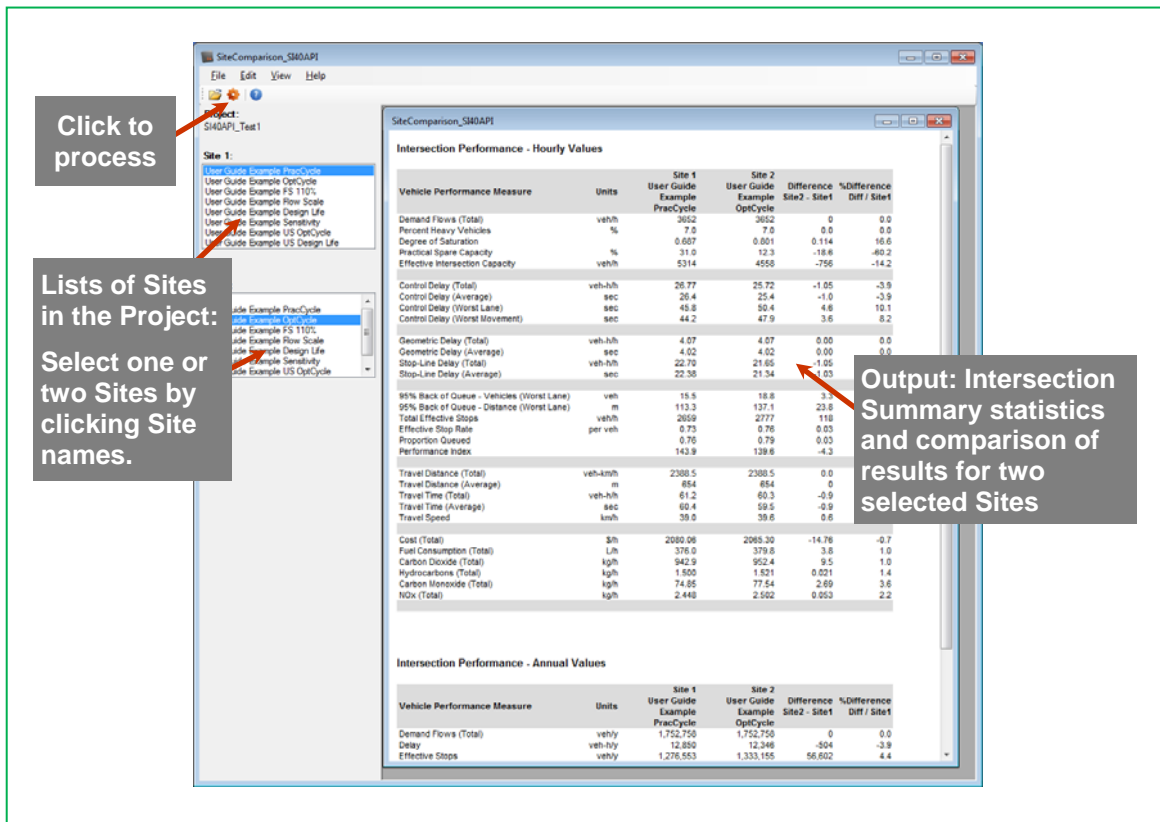


Figure 4.1 - The Site Comparison program user interface

Click the **Open** button (or use **File - Open**) to open a SIDRA INTERSECTION Project file. All Sites existing in the selected Project will be displayed in each Site List. The Project must include at least one Site.

Select **Site 1** and **Site 2** in the Site Lists by clicking on the Site names. Site 2 selection can be **None**.

For comparison of Site statistics, the two selected Sites must both use the same units (Metric or US Customary).

Click the **Process** button (or use **File - Process**). The results will be shown in HTML format in the Output window. Intersection Summary statistics are shown in two tables (Hourly Values and Annual Values). The selected Site names will be indicated in the headers in the Output.

To print the results, use **File - Print** or right-click the Output pane area and click **Print**.

You can copy the results and paste in a Word document. Windows selection methods apply. To select all results, you can right-click the Output pane area and click **Select All**.

You can save the Output in HTML file format using **File - Save Output**.

Various functions in the right-click menu (e.g. Encoding, Export to Microsoft Excel, Convert to Adobe) are not available although they are not blocked.

## REFERENCES

AKCELIK & ASSOCIATES (2009). *SIDRA INTERSECTION User Guide (For Version 4)*. Akcelik and Associates Pty Ltd, Melbourne, Australia.